DEPEND ON

DAVEY

WATER PRODUCTS

ECO-matic
ESC Chlorinator

SERVICING INSTRUCTIONS

WARNING: ALL ELECTRICAL WORK TO BE PERFORMED BY SUITABLY QUALIFIED ELECTRICAL PERSONNEL.

Always disconnect from electrical supply BEFORE any work is carried out.

Handle components carefully to avoid personal injury.

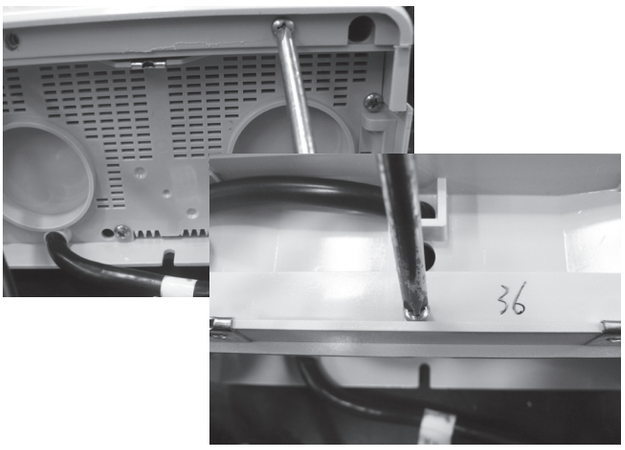
Tools Required

- 8mm spanner
- Phillips head screwdriver – One point
- Phillips head screwdriver – Two point
- Phillips head screwdriver – Long blade two point
- Flat blade screwdriver – 3mm
- Long nose pliers
- Side cutters
- Soldering iron
- Solder
- De-soldering tool
- Universal Cell Tester

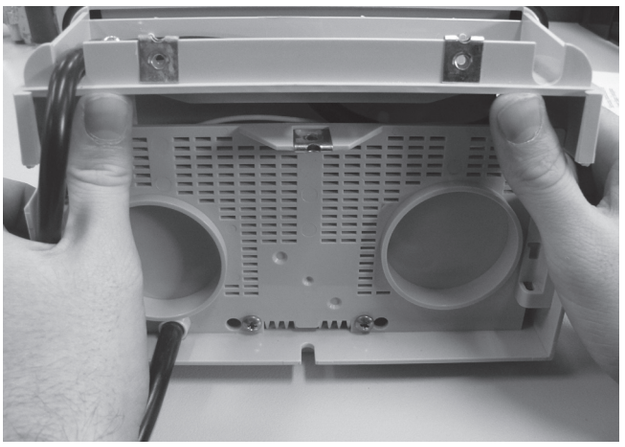
Contents

Disassembling/ Assembling the Housing

Disassembly

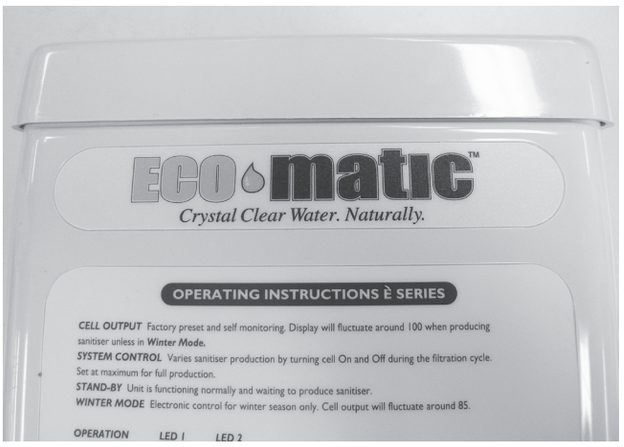


Step 1 – Using a Phillips head screwdriver (two point) remove the screws in the panel housing the cell cord assembly & remove the panel then remove the screw connecting the two chlorinator halves.

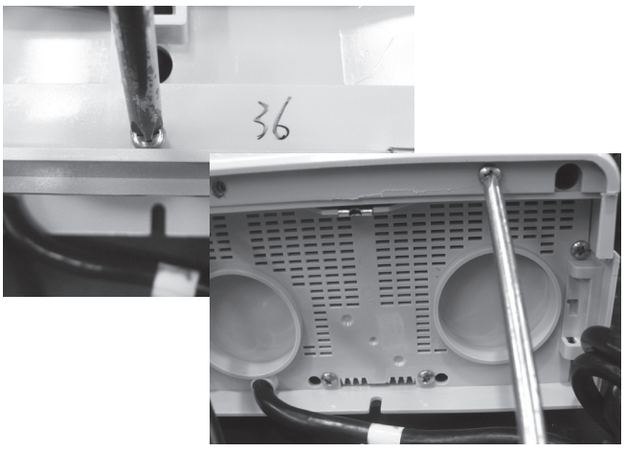


Step 2 – Using both hands lift the front panel up & slide it out from the top panel, keep sliding until the top of the chlorinator comes free & the housing is able to be flipped open.

Assembly



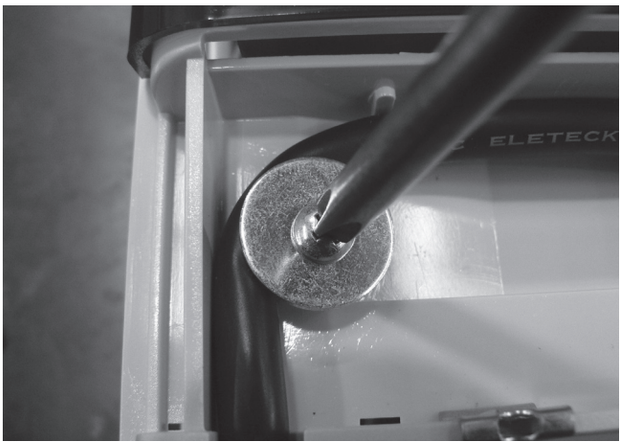
Step 1 – Place the top of the chlorinator flush with the top panel.



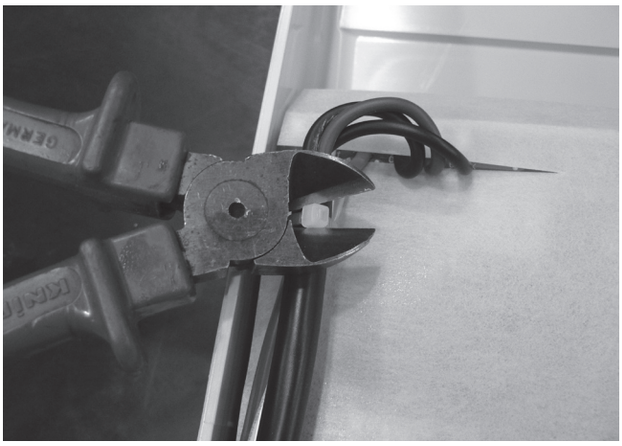
Step 2 – Push the bottom of the front panel into place; panel is correctly placed when the screw connecting the two chlorinator halves can be placed through its connection & tightened. Reconnect front panel screws with a Phillips head screwdriver (two point).

Replacing the Cell Cord Assembly

Disassembly

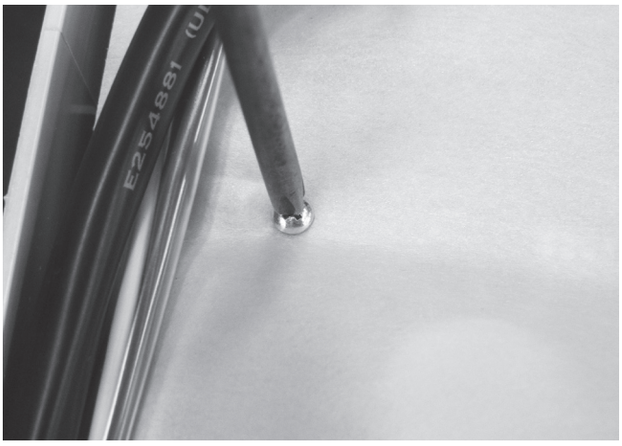


Step 1 – After opening front panel of the chlorinator use a Phillips head screwdriver (two point) to remove the holding plate allowing the cell cord assembly to be more easily manoeuvred.

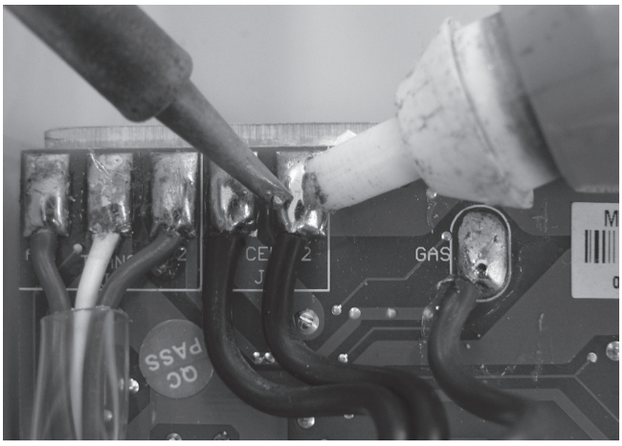


Step 2 – Remove the appropriate cable ties with side cutters. Take special care not to cut or damage the wiring

Note position of cable ties for easier reassembly

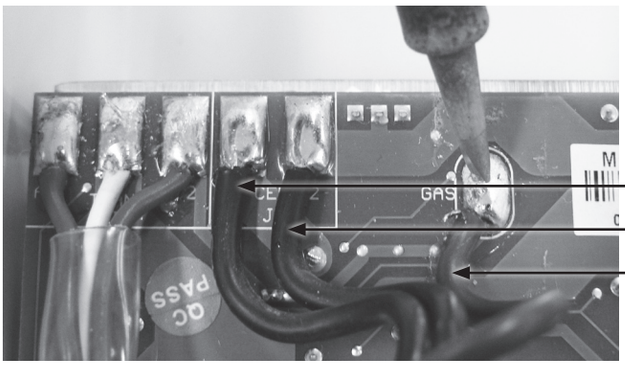


Step 3 – Remove the screws holding the protective covering on the PCB using a Phillips head screw driver (one point). This will expose the cell cable connections.



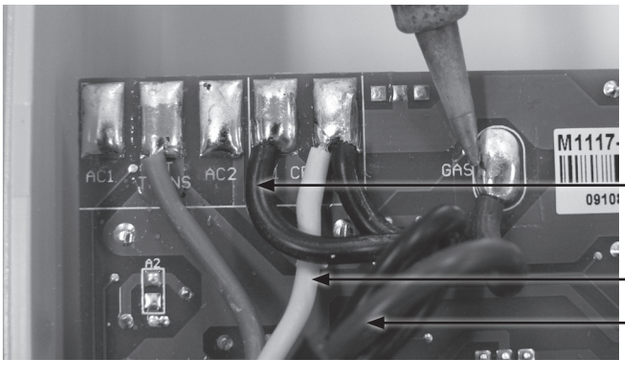
Step 4 – With a soldering iron & solder sucker or solder wick remove the wires for the cell cables & gas sensor. When the metal has cooled remove the cell cords.

Assembly

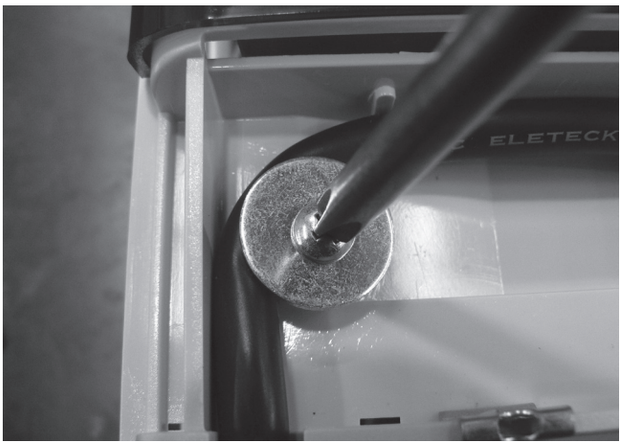


Step 1 – With a soldering iron & unleaded solder reattach the cell cables & gas sensor cable to the PCB.

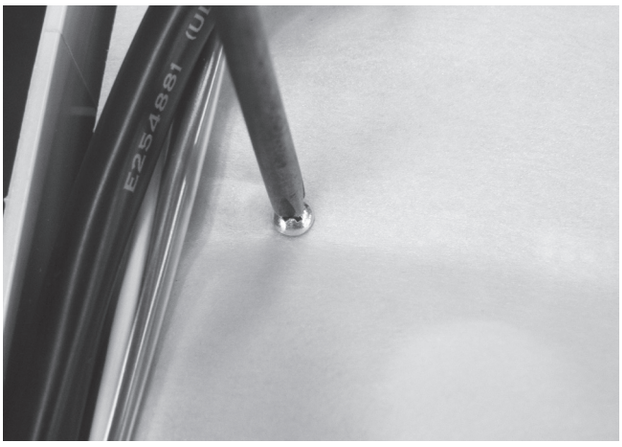
ESC 16 – 24 110V & 220V: The order for soldering the cell cables back onto the PCB from left to right is 1) black, 2) black, 3) dark blue. The gas sensor is the dark blue cable which should be soldered onto the position on the PCB marked Gas.



ESC 36 – 48 220V: The order for soldering the cell cables back onto the PCB from left to right is: 1) black cell cable, 2) light blue transformer cable & black cell cable in the same slot, 3) dark blue cell cable which goes in the slot marked Gas.



Step 2 – Place cell cord assembly into position & secure with the holding plate using a Phillips head screwdriver (two point).

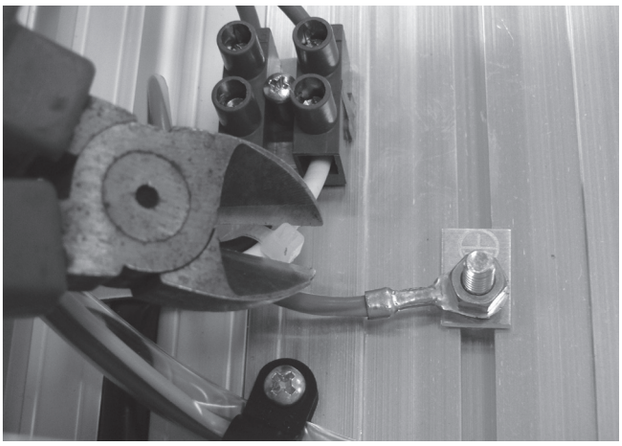


Step 3 – Replace any cable ties that were removed then replace the protective covering on the PCB with a Phillips head screwdriver (one point).

