Introduction

The following heat pump diagnostic flow charts and accompanying wiring diagrams are to be used in diagnosing and repairing Hayward & Summit branded pool heat pump systems. They are not intended for use with any other manufacturers heat pumps.

Summit Branded heat pumps are in Section 2 and have their own table of contents starting on page 32.
However, there are certain portions of Section 1 that can be used on all brands, and these are denoted by underlining them in the table of contents

Heat Pump pool heaters are similar to the heat pumps for home heating and cooling in that they contain refrigerant. As such, service personnel should observe EPA regulations for refrigerant handling. Pool heat pumps operate on 240 volts A/C. There is a risk of electric shock at all terminals and the heat pump should only be serviced by trained personnel.

To use this guide, determine the model number of the heat pump and the nature of the problem.
Refer to page one to find the appropriate page for the problem and follow the flow charts to the solution.

If you have further questions
Call Hayward's tech service department at 908-355-7995

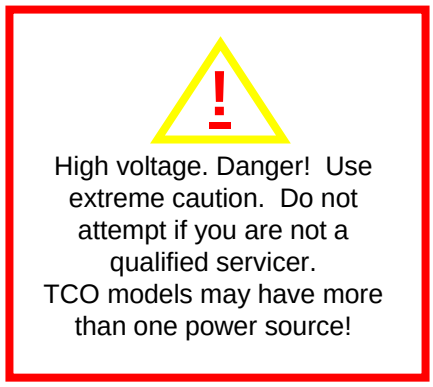


Table of Contents

What's The Complaint?

Unit not coming on

Runs for a few seconds and then shuts off

Running but not heating
Refer to page 15

Leaking water
Refer to page 17

Noisy
Refer to page 17

What type of control for your heat pump?

Digital Display Units → Diagnostics begin on page 2

Non-Digital Display Units → Diagnostics Begin on Page 11

HPABG /HP380 → Diagnostics Begin on Page 14

Model number is found on the data plate located on the bottom right of the electrical cover on Hayward Heat Pro units.
On Summit style Heat Pumps the data plate is located on the left side of the base pan

What's On The Display?

PS → Water flow issue. Heater requires a minimum flow of 30 GPM. The water pressure switch is not sensing pressure. Is filter pump on and filter clean? Bypass closed?

SH(SF) HI(HP) Refer To Page 3

LP Refer To Page 4

OP(120) Refer To Page 7

... Refer To Page 7

Blank Display Refer To Page 8

dEF Refer To Page 10

cOP Refer To Page 10

cSH Refer To Page 10

NO → Turn on filter pump or clean filter.

YES → Check continuity (ohms reading) of pressure switch. Ohms reading zero? Fig A. Unit off & filter pump running.

YES → Check all connections at display board and wire harness. Connections OK?

NO → Correct connections.

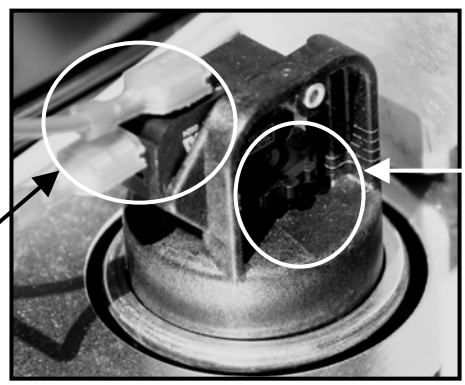
YES → Replace display board and wire harness

NO → With meter hooked up, adjust dial on switch counter clockwise until switch closes- reading of zero Ohms. Fig A Switch closed (zero Ohms)?

YES → Unit operates.

NO → Replace pressure switch.

Figure A



Disconnect these wires and place the test probe ends at each terminal on the switch.

Rotate dial counter clockwise to check for mis-adjustment. Switch will 'close' and reading will be zero Ohms.

What's On The Display?

HI(HP)

Does heat pump run for a short time, then cut off showing Hi or HP?

YES → See Note 1

NO → Is this a new install?

YES → Check for loose wires to interface board. Check for loose wires from interface board to control board. See Fig. B

NO → Check Ohm's reading on HP switch. Reading 0 Ohms?

NO → On R-22 units abandon existing switch. Replacement switch is a screw on switch. Use swivel tee on high side access port. See Fig. C

For Summit and 4T Hayward models

The existing switch is a screw on, simply replace existing with new.

YES → Check all wires and connections to interface board and from interface board to display board. Wires and connections OK?

NO → Correct wiring

YES → Replace display and wiring harness

SH(SF)

Is this a new install?

NO → Water Sensor failure. Check sensor with values in Chart 1. If values are not correct, replace sensor. Refer to chart, Page 24. Pg. 34 for Summit units.

YES → Check for loose wires to interface board. Check for loose wires from interface board to control board. See Fig. B

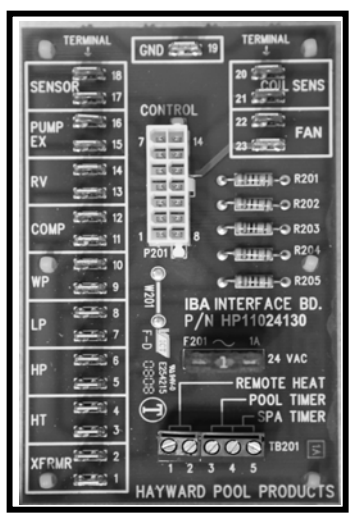
Note 1

Heater runs for a while then shuts off and shows 'HI or HP' on display. Low water flow is normally the problem. Check filter and pump. A common problem when running unit on spa only exists in the summer when spa temperature of about 100° F is reached and the unit shuts off with the 'HI' fault. At higher outdoor and water temperatures a higher flow rate may be required for proper operation. The unit requires a minimum of 30 GPM, but may require more under these conditions.

On 3T and 4T heat pumps this can also be a sign of a failed TXV. Check capillary tube to TXV bulb for failure. See also Pg. 6

Figure C

Figure B
Interface Board



What's On The Display?

LP → Low refrigerant pressure.

Does LP code flash constantly? **YES** → See Page 5

NO

Does heater run for a few seconds and stop? **NO** → See Page 5

YES

Does fan motor come on? **NO** → Check fan capacitor See note 9 on pg. 16 check fan motor.

YES

Attach manifold gauges to heater. Start heater again. Does low side pressure drop below 30 psi for R-22 unit or 80 psi on a R-410A unit? Figure C. **NO** → Replace LP switch. See Note 2 below

YES

Check for refrigerant leak. Leak found? **YES** → Repair leak and recharge.

NO

Add 1 lb. of refrigerant. Does this make a difference in operating pressure? **YES** → There has been a loss of charge. Re-check for leaks, recharge and test.

NO

Check expansion valve. See page 6

Note 2

Abandon existing switch on Hayward R-22 units. Replacement switch is a screw on switch. Use a swivel tee on the low side access port.
On Summit and R-410A (4T) Hayward units the existing switch is screw on.
Replace existing with new.

Figure C

Low side charging port

What's On The Display?

LP

Attach low side (blue) manifold gauge hose to heat pump.
See Figure E

Is pressure reading > 65 psi for R-22 units? or >120 psi for R-410A units?
See note 3 below

NO

Perform leak check on heat pump. Leak found?
Some refrigerant may need to be added if unit is completely empty

YES

Repair and recharge as needed.

NO

Remove tube to water pressure switch from top of exchanger and check for refrigerant in the water. Refrigerant detected in water?

YES

Unit breached. Replace unit.

YES

Check Ohm's (continuity) reading on LP switch. Reading zero Ohm's?
See Fig. D

NO

Replace LP switch.
See Note 4 Fig. E below

YES

Check all wires and connections to interface board and from interface board to display board. Wires and connections OK?

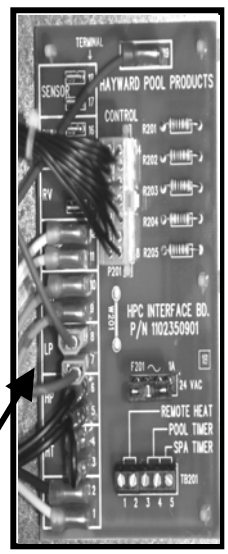
YES

Replace display board and wire harness

NO

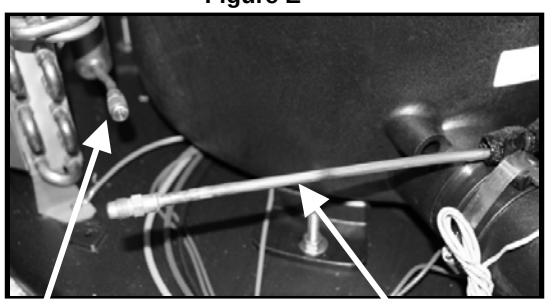
Correct wires or connections

Figure D



Blue LP wires. Remove and connect multimeter to wire ends and measure Ohm's reading. Set scale on meter to lowest setting.

Figure E



Low side

High side marked with a red tag

NOTE 3

If water comes out of access port when removing gauge hose, unit is breached and will have to be replaced.

NOTE 4

Abandon existing switch for Hayward R-22 heat pumps. Replacement switch is a screw on switch. Use a swivel tee on the low side access port.
For Summit and Hayward R-410A units replace existing screw on LP switch with new.

Checking Expansion Valve (TXV)

After adding 1 lb. Refrigerant to System, there is little or no difference in operating pressures

Note:
On 3T and 4T heat pumps failure mode for a failed TXV is normally **HI** error code. Check water flow, and valve positions to rule out other possible reasons for HI code. Check capillary to bulb for breakage. Be sure heat pump is actually failing on High Pressure by attaching gauges to service ports. If so replace TXV.

Check capillary tube from TXV head to bulb attached to suction line near left edge of evaporator coil. Capillary tube broken or cracked? See Note Below

YES → Replace TXV

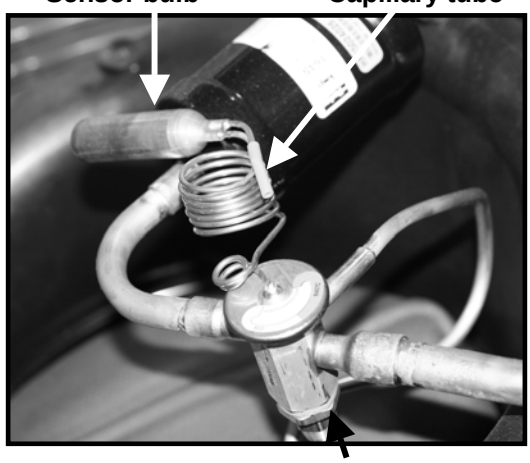
NO

3T Models

Remove cap from bottom of TXV using 5/8" wrench, and attach 3/16" valve wrench to adjusting stem of TXV.Turn valve clockwise until closed,then turn valve counter-clockwise until completely open, then turn valve clockwise until closed again. Now open valve number of turns listed by model in **Table1** below. Restart heat pump. Heat pump runs normally?

YES → Heat pump runs

NO → Replace TXV



Note
On Hayward units only heat pumps with 3T in model number have adjustable TXV.
All Summit R-22 heat pumps have adjustable TXV
For all other models replace TXV if no difference In operating pressures after adding refrigerant.

Adjust TXV with valve wrench

Table 1

HP6003T	2.5 turns
HP21003T	3.5 turns
HP21203T	1.75 turns

Summit TXV settings can be found on page 33.

Remove cap

What's On The Display?

OP(120) → Water sensor failure. Test sensor against resistance-water temperature chart on page 24. See Fig. F

→ Readings OK?

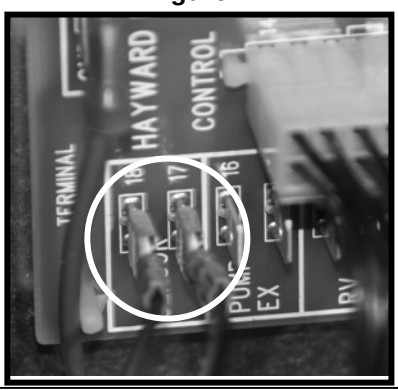
- **NO** → Replace sensor See Figure G
- **YES** → Check all wires and connections to interface board and from interface board to display board. Wires and connections OK?
  - **YES** → Replace display board and wire harness
  - **NO** → Correct wires or connections

...

→ Heater is in standby mode. Press Pool or Spa to energize. Does unit energize?

- → OK
- **NO** → Replace display board.

Figure F



Remove top two wires. Test Ohm's reading by hooking meter leads, one to each wire. Refer to chart on page 26 for correct reading.

Figure G

Sensor is located in water inlet pipe To replace loosen band clamp and pull sensor out of tube.

Note
In some older model heat pumps temp. sensor is located in well on left side of heat exchanger base.

What's On The Display?

Blank display, unit not running.

TCO model?

NO

YES

Remove front panel. Check voltage between contactor L1 & L2. Voltage 240volts? See Fig. H

YES

Remove front panel. Is power connected to compressor (heater) contactor? See Fig. J

NO

Correct wiring See Fig. J

NO

YES

See page 8

Turn off power to heater! Check circuit breaker at main. Check for short to ground, T1 to ground & T2 to ground. Short to ground found? See Figure H & Note 7

High voltage. Danger!

YES

Check fan and compressor to ground. Replace as needed. If compressor is shorted contact Tech Support 908 355-7995

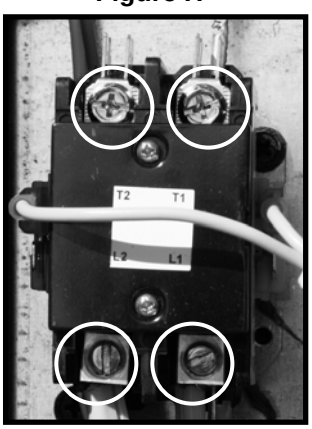
NO

Main power feed problem

Note 7

To check for grounded unit (short), turn off power to heater. Set multi-meter to zero Ohm's. Place one test lead on T1 and then T2 and the other test lead to grounding lug in panel.(Figure H) Any reading of continuity indicates a grounded component. Disconnect all wires to fan and check each one to ground lug. A reading of continuity means a bad fan motor. Check the compressor the same way. Be sure all wires for each component are disconnected before testing.

Figure H



Check both T1 & T2 to ground lug in panel for short.

Check across L1 & L2 for 240 volts.

Figure J

On TCO control panel. Left contactor set is heater contactor.

What's On The Display?

Blank display
240 volts between L1 & L2?

YES

Check for 24 volts between terminals 1 & 2 on the interface board. 24 volts?
See Fig. L

NO

Check for 24 volts AC between blue and yellow wires from transformer. 24 volts?
See Fig. L

YES

Replace display board

YES

Check for blown fuse on interface board. Fuse good?
See Fig. M

NO

Check low voltage wires For shorts or grounds. Then replace transformer

YES

Replace interface board

NO

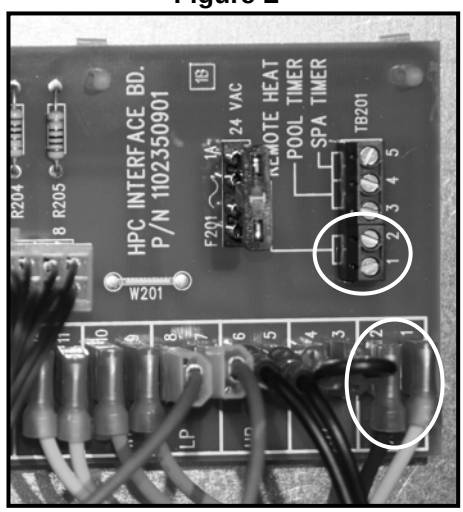
Check all low voltage wires, and safety switches, for shorts or grounds
Replace fuse.

Figure M

Replace **only** with 1 amp fuse

High voltage.
Danger!

Figure L



Check for 24 volts at terminals 1 & 2.

Remove bottom two leads (yellow and blue) and check for 24 volts AC

What's On The Display?

dEF

cOP

cSH

Coil Sensor error

Heat pump is in Defrost Mode
After 2 hours the heat pump will automatically resume normal operation.
(See note 1 below)

Heat pump resumes normal operation after 2 hours?

YES

Heat Pump working

NO

Check coil temperature sensor using chart on page 16.
Sensor reading correctly?

NO

Replace sensor

YES

Check wiring to sensor. And wiring harness from interface to control board.
Wiring OK?

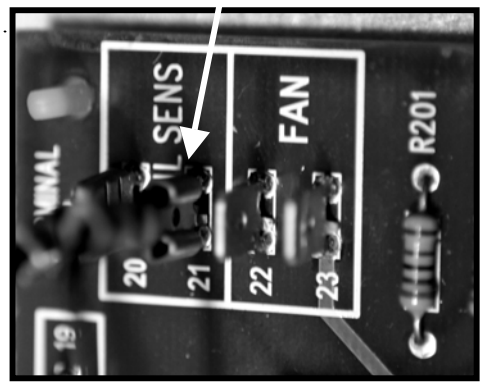
NO

Correct Wiring

YES

Replace control board

Coil sensor connection at interface board



NOTE 1

Defrost operation of heat pumps (3T and 4T Models)

When the coil temperature sensor senses that the coil temp. is low enough that frost will start to form on the coil,it will cut the compressor off and continue to run the fan for 15 minutes. After 15 minutes it will check the coil temp. again.
If the temperature has reached operating temperature the heat pump will resume normal operation. If it hasn't, the heat pump will continue to run the fan with the compressor off for an additional 15 minutes before checking the coil temperature again.
The heat pump will go thru a 3rd fan only cycle, and if the temperature is still not sufficient for safe, normal operation, the heat pump will shut down and display dEF.
The heat pump will be off for 2 hours, and then will begin the defrost process as described above, again.

What's the problem?

