



CrystalChlor CSM

salt water chlorinator

INSTALLATION & OPERATING INSTRUCTIONS



MODEL: CSM RANGE

CrystalChlor CSM

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1. IMPORTANT WARNINGS & SAFETY INSTRUCTIONS

1.1 Important Warnings



This manual contains important information about the installation, operation and safe use of this product. This information should be given to the owner and/or operator of this equipment. When installing and using this electrical equipment, basic safety precautions should always be followed. Failure to follow safety warnings and instructions in this manual can result in serious injury and/or damage to your equipment. Read and follow all warning notices and instructions which are included in this manual.

The Power Pack internally contains live components. There is a danger of electric shock if opened. If the power cord is damaged then it should be replaced by the manufacturer, their agent or similar qualified person, in order to avoid a hazard. The product shall be installed according to AS/NZS 3000 wiring rules. It shall be installed outside the pool zone.

1.2 Important Safety Instructions



To reduce the risk of injury, do not permit young children to use this product unless they have been trained by the person responsible for their safety and they acknowledge their ability to use such equipment. To reduce the risk of accidents or incidents, service on the unit should only be performed by a qualified pool service professional.



When mixing acid with water, **ALWAYS ADD ACID TO WATER. NEVER ADD WATER TO ACID.**



DO NOT PLUG UNIT IN IF CARTON HAS BEEN WET.



CHLORINE GAS BUILDUP CAN OCCUR WITH IMPROPER WIRING: To reduce the risk of personal injury the Power Pack is designed so that the Electrolytic Cell will only receive power when the pool pump is on. Otherwise, dangerous chlorine gas build-up can occur. If the pump is not installed to the AC Socket (pump outlet) on the Power Pack then the installer must ensure that the Electrolytic Cell is never energised when the pool pump is OFF or water is not flowing through the unit.

Should you require further information visit
www.crystalclearaus.com

2. GENERAL OVERVIEW

Congratulations on your recent purchase of your CrystalChlor™ CSM Salt Water Chlorinator. Please take a moment to read through the entire manual before installing your new unit. Your chlorinator must be installed and operated as specified.

While every effort has been made to ensure that the information contained in this guide is accurate and complete, no liability can be accepted for any errors or omissions. Crystal Clear Chlorinators reserves the right to change the specifications of the hardware and software described herein at any time without prior notice.

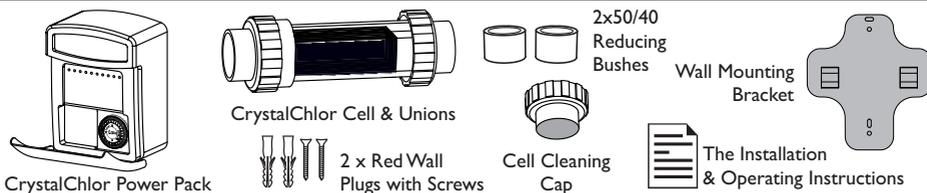
Please remember that your CrystalChlor™ CSM Salt Water Chlorinator is not designed to chemically maintain your pool water and keep it balanced, but rather to produce chlorine from a mild salt solution within the water. We encourage regular water testing, balancing and correction if & when required to maintain the recommended balanced levels of your pool water. This is a vital part of a complete maintenance program and will ensure trouble free performance as well as a healthy and sparkling clean pool.

Thank you again for choosing a "Simply Reliable" CrystalChlor™ CSM Salt Water Chlorinator. We wish you many happy years of swimming in your "Crystal Clear" pool.

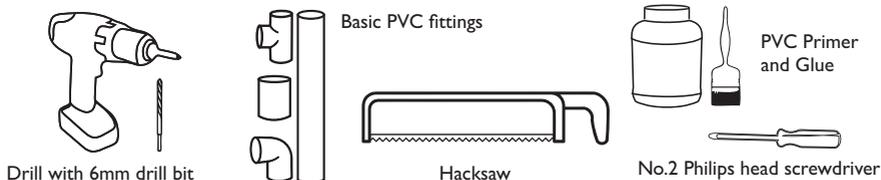
2.1 Recommendations and Helpful Hints

- Read and keep your manual in a safe place.
- Increase chlorine production when temperature goes up.
- Increase chlorine production when number of swimmers increases.
- Use stabiliser (cyanuric acid) to stabilise chlorine in pool.
- Decrease production when temperature goes down – (during winter).
- Take pool water sample to your local pool professional at least twice a month.

2.2 Contents



2.3 Tools Needed



**Should you require further information visit
www.crystalclearaus.com**

3. POOL PREPARATION

Before operating your CrystalChlor™ unit please read the following:



- Check your salt levels with your local pool professional before installing your unit.
- Salt levels should ideally be 2500–3500ppm (0.25–0.35%)
Suited for high salt pools (CAN BE USED WITH SEA WATER)
- **NEVER ADD SALT DIRECTLY TO THE SKIMMER BOX.** This high concentration of salt will pass through your filtration, pump and other pool equipment.
- For all new pool installations please seek advice from your pool builder before adding salt as some new surfaces request no salt to be added when initially completed.

Handy Tips

- The colder the water the lower your output but this does not mean you need more salt. There will always be less chlorine demand in colder water.
- We recommend 3.0kg per 1000 litres (1 cubM) of pool water and a 50 000 litre (50 cubM) new pool needs approximately 150kg of salt.
- The unit can operate on mineral/magnesium chloride salts and you should allow an extra 20 – 30% on the ppm for these types of salts.
- Salt should always be added to the shallow end of the pool and allowed to dissolve. Do not let the salt settle on the floor of the pool as this may cause damage to the surface. Use your pool brush to mix the salt into the water.
- Running the pump will mix the water and help the salt to dissolve.
- Only run the pump in the first 8 – 12 hours (ensure the Cell is switched off) to allow the salt to dissolve.
- If you press the Increase output button for 10 seconds and can get all 10 lights ON then you have enough salt. DO NOT ADD ANY MORE SALT.

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4. POWER PACK & CELL ELECTRODE INSTALLATION

4.1 Power Pack Installation



- The CrystalChlor™ CSM Power Pack has a Ingress Protection Rating of IP23 enabling it to be installed outdoors. Regulations require that the Power Pack shall be installed outside the pool zone.
- The Power Pack shall be installed according to AS/NZS 3000 wiring rules.
- The Power Pack should be installed in a well ventilated position ideally away from sunlight and rain to prolong life and at least 1m above ground to prevent run off water entry.
- Ensure that the Power Pack is not stored near chemicals, fertilisers or in a closed unventilated shed with similar products as the fumes will cause excessive corrosion and damage to the Power Pack and Control Board.
- When mounting the Power Pack on a post it is recommended to install a flat panel at least the size of the Power Pack to act as a waterproof backing plate.
- Mount the Power Pack with the Red Plugs, Mounting Screws and Wall Mounting Bracket provided.



