

ASTRALPOOL **Astral Heat
Pumps**

INSTALLATION AND OPERATING INSTRUCTIONS



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INTRODUCTION

Congratulations on the purchase of an Astral Pool Heat Pump, Pool and Spa Heater. Proper installation and service of your new heating system and correct chemical maintenance of the water will ensure many years of service. It is equipped with features that take advantage of new technology developed exclusively by Astral Pool.

This unit can safely be connected to PVC pipe. In addition, the unit is equipped with an accurate electronic thermostat to ensure ease of use and accurate temperature control. The electronic display tells at a glance the operational status of the heater.

Your heat pump works by extracting heat from the surrounding air. The heat pump works most efficiently in warm weather. So, it is best to operate the heat pump during the warmest part of the day rather than overnight or early in the morning.

It is important to ensure an adequate supply of air and to avoid recirculation of the cooled air exiting the top of the unit. For this reason, the heat pump should not be installed in confined spaces and must have a minimum of 1000 mm clearance above it and 500 mm clearance to the sides and rear. A clearance of 1000mm is required to the front of the unit to allow air flow out of the unit.

Although the unit is weatherproof, it is recommended some protection from the harsh effects of direct exposure to the elements be provided.

The heat pump **must** be installed outdoors on a level concrete pad.

In most circumstances where heating is required, the heat pump will need to run longer than the filtration. For the most effective heating it may be necessary to install a small pump to circulate water through the heat pump independent of the filtration system. Since the heat pump uses electricity so efficiently, it is a pity to waste electricity running an oversized pump. For this reason, the small added cost of a dedicated pump can be recouped and a great deal of energy saved over the life of the heater.

NOTICE TO INSTALLERS

Heat Pump must be located outdoors with sufficient ventilation as explained on page 10.

This appliance must be installed by an authorized person.

This appliance must be installed in accordance with the installation instructions, the National Wiring Rules and any other relevant statutory authorities.

Refer to data plate for details of operating voltage and current.

A multi-pole isolating switch must be installed that operates in all live conductors so that it isolates the entire equipment from the supply.

Phase rotation must be checked on 3 phase units. Incorrect rotation will damage the compressor and void any warranties.

SAFETY RULES

1. Spa or hot tub water temperature should never exceed 40°C.
2. Drinking of alcoholic beverages before or during spa or hot tub use can cause drowsiness which could lead to unconsciousness and subsequently result in drowning.
3. Pregnant women beware! Soaking in water above 38°C can cause foetal damage during the first three months of pregnancy.
4. Before entering the spa or hot tub, the user should check the water temperature with an accurate thermometer, spa or hot tub thermostats may be inaccurate by as much as 2°C.
5. Persons with a medical history of heart disease, circulatory problems, diabetes or blood pressure problems should obtain their physician's advice before using spas or hot tubs.
6. Persons taking medications which induce drowsiness, such as tranquillisers, antihistamines or anticoagulants, should not use spas or hot tubs. If in doubt seek medical advice.

WARNING: Should overheating occur or the heater fail to shut off, turn off the manual isolation switch to the appliance. Do not use this heater if any part has been under water.

OPERATING INSTRUCTIONS

1. STOP! Read the safety information above.
2. Turn filtration pump or dedicated pump on. The display should indicate flow.
3. Turn on power to the Heat Pump.
4. Set thermostat to desired setting
5. If the water temperature is below the set temperature, the fan will start. The compressor will start in a few minutes. (Set by the compressor delay timer)
6. If the appliance will not operate, follow instructions 2 to 4 above ensuring the thermostat is set to a higher temperature than the indicated water temperature. If the appliance still does not operate, call your service technician.

During operation in weather below about 10 deg, ice may appear on the evaporator coil. An automatic defrost mode will initiate. During a defrost cycle the compressor will continue to run however the direction of the gas in the system is reversed so that the evaporator coil is heated. A 'whoosh' may be heard as this occurs. The fan will continue to run in order to melt the accumulated ice. When the evaporator temperature rises sufficiently to allow continued operation, the compressor will restart in heating mode.

During this heated defrost mode, there may be visible water vapour in the airstream. This is normal during cold weather.

CHEMICAL BALANCE

It is imperative that correct chemical balance be maintained in your pool and spa water, otherwise corrosion of your heater may occur. **Corrosion due to chemically imbalanced water or excessive sanitiser is detectable and will void warranty.** Your local pool shop specialist or spa retailer can advise correct chemical balance. Your water should be checked and maintained regularly by a pool water professional. As a guide the following parameters may be used.

pH	7.6 to 7.8
Total Alkalinity	80 to 120 ppm
Calcium Hardness	150 ppm

You should test your water chemical balance at least on a weekly basis.

Excessive sanitiser can damage your heater. Chlorine should not exceed 3 ppm and bromine should not exceed 5 ppm. Salt chlorinators, especially when used on spa pools or indoor or covered pools, can easily produce excessive chlorine levels which will damage the heater internals.

TECHNICAL SPECIFICATIONS

Model	ASTRAL	BPM400A	BPM600A	BPM700A	BPM800A	BPT900A
HEATING CAPACITY	BTU/H	29000	43000	58000	72000	85000
	W	8500	13000	17000	21000	25000
HEATING POWER INPUT	W	1700	2600	3500	4500	5500
EFFICIENCY	COP	5.0	5.0	4.9	4.7	4.6
HEATING NOMINAL CURRENT	A	8.3	11	14.7	19.3	8.8
VOLTAGE/FREQUENCY	V/PH/Hz	240/1/50	240/1/50	240/1/50	240/1/50	415/3/50
COMPRESSOR UNIT		1	1	1	1	1
COMPRESSOR TYPE		ROTARY	ROTARY	SCROLL	SCROLL	SCROLL
HEAT EXCHANGER	<i>PVC HERMETIC WATER BARREL WITH SPIRAL SOFT TITANIUM PIPES INSIDE</i>					
REFRIGERANT	<i>R407C</i>					
BLOWER QUANTITY		1	1	1	1	1
FAN POWER INPUT	W	45	60	120	200	200
FAN ROTATE SPEED	RPM	850	850	850	850	850
BLOWER STYLE	<i>LATERAL-BLOW</i>					
NOISE LEVEL	dB(A)	≤1	≤8	≤8	≤8	≤8
WATER CONNECTION	mm	50	50	50	50	50
WATER FLOW	m ³ /h	≥3.0	≥7.5	≥8.0	≥9.0	≥10.0
WATER PRESSURE LOSS	kPa	10	12	12	12	12
NET DIMENSION	mm	860×310×920	860×310×920	950×340×1300	950×340×1300	950×340×1300
GROSS DIMENSION	mm	930×430×1080	930×430×1080	1030×460×1450	1030×460×1450	1030×460×1450
WOODEN PLATE	mm	920×420×100	920×420×100	1020×450×100	1020×450×100	1020×450×100
PACKING		CARTON	CARTON	CARTON	CARTON	CARTON
NET WEIGHT	Kg	70	75	97	110	115
GROSS WEIGHT	Kg	85	90	117	140	145
Starting Current	A	30	40	40	40	40
Fuse gauge	A	20	32	40	60	20
Supply gauge	mm ²	3×2.5	3×2.5	3×4.0	3×4.0	5×2.5

NA6888 User Guide

☞ Main Function and Technique Index

Main Function:

The controller is the special controller for heat pump water heater, it contains two temperature sensors (water temperature, outdoor temperature), four control outputs (compressor, valve, fan, water pump) and one alarm signal input (used for high and low pressure protection). Its main function is showing below:

- ☞ **Temperature Display and Controlling:** It can display water tank temperature and outdoor temperature, and control the temperature of water in tank between the temperature upper and lower limit.
- ☞ **Auto Defrost Controlling:** It has optimize design of logical defrost controlling logic fit for heat pump, and can defrost effectively in order to ensure the outdoor machine can run normally at low temperature.
- ☞ **External alarm:** one outside alarm signal input, it can be set to 5 modes: always open, always open locked, always closed, always closed locked or forbidden.
- ☞ **Real Time Clock (RTC):** Internal RTC, it is still running when power off, and it supplies accurate time, used for real time defrost function etc.
- ☞ **Others:** Temperature upper and lower limit can be set, direction of four-way valve can be set, compressor start delay protection, temperature sensor error alarm and so on.

