



Salt Water Chlorination

Trouble shooting Guide



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A. ProMATIC

A.1 - Trouble shooting by phone

Defects of Salt Water Chlorinators may come from:

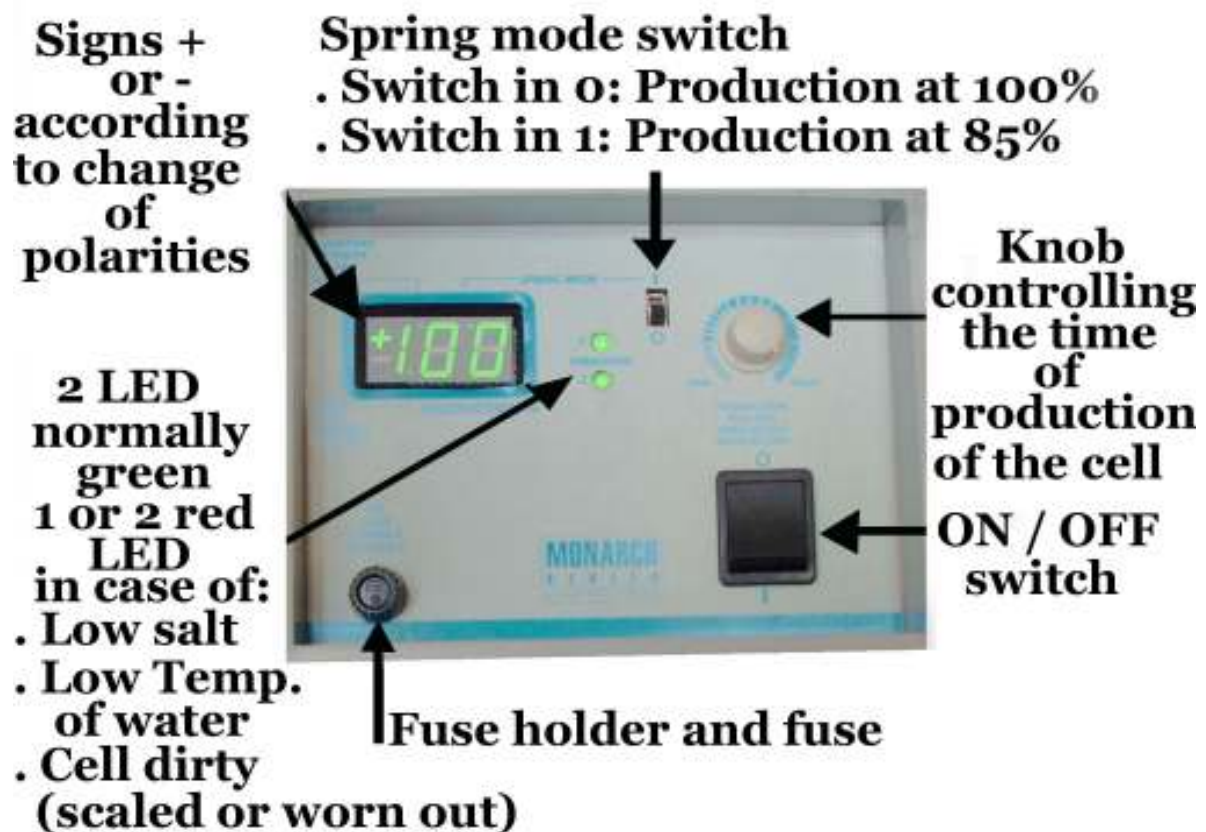
- . The control box
- . The cell
- . The water of the pool or the installation of the unit.

It is very important to diagnose by telephone if the problem comes from the control box, from the cell or from the environment (Quality of the water – Installation of the unit). This diagnosis avoids expensive trips and dismantling of units which are often not necessary.

(Please refer to control panel of **ProMATIC**)

We are going to see how we can find out the origin of the defect by telephone, by asking the right questions to the pool dealer or to the pool owner.

Here is the photo of the control panel of **ProMATIC**:



A.1.1 The display indicates production lower than 100 – There is 1 (or 2) red alarm.

One red alarm (or 2) is ON and the indication of production is lower than 100 (between 15 and 100) with the production control being set up at maximum.

Note: If the unit is in « **Spring mode** », the number 85 will be displayed (instead of 100).

The following questions have to be asked:

A.1.1.1- Is there enough salt in the water of the pool ?

The minimum salt content is 4g/l and it is better to adjust this salt content at Approx. 4.5 g/l at the beginning of the season.

IMPORTANT: Measurements are often made with strips which are often not accurate and results obtained can mislead the pool owner. You may ask for a sample of the water to really make sure that the salt content is right.

In case of doubt, **ask the pool owner to add 1 Kg of salt per m3 of water** and check if the indication of the production is then increasing (and reaches 100).

Note: An excess of salt in the pool (5 or 6 g/l) will not be a problem for the unit.

A.1.1.2- Is the cell clean ?

The control of the cell has to be done in order **to make sure that there is no scale between the plates of the cell**. If there is some scale (white deposit on plates), the cell has to be removed and immersed into a mixture solution of water and Chlorydrique acid (1/3 acid – 2/3 water) or into a special product (LIMPIA-CELL).

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 **Paragraph B on cells**. The cell is a wearing part and has to be changed every 4, 5, 6 or 7 years. If the salt content is fine and if the cell is clean, the best way to check if the cell is still fine, will be to check the unit with a brand new cell.

The fabrication date of the cell is engraved on cell, near connectors:

First letter : The month of fabrication: 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: The year of fabrication: G: 2010 – H: 2009 – I: 2008 - J: 2007
K: 2006 – L: 2005 – M: 2004

e.g.: **DH** means Date of fabrication: April 2009



A.1.1.4: Is the cable of the cell correctly connected?

For the ESC-MPS cells, **check that there is no inversion between the black connector and the blue connector** (gas detector checking presence of gas in the cell housing). The two black female connectors have to be connected to the black male connectors. In case of such error, the indication of production will be 1 or 2.

Check that the blue connector (gas detector 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 must be under voltage when the pump is under voltage (LED indicators ON) and **the unit must be OFF when the pump is OFF** (LED indicators OFF).

A.1.2.2: Check that the small red dot « Flow » is not ON

(Small dot on digital indicator).