The Power Pack should be mounted no further than 1.5 metres from the chlorinator Cell, for ease of operation of the controls on the Power Pack.

4.2 Cell Electrode Installation



- Connect the Cell Housing horizontally in the return line to the pool (use reducing bushes supplied if 40mm PVC pipe) using high pressure PVC glue. The Cell Housing can be mounted vertically but provision must be made for a gas trap (as seen in the installation diagram over the page in 4.3) .
- Direction of water flow through the Cell Housing must follow the direction as indicated on the Cell Housing.
- Check that the O-rings are clean, greased with silicone grease (DO NOT use petroleum based jelly) and securely located in either end of the Cell Housing.
- Fit the Cell Electrode and ensure both Cell Locking Rings are firmly tightened by hand (DO NOT use a tool to tighten).
- Connect the leads from the Power Pack to the Cell ensuring the Brass Pins are inserted fully into the sockets on the Cell Housing and the Water Sensor lead is pressed firmly into position.
- Plug the Power Pack 3 pin plug into a suitable weatherproof RCD protected 10amp outlet and then plug the pump into the 3 pin AC Socket located at the bottom of the Power Pack.

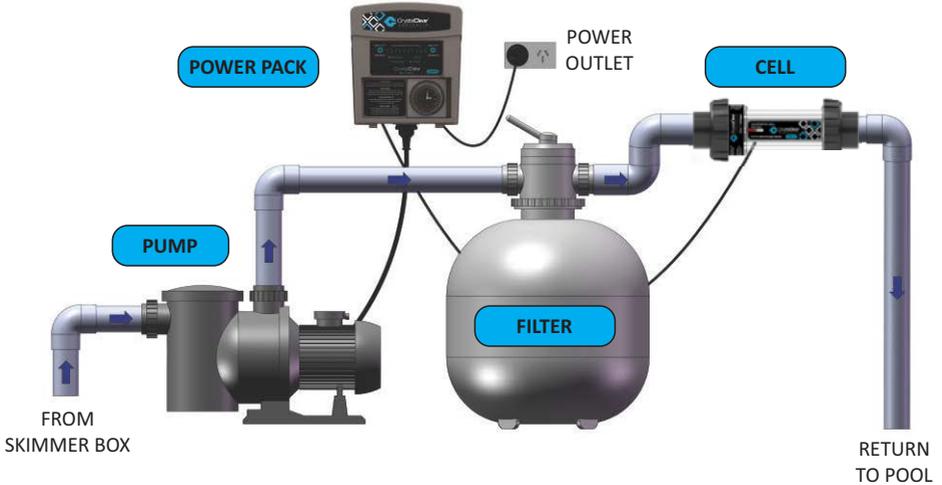
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4. POWER PACK & CELL ELECTRODE INSTALLATION

4.3 Installation Diagram

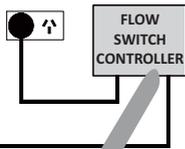
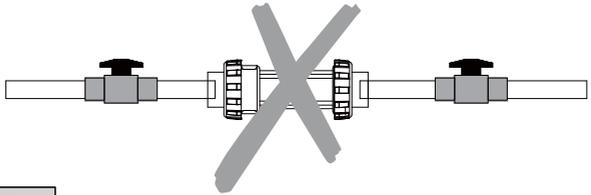


⚠ WARNING: DO NOT plug in if carton has been wet.

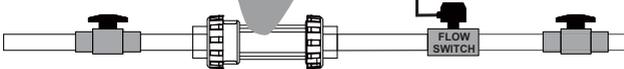


4.3.1 Cell with Valves and a Flow Switch

INCORRECT: Never use valves in-line with the cell **WITHOUT** a flow switch.



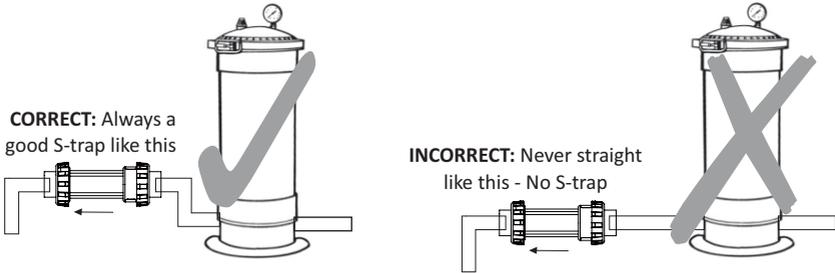
CORRECT: Always have a flow switch (not-included) for each Cell or set of Cell between two valves.



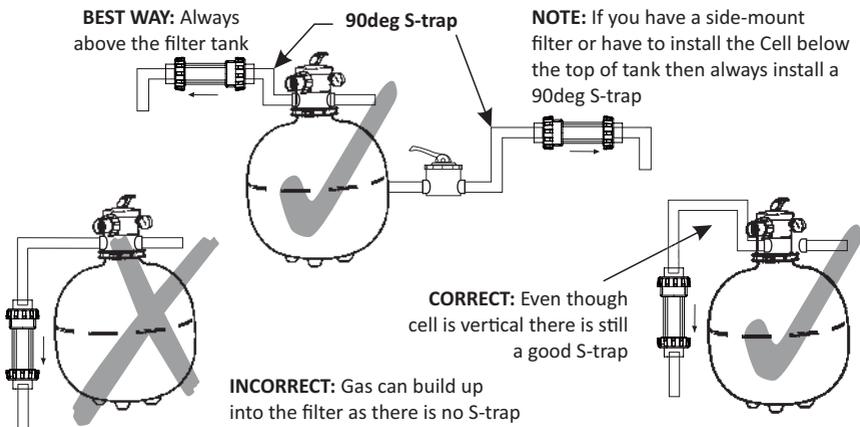
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4. POWER PACK & CELL ELECTRODE INSTALLATION

4.3.2 Cartridge Filter and Cell Installation



4.3.3 Sand Filter and Cell Installation



Important Notes



- The pump rating must not exceed 8amps.
- Saltwater may damage the electrical components in the Power Pack.