Non-Digital display models

Is power light on?

YES

With pump running and thermostat turned to max, check voltage between terminal 1 on TB1 and the blue wire on time delay relay. 24 volts?
See figs. O & Q

NO

Check voltage across connectors on blue and yellow wires leading from transformer. 24 volts?
See Fig. R

NO

Replace transformer

YES

Go to page 12

YES

Check voltage across black/red wire and yellow wire on contactor. 24 volts?
See Fig. P

NO

Replace time delay relay

YES

Replace contactor

NO

Check voltage at contactor L1 & L2. 240 volts?

NO

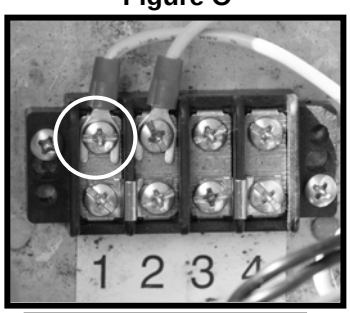
YES

Replace power light. Return to power light on diagnostic if needed after light replacement

Refer to diagnostics beginning on page 7

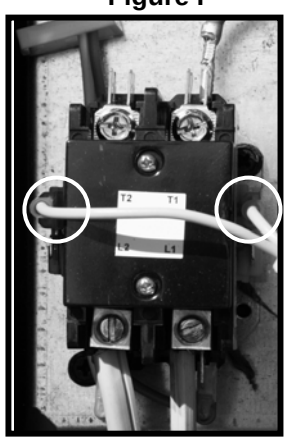
High voltage. Danger!

Figure O



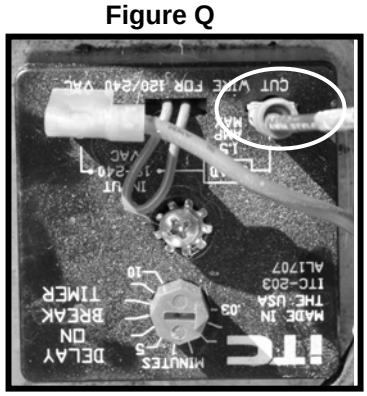
Check for 24 volts between terminal 1 on TB1 & blue wire on time delay relay

Figure P



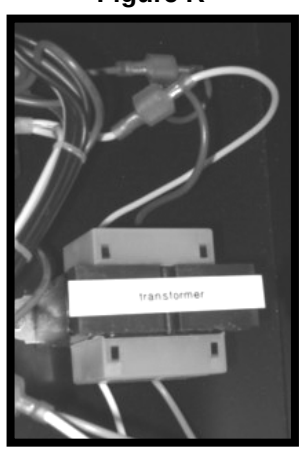
Check for 24 volts across black/red & yellow wire

Figure Q



Check for 24 volts across blue wire and terminal 1 on TB1

Figure R



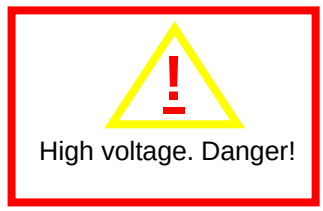
From page 11

Unit will not run. 24 volts present at transformer

Non-Digital Display Models

Safety switch open. Attach manifold gauge hoses and check low side pressure. Pressure > 80 psi?
See Fig. R

NO → Out of refrigerant. Repair leak and recharge.
See note 4



NOTE 4

If water comes out of access port when removing gauge hose, unit is breached and will have to be replaced.

YES → **Turn power off to heater**

With filter pump running

Check continuity (ohms reading) of pressure switch. Ohms reading zero?
Fig A. Unit off & filter pump running.

YES → Check continuity of LP and HP switches. Check between black wire on water pressure switch and blue wire on time delay relay. If no continuity, isolate switches and check individually. Ohms Reading zero?

YES → Go to page 13

NO → Replace switch with no continuity

NO → With meter hooked up, adjust dial on switch counter clockwise until switch closes- reading of zero Ohms.
Fig. A Switch closed (zero Ohms)?

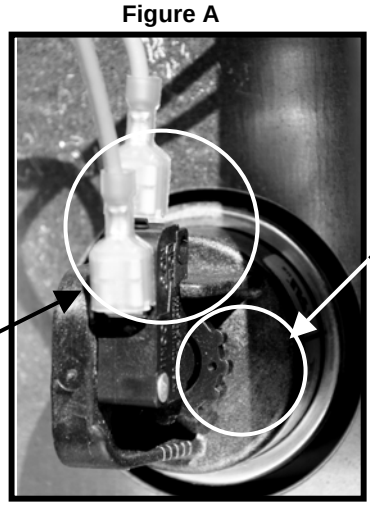
NOTE

Abandon existing switch. Replacement switch is a screw on switch. Use a swivel tee on the refrigerant access port.

YES → Unit operates.

NO → Replace pressure switch.

Figure A



Disconnect these wires and place the test probe ends at each terminal on the switch.

Rotate dial counter clockwise to check for mis-adjustment. Switch will 'close' and reading will be zero Ohms.

Figure R

Low side port

From page 12

Non-Digital Display Models

24 volts at transformer.

0 ohms resistance through safety switches

↓

Check sensor values against Chart 1 on page 24. Value correct? See Fig. V & Note 17

NO → Replace sensor

YES ↓

Check potentiometer on face plate. See Note 16 & Fig. T

↓

Ohm's reading correct?

NO → Replace faceplate

YES ↓

Replace control board

Note 16

Disconnect harness from faceplate. Attach meter leads to the two large wires leading from the control. Resistance should be from 0 Ohm's at off to 13 Ohm's at full on.

Note 17

Disconnect leads to sensor. Attach meter leads to each lead of sensor. Compare reading to Chart 1 on page 24.

Figure T

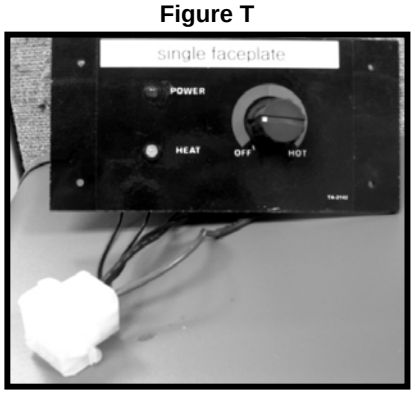
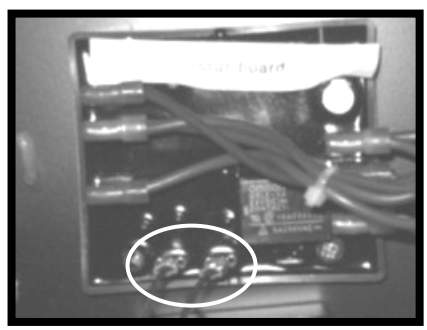
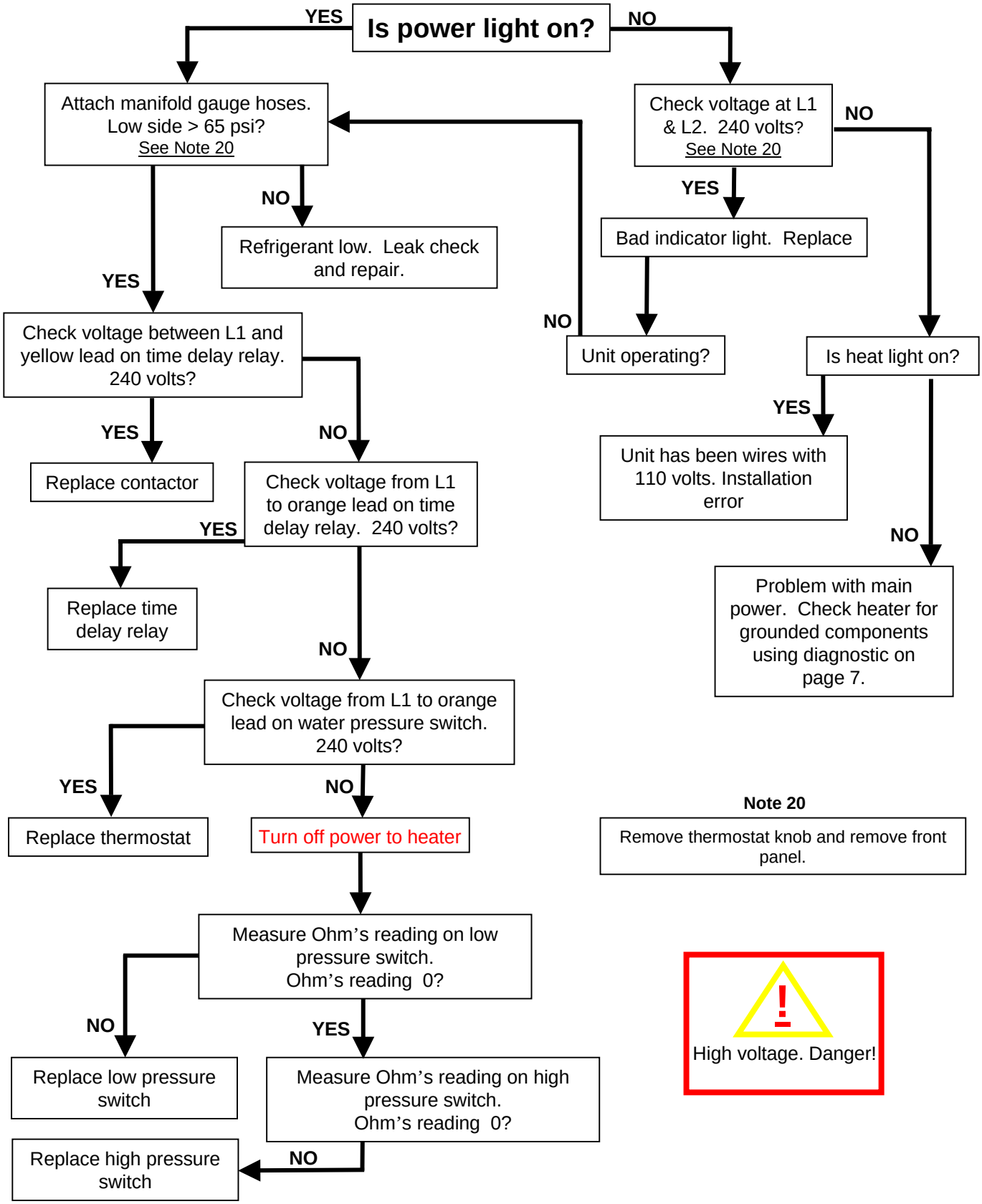


Figure V



Service Provider Diagnostic For HPABG/HP380



What's the Problem?

Running but not heating

Is air coming out of top of unit (blowing from fan) colder than the ambient (outside) air?

NO

Check unit for compressor operation by connecting manifold gauge hoses to service ports. If the compressor is running, the low side pressure will be considerably lower than the high side pressure. The high side pressure will vary depending on the water temperature and the water flow rate. If the compressor is not operating, both pressures will be the same.

YES

The difference in air temperature should be around 12 to 16 degrees, less in lower humidity conditions, 6 to 8 degrees. If this is the case, the unit is operating correctly. The problem could be too short a run time. Adjust as necessary. It may also be necessary to add a solar cover to prevent evaporative cooling of the water.

YES

Low side pressure considerably lower than high side pressure?

NO

TURN OFF POWER TO UNIT!

Check for burned wires on compressor, capacitor and contactor. Wires OK?

YES

NO

Replace wires

Check compressor capacitor. Capacitor OK? See Fig. N and Note 9 page 16

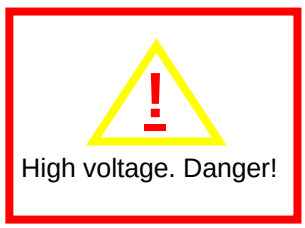
NO

Replace capacitor

YES

Check compressor for internal overload trip.

Go to page 16



From Page 15

Remove wires from compressor to capacitor and contactor. Set meter to lowest Ohm setting. Check reading between the red and blue wires. Reading of infinite resistance?

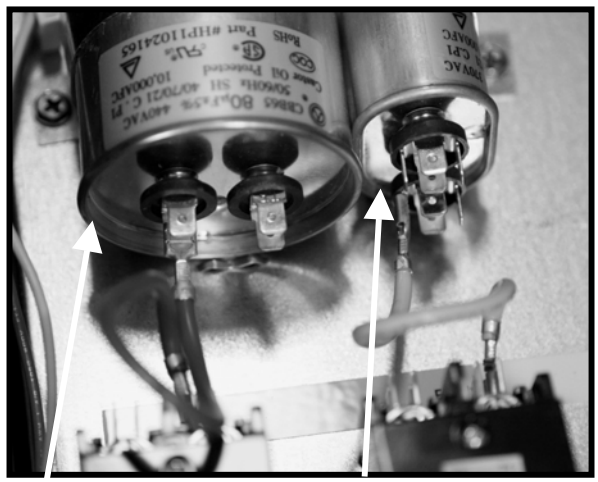
NO →

Compressor may be stuck. Install hard start capacitor between terminals on compressor capacitor and retry.
Fig. O
If compressor doesn't start Contact Tech Support 908-355-7995 For further instruction

YES ↓

Overload on compressor may be open. It must cool before it will reset. To verify, check resistance between black and blue wires. If resistance here is infinite, check between red and black. The resistance here should be less than 3 Ohms. If it is, the overload is open. Once reset it will attempt to operate again.

Figure N
Capacitors



Compressor Fan

Note 9
Checking a capacitor

Disconnect capacitor wires. With meter set at 20k Ohm scale, place test leads on terminals. The resistance should initially be high, then slowly drop towards zero. This will happen very quickly when checking a fan capacitor, and will take several seconds when checking a compressor capacitor. This indicates a good capacitor. If you have a reading of no resistance, (0.00 on your read-out) or if the capacitor does not cause the meter to "jump up " to a high resistance then fall back, the capacitor is bad. If you have a capacitance setting on your meter, place the test leads across the terminals. You should see a reading of between 6 and 8 microfarads.for a fan capacitor, and 60 to 80 for a compressor capacitor.

Note
Older models have 1 dual capacitor not individual fan & compressor capacitors. Check is the same

Note 10

Hard start kit installs on compressor capacitor terminals

Figure O

What's the problem?

LEAKING WATER

Is unit leaking when not running?

YES → Check condenser for water leaks. See Note 12

NO → Water around unit while running is normal condensation. Unit can produce as much as 3-5 gallons of water an hour, depending on conditions. Check water around unit with a chlorine test strip. Condensation will not have chlorine. Alternately, shut unit off and allow system pump to operate for 12 hours. If water dries up, it is condensation.

NOISY

Common noises and problems

Grinding	Fan motor
Screeching	Fan motor
Chattering	Bad wiring or control board.
Buzzing	Contactor See Note13

