

Morgan

Spa Owner's Manual Operation and Care For Your Spa

***OVER 35 YEARS
IN BUSINESS***

Spas manufactured between:
January 1991 to December 1995

(Prior to 1995)

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SECTION 1

Installation and Safety Instructions

Introduction

The Morgan equipment pack and spa incorporates the finest components available, assembled in a manner designed to provide maximum enjoyment, ease of operation and years of trouble-free service.

Please read your owners manual very carefully and thoroughly. Keep it in an easily-accessible place, so you are able to refer to it whenever you use your spa. The following pages contain complete, detailed instructions and precautions regarding the use, care and maintenance of your hot water product.

IMPORTANT SAFETY INSTRUCTIONS FOR ELECTRICAL EQUIPMENT

When installing and using this electrical equipment basic safety precautions should always be followed including the following:

1. **READ AND FOLLOW INSTRUCTIONS.**
2. **WARNING**-to reduce the risk of injury, do not permit children to use this product unless they are closely supervised.
3. A wire connector is provided on this unit to connect a minimum NO. 8 AWG (8.4mm²) solid copper conductor between this unit and any metal equipment, metal enclosures of electrical equipment, metal water pipe, or conduit within 5 feet (1.5m) of the unit.
4. **DANGER**-Risk of Injury
 - A. Replace damaged cord immediately.
 - B. Do not bury cord.
 - C. Connect to a grounded, grounding type receptacle only.
5. **WARNING**-certain models are provided with a ground fault circuit interrupter located on the front panel marked 'GFCI'. The GFCI must be tested before each use; with the plug connected to the power supply and with unit operating push the test button. The unit should stop operating and the reset button should appear. Push the reset button. The unit should now operate normally. If the interrupter fails to operate in this manner, there is a ground current flowing indicating the possibility of an electric shock. Disconnect the plug from the receptacle until the source of the breakdown has been identified and corrected.
NOTE: This is only for 120/240V convertable packs. This does not apply to the 240V Single Pump System or the 240V Deluxe Digital Control System.

6. **DANGER**-Risk of Accidental Drowning.
Extreme caution must be exercised to prevent unauthorized access by children. To avoid accidents, ensure that children cannot use this spa unless they are supervised at all times.
7. **DANGER**-Risk of Injury.
The suction fittings in this spa are sized to match the specific water flow created by the pump. Should the need arise to replace the suction fittings or the pump, be sure that the flow rates are compatible. Never operate spa if the suction fittings are broken or missing. Never replace a suction fitting with one rated less than the flow rate marked on the original suction fitting.
8. **DANGER**-Risk of Electric Shock.
Install at least 5 feet (1.5m) from all metal surfaces. As an alternative, a spa may be installed within 5 feet of metal surfaces if each metal surface is permanently connected by a minimum No. 8 AWG(8.4mm²) solid copper conductor to the wire connector on the terminal box that is provided for this purpose.
9. **DANGER**-Risk of Electric Shock.
Do not permit any electric appliances, such as a light, telephone, radio or television within 5 feet (1.5m) of a spa.
10. **WARNING**-To Reduce the Risk of Injury:
 - A. The water in a spa should never exceed 40°C (104°F). Water temperature between 38°C (100°F) and 40°C are considered safe for a healthy adult. Lower water temperatures are recommended for young children and when spa use exceeds 10 minutes.
 - B. Since excessive water temperature has a high potential for causing fetal damage during the early months of pregnancy, pregnant or possibly pregnant women should limit spa water temperature to 38°C (100°F).
 - C. Before entering a spa, the user should measure the water temperature with an accurate thermometer since the tolerance of water temperature regulating devices varies.
 - D. The use of alcohol, drugs, or medication before or during spa use may lead to unconsciousness with the possibility of drowning.
 - E. Persons suffering from obesity or with a medical history of heart disease, low or high blood pressure, circulatory system problems, or diabetes should consult a physician before using a spa.
 - F. Persons using medication should consult with a physician before using a spa since some medications may induce drowsiness while other medication may affect heart rate, blood pressure, and circulation.
 - G. Do not allow you spa temperature to go above 40°C (104°F). Immersion in water above this point and prolonged immersion in water even at lower temperatures can cause hyperthermia.

HYPERTHERMIA: The cause, symptoms and effects of hyperthermia may be described as follows: Hyperthermia occurs when the internal temperature of the body reaches a level several degrees above the normal body temperature of 98.6°F. The symptoms of hyperthermia include an increase in the internal temperature of the body, dizziness, lethargy, drowsiness, and fainting.

The effect of Hyperthermia include (1) failure to perceive heat, (2) failure to recognize the need to exit spa or hot tub, (3) unawareness of impending hazard, (4) fetal damage in pregnant women, (5) physical inability to exit the spa or hot tub, (6) unconsciousness resulting in the danger of drowning.

WARNING- The use of Alcohol, Drugs or Medication can greatly increase the risk of fatal Hyperthermia.

11. **SAVE THESE INSTRUCTIONS.**

**WARNING
DO NOT EXCEED 104°F
Check Water Temperature
Before Entering Spa**

A WORD ABOUT SPA FUN AND SAFETY

MORGAN spas provide year-round enjoyment, however; YOU are responsible for the maintenance and sensible use of a MORGAN spa. For the most fun and safety, be sure you and your family members review this safety manual completely. Keep it on hand for future reference or pass it along to new owners. MORGAN recommends that you follow these safety precautions:

1. Do not use the spa when pregnant, if you suffer from heart disease or high/low blood pressure unless you have obtained the approval of a medical doctor.
2. If you are taking medication (including, without limitation, anticoagulants, antihistamines, vasoconstrictors, basodilators, tranquilizers, narcotics, hypnotics, stimulants) you should contact a medical doctor before using the spa.
3. Do not use the spa when under the influence of alcohol or other drugs.

The calming effect of your spa in combination with the effects of alcohol and/or drugs are a dangerous combination which can induce unconsciousness that can lead to drowning in the spa water. It is critical that you understand the serious danger created by this combination, and do not use the spa under the influence of alcohol and/or drugs.

4. Persons with long hair should wear a bathing cap when using the spa and small children with long hair and/or loose clothing should never be allowed to use the spa. Hair or clothing could be sucked into skimmers, suction fittings or drains causing serious injury or death.
5. Using the spa alone is not recommended.
6. Always check the water temperature before using the spa. Make sure the water temperature is never higher than 104 degrees Fahrenheit (40 degrees Centigrade.) Higher temperatures could result in serious bodily injury or death.

You don't have to take fun out of spa ownership. Your knowledge of safety precautions and good sense minimize risks. One individual must assume responsibility for supervising the spa or hot tub. This person should be thoroughly familiar with the contents of this manual and be responsible for enforcing "house rules" for your spa or hot tub.

SPA LOCATION

If your spa is to be located outdoors, consider the following:

1. Local codes pertaining to fencing.
2. Local electrical codes.
3. View from house.
4. Wind direction.
5. Sun exposure.
6. Location relative to trees (falling leaves and shade).
7. Dressing and bathroom locations.
8. Storage area for maintenance equipment and chemicals.
9. Landscaping and nite time lighting.
10. Sprinkler systems already installed in yard.
11. Location to facilitate adult supervision.
12. A level, hard surface capable of withstanding weight in excess of one (1) ton.
13. Rain run-off from the roof.

If your spa is to be located indoors, consider the following:

1. Indoor spas develop high humidity. Removing this humidity can be accomplished by cross ventilation fans, oversize dehumidifiers, or both.
2. Chemicals will evaporate off the water surface. This may cause corrosion to certain metals found in home hardware and appliances.
3. Floor drains should be provided to carry off water splashed from the spa.
4. Walls, ceilings, woodwork, etc. should be materials capable of withstanding high humidity.
5. Be sure the supporting structure is capable of withstanding the weight of the spa which is in excess of one (1) ton.
6. Be sure surface on which spa is to be put is smooth and level.

ALTHOUGH MANY PEOPLE USE SPAS BOTH INDOORS AND OUTDOORS, YOUR SPA FUNCTIONS AS A VESSEL AND CONTAINS PLUMBING; WHEN FILLED WITH WATER, IT WEIGHS IN EXCESS OF ONE (1) TON. IF YOU ELECT TO USE YOUR SPA INDOORS, MORGANS WILL NOT BE RESPONSIBLE FOR ANY DAMAGES CAUSED BY THE WEIGHT OF THE VESSEL OR RESULTING FROM PLUMBING FAILURE OR LEAK.

ELECTRICAL REQUIREMENTS
FOR
120V/240V CONVERSION POWER PACK

Prior to performing any service to the spa pack **TURN OFF ALL** primary electric power to the main circuit breaker or disconnect panel. All electrical connections can be made by removing the lower front cover of the electrical control box.

All electrical connections to this spa pack must be accomplished by a qualified electrician in accordance with the National Electric Code and in accordance with any local electrical codes in effect at the time of installation.

All connections should be made with the wiring diagrams within this manual. These spa packs are designed to operate on 60Hz Alternating Current only, at a voltage of 120/240 volts as required.

Connections should be made using copper conductors only. The connecting wire and circuit breakers or fuses must all be sized to accommodate the Total Ampere load as specified on the data label.

A bonding lug has been provided on the equipment module to allow connection to local ground points. To reduce the risk of electrical shock, a NO. 8 AWG solid copper bonding wire should be run from this lug to any metal ladders, water pipes or other metal within 5 feet of the spa.

120 VOLT INSTALLATION

Units to be operated at 120 volts must be connected to a properly wired 120 volt, 20AMP dedicated receptacle.

Equipment pack installed for 120 volt operation, requires a two-wire electrical service, plus ground. Refer to manual for wiring instructions. Assure that all procedures on the conversion pages have been followed, to allow for 120 volt operation.

240 VOLT INSTALLATION

For 240V Single Pump System, 240V Dual Pump System & 240V Deluxe Digital Control System

Units to be operated at 240 volts must have all electrical connections accomplished by a qualified electrician in accordance with the National Electric Code or other local electrical codes in effect at the time of installation.

Equipment pack installed for 240 volt operation requires a three-wire 50AMP circuit, plus ground. Assure that your electrician used the proper size wire for the distance and amperage draw, and all the procedures on the conversion pages have been followed.

FIELD WIRING DIAGRAM 120/240V CONVERTABLE PACK

DANGER
RISK OF ELECTRIC SHOCK

CONVERSION PLUG

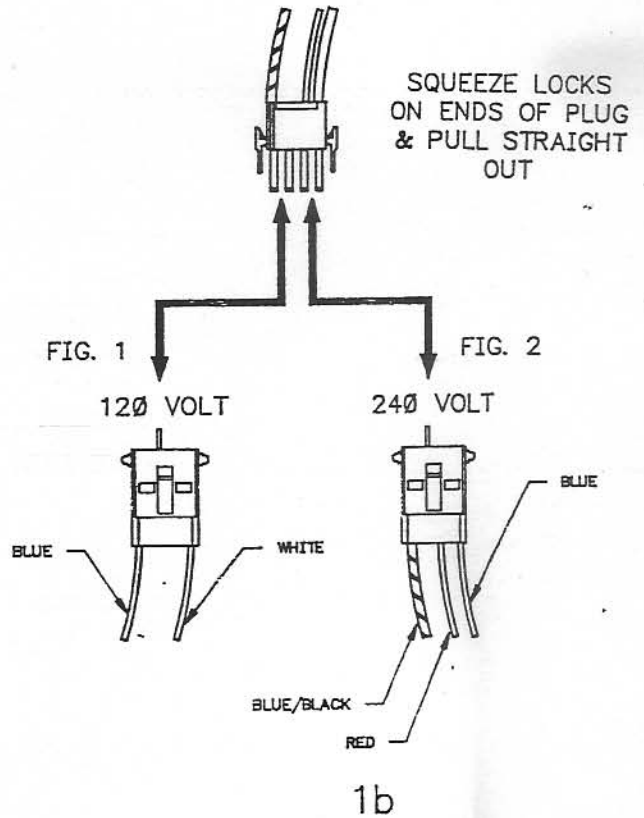
THIS UNIT IS PRE-WIRED FOR A 120 VOLT 20 AMP 60Hz DEDICATED CIRCUIT ONLY. NO OTHER DEVICE MAY BE ON THIS CIRCUIT. PLUG INTO AN APPROVED GROUNDING TYPE RECEPTACLE ONLY.

DO NOT ATTEMPT TO ALTER THE PLUG OR USE CONVERTERS TO FIT OTHER RECEPTACLE CONFIGURATIONS.

CONVERSION TO 240V:

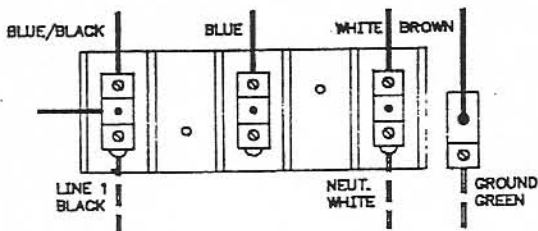
CONVERSION TO 240V AC MUST BE DONE BY A LICENSED ELECTRICIAN ONLY. TO WIRE THE SYSTEM FOR 240V AC OPERATION: SUPPLY INPUT POWER AS INDICATED IN FIG. 1b AND INSTALL THE PLUGS AS SHOWN IN FIG. 2.

THE 120V POWER CORD THAT CAME WITH THE UNIT MUST BE REMOVED WHEN THE UNIT IS CONVERTED TO 240V AC AND DISCARDED.



