



INSTALLATION & INSTRUCTION MANUAL

SN-HP-55

SN-HP-90



Australia



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POWER SMART 



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Specifications

Description	SV-HP-55	SV-HP-90
Power supply	220-240V~/1PH/50Hz	220-240V~/1PH/50Hz
Rated heating capacity	5.5Kw	8.8Kw
Rated heating input	1.4Kw	2.1Kw
Running current heating	5.83A	8.75A
Rated cooling capacity	3.3Kw	5.4Kw
Rated cooling input	1.2Kw	2.0Kw
Running current cooling	5.0A	8.33A
Refrigerant	R410A, 900g	R410A, 1500g
Sound pressure level	<49 dB(A)	<49 dB(A)
Protection class	1	1
Waterproof class	IPx5	IPx5
Net weight	42Kg	48Kg
Fan speed	850 RPM	850RPM
Water temperature range	10 to 40°C	10 to 40°C
Operating temperature range	-10 to 45°C	-10 to 45°C
Minimum water flow rate	2.2 m3/hr	3.0 m3/hr
Cabinet dimensions L x W x H	955 x 305 x 550mm	955 x 305 x 550mm
Heat exchanger	Titanium + PVC	Titanium + PVC
Expansion valve	Mechanical	Mechanical
Outlet size	40mm	40mm
Max heat exchanger pressure	5.0MPa	5.0MPa
Max discharge pressure	4.5MPa	4.5MPa
Max suction pressure	0.7MPa	0.7MPa
Defrost element	40W	40W
Compressor	Panasonic YDK-20-6D	Panasonic YDK-20-6D
Compressor capacitor	CBB6-5, 30uF +/- 5%, 450V	CBB6-5, 30uF +/- 5%, 450V
Fan capacitor	CBB6-1, 2uF +/- 5%, 450V	CBB6-1, 2uF +/- 5%, 450V
PCB Fuse	IEC 15A time delay, 250V	IEC 15A time delay, 250V

Warnings

Please read the following before installing or connecting this appliance

!!! RISK OF ELECTRICAL SHOCK !!!

- The heat pump **MUST** be installed according to the installation instructions **AND** air space requirements shown in Figure 1 on page 5 of this manual. **FAILURE TO FOLLOW THESE INSTALLATION INSTRUCTIONS WILL IMMEDIATELY VOID ANY WARRANTY.**
- All electrical connections must be performed by a licensed electrician and must confirm to all national, state and local electrical codes in effect at the time of installation.
- The appliance should be supplied through a residual current device (RCD) having a rated residual operating current not exceeding 30mA.
- The appliance must be connected to a suitable rated and weather protected power supply. The supply line should be a dedicated power circuit and means for disconnection must be incorporated in the fixed wiring in accordance with your local wiring regulations. Means for disconnection from the supply mains should have a contact separation in all poles that provide full disconnection under over voltage Category III conditions.
- Earthed appliances must be permanently connected to fixed wiring (European models only).
- The appliance contains no serviceable parts. Do not attempt service of this appliance. Contact your dealer or authorized service agent for assistance.
- Turn the mains power OFF before servicing appliance or modifying any cable connection.
- Low voltage or improper wiring may cause damage to this appliance. Read and follow all wiring instructions when connecting to power supply.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- To prevent electric shock hazard and/or water damage to this appliance, all unused receptacles must have a water proof seal in place.
- Parts incorporating electrical components must be located or fixed so that they cannot fall into the bath or spa.
- Parts containing live parts, except parts supplied with safety extra-low voltage not exceeding 12V must be inaccessible to a person in the bath or spa.
- This appliance must not be installed in proximity to highly flammable materials.
- Water temperature in excess of 38°C may cause hyperthermia (heat stress).
- It is the installer's responsibility to ensure the floor is capable of supporting the expected load of the bath or spa and an adequate drainage system has to be provided to deal with overflow water.
- A whirlpool spa should incorporate a water filtration system where the required level of water purity can be achieved.
- An adequate drainage system has to be provided if the equipment is to be installed in a pit.
- Spanet series heat pumps can only be used with Spanet series SV controllers.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.
- When ambient temperatures are close to or under freezing point, water circulation to the heat pump must never be stopped for more than 4 hours without completely draining the heat exchanger. **In areas where freezing conditions are prevalent and sustained, in advance of any freeze event, all water MUST be removed from the entire heat pump water circuit. Refer "Winterising" section on page 11. FREEZE DAMAGE NOT COVERED UNDER PRODUCT WARRANTY**

Introduction

The SpaNET SV Series consists of a range of spa pool equipment designed to offer complete flexibility to the spa pool builder and user. It is a modular system that allows connection of desired equipment at the spa factory and also allows in field connection should the user wish to expand their system.