Replacing the Bottom Panel

IMPORTANT NOTE: Power MUST be switched off before removing power lead.

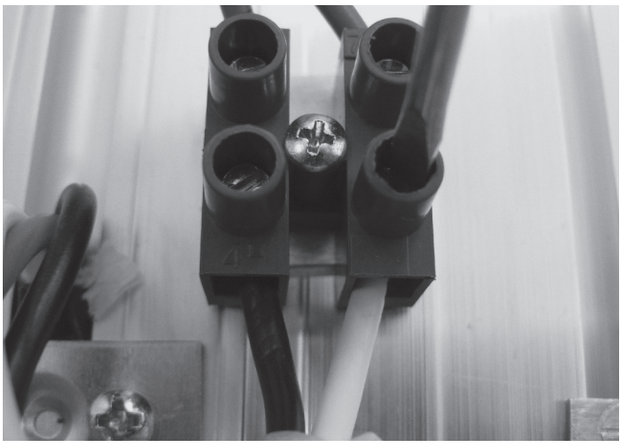
Disassembly



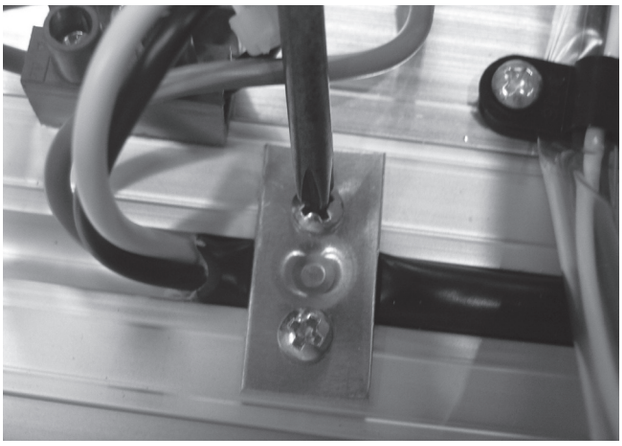
Step 1 – Remove the appropriate cable ties with side cutters. Take special care not to cut or damage the wiring.

Note position of cable ties for easier reassembly.

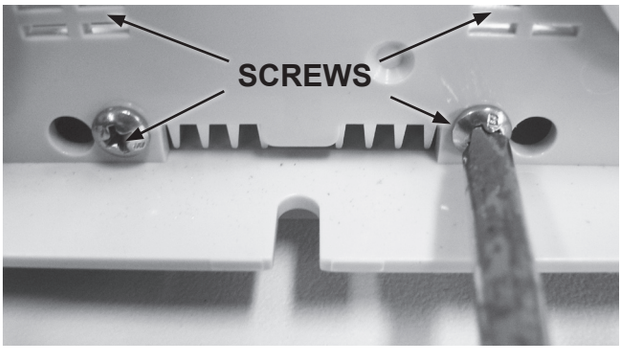
Step 2 – Remove the nut holding down the green Earth lead using an 8mm spanner.



Step 3 – Remove the black & white cables coming from the power cord cable & connecting to the terminal strip using a flat blade screwdriver (3mm). Mark the wires to allow for easier reconnection.

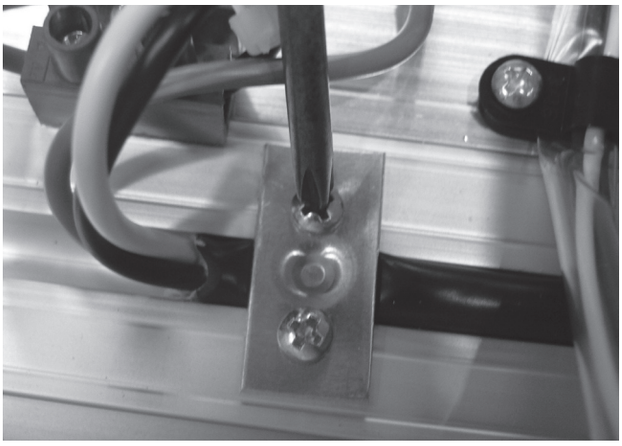


Step 4 – Remove the screws on the holding plate using a Phillips head screwdriver (two point) which will allow the removal of the power cord.



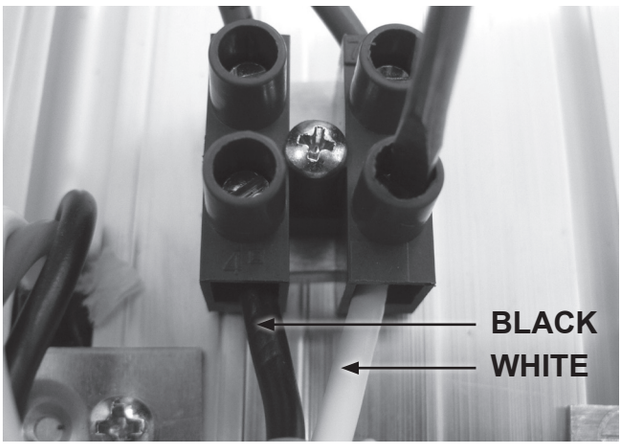
Step 5 – Remove the bottom panel by using a Phillips head screwdriver to remove the 4 screws holding it in place.

Assembly

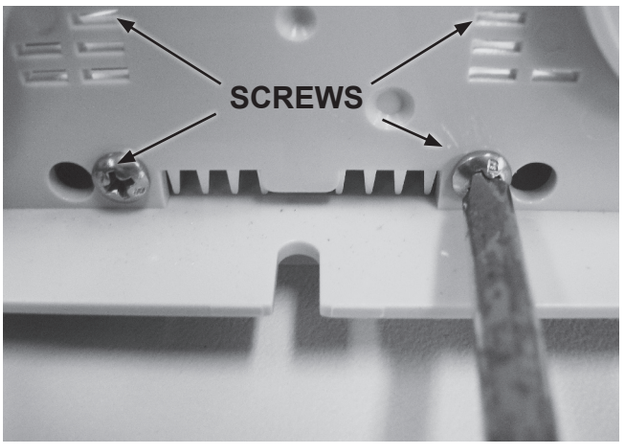


Step 1 – Feed the power cord through the slot in the bottom panel & replace the holding plate onto the power cord using a Phillips head screwdriver (two point).

Step 2 – Reattach the green power cord Earth lead, use an 8mm spanner to tighten nut.



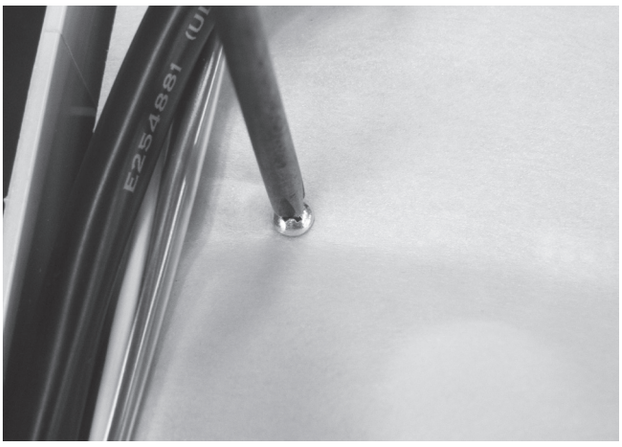
Step 3 – Reconnect the black cable to the left & the white cable to the right of the terminal strip using a flat blade screwdriver (3mm) & replace any cable ties that were removed.



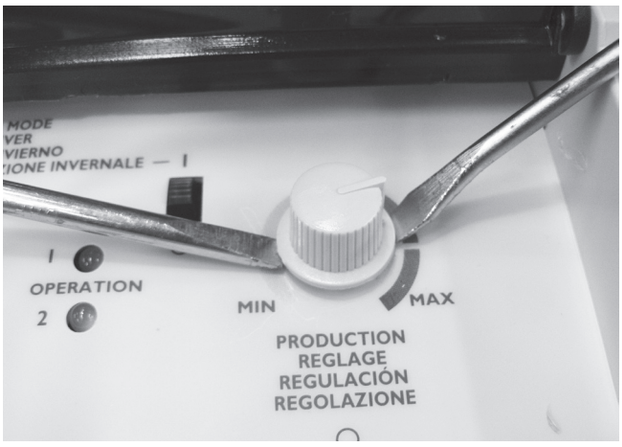
Step 4 – Tighten the four screws on the bottom panel to hold it in place using a Phillips head screwdriver (two point).

Replacing the Door

Disassembly

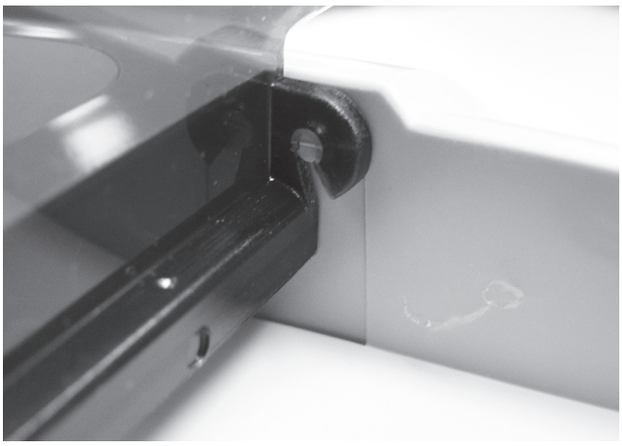


Step 1 – Remove the screws holding the cover on the PCB with a Phillips head screwdriver (one point).



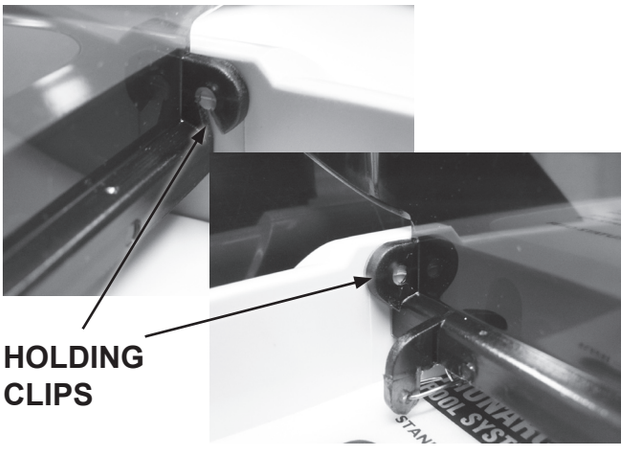
Step 2 – Remove the sanitiser output knob which will allow you to move the PCB to the side. May need to use two flat blade screwdrivers to lever the knob off if it is fastened too tight to remove by hand. If using screwdrivers be careful not to damage the control panel.

Step 3 – Manoeuvre the spring so that it is able to be unhooked, may need to use long nose pliers to enable this.



Step 4 – From the front of the chlorinator unhook holding clips & remove door. This is best done by doing the right hand side first.

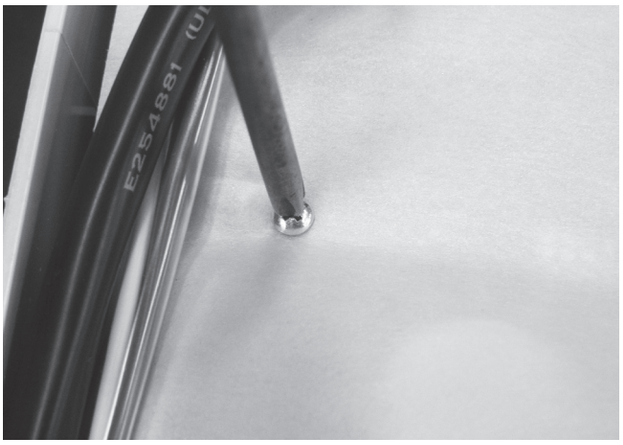
Assembly



Step 1 – Attach door to holding clips on side of chlorinator.

Step 2 – Reattach spring to clip located on inside of chlorinator.

Step 3 – When PCB is in place the sanitiser output holder will be visible poking through the front panelling. Reconnect sanitiser output knob to its holder ensuring it is able to be adjusted to both minimum & maximum settings.

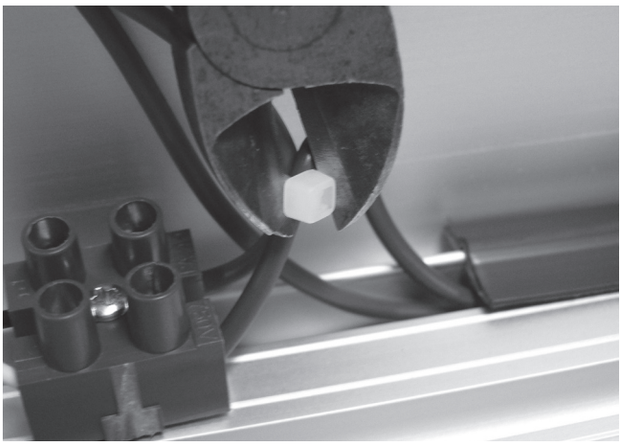


Step 4 – Replace the protective covering on the PCB using a Phillips head screwdriver (one point).

Replacing the Transformer – ESC 16 110V

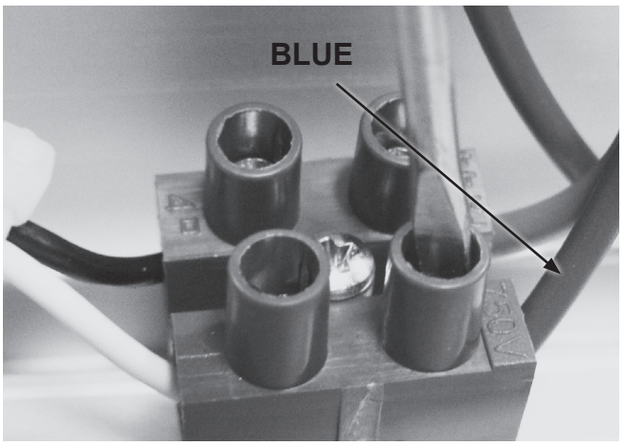
IMPORTANT NOTE: Power MUST be switched off before removing transformer.

