



HD Mineral & Salt Chlorinator
Models: HHDMSC24, HHDMSC36

INSTALLATION & OWNERS MANUAL



**SUITABLE
FOR USE WITH
SALT OR
MINERAL
POOLS**

IMPORTANT
Please read carefully



WARNING:
Failure to follow these instructions and comply with all applicable codes may cause serious bodily injury and/or property damage.

The installation of this product should be carried out by a person knowledgeable in swimming pool plumbing requirements following the installation instructions provided in this manual.

Please pass these instructions on to the operator of this equipment

Contents

Henden HD Mineral & Salt Chlorinator

INSTALLATION

1. INSTALLATION INSTRUCTIONS FOR HENDEN HD MINERAL & SALT CHLORINATOR 5

- 1.1 Installing The Power Supply 5
- 1.2 Connecting The Electrolytic Cell to the Power Supply 5

2. PRE-START UP PROCEDURE 6

OWNERS MANUAL

3. OPERATION OF YOUR HENDEN HD MINERAL & SALT CHLORINATOR SYSTEM 8

- 3.1 Control Panel Layout 8

4. HENDEN HD MINERAL & SALT CHLORINATOR FEATURES 9

- 4.1 Stand - By 9
- 4.2 Flow 9
- 4.3 Sanitiser Output Control 9
- 4.4 Low Salinity Indicator 9

5. OPERATION OF HENDEN HD MINERAL & SALT CHLORINATOR 9

- 5.1 Normal Operation 9
- 5.2 Winter Mode 10

6. AUTOMATIC TIME CLOCK OPERATION 10

7. MAINTENANCE OF POWER SUPPLY 12

8. MAINTENANCE OF ELECTROLYTIC CELL 12

9. DAY TO DAY OPERATION 12

- 9.1 Stabiliser 12
- 9.2 pH and Total Alkalinity 12
- 9.3 Salt Levels 13
- 9.4 Running Times 13

10. CHLORINE PRODUCTION 13

- 10.1 "Shock" Treatment 13
- 10.2 Chlorine Types and Comparisons/Max Pool Size 14
- 10.3 Safety Device 14

11. GENERAL INFORMATION 15

- 11.1 Common Terms 15

12. IMPORTANT NOTES 15

13. TROUBLE SHOOTING 16

14. HENDEN™ REPAIR OR REPLACEMENT GUARANTEE 16

15. MOUNTING TEMPLATE 18

INSTALLATION

Congratulations! You are now the proud owner of a Henden HD Mineral & Salt Chlorinator. Please read all information in this manual carefully before installing or operating your Henden HD Mineral & Salt Chlorinator.

PACKING LIST

1. Power Supply / Controller
2. Electrolytic Cell
3. 2 x 50 x 40PVC Reducing Bush
4. Mounting Kit and Spare Fuse
5. Installation & Operating Manuals

IMPORTANT NOTICE

FACTORS THAT WILL IMPROVE THE PERFORMANCE AND LIFE OF YOUR HD MINERAL AND SALT WATER CHLORINATOR

PLEASE READ THIS BEFORE OPERATING YOUR CHLORINATOR

POOL BUILDERS: Please cover this information with your customer during the new pool "Hand over Session"

Mineral & Salt Water Chlorinators are a valuable piece of pool sanitising equipment and must be cared for to get the best performance and life span from it.

There are THREE main factors that will damage your chlorinator and reduce the life of the product. Please monitor the following factors in accordance with your installation & operating instructions.

1. MAINTAIN OPTIMUM SALT LEVELS:

OPTIMUM SALT LEVELS: 4500-6000ppm

- Run chlorinator at the optimum salt levels stated within this document and on the product to ensure optimum sanitiser output and cell life.
- Operating this device at low salt levels will damage the cell and reduce its life.
- The control panel displays red LED indicator warnings when the salt levels are low.
- If no action is taken to rectify the salt levels, damage to the cell may result which will not be covered under warranty.

2. MONITOR & MAINTAIN YOUR CHLORINATOR CELL:

- To keep your salt water chlorinator in the best possible condition, regular monitoring of the electrolytic cell is recommended. The 'cell' is the unit containing the plates.
- During the chlorination process a white powdery calcium scale may naturally build up on the titanium plates in the cell. Monitor the cell to prevent excessive scale build up. Excessive scale build up will cause damage to your cell, and dramatically reduce its efficiency and lifespan.
- Reverse Polarity models are low maintenance models that minimise scale build up.
- The control panel displays red LED indicator warnings when the cell requires cleaning.
- If calcium scale builds up please clean the cell, following the cleaning instructions provided on page 11.
- NEVER: Use concentrated acid to clean your cell.
- NEVER: Leave cell in cleaning solution for extended periods of time
- NEVER: Use metal implements, scourers or brushes to clean your cell

3. BALANCED POOL WATER CHEMISTRY:

- Salt levels MUST be maintained at 4500-6000ppm for optimum performance and lifespan
- Calcium hardness levels MUST be kept to ideal ranges of 200-275ppm (for concrete and tiled pools) and 100-225ppm (for other surfaces) to prevent excessive scale build up and damage to equipment.
- pH levels MUST be kept to ideal levels to prevent damage to equipment and pool surfaces and to obtain optimum sanitiser effectiveness.
- Total alkalinity and stabiliser levels must also be kept in an ideal range.

Note: Please refer to the RECOMMENDED POOL WATER CHEMISTRY chart on page 14 for more information.



Note: The chlorinator is not intended for use by young children or infirm persons without supervision. Please ensure that young children are supervised to ensure that they do not play with the chlorinator.



Power connections and wiring must be carried out by an authorised electrician.

1. INSTALLATION INSTRUCTIONS FOR HENDEN HD MINERAL & SALT CHLORINATOR

1.1 INSTALLING THE POWER SUPPLY

Select a convenient location that is not in line with direct sunlight and is well-ventilated and within one metre of the filtration equipment. Mount the power supply vertically, at a serviceable height of 1.5 metres above ground level. Australian Standards requires that the power supply shall not be located within 3 meters of the pool water. Plug the power supply into a suitable weatherproof outlet and plug the pool filtration pump into the chlorinator power outlet in the base of the power supply. The unit must be kept away from acid and other chemical storage areas. Acid and chemical vapours will corrode the electronics inside the unit. It must also be kept away from heat sources. Good ventilation is necessary for correct operation.