The SV Series has at its heart a powerful SV Series Spa Pool Controller (refer below)



Accessory equipment offered in the series are (not limited to): touch pads, lights, pumps, blowers, sensors and heat pumps.

This manual is only concerned with SV Series Heat Pumps. They are designed to be used with only SV Series Spa Controllers. They have no intelligence and can only be controlled by a SV Series Spa Controller.

When installed correctly they offer a truly integrated heat pump solution for a spa pool. They offer outstanding efficiency, low noise and high build quality. They are easy to use and maintain and will provide years of trouble free service.



Genuinely interfaced to spa controller

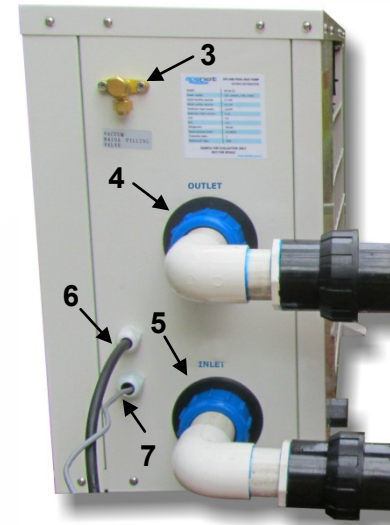
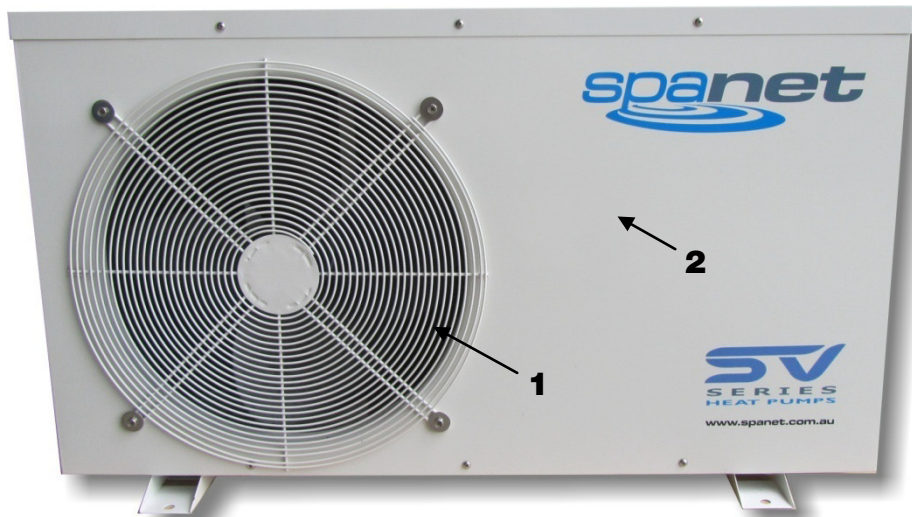
Fully insulated heat exchanger & cabinet

Corrosion resistant gold fin condenser

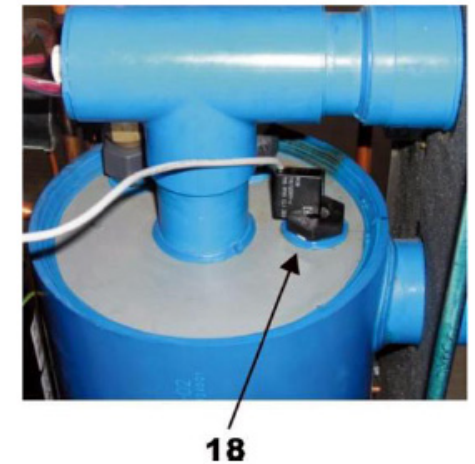
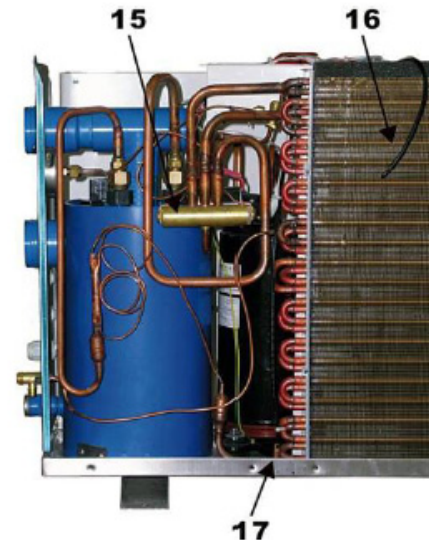
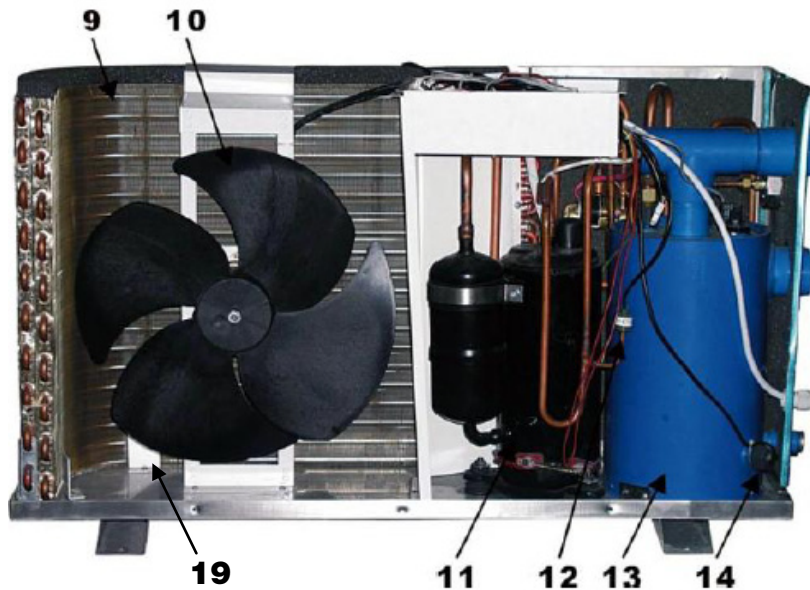
Eco-friendly R410A refrigerant

