

I . Overview of the Panels

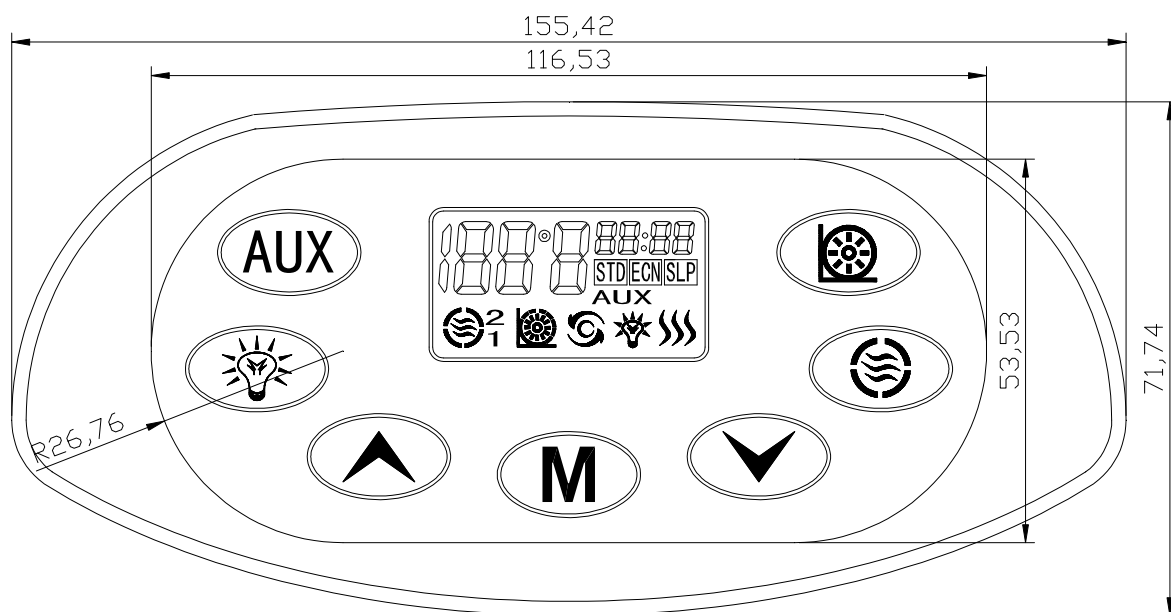


Fig . 1: A8=OFF 7 keys single color back lighting control panel- Installation sketch(156*72mm)

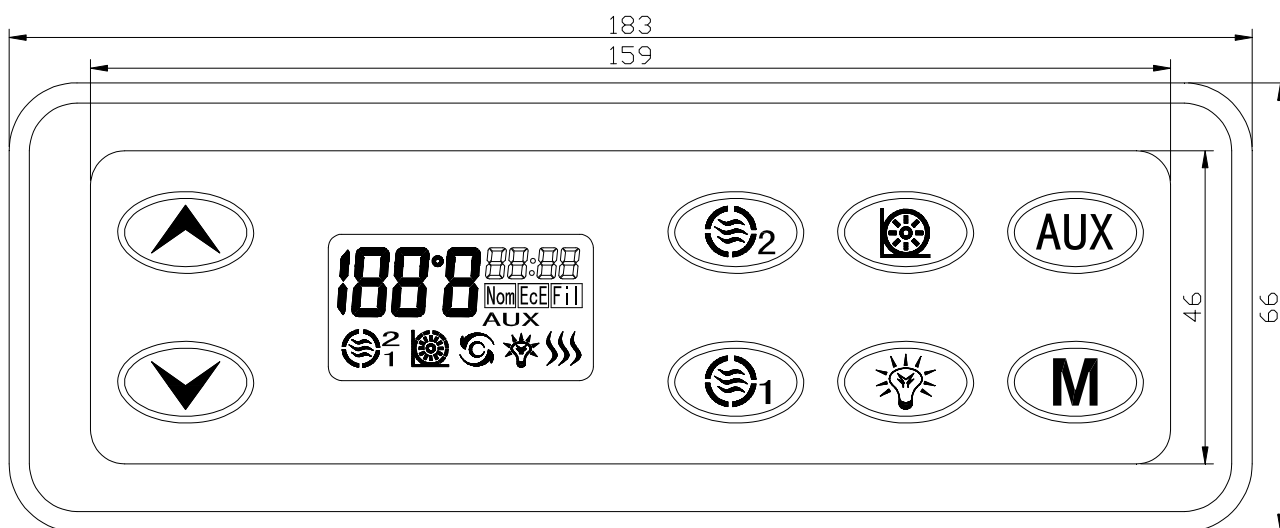


Fig . 2: A8=OFF 8 keys single color back lighting control panel- Installation sketch(183*66mm)