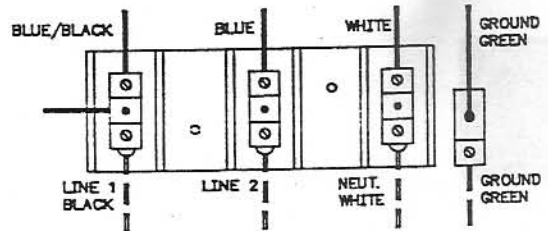
Volts 120; Amps 16; Wire 2
Conductor Ampacity 20 AMPS
Circuit Breaker 20 AMPS
1 Phase, 60Hz

**120 VOLT WIRING DIAGRAM
FOR 120V OF CONVERTABLE 120/240**



Volts 240; Amps 39; Wire 3
Conductor Ampacity 49 AMPS
Circuit Breaker 50 AMPS
1 Phase, 60Hz

240 VOLT WIRING DIAGRAM



NOTE: SEE DATA LABEL ON SPA CABINET OR MANUAL

FIELD WIRING DIAGRAM

240 Volt Wiring

240V Single Pump System, 240V Dual Pump System
& 240V Deluxe Digital Control System

DANGER
RISK OF ELECTRIC SHOCK
UNIT MUST BE GROUNDED AND BONDED

ALL WIRING MUST BE DONE BY A LICENSED ELECTRICIAN ONLY

240V Single Pump Pack
Volts 240, Amps 35, Wire 3

240V Single Pump Deluxe
Volts 240, Amps 35, Wire 3
Digital Control Pack

240V Dual Pump Pack
Volts 240, Amps 40, Wire 3

240V Dual Pump Pack
Volts 240, Amps 40, Wire 3
Digital Control Pack

Conductor Ampacity 44 Amps
Circuit Breaker 50 Amps
1 Phase, 60Hz

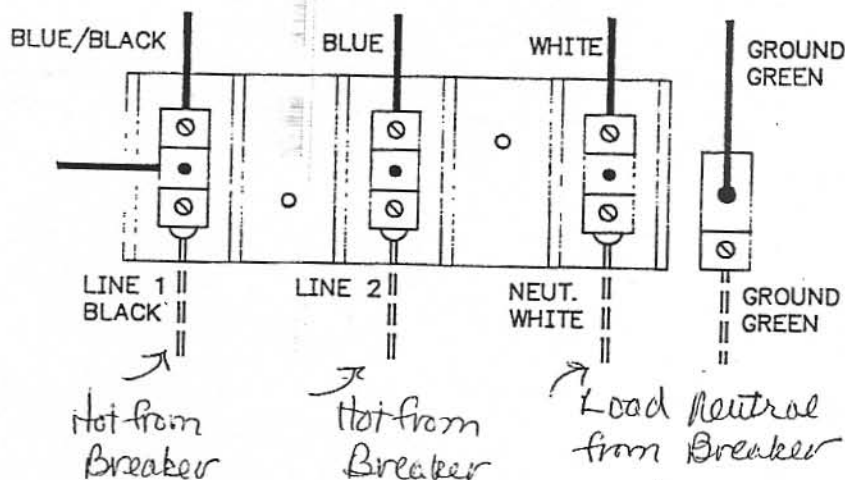
Conductor Ampacity 44 Amps
Circuit Breaker 50 Amps
1 Phase, 60Hz
50

Conductor Ampacity 50 Amps
Circuit Breaker 50 Amps
1 Phase, 60Hz

Conductor Ampacity 50 Amps
Circuit Breaker 50 Amps
1 Phase, 60Hz

240 VOLT WIRING DIAGRAM

240V Single Pump System, 240V Dual Pump System & 240V Deluxe Digital Control System



NOTE: SEE DATA LABEL ON SPA CABINET OR MANUAL

INITIAL FILL & STARTUP

1. Turn off all electrical power to the spa.
2. The equipment pack must never be operated without water in the spa, as serious damage to the heater and/or pump could result.
3. Before filling your MORGAN spa for the first time, clean the surface with MORGAN All Purpose Cleaner. Then use two (2) thin coats of MORGAN Quik Gloss. This will protect the acrylic surface and make it easier to keep clean.
4. Fill your spa with normal tap water. Do not use water from any type of water softener.
5. Fill the spa with water to the recommended level, which is approximately 5 inches from the top.
6. With the thermostat in the off position, turn the main power on to the spa. The pump and or air blower will start in one of the modes described in Section 2 under Operation Modes. It is important to run the pump for several minutes to remove all the air from the system.
7. At this time add MORGAN Metal Protector and Stain Preventor. Add one (1) ounce of MORGAN Chlorination Granduls or add MORGAN Dissolving Bromine Tabs to your brominator dispensor, which is located in your top loading filter (Refer to Section 5).

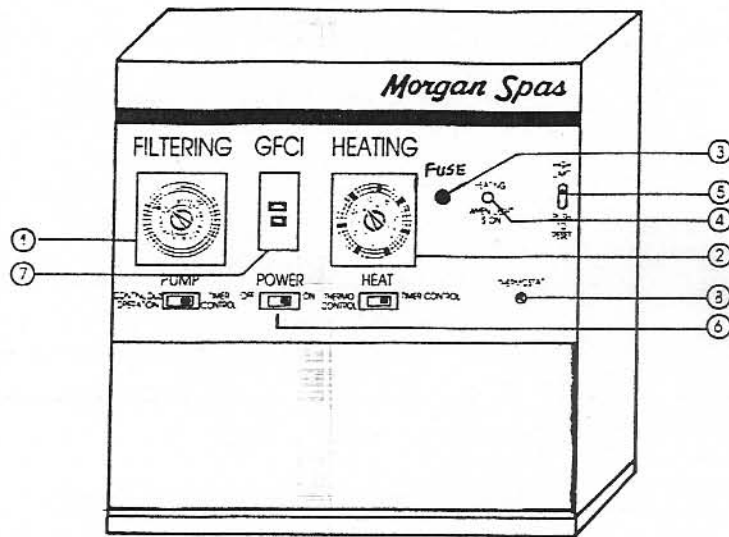
IMPORTANT: When using MORGAN Dissolving Bromine Tabs, two (2) ounces of MORGAN Shock Out must be added whenever the spa is filled with fresh water. Shock Out activates the bromine tabs so that an adequate bromine reading will be obtained in less than 60 minutes. If Shock Out is not used, the test strips may not register any bromine level. All chemicals should be added with the spa in blower mode only.

8. At this time you will need to test your water with the Aqua Check Test Strips, which you will find in your chemical start-up kit. Check the water total alkalinity and pH and adjust to proper level. Refer to Section 6 in this manual for instructions or you may refer to the Water Balance of Spa Maintenance Guide that is provided in your chemical start-up kit.
9. Allow the spa to remain ON in low speed mode or filtration cycle for 24 hours, then clean the filter thoroughly. You will need to refer to the Recommended Maintenance Schedule, Section 5.

IMPORTANT NOTE:
READ AND FOLLOW ALL INSTRUCTIONS ON THE CHEMICAL LABELS.

SECTION 2

Equipment Controls and Their Use For All Packs Except *Deluxe Digital Control System (*Refer to Section 3 for these Controls)



WARNING

**Water Temperature Should Not Exceed 104°F.
Check Water Temperature Before Entering Spa**

#1 Timer operation-Filtering: refer to page 11.

#2 Timer operation-Heating: refer to page 12.

#3 The fuse: provides protection for all 120 volt circuitry and components. If electrical fault would occur, the fuse line will open and need replacing.

#4 Heater light: when the heater light is on the heater will be heating.

#5 High limit switch: the electrical heater in the equipment pack is equipped with a high-limit safety switch that will shut the HEATER OFF if the temperature within the heater assembly reaches a factory set, non-adjustable limit.

#6 Main power switch: used to turn all electricity components of the equipment pack ON and OFF. When on, the equipment can be operated by the remote control at spa side. CAUTION: When the main power switch is off the central panel still has power to the GFCI and timer.

#7 GFCI: the ground fault circuit interrupter should be tested before each spa use to confirm it is providing maximum protection. Test as follows:

a. Depress and release TEST button. RESET button pops outward.

b. Depress and release RESET button. RESET button will stay depressed.

If the GFCI does not operate in this manner, disconnect power from the pack until a qualified service technician has corrected the problem.

#8 Thermostat control: only pertains to models which do not have the command center. In the extreme left position, temperature is off. Rotate clockwise to increase temperature.

W A R N I N G

FOR YOUR SAFETY RISK OF ELECTRICAL SHOCK

MORGAN REQUIRES THAT YOUR SPA BE WIRED BY A QUALIFIED ELECTRICIAN. A SEPERATE GROUNDING SOURCE MUST BE PROVIDED AT THE SPA LOCATION.

YOUR ELECTRICIAN WILL DECIDE ON THE LENGTH OF THIS GROUND ROD DEPENDING ON SOIL CONDITIONS IN YOUR AREA.

ATTACH A SOLID #8 COPPER WIRE BETWEEN THE GROUND SOURCE AND THE 4TH TERMINAL OF THE TERMINAL BAR AND THE GROUND CONNECTION LUG ON THE EQUIPMENT PACK.

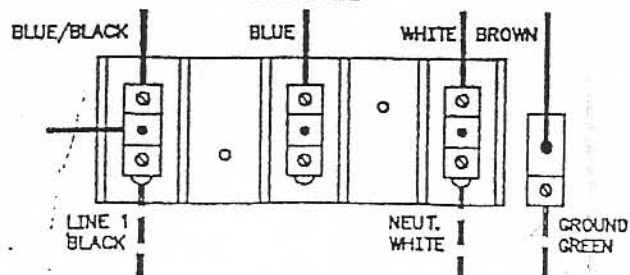
ALSO MORGAN RECOMMENDS YOU INSTALL A 2 POLE 50 AMP GROUND FAULT CIRCUIT BREAKER. YOUR ELECTRICIAN WILL EXPLAIN TO YOU THE PURPOSE OF THE ADDED GFCI PROTECTION. THESE BREAKERS ARE MANUFACTURED BY WESTINGHOUSE AND SQUARE D.

NOTE: THIS GFCI PROTECTION IS NOT REQUIRED IF SPA IS TO BE WIRED FOR 120 VOLT OPERATION. THIS ADDED PROTECTION IS RECOMMENDED FOR 220 VOLT OPERATION, SINCE THE BUILT IN GFCI ONLY PROTECTS THE EQUIPMENT WHICH OPERATES ON 120 VOLTS.

120 VOLT WIRING DIAGRAM

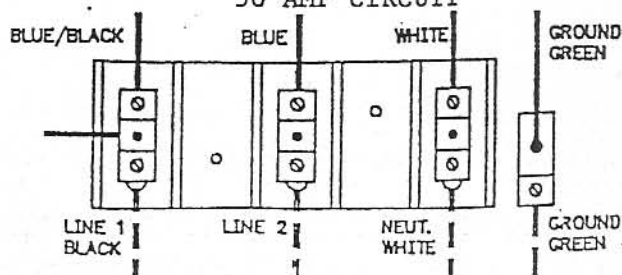
FOR 120V OF CONVERTABLE 120/220

20 AMP CIRCUIT



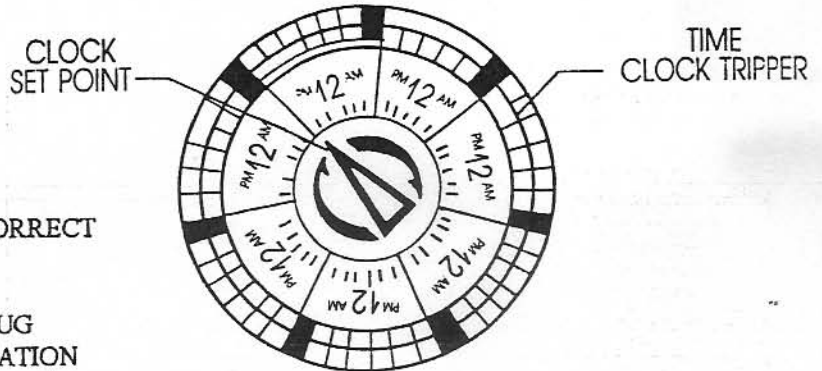
240 VOLT WIRING DIAGRAM

50 AMP CIRCUIT



FILTERING: TIMER OPERATION

The dual clocks built into the equipment pack provides the ultimate in operating convenience and economy. The spa water can be filtered daily, or several times a day to maintain a sparkling clear, clean condition with ideal chemical distribution. The temperature of the water can be automatically controlled to be ready whenever desired. Both may be overridden at any time without disturbing the clock settings when the function button is pushed.



SET OUTER CLOCK RING CLOCKWISE AND SET CORRECT TIME OF DAY OPPOSITE SET POINT ARROW.

PULL LUGS OUTWARD TO SET ON TIMES. EACH LUG REPRESENTS A 30 MINUTE PERIOD. ANY COMBINATION OF CYCLES IS POSSIBLE. TO CANCEL SETTINGS, PUSH LUGS INWARD.

- CLOCK SET POINT:** Set outer clock ring clockwise and set correct time of day opposite set arrow point.
- TIME CLOCK TRIPPER:** Pull lugs outward to set on times. Each lug represents a 30 minute time period. Any combination of cycles is possible. To cancel settings, push inward on the lugs.

FILTERING BY-PASS SWITCH

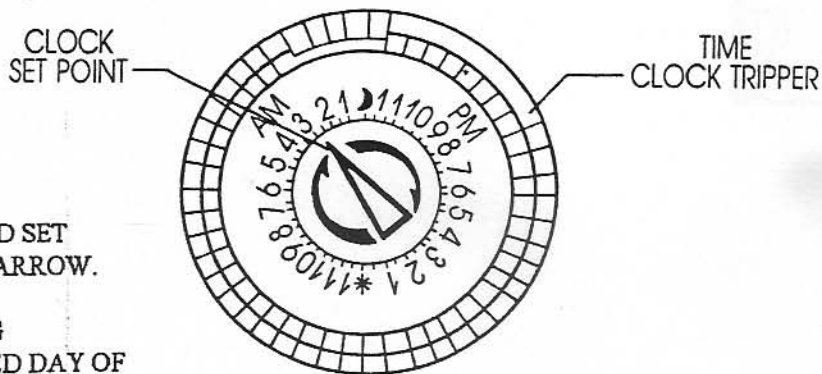
IN THIS POSITION THE TIME CLOCK HAS CONTROL AND WILL START AND STOP FILTRATION ACCORDING TO THE TIME CLOCK SETTINGS.