Titanium / PVC heat exchanger

Overview



No.	Description
1	Fan protection grid (air outlet)
2	Cabinet
3	Refrigerant charge valve
4	Water outlet
5	Water inlet
6	SV spa controller power cable
7	SV spa controller data cable
9	Condenser
10	Fan
11	Compressor
12	High and Low pressure switches
14	Heat exchanger thermal cut out
15	Four way valve
16	Ambient temperature sensor
17	Condenser temperature sensor
18	Water flow switch
19	Defrost element



Installation Instructions

The heat pump will be supplied with a data and power cable already fitted. They simply need to be connected to the SV spa controller. Once connected the SV will automatically detect the heat pump and enable its operation. Operation and use of the heat pump is covered in a dedicated section. This section concentrates on the installation of the heat pump and connection of pipe work and cables.

- The SV Series of heat pumps must be located outside in a clean area where noise and air flow will not be disruptive. The heat pump must be located external to the spa pool cabinet to allow sufficient air flow for optimum efficiency.
- The heat pump **MUST** be installed according to the air space requirements shown in Figure 1, and the instructions as detailed below. **FAILURE TO FOLLOW THESE INSTRUCTIONS WILL IMMEDIATELY VOID ANY WARRANTY.**

The following pages contain detailed drawings of plumbing, wiring and installation. Please study them carefully before attempting any installation. Select a suitable location in accordance with below notes and consult the local swimming pool safety regulations to check requirements for proximity to other equipment.

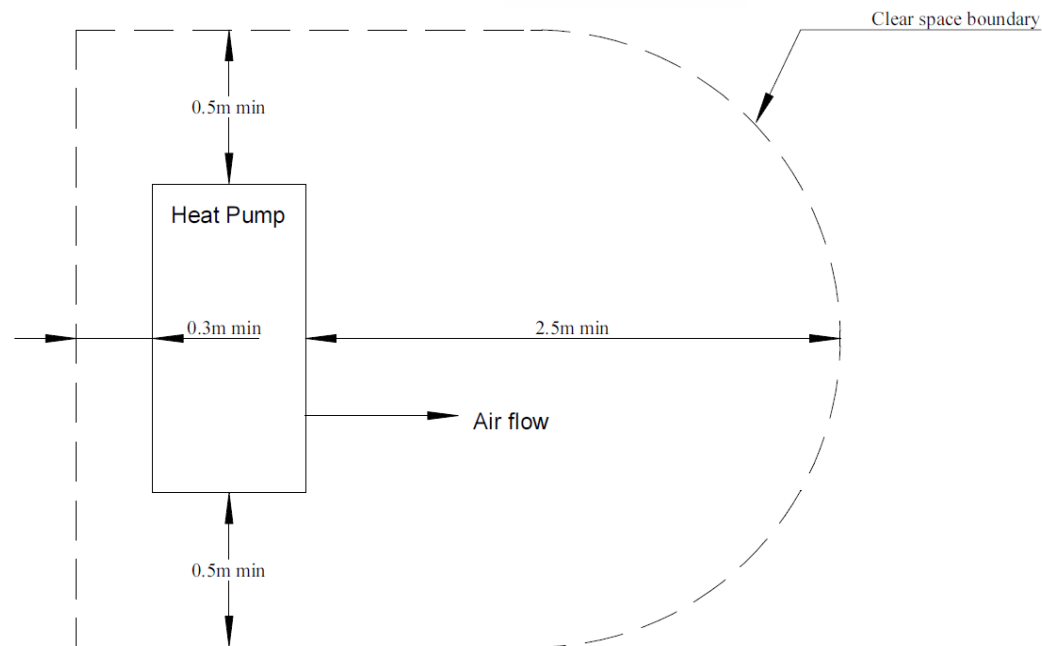
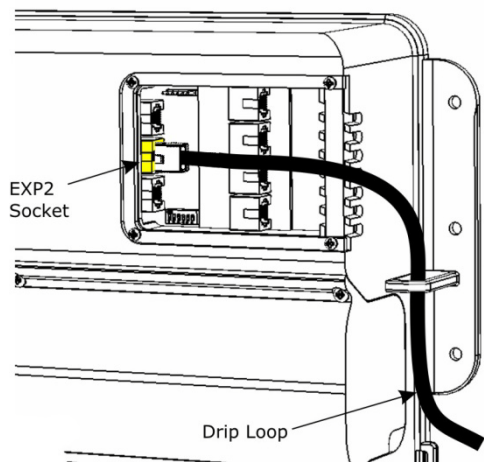