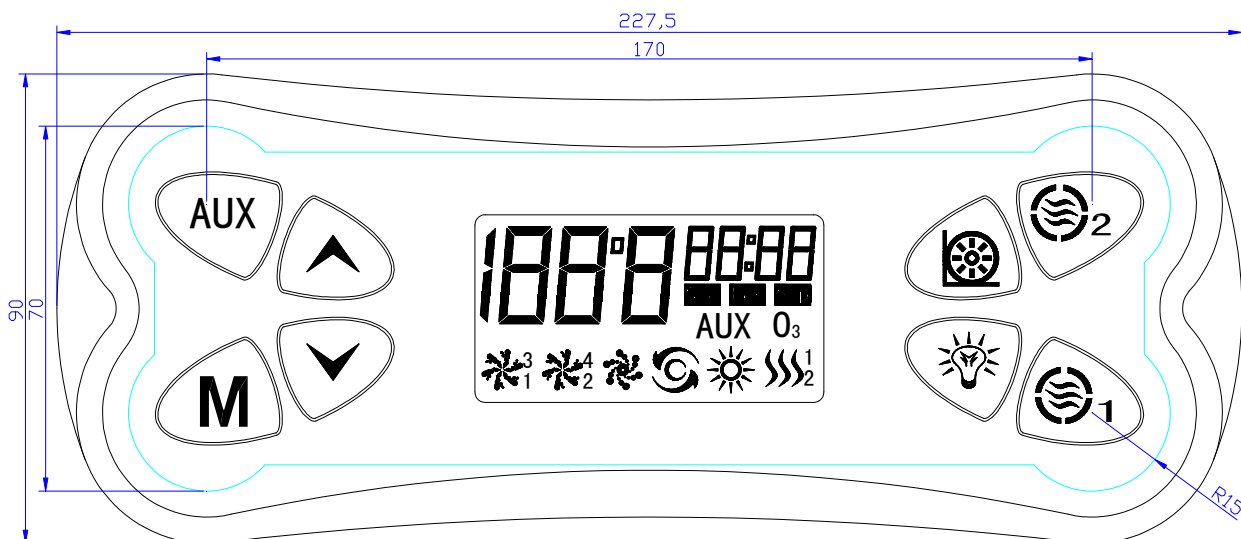


Fig . 3: A8=ON 8 keys double color back lighting control panel- Installation sketch(230*90mm)