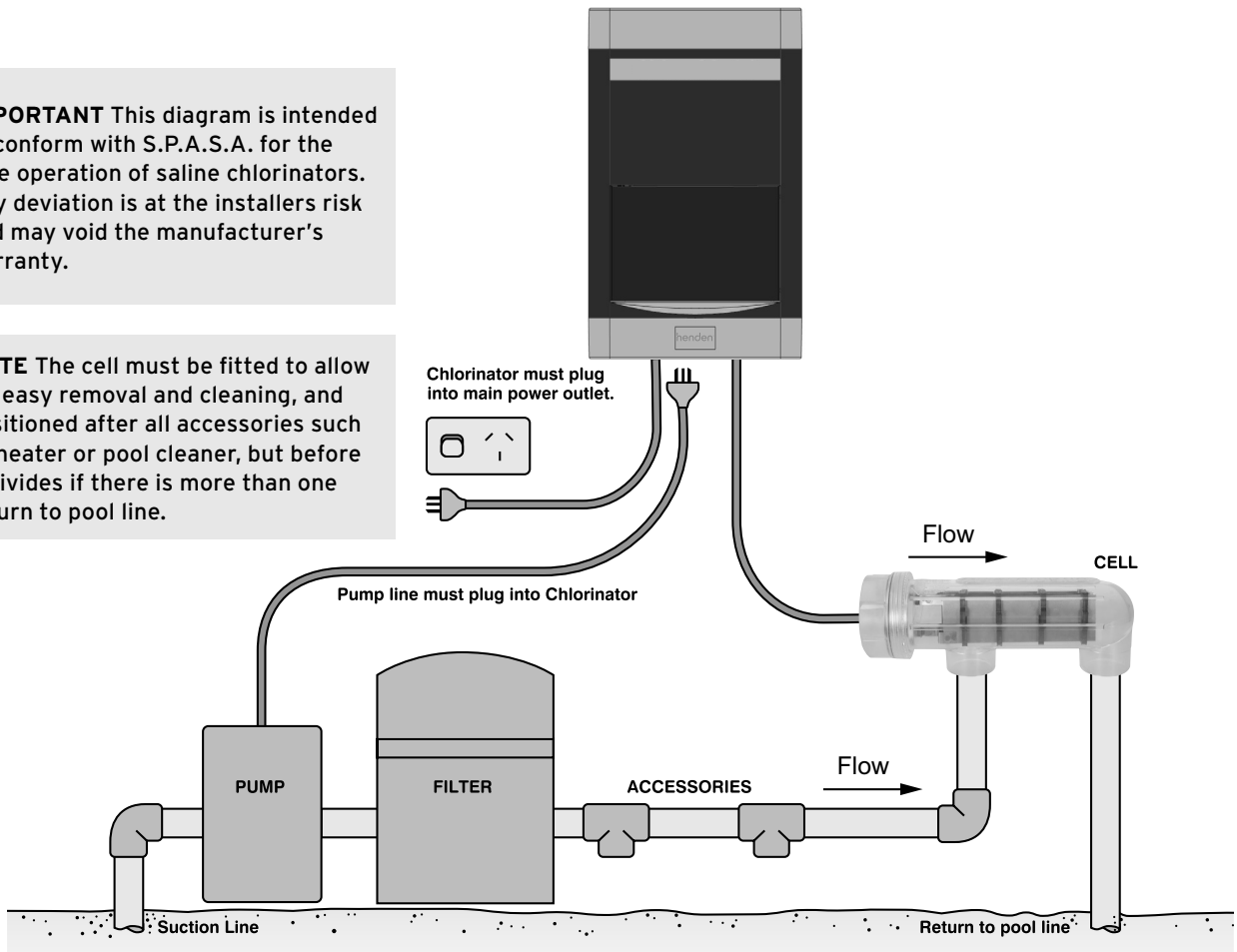
Two self-tapping screws and wall plugs have been provided for fast and simple installation. Simply cut out the template on page 18 for location of drill entry points. Use a 7mm masonry drill bit when fitting power supply to a brick or concrete wall. When mounting on a wall or a post in the pool equipment area, drill pilot holes and fit screws provided. Once screws are in position simply hang chlorinator via bracket on back of unit.

1.2 CONNECTING THE ELECTROLYTIC CELL TO THE POWER SUPPLY

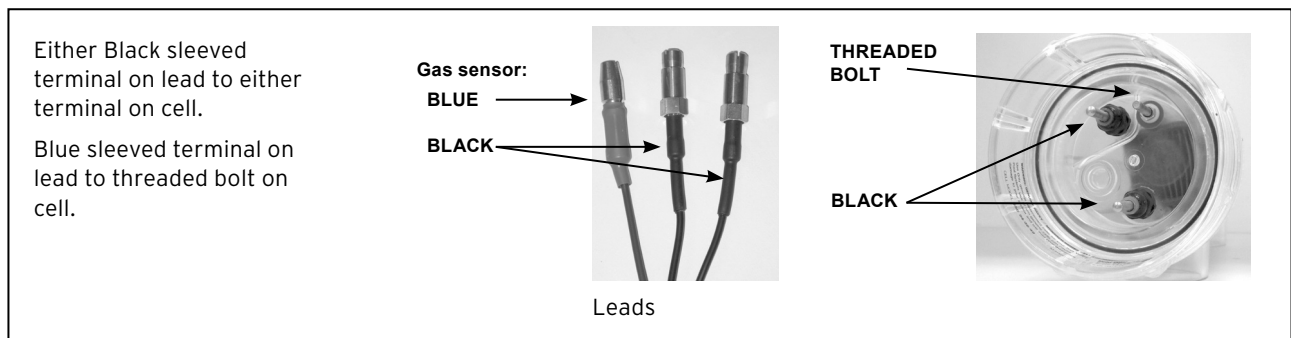
The power supply is fitted with a flexible lead terminated with brass connectors. These must be correctly and securely fitted to the connections on the cell. To prevent incorrect connection the fittings have been colour coded.


IMPORTANT This diagram is intended to conform with S.P.A.S.A. for the safe operation of saline chlorinators. Any deviation is at the installers risk and may void the manufacturer's warranty.

NOTE The cell must be fitted to allow for easy removal and cleaning, and positioned after all accessories such as heater or pool cleaner, but before it divides if there is more than one return to pool line.



Note The gas sensors are pushed onto the gas sensor bolt and are not screwed on, even though the gas sensor is threaded.



 Do not use a double adaptor to connect more than one pump - it can overload the system and could void your warranty.

Important: The cell must be installed so that the water flows through the cell housing via the cell head end in accordance with the arrow on the cell housing. This is to ensure correct operation of the gas sensor. It is also important to ensure that terminals from the connection leads fit tightly to the cell terminals.