Figure 1: Air space requirements

Connection of heat pump

1. Isolate spa power, empty spa water and **connect pipe work from the spa to the heat pump ensuring the SV spa controller is plumbed last in line before the water returns to the spa.** Water **MUST** flow from the heat pump into the SV controller before returning to the spa. **DO NOT** plumb SV controller prior to heat pump. All pipes should be insulated and secured. Tighten all fittings before opening water shut off valves.
2. Supply power to the spa and operate filtration pump to purge all air from the heat pump and pipe work. Operate the pump for a period of time to check for drips and leaks. Isolate spa power ready for data and power cable connection.
3. Data and power cables must be protected (placed in a protective conduit) between the heat pump and spa pool in accordance with the local wiring regulations. Earth bonding may be required by local wiring regulations and should be installed by a licensed professional. It is best practice to separate data and power cables from each other.

Cable Connections



Data Cable Connection

- ▶ Unscrew and remove low voltage connections cover from spa pack enclosure
- ▶ Connect data cable RJ45 plug into EXP2 socket (refer aside)
- ▶ Route the keypad cable through the cable guide provided
- ▶ Ensure the keypad cable has a drip loop before it enters the enclosure

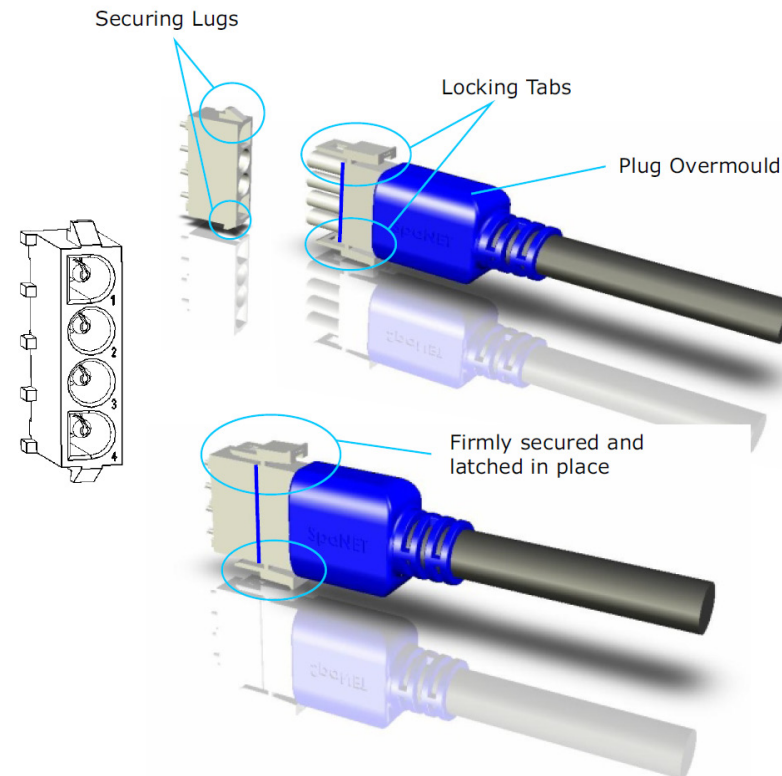
Power cable connection

The SV spa controller will have up to two mains power outlets that the heat pump can be connected to. These outlets are not switched, they are always powered. Please refer to the SV Series Installation manual to choose the best AMP socket to use, alternatively contact your sales representative for assistance. **NOTE: Phase and controller loading must be considered.**