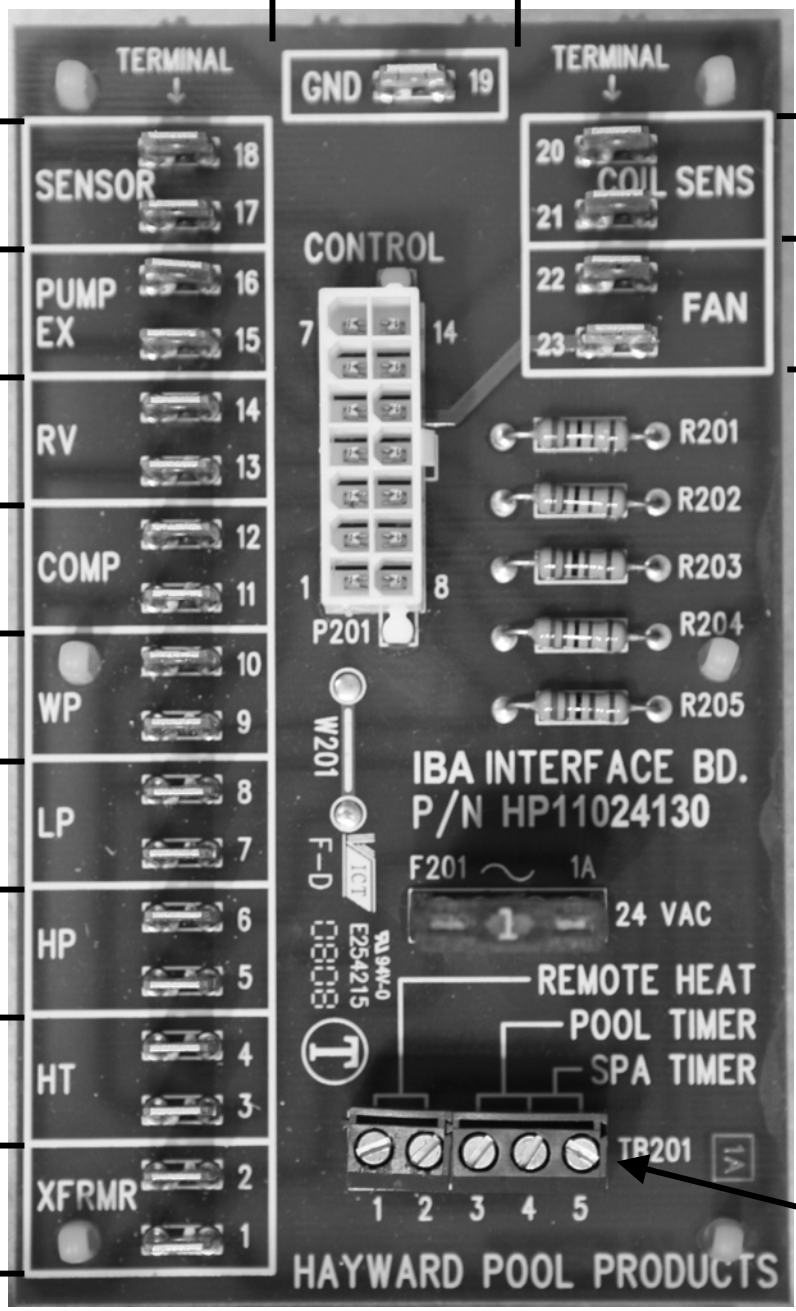
Note 12

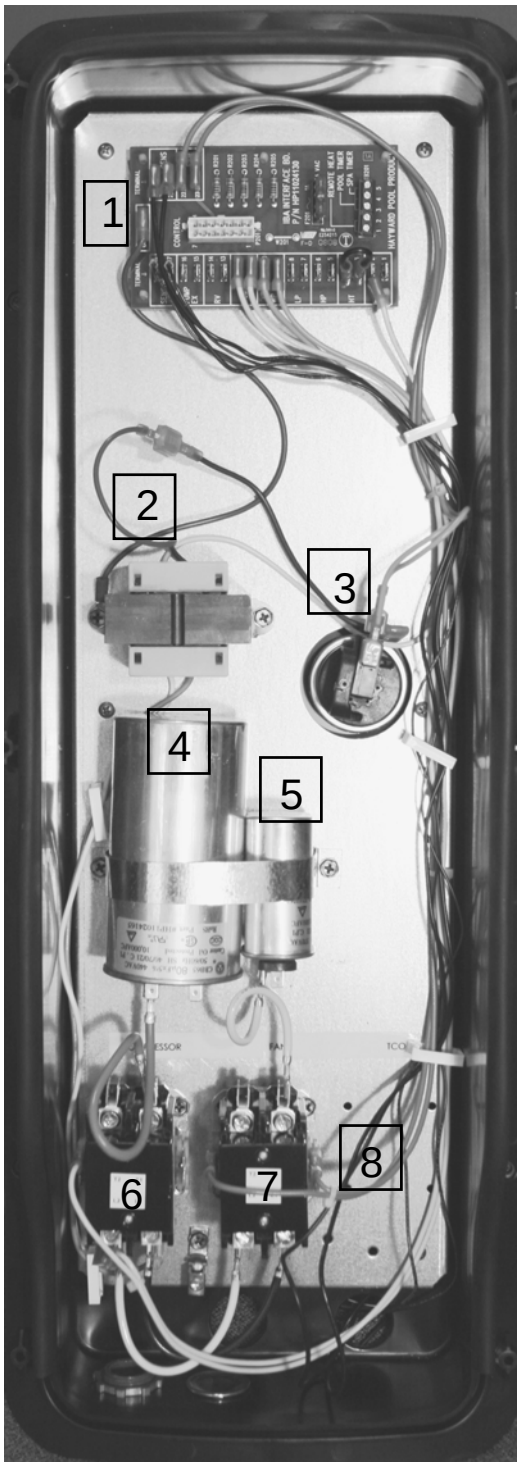
Cracked condensers are usually caused by freeze damage. Freeze damage is not covered under warranty.

Note 13

A buzzing contactor will normally clear itself up in a few days. The problem is usually more common in the spring and fall when the unit is being used after being shut down for several weeks.

Interface Board Connections

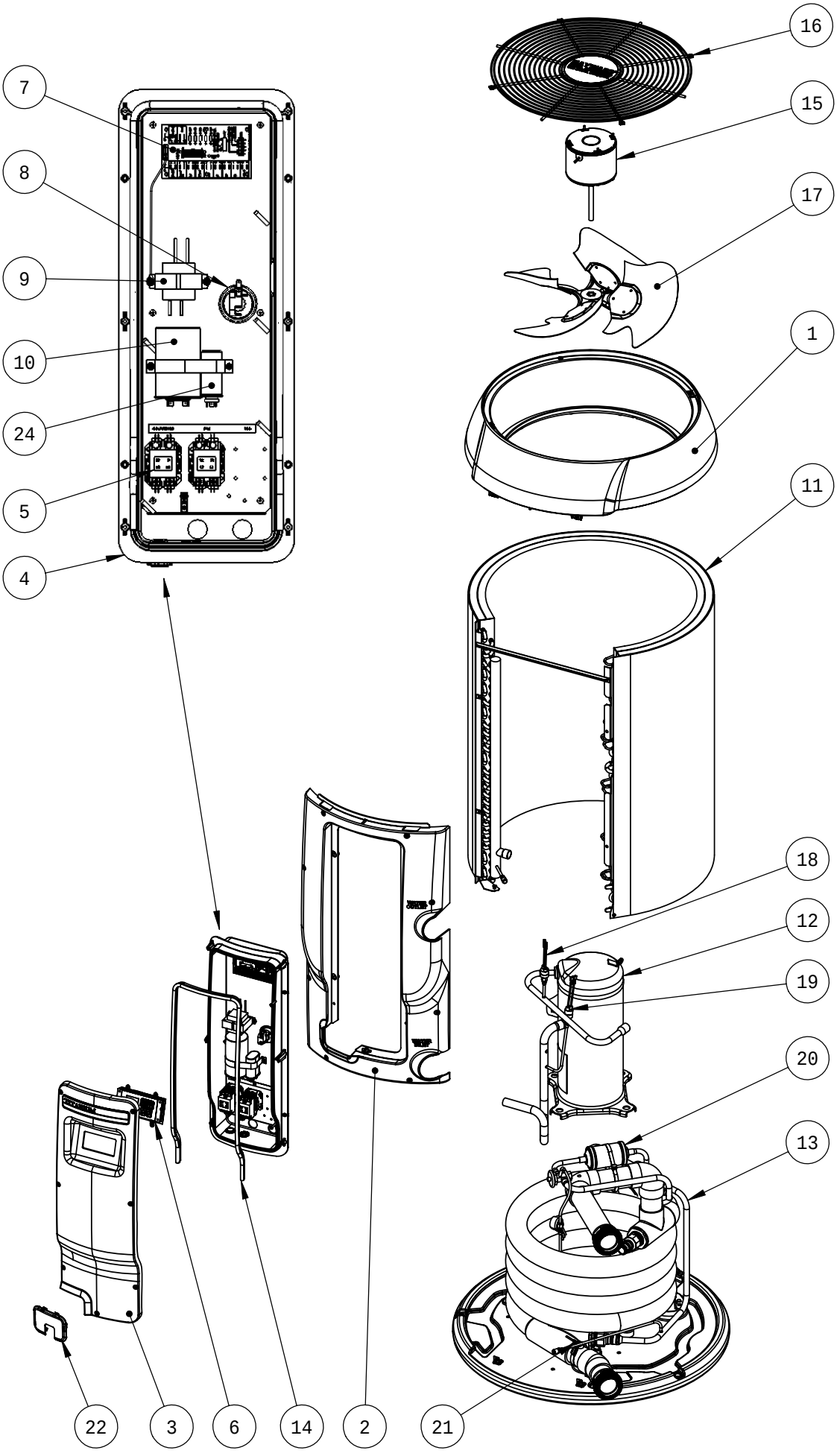




Control Panel Parts Identification 3T and 4T Models

1. Interface Board
2. Transformer
3. Water Pressure Switch
4. Compressor Capacitor
5. Fan Motor Capacitor
6. Compressor Contactor
7. Fan Motor Contactor
8. TCO Contactor (if used)

TCO Contactor not shown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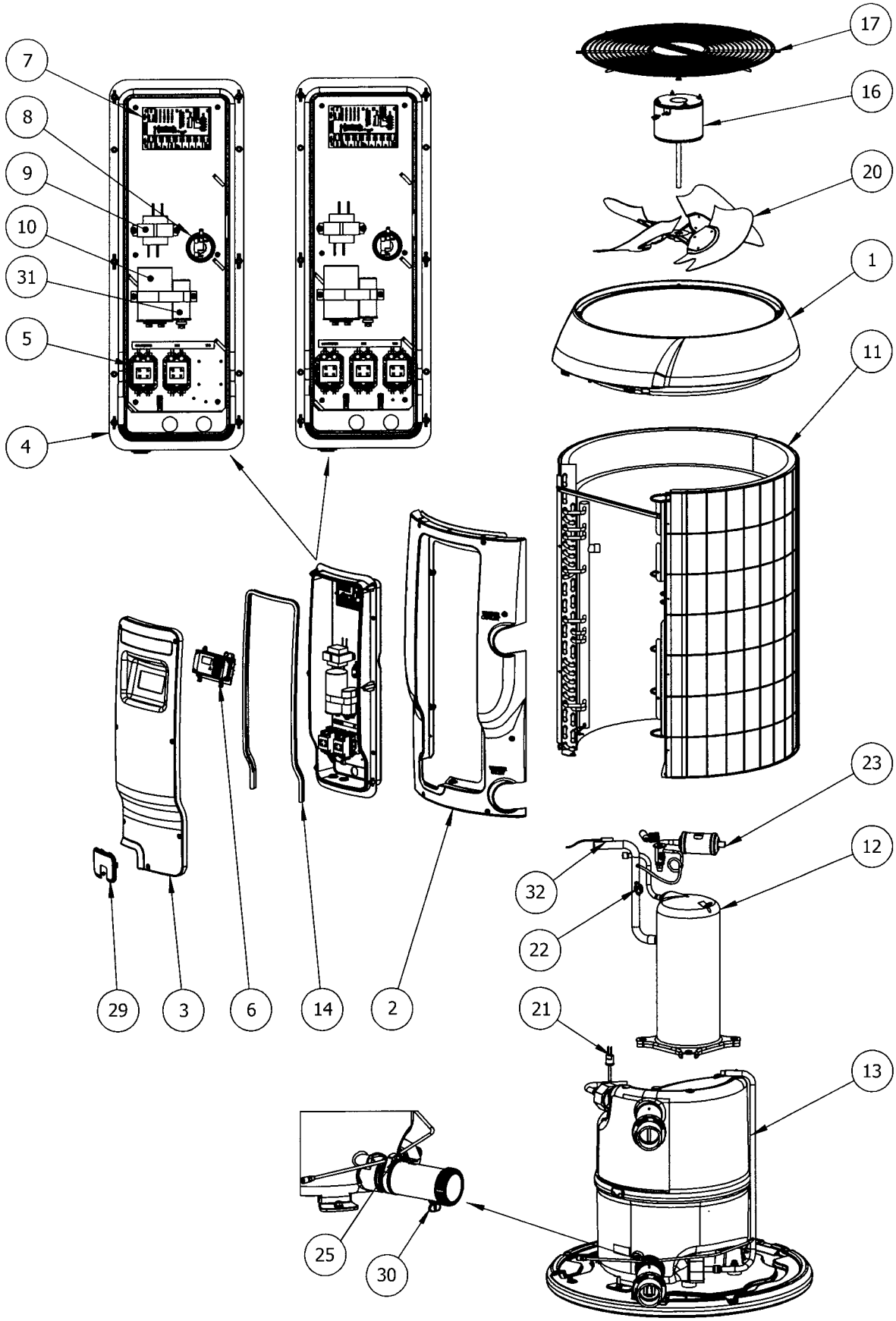
HAYWARD HEAT PRO 4T PARTS LIST

Item	Part description	HP211404T (built on Summit platform)	HP21104T	HP20854T	HP20854BT (Canada only)	HP20654T	HP20654BT (Canada only)
1	FAN TOP	SMX309077011	HPX01023502		HPX01024821	HPX01023502	HPX01024821
2	SIDE PANEL	SMX309099015	HPX01023503		HPX01024822	HPX01023503	HPX01024822
3	CONTROL BOX COVER	N/A	HPX01023505				
4	CONTROL BOX	N/A	HPX010235065				
5	CONTACTOR	HPX1985	HPX1985				
6	CONTROL BOARD ASSY	SMX306000016	HPX26024139				
7	INTERFACE BOARD	N/A	HPX110241310				
8	WATER PRESSURE SWITCH	HPX2181	HPX2181				
9	TRANSFORMER	HPX11023693	HPX11023693				
10	CAPACITOR	HPX11024743	HPX11024743	HPX11024272		HPX11024270	
11	BENT COIL with GUARD	SMX305099004	HPX24024241	HPX24024238			
12	COMPRESSOR	SMX11024201	HPX11024203	HPX11024204		HPX11024257	
13	CONDENSER	SMX24024864	HPX24024210	HPX24024712			
14	COVER GASKET	N/A	HPX05023549				
15	FAN MOTOR, 1/3 HP	SMX300055036	HPX11023564				
16	FAN GUARD	SMX305000004	HPX01023561				
17	FAN BLADE	SMX303140003	HPX15024321				
18	REPLACEMENT HP SWITCH	HPX11024258	HPX11024258				
19	REPLACEMENT LP SWITCH	HPX11024259	HPX11024259				
20	EXPANSION VALVE ASSY	SMX15024907	HPX15024214	HPX15024215		HPX15024216	
21	TEMPERATURE SENSOR	SMX306000024	HPX2169				
22	ELECTRICAL ENTRY PLUG	N/A	HPX01023760				
23	FAN RUN CAPACITOR	SMX306050001	HPX11024151				
24	DEFROST SENSOR (NS)	SMX306000023	HPX11024169				
25	HPC CABLE (NS)	N/A	HPX10023517				
26	COMPRESSOR MOUNT KIT (NS)	N/A	HPX0054				
27	COMPRESSOR EL. PLUG (NS)	SMX306000042	HPX10024289			HPX10024732	
28	REPLACEMENT FILTER DRIER	HPX1462	HPX1462				
29	UNION KIT	SPX3200UNKIT	SPX3200UNKIT				

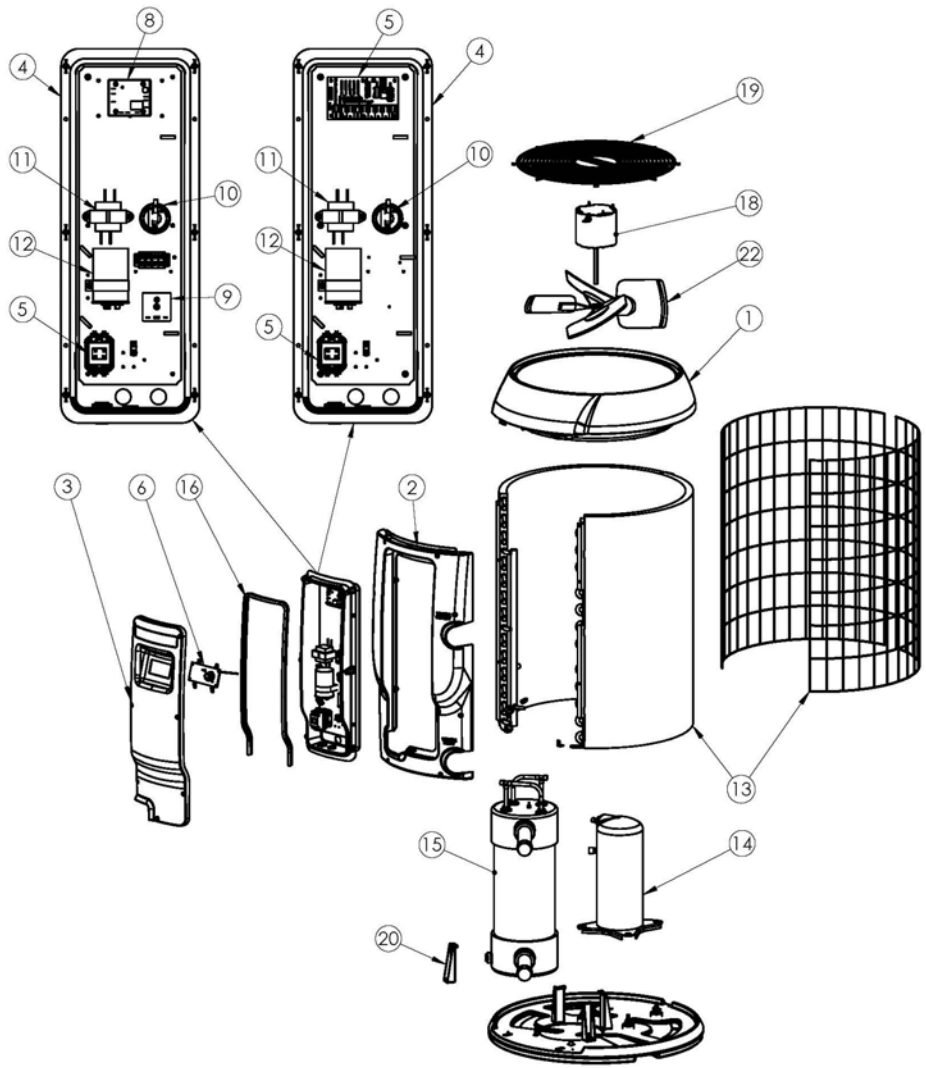
Parts Breakdown (3T Models)



Parts Breakdown (3T Models)

Item	Part description	HP21203T	HP21003T	HP2100TCO3T	HP11003T	HP6003T
1	FAN TOP	HPX01023502				
2	SIDE PANEL	HPX01023503				
3	CONTROL BOX COVER	HPX01023504				
4	CONTROL BOX	HPX01023505				
5	CONTACTOR	HPX1985				
6	CONTROL BOARD ASSY	HPX26024139		HPX26024140	HPX26024138	HPX26024139
7	INTERFACE BOARD	HPX11024130				
8	WATER PRESSURE SWITCH	HPX2181				
9	TRANSFORMER	HPX11023693				
10	CAPACITOR	HPX11024155	HPX11024154			
11	BENT COIL with GUARD	HPX24023929				
12	COMPRESSOR	HPX11023911	HPX11024170			HPX11024077
13	CONDENSER	HPX24023941				
14	COVER GASKET	HPX05023549				
15	HPC CABLE (NS)	HPX10023517				
16	FAN MOTOR, 1/3 HP	HPX11023564				
17	FAN GUARD	HPX01023561				
18	COMPRESSOR BLANKET (NS)	HPX02024108				
19	-	-				
20	FAN BLADE	HPX15023562				
21	REPLACEMENT HP SWITCH	HPX2186				
22	REPLACEMENT LP SWITCH	HPX2179				
23	EXPANSION VALVE ASSY	HPX15024023				HPX15024026
24	-	-				
25	TEMPERATURE SENSOR	HPX2169				
26	SCREW REPLACEMENT KIT (NS)	HPXSCRKIT1				
27	COMPRESSOR MOUNT KIT (NS)	HPX0054				
28	COMPRESSOR EL. PLUG (NS)	HPX2223				
29	ELECTRICAL ENTRY PLUG	HPX01023760				
30	DRAIN PLUG	SPX4000FG				
31	FAN RUN CAPACITOR	HPX11024151				
32	DEFROST SENSOR	HPX11024169				

