S-SERIES PROPAK OWNER'S MANUAL

• by Gecko Electronics Inc. •

All you need to know to install, use and enjoy your S-Series Propak!





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General Information



Congratulations! You have purchased one of the finest spa packs available. Take the time to carefully read these instructions.

Warranty

Your Propak warranty gives you specific coverage. The Propak warranty does not cover problems arising from misuse, abuse, neglect, miswiring or improper installation.

Problems due to improper or inadequate electrical service are not covered by your warranty. Refer to the warranty page of this manual for more info.

This manual

This manual covers only the installation and the user instructions of your Propak. It should not be mistaken for your spa's owner manual. Please refer to the spa manufacturer's written documentation for more info on your spa.

General Information

Important Safety Instructions



Caution Low voltage or improper wiring may cause damage to this

control system. Read and follow all wiring instructions when connecting to power supply. Damage caused by improper wiring or installation is not covered under warranty.

Electrical Hazard This pack contains no user serviceable parts.

Contact an authorized service center for service.

Notice All connections must be made by a qualified electrician in

accordance with the National Electrical Code and any state, province or local electrical codes in effect at the time of the

installation.

Important RISK OF ELECTRICAL SHOCK!

If used with 120V, your Propak must be connected only to a

grounded receptacle.

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General Specifications



Description

Propaks are perfect for spas with one or two pumps (or one pump and a blower), a heater, an ozone generator and a mood light.

Features

- Automatic time-out on all outputs
- 3 digit LED display
- Digital temperature display
- Spa side-panel High-Limit reset
- Sensor failure detection
- Programmable filtering cycles
- High-Limit protection
- Pressure switch failure detection
- Current limiting option
- Freeze protection
- Temperature measurement within ± 1°F

From keypad

- Temperature set point
- Temperature display in °C or °F
- Spa light control (on/off)
- One or two-speed pump control
- High-limit temperature reset

Electrical specifications



Input 240 V, 50 A, 60 Hz

Outputs

Pump 1

(high) 120 V, 15 FLA / 80 LRA (low) 120 V, 15 FLA / 80 LRA or (high) 240 V, 15 FLA / 80 LRA (low) 240 V, 15 FLA / 80 LRA

Connector: J&J or AMP

Pump 2 (blower)

120 V, 15 FLA / 80 LRA or 240 V, 15 FLA / 80 LRA Connector: J&J or AMP

Heater

120 V, 8.3 A or 240 V, 17 A

Ozone

120V. 5A or 240 V, 5A

Light

12 V, 1 A

Connector: Direct lamp socket assembly

Temperature specifications



Operating $0 \longleftrightarrow 122^{\circ}F$ -17 $\longleftrightarrow 50^{\circ}C$

Storage

-40 160°F -40 70°C

Humidity

Up to 80% non-condensing

Set Point Adj.

Adjusted in 1° increments from 59° to 104°F (10° to 40°C)

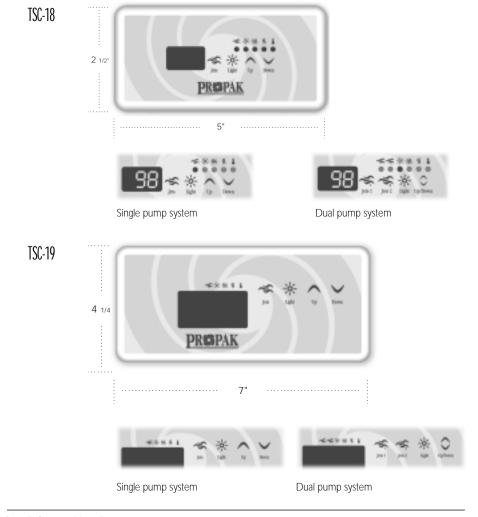
Temp. Measure

Better than 1°F

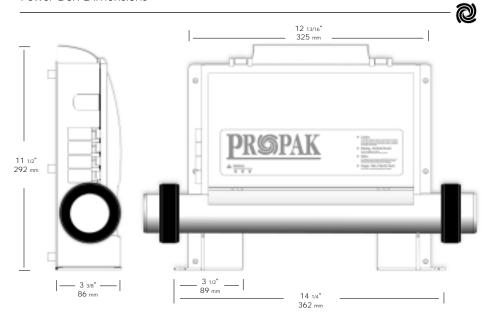
Keypad dimensions



All Propak keypads have been sealed to perfection to insure years of trouble-free usage. The extent of their design demonstrates a clear commitment to excellence in quality and reliability. Two models of Propak keypads are available: TSC-18 & TSC-19. Both models include specific overlays for single pump and dual pump systems



Power Box Dimensions



Power Box

The design of your Propak power box took size, weight and ease of installation into account. Compact and light, the power box of your Propak is made of thick plastic and is highly resistant to shock, corrosion, chemicals and humidity.