In the continuous position, the filtration cycle will be continuous. This is desirable when extra filtration is desired following periods of heavy spa usage or when adding chemicals. The time clock settings are not disturbed and timed cycles will begin again when this switch is returned to the "timer control" position.

HEATING: TIMER OPERATION

If the thermostat is calling for heat and the time clock reaches an ON time, the pump will start and the heater will turn on. When the water reaches the desired temperature, the thermostat will turn the heater and the pump off. This cycling will continue during each period set on the time clocks.



ROTATE OUTER CLOCK RING CLOCKWISE AND SET CORRECT TIME OF DAY OPPOSITE SET POINT ARROW.

PULL OUTWARD TO SET ON TIMES. EACH LUG REPRESENTS A 3-HOUR PERIOD OF A SELECTED DAY OF THE WEEK. TO CANCEL SETTINGS, PUSH LUGS INWARD.

CLOCK SET POINT: Rotate outer clock ring clockwise and set correct time of day opposite set point arrow.

TIMER CLOCK TRIPPER: Pull outward to set on times. Each lug represents a 3-hour period of a selected day of the week. The example shows on at 6 AM on Friday and off at midnight Friday. To cancel settings, push inward on the lugs.

HEATER BY-PASS SWITCH

IN THIS POSITION THE CLOCK HAS CONTROL AND WILL START AND STOP HEATING & FILTRATION ACCORDING TO THE TIME CLOCK SETTINGS.



In the thermostat position the heating cycle will be continuous, controlled only by the setting of the thermostat. The heater, and pump will start and stop as required to maintain the desired temperature. This position is ideal for freeze protection with the thermostat set at the cold position, the heater and pump will automatically cycle to maintain water temperature of approximately 50 degrees. The time clock settings are not disturbed and timed cycles will begin again when this switch is returned to the "timer control" position.

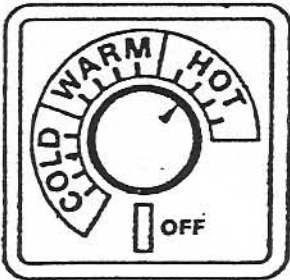
OPERATION MODES
ALL SPAS NO BLOWERS

2 FUNCTION (Units without Air Blower)

The operation of the 2 Function unit is similar to the 4 Function unit except that there are no Air Blower Modes.

120 VOLT OPERATION	MODE 1	Pump runs in LOW speed for filtration and Heater will operate as determined by thermostat setting.
	MODE 2	Pump runs in HIGH speed for maximum hydrotherapy jet action.
240 VOLT OPERATION	MODE 1	Pump runs in LOW speed for filtration and Heater will operate as determined by thermostat setting.
	MODE 2	Pump runs in HIGH speed for maximum hydrotherapy jet action and Heater will operate as determined by thermostat setting.

MANUAL TEMPERATURE SETTINGS



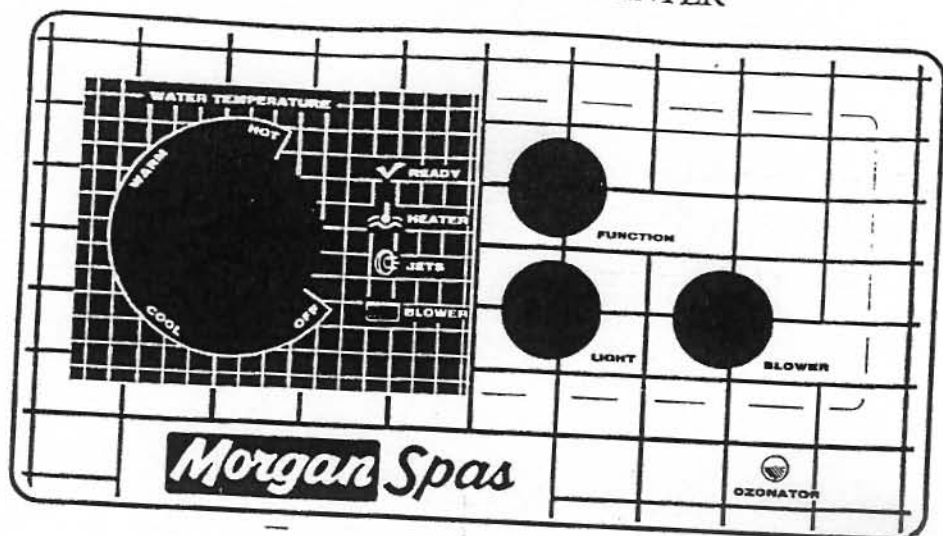
With the Equipment Module operating in any of the heat modes, the thermostat will control the electric Heater. Initially, adjust the thermostat knob to the center of the HOT range as shown. This setting will cause the water temperature to rise to 95 to 100 degrees F. DO NOT expect to feel hot water coming from the jets. The highly efficient electric heater is designed to provide cost-saving, low level heating, and to maintain the desired temperature 24 hours a day.

The length of time it takes the water to reach desired temperature depends upon several factors: water temperature at start, ambient air temperature, size of spa, relative humidity. An insulative cover should be kept on the spa at all times it is not in use. Also, remember that prolonged use of your spa will have a significant cooling effect on the water.

OPERATION MODES
ALL SPAS WITH BLOWERS

Your spa is equipped with air operated switches located on the top of the spa. If your spa is equipped with a Command Center (as shown), the air switches sequence the spa into different modes of operation. The command center also allows you to adjust the temperature on the top side of the spa instead of on the equipment.

COMMAND CENTER



READY LIGHT:

HEATER LIGHT:

JETS LIGHT:

BLOWER LIGHT:

THERMOSTAT:

FUNCTION SWITCH:

LIGHT SWITCH:

4-SPEED BLOWER:

Lights when the desired temperature is reached.

Lights when the heater is on.

Lights when the high speed jets are on.

Lights when the air blower is on.

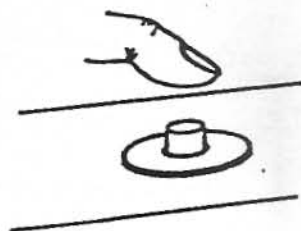
Regulates the temperature setting of your spa.

Controls the operation of the equipment as described in Operation Modes

Turns the spa light ON and OFF.

Allows for 4 different levels of blower performance.

Spas without a command center will have switching buttons on the top lip. By depressing the center of the button, you will be able to sequence the mode of operation desired.



FUNCTION BUTTONS (Which Controls the Jets & Blower)

120 Volt Operation

- MODE 1:** Pump runs in LOW speed for filtration and heater will operate as determined by thermostat setting.
- MODE 2:** Pump runs in HIGH speed for maximum hydrotherapy jet action and air blower operates. Heater will not operate.
- MODE 3:** Pump runs in HIGH speed for continued hydrotherapy jet action. Heater and blower will not operate.
- MODE 4:** Air blower operates alone.

240 Volt Operation

- MODE 1:** Pump runs in LOW speed for filtration and heater will operate as determined by thermostat setting.
- MODE 2:** Pump runs in HIGH speed for maximum hydrotherapy jet action, air blower operates heater will operate as determined by the thermostat setting.
- MODE 3:** Pump runs in HIGH speed for continued hydrotherapy jet action. Heater will operate as determined by thermostat setting, but blower will not operate.
- MODE 4:** Air blower operates alone.

Blower Button

This allows for four (4) different levels of blower performance. Each time the button is pressed, the blower speed is reduced. Pressing it while the blower is on the lowest setting, sets the blower to high. For convenience, the blower is set to start on high speed when you first turn on the spa. This is not found in all models of spas.

Lights

For added enjoyment at night time most spa models are equipped with a low voltage light; some models also have a lighted bar hand rail. If your spa is equipped with a command center, the button marked light will control it by simply depressing the button for ON and OFF operation. On models without the command center, a separate button controls the function of the light. Two different colored lens are supplied. By simply snapping the lens cover over the top of the light fitting you can change the color mood of your spa.

Bulb replacement: A spare bulb has been included with your spa. To replace the main spa light, open the service door of your spa cabinet and reach behind your equipment pack to the light location. The reflector holding the bulb screws off and the new bulb can be replaced. If your spa has a lighted bar hand rail, remove the screws in the removable panel at the lighted bar hand rail. The reflector holding the bulb screws off and the bulb can be replaced. Make sure you turn the light off when not using your spa to conserve the life of the bulb.

Remote Button

For your convenience, a second four-function control button is located on the side of the spa opposite of the command center. By depressing this button you can sequence any four functions of the spa. This is not found in all models of spas.

SYMPTOM

POSSIBLE CAUSE

CORRECTIVE ACTION

Equipment pack does not operate

- (1) Fuse.
- (2) GFCI On/Off Switch "OFF".
- (3) Thermostat is turned off.
- (4) Time clock.

- (1) Replace fuse on front panel
- (2) Push "Reset". If the GFCI will not Reset, the possibility of shock exists. Call MORGAN representative for repairs. Applies to 120/240V convertible models only.
- (3) Turn thermostat up.
- (4) Check setting of timers.

Low flow of water, reduced jet action.

- (1) Clogged filter.
- (2) Plugged or restricted discharge line or suction line.
- (3) Water level too low.
- (4) Partially closed inlet or outlet slide valve.

- (1) Clean filter.
- (2) If obstruction is not visible, contact your MORGAN representative.
- (3) Add water.
- (4) Make sure the handles of the slide valve are pulled out all the way.

Spa does not change modes.

- (1) Plastic tubing may be disconnected from air control switch.
- (2) Water in air tubing running from air control switch.
- (3) Hole in air tubing from air control switch.

- (1) Reinstall.
- (2) Disconnect air tubing and remove water.
- (3) Replace tubing.

Pump leaks at shaft.

- (1) Bad seal.

- (1) Contact your MORGAN representative

Equipment pack works, but heater does not work.

- (1) Incoming power is 240V, but pack has not been converted to 240V operation.
- (2) Equipment pack is not receiving 240V but wired for 240V.
- (3) Thermostat set too low.
- (4) Hi-limit switch tripped.
- (5) Pressure switch not properly
- (6) Spa in wrong mode.

- (1) Check the conversion plug in lower panel of control box. Make conversion as shown by diagram on the inside of the power access door.
- (2) Have checked by a qualified electrician.
- (3) Turn up thermostat.
- (4) Push "Reset".
- (5) Call your MORGAN representative.
- (6) Put spa in correct mode.

SYMPTOM

POSSIBLE CAUSE

CORRECTIVE ACTION

Does not heat to proper temperature.

(1) Spa cover left off.

(1) Using spa cover when the spa is not in use will shorten the heating time.

(2) Allow adequate time for initial heating.

(2) Minimum 24 hours for 120V, 8 hours for 240V.

(3) Thermostat too low.

(3) Turn up thermostat.

Pump runs, but won't prime. No water coming from jets.

(1) Air in filter system.

(1) Open bleeder valve on top of filter canister until steady stream of water begins.

(2) Inlet or outlet valve closed.

(2) Open valve.

(3) Impeller clogged.

(3) Contact your MORGAN representative.

Pump motor hums, but does not start.

(1) Binding of motor shaft.

(1) Contact your MORGAN representative.

(2) Improperly wired.

(2) Contact your MORGAN representative.

(3) Wrong size of wiring.

(3) Contact your MORGAN representative.

Noisy pump.

(1) Motor loose on mounting.

(1) Tighten.

(2) Foreign material in pump.

(2) Disassemble pump and clean. Contact your MORGAN representative.

(3) Impeller damaged.

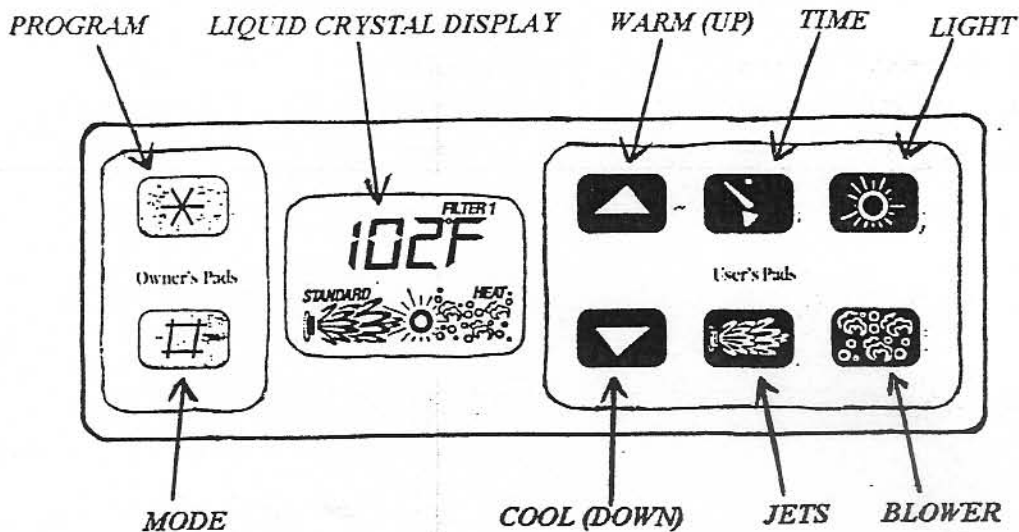
(3) Contact your MORGAN representative.

(4) Worn bearing.

(4) Contact your MORGAN representative.

SECTION 3

Deluxe Digital Control System



CONTROL PANEL PADS & FUNCTIONS

(Each pad has a specific function, thus eliminating any confusion for the spa user.)