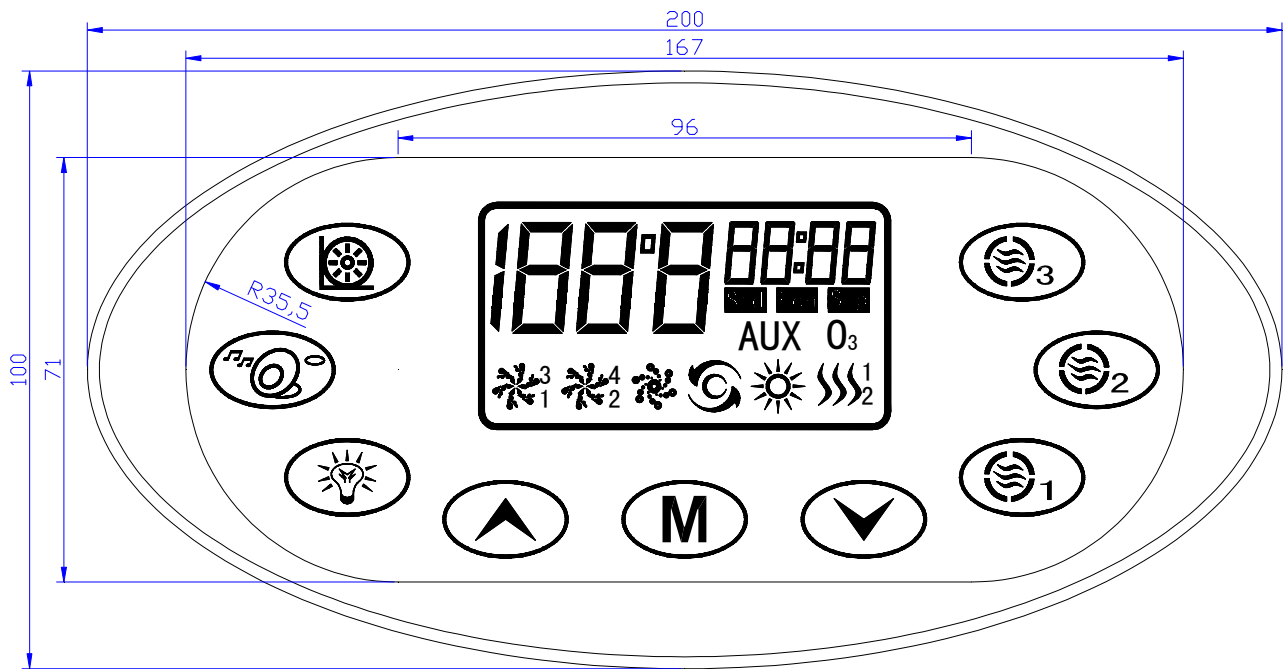


Fig . 4: A8=ON 9 keys double color back lighting control panel-- Installation sketch(200*100mm)

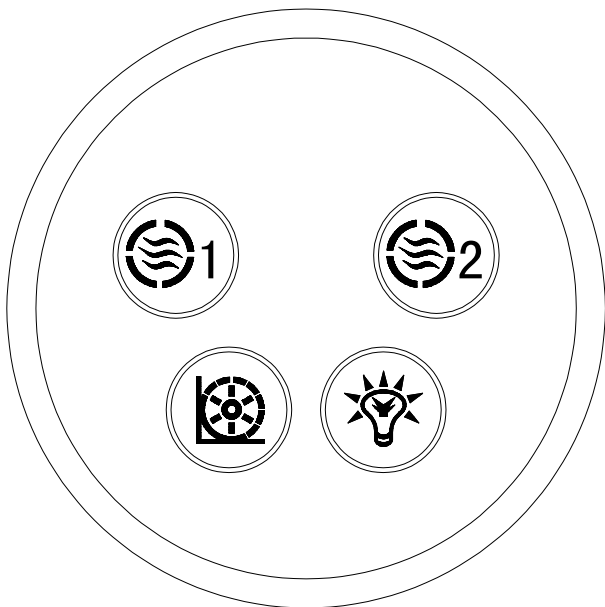


Fig . 5: Sub panel A

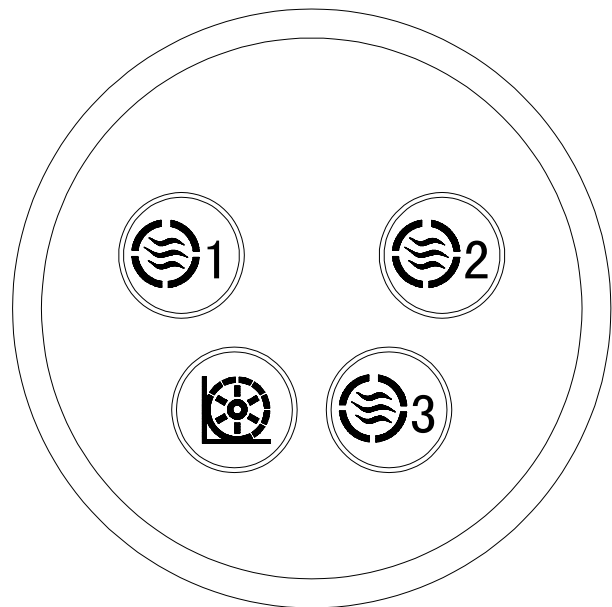


Fig . 6: Sub panel B





II . Function Summary

1. Three working modes: Normal Mode, Economy Mode and Filter Mode.
2. Plug-and-play connection, easy to operate and install.
3. 24 hours clock display and setting are used for circulating clean.
4. Max allow heater(thermostat) power is 4.5KW, with water temperature display and setting function.
5. Max allow 3 surfing pumps and 1 circulating pump (or 2 surfing pumps and 1 dual speed pump) and a blower.
6. Multiple lights synchronously change color or fix color, and with Ozone function.
7. Automatically anti-freeze.
8. Single color back lighting 7/8 keys control panel or double color back lighting 8/9 keys control panel could be selected.

9. Single phase, three phase or bi-phase 110V input, 110-120V or 220V-240V output is available.
10. With an additional power supply output, it could connect DVD/TV or any other loads.
11. Switch bank is available to select various functions.
12. Automatic replenishing water and mandatory draining water.
13. Error code hinting.