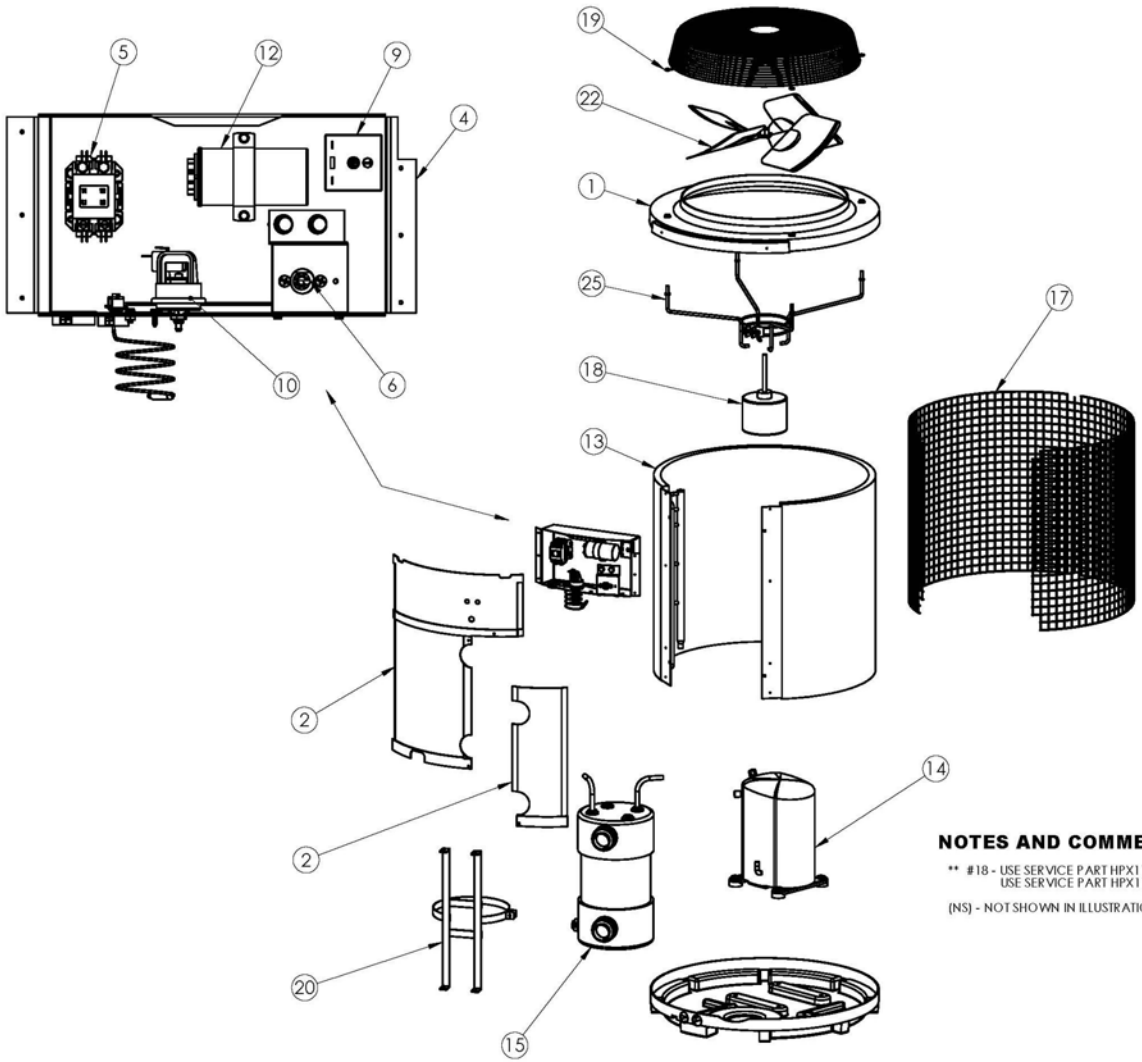
Parts Breakdown Generation 2 Models



	Part description	HP21002	HP2100TCO2	HP21002C	HP11002, PE52A2	HP6002, PE42B2S2	HPABG DELUXE2
1	FAN TOP	HPXD1023502	HPXD1023502	HPXD1023502	HPXD1023502	HPXD1023502	HPXD1023502
2	SIDE PANEL	HPXD1023503	HPXD1023503	HPXD1023503	HPXD1023503	HPXD1023503	HPXD1023503
3	ELECTRICAL BOX COVER	HPXD1023504	HPXD1023504	HPXD1023504	HPXD1023504	HPXD1023504	HPXD1023504
4	CONTROL BOX	HPXD1023505	HPXD1023505	HPXD1023505	HPXD1023505	HPXD1023505	HPXD1023505
5	CONTACTOR	HPX1985	HPX1985	HPX1985	HPX1985	HPX1985	HPX1985
6	CONTROL BOARD ASSY	HP26023631	HP26023632	HP26023631	HPX26023633	HPX26023631	HPX26023631A
7	INTERFACE BOARD	HPX11023509	HPX11023509	HPX11023509	N/A	HPX11023509	HPX11023509
8	POTTED T'STAT BOARD	N/A	N/A	N/A	HPX2134	N/A	N/A
9	TIME DELAY RELAY	N/A	N/A	N/A	HPX1483	N/A	N/A
10	WATER PRESSURE SWITCH	HPX2181	HPX2181	HPX2181	HPX2181	HPX2181	HPX2181
11	TRANSFORMER	HPX11031130	HPX11031130	HPX11031130	HPX11031130	HPX11031130	HPX11031130
12	CAPACITOR	HPX2040	HPX2040	HPX2040	HPX2040	HPX11023542	HPX11023542
13	BENT COIL WITH GUARD	HPX24023528	HPX24023528	HPX24023528	HPX24023528	HPX24023548	HPX24023548
14	COMPRESSOR	HPX1916	HPX1916	HPX1916	HPX1916	HPX1916	HPX1916
15	CONDENSER	HPX24023619	HPX24023619	HPX24023730	HPX24023619	HPX24023619	HPX24023619
16	COVER GASKET	HP05023549	HP05023549	HP05023549	HP05023549	HP05023549	HP05023549
17							
18	FAN MOTOR	HPX11023564	HPX11023564	HPX11023564	HPX11023564	HPX11023564	HPX11023564
19	FAN GUARD	HPXD1023561	HPXD1023561	HPXD1023561	HPXD1023561	HPXD1023561	HPXD1023561
20	CONDENSER BRACKET	(SET OF 4)	HPXD1023515	HPXD1023515	HPXD1023515	HPXD1023515	HPXD1023515
21	BULB WELL (NS)	HPX2001	HPX2001	HPX2001	HPX2001	HPX2001	HPX2001
22	FAN BLADE	HPX15023562	HPX15023562	HPX15023562	HPX15023562	HPX15023562	HPX15023562
23	REPLACEMENT LP SWITCH (NS)	HPX2179	HPX2179	HPX2179	HPX2179	HPX2179	HPX2179
24	REPLACEMENT HP SWITCH (NS)	HPX2186	HPX2186	HPX2186	HPX2186	HPX2186	HPX2186
25							
26							
27	EXPANSION VALVE ASSY (NS)	HPX15023570	HPX15023570	HPX15023570	HPX15023570	HPX15023600	HPX15023600
28	DEFROST VALVE (NS)	N/A	N/A	HPX15023676	N/A	N/A	N/A
29							
30	TIE- DOWN KIT (NS)	HPX2263A	HPX2263A	HPX2263A	HPX2263A	HPX2263A	HPX2263A
31	TEMPERATURE SENSOR (NS)	HPX2169	HPX2169	HPX2169	HPX2169	HPX2169	HPX2169
32	SCREW REPLACEMENT KIT (NS)	HPXSCR1	HPXSCR1	HPXSCR1	HPXSCR1	HPXSCR1	HPXSCR1
33	COMPRESSOR MOUNT KIT (NS)	HPXD054	HPXD054	HPXD054	HPXD054	HPXD054	HPXD054
34	COMPRESSOR EL. PLUG (NS)	HPX2223	HPX2223	HPX2223	HPX2223	HPX2223	HPX2223

(NS) - NOT SHOWN IN ILLUSTRATYION.

Parts Breakdown HPABG / HP380 models



	Part description	HP380, HPABG
1	FAN TOP	HPX2327
2	SIDE PANEL	HPX2427H, HPX2428H
3		
4	CONTROL BOX	HPX2416
5	CONTACTOR	HPX1811
6	THERMOSTAT	HPX1105
7		
8		
9	TIME DELAY RELAY	HPX1483
10	WATER PRESSURE SWITCH	HPX2181
11		
12	CAPACITOR	HPX11023543
13	BENT COIL	HPX2088
14	COMPRESSOR	HPX2417
15	CONDENSER	HPX2423
16		
17	EVAPORATOR GUARD	HPX2353
18	FAN MOTOR**	HPX11031134
19	FAN GUARD	HPX0970
20	CONDENSER BRACKET	HPX2415
21	BULB WELL (NS)	HPX2001
22	FAN BLADE	HPX0689
23	REPLACEMENT LP SWITCH (NS)	HPX2179
24	REPLACEMENT HP SWITCH (NS)	HPX2186
25	FAN MOUNTING BRACKET	HPX1140
26	KNOB FOR HPX1105 T'STAT (NS)	HPX0717
27	EXPANSION VALVE ASSY (NS)	HP15031135
28		
29		
30	TIE- DOWN KIT	HPX2261A
31		
32		
33	COMPRESSOR MOUNT KIT	HPX0054

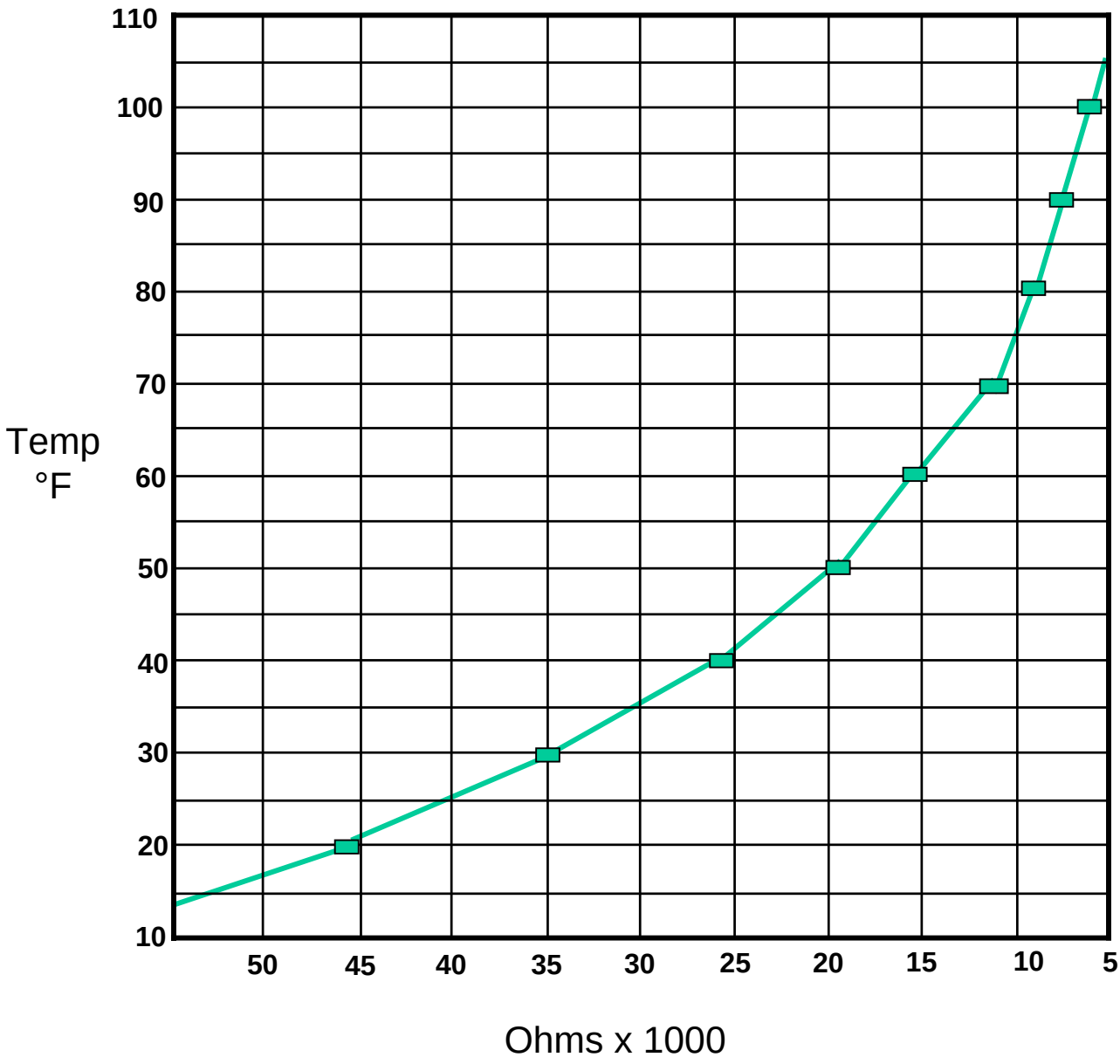
NOTES AND COMMENTS:

** #18 - USE SERVICE PART HPX1103113440 ON UNITS HP600, PE42B2S, HPABGDELUXE, BUILT PRIOR TO S/N 211205020063960
USE SERVICE PART HPX1103113435 ON UNITS HP380 AND HPABG BUILT PRIOR TO S/N 211205010071210O.

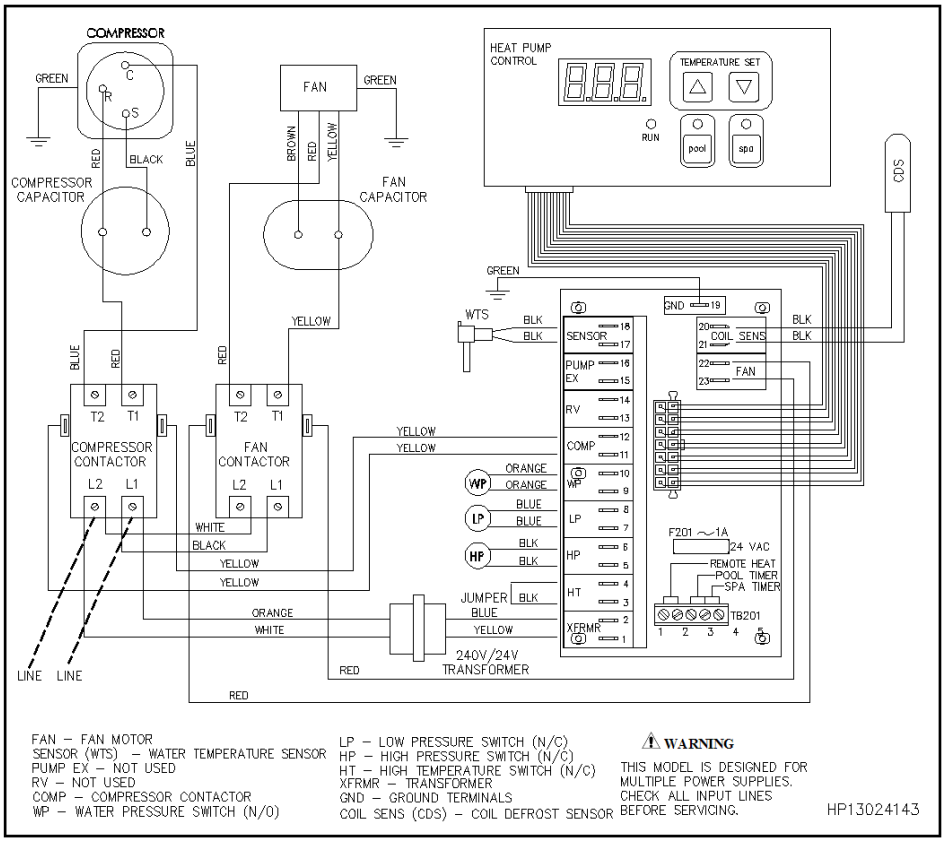
(NS) - NOT SHOWN IN ILLUSTRATION

Thermistor Resistance vs Temp.

CHART 1



Example: Outside ambient temperature is 80° F. Locate this on left hand side of chart and move across to the right until you meet the graph line intersection. At the intersection, move down the chart and locate the respective Ohm's reading. For an outside temperature of 80° F, the respective Ohm's reading is 9 (times 1000) = 9,000 Ohm's. If the sensor reading does not match this, replace sensor.