WARNING:

- We **DO NOT** recommend the use of valves on the inlet or outlet of the Cell Housing. If you do use a valve then it is important to ensure that the valve cannot deadhead (lock closed) while the pump is running. It is the installer's responsibility to ensure some form of flow control is installed in this instance and it disables the pump.
- **ALWAYS** ensure that pipe work and equipment do not allow gases generated from the Cell to collect and build up in any part of the installation.
- It is **RECOMMENDED** that the Cell Housing be installed horizontally to create a natural gas trap that acts as a safety device. Installation in any other way may cause explosion, injury or death if the installer does not allow for gas removal.
- The Cell Housing must be installed in the **RETURN** pipework to the pool. It must always be installed after the filter, gas heater, solar heating or heat pump.
- **DO NOT** apply priming fluid to the Cell Housing, it is not needed and may react with the plastic.

5. POWER PACK OPERATION

5.1 Output LEDs

There are ten chlorine production indicating LEDs. Each indicator corresponds to 10% of chlorine production.

5.2 Decrease Button

A single press of this button decreases chlorine production by approx. 5%. In order to turn OFF chlorine production it is necessary to press the button several times to make sure all chlorine production indicators are off.

5.3 Increase Button

A single press of this button increases chlorine production by approx. 5%. When all ten lights are ON the chlorine production is 100%.

5.4 Water Flow LED

In normal operation this LED should be OFF. If the water flow indicator is flashing or ON, the chlorinator is in the Stand By mode and there is no water flowing through the Cell. Please ensure that the pump is running and there is water passing through the Cell. It may take a few minutes for this indicator to reset. At any stage that the Water Flow LED is ON pressing either the INCREASE or DECREASE buttons will try to start up the unit again.

5.5 Forward LED

When this is ON it indicates that the chlorinator is operating in the Forward Direction.

5.6 Reverse LED

When this light is ON it indicates that the chlorinator is operating in the Reverse Direction.

5.7 Power Status LED

In normal operation if the LED is on steady then everything is functioning normally. If the power light is flashing then one of the following will apply.

- Output set too low (<30%) needs turning up Cell.
- Salt level too low. Only add salt after a professional water test.
- Calcium has built up on the Cell. Clean the cell to lift output.
- Cell may be failing and a new Cell is needed to lift output.

5.8 Timer

The time clock controls the operating hours of the chlorinator. See section 6 for Timer setting instructions.

5. POWER PACK OPERATION

5.9 Start Up Procedure

- Plug the Power Pack 3 pin plug into a suitable weatherproof RCD protected 10 amp outlet and then plug the pump into the 3 pin AC Socket located at the bottom of the Power Pack.
- Ensure the Cell is connected and make sure the Brass Pins are inserted fully into the connections on the Cell Housing.
- Turn the 10 amp wall outlet supply switch to "ON".
- The pump should start up and prime.
- LED's 1,2 and/or 3 will light up for 0.5 seconds.
- The last saved output set point is displayed on the top ten LED's.
- The Power status LED will be on.
- Either the "Reverse" or "Forward" LED will be on.
- Set the Timer to run 6 – 10 hours per day in the summer and 3 – 6 hours per day in the winter. Refer to sec. 6 Timer setting for further details.
- Ensure the White Lever on the Timer is in the Automatic position and leave it here to run the chlorinator automatically.

5.10 Temporary Change of Polarity

- Start with the unit "ON" and identify if it is operating in the FORWARD or REVERSE direction.
- Turn the unit off by moving the White Lever on the Timer to the "OFF" position.
- Wait 10-15 seconds and then return the White Lever to the "ON" position.
- The polarity should change and the LED will display the opposite direction now.
- The unit will stay in this direction for 2 minutes and then revert back to the original direction.
- Return the White Lever on the Timer to the "AUTOMATIC" position for normal operation.

5.11 Modifying the Polarity change frequency

The polarity will change every 10 hours in normal operation (factory set). This polarity change can be permanently set to 10hrs, 7.5hrs or 5hrs if required. Only lower this time if the Cell is not cleaning (mainly due to very high calcium levels).

IMPORTANT: The platinum coating on the Cell plates may not last as long with quicker change over times as a percentage of the wear on the coating is related to the number of polarity changes.

To permanently set the polarity change frequency follow the directions below.

- Start with the unit "OFF".
- Press and hold the "DECREASE" button.
- Turn the unit "ON".
- Release the "DECREASE" button when the left 3 OUTPUT LED's are flashing indicating 10hrs (to save this setting turn unit "OFF" now).
- To change to a 7.5hr cycle press the "INCREASE" button once and the first 2 OUTPUT LED's will be on indicating 7.5hrs (to save this setting turn unit "OFF" now).
- To change to a 5hr cycle press the "DECREASE" button once and only the first OUTPUT LED will be on indicating 5hrs (to save this setting turn unit "OFF" now).
- After 10 seconds turn the unit "ON" and confirm that the number of LED's that light up correspond to the setting you desire. (3 LED's = 10hrs, 2 LED's = 7.5hrs, 1 LED = 5hrs).

All CrystalChlor™ Self Cleaning models are controlled by a Main Power Supply PCB that performs several functions, including the change of current direction and water sensing.

6. TIMER SETTING



Your CrystalChlor™ CSM unit comes with a simple to operate quartz mechanical Timer which has a built in battery back up function.

This area of set up is critical and we recommend you take time to read it and understand why we recommend certain settings.

Obviously sunlight and higher bather loads in summer dissipate more chlorine than in winter. That is why you need to check your chlorine reading regularly and adjust your settings when required.

It is recommended to run the unit for 2 periods every day (early morning and evening) when the sun extracts the least amount of chlorine from the pool, giving it time to do its work.

Summer Settings



Ideally, run for 4 hours in the morning (6 – 10am) and 4 hours in the evening (4 – 8pm).

For a smaller pool you can run less hours. In extreme weather it may be necessary to run longer hours.

Winter Settings



In winter you should lower your running time by up to 50% of your summer setting depending on your free chlorine levels. You should ideally run 2-3 hours in the morning and 2-3 hours in the evening. This preserves and extends the life of your equipment.

Important Notes



For Timer settings to control the unit the White Lever needs to be in the AUTO position.

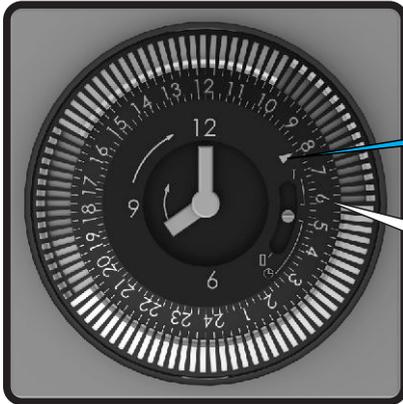
WARNING:

ALWAYS TURN THE CLOCK FACE CLOCKWISE NEVER ANTI – CLOCKWISE. You will strip plastic gears and damage the Timer.

