IMPORTANT SAFETY INSTRUCTIONS

When using this electrical equipment, basic safety precautions should always be followed, including the following

READ AND FOLLOW ALL INSTRUCTIONS

* A green colored terminal or a terminal marked G, GR, Ground, Grounding, or the "G" symbol is located inside the supply terminal box or compartment. To reduce the risk of electric shock, this terminal must be connected to the grounding means provided in the electric supply service panel with a continuous copper wire equivalent in size to the circuit conductors supplying this equipment.

* At Bus Bar marked “BONDING LUGS” is provided on the external surface of the supply terminal box or compartment. To reduce the risk of electric shock, connect the local common bonding grid in the area of the hot tub or spa to these terminals with an insulated or bare copper conductor not smaller than No. 6 AWG.

* All field-installed metal components such as rails, ladders, drains or other similar hardware within 3m of the spa or hot tub shall be bonded to the equipment grounding bus with copper conductors not smaller than No. 6 AWG.

SAVE THESE INSTRUCTIONS!

POTENTIAL RISKS OF PERSONAL INJURY OR HEALTH HAZARDS MAY BE ASSOCIATED WITH USE OF EQUIPMENT PLEASE READ AND FOLLOW ALL WARNINGS CAREFULLY !!

WARNING

- Children should not use spas or hot tubs without adult supervision.
- Do not use spas or hot tubs unless all suction guards are installed to prevent body and hair entrapment
- People using medications and/or having an adverse medical history should consult a Physician before using a spa or hot tub.
- People with infectious diseases should not use a spa or hot tub.
- To avoid injury exercise care when entering or exiting the spa or hot tub.
- Do not use drugs or alcohol before or during the use of a spa or hot tub to avoid unconsciousness and possible drowning.
- Pregnant or possibly pregnant women should consult a physician before using a spa or hot tub.
- Water temperature in excess of 38 degrees C may be injurious to your health.
- Before entering the spa or hot tub measure the water temperature with an accurate thermometer.
- Do not use a spa or hot tub immediately following strenuous exercise.
- Prolonged immersion in a spa or hot tub may be injurious to your health.
- Do not permit electric appliances (such as a light, telephone, radio or television) within 5 feet of this spa or hot tub.

CONTENTS

- SAFETY PRECAUTIONS & THERMOSTAT USE
- INSTALLATION INSTRUCTIONS
- DESCRIPTION & USE OF CONTROLS
- START UP PRECAUTIONS
- INSTALLATION DIAGRAMS
- START UP & OPERATION
- SCHEMATIC / WIRING DIAGRAM
- TROUBLE-SHOOTING GUIDE
- MAINTENANCE AND CARE
- GROUND FAULT CIRCUIT INTERRUPTOR (GFCI)
- NU-WAVE INC. LIMITED WARRANTY

CAUTION: DO NOT OPERATE THE EQUIPMENT WHEN THERE IS LITTLE OR NO WATER IN THE SPA OR HOT TUB.

PROLONGED IMMERSION IN HOT WATER MAY INDUCE HYPERTHERMIA READ THE FOLLOWING SYMPTOMS:

The causes, symptoms, and effects of hypothermia may be described as follows. Hypothermia occurs when the internal temperature of the body reaches a level several degrees above the normal body temperature of 37 degrees C. The symptoms of hypothermia include drowsiness, lethargy, and an increase in the internal temperature of the body. The effects of hypothermia include:

a) Unawareness of impending hazard;
b) Failure to perceive heat;
c) Failure to recognize the need to exit spa;
d) Physical inability to exit spa;
e) Fetal damage in pregnant women, and
f) Unconsciousness and danger of drowning.

WARNING: THE USE OF ALCOHOL OR DRUGS CAN GREATLY INCREASE THE RISK OF FATAL HYPERTHERMIA IN HOT TUBS AND SPAS

SAVE THESE INSTRUCTIONS!

INTRODUCTION 2

The Nu-Wave Spa Pack that you have purchased is one of the very best available and incorporates features designed to assure long, reliable use if properly installed, operated and maintained. This model is certified for your safety and protection. The Spa Pack must be installed in accordance to the instructions specified in this manual, otherwise the warranty is void.

