

SSPA controller - Installation and user manual

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1. General warnings

Before installing or operating on the appliance, carefully read and follow the instructions contained in this manual. The information on installation refers to the electrical connections. No information is provided on the mechanical or plumbing fittings for connecting the MSPA controller to the minipool.

This manual is an integral part of the product and therefore must be kept for future reference.

Astrel S.p.A. reserves the right to make any modifications it considers necessary without prior warning or replacement.

2. Responsibility of the user

The device described in this manual has been manufactured to operate risk-free and for the specific purpose, as long as:

- the device is installed, programmed, operated and serviced according to the instructions in this manual;
- the environmental conditions and the power supply are within the specified limits.

All other uses and modifications made to the device that are not authorised by the manufacturer are considered incorrect.

Liability for injury or damage caused by the incorrect use of the device lies exclusively with the user.

In the event of faults or malfunctions of the product under warranty, contact authorised technical personnel only. The manufacturer is not liable for any damage caused by products that have been tampered with or repaired incorrectly.

3. Accessing the live parts

This device contains live electrical components. Consequently, all the service and maintenance operations must be performed by expert and qualified personnel, after having taken the necessary precautions.

As the SSPA controller does not feature any internal systems for disconnecting the power supply, the power line must be fitted with disconnecting and protection devices compliant with the standards in force in the country of installation.

Before accessing the inside parts, the unit must be disconnected from the mains power supply using a disconnecting switch.

4. Precautions when handling the board

To avoid damage of an electrostatic nature to the board, the following precautions must be adopted.

- Before handling the controller, the board or any electronic component, touch an earthed object so as to discharge the electrostatic charges present on the body and on the clothing.
- The materials must remain as long as possible inside their original packages; when having to remove the board from the antistatic packaging, touch it as little as possible.
- Never use plastic, polystyrene or non-antistatic sponge bags for packaging the board.
- Never pass the unpackaged boards, as described previously, between operators (to avoid electrostatic induction and consequent discharges).

5. Installation tips

The following suggestions should be heeded to prevent potential problems during the life of the product:

- do not install the controller in environments with high levels of relative humidity, exposure to direct pressurised jets of water, high levels of magnetic and/or radio frequency interference.
- use cable ends suitable for the corresponding terminals and the cross-section of the wires used; tighten the cable terminals and slightly tug the cables to check that they are sufficiently tight.
- separate as much as possible the probe cables, the keypad cables and sensor cables from the power lines and cables supplying power to the inductive loads.
- protect the controller and the user with suitably rated electrical protection devices, in compliance with the standards in force of the country of installation.

6. Disposal and cleaning

The controller is made up of metal and plastic parts. These should be disposed of according to the local legislation in force.

The controller should be only be cleaned on the outside using neutral detergents and/or water.

7. Connection to the power supply

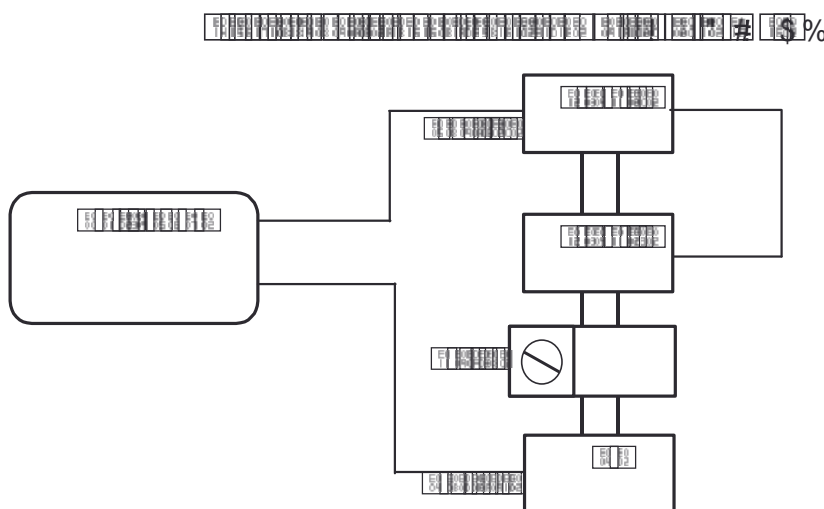
IMPORTANT:

Carefully read this paragraph before connecting the controller! Failure to observe the instructions contained in this paragraph may cause serious damage to the controller and to the other electrical devices installed.