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 has to be installed horizontal**, with the inlet of water 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 presence of gas, the blue connector of the cell detects this gas and the unit cannot operate. This “bubble” of air has to be eliminated: make sure that there is no air intake that could form this bubble in the cell housing. If there is no gas in the cell housing and if this red dot “flow” stays ON, 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 “cloudy” or green

We have to first check if the problem comes from the unit.

A.1.3.1: Does the digital display of the unit show 100 when the unit operates?

Make sure that the production control is at maximum and if the display shows 100, (Between 95 and 105), the problem does not come from the unit that works fine. In that case, please refer to the following chapter concerning the water treatment. 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 too high (ideally between 7 and 7.4). The lower the pH, the better the efficiency of the salt chlorination process.

A.1.3.3: Is there some stabilizer in the water?

Without the presence of stabilizer in the water, (isocyanuric acid), the chlorine is rapidly destroyed by the UV (Ultra Violets of the sunrays) and its efficiency becomes very limited. **The chlorine of the water has to be protected against UV by Chlorine stabilizer** (40 to 70 ppm of stabilizer are necessary- 40 grams of stabilizer per m³ of water).

A.1.3.4: Is the filtration time sufficient?

The warmer the water, the longer the filtration time should be...

As a practical rule, the daily number of hours of filtration should be at least the number obtained by dividing by 2 the temperature of the water in °C.

Example: If the water is at 24°C, the filtration time should be 12 hours/day.

If the filtration time is not sufficient, the salt chlorination 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?

The units ESC or MPS are designed for private pools not exceeding 200 m³.

Some larger units like the SC Max. are better adapted. for larger semi-public or public pools

A.1.4: There is no chlorine in the water

With salt chlorination, the amount of chlorine in the water is often very limited (from 0,5 ppm to 1 ppm) and the pool owner may not detect chlorine in the water. We have to make sure first that the unit works fine. The following questions have to be asked:

A.1.4.1: Does the display of the unit show 100 when the unit operates?

Make sure that the production control is at maximum and if the display shows 100, (Between 95 and 105), the problem does not come from the unit that works fine. In that case, please refer to the chapter concerning the water treatment.

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

A.1.4.2: How did you check the presence of chlorine?

How was this chlorine measured? Test kit is not accurate at all.

The presence of chlorine can be checked by taking a sample of water at the pool return line, the salt chlorinator being in operation.

A.1.4.3: Is there some stabilizer in the water?

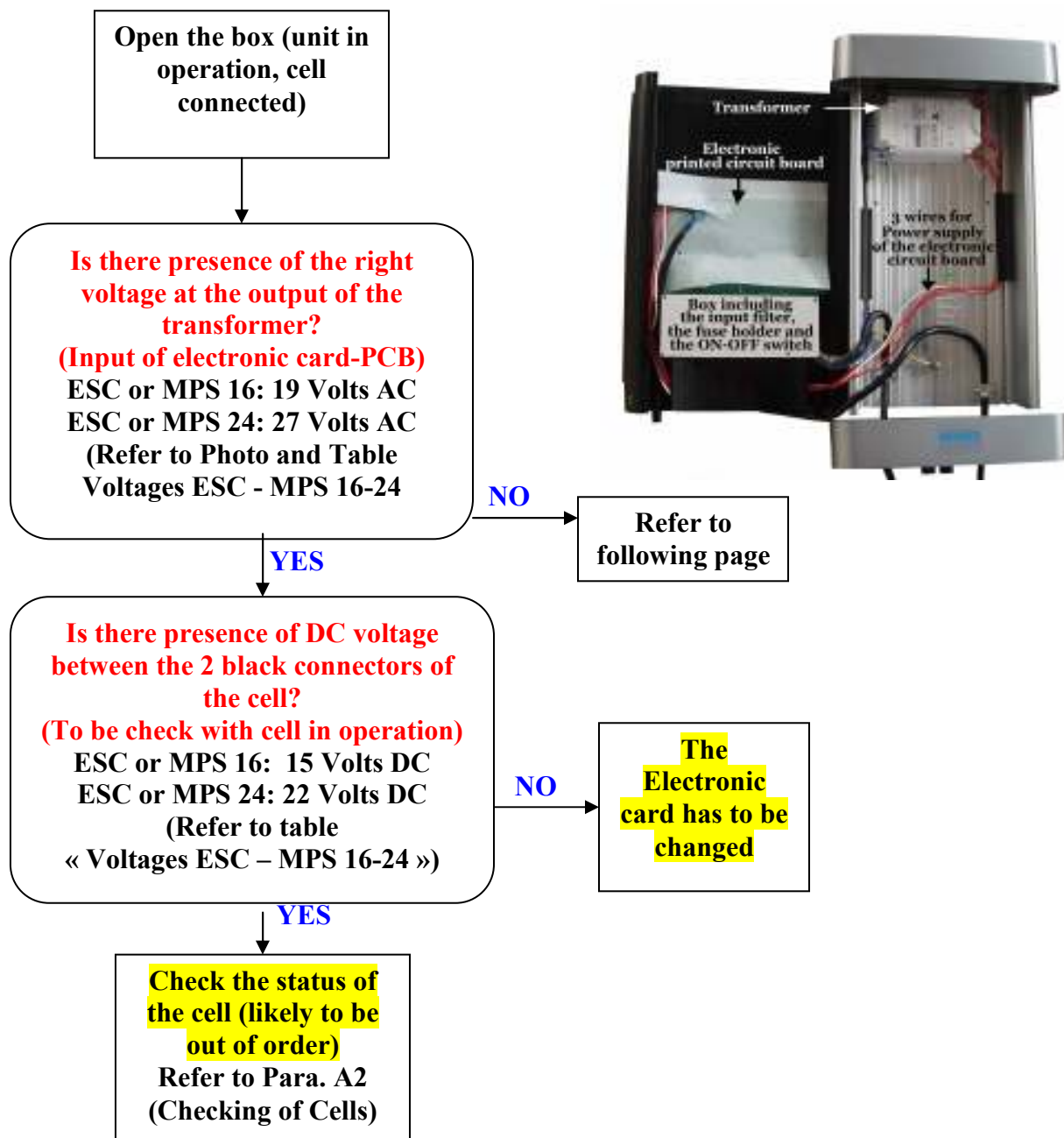
The presence of stabilizer in the water has to be checked: 40 to 70 ppm of chlorine stabilizer should be in the water to protect the chlorine against sunrays.