Check for shipping damage before unpacking. Nu-Wave is not responsible for damage to the unit sustained during shipping. If damage is evident before unpacking, contact the freight carrier regarding shipping damage claims.

DESCRIPTION

Nu-Wave

The heater assembly described in this manual consists of one electric heating element mounted within a stainless steel manifold or vessel whose ends are fitted with unions for connection to the water input and output plumbing system. In addition, there is a water pressure-switch threaded into the body.

CAUTION

It is strongly suggested that you read this entire manual first before any installation has begun so that you are entirely familiar with the requirements that are absolutely necessary to accomplish a safe and reliable installation.

GENERAL INSTALLATION INSTRUCTIONS

This Spa Pak manual shows all of the options available, your particular model may not have all options shown.

DANGER - RISK OF ELECTRIC SHOCK

- Do not permit any electric appliance such as a light, telephone, radio, or television, within five feet 5'of the spa, hot tub or pool.
- Never operate any electrical appliances from inside the water or while wet.
- The electrical supply to this product must include a suitably rated switch or circuit breaker to open all un-grounded supply conductors to comply with Local Electric Codes. The disconnecting means must be readily accessible to the tub or pool occupant but installed at least five feet (1.5 meters) from the water.
- All wiring connections should be made **USING COPPER CONDUCTORS ONLY** .
- **UNDER NO CIRCUMSTANCES SHALL AN EXTENSION CORD BE USED. USE OF AN EXTENSION CORD WILL INVALIDATE THE WARRANTY AND MAY DAMAGE ELECTRICAL COMPONENTS.**
- It is necessary to use **ONLY A DEDICATED CIRCUIT** to supply power. A dedicated circuit is one where no other electrical appliances are connected to the same circuit. If a dedicated service is not available, or there is a question if the circuit serves other electrical appliances, it is the responsibility and obligation of the owner/user to have one installed by a qualified electrician.

- An earth grounding wire must be attached to the heater housing and to any other piece of equipment in the system, such as the pump. The grounding connector should be at least the same size or larger than the wire size supplying the power.

READ AND FOLLOW ALL INSTRUCTIONS !!

DESCRIPTION AND USE OF CONTROLS :

ELECTRONIC THERMOSTAT

The electronic thermostat works through a processor and an "in water" temperature sensor, sometimes referred to as a thermo-probe. The temperature is adjusted by depressing the heat key on the topside control. There is an LED that displays the actual water temperature as well as the desired "set point" . See detail in the start up and operation section of this manual.

HIGH TEMPERATURE RESET SWITCH

If the temperature of the water reaches 118F, the system will shut down and can only be reset by depressing the heat key at the topside control. The water temperature must be less than 112F to be manually reset.

HEATER INDICATOR LIGHT

This red LED light is located on the control panel lower right side of the readout is lit only when the heater is heating. This light will shut off when set temperature is attained.

PRESSURE SWITCH

The switch is pre set and cannot be adjusted.

TEMPERATURE SENSOR

The temperature sensor must be located where it will not be affected by ambient air. It is recommended that the sensor be located in an insulated dry well or a wet compression fitting in the side wall or foot well of the spa / hot tub. If there is doubt of the accuracy of the temperature readout after the sensor is installed, the test is to place the sensor directly in the spa / hot tub water and measure it against another accurate digital temperature thermometer. This will tell you if it is the sensor or the application.

START UP PRECAUTIONS

- **Before performing the operations of this section, make sure you TURN OFF ALL ELECTRICAL POWER TO THE UNIT and that you have read and understood these instructions and the uses for the heater as previously described in this manual.**

- Make sure the spa is first filled with water. **DO NOT OPERATE THIS SYSTEM WITH LITTLE OR NO WATER IN THE SPA.**

- Plug in each piece of peripheral equipment, (pump, blower, light, etc.) into the appropriate receptacle. All plug/receptacles are uniquely polarized, therefore you can not insert a plug into the “wrong” receptacle.

- Review the start up an operation section of this manual.
- Turn on the power to the unit and test the ground fault circuit interrupter (GFCI).

- If a particular function does not seem to be working properly, first go back and re-read the DESCRIPTION AND USE OF CONTROLS section as well as START UP AND OPERATION section. If further problems persist, refer to the troubleshooting section of this manual.