2. PRE-START UP PROCEDURE:

POOL SALT

SALT LEVEL GUIDE – 20kg Bag											
To raise salt concentration by		Salt Required									
ppm	%	25,000L Bags / kg	30,000L Bags / kg	35,000L Bags / kg	40,000L Bags / kg	45,000L Bags / kg	50,000L Bags / kg	55,000L Bags / kg	60,000L Bags / kg	65,000L Bags / kg	70,000L Bags / kg
1000	0.1	1.3 / 26	1.5 / 30	1.8 / 36	2.0 / 40	2.3 / 46	2.5 / 50	2.8 / 56	3.0 / 60	3.3 / 66	3.5 / 70
2000	0.2	2.4 / 48	2.8 / 56	3.3 / 66	3.7 / 74	4.2 / 84	4.6 / 92	5.1 / 102	5.5 / 110	6.0 / 120	6.4 / 128
3000	0.3	3.6 / 72	4.4 / 88	5.1 / 102	5.9 / 118	6.6 / 132	7.4 / 148	8.1 / 162	8.9 / 178	9.6 / 192	10.4 / 208
4000	0.4	5.0 / 100	6.0 / 120	7.0 / 140	8.0 / 160	9.0 / 180	10.0 / 200	11.0 / 220	12.0 / 240	13.0 / 260	14.0 / 280
5000	0.5	6.3 / 126	7.5 / 150	8.8 / 176	10.0 / 200	11.3 / 226	12.5 / 250	13.8 / 276	15.0 / 300	16.3 / 326	17.5 / 350
6000	0.6	7.3 / 146	8.8 / 176	10.3 / 206	11.8 / 236	13.3 / 266	14.8 / 296	16.3 / 326	17.8 / 356	19.3 / 386	20.8 / 416

Before operating your Henden Salt Chlorinator please ensure the following items have been added to your pool:

- **SALT** - Load salt into the pool at the following rates:
 - All Henden Salt Chlorinator Models - 45-60kg per 10,000 litres (4500-6000ppm)
- **MINERAL SALTS** - Your Henden salt system can also be used with all available pool salts, including mineral salts containing Magnesium and Potassium. When used exclusively with mineral salt pools, the chlorine production is 50% of the normal rated output. However, if used as an additive to normal salt pools, the rated output is similar.

Connect manual vacuum system and turn on filtration pump, slowly vacuum until salt dispersal is complete. Place vacuum head into deepest end of pool and allow vacuum to continue for a further 2 to 3 hours. Salt should now be completely mixed. For pop up automatic "In-Floor" cleaning systems allow the filter pump to run for 2 to 3 hours. Never add salt directly into skimmer box.

- **CHLORINE** - For a new pool installation that has not been chlorinated, add sufficient chlorine (liquid or granular) to achieve a reading of 3 ppm (with a suitable test kit), or run the chlorinator system continuously for at least 24 hours or until a reading of 3 ppm is reached.

- **STABILISER** - It is essential that pool stabiliser be added and maintained at the rate of 30 - 50 ppm at all times. Do not exceed 100 ppm. **(FOR OUTDOOR POOLS ONLY)**

(Refer Day to Day Operation page 12 for further information).

Storage and safety

1. Store in a dry, covered place away from direct sunlight for longer bag life
2. Always use the entire bag content of salt, once opened. Do not keep open bags of pool salt, as it is sensitive to moisture in the air.
3. Care should be taken to avoid contact with eyes and inhaling salt dust. Wearing eye protection and a dust mask is good practice.
4. If eyes become affected, flush with clean tap water.
5. If skin becomes irritated, immediately wash contaminated skin with plenty of water and then wash with soap and water.

Mineral Salt

For Mineral Salt applications please ensure the following quantity of Mineral Salt (P/N: HMS15) and Mineral Activator (P/N: HMA15) has been added to your pool.

Converting existing salt pools

Pool Size (Litres)	Henden Therapeutic Mineral Salt (15kg bags)
Up to 5,000	1 Bag = 15kg
Up to 10,000	2 Bags = 30kg
Up to 15,000	3 Bags = 45kg
Up to 20,000	4 Bags = 60kg
Up to 25,000	5 Bags = 75kg
Up to 30,000	6 Bags = 90kg
Up to 35,000	7 Bags = 105kg
Up to 40,000	8 Bags = 120kg
Up to 45,000	9 Bags = 135kg
Up to 50,000	10 Bags = 150kg
Up to 55,000	11 Bags = 165kg
Up to 60,000	12 Bags = 180kg
Up to 65,000	13 Bags = 195kg
Up to 70,000	14 Bags = 210kg
Up to 75,000	15 Bags = 225kg

1. Continue to operate your filter pump for a period of 24 hours following the addition of Mineral Salt to ensure proper blending has occurred.
2. Henden Mineral Salt can be used with all Henden Salt Water Chlorinators with recommended TDS levels of between 4,000 and 6,000ppm.
3. When replacing normal pool salt with Henden Mineral Salt, ensure that TDS levels do not exceed 6,000ppm after its addition to the pool.
4. Ensure pH levels are between 7.4 & 7.6 after the addition.

To increase TDS by Approximately 1,000ppm

Pool Size (Litres)	Henden Therapeutic Mineral Salt (15kg bags)	Henden Mineral Activator (15kg bags)
Up to 10,000	0.5 Bag	0.5 Bag
Up to 20,000	1 Bag	1 Bag
Up to 30,000	1.5 Bags	1.5 Bags
Up to 40,000	2 Bags	2 Bags
Up to 50,000	2.5 Bags	2.5 Bags
Up to 60,000	3 Bags	3 Bags
Up to 70,000	3.5 Bags	3.5 Bags

New mineral salt pools

Pool Size (Litres)	Henden Therapeutic Mineral Salt (15kg bags)	Henden Mineral Activator (15kg bags)
Up to 5,000	1 Bag = 15kg	1 Bag = 15kg
Up to 10,000	2 Bags = 30kg	2 Bags = 30kg
Up to 15,000	3 Bags = 45kg	3 Bags = 45kg
Up to 20,000	4 Bags = 60kg	4 Bags = 60kg
Up to 25,000	5 Bags = 75kg	5 Bags = 75kg
Up to 30,000	6 Bags = 90kg	6 Bags = 90kg
Up to 35,000	7 Bags = 105kg	7 Bags = 105kg
Up to 40,000	8 Bags = 120kg	8 Bags = 120kg
Up to 45,000	9 Bags = 135kg	9 Bags = 135kg
Up to 50,000	10 Bags = 150kg	10 Bags = 150kg
Up to 55,000	11 Bags = 165kg	11 Bags = 165kg
Up to 60,000	12 Bags = 180kg	12 Bags = 180kg
Up to 65,000	13 Bags = 195kg	13 Bags = 195kg
Up to 70,000	14 Bags = 210kg	14 Bags = 210kg
Up to 75,000	15 Bags = 225kg	15 Bags = 225kg

1. With the filter pump running, pour the contents of Henden Mineral Salt and Henden Mineral Activator into the pool evenly around the edge.
2. Continue to operate the filter pump for a period of 24 hours following the addition to ensure proper blending has occurred.
3. It is recommended that TDS levels be maintained between 4,000 and 6,000ppm.
4. When using the Henden Mineral Salt and Henden Mineral Activator, ensure that TDS levels do not exceed 6,000ppm after its addition to the pool.
5. Ensure pH levels are between 7.4 & 7.6 after the addition.

