



# **HAYWARD®**

## **CHLORINATOR**

### **Installation and Operation manual**

**KEEP IN A SAFE PLACE**

[www.haywardpool.com.au](http://www.haywardpool.com.au)

# **IMPORTANT SAFETY INSTRUCTIONS**

When installing and using this electrical equipment, basic safety precautions must always be followed.

- **READ AND FOLLOW ALL INSTRUCTIONS**
- **WARNING:** Potential risk of fire, electric shock, or injury to persons is possible if the installation and safety instructions listed in this manual and on the chlorinator itself are not followed.
- Disconnect all AC power during installation and or removal
- **WARNING:** To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times
- **SAVE THESE INSTRUCTIONS**

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# **IMPORTANT SAFETY INSTRUCTIONS**

**WARNING:** Heavy pool (or Spa) usage, and higher temperatures may require higher chlorine output to maintain proper free available chlorine residuals.

If additional chlorine is required due to heavy bather loads, use liquid chlorine (Sodium Hypochlorite) to maintain an appropriate chlorine residual in the water.

Maintaining high salt and chlorine levels above recommended range may contribute to corrosion of pool or spa equipment

DO NOT add pool or spa chemicals directly to the skimmer. This may damage the rubber seals.

Check the expiry date of the test kit as test results may be inaccurate if used after that date

Only use original Hayward replacement cells with identical model numbers

Follow all aspects of the local and National Electrical Code(s) when installing Hayward chlorine generators

For chlorine generators: NOTE: For outdoor pools, chlorine residuals can be protected from destruction by sun light by addition of stabilizer (cyanuric acid)

For devices that can be used on spas: For proper sanitation, spas must be completely drained periodically. The number of days between COMPLETE SPA DRAINAGE is equal to the volume of spa water in litres, divided by 10 times the maximum number of daily spa users. Refill spa with water and repeat DIRECTIONS FOR USE of the device.

Health and Hyperthermia warnings for spa devices:

People with a medical condition should consult a physician before entering pool or spa water.

Maximum spa water usage temperature is 40 deg C. Bathing in spa water at 40 deg C should not exceed 15 minutes.

# IMPORTANT INSTRUCTIONS

- Test salt level before calculating your salt addition requirement. This is important because the pool water may already contain sufficient salt or a percentage of the required concentration.
- The need or period between cell cleans is determined by the water chemistry and temperature of the water. In areas where the calcium hardness of the water is low, (less than 200ppm), cleaning of the cell may not be necessary. Where calcium levels exceed 200ppm, regular inspection of the cell, is necessary. Cleaning in an acid solution may be necessary.
- **IF THE CELL REQUIRES MORE THAN 15 MINUTES TO CLEAN, THE CELL IS NOT BEING CLEANED REGULARLY ENOUGH. - INSPECT MORE FREQUENTLY**
- **It is a condition of the warranty for the home owner to ensure the cell is inspected and maintained in accordance with the directions in this manual.**
- **It is the home owner's responsibility to ensure all materials in contact with the pool or spa water are compatible with and intended for the application intended.**
- Time clock is in 24hr format. The built in digital clock will not accept an operating time period which travels from PM to AM (Through midnight).  
eg. Where it is desired to operated the unit from 22:00 to 06:30 follow the following -

ON1	set to 22:00
OFF1	set to 23:50
ON2	set to 00:10
OFF2	set to 06:30
- DO NOT USE BROMINE BASED PRODUCTS IN POOL - Use of bromine will void warranty
- It is the home owner's responsibility to ensure the water is regularly tested and balanced. Ensure your local pool professional provides advise relating to the frequency of testing and water balance criteria in your area.
- Where the Calcium hardness of the Pool or Spa water exceeds 200ppm, the water must be balanced as per the langlier index on a daily basis to ensure the water is not scale forming. - consult your pool professional.
- Do not assume the chlorinator is faulty if a chlorine test reveals a low or zero level. There are many factors that relate to chlorine demand in the water. Refer to the trouble shooting guide in this manual.
- Regular manual chlorine super chlorination or shock dosing may be required where chlorine demand is high. To supplement the chlorine requirement during peak use periods is normal and good practice.
- Always wear safety goggles and suitable gloves when handling pool chemicals. Where muriatic (Hydrochloric) acid is used, also wear a suitable respirator. Always add acid to water and not water to acid.
- **It is highly recommended to use this product in combination with a Hayward Water Manager. The Water Manager will automatically test and control the chlorine and pH levels. Ask your pool professional for details on this exciting product.**

## INTRODUCTION

Congratulations, you have wisely purchased the most technologically advanced salt water chlorinator in the world. The benefits of doing so will be evident for many years to come. Hayward's research and development team is committed to producing the finest chlorination systems and being recognized world wide as the leaders in salt chlorination technology.

Your Hayward chlorinator will eliminate the need to store dangerous quantities of chlorine, daily manual chlorine dosing and the risks associated with these practices. It is automatic, clean, safe and economical and for these reasons, salt chlorination as a method for treating pool water is increasing world-wide.

Mild salt water is gentle on eyes and skin and is said to benefit asthma sufferers and those people who find conventional chlorinated pools irritating. The salinity of seawater is approx. 35,000ppm or 3.5%, while Hayward chlorinators require only 2,500ppm to 3750ppm, depending on the model. The human body has a salinity of approximately 4500ppm and fresh water is zero. It is the similarity between the salinity of the human body and that of a salt pool that make for a silky luxurious swimming experience.

The chlorinator comprises two basic components, the power supply and cell. It is within the cell that the electrolytic reactions occur. Chloride ions in the water are converted into chlorine gas, this dissolves immediately into the water to ultimately form sodium hypochlorite, (liquid chlorine). The chlorine oxidizes bacteria, algae and other harmful matter in the pool water and through this process reverts back into available chloride ions.

The major by-product of the reaction in the cell is the liberation of Hydrogen gas at the cathode. This explains the small bubbles often seen passing out of the pool returns. Hayward's patented vertical cell is the worlds safest and ensures the excess hydrogen gas can not accumulate to dangerous levels.

No salt is lost through this process or as a result of evaporation. The necessity to top up the salt level is because of dilution through events such as backwashing and splashing out etc. All Hayward models contain digital time clocks, the four ON/OFF periods available are easily programmed for fully automatic operation of your pump & chlorinator.

**All models have a built in back up power system that will hold all your programmed information for at least seven days. This is particularly useful where the mains power is interrupted.**

**Hayward units do not contain batteries.**

**Your Hayward Chlorinator will perform best if operated in conjunction with a Hayward Water Manager. The Water Manager will test the poolwater and precisely control the chlorine and pH levels.**

# CELL MAINTENANCE

Where calcium levels are below 200ppm, the mineral content is low and the water is correctly balanced, little or no maintenance to the cell is normally required. The automatic reversing of the electrode polarity will be sufficient to dissolve the calcium scale formed.

Periodic inspections must however be made to ensure scale and or debris is not forming or building up on the electrodes within the cell. If a calcium scale has formed it must be removed by cleaning in an acid solution.

Where calcium levels are higher than 200ppm and or mineral content is high, regular inspections of the cell must be performed. If calcium scale is present, the cell must be cleaned in an acid solution.

The higher the water temperature, the greater the capacity for the water to deposit scale on the cell.

Each pool will vary with regard to the frequency of cell maintenance.

Factors other than Calcium hardness which increase the cell cleaning frequency are:

- High water temperature
- High mineral content of water
- Low water velocity
- Poor water balance
- Excessive salt level
- Electrode coating is breaking down - Ensure a qualified technician evaluates condition of cell

**It is crucial in areas where the water supply has high calcium hardness levels that the waters pH is adjusted as recommended by the langlier index and not simply to a broad scale recommendation.**

The pH must be tested on a daily basis under these poor water conditions. Failure to regularly test and balance the water may accelerate scale build up in the cell.

Water temperature has a direct relationship with the rate of scale deposition. The higher the temperature, the greater the rate of scale build up.

