



SPA-TECH Control Systems Instruction Manual



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GENERAL INSTRUCTION

- SPAtech control system is specially designed for portable spa and swim spa, which have several Intelligent Control and self-protection technology. According to the numbers of pump, the system can be divided to two pumps system, three pumps system and four pumps system, each system have standard version and luxury version for your choice.
- The manual suit for both standard control version and luxury control version, please be kindly informed that some content only suit for luxury control version will come with special remark.
- If some part of the equipment are not available in your product, the related function is not available as well, the related button on the control panel should be ignored accordingly.
- The manufacturer reserves the right to modify part of the design or specifications without prior notice and without entering into any obligation.

CONTROL SYSTEM FEATURE

- **Compatibility**
 - The system can work in AC220~240V, AC380V and AC220V*2P, the frequency can work in 50Hz and 60Hz.
 - The system can work with both circ pump system and dual speed pump system.
 - The system reserve several control programs with 12 DIP switches setting.
- **Safety**
 - The control system have multi-self-protection program: water flow protection, high voltage protection, low voltage protection, low temperature protection, high temperature protection, super high temperature protection and anti dry heating protection to guarantee the system runs safely.
 - Control box is made by ABS with water proof design up to IP55.
- **Heater control**
 - The control system comes with a built-in heater to heat up the water.
 - The control system can control heat pump or heat exchanger by setting different DIP of composited programme system.
- **Multimedia control**





The system support DVD, liftable TV, IPOD and different kinds of Audio medias.
- **Expansibility**

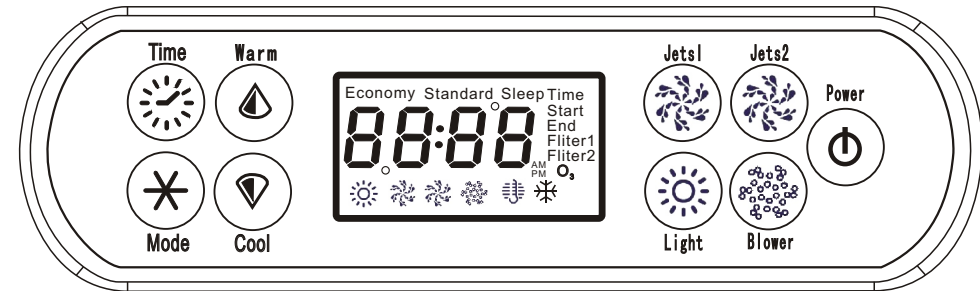
The luxury control system comes with excellent expansibility, through adding the extended circuit board, separated control panel, assistant control panel to achieve extra function.










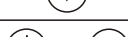
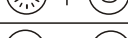
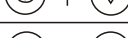
SPA-TECH CONTROL

■ SPA-Tech control panel operation instruction

NOTES:

1. Above guide is used to Spa-Tech C-II control panel only.
2. Key  : If it controls a 1 speed pump, it functions  for this pump. If it controls a 2 speed pump, it functions /turn to low speed/turn off .



KEY	SYMBOL	FUNCTION	DESCRIPTION
POWER		Power	Turn on/off /standby
Jets 1		Pump 1	Turn on/off pump1
Jets 2		Pump 2	Turn on/off pump2
Blower		Air Blower pump	Turn on/off blower
Light		Lighting	Turn on/off light, and set light mode
Mode		Mode	1. Sleep/economy/standard mode 2. Yes/no
Time		Time setting	Time setting
Warm		Warm	Adjust Time/Temp(+)/Select modes
Cool		Cool	Adjust Time/Temp(-)/Select modes
Time+Warm		Time+Warm	Reverse/non-reverse time and temperatue display
Warm+Cool		Warm+Cool	Panel Locked(PL)/unlock panel
Time+Blower		Time+Blower	Restore factory settings

■ Stand-by / Power on ()

- Stand by: The SPA will automatically go into stand-by mode when the spa is properly supplied with power. In the stand-by mode, the current temperature will appear on the LCD screen, and the Thermostatic function and filtration cycle will get started as per the default setting. No back light on the screen.

Note: In the stand-by mode, except Power button and Time button, no buttons are available.

- Power on: Press the power button, the screen will be illuminated and all the buttons on the panel are available.