AMP Sockets & Plugs

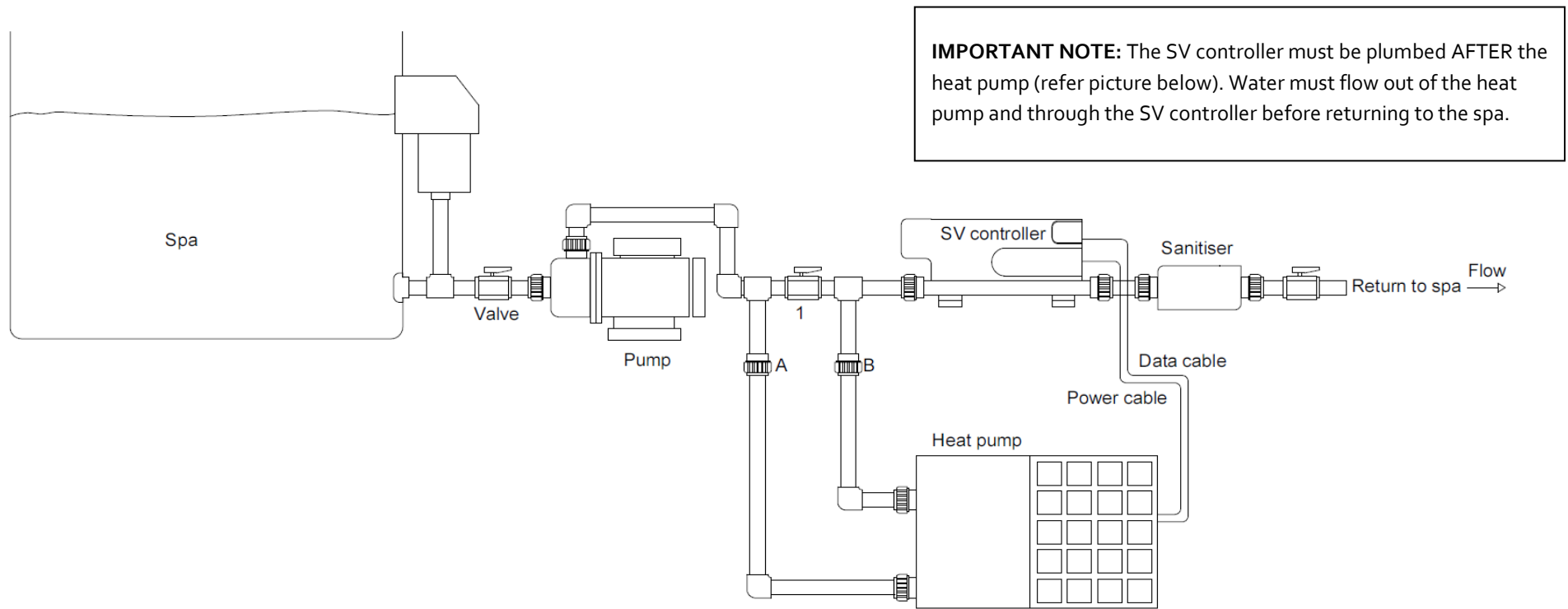
SV series spa controllers utilise AMP mate-N-lok power connectors. The AMP connectors feature a key pattern for fail safe one way connection. When connecting the heat pump be sure to push cordset firmly into socket and ensure both side locking tabs have been secured and latched in place.



Once power and data cables have been connected power can be restored to the spa pool. The SV controller will detect that the heat pump has been connected and will automatically engage it for heating and cooling functions based on factory default settings.

Some settings may be adjusted to tailor the heat pump operation for the customer's needs. Refer to SV Controller Heat Pump Set Up section for more detail.

Plumbing Diagram



Non heat pump configuration:

Unions A and B are mounted on spa cabinet and capped off. Valve 1 is open.

When heat pump is installed:

Unions A & B caps are removed and valve 1 is closed.

Plumbing notes

- 1) Heat pump powered from SV 230V AMP outlet or similar 230V power.
- 2) Heater pump data cable connected to SV controller port EXP2.
- 3) Pump wet end can be rotated to reduce air locks.
- 4) Pipe work external to spa cabinet should be insulated.
- 5) All pipe work to be restrained to prevent movement and stress.