STORAGE AND SAFETY

Store in a dry, covered place away from direct sunlight for longer bag life

Always use the entire bag content of Mineral Salt, once opened. Do not keep open bags of Mineral Salt as it is sensitive to moisture in the air.

Care should be taken to avoid contact with eyes and inhaling salt dust. Wearing eye protection and a dust mask is good practice.

If eyes become affected, flush with clean tap water.

If skin becomes irritated, immediately wash contaminated skin with plenty of water and then wash with soap and water.

CHLORINE - For a new pool installation that has not been chlorinated, add sufficient Chlorine (liquid or granular) to achieve a reading of 3 ppm (with a suitable test kit), or run the Sanitiser system continuously for at least 24 hours or until a reading of 3 ppm is reached.

STABILISER - It is essential that pool stabiliser be added and maintained at the rate of 30 - 50 ppm at all times. Do not exceed 100 ppm. **(FOR OUTDOOR POOLS ONLY)**

(Refer Day to Day Operation page 16 for further information).

Note: When the need arises to top up your pool with Henden Mineral Salt or Henden Mineral Activator, due to dilution through rainfall or backwashing. Henden recommends you use equal quantities of Mineral Salt to Activator (ratio 1:1) and that you maintain your TDS level between 4,000 and 6,000ppm. This will ensure your mineral pool water stays soft, silky and crystal clear.

After adding Henden Mineral Salts to your pool the water may temporarily have discolouration and form clusters of foam on the surface. This is completely normal and is part of the mineralisation stage and transformation process. This may last for 24 hours, however after this time, your pool will return to normal and become crystal clear and clean. It is recommended that you run your filter pump for a minimum 24 hours after the addition of Henden Mineral Salts.

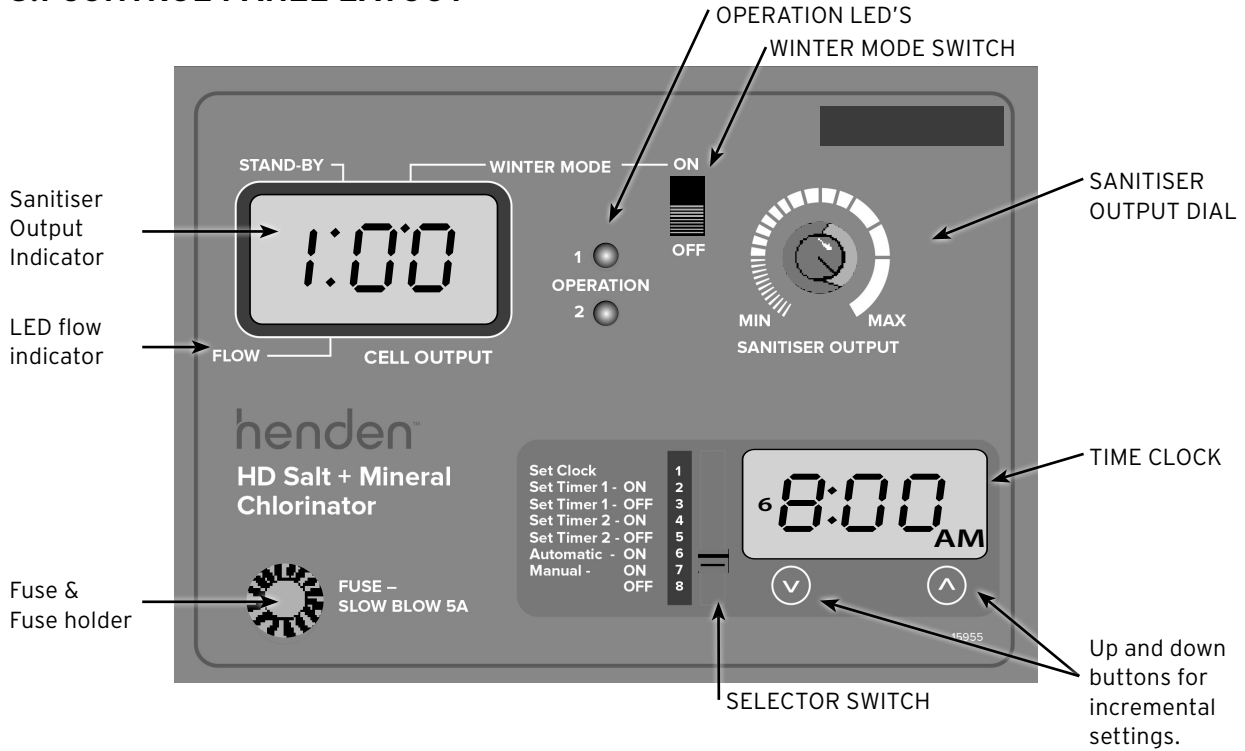
OWNERS MANUAL

3. OPERATION OF YOUR HENDEN CHLORINATOR SYSTEM

Cell output on the digital LED display is expressed as a percentage. The display will fluctuate around 100 when producing chlorine - unless in Winter Mode, in which case the display will fluctuate around 85. (Refer Winter Mode on page 10). The unit is fitted with an electronic

control and warning system. This regulates the output of the unit to the preset maximum. The warning system consists of two Operation LED's that will glow green, or red to indicate possible faults with the unit or damaging operating conditions.

3.1 CONTROL PANEL LAYOUT



Once the salt level in the pool is correct the unit may be switched on. Set Sanitiser Output to Max (100%). The stand-by indicator will be on and no cell output will be seen for approx 30 seconds, this allows the pool pump and filter to prime and the cell housing to fill with water. After this

start-up delay, the display should show 100 (+/-2), unless in Winter Mode where it will display 85 (+/-2). At this point both Operation LED's should be green; if not there may be a problem. (Refer table).