Should you require further information visit
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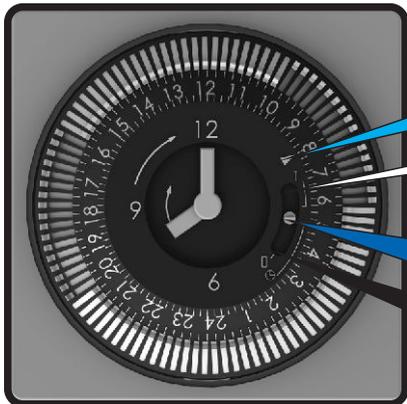
6. TIMER SETTING

To adjust the time of the clock, simply hold the outside of the white segments and turn the dial until the clock reads the right time and the number near the timer on/off arrow is close to the same number.



This time is set at 8:00am and the dial pointer shows the 8:00 position as does the clock face hands

The Timer comes on where the pins that are pressed out reach the White dial pointer (in this case it will be from 6 – 10am and 4 – 8pm)



When White adjustable segment pins reach this dial pointer (in AUTOMATIC position) the Power Pack turns: **ON** if pins pressed out
OFF if pins pulled in

With White Lever in this position power pack is **ON**

With White Lever in this position Power Pack is in AUTOMATIC and the timer setting turns it **ON/OFF**

With White Lever in this position Power Pack is **OFF**

Your Timer is simple to use, easy to understand and a reliable well known design. It has a battery back up function if you operate your pool equipment from a low tariff supply that turns off at times. It does require at least 12 hours charging at first but simply leave it alone and it will charge itself as required.

7. WATER CHEMISTRY



The CrystalChlor™ CSM unit is designed for use with swimming pool water balanced in accordance with the Langelier Saturation Index with a pH range of 6.8–7.8.

As previously advised, for best performance and operation of your CrystalChlor™ CSM unit, certain water balances must be maintained within your swimming pool. Have your water tested regularly. Transport the test water in an opaque container and have the test done as soon as possible for the most accurate results. Following is a list of recommended water chemistry levels.

7.1 Chlorine

Measurement Interval: Once a week

Ideal Chlorine (Free Chlorine) Levels: 2 – 3ppm (2 – 3mg/L) and no more than 4ppm (4mg/L).

Adjust the chlorine output by pressing the Increase or Decrease output buttons, a single press of the button adjusts the output by approx. 5%. When all ten lights are ON the chlorine production is 100%.

7.2 Salt

Measurement Interval: Every 4 – 6 weeks

Ideal Salt Levels: 2500-3500ppm

Although salt is not consumed by the chlorinator, salt is lost during backwashing, pool overflow, splashing and on bathers that use it. The correct salt level allows for the most efficient production levels and electricity consumption.

The salt level **SHOULD NOT** go below 2500ppm. Operating the unit with too little salt in the pool will cause damage to your Cell.

Salt is the essential element by which your unit operates. Not enough salt means not enough chlorine – this simple rule governs the total operation of your CrystalChlor™ CSM unit, and insufficient salt will damage your Cell.

The unit will operate with good stability on higher salt levels but it is still advisable to run at the correct level to prevent damage should the output be turned up by accident. **It is important to note that the unit can operate with sea water.**

Important Notes



- **NEVER ADD SALT DIRECTLY TO THE SKIMMER BOX.** This high concentration of salt will pass through your filtration, pump and other pool equipment.
- **HANDY TIP:** If you press the Increase output button for 10 seconds and can get all 10 lights ON then you have enough salt. **DO NOT ADD ANY MORE SALT.**
- The colder the water the lower your output but this does not mean you need more salt. There will always be less chlorine demand in colder water.
- We recommend 3.5kg per 1000 litres (1 cubM) of pool water and a 50 000lt (50 cubM) new pool needs approximately 150kg of salt.
- The unit can operate on mineral/magnesium chloride salts and you should allow an extra 20 – 30% on the ppm for these types of salts.
- Salt should always be added to the shallow end of the pool and allowed to dissolve. Do not let the salt settle on the floor of the pool as this may cause damage to the surface. Use your pool brush to mix the salt into the water.
- Running the pump will mix the water and help the salt to dissolve.
- Only run the pump in the first 8-12 hours (ensure the output control is set to zero lights) to allow the salt to dissolve.
- **Low salt levels (<1500ppm) will destroy the coating on the Cell and void the warranty.**

7. WATER CHEMISTRY

7.3 pH

Measurement Interval: Once a week

- Ideal pH Levels:
- Concrete Pools: 7.4 – 7.6
 - Fibreglass/Vinyl Pools: 7.0 – 7.2

A pH of 8.0 makes your chlorine only about 26% efficient so that is why it is critical to keep your pH in range.

A correct pH level must be maintained to prevent problems such as black spot, staining, cloudy water, etc. An incorrect pH level can damage the surface finish and walls of your pool.

- When pH is high you can add hydrochloric acid to lower the pH.
- When pH is low you can add sodium carbonate (soda ash) to increase the pH.

7.4 Total Alkalinity

Measurement Interval: Every 4 – 6 weeks

- Ideal Total Alkalinity Levels:
- Concrete Pools: 80 – 150ppm
 - Fibreglass/Vinyl Pools: 80 – 120ppm

Total Alkalinity should not be confused with pH, although the two are closely related. Total Alkalinity determines the speed and ease of pH change, it is measured in ppm. You should use a test kit which includes a test for Total Alkalinity. Low Total Alkalinity can cause unstable pH levels. This causes an inability to keep the pH constant and may cause staining, etching and corrosion of metals. High Total Alkalinity will cause constantly high pH levels.

- When Total Alkalinity is high you can add hydrochloric acid (a little at a time) to lower the Total Alkalinity.
- When Total Alkalinity is low you can add sodium bicarbonate (buffer/baking soda) to raise the Total Alkalinity.

7.5 Calcium Hardness

Measurement Interval: Every 3 months

- Ideal Calcium Hardness Levels:
- Concrete Pools: 250 – 300ppm
 - Fibreglass/Vinyl Pools: 150 – 190ppm

In addition to pH and Total Alkalinity, Calcium Hardness must be kept in balance so that your pool water does not become too corrosive or end up scaling the surface of your pool. These are symptoms of swimming pool water that is unbalanced.

