

SMARTOUCH DIGITAL

*ePACK*TM

USER MANUAL



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Micro-processor technology is becoming a familiar name in the spa industry. Here, at Applied Computer Controls, we produced our first intelligent microprocessor based spa control system, in 1981-82. The SC-100 and SC-200; the forerunners of intelligent electronic spa controls.

Today, SmarTouch Digital includes more than 25 years experience. SmarTouch Digital, is a third generation microprocessor-based control system. A reliable energy efficient spa controller, so advanced but easy to operate, is conveniently located at your fingertips. A high intensity, oversized characters, LED display or our multi colored LCD display, keeps you informed of the spa temperature, time-of-day and elapsed time and a list of error codes, to inform and identify a malfunction.

Safety and reliability are built-in to meet or exceed the most stringent, up to date requirements set by (UL) Underwriters Laboratories.

SmarTouch Digital is the culmination of proven designs and extensive testing... from Applied Computer Controls.

SmarTouch Digital controls are microprocessor based electronic spa control systems and as such are susceptible to static discharge and high levels of humidity. To prevent premature control failure do not hose down, flood or allow water to enter the control box enclosure.

CAUTION

High voltage levels exist inside the control box, they can cause injury and even electrocution.

Only certified electricians or trained servicemen should have access to the components inside the box.

There are no user serviceable parts inside the box. All programming is done at the spa side control panel without the need to access the inside of the box. If for some reason the control system needs to be serviced, please contact Applied Computer Controls for proper procedures.

TABLE OF CONTENTS

INTRODUCTION	3
TEMPERATURE SETTING	4
SETTING TIME-OF-DAY.....	5
COOL-DOWN TIMER	5
USER TIMER	5
SPA-SIDE CONTROL PANEL 2020.....	6
SPA-SIDE CONTROL PANEL 1000	7
SELF-DIAGNOSTIC CODES.....	8
START-UP PROCEDURE.....	9
WATER PRESSURE.....	9
FILTER CARTRIDGES	9
IMPORTANT SAFETY INSTRUCTIONS	10
PROGRAMMING (OPTIONAL)	11-15
ELECTRICAL INSTRUCTIONS INSTALLATION.....	16-18
WIRING DIAGRAM.....	19
EXPLODED VIEW	20

INTRODUCTION

Thank you for buying a spa equipped with a SmarTouch Digital control system. Many years of experience went into the design of this family of controls. You can be assured your spa control system is the most advanced, it is highly reliable and will serve you for many years to come.

The control system has been designed with you, the user in mind. It is very easy to operate and requires a minimal effort on your part. You may use it just as it comes to you and without any programming. Yet you have the option of getting deeply involved in the inner workings of the control if you so choose. You can custom tailor it to fit your needs.

Please take the time to read at least the first section (next page) "IN A HURRY – READ THIS" portion of the manual before starting to use your spa for the first time. You can familiarize yourself with the rest of the manual at your leisure.

**SAVE THIS MANUAL.
Make it available for other spa users.**

You should also have a spa user's manual which explains how to care for your spa. Please read and follow all instructions in your spa user's manual. Maintaining the proper levels of pH and the sanitizer will extend the life of your spa equipment. Improper chemical levels in the spa are sure to cause premature heater failure as well as failure of other components in the system. Failures caused by chemical imbalance are not covered by warranty.



IN A HURRY - READ THIS

SmarTouch Digital comes to you with a universal set of default settings. If you choose to keep these settings, then you only need to remember 2 things: how to set the spa temperature and to press the SET key whenever you are done using the spa.

Setting Temperature

The **UP(TEMP)** & **DOWN(TIME)** arrows.



Both buttons are used to select, increase or decrease temperature or time setting.

Note: Both keys are active when pressed individually and held down 2 seconds, to eliminate accidental changes.

Press and hold for 2sec. the UP (TEMP) arrow key.



Controller will display current spa temperature. Use the UP or DOWN arrow keys to select desired temperature.



*To enter new temperature press → SET key



The controller will:

- Lock-in the new temperature.
- Display current spa temperature.

IMPORTANT: Always turn down the heat before you drain the spa.

