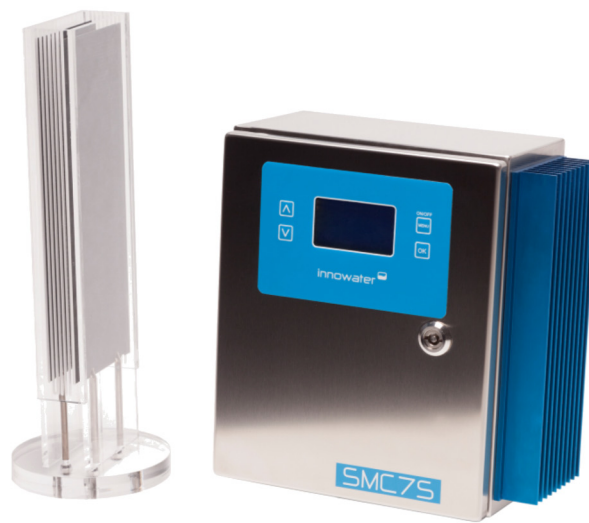


SALT WATER CHLORINATORS

SMC100-SMC150

USER MANUAL



IMPORTANT:



- The unit must imperatively be connected to a protective earth conductor.
- The unit must imperatively be protected by a 30 mA residual current circuit breaker .
- Only qualified and authorized personnel should open the electrical cabinet. Risk of electrical shock or fire hazard. 230VAC.
- The unit must imperatively be installed after the filter and must be the last element the water passes through before returning to the pool.

CONTENTS

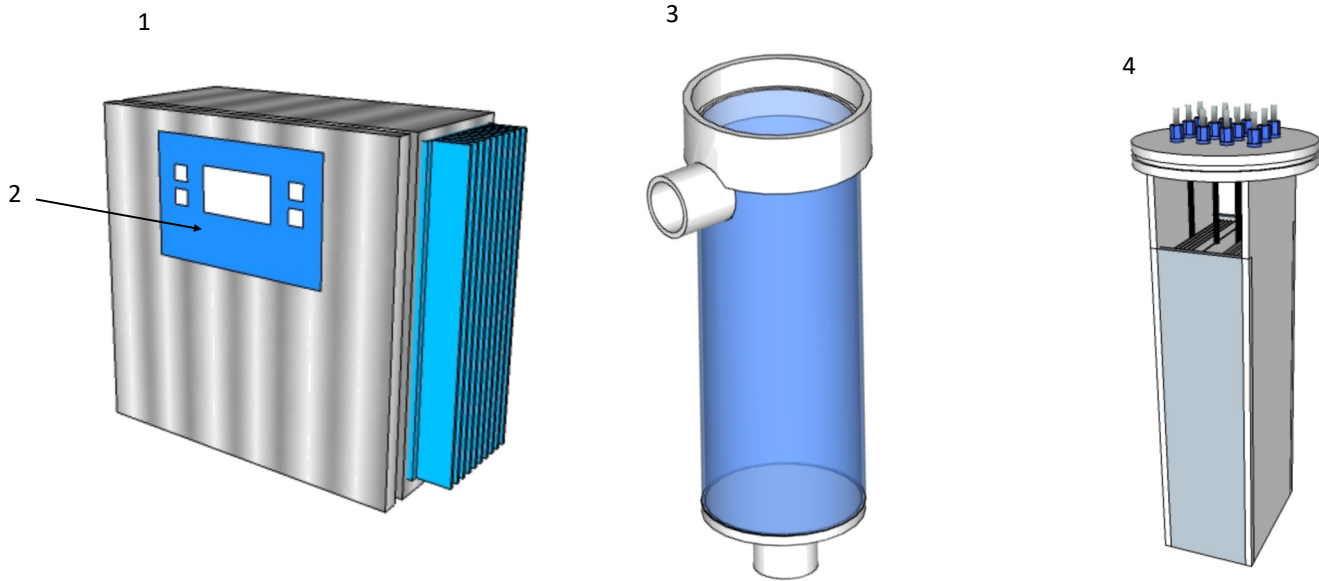
1. Security warnings.....	3
2. Unit description	4
3. Control and power panel installation.....	5
4. Cell installation.....	5
Cell housing	
Electrode assembly	
Flow switch	
Celle leads	
5. Pump commissioning.....	6
6. Electrical connections.....	7
6. Operation.....	7
6.1 Screen indications	
6.2 ON/OFF switching	
6.3 ON state: production	
7. Display messages.....	9
8. Menus.....	10
9. Regular maintenance.....	11
10. Warnings.....	12