Hinged Cover

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The cover of the power box can be easily opened to access the connection ports. Simply remove the 2 front cover screws and pull the hinged cover up to access main board, connectors and jumpers.



Main Spa Side Control (TSC-18)



Installation

The first step in the installation procedure of the TSC-18 main spa side control is to cut a hole directly on the edge of the spa.

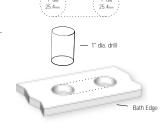
The hole must be a 1" by 3 5/8 " rectangle to allow the keypad box to slide into position.

Mounting System

The keypad should be installed directly on the spa (or very close) for it to be easily reached by the user.

Steps to follow:

- 1- Select the appropriate location for the control unit.
- 2- Drill two 1" holes as shown in figure 2. Cut the material between the two holes.



3- Peel off the doublefaced tape protective layer.



4- Insert the keypad and secure it in place by pressing firmly on the keypad.



Main Spa Side Control (TSC-19)



Installation

The first step in the installation procedure of the TSC-19 main spa side control is to cut a hole directly on the edge of the spa.

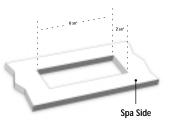
The hole must be a 2 5/8 " by 6 3/8 " rectangle to allow the keypad box to slide into position.

Mounting System

The keypad should be installed directly on the spa (or very close) for it to be easily reached by the user.

Steps to follow:

- 1- Select the appropriate location for the control unit.
- 2- Cut a 2 5/8" by 6 3/8" rectangle on the edge of the spa.



3- Peel off the double-faced tape protective layer.



4- Insert the keypad and secure it in place by pressing firmly on the keypad.



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Overlay



Note:

Please note that the following installation procedure is similar for TSC-18 and TSC-19 Propak overlays.

Make sure to select the overlay that goes with your spa configuration

TSC-18 overlays

Single-pump system



Dual-pump or Pump & Blower systems



TSC-19 overlays

Single-pump system



Dual-pump or Pump & Blower systems

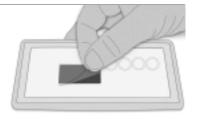


Installation

To properly install an overlay on a keypad, you only need a hair dryer, paper towel and rubbing alcohol.



First, peel off the plastic film that protects the LED display window.



Overlay



Clean the surface of the keypad with an alcohol saturated paper towel.



Peel the protective paper from the overlay.



Gently heat the back of the overlay with the hair dryer.



Heat the surface of the keypad.



Place the overlay on the keypad starting with its left side. Make sure the overlay is well aligned and rests perfectly in the recess of the keypad.

Insure that the overlay is properly glued by pressing with your finger over the entire surface.



Power Box



Power Box

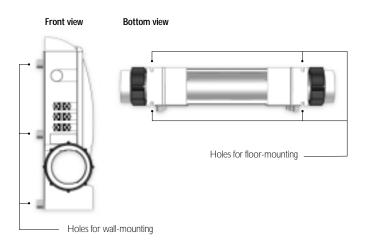
The power box must be installed close to the spa side, preferably under the spa, at a location where possibility of water leaks is minimal.

It can be wall-mounted or installed directly on the floor (or both at the same time).



Six holes on the back of your Propak are provided to mount the pack on a wall.

Four holes located on the pack feet can be used to fix it to the floor.



Connecting your Propak

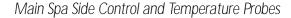


Connect to Spa Plumbing

Your Propak must be connected to your spa plumbing. The connections must be made with the tail pieces at both ends of the Propak heater and must be perfectly sealed

Refer to your spa manual for more information on how to properly seal your plumbing connections.



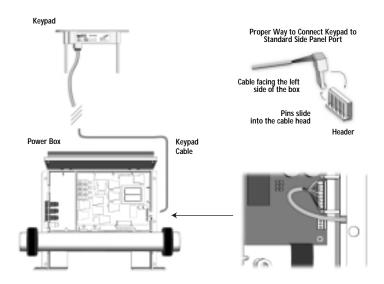




Connecting to the Power Box

The main spa side keypad must be connected to the standard side panel port of the control box.