START UP AND OPERATION
Model - MM1 Program r24

- Power up system and **" Pur"** will appear for 30 seconds while system is in purge mode and then normal operation will assume.
- The unit will now display the water temperature of the spa water the low speed pumps will be running in filter mode. The unit when delivered is setup to run filter mode for 2 hours 2 times pr day.(this can be adjusted as follows)

Adjusting filter time

- **Push and hold AUX & HEAT down buttons. After 5 seconds C 2 will appear indicating a 2 hour 2 times pr day cycle continue to hold and it will change. C 3 , C 4, C 5. on to C 12 indicating 2 ea.12 hr heating cycles**

- Press **HEAT up key** ^ and hold to adjust temp higher. Press **HEAT down key** and hold to lower temperature. to the minimum set point of 70 F or 21C. A red LED will flash at the topside control when the heater is on.
- Press **JETS key** to activate Pump One. HI & LOW
- The pumps or air blower will run in HI for 30 minutes at which time the system will automatically return to automatic mode.
- Press **Light Key** to activate light on/off.
- Press **Auxiliary Key to activate Blower or Pump 2** This system does not have both Blower and Pump 2, it has one or the other as a auxiliary option.
- Press **Heat up Key and Pump Key** simultaneously to activate temperature **LOCK** and the same do de-activate **LOCK**.
- If the tub temperature reaches **112 F the control will flash** the temperature and shut the system down until the temperature drops below **112F then auto reset.**
- There is a second level of protection via a **high limit relay that will trip at 118 F**. If this trips, the readout at the topside control will flash and the tub must cool to less than **112 F. before the hi limit can be manually reset** by pressing the heat key of the control pad or re-booting the system. If this trips repeatedly, call your dealer for service.
- **The low speed pump will shut off if the temperature creeps** more than 2 degrees above the set point. It will turn back on when temperature drops to the set point.

NOTE

- - Indicates no water flow Check shut off valves, Check for air lock.

- - - Indicates temp sensor problem. Check connections Check for damage

- - - Indicates hi limit sensor problem. Check connections Check for damage.

Flashing Display Indicates over temperature. Check shut off valves.

MINI MAX DIGITAL
TROUBLE SHOOTING GUIDE

No display at topside

- Check that connection to main board is clean and sound at J8
- Test a new topside control.

Display flashes "- - - 39 " on system start up

- Check that temperature sensing probe connection to main board is clean and sound at location J2.
- Try new temperature sensing probe.

Display flashes " - - - current temperature " on system start up

- Check that the temperature sensing probe connected to the main board is clean and sound at location J1.
- Try new temperature sensing probe.

Display flashes

- This indicates that the **spa** water temp is over 112F. The system should be shut down in this state and will re-start automatically when the water cools below 112F

Display flashes " - - "

- This indicates that there is a water flow problem
- make sure filters are clean
- Check that gate valves are open
- Check for air lock
- Check that service valves are open
- Check for obstruction of flow

Pump(s), Blower or light does not shut off

- Try new topside control
- Replace main board

Circulation pump does not work

- Check the fuse and power connections.

Light does not work

- Press Light Key at top side
- Check bulb
- Check 12V out to light at J4 & J5

Ground Fault Interrupter Trips

- Check if it does it only when heat turns on, if so check element by removing the power to the element terminal and turn the heat on. If it only faults when the element is connected with power, the element has a ground fault and must be replaced.

- This can be done with the pump(s), blower, ozonator, or any other peripheral equipment as a process of elimination to see where the fault may be.
- Be sure that the neutral on the GFCI has been wired properly in the main panel.

Improper Temperature Measurement

- Remove temperature sensor from it's curent location an submerge directly into the spa / hot tub water. Compare it to another accurate digital thermometer. This will tell you if it is the sensor or the application. (See temperature sensor in the description and use of controls section of this manual.

MAINTENANCE AND CARE OF SPA/HOT TUB

The maintenance and care of a spa is simple and easy to carry out and if performed regularly as scheduled, problems will be minimal. It is important that the following procedures be read thoroughly and carried out on a regular basis for best long-term overall performance of your spa.

