AquaPure Troubleshooting

Control Center

Flow/Temp/Salinity Sensor

PureLink

OR

Tee

Low Voltage Cable

Cell

AquaPure
What is the unit saying?

• What is the serial #?
The serial# is on a white tag on the bottom of the power supply. For example, serial number CM3 01 06 13 86 can be read as follows: CM3 means it is a ClorMatic III, 01 is the year, 06 is the month, 13 is the day and 86 is the unit manufactured that day.

• Is the unit in warranty? Warranty is 2 years from the date of installation.

• What is displayed on the LCD?
  If the unit is on don’t turn it off!

• Which indicator lights are lit (if any)?
AquaPure Display

Directions for Adding Salt:
1. Set Unit to "00" % for 24 Hours. Broadcast or Spread Salt into Shallow End of Pool.
2. Do not Add Salt through Skimmer, Main Drain or Surge Tank.

- Boost – 24 Hour 100% Chlorine Production Cycle – Refer to Manual –
  ---- To Enter Boost Mode Press and Hold "Temperature" Button 10 Seconds
- Pool Temperature – Temperature of Water at Flow Sensor
- Cell On – Making Chlorine
- Cell Resting – Off Portion of Chlorine Production Cycle
- Flow – Water Flow Present
- Cell Reversing – Automatic Cleaning Cycle in Progress
- Add Salt – Salinity Should be 3.0 – 3.5 Grams / Liter
- Service – Refer to Manual –
  ---- To Silence Audible Service Alarm Press and Hold “Salinity” Button 5 Seconds

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**CHLORINE PRODUCTION RATE**

- CELL ON
- CELL RESTING
- FLOW
- CELL REVERSING
- ADD SALT
- SERVICE

- Power On

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**Salinity**

- Pool Temperature -Boost-
Audible Alarm Jumper (J10). Shown in the OFF position.

Firmware revision number.
What does the LCD mean?

On power up the AquaPure/PureLink unit:

• ‘50’ or ‘60’ – The unit is detecting the electrical supply to optimize the unit settings. 60 cycle power is the US standard. 50 cycle power is common in Europe (note: if the unit detects 60 cycle electric supply then it will default to degrees F for the pool temperature reading).

• ‘Chlorine Production’ – displays current % production rate for chlorine

• ‘Wait’ – the unit is still testing its diagnostics

• ‘No Flow’ – the unit does not detect enough water flow

• ‘Flow’ – flow sensor is indicating to the unit that it has enough water flow
What does the LCD mean?

- ‘LO’ – indicates that the water temperature is less than 51 deg. F
- ‘BO’ – indicates the boost cycle which can be activated by pressing the ‘Pool Temperature’ key for 10 seconds; it can be cancelled by holding the same key for 10 seconds.
- ‘EC’ - indicates the unit is being controlled by an external controller or ORP device.
- ‘JA’ – Indicates operation is controlled by a Jandy AquaLink RS or PDA, and system is in AUTO MODE.
- ‘JO’ – Indicates operation is controlled by a Jandy AquaLink RS or PDA, and system is in SERVICE or TIME MODE.
- ‘JB’ – Indicates operation is controlled by a Jandy AquaLink RS or PDA, and system is in BOOST MODE.
What do the indicator lights mean?

- ‘Cell On’ – Full power is being applied to the cell, and making chlorine
- ‘Cell Resting’ – The cell is in the off portion of the chlorine production cycle
- ‘Flow’ – Water flow is present
- ‘Cell Reversing’ – Automatic cell cleaning cycle in progress
- ‘Add Salt’ – Salinity is 2.5 grams/liter or less. Should be 3.0 – 3.5 grams/liter
- ‘Service’ – Read the service code and refer to the manual
- ‘Power On’ – Power is turned on and reaching the front board
What do the other keys mean?

**Chlorine Production Rate**
- The arrow up button (‘B’) increases the % chlorine production
- The arrow down button (‘A’) decreases the % chlorine production

- **‘Pool Temperature’** (‘D’) will give the water temperature in either degrees Fahrenheit or Centigrade

- **Salinity** (‘C’) will give the salt reading in grams per liter, this can be converted to parts per million by removing the decimal point and add 2 zeros. Example 2.8 gpl = 2800 ppm
Visual check - flow sensor/cell

- Check the cell, flow/salinity sensor and power supply for damage
- Ensure that there is water flow through the cell and that the flow sensor is plumbed in the proper position below the pipe so that it can’t trap air or gas (hazardous) against the sensor.
Visual check for installation & damage

- Be sure that the cell positioned properly and the DC cord is connected properly to the cell.