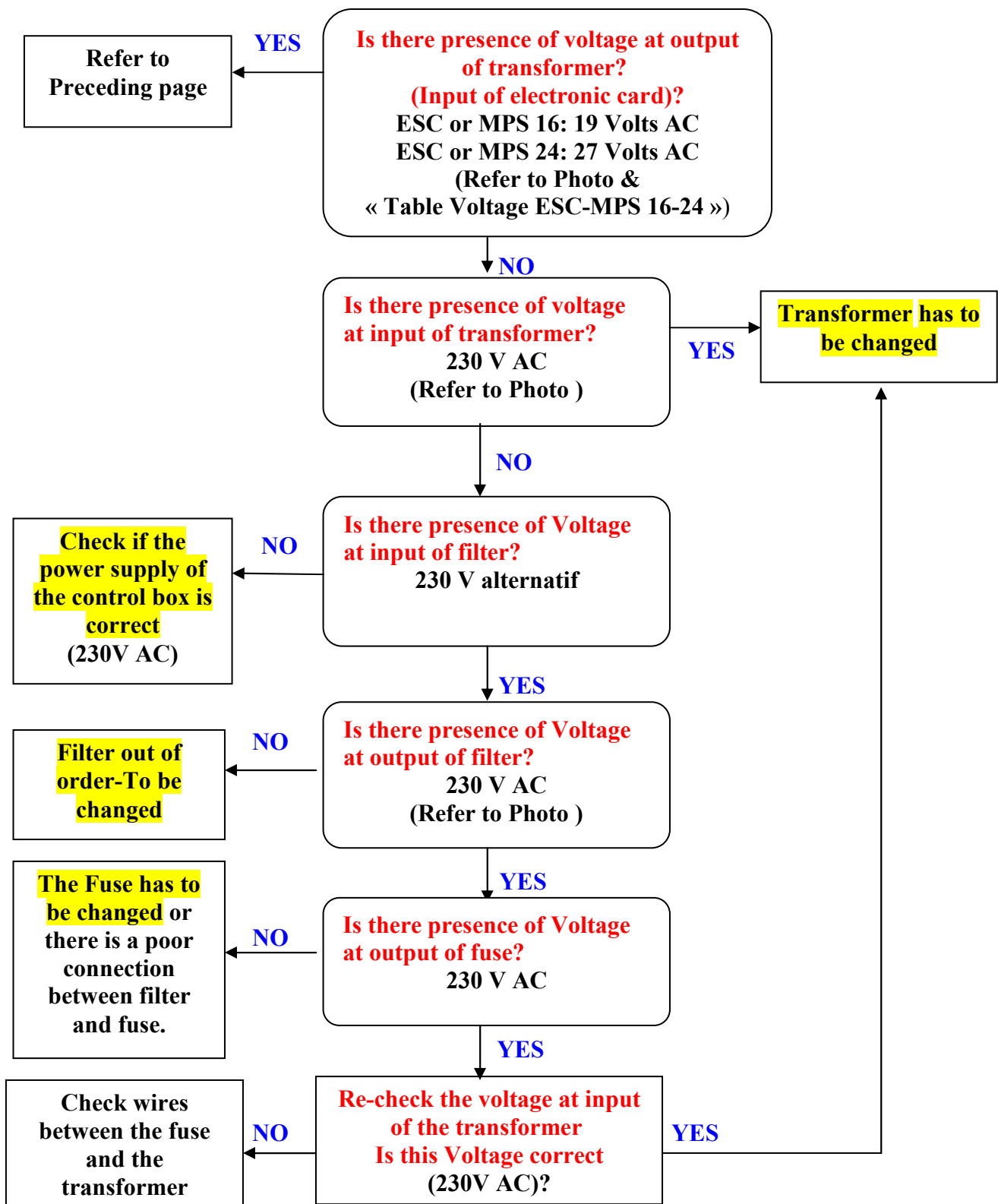
Refer to **Para. A.1.3.3**

A2- ProMATIC ESC or MPS 16-24- Repairing the control box

This checking procedure is applicable in the following cases:

- . The unit does not produce enough with cell being in good condition.
- . There are 1 or 2 red alarms.
- . The fuse blows.





If the fuse blows: In order to check the control box when the fuse blows, the wires at output of the transformer have to be disconnected (input of PCB).

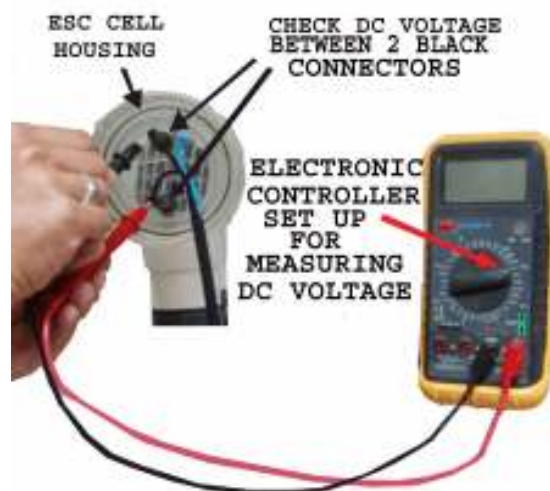
. If the fuse blows again, the problem is upstream of transformer (Refer to transformer or input of filter).

. If the fuse does not blow, the problem comes from the electronic card (PCB) which has to be changed.



A.3 Voltages ProMATIC 16-24

	CHECKING VOLTAGE - INPUT PCB				CHECKING CELL VOLTAGES
Model Units	COLOR OF WIRES		Voltage Approx. Volts- AC		Volts - DC
ProMATIC 16	Red wire Left	White wire central	19 volts		Between black connectors 15 volts Approx.
		White wire central	Red wire right	19 volts	
	Red wire Left		Red wire right	38 volts	
ProMATIC 24	Red wire Left	white wire central		27 volts	Between black connectors 22 volts Approx.
		white wire central	Red wire right	27 volts	
	Red wire left		Red wire Right	54 volts	