The filtering cycle of your spa should be operated minimum of four hours day whether or not the water is heated, to remove impurities from, and to prevent deposition of contaminants in your spa. The filtering system works automatically during the heating cycle of the spa water and during the time the filtration timer is on (low speed pump on) or when the high-speed pump is on.

Keep the spa covered when not in use to reduce the loss of heat and to keep out leaves, dirt and other foreign materials from settling in the water.

Maintaining the spa's proper water chemical balance is essential to the comfort and safety of the user. Water mineral content varies constantly and is directly affected by evaporation and the use of cleansing and maintenance chemicals which will increase mineral content when added. If the mineral content deviates from prescribed pH level (7.2 to 7.8), the condition and operation of your spa and equipment may be adversely affected by deposits on spa walls, filter, **electric heating element** (or gas heating internal manifold) and piping.

REMEMBER THESE IMPORTANT SAFETY INSTRUCTIONS

DANGER - RISK OF ELECTRICAL SHOCK.

Install at least five feet from all metal surfaces. A spa may be installed within five feet of a metal surface if, in accordance with the Local Electrical Codes, each metal surface is permanently connected by a No. 8 AWG (8.4) solid copper connector attached to the wire connector on the control box that is provided for this purpose.

GROUND FAULT CIRCUIT INTERRUPTER INFORMATION INSTRUCTIONS

WHAT THE GFCI DOES FOR YOU:

The GFCI helps protect you against hazardous electrical shock that may be caused if your body becomes a path through which electricity travels to reach ground. This could happen when you touch an appliance that is "live" through a faulty mechanism, damp or worn insulation on the power cord, etc. You don't even have to be on the ground yourself. You

could be touching plumbing or other material that leads to the ground. When using a GFCI devise you may still feel a shock , but the GFCI is designed to cut off power quickly enough so that a normal, healthy adult will not experience serious electrical injury.

CAUTION: If the GFCI trips on it's own accord, this indicates a possible ground fault condition, which is potentially hazardous. Carry out the test procedure outlined below to ensure that your GFCI is operating properly. If the GFCI does not reset, this indicates a ground fault still exists, and must be corrected. Have a qualified electrician investigate the ground fault condition and correct the defect at once.

TEST THE GFCI UNIT AT LEAST ONCE PER MONTH. DO NOT BY PASS THE GFCI TO USE POTENTIALLY FAULTY EQUIPMENT.

TEST PROCEDURE

1. Turn your equipment ON to the lowest setting. PUSH THE TEST BUTTON. This should result in the motor or lamp going OFF. (**NOTE:** Be sure you are turning off all applicable motors. Some equipment, such as Spas, have blower motors, jet motors, and heater motors.)

CAUTION: If the motor keeps running or lamp remains lit, DO NOT USE YOUR EQUIPMENT. UNPLUG EQUIPMENT OR TURN OFF POWER AT CIRCUIT BREAKER OR FUSE. CONSULT A CERTIFIED ELECTRICIAN.

2. If the GFCI tests okay, restore power by pushing the RESET button and releasing it. The motors or lamps should go ON again. If the GFCI fails to reset properly, DO NOT USE YOUR EQUIPMENT. UNPLUG EQUIPMENT OR TURN OFF POWER AT CIRCUIT BREAKER OR FUSE. CONSULT A QUALIFIED ELECTRICIAN.

LIMITED WARRANTY

Nu-Wave warrants that all the parts of this product will be free from defects or materials and workmanship under normal use and service for a period of ONE YEAR FROM DATE PURCHASED. In accordance with the terms of this warranty, we will furnish an unrepaired portion of the original warranty. Labor costs for removal or installation of parts not covered by the warranty, nor are shipping charges to or from designated Nu-Wave repair center. This warranty does not cover rusting or corrosion on closures that does not affect heater & operation. Electronic components (printed circuit boards) are guaranteed to be free from defect for a period of three years and are subject to the above noted conditions. Heater elements are guaranteed for a period of three years (see heater warranty details for limitations).

WARRANTY CONDITIONS

This warranty applies only to the spa control at its original place of installation. This warranty will be void if the spa control is installed in violation of applicable local codes and ordinances or if the rating plate or serial number is altered or removed. This spa control warranty is void if installed by an end user and if not wired by a certified electrician.