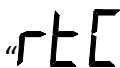
III. Function Instructions



I). Temperature Control (77-104°F /25-40°C)



Without any setting at the initial, press “” or “” key once to enters temperature setting status. At this time, the setting temperature is flashing on the LCD. Before the setting temperature stops flashing, each press the “” or “” key again to change the setting temperature value. Without any action in 6 seconds, the system will exit and save temperature settings and display current actual temperature of the SPA.



In order to ensure the precision of the detected temperature, if no water flowing in the SPA within 60 minutes, the circulation pump(low speed pump) will automatically turn on and work for 60 seconds.



II). The Operation of “” key



1. Press “” key and hold for more than 5 seconds until it appears a flashing “”, it represents the system enters to setting mode, and go into a “real-time clock” setting as well.

2. Under the setting mode, click on “” to set “start time of filter cycle”, the LCD is showing “”.

3. The 3rd time to click on “” to set “continuous working period of filter cycle”, the LCD is showing “”.

4. The 4th time to click on “” to set “temperature fine tuning”, the LCD is showing “”.

5. The 5th time to click on “” to set “LED light brightness adjustment”, the LCD is showing “”.

6. The 6th time to click on “” to set “mandatory draining water”, the LCD is showing “”.

7. The 7th time to click on “**M**” to set “start automatically replenishing water”, the LCD is showing “**Fl n**”.

8. The 8th time to click on “**M**” to return to set “real clock”, the LCD is showing “**rt [**”.

When finish settings(or without pressing any key within 6 seconds), the data will be saved and the system exit. Any parameter setting or change must be operated within 6 seconds.

Note

1. When A1 = ON or A2=ON, press “**M**” key, the above step 2 and 3 will be skipped.
2. When A4=ON, the above step 4 and 5 will be skipped.
3. When B3=OFF, then the above step 7 will skipped.
4. When B4=OFF, the above step 6 will be skipped.
5. Only “**M**” has the operation of “press and hold” and “click pressing”, the other keys are all “click pressing”
6. “Press and hold” means to press the key and hold for a while until it appears some icons or enters to a certain status.
7. “Click pressing” means to click on the key and let it go within a second.

III). Working Mode

1. Three working modes: Normal Mode, Economy Mode and Filter Mode. The working mode is only effective for circulation pump, heater, circulation filtration and anti-virus function.

2. When A1 = ON, no working mode is available. Press “**M**” key to turn on or turn off the heater, the circulation pump will automatically turn on/off.

3. The switch of working mode:


1) When it is initially powered up, the system is working at the “Filter Mode”, and the LCD is showing “**Fl**”. The system will just work under filter cycle and the heater don’t work under this mode.

2) The 1st time to press “**M**” key, the system enters to “Normal Mode”, and the LCD is showing “**Nom**”, the system will keep the setting temperature all day.

3) The 2nd time to press “**M**”, the system enters to transformation status from “Economy Mode” to “Normal Mode”, “**Nom**” is displaying on the LCD and “**EcE**” is flashing. The system will turn into “Economy Mode” after running “Normal Mode” for an hour.

4) The 3rd time to press “**M**”, the system goes into “Economy Mode”, the LCD is showing “**EcE**”. The system will only work during the filter cycle, and it will heat the SPA to your


setting temperature at the first filter cycle(The heater will not work at the second filter cycle).

5) The 4th time to press “”, the system goes back to “Filter Mode” and the LCD is

showing “”, the system will just work under the filter cycle and the heater doesn’t work.

4. Automatically Anti-freeze Function



When the water temperature is less than 44°F /6.7°C or much lower, anti-freeze function will automatically start up, all the pumps and blower work for 30 seconds and then turn off, then all

the heaters and circulation pumps turn on, and the LCD is showing “”.

When the water temperature reach to 46°F /7.8°C or above, the heater will stop working and the circulation pump will turn off after several seconds delay.

4. To ensure the lifetime of heater’s relay, the heater will automatically shut down once every 40 minutes for 40s(Hot pump is 3 minutes).

IV). Clock Setting

At clock setting status (Fig. 4), press “” key to set hours (down button), the adjustable range is “0 ~ 23”. And press “” key to set minutes (up button), the adjustable range is “0 ~59”.