As an example: It may be necessary to clean the cell once every three months during the colder part of the year and then once every month during the hot.

**It is important that the calcium scale does not build up within the cell and bridge across the opposing electrode plates. Allowing this to occur will damage the electrodes and void the warranty.**

**Where cells are not maintained in accordance with this manual - warranty will be voided.**

## **TO INSPECT AND CLEAN CELL**

### **IMPORTANT - SUBMERGE THE ELECTRODE BUNDLE ONLY, NOT THE CAP**

- Switch off power to pump/s and chlorinator
- Close all relevant valves and unplug the cell cable placing it in a dry location
- Loosen the large Cell nut and remove
- Carefully remove the electrode from the housing - It may be necessary to eliminate the vacuum imposed by a system full of water that is above pool water level. This can be done by briefly pushing down on the backwash valve or opening a relief valve.
- Fit the protective cap over the electrical terminals on the Cell Cap
- In a 10lt or greater plastic bucket, mix five parts water with 1 part Muriatic Acid (Hydrochloric). Caution - wear appropriate safety goggles, a respirator and gloves. Ensure the bucket is tall enough for the electrode bundle only to be submerged
- Submerge electrode bundle only and wait for fizzing to stop.
- If fizzing stops and electrode bundle is not 100% clean, make another acid mixture and resubmerge electrode bundle only. Repeat this process until you are 100% sure that no scale build up appears between or on the electrode plates.
- Rinse the electrode bundle only, with fresh water
- Reinstall cell, remove electrical terminal cap, fit Cell lead, open the appropriate valves and switch power back on to pumps and chlorinator

### **The Cell cleaning process should take less than 15 minutes**

If the time to remove all the calcium scale is more than 15 minutes, the cell is not being inspected and cleaned frequently enough. Lengthy cleaning time is also an indicator that the scale is so thick that it has bridged between the electrode plates. When this occurs, the acid mixture has less surface area to work with and so the period to clean is long.

**Where scale bridges between the electrode plates, the cell warranty will be voided.**

**NOTE: IF IT TAKES MORE THAN 15 MINUTES FOR THE ACID MIXTURE TO DISSOLVE ALL THE CALCIUM SCALE , THE CELL IS NOT BEING CLEANED REGULARLY ENOUGH.**



## CONTROL PANEL BUTTONS

### MODE BUTTON:



Press to select ON, OFF or AUTO operation. (When AUTO mode is selected, the ON/OFF times you have set will switch both pump and chlorinator on and off on a daily basis.)

### OFF MODE:



Indicated by way of the anti-clockwise rotation of the top portion of the first digit. Neither pump or chlorinator will operate.

### ON MODE:




Indicated by way of the clockwise rotation of the top portion of the first digit. Pump and chlorinator will operate continuously.

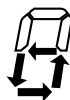
### AUTO MODE:



Indicated by way of the clockwise rotation of the lower portion of the first digit. While in the auto mode and during an OFF time period, the display will alternate from displaying OFF to displaying the next ON time. This feature allows for an easy visual of when the unit will next switch on.

eg  OFF  $\longleftrightarrow$  10:30

### AUTO DEMAND MODE:

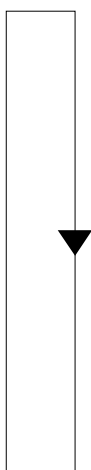


Auto Demand feature is only active if a Hayward Water Manager is fitted. This feature allows the Water Manager to over-ride the time clock if necessary and extend operating time to ensure chlorine target is hit before switching off for the day.

### VIEW BUTTON:



Press repeatedly to display, current time, % chlorine output and all four ON/OFF periods. All values remain displayed for 30 sec, the normal real time % chlorine output is then displayed.



**Current 24Hr time is displayed.**

**% Chlorine output, is displayed.** Use UP/Down buttons to alter output

**ON1 is displayed, wait to see ON1 time.** Use UP/Down buttons to alter time

**OFF1 is displayed, wait to see OFF1 time.** Use UP/Down buttons to alter time

**ON2 is displayed, wait to see ON2 time.** Use UP/Down buttons to alter time

**OFF2 is displayed, wait to see OFF2 time.** Use UP/Down buttons to alter time

**ON3 is displayed, wait to see ON3 time.** Use UP/Down buttons to alter time

**OFF3 is displayed, wait to see OFF3 time.** Use UP/Down buttons to alter time

**ON4 is displayed, wait to see ON4 time.** Use UP/Down buttons to alter time

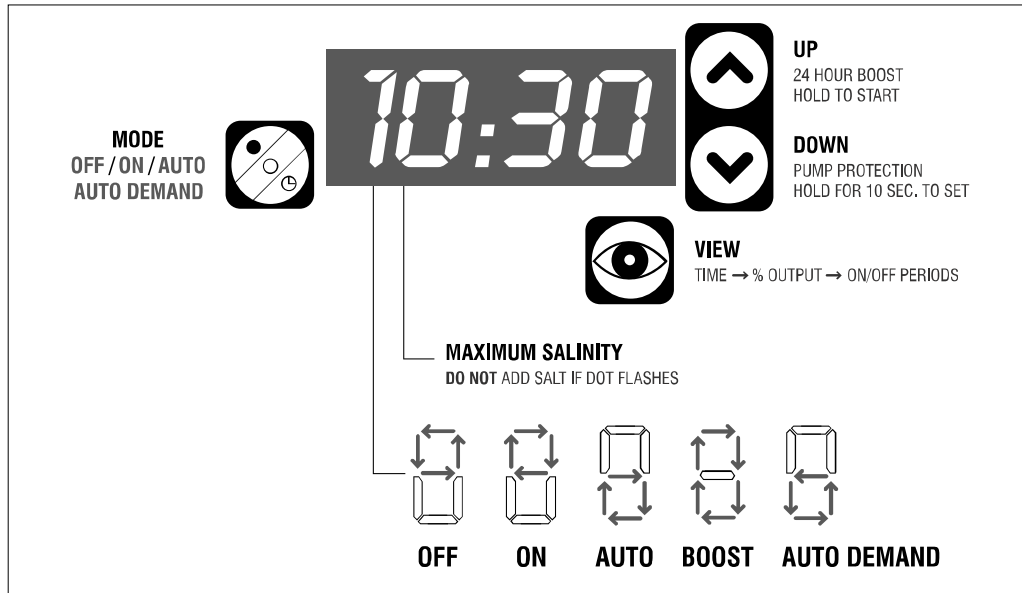
**OFF4 is displayed, wait to see OFF4 time.** Use UP/Down buttons to alter time

## UP/DOWN BUTTONS:

These are used to adjust the %chlorine level output either during a real time display or if the view button has been used to display the programmed %chlorine output. They are also used to alter the time periods displayed by the View button.

(The initial push of an UP/DOWN button will initiate the set mode and the display will begin to flash. Further pushes will alter the display).

## POWER PACK CONTROL PANEL



## Operational Understanding

On start up, power is ramped up to the cell after a 10 second period.

The chlorine output can be controlled from zero to 100% output of the total capacity. This is achieved by altering the duty cycle of power delivery to the cell. When the chlorine output is set to 100%, the power is delivered for only 60% of the time period. Similarly if the unit is set to 50%, the power is delivered for 30% of the time period. At a setting of 100%, you will find the cell power switches off and on approx every three minutes.

# TIME AND ON/OFF PERIODS – SETTING GUIDE

Hayward's digital clock operates on a 24Hr system where 00:00 is 12:00

## midnight. TO SET 24 HR TIME CLOCK

1. Press the view button once to display the time.
2. If the time is not current and you wish to alter it, press the up or down button once, display will begin flashing indicating it is in the set mode.
3. Press the up or down button while the display is flashing and the time will alter. When you have attained the correct time, wait 30 seconds or push the view button and the unit will automatically lock the time in.