Disassembly

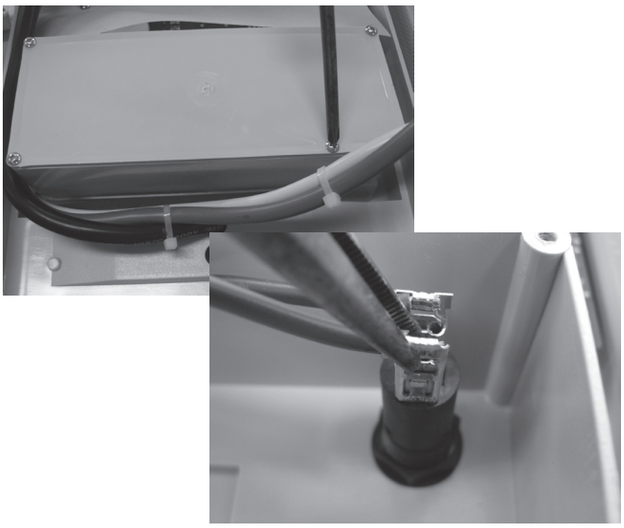


Step 1 – Remove all applicable cable ties with a pair of side cutters. Take special care not to cut or damage the wiring.

Note position of cable ties for easier reassembly.

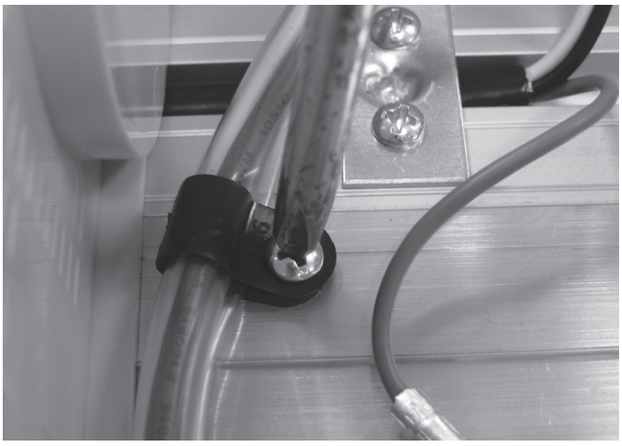


Step 2 – Remove the blue wire connecting the transformer to the terminal strip using a flat blade screwdriver (3mm).

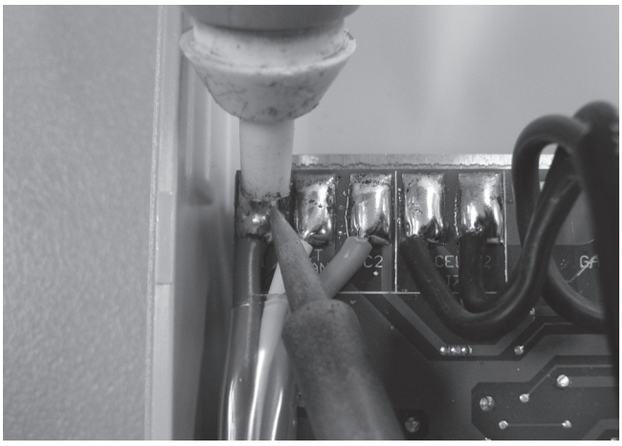


Step 3 – Open the terminal box using a Phillips head screwdriver (one point) & remove the brown transformer wire from the lower terminal on the fuse housing using a pair of long nose pliers.

Step 4 – Remove the screws holding the protective covering on the PCB using a Phillips head screw driver (one point).



Step 5 – Remove the cable clamp holding down transformer cables using a Phillips head screwdriver (two point).

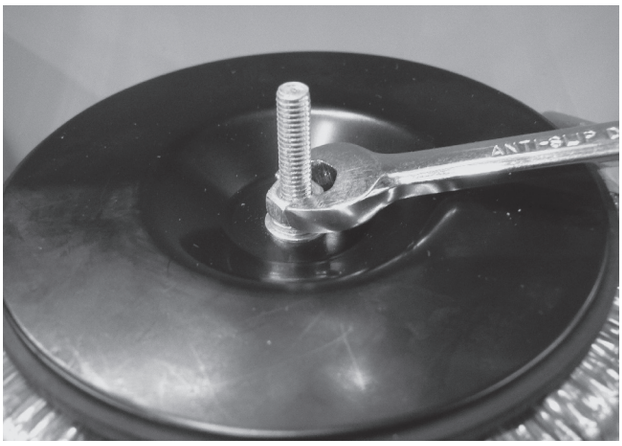


Step 6 – With a soldering iron & solder sucker or solder wick remove the 3 transformer wires. The transformer wires are the red, white & orange wires on the top left corner of the PCB. When the metal has cooled remove the transformer wires.

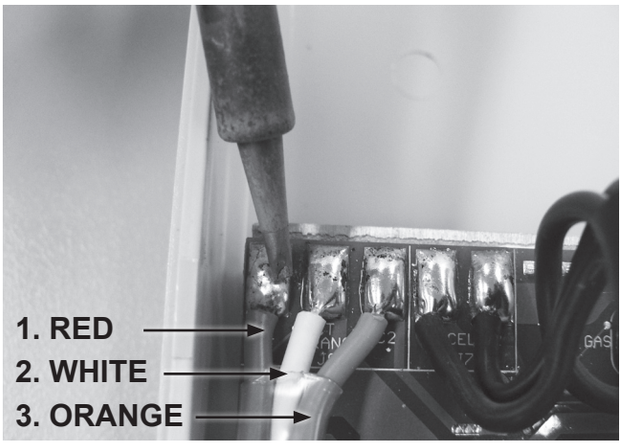
Step 7 – Remove the nut on the top of the transformer with an 8mm spanner then lift off the black heat dispersion disk which when removed allows for the transformer to be lifted out of the chlorinator. When removing heat dispersion disk also remove the flat washer & spring washer located beneath the nut.

Assembly

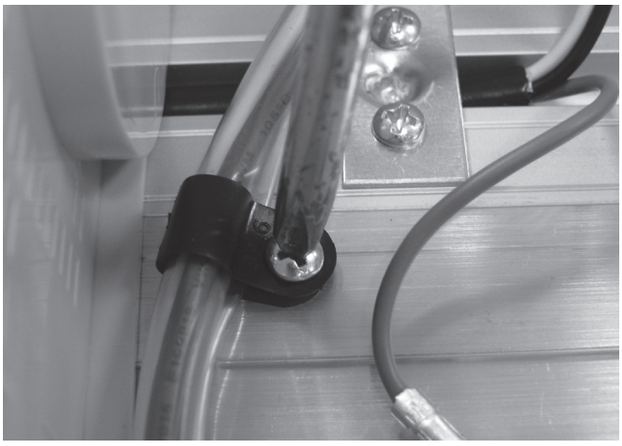
Step 1 – Place transformer over the locating screw.



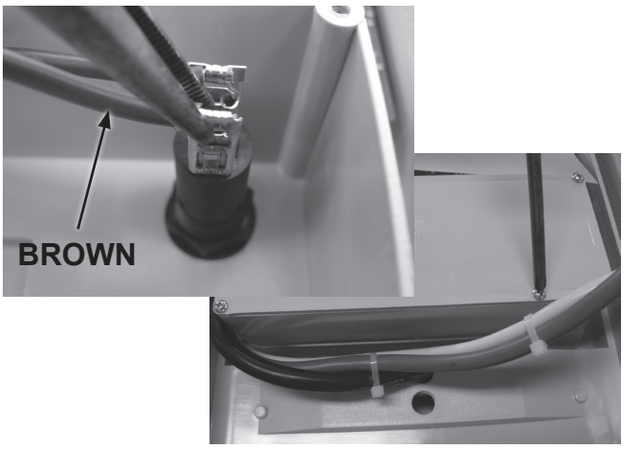
Step 2 – Place heat dispersion disk over the transformer with the shiny metallic side face up. Place flat washer with the spring washer on top of it in place over the locating screw, tighten the transformer nut using an 8mm spanner.



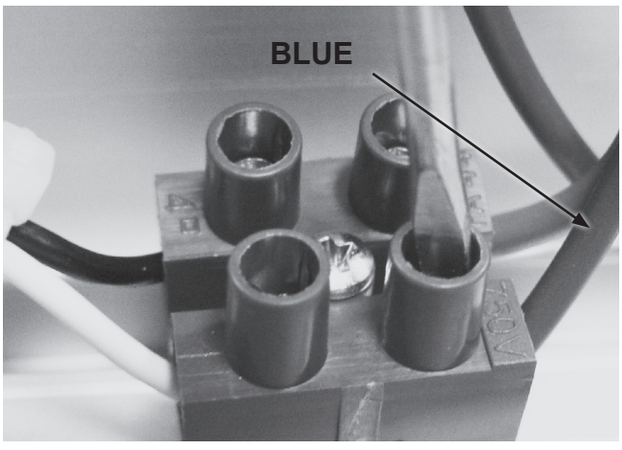
Step 3 – After feeding the transformer wires through the clear tubing use a soldering iron with unleaded solder to attach the wires to the PCB. The order for connecting the wires from the left of the PCB is 1) red, 2) white, 3) orange.



Step 4 – Tighten cable clamp using a Phillips head screwdriver (two point).



Step 5 – Replace brown transformer wire from the primary side of the transformer to the fuse housing terminal using a pair of long nose pliers, the brown transformer wire slots onto the lower terminal on the fuse housing. Close the terminal box using a Phillips head screwdriver (one point).



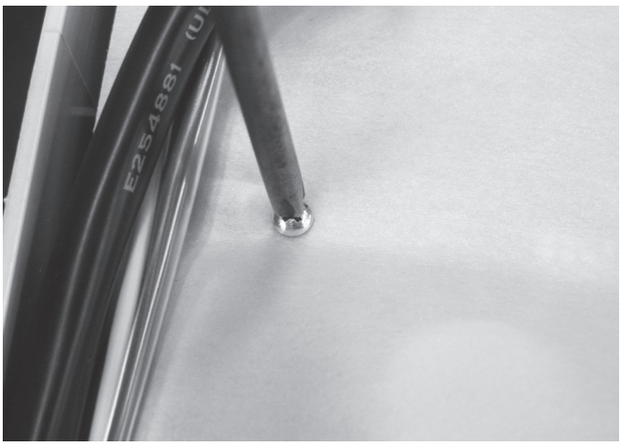
Step 6 – Replace the blue transformer wire into its slot on the terminal strip using a flat blade screwdriver (3mm), the blue wire goes in the top right slot of the terminal strip. Replace any cable ties that were removed.

Replacing the Transformer

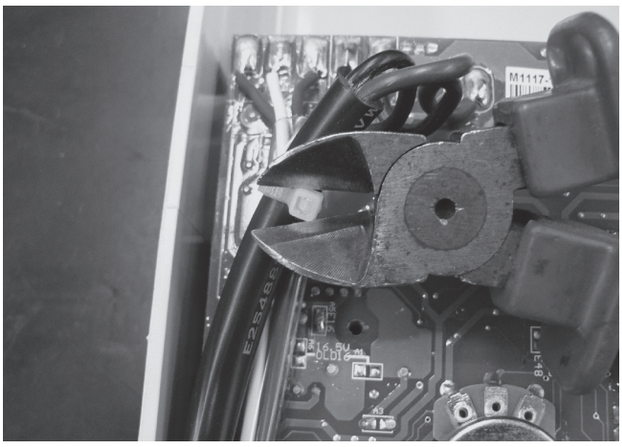
– ESC 16 220V & ESC 24 110V & 220V

IMPORTANT NOTE: Power MUST be switched off before removing transformer.

Disassembly



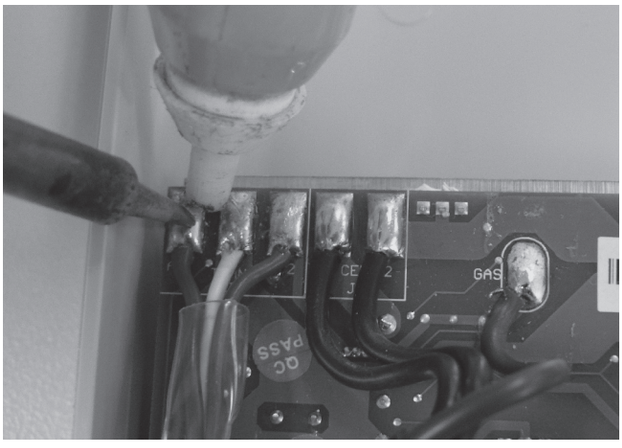
Step 1 – Remove the screws holding the protective cover on the PCB with a Phillips head screwdriver (one point).



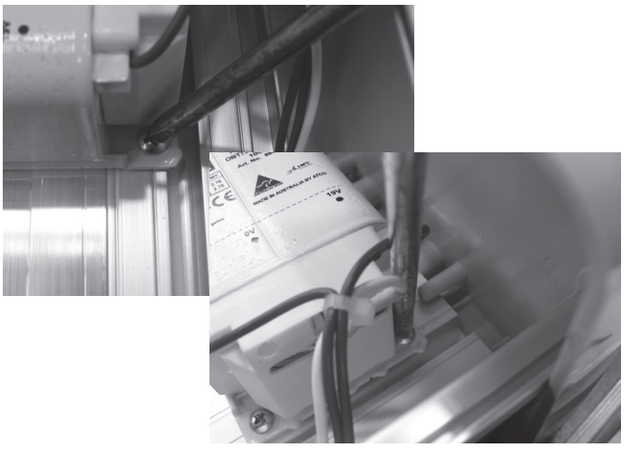
Step 2 – Remove all applicable cable ties with a pair of side cutters. Take special care not to cut or damage the wiring.

Note position of cable ties for easier reassembly.