*Note:

Once you select the TEMP or TIME and the SET key is not pressed within 30 seconds the controller reverts to the previous setting and the change will not take effect.



The SET Key

After using the spa, press the SET key to tell the micro controller you are done using the spa. It will then take over the spa's management, including the different filtration cycles, heat maintenance, economy modes and protection against freezing.

SETTING TIME-OF-DAY

Setting Time-Of-Day

Press and hold for 2 sec. the DOWN (Time) arrow key. 

Controller will display 12:00 noon. Use  OR  to set the correct time-of-day.

*After every selection "Hours , Minutes" press → SET key. 

Cool-Down Timer

A 30-second timer keeps the low speed jets, ON, after the heater turns OFF, to remove all residual heat from the heater element.

User Timer

A built-in, 20 minutes elapsed-time clock switches off any active function. The elapsed time is displayed periodically, the last 10 seconds of every minute, in conjunction with the spa temperature and the time-of-day.

Economy mode. Water & Energy Management.

The **Economy** mode manages water temperature, filtration and energy consumption knowing "when" to heat and "how much".

The Economy mode starts when the heater is turned off and the spa is not in use.

Upon entering the ECONOMY mode the message "**ECON**" is displayed. During the Economy mode the spa controller is in stand-by, three hours at a time, monitoring and sampling the water temperature.

At the end of every Economy period which is 3 hours the controller activates the low jets only for 5 minutes to perform the following:

- 1-Filter and sanitize the water. Check your spa manual for the type of sanitizer in your spa.
- 2- Stabilize the water temperature and heat if necessary, in that case the low jets run more than 5 minutes for the duration of the heating cycle.

Tie down your spa cover to minimize heat loss and to conserve energy.

Note: The message "**ECON**" is not an error code.

SPA-SIDE CONTROL PANEL 2020

FUNCTIONS



Press once to activate the low jets. Press again for high jets. A third depression turns the jets OFF, if the heater is off.



Press, for second or third pump.



Press, for air bubbles.



Light switch ON/OFF, or an optional three functions' mode for fiber-optic lighting.

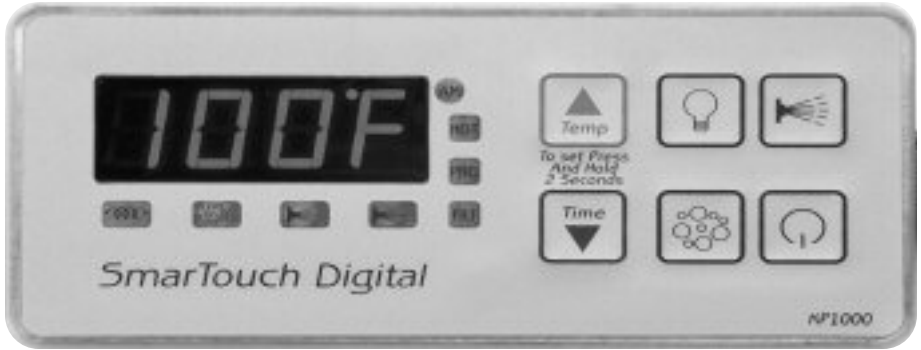
*Optional

- TEMPERATURE
- TIME OF DAY
- ELAPSED-TIME



**FOR IN-SPA VIEWING OF THE TEMPERATURE DISPLAY:
PRESS THE SET & UP ARROW KEYS TOGETHER AT THE SAME TIME**

SPA-SIDE CONTROL PANEL 1000



FUNCTIONS

JETS

Press once to activate the low jets. Press again for high jets. A third depression turns the jets OFF, if the heater is off.

*AIR

Press, for air bubbles.

LIGHT

Light switch ON/OFF, or an optional three functions' mode for fiber-optic lighting.

**FOR IN-SPA VIEWING OF THE TEMPERATURE DISPLAY:
PRESS THE SET & UP ARROW KEYS TOGETHER AT THE SAME TIME.**

SELF-DAIGNOSTIC CODES

CODE EXPLANATION

COLD Water temperature below 40 F.

OH Water temperature above 108 F.