The power cable should be connected to the main power supply.

The SSPA controller can be connected of power supply:

- Single-phase: 230 V, 50/60 Hz, 16 A



8. Connecting the 230 VAC loads

The loads operating at mains voltage (230 VAC) must be connected to the controller using the jacks. Each jack can only accept the type of plug with the contacts set out in a similar manner. For this reason, before making the connection, check that the jack corresponds to the plug.

For good mechanical tightness and protection against water penetration, insert the plug fully into the jack.

WARNING

The jacks on the controller that are not used are still connected to mains voltage.

To prevent personal injury or material damage and maintain conformity to safety standards, these must be covered on the outside so that internal contacts cannot be reached by sprays of water and are not accessible.

9. Connecting the light

The controller is fitted with a cable for connecting the spa lighting. This cable is located on the right side of the controller, and supplies 12 Vac, 2 A.

For the connection of the halogen or LED light simply fit the light bulb into the bayonet at the end of the cable.

10. Starting for the first time

Before switching the controller on for the first time, make sure that:

- there is sufficient water in the pool;
- all the valves are open;
- there is nothing that can block the flow of the water in the pipes.

Moreover, check that the connections of the loads correspond to the configuration settings.

Generally, when starting for the first time, the temperature of the water introduced into the spa should be lower than the temperature set point (35°C). For this reason, when started, the controller will activate the pump to send the water to the heater, as well as the heater itself.

11. Main functions

This section describes the most commonly used functions during the operation of the controller. The controller can be installed with three different configuration as following and every single configuration has the properly overlay to identify the key:

- Single Pump System
- Dual Pump System
- Single Pump and Blower System

11.1 Single Pump System

In this configuration the overlay of the keypad has the following icons to identify the keys: Pump, Light, Up, Down.

- **Pump**

The first press the pump is active in low speed and the led is on solid.

The second press the pump is active in high speed and the led is on solid.

The third press the pump is off.

If the pump is not stopped manually, it stops automatically after 20 minutes of operation.

Nota 1: If the user presses this key while the pump is already in low speed (due to filtration, smart winter mode, heater cool down, ...) then the pump will go directly in high speed.

Nota 2: If the system is in Smart Winter Mode (pump running in high speed) and this key is pressed, the cycle will be cancelled and the pump will be turned in low speed.

- **Light switch**

The system can be controlled the standard halogen/LED light.

- **Standard alogen/LED light**

The first press of the light key, the light is switched on and the led is on solid.

The second press of the light key, the light is switched off.

If the light is not switched off manually, it switched off automatically after 2 hours of operation.

- **Controlling the water temperature (Up, Down arrow)**

The SSPA controller can control water temperature in a range of temperatures between 15 and 40°C.

The user can set the desired temperature from keypads using on the UP/DOWN keys.

The temperature control function is achieved by heating the water using the heater connected to the controller. When the water temperature is less than the desired temperature, the SSPA controller:

- starts the pump configured as the heating pump
- checks the flow of water through the heater, using the pressure switch (this takes a few seconds);
- starts the heater.

Once the set point has been reached, the SSPA controller first deactivates the heater and, after 1 minute, the heating pump to avoid overheating the heating element.

The water is cooled by simply not activating the heater. The water may not cool down when the ambient temperature is high.

The SSPA controller maintains the temperature within an interval of $\pm 0.5^{\circ}\text{C}$ around the desired temperature.

The set point icon is on when key is pressed and for 5 seconds after key is let go.

When the heater is activated, the corresponding led on the keypad is on solid. The same led blinking when the water needs to be heated, but the heater is not activated to limit the power input. In fact, the heater may be off when multiple user loads are active.

The higher limit temperature is 40°C.

The lower limit temperature is 15°C.

The default temperature is 35°C.

11.2 Dual Pump System

In this configuration the overlay of the keypad has the following icons to identify the keys: Pump1, Pump2, Light, Up/Down.

- **Pump1**

Same function as Single Pump System

- **Pump2**

The first press the pump is active and the led is on solid.

The second press the pump is off.

If the pump is not stopped manually, it stops automatically after 20 minutes of operation.

- **Light switch**

Same function as Single Pump System.

- **Controlling the water temperature (Up/Down arrow)**

In this system, the water temperature is controlled by one key.

The set point will change direction every time key is let go.

For example: if set point is increasing when you are holding the key, next time you hold key the set point will start decreasing.