## TO SET THE FOUR AVAILABLE ON/OFF PERIODS

1. Push the view button until ON1 appears, wait a moment and the corresponding ON1 time will be displayed. Initially this time may read 00:00, push the UP or DOWN button once, the display will begin to flash indicating it is in the set mode.
  2. Press the up button and adjust the time to that which you would like the pump and chlorinator to switch on.  
Wait 30 seconds or push the view button and the unit will automatically lock it in.
  3. You must then set an OFF1 time. Push the view button until OFF1 appears, wait a moment and the corresponding OFF1 time will be displayed. Initially this time may read 00:00, push the UP or DOWN once, the display will begin to flash indicating it is in the set mode.
  4. Press the UP button to adjust the time that you would like the pump and chlorinator to switch off. Wait 30 seconds or push the view button and the unit will automatically lock it in.
- If you would like the system to operate for two, three or four intervals during a 24Hr period, there is provision to do so by selecting, ON2, OFF2 etc and setting a time for each.

## TO VIEW ALL PROGRAMMED SETTINGS

**Push the view button repeatedly to scroll through all the settings.**

1. Current time (24Hr clock)
2. %Chlorine output (Programmed value)
3. ON1 - wait 2 seconds for the corresponding time to display
4. OFF1 - wait 2 seconds for the corresponding time to display
5. ON2 - wait 2 seconds for the corresponding time to display
6. Continue to view all four on/off times

**NB: If your Hayward chlorinator is unplugged, or the power is switched off, the unit will retain all you programmed settings for at least seven days.**

# SPECIAL FUNCTIONS

## TO ACTIVATE 24 HR BOOST

1. The unit must be in the **AUTO** mode.
2. Hold the **UP** button until the display flashes and the rotating boost mode indicator will begin. (The pump & chlorinator will operate at full power for 24Hrs regardless of current settings and then switch back to the normal auto mode settings for both time & output)
  - Ideal for periods where pool encounters heavy bather loads
  - Avoids the necessity to manually switch unit On and then Off after extended chlorination periods

## PUMP PROTECTION MONITOR

Optional function that protects the pump from operating with little or no water. These conditions often exist and may damage the pump. The pump protection function uses the gas sensor in the cell to detect the absence of sufficient water and after a delay period, the pump is switched off.

**TO SET MONITOR:** Hold the **DOWN** button until the display flashes. If a zero is displayed, this indicates that the pump protection monitor is not activated. While the display is flashing, use the **UP/DOWN** buttons to activate the monitor and set the delay in minutes that you would allow the pump to run in a starved of water condition. Once set, the display will lock in the value and return to the live display within 30 seconds. Eg. If a delay of 4 minutes is set, the pump will automatically switch off if the chlorinator cell detects a low water flow for a period of 4 minutes. The message **FLO FAIL-OFF** will scroll across the display indicating this condition. If the unit is in the **AUTO** mode, the system will retest the condition at the next **ON** time period, if the condition no longer exists, the pump will continue to operate as per normal. Pushing the mode button will also cancel the condition enabling you to operate the system and determine what the problem is.

All pools have different hydraulic characteristics and risk levels with respect to the possibility of pump damage occurring due to lack of water. Pumps also have different tolerance levels to operating dry or in a starved condition. The average delay time would be from 3 to 6 minutes but we would recommend you seek advice from the pump manufacturer or a pool professional.

To deactivate the pump monitor, hold the **DOWN** button until the flashing delay time is on display. Use the **DOWN** button to reduce the time to **zero**, this disables the protection monitor.

**NB: Remember, if you backwash the filter, vacuum to waste or perform any other function that by-passes water through the cell, the flow fail function will switch the pump off after it has timed out since it recognizes no water flow.**

**Simply push the mode button to reset or de-activate pump monitor.**

## PLUMBING FLUSH FEATURE

This feature is automatic, no programming or adjustments are necessary.

When in auto mode, the cell power will automatically switch off 30 seconds before the pump to ensure cell housing and plumbing is flushed of concentrated chlorine. This unique feature prevents high chlorine levels in the pipework diffusing through and corroding heater tube bundles and the possibility of damaging other sensitive equipment up-stream of the cell.

## AUTO DEMAND FEATURE

Auto Demand feature is only active if a Hayward Water Manager is fitted. This feature allows the Water Manager to over-ride the time clock if necessary and extend operating time to ensure chlorine target is hit before switching off for the day. This feature ensures that the most important element, sanitation, is correctly maintained.

## **ASC - Auto Sampling Colorimeter or Water Manager.**

At the base of the Chlorinator power pack is a Spa Flow /ASC data port and a Remote/Pump Override data port.

### **When is the Spa Flow/ASC data port utilized?**

#### **Situation No.1**

Hayward Chlorinator is installed on a Pool and Spa combination without a Hayward Water Manager. To avoid over chlorination of the Spa when it is isolated from the Pool system, an optional Spa Flow Switch is installed in the Spa Suction line. This line is only active when the Spa only is being used.

The Spa Flow Switch plugs into the Spa Flow/ASC port and when activated, switches the chlorinator Output OFF to avoid over chlorination.

#### **Situation No.2**

Hayward Chlorinator is installed on a Pool and Spa combination with a Hayward Water Manager. This combination is the ultimate in Pool and Spa control. The Spa Flow Switch is installed into the Spa Suction line and is plugged into the Spa Flow data port on the Water Manager. The Water Manager then plugs into the Spa Flow/ASC data port on the chlorinator. When the Spa only is operated, instead of simply switching the Chlorinator output OFF, the Water Manager automatically increases the frequency of it's water testing and adjust both chlorine and pH levels precisely to the Pre-programmed Spa volume.

### **When is the Remote/Pump Override data port utilised?**

Where remote operation of the Chlorinator and Pump is required. An optional remote ON/OFF switch complete with 30m of cable is plugged into the Remote/Pump Override data port on the Chlorinator. This switch when activated will force the chlorinator from the AUTO mode to the MANUAL mode. This allows the home owner to switch on the chlorinator and pump from a remote location.

The Hayward wireless and panel mount remote control system also plugs into the Remote/Pump Override data Port to force the chlorinator into the Manual mode. This system is able to control actuated valves and other Pool devices to further automate your pool system.

# DIAGNOSTIC DISPLAY

## Lo SALT – OFF scrolling message

This message indicates one of three conditions and each must be eliminated in this order.

1. Remove cell and ensure it is 100% free from scale or debris. If it isn't, clean cell as per instructions. Switch power to power pack off briefly to re-set.
2. Before adding any salt, have the salt level checked by a pool professional. If the salt is indeed low, add the required salt quantity as per the chart in this manual.
3. If the cell is 100% clean and the salinity is correct, the cell may be at the end of it's life. Contact an accredited service company for cell testing and or replacement.

During the **Lo SALT - OFF** condition, power is not delivered to the cell and chlorine **production is off**. The pump will continue to operate as normal.

## CLEAN CELL OR LO SALT Scrolling message

If the salt level falls below the ideal operating level, or the cell is calcified sufficiently to reduce the output, this warning message will scroll intermittently across the display.

This message indicates one of three conditions and each must be eliminated in this order.

4. Remove cell and ensure it is 100% free from scale or debris. If it isn't, clean cell as per instructions. Switch power to power pack off briefly to re-set.
5. Before adding any salt, have the salt level checked by a pool professional. If the salt is indeed low, add the required salt quantity as per the chart in this manual.
6. If the cell is 100% clean and the salinity is correct, the cell may be at the end of it's life. Contact an accredited service company for cell testing and or replacement.

During the **CLEAN CELL OR LO SALT** condition, power is delivered to the cell and chlorine production is on. The pump will continue to operate as normal.