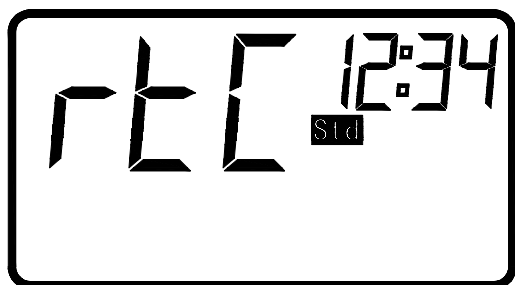


Fig. 7: Current time is 12:34

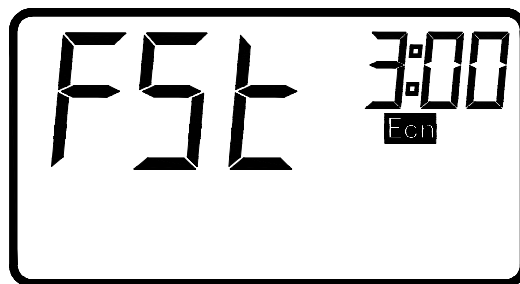



Fig. 8: Start time of filtration is 3:00 o'clock


V). Pre-settings for Filter Anti-virus Cycle (Only valid when A1=OFF)

1. The system will execute filter cycle twice each day, but the user can only set up the start time for the 1st filter cycle, the start time of the 2nd filter cycle will automatically increase and start up after 12 hours.(Example: The start time of the 1st filter cycle is 14:00, then the 2nd filtration start time will be 2:00)

2. When A2 = ON, the time for filter cycle is fixed and it will start up at 14:00 every day and lasts for 3 hours. The start time of the 2nd filtration is 2:00.

3. When A2= OFF and the system is under the status of “start time of filtration setting” (Fig. 8),

press “” key to change the start time for hours, the “minutes” setting is always 00(It means the minimum time range is hours).

4. Under the status of “continuous working period of filter cycle setting”, press “” key to change the period, the setting range is 1-11 hours (Fig. 9).

5. At the initial stage of each filter cycle, all other loads will run for 15 seconds to purify the pipeline. Ozone will start to work after 15 seconds.

In order to prolong the lifetime of anti-virus system, ozone will work for 15 minutes and then idle for 15 minutes, and that cycle repeats.

When any surfing pump (or high speed pump) and blower is turned on, ozone will stop working.

VI). Valid when A4=OFF: The temperature fine tuning (**This function is only effective for °F temperature display**)

Press and hold “**M**” key to enter setting mode, and continuously press “**M**” key to go into temperature fine tuning mode(Fig. 9). At this moment, the user could click on “**▼**” or “**▲**” to change the temperature in small range, the ADJ(adjusting) range is -3~-7°F.

When ADJ=-3°F and the desired setting temperature is Tset=90°F, then the heater will turn off after the water temperature reach to 91°F, and the heater will automatically start to heat the water when the real temperature reach to 87 °F (90°F -3°F =87°F).

In the same way, when ADJ=-7°F and the desired setting temperature is Tset=90°F, then the heater will turn off after the water temperature reach to 91°F, and the heater will automatically start to heat the water when the real temperature reach to 83 °F (90°F -7°F =83°F).

Note

When the temperature displayed in Celsius(°C), the temperature control range is ±1°C. This means that if the setting temperature is Tset=30°C, when the temperature reach to 31°C, then the heater will turn off. When the temperature drop to 29°C, the heater will automatically start to work again.

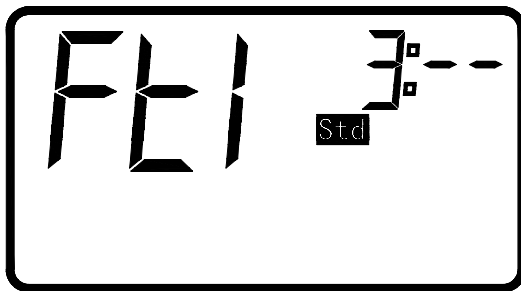


Fig. 9: The last time for filter cycle is 3hrs

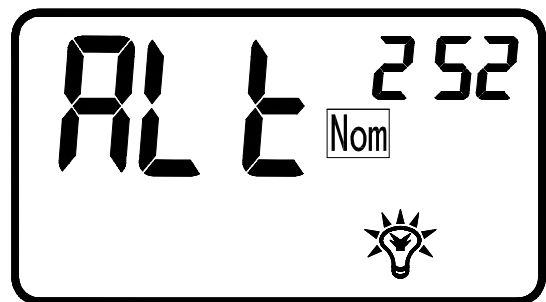


Fig. 10: Light brightness adjustment

VII). Valid when A4=OFF: The light brightness adjustment

Press and hold “**M**” key to enter setting mode, and continuously press “**M**” key to go into light brightness adjustment mode(Fig. 10). At this moment, the user could click on “**▼**” or “**▲**” to change the light brightness, the adjustment range is 3~252.