Main Technique Index:

- ☞ **Temperature display range:** -50~150°C(The resolution is 0.1°C)
-58~302°F(The resolution is 0.1°F)
- ☞ **Power supply:** AC 220V±10% or AC 380V±10% (Refer to the wiring diagram)
- ☞ **Operating environment:** temperature -10°C~50°C, humidity≤85%.
- ☞ **Relay contact capability:** 2A/250VAC (pure resistive load)
- ☞ **Temperature sensor:** NTC R25=5kΩ, B (25/50) =3470K
- ☞ **Executive standard:** Q/320585 XYK 01

📖 Operating Guide

Panel:



☞ *What's the meaning of the index lights on the panel?*

The function of the LED on the panel is showing below:

Index Light	Name	Light	Flash
	Temp Setting	In the state of temp setting	-
	Refrigeration	Refrigerating	Ready to refrigerate, in the state of compressor start delay protection
	Heat	Heating	Ready to heat, in the state of compressor start delay protection
	Defrost	Defrosting	Ready to defrost, in the state of compressor start delay protection
	Fan	Fan running	-

((•))	Alarm	-	Alarm state
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🔑 **The meaning of the LED display**

The LED usually shows temperature, if it shows “SHr”, it means the temperature sensor is short, and “OPE” means the temperature sensor is open. The temperature and the alarm code (Axx) will show alternately when in the alarm state.

The code is showing below:

Code	Signification	Explanation
A11	External alarm	Low Pressure Alarm
A12	External alarm	High Pressure Alarm
A15	External alarm	Water Flow Alarm
A21	Water temperature sensor error	Open or short (showing “OPE” or “SHr”)
A22	Outdoor machine sensor error	Open or short (showing “OPE” or “SHr” when press the key “↓”)
A99	Over probation time	If you have set the probation time F87, the alarm occurs when the accumulative running time is over probation time, and the controller can not work.

🔑 **How to set the temperature?**

Press the key “set” for at least 2 seconds, then enter the state of temperature setting, here the LED displays the setting temperature, then using “▲” key or “▼” key can change the parameter (the key “▲” adds 0.1°C, the key “▼” minus 0.1°C, press and hold it over 0.5 seconds can add or minus rapidly) . After setting, press “set” again, then exit the state of parameter setting. (The setting temp range is limited by the parameters F13 and F14, please refer to the advanced operation). Pressing the key “M” in the setting process means cancel and exit, but the setting value will not be saved.

🔑 **How to read the outdoor temperature?**

When displaying current temperature, press “▼” key, Controller will display defrosting temperature. Loose “▼” key, then return to current temperature. Notice that if you press the key and hold it for 5 seconds, the controller will enter or exit the defrosting state forcibly.

🔑 **How to look over and adjust the real clock time?**

Press the key “Set” to enter the state of displaying time when in the state of displaying temperature. Press the key “Set” for some time to enter the state of adjusting time, and press the key “Set” to return to the state of displaying temperature.

In the state of adjusting time, the hour part of the LED flashes, and you can adjust the hour by using the key “▲” and “▼”, then press the key “Set”, and the minute part of the LED flashes, you can also use the key “▲” and “▼” to adjust the value, then press the key “Set” again to exit. Pressing the key “M” in the adjusting process means giving up and exiting, but the time will not be saved.

🔑 **How to heat forcibly?**

When displaying current temperature, the temperature is between “setting temperature—temperature difference” and “setting temperature+temperature difference”, the system may or not heat, here you press the key “▲” and hold it for 5 seconds, the controller will enter the heat state forcibly when in the heat state, and stop heating when the temperature is above “setting temperature+temperature difference”.

✓ **Advanced Operation**

Press the key “M” and hold it for 5 seconds, and if you have set the password, the LED display the “PAS” to hint you to enter the password, you can use the key “↑” and “↓” to enter the password, if the password is correct, the LED will display the parameter code, use “↑” or “↓” to select the parameter code , Pressing the “set” key can make it to show the value of the parameter after select the parameter, here you use “↑” or “↓” to set the parameter (pressing the key and not release can add or minus rapidly), then press the “set” key to return to the state of showing parameter code after finishing setting. Pressing the key “M” can exit the parameter setting state when display the parameter code, pressing the key “M” means cancel when in the process of setting parameter, and the parameter will not be changed.

Internal parameter code is showing below:

Sort	Code	Parameter Name	Range	Factory setting	Unit	Remark
Temperature	F11	Setting temperature	F14 – F13	28	°C/°F	The setting range is limited by F13 and F14
	F12	Temperature difference	0.1 – 20	1.0	°C/°F	Control the temperature difference, please refer to the temperature controlling
	F13	Max setting temperature	-58 - 302	35	°C/°F	Notice: the controller will follow the rule of F14<F11<F13 forcibly, if you find out that one parameter can not be adjusted, it is because the parameter is limited by other parameters, you must first adjust other parameters
	F14	Min setting temperature	-58 – 302	10	°C/°F	
	F17	Auto mode temperature difference	3 - 20	3	°C/°F	If F17<F12,F17=F12 admitted
	F18	Evaporator sensor adjustment	-20 – 20	0.0	°C/°F	Adjust the outdoor machine sensor bias
	F19	Temp sensor adjustment	-20 – 20	0.0	°C/°F	Adjust the temperature sensor bias
Compressor	F21	Compressor delay time	0 -- 10	3	min	
	F29	Compressor controlling mode (temp controlling mode)	COOL / HEAT /C/H	HEAT	-	COOL: refrigeration mode HEAT: Heat mode C/H :Auto mode
Defrosting	F31	Defrost start temperature	-20 – 80	-2	°C/°F	
	F32	Defrost end temperature	0 – 100	10	°C/°F	
	F33	Defrost start time	1 – 999	30	min	
	F34	Max defrost time	Off, 1 – 99	10	min	Off means no defrost
	F37	Defrost mode	0 – 1	0	-	0:air defrost 1: 4 way valve defrost
Water Pump	F40	Water Pump Select	0 – 1	1	-	0: water pump is not enable 1: water pump is enable
	F41	Water pump starts time before compressor starts	1 – 10	3	min	
	F42	Water pump stops time after compressor stops	0 – 10	3	min	
	F43	Water pump stop time	OFF 1 – 99	60	min	
	F44	Water pump run time	OFF 1 – 10	5	min	
Alarm	F50	External alarm mode	-	3	-	always closed, unlocked
	F51	External alarm mode	-	3	-	always closed, unlocked
	F52	External alarm mode	-	3	-	always closed, unlocked
	F59	Buzzer alarm sound duration	OFF, 0.1 -- 10, On	OFF	min	Off: No alarm sound On: Alarm sound is always on until pressing any key
RTC	F60	Set the RTC time	00: 00—23: 59	-	-	
	F61	Period 1 start time	00: 00—23: 59 OFF	05: 00	-	OFF means not using
	F62	Period 1 end time	00: 00—23: 59 OFF	07: 00	-	
	F63	Period 2 start time	00: 00—23: 59 OFF	16: 00	-	
	F64	Period 2 end time	00: 00—23: 59 OFF	18: 00	-	
	F65	Period 3 start time	00: 00—23: 59	22: 00	-	