## MAXIMUM SALT LEVEL – LED FLASHES

The high salt level light will begin flashing as the level approaches the upper end of the ideal range. **Operating the unit at higher than recommended Salt levels will reduce cell life and it's ability to self clean.**

**If the salt level is 20% higher than the ideal recommendation, dilute the water.**

Hayward HPS15LS, HPS20LS, HPS30LS:	Dilute if salt level is 3000ppm or higher
Hayward HPS40LS, HPS50LS:	Dilute if salt level is 3600ppm or higher
Hayward HPS25, HPS35, HPS45:	Dilute if salt level is 4500ppm or higher

## INITIAL SALT ADDITION

- **ONLY USE APPROVED POOL GRADE SALT THAT IS SPECIFICALLY LABELLED FOR SWIMMING POOL AND SPA USE**
- **SALT MUST BE GREATER THAN 99% PURE**
- **DO NOT USE ROCK SALT, SALT WITH YELLOW PRUSSATE OF SODA, SALT WITH ANTI-CAKING ADDITIVES OR IODIZED SALT.**

Do not assume a pool full of water whether it is new or old has a zero salinity. A substantial amount of salt may be present in the water if the pool was previously treated with liquid chlorine or if the pool is filled by a water source high in salt.

Depending on the geographical area, the tap water may have a high salinity level.

**It is important to test the water first before calculating the initial salt dosage or you may over-salt the pool water.**

The left hand column of the salt addition chart lists the current salinity of the pool water. Find the current salinity that best approximates what you have, go across the row until you are in the column that lists your pool volume and read the recommended salt addition in both pounds and kilograms. Use this chart when topping up of the salt level is required.

**Please note: Although the salt chlorinator diagnostics will advise when to add salt and when not to add salt, you must always perform a salt test using a test kit or salinity meter to confirm the findings before making a salt addition.**

### **HAYWARD HPS15LS, HPS20LS, HPS30LS,**

Ideal Salt level – 2500ppm @ 25 deg C (77 deg F) – 25kg salt per 10,000Lts  
(55lbs per 3,000 U.S. Gallons)

### **HAYWARD HPS40LS, HPS50LS**

Ideal Salt level – 3000ppm @ 25 deg C (77 deg F) – 30kg salt per 10,000 Lts  
(66lbs salt per 3000 US Gallons)

### **HAYWARD HPS25, HPS35, HPS45**

Ideal Salt level – 3750ppm @ 25 deg C (77 deg F) – 37.5kg salt per 10,000 Lts  
(69lbs salt per 3000 US Gallons)

## **SALT: HOW TO ADD**

Never add salt to the skimmer box, this will not harm your Hayward chlorinator however coarse salt granules may seize the pump impeller.

Always disconnect any automatic cleaners before adding salt and leave them off until the salt has fully dissolved. Cleaners too may be affected by the coarse granules and because the salt solution initially formed is denser than water, it remains at the bottom of the pool.

If an automatic cleaner operates through this dense solution, the suction hose will drop to the floor and may be damaged as a result.

Cut open bags (normally 55lbs pool grade salt only) and pour into pool away from skimmer and suction points. Brush with a pool broom to dissolve quickly.

# HAYWARD HPS15LS, HPS20LS, HPS30LS

POUNDS AND KILOGRAMS OF SALT REQUIRED TO ATTAIN 2500 PPM FROM THE CURRENT SALINITY AS SPECIFIED IN THE FAR LEFT COLUMN

Gallons and Litres of Pool Water

Current Salt Level PPM	8000 gal	10000 gal	12000 gal	14000 gal	16000 gal	18000 gal	20000 gal	22000 gal	24000 gal	26000 gal	28000 gal	30000 gal	32000 gal	34000 gal	36000 gal	38000 gal	40000 gal
	30000 L	37500 L	45000 L	52500 L	60000 L	67500 L	75000 L	82500 L	90000 L	97500 L	105000 L	112500 L	120000 L	127500 L	135000 L	142500 L	150000 L
0	165 lbs	207 lbs	248 lbs	289 lbs	331 lbs	372 lbs	413 lbs	455 lbs	496 lbs	537 lbs	579 lbs	620 lbs	661 lbs	703 lbs	744 lbs	785 lbs	827 lbs
	75 kg	94 kg	113 kg	131 kg	150 kg	169 kg	188 kg	206 kg	225 kg	244 kg	263 kg	281 kg	300 kg	319 kg	338 kg	356 kg	375 kg
250	149 lbs	186 lbs	223 lbs	260 lbs	298 lbs	335 lbs	372 lbs	409 lbs	446 lbs	484 lbs	521 lbs	558 lbs	595 lbs	632 lbs	670 lbs	707 lbs	744 lbs
	68 kg	84 kg	101 kg	118 kg	135 kg	152 kg	169 kg	186 kg	203 kg	219 kg	236 kg	253 kg	270 kg	287 kg	304 kg	321 kg	338 kg
500	132 lbs	165 lbs	198 lbs	231 lbs	265 lbs	298 lbs	331 lbs	364 lbs	397 lbs	430 lbs	463 lbs	496 lbs	529 lbs	562 lbs	595 lbs	628 lbs	661 lbs
	60 kg	75 kg	90 kg	105 kg	120 kg	135 kg	150 kg	165 kg	180 kg	195 kg	210 kg	225 kg	240 kg	255 kg	270 kg	285 kg	300 kg
750	116 lbs	145 lbs	174 lbs	203 lbs	231 lbs	260 lbs	289 lbs	318 lbs	347 lbs	376 lbs	405 lbs	434 lbs	463 lbs	492 lbs	521 lbs	550 lbs	579 lbs
	53 kg	66 kg	79 kg	92 kg	105 kg	118 kg	131 kg	144 kg	158 kg	171 kg	184 kg	197 kg	210 kg	223 kg	236 kg	249 kg	263 kg
1000	99 lbs	124 lbs	149 lbs	174 lbs	198 lbs	223 lbs	248 lbs	273 lbs	298 lbs	322 lbs	347 lbs	372 lbs	397 lbs	422 lbs	446 lbs	471 lbs	496 lbs
	45 kg	56 kg	68 kg	79 kg	90 kg	101 kg	113 kg	124 kg	135 kg	146 kg	158 kg	169 kg	180 kg	191 kg	203 kg	214 kg	225 kg
1250	83 lbs	103 lbs	124 lbs	145 lbs	165 lbs	186 lbs	207 lbs	227 lbs	248 lbs	269 lbs	289 lbs	310 lbs	331 lbs	351 lbs	372 lbs	393 lbs	413 lbs
	38 kg	47 kg	56 kg	66 kg	75 kg	84 kg	94 kg	103 kg	113 kg	122 kg	131 kg	141 kg	150 kg	159 kg	169 kg	178 kg	188 kg
1500	66 lbs	83 lbs	99 lbs	116 lbs	132 lbs	149 lbs	165 lbs	182 lbs	198 lbs	215 lbs	231 lbs	248 lbs	265 lbs	281 lbs	298 lbs	314 lbs	331 lbs
	30 kg	38 kg	45 kg	53 kg	60 kg	68 kg	75 kg	83 kg	90 kg	98 kg	105 kg	113 kg	120 kg	128 kg	135 kg	143 kg	150 kg
1750	50 lbs	62 lbs	74 lbs	87 lbs	99 lbs	112 lbs	124 lbs	136 lbs	149 lbs	161 lbs	174 lbs	186 lbs	198 lbs	211 lbs	223 lbs	236 lbs	248 lbs
	23 kg	28 kg	34 kg	39 kg	45 kg	51 kg	56 kg	62 kg	68 kg	73 kg	79 kg	84 kg	90 kg	96 kg	101 kg	107 kg	113 kg
2000	33 lbs	41 lbs	50 lbs	58 lbs	66 lbs	74 lbs	83 lbs	91 lbs	99 lbs	107 lbs	116 lbs	124 lbs	132 lbs	141 lbs	149 lbs	157 lbs	165 lbs
	15 kg	19 kg	23 kg	26 kg	30 kg	34 kg	38 kg	41 kg	45 kg	49 kg	53 kg	56 kg	60 kg	64 kg	68 kg	71 kg	75 kg
2250	17 lbs	21 lbs	25 lbs	29 lbs	33 lbs	37 lbs	41 lbs	45 lbs	50 lbs	54 lbs	58 lbs	62 lbs	66 lbs	70 lbs	74 lbs	79 lbs	83 lbs
	8 kg	9 kg	11 kg	13 kg	15 kg	17 kg	19 kg	21 kg	23 kg	24 kg	26 kg	28 kg	30 kg	32 kg	34 kg	36 kg	38 kg
2500	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL
2750	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
3000	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
3250 +	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE



# HAYWARD HPS25, HPS35, HPS45

POUNDS AND KILOGRAMS OF SALT REQUIRED TO ATTAIN 3750 PPM FROM THE CURRENT SALINITY AS SPECIFIED IN THE FAR LEFT COLUMN

		Gallons and Litres of Pool Water																							
Current Salt Level PPM		8000 gal	10000 gal	12000 gal	14000 gal	16000 gal	18000 gal	20000 gal	22000 gal	24000 gal	26000 gal	28000 gal	30000 gal	32000 gal	34000 gal	36000 gal	38000 gal	40000 gal							
0	248 lbs	310 lbs	372 lbs	434 lbs	496 lbs	558 lbs	620 lbs	682 lbs	744 lbs	806 lbs	868 lbs	930 lbs	992 lbs	1054 lbs	1116 lbs	1178 lbs	1240 lbs								
	113 kg	141 kg	169 kg	197 kg	225 kg	253 kg	281 kg	309 kg	338 kg	366 kg	394 kg	422 kg	450 kg	478 kg	506 kg	534 kg	563 kg								
	231 lbs	289 lbs	347 lbs	405 lbs	463 lbs	521 lbs	579 lbs	637 lbs	694 lbs	752 lbs	810 lbs	868 lbs	926 lbs	984 lbs	1042 lbs	1100 lbs	1157 lbs								
250	105 lbs	131 kg	158 kg	184 kg	210 kg	236 kg	263 kg	289 kg	315 kg	341 kg	368 kg	394 kg	420 kg	446 kg	473 kg	499 kg	525 kg								
	215 lbs	269 lbs	322 lbs	376 lbs	430 lbs	484 lbs	537 lbs	591 lbs	645 lbs	699 lbs	752 lbs	806 lbs	860 lbs	914 lbs	967 lbs	1021 lbs	1075 lbs								
	98 kg	122 kg	146 kg	171 kg	195 kg	219 kg	244 kg	268 kg	293 kg	317 kg	341 kg	366 kg	390 kg	414 kg	439 kg	463 kg	488 kg								
500	198 lbs	248 lbs	298 lbs	347 lbs	397 lbs	446 lbs	496 lbs	546 lbs	595 lbs	645 lbs	694 lbs	744 lbs	794 lbs	843 lbs	893 lbs	942 lbs	992 lbs								
	90 kg	113 kg	135 kg	158 kg	180 kg	203 kg	225 kg	248 kg	270 kg	293 kg	315 kg	338 kg	360 kg	383 kg	405 kg	428 kg	450 kg								
	182 lbs	227 lbs	273 lbs	318 lbs	364 lbs	409 lbs	455 lbs	500 lbs	546 lbs	591 lbs	637 lbs	682 lbs	728 lbs	773 lbs	818 lbs	864 lbs	909 lbs								
1000	83 kg	103 kg	124 kg	144 kg	165 kg	186 kg	206 kg	227 kg	248 kg	268 kg	289 kg	309 kg	330 kg	351 kg	371 kg	392 kg	413 kg								
	165 lbs	207 lbs	248 lbs	289 lbs	331 lbs	372 lbs	413 lbs	455 lbs	496 lbs	537 lbs	579 lbs	620 lbs	661 lbs	703 lbs	744 lbs	785 lbs	827 lbs								
	75 kg	94 kg	113 kg	131 kg	150 kg	169 kg	188 kg	206 kg	225 kg	244 kg	263 kg	281 kg	300 kg	319 kg	338 kg	356 kg	375 kg								
1500	149 lbs	186 lbs	223 lbs	260 lbs	298 lbs	335 lbs	372 lbs	409 lbs	446 lbs	484 lbs	521 lbs	558 lbs	595 lbs	632 lbs	670 lbs	707 lbs	744 lbs								
	68 kg	84 kg	101 kg	118 kg	135 kg	152 kg	169 kg	186 kg	203 kg	219 kg	236 kg	253 kg	270 kg	287 kg	304 kg	321 kg	338 kg								
	132 lbs	165 lbs	198 lbs	231 lbs	265 lbs	298 lbs	331 lbs	364 lbs	397 lbs	430 lbs	463 lbs	496 lbs	529 lbs	562 lbs	595 lbs	628 lbs	661 lbs								
1750	60 kg	75 kg	90 kg	105 kg	120 kg	135 kg	150 kg	165 kg	180 kg	195 kg	210 kg	225 kg	240 kg	255 kg	270 kg	285 kg	300 kg								
	116 lbs	145 lbs	174 lbs	203 lbs	231 lbs	260 lbs	289 lbs	318 lbs	347 lbs	376 lbs	405 lbs	434 lbs	463 lbs	492 lbs	521 lbs	550 lbs	579 lbs								
	53 kg	66 kg	79 kg	92 kg	105 kg	118 kg	131 kg	144 kg	158 kg	171 kg	184 kg	197 kg	210 kg	223 kg	236 kg	249 kg	263 kg								
2000	99 lbs	124 lbs	149 lbs	174 lbs	198 lbs	223 lbs	248 lbs	273 lbs	298 lbs	322 lbs	347 lbs	372 lbs	397 lbs	422 lbs	446 lbs	471 lbs	496 lbs								
	45 kg	56 kg	68 kg	79 kg	90 kg	101 kg	113 kg	124 kg	135 kg	146 kg	158 kg	169 kg	180 kg	191 kg	203 kg	214 kg	225 kg								
	83 lbs	103 lbs	124 lbs	145 lbs	165 lbs	186 lbs	207 lbs	227 lbs	248 lbs	269 lbs	289 lbs	310 lbs	331 lbs	351 lbs	372 lbs	393 lbs	413 lbs								
2500	38 kg	47 kg	56 kg	66 kg	75 kg	84 kg	94 kg	103 kg	113 kg	122 kg	131 kg	141 kg	150 kg	159 kg	169 kg	178 kg	188 kg								
	66 lbs	83 lbs	99 lbs	116 lbs	132 lbs	149 lbs	165 lbs	182 lbs	198 lbs	215 lbs	231 lbs	248 lbs	265 lbs	281 lbs	298 lbs	314 lbs	331 lbs								
	30 kg	38 kg	45 kg	53 kg	60 kg	68 kg	75 kg	83 kg	90 kg	98 kg	105 kg	113 kg	120 kg	128 kg	135 kg	143 kg	150 kg								
2750	50 lbs	62 lbs	74 lbs	87 lbs	99 lbs	112 lbs	124 lbs	136 lbs	149 lbs	161 lbs	174 lbs	186 lbs	198 lbs	211 lbs	223 lbs	236 lbs	248 lbs								
	23 kg	28 kg	34 kg	39 kg	45 kg	51 kg	56 kg	62 kg	68 kg	73 kg	79 kg	84 kg	90 kg	96 kg	101 kg	107 kg	113 kg								
	33 lbs	41 lbs	50 lbs	58 lbs	66 lbs	74 lbs	83 lbs	91 lbs	99 lbs	107 lbs	116 lbs	124 lbs	132 lbs	141 lbs	149 lbs	157 lbs	165 lbs								
3000	15 kg	19 kg	23 kg	26 kg	30 kg	34 kg	38 kg	41 kg	45 kg	49 kg	53 kg	56 kg	60 kg	64 kg	68 kg	71 kg	75 kg								
	17 lbs	21 lbs	25 lbs	29 lbs	33 lbs	37 lbs	41 lbs	45 lbs	50 lbs	54 lbs	58 lbs	62 lbs	66 lbs	70 lbs	74 lbs	79 lbs	83 lbs								
	8 kg	9 kg	11 kg	13 kg	15 kg	17 kg	19 kg	21 kg	23 kg	24 kg	26 kg	28 kg	30 kg	32 kg	34 kg	36 kg	38 kg								
3250	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL								
3500	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL								
3750	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL								
4000	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK								
4250	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH								
4500 +	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE								