VIII). The Main Board Specifications and DIP jumper settings(Fig. 11)

- A1: OFF: The system with three working mode.
ON: No working mode available, anti-virus function is invalid. Press the “**M**” key can only control the heater ON or OFF.
- A2: OFF: Could manually set the anti-virus filter cycle.
ON: The built-in setting of the filter cycle is unchanged. It starts to work at 14:00 and lasts for 3 hours.
- A3: OFF: The system will perform two anti-virus filter cycles every day. The time interval for the 2nd time filter cycle is 12hrs.
ON: The filter cycle only works once a day.
- A4: OFF: Display temperature in Fahrenheit (°F).
ON: Display temperature in Celsius(°C) .
- A5: OFF: Surfing pump 1 works as a single-speed pump.
ON: Surfing pump 1 works as a dual-speed pump.
- A6: OFF: When the temperature appears abnormality or the sensor detected no water, the heater and pump will stop working.
ON: All HV loads can't be controlled by temperature sensor and water level probe.
- A7: OFF: With a water flow sensor, when it detected no water flow, the heater doesn't work.
ON: No water flow sensor.
- A8: OFF: The system could connect 7/8 key single color back lighting control panel.
ON: The system could connect 8/9 key double color back lighting control panel.

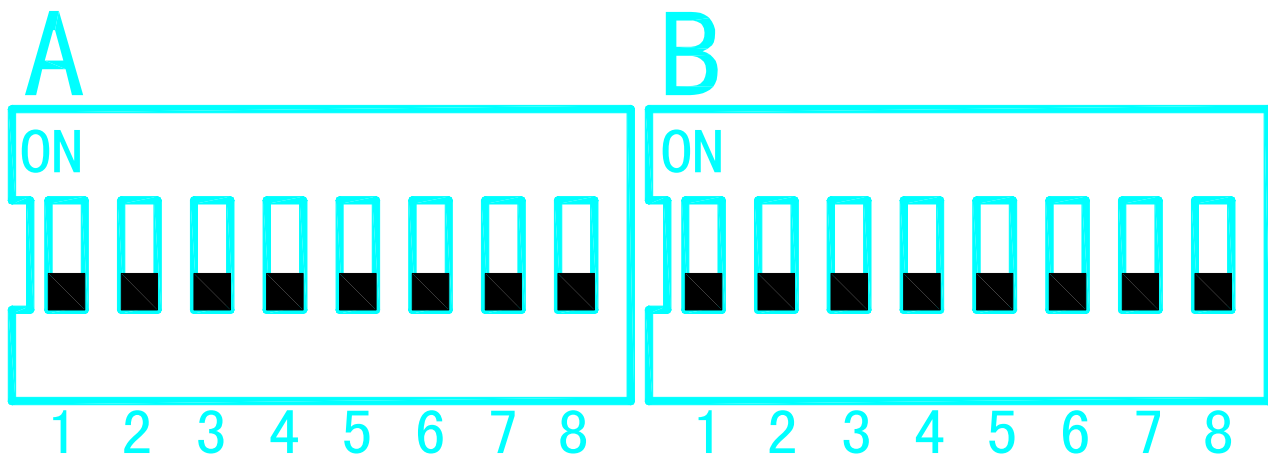


Fig. 11: Switch bank A and B (Above jumper status are all OFF)

- B1: OFF: Normal working mode.
ON: Engineer testing mode.
- B2: OFF: With light synchronizer, the LED light could synchronously change color and fix color.
ON: No light synchronizer.
- B3: OFF: No replenishing water function.
ON: With automatic replenishing water function.
- B4: OFF: No drainage function.
ON: With mandatory drainage function.




- B5: OFF: "HEAT2" position could connect heater.
ON: "HEAT2" position could connect hot pump.
B6: OFF: Connect sub panel A.
ON: Connect sub panel B.




Note

1. Please turn off the system when you change any settings of the DIP jumpers, and then waiting for 60 seconds before turn on the system again.
2. All the jumper settings have been set up ok before fab out. The user had better not change these settings.