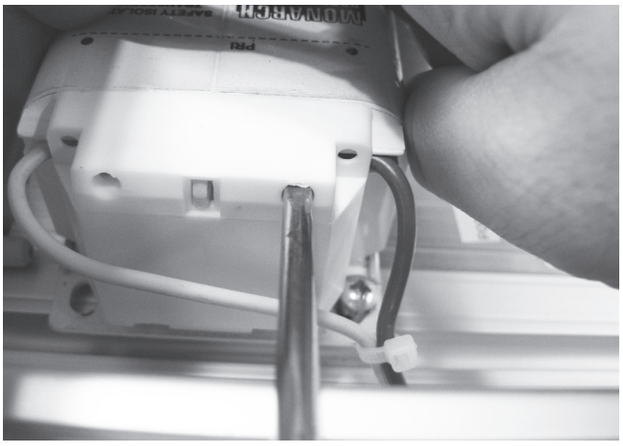
Step 3 – Remove wire clamp holding the transformers secondary wires in place on the chlorinator using a Phillips head screwdriver (two point).



Step 4 – With a soldering iron & solder sucker or solder wick remove the 3 transformer wires. When the metal has cooled remove the cell cords.

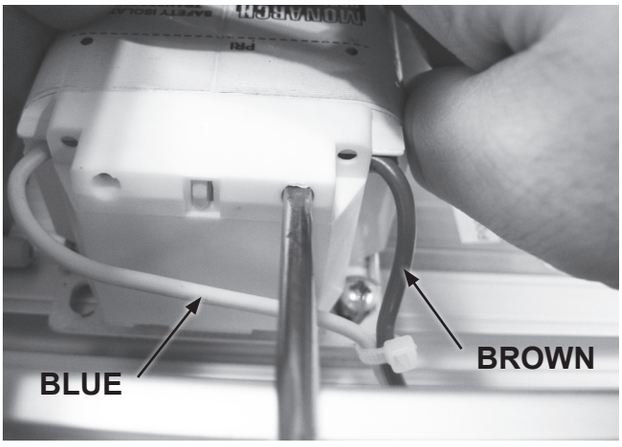


Step 5 – Remove the locating screws connecting the transformer to the chlorinator. Remove the front two first using a Phillips head screwdriver (two point) then using a long blade Phillips head screwdriver remove the rear screw.

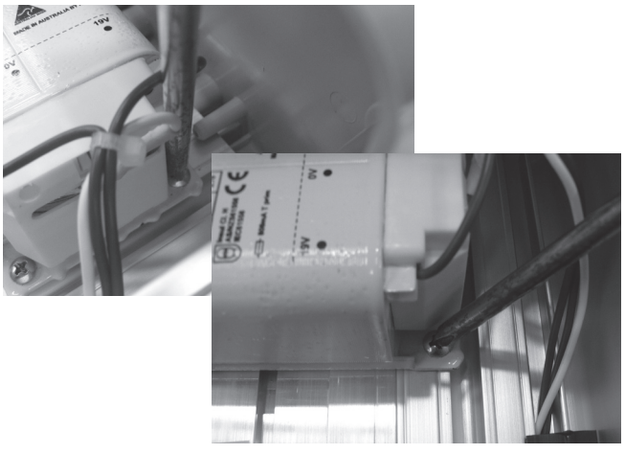


Step 6 – Mark the wire connections on the **PRIMARY** side of the transformer to allow for easy reconnection. Remove the 2 wires with a flat blade screwdriver (3mm) & remove the transformer.

Assembly

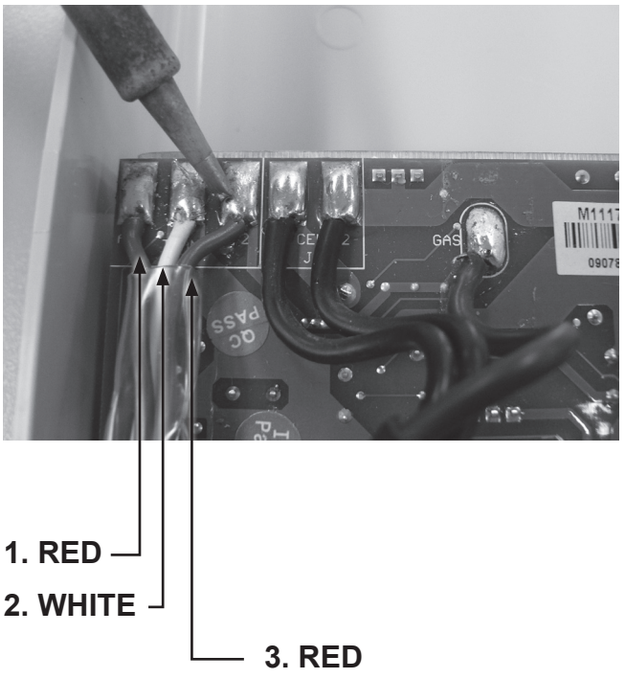


Step 1 – Replace previously marked wires back into correct locations on **PRIMARY** side of transformer with a flat blade screwdriver (3mm). The blue wire connects to the rear of the transformer & the brown wire connects to the front.

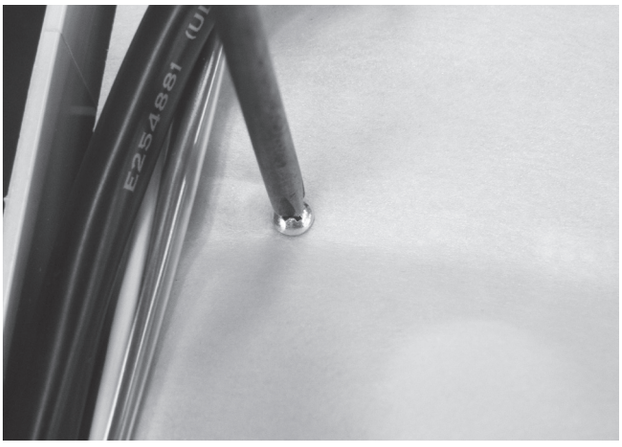


Step 2 – Place transformer in correct location, replace the rear screw first using a long blade Phillips head screwdriver then the front two screws using a Phillips head screwdriver (two point).

Step 3 – Feed the secondary transformer wires through the clear tubing then using the wire clamp, fasten the wires back onto the chlorinator using a Phillips head screwdriver (two point).



Step 4 – Replace transformer wires on the PCB using a soldering iron with unleaded solder. The order for replacing the transformer wires back onto the PCB from left to right is 1) red, 2) white, 3) red.



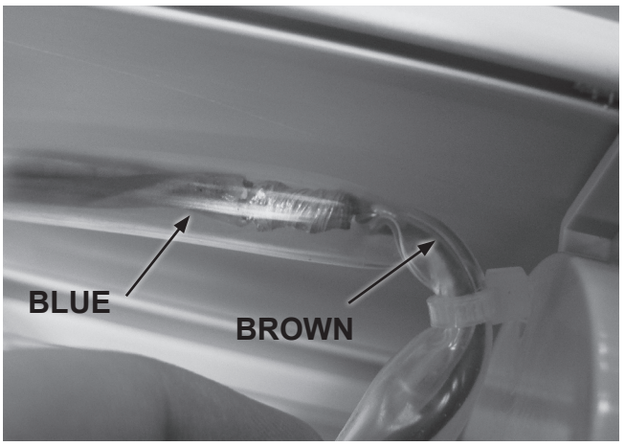
Step 5 – Replace any cable ties that were removed then replace the protective covering on the PCB with a Phillips head screwdriver (one point).

Replacing the Transformer – ESC 36 - 48 220V

IMPORTANT NOTE: Power MUST be switched off before removing transformer.

Disassembly

Step 1 – Remove the screws connecting the transformers **PRIMARY** wires to the terminal strip with a flat blade screwdriver (3mm).



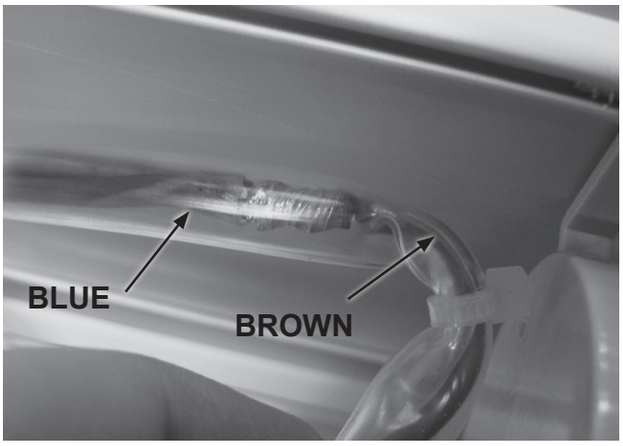
Step 2 – Remove the clear tubing covering the blue wire & using a soldering iron & a solder sucker disconnect the blue & brown wires connecting the transformer & the PCB.

Step 3 – Using a soldering iron & a solder sucker remove the wires connecting the transformer to the Triacs. Mark the wires to allow for easier reconnection.

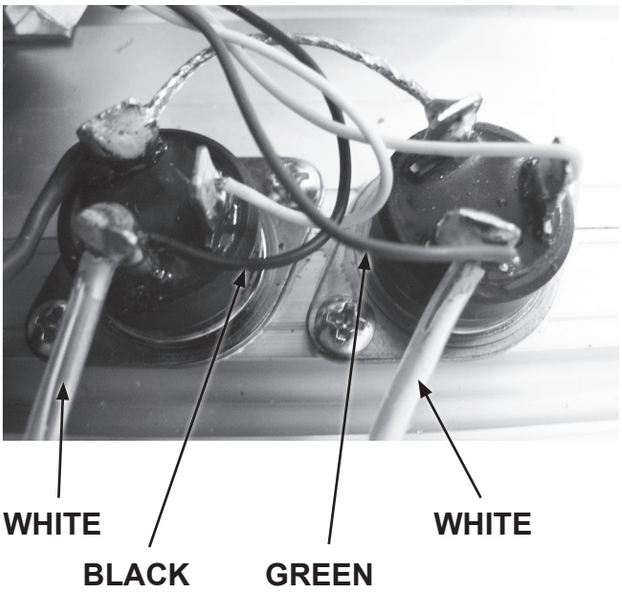
Step 4 – Remove the screws holding the transformer in place using a Phillips head screwdriver (two point).

Assembly

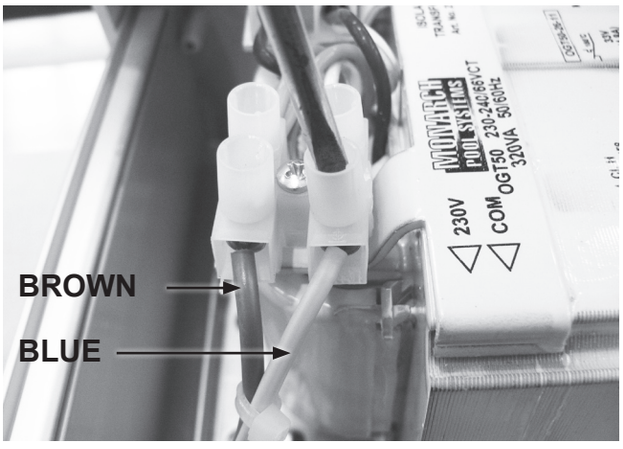
Step 1 – Replace the screws holding the transformer in place using a Phillips head screwdriver (two point).



Step 2 – Solder the blue transformer wire to the brown PCB wire which connects the transformer to the PCB & replace the clear covering. Alternatively use crimping pliers & a crimp connector to fasten the wires together.



Step 3 – Using a soldering iron reconnect the secondary transformer wires to their respective position on the Triacs with the PCB wires. Connections on the lower Triac are the white transformer wire on the right terminal with the black PCB wire on the same terminal. The top Triac has the white transformer wire on the right terminal with the green PCB wire on the same terminal.



Step 4 – Connect the transformer wires to the **PRIMARY** terminal strip with a flat blade screwdriver (3mm) & replace any cable ties that were removed. The brown wire should be fastened to the left side of the terminal strip with the light blue wire belonging on the right of the terminal strip.

Replacing the Triacs – ESC 36 - 48 220V

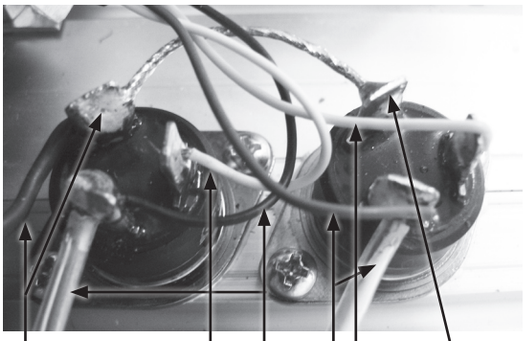
Disassembly

Step 1 – Using a soldering iron & a solder sucker remove the wires connected to the Triacs. Mark the positioning of the wires to assist in reconnection.

Step 2 – Remove the screws connecting the Triacs to the chlorinator using a Phillips head screwdriver (two point) & remove the Triacs.

Assembly

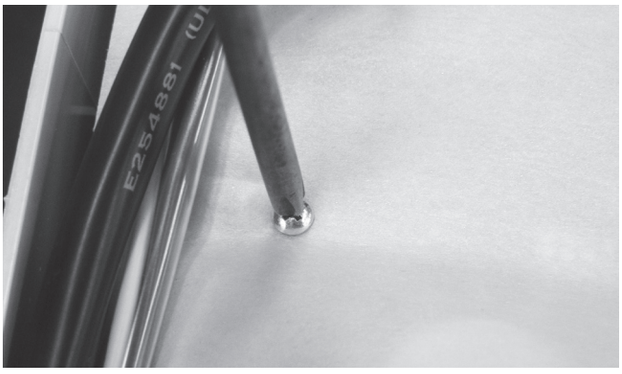
Step 1 – When placing the Triacs back onto the chlorinator use a heat transfer compound such as Unick to assist with heat dispersion during operation. Unick is generally available from electrical repair stores & some electronic retailers. Fasten the Triacs down using a Phillips head screwdriver (two point).