# HAYWARD HPS40LS, HPS50LS

POUNDS AND KILOGRAMS OF SALT REQUIRED TO ATTAIN 3000 PPM FROM THE CURRENT SALINITY AS SPECIFIED IN THE FAR LEFT COLUMN

Gallons and Litres of Pool Water

Current Salt Level PPM	8000 gal	10000 gal	12000 gal	14000 gal	16000 gal	18000 gal	20000 gal	22000 gal	24000 gal	26000 gal	28000 gal	30000 gal	32000 gal	34000 gal	36000 gal	38000 gal	40000 gal
0	198 lbs	248 lbs	298 lbs	347 lbs	397 lbs	446 lbs	496 lbs	546 lbs	595 lbs	645 lbs	694 lbs	744 lbs	794 lbs	843 lbs	893 lbs	942 lbs	992 lbs
	90 kg	113 kg	135 kg	158 kg	180 kg	203 kg	225 kg	248 kg	270 kg	293 kg	315 kg	338 kg	360 kg	383 kg	405 kg	428 kg	450 kg
250	182 lbs	227 lbs	273 lbs	318 lbs	364 lbs	409 lbs	455 lbs	500 lbs	546 lbs	591 lbs	637 lbs	682 lbs	728 lbs	773 lbs	818 lbs	864 lbs	909 lbs
	83 kg	103 kg	124 kg	144 kg	165 kg	186 kg	206 kg	227 kg	248 kg	268 kg	289 kg	309 kg	330 kg	351 kg	371 kg	392 kg	413 kg
500	165 lbs	207 lbs	248 lbs	289 lbs	331 lbs	372 lbs	413 lbs	455 lbs	496 lbs	537 lbs	579 lbs	620 lbs	661 lbs	703 lbs	744 lbs	785 lbs	827 lbs
	75 kg	94 kg	113 kg	131 kg	150 kg	169 kg	188 kg	206 kg	225 kg	244 kg	263 kg	281 kg	300 kg	319 kg	338 kg	356 kg	375 kg
750	149 lbs	186 lbs	223 lbs	260 lbs	298 lbs	335 lbs	372 lbs	409 lbs	446 lbs	484 lbs	521 lbs	558 lbs	595 lbs	632 lbs	670 lbs	707 lbs	744 lbs
	68 kg	84 kg	101 kg	118 kg	135 kg	152 kg	169 kg	186 kg	203 kg	219 kg	236 kg	253 kg	270 kg	287 kg	304 kg	321 kg	338 kg
1000	132 lbs	165 lbs	198 lbs	231 lbs	265 lbs	298 lbs	331 lbs	364 lbs	397 lbs	430 lbs	463 lbs	496 lbs	529 lbs	562 lbs	595 lbs	628 lbs	661 lbs
	60 kg	75 kg	90 kg	105 kg	120 kg	135 kg	150 kg	165 kg	180 kg	195 kg	210 kg	225 kg	240 kg	255 kg	270 kg	285 kg	300 kg
1250	116 lbs	145 lbs	174 lbs	203 lbs	231 lbs	260 lbs	289 lbs	318 lbs	347 lbs	376 lbs	405 lbs	434 lbs	463 lbs	492 lbs	521 lbs	550 lbs	579 lbs
	53 kg	66 kg	79 kg	92 kg	105 kg	118 kg	131 kg	144 kg	158 kg	171 kg	184 kg	197 kg	210 kg	223 kg	236 kg	249 kg	263 kg
1500	99 lbs	124 lbs	149 lbs	174 lbs	198 lbs	223 lbs	248 lbs	273 lbs	298 lbs	322 lbs	347 lbs	372 lbs	397 lbs	422 lbs	446 lbs	471 lbs	496 lbs
	45 kg	56 kg	68 kg	79 kg	90 kg	101 kg	113 kg	124 kg	135 kg	146 kg	158 kg	169 kg	180 kg	191 kg	203 kg	214 kg	225 kg
1750	83 lbs	103 lbs	124 lbs	145 lbs	165 lbs	186 lbs	207 lbs	227 lbs	248 lbs	269 lbs	289 lbs	310 lbs	331 lbs	351 lbs	372 lbs	393 lbs	413 lbs
	38 kg	47 kg	56 kg	66 kg	75 kg	84 kg	94 kg	103 kg	113 kg	122 kg	131 kg	141 kg	150 kg	159 kg	169 kg	178 kg	188 kg
2000	66 lbs	83 lbs	99 lbs	116 lbs	132 lbs	149 lbs	165 lbs	182 lbs	198 lbs	215 lbs	231 lbs	248 lbs	265 lbs	281 lbs	298 lbs	314 lbs	331 lbs
	30 kg	38 kg	45 kg	53 kg	60 kg	68 kg	75 kg	83 kg	90 kg	98 kg	105 kg	113 kg	120 kg	128 kg	135 kg	143 kg	150 kg
2250	50 lbs	62 lbs	74 lbs	87 lbs	99 lbs	112 lbs	124 lbs	136 lbs	149 lbs	161 lbs	174 lbs	186 lbs	198 lbs	211 lbs	223 lbs	236 lbs	248 lbs
	23 kg	28 kg	34 kg	39 kg	45 kg	51 kg	56 kg	62 kg	68 kg	73 kg	79 kg	84 kg	90 kg	96 kg	101 kg	107 kg	113 kg
2500	33 lbs	41 lbs	50 lbs	58 lbs	66 lbs	74 lbs	83 lbs	91 lbs	99 lbs	107 lbs	116 lbs	124 lbs	132 lbs	141 lbs	149 lbs	157 lbs	165 lbs
	15 kg	19 kg	23 kg	26 kg	30 kg	34 kg	38 kg	41 kg	45 kg	49 kg	53 kg	56 kg	60 kg	64 kg	68 kg	71 kg	75 kg
2750	17 lbs	21 lbs	25 lbs	29 lbs	33 lbs	37 lbs	41 lbs	45 lbs	50 lbs	54 lbs	58 lbs	62 lbs	66 lbs	70 lbs	74 lbs	79 lbs	83 lbs
	8 kg	9 kg	11 kg	13 kg	15 kg	17 kg	19 kg	21 kg	23 kg	24 kg	26 kg	28 kg	30 kg	32 kg	34 kg	36 kg	38 kg
3000	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL	IDEAL
3250	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
3500	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
3750 +	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE	DILUTE

# CHLORINE PRODUCTION AND CONTROL

**A free chlorine residual of 1.0ppm to 3.0ppm must be maintained.**

This ability of the Chlorine generator to maintain this level will alter with respect to the chlorine demand imposed by bather load and environmental factors.

The %chlorine output is displayed on the power supply and may be altered using the UP and DOWN buttons. This allows you to increase or decrease the chlorine production without alteration of the operation time.

Testing for chlorine levels is very important and should be performed on a daily basis. The sample of water to be tested should be taken at arms depth away from the pool returns. This avoids highly chlorinated water, which has traveled directly from the chlorinator cell and ensures the reading will be a true representation of the pools residual level.