			OFF			
	F66	Period 3 end time	00: 00—23: 59 OFF	00: 00	-	
	F69	Run Mode	0/1	0	-	0: Automatic 1: Economical
System setting	F80	Password	OFF 0001 -- 9999	OFF	-	OFF means no password 0000 means clearing password
	F81	Temperature unit	C/F	C	-	C: Centigrade F: Fahrenheit
	F85	Display accumulative running time	-	-	hour	
	F86	Accumulative running time reset	-	-	-	
	F87	Probation time	OFF 1 -- 9999	OFF	hour	The controller will stop if the accumulative time is over probation time, and show the alarm code "A99". OFF means no probation time
Testing	F98	Reserved				
	F99	Test self	This function can attract all relays in turn, and please don't use it when the controller is running!			
	End	Exit				

❄️ Basic Operating Principle

🌀 Temperature controlling

The controller has 3 temperature controlling mode: Refrigeration, Heat and auto(F29). Temperature controlling point is controlled by “setting temperature (F11, or press the “set” key for some time to set)”, “temperature difference(F12)” and “Auto mode temperature difference”. In refrigeration mode (4 way Valve is enable and follow compressor), the controller begins to refrigerate when the temperature of the temperature sensor is over “setting temperature + temperature difference”, and it stops refrigerating when the temperature is under “setting temperature — temperature difference”; In heat mode (Valve is disable except when defrosting), the controller begins to heat when the temperature of the temperature sensor is under “setting temperature — temperature difference”, and it stops heating when the temperature is over “setting temperature + temperature difference”; In auto mode, the controller begins to refrigerate when the temperature of the temperature sensor is over “setting temperature + Auto mode temperature difference”, and it stops refrigerating when the temperature is under “setting temperature”, the controller begins to heat when the temperature of the temperature

sensor is under “setting temperature — Auto mode temperature difference”, and it stops heating when the temperature is over “setting temperature”.(Attention:when set F17<F12, F17=F12 admitted)

⌘ Compressor delay time

The compressor delay time is set by F21, for example, 3 minutes. The controller contains a “compressor halt calculagraph”, and it begins to time when compressor stops, the program first check the calculagraph before booting the compressor next time, the program will immediately boot the compressor if the calculagraph reach 3 minutes ,if the calculagraph doesn’t reach 3 minutes ,it will boot again when the calculagraph reaches 3 minutes. Thus you can ensure that the boot alternation is over 3 minutes after halt, so it can prevent to breaking the compressor as a result of frequent boot. In addition, the controller doesn’t boot the compressor within 3 minutes after turning on the power supply, thus the compressor can also be protected in the state of power cut and then power on.

⌘ Auto defrosting principle

The controller will supervise the temperature of outdoor machine when heating normally, and decide whether need to defrost according to the time of the outdoor machine in the continuous low temperature state. In other words, the defrosting calculagraph begins to time when the outdoor machine temperature is lower than “defrost start temperature”, and turns on the defrosting when the value of time reaches “defrost start time”. The calculagraph will be cleared if the outdoor machine temperature is higher than “defrost start temperature” when timing, and it begins to time again when the outdoor machine temperature is lower than “defrost start temperature” next time. In other words, the value of defrosting calculagraph shows the continuous low temperature time of the outdoor machine.

The controller can check the defrosting effect with the temperature of outdoor machine, if the temperature of outdoor machine goes up to the “defrost end temperature”, the controller will turn off the function of defrosting. If the defrosting time is above “max defrost time”, the controller will turn off defrosting forcibly.

The process above can only run in heating state, in other words, the controller will not turn on defrosting in non-heating state.

Air defrost mode:when start defrost,the compressor stop running ,the fan continue running;when stop defrost the compressor and fan continue running;

4 way valve defrost mode: when start defrost,the compressor and fan continue running,the four-way valve energized;when stop defrosting the compressor and fan continue running, the four-way valve powered off.

⌘ Water pump control

The controller can choose whether to use water pump or not (F40),0 means no water pump function, 1 means use water pump. When water pump runs, the compressor start up ahead of the time of F41, delaying turn off the compressor of the time of F42.When external alarm and probation time over alarm,cut off water pump output immediately.The compressor won’t start up until the water pump achieve the working time of F41.

When the machine unit stop running,the water pump follow the below request: F43stop, F44 run,and circle.

⌘ External alarm

The controller can connect 3 switching values as external alarm source (Pin 4, 5), (Pin 13, 14), (Pin 14, 15), Only when the compressor is running ,and the external alarm occurs, the controller stops, displays the alarm code “A11”, “A12” “A15”. External alarm signal: always closed, unlocked.

⌘ Running in different period of time

The controller contains real time clock, and can time accurately. In “Econ Mode”, the controller will ensure that whether need to heat according to water temperature, otherwise the current time is in or not in the setting period of time, if it is not in the setting period of time, then the controller will not heat whether the water temperature is high or low.

The controller can be set 3 heat periods of time at most, if you don’t need some periods of time, you can set the starting time and ending time which you don’t need as “OFF”.

In addition, if the ending time is earlier than starting time, the controller considers this ending time is next day. For example, the period of time is “22:00”to“03:30”, the controller considers it as 22:00 at night to 03:30 next day.