A cable is provided to connect the keypad to the power box. Attach the connector to the power box as shown.

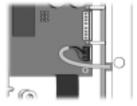


Warning

Clearance between Low and High Voltage conductors must be at least 1/4"

Connecting the Temperature Probe

The water temperature probe must be similarly connected to the power box, with cable following the same route as the main keypad.



Optional Wet-End Fitting

Optional Wet-End Fitting

The optional wet-end fitting secures your Propak temperature sensor into position in the spa.



- 1) Select a location for the temperature sensor. It should be below water level, accessible and as close as possible to the pack.
- 2) Drill a 1" diameter hole in the spa wall.
- 3) Install the fitting as shown. It should be tight enough to prevent water leaks. Do not forget to apply silicone.

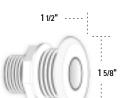


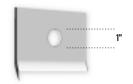
- Slide the temperature sensor inside the stopper nut of the wet-end fitting.
- Insert the sensor into the fitting. Fully insert the sensor into the wet-end fitting until the tip of the sensor slightly intrudes into the spa





- Tighten the stopper nut to ensure proper sealing.
- Apply foam on the back of the fitting to prevent cold or warm air from affecting the sensor reading.







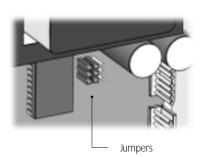


Jumpers

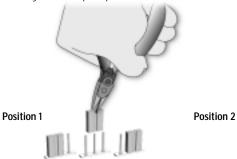
Jumper selection



It is possible to change some parameters of your Propak by positioning specific jumpers located on the board. To access the jumpers, remove the 2 front cover screws then lift the cover of your Propak power box.



 The jumpers are located on the lower right section of the board.



2 To change a setting, simply pull the jumper out and re-insert it in the desired position.

Jumper 1: Current Limiting Option

Jumper 1 is used to limit the current drawn when 2 pumps or a pump and a blower are used.

Position 1 (HC): Position 2 (LC)*: *Mandatory for 120 vac systems All outputs can be turned on at the same time. The system will not turn the heater on when one pump (or blower) is in high speed. The heater Icon will flash on the display to tell the user that there is a call for heat but the heater is not allowed to start.

Jumper 2: Temperature Unit

This jumper is used to select the temperature unit.

Position 1: Temperature will be displayed in Fahrenheit degrees. Position 2: Temperature will be displayed in Celsius degrees.

Jumper 3: Pumps

Position 1: Single pump (single pump TSC-18 or TSC-19 overlays)

Position 2: Dual pump or single pump and a blower

(dual pump system TSC-18 or TSC-19 over lays)

Note: It is mandatory that the topside overlay matches

the settings of this jumper

Output connections

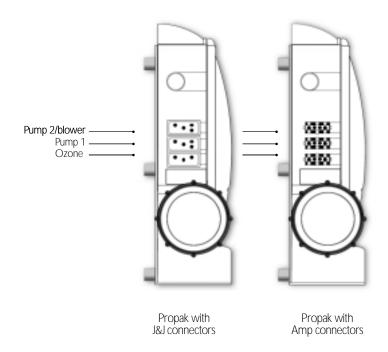
J&J or Amp connectors



Connecting the equipment

The pumps, blower and ozonator must be connected to their respective connectors on the side of the pack.

Your Propak also comes with a light socket that is ready to receive a lamp.



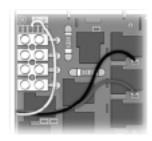
Pump 1



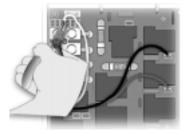
Configuration of Pump 1

The Pump 1 is configured at the factory as a 120 V pump. If you are using an 240 V pump, you must change the wiring configuration. Perform the following steps:

1) Locate the pump 1 connectors.



2) Using a needle nose plier, unplug the white wire of the pump 1 connector from the board. (P7)



 Reconnect the white wire to the P18 (connector) and make sure the connector is properly inserted.



Pump 1



Important Note:

Unfortunately, there are two different color standards for two-speed pump wires. Some use the red wire for the high speed winding and others use the black wire.

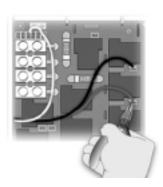
It is important to have the proper wiring configuration.