7.6 Stabiliser

Measurement Interval: Every 4 – 6 weeks

Ideal Stabiliser Levels: 30 – 70ppm

The importance of pool Stabiliser cannot be over emphasised. It is essential in helping retain chlorine in your pool. Chlorine is rapidly dissipated by sunlight and the use of Stabiliser will reduce this dissipation dramatically. Without Stabiliser, it may be necessary to run the unit for longer hours.

THE MOST IMPORTANT NOTICE AND WARNING



Only add chemical in the method and quantities as indicated on the packaging provided or advised by your local pool professional. Also, if in doubt of any results you achieve then do not hesitate to consult with your local pool professional.

8. CHLORINATOR MAINTENANCE



Maintenance of your CrystalChlor™ CSM Salt Water Chlorinator is simple and a saltwater chlorinator has to be one of the most productive pieces of equipment on your swimming pool so it requires some basic maintenance.

While water chemistry will always be the most important form of maintenance there are also other hints and pointers to take note of.

- **DO NOT** cover the Power Pack with towels or similar. There are vents that could be closed and these need air to keep the unit cool.
- To extend the life of your unit we always recommend installation in an under cover area away from the elements.
- Placing the unit in a closed shed or similar environment with chemicals, fertilisers and other corrosives will damage the unit and could void your warranty.
- Keep the chlorinator off at all times during backwash cleaning of your filter by turning the Cell Switch to the OFF position. Please remember to turn it on once done and return the unit to AUTO mode.
- Check that the Brass Pins are tight and Cell leads are in sound condition at least once a

8.1 Inspecting and Cleaning the Power Pack

Little or no maintenance is normally required with the CrystalChlor™ CSM Power Pack.

Ensure the Power Pack 3 pin plug plugs into a suitable weatherproof RCD protected 10amp outlet. Ensure that the pump plugs into the 3 pin AC Socket located at the bottom of the Power Pack. Check all plugs and cords for damage. If damaged then it should be replaced by the manufacturer, their agent or similar qualified person, in order to avoid a hazard.

If the chlorinator is to be hard wired, then a qualified electrician must complete the installation.

The CrystalChlor™ CSM Chlorinator Power Pack has small air vents and a fan inside the Power Pack to allow internal components to remain cool in hot weather. The CrystalChlor™ CSM Power Pack has a special oil spray applied to the inside of the unit during production to stop the insects from entering the unit. To help assist in keeping the insects away, apply a surface spray periodically on the wall or post that the unit is mounted on. **DO NOT** spray directly into the Power Pack and make sure the power is off when you spray. Allow adequate time for the spray to dry before turning power on again.

Should you require further information visit
www.crystalclearaus.com

8. CHLORINATOR MAINTENANCE

8.2 Inspecting and Cleaning the Cell Electrode

Reverse Polarity cells should not normally require cleaning, however, in areas with very hard water all calcium may not be removed. A calcium deposit might form on the lower areas of the cell, the sensor or the sides of the cell plates. This will NOT affect the operation of your chlorinator. **IMPORTANT:** Excessive calcium build up is not a chlorinator problem but rather a water balance issue.

All salt chlorinator cells must be cleaned before scale/calcium builds up to the point where the electrode gaps in the Cell are bridged. If the Cell has excessive calcium deposit, this may damage the electrode coating, as the bridging causes rubbing on the plate coating and this will affect the operation.

Check the Cell frequently to prevent the accumulation of pool debris that for any reason may have by-passed the pool filter, particularly after backwashing.

Check that the O-rings are clean, greased with silicone grease (**DO NOT** use petroleum based jelly) and securely located in either end of the Cell Housing.

For cleaning, please follow these steps:

- Switch off the wall outlet switch as this ensures the pump and CrystalChlor™ CSM unit will not turn on.
- Unscrew the Cell Locking Rings and remove the Cell for inspection. If calcium build-up is present, use the acid blanking cap provided and immerse the electrode in cell cleaning solution. It is advisable to always remove the Cell for inspection as it may be difficult to actually see calcium build up in some circumstances.
- A solution can be made by mixing 1 part hydrochloric acid to 10 parts of water. If excessive build up is present a stronger solution may be used to remove the calcium. Using 5 parts of water will make a more aggressive solution but will not damage the Cell. You can use Cell Cleaning Solutions and if you do then follow the instruction supplied.
- Allow the cleaning solution to dissolve the calcium deposits for 10 minutes. Dispose of the cleaning solution at an approved Council Depot and never into storm water or sewage drains.
HANDY TIP: Returning this mix to your pool only returns the calcium you just removed, so you may be better off reusing the solution until exhausted then disposing of it. Always store this solution in a safe method as advised on the container.
- Do not scratch or bend the cell plates in the Cell Housing.
- Ensure that the O-rings are clean, greased and properly seated.
- Rinse the electrode in clean water and ensure that you dry the connections before you re-fit the Cell into the system, ensuring that the Cell Locking Rings are hand tight and secure.
- Turn on the wall outlet switch and the pump and chlorinator will return to the mode it was in before.
- Turn on the unit and confirm chlorine output and Timer settings on the Power Pack.

WARNING



When mixing acid with water, **ALWAYS ADD ACID TO WATER. NEVER ADD WATER TO ACID.**

Eye Protection, mask and gloves should be worn when cleaning the Cell.

9. CHLORINATOR TROUBLESHOOTING

If you suspect for any reason your CrystalChlor™ CSM Chlorinator is not performing or running as it should be, here are some handy troubleshooting tips that may assist you.

9.1 Not operating at all – no lights

Potential Cause	Remedy
Not plugged into power point or power point not turned on	Check that unit power cord goes into wall outlet and outlet is turned on
Plugged into power point and turned on but still no power	Test wall outlet with a working appliance
Wall outlet working but still no power	Move white lever on Timer to the ON position
White lever in the ON position but still no lights	If you have checked all of the above then there is an internal fault - call for service

9.2 Power and Direction Lights on - No output lights

Potential Cause	Remedy
Cell is not connected	Check Brass Pins and Cell connections and tighten if needed
Output set too low	Adjust output with the Output (+) button and output lights should increase
Excessive calcium build up in the Cell	See Cleaning of Cell Electrode (sec. 8.2)
Low salt level	Check salt level (sec. 7.2)
The Cell could be damaged or at the end of its life	Damaged coating will reduce Cell life and reduce output. If all conditions are correct then Cell could be at the end of its life
Faulty control PCB or Faulty Main Power Supply PCB	Call for service