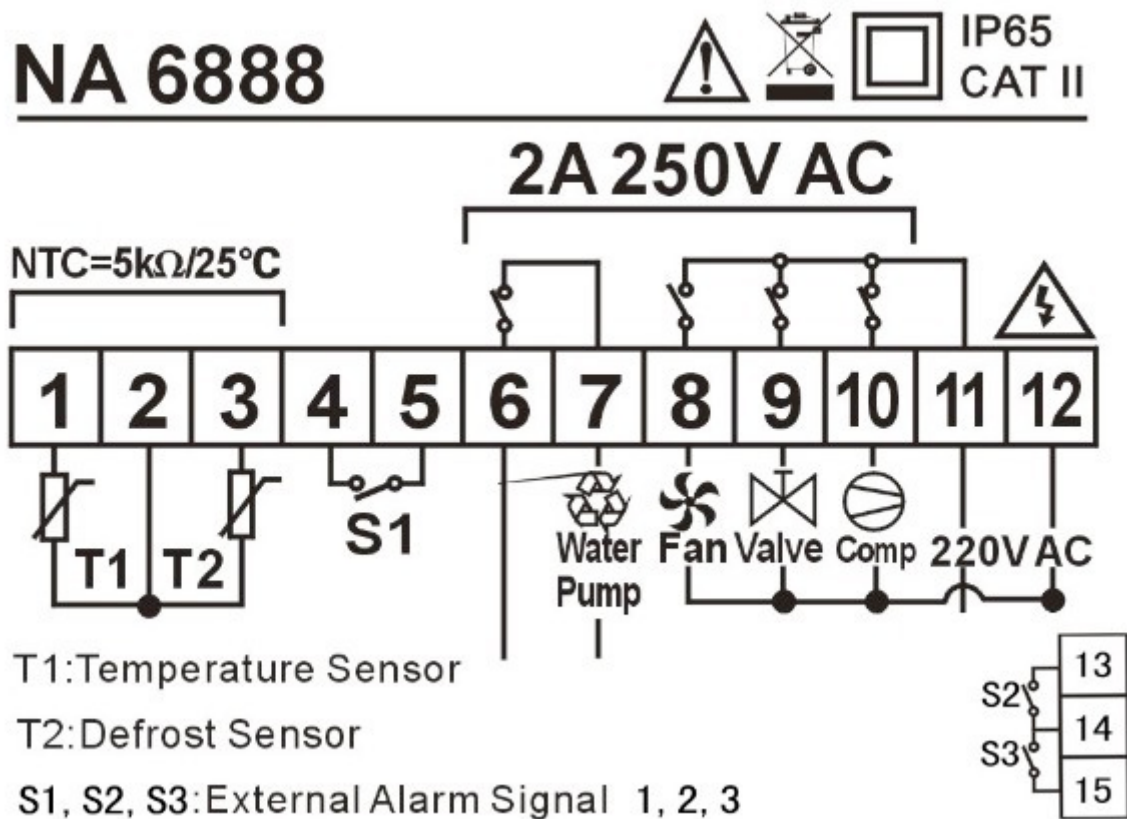
⌘ Probation time

A probation time can be set (F87), the controller can add up the running time after power is on, if the accumulative running time is over the probation time, the controller will stop and display the alarm code A99, if you want to eliminate the limit of probation time, set the F87 to “OFF”, also you can use the F86 to clear the accumulative running time, and you can try to use it again. The parameter F85 can be used to examine the accumulative running time of the controller (hour).

⌘ Password

In order to prevent irrespective persons from changing the parameters, you can set a password (F80), and if you have set a password, the controller will hint you to enter the password after you press the key “M” for 5 seconds, you must enter the correct password, and then you can set the parameters. If you don’t need the password, you can set F80 to “OFF”. Notice that you must remember the password, and if you forget the password, you can not enter the set state.

Wiring Diagram:



Note:

1. Please read the guide carefully before using, and set the parameter accurately.
2. Please place the temperature sensor at the place of air return of the air-cooler.
3. Please use the temperature sensors which are supplied by our company.

MAINTENANCE

It is recommended that you check the following at least every six months and at the beginning of every swimming season.

1. Make sure there are no obstructions to the flow of air to or from the appliance.
2. Examine the evaporator coil and fan grille. Check that debris such as leaves has not accumulated on the inside or outside of the heater. If the evaporator coil is restricted, the heater will not perform at optimum efficiency. The interior of the heater should be cleaned by a qualified service technician.
3. Keep the heater area clear and free of combustibles and flammable liquids. Chlorine should not be stored in the vicinity of the heater. Chlorine vapour, when drawn through a heater, can rapidly cause corrosion of working parts and exterior panels.
4. Keep the heater area free from garden refuse and debris. This will help prevent insects nesting in the unit and ensure extended life and reliability of your heater.

ENERGY SAVING TIPS

1. If possible, keep pool or spa covered when not in use. This will not only cut heating costs, but will also keep dirt and debris from settling in the pool and conserve chemicals.
2. Reduce pool thermostat setting to 28 °C or lower. This is accepted as a comfortable and healthy swimming temperature.
3. Use an accurate thermometer.
4. Set timeclock to start filtration and circulation system no earlier than daybreak. The pool loses less heat at this time and the heat pump operates more efficiently during the warmer times of the day.
5. If your filtration pump is large, consider installing a small pump for circulating water through the heat pump.
6. For pools that are only used on weekends, it is not necessary to leave the thermostat set at normal swimming temperature. During the week, lower it by an amount that can easily be achieved in one day (generally 2 °C to 5 °C).
7. During the winter or while on vacation, turn the heater off.
8. Set up a regular program of preventative maintenance for the heater each new swimming season.

WINTER OPERATION

If the pool won't be used for a month or more, turn the heater off at the main isolating switch. For areas where there is no danger of freezing, water should circulate through your heater all year long even though you are not heating your pool.

Where freezing is possible, it is necessary to drain the water from the heater. This may be done by loosening the inlet or outlet barrel union. If the heater is below water level, isolate it from the pool first by closing shut off valves before and after the heater.

CAUTION: If the heater has been drained for freezing conditions, do not turn on until the system is circulating water.

INSTALLATION

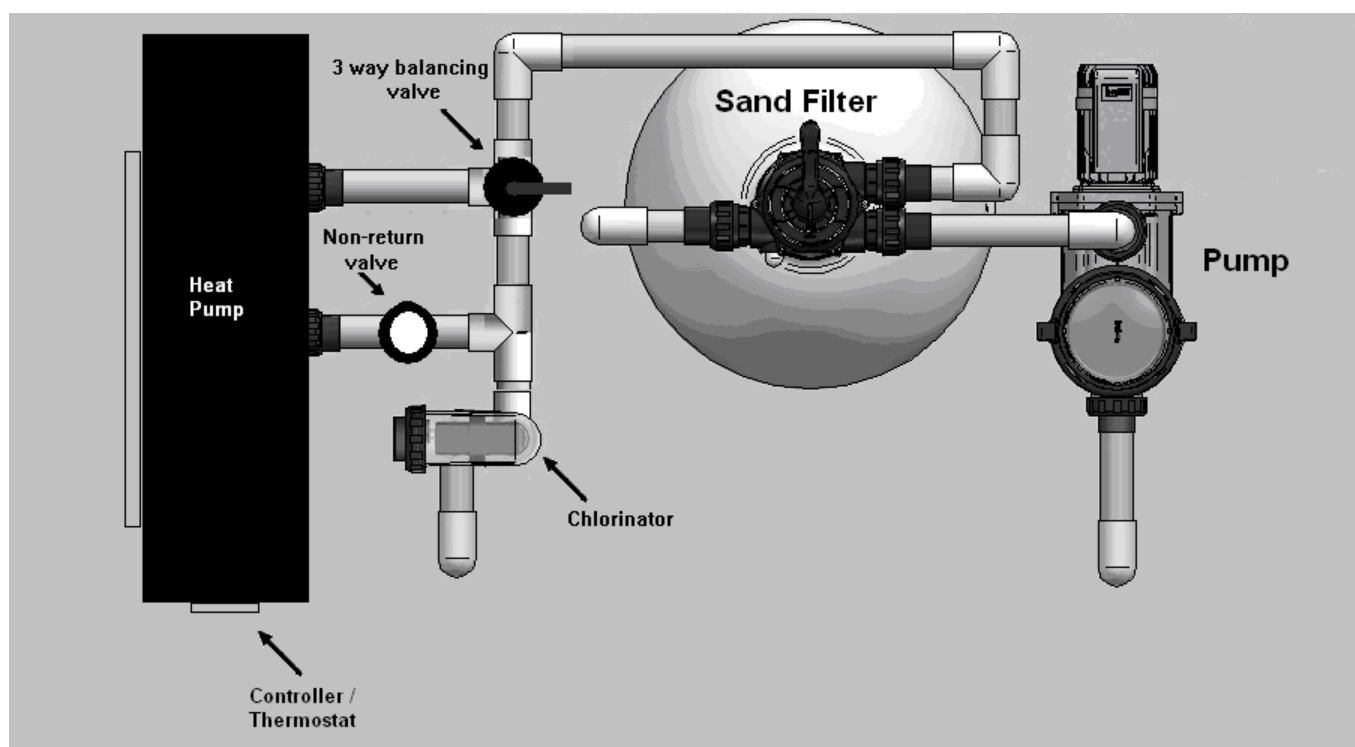
THIS APPLIANCE MUST BE INSTALLED BY AN AUTHORISED PERSON. Refer to heater data plate for specifications of operating voltage and current and water pressure.