Note: When leaving the spa run for one hour without touching any panel's buttons, the system will automatically go into stand-by mode, and the screen light will be turned off.

Stand-by mode



Power on



■ Temperature setting (+)

- The SPA comes with thermostatically controlled heater; set the temperature from the control panel, when the actual temperature is lower than the set temperature, the heater will automatically turn on to heat the spa water.

Note: Only the spa equipped with heat pump have the cooling function.

- In the power on mode, the screen displays the actual water temperature. When Warm or Cool button is pressed, the digital number showing the set temperature will flash, press Warm or Cool again to change the set temperature. After 5 seconds, the digital numbers will stop flashing and begin to display the current spa temperature, temperature setting complete.
- To raise the set temperature press the Warm button. To lower the set temperature, press the Cool button. The temperature set point (set temperature) can be adjusted from 10°C to 40°C.

■ Systemic time setting (+)

- Press Time button, the current time will be displayed. Program the clock by pressing the Mode button and the digital display window will display a digital clock with the HOUR setting flashing. Use the Warm or Cool buttons to change to the correct HOUR. When the HOUR is correct, press the Mode button to save changes and go to minutes setting. Use the Warm or Cool Buttons to change to the correct MINUTES. When the MINUTES are correct, press the Mode button to save changes and complete the time setting.

Before setting the time



After setting the time



Note:

1. The time displayed in the screen is 12-hour clock, AM means "before midday", and PM means "after midday"
2. If the HOUR and MINUTE of the time don't need to be changed, press "MODE" twice to skip it;
3. Program the time setting as per the above procedures, if leaving the buttons alone for 5 seconds, you will exit the time setting.
4. The clock will remain ticking when the spa is turned off or powered off suddenly, no need to adjust the time when the spa is turned on again.

■ The filtering cycle setting (+)

- The SPA will run the automatic filtering cycle 2 times in 24 hours. By running the filter system, the spa will be sterilized and filtered.
- The default setting of filtering cycle will be operated from 8:00 to 10 AM and 20:00 to 22:00 PM. The customer can reset it through the control panel.
- There is 5 steps to set the filtering cycle, including the time setting of spa, start time for the 1st filtering cycle, end time for the 1st filtering cycle, start time for the 2nd filtering cycle and end time for 2nd filtering cycle.

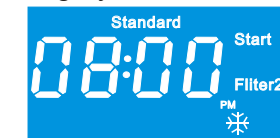
Details are as follows:

When the spa is on, press **Time** button to set the time of spa, press **Mode** button, the control panel will show **Filter 1, start time**. You can set the start time for 1st filter cycle. Please set it referring to the time setting of spa. When the setting is finished, press **Mode**. Then the control panel will show **Filter 1, end time** to set the end time of 1st filter cycle. You can set the start time and the end time of 2nd filter cycle step by step. When the setting is finished, press **mode** button. The control panel will show the water temperature. The setting of filter cycle is done.

The 1st filtering cycle



The 2nd filtering cycle



Notes:

1. Only the hours can be set for the filter cycle.
2. If you don't want to change the setting, please press **Mode**. If it is stopped or no operation within 5 seconds during the setting. The system will exit the setting automatically. And the setting is failed.
3. The filter cycle has to be run when the spa is stand-by mode. In this case, the control panel will show O3. When the spa is powered on, the filter cycle will not be operated.
4. Different time setting will be recommended. If the time setting is same, only 1 time filter cycle will be operated.

■ Mode setting ()

Standard mode



Economic mode (Power on)



Sleep mode




Economic mode (Stand-by)





How to activate economy mode: Economy mode works only under standby status. After setting economy mode, the screen will show **Standard** signal and at the same time the **Economy** signal is flashing. Press the **power** button to enter standby status for activating the economy mode.

▪ Light Setting ()


Press the button  to turn on the light, once again to turn off the light, press the button again to turn the light and change into another mode.

▪ Massage automatically turns off

The Jest1 \ Jets2 and Blower will automatically turn off if have 15 minutes without press button. If need to use, please press the relevant button again.

Note: if press ( + ) these both button at the same time, will display P30, the water pump and blower will automatically turn off after 30 minutes without press button . Once again press these two button, will display P15, the water pump and blower will automatically turn off after 15 minutes without press button. this setting is circular setting, also will revert after power on.