USER'S PADS:

1. **TEMPERATURE:** When either of the 'WARM' or "COOL" pads is touched once, the LCD will display the set temperature, as well as the words "set heat". Each time either of these pads is pressed again, the set temperature will increase or decrease, depending upon which pad is pressed. After 3 seconds, the LCD will automatically display the current spa temperature.
2. **JETS:** Push the pad once and pump 1 (low-speed) will turn on. Push the pad again and pump 1 (high-speed) will turn on. Push the pad again and pump 2 (high-speed) will turn on. Push the pad again and pump 2 (high-speed) will also turn on. Push the pad a fourth time and only pump 2 will be on. Each pump will automatically turn off after 15 minutes of operation.
3. **BLOWER:** Push the pad once and the blower will turn on in high speed. Push the pad again to get medium speed. Push the pad again to get low speed. Push the pad again to turn off. The blower automatically turns itself off after 15 minutes of operation.
4. **LIGHT:** Press the pad once to turn on the spa light. Press the pad again to turn it off. The light will automatically turn itself off after 4 hours of continuous operation.
5. **TIME:** Press the pad to view the time of day. The display will revert to the current temperature within 3 seconds.

DISPLAY SCREEN:

6. **LIQUID CRYSTAL DISPLAY:** Continually shows the operating status of the spa, as well as the various monitoring functions and programming information.

OWNER'S PADS:

7. **PROGRAM FUNCTION (*):** Initiates time setting, and panel lock routines.

8. **MODE FUNCTION (#):** Switches spa operation to either the economy or standard mode, and resets the spa in the case of an overheat.

SYSTEM PROGRAMMING

Economy/Standard Selection:

Press the mode pad (#) to select the economy or standard setting. When standard is selected, the spa will maintain the set temperature. When economy is selected, the spa will maintain 20 degrees F. below the set temperature. In either mode, the spa will maintain itself per the schedule under "Filter Cycle".

Setting the Time of Day:

1. Push the "TIME" pad to view the time of day. (The display will revert to current temperature within 3 seconds.)
2. Push the program pad "*" to program the time of day.
3. Push the "WARM" or "COOL" pad to set time forward or set time backward respectively.
4. Push the mode pad "#" to exit.

FILTER CYCLES

Once the time has been set correctly, the spa will display that it is in a filter cycle for a 2-hour period every 12 hours. During this period, the heater will be disabled when the spa is in economy mode. However, the heater may be disabled when in economy mode by following the steps in the "Changing Filter Cycle" section.

The blower will turn on for 30 seconds at the start of each filter cycle to clean out debris. The low-speed pump will constantly run during the filtering times unless the high-speed pump is on.

Whenever a filter cycle is active, this automatic filtering sequence is indicated by the following messages on the LCD screen:

Filter 1: The first filter cycle automatically turns on at 2:00 AM and operates until 4:00 AM. The heater will operate in the economy mode.

Filter 2: The second filter cycle is automatically activated at 2:00 PM and operates until 4:00 PM. Again, the heater will operate in the economy mode.

CHANGING FILTER CYCLES

If the preset times are inconvenient, if a different duration is preferred, or if you wish to leave the heater off during filtering, the following procedure can be used to change the automatic filter cycle settings.

1. Press "TIME" pad. (The time of day will appear.)
2. Press the program pad "*". ("Set Time" message will appear on the LCD.)
3. Press the program pad "*" again.

("Set Start Filter 1" message will appear. At this point, each time the program pad is pressed, the filter-start time, the heater-enable status, and the filter-stop time will be indicated on the LCD screen.)

When the filter-start or filter-stop times are displayed on the screen.

4. Press the "WARM" or "COOL" pad to reset the times.

When the "set heat" message is displayed,

5. Press the "WARM" or "COOL" pad to set the center display to "on" or "off".

In the "on" position, the spa will warm to the set temperature during the filter cycles. In the "off" position, the heater, in the economy mode, will not be activated during the filter cycles.

After entering the filter-set routine, you must:

6. Press the program pad "*" to proceed through all the start and stop times for both filter cycles. Follow the same procedure to adjust "Filter 2" settings.

To exit the filter-set routine,

7. Press the mode pad "#" and the LCD will display the current water temperature.

PANEL LOCK

The panel may be locked in the following ways to prevent unauthorized use. When the lock is engaged, all automatic spa functions will operate normally.

1. Panel Lock: Every pad on the panel is non-functional until the panel is unlocked.
2. Temperature Lock: Only the set temperature is non-changeable. All other pads and functions are active.

TO LOCK THE PANEL


The following pads must be pressed within 3 seconds.

1. Press the program pad "*". The LCD will show "LOC".
2. Press the mode pad "#". The LCD will show "O".
3. Press the "WARM" pad, and "1" will appear on the LCD.

The center display will show the spa temperature along with the lock symbol.

TO LOCK THE SET TEMPERATURE ONLY

Press the "WARM" or "COOL" pad until the desired temperature is reached, then follow steps 1 through 3 in the set temperature mode for the normal panel lock sequence.

If the temperature is locked, when either the "WARM" or "COOL" pad is pressed, this symbol "  " and the set temperature will appear.

TO UNLOCK THE PANEL

All three pads must be pressed in the correct sequence and within 2 seconds. When the last pad is pressed, the lock symbol will disappear and all pads will be active again.

1. Press the program pad "*".
2. Press the mode pad "#".
3. Press the "COOL" pad. The display will show "O".

PANEL DISPLAY MESSAGES FOR TROUBLESHOOTING

1. "Pd" = Battery backup.

The power has been cut off to the spa, and it is using its 45 minute battery backup to preserve its programmable settings. The control panel will be disabled until power is restored to the unit. The battery requires at least 24 hours to charge.

2. "OH" = Overheat protection. (Spa is disabled.)

Software hi-limit protection for water temperature = 112 degrees F. Software hi-limit sensor protection = 118 degrees F.

Both the water temperature sensor and the hi-limit sensor have a stainless steel housing for greater reliability.

The hi-limit sensors provide protection in the following manner:

- a. If the water temperature reaches 112 degrees F., the water temperature sensor will detect the condition and the spa will be disabled. When the water cools below 110 degrees F., the spa will automatically reset.
- b. If the heater element's temperature reaches 118 degrees F., the hi-limit sensor will detect the condition and the spa will be disabled. When the heater element cools to 116 degrees F., the spa may be reset by pressing the mode pad "#".

3. "FLO" = Flow Switch.

The software has detected an error at the pressure switch. The display will show a non-flashing "FLO" on the LCD if the flow switch is closed without a pump running and disable the spa. The display will show a flashing "FLO" if the flow switch is open, but the heater will not turn on.

4. "COOL" = Temperature Set Back.

The spa water is more than 20 degrees F. cooler than the set temperature. The heater will automatically activate to provide freeze protection. This is normal spa function; no corrective action is necessary.

5. "ICE" = Freeze Protection.

The hi-limit sensor or an optional freeze sensor reads below 40 degrees F. at the heater element. The controller automatically activates both pumps to circulate the water. This is normal spa function; no corrective action is necessary.

6. "Sn1" = Open Sensor. (Spa is deactivated.)

The hi-limit temperature sensor is non-functional.

7. "Sn3" = Open Sensor. (Spa is deactivated.)

The water sensor is non-functional.

SECTION 4

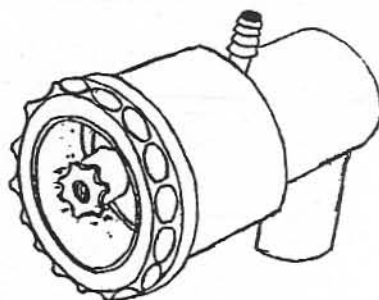
Air Controls & Jets

Air Controls

The air controls are the dials on the control panel and, on some models, along the top edge of your spa. These control the amount of air mixed with water. The more air mixed in, the greater the therapeutic action. To add air, open the controls by turning them counter-clockwise. To reduce the amount of air, close the controls by turning them clockwise. Each controls different jets. This MORGAN feature enables you to vary the therapeutic action in different areas of the spa at the same time. These are also used to control the air in some model spas which are turbo charge.

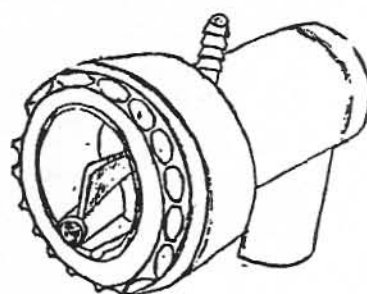
Ultramassage Luxury Jet

Each of the luxury jets is adjustable. To adjust luxury jets, turn the white ring clockwise to reduce the water flow, or counter-clockwise to increase the water flow. By moving the nozzle in the center, you can adjust the direction of the jet.



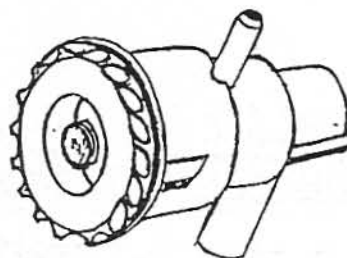
Flutter Blaster Jet

Flutter spinning motion gives a unique and pleasurable massaging sensation. Jets can be easily adjusted for water flow necessary for effective hydrotherapy.



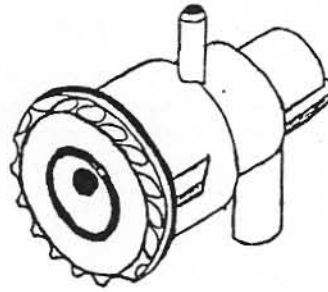
Mini Luxury Jet (Not found in all spa models)

Gives massaging action similar to the full size Luxury Jet but with a smaller plume of water. Range of adjustability helps you customize your hydrotherapy.



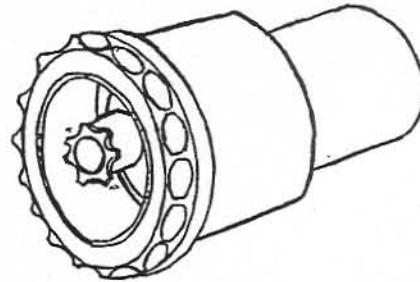
Mini Flutter Blaster Jet
(Not found in all spa models)

Unique flutter action that provides tingling sensations similar to the large Flutter Blaster. Great adjustability helps you to select the hydrotherapy that fits.



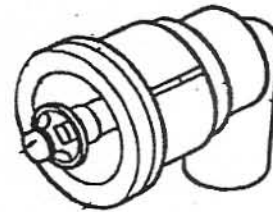
Swirlpool Jet
(Not found in all spa models)

This jet creates a whirlpool within the spa. Point the nozzle in the direction you want the whirlpool and open the jet by turning the white ring clockwise. To reduce the whirlpool, or close the jet entirely, turn the white ring counter-clockwise.



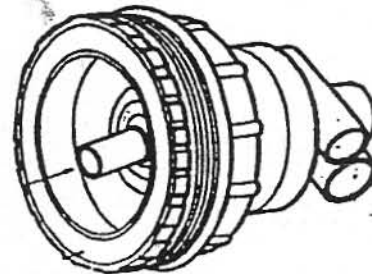
Neck Jet
(Not found in all spa models)

The ultimate neck massage. The jet is located out of the water, flow goes directly onto the body for greater hydrotherapy. Nozzle is multi-directional and is easily adjusted.



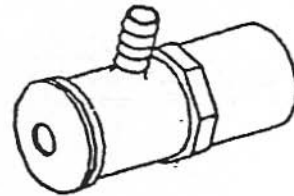
Cyclone Jet
(Not found in all spa models)

It gives a truly remarkable and powerful massage by boasting a 360-degree circular motion and can be adjusted for pressure and direction.



Ozone/Foot Jet
(Not found in all spa models)

This jet is the entry point for your ozonator output and also has strong massaging action that is ideally positioned for the feet.



Turbo Charged Spas
Turbo Charger Maximizes the Therapeutic Action of the Jets

To use Turbo Charge:

1. Switch the command center function control so that both the pump and air blower are on.
2. Switch the turbo charger on by turning the air control knobs counter-clockwise. These are located on the top edge of the spa. When air controls are closed in clock-wise position, all the turbo air from the blower will go to the air channel. NOTE: It is good habit to turn air controls off after each use of the spa. This will reduce heat loss in the water.
3. By depressing the blower button you can control the turbo action to your jets.

CAUTION:

IF SPA IS LEFT IN BLOWER MODE ONLY AND THE TURBO CHARGER IS LEFT ON, YOU MAY EXPERIENCE SOME WATER SPLASHING OUT OF THE SPA.

SECTION 5

Maintaining Your Portable Spa

Your MORGAN spa, just like any other appliance, must be regularly maintained. MORGANS recommends that the following maintenance and operation procedures be followed:

1. The filtration system of your spa should be run at least 6 hours a day to keep the spa clean. This 6 hours required should be met at two different intervals of a 24 hour day with one interval being right after normal use of the spa. This requirement will be met by following directions in Section 2 or Section 3, depending on the type of pack in your spa.
2. The air blower unit should be used only when people are in the spa or adding chemicals. This will minimize heat loss and prevent unnecessary dissipation of chemicals.
3. The chlorine or bromine level in a spa should be kept between 2-3 parts per million. The pH of the water in the spa should be kept between 7.2 - 7.6 to avoid eye irritation.
4. Effective usage of your chemicals is determined by the pH of the water in your spa. Refer to your manual on testing procedure and how to use your test strips.

WARNING:
CHECK WATER TEMPERATURE BEFORE ENTERING SPA.
WATER TEMPERATURE SHOULD NOT EXCEED 104°F.

RECOMMENDED MAINTENANCE SCHEDULE FOR YOUR SPA

The following directions are important for your reference in keeping your spa bright, clean and sanitary. Follow the MORGAN SPA GUIDE included with your spa. The following schedule is recommended to maintain your spa:

MONDAYS:

1. Test your water for bromine, chlorine or pH level.
2. Add chlorine or bromine as necessary to maintain disinfectant level.
3. Adjust pH and total alkalinity. Refer to chart in the MORGAN SPA GUIDE.
4. Add 1 ounce of SPA CLEAR & BRIGHT to your water. This will aid in the removal of both organic and inorganic suspended particles in the water.