DISPLAY / INDICATOR	LED 1	LED 2	REASON / ACTION
STAND - BY ON	Green	Green	1. Start-up delay functioning. 2. Sanitiser Output set below max. Cell is turned off. (Refer Sanitiser Output page 8)
FLOW STAND - BY ON	Green	Green	1. Gas detected. Check pump/pipes for damage. 2. Gas sensor not connected to cell.
FLUCTUATING AROUND 100	Green	Green	System operating normally.
	Green	Red	1. Salt level too low. Add salt at a rate of 25kg per 25,000L. 2. Cell is calcified. Clean cell. 3. Water temperature low. Switch to Winter Mode .
	Red	Red	1. Salt level below minimum. Add salt. 2. Cell is calcified. Clean cell. 3. Water temperature very cold. Switch to Winter Mode . Continued operation may cause damage to system-Consult dealer for problem rectification.

PLEASE NOTE: When Winter Mode switch is on unit will operate similar to above except display will fluctuate around 85. (Refer Winter Mode page 10).

4. HENDEN HD MINERAL & SALT WATER CHLORINATORS FEATURES

4.1 STAND - BY

The **Stand - By** indicator will be on when the unit is preparing to produce chlorine. This will be either during the systems initial start up or when the cell has been turned off during the filtration cycle.

4.2 FLOW

If there is a problem with water flow or chlorine gas is detected in the cell housing the flow indicator will be on. When this occurs the pump or pipes should be inspected for damage and the Flow Sensor connection checked.

4.3 SANITISER OUTPUT CONTROL

The Sanitiser Output Control varies the amount of time the cell operates during the filtration cycle.

The **Sanitiser Output Control** will not vary the electrical current supplied to the cell.

As an example, if one filtration cycle is set at 5 hours, and the **Sanitiser Output Control** is set to 80%, then the total amount of time the cell will operate during the 5-hour cycle will be 4 hours. If the Sanitiser Output Control is set to 60%, the cell will operate for 3 hours total over the 5-hour filtration cycle.

When the **Sanitiser Output Control** is set to MIN, the cell will be OFF for the duration of the filtration cycle. When the **Sanitiser Output Control** is set to MAX, the cell will be ON for the duration of the filtration cycle.

The **Sanitiser Output Control** is graduated in steps of 10% from MIN (OFF) to MAX (ON).

During the filtration cycle, the cell will be turned ON and OFF a number of times each hour, unless the **Sanitiser Output Control** is set at MIN or MAX. Using the previous example (of 60%), the cell will operate for about 36 minutes each hour. This 36-minute operating time will be made up of a number of smaller operating periods. As an example, the cell may turn ON 12 times (for a period of 3 minutes each time) over the hour to make up the 36 minutes.

This enables the electronic circuitry to re - adjust to any changes in the pool water condition. For example, dilution from winter rains, the addition of salt etc.

If the cell is OFF and you wish to check its operation, simply turn the **Sanitiser Output Control** to MAX and the cell will turn ON. Once checked, adjust the **Sanitiser Output Control** back to the desired position and after a few minutes the cell will turn OFF again.

To turn the cell OFF, simply turn the **Sanitiser Output Control** to MIN. This will be convenient for backwashing.

4.4 LOW SALINITY INDICATOR

Your chlorinator is fitted with a number of protective systems including the **Low Salinity Indicator (operation LED's)**. As the salt level in the pool decreases, the wear on the cell increases. Although salt is not consumed in the chlorination process, it is lost through splashing, back - washing and on bathers as they leave the pool. The salt level is also reduced by rain, which causes dilution. Salt is not lost to evaporation.

As the salt level in the pool falls toward the minimum **Operation LED2** will turn RED. At this point the salt level should be increased by adding 25kg of salt per 25,000 litres of pool water. The addition of salt should not affect the chlorinator as it is protected against overloads. If no action is taken and the salt level continues to fall damage to the system may result.

5. OPERATION OF HENDEN HD MINERAL & SALT CHLORINATOR

5.1 NORMAL OPERATION

The Henden HD Mineral & Salt Chlorinator has the following additional features:

- 1. POLARITY INDICATOR ON OUTPUT Display** - The \pm **Symbol** appears before the cell output display to indicate which polarity the system is in, i.e. positive or negative. This symbol will alternate and is factory pre set.
- 2. SANITISER OUTPUT** - When adjusting the **Sanitiser Output (refer previous section)** the ESC system's Cell Output Display flashes the control setting (i.e. percentage of time that the cell operates during the filtration cycle) for a few seconds then resumes displaying Cell Output, or standby light (if in waiting).
- 3. CLEANING OF CELL** - The ESC System uses a patented electronic reverse polarity system to clean your cell, providing the convenience of lower maintenance.
- 4. PUMP CUT-OUT** - The ESC System features a protective interlock system which cuts off power to the pool pump if there is no water flowing through the cell housing. This is especially helpful if the pump 'runs dry' and hence may stop the pump motor from burning out.

There are other factors that can cause the unit not to work correctly:

- 1. Heavy rain** - can cause very diluted pool water to pass over the cell due to surface skimming.
- 2. Scaled cell** - a scaled cell will not draw as much electrical current as a clean cell when first started.
- 3. Cold water** - cold pool water reduces the ability of a cell to carry electrical current. (Refer Winter Mode on next page).
- 4. Failing cell** - as the cell ages there will come a time when the electrical current draw will drop. This can be compensated for with the addition of extra salt. A cell is considered failed when it draws less than 80 % of maximum current. To keep a failed cell in operation Winter Mode can be used along with extra salt. There will come a time when the cell will not respond to either extra salt or Winter Mode. It will then need to be replaced. Please note that the Low Salinity Indicator is not like T.D.S. meters, which are temperature compensated scientific instruments. The accuracy will be within 500ppm salinity and they are water temperature dependent, just as the cell is.

5.2 WINTER MODE

When the cell draws electrical current from the power supply, the amount of current drawn is dependent upon a number of factors. Two of these factors are salinity and water temperature.

The Low Salinity Indicators on your chlorinator are designed to operate at swimming season water temperatures. When the pool begins to cool in the off-season the temperature drop causes the cell to behave differently - it will draw less electrical current. This can cause the Low Salinity Indicator to assume that the salinity has fallen even if the salinity has remained relatively constant.

When the temperature of the pool water drops, the Winter Mode Switch should be placed in the ON position.

The Winter Mode Indicator will then be ON. This has two effects:

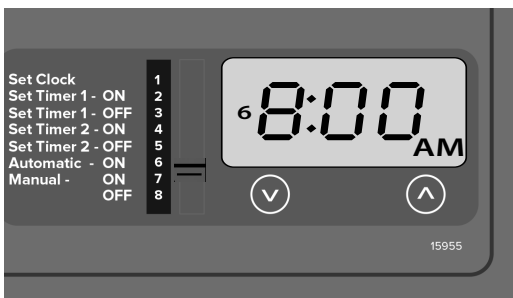
1. It alters the setting of the Low Salinity Indicator.
2. It reduces the cell output by approximately 15%

The unit will now respond to a cold pool environment. Winter Mode should not be used in the swimming season as it reduces the cell output, leading to less chlorine, and it alters the setting of the Low Salinity Indicator, which could lead to premature cell failure.