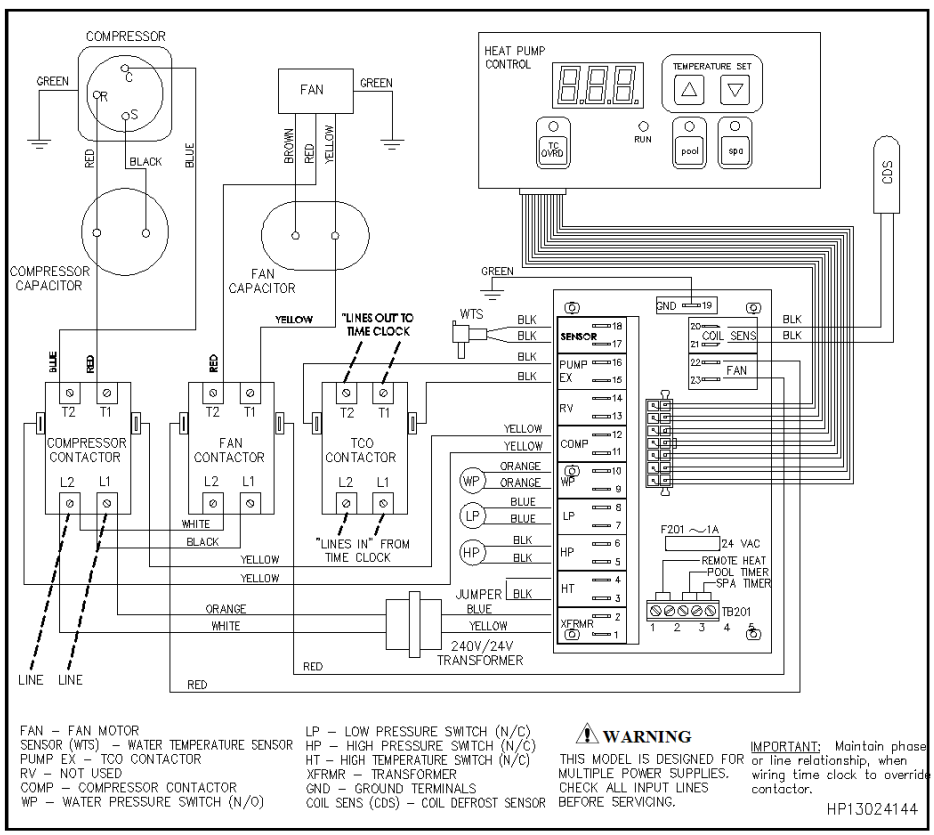
FAN – FAN MOTOR
SENSOR (WTS) – WATER TEMPERATURE SENSOR
PUMP EX – NOT USED
RV – NOT USED
COMP – COMPRESSOR CONTACTOR
WP – WATER PRESSURE SWITCH (N/O)

LP – LOW PRESSURE SWITCH (N/C)
HP – HIGH PRESSURE SWITCH (N/C)
HT – HIGH TEMPERATURE SWITCH (N/C)
XFRMR – TRANSFORMER
GND – GROUND TERMINALS
COIL SENS (CDS) – COIL DEFROST SENSOR

⚠ WARNING
THIS MODEL IS DESIGNED FOR MULTIPLE POWER SUPPLIES. CHECK ALL INPUT LINES BEFORE SERVICING.

HP13024143

3T & 4T Models Wiring Diagram(except HP2100TCO3T)



FAN – FAN MOTOR
SENSOR (WTS) – WATER TEMPERATURE SENSOR
PUMP EX – TCO CONTACTOR
RV – NOT USED
COMP – COMPRESSOR CONTACTOR
WP – WATER PRESSURE SWITCH (N/O)

LP – LOW PRESSURE SWITCH (N/C)
HP – HIGH PRESSURE SWITCH (N/C)
HT – HIGH TEMPERATURE SWITCH (N/C)
XFRMR – TRANSFORMER
GND – GROUND TERMINALS
COIL SENS (CDS) – COIL DEFROST SENSOR

⚠ WARNING
THIS MODEL IS DESIGNED FOR MULTIPLE POWER SUPPLIES. CHECK ALL INPUT LINES BEFORE SERVICING.

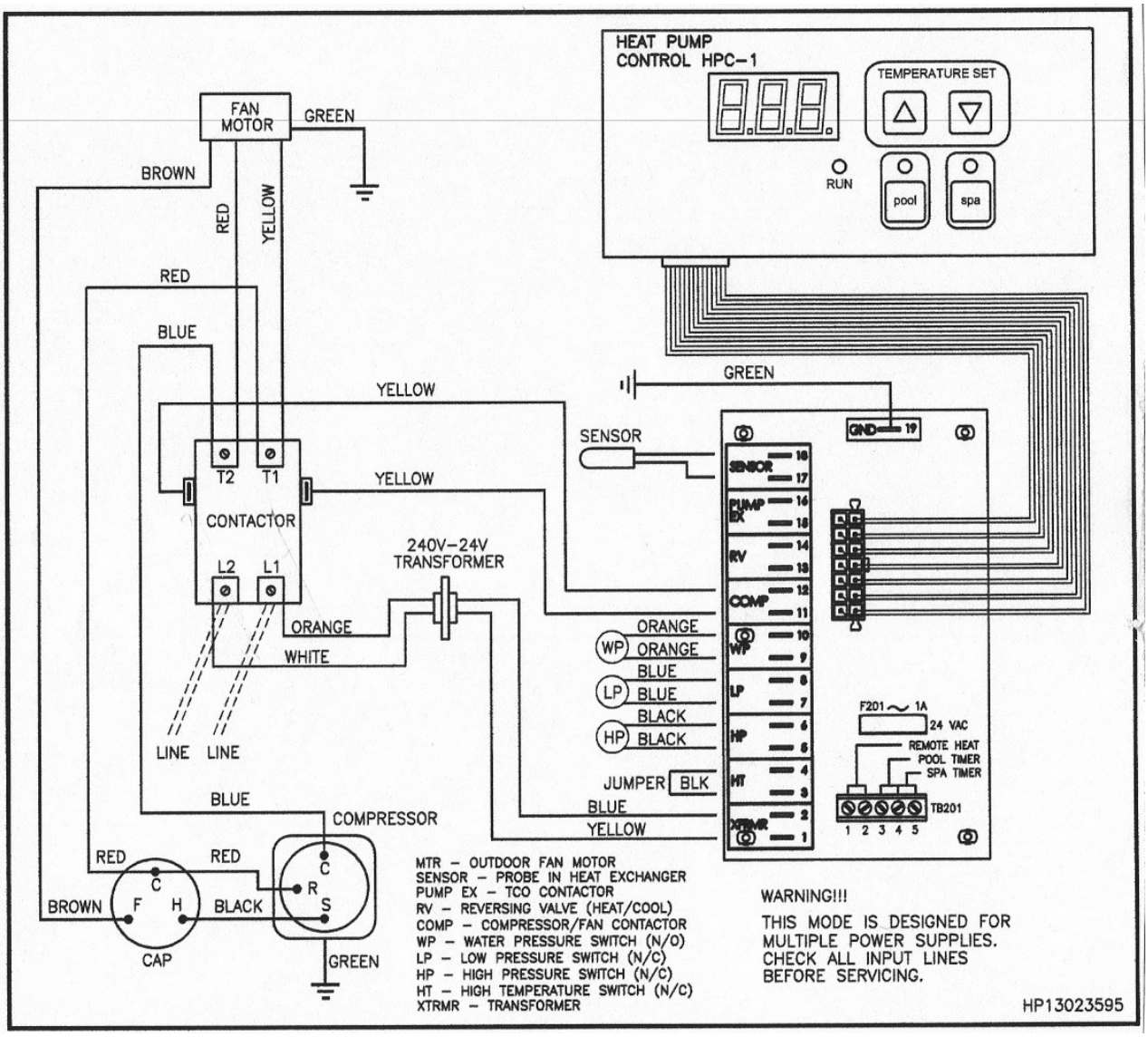
IMPORTANT: Maintain phase or line relationship, when wiring time clock to override contactor.

HP13024144

HP2100TCO3T Wiring Diagram

Wiring Diagram for Digital Control Heat Pumps

Except 3T Models



Connection of remote controllers to Digital Control Heat Pumps

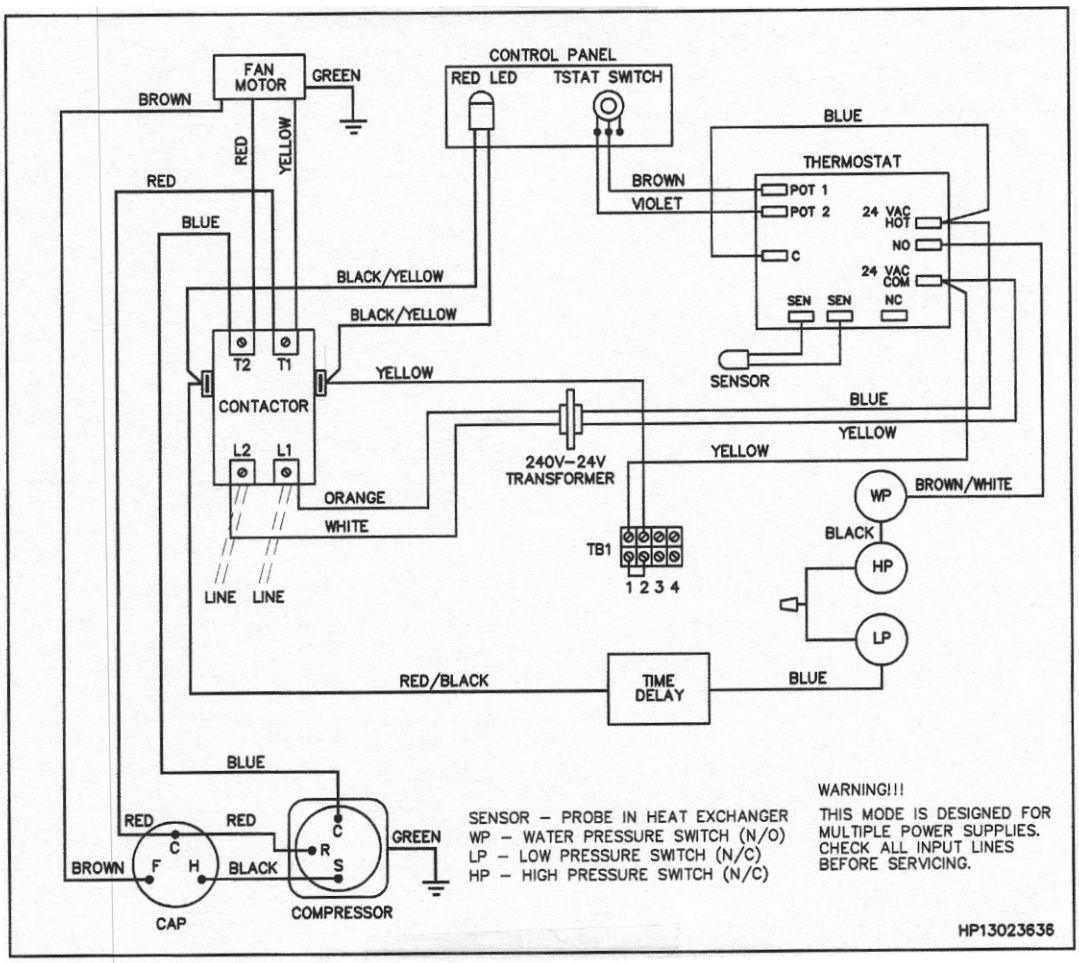
For 2 wire remote controllers such as the Goldline AquaLogic, connect to terminals 1 & 2 on the interface board(labeled remote heat).

For 3 wire remote controllers, where the heat pump retains temperature control, connect your common wire to terminal # 4, pool wire to terminal #3 and spa to terminal # 5.

The heat pump must be in the standby mode for the remote to control the unit.

For 2 wire air switch controls (popular in Florida) where the heat pump is controlling the temp. use terminals 3 and 4.

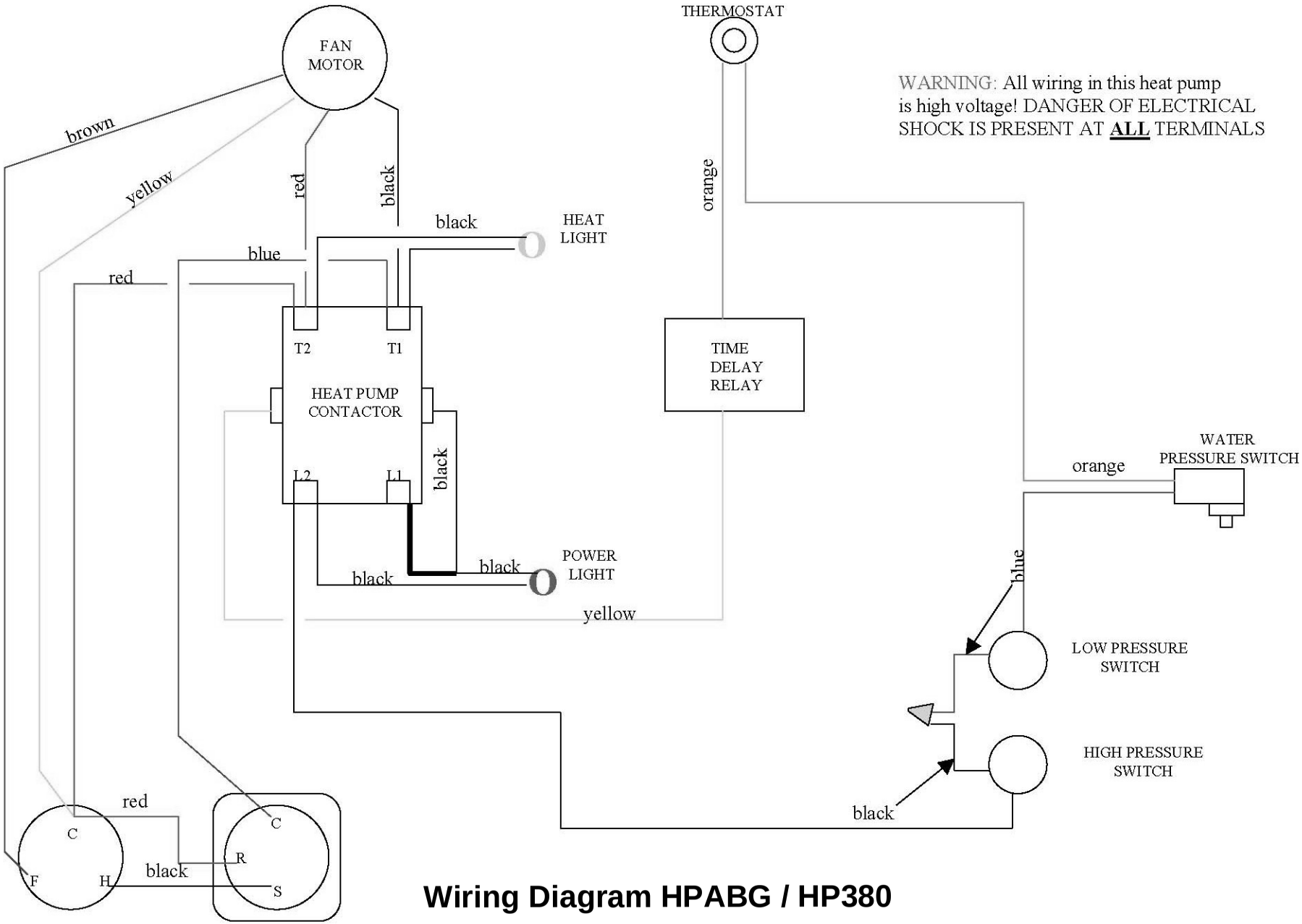
Wiring diagram for Non-Digital Control Heat Pumps



Connection of Remote Controllers for Non-Digital Models

The mechanical control heat pumps are compatible with 2 wire remotes such as the Goldline AquaLogic. To connect the remote, remove the jumper between terminals 1 & 2 on terminal block 1(TB1) and replace it with the 2 wires from your remote. Turn the thermostat all the way up on the heat pump. These units are not compatible with 3 wire remotes.

For 2 wire air switch installations remove the jumper between terminals 1 & 2 and replace it with the 2 wires from your switch. Set the thermostat on the heat pump to the desired temp.