WEDNESDAYS:

1. Test your water for bromine, chlorine or pH level.
2. Add chlorine or bromine as necessary to maintain disinfectant level.
3. Adjust pH and total alkalinity, if necessary.
4. Add MORGAN METAL PROTECTOR to your spa to aid in the prevention and elimination of calcium precipitation and scaling, iron, copper or manganese staining. Especially recommended in areas with water high in calcium, total alkalinity and pH.

FRIDAYS:

1. Repeat Monday's program.
2. Super chlorinate the spa with 2 ounces of SANI-SPA or use MORGAN'S SHOCK OUT, a rapid non-chlorine

MAINTENANCE SCHEDULE

USAGE	CLEAN FILTER	DRAIN WATER
1-3 USES PER WEEK	ONCE EVERY 45 DAYS	ONCE EVERY 6 MONTHS
MORE THAN 3 USES	ONCE EVERY 30 DAYS	ONCE EVERY 3 MONTHS

This schedule may vary depending on the use and care of your spa. Anytime the jet pressure decreases immediately, check and clean the filter. The above schedule has been scheduled for an average spa with average usage. Under heavy usage you should check and make chemical additions to your spa more often than suggested.

We strongly recommend that you refer to the "MORGAN SPA GUIDE" included in your spa start-up kit for a better understanding of the spa chemicals and their use.

CLEANING AND CHANGING THE FILTER CARTRIDGE

(Your spa can be equipped with either a top-load filter or an under-cabinet filter)

TOP-LOAD FILTERS

Top-load filters are located under the small decorative cover on the top lip of the spa. **Caution:** do not try to remove the lock-ring or filter cap "manifold" before turning main power switch off and opening air relief valve. Remove the lock-ring then remove the filter cap "manifold" by lifting or pulling on the handle. The cartridge filter element can now be removed and cleaned by squirting in between the pleats with a garden hose. Rotate the cartridge housing from top down. After hosing the cartridge filter, allow the cartridge to dry and carefully brush the pleated surface area to remove the particles. Once cleaned or new filter cartridge has been replaced and the manifold reinstalled make sure the lock-ring has been installed properly and locked in place.

Caution: do not try to operate the spa without the filter or without replacing the lock-ring on the manifold. Trying to operate the spa with the manifold in place but without the lock-ring properly in place and locked may cause injury. **Note:** you should lubricate the o-ring with silicone lubricant, this will make installing much easier. **Note:** for spas with the Deluxe Digital Control System, once the power is cut off for more than 45 minutes the unit will need to be reprogrammed.

Algae, suntan oil and body oils form a coating on the cartridge pleats which may not be thoroughly removed by hosing. To remove such materials, soak the cartridge in MORGAN FILTER CLEANER, which may be purchased at any MORGAN spa sales location. Follow the directions on the label for use. After cleaning, hose the filter thoroughly before re-installing. Depending on use and care, the filter cartridge should be cleaned monthly or more often with heavy use.

A SPARE "'STANDBY" CARTRIDGE FILTER ELEMENT IS AN EXCELLENT INVESTMENT. IT PROVIDES CONVENIENCE AND ASSURES THAT YOUR FILTER WILL ALWAYS BE READY TO OPERATE AT PEAK EFFICIENCY. IT TOO IS AVAILABLE AT YOUR MORGAN SALES LOCATION.

UNDER CABINET FILTERS

To clean and change the filter cartridge in spas with under cabinet filtering systems, turn main power switch off. Close the two slide valves with red handles on the far left and far right of the power pack. Now remove lock-ring from filter manifold then remove filter cartridge. The cartridge filter element can now be removed and cleaned by squirting in between the pleats with a garden hose. Rotate the cartridge housing from top down. After hosing the cartridge, allow the cartridge to dry and carefully brush the pleated surface area to remove the particles. Place the filter cartridge back into the filter canister, re-install canister and secure with lock-ring.

Caution: do not operate the spa without the filter cartridge or filter canister. It may cause damage to the spa or injuries. **Note:** you should lubricate the o-ring with silicone lubricant; this will make installing much easier. Do not use vaseline as this will damage the o-ring.

Algae, suntan oil and body oils form a coating on the cartridge pleats which may not be thoroughly removed by hosing. To remove such materials, soak the cartridge in MORGAN FILTER CLEANER, which may be purchased at any MORGAN spa sales location. Follow the directions on the label for use. After cleaning, hose the filter thoroughly before re-installing. Reopen all slide valves after replacing the filter housing. **BE SURE THIS IS DONE BEFORE RE-STARTING THE SPA.** Depending on use and care, the filter cartridge should be cleaned monthly and more often with heavy use.

A SPARE "STANDBY" CARTRIDGE FILTER ELEMENT IS AN EXCELLANT INVESTMENT. IT PROVIDES CONVENIENCE AND ASSURES THAT YOUR FILTER WILL ALWAYS BE READY TO OPERATE AT PEAK EFFICIENCY. IT TOO IS AVAILABLE AT YOUR MORGAN SALES LOCATION.

HOW TO DRAIN & CLEAN YOUR SPA

1. Turn off all electrical power to the spa.
2. Attach a garden hose to small ball valve faucet located in the toe kick of cabinet, same side as equipment pack.
3. Route the hose to a safe discharge area, as chemical treated water may damage plants.
4. Turn the ball valve knob inline with the hose, this is the open position. You will need to allow approximately 3 hours to drain spa depending on its size, this is a gravity flow and spa will not drain below suction fitting. You may use a small plastic container to remove remaining water from spa.

To clean the spa use any of the cleaners listed below. These cleaners have been laboratory tested and found to be harmless to the acrylic finish. **IT IS RECOMMENDED THAT ONLY THOSE PRODUCTS FOUND ON THIS LIST BE USED. OTHER PRODUCTS MAY BE ACCEPTABLE, BUT BECAUSE INFORMATION CONCERNING THEIR ACCEPTABILITY IS NOT AVAILABLE THEY ARE EXCLUDED FROM THIS LIST. BE SURE TO RINSE THOROUGHLY BEFORE REFILLING SPA.**

List of Recommended Cleaners

- | | | |
|---------------------------|-----------------------|------------------------|
| 1. Wilbert Fresh Pine | 8. Dow Orange Can | 15. Mr. Clean |
| 2. Lysol-Basin/Tub/Tile | 9. White Cap | 16. 409 Cleaner |
| 3. Janitor in a Drum | 10. Lestoil | 17. Pine Sol |
| 4. Fantastic Liquid Spray | 11. Sea Mist Lemon | 18. Ajax Liquid |
| 5. Sea Mist Swiss Pine | 12. Fantastic Spray | 19. Crew |
| 6. A&P Sudsy Ammonia | 13. A&P Clear Ammonia | 20. Dow-Liquid Cleaner |
| 7. A&P Lemon Ammonia | 14. Dow Spray Cleaner | |

After cleaning your spa follow these steps to get your spa in working order again:

5. After you have washed out your spa, dry it with a clean non-abrasive cloth.
6. Apply a layer of MORGAN QUIK GLOSS to the acrylic surface; available at your MORGAN sales location. This will give a shiny, silky-smooth finish to your spa for added beauty and comfort.
7. At this time you need to also clean or change the filter cartridge. See Section on "Cleaning and Changing Filter Cartridges".
8. Close ball valve faucet and refill the spa with water to proper level.
9. Run in the high jet mode until you have good water circulation.
10. Add chemicals and recommended amount of metal protector. Metal protector is very important in order to prevent calcium buildup. See section on initial startup.

CARE AND UPKEEP

The Redwood Cabinet

MORGAN uses the finest redwood in its cabinets. If exposed to the elements without a protective finish, the wood will turn to a natural gray finish. To preserve the original beauty of the redwood color it is recommended that you apply a clear wood preservative, a product similar to Thompson Water Sealer, on your spa every 6 months as needed. All MORGAN sales locations have available for sale a wood preservative that can be purchased to apply to your spa.

The cabinet is designed with removable panels around the exterior of the spa. By simply removing the four (4) screws on the upper and lower portion of the panel, they can be removed for access to the equipment and other components of the spa.

Acrylic Finish

Your spa tub is constructed of cross-linked acrylic, some of the most chemical resistant material available. However, care should be exercised not to drop objects on the surface or rub sharp objects on the surface as the material can be scratched by doing so.

If scratches do occur, a polishing compound (the kind most used on automobiles) can be used to remove them. Also sanding with a 600-Grit wet/dry sandpaper lightly can remove these scratches. CAUTION should be exercised when sanding the surface. MORGAN QUIK GLOSS will brighten the luster of the acrylic finish.

Spa Cover

Your MORGAN spa is furnished with an attractive insulated vinyl cover. The cover should be used at all times when the spa is not in use. The surface of the cover can be cleaned with soap and water and then sprayed with MORGAN ALL-SURFACE CLEANER.

DO NOT WALK ON YOUR SPA COVER OR ALLOW CHILDREN TO PLAY ON TOP OF IT. IT IS NOT DESIGNED FOR USE AS A SAFETY DEVICE AND IS NOT INTENDED TO HOLD WEIGHT.

A deck or patio around your spa can add real beauty and enjoyment. Contact your local MORGAN sales representative for decking ideas and suggestions.

IMPORTANT NOTE: BE SURE YOUR PATIO HAS A SLIP RESISTANT SURFACE WITH ADEQUATE DRAINAGE. CHECK PERIODICALLY FOR ANY SIGNS OF WEAR AND TEAR WHICH MAY MAKE THESE SURFACES HAZARDOUS.

Protecting Your Spa In Winter Months

Cold climates, where the danger of freezing exists, require special care on your part in order to prevent damage to the spa shell and equipment. If you plan to use your spa during the cold months be sure the pump and heater are operating. The timer power switch should be turned to continuous operation on the filtering timer, and the heater timer should be on thermostat control. The heater thermostat should be set on warm or hot. To insure pump and heater operation, keep thermostat at or above the warm position. The heater will then automatically turn on as the temperature falls.

NOTE: If your spa is equipped with a Deluxe Digital Control System one of the features of this system is that it has freeze protection built in. When the hi-limit sensor or an optional freeze sensor reads below 40 degrees F. at the heater element then the controller automatically activates both pumps to circulate the water. This is a normal spa function and no action is necessary.

CAUTION: THE ABOVE WILL NOT WORK IF THERE IS A POWER FAILURE

The only sure way to winterize your spa is to complete the following steps:

1. Drain spa of all water.
2. Run blower to clear air channels of water. Be sure pump and heater are not running.
3. Remove any remaining water with a sponge.
4. Remove drain plug from bottom of pump housing.
5. Remove cartridge housing and cartridge filter. Drain water and leave off.
6. For the best protection, the power pack can be removed.
7. If you cannot drain all of the water, especially from the air channels and the heater housing, a non-toxic anti-freeze, which can be purchased at any recreation/vehicle supply center, should be added.

If there is a power failure, and you do not want to drain the spa, the following will minimize damage:

1. If tub has been heated, leave covered to conserve heat.
2. Loosen union nut or remove plug from pump housing.
3. If possible, remove the whole pack and take indoors. That is the best.

If power is to be out for a considerable length of time it is advised that you contact your nearest sales location for instructions on how to minimize damage to your spa. We recommend that you use and enjoy your spa during the winter months. This takes the worry out of freezing temperatures and gives you twelve months of spa enjoyment.

MOVING A MORGAN SPA

Your MORGAN portable spa can be moved when you change your address or you simply want to change the location of the spa in your backyard. When moving a spa, care must be taken to block and level the spa at key bearing points. For this reason, MORGAN personnel must move your spa for the warranty to remain in force.

**RELOCATION OF THE SPA BY PERSONS OTHER THAN
MORGAN PERSONNEL VOIDS THE WARRANTY**

SECTION 6

Chemicals

Your MORGAN spa is just like a swimming pool, only on a much smaller scale. The water in the spa must be treated with chemicals to prevent the growth of bacteria and fungi and the transmission of diseases. **NEVER USE SWIMMING POOL CHEMICALS IN YOUR SPA.**

IMPORTANT NOTE: DO NOT USE THE BAQUASPA CLEANING SYSTEM IN YOUR SPA.
The Baquaspa Cleaning System can cause severe damage to your spas plastic pvc plumbing.

Instead, you should conscientiously follow the instructions provided concerning the chemical balance of the water in your spa. The following is a list of general tips on the use and storage of chemicals.

1. Before using chemicals, **READ** the labels and directions carefully. Follow use instructions found on the labels.
2. Keep all chemicals out of the reach of small children.
3. Store your spa chemicals in a clean, cool, dry, well ventilated area preferably off the floor to prevent contamination from other materials.
4. Always add the chemicals directly to the spa water. It should be broadcast across the surface of the water or diluted and poured into the water with the spa operating on "BLOWER ONLY".
5. **NEVER** add chemicals to the spa while people are using it.
6. Carefully clean up any spilled chemicals with large amounts of water to dilute and wash away the chemicals.
7. Since the chemistry of spa and hot tub water changes very quickly, test the water in your spa or hot tub with a reliable test kit on a daily basis. Add the necessary chemicals according to the test results and chemical manufacturer's instructions.

WARNING-Do not store spa chemicals underneath spa cabinet. It is advised that they be stored in a locked cabinet away from the spa itself.

THE IMPORTANCE OF CHEMICAL BALANCE

Spa chemicals serve a variety of functions in your spa. They purify and disinfect the spa water and they also help to prevent mineral build-up and damage to your spa's power pack. **FAILURE TO MAINTAIN PROPER CHLORINE AND pH BALANCE IN YOUR SPA AT ALL TIMES CAN CAUSE SEVERE PERMANENT DAMAGE TO YOUR SPA'S POWER PACK.** Please read the following paragraphs about spa chemical balance, and also read the MORGAN SPA GUIDE and be thoroughly familiar with it.