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Title : **SV Series Heat Pump
 - Plumbing**

Pt No. : Issue : V1 Date : 14/01/11

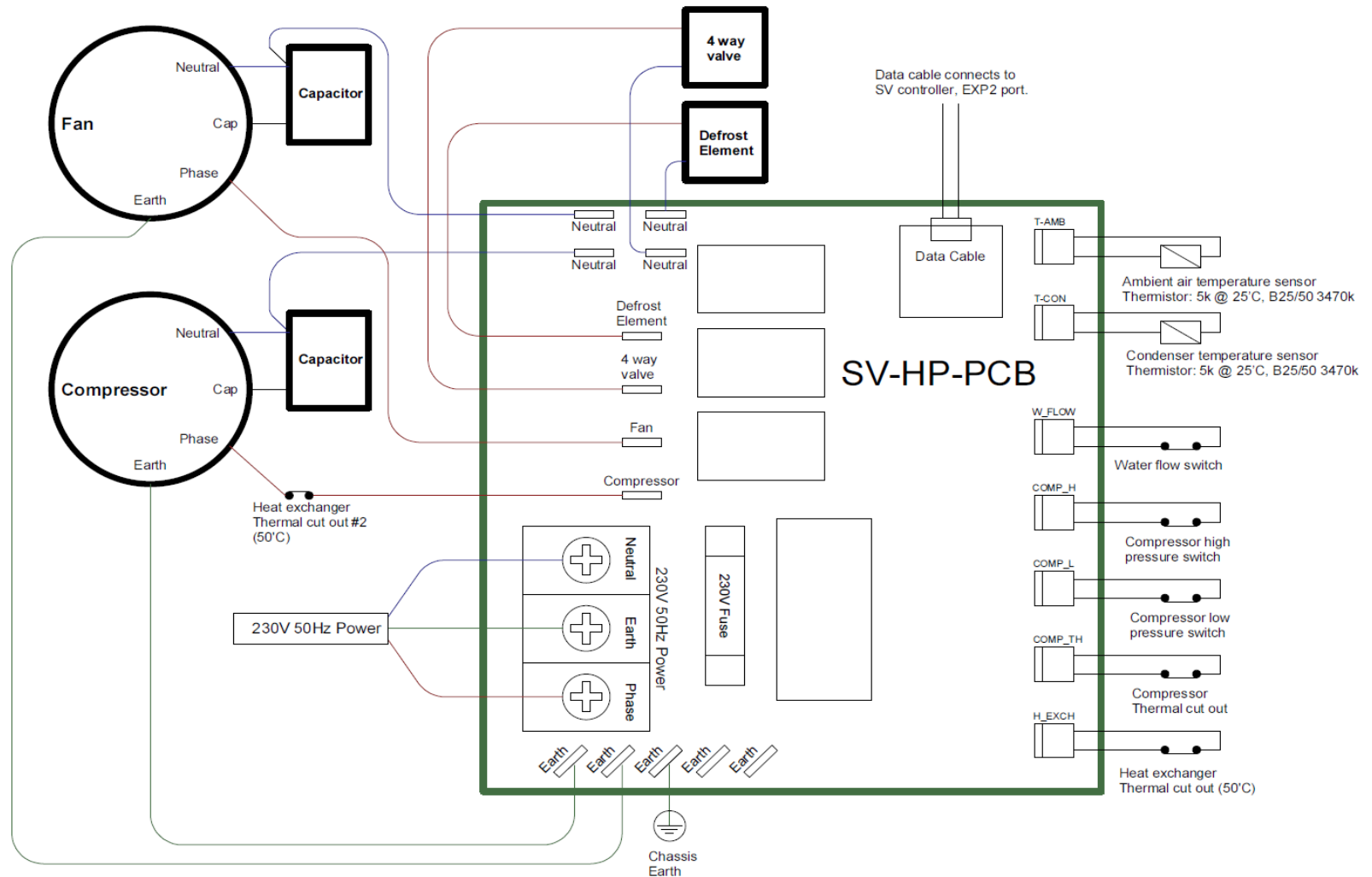
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Sheet size : A4 Page : 1 of 1

Electrical Wiring Diagram

SV Series Heat Pumps are supplied pre-wired. No additional wiring is required. This drawing is supplied for informative purposes only.



Notes:
 SV spa controller contains pool water temperature sensor.
 SV spa controller controls the SV-HP-PCBA.
 SV-HP-PCBA has no intelligence.

Fuse = IEC 15A Time delay, 250V



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Title : **SV Series Heat Pump
 - Wiring Diagram**

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SV System Set Up

All models of the SV Series spa controllers have the capability to seamlessly integrate and control a SV Series heat pump for efficient heating and cooling of the spa water. When a SV Series heat pump is connected the SV controller will automatically detect the heat pump and take control of its operation. All heat pump functions including heating / cooling / temperature adjustment / defrost cycles / over temp protection / diagnostics and monitoring are all controlled by the SV spa controller and the SV spa side touch pad.