You can only test it when the system is ready to use. To do so, lower the set point below the water temperature to turn the pump off (it will take 30 secs. for the pump to go off). Press the Jets 1 key to manually turn on the pump. It should start in low speed and not high speed. If the pump starts in high speed, follow this procedure to correct the problem.

- 1) Turn the breaker off.
- 2) Locate the pump 1 connectors. (P12 and P14)
- Using a needle nose plier, invert the connection of the black and red wires. Make sure the connectors are properly inserted.







Blower

Configuration of the blower

If you purchased a Propak with J & J connectors and your spa is equipped with a blower, you need to replace the factory installed J&J pump 2 connector with the supplied J&J blower connector.

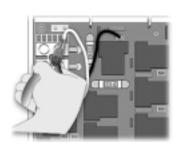
To do so:

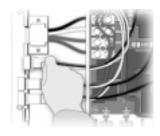
- 1) Locate the Pump 2 connectors. (P6, P11 & P19 for a 120V pump) (P6, P11 & P17 for a 240V pump)
- 2) Using a needle nose plier, unplug all three wires from the connectors on the board.
- 3) Remove the J&J Pump 2 connector by sliding it from its slot on the pack.
- 4) Put the J&J Blower connector (included with your pack) in place and slide the wire through the hole of the interior panel.
- 5) Reconnect the three wires on the board at the following locations Black= P11

Green= P6

White= P9 for a 120V blower

P17 for a 240V blower







Make sure they are properly inserted.



Pump 2 / blower



Configuation of Pump 2 / Blower

The configuration of Pump 2 (or Blower) depends on:

- The pump (or Blower) voltage (120V or 240V)
- The power input voltage of the pack

Do not change anything if your Propak will be powered with 240V and your Pump (or Blower) 2 is a 120V pump (or Blower).

If your Propak will be powered with 120V and your Pump 2 (or Blower) is a 120V pump (or Blower), or if your Propak will be powered with 240V and your Pump 2 (or Blower) is a 240V pump (or Blower), perform the following steps:

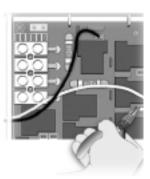
1) Locate the Pump2 (or Blower) white wire connector (P9 for a 120V pump or Blower)



2) Using a needle nose plier, unplug the white wire of the pump 2 (or Blower) connector.



 Reconnect the white wire to the P17 connector and make sure the connector is properly inserted.



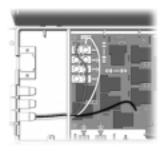
Ozonator



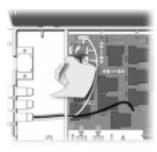
Configuration of ozonator output

Your Propak is configured at the factory to control a 120V ozonator. If you want to use a 240V ozonator, you need to change the white wire connector on the board. To do so:

1) Locate the ozonator connector.



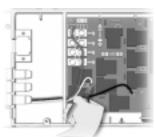
2) Using a needle nose plier, unplug the white wire of the ozonator connector (P8) from the board.



3) Reconnect the white wire to P19 (see wiring drawing). Make sure the connector is properly inserted.



The ozonator will be activated only during the filter cycle



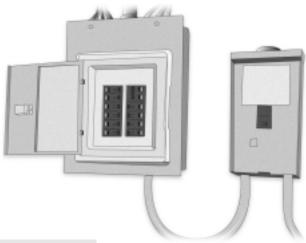
Electrical Wiring

Proper wiring of the electrical service box, GFCI box and pack terminal block is essential.



• Refer to supplied wiring diagrams.

Connections must be made by a certified electrician



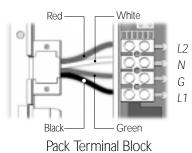
For 240 vac systems:



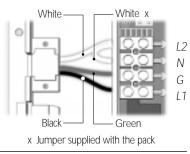
Electrical Box



GFCI



For 120 vac systems:



Powering your Propak

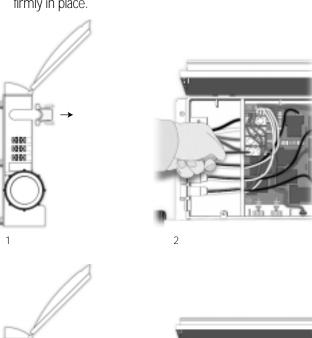
With conduit

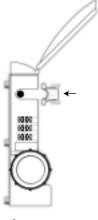


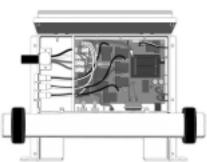
Powering the pack

If you are not using a conduit for the power cable:

- 1) Remove the strain relief.
- 2) Connect the wires to the terminal block.
- 3) Install the strain relief and make sure it holds the cable firmly in place.