SESH Temperature sensor shorted.

SEOP Temperature sensor open or disconnected

HLer Overheat condition or overheat sensor is disconnected

PSOL Pressure-switch open with low speed jets ON.

PSOH Pressure-switch open with high speed jets ON.

PSOC Pressure-switch open with circulating pump ON.

START-UP PROCEDURE

Once the spa is delivered and the electrical installation accomplished, the next step is to fill it and heat the water.

IMPORTANT

It is recommended to perform the following procedure when you drain and refill the spa, to protect the heater element.

- Power must be turned OFF at the circuit breaker and at the G.F.C.I before you start.
- Open the access door and inspect all fittings to be tight and slide-valves fully extended.
- Fill the spa, using your garden-hose, to the proper water level (half way mark on the skimmer door).
- To apply power, push the RESET (ON) button at the G.F.C.I. & reset Circuit Breaker to the ON position.
- Push the Jets button at the Spa Side Control Panel activating the high speed pump. Keep pump running for at least three minutes to **purge the air out**.
- Once air bubbles stop coming out of the jets and the pump is primed select the desired temperature.

IMPORTANT: TURN DOWN THE HEAT BEFORE YOU DRAIN AND REFILL YOUR SPA TO PROTECT THE HEATER.

WATER PRESSURE

FOR YOU TO KNOW.....!

PSOL or PSOH error codes = NO WATER PRESSURE

A pressure-switch protects the heater element when the water level drops below the recommended level. The switch is activated by water pressure in the heater housing, meaning the pump is running and there is water in the spa.

In a new installation, or when the spa is drained then refilled, a small volume of air is trapped in the plumbing and in the heater-housing, lowering the pressure, disabling the pressure-switch, consequently shutting down the heater.

Or, the opposite is also possible, where the trapped air exposes part of the heater element but not enough to disable the pressure-switch resulting in a burnt element. To avoid damage to the heater, refer to the start-up procedure.

FILTER CARTRIDGES

The filter cartridge(s) must be cleaned periodically. It should be totally submerged. If the top of the cartridge is above water level, air is sucked into the pump's intake causing pump surges, lower pressure and damage to the heater.

IMPORTANT SAFETY INSTRUCTIONS

READ AND FOLLOW ALL INSTRUCTIONS

WARNING

1. To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.
2. A wire connector is provided on this unit to connect a minimum 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.
3. **WARNING:** For indoor use only. This unit is not intended for outdoor use.
4. **CAUTION:** THE EQUIPMENT AND CONTROLS SHALL BE LOCATED NOT LESS THAN 1M (5FT) HORIZONTALLY FROM THE SPA OR HOT TUB.

CANADA

5. **Attention:** Maintenir une distance minimale, mesurée dans un plan horizontal., de 1M entre la cuve de relaxation et les appareils et commandes.
6. Only a licensed electrician can install power to the spa.
7. Spa power supply installation must include a properly rated GFCI/Circuit Breaker, as per label on control box enclosure.
8. Supply lines must be properly sized as per National Electric Code.

PROGRAMMING

SmartTouch Digital comes with factory settings. Programming the SmartTouch controller is optional. The following options are necessary only if you have certain requirements or you need to custom program the filtration and heating cycles.

Parameter Programming is a means by which the spa owner / user can change the various timing elements and calibrate temperature. The process is simple and intuitive. Only 3 keys are used: UP, DOWN, and SET. To program one or more parameters follow the outlined this procedure:

1. Press SET and DOWN keys together. The first message in the menu, FP1 will be displayed.
2. Use the UP & DOWN keys to scroll thru the messages in the menu.
3. Press the SET key to display the current value associated with the current message.
4. Use UP or DOWN keys to increase or decrease the value.
5. Press SET to lock in the new value and return to menu.
6. If another item needs programming go to number 2 above.
7. To Save changes scroll to message SEND and press SET.
8. To discard changes and restore previous values scroll to message CANC and press SET.

The menu of the parameters is circular. Scrolling is from first to last or from last to first.

When in programming mode please note that this mode will be cancelled if there is no key activity for a period of 60 consecutive seconds. Programming mode is aborted and all changes will be restored to previous values.