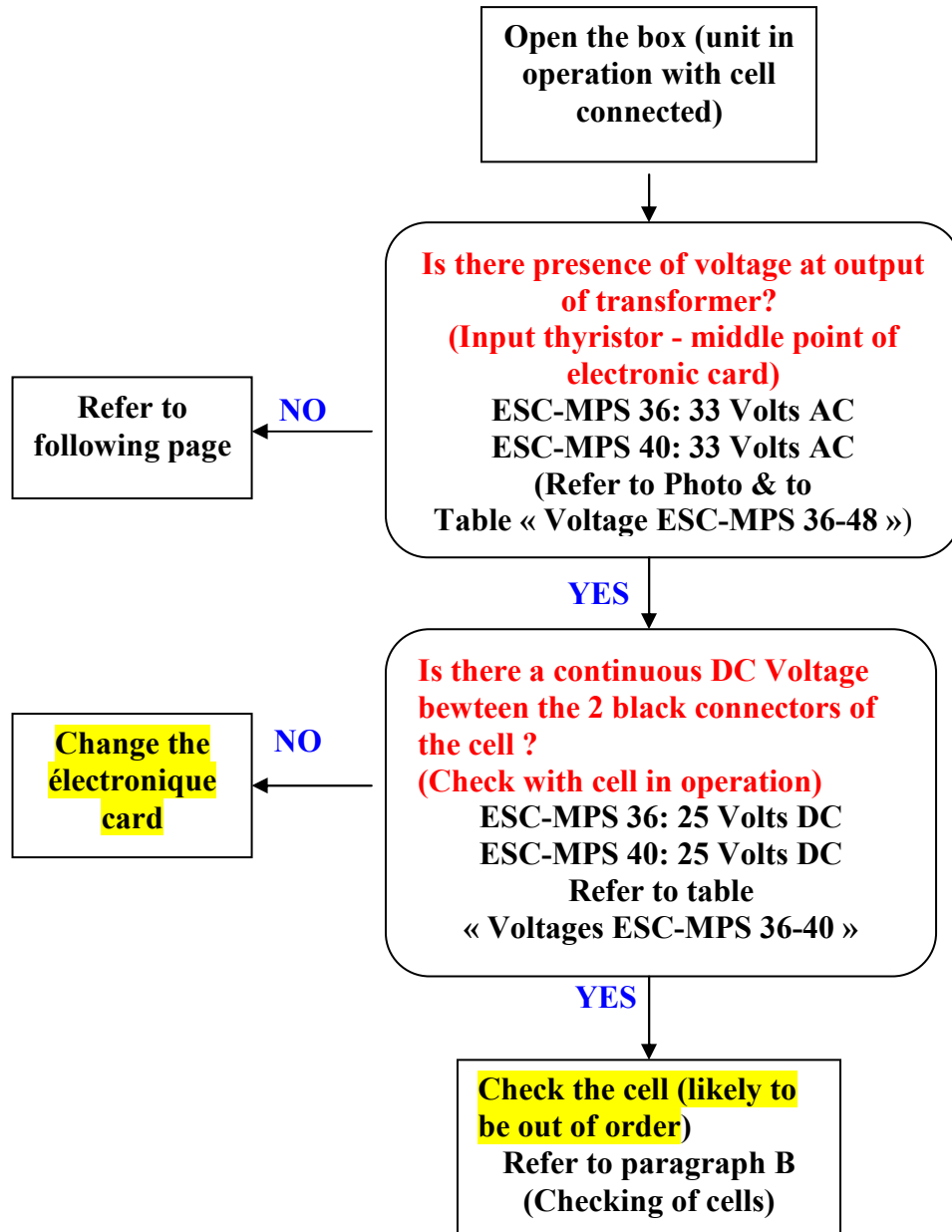


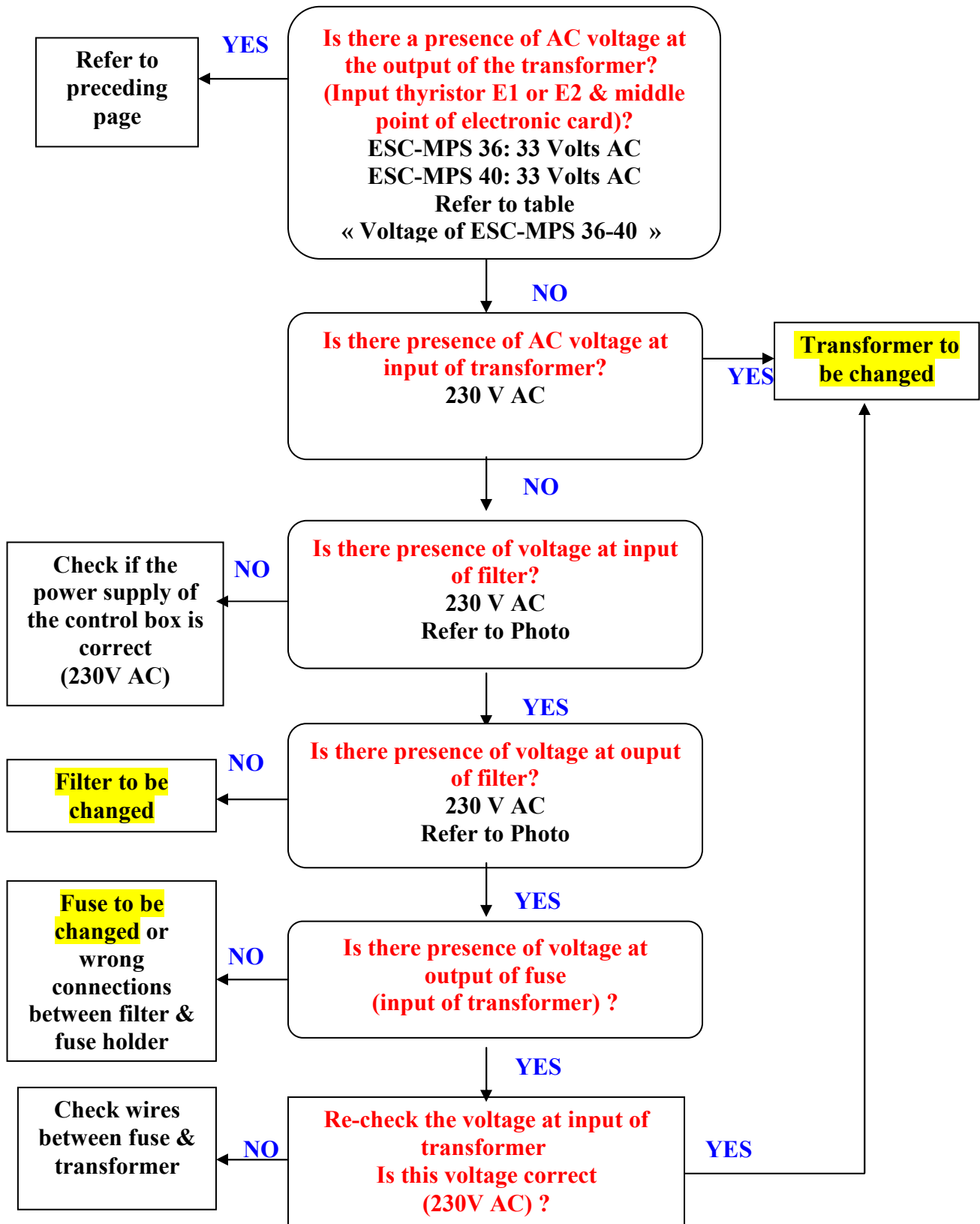
CHECKING OF DC VOLTAGE
BETWEEN CONNECTORS OF ESC CELL

A4- ProMATIC ESC-MPS 36-40 – Repairing control box

This checking procedure is applicable in the following cases:

- . Unit does not produce (with cell being in good condition)
- . Abnormal red alarm ON
- . Fuse blows.

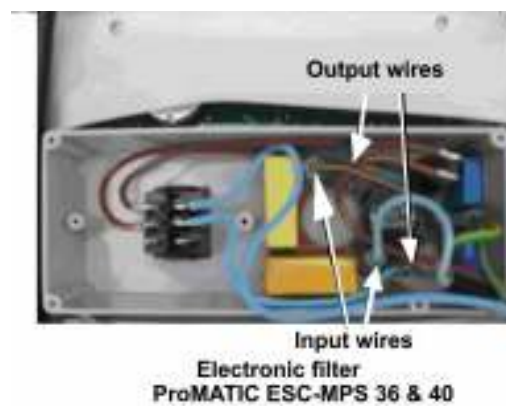




If the fuse blows: In order to check the control box when the fuse blows, the wires at output of the transformer have to be disconnected (input of PCB).

. If the fuse blows again, the problem is upstream of transformer (Refer to transformer or input of filter).

. If the fuse does not blow, the problem comes from the electronic card (PCB) which has to be changed.



ProMATIC ESC or MPS 36 - 40					
	CHECKING VOLTAGE OUTPUT TRANSFORMER				CHECKING
Model Units	Test points (Refer to photos hereunder)		Voltage Approx.		CELL VOLTAGE
			Volts- AC		DC Voltage
ESC-MPS 36 ESC-MPS 40	E1 thyristor 1	Central Point Transformer	33 volts		Between black connectors 25 volts
		Central Point Transformer	E2 thyristor 2	33 volts	
	E1 thyristor 1		E2 thyristor 2	66 volts	

B- Checking of cells

The cell is the most important part of the unit and is also the most expensive part. For the ProMATIC ESC or MPS, 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: G: 2010 – H: 2009 – I: 2008 - J: 2007 K: 2006
L: 2005 M: 2004

e.g.: **DH** means a manufacturing date in **April 2009**



EcoSalt cell

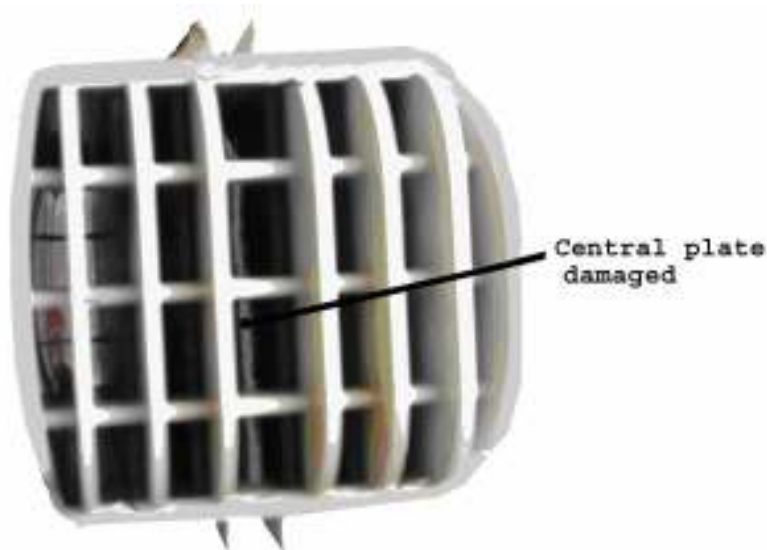


ProMATIC cell

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

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

. **Wearing:** Normally, an ESC - MPS cell should last at least 4 to 5 years under normal conditions of use and maintenance for a swimming season going from April to October. The cell will obviously not last so long if it is used all the year along and all the day along. (e.g.; cell sanitizing swimming pools for medical use). A cell which is dead has got its central plate damaged. Refer to photo:



It is better to stop the unit when the temperature of the water is lower than 15°C.

. **Scaling of the cell:** When the **pH of the water is too high**, although the units **ProMATIC** and **EcoSalt** are self-cleaning, it is possible to find the cell full of scale. In that case, the pH of the water of the pool has to be adjusted at a lower value – Ideally between 7 and 7.4.

Clean the cell with a mixture of 2/3 of water and 1/3 of Chlorydrique acid. Then, the owner will have to maintain the pH of the water at its normal value (between 7 and 7.4) by adding some “pH minus” to the pool from time to time.

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

Refer to chapter B1 – The production of the unit goes down if the cell is not clean. This is not common for the units **ProMATIC** and **EcoSalt** having self cleaning cells.

B3. The cell is leaking around the connectors.

The leak is often at the gland of the cell connectors. This can be found by installing the unit on the circuit and check the possible leak at the gland when the filtration pump is in operation.

B.4 The cell housing is cracked

This is usually occurring when the pressure is increasing sharply in the cell housing. This high pressure can occur **only if the salt chlorinator is in operation, with isolating valves closed.**

Important: In order to avoid this type of problem, we suggest installing a non return valve (and not a valve) between the cell and the pool water return.

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

If the housing is not transparent anymore, this is because the material of the housing was overheated. This overheating can succeed when the flow through the cell housing is not big enough. This lack of flow can happen for the following reasons:

. **One valve closed or partially closed on the filtration circuit.** This has the effect of restricting the flow in the cell.

. **A cell full of scale:** If the cell is full of scale, the flow going through the cell housing is restricted, particularly in the case of the EcoSALT cell.



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

These brown or black traces are the sign of 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 being in the middle of vineyards which have been treated with copper sulphates.