- Check the flow sensor cable and cell cable for damage (chewed on by an animal, weed-wacked, etc.).

- Look for water leaks at the cell and flow sensor.

- Examine the cover and overlays to ensure their integrity against the elements

- Inspect for proper installation of unit. For safety reasons it is IMPORTANT that the unit is wired to turn off/on with the pool pump. The cell is mounted as the last piece of equipment in the return line.
Inspection of Power Supply

• Carefully remove the front cover and support it to avoid damaging the connectors and wires inside. There is a cable which connects the front and back boards together, which can be easily damaged.

• Inspect the front and back boards for damage (cable pulled loose, pins bent in connectors, etc.). Look for burn marks that might indicate an over-heating condition.

• Inspect the transformer wires at the back board connection to ensure there isn’t any indication of overheating.

• Look for indications that water has been in the unit.

• Check the unit to be sure that it is grounded to a permanent earth ground (the common approved earth bonding point).
Temperature

Change display between Fahrenheit and Celsius

• Press and hold the ‘Pool Temperature’ (‘D’) key for 15 seconds. The system will beep when the button is pushed, it will beep again after 10 seconds, and again after 15 seconds. Release the key after the third beep.

• Press ‘Salinity’ (‘C’) key within 5 seconds to enter temperature change screen.

• The system will display a “1” followed by ‘F’ or ‘C’. Press ‘Chlorine Production Rate’ up arrow key (‘B’) to toggle from F to C.

• Press ‘Salinity’ (‘C’) key within 5 seconds to place the change into memory, (the unit will beep when pressed).
Salinity Calibration

Conditions to check before calibrating
The salinity reading must be compared to a reliable outside source. (Myron meter, titration test, etc.) Minor variations are to be expected.
The flow sensor must be cleaned, and checked for damage.
If unit has a Rev. 8 front board it must be tested before proceeding.
Salt must NOT have been added within the last 24 hours.
If a spare flow sensor is available. Connect it to the unit and place it in a bucket of the pool water to compare readings.

Note- The unit must have the power turned off before either the old or new flow sensor can be installed. Each time a flow sensor is unplugged and plugged back in again the computer inside the unit must be reset by turning the power ‘off’ and then ‘on’. Failure to do this will result in erroneous readings.
Salinity Calibration

- Press the “Salinity” button and hold it until it beeps 3 times. The system will beep when you push it and then at 5 seconds and again at 10 seconds. Release the button after the 3rd beep.
- Press and release the “Temperature” button within 5 seconds to enter the salinity calibration screen.
- The system will display the salinity reading, press the up arrow to increase the reading and the down arrow to decrease the reading.
- When the proper reading is reached press the “Temperature” button within 5 seconds to store it in memory.
Transformer Voltage on Rev. 2 backboard

Reading the AC voltage between T.P.-A and T.P.-B will check the transformer output voltage. It should be approximately 75 VAC.
Back Board Test Points

- In the upper left corner are test points 1-8
- In the middle of the left side are the voltage readings that each of the test point combinations should have.
- In the middle of the right side are the cell test points with the DC voltage readings.

Test Information

Cell Test Points
Current test on front board

(Note: - either the ‘Cell On’ or ‘Cell Reversing’ light must be lit during this entire test)

Test Cell Current Flow
To test the amperage going across the cell, you need to test the DC millivolts from K to H
The reading should be approximately 120 DC millivolts.

- 20 millivolts equal 1 ampere on a 1400 unit,
- 40 millivolts equal 1 ampere on a 700 unit.
Electrical Test on Front Board.

To read the front board AC voltage, test between “A” and “C” on the test strip that is in the upper left hand corner of the front board. The AC voltage should be around 21 VAC.
Troubleshooting - Front Board

To help diagnose whether faults are occurring on the front board or with the flow/salinity sensor three new test buttons have been added in the upper corner of the front board. They are:

- ‘R-Temp’
- ‘H-Temp’
- ‘Salinity’
Troubleshooting - Front Board

**Disconnect the flow salinity temp sensor** from the front board. Press and hold the test buttons marked salinity and R-temp. While still pressing the test buttons press the ‘Salinity’ key (‘C’) on the front cover of the unit. The LCD should read **2.8 gpl**.

While still holding the two front board test buttons press the ‘Pool Temperature’ key (‘D’). It should read **75° F or 24° C**.

Next, press and hold the board ‘H-Temp’ test button, and at the same time press the ‘Salinity’ key (‘C’) together with the ‘Chlorine Production Rate’ arrow down key (‘A’) on the front cover of the unit. The LCD should read **91° F or 33° C**.

If the readings are correct then the front board is O.K. and the problem is with the flow sensor.