9.3 Water Flow LED on and no output -

Potential Cause	Remedy
Low or no water flow	Ensure sufficient water flow through chlorinator Cell Check that the pump is ON and running Look for air pocket - perform backwash if needed Check skimmer and pump baskets are clean and securely tightened Check for suction leaks Seek advice from a pool professional for any of the above
Cell is not connected	Cell and Brass Pins and Cell connections and tighten if needed

9.4 Low output reading

Potential Cause	Remedy
Output set too low	Adjust output with the Output (+) button and output lights should increase
Low salt level	Check salt level (sec. 7.2)
Build up of calcium on the Cell plates	Calcium acts as an insulator and needs to be removed See Cleaning of Cell Electrode (sec. 8.2)
Water temperature is low	Winter water temperature can be very low For every 1°C below 28°C the output can drop 2-3%
Insufficient water flow through the Cell	Check water flow and ensure a full chamber of water is passing through the Cell You may need to backwash your filter
The Cell could be damaged or at the end of its life	Damaged coating will reduce Cell life and reduce output If all conditions are correct then Cell could be at the end of its life
Level low in one direction but OK in the other	Cell may need cleaning (sec. 8.2) or the Cell may have run its life in one direction

9. CHLORINATOR TROUBLESHOOTING

9.5 Power light is constantly flashing

Potential Cause	Remedy
Cell is not connected	Check Brass Pins and Cell connections and tighten if needed
Output set too low	Adjust output with the Output (+) button and output lights should increase and Power light will stay ON
The Cell could be damaged or at the end of its life	Cell may need cleaning (sec. 8.2) or the Cell may have run its life
Faulty Main Power Supply PCB	Return unit for service

9.6 Power Pack only works in one direction

Potential Cause	Remedy
Faulty Main Power Supply PCB or Relay	See Changing of Polarity (sec. 5.10). If unit still only operates in one direction contact service dept

9.7 Timer is not functioning properly

Potential Cause	Remedy
Incorrect Timer settings	<ol style="list-style-type: none"> 1. Timer is not set correctly Refer to Timer Setting in this manual (sec. 6) 2. Faulty Timer - contact service dept

9.8 Pool pump outlet not functioning properly or pump always on

Potential Cause	Remedy
Pump not plugged into chlorinator	Check that pump is plugged into the bottom of the Power Pack and not directly in to the wall outlet

9.9 Cell not cleaning, excessive calcium build up on Cell or Power Pack not changing direction

Potential Cause	Remedy
Excessively high calcium, change of direction time set too high or faulty Main Power Supply PCB	<ol style="list-style-type: none"> 1. See Calcium Hardness test (sec 7.5) and adjust water accordingly 2. Manually try reverse direction (sec 5.10 – Temporary Change of Polarity). Failure for this to work could indicate a faulty Main Power Supply PCB – contact service dept

9.10 Low or No Chlorine Output

Potential Cause	Remedy
Unit not working correctly	Go through Troubleshooting from 9.2
Unit not set correctly	Basic settings such as Output Control and Timer running hours need to be checked
Excessive calcium build up on the Cell plates	Calcium acts as an insulator and needs to be removed See Cleaning of Cell Electrode (sec. 8.2)
Salt level is to low	Check Salt guide (sec. 7.2)
pH is too high	Check pH guide (sec. 7.3)
Stabiliser is too low	Check Stabiliser guide (sec. 7.6)
Cell at the ends of its life	If full output is not reached then it could be a failing Cell

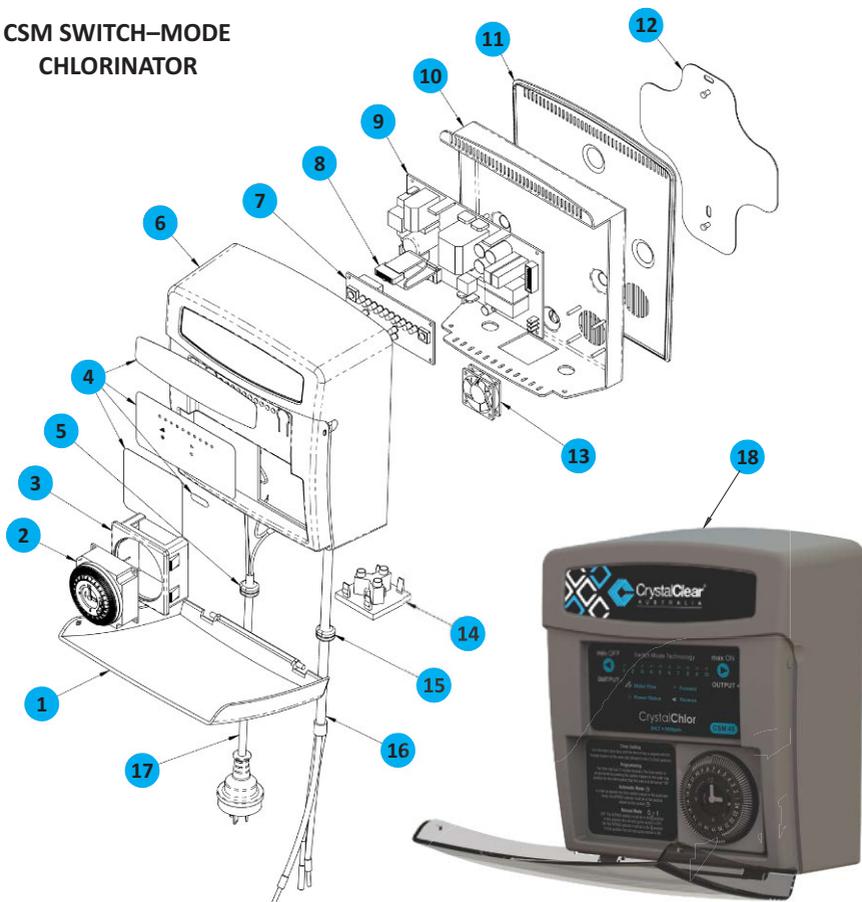
9.11 Timer loses time when mains power removed