We suggest not using water coming from wells to fill up the swimming pools.

C- EcoSALT-Général

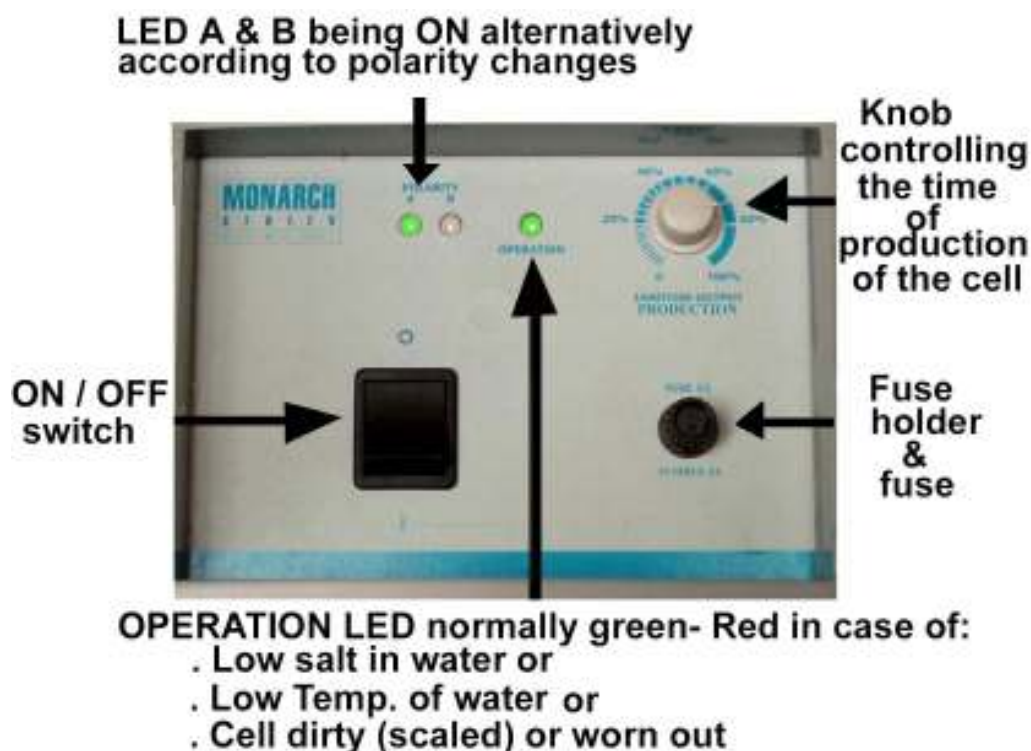
Defects of Salt Water Chlorinators may come from:

- . The control box.
- . The cell.
- . The water of the pool or the installation of the unit.

It is very important to diagnose by telephone if the problem comes from the control box, from the cell or from the environment (Quality of the water – Installation of the unit). This diagnosis avoids expensive trips and dismantling of units which are often not necessary.

We are going to see how we can find out the origin of the defect by telephone, by asking the right questions to the pool dealer or to the pool owner.

Here is the photo of the control panel of EcoSalt:



C.1.The red alarm is ON

C.1.1- Is there enough salt in the water?

The minimum salt content is 4g/l and it is better to adjust this salt content at Approx. 4.5 g/l at the beginning of the season.

IMPORTANT: Be careful when the answer is « *Yes, salt content is OK* » since measurements are often made with strips which are often not accurate and results obtained can mislead the pool owner. You may ask for a sample of the water to really make sure that the salt content is right.

C.1.2- Is the cell clean?

The control of the cell has to be done in order to make sure that there is no scale between the plates of the cell. If there is some scale (white deposit on plates), the cell has to be removed and the cell housing has to be filled up with an acid solution of water and Chlorydrique acid (1/3 acide – 2/3 d'eau) - or use the special product called LIMPIA-CELL.

Install the cell again and start the unit to check if the LED alarm goes OFF.

C.1.3- Is the cell worn out? Date of installation of the unit?

Refer to **Paragraph A.2 on cells**. The cell is a wearing part and has to be changed every 4, 5, 6 or 7 years. If the salt content is fine and if the cell is clean, the best way to check if the cell is still fine, will be to check the unit with a brand new cell.

The fabrication date of the cell is engraved on cell, near connectors:

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

Second letter: The year of fabrication: G: 2010, H: 2009, I: 2008 J: 2007, K: 2006 L: 2005, M: 2004 N: 2003, e.g.: **DJ** means "Date of fabrication: April 2007"



C.1.4: Is the cell cable connected correctly?

Check that the white connector is connected to the central rod of the cell and that the two black connectors are connected on both sides of the white connector.

Check that the blue connector detecting the presence of gas is connected to the connector located at the upper part of the cell housing.

C.1.5: Is there presence of gas in the cell housing?

If there is gas in the cell housing (bubble that can be seen through the transparent wall of the cell housing), the unit will not work and this gas has to be eliminated in order to have a correct operation of the salt chlorinator.

C.2: There is no production

Be sure that the production control of the unit is set up at Maximum.

The actual production can be seen thanks to the presence of a small cloud created by fine bubbles at the outlet of the water in the cell housing. If the water and cell housing is perfectly transparent, it is likely that the unit does not work.

C.2.1: Check the electrical connection. The unit must be under voltage when the pump is under voltage (LED indicators ON) and the unit must be OFF when the pump is OFF (LED indicators OFF).

C.2.2: Is there a red LED?

Refer to paragraph C.1.1.

If the electrical connection and the connections to the cell are corrects, a brand new cell has to be installed. If there is still no production, refer to the chapter concerning the repairing of the control box.

C.3: The water is cloudy or green

C.3.1: Is there presence of a cloud at the outlet of the water in the cell housing ?

Make sure that the production control is set up at Maximum and if there is presence of this cloudiness at the outlet of water in the pool housing, the problem does not come from the unit that works fine.

In that case, refer to the following chapter concerning the water treatment.

If there is no cloud that can be seen in the cell housing (cell perfectly transparent), Refer to chapter C.1.2.

C.3.2 Is the value of the pH correct?

Check that the pH of the water is not too high (ideally between 7 and 7.4). The lower the pH, the better the efficiency of the salt chlorination process.

C.3.3 Is there some stabilizer in the water?