On the other hand if the readings are different then it indicates that there is a problem with the front board.

*When the testing and repair is complete reconnect the flow sensor and reset the internal computer (do this by restarting the unit).*

*Note: If the the salinity reading has been recalibrated this reading maybe different. Before condemning the board check salinity setting.*
Test the DC voltage at the Back Board.

With the cell under full load you should read 22 to 28 volts DC.
Test the DC voltage at the Cell.

With the cell under full load you should read 22 to 28 volts DC.
SERVICE CODES

LEVEL 1

120 - Low cell current in forward direction - check DC cord, clean cell if necessary or replace cell.

121 - Low cell current in reverse direction, same as 120 above.

123 - Low to no current at cell - check DC cord, clean cell or replace if necessary.

124 - High current indicated at the cell - this usually means a bad back board.

125 - Cell needs to be cleaned or replaced.

126 - Low current in forward direction and VAC input voltage below 100/200 VAC - check input voltage, transformer and back board voltages.

127 - Low current in reverse direction and VAC input voltage below 100/200 VAC - check input voltage, transformer and back board voltages.

144 - Low Salinity (below 2.0 gpl) - indicates the pool needs salt added.

145 - High Salinity (above 4.0 gpl), indicates pool needs to be diluted.

170 - Front board service condition indicated and is usually caused by low AC voltage from back board - check transformer and back board voltages.

171 - Back board service condition - indicates board needs to be replaced.

172 – Flow sensor service - clean sensor, check for damage and replace if necessary.

173 - Low VAC input voltage and on-board power supply is not regulated - make sure unit is wired with the proper voltage.

174 - Pool temperature is too high for operation of AquaPure (i.e. > 108°F).

175 - Flow sensor air lock condition or very low salinity.
LEVEL 2

180 - Heated sensor element not heating (generates 172 code)

181 - Flow sensor temperature sensor failure (generates 172 code – Flow sensor service)

182 - Salinity Sensor sees less than 0.2 gpl of salt, either no salt in pool or sensor air locked (generates 175 code – Flow sensor air lock)

183 to 186 - Flow salinity sensor temperature probe error codes. They will all generate 172 codes which indicate flow sensor service is required.

187 - Front board power supply either too low or too high (generates 173 - Low input voltage code if Level II code 188 is present) (generates 170 code if 188 is not present).

188 - VAC input voltage is too low (generates 173 code if Level II code 187 is present)

189 - Relay not conducting in the forward direction (generates 171 code - Back board service)

190 - Relay not conducting in the reverse direction (generates 171 code - Back board service)

191 - High cell current (at upper limit of A/D converter) and cell voltage below 19V (generates 170 code - Front board service)

192 - High cell current and cell voltage below 19V (generates 171 code – Back board service).

193 - Measured significant cell current when SCRs were turned off (generates 170 code – Front board service).

194 - Cell Current is 85% lower than desired and cell voltage above 19V (generates 125 code - Cell dirty or needs replacement).

195 - Salinity invalid due to out of range measurements caused by front board error (generates 170 code – Front board service).
AquaPure Troubleshooting Flow Chart*

*Step 1 - Check Power

- **Is The Power light on?**
  - yes
    - **Is the pump turned on?**
      - yes
        - **Is the front board plugged into the backboard?**
          - yes
            - Proceed to voltage tests on back circuit board
          - no
            - **Is unit wired to pump circuit**
              - yes
                - Proceed to voltage tests on back circuit board
              - no
                - Turn on pump and then recheck power on light
      - no
        - **Wait 5 minutes for unit to conduct self testing and startup, if service code is displayed, proceed to applicable section for diagnosis.**
    - no
      - **Is the input voltage, 115 or 230 VAC**
        - 115
          - yes
            - Rewire unit for 115 VAC
        - no
          - 230
            - yes
              - **Is the unit still factory wired for 230 VAC**
                - yes
                  - Rewire unit for 115 VAC
                - no
                  - Plug the front board into the backboard
            - no
              - **Is unit wired to pump circuit**
                - yes
                  - Proceed to voltage tests on back circuit board
                - no
                  - Turn on pump and then recheck power on light

*Note: If the AquaPure is connected to an AquaLink RS, and you do not have a AquaLink RS Service Controller, disconnect the 4 conductor wire to the AquaLink RS before proceeding.
Step 2 - Insure Flow Salinity sensor operation

Is the Flow light on?

- yes
  - Make sure pump is operating properly, and that filter doesn't need to be cleaned. Check cable for damage, replace sensor if cable is damaged
  - no

Is the flow salinity sensor installed properly in the plumbing?