This appliance must be installed in accordance with local regulations and the National Wiring Rules.

A multi-pole isolating switch must be installed that operates in all live conductors so that it isolates the entire equipment from the supply.

FLOW RATES

The Astral Pool Heater requires a flow rate of approx 150 to 550 litres per minute. For flow rates in excess of 250 litres per minute, an external by-pass valve must be fitted. When setting up the unit, the water balancing valve should be adjusted while the heat pump is operating. Using the gauge fitted on the front of the unit, adjust water flow until reading is approximately 1.5MPa. With the unit turned off, the gauge should settle at approximately 0.8MPa. If these readings are not achieved, please contact Astral Pool service.



WATER CONNECTIONS

Where the heat pump is installed in the filtration circuit, the heater should always be installed after the pump and filter. The water connections are located on the right hand side of the heater. The inlet and outlet are clearly marked. Water connections supplied are for 50mm PVC glue in plumbing.

All automatic sanitising devices must be installed after the heater and in such a way that the sanitiser cannot enter the heater without first mixing with the water in the pool or spa. Sanitisers that are connected prior to the heater will void heater warranty.

The Astral Pool Heat Pump Pool Heater is only suitable for outdoor installation.

Note: These units are supplied with an internal water pressure switch mounted on the lower heat exchange. This must be adjusted as part of the installation / commissioning.

CLEARANCES

The heater must be installed at least 500 mm from any obstruction to airflow at the rear and sides.

There must be at least 1000mm clearance above the heater.

A minimum of 1000mm clearance should be provided at the front of the heater to permit discharge air flow.

Heater must be installed on a solid, level base.

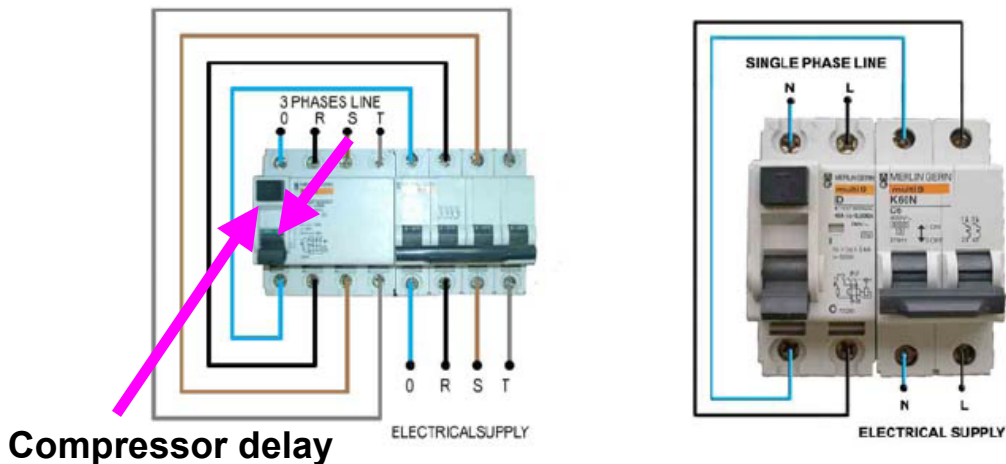
ELECTRICAL CONNECTION

The heater must be installed by a licensed electrician. It is recommended all pool or spa equipment connected to mains power should be protected by an RCD circuit breaker.

Refer to heater data plate for specifications of operating voltage and current.

This appliance must be installed in accordance with local regulations and the National Wiring Rules.

A multi-pole isolating switch must be installed that operates in all live conductors so that it isolates the entire equipment from the supply.



ELECTRICAL DATA	BPM400	BPM600	BPM700	BPM800	BPT900
Voltage(V)	240II	240II	240II	240II	415III
Section(mm ²) PURIFICATION PUMP	1,5	1,5	1,5	1,5	1,5
Section(mm ²) POWER	2,5	2,5	4	4	2,5
N ^o . of wires	1+N+T	1+N+T	1+N+T	1+N+T	3+N+T

GUIDE TO HEAT PUMP NOISE

Heat Pumps are designed for slow heat up times and maintenance heating. The limitation of power supply in nearly all residential homes means that a Heat Pump's maximum size for most homes is about 6 hp. A unit of this size will typically generate around 25 kW of pool heating at maximum efficiency. For most swimming pools, this means the Heat Pump will operate for 2 or 3 days continuously for the initial heat up period and then between 12 and 24 hours each day to maintain the swimming pool temperature.

Heat Pumps are very similar to air conditioners. An evaporator fan and compressor operate during their "on" time and as the "on" time can be 12 to 24 hours per day, care must be taken to locate the Heat Pump so that the noise produced during its operation does not interfere with sensitive areas - not only in your own home but in your neighbour's home.

Each State in Australia has municipal, state and EPA laws which govern the installation and operation of outdoor appliances in residential areas. In general, noise from an appliance such as a Heat Pump must not unreasonably interfere with the health, welfare, convenience, comfort and amenity of any person having regard to the nature and duration of the noise emission and the time of day at which the noise is emitted.

Criteria for noise emissions generally take into account back ground noise at the time of day, but the most stringent criteria applies at night – and take into account, the Heat Pump will most likely need to operate at night during cooler months of the year to maintain the pool temperature.

This guide provides an estimate only and should not be taken as definite advice on the location and installation of your Heat Pump. Should any doubt exist, seek advice from an Acoustical Consultant which can be found in the Yellow Pages.

The ASTRAL POOL Heat Pump has a sound power level of 66 dB(A) at 1 metre distance. The following factors should be taken into account when working out where to locate the Heat Pump.

Determining Distance to Neighbour's Boundary

$$\boxed{6 \text{ db(A)}} - \boxed{\text{Barrier Factor}} + \boxed{\text{Reflection Factor}} = \boxed{\text{Distance Factor}}$$

Box 1 Box 2 Box 3

Barrier: A fence or barrier can reduce the level of the Heat Pump's noise heard in neighbouring premises. To do this, the barrier or fence needs to be continuous with few or no gaps and go down to ground level. It must also prevent the Heat Pump from being seen from noise sensitive locations on neighbouring premises. Noise sensitive locations include bedroom and living room windows (including second storey dwellings) and outdoor entertaining/relaxing areas.

Factor for Box 1

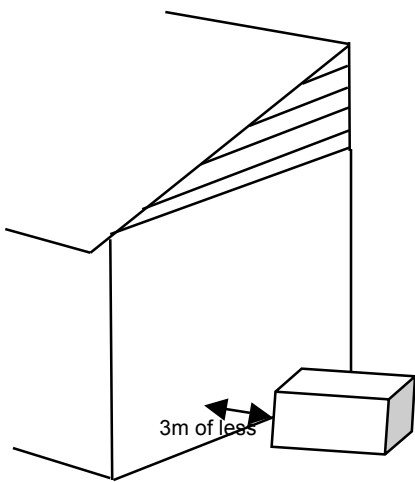
Carefully read through the fence/barrier descriptions below. Select a value that corresponds to the fence/barrier description applicable to your situation. Put this value in Box 2 above.