There is no system setup required, it will simply detect the heat pump use it. However, the SV spa controller offers H.PMP and H.ELE "SETUP" menu options for tailoring the heat pump operation to the installation:

H.PMP Heat Pump Operating Modes

This setting determines how the heat pump should function. The operating mode choices are:

AUTO	Heat pump will heat and cool
HEAT	Heat pump will only heat
COOL	Heat pump will only cool (SV element heating also disabled)
OFF	Heat pump is disabled

H.ELE Heat Pump with SV Element Boost

This setting defines how the SV electric heating element operates with the heat pump. The benefit of this feature is that the SV heater can be set to operate together with the heat pump to boost heating and reduce heating times. The setting choices are:

- ON heat pump + SV element
- OFF heat pump only

Note: If H.ELE is set to ON the SV spa controller's electric heating element will operate in conjunction with the heat pump to boost heating *only* if the water temperature is 2°C or more below the set temperature point or the heat pump has been operating for more than 1 hour and the set temperature point has not been reached.




Heat Pump Operation

The heat pump is operated by the SV spa controller. It is a slave device and contains no intelligence. The SV spa controller will control its operation. The desired temperature of the spa pool is adjusted by the SV touch pad. If heating or cooling is required the SV spa controller will operate the heat pump as required.

The SV spa controller monitors the heat pump sensors and data. It looks after defrosting requirements, diagnostics and protection of the heat pump.

Refer to the SV Series spa controller instructions for detailed operation instructions and information.

Unless adjusted the SV controller will automatically heat to and maintain the default temperature of 38°C. The water temperature set point can be adjusted from 10°C to 41°C in steps of 0.2°C increments.

- ▶ Press and hold  OR  to begin set temperature point adjustment
- ▶ The keypad numbers will flash during temperature adjustment
- ▶ Once desired set temperature point has been selected press  to confirm

Notes:

1. If the ambient temperature is below the operational limit of the heat pump (-10 °C) the SV spa controller's electric heating element will be enabled regardless of the H.ELE setting, and the heat pump is disabled.
2. A defrost cycle will run for a minimum of 3 minutes and a maximum of 10 minutes when required.
3. The SV Series Heat Pumps are fitted with a flow switch. The flow switch must close within 30 seconds of filtration pump operation otherwise a flow error will occur.

Trouble Shooting

Should a problem occur the SV spa controller will shut down and disable the heat pump.

There are no user serviceable parts inside the heat pump. If a problem occurs please contact a licensed professional for service.

Water leaking from unit

Heat pump operation in heating or defrost mode will cause condensation on the condenser, this is normal. The condensation will collect in the base of the machine and exit via the drain pipe under the machine. Confirm that drain pipe work is not blocked and that the machine is mounted on a level surface.

If water leaking from the machine is not from condensation then all pipe work and connections should be checked for damage and leaks.

No heat pump operation

Check that the heat pump has power from the SV spa controller. Confirm the data cable is connected to the heat pump and SV spa controller. Check cables for signs of damage. Check the fuse located on the internal heat pump PCB.

Check SV spa controller settings. Confirm that P.PMP setting has not disabled the heat pump. Confirm ambient air temperature is within operational limits.

Flow error

The flow switch must close within 30 seconds of filtration pump operation. Check that the heat pump is connected to the correct water pump. Check there is adequate water flow. Check water pump operation for internal thermal cut out operation or motor stall. Check spa filters and shut off valves.

Thermal cut out errors

Check for poor water pump flow performance. Confirm ambient air temperatures are within operational limits.

Maintenance

Little maintenance is required however the following should be performed on a regular basis to ensure long equipment service life.

When performing maintenance isolate power to the spa pool and heat pump for safety.

Clean condenser using a very soft brush and water containing a mild detergent. This will remove any built up dust and grime and help to restore maximum efficiency.

Wash the exterior of the cabinet using an automotive detergent. Remove any moss/mould or other growth. Check the cabinet for signs of corrosion or damage and remedy them. Touch up any scratches or chips in paint work and apply a coat of automotive wax to the cabinet exterior.

Check condensation drain pipe work is clean and clear.

Inspect cables and pipe work for signs of damage or wear. Replace if necessary.

Inspect securing bolts for tightness and corrosion.

Ensure that air space surrounding the heat pump is clear. Remove any impending vegetation or objects.

Note: Should the unit vibrate more than usual or emit strange noises contact a licensed professional for service.

Winterizing the Heat Pump

Winterizing is a procedure that prepares your heat pump for freezing conditions. In areas where freezing conditions are a rare and brief occurrence, the water filtration system can be programmed to run continuously throughout the freeze period. Typically, during light freeze conditions circulating (moving) water will not solidify.