▪ Digital diagnostics function

The control system will automatically turn on the protect function after error message appear on the LCD display if there is probably something wrong with the SPA, you can refer to  to deal with these problem or provide these information to your dealer.

▪ Hose and pipe clearing cycle

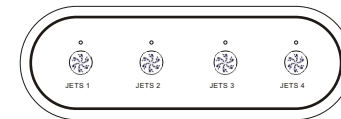
One minute after the filtration cycle has started; the system will automatically turn on the blower and the massage pump for 2 minutes to purge the hydraulic circuits.

▪ Memory function:

The system will revert to the last setting after each power on.

▪ Expanding function (suitable for luxury panel)

Luxury control system can control not only the main control panel for standard equipment, but also can control auxiliary control panel and independent control panel. It can maximum control 4 massage pump through by the auxiliary control panel. Independent control panel can specially control the option equipment by itself.



Auxiliary control panel



Independent control panel

Note: The luxury control system can control up to one auxiliary control panel and 5 independent control panel.

▪ Night light function(suitable for luxury panel)

Luxury main control panel, auxiliary control panel and independent control panel are all have high brightness LED backlight, it will convenience to operate the control panel at night.

▪ Default setting

Temperature: 38°.

Model: Standard model.

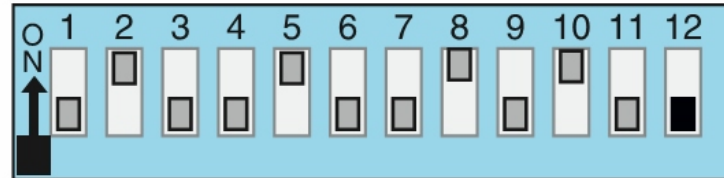
First filter cycle (filter 1): (8:00AM-10:00AM or 8:00-10:00).

Second filter cycle (filter 2): (8:00PM-10:00PM or 20:00-22:00).

DIP SWITCH SETTING

The control system have provide several control programs for choose, but almost have setting one mode before delivery, you can change the DIP switch to adjust the mode which you need. The DIP switch setting must be set by professional personnel. Damage may be caused by wrong setting will not be covered in warranty.

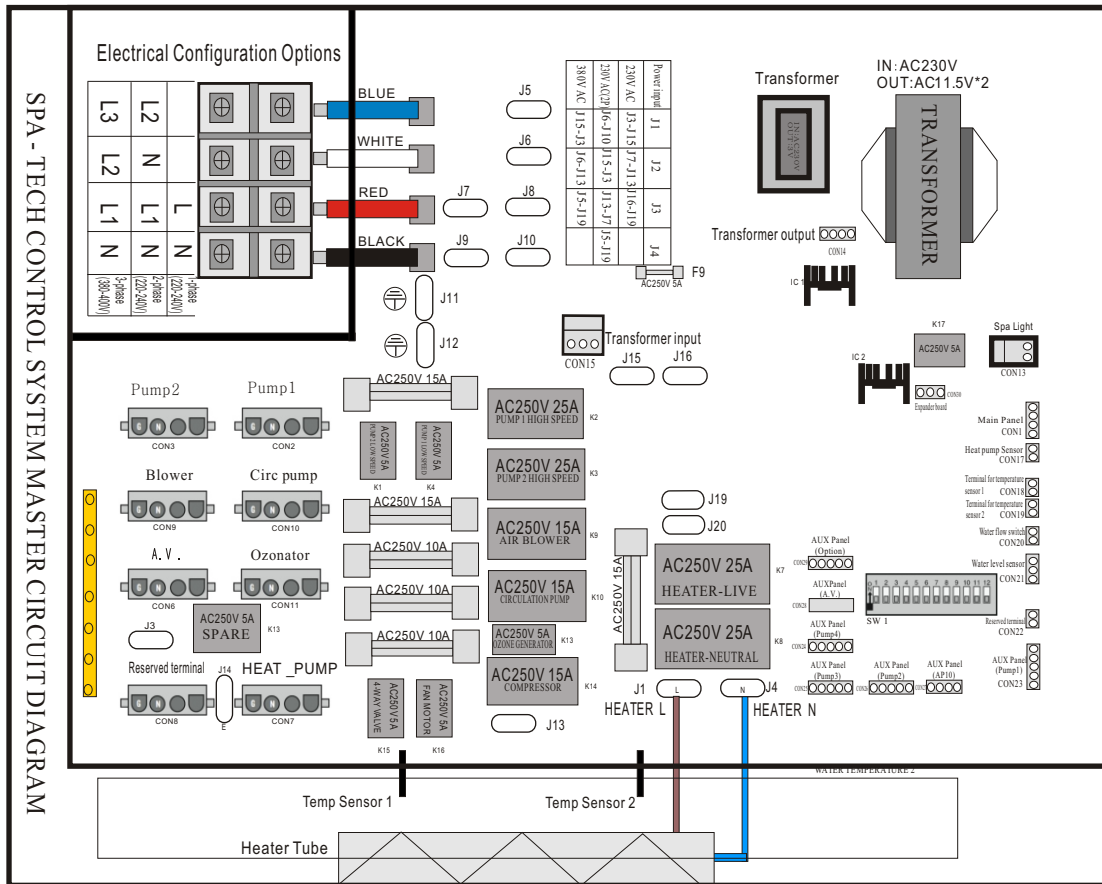
The drawing of
12 DIP switch:



Setting Mode	ON	OFF	Default setting
1	OFF(DIP 1)/OFF(DIP 2), Heap pump work mode. OFF(DIP 1)/ON(DIP 2),Heater work mode.		According to heater system selected.
2	ON(DIP 1)/OFF(DIP 2), Heater work with Heap pump mode. ON(DIP 1)/ON(DIP 2), Heat exchanger work mode.		
3	Pump 1 is two speed pump, low speed as circulation fuction	Pump 1 is single speed pump, extra circulation pump	According to massage pump 1 type.
4	Pump 2 is two speed pump	Pump 2 is single speed pump	OFF
5	E8 mode (compressor protection)	E8 mode (compressor protection)	ON
6	Fahrenheit Temperature display	Centigrade Temperature display	OFF
7	24 hours timing	12 hours timing	OFF
8	Without water level sensor	With water level sensor	ON
9	Single phase voltage no limited	Single phase voltage limited	OFF
10	Water flow detected by temperature sensor	Water flow detected by Flow switch	ON
11	OFF (DIP 11)/OFF (DIP 12):Any one water pump running high speed, the heater stop working. OFF (DIP 11)/ON (DIP 12):Any two pumps running high speed, the heater stop working.		OFF(DIP 11)/OFF(DIP 12)
12	ON (DIP 11)/OFF (DIP 12):Any three pumps runing high speed, the heater stop working. ON (DIP 11)/ON (DIP 12):Any pumps and the heater can run at the same time.		

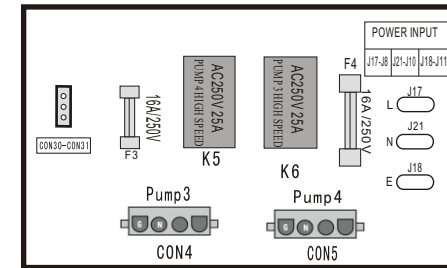
SPA - TECH CONTROL SYSTEM CIRCUIT DIAGRAM

■ SPA - Tech control system master circuit diagram



■ SPA - Tech extension circuit diagram (apply for luxury version control system)

SPA- Tech luxury version of control system will have the extension function after the extension control circuit board is set inside the control box. Following is the wiring reference for the circuit diagram of the extension control board:



VOLTAGE JUMPER SET UP

This system has designed phase splitter to meet the requirement of AC220V , AC220V-2P, AC380V , jumper set up reference as following:

Power input	J1	J2	J3	J4
AC230V	J3-J15	J7-J13	J16-J19	/
AC230V/2P	J6-J10	J15-J3	J13-J7	J5-J19
AC380V	J3-J15	J6-J13	J5-J19	/

PROBLEM SHOOTING

- **Message E1-> Means the water temperature sensor 1 protection.**

Phenomenon: Control panel display E1, none of the keys respond. The circulation pump works for 1 minute and then stops.

Causes: 1. The connection between the temperature sensor 1 and main PCB loosed.
2. Temperature sensor 1 fault.

Solutions:

1. Tighten the temperature sensor 1 and control panel following the wiring diagram.
2. Replace the temperature sensor 1.

- **Message E2-> Temperature sensor 2 protection.**

Phenomenon: Control Panel display E2, none of the keys respond. The circulation pump works for 1 minute and then stops.