IV. The Operation Instruction of Output Loads

I). The operation of surfing pump


Press " " " " and " " key to control the surfing pump 1/2/3 to be ON/OFF. All of surfing pumps will automatically turn off after 15 minutes.




When A5=ON, the surfing pump 1 work as a dual speed pump. The 1st time to press " " is to start high speed, the 2nd time to press " " to turn off high speed and turn on low speed, the 3rd time to press " " to turn off both high speed and low speed.

II).The operation of the blower

Press " " key to turn on/off the blower, it will automatically turn off after 15 minutes.

III). The operation of the light

" " key is used to turn on /off the LED light. The light will automatically turn off after 120 minutes.

When B2=OFF, press " " key once, the light will be turn on and automatically change color at the same time; Press " " key again, the light will fix color; The third time to press " " key, the light will turn off.

When B2=ON, the user can just turn on or turn off the light.

IV). The operation of "AUX" or "Q" key

"AUX" or "Q" key could connect a DVD/TV/Ethink Blue tooth or other extra load and control its to be ON/OFF, the max allowable power is 1KW/230V(If the user choose the blue tooth, the the power will be 24W/12VAC).

V).Mandatory drainage(B4=ON) and automatic replenishing water(B3=ON)

1. The automatic replenishing water function and mandatory function can't work at the same time, the first priority is draining water if there is conflict.

2. Press "M" and "V" to set the drainage and automatic replenishing water/feeding water. When the drainage is set to ON, then the initial setting for replenishing water must be OFF.

3. The drainage function and replenishing water function will be executed after finished the related setting.

4. The process of mandatory drainage

4.1 When B4=ON, press "M" and "V" to start the mandatory drainage, all of the blowers and surfing pumps will be on at the initial of drainage to average the water in spa, and they will stop work after 15 seconds, then then drainage valve start. The LCD is showing "out" at this moment.

4.2 There is a water level probe WATER1 to control the drainage, the drainage will work for 1 hour and then automatically shut up when the probe detected water.

4.3 When the water level probe detected no water, the drainage will stop after 1 minute and the whole drainage process is finished.

5. The process of automatic replenishing water/feeding water

5.1 When B3=ON, the mandatory drainage is set to OFF or without this function, the user could set and active the automatic replenishing water by operate "M" and "V".

5.2 After the setting is completed, when the water level probe detected no water(the LCD is showing "LLL" if no water), the replenishing water/feeding water function start up. The LCD is showing "InF".

5.3 If the water can't reach to the specified water level in 30 minutes(Maybe no water supply), the replenishing valve will stop working and the LCD is showing "InP" at this time. The replenishing valve will restart again after 10 minutes, and the system will repeat this process until the water reached specified level, the symbol "InF" is disappeared.

5.4 After the water reached the water level probe, the symbol "LLL" is disappeared and the inlet valve will delay for 1 minute and then shut up.

V. System Malfunction Warning

Fault Indication	Root Cause	Solutions
"E5A"	Temperature sensor open or short.	1. Check whether the plug is loose or the cable is damaged. 2. If plug and cable are OK, please replace the main circuit board. 3. If it is not workable after replacing main board, please replace the heater.
"E5B"	Water flow sensor open or short.	
"E0B"	Detected the water flow sensor is over limitation.	
"EHH"	Detected the temperature inside the heater reaches 118 °F / 48 °C or higher than it.	1. Check whether ambient temperature is too high. 2. Check whether the filter is blocked or just replaced. 3. Check whether the metering valves and circulating pump are normal.
"E0H"	Detected the temperature inside the heater reaches 110°F / 43.5°C or much higher.	
"EPL"	The water flow inside the heater is possibly too low.	1. Check whether the filter is blocked or just replaced. 2. Check whether the metering valves and circulating pump are normal. 3. If the above loads are normal, please turn off the power supply and wait for 15 seconds, then turn on the power and reset system.
"ECP"	It is sure that the volume of water flow inside the heater is not enough.	
"LLL"	Lack of water or the water level not reach the target.	1. Please check whether the water level reach the target level. 2. Please check whether all the cables related to the water level probe are normal.

Other Operation Information

1. "ICE": Detected the it is going to frostbite status and the system running anti-freeze function.
2. "InF": The system is replenishing water, other functions could be operated normally. VI
3. "InP": Replenishing water is paused, other functions could be operated normally.
4. "out": Mandatory drainage is running.