All other function are same as Single Pump System.

11.3 Single Pump and Blower System

In this configuration the overlay of the keypad has the following icons to identify the keys: Pump, Blower, Light, Up/Down

- **Pump**

Same function as Single Pump System

- **Blower**

The first press the blower is active and the led is on solid.

The second press the blower is off.

If the blower is not stopped manually, it stops automatically after 20 minutes of operation.

- **Light switch**

Same function as Single Pump System.

- **Controlling the water temperature (Up/Down arrow)**

Same function as Dual Pump System.

11.4 Smart Winter Mode

Smart Winter Mode is a function that is activated automatically when the room temperature measured by a sensor located inside the controller is less than 6°C, so as to prevent the water in the pipes of the SPA from freezing.

This protection function automatically activates all the pumps and the blower for 1 minute at variable time intervals; the lower the room temperature the more frequently the pumps will be started. The longest interval between two consecutive starts is two hours.

The activation of this function is not related to the water temperature inside the SPA.

The filter led blinking.

11.5 Filtration Cycle

When there is an active Filter cycle, the led is on solid. It's consists of starting the pump in high speed and the blower for one minute to purge the plumbing, then only the pump at low speed is on for the rest time of the cycle. The ozonator, if it's installed, will be on for the entire duration of the filtering cycle. At any other time, the ozonator is not allowed to be on.

It's possible to program the duration of the Filter cycle. By holding the light key for five second, the display shows the current duration value (0 to 12). Use the Up/Down key to adjust this value as desired.

If the user press the second time the light key, the new setting up will be saved and start immediately a new filter cycle and return to main display.

If the user doesn't press a second time the light key, the new value is saved and the filter cycle will start in 12 hours.

The default filtration cycle start 12 hours after a power up and has a duration of 6 hours.

If during the Filter cycle the user press any keys pump or light, the cycle is suspended the time the accessories are used. The Filter cycle remains suspended for an extra 40 minutes.

11.6 Heater Management

When the water temperature is 0,5°C lower than the set point, the heater will come on until the water temperature reaches the set point plus 0,5°C.

The heater arrow on the display will blink when the system calls for heat and will come steady hen the heater is actually turned on.

If the LC mode (low current) is selected in the jumper configuration, the heater is not allowed to be if the pump is on high speed.

If the HC mode (high current) is selected, there are not restriction to the heater output.

11.7 Jumper Configuration

Jumper Number	Fucntion	Position 1 (Left)	Position 2 (Right)
JMP-1	Input Current Mode	High current (HC)	Low Current (LC)
JMP-2	Temperature Units	Fahrenheit	Celsius
JMP-3	Pump2/Blower	Not installed	Installed

The values in bold are the factory default.

12. Error Messages

12.1 High limit error

The high-limit circuit will shut the heater off when High Limit (HL) probe temperature reaches 48°C. The condition keep it up until the temperature at HL probe falls below 44°C and power is reset. On the display appear three dots blinking and a LED light on the board blink.

12.2 Pressure Switch Error

The pressure switch error can have to condition, FLO error or FLC error.

- **FLO Error**

When pump1 is on, pressure switch is given 5 second to close. If after this delay, the switch is still open, FLO error occurs. The heater can't be turned on, when we have this error.

The error persist until flow problem is resolved. The system will clear the error itself, if it detects that the error condition no longer exists.

On the display appear three dots blinking.

- **FLC Error**

When pump1 is not on, pressure switch must be opened. If not, an FLC error occurs and the heater is turned off.

The error persist until flow problem is resolved. The system will clear the error itself, if it detects that the error condition no longer exists.

On the display appear three dots blinking.

12.3 Over Temperature Error

Turns the heater and all the outputs off when water temperature reaches 44.4°C. All keys that start accessories are disabled.

The error persist until the water temperature cools to 43°C.

The temperature on the display starts blinking

12.4 Over Temperature during Filter Cycle Error

Suspends filter cycle if water temperature exceed set point by more than 1°C for 3 hours.

The error persist until the temperature cool down one degree above the set point.

The filter arrow or logo start blinking.

12.5 Temperature Sensor Failure

Turns the heater off when the temperature probe is out of range.

The error persist until unit reads a temperature between 0°C and 50°C.

On the display the upper or lower temperature limit is displayed

12.6 Power-up Detection

The display blinking after a power failure until a key is pressed