WARRANTY EXCLUSION

This warranty does not cover defects or malfunctions resulting from:

1. Failure to properly install, operate or maintain the heater in accordance with our printed instructions.
2. Abuse, alteration, accident, fire, flood, freeze and the like.
3. Misuse and neglect, including but not limited to freeze-ups, having flow restrictions or abstractions between the heater outlet and the spa, or not maintaining a proper chemical balance (PH level between 7.4 and 7.8 and the total alkalinity between 100 and 150 PPM.) Total dissolved solids (TDS) must be no greater than 3000 PPM.

HOW TO MAKE A CLAIM

Immediately notify the dealer from whom the heater was purchased. Supply **model and serial number** of the unit, date of purchase and a description of the problem. The dealer should then promptly contact their supplier regarding a warranty claim for the location of Nu-Wave nearest designated repair center. If the dealer or spa manufacturer for any reason is not available, contact Nu-Wave directly at the address shown below. Attention to Warranty Service. After such notification has been given and Nu-Wave has advised the location of it's designated repair center (which may be the dealer), bring or ship, transportation prepaid, the defective part for replacement or repair to the designated repair center. However Nu-Wave reserves the right to inspect the claimed defect and verify warranty coverage at its factory

MISCELLANEOUS

No one is authorized to make any other warranties on our behalf. ANY IMPLIED WARRANTIES, INCLUDING MERCHANT ABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL NOT EXTEND BEYOND APPLICABLE WARRANTY PERIODS SPECIFIED ABOVE CBM SOLE LIABILITY WITH RESPECT TO ANY DEFECT SHALL BE AS SET FORTH IN THIS WARRANTY AND FOR ANY CLAIMS FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING DAMAGES FROM WATER LEAKAGE) ARE EXCLUDED. Some states and provinces do not allow limitations on how long an applied warranty lasts or for the exclusion of incidental and consequential damages to the above limitations or exclusion may not apply to you.
We suggest you immediately complete the information below and send this Warranty Certificate to Nu-Wave.

QUICK START

POWER ON
The system will PURGE " Pur" will appear for 30
The unit will now display the temperature of the spa water.
Low speed pumps will be running in a filter mode. 2 hours 2 times pr day.
FILTERING
The filtering time can be increased as follows.
Push and hold **AUX & HEAT** down buttons.
After 5 seconds C 2 will appear indicating 2 hrs twice daily filter cycle
continue to hold to increase filtering time.
TEMP READOUT C & F
Press **AUX & LIGHT** keys simultaneously and hold to toggle from C to F.
INCREASE WATER TEMP.
Press **HEAT up key** and hold to adjust temperature higher.
LOWER WATER TEMP
Press **HEAT down key** and hold to lower temperature lower.
A red LED will flash on the topside control when the heater is on.
PUMP & JETS OPERATION
Press **JETS** key to activate Pump One. HI & LOW
Press **AUX key** to operate pump 2 Two HI & LOW
NOTE Pumps or Blower will run HI for 30 minutes to shut off.
LIGHT
Press **Light key** to activate light ON / OFF.
LOCK / UNLOCK
Press **Heat up Key** and **Pump Key** simultaneously to activate temp **LOC**
Repeat operation to deactivate.
SAFETY INDICATORS
- - Indicates no water flow.
FLASHING DISPLAY Indicates over-temp condition. (high heat)
Water temp112 F system will shut down until the temp drops below 112F.
RESET by pressing **heat- up key.**
If this trips repeatedly, call your dealer for service.
NOTE
If the temperature creeps more than 2 degrees above the set point.
The low speed pumps will turn off until temp drops to set point.

- - Indicates no water flo Check shut off valves, Check for air lock.

- - - 39 Indicates temp sensor problem.Check connections Check for damage

- - - Indicates hi limit sensor problem. Check connections Check for damage.

Flashing Display Indicates over temperature. Check shut off valves.

WARRANTY CERTIFICATE

Name of Owner

Name of Dealer

Address

Address

Model No.

Serial No.

Date of Purchase

Mail or Fax to Nu-Wave Spa Controls, Inc.
3949 E. LaPalma Ave.
Anaheim CA 92807
714 666-2171
FAX: 714 666 1053