	Description	Value for Box 1
1	The fence/barrier does not prevent the Heat Pump from being seen from noise sensitive locations on neighbouring properties	0
2	The fence/barrier blocks line of sight but is made of material having large gaps, such as a picket fence, or brick wall with openings or fancy inserts.	0
3	The fence/barrier blocks line of sight of the Heat Pump from noise sensitive location eg: Typical paling fence with small gaps due to warping.	5
4	The fence/barrier blocks line of sight of the Heat Pump from noise sensitive location e.g. "Colorbond" fencing, concrete block/masonry/brick, Fibre cement sheeting	10

Reflection Factor

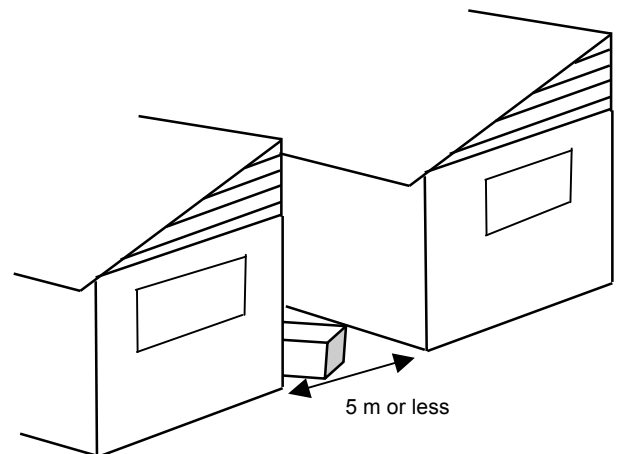
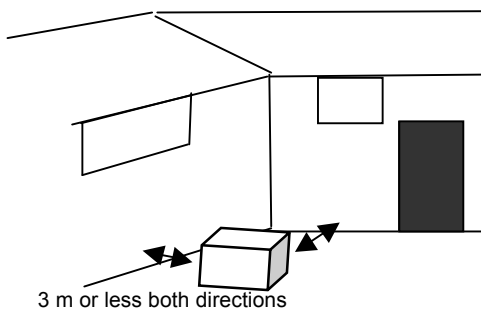
Noise can reflect from walls, roofs, sheds etc. This can have the effect of making the noise seem louder than what it is. Put the corresponding value in Box 3.

Factor for Box 2



One Reflective Surface
Value for Box 3 = 3

2 reflective surfaces
Value for Box 3 = 6



Distance Factor

An example may look like this:

A Timber Paling fence that goes right to the ground with some small gaps due to age, is worth a barrier factor of 5.

One reflective surface adjacent to the Heat Pump is worth a factor of 3.

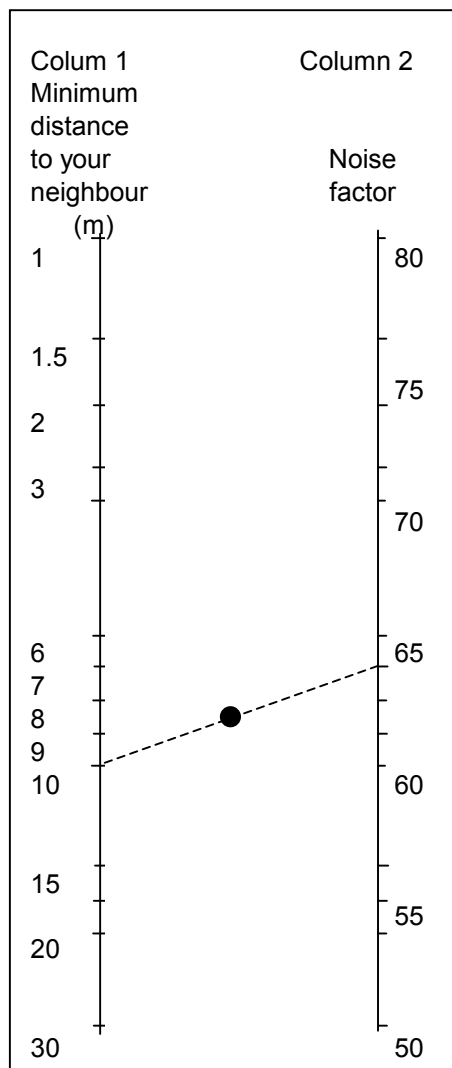
The Heat Pump has a sound power level of 64 db(A).

Therefore your equation will now look like this:

$$\begin{array}{ccccccc} 64 \text{ {db(A)}} & - & 5 & + & 3 & = & 62 \\ \text{Heat Pump Sound} & & \text{Barrier Factor} & & \text{Reflective Surface} & & \text{Distance Factor} \\ \text{Pressure Level} & & & & \text{Factor} & & \end{array}$$

The distance factor is 62 which should be written in Box 3.

The final step is to mark 64 on Column 2 below and draw a straight line through the middle X to reach Column 1. Column 1 is the minimum distance the Heat Pump should be installed from a noise sensitive area in your neighbour's residence.



With one reflective surface and a timber paling fence with small gaps, the Heat Pump needs to be installed at least 10 metres from a noise sensitive area in your neighbour's property.

This calculation is intended as a guide only and no warranty is made or implied by Astral Pool as to its accuracy. Please consult an Acoustical Consultant or phone your Astral Pool branch office if in any doubt.

Further Guidelines for installation of Heat Pumps

- ASTRAL POOL Heat Pumps must be installed outdoors – never install inside a plant room, garage etc.
- Allow a minimum of 500mm clearance from the sides and rear of the heat pump and a minimum of 1000mm service access from the front of the Heat Pump.
- Ensure an electrical isolation switch is located nearby the Heat Pump.
- On Three Phase models, ensure the phase rotation of the compressor is checked before commissioning of the unit.
- Ensure the water pressure switch operation is checked at least 6 times prior to handing over the Heat Pump.
- Refer to Installation and Operating Instructions for full installation, commissioning and operating procedures.