On the following page is an example of how to program a filtration period. When in programming mode you may program as many parameters as needed.

SETTING FILTRATION PERIODS & SILENT MODE

FP1, FP2, FP3, FP4 & SIL

BEFORE YOU START THIS PROCEDURE PLEASE MAKE SURE YOU SET THE CORRECT TIME-OF-DAY.

Note the a.m. LED light

- Press SET & DOWN arrow keys together **at the same time.**
- Code **"FP1"** is displayed.
- Press the SET key.
- Enter the desired start time to begin the First Filtration Period FP1. Enter the hour then press "SET". Enter the minutes then press "SET"
- Press UP arrow and go to code "FP1d".
- Press "SET". Enter the number of hours or the duration of the First Filtration Period in minutes. Maximum is 4 hours, then press "SET".
- Repeat above procedure for FP2, FP3, and FP4 if necessary.
- Press UP arrow (ignore the rest of the codes) and go to code **"SEND"**.
- Press SET to exit and save the new values.

'UP ARROW' KEY IS MARKED 'TEMP'
'DOWN ARROW' KEY IS MARKED 'TIME'

NOTE:

IF POWER TO THE SPA IS TURNED OFF OR INTERRUPTED PROGRAMMING FOR THE "FILTRATION PERIODS" IS NOT AFFECTED TIME OF DAY MUST BE RE-ENTERED.

PARAMETER MENU LIST

Press momentarily the "SET" & "DOWN ARROW" keys at the same time to access the following options.

Msg	Min	Def	Max	Detail
FP1		12:00		Start time of filtration period 1
FP2		12:00		Start time of filtration period 2
FP3		12:00		Start time of filtration period 3
FP4		12:00		Start time of filtration period 4
<p>Note : If filtration periods overlap, the most recent period (last) is in the effect.</p>				
SIL		12:00		Start time of the silence period. This is a period which nothing will run. It overrides all filtrations, the economy cycle, and temperature sampling. Except if temperature drops below 40 degrees. A spa may be installed near a bedroom and need not come on at specific times.
FP1d	0	0	240	Duration in minutes FP1 timer will run.
FP2d	0	0	240	Duration in minutes FP2 timer will run.
FP3d	0	0	240	Duration in minutes FP3 timer will run.
FP4d	0	0	240	Duration in minutes FP4 timer will run.
SILd	0	0	12	Duration in hours the Silence Timer runs. Only a user may override the silence timer.

Note : Keep the value of any time to 0 to keep it from running. Filtration timers must be programmed first one first. If the FP1d (first) timer has a duration of 0, Auto Filtration will be in effect and all 4 programmed timers will be disabled.

Msg	Min	Def	Max	Detail
CLDN	30	60	180	Cool Down cycle in seconds. Whenever the heater is turned off the pump keeps running the extra seconds to even the temperature of the heater element and the surrounding water to prevent scale build up and premature heater failure.
ECL	60	180	240	Economy Cycle Length. Time in minutes to specify the intervals between spa temperature sampling when the spa is not in use. During this period the spa is in economy mode. Temperature is sampled at the end of the period. Press any key to cancel this mode.
CHCL	0	60	180	Channel Clear. Time in seconds to clear the air channel and the secondary pump(s) plumbing if the spa has not been used for a period of 24 hours. This prevents water stagnation in the plumbing.
UTO	10	20	60	User Time Out. The time in minutes from starting any device, after which all devices will be turned off, and the spa put in "not in use mode". If you should leave the spa with a pump or light running, it will be turned off after the specified time.
PUF	60	120	180	Post Use Filtration. Time in minutes to perform Post Use Filtration this is the optimal time to filter the spa. When you have finished using the spa. When you have finished using the spa, that is when it needs filtration the most. Press the SET key to turn everything off and start this cycle. This cycle is performed only once and after pressing the SET key. It is in addition to the standard filtration cycles. Pressing any other device key will cancel this function.