6. AUTOMATIC TIME CLOCK OPERATION

Your Henden HD Mineral & Salt Chlorinator is fitted with a digital automatic timer.

The digital timer includes a backlit Liquid Crystal Display (LCD) which displays time of day in 12-Hour format with AM / PM indication and a selector switch position indicator. The digital timer has up and down buttons for incremental settings.



Timer Setting and Functions:

To set your clock and various functions please refer to the table of instructions following.

NOTE:

When you first turn on the power to the chlorinator, it will take approximately 5 seconds for the LCD to appear on the screen.

Function Description	Selector Switch Position	Functions and Instructions
Set Clock	1	Set the current time on the digital clock.
		Select the Set Clock position on the selector switch to enable the time of day to be input. A number '1' will appear at the left of the screen. (a) The display will flash on and off as long as the selector switch remains at this position. Use the up ▲ and down ▼ buttons to reach the desired times. Hold the buttons down for fast increments.
Set Timer 1 - ON	2	Set the start time for the first run time sequence.
		Select the Set Timer 1 - ON position on the selector switch. A number '2' will appear at the left of the screen. This time is factory pre-set to 6am. Proceed as per (a) in the 'Set Clock' instruction to change time. To disable this timer, move up or down to 11.59PM. Press the UP button one more time to turn OFF. NOTE: This step will also disable the time for 'Set Timer 1 - OFF'.
Set Timer 1 - OFF	3	Set the completion time of the first run time sequence.
		Select the Set Timer 1 - OFF position on the selector switch. A number '3' will appear at the left of the screen. This time is factory pre-set to 8am. Proceed as per (a) in the 'Set Clock' instruction to change time.
Set Timer 2 - ON	4	Set the start time for the second run time sequence.
		Select the Set Timer 2 - ON position on the selector switch. A number '4' will appear at the left of the screen. This time is factory pre-set to 5pm. Proceed as per (a) in the 'Set Clock' instruction to change time. To disable this timer please refer to selector switch position 2 above.
Set Timer 2 - OFF	5	Set the completion time for the second run time sequence.
		Select the Set Timer 2 - OFF position on the selector switch. A number '5' will appear at the left of the screen. This time is factory pre-set to 11pm. Proceed as per (a) in the 'Set Clock' instruction to change time. To disable this timer please refer to selector switch position 2 above.
Automatic ON	6	Filtration system switches on and off automatically according to your set times.
		Select the Automatic ON position on the selector switch. A number '6' will appear at the left of the screen.
Manual ON	7	Overrides the automatic time clock settings and switches filtration system ON.
		Select the Manual ON position on the selector switch. A number '7' will appear at the left of the screen. NOTE: Chlorination will be constant until turned OFF or back to Automatic ON. Over chlorination may occur if left for long durations.
OFF	8	Overrides the automatic time clock settings and switches filtration system OFF.
		Select the OFF position on the selector switch. A number '8' will appear at the left of the screen. NOTE: Chlorination / sanitisation will cease. Not recommended for long durations.

7. MAINTENANCE OF POWER SUPPLY

Little or no maintenance is normally required with the exception of replacing blown fuses. These fuses can be sourced from your local Reece Irrigation & Pools branch. However, it is essential that the wall or post to which the unit is installed be sprayed (not the unit itself) periodically with a good surface type insect repellent, since penetration by insects may cause damage, which is not covered by your warranty.

The back of the unit has been designed as a heat sink. It is normal for this area to become very hot.

8. MAINTENANCE OF ELECTROLYTIC CELL

The cell is composed of precious materials, and although proper maintenance can prolong its life to the maximum, eventually the process of electrolysis will wear away its delicate coating, at which time it gradually ceases to produce chlorine.

Mineral salts and calcium (scale) are deposited on the outer and the inner plate as electrolysis takes place. This build up - will interfere with the flow of electrical current in the cell and thus lowers sanitiser production. It is essential to inspect the cell regularly and clean when necessary. The rate at which deposits will form on the plate differs with each pool and can be influenced by the following:

- Calcium hardness of the water
- Water temperature
- pH control
- Water which has been chlorinated with calcium hypochlorite for an extended period
- Calcium in the plaster surfaces of a concrete pool

Because these conditions vary so much, check the cell at least weekly to begin with to see when either scale or a blue/green soapy substance appears on the plate. You will then be able to determine the cleaning cycle necessary for your pool (obviously more in summer). The intervals between cleaning could get longer to the point where cleaning is only necessary a few times each year. One exception is the use of bore water or ground water, in which case cleaning may always need to be as frequent as once a week.



NOTE In areas with hard water, reverse polarity systems may require occasional manual cleaning.

Life of Henden electrolytic cells vary substantially from one installation to another due to variations in operating time, water quality and composition, system and cell maintenance. Please ensure that when cell replacement is necessary you use the correct genuine Henden replacement cell to match your system.

To clean the cell: Turn off the chlorinator unit. Remove all leads connected to the head assembly. Unscrew the cell by turning the head assembly clockwise - as per instructions, and withdraw from the cell housing.



NOTE If using mineral salts in areas with hard water, reverse polarity systems may require occasional manual cleaning. Mineral salts can form scale on the cell that isn't removed through the polarity reversal process, therefore more frequent manual cleaning may be required. In some cases this scale is soft enough to remove with a strong jet of water if acid cleaning proves ineffective.

METHOD 1

Add 1 part HYDROCHLORIC ACID to 10 parts WATER in a suitable container and immerse the cell in this solution. It should not take longer than a few minutes to clean, if it does the cell should be cleaned more frequently. If the build - up is not excessive it may be possible to clean the cell plates with a jet of running water. Return the cell to its housing and connect leads to the head assembly.

METHOD 2

As an alternative, an approved commercial cell cleaning solution can be used a number of times effectively.



WARNING Follow safety instructions provided with the Hydrochloric Acid or cleaning solution. When handling Hydrochloric Acid, the use of eye protection, mask and gloves are highly recommended. Extreme caution should be taken whenever handling Hydrochloric Acid or cell cleaning solution.

9. DAY TO DAY OPERATION

Four prime rules must be observed if your unit is to give the best possible service:

9.1. STABILISER

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 substantially. Without stabiliser, it may be necessary to run the unit for up to three times as long!