A SIMPLE OVERVIEW OF SPA CHEMISTRY AND DISINFECTION

The filtering action of your spa's power pack can effectively remove soil particles and other debris, but the addition of spa chemicals is required to disinfect your spa. Disinfection can be accomplished by adding a germ-killing chemical to the spa water in sufficient strength to provide nearly instantaneous destruction of bacteria. Chlorine is the disinfecting agent used most in pools and spas. It reacts with water to produce hypochlorous acid (HOCL). Hypochlorous acid, in turn, attacks and kills bacteria.

Chlorine products also possess strong oxidizing properties which cause them to react with and destroy many foreign materials other than bacteria. Many of these materials, if not destroyed by oxidation, would impart undesirable characteristics to the water such as turbidity, color, and odor. This chemical destruction of soil plays an important part in the filtration-disinfection process.

THE IMPORTANCE OF pH CONTROL

pH is one of the most important aspects of spa water chemistry, yet it is also the most misunderstood. Maintaining pH balance is important to the long life of your spa and to your personal comfort when using your spa.

The relative acidity or alkalinity of water (pH) is measured on a scale of numbers ranging from 0 to 14. The mid-point of seven (7) is said to be precisely neutral, above which acidity becomes progressively greater.

Your spa water pH should always be maintained at a slightly alkaline condition of 7.2 or 7.6 on this scale. This level may be checked using chemical test strips which are available at your MORGAN store. Refer to the MORGAN SPA GUIDE instruction booklet for information on using these test strips.

From the viewpoint of health and sanitation, the most serious effect of improper pH control is reduced efficiency of the disinfection process. As pH rises above 8.0, the chlorine residual progressively weakens to the point at which it may be virtually useless for disinfection and oxidation purpose.

It can surprise the new spa owner to discover that serious water problems can develop despite the fact that the filters are functioning properly, and chlorine levels are testing at normal. In such cases, the problem can often be traced to the fact that the pH has been permitted to drift well into the undesirable zone above 7.6 or below 7.2.

CHLORINATING YOUR SPA

This is the simple procedure of adding chlorine to the spa water in the correct amounts under the regular schedule. While chlorination is a rather simple procedure, its importance should not be minimized. You must maintain a schedule of regular chlorination to maintain the proper water condition in your spa.

Use a completely soluble granular concentrate mixed in water, added directly to the spa with the filter system in operation. The amount of chlorine will vary with such factors as user load, temperature, ultra violet exposure, etc. Determine the proper amount of chlorine to add by using the test strips provided with your spa. A free chlorine residual of 2-3 parts per million should be maintained at all times.

Normally, your spa should be "shocked" once a week using MORGAN SHOCK-OUT. In addition, you should "shock" your spa following heavy use.

BROMINE IN LIEU OF CHLORINE

Bromine tabs can be also used to sanitize your spa. It works on the same principal as chlorine. The recommended level is 2-3 parts per million. The available test strips also work on bromine.

MORGAN has designed a top load inline filtering system with a built-in brominator dispenser. Loading instructions for the bromine tabs are printed on the brominator dispenser. See the section on cleaning and changing the top load filter cartridge for instructions on removing the filter manifold to get to the brominator dispenser.

If you have purchased an ozonator as original equipment to your spa or have added it at a later date, please refer to Section on Ozonators.

NOTE: READ THROUGH THE MORGAN SPA GUIDE INSTRUCTION BOOKLET THOROUGHLY AND FOLLOW THE INSTRUCTIONS GIVEN PRIOR TO USING YOUR SPA.

SECTION 7 Ozonators

YOUR OZONE GENERATOR

Your spa has an option of having an ozone generator installed. If factory installed, follow these directions made to your spa's specifications. The OZONE GENERATOR will introduce ozone into your spa automatically to keep both the water and the spa sparkling clean. Refer to the chart on page 34 for operating time guidelines necessary to keep your spa clean and your water sparkling clear.

OZONE: WHAT IS IT?

Ozone, with the chemical formula O₃, is comprised of three atoms of oxygen, one of nature's basic elements. Ozone is produced in nature when the ultraviolet rays of the sun strike oxygen molecules high (about 90,000 feet) in the earth's atmosphere. This process creates what we know as the "ozone layer". Because the oxygen absorbs the sun's energy, people on earth are protected from the damaging and potentially cancer-causing rays of the sun. Nature also produces ozone nearer to the earth's surface each time lightning flashes. The sweet, fresh smell near a thunderstorm is ozone.

Ozone's practical use as a water purifier was discovered in the later 1800's in The Netherlands. Its first large-scale use was the installation of an ozone purification plant for the city of Nice, France in 1906. Today, more than thirty countries use ozone systems to purify drinking water. In fact, the city of Los Angeles has installed one of the largest ozone water treatment plants in the world, processing more than 74 million gallons of water per day.

Ozone may not completely replace traditional water sanitizing chemicals such as chlorine or bromine. A small amount of chlorine or bromine may be needed in the water during times when the ozone generator is not in use, or after the spa has been heavily used. Ozone will be doing the major job of killing micro-organisms and oxidizing bather waste, such as perspiration, body oil, suntan lotion, etc. At the same time ozone will be eliminating chloramines and bromamines, the chlorine and bromine by-products that cause bad odors and taste; and irritate skin and eyes. The chlorine or bromine will be providing the measurable, lasting residual and preventing algae from growing.

SOME OF THE BENEFITS OF USING OZONE:

1. It kills all known bacteria and viruses found in spas, hot tubs, and pools quickly and effectively.
2. It is inexpensive and automatic.
3. It does not discolor hair, fade swimsuits, or cause dry skin.
4. It does not irritate eyes or skin.
5. It is safe for your spa and equipment.
6. It eliminates cloudy water.
7. It will not adversely affect the pH.
8. It eliminates chlorine and bromine by-products.
9. It is environmentally safe.
10. It makes your water sparkle.

Important Additional Information:

1. Ozonators generate ozone only when the spa circulation system is running which in most cases is an average of approximately 8 hours a day.
2. Ozone is not a residual sanitizer. The ozone only remains in the water at a sufficient concentration to sanitize water for approximately 15 minutes after the ozonator is turned off.
3. Spas with ozonators ***MUST*** have an additional residual sanitizer, such as chlorine, bromine or a combination of both.
4. The level of chlorine/bromine required to maintain safe water (2-3 ppm) is the same, with or without an ozonator. The two sanitizing systems (chlorine/bromine and/or ozone) are entirely independent of each other.
5. The amount of bromine a spa will use to properly sanitize spa water will be less for spas with ozonators because the ozone does some of the sanitizing work when it is being introduced into the water.

OPERATION

WATER CHEMISTRY AT START-UP

If you have been using chlorine or bromine in your spa, it is a good idea to drain the spa and start with fresh tap water. ***PLEASE NOTE*** - if water conservation or other restrictions are being practiced in your area, it is OK to use the water that is already in your spa.

The water right out of the tap is not always as "fresh" as your might think. Normal tap water is usually filled with minerals and micro-contaminants that are not visible to the naked eye. Ozone will oxidize and destroy these contaminants, giving you very clear, safe water without adding large amounts of chemicals to the water. The steps to achieving this are very simple.

1. Fill your spa with fresh water.
2. Check the water's total alkalinity and pH. Adjust to proper levels (see chart below) with "pH Up" or "pH Down".
3. The Ozone Generator will automatically come ON when the spa is in filtration mode only.
4. Add 1/2 ounce of chlorinating granules or put a bromine floater filled with tablets into the spa.
5. Allow the spa to remain ON in low-speed mode for 24 hours.
6. After the spa has run for 24 hours, clean the filter and filter cleaner.
7. If the water is cloudy or has turned any color other than clear or slightly blue, this has probably been caused by a small amount of minerals in the water. You should add a metal remover per package instructions. (See the section on "Cloudy Water" that follows)
8. Allow the spa to operate in low speed mode for another 24 hours.
9. Water should now be crystal-clear and have a fresh smell.
10. Proper operating parameters are:

Total Alkalinity:	80 to 120 ppm	
pH:	7.2 to 7.6	
Free Chlorine:	2-3 ppm	(Depending on sanitizer used)
or Bromine:	2-3 ppm	(Depending on sanitizer used)

SPA MAINTENANCE WITH OZONE

Ozone is a very effective natural water purifier that is lethal to bacteria, viruses, and contaminants without harming people and equipment. There are just a few "Rules of Thumb" that you should follow. Take the time to learn these simple rules and you will have no trouble maintaining a clear, clean spa that will provide you with years of enjoyment.

Always maintain the following spa water operating parameters:

Total Alkalinity:	80 to 120 ppm	
pH:	7.2 to 7.6	
Free Chlorine:	2-3 ppm	(Depending on sanitizer used)
or Bromine:	2-3 ppm	(Depending on sanitizer used)

1. Operate your spa Filtration Cycle for the minimum time according to the following chart. For best results, and to minimize chlorine or bromine use, you may operate your spa in the low-speed mode 24 hours a day.

Gallons

Operating Time Per Day

Up to 250.....	4 to 6 Hours
251 - 500.....	8 to 10 Hours
Over 500.....	12 to 18 Hours

NOTE: Spa conditions can vary due to location and bathing load - adjust accordingly.

2. Total alkalinity is very important. If the spa water's total alkalinity is too low, the pH can change rapidly and maintaining the proper pH level will be difficult. Equipment will become corroded if the total alkalinity is too low. If the total alkalinity is too high, it will be very difficult to adjust the pH. In addition, scale will form on the walls of the spa and in the equipment if the total alkalinity is too high. The water's total alkalinity should be adjusted to the proper level BEFORE adjusting the pH. Check total alkalinity once a week and adjust to proper levels as necessary.
3. Ozone does not have an effect on the spa water's pH and ozone is not affected by the water's pH. Bathers will have the most effect on the pH. It is therefore necessary to check the pH of your spa water twice a week and adjust it to the proper level.
4. Check chlorine or bromine levels twice each week. If the chlorine level is below 1 ppm, add 1/4 to 1/2 ounce (about one level tablespoon) of Chlorinating Granules. If you are using bromine and the level is less than 2 ppm, you should increase the opening setting on your bromine tablet feeder.
5. Filtration is critical to proper ozone operation and water purity. Because ozone purifies the water so completely, the filter gets dirty fast. Clean the filter properly and often. It is a good idea to have an extra filter cartridge handy so you can take the time to clean the filter properly and thoroughly. Algae, suntan oil, body oils, and other personal care products can form a coating on the cartridge surface that may not be removed thoroughly by rinsing with a hose. We recommend soaking the filter overnight in Filter Cleaner. After soaking, rinse the cartridge thoroughly with a garden hose to remove any cleaner and debris from the bottom. Carefully replace the cartridge element over the rod making sure it seats properly. It is important that all the filter seals and gaskets are in their proper positions. If the filter is not sealed properly, it cannot do its job. Inspect the filter cartridge and housing regularly. Bad gaskets or a loose or cracked filter housing can result in cloudy and unpleasant smelling water.
6. After heavy use (more than 2 people in the spa for longer than half an hour), the spa should be "shocked" by adding 1 to 2 tablespoons of Chlorinating Granules or a non-chlorine shock treatment to rid the water of the extra contamination.
7. If the pH is too high (over 7.6) or too low (under 7.2), the water may look cloudy or green. The water may also be irritating to the eyes. High or low pH can also cause damage to the spa's equipment or scale build-up on the spa walls and plumbing.
8. Drain your spa completely at least twice a year. Clean the spa according to your Spa Maintenance Manual and refill. Follow the directions in the WATER CHEMISTRY AT START-UP section of this manual.

RESIDUAL OXIDIZERS

Ozone is very reactive and does not remain in the water for very long - usually only minutes. It is therefore recommended that you supplement the ozone with a small amount of chlorine or bromine if you do not operate the OZONE GENERATOR for 24 hours a day. This small amount of chlorine or bromine will provide that little bit of extra protection when the OZONE GENERATOR is not operating. If you use chlorine, add 1/2 ounce (or one level tablespoon) of Chlorinating Granules (dry sodium dichloro-chlorine) often enough to maintain a residual

level of 1 ppm. If you decide to use bromine, use the type that uses tablets or sticks in a floater. Set the floater to its lowest setting. Increase the setting only enough to maintain a residual of 2-3 ppm.

Having a few people in your spa is like inviting hundreds of people to jump into your backyard swimming pool. During these times of high bather load, your OZONE GENERATOR may not be able to keep up with the extra bather load. It is a good idea to add a little chlorine (1/2 ounce or one level tablespoon) before the expected extra bathers get into the spa. It is also recommended that you add a little more chlorine (another 1/2 ounce or one level tablespoon) to the spa after they leave. Because the OZONE GENERATOR puts out a fixed amount of ozone, it could take a few hours for the ozone to oxidize this extra contamination. If the spa were to be used during this "recovery time", bathers would not be protected. Using a small amount of chlorine will provide immediate protection for bathers.

ALGAE CONTROL

When covered, ozonated spas rarely grow algae. If you experience algae in your spa, add about three times the normal amount (or three level tablespoons) of chlorine. Increase the running time of the OZONE GENERATOR and circulation equipment and brush the algae with a stiff brush. Maintaining a residual of 2 ppm of chlorine, or 2 ppm of bromine, or operating the OZONE GENERATOR continuously will prevent a reoccurrence.

CLOUDY WATER

Sometimes spa owners complain or are concerned when within a day or two of installing the OZONE GENERATOR their spa water turns cloudy or murky with some color. Their most common first step is to shock the water with either chlorine or non-chlorine shock which clears the water for one or two days but then it turns cloudy and they need to "shock" it again. This is a common cycle and is easily explained. The spa is filled with water and the OZONE GENERATOR is turned on. The ozone slowly begins to oxidize contaminants. Other contaminants are attracted to these partially oxidized molecules causing larger molecular chains to be formed. Over time these molecular chains grow in size and become visible. The spa owner thinks that there is a problem and pours in a shock dose of oxidizer which immediately breaks down the molecular chains formed by the ozone. The water will appear clear again. A few days later the shock is chemically exhausted and the ozone cycle begins again, resulting in cloudy conditions. If the spa's water chemistry is not maintained at the optimum levels the problem can be even worse.