Msg	Min	Def	Max	Detail
CALB	194	208	218	This is not a time element. It is one of the distinctive features of the Smartouch Control System. The number is internal and in indicative of what the processor sees as temperature. It is used to calibrate the temperature reading. Increase this value by 1 to decrease the displayed temperature by ½ a degree. Decrease this number by 1 to increase displayed temperature by ½ a degree. For example the controller is displaying a temperature 2 degrees lower than real temperature increase the number by 4 to get a correct reading. The total range of this parameter is 10 degrees Fahrenheit. Before doing a calibration Please read warning note at end of this page.
SEND				This menu message has no numerical value. Pressing SET while it is displayed records and saves all changes made to all parameters.
CANC				This menu message also has no value. Pressing SET while it is displayed discards all changes made to all parameters and restores last saved or previous values.

WARNING

The recommended maximum temperature of a spa is 104°F. The absolute maximum beyond which no person should ever be exposed to is 108°F. When you calibrate the spa temperature you are doing so at your own risk. Obtain an accurate medical thermometer to check against. Please contact ACC for proper procedure or if you do not feel confident.

ELECTRICAL INSTALLATION INSTRUCTIONS

All electrical wiring must be performed by a qualified, licensed electrician in order to meet NEC, (National Electrical Code) state and local codes.

- This unit is a “Permanently Connected Equipment Assembly with Pump(s), Heater, Blower and Control.”
- All wiring must be shielded by a ground metal conduit. The conduit must terminate at the electrical access compartment either from the bottom of the spa or through a hole in the side paneling of the spa.
- The lines carrying power to the spa must be dedicated and should not be shared with other appliances. **Use copper wiring only. Use # 6 AWG conductors.**
- A pressure wire connector is provided on this unit to connect a minimum 8 AWG (8.4mm²) solid copper conductor between this unit and any metal equipment, metal enclosures of electrical equipment, metal pipe , or conduit within 5 feet (1.5m) of the unit.
- The electrical supply for this unit must include a suitably rated GFCI/ CIRCUIT BREAKER to open all ungrounded supply conductors to comply with Section 422-20 of the National Electric Code.
- A quick disconnect marked OFF must be readily accessible to the tub occupant , installed at least 5 feet (1m) from the tub.
- All electrical wiring lines must originate from the main electrical panel and terminate, hard wired, into the electrical wiring compartment. The use of extension cords, or plug type termination is expressly prohibited and voids the warranty.
- Minimum supply conductor ampacity must be 125 percent of the current rating stated on the ID label affixed to, equipment control enclosure.

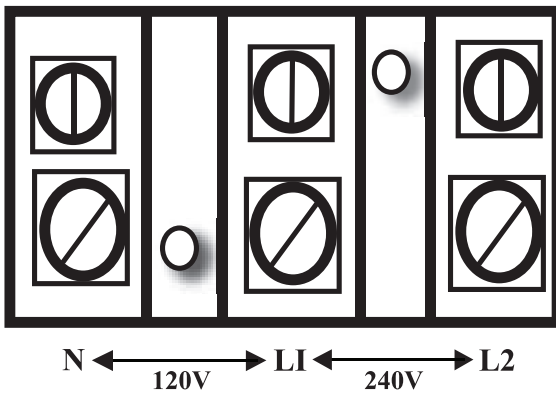
ELECTRICAL INSTALLATION INSTRUCTIONS

BREAKER CAPACITY 50 AMPS 240V SINGLE PHASE

VOLTS	AMPS	HZ	PHASE
240	41	60	1
PERMANENTLY CONNECTED			
USE #6 AWG COPPER CONDUCTOR			

4 WIRES 220V CONNECTIONS

GROUND



BRANCH CIRCUIT BREAKER REQUIREMENTS

240 Volts 4 Wire System **30/50 Amp 2 Pole Breaker**

USE COPPER CONDUCTOR ONLY. #6 AWG WIRE

120 Volts 3 Wire System **20 Amp 1 Pole Breaker**

CAUTION: A new breaker must be used for a new spa installation. Do not use an existing or used breaker.