TROUBLESHOOTING

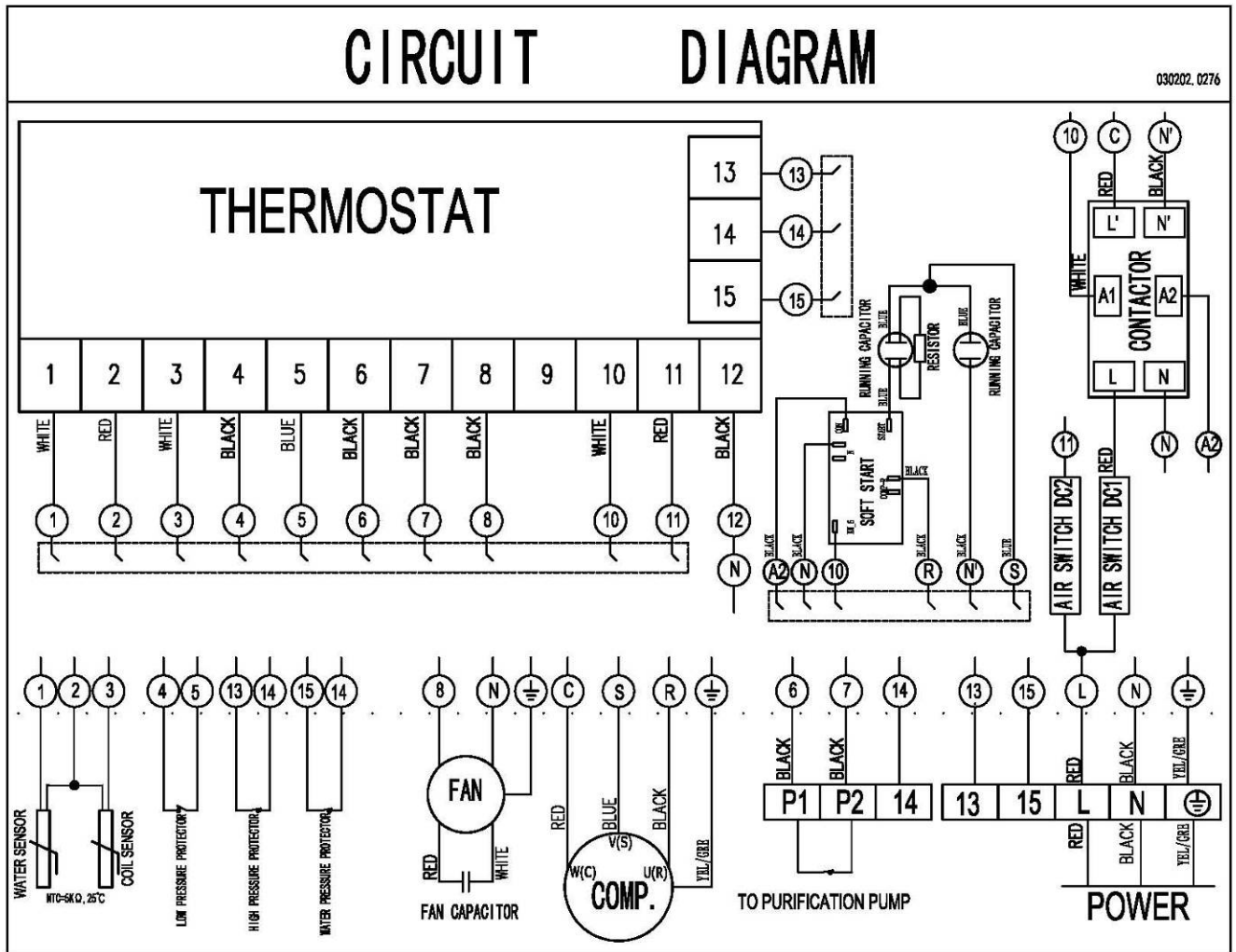
HEATER WILL NOT START	
Possible cause	Remedy
Automatic control system fails	Check if power to heater is turned on and pump is in operation
Pump not running	Start pump
Pump airlocked	Check for leaks, check non return valve
Filter dirty	Clean filter
Pump strainer basket clogged	Clean strainer
Defective heater control	Shut off electrical supply and call for service
Thermostat turned off	Turn on and set to correct setpoint
Set temperature lower than water temperature	Increase set temperature (to heat)
Set temperature higher than water temperature	Decrease set temperature (to cool)
Water too hot-fault condition displayed	Refer to fault indication table
HEATER SHORT CYCLING (RAPID ON AND OFF OPERATION)	
Possible cause	Remedy
Insufficient water flow	Clean filter and pump strainer
Defective wiring	Repair or replace wiring
Defective high limit or thermostat	Repair or replace

If the heater cannot be made to perform correctly, please contact the Astral Pool office closest to you, your equipment installer or Astral Pool Service on 1300 727 116 local call cost.

For VIC: Phone (03) 9765 9700
 NSW: Phone (02) 9853 2100
 QLD: Phone (07) 3308 5400
 GC: Phone (07) 5552 2600
 SA: Phone (08) 8349 2500
 WA: Phone (08) 9350 2600

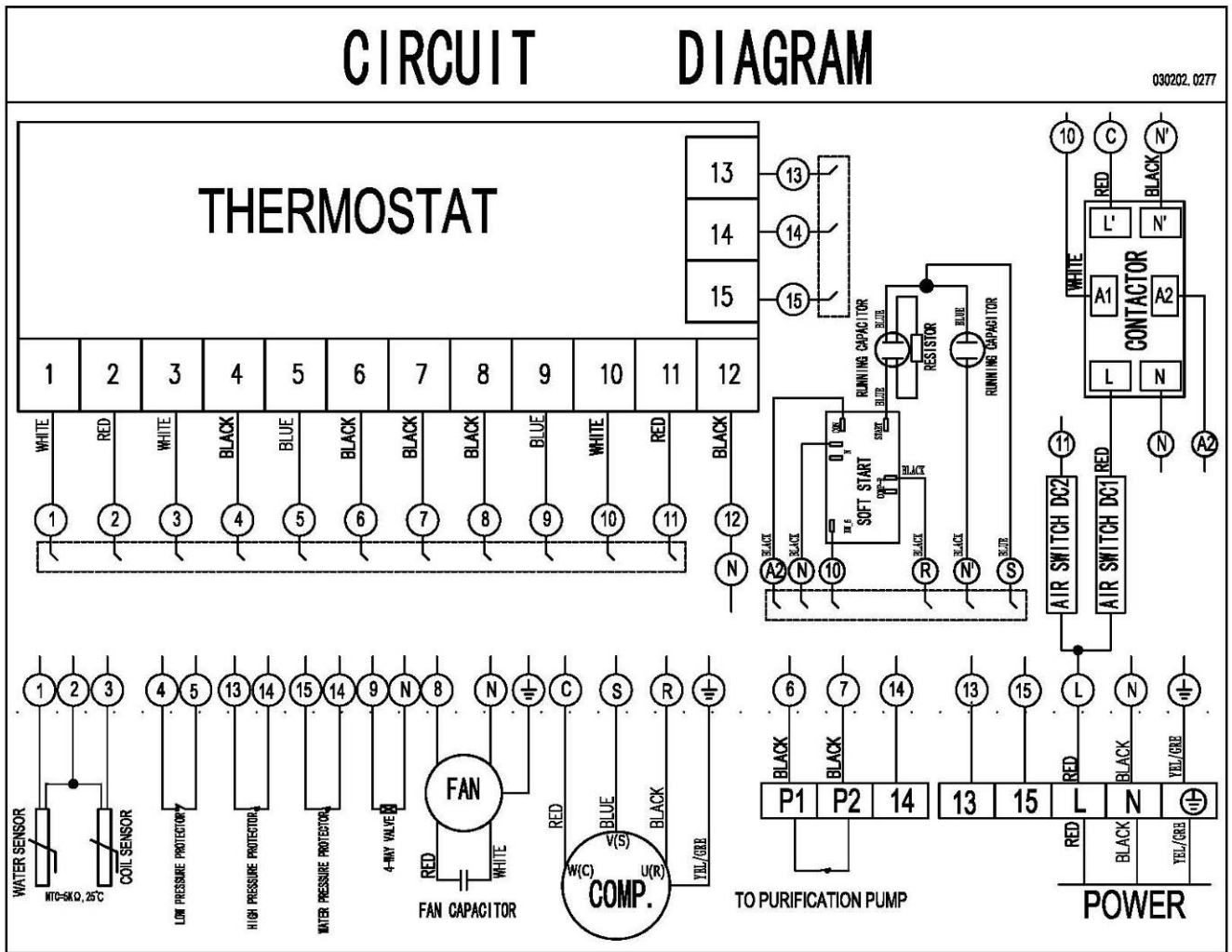
For all other areas, please contact our Victorian sales office.