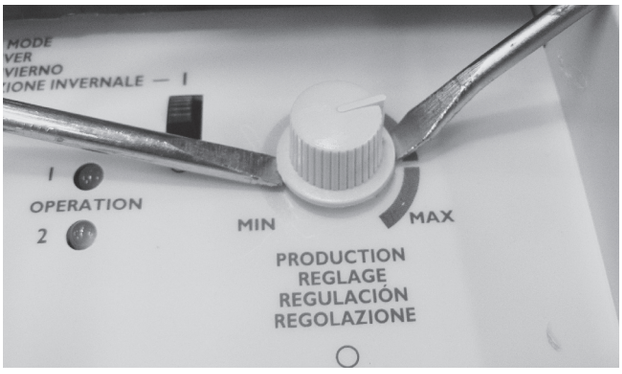
Step 2 – Using a soldering iron reconnect Triac wires to their correct locations. The position of the wires to solder back onto the lower Triac from left to right is 1) Blue PCB wire & Solder Bridge, 2) White PCB wire, 3) White transformer cable with the black PCB wire. The position of the wires on the top Triac from left to right is 4) Solder Bridge, 5) Yellow PCB wire, 6) White transformer cable with green PCB wire.

Replacing the PCB

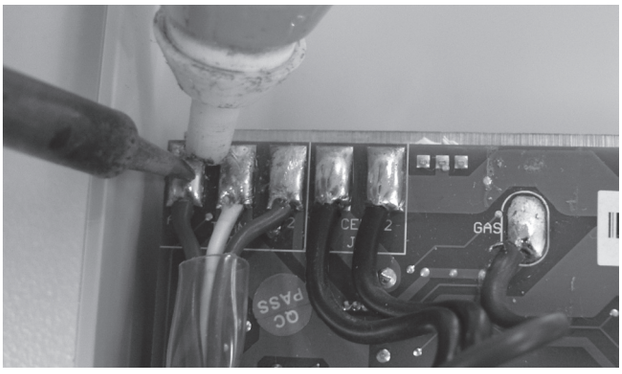
Disassembly



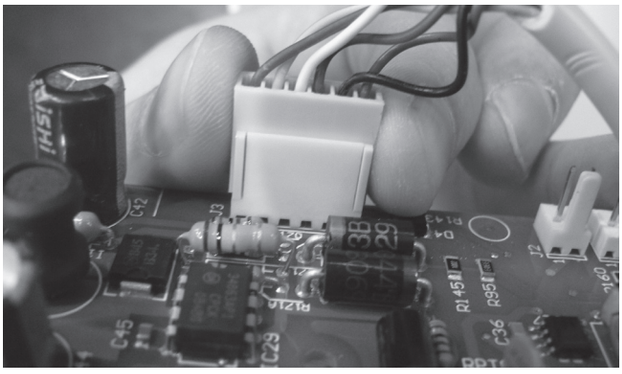
Step 1 – Remove the screws holding the protective cover on the PCB with a Phillips head screwdriver (one point).



Step 2 – Remove the sanitiser output knob which will allow you to move the PCB to the side. May need to use two flat blade screwdrivers to lever the knob off if it is fastened too tight to remove by hand. If using screwdrivers be careful not to damage the control panel.

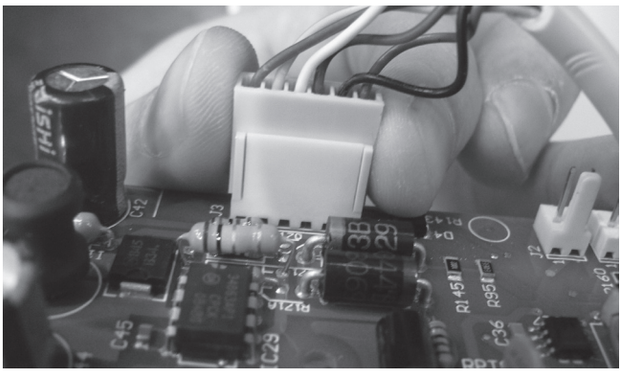


Step 3 – With a soldering iron & solder sucker or solder wick remove all the wires for the cell cables, gas sensor & transformer.

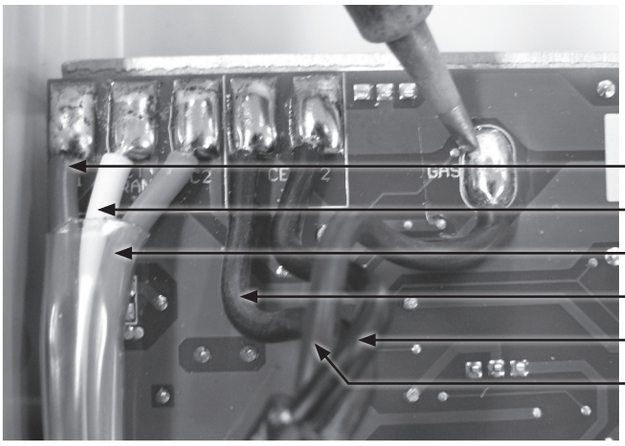


Step 4 – On ESC 36 - 48 it's also necessary to remove the Triac plug.

Assembly

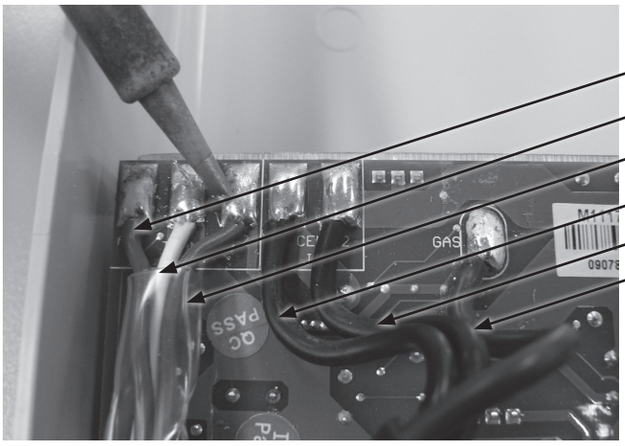


Step 1 – On ESC 36 – 48 reattach the Triac plug to the PCB.

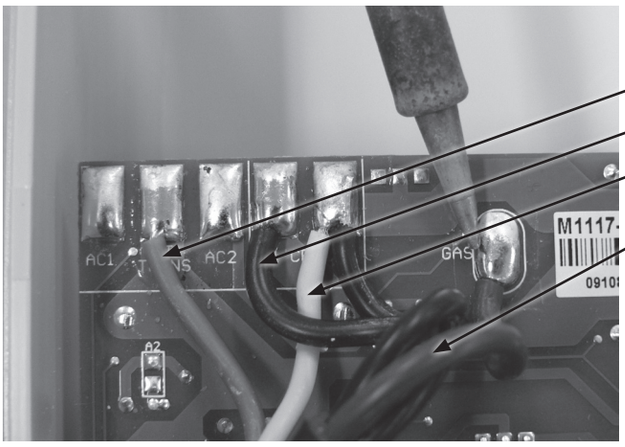


Step 2 – Use a soldering iron with unleaded solder to reattach the transformer & cell cable wires to the PCB.

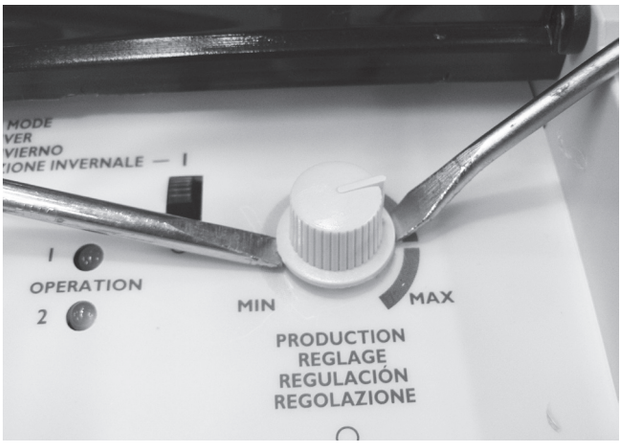
Esc 16 110V: Connections from left to right on the PCB are as follows, first the three transformer cables, 1) red, 2) white 3) orange. The cell cables are in the next three slots positioned 4) black, 5) black 6) blue. The blue cell cable goes to the slot marked Gas.



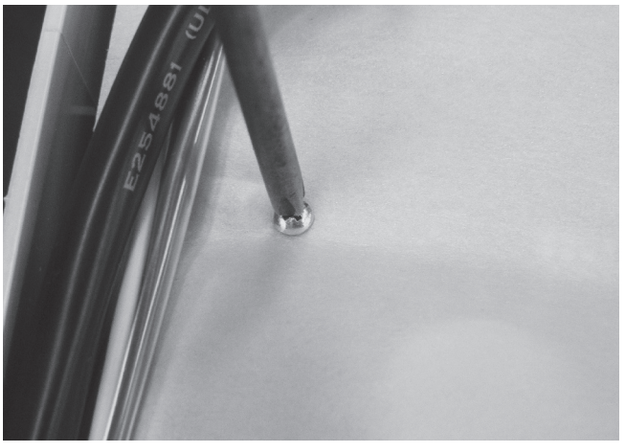
Esc 16 220V – 24 110V & 220V: Connections from left to right on the PCB are as follows, first the three transformer cables, 1) red, 2) white 3) red. The cell cables are in the next three slots positioned 4) black, 5) black 6) blue. The blue cell cable goes to the slot marked Gas.



Esc 36 – 48 220V: Connections from left to right on the PCB in the 6 slots are as follows: blank slot, 1) brown transformer wire, blank slot, 2) black cell cable, 3) light blue transformer wire & black cell cable, 4) blue gas sensor cable in slot marked Gas.



Step 3 – When PCB is in place the sanitiser output holder will be visible poking through the front panelling. Reconnect sanitiser output knob to its holder ensuring it is able to be adjusted to both minimum & maximum settings.

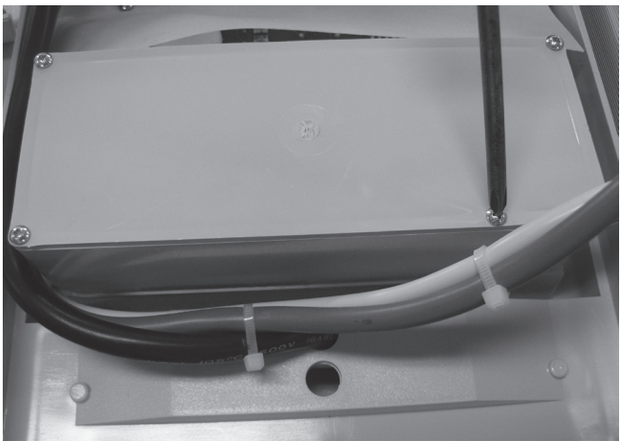


Step 4 – Screw the protective cover for the PCB back on using a Phillips head screwdriver (one point).

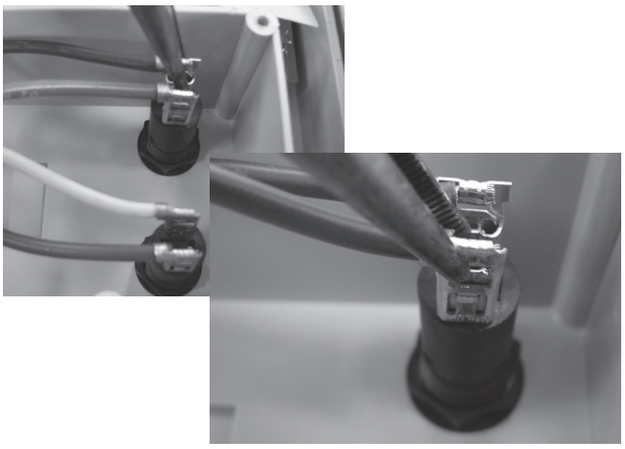
Replacing the Fuse Housing

Note that ESC 16 – 24 110V has only one fuse whereas all 220V models have 2 fuses.

Disassembly

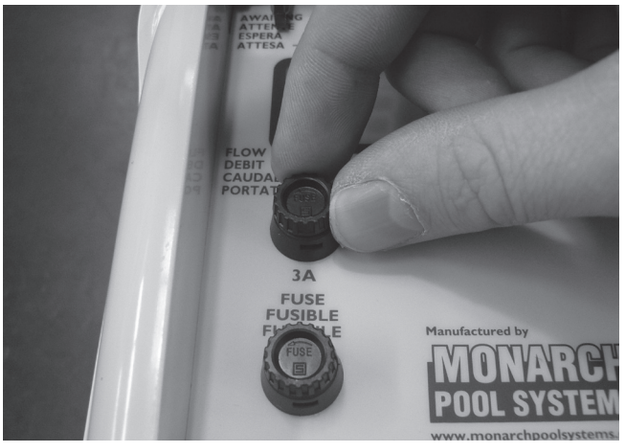


Step 1 – Open the terminal box using a Phillips head screwdriver (one point).



Step 2 – Using long nose pliers remove the clips from the fuse housing terminals.

Step 3 – Using a pair of long nose pliers undo the nut holding the fuse housing in place.

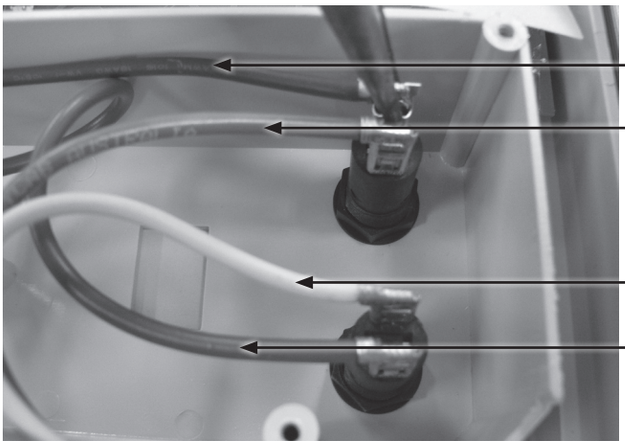


Step 4 – Remove the fuse housing.

Assembly

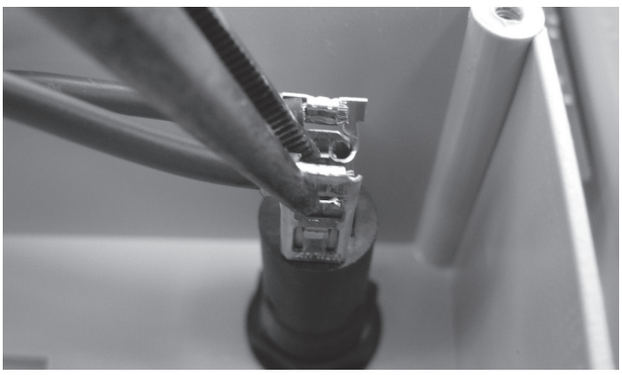
Step 1 – Replace the fuse housing.