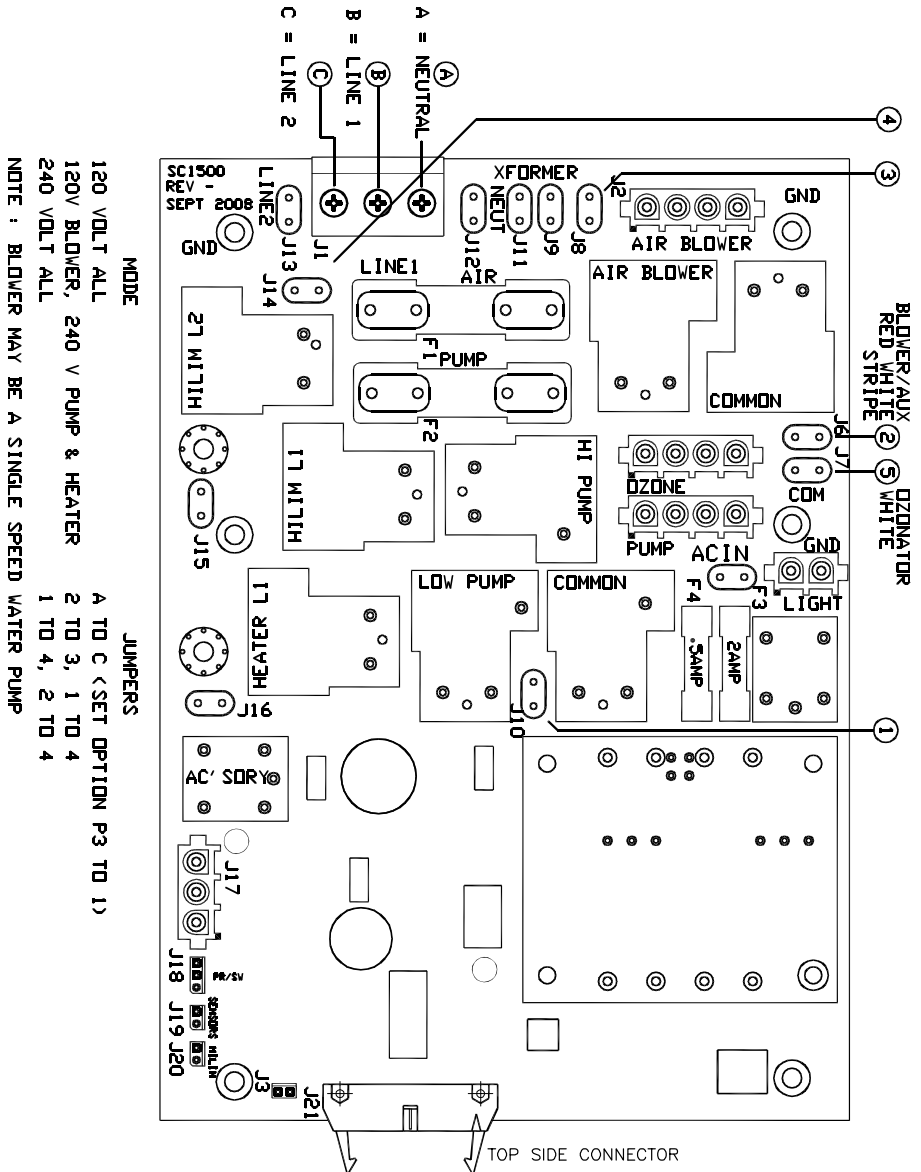
GFCI: All spa installations must be protected by a GFCI. If your spa control box does not include an integrated GFCI then you must use a GFCI breaker per National Electrical Code requirements.