1. SECURITY WARNINGS



- Before attempting the installation or any manipulation on the unit make sure the it is disconnected from the power mains.
- The unit should be connected to a proper **protective earth conductor**.
- The unit should be protected by an external **30 mA residual circuit breaker**.
- Do not operate the chlorinator if the pump is not running or if the flow through the cell is too low. The gas generated in the electrolytic process could break the cell and eventually explode.
- Do not install the cell before the filter or any other element. The cell must be the last element the water passes through before returning to the pool. Otherwise the gas generated in the cell could build up in the circuit and cause an explosion.
- Install the unit in a fresh and well ventilated area and protected from flooding and liquid splashes
- Only qualified technical personnel should manipulate the unit. The manufacturer declines any responsibility derived from the installation, the start up and from any manipulation or added component not factory installed.

2 . UNIT DESCRIPTION



The SMC75 is an high performance electrolytic chlorine generator. The unit produces pure chlorine, without any additives, directly from water with a salt concentration above 4.0 gr/l. The chlorinator is installed in-line in the pool filtration circuit. Part of the return water flow is forced through the cell by means of a by-pass placed at the end of the circuit, once the water has passed through the filter and through any other element and just before the return to the pool. When passing through the cell, the water acquires a high and very effective chlorine concentration capable of destroying most contaminants.

The SMC75 main elements are:

- 1. Power and control cabinet.** It houses the control and power units.
- 2. Control keyboard and display.**
- 3. Cell housing.** Its holds the electrolytic cell and is powered by two cell cables and connectors. Two 63 mm unions are supplied.
- 4. Electrode assembly.**
- 5. T fitting for the flow switch**

3. CONTROL AND POWER PANEL INSTALLATION

Install the unit in a fresh and well ventilated place. Mount the panel on the wall using the supports on its back. The panel should imperatively be mounted upright.



Keep any acid tanks away from the room where the unit has been installed. Acid vapours attack metals including stainless steel and destroy electronic circuits.



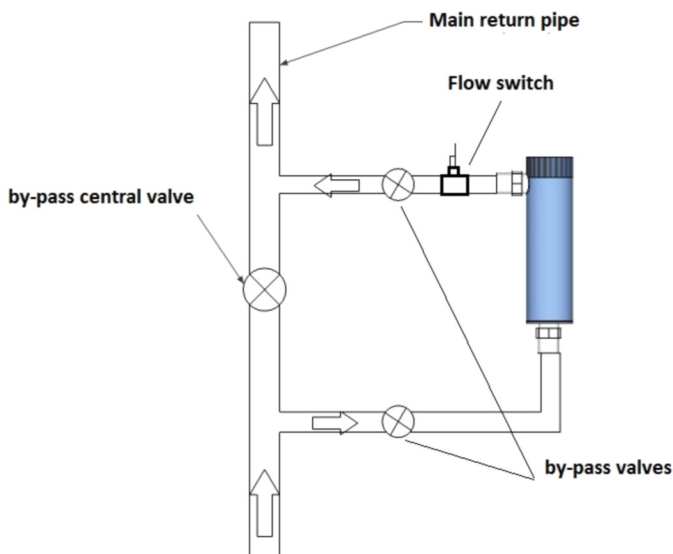
Keep the top of the panel and the heat sink area clear of any objects.

4. CELL INSTALLATION

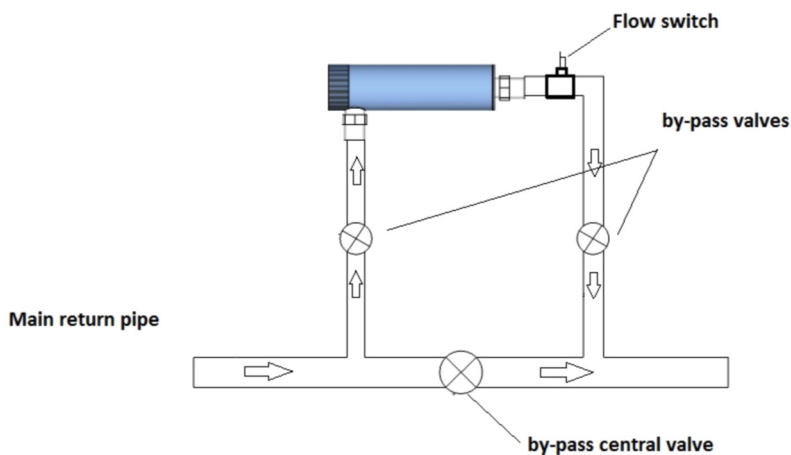
Cell housing

The chlorinator must be fed with filtered water. Install the cell housing by means of a by-pass at the end of the return water flow: once the water has passed through the filter and through any other element and just before the return to the pool. Send the flow into the the cell by partially closing the main pipe valve until you obtain a rapid and smooth flow through the cell.