WIRING DIAGRAMS



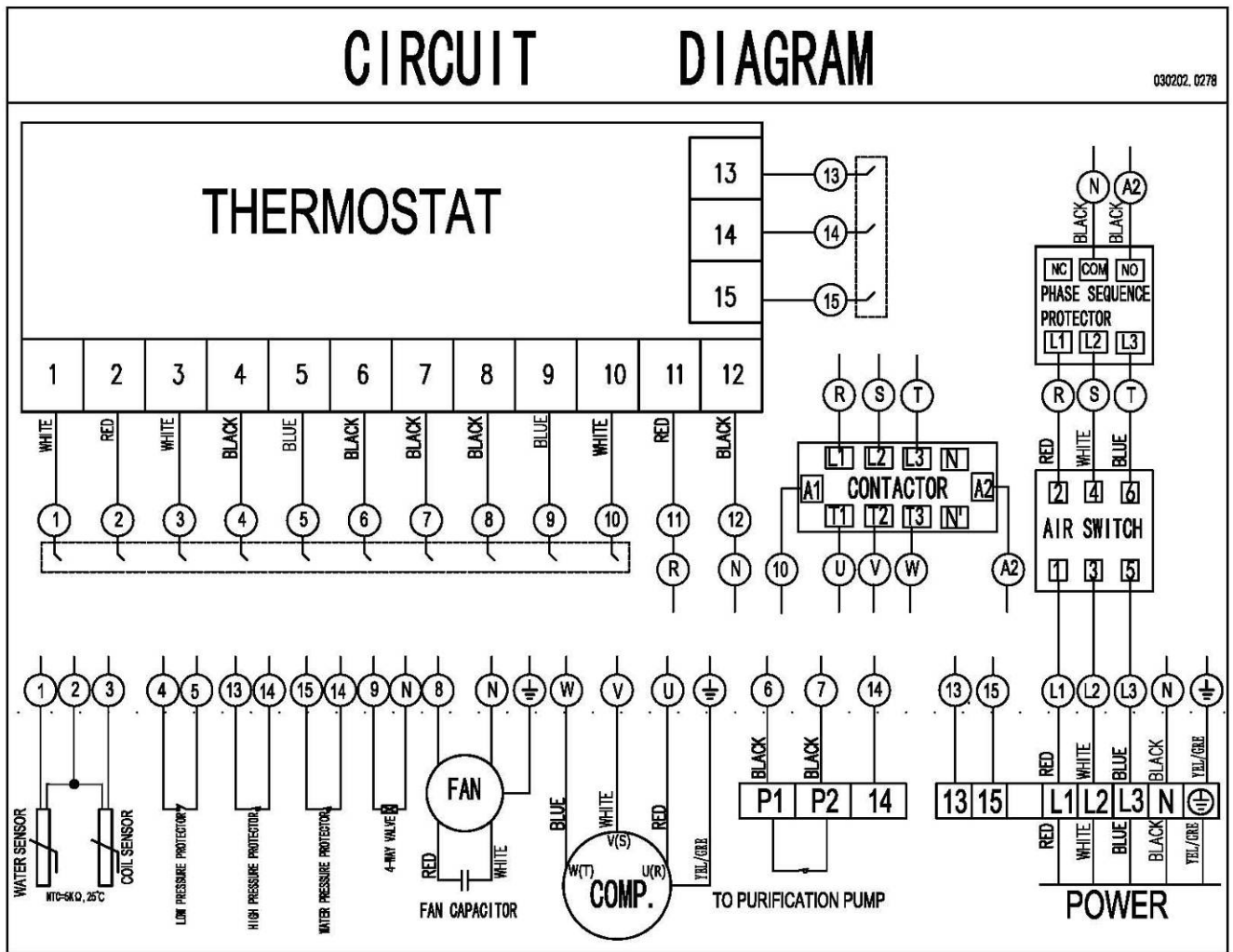
BPM400 BPM600

WIRING DIAGRAMS



BPM700 BPM800

WIRING DIAGRAMS



BPT900

WARRANTY

AstralPool Australia Pty Ltd (ABN 97 007 284 504) ("AstralPool") provides the following warranty in relation to its BP Series Heat Pumps ("Product").

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

The benefits of this warranty are in addition to any rights and remedies imposed by Australian State and Federal legislation that cannot be excluded. Nothing in this warranty is to be interpreted as excluding, restricting or modifying any State or Federal legislation applicable to the supply of goods and services which cannot be excluded, restricted or modified.

WARRANTY

AstralPool warrants that, subject to the exclusions and limitations below, the Product will be free from defects in materials and workmanship during the warranty period. The warranty periods are set out below and commence 30 days after the date of purchase (to allow for installation). The warranty period may vary for different parts of the Product.

Parts	Warranty Period
Titanium heat exchange	10 years
Compressor and evaporator	3 years
Thermostat, switches and all other components	12 months

If a defect appears in the Product before the end of the warranty period and AstralPool finds the Product to be defective in materials or workmanship, AstralPool will, in its sole discretion, either:

- (a) replace or repair the Product or the defective part of the Product free of charge; or
- (b) Cause the Product or the defective part of the Product to be replaced or repaired by an Authorised AstralPool Service Agent free of charge.

AstralPool reserves the right to replace defective parts of the Product with parts and components of similar quality, grade and composition where an identical part or component is not available.

Goods presented for repair may be replaced by refurbished goods of the same type rather than being repaired. Refurbished parts may be used to repair the goods.

WARRANTY CLAIMS

1. If a fault covered by warranty occurs, the customer must first contact AstralPool at the contact address listed below, or an Authorised AstralPool Service Agent.
2. Any warranty claim must be accompanied by:
 - (a) proof of purchase;
 - (b) full details of the alleged defect; and
 - (c) appropriate documentation (such as historical and maintenance records).
3. The customer must make the Product available to AstralPool or its Authorised AstralPool Service Agent for inspection and testing. AstralPool or its Authorised AstralPool Service Agent will attend the premises where the Product is installed for inspection and testing. If the Product is installed:
 - (a) outside a capital city metropolitan area; and
 - (b) is not within a 20 km radius of an Authorised AstralPool Service Agent;then the customer may have to pay a travel fee.

4. If such inspection and testing finds no defect in the Product, the customer must pay AstralPool's usual costs of service work and testing. If such inspection and testing finds a defect that is not covered by this warranty, the customer must pay AstralPool's usual costs of service work plus any parts and labour required to repair the Product, unless recoverable from AstralPool on the failure of any statutory guarantee under the ACL.

Exclusions

The warranty will not apply where:

- (a) the customer is in breach of the Terms and Conditions of Sale;
- (b) the Product was used for a purpose other than one it was intended for;
- (c) the Product was repaired, modified or altered by any person other than AstralPool;
- (d) the Product has not been installed, maintained and/or operated in complete compliance with the installation and operating instructions and any instructions by AstralPool;
- (e) the Product has been subject to accident, negligence, alteration, abuse or misuse.

The warranty does not extend to:

- a) normal wear and tear;
- b) weather and other environmental conditions including but not limited to storm, flood, and/or heat wave damage; or
- c) service and maintenance items.

Examples of exclusions include but are not limited to:

- incorrect water chemistry
- incorrect power supply / connection

Commercial Installations

On commercial installations, such as health clubs, motels/hotels and hydrotherapy facilities, the warranty is limited to parts and in field labour (within capital city metropolitan areas or 20 km radius of Authorised AstralPool Service Agents) for a period of 12 months from the date of purchase plus 30 days to allow for installation.

LIMITATIONS

AstralPool makes no express warranties or representations other than set out in this warranty.

The repair or replacement of the Product or part of the Product is the absolute limit of AstralPool's liability under this express warranty.