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Powering your Propak

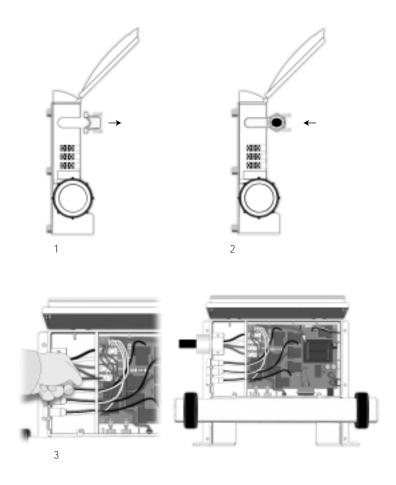
With strain relief



Powering the pack

If you are using a conduit for the power cable:

- 1) Remove the strain relief
- 2) Install the conduit adaptor.
- 3) Bring the 4 wires to the pack and connect them to the terminal block.



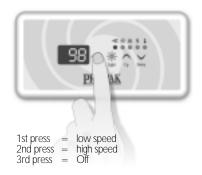
Main Spa Side Control • Single Pump System



Jets Key

The Jets key is used to turn the pump on or to select between off, low and high speeds.

Press the Jets key to turn the pump on. A second press will change the pump speed. A third press will turn the pump off.



A built-in timer will shut the pump off 20 minutes after it has been started unless the user does so manually.

TSC-18: The Jets on Light Indicator will appear on the

function panel when the Pump is running.

TSC-19: The Jets on triangular icon will appear on the

dispaly when the pump is running.

Light Key

The Light key is used to turn light on or off.

The first press of the Light key will turn the light on.

A second press will turn the light off.

The light will automatically shut itself off after 2 hours.



TSC-18: When the light is on, the Light indicator will appear

on the function panel.

TSC-19: When the light is on, the light triangular icon will

appear on the display.

Main Spa Side Control • Single Pump System



Up & Down Arrows

Up & Down arrow keys are used to set the temperature of the water.

Keeping pressure on the keys will increase (or decrease) the current temperature setting.
The new and desired temperature setting will remain for 5 seconds on the LED display as a confirmation of its new value.



The Set Point Light Indicator (TSC-18) or triangular icon (TSC-19) tells the user that the temperature shown is the desired, and not the actual, temperature of the water. The temperature can be adjusted in 1 degree increments from 59 to 104°F (or from 15 to 40°C.).

Some end users feel 104°F is not hot enough. It is possible to set the water temperature higher. To do so, press the Up arrow key until the display shows 104°. Keep pressure on the key for 5 more seconds. The display will then show Or5, Or6 and Or7 for 105°, 106° and 107°F.

Water Heater Automatic Start

When the water temperature is 1°F lower than the set point, the heater will be turned on until the water temperature reaches the set point plus 1°F. The Heater On Light Indicator (TSC-18) or icon (TSC-19) will appear when the heater is on.

The Heater On Light Indicator or triangular icon will flash whenever there is a call for heat and the heater has not been powered.

Water Temperature Display

The 3 digit LED display shows the water temperature reading. The reading will be refreshed every second.

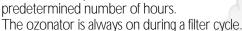
30

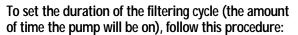
Main Spa Side Control • Single Pump System



Filter Cycles

The system will automatically perform two filtering cycles per day, 12 hours apart. During a cycle, the pump will start in high speed for 1 minute then will run in low speed for a predetermined number of





- Press the light key and hold for 5 seconds.
- The display will show a digit that represents the duration of the filter cycle in hours.
- Use the Up & Down arrow keys to change the number of hours.
 0 = no filtration,
 12 = continuous filtration.
- When the desired setting is displayed, press the light key again. The filter cycle will start.
 - TCS-18: The filter on light indicator will appear on the function panel when a filter cycle is running.

TCS-19: The filter on triangular icon will appear on the display when a filter cycle is running.

Note that after a power failure, the filter cycle duration will return to its default value (6 hours, twice a day). In this case, the first filter cycle will start 12 hours after power has been restored.