Stabiliser should be added at the rate of 500 grams for every 10,000 litres of water. Stabiliser should be maintained at a level of 30 - 50 ppm. Before adding more stabiliser, have your pool water analysed at your local Reece Irrigation & Pools branch to ensure that you do not add too much.

9.2. pH AND TOTAL ALKALINITY

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 pool. Correct pH levels are as follows; fibreglass - 7.2 to 7.4 concrete & tiled - 7.4 to 7.6 If you allow the pH level to rise to 8.0 or above, the chlorine required could be as much as three times the normal amount.

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 - the ideal range is 80 - 150 ppm, or refer to your pool professional.

You should use a test kit which includes a test for total alkalinity. Low total alkalinity can cause unstable pH levels - i.e. An inability to keep the pH constant may cause staining, etching and corrosion of metals. High total alkalinity will cause constantly high pH levels.

9.3. SALT LEVELS

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 Henden HD Mineral & Salt Chlorinator, and insufficient salt will damage your cell.



WARNING Some people recommend that you put salt directly in the skimmer box. This is a very poor practice as it allows very high concentrations of salt to be passed through your filtration and other pool equipment.

RECOMMENDED SALT LEVEL RANGE: 4500 - 6000ppm



WARNING Do not add Hydrogen Peroxide to pool water or through swimming pool hydraulic or sanitiser system. Use of Hydrogen Peroxide will void warranty on Henden products.

Salt is NOT used up in the process of producing chlorine or by evaporation. Salt is only lost through back - washing, splash - out, overflow or by leakage from the pool or plumbing. Winter rains can dilute the salt solution in your pool; therefore salt levels should be checked during this season. In colder water, the Henden HD Mineral & Salt Chlorinator should be set to **Winter Mode**. (Refer **Winter Mode** page 10).

Low salt levels will destroy the coating on the anode plates and will void all warranty.

The Henden HD Mineral & Salt Chlorinator has built in warning indicators to minimise damage resulting from insufficient salt levels, however, the ultimate responsibility is on the owner to ensure adequate salt levels are maintained all year round.

9.4. RUNNING TIMES

These instructions cover Henden HD Mineral & Salt Chlorinators for residential use only.

If you run your chlorinator for 24 hours a day, or for long periods, the cell life will be greatly reduced. It is important that the correct model Henden Salt Chlorinator has been installed on your pool. Many models are available to cope with small courtyard pools up to commercial applications. (Consult Henden for more information).

10. CHLORINE PRODUCTION

The Henden HD Mineral & Salt Chlorinator must be run daily to generate sufficient chlorine to sanitise the pool. During Summer this is approximately eight hours per day, preferably in two periods - between 6.00am and 8.00am and between 5.00pm and 11.00pm. Night time is preferable because chlorine dissipates rapidly in direct sunlight. If these running times are observed, and the cell is functioning correctly, your pool will have sufficient chlorine when tested in the morning.

If the level is too low either longer running times are required or the **Sanitiser Output Control** needs to be adjusted to maximum. Harsh local conditions such as traffic pollution or windborne dust require different running times, in which case, seek advice from your local Reece Irrigation & Pools branch. During winter approximately 4 to 6 hours a day should provide enough chlorine. Without sufficient filtration/chlorination, your pool will never function correctly. **ALWAYS RUN THE FILTER WHEN SWIMMING IN THE POOL**. In extremely hot weather or during periods of heavy bathing loads, the running time may need to be extended to 10 - 14 hours per day.

In some cases you may find your chlorine level to be too high. To determine if this is the case, run your filter/chlorinator for the suggested times/chlorine production level and test your pool water on the morning after operation. If your chlorine test shows a high level of chlorine, either the running times can be reduced slightly, or the Sanitiser Output Control can be turned anti - clockwise. Test your chlorine level again the following morning at around the same time. If your chlorine level is still high, repeat the above process until the correct level is attained.



NOTE The appropriate chlorinator size for your pool is dependent on the local climate and the bather load of the pool. Please note that chlorinator cell life can be increased with shorter running times during winter and lower output settings. Henden recommends that a chlorinator is run for between 6 - 8 hours a day during summer, and 4 hours during winter.

10.1 "SHOCK" TREATMENT

Periodically, especially during extremely hot conditions, it may be necessary to boost the amount of chlorine in your pool in order to maintain absolute sanitation of the water. This can be achieved by adding either liquid or granulated chlorine. If granulated chlorine is added, the cell must be checked regularly, since the additives from this product will clog the electrodes. Alternatively, extend the running time of your Henden HD Mineral & Salt Chlorinator.

10.2 CHLORINE TYPES AND COMPARISONS / MAX POOL SIZE

Many chlorinator manufacturers calibrate their units to compare with 65% granulated chlorine, making it necessary to adjust their readings to a lower level in order to determine true chlorine production. The display on your Henden Salt Chlorinator expresses production as pure 100% chlorine so you will know the exact output of your unit. Below is a comparison table of the available types of chlorine used to sanitise pools.

10.3 SAFETY DEVICE

Hydrogen gas is a by-product of the chlorine producing process. A gas sensor has been incorporated into the unit and cell, which will switch off chlorination if gas is detected in the cell housing or there is no water flow.

Henden HD Mineral & Salt Chlorinator units are also fitted with a thermal cut-out to prevent overheating. If the temperature rises too high, power is automatically disconnected. The unit will resume operation when it cools down.

Note: When used exclusively with magnesium and potassium mineral salts, the chlorine production is 50% of the normal rated output. However, if used as an additive to normal salt pools, the rated output is similar.

Henden Salt Chlorinator	Production maximum grams/hour (100%)	Production* grams/hour (65% equivalent)	Chlorine produced over 8 hours grams (100%)	Equivalent in dry granulated chlorine grams (65%)	MAX POOL SIZE (litres)		
					COOL CLIMATES	TEMPERATE CLIMATES	HOT & TROPICAL CLIMATES
HHDMSC24	24	37	192	296	120,000	75,000	55,000
HHDMSC36	36	55	288	440	180,000	112,000	80,000

Dimensions	Type	Controller				Cell Housing				
		Height (mm)	Width (mm)	Depth (mm)	Mounting holes	Height (mm)	Width (mm)	Diameter	Inlet/Outlet	Plumbing Holes
	HHDMSC24	390	235	130	66 (centre to centre)	141	376	123	50	194 (centre to centre)
HHDMSC36										

Electrical Data All Models	Voltage (V)	220-240
	Phase	1
	Supply Frequency (Hz)	50
	Enclosure Class (IP)	34
	Approval No.	TUV16001EA