**The requirement to super chlorinate or shock dose the pool manually during periods of high chlorine demand is highly recommended and in cases absolutely necessary.**

**When a test reveals low chlorine or zero chlorine, always treat manually with chlorine and investigate if the Chlorine generator is operating to it's maximum capacity and for long enough hours to meet the demand.**

**Contrary to popular belief, a Chlorine generator can not shock dose the pool water. It is however beneficial especially where high bather loads exist to perform this task. Shock dosing the water manually with chlorine, breaks irritating chloramines down and provides for safer water with reduced chlorine demand.**

**The chlorine output may be altered in three ways**

- Increasing or decreasing the operating time
- Increasing or decreasing the output percentage
- Automatic control system – Recommended (Hayward Water Manager)

**For Automatic Chlorine and pH control, link the Hayward Chlorine generator with a Hayward Water Manager. The Water Manager periodically obtains samples of water and performs colorimetric tests to determine Chlorine level and pH level. Based on the results, the Water Manager controls the output of the chlorine generator to maintain the correct chlorine level and automatically feeds acid into the water to control the pH.**

## CYANURIC ACID – CHLORINE STABILIZER

The sun's ultraviolet light breaks down chlorine so it is essential to use a chlorine stabilizer. The importance of it's use is such that our range of chlorinators are sized with the express requirement that chlorine stabilizer be used as per the directions. Cyanuric acid or chlorine stabilizer, when dissolved in the pool water to achieve levels of between 40ppm to 80ppm will effectively reduce the breakdown of chlorine by ultraviolet light. Higher stabilizer levels may in fact be detrimental and hinder the kill rate of chlorine. Consult with your pool professional.

# WATER BALANCE

The balance of your pool water is no less critical because you have installed a salt chlorinator. All the parameters relating to water balance in Pool and Spa water must be constantly checked and adjusted.

## pH

A high pH will reduce the effectiveness of chlorine, potentially cause scale on both the pool and the equipment, and irritate bathers. A low pH may cause the water to become corrosive, damaging the pool interior finish, equipment (heat exchangers especially) and also irritate bathers. Each pool finish and type has a specific range in which the pH should remain. Generally a pH of between 7.2 – 7.6 is suitable for most pool types, however those requiring a higher pH will also require a higher chlorine residual. (Consult with your pool shop)

## Total alkalinity (T.A.)

The total alkalinity is a measurement of all the alkalis in your pool water, (Carbonates, Bicarbonates and Hydroxides). When adjusted within the accepted levels, T.A. acts as a pH buffer, resisting change to the pH. The recommended T.A. level of your pool may vary from 80ppm – 120ppm depending on the pool finish, again consult with a pool water professional.

## Calcium Hardness

Probably the most ignored of the three yet just as important. The hardness of your pool water is very important in controlling scale and the corrosive effects of water. A low calcium level may cause pool water to become corrosive even if the pH is within its recommended range. A tell tale sign of this is brown stains on the pool finish and in adjoining Spa's especially. This is metal staining, the source is usually the heater. A high calcium level may cause pool water to deposit scale, again even if the pH is within its recommended range. The salt chlorinator cell may require very frequent cleaning and scale may deposit on pool finish and equipment. Generally a level of 100ppm – 200ppm is recommended. Consult with your pool builder or pool shop.

**NOTE: We strongly recommend you seek advice from a pool professional regarding the balancing of water for your pool. A correctly balanced pool will protect it and the equipment from chemical damage and ensure bathers are swimming in clean clear healthy pool water.**

# Langlier Index

The Langlier Saturation index (Si) is a relationship between the Calcium Hardness, Total Alkalinity, pH and water temperature.

When the water is correctly balanced, the (Si) is +/- 0.2.

A Saturation index of less than -0.2, the water is corrosive.

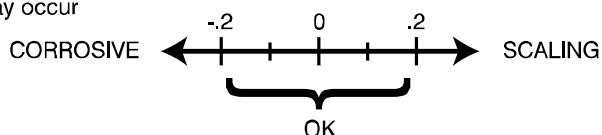
A Saturation index of greater than +0.2, the water is scale producing and staining may occur.

Use the chart below to determine the saturation index.

$$Si = pH + Ti + Ci + Ai - 12.1$$

°C	°F	Ti	Calcium Hardness	Ci	Total Alkalinity	Ai
12	53	.3	75	1.5	75	1.9
16	60	.4	100	1.6	100	2.0
			125	1.7	125	2.1
19	66	.5	150	1.8	150	2.2
24	76	.6	200	1.9	200	2.3
			250	2.0	250	2.4
29	84	.7	300	2.1	300	2.5
34	94	.8	400	2.2	400	2.6
			600	2.4	600	2.8
39	103	.9	800	2.5	800	2.9

How to use: Measure pool pH, temperature, calcium hardness and total alkalinity. Use the chart above to determine Ti, Ci and Ai from your measurements. Insert values of pH, Ti, Ci and Ai into the above equation. If Si equals .2 or more, scaling and staining may occur. If Si equals -.2 or less corrosion or irritation may occur



## TROUBLE SHOOTING

### Display is not illuminated

- Possible cause : Chlorinator power supply is not wired into live circuit.  
Solution : Wire unit into live circuit.  
Possible cause : Chlorinator is switched on via an external time clock.  
Solution : No action necessary. Perhaps momentarily over-ride time clock to check units operation.

### Flow fail – OFF scrolls across the display and pump has switched off

- Possible cause : The pump protection monitor has been set and has timed out.  
Solution : Investigate flow problem by eliminating possible solutions from the Lo Flow – OFF file above. (To reset, push the mode button)  
Note : Remember, any filter settings that require the pump to run and where the water is not returned through the cell, eg. backwashing, rinse, waste etc will cause the pump protection monitor to activate if the period exceeds the programmed time out period.

**NOTE: If the cell is disconnected for any reason, always remember to disable the pump protection monitor (set to zero) or the pump will continue to switch off after the time out period.**

### Lo Flow – OFF scrolls across the display

- Possible cause : Flow switch paddle is obstructed or damaged.  
Solution : Check paddle operation.  
Possible cause : Flow sensor is detecting insufficient or no water flow through cell.  
Solutions : Check pump is operating and actually pumping water.  
Are skimmer and pump baskets clean?  
Are valves in the correct positions?  
Is the filter restricting the flow? If so, backwash filter.  
Is the pool full enough?  
Is the pump sucking air?  
Is the skimmer weir door obstructing the water flow?  
Is the inlet to the cell blocked with debris? If so, clean and investigate filter problem.  
Water is by-passing filtration medium. Is the pump losing prime?  
Has the solar system just powered up? On start up, the displaced air in the system may switch cell off briefly.

### Chlorine output display reads a lower value than that which was set

- Possible cause : Salt level is too low for the unit to operate at full power but not low enough for a warning message to scroll across the display.  
Solution : Add more salt.  
Possible cause : Fluctuations in mains voltage.  
Solution : No action required since effect on output is negligible.

### No chlorine residual in swimming pool

- Possible cause : Chlorinator is not operating sufficient hours per day.  
Solution : Check time clock ON/OFF periods and adjust accordingly.  
Possible cause : Cell electrode is coated with a mineral or metal coating.  
Solution : Clean electrode as described in this manual.  
Possible cause : % Chlorine output setting is too low.  
Solution : Increase % Chlorine output setting.  
Possible cause : Cyanuric acid (Stabilizer) level in pool is insufficient.  
Solution : Increase levels as specified.  
Possible cause : Heavy usage of pool.  
Solution : Use the BOOST function regularly or shock dose pool using an approved oxidizing agent as per the manufacturers instructions.  
Activate Auto Demand Mode.

# HYDROGEN GAS SAFETY

You may take comfort from the fact that the Hayward Cell has worldwide patents on it's design relating to safety.

## Hayward has the worlds safest Cell

Your Hayward Chlorinator must be installed in accordance with the installation instructions listed in this manual.

The Cell, apart from producing Chlorine, produces a byproduct gas Hydrogen. Hydrogen is not readily dissolved in the water and under normal filtration conditions passes through and out of the pool returns, harmlessly dissipating into the atmosphere.

If however the water flow is restricted (blocked skimmer box, incorrectly closed valve, etc) and these gases collect in the system, a potentially explosive mixture could result under certain conditions.

The Hayward chlorinator has eliminated this potential hazard with in-build electronic and physical safety features.