Step 2 – Replace the nut that holds the fuse housing in place & tighten using long nose pliers.

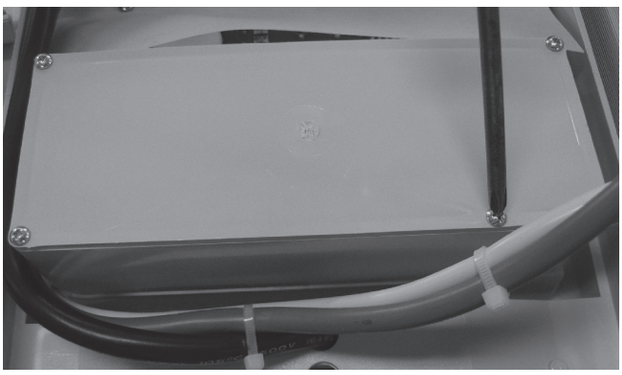


Step 3 – Being careful not to bend the terminals on the fuse housing put the clips back in place. Use long nose pliers to slide the clips onto the terminals.

All 220V models: From the bottom of the chlorinator the correct positioning of the wires on the 2 fuse housings is as follows: 1) dark blue wire from the power switch, 2) light blue wire from the transformer, 3) brown wire from the transformer, 4) dark brown wire from the power switch.



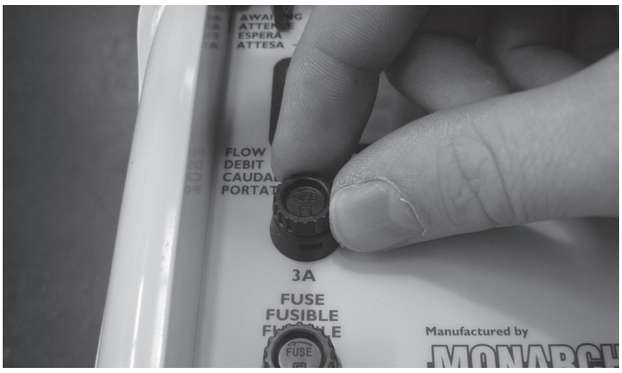
All 110V models: The correct positioning of the wires to the fuse housing has the brown wire from the primary (left) side of the transformer connected to the bottom terminal & the brown wire from the top right terminal on the power switch connected to the top fuse terminal.



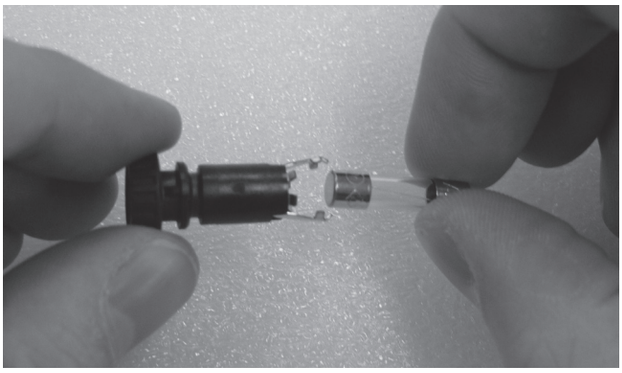
Step 4 – Replace the covering on the terminal box using a Phillips head screwdriver (one point).

Replacing the Fuse

Disassembly

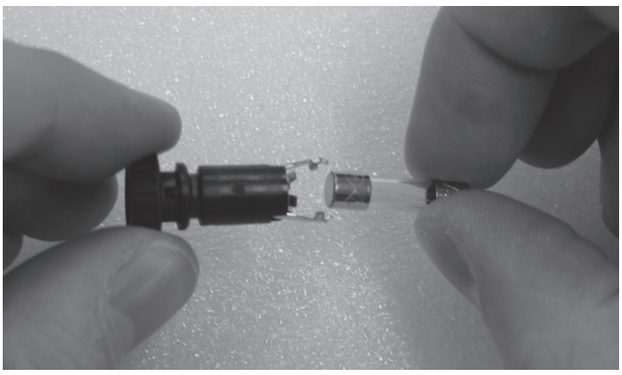


Step 1 – Push down on the fuse & twist to the left.

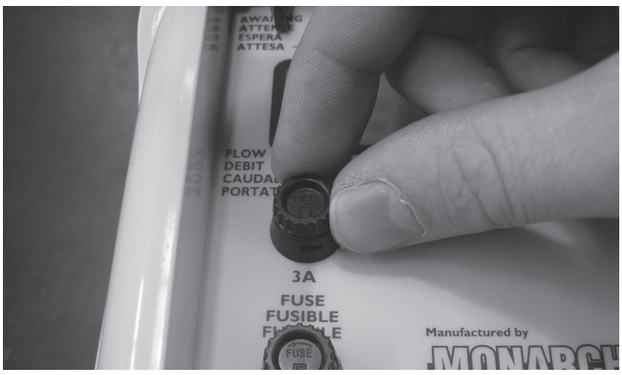


Step 2 – Remove the fuse from its holder.

Assembly



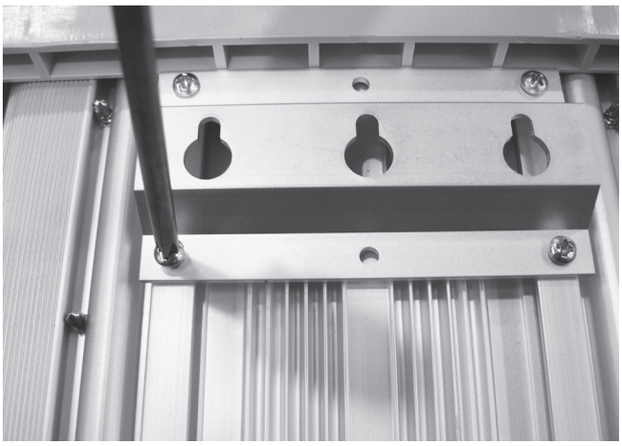
Step 1 – Place fuse back in its holding.

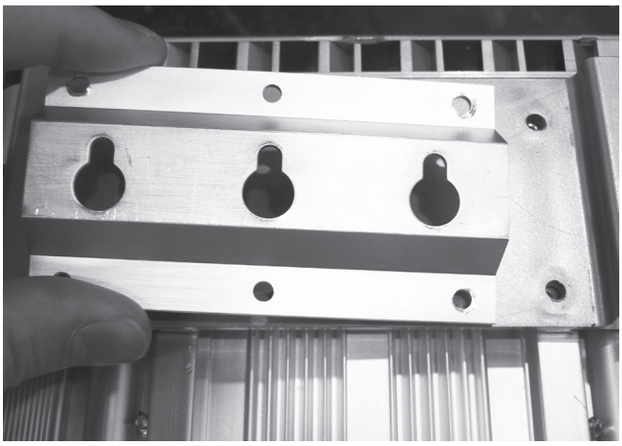


Step 2 – Place fuse into fuse housing & pushing gently down twist to the right to lock in place.

Replacing the Hanging Bracket

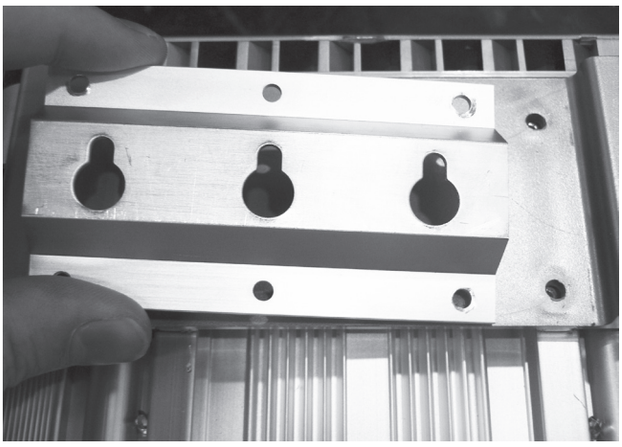
Disassembly

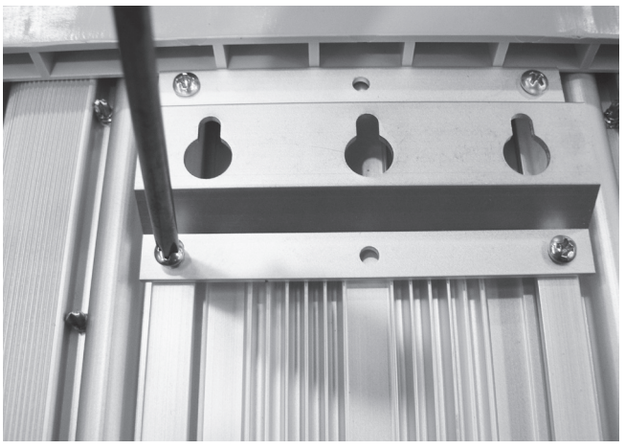




Step 1 – Remove screws holding the hanging bracket in place with a Phillips head screwdriver (two point) & remove the hanging bracket.

Assembly

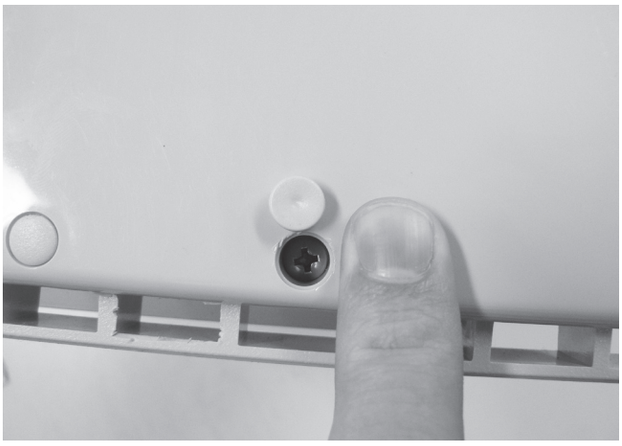




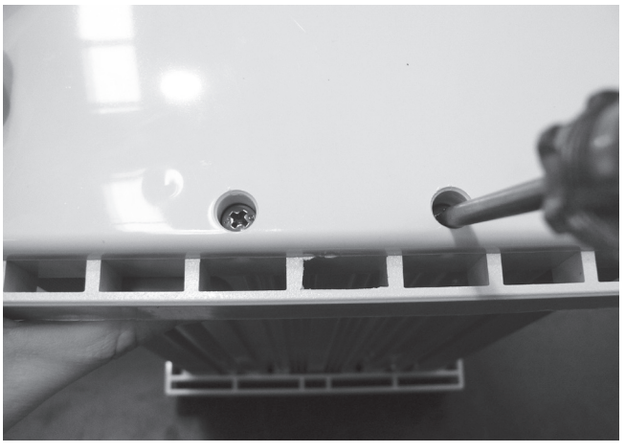
Step 1 – Place hanging bracket in position over screw holes & replace screws using a Phillips head screwdriver (two point).

Replacing the Top Panel

Disassembly

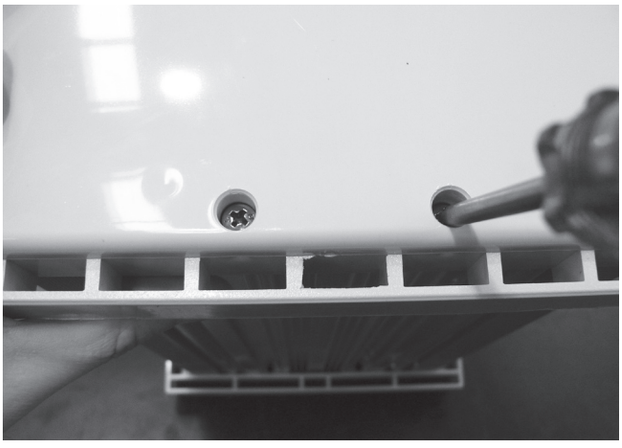


Step 1 – Pry the tabs covering the screws on the top panel off. These tabs are not reusable & will need to be replaced after removal (Part number M1500GRY).



Step 2 – Remove the screws holding down the top panel using a Phillips head screwdriver (one point).

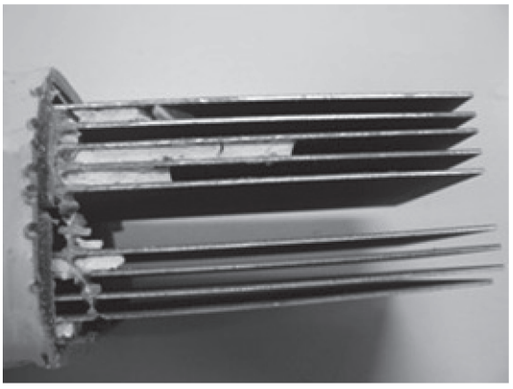
Assembly



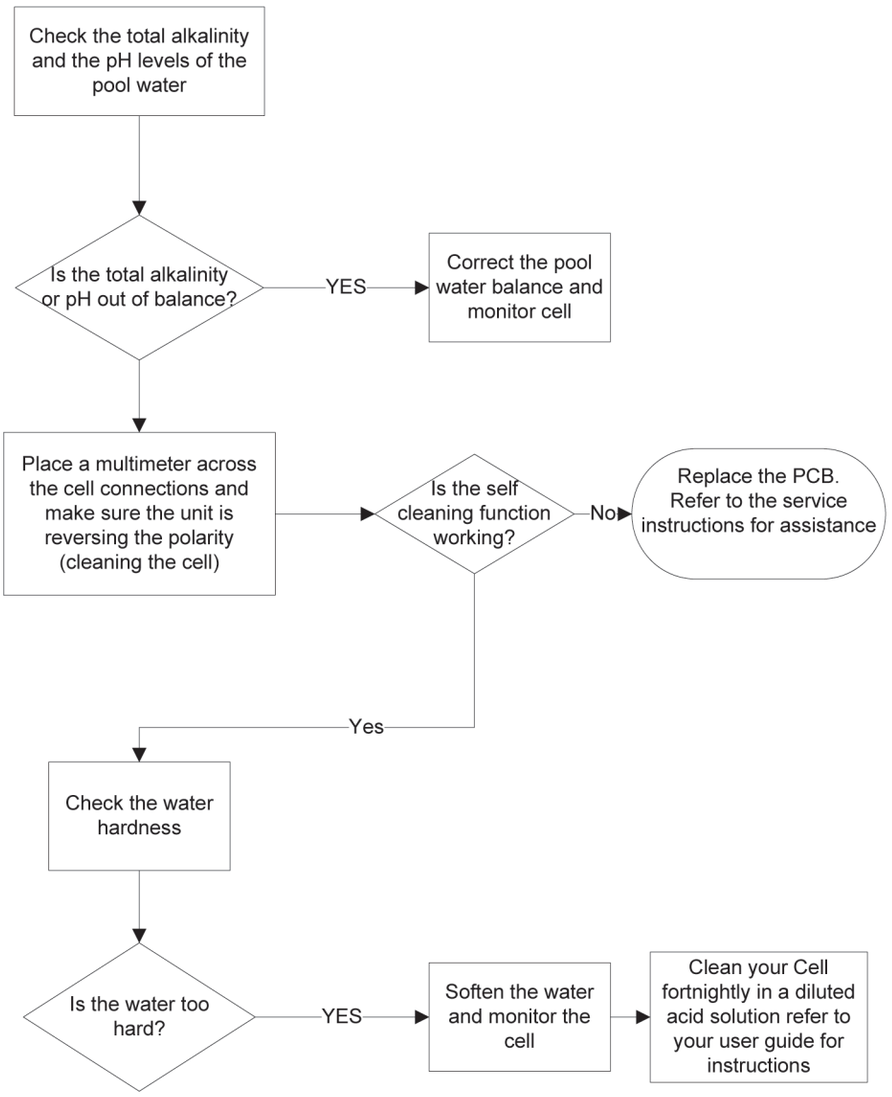
Step 1 – Replace the screws holding down the top panel using a Phillips head screwdriver (one point) & press tabs back into place, (Part number M1500GRY).