To avoid this "shocking" cycle if your spa water becomes cloudy, it is important to follow some simple steps. It is a fact that filtration is responsible for about 90% of a spa's water clarity, and oxidation is responsible for the other 10%.

1. Remove and clean the filter.
2. Operate the spa circulation system for minimum recommended time. It may be necessary to increase the filtration time.
3. Make sure that the ozone generator is working properly for the entire filtration cycle.
4. Maintain total alkalinity, pH, and hardness within the regular parameters.
5. Add MORGAN Metal Protector.
6. Let the cloudy water remain cloudy for an extended period of time. This will allow the "chains" to become large enough to be caught in the filter

WATER TESTING

If your spa water smells fresh and clean, you can assume your OZONE GENERATOR is working properly. If you would prefer to test your water to be sure it is clean and sanitized, there are separate water test kits available for measuring oxidizers levels (chlorine or bromine) in water. If your OZONE GENERATOR is operating properly and the results of your chlorine test show 1 ppm or greater of chlorine in your water, then you are assured of having sanitized water. If you are using bromine, 2 ppm will assure you of having sanitized water.

OZONATOR TROUBLE SHOOTING GUIDE

If there is correct air flow, the ozone indicator light is lit, and you can smell ozone, your OZONE GENERATOR should supply adequate ozone to keep your water sparkling clean and clear, provided your system operates long enough each day. If your water is not sparkling clean and clear, refer to this chart for possible causes and corrective action.

SYMPTON	PROBABLE CAUSE	CORRECTIVE ACTION
Inadequate suction	<ol style="list-style-type: none">1. Lack of suction through ozone supply tubing (not enough air flow)	<ol style="list-style-type: none">1. Check for dirty filter or incorrectly operating pump2. Check adjustable jets and open completely3. Check for debris in jets4. Check ozone supply check valve
Indicator light on the control panel	<ol style="list-style-type: none">1. No power to ozone generator2. Broken or defective generator cartridge3. Defective power supply	<ol style="list-style-type: none">1. Check power source2. Replace generator cartridge3. Return for replacement
Cloudy water condition even though the ozone generator appears to be operating properly	<ol style="list-style-type: none">1. Recent startup with new water2. Total alkalinity out of balance3. pH out of balance4. Lack of filtration5. Trace metals in water6. Organic micro-debris in the water7. Too much clarifier added	<ol style="list-style-type: none">1. See the section on "cloudy water"2. Balance total alkalinity to 80 - 120ppm3. Balance pH to 7.2 - 7.64. Clean filter, check for cracks in filter, increase filtration time, D.E.5. Add metal remover6. Operate ozone generator longer or add chlorine or bromine7. Don't add anymore, operate filter and skim excess clarifier off surface of water
If water is still cloudy after addressing all of the above, go back and re-check - you have probably missed something.		
My water looks clear but smells bad	<ol style="list-style-type: none">1. Trace metals in water2. pH out of balance3. Not enough oxidizer	<ol style="list-style-type: none">1. Add metal remover2. Balance pH to 7.2 - 7.63. Operate ozonator longer or add chlorine or bromine
My pH bounces up and down like a yo-yo	<ol style="list-style-type: none">1. Total alkalinity out of balance2. Trace metals in water	<ol style="list-style-type: none">1. Balance total alkalinity to 80 - 120 ppm2. Add metal remover

OZONE QUESTIONS & ANSWERS

What is Ozone?

Ozone is active oxygen, O₃. It occurs naturally in the Earth's atmosphere to protect us from the sun's harmful rays.

What are some uses for Ozone (active oxygen)?

Some common uses are: Drinking Water Purification, Waster Water Purification, Air Freshening, Pool and Spa Water Purification.

How long has Ozone been used to purify water?

Since the late 1800's.

How long has Ozone been used to purify pool & spa water and remove odors from air?

Over 50 years.

How does Ozone used for water purification affect the air we breathe?

The amounts of Ozone produced by an ozone generator are insignificant to the normal atmosphere we live in. Excess ozone converts back to oxygen. **NOTE: DO NOT BREATHE CONCENTRATED OZONE.**

Isn't Ozone the same as "SMOG"?

NO! "Smog" is air pollution created by combustion pollutants. While smog contains small amounts of ozone, it is largely composed of harmful chemicals such as carbon monoxide. In fact, Smog and other pollutants may contribute to the damage of the "Ozone Layer".

If I use Ozone in my pool or spa, will I help to replenish the "Ozone Layer"?

NO! It takes such tiny amounts of Ozone to effectively purify water that any molecules breaking free into the air are insignificant. **NOTE: DO NOT BREATHE CONCENTRATED OZONE.**

Will Ozone hurt me?

NO! In the quantities necessary to be effective, Ozone is very gentle to humans and equipment in water. **NOTE: DO NOT BREATHE CONCENTRATED OZONE.**

Does Ozone have an odor?

Yes. Depending on the concentration, the odor ranges from slightly sweet to moderately antiseptic.

How is Ozone better than chlorine?

In the quantities needed for water purification, it has no noticeable odor, taste, or color. It is not irritating to humans or equipment. It purifies water and air very quickly and efficiently. It leaves no by-products except pure oxygen. In contrast, chlorine leaves a dangerous chemical called hydrochloric acid and additional salts in water applications that will require periodic pool or spa draining.

Will Ozone kill bacteria?

Yes. It is one of the most effective, complete bacteriacides of all Earth's measurable elements.

Will Ozone kill viruses?

Yes. Ozone kills virtually all known forms of viruses found in pool and spa water.

Will Ozone reduce scum lines and foaming in spas?

Yes. With proper filtration it should completely eliminate them.

How is Ozone produced?

It can be produced in a number of different ways, however; the most common method for spas and residential pools is by Ultraviolet Light Generation.

How does Ultraviolet Light Generation work?

A special lamp gives off a specific wavelength of ultraviolet light which converts Oxygen (O_2) molecules into Active Oxygen (O_3) molecules. This all occurs instantly inside the Ozone chamber in the ozone generator.

Can Ozone damage my spa or equipment?

No. In fact it is very gentle to spas, pool and equipment. Applied properly, ozone is more gentle than any other water purifier in existence.

Can the Ozone in my spa irritate skin or eyes like chlorine in spas?

NO! Ozone is very gentle to skin and eyes.

How long will Ozone last in my spa?

Scientific theory states that Ozone has a half life of about 22 minutes in water. However recent tests have proven that a measurable residual can be found after several hours in clean water.

Will water temperature affect Ozone?

Ozone produced by an ozone generator that is designed and sized for spa use will not be noticeably affected by temperature.

Will Ozone affect my pH?

Ozone is pH neutral. It will not adversely affect the pH.

Do I still have to filter the water as often?

Yes. Because impurities are constantly being introduced into the water and the ozone is constantly destroying the microscopic remains will need to be filtered out of the water.

Will I notice a difference in the spa water?

Very definitely yes! Most minerals and impurities in the water will be removed, resulting in very clear water. Even if your source water is very hard and murky, it will become clear and odorless.

Should I drain my spa periodically?

Once or twice a year water changes should be all that are necessary under normal conditions. Check the spa manufacturer's recommended cleaning schedule.

How long does the lamp last?

The lamp in the ozone generator last approximately 8,000 to 16,000 hours.

How much power is used by the Ozone Generator?

Power required is 120 volts AC, 0.5 Amps.

How much does it cost to operate an Ozone Generator?

Less than half a cent per hour or less than \$4.00 per month when operated continuously.

SECTION 8 Accessory Items

These are the accessory items available through your *MORGAN* representative:

Complete line of chemicals
Spa fragrances
Stainless steel and chrome escutcheons
Stainless steel handicap rails
Ozonators
Pillows and deck cushions
Thermometers
Replacement filter cartridges
Complete line of redwood products including spazebos,
climate rooms, change rooms, side decks, back rests,
stools, towel bars and planters

Glossary of Terms

2 SPEED PUMP	The engine of the spa which draws water from the main drain and skimmer, pushes it through the filter and heater, and returns it through the spa jets.
4 SPEED AIR BLOWER	Allows for four (4) different levels of blower performance.
FILTER	The filter cleans the spa by removing debris and impurities from the water.
HEATER	A heater element in a stainless steel housing used to heat the water to a desired setting.
TIME CLOCKS	Two sets of timers: One used to control the heating timer of the spa; and the other to control the filtration of the spa.
GFCI	A safety device that protects against 110V circuit malfunctions, should they occur.
COMMAND CENTER	Center for controls used to adjust spa functions, including air induction, temperature, jet action, lighting and 4-speed air blower. All switches are air actuated.
DIGITAL CONTROL CENTER	Serves same function as a Command Center but also reflects the time and temperature and is used to program the spa.
AIR CONTROLS	Located on the top lip of your spa, allow air to be mixed water flowing from the jets.
ULTRAMASSAGE LUXURY JETS	Therapeutic jets that allow you to adjust water flow and direction.
FLUTTER BLASTER JETS	Flutter spinning motion gives a unique and pleasurable massaging sensation. Jets can be easily adjusted for water flow necessary for effective hydrotherapy.
MINI LUXURY JETS	Gives massaging action similar to the full size Luxury Jet but with a smaller plume of water. Range of adjustability helps you customize your hydrotherapy.
MINI FLUTTER BLASTER JETS	Unique flutter action that provides tingling sensations similar to the large Flutter Blaster. Great adjustability helps you select the hydrotherapy that fits.
SWIRLPOOL JETS	Diverts most of the water flow to create a whirlpool effect.
NECK JETS	The ultimate neck massage. The jet is located out of the water, flow goes directly onto the body for greater hydrotherapy. Nozzle is multi-directional and is easily adjusted.
CYCLONE JETS	It gives a truly remarkable and powerful massage by boasting a 360-degree circular motion and can be adjusted for pressure and direction.

OZONE/FOOT JETS

This jet is the entry point for your ozonator output and also has strong massaging action that is ideally positioned for the feet.

MAIN DRAIN/SUCTION

The lower suction fitting on the bottom of the spa that returns water to the pump and filter.

SKIMMER/BOX SKIMMER

Rectangular outlet at water level. The skimmer removes surface water to filter out body oils and floating debris from the top of the water.

LIGHT

A safe 12 volt light.

TURBO-CHARGE

Maximum air mix to increase the therapeutic action of the water jets.

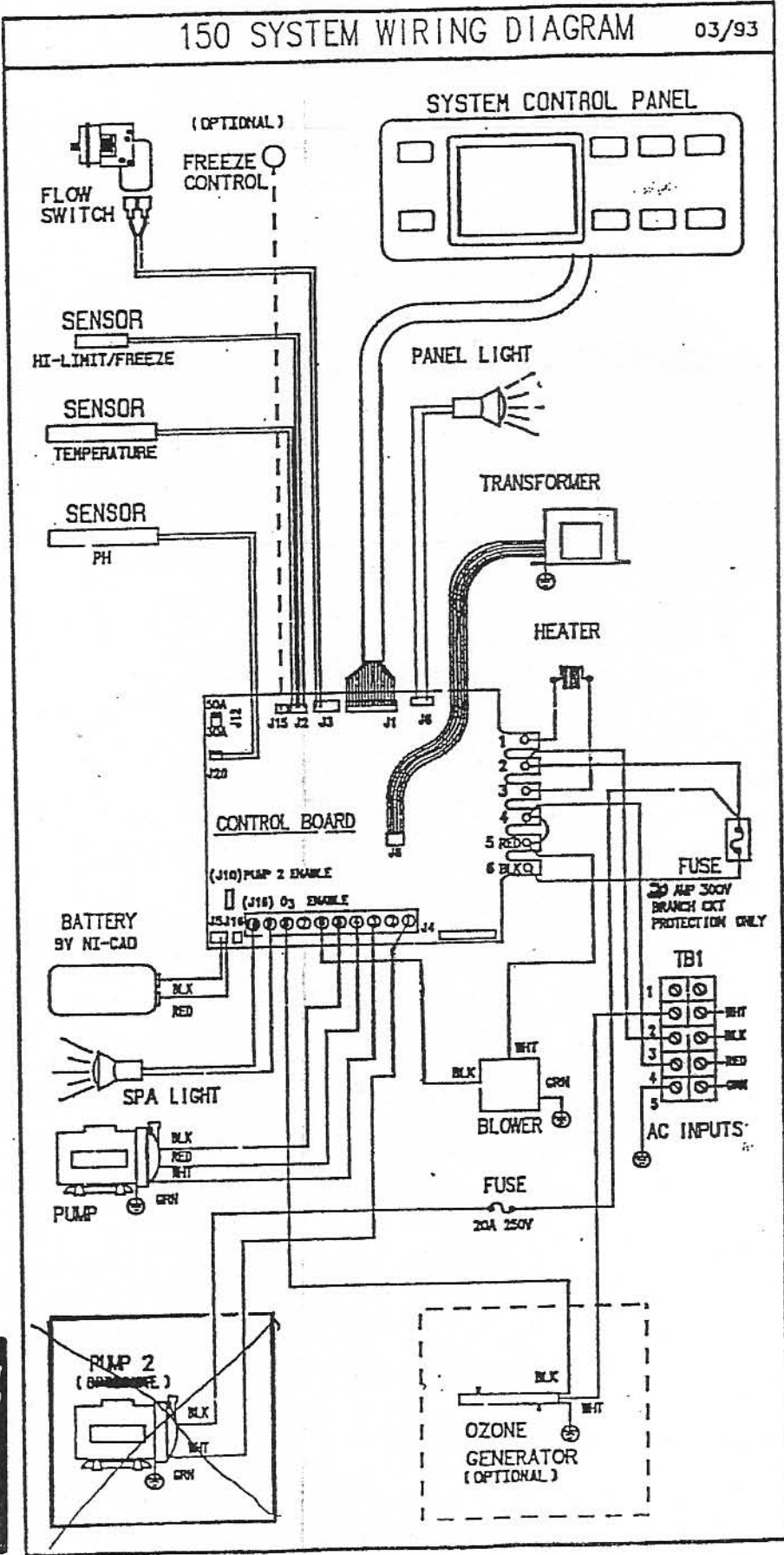
REMOTE SWITCH

A separate air operated button that controls the four-function operation of the spa.