Primarily it is important that whenever chlorine is produced that we have water flow to transport the byproduct hydrogen gas through the return pipes, to the eyeball returns and to atmosphere. We have three mechanisms that ensure this occurs.

- If the water flow stops, the flow switch at the top of the Chlorinator Cell detects this and switches power off to the cell. The unit remains on standby until correct water flow is re-established. **A scrolling message Lo Flo – OFF is displayed.**
- It is an installation requirement that the filter pump is electrically interconnected with the chlorinator and operating from the one time clock. This ensures simultaneous operation.
- The most important hydrogen gas containment feature is the Hayward Cell's physical design. It's unique patented vertical design ensures that even in the unlikely event that the electrical or electronic flow protection features fail, the gas will be contained to a volume of less than 2lts within the cell housing.

## **POWER PACK - Installation guide**

The Hayward power pack is supplied with a mounting bracket, three screws and three masonry plugs. To comply, the unit must be mounted on a solid wall or post that covers an area no less than the rear area of the back of the power pack. Always mount the power pack as per local electrical codes and within 9' feet or 3m of the cell and 2m from the pool pump. Air flow around the power supply must not be restricted or warmed from a heat source.

The unit is suitable for outdoor installation and has an IP23 rating. This allows the unit to be installed either 1.2m higher than the highest water level or at least 3m from the pool edge as defined in AS3000 section G.3.

The power pack has a built in digital time clock which will control both the chlorinator and pump ON and OFF times. Both pump and chlorinator must operate simultaneously. You may use an external time clock to control the chlorinator and pump, however some of the delay features involving the pump will not operate.

**WARNING - ISOLATE SUPPLY POWER TO CHLORINATOR POWER PACK BEFORE OPENING ELECTRICAL JUNCTION BOX OR SERVICING CHLORINATOR OR PUMP.**

**CAUTION - FOR CONTINUED PROTECTION AGAINST POSSIBLE ELECTRIC SHOCK USE ONLY IDENTICAL REPLACEMENT PARTS WHEN SERVICING.**



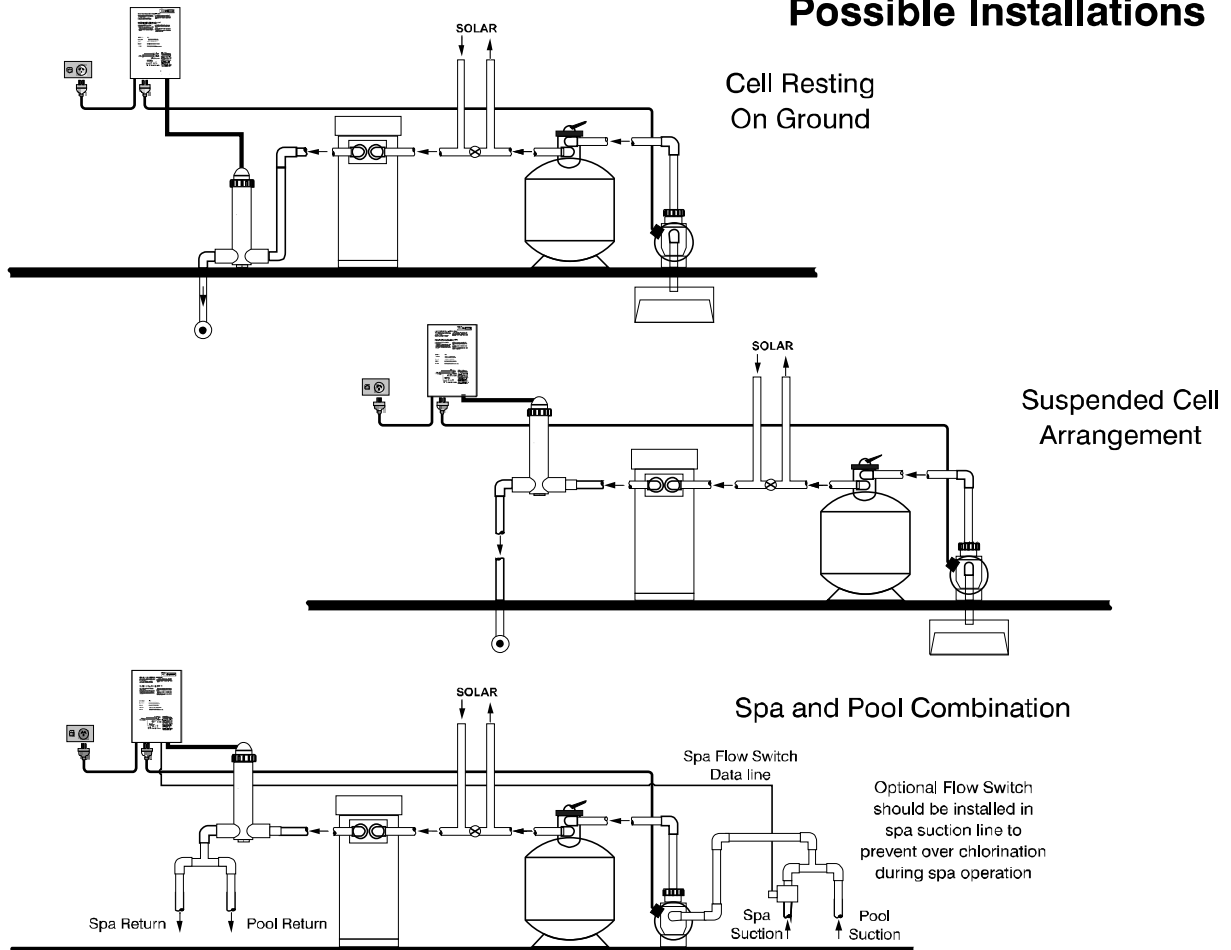
## CAUTION - INSTRUCTIONS MUST BE READ PRIOR TO INSTALLATION OF CELL AND POWER PACK.

**Cell Installation** - The Cell housing must be installed vertically with the inlet and discharge plumbing positioned such that the water enters and exits the cell chamber at the lowest point of the vertical cell. 2" (50mm) or 1 1/2" pipe must be plumbed directly onto both ends of the cell with the water flowing in the direction as indicated by the arrow on the cell housing. Do not use barrel unions on both sides of the horizontal plumbing that connect to the cell housing. Unions may loosen and cause the cell to rotate from a vertical upwards position which will disable the physical ability for the cell to contain a hydrogen gas build up.

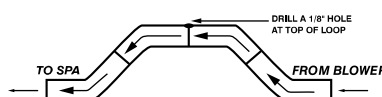
This is imperative in forming the inverted "U - shaped" physical gas trap required to ensure a safe cell installation.

**Positioning Cell in Plumbing System** - The cell must be installed on the pool return line, DOWN STREAM of all other equipment such as the filter, heaters and solar heaters. This is very important in preventing accumulation of Hydrogen gas and high return line chlorine levels corroding heat exchangers. Where the cell is installed below pool water level, ensure isolating valves are installed so the cell can be inspected or removed.

### Possible Installations



**Air Blower Installation** - If an air blower is installed and connected directly to venturi spa jets, a vented loop must be installed. This allows any build up of hydrogen gas to escape from the blower line before it comes in contact with the blower motor.



**NOTE: TOP OF LOOP MUST BE ABOVE SPA WATER LEVEL.**

# WARRANTY

The following invalidates warranty:

- Incorrect installation.
- Failure to clean cell regularly and to the specifications listed in this manual.
- Misuse.
- Water in excess of 40deg C/113 deg F passing through the cell.
- Pressures exceeding 350kPa/50psi.
- Where used for a purpose other than that described in this manual.
- Operating unit at higher or lower than recommended salt levels.
- Freezing water in cell chamber.
- Operating unit on a pool volume larger than the maximum specified in literature for a tropical climate.

For further terms, conditions, and product registration, please refer to the accompanying Hayward Warranty Card.