Troubleshooting Guides

Ecomatic
Cell Calcification



Dissected Calcified Cell-Note the white Calcium build up between the plates



Ecomatic Not Producing Enough Sanitizer

Is the Ecomatic production control set to maximum?

NO

Raise the Ecomatic Production control to maximum then monitor chlorine levels over a 24hr period until desired level is attained

Is the pool chlorine level rising?

YES → Monitor and adjust the Ecomatic Production control as necessary

NO

Yes

Is the operating/filtration cycle long enough to turn the water over once in a 24hr period? For example 4 hrs in winter and 8hrs Max in summer

NO → Increase the operation / filtration time per 24hr period → Is the pool chlorine level rising?

YES → Monitor and adjust the Ecomatic Production control as necessary

NO

YES

Does the filter require backwashing or cleaning

YES → Backwash or clean your filter → Is the pool chlorine level rising?

YES → Monitor and adjust the Ecomatic Production control as necessary

NO

NO

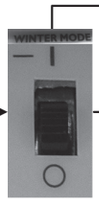
Is the salt level salinity of the pool water between 4500-5500ppm

NO → Raise the salt level/salinity of the pool water to 4500-5500ppm → Is the pool chlorine level rising?

YES → Monitor and adjust the Ecomatic Production control as necessary

NO

Yes

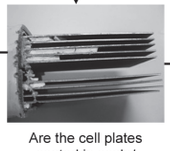


Is the Ecomatic set to winter mode during swimming season

YES → Turn winter mode off → Is the pool chlorine level rising?

YES → Monitor and adjust the Ecomatic Production control as necessary

NO



Are the cell plates coated in scale/ calcium?

YES → Clean the cell in a diluted acid refer to page 10 of your user guide → Is the pool chlorine level rising?

YES → Monitor and adjust the Ecomatic Production control as necessary

NO

NO

Is the pool chlorine level rising?

YES → Monitor and adjust the Ecomatic Production control as necessary

Ecomatic Not Producing Sanitizer

Is the Ecomatic production control set to Minimum?

YES

Raise the Ecomatic production control to maximum then monitor chlorine levels over a 24hr period until desired level is attained

Is the pool chlorine level rising over a 24 hr period?

YES → Monitor and adjust the Production control as necessary

NO

No

Is the no flow Led indictor light on?

YES → Increase the water flow through the cell to the minimum rate refer to your user guide for assistance

NO

are the fuses blown?

YES

Replace the fuses

Is the pool chlorine level rising over a 24 hr period?

YES → Monitor and adjust the Production control as necessary

NO

Are the fuses blowing repeatedly?

YES

On 16 & 24 gram models replace the PCB. On 36 and 48 gram models replace the triacs.Refer to the service instructions for assistance

Is the salt level salinity of the pool water between 4500-5500ppm

NO

Raise the salt level/salinity of the pool water to 4500-5500ppm

Is the pool chlorine level rising over a 24 hr period?

YES

Monitor and adjust the Ecomatic production control as necessary

YES

Is the pool waer temperature below 70 deg farenheit

YES

Is the pool chlorine level rising over a 24 hr period?

Monitor and adjust the Ecomatic production control as necessary

NO

No

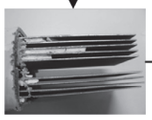
Raise the Ecomatic production control set to maximum

Place a digital clamp meter around one of the black cell cords and record the reading

MODEL	Cell Current
ESC16gm	3.5-4 amps
ESC24gm	3.5-4 amps
ESC36gm	6-6.5 amps
ESC48gm	7-8 amps

Does the current match the previous table?

NO



Are the cell plates coated in scale/ calcium?

YES

Clean the cell in a diluted acid refer to page 10 of your user guide

Is the pool chlorine level rising over a 24 hr period?

YES → Monitor and adjust the Ecomatic production control as necessary

NO

Using a multimeter check for the presence of a DC voltage across the cell connector terminals

Is the DC voltage present at the cell terminals?

YES → Replace the cell

NO

Are the cell cord connectors making good contact with the cell?

NO → Repair the connections or replace the cell cord

Replace the cell

Ecomatic Will Not Turn On
E.g No Lights No Display

Is the Ecomatic connected to the power supply

NO

Plug the Ecomatic into the power outlet

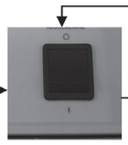
Is the unit now operational ?

YES

Refer to your user guide for operating instructions

YES

NO



Switch the Ecomatic on

Is the unit now operational ?

YES

Refer to your user guide for operating instructions

Is the Ecomatic switched On

NO

YES

are the fuses blown?

YES

Replace the fuses

Is the unit now operational ?

YES

Refer to your user guide for operating instructions

NO

Are the fuses blowing repeatedly?

YES

On 16 & 24 gram models replace the PCB. On36 & 48 gram models replace the triacs. Refer to service instructions for assistance

Is the unit now operational ?

YES

Refer to your user guide for operating instructions

NO

Using a Multi meter measure the AC voltage supplied to the Ecomatic by the power outlet

Is the Line voltage sufficient e.g does it match the minimum rating on the label of the product

YES

Primary supply connections

Repeat the previous step at the primary side of the Ecomatic transformer

Is the voltage correct?

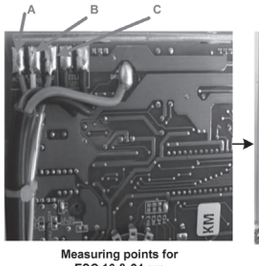
NO

Contact your electrician/ electricity supplier about raising the line voltage to a suitable level

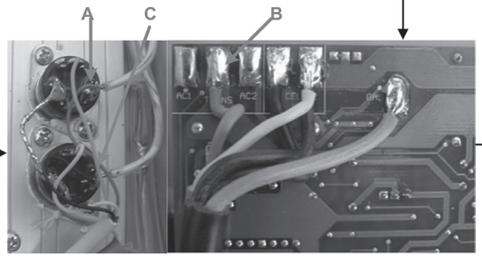
YES

Check the output voltages from the secondary side of the transformer against the table

	A-B	A-C	B-C
ESC 16	18-19 V	36-38 V	18-19 V
ESC 24	25-27 V	52-54 V	25-27 V
ESC 36 & 48	31-33V	64-66 V	31-33 V



Measuring points for ESC 16 & 24 gm



Measuring points for ESC 36 & 48 gm

Do the secondary output voltages match those in the previous table

YES

Replace PCB
Refer service instructions

NO

Replace Transformer
Refer service instructions

Maintenance Guide – Controller

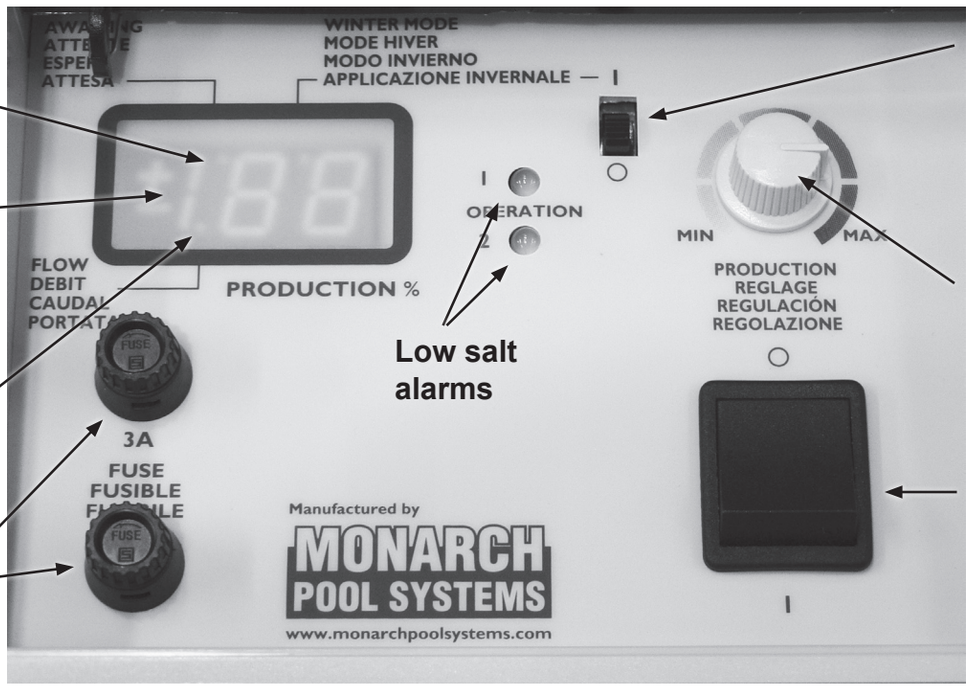
A1. ECO-matic ESC & ESR

A Salt Water Pool System has 3 potential sources to cause failure:
- The control box
- The cell
- The quality of the pool water or the incorrect installation of the unit.

Diagnosis of a potential fault by phone is important as the problem may come from the control box, from the cell or from the environment (quality of the water or installation). Correct diagnosis by phone helps to avoid call out fee's and unnecessary dismantling of units.

This troubleshooting guide is to assist in assessing a fault by phone by demonstrating the correct questions to ask the pool trader or the pool owner.

ESC Control Panel



A.1.1 The indicated production is lower than 100 – There are 1 or 2 red alarms.

One red alarm (or the two) is ON and the indication of production is lower than 100 (between 15 & 100) and the production control is set at maximum output.
Note: If the unit is set in Winter mode, the number 85 will be displayed (instead of 100).

There are 4 questions to ask:

A.1.1.1: Is the salt content of the water high enough? The minimum salt content required is 3g/l, at the beginning of the new swimming season it is advised that salt content be set to approximately 4 g/l at the beginning of the season.

IMPORTANT: Be wary when a customer's answer is ***Yes, salt content is OK*** since measurements are often made with strips which can vary in accuracy thus misleading the pool owner. If unsure about the accuracy of the salt level then ask for the customer to obtain a water sample to be tested by their local pool dealer or water specialist. If owner does not want to obtain a water test & you still have doubts ask the owner to add 1Kg of salt per m3 (meter cubed) of water and check if the indication of the production is then increasing (possibly reaching 100 eliminating problem).
Note: An excess of salt in the pool (5 or 6 g/l) will not create a problem to the pool.

A.1.1.2: Is the cell clean? The maintenance of the cell is imperative to ensure that there is no or minimal scale buildup between the plates of the cell. If there is scaling occurring (white deposit on plates), the cell needs to be removed and submerged in a mixture of water and hydrochloric acid (1/3 acid – 2/3 water).
Install the cell again and start the unit to check if the production increases.

A.1.1.3: Is the cell worn out? Date of installation of the unit?
Refer to section A.2 on cells. The cell will incur wear over time and needs to be changed every 4 to 7 years.

To check the fabrication date it is engraved on the cell near the connectors:

First letter: <u>The month of fabrication:</u> A: January, B: February, C: March, D: April, E: May, F: June, G: July, H: August, I: September, J: October, K: November, L: December
Second letter: <u>The year of fabrication :</u> H: 2009, I: 2008, J: 2007, K: 2006, L: 2005, M: 2004, N: 2003, O: 2002, P: 2001
E.g.: DN indicates date of fabrication: April 2003

A.1.1.4: Are the cables of the cell correctly connected?
For ESC cells, check that there is no inversion between the black connector and the blue connector (indicates presence of gas in the cell housing). The two female connectors in black must be connected to the black male connectors. In the case of such error, the indication of production is 1 or 2.

For ESR cells, check that the white male connector is connected into the white female connector (same for black connectors).
Note: Check that the blue connector (detects gas in the cell housing) is connected.

A.1.2 :There is no production displayed on indicator

A.1.2.1: Check the electrical connection. The unit should have the LED indicators ON when the pump is running & should have LED lights OFF when pump is not running.

A.1.2.2: Check that the Flow indicator (small red dot on LED panel) is not ON?
If this dot is ON, it indicates that the unit detects a presence of gas in the cell housing.
Check that when the unit is in operation there is no bubble of air in the top part of the cell housing.
Note: The housing must be installed horizontal, with the inlet on the side of the threaded plug of the cell. (The direction of flow is indicated with an arrow on the cell housing). If there is gas in the housing the blue connector of the cell detects this gas and the unit will not operate. This bubble has to be eliminated: make sure that the unit is installed correctly at the inlet & outlet to prevent the bubble forming in the housing.