Potential Cause	Remedy
Battery life expired	Replace Timer - contact service dept

Should you require further information visit
www.crystalclearaus.com

10. SCHEMATICS AND PART NUMBERS

CSM SWITCH-MODE CHLORINATOR

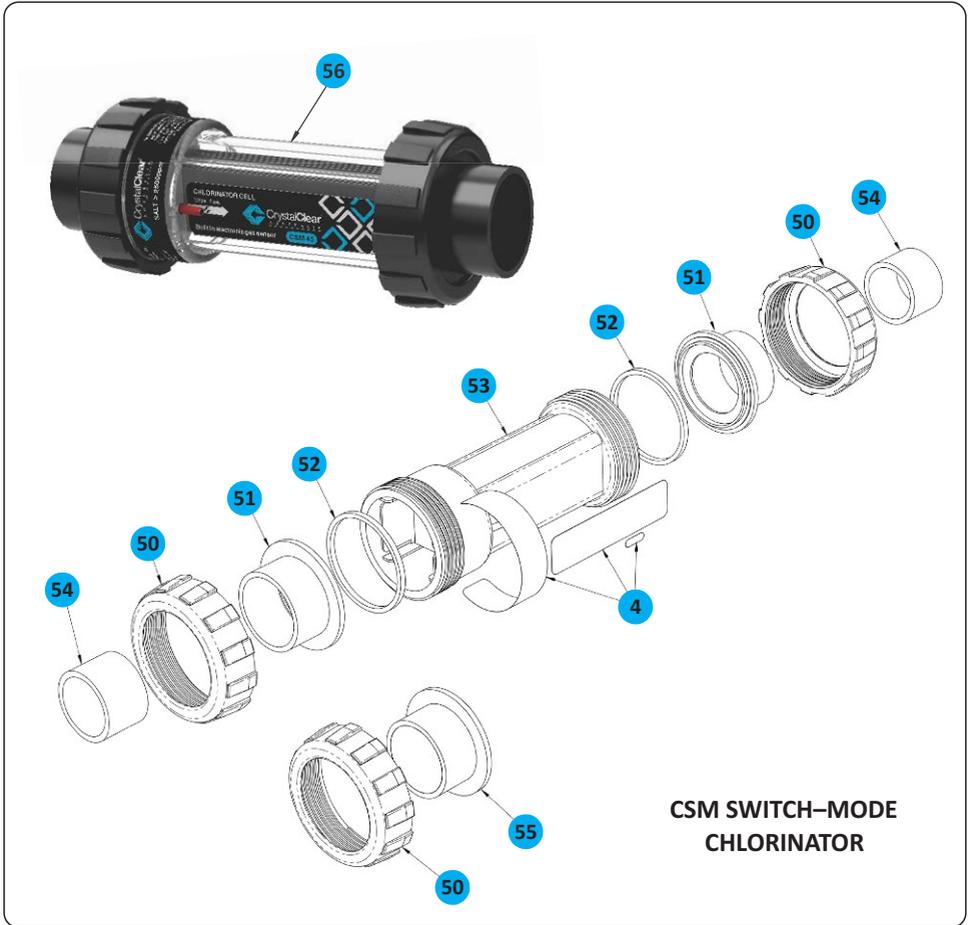


POWER SUPPLY SCREWS AND COMPONENTS (SHOWN IN SCHEMATIC)

PARTS LIST

ITEM No.	CODE	QTY	DESCRIPTION	ITEM No.	CODE	QTY	DESCRIPTION
1	N00659	1	ACRYLIC FRONT	10	SMALC	1	ALUMINIUM CASING
2	N00414	1	TIMER – QUARTZ BATTERY BACK – UP	11	N00644	1	BACKING PLATE
3	N00029	1	TIMER – BRACKET	12	N00182	1	MOUNTING BRACKET
4	N00061	1	STICKER SET	13	N00323	1	COOLING FAN
5	N00034	1	GROMMET POWER CORD	14	N00001	1	AC SOCKET
6	N00643	1	OUTER CASE	15	N00411	1	GROMMET SM CELL CABLE
7	N0031	1	CONTROL PCB – CSM15	16	N00237	1	CELL CABLE C/W BRASSWARE
7	N00415	1	CONTROL PCB – CSM25	17	SMPCORD	1	POWER CORD
7	N00416	1	CONTROL PCB – CSM35	18	CSM 15PP-M	1	COMPLETE CSM15 POWER PACK
7	N00417	1	CONTROL PCB – CSM45	18	CSM 25PP-M	1	COMPLETE CSM25 POWER PACK
8	SMPCBC AB	1	CONNECTOR CABLE	18	CSM 35PP-M	1	COMPLETE CSM35 POWER PACK
9	N00173	1	MAIN POWER SUPPLY PCB	18	CSM 45PP-M	1	COMPLETE CSM45 POWER PACK

10. SCHEMATICS AND PART NUMBERS



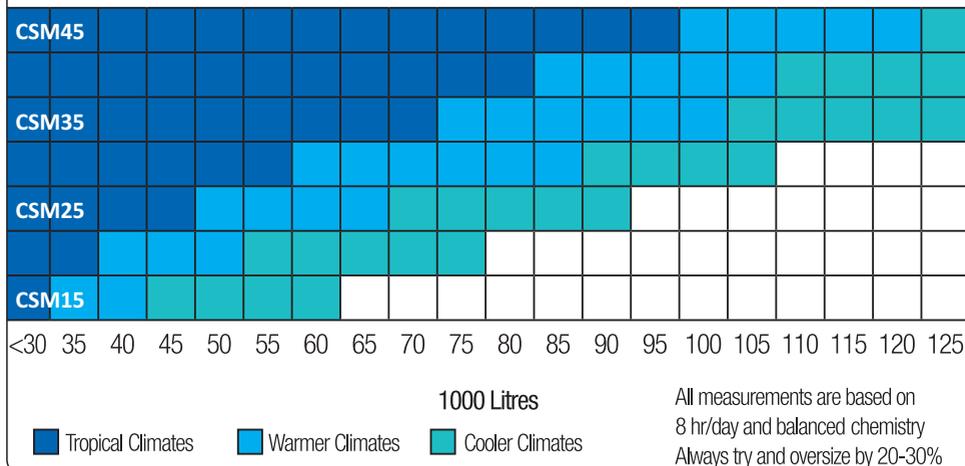
POWER SUPPLY SCREWS AND COMPONENTS (SHOWN IN SCHEMATIC)

PARTS LIST

ITEM No.	CODE	QTY	DESCRIPTION
50	SM – CELLNUT	2	CELL NUT
51	SM – CELLTAIL	2	CELL TAIL
52	N00073	2	CELL O-RING
53	SM – CELLHB	1	HOUSING – CLEAR RESIN FILLED (CAN BE USED AS A BLANK)
54	N00670-1	2	REDUCING BUSH
55	SMBLANKB	1	TAIL WITH BLANKING BUSH FOR CELL CLEANING CAP
56	CELLSM15CC	1	CELL – SM15
56	CELLSM25CC	1	CELL – SM55
56	CELLSM35CC	1	CELL – SM35
56	CELLSM45CC	1	CELL – SM45
–	N00696	1	BROCHURES
–	N00204	1	SLEEVE (COLOUR – TO FIT OVER WHITE CARTON)
–	N00203	1	CARTON BOX WHITE
–	N00695	1	OPERATING MANUAL