Wiring Diagram HPABG / HP380

Hayward Heat Pump Data

Description	Generation 1	Generation 2				
Model number	**HP3100**	**HP21002**	**HP21002TCO2**	**HP21002C**	**HP11002**	**HP6002**
Refrigerant Type	R-22	R-22	R-22	R-22	R-22	R-22
Factory Charge	10 lbs.	5 lbs. 10 oz	5 lbs. 10 oz	5 lbs. 10 oz	5 lbs. 10 oz	6 lbs.
Factory Test Pressure	300 psi	300 psi	300 psi	300 psi	300 psi	300 psi
Compressor Amps	27.9	27.9	27.9	27.9	27.9	18.2
Compressor LRA	129	129	129	129	129	115
Fan Amps	1.8	1.8	1.8	1.8	1.8	1.8
Fan LRA	2.8	2.8	2.8	2.8	2.8	2.8
Minimum Water Flow	30 gpm	30 gpm.	30 gpm	30 gpm	30 gpm	30 gpm
Maximum Water Flow	75 gpm	75 gpm	75 gpm	75 gpm	75 gpm	75 gpm
Maximum Water Inlet Temp.	108 F	108 F	108 F	108 F	108 F	108 F
Nominal Power Required (Watts)	6150	6150	6150	6150	6150	4200
A/C Power	230v 60Hz 1Ph	230v 60 Hz 1Ph	230v 60Hz 1Ph	230v 60 Hz 1Ph	230v 60Hz 1Ph	230v 60 Hz 1Ph
Max. Circuit Breaker	50	50	50	50	50	40
Min. Circuit Ampacity	40	40	40	40	40	30

Description	Generation 3				
Model number	**HP21203T**	**HP21003T**	**HP2100TC03T**	**HP11003T**	**HP6003T**
Refrigerant Type	R-22	R-22	R-22	R-22	R-22
Factory Charge	4 lb 12 oz	4 lb 4 oz	4 lb 4 oz	4 lb 4 oz	3 lb 14 oz
Factory Test Pressure	300 psi	300 psi	300 psi	300 psi	300 psi
Compressor Amps	33.5	28	28	28	18.2
Compressor LRA	176	176	176	176	137
Fan Amps	1.8	1.8	1.8	1.8	1.8
Fan LRA	2.8	2.8	2.8	2.8	2.8
Minimum Water Flow	30 gpm	30 gpm	30 gpm	30 gpm	30 gpm
Maximum Water Flow	75 gpm	75 gpm	75 gpm	75 gpm	75 gpm
Maximum Water Inlet Temp.	108 F	108 F	108 F	108 F	108 F
Nominal Power Required (Watts)	7300	6200	6200	6200	4200
A/C Power	230v 60Hz 1Ph	230v 60Hz 1Ph	230v 60Hz 1Ph	230v 60Hz 1Ph	230v 60Hz 1Ph
Max. Circuit Breaker	60	50	50	50	40
Min. Circuit Ampacity	60	40	40	40	30

Description	Generation 4				
Model number	**HP50TA***	**HP20654T**	**HP20854T**	**HP21104T**	**HP21404T***
Refrigerant Type	R-410A	R-410A	R-410A	R-410A	R-410A
Factory Charge	3 lbs. 0 oz.	3 lbs. 14 oz.	4 lbs. 2 oz	5 lbs. 6 oz.	5 LBS. 13.5 OZ.
Factory Test Pressure	440 psig	441 psig	441 psig	441 psig	441 psig
Compressor Amps	10.5	17.9	28	27	27
Compressor LRA	60	112	135	145	145
Fan Amps	1.3	1.8	1.8	1.8	2.4
Fan LRA	2.8	2.8	2.8	2.8	4.3
Minimum Water Flow	30	30	30	30	30
Maximum Water Flow	75	75	75	75	75
Maximum Water Inlet Temp.	108	108	108	108	108
Nominal Power Required (Watts)	2400	2830	3700	5400	6600
A/C Power	230v 60Hz 1Ph	230v 60Hz 1Ph	230v 60Hz 1Ph	230v 60Hz 1Ph	230v 60Hz 1Ph
Max. Circuit Breaker	20	40	60	60	60
Min. Circuit Ampacity	14.4	24	36	35	36.2

* HP50TA, AND HP21404T ARE BUILT ON SUMMIT PLATFORM. LOOK TO SUMMIT EXPLODED VIEW FOR PARTS DESCRIPTION AND LOCATION.

SUMMIT HEAT PUMP TECHNICAL SERVICE GUIDE

TABLE OF CONTENTS

Summit Heat Pump Tech Service Guide

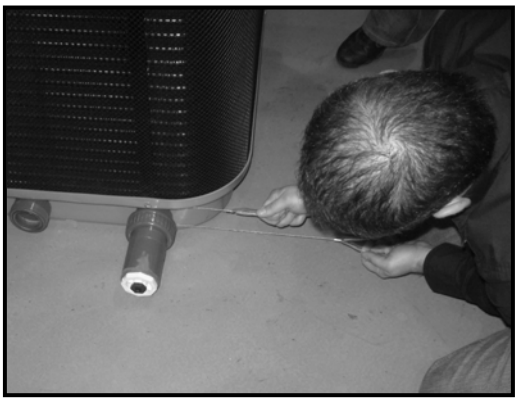
Defrost Operation

Heat pump will operate normally until evaporator coil sensor senses an evaporator coil temperature of 24º F. At this point the control will turn the compressor off, display **FS**, and leave the fan running until the evaporator coil temperature rises to 42º F. Once 42º is reached the heat pump will turn the compressor back on and the heat pump will run normally. There is no time limit on the defrost cycle, it will run in this cycle as long as necessary for the heat pump to warm up to 42º.

Fan Motor Replacement

All Summit fan motors come with female spade connectors that mate with male spade connectors just inside the electrical box. Do not cut wires.

Heat Exchanger/Condenser Replacement



You have to cut the female union connectors off existing heat exchangers to remove/ replace them. New heat exchanger will come with new female union ends, and nipples to attach. Do not attach either the nipple or the union until the heat exchanger has been installed into heater. Heat exchanger will not set in heat pump with nipples attached. See picture above for technique to cut unions using wire saw.

TO REPLACE HEAT EXCHANGER/CONDENSER

1. Cut water lines outside unit (see picture above)
2. Cut liquid and hot gas lines in a convenient place to reconnect later.
3. Cut tie-wrap on front of condenser
4. Lift condenser out of heat pump
5. Install new condenser
6. Cut hot gas and liquid lines attached to new condenser to match lines from unit and braze in.
7. Glue in nipples and male union section that come separate from condenser

TXV

All TXV's on R-22 Summit units are adjustable type. TXV's on R-410A units are not.

Refrigerant charges are on chart Pg. 44

Do not attempt to calibrate TXV unless you have been authorized to do so by Hayward/Summit tech service. Once you have been authorized use the following procedure.

1. Remove cap from rear of TXV assembly being sure to use back up wrench on valve body.
2. Using valve wrench turn adjusting stem clockwise until fully closed (do not over tighten).
3. Then open valve fully open
4. Adjust valve to setting listed in table above.

UNIT	VALVE SETTING
SUMMIT	
SUM3T	closed 5 turns from totally open
SUM4T	closed 5 turns from totally open
SUM5T	closed 7 3/4 turns from totally open
SUM7T	closed 9 1/2 turns from totally open
ENERGYTHERM	
HET80BT	closed 5 turns from totally open
HET110BT	closed 7 3/4 turns from totally open
HET125BT	closed 9 1/2 turns from totally open
EASYTEMP	
HCB65BT	closed 5 turns from totally open
HCB80BT	closed 5 turns from totally open
HCB110BT	closed 7 3/4 turns from totally open
HCB125BT	closed 9 1/2 turns from totally open
HEATMASTER	
HML80T	closed 5 turns from totally open
HML110T	closed 7 3/4 turns from totally open
HML125T	closed 9 1/2 turns from totally open
OASIS	
5	set at factory do not adjust
6	set at factory do not adjust

SENSORS: Summit uses a 4.8 K ohm sensor for both sensor applications on their heat pumps. To check for accuracy of the sensors use the following chart.

4.8 Kohm Sensor Temperature / Resistance Chart		
Temperature °F	**Temperature °C**	**Sensor resistance (Kohm)**
180.0	82.2	0.549
175.0	79.4	0.601
170.0	76.7	0.659
165.0	73.9	0.722
160.0	71.2	0.793
155.0	68.4	0.872
150.0	65.7	0.961
145.0	62.9	1.06
140.0	60.2	1.17
135.0	57.4	1.294
130.0	54.7	1.434
125.0	51.9	1.591
120.0	49.2	1.768
115.0	46.4	1.968
110.0	43.7	2.194
105.0	40.9	2.451
100.0	38.2	2.741
95.0	35.4	3.072
90.0	32.7	3.448
85.0	29.9	3.879
80.0	27.2	4.37
75.0	24.4	4.935
70.0	21.7	5.583
65.0	18.9	6.328
60.0	16.2	7.187
55.0	13.4	8.18
50.0	10.7	9.334
45.0	7.9	10.671
40.0	5.2	12.23
35.0	2.4	14.044
30.0	-0.3	16.167
25.0	-3.1	18.655
20.0	-5.8	21.581
15.0	-8.6	25.036
10.0	-11.3	29.11
5.0	-14.1	33.95
0.0	-16.8	39.683

The following error codes are for use on older style Summit control boards.
These boards can be identified by the prominent fan relay (fan wires connected) on the back of the board

Summit Heat Pump Error Codes/Meanings/Causes

CODE	MEANING	CAUSES	SOLUTIONS
dPO	Evaporator Temperature Sensor Connection Open	Cut or loose wire or open sensor. Sensor connected at terminals 3 & 4 on control board	Repair broken wires or replace sensor
PO	Water Temperature Sensor Connection Open	Cut or loose wire or open sensor. Sensor connected at terminals 1 & 2 on control board	Repair broken wires or replace sensor
dPC	Evaporator Temperature Sensor Connection Shorted	Check for short in wiring or defective sensor. Sensor connected at terminals 3 & 4 on control board	Repair shorted wires or replace sensor
Pc	Water Temperature Sensor Connection Shorted	Check for short in wiring or defective sensor. Sensor connected at terminals 1 & 2 on control board	Repair shorted wires or replace sensor
LP	Low Refrigerant Pressure	Low refrigerant pressure, fan not starting, TXV issue, bad low pressure switch, loose connection to low pressure switch, bad control board. Fan not starting. Low Pressure Switch connected at terminals 7 & 8 on control board.	Check system for refrigerant leaks. Check TXV operation, check continuity of low pressure switch. Check fan operation. Repair as needed
HP	High Refrigerant Pressure	Low water flow, Refrigerant overcharge, bad high pressure switch or connection, bad control board High Pressure Switch is connected at terminals 5 & 6 on control board	Check pump and valve positions, be sure by-pass valve is closed, check connections and wiring to high pressure switch, check for continuity through high pressure switch. Repair as needed
Note: When unit fails on LP or HP code 3 times within one hour the unit will lock out and show the code with a 3 after it (LP3, HP3). To reset press any button on display.			

BLANK DISPLAY
A blank display can be caused by any of the following.

1. No 240-volt power to unit. Check for proper voltage at L1 and L2 on contactor. Check for tripped breaker or open disconnect.
2. No 24 volts coming from transformer. Check for 24 volts AC between blue wire at terminal 15 and yellow wire at terminal 17 on control board. If 24 volts are present, check for 12 volts AC between the blue wire and the white wire at terminal 16 on the control board. If either voltage is not present replace transformer.
3. Bad control board. If 12 & 24 volts are present at board but display is still blank replace control board.

Summit Heat Pump Error Codes/Meanings/Causes

CODE	MEANING	CAUSES	SOLUTIONS
Flo	Water Pressure Switch open	Low or no water flow to heat pump, bad water pressure switch, bad connections to water pressure switch, bad control board	Check for continuity through water pressure switch while pool pump is running, check wiring to water pressure switch, check valve positions… by-pass closed , valves to inlet and outlet open. Repair as needed.
FS	Evaporator coil frosted.	Heat Pump is in Defrost Mode	Heat pump evaporator coil will have to warm to 42 degrees F. before normal heat pump operation resumes. Fan should be running during this period. If fan is not running replace control board. If heat pump remains in defrost mode for longer than 2 hours with outdoor temperatures above 50 degrees F. check coil temp sensor. if ok replace control board.
PLE	Memory Data Loss		If PLE or CSE error occurs, hold down the Service / Select Key for approx. 4 seconds until the error message disappears. The control will be reset to factory defaults, and all setpoints must be re-entered. Make sure to set FIL to off position. (see below)
CSE	Memory Data Loss		
SPi	Defective Control Board		Turn off power to heat pump and then re-energize. If SPi still showing, replace control board

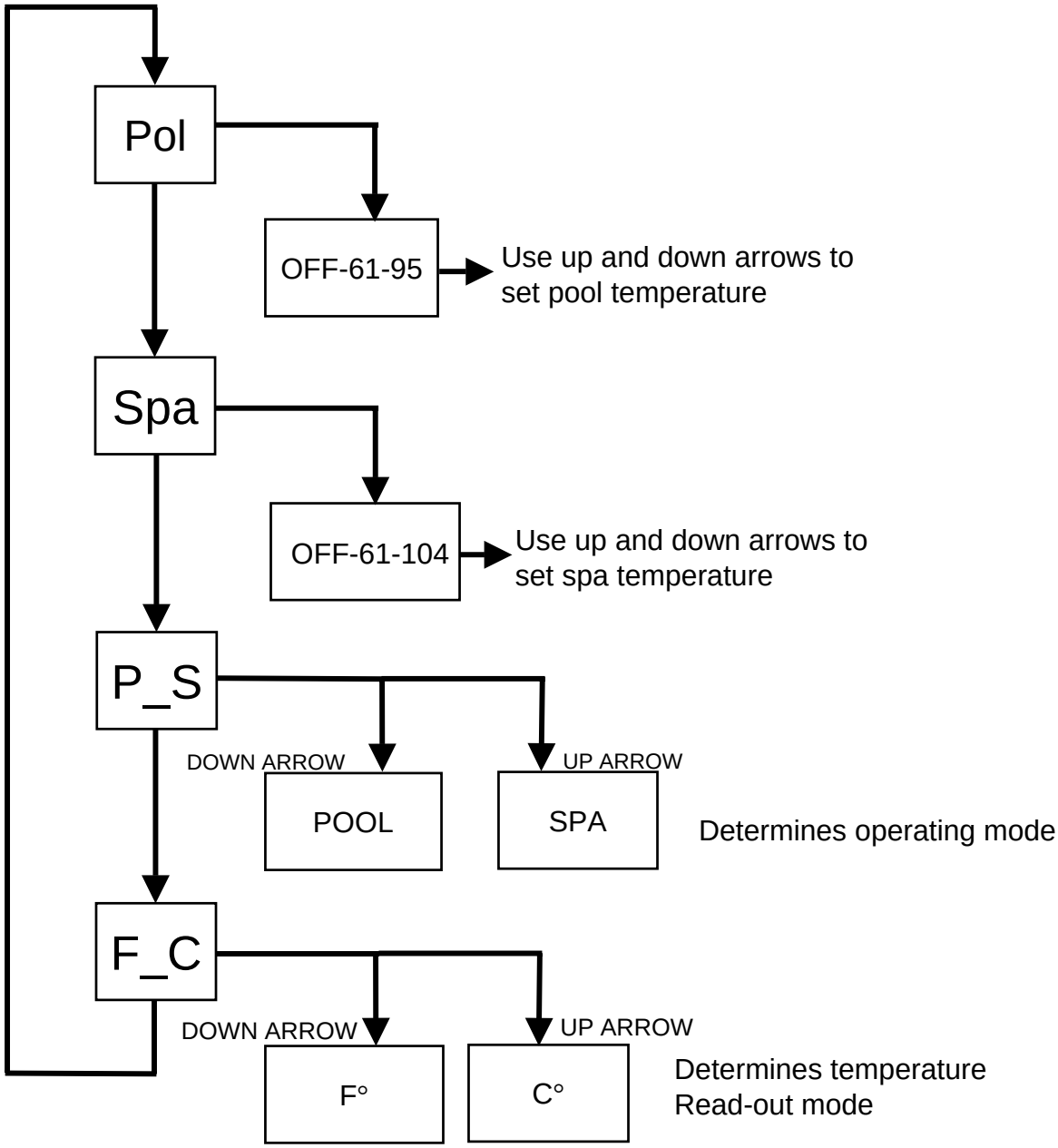
The following Calibration & Reconfiguration codes are for use on older style Summit control boards. These boards can be identified by the prominent fan relay (fan wires connected) on the back of the board