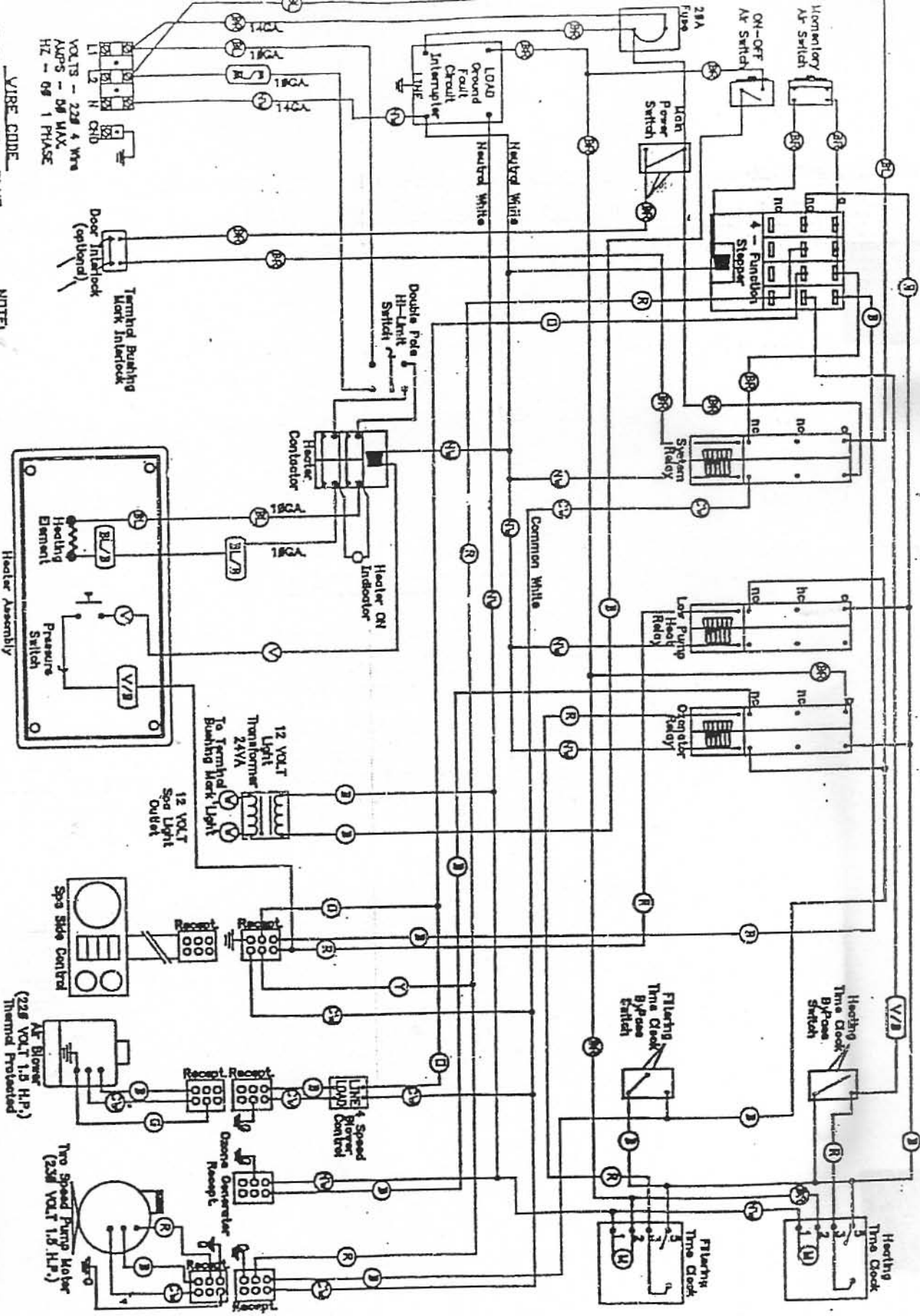
150 SYSTEM WIRING DIAGRAM

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DELUXE DIGITAL CONTROL SYSTEM POWER PACK



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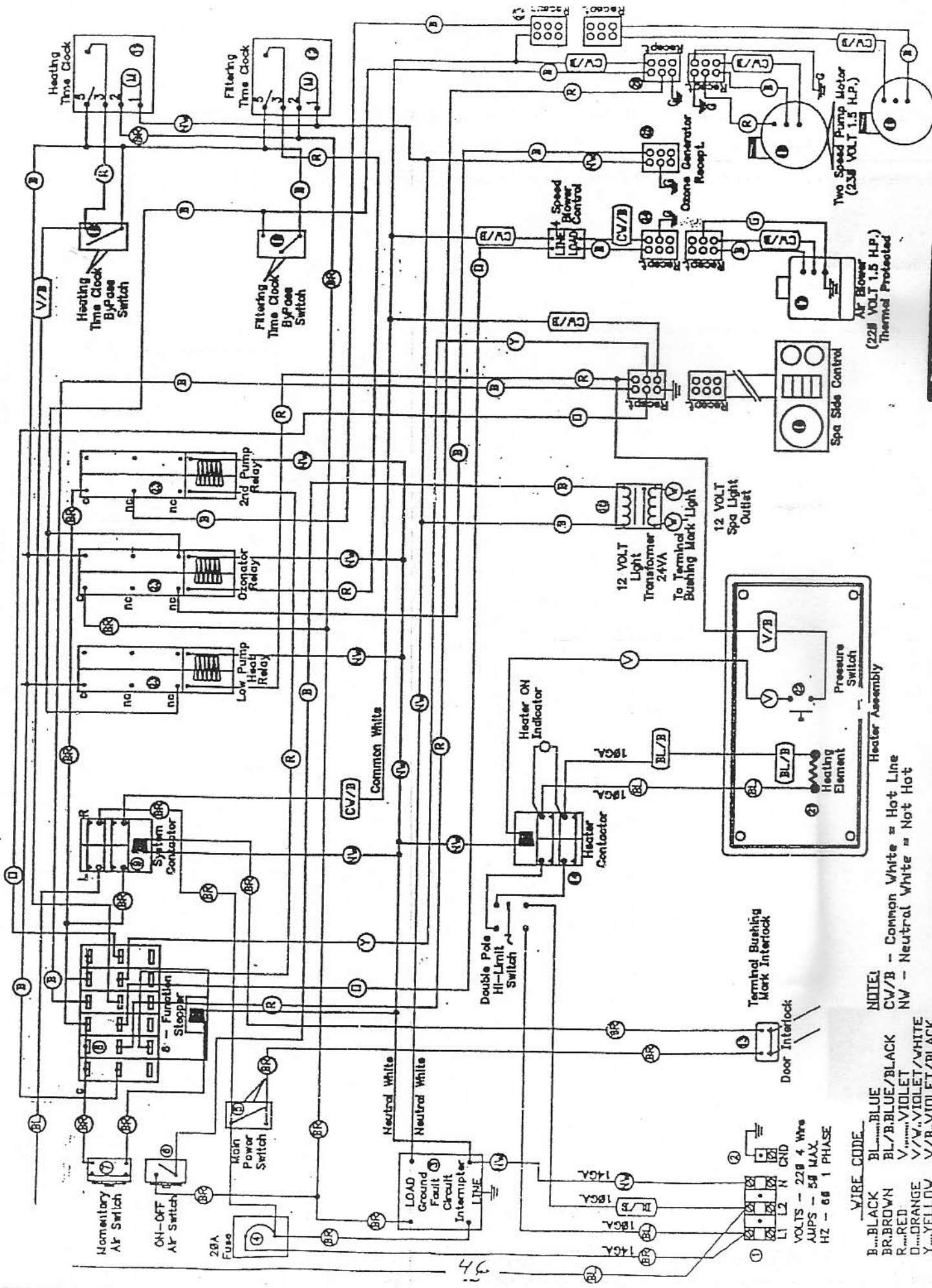
VOLTS - 228 4 Wires
 AMP'S - 60 MAX
 HZ - 60 1 PHASE

WIRE CODE
 B...BLACK
 BR,BRD,VN
 R...RED
 O...ORANGE
 Y...YELLOW
 G...GREEN
 BL...BLUE
 BL/B,BLUE/BLACK
 V...VIOLET
 V/V,V,VIOLET/WHITE
 V/B,V,VIOLET/BLACK
 W...WHITE

NOTE:
 CV - Common White = Hot Line
 NV - Neutral White = Not Hot

MORGAN 240VOLT SINGLE POWER PACK





WIRE CODE
 B...BLACK
 BR...BROWN
 R...RED
 D...ORANGE
 Y...YELLOW
 G...GREEN
 BL...BLUE
 BL/B...BLUE/BLACK
 V...VIOLET
 V/V...VIOLET/WHITE
 V/B...VIOLET/BLACK
 NW...NEUTRAL WHITE/BLACK

NOTE!
 CV/B - Common White = Hot Line
 NW - Neutral White = Not Hot

VOLTS - 220 4 Wire
 AMPS - 50 MAX.
 HZ - 60 1 PHASE

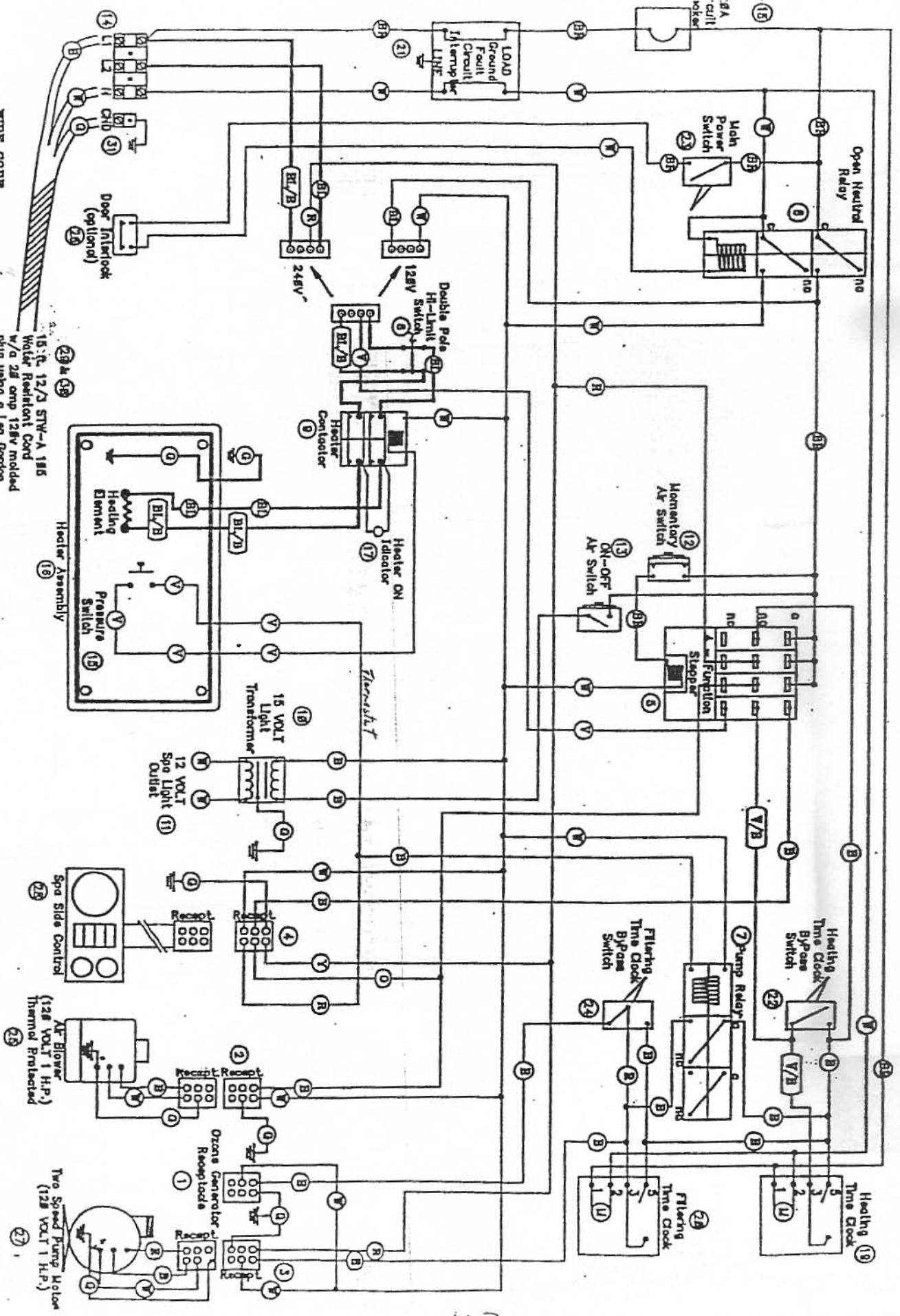
MORGAN 240 VOLT DUAL POWER PACK



Oris Speed Pump Motor (235 VOLT 1.5 H.P.)
 AF Blower (225 VOLT 1.5 H.P.)
 Thermal Protected

WIRE CODE
 B... BLACK BL... BLUE
 BR... BROWN BL/B... BLUE/BLACK
 R... RED V... VIOLET
 O... ORANGE V/W... VIOLET/WHITE
 Y... YELLOW W... WHITE
 G... GREEN

15 ft. 12/2 STW-A 185
 Water Resistant Cord
 w/a 2g amp 128v molded
 strain Relief where it
 goes through control bar.



MORGAN 120/240 CONVERTIBLE POWER PACK