11. SPECIFICATION TABLE

CHLORINATOR SIZING CHART



CHLORINE PRODUCTION

Model	Per Hour			Over 8 Hours		
	Chlorine Output	Cal. Hypo. Equivalent (65%)	Sod. Hypo. Equivalent (12.5%)	Chlorine Output	Cal. Hypo. Equivalent (65%)	Sod. Hypo. Equivalent (12.5%)
CSM15	15g	23g	120ml	120g	184g	960ml
CSM25	25g	38g	200ml	200g	304g	1600ml
CSM35	35g	54g	280ml	280g	432g	2240ml
CSM45	45g	69g	360ml	360g	552g	2880ml

SPECIFICATION TABLE

Model	VOLTS (Vac) Input	AMPS* (Aac) Input	VOLTS* (Vdc) Output	AMPS* (Adc) Output	Chlorine* (g/hr) @3500 ppm salt	Power* Consumption (Watts)	Frequency (Hz)	Weight (kg)
CSM15	110-265	0.68	27.50	2.8-3.2	15	100.40	50-60	4.56
CSM25	110-265	0.76	27.50	3.8-4.2	25	121.10	50-60	4.64
CSM35	110-265	1.06	27.50	4.8-5.2	35	161.40	50-60	4.72
CSM45	110-265	1.26	27.50	5.8-6.2	45	190.10	50-60	4.80

* – all readings taken at 240Vac and in 3000ppm saltwater with a temperature of 28°C.

AC Socket / Pump Outlet: Rated for 8amps - max is 1.5kW (2HP)

12. WARRANTY

THIS EQUIPMENT HAS BEEN MANUFACTURED AND TESTED TO THE HIGHEST STANDARD AND ACCORDINGLY CARRIES THE FOLLOWING WARRANTY.

- 12.1** The CrystalChlor™ CSM Power Pack will be repaired at no charge for a period of 24 Months from the date of purchase should it be found, after examination, that the failure has been caused by faulty workmanship or materials. This is a back to base warranty. The Electrolytic Cell carries a 1 year repair / replacement + 4 years pro-rata warranty (based on a percentage of the recommended retail price nominated by the manufacturer).
- *The warranty applicable to commercial application is limited to 12 months from the date of installation unless a commercial model is purchased then this is 24 months.
- 12.2** Adverse operating conditions beyond the control of the manufacturer such as improper voltage or water pressure, excessive ambient temperature or any condition that adversely affects the performance of the equipment will render this warranty null and void.
- 12.3** Defective equipment must be returned to the manufacturer or dealer as soon as the purchaser becomes aware of the defect and all transport must be prepaid. Neither the manufacturer nor the dealer shall be responsible for any goods damaged in transit.
- 12.4** If after examination the equipment is found to be defective it will be repaired or replaced free of charge (other than transport costs which will be borne by the purchaser). However, if upon inspection of the equipment it is found that the terms of this warranty are not satisfied, then the usual charges of the manufacturer for repair or replacement will be made.
- 12.5** Any liability of the manufacturer pursuant to the Trade Practices Act 1974, as amended for a breach of a condition or warranty shall be limited to replacing or acquiring the equipment (or part thereof) where the same has been supplied.
- 12.6** The maximum liability incurred by the manufacturer shall not in any case exceed the contract price for the equipment or the product parts or components thereof claimed to be defective. Further, the manufacturer shall not be liable for any loss, damage or delay directly or indirectly caused by any malfunction of or defect of or failure of the equipment other than as expressly provided in this warranty.
- 12.7** Products sold by the manufacturer are designed for use with swimming pool water balanced in accordance with the Langelier Saturation Index with a pH range of 6.8-7.8. Chlorine level should not exceed 4ppm.
- 12.8** The manufacturer will not be held liable for damage caused by, but not limited to, corrosion, scaling or stress.

The Warranty is void under the following circumstances:

- Installation is carried out incorrectly by any person other than a person authorised by us to do so.
- The Power Pack or Cell is serviced by any person other than a person authorised by us to do so.
- Correct salt levels are not maintained at all times.
- The Power Pack is not protected from the elements.
- The Power Pack is not operated in a position/area with good ventilation.
- Water has been allowed to enter the Power Pack.
- Run in a commercial installation (these have a 1 year warranty on Power Pack and Cell unless a commercial model is purchased then this is 24 months).
- Insect infestation or penetration by dust, sand or other foreign particles inside the Power Pack.
- Damage beyond our control.
- Equipment that has been misused, neglected, damaged, repaired without authorisation or altered in any way.

This warranty is applicable to workmanship and materials only.

This warranty is not transferable under any circumstance.

This unit is for use in domestic swimming pools only where the correct size unit produces enough chlorine in approx. 8 hours. Extended periods to gain more chlorine production voids the Warranty.

Keep your original purchase invoice and serial number in a safe place.

12. WARRANTY

Claiming Warranty on your CrystalChlor™ CSM

When making a warranty claim, please note the following information **MUST** be provided or claim may not be approved.

- Model Number
- Power Pack
- Serial Number
- Cell Serial Number
- Proof of Purchase showing the Purchase Date and Purchased From
- Installation Date
- Installer
- Your Full Name
- Your Phone Number
- Your Address Details
- Details of the Issue

We keep extensive production and sales records so this information will expedite the processing of your claim. Crystal Clear Chlorinators reserve the right to modify any model without notice and whilst we do our utmost to ensure accuracy this may result in slight model variances in this manual.

13. TECHNICAL SUPPORT

For all warranty enquiries please contact your local distributor or contact Crystal Clear Chlorinators directly and we will either direct you to your nearest authorised repairer or assist you with your enquiry.

Crystal Clear Chlorinators Contact Details

P – 07 55935494
F – 07 55936072
E – service@crystalclearaus.com
W – www.crystalclearaus.com



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No representations or warranties are made that the content, advice and recommendations in this guide are current, free from errors or omissions, or appropriate for the user's circumstances or abilities. No liability or responsibility is accepted for any loss suffered as a result of any user's reliance on such content.

Repairs should only be carried out by qualified persons or CrystalChlor™ CSM appointed agents. Crystal Clear Chlorinators reserve the right to refuse warranty if any damage caused to the chlorinator or auxiliary pool equipment that is not a result of a manufacturer's defect.

Should you require further information visit
www.crystalclearaus.com



CrystalChlor CSM
salt water chlorinator