VI. Electrical Parameters

1. Performance index

Working Voltage: 3×220-240VAC/50Hz (or 240VAC/60Hz)

Maximum Working current: 3 ×16A/220-240V (or 48A/240VAC)

Dielectric Strength: 1250V / 1 minute, no punch through

Insulation Resistance: $\gg 200M\Omega$

Waterproof Level: IPX5

Electric Shock Protection Level: Class 1

2. Maximum output load index

Heater: (4KW+3KW)/220-240VAC

Surfing pump: 10A/220-240VAC×3

Circulation pump: 5A/220-240VAC

Blower: 5A/220-240VAC

Replenishing valve: 5W/12VDC

Drainage valve(or pump): 5A/220-240VAC

AUX: 5A/220-240VAC

LED Light: 12W/12VAC or 12W/12VDC

Ozone: 8W/12VAC

VII. Installation Sketch

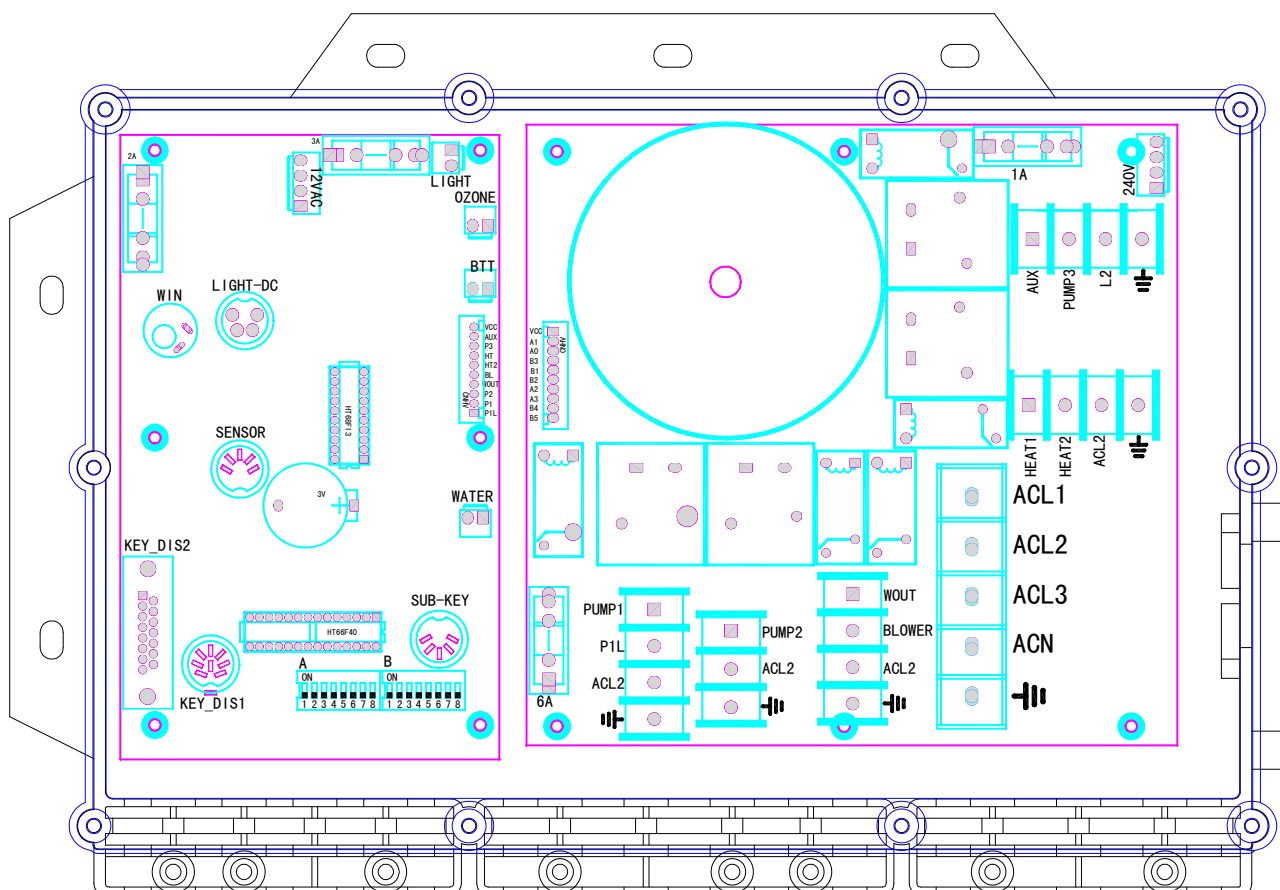


Fig. 12: Installation map for Europe version