VERTICAL INSTALLATION



HORIZONTAL INSTALLATION



In order to effectively evacuate the gas generated, the water outlet must always be above the water inlet. If the cell is installed vertically, the water must enter the cell through the bottom inlet.



Do not install the cell before the filter or any other element. The chlorinator cell must be the last element the water passes through before returning to the pool. Otherwise the gas generated in the cell could build up in the circuit and cause an explosion.

Electrode assembly

Once the cell housing placement is ready remove the cell housing from the piping before inserting the electrode assembly. Support the cell housing against its base. Do not support the cell housing against its bottom fitting because it could break. Verify that the O ring seal is in its electrode assembly housing and insert the electrode assembly in the cell housing. The open upper sides of the electrode assembly must be aligned with the upper water outlet of the cell housing. Push the electrode assembly down to the top until the locking ring slot in the cell housing is clear. Install the locking ring.

When the cell is being filled with water, the air trapped in the tube can prevent the water to flow. You can temporarily loose the flow switch in order to evacuate the air inside. Once the cell tubes are completely filled, don't forget to retighten the flow switch. Verify that the arrow marking on the flow switch corresponds to the water flow direction after retightening.

Water must flow at sufficient speed through the cell. If the flow is too low, scale could build on the electrodes. If the installation is not provided with a dedicated pump for the chlorinator, adjust the flow rate by acting on the by-pass centre valve.

Flow switch

Install the flow switch preferably downstream. Install the T-fitting horizontally so that, once installed, the flow switch will stand vertically. If you cannot install the switch vertically make sure the arrow points up, NEVER DOWN. Before tighten the flow switch verify that the O ring is on its housing and that the arrow marking on the switch body matches the water flow direction.

Cell cables

Connect each cell cable pair (black and blue) on a different cell side. The black cables must be on the black centre pins and the blue ones on the side blue pins. Push the connectors down to the top. Make sure the two cable pairs are not mixed: one pair on a side, the other pair on the opposite side.

5. PUMP COMMISSIONING



Verify that the locking cell rings are properly installed before starting the pump. Press the rings outwards along their entire length to make sure they are entirely inserted in the slots .



When water is being injected into the cell, make sure that there aren't any CLOSED VALVES downstream because the pressure generated will break the cell housing. Similarly, NEVER CLOSE any valves downstream when the pump is running.

Before starting the pump for the first time, open the central by-pass valve fully to avoid any over pressure in the cell housing. Once the pump is running, open the inlet and outlet valves slowly until they are fully open. You can then partially close the central valve in order to send the flow through the cell until you have a rapid and uniform flow. The water must flow at a sufficient speed through the cell. If the flow is too low scale could build on the electrodes. If the installation is not provided with a dedicated pump for the chlorinator, adjust the flow rate by acting on the by-pass centre valve.

When the cell is being filled the air trapped in the cell housing can prevent the water to flow. You can temporarily loose the flow switch in order to evacuate the air inside. Once the cell housing is completely filled, don't forget to retighten the flow switch. Verify that the arrow marking on the flow switch corresponds to the water flow after retightening.

6. ELECTRICAL CONNECTIONS

Power supply cable

The chlorinator must be powered to 230 VAC. Connect the three-wire power supply cable (marked "230 VAC power supply") to a permanent 230 VAC mains power supply with protective earth. The voltage on this cable must be kept constant as long as the chlorinator is in use. **DO NOT INTERRUPT** the power on this cable along the pump working cycles or by means of any other control device. In order to control the chlorinator production cycles use the **External Control Cable**. Disconnect the power supply only when you are not going to use the chlorinator or in case of fault.



The chlorinator must imperatively be connected to a protective earth through its power supply cable and protected by a 30 mA residual circuit breaker.

External Control Cable

The two-wire cable marked "**EXTERNAL CONTROL 230VAC**" is used to start and stop the chlorine production synchronically with the pump working cycles or by means of a control device. When the voltage applied between the two wires is 230VAC the chlorinator will produce chlorine. When the voltage between the wires is 0 VAC the chlorinator will halt the chlorine production and enter a pause mode. Therefore, the voltage applied to the control cable must be driven by the same means, signal or device that powers or controls the pump.