However in areas where freezing conditions are prevalent and sustained, and the spa is to be turned OFF during the winter period, in advance of any freeze event, all water **MUST** be removed from the entire heat pump water circuit including heat exchanger. Freezing of the unit will severely damage the heat exchanger and other components due to water/ice expansion. Damage resulting from a failure to properly winterize is **NOT** covered under the heat pump product warranty.

Preparing for Light Freeze Conditions

When ambient temperatures are close to or under freezing point, water circulation to the heat pump must never be stopped for more than 4 hours. To ensure this certain SV "SETUP" menu software options should be adjusted/checked prior to occurrence of light freeze events. Carry out the following:

1. Disable sleep timers

- a. Press and hold UP and DOWN buttons simultaneously until [MODE] is displayed
- b. Press DOWN button to skip through menu items until [SNZE] is displayed
- c. Press OK button to enter SNZE adjustment, [1.SNZ] is displayed
- d. Press OK button to enter 1.SNZ (first sleep timer) programming
- e. Press UP or DOWN button to adjust 1.DAY setting until the semicolon [:] DISABLED sleep timer icon is displayed
- f. Press OK to confirm and save setting
- g. Re-enter SNZE menu and ensure 2.SNZ (second sleep timer) is also disabled [:]

2. Set filtration to 24 hr circulation

- a. Press and hold UP and DOWN buttons simultaneously until [MODE] is displayed
- b. Press UP button to skip setup menu to filtration [FILT] menu option
- c. Press OK button to enter filtration [FILT] adjustment
- d. Press UP button to increase daily filtration time to twenty-four hours [24 HR]
- e. Press OK to confirm and save setting

Preparing for Freezing Conditions

If the heat pump is located in an area where the temperature drops below the freezing point of 0°C, and the spa is to be shut down and turned OFF for the winter period, it is mandatory that the water accumulated in the heat pump be drained completely before freezing weather occurs. To prevent damage from freezing perform the following steps:

1. Switch power to spa OFF.
2. Disconnect heat pump power and data cables from the SV controller.
3. Shut off all heat pump water isolating valves to close the water supply to the heat pump.
4. Drain the heat exchanger by removing the heat exchanger drain plug found on the back of the unit.
5. Disconnect water inlet and outlet coupler fittings and completely drain pipe work of all water.
6. It is recommended to flush the inside of the heat exchanger with a garden hose and to drain the unit again.
7. Replace drain plug and loosely re-attach inlet and outlet couplers to prevent lost parts and insect / debris ingress.
8. If the spa has been plumbed to run independently from the heat pump, alter by-pass valves according and switch power to spa ON again if desired.

Restarting the heat pump after winter:

1. Switch power to spa OFF.
2. Check heat exchanger drain plug is correctly installed and water inlet and outlet coupler fittings are tight.
3. Open all water shut off valves and alter by-pass valves if required.
4. Supply power to the spa and operate filtration pump to purge all air from the heat pump and pipe work. Operate the pump for a period of time to check for drips and leaks.
5. Switch power to spa OFF again, ready for data and power cable connection.
6. Connect heat pump power and data cables to SV controller.
7. Switch power to spa ON again.

NOTE: FREEZE DAMAGE NOT COVERED UNDER PRODUCT WARRANTY

Heat Pump Error Codes

If a heat pump fault condition is detected a warning message is scrolled across the SV Series Spa Controller touch pad LCD every 60 seconds and the heat pump is disabled. Spa operation will continue however the spa will now heat with the SV spa controller's electric heating element and there will be no ability to cool the water.

The heat pump warning message will continue to scroll every 30~60 seconds, and the heat pump will remain disabled until the mains power is turned OFF and back ON again.

If after resetting mains power the fault condition persists please contact your spa reseller and report the warning message that is shown. A list of the fault conditions and warning messages are detailed below for reference.

WARNING MESSAGE	DESCRIPTION
"HEAT PUMP AMB"	Ambient thermistor temperature sensor error
"HEAT PUMP COND"	Condenser thermistor temperature sensor error
"HEAT PUMP FLOW"	Water flow not detected
"HEAT PUMP LOW P"	Compressor low pressure switch open
"HEAT PUMP HIGH P"	Compressor high pressure switch open
"HEAT PUMP COMP"	Compressor thermal cut out open
"HEAT PUMP EXCH"	Heat exchanger thermal cut out open



IMPORTANT NOTE

If a heat pump encounters an error the heat pump will remain disabled until the mains power is turned OFF and back ON again. The heat pump warning message will continue to scroll every 30~60 seconds until the power is reset

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