Without the presence of stabilizer in the water, (isocyanuric acid), the chlorine is rapidly destroyed by the UV (Ultra Violets of the sunrays) and its efficiency becomes very limited. **The chlorine of the water has to be protected against UV by Chlorine stabilizer** (40 to 70 ppm of stabilizer are necessary- 40 grams of stabilizer per m³ of water).

C.3.4 Is the filtration time sufficient?

The warmer the water, the longer the filtration time should be...

As a practical rule, the daily number of hours of filtration should be at least the number obtained by dividing by 2 the temperature of the water in °C.

Example: If the water is at 24°C, the filtration time should be 12 hours/day.

If the filtration time is not sufficient, the salt chlorination will not be sufficient since the electrolysis works only during the filtration time.

C.3.5 Is the size of the unit adapted to the swimming pool?

The EcoSALT units are designed for private pools use not exceeding 130 m³. Some larger units like the SC Max. are better adapted. for larger semi-public or public pools.

C.4: There is no chlorine in the water

In the case salt chlorination, the amount of chlorine in the water is often very limited (from 0,5 ppm to 1 ppm) and the pool owner that cannot detect chlorine in the water may be worried. We have to make sure first that the unit works fine and ask the following questions:

C.4.1 Is there presence of a cloud at the outlet of the water in the cell housing?

Make sure that the production control is set up at Maximum and if there is presence of this cloudiness at the outlet of water in the pool housing, the problem does not come from the unit that works fine.

C.4.2 How did you check the presence of chlorine?

How was this chlorine measured? Does it use a test kit? This is not accurate at all. The presence of chlorine can be checked by taking a sample of water at the eye return of the pool water, when the salt chlorinator is in operation.

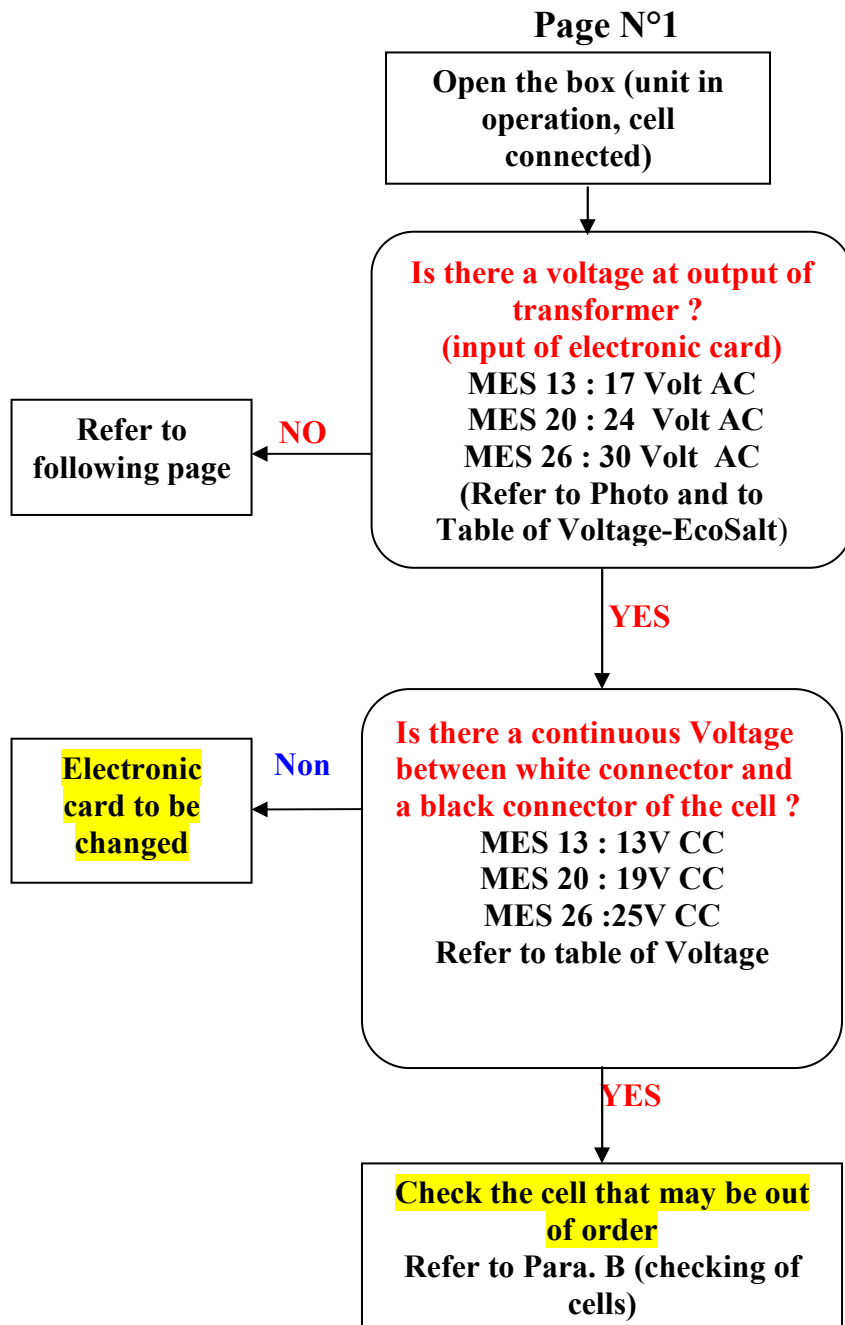
C.4.3 Is there some stabilizer in the water?