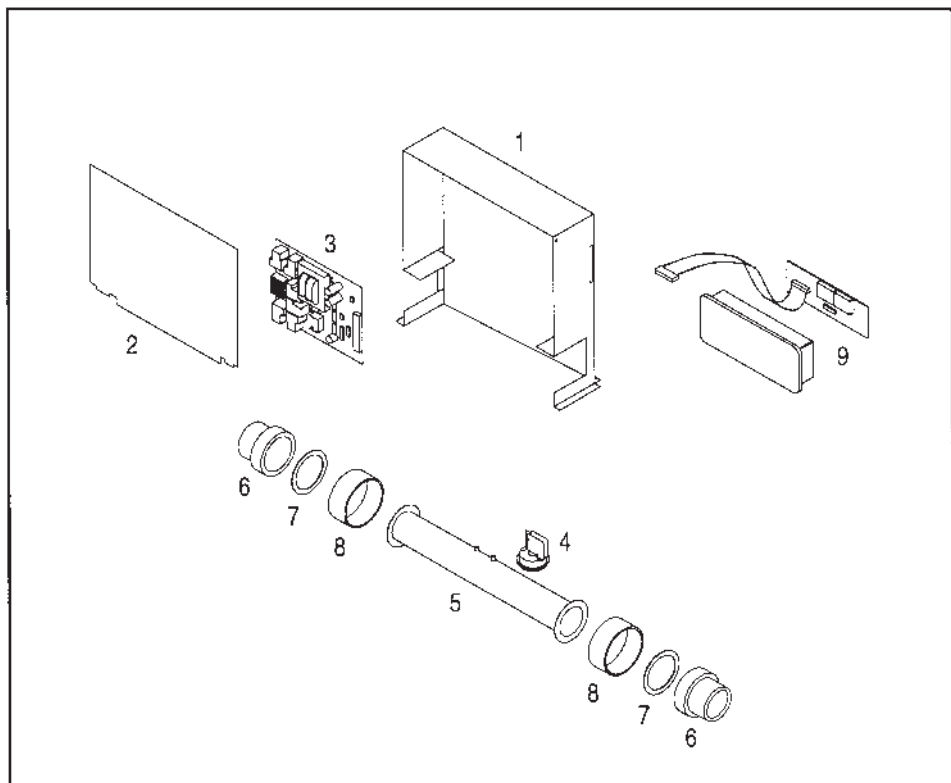
120/240 Volt Conversion. Check the nameplate on the control enclosure to identify the type of system in your spa. If the nameplate indicates a 120/240 Volt type system, then it is possible to convert the spa to 120 volt operation.

30/50 Amp Conversion. Some homes may have limited power service. It is possible to operate a 240 volt spa system using a 30 amp breaker. Connect 240 volt power to the system as previously described, then set it to operate in the low power mode.

Note: Only experienced service personnel should perform conversions. Improper modifications may cause damage to the control system and/or the attached heater and pump motors.

WIRING DIAGRAM



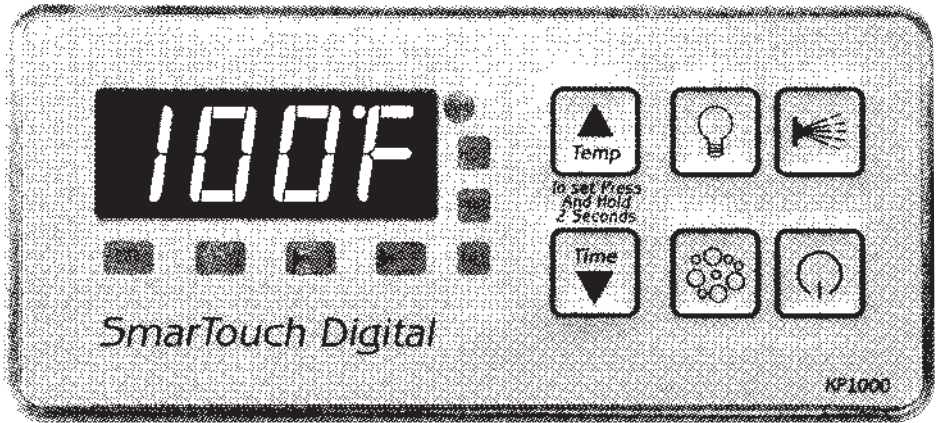


SmartTouch Digital Typical view - exploded

1. Enclosure Box
2. Cover Plate
3. Printed circuit control board - SC1500
4. Pressure Switch
5. Stainless steel heater manifold tube
6. Heater union, male fitting.
7. Gasket
8. Heater union, female fitting
9. Spa side control assembly

NOTES

NOTES



SmarTouch Digital

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