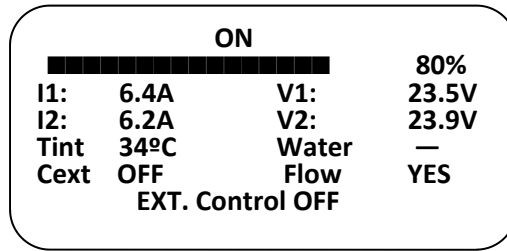


Make sure that the voltage applied to the External Control Cable is 230VAC ONLY when the pump is running and the water flows freely through the cells and to the pool.

6. OPERATION

The SMC150 cell is controlled by means of a keyboard and a display. In an electrolytic cell, chlorine generation is proportional to the electrical current flowing through it. The SMC150 will try to maintain a constant electrical current in the cell according to the chlorine production rate (0—100%) set by the user. The values of current and voltage in the cell are constantly displayed in the main screen. In normal conditions and at 100% production rate the current values (I1, I2) must be between 11.0 and 13.5 A.

6.1 Main Screen Readings



Description:

ON	→	Production state
████████████████████	→	Chlorine production setting
I1: 6.4A	→	Cell 1 working values
I2: 6.2A	→	Not used in these models
Tint 34°C	→	Temperatures Not used
Cext OFF	→	Ext. control Flow Switch
V1: 23.5V		
V2: 23.9V		
Water —		
Flow YES		

ON/OFF: indicates production state. To toggle between ON and OFF press the **MENU (ON/OFF)** key for at least two seconds.

Production setting: Indicates the current chlorine production rate. It can be adjusted by pressing the **↑** **o** **↓** keys.

I1, V1, I2, V2.: Indicate the cell working values and provide a valuable information for checking and diagnose. At 100% production rate and in normal conditions I1 and I2 should be between 11.0 and 13.5 A.

Tint: Cabinet interior temperature.

Water: Water sensor state (— when not implemented).

Cext: External control signal (signal read by the External Control Cable)

Flow: Indicates the state of the flow switch.

6.2 Switching the unit ON and OFF

To alternatively switch the unit ON and OFF, make sure you are in the main Screen and press the **MENU (ON/OFF)** key for about two seconds. If the display was not in the Main Screen, you can always come back to it by pressing one or several times the **MENU** key. The unit state (ON or OFF) is indicated in the upper line of the display.

When you connect the mains power supply for the first time, the display will light and the unit will remain in **OFF** state. Depending on how the unit has been programmed, whenever the mains is disconnected, the unit will remain in **OFF** state or will remember its previous state (ON or OFF) once the mains power has been restored.

To control the chlorine production according to the pump running cycles or any other signal use the External Control Cable as explained in section 5. **DO NOT** disconnect and reconnect the mains power supply cable.

When the unit is in **OFF** state the chlorine production is not allowed but you will still have access to the production settings, menus and to all working parameters.

6.3 ON state : Chlorine production

By pressing the **MENU (ON/OFF)** key for two seconds the display will show **ON** in its upper line and the chlorine production will start (provided all signal readings are OK: Flow = ON, Cext = ON, etc.). The **I1, V1, I2, V2** values will increase progressively until they reach the cell working point. You can adjust the chlorine production rate at any moment by pressing the **↑** or **↓** keys. There is a minimum production adjustable rate (normally 30%) to prevent the cell from working out of its optimal performance range.

In **ON** state, the chlorine production is started or halted according to the External Control Cable signal. The state of this signal is always shown on the screen next to the "**Cext**" label.

- When the External Control Cable signal is ON (230 VAC between its wires), the **Cext** reading turns **ON** and the chlorine production is started.

- When the External Control Cable signal is OFF (0 VAC between its wires), the **Cext** reading turns **OFF** and the chlorine production is halted until the signal turns on again. This pausing state is also indicated on the screen bottom line with the message **CONTROL EXT. OFF**. Be aware that, even if the production is halted, the unit is still in **ON** state.

7. DISPLAY MESSAGES

The bottom line of the screen is used to indicate the following states or faults:

CONTROL EXT. OFF

This message is displayed when the unit is in ON state but the control signal is in OFF state (external control cable wires at 0 VAC). The production is halted until the signal will turn back ON.

NO FLOW

The flow switch has detected NO FLOW. The system stops the production and turns the unit to OFF state. If the user press OK to confirm the message, the unit will stop displaying the message and will then remain in OFF state indefinitely until the user turns the unit ON again (**MENU (ON/OFF) + 2 seconds**). If water flow is detected again before the user has pressed OK, the unit will come back to ON state and the chlorine production will resume.