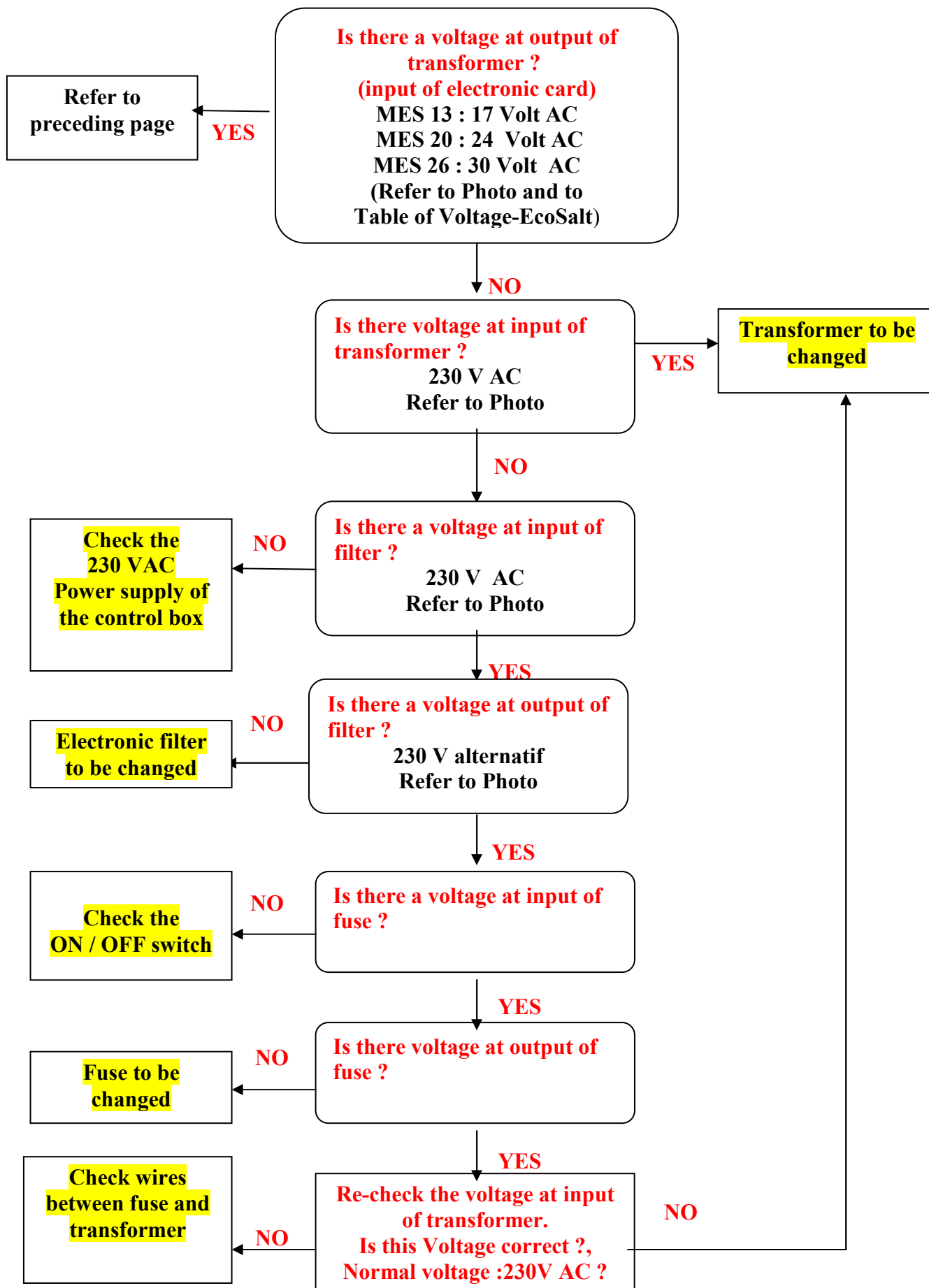
The presence of stabilizer in the water has to be checked. 40 à 70 ppm of stabilizer should be in the water to protect the chlorine against sunrays. Refer to **Para. C.3.3**

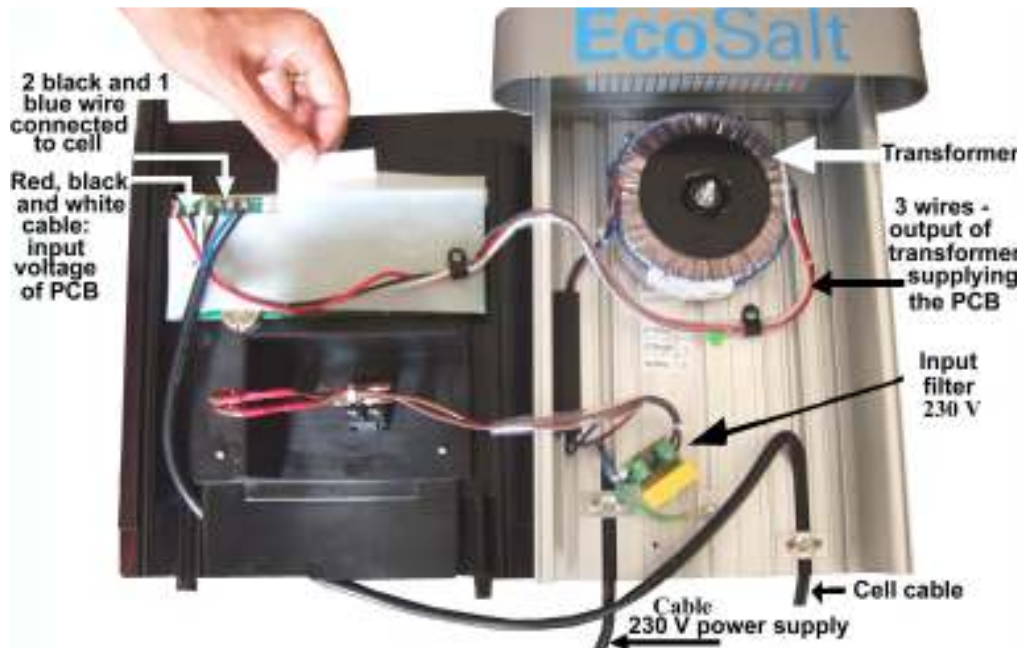
C.5-Trouble shooting of the control box

This checking procedure is applicable in the following cases:

- . Unit does not produce (with cell being in good condition)
- . Abnormal red alarm ON
- . Fuse blows.







C6- Voltage - EcoSALT 13-20-26

CHECKING of VOLTAGE –INPUT of PCB – AC VOLT					CHECKING CELL VOLTAGE
Model Unit	COLOR of Wires			Approx. Voltage VAC	DC VOLT
MES 13	Red wire Left side	Black wire central		17 Volts AC	Between black wires on PCB
		Black wire central	White wire right	17 Volts AC	13 Volts
	Red wire Left side		White wire right	34 Volts AC	
MES20	Red wire Left side	Black wire central		24 Volts	Between black wires on PCB
		Black wire central	White wire right	24 Volts AC	19 Volts DC
	Red wire Left side		White wire Right	48 Volts AC	
MES 26	Red wire Left side	Black wire central		30 Volts AC	Between black Wires on PCB
		Black wire central	White wire right	30 Volts AC	25 Volts DC
	Red wire Left side		White wire Right	60 Volts AC	