Main Spa Side Control • Dual Pump System



Jets 1 & 2 Keys

The Jets 1 key is used to turn Pump 1 on or off and to select speeds.

The Jets 2 key is used to either turn Pump 2 or blower on and off.



Pump 1:

Two-speed pump:

Pump 1 is a two-speed pump, the Jets 1 key is used to turn it on and to select between off, low and high speeds.

Press on the Jets 1 key to turn pump 1 on. A second press will change pump 1 speed. A third press will turn pump 1 off.

1st press = low speed 2nd press = high speed 3rd press = Off

A built-in timer will shut the pump off 20 minutes after it has been started unless the user does so manually.

TSC-18: The Jets 1 on Light Indicator will appear on the function panel when Pump 1 is running.

TSC-19: The Jets 1 on triangular icon will appear on the display when Pump 1 is running.

Pump 2 (or Blower):

Single-speed pump (or blower):

Pump 2 (or blower) is a single-speed pump (or a single-speed blower), the Jets 2 key is used to turn it on or off.

Press on the Jets 2 key to turn pump 2 (or blower) on. A second press will turn pump 2 (or blower) off.

A built-in timer will shut pump 2 (or blower) off 20 minutes after it has been started unless the user does so manually.

TSC-18: The Jets 2 on Light Indicator will appear on the function panel when Pump 2 or the blower is running.

TSC-19: The Jets 2 on triangular icon will appear on the display when Pump 2 or the blower is running.

Main Spa Side Control • Dual Pump System



Light key

The Light key is used to turn the light on or off.

The first press of the Light key will turn the light on. A second press will turn the light off.

The light will automatically shut itself off after 2 hours.



TSC-18: When the light is on, the Light on indicator will

appear on the function panel.

TSC-19: When the light is on, the Light on triangular icon will

appear on the display.

Main Spa Side Control • Dual Pump System



Up & Down Arrows

Up & Down arrows key is used to set the temperature of the water.

A first press on the key will display the set point value. Keeping pressure on the key will increase the desired temperature value.



To decrease the value of

the desired water temperature, press again on the Up & Down arrows key and hold until the desired value is reached. The new and desired temperature setting will remain for 5 seconds on the LED display as a confirmation of its new value.

The Set Point Light Indicator (TSC-18) or triangular icon (TSC-19) tells the user that the temperature shown is the desired, and not the actual, temperature of the water. The temperature can be adjusted in 1 degree increments from 59 to 104°F (or from 15 to 40°C.).

Some end users feel 104°F is not hot enough. It is possible to set the water temperature higher. To do so, press the Up arrow key until the display shows 104°. Keep the pressure on the key for 5 more seconds. The display will then show Or5, Or6 and Or7 for 105°, 106° and 107°F.

Water Heater Automatic Start

When the water temperature is 1°F lower than the set point, the heater will be turned on until the water temperature reaches the set point plus 1°F. The Heater On Light Indicator (TSC-18) or triangular icon (TSC-19) will appear when the heater is on.

The Heater On Light Indicator or icon will flash whenever there is a call for heat and the heater has not been powered.

Water Temperature Display

The 3 digit LED display shows the water temperature reading. The reading will be refreshed every second.





Filter Cycles

The system will automatically perform two filtering cycles per day, 12 hours apart. During a cycle, pump 2 (or blower) will run for one minute at the beginning of the cycle. Then pump 1 will start in high speed for 1 minute and will run in low speed for a predetermined number of hours. The ozonator is always on during a filter cycle.

To set the duration of the filtering cycle (the amount of time pump 1 will be on), follow this procedure:

- Press the light key and hold for 5 seconds.
- The display will show a digit that represents the duration of the filter cycle in hours.
- Use the Up & Down arrow keys to change the number of hours.
 0 = no filtration,
 12 = continuous filtration.
- When the desired setting is displayed, press the light key again. The filter cycle will start.
- TCS-18: The filter on light indicator will appear on the function panel when a filter cycle is running.
- TCS-19: The filter cycle on triangular icon will appear on the display when a filter cycle is running.

Note that after a power failure, the filter cycle duration will return to its default value (6 hours, twice a day). In this case, the first filter cycle will start 12 hours after power has been restored.



Main Spa Side Control



Alarms



The pump occasionally starts by itself for 1 minute and the filter on cycle light indicator (or icon) is flashing when that happens.