Causes: 1. The connection between the temperature sensor 2 and main PCB loosed.
2. Temperature sensor 2 fault.

Solutions:

1. Tighten the temperature sensor 2 and control panel following the wiring diagram.
2. Replace the temperature sensor 2.

- **Message E3-> Heat pump Temperature sensor protection.**

Phenomenon: Control Panel display E3, none of the keys respond. The circulation pump works for 1 minute and then stops.

Causes: 1. The connection between the temperature sensor and main PCB loosed.
2. Temperature sensor fault.

Solution:

1. Tighten the temperature sensor and control panel following the wiring diagram.
2. Replace the temperature sensor.

- **Message E4-> Water level sensor protection.**

Phenomenon: Control Panel display E4, none of the keys respond. The circulation pump works for 1 minute and then stops.

Causes:

1. The connection between the water level sensor and main PCB loosed.
2. Water level sensor fault.
3. Water in the spa is lower than the minimum water level.

Solutions:

1. Tighten the connection between water level sensor and main PCB.
2. Replace the water level sensor.
3. Fill the spa water till it is over the minimum water level.

- **Message E5-> High voltage or low voltage protection.**

Phenomenon: Control Panel display E5, none of the keys respond. The circulation pump works for 1 minute and then stops.

Causes:

1. Power supply voltage is higher/ lower than the spa rated voltage.
 2. power receptor in PCB fault.
- Solutions:
1. Cut off the power supply, check and make sure the power supply according to Spa rated power supply requirement.
 2. Contact your dealer, replace the PCB.

- **Message E6-> Water flow switch protection**

Phenomenon: Control Panel display E6, none of the keys respond. The circulation pump works for 1 minute and then stops.

Causes:

1. The connection between the water flow switch and main PCB loosed.
2. Water flow switch fault.
3. Circulation tube blocked with air.

Solutions:

1. Tighten the connection between water flow switch and main PCB.
2. Replace the water flow switch.
3. Check and make sure all the side check valves are fully open.
Uptight the slipknot of the circulation pump to drain out the blocked air in the plumbing.

- **Message E8-> Heat pump compressor high/low pressure protection.**

Phenomenon: Control Panel display E8, none of the keys respond. The circulation pump works for 1 minute and then stops.

Causes: Heat pump compressor high/low pressure.

Solution:

Shut off the power supply, disconnect the heat pump, check if the power cables and signal cables are correctly connected, if the problem persists, contact your dealer.

- **Message E9-> Inadequate water flow or incorrect water level protection.**

Phenomenon: Control Panel display E9, none of the keys respond. The circulation pump works for 1 minute and then stops.

Causes: Inadequate water flow or incorrect water level protection from heater.

Solution:

1. Power off, refer to the solution of E4/E6 message, rewire and check.
2. If the problem persists, contact your dealer.

- **Message C - Low temperature protection.**

Phenomenon: Control Panel display C message, none of the keys respond, circulation pump is working, and heater is working automatically.

Causes: 1. Actual water temperature $\leq 7?$.
2. Temperature sensor fault.

Solution:

1. Heater will heat till the spa water temperature has arisen up to $9?$, then the message $\square C \square$ disappears.
2. If the actual temperature stays below $7?$ for long time, please contact your dealer.

- **Message H-> High temperature protection.**

Phenomenon: Control Panel display H message, none of the keys respond, heater stops working, circulation pump working automatically.

Causes: 1. The detected water temperature $\geq 43?$.
2. Temperature sensor fault.

Solution:

1. Shut off the power and wait till spa water temperature $< 41?$.
2. If the problem persists, contact your dealer.

- **Message HH-> Over heat protection**

Phenomenon: Control Panel display HH message, none of the keys respond, and all the equipments are shut down.

Causes: 1. The detected water temperature $\geq 47?$.
2. The temperature sensor fault;

Solution:

1. Cut off the power supply, wait the water to cool down $< 41?$.
2. If the problem persists, contact your dealer for help.

- **Message PL-> Control panel locked**

Phenomenon: the screen displays PL message, all the buttons are unavailable

Causes: The panel is locked;

Solution: Press the button $\square WARM \square$ and $\square COOL \square$ simultaneously to unlock the panel.

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