If there is no gas in the cell housing and the red dot is indicating there is “flow”, the problem may come from the PCB. Refer to the trouble shooting of the control box.

If this dot is not ON, Refer to the trouble shooting of the control box. .

A.1.3 : The water is not clear or is green

Need to first establish if the problem comes from the unit.

A.1.3.1: Does the digital display of the unit show <u>100</u> when the unit operates?
Make sure that the chlorine production control is at maximum, if the display is showing 100, (between 95 and 105 is within acceptable levels), the problem does not come from the unit as it is functioning correctly. If this is the case the water chemistry is likely to be incorrect.

If the display does not show 100, (one or two red alarms ON), refer to chapter **A.1.1.**

A.1.3.2: Is the value of the pH correct?
Check that the pH of the water is not above recommended levels (between 7 and 7.4). The correct pH level ensures maximum efficiency of the salt electrolysis process.

A.1.3.3: Is there some stabilizer in the water?
Without the presence of stabilizer in the water, (isocyanuric acid), chlorine is rapidly destroyed by UV (Ultra Violets rays from the sun) and its effectiveness becomes very limited. The chlorine of the water needs to be protected by **40 to 70 ppm of stabilizer in the water** (40 grams of stabilizer per m3 of water).

A.1.3.4: Is the filtration time sufficient?
The warmer the water is, the longer the filtration time should be. The number of hours of filtration every day should be a minimum of half of the temperature of the water in °C.

<u>Example :</u> Water at 26°C. Filtration time should be 13 hours/day.
If the filtration time is not sufficient, the electrolysis will not be sufficient since the electrolysis works only during the filtration time.

A.1.3.5: Is the size of the unit adapted to the swimming pool?
ESC, ESCpH and ESR units are designed for private pools not exceeding 200 m3 (meters cubed). For semi-public or public pools, larger units such as units in the range of SC Max are more appropriate.

A.1.4 :There is no chlorine in the water

In salt chlorination applications, the amount of chlorine in the water is often very limited (from 0.5 ppm to 1 ppm) so the owner may not feel that the unit is working correctly. We have to first ensure that the unit is working; the following questions will enable this to be established:

A.1.4.1: Does the display of the unit show 100 when the unit operates?
Make sure that the chlorine production control is at maximum, if the display is showing 100, (between 95 and 105), the problem does not come from the unit as it is functioning correctly. If this is the case the water chemistry is likely to be incorrect, refer to section A.1.3.2

If the display does not show 100, (one or two red alarms ON), refer to section **A.1.1.**

A.1.4.2: How did you check the presence of chlorine?
How was the chlorine measured? Was a test kit used? If a test kit was not used then the test will be inaccurate. The presence of chlorine should be checked by taking a water sample at the eye return of the pool water, when the salt chlorinator is in operation.

A.1.4.3: Is there some stabilizer in the water?
Check water for presence of stabilizer, there should be between 40 & 70 ppm of stabilizer to protect against chlorine evaporation from UV. Refer to section **A.1.3.3**

Maintenance Guide – Cell

B- Checking of cells EcoMatic ESC & ESR & EcoSALT BMSC

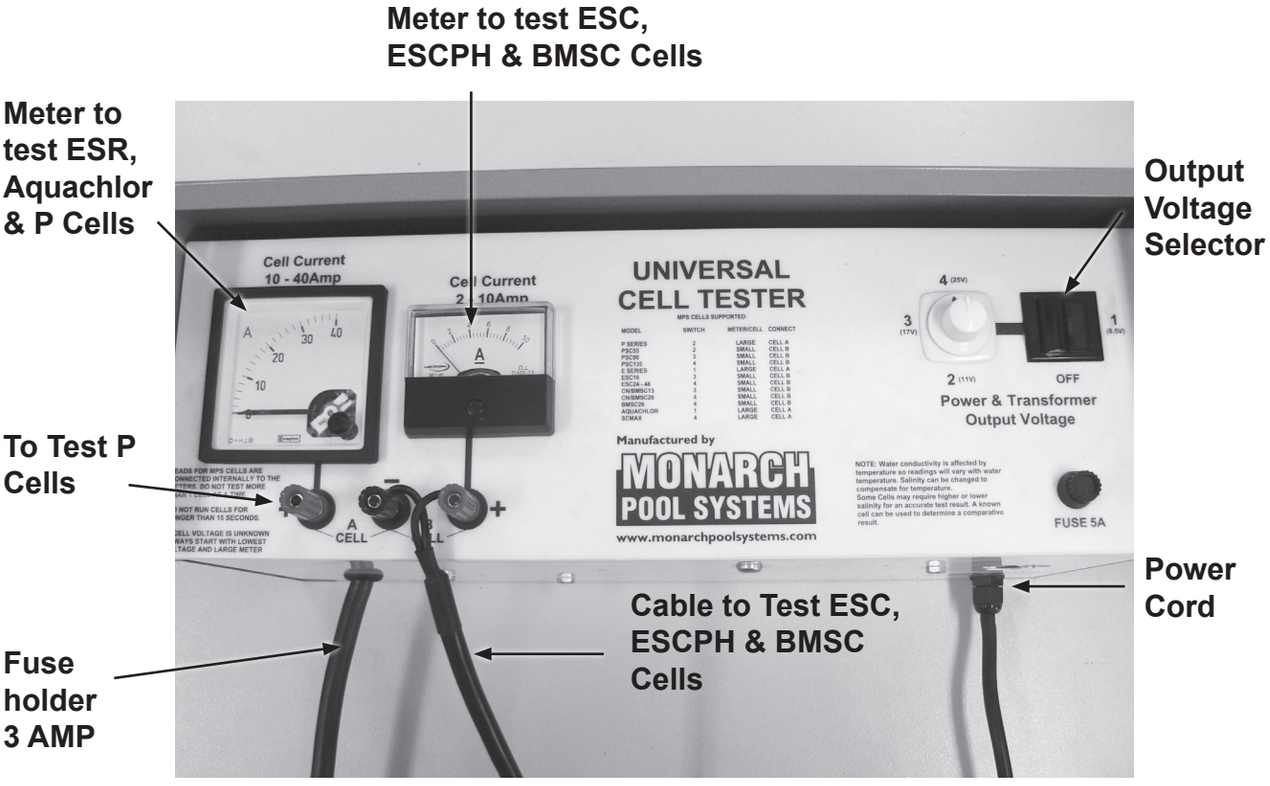
The cell is the most important part of the chlorinator and also the most expensive part.
For the EcoMatic ESC & ESR cells, the manufacturing date of the cell is engraved on the transparent plastic head.

For the EcoSALT BMSC cells, this date is engraved on the transparent body, near the connectors:

First letter: Month of Manufacturing: A: January, B: February, C: March, D: April, E: May, F: June, G: July, H: August, I: September, J: October, K: November, L: December

Second letter: Year of Manufacturing: H: 2009, I: 2008, J: 2007, K: 2006, L: 2005, M: 2004, N: 2003, O: 2002, P: 2001.
e.g.: **DN** means a manufacturing date of **April 2003**

The cell can be tested either by connection with a chlorinator or by connecting it to the MONARCH universal Tester.



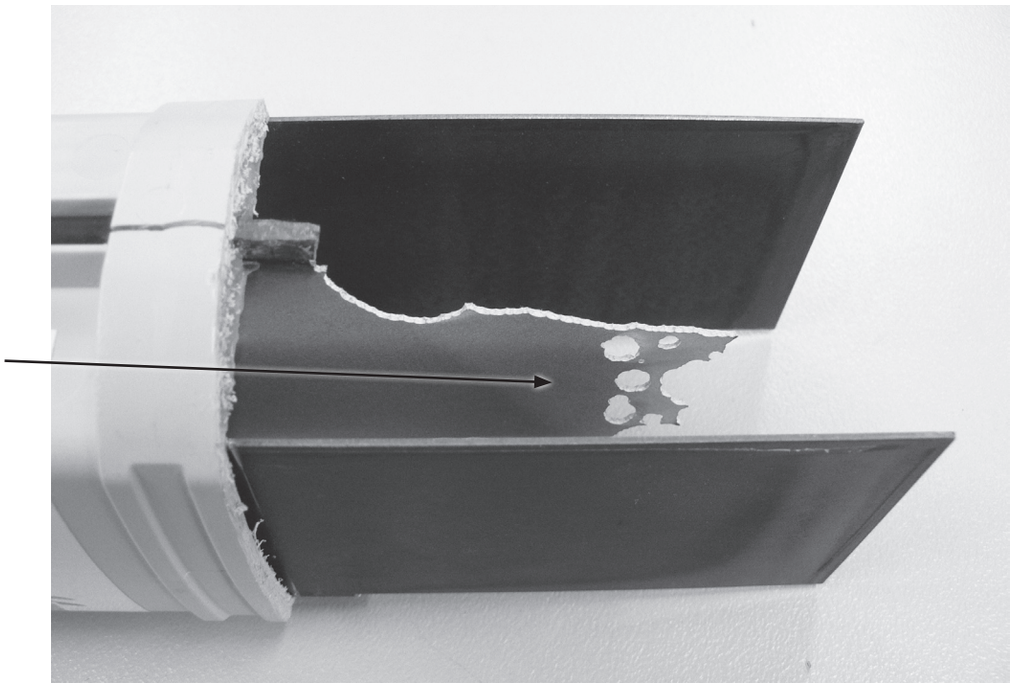
B.1. The production of the cell is not sufficient

There are two possible reasons for a cell having low production: The wearing of the cell and the scaling of the cell.

Wearing

Normally, an ESC or ESR cell should last 5 years under normal conditions with correct maintenance & operating in swimming seasons ranging from April to October.
The cell will incur more significant wear & tear if used for a higher frequency for an extended period of time (e.g.; cell sanitizing swimming pools for medical use).

Below is an example of a cell which has had its central plate worn out by heavy use.



It is recommended that the unit be turned off when the water temperature falls lower than 15°C.

Scaling of the cell

Scaling of the cell can occur when the pH of the water is too high, although the units ESC & BMSC are self cleaning, it is still possible to find the cell full of scales. In case of scaling of an ESC or BMSC cell, the pH of the water of the pool has to be adjusted lower (between 7 and 7.4).

Clean the cell with a mixture of 2/3 of water and 1/3 hydrochloric acid. The owner will then have to maintain the pH of the water at its normal value (between 7 and 7.4) by adding some “pH minus” when necessary.

B2. The cell is full of scale (white deposit on plates)

Refer to above chapter **(Scaling of cell)** which is a cause of scale production that can make the unit inefficient. This is not common for self cleaning units such as the EcoMatic ESC, ESCpH and also EcoSALT but is more common for units without self cleaning system such as the EcoMatic ESR.

B3. The cell has got a leak around the connectors.

The leak can often be found at the gland of the cell connectors. To check for leaks install the unit on the pool system & check the gland when the filtration pump is in operation.

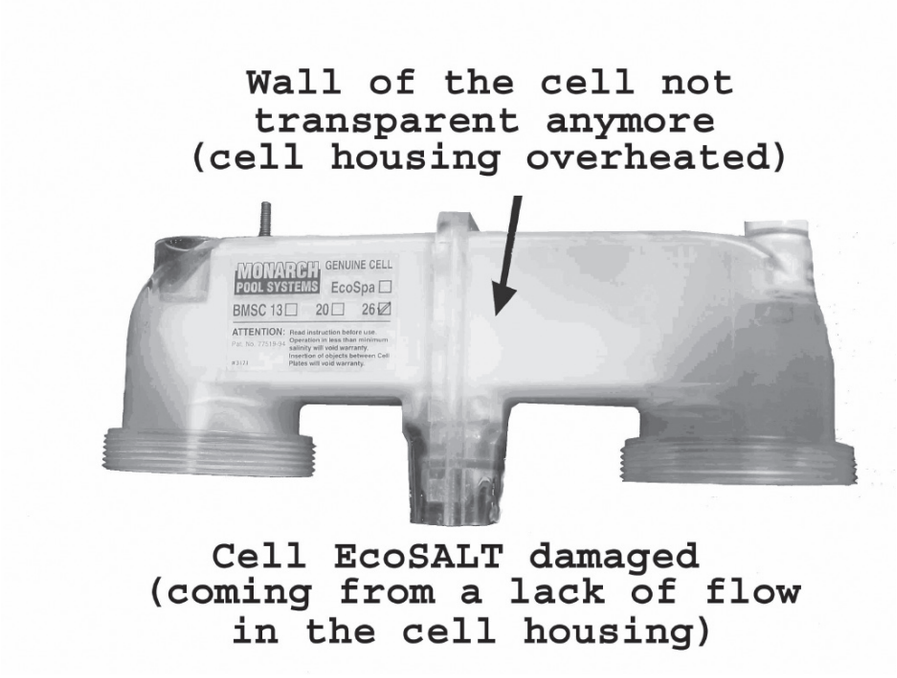
B.4 The cell housing is cracked

This cracking can typically occur when the pressure sharply increases in the cell housing. This high pressure can occur **only if the salt chlorinator is in operation with the isolating valves closed.**

This fault is the consequence of a mistake made by the pool owner having mistakenly closed the valves and having forgotten to open these valves when the chlorinator was started.
Important: In order to avoid this type of problem, it is strongly advised that a Non return valve be installed in the pipe work between the cell & the pool return.

B.5 The wall of the housing is not transparent anymore

Overheating of the cell will result in you no longer being able to see through the cell housing to the cell plates. This overheating occurs when the flow through the cell housing is insufficient. This lack of flow can happen for the following reasons:
One valve closed or partially closed on the filtration circuit. This will result in the flow to the cell being blocked or restricted thus causing overheating.
A cell full of scale: If the cell is scaled the flow going through the cell housing is restricted, more common in the case of the EcoSALT cell.



B.6 Brown or black traces on plastic part of the ESC cell

Brown or black traces on the cell indicate the presence of metals in the water. The water coming from wells often contain metals that can damage the cell. These traces can also be found in pools located in close proximity to vineyards which have been treated with copper sulphates. Davey advises against using water drawn from wells to fill up a swimming pool.

NOTES

Note:
Product specifications may change without notice.
Drawings are indicative only, product appearance may change slightly.

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