11. GENERAL INFORMATION

RECOMMENDED POOL WATER CHEMISTRY						
POOL WATER BALANCING	Free Chlorine (ppm)	pH	Total Alkalinity TA (ppm)	Calcium Hardness (ppm)	Stabiliser – Cyanuric Acid (ppm)	Optimum Salt Level (ppm)
Ideal Reading / Range	1 – 3	Concrete & Tiled Pools: 7.4-7.6 Other Surfaces: 7.2-7.4	Concrete & Tiled Pools – 80-120. Other Surfaces – 125-150	Concrete & Tiled Pools – 200-275. Other Surfaces – 100-225	25 – 50	4500 – 6000
To Increase	Increase output of chlorinator. Add chlorine. Increase filtration time.	Add buffer or soda ash (Sodium Carbonate)	Add Sodium Bicarbonate	Add Calcium Chloride	Add Cyanuric Acid	Add Salt
To Decrease		Add Muriatic Acid	Add Muriatic Acid or Dry Acid	Partially drain & refill pool with lower hardness water to dilute	Partially drain & refill pool to dilute	Partially drain & refill pool to dilute
Frequency of Testing	Weekly	Weekly	Weekly	Weekly	Regularly	Regularly

11.1 COMMON TERMS

Algae - Microscopic forms of plant life which enter the pool by rain, wind and dust. There are numerous varieties - some are free floating whilst others grow on walls and in cracks and come in different colours. Some are more resistant to chemical treatment than others.

Bacteria - The germs that contaminate your pool. Introduced by swimmers, dust, rain storms and other elements.

Balanced Water - The correct ratio of mineral content and pH level that prevents pool water from being corrosive or scale forming.

Chloramines - Compounds formed when chlorine combines with nitrogen from urine, perspiration, etc. Chloramines cause eye and skin irritation, as well as unpleasant odours.

Chlorine Demand - The chlorine required to destroy germs, algae and other contaminants in the pool.

Chlorine Residual - The amount of chlorine remaining after chlorine demand has been satisfied. This is the reading obtained with your test kit.

Cyanuric Acid - Also known as stabiliser or conditioner. It reduces dissipation of chlorine by direct sunlight.

Liquid Acid - Chemical used to reduce the pH and total alkalinity in the pool water, and for cleaning chlorinator cell.

ppm - An abbreviation for parts per million the accepted measurement of chemical concentration in swimming pool water. 1 ppm= 1 mg/L.

12. IMPORTANT NOTES

1. The Henden HD Mineral & Salt Chlorinator guarantee does not apply to commercial or semi-commercial installations, i.e. where the system runs more than an average of 8 hours per day over the year. Guarantee on commercial and semi-commercial installations is 12 months only on both power supply and cells.

2. ALWAYS INSIST ON GENUINE Henden HD Mineral & Salt Chlorinator REPLACEMENT PARTS. If it is necessary to replace the Electrolytic Cell, beware of "look alike". Only the Genuine Henden HD Mineral & Salt Chlorinator Cell is designed and warranted to operate with the Henden HD Mineral & Salt Chlorinator Power Supply.

SERIOUS DAMAGE MAY RESULT TO THE ELECTRONICS INSIDE THE UNIT IF COPY ELECTRODES ARE USED AND WILL VOID WARRANTY.

Note: The Henden guarantee does not apply to commercial or semi-commercial installations, i.e. where the system runs more than an average of 8 hours per day over the year. Guarantee on commercial and semi-commercial installations is 12 months only on both power supply and cells.

13. TROUBLE SHOOTING

No Chlorine Production - Check for

1. Main power outlet switched off
2. Chlorinator not plugged into main outlet
3. Pump not plugged into chlorinator
4. Time Clock set to off position/power switch turned off
5. Sanitiser Output Control turned to lowest setting
6. Chlorinator fuse blown
7. Dirty cell
8. Filter needs backwashing
9. Gas Sensor not connected
10. Running times incorrect
11. Main house fuse blown
12. Pump motor faulty

Low Chlorine Production - Check for

1. Dirty cell - clean if required
2. Filter needs backwashing
3. Display not at correct production level/cell failing
4. Winter Mode turned on
5. Pool stabiliser too low
6. pH too high
7. Salt level too low
8. Chloromatic running time inadequate
9. Sanitiser output control set too low

14. HENDEN™ REPAIR OR REPLACEMENT GUARANTEE

Henden Guarantee Period

Power Supply - Four Years
Electrolytic Cell - Three Years

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

Should you experience any difficulties with your Henden product, we suggest in the first instance that you contact the installer of the product or your local Reece Irrigation & Pools branch.

Alternatively you can phone Henden. On receipt of your claim, Henden will seek to resolve your difficulties, if the product is faulty or defective, advise you on how to have your Henden product repaired, obtain a replacement or a refund.

Henden does not cover normal wear or tear, or damage resulting from misuse or negligent handling, improper use for which the product was not designed or advertised, failure to properly follow the provided installation and operating instructions, failure to carry out maintenance, corrosive or abrasive water or other liquid, lightning or high voltage spikes, or unauthorized persons attempting repairs. Where applicable, your Henden product must only be connected to the voltage shown on the nameplate.

Henden does not cover freight or any other costs incurred in making a claim. Please retain your receipt as proof of purchase; you MUST provide evidence of the date of original purchase when making a claim.

Henden shall not be liable for any loss of profits or any consequential, indirect or special loss, damage or injury of any kind whatsoever arising directly or indirectly from Henden products.

Should your Henden product require repair or service after the guarantee period; contact your nearest Reece Irrigation & Pools branch or phone the number below.

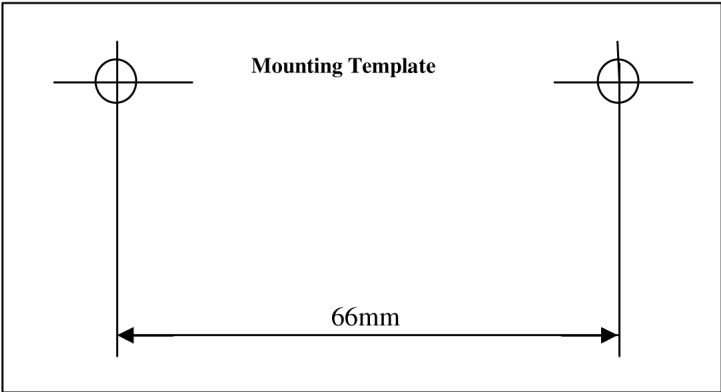
For a complete list of Reece Irrigation & Pools branches visit our website reece.com.au/storefinder or contact:

TECHNICAL AND AFTER SALES SUPPORT:

1300 HENDEN (1300 436 336)

MAILING/MANUFACTURER ADDRESS:

Davey Water Products
6 Lakeview Drive, Scoresby,
Victoria, 3179



henden™