Summit Heat Pump Calibration & Reconfiguration Codes

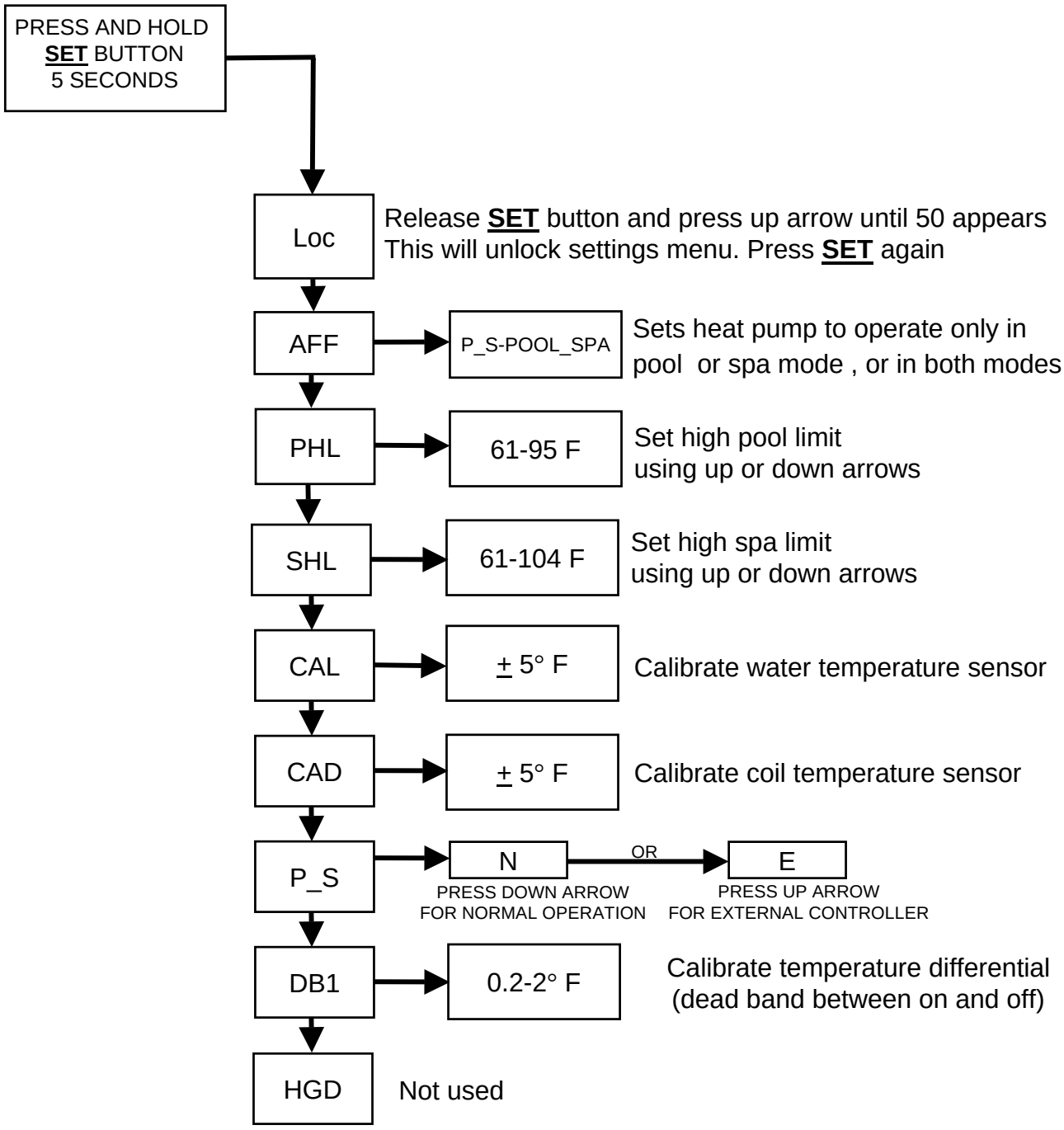
CODE	MEANING	CAUSES	SOLUTIONS
Note: The following codes are only visible in the **service mode.** To enter the service mode press and hold the Service/ Select key for 8 seconds, until the **Loc** code appears. You have 12 seconds from the last time a key is pressed to make an adjustment. After 12 seconds the modified value will be saved to memory, and the heat pump will resume normal operation mode. Use the up and down arrows to scroll through available Calibration/ Configuration parameters.			
Loc	Lock Code	Calibration/Configuration mode can be locked to prevent tampering by unauthorized persons. Code is adjustable from 00 to 99. 00 is no lock mode. Factory default setting is 50. To enter the Calibration/ Configuration Mode: Once Loc is displayed enter the Lock code by pressing the up or down arrows	**If lock code is forgotten:** *Turn off power to unit *Press and hold Service/ Select button while returning power to unit. *When dEL message appears the lock function is temporarily disabled. *Scroll to Loc screen and enter a new Loc code.
dEL	Compressor anti-cycle time delay bypass	Use to by-pass 3 minute automatic compressor time delay	Value will be 0. Adjust value to 1 and allow heat pump to return to normal operation. 3 minute time delay will be by-passed for 1 cycle only.
tSC	Water Temperature Calibration	Use to calibrate the temperature displayed on heat pump to actual water temperature	Adjustment is ± 5°F Use up or down arrows to adjust. There is a delay of a couple of seconds between each adjustment.
dSC	Evaporator Coil defrost temperature Calibration	Use to calibrate the temperature of evaporator coil for defrost adjustment.	Adjustment is ± 5°F Use up or down arrows to adjust. There is a delay of a couple of seconds between each adjustment.
FIL	Time Clock Override Function	Use to set parameters for Time Clock Override Function	While the control has time clock override functionality, it is not available on any units.FIL MUST be turned off to avoid lockout of heat pump on flow failure.
Note: If FIL is inadvertantly turned on the heat pump will lock out and show FL3 error code when used in conjunction with a pump timer. To reset press any button. However, to prevent further lock outs, reset FIL parameter to off. (Factory setting is 8 hours, must be set to off at installation)			

HPEC-003 (New Style) Control Board
Operations Menu

ACCESS SETTINGS BY PRESSING AND RELEASING **SET** BUTTON



HPEC-003 (New Style) Control Board Settings Menu



Combination Key Functions

Set + Dn	Set + Up	Set+Up+Dn
Bypass 3 minute time delay	Display coil temperature	Reset factory defaults

HPEC-003 Control Board Error Codes and Meanings		
ERROR CODE	**MEANING**	**POSSIBLE CAUSES**
HP	high refrigerant pressure	low water flow, bad high pressure switch, overcharged with refrigerant, bad TXV
HP3	3 HP errors within a single call for heat	same as above
LP	low refrigerant pressure	refrigerant leak, fan failure, bad low pressure switch
LP3	3 LP errors within a single call for heat	same as above
FLO	water flow switch open	pump not working, valve in wrong position, time clock off, bad water pressure switch
FS	ambient temperature too low for operation	Ambient temperature too low, bad coil temperature sensor
dPO	coil (defrost) sensor open	wiring to sensor damaged (broken), control board failure
PO	water temperature sensor open	wiring to sensor damaged (broken), control board failure
dPc	coil (defrost) sensor shorted	Sensor bad, control board failure
Pc	water temperature sensor shorted	Sensor bad, control board failure

Setting the HPEC-003 for use with an external controller

For use with an Aqua-Logic type controller (temperature controlled by external device)

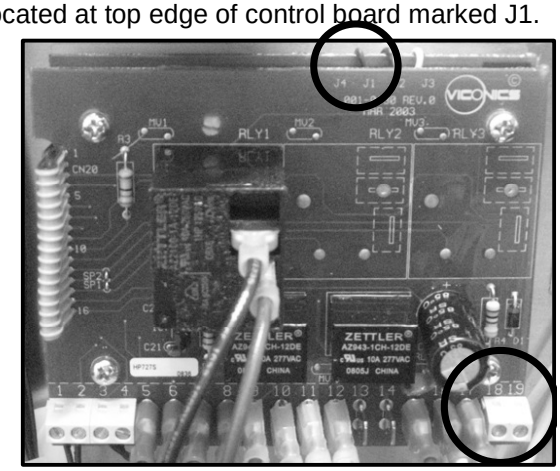
1. Turn heat pump on
2. Set pool temperature to off.
3. Set Spa temperature to 104º
4. From settings menu (see previous page) scroll to P_S
5. Press up arrow and “E” should show on display.
6. Attach two wires from controller to P & S terminals on back of display board
7. External controller will now control heat pump.

This control is not designed for use with a 3 wire external control system.
However, it can be used with a switch type controller when the temperature is set on the heat pump
And the switch simply changes the control from Pool to Spa.
Follow the instructions above EXCEPT: Set your pool temperature to the desired temperature
Now the heat pump will be in the pool mode except when the switch is engaged at which time
It will switch to Spa mode for as long as the switch is closed.

Remote Connections for old style control boards

Summit units are compatible with 2 wire remotes. They are also compatible with systems that have the pool on all the time but use a spa flow switch to change the heat pump over to spa temperature control.

For two wire remote applications, connect the two low voltage wires from the remote to terminals 18 and 19 on the control board, and clip red wire located at top edge of control board marked J1. Set pool thermostat to off (below 61º F), and the spa thermostat to 104º F (maximum).



- If the pool thermostat is not set to off the heat pump will switch to pool mode and continue to run after the remote is no longer calling for heat as long as the filter pump is running and the pool thermostat is not satisfied. If the spa thermostat is not set to maximum, the remote will not be able to control the heat pump above the set point on the heat pump control.

- For use with spa water flow switch controls, connect the 2 wires from the switch to terminal 18 & 19 as above, and then set your pool and spa thermostats to the desired temperature. On closure of the flow switch the heat pump control will switch from pool to spa settings. When flow switch opens the control will revert to pool mode. It will always be in either pool or spa mode with this configuration. If the pool is not to be heated, set pool thermostat to off position.

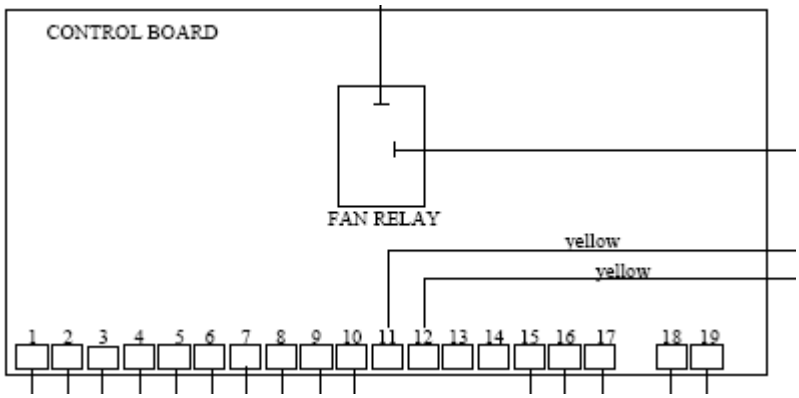
Replacing Existing Board With New HPEC-003 Control Board

The new control board in Summit units has a different wiring configuration than the old style board. Part number is the same for both SMX306000016.

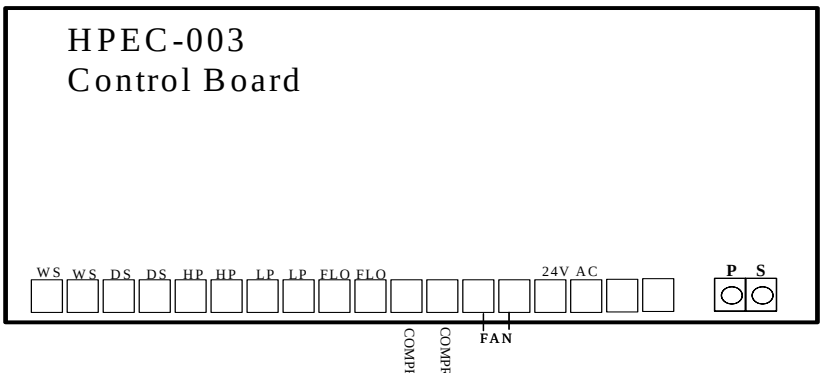
Old style board has 3 low voltage wires from transformer- blue common, yellow 24v, and white 12v.

New Board has only 2 low voltage wires from transformer. Do not use the white wire from transformer attached at terminal 16 on old board, Tape off terminal end to avoid shorting.

The brown and black wires connected at the fan relay on the old board are attached at the terminals marked FAN on the new board.
All other wiring will be the same between the two boards.
Mounting screws are different, use new screws on replacement.