Not a bug but a feature! The Smart Winter Mode of your Propak protects your spa from the cold by turning the pump on for 1 minute several times a day to prevent the water from freezing in the plumbing.

Propaks are equipped with a sensor that measures the temperature of the air in the plumbing area of the spa. If the system monitors air cold enough to freeze the water in the pipes, it will automatically activate the Smart Winter Mode for a period of 24 hours.



The Heater On light indicator (or icon) flashes when the pump is in high speed.



Not a bug but a feature! The system is turning the heater off when the pump is in high speed to limit the amount of electrical current drawn.



The HL error message appears on the display.

Steady message:

The system has shut down the heater because the water temperature at the heater has reached 119°F. Do not enter the water. Remove the spa cover and allow the water to cool down. The system will resume normal operations when the water temp. cools down to 109°F.

Flashing message:

Except for the Smart Winter Mode, the system has shut down because the water temp. in the spa has reached 112°F. Do not enter the water. Remove the spa cover and allow the water to cool down to 104°F, then press a key to reset the system. Call your dealer or service supplier if the problem persists.



Messages



The FLO error message appears on the display.

The system does not detect any water pressure when Pump 1 is turned on. Check and open water valves. Check for water level. Clean filter. If the problem persists, call your dealer or service supplier.



The FLC error message appears on the display.

The system detects a problem with the pressure switch. Call your dealer or service supplier.



The Prr error message appears on the display.

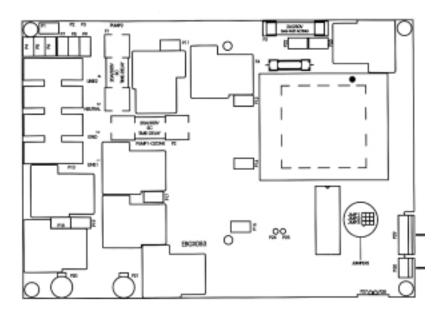
The system detects a problem with the temperature probe. Call your dealer or service supplier.

The display is flashing.

A power failure must have occurred. Press any key to stop the flashing and reprogram your filter cycle.

Wiring Diagram





Pump 1		
Voltage	120v	240v
Green / Ground High Speed Low Speed White / Com	P4 P14 P12 P7	P4 P14 P12 P18

120v 120V P6 P11 P11 P17

Ozone		
Voltage	120v	240v
Green / Ground Black / Line White / Com	P5 P16 P8	P5 P16 P19

	40.4
120V	40v 240V
P6	P6
P11	P11
P11	P11 P17
F9	P1/

Pressure Switch	
Black Black	P25 P24

Light Connector White / 0 vac Black / 12 vac

Black 1 Black 2 Green / Ground

Heater

Jumper Settings

Input Voltage
Pump Voltage
Green / Ground
Black / Linr
Red / Line
White / Com

Pump 2 or Blower

Refer to jumper page

P23 P22

P20 P21 Ground

Warranty and Return of goods



In case of technical problems, service technicians should have the right tools, proper replacement parts, follow the recommended trouble shooting procedures as described in the Propak Service Manual and fix your spa.

Call your dealer for more information.

The Propak Service Department can also be called for technical assistance

Warranty process

- 1- Call Propak Service Department at 877-784-3256 to obtain a return authorization (RMA) number.
- 2- Send the pack back to:

Propak Service Department

419 S. Las Posas Rd San Marcos, CA USA, 92069 877-784-3256

Fax: 760-736-3697

with the RMA number clearly indentified on the box and a detailed description of the problem.

3- We will either repair or replace your Propak within 1 week. If your Propak has been damaged because of an improper installation or improper use, you will be billed for the repair.

Warranty

- 2 years on pack parts (replacement)
- 90 days on heater and pressure switch

Factory Default Settings

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Filter Cycle	- Filter cycle duration:	6hrs
Jumpers	- Jumper default settings:	J1 = HC J2 = F° J3 = 2 Pump system (or 1 Pump and 1 Blower)
Outputs	Pump 1:Pump 2:Ozonator:	120V output 120V output 120V output
Heaters	- 240V= 4Kw Heater - 120V= 1Kw Heater	
) 181	 J&J mini (SS2RSP-103P-3) connector for pump 2, 1 speed connector installed Additional J&J mini Blower connector plug (SS2RSP-10301) also supplied 	
Set Point	- Water temperature at 95°F	

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