CELL NOT DETECTED

The system does not detect the a cell and turns the unit OFF. Verify if the cell is properly connected or if salt has been added to the pool. Press OK to confirm the message. The system will stop displaying the message and the unit will go on OFF state. Once the problem has been solved, the user can turn the unit ON again.

LOW SALT

The estimated salt concentration is lower than the optimum working range. The unit will remain in ON state and chlorine production will continue normally. This message can also be displayed if the water is too cold, the electrodes are worn-out or calcium has built up on the electrodes.

SALT TOO LOW

The estimated salt concentration too low and out of the working range. The system will stop the production to avoid damage to the cell. This message can also appear if the cell is not properly connected. Press OK to confirm the message. The system will stop displaying the message and the unit will go to OFF state. Once the problem has been solved, the user can turn the unit ON again.

PAUSE 04:54

When the system is carrying out a polarity inversion, the unit enters a pause mode and the remaining time is displayed on the screen.

8. MENUS

To enter the menus, press the MENU key and move up or down between the different sub-menus using the ↓ ↑ keys. To enter a particular sub-menu press OK. Once in a sub-menu use ↓ o ↑ to change a parameter, MENU to go to the next parameter and OK to confirm and save changes. Then, use MENU once or more times to come back to the Main Screen.

8.1 Functions menu

8.1.1 Language

Select the language and press **OK**.

8.1.2. LCD Contrast

This menu is no longer implemented . In order to be able to adjust the contrast even when an incorrect setting does not allow to read the screen, a potentiometer marked with “**CONTRASTE**” has been mounted on the PCB, in the reverse side of the display. If you need to adjust the contrast, open the cabinet door and use a small screwdriver to turn it slowly until the contrast is OK.

8.1.3. Readings

This is an only-read screen that provides a list of system measurements. These values are used for diagnose in technical support.

8.1.4. 4-20 mA Control

Activate or deactivates the 4-20 mA external control.

8.1.5. pH Adjustment —option

Follow the instructions joined when the pH option has been included.

8.2 Status menu

This is an only-read screen that provides a list of system measurements. These values are used for diagnose in technical support.

8.3. Programming menu

The access to this menu requires a password. **DO NOT enter this menu or try to change any of its parameters. Any parameter alteration will reconfigure the system and lead to a fail of the security systems.**

9. REGULAR MAINTENANCE

The SMC50-75 requires a minimal maintenance that is basically reduced to the inspection and cleaning of the cell and its connections. Nevertheless, this minimal maintenance is fundamental for good operation and performance of the unit and to avoid future expensive failures.

9.1 Cell

Inspect the cell frequently. The electrodes blades should be clean and free from any build up or objects. The water must flow rapidly and without any obstacle through the tubular cell to avoid calcium build up. If you observe high turbulence near the water inlets or a low flow speed, increase the water speed through the cell by sending more flow to cell the by-pass (closing g the central valve). If the water hardness is very high, even a fast flow won't prevent the scale from building up. If this occurs decrease the polarity period and make sure the water pH stays close to 7.0.

The polymer seal under the cell cap and the protective sleeves of the electrode rods must both be intact. If any damage is observed, send the cell to the technical service for inspection and reconditioning.

The electrodes of the SMC75 cell have been build using the most advanced technique in the market and with a very high quality control. However there are several situations that can reduce the performance and the life span of any electrode and you should avoid them:

- Operation with a low water level or flow in the cell
- Operation with scale build up on the electrodes
- Frequent acid cleansing
- Water pH too high or too low
- Acid injection before the cell

9.2 Cell pins

Check regularly the connection area of the cell and make sure it's completely dry and clean. Turn the unit OFF and remove the cell connectors. Verify that all the pins are moderately tighten.



Tighten the pins preferably by hand. If you use a wrench, do it very carefully because you could easily damage the sealing or the electrodes.

10. WARNINGS



- NEVER power the unit without being connected to a protective earth conductor.
- NEVER operate the chlorinator without an external 30 mA residual circuit breaker protection.
- NEVER operate the chlorinator if the pump is not running or if the flow through the cells is too low.
The gas generated in the electrolytic proceeds could break the cell and eventually explode.
- NEVER install the chlorinator before the filter or any other element. The chlorinator must be the last element the water passes through before returning to the pool. Otherwise the gas generated in the cell could build up in the circuit and cause an explosion.
- DO NOT access the Programme menu or change any parameter in it.
- ALWAYS keep the cell caps, cell terminals, and cell connectors completely dry. Salty water or moisture will create an electrolytic process and corrode the connectors rapidly..
- ALWAYS keep acid tanks away from the unit room.