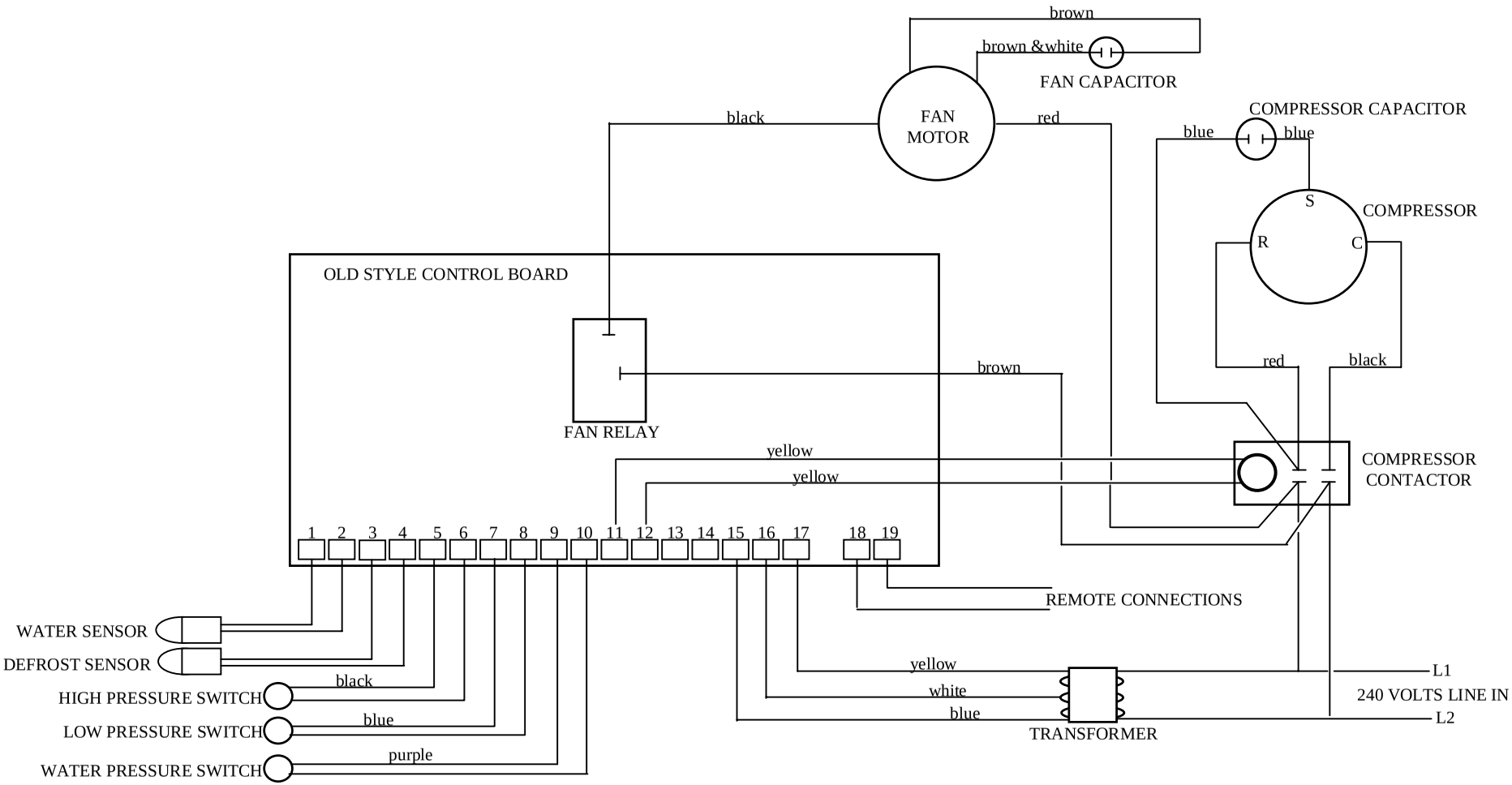


Old Style Board

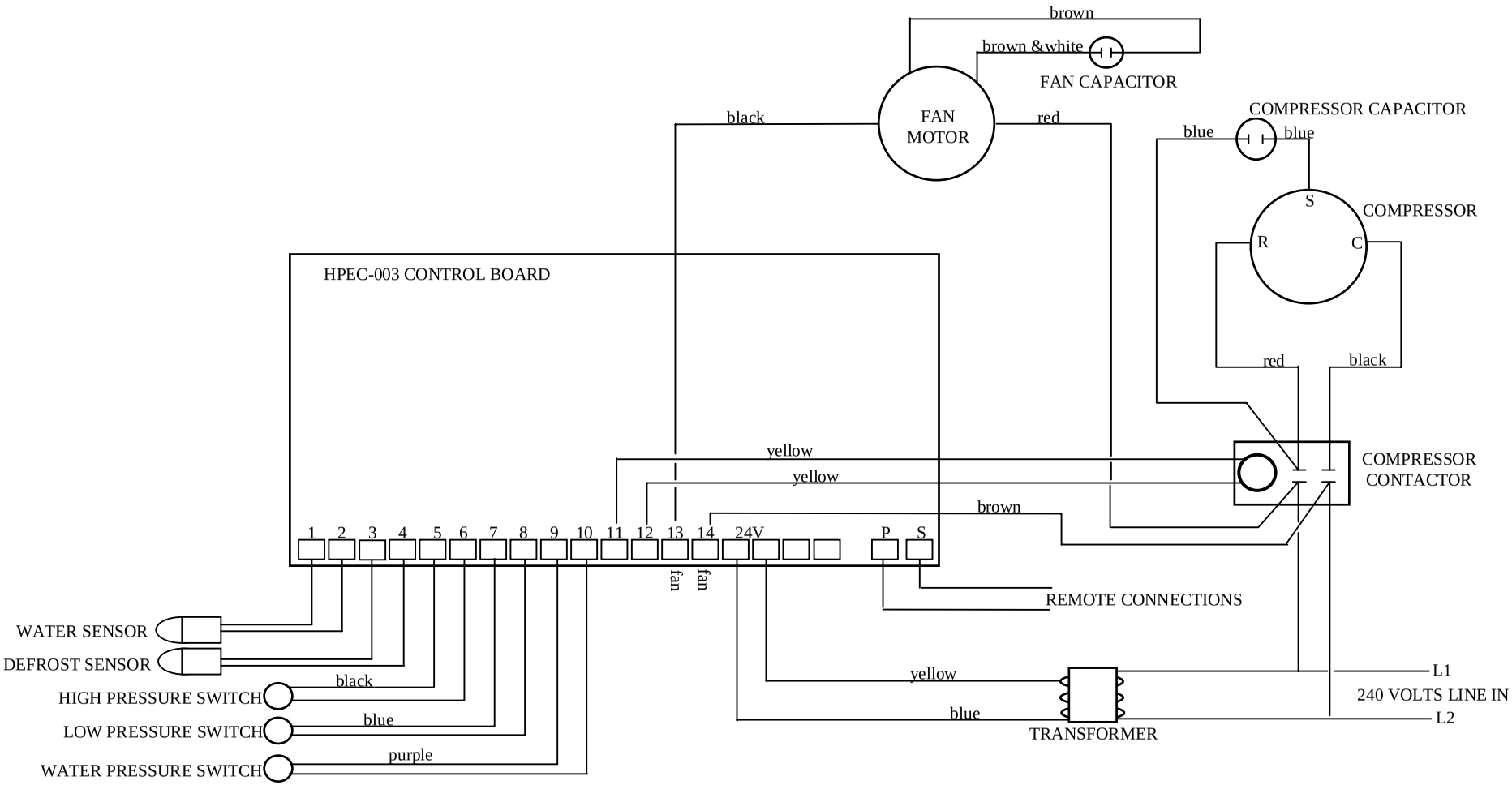


New Style Board

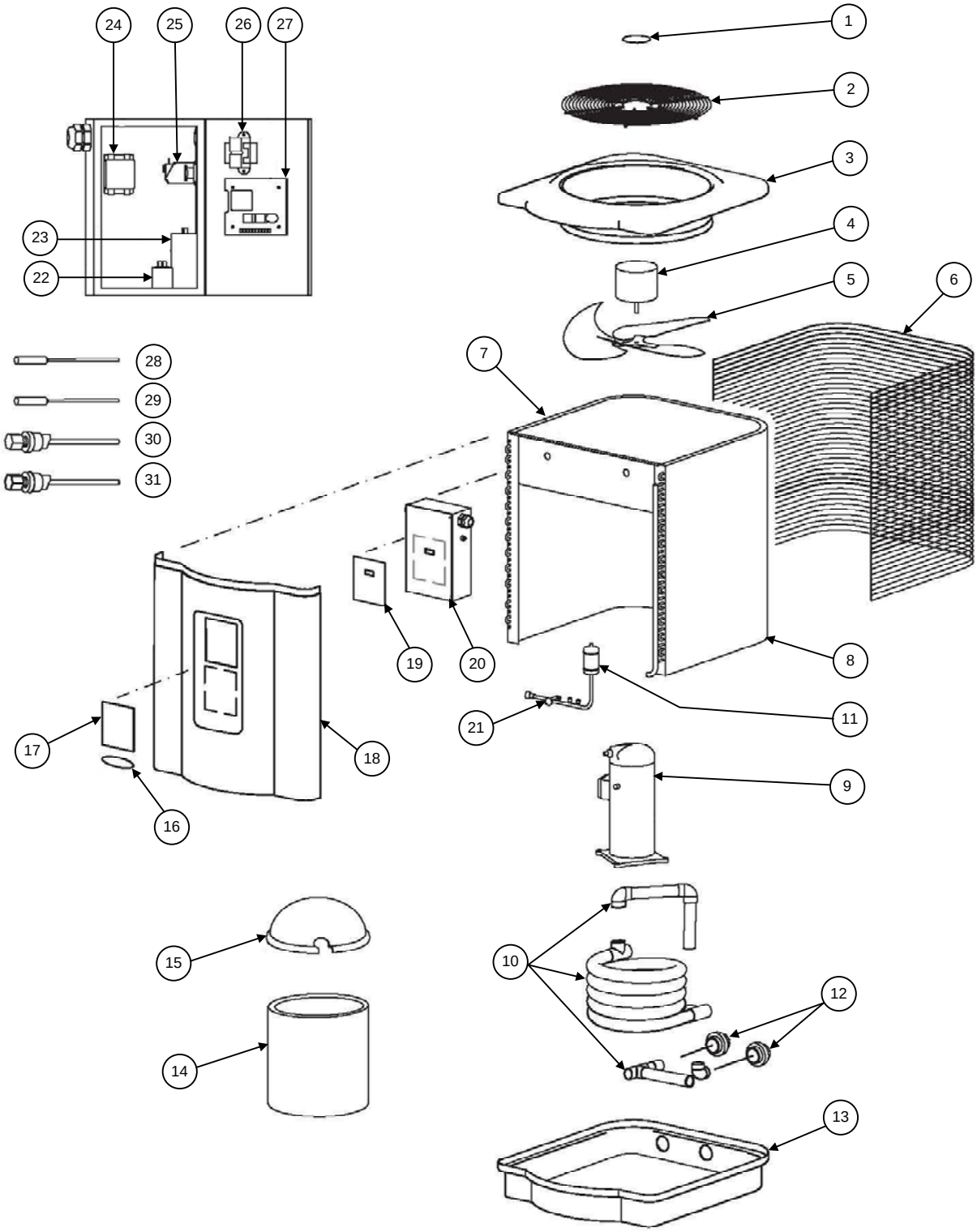
Summit Heat Pumps Wiring Diagram



Summit Heat Pumps Wiring Diagram



SUMMIT TITANIUM MODELS



SUMMIT HEAT PUMP PARTS

	Part Description	EnergyTherm by Hayward				Summit By Hayward			
		HET80BT	HET110BT	HET125BT	SUM25T	SUM3T	SUM4T	SUM5T	SUM7T
3	FAN TOP	SMX309077021			SMX309077011				
18	SIDE PANEL	SMX309099023			SMX309077013	SMX309099013			SMX309099015
24	CONTACTOR	HPX1985			HPX1985				
27	CONTROL BOARD ASSEMBLY	SMX306000016			SMX306000016				
25	WATER PRESSURE SWITCH	HPX2181			HPX2181				
26	TRANSFORMER	SMX306000004			SMX306000004				
23	COMPRESSOR CAPACITOR	SMX306000028	SMX306170001	SMX306170001	SMX306055004	SMX306040001	SMX306170001	SMX306040001	SMX306170001
7	BENT COIL with GUARD	SMX305099001	SMX305099003	SMX305099004	SMX305077001	SMX305099001		SMX305099003	SMX305099004
9	COMPRESSOR	SMX301140003	SMX301150001	HPX11023911	SMX301130002	SMX301130003	SMX301140003	SMX301150001	HPX11023911
10	CONDENSER	SMX24024804	SMX24024509	SMX24024510	SMX24024511	SMX24024804		SMX24024509	SMX24024510
4	FAN MOTOR	SMX303088001	SMX300055036		SMX303088001			SMX300055036	
2	FAN GUARD	SMX305000004			SMX305000004				
14	ISOLATION KIT	SMX304077002			SMX304077002				
15	ACOUSTICAP	SMX309000011			SMX309000011				
21	TXV ASSEMBLY	SMX305050001	SMX305055001	SMX305099006	SMX305077002	SMX305040001	SMX305050001	SMX305055001	SMX305099006
29	WATER SENSOR	SMX306000024			SMX306000024				
	COMPRESSOR ELECT. PLUG(NS)	SMX306000042			SMX306066002				
22	FAN RUN CAPACITOR	SMX306088001	SMX306050001		SMX306088001			SMX306050001	
28	DEFROST (COIL) SENSOR	SMX306000023			SMX306000023				
5	FAN BLADE	SMX303200001			SMX303140002			SMX303140003	
30	LP SWITCH	SMX306000001			SMX306000001				
31	HP SWITCH	SMX306000002			SMX306000002				
11	FILTER DRIER	SMX300055034	SMX300060001		SMX300055034			SMX300060001	
12	COUPLING	SMX300055073			SMX300055073				
	PANEL LOCK BOX (NS)	SMX308000034			SMX308000034				

SUMMIT HEAT PUMP PARTS

	Part Description	EasyTemp by Hayward					HeatMaster by Hayward			Oasis by Summit	
		HCB65BT	HCB80BT	HCB110BT		HCB125BT	HML80T	HML110T	HML125T	5	6
3	FAN TOP	SMX309077021					SMX309077021			SMX309077021	
18	SIDE PANEL	SMX309099023					SMX309099013		SMX309099015	SMX309099023	
24	CONTACTOR	HPX1985					HPX1985			HPX1985	
27	CONTROL BOARD ASSEMBLY	SMX306000016					SMX306000016			SMX306000016	
25	WATER PRESSURE SWITCH	HPX2181					HPX2181			HPX2181	
26	TRANSFORMER	SMX306000004					SMX306000004			SMX306000004	
23	COMPRESSOR CAPACITOR	SMX306040001	SMX306000028	SMX306170001		SMX306170001	SMX306170001	SMX306040001	SMX306170001	SMX306150002	
7	BENT COIL with GUARD	SMX305099001		SMX305099003		SMX305099004	SMX305099001	SMX305099003	SMX305099004	SMX306040001	
9	COMPRESSOR	SMX301130004	SMX301140004	SMX301150001		HPX11023911	SMX301140003	SMX301150001	HPX11023911	SMX301150001	
10	CONDENSER	SMX24024804		SMX24024509		SMX24024510	SMX24024804	SMX24024509	SMX24024510	SMX24024500	
4	FAN MOTOR	SMX303088001		SMX300055036			SMX30388001	SMX300055036		SMX300055036	
2	FAN GUARD	SMX305000004					SMX305000004			SMX305000004	
14	ISOLATION KIT	SMX304077002					SMX304077002			SMX304077002	
15	ACOUSTICAP	SMX309000011					SMX309000011			SMX309000011	
21	TXV ASSEMBLY	SMX305040001	SMX305050001	SMX305055001		SMX305099006	SMX305050001	SMX305055001	SMX305099006	SMX305050001	
29	WATER SENSOR	SMX306000024					SMX306000024			SMX306000024	
	COMPRESSOR ELECT. PLUG	SMX306000042					SMX306066002			SMX306066002	
22	FAN RUN CAPACITOR	SMX306088001		SMX306050001			SMX306088001	SMX306050001		SMX306050001	
28	DEFROST (COIL) SENSOR	SMX306000023					SMX306000023			SMX306000023	
5	FAN BLADE	SMX303200001					SMX303140002	SMX303140003		SMX303200001	
30	LP SWITCH	SMX306000001					SMX306000001			SMX306000001	
31	HP SWITCH	SMX306000002					SMX306000002			SMX306000002	
11	FILTER DRIER	SMX300055034		SMX300060001			SMX300055034	SMX300060001		SMX300055034	
12	COUPLING	SMX300055073					SMX300055073			SMX300055073	
	PANEL LOCK BOX	SMX308000034					SMX308000034			SMX308000034	

SUMMIT HEAT PUMP PARTS

	Part Description	EnergyTherm by Hayward						Summit By Hayward					
		HET50TA (Canada only)	**HET65TA**	**HET80TA**	**HET110TA**	**HET125TA**		**SUM25TA** (Canada only)	**SUM3TA**	**SUM4TA**	**SUM5TA**		**SUM8TA**
2	FAN GUARD	SMX305000004						SMX305000004					
3	FAN TOP	SMX309077021						SMX309077011					
	FAN MOTOR	SMX303088001			SMX300055036			SMX303088001			SMX300055036		
5	FAN BLADE	SMX15024648	SMX303140002		SMX303140003			SMX15024648	SMX303140002		SMX303140003		
7	BENT COIL with GUARD	SMX305099001		SMX24024414	SMX24024408			SMX305099001		SMX24024414	SMX24024408		SMX305099004
9	COMPRESSOR	SMX11024624	SMX11024622	SMX11024621	SMX301150010	SMX11024201		SMX11024624	SMX11024622	SMX11024621	SMX301150010	SMX11024201	
10	CONDENSER	SMX24024500	SMX24024804		SMX24024509	SMX24024510		SMX24024500	SMX24024804	SMX24024808	SMX24024509	SMX24024510	SMX24024864
11	FILTER DRIER	HPX1462						HPX1462					
12	COUPLING	SPX3200UNKIT						SPX3200UNKIT					
18	SIDE PANEL	SMX309077023	SMX309099023					SMX309077013	SMX309099013				SMX309099015
21	TXV ASSEMBLY	SMX15024592	SMX15024593	SMX15024594	SMX15024595	SMX15024907		SMX15024592	SMX15024593	SMX15024594	SMX15024595		SMX15024907
22	FAN RUN CAPACITOR	SMX306088001			SMX306050001			SMX306088001			SMX306050001		
23	COMPRESSOR CAPACITOR	SMX306150002	HPX11024154	HPX11024272	HPX11024743			SMX306150002	HPX11024154	HPX11024272	HPX11024743		
24	CONTACTOR	HPX1985						HPX1985					
25	WATER PRESSURE SWITCH	HPX2181						HPX2181					
26	TRANSFORMER	HPX11023693						HPX11023693					
27	CONTROL BOARD ASSEMBLY	SMX306000016						SMX306000016					
28	DEFROST (COIL) SENSOR	SMX306000023						SMX306000023					
29	WATER SENSOR	SMX306000024						SMX306000024					
30	LP SWITCH	HPX11024259						HPX11024259					
31	HP SWITCH	HPX11024258						HPX11024258					
	COMPRESSOR ELECT. PLUG(NS)	SMX10024283	SMX306000042					SMX10024283	SMX306066002				

Note: Hayward branded (not Heat Pro) HP50TA uses same parts as SUM25TA and will be available in the U.S. except FL.(Except: union spare part is SP1493)

SUMMIT HEAT PUMP PARTS

	Part Description	EasyTemp by Hayward						HeatMaster by Hayward					
		HCB50TA(Canada only)	**HCB65TA**	**HCB80TA**	**HCB110TA**	**HCB125TA**		**HML50TA**(Canada only)	**HML65TA**	**HML80TA**	**HML110TA**	**HML125TA**	
2	FAN GUARD	SMX305000004						SMX305000004					
3	FAN TOP	SMX309077021						SMX309077021					
4	FAN MOTOR	SMX303088001			SMX300055036			SMX303088001			SMX300055036		
5	FAN BLADE	SMX15024648	SMX309077021		SMX303140003			SMX15024648	SMX303140002		SMX303140003		
7	BENT COIL with GUARD	SMX305099001		SMX24024414	SMX24024408			SMX305099001		SMX24024414	SMX24024408		
9	COMPRESSOR	SMX11024624	SMX11024622	SMX11024621	SMX301150010	SMX11024201		SMX11024624	SMX11024622	SMX11024621	SMX301150010	SMX11024201	
10	CONDENSER	SMX24024500	SMX24024804		SMX24024509	SMX24024510		SMX24024500	SMX24024804		SMX24024509	SMX24024510	
11	FILTER DRIER	HPX1462						HPX1462					
12	COUPLING	SPX3200UNKIT						SPX3200UNKIT					
18	SIDE PANEL	SMX309077013	SMX309099023					SMX01024505	SMX309099023				
21	TXV ASSEMBLY	SMX15024592	SMX15024593	SMX15024594	SMX15024595	SMX15024907		SMX15024592	SMX15024593	SMX15024594	SMX15024595	SMX15024907	
22	FAN RUN CAPACITOR	SMX306088001			SMX306050001			SMX306088001			SMX306050001		
23	COMPRESSOR CAPACITOR	SMX306150002	SMX11024742	SMX11024272	SMX11024743			SMX306150002	SMX11024742	SMX11024272	SMX11024743		
24	CONTACTOR	HPX1985						HPX1985					
25	WATER PRESSURE SWITCH	HPX2181						HPX2181					
26	TRANSFORMER	HPX11023693						HPX11023693					
27	CONTROL BOARD ASSEMBLY	SMX306000016						SMX306000016					
28	DEFROST (COIL) SENSOR	SMX306000023						SMX306000023					
29	WATER SENSOR	SMX306000024						SMX306000024					
30	LP SWITCH	HPX11024259						HPX11024259					
31	HP SWITCH	HPX11024258						HPX11024258					
	COMPRESSOR ELECT. PLUG	SMX10024283	SMX306000042					SMX10024283	SMX306000042				

SUMMIT HEAT PUMP DATA

Description	R-22 MODELS				
Model number	SUM25T AS50 HET50BT	SUM3T HET65BT AS65 HML65T HCB65BT	SUM4T HET80BT AS85 HML80T HCB80BT	SUM5T HET110BT AS115 HML110T HCB110BT	SUM7T HET125BT AS130 HML125T HCB125BT
Refrigerant Type	R-22	R-22	R-22	R-22	R-22
Factory Charge	3 LBS. 2 OZ	3 LBS. 2 OZ	3 LBS. 10 OZ.	4 LBS. 8 OZ.	5 LBS. 12 OZ.
Factory Test Pressure	300 PSIG	300 PSIG	300 PSIG	300 PSIG	300 PSIG
Compressor Amps	16.7	17.3	25	25	28.2
Compressor LRA	97	97	150	129	176
Fan Amps	1.3	1.3	1.3	2.4	2.4
Fan LRA	2.8	2.8	2.8	4.3	4.3
Minimum Water Flow	30	30	30	30	30
Maximum Water Flow	75	75	75	75	75
Maximum Water Inlet Temp.	108	108	108	108	108
Nominal Power Required (Watts)	4140	3050	3500	5350	6850
A/C Power	230V 60Hz 1Ph	230V 60Hz 1Ph	230V 60Hz 1Ph	230V 60Hz 1Ph	230V 60Hz 1Ph
Max. Circuit Amps	35	40	50	50	60
Min. Circuit Amps	22.2	22.9	32.6	33.7	37.7

Description	R-410A MODELS					
Model number	SUM25TA HML50TA HCB50BTA	SUM3TA HML65TA HCB65BTA	SUM4TA HML80TA HCB80BTA HET80BTA	SUM5TA HML110TA HCB110BTA HET110BTA	HML125TA HCB125BTA HET125BTA	SUM8TA
Refrigerant Type	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A
Factory Charge	3 LBS. 0 OZ.	3LBS. 11 OZ.	3 LBS. 12 OZ.	5 LBS. 5 OZ.	5 LBS. 12 OZ.	5 LBS. 13.5 OZ.
Factory Test Pressure	440 PSIG	440 PSIG	440 PSIG	440 PSIG	440 PSIG	440 PSIG
Compressor Amps	10.5	21	26.3	27	27	27
Compressor LRA	60	115	150	145	145	145
Fan Amps	1.3	1.3	1.3	2.4	2.4	2.4
Fan LRA	2.8	2.8	2.8	4.3	4.3	4.3
Minimum Water Flow	30	30	30	30	30	30
Maximum Water Flow	75	75	75	75	75	75
Maximum Water Inlet Temp.	108	108	108	108	108	108
Nominal Power Required (Watts)	2400	3130	3930	5600	6600	6600
A/C Power	230V 60Hz 1Ph	230V 60Hz 1Ph	230V 60Hz 1Ph	230V 60Hz 1Ph	230V 60Hz 1Ph	230V 60Hz 1Ph
Max. Circuit Breaker	20	40	60	60	60	60
Min. Circuit Ampacity	14.4	27.6	34.2	36.2	36.2	36.2