- yes
  - Remove and install properly in plumbing.
  - no

Is the flow salinity sensor installed properly in the plumbing?

- yes
  - Remove sensor and install properly in plumbing.
  - no

Is the add salt light on?

- yes
  - Check salt level with Myron meter or other accurate method of testing and inspect for damage.
  - no
  - Add proper amount of salt from table and wait 24 hrs. for salt to evenly distribute in water, and retest.
  - yes
  - Conduct system self test to determine if flow sensor of front board needs to be replaced.

Restart system, does the "Flow" turn on and "Add Salt" light remain

- yes
  - Proceed with further system checks.
  - no

Proceed to 3rd step
Step 3 - Codes and what to do

- **Service light lit?**
  - no
  - **Is unit set at 100% production?**
    - no
    - **Set unit at 100% and wait for 3 minutes to see if service light comes on.**
    - no
    - **No service code appears unit is functioning normally. If service light comes on go to beginning of step 3**
    - yes
      - **Code 120, or 121 appears**
        - yes
          - **Inspect DC cord and cell for damage, also inspect cell for calciumcarbonate and debris**
        - no
          - **Clean cell in a mixture 4 parts water and 1 part acid, rinse with fresh water when done.**
          - yes
            - **Code 123 appears**
              - yes
                - **Inspect DC cord and cell for damage, also inspect cell for calciumcarbonate and debris**
              - no
                - **Replace damaged part or parts.**
      - no
        - **Code 123 appears**
          - no
            - **4**
          - yes
            - **Inspect DC cord and cell for damage, also inspect cell for calciumcarbonate and debris**
            - **Clean cell in a mixture 4 parts water and 1 part acid, rinse with fresh water when done.**
            - yes
              - **Reinstall cell and start unit, after the cell on light comes on if codes appear test the cell voltage at cell & backboard test points for DC voltage also between test points 4 & 5 for DC millivolts.**
              - no
                - **Reinstall cell and start unit, after the cell on light comes on if codes appear test the cell voltage at cell & backboard test points for DC voltage also between test points 4 & 5 for DC millivolts.**

Code 124 appears

Remove DC cord from cell and leave it removed, unit must be in alarm state with production set at 100%

What code appears after 2 alarm cycles?

123

Code 123 stays or returns, replace cell and DC cord

124

Code 124 is shown on LCD after second alarm cycle, replace backboard, current sensing circuit has failed.

Code 124 appears after 2 alarm cycles?

125

Inspect DC cord and cell for damage, also inspect cell for calcium carbonate and debris

Clean cell in a mixture 4 parts water and 1 part acid, rinse with fresh water when done.

Reinstall cell and start unit, after the cell on light comes on if codes appear test the cell voltage at cell & backboard test points for DC voltage also between test points 4 & 5 for DC millivolts.

Replace damaged part or parts.

If DC voltage exceeds 28 VDC or less than 120 DC millivolts, replace cell and DC cord
Code 126 appears

Indicates low current in the forward or normal direction

Unit input voltage > 100/200 VAC

no

yes

Source voltage problem notify electric company.
"NOTE"
Unit will not operate properly on 208 VAC

Read AC voltages on backboard test points using the following pairs 1 - 8, 2 - 7, if these voltages are wrong the transformer is bad, 3 & 6 voltage > 19 VAC replace backboard.

Code 127 appears

Indicates low current in the reverse or self-cleaning direction

Unit input voltage > 100/200 VAC

no

yes

Source voltage problem notify electric company.
"NOTE"
Unit will not operate properly on 208 VAC

Read AC voltages on backboard test points using the following pairs 1 - 8, 2 - 7, if these voltages are wrong the transformer is bad, 3 & 6 voltage > 19 VAC replace backboard.
Code 144 appears

Test salinity with Myron meter or other calibrated source

Do the readings agree

Add salt according to table in manual, wait 24 hours and recheck salinity level.

If there is any doubt test the salinity with Myron meter or other calibrated source

Do the readings agree

Clean flow salinity sensor and recheck readings

Do the readings agree

Conduct self test using the front board to determine which part has failed. Replace either the front board or the flow salinity sensor.

Dilute pool water until desired salinity reading is achieved.

Conduct self test using the front board to determine which part has failed. Replace either the front board or the flow salinity sensor.
Code 170 appears alone

Is the 170 on the LCD screen constantly

yes

Test the input voltage

Is input voltage 115 or 230 VAC

115

230

Is the AC voltage between the backboard test points 3 & 6 is <21volts

no

no

yes

Test the remaining test points on the backboard

If these readings are normal replace the back board

If AC voltage between test points 1-8, & 2 - 7 are low, test the input source voltage and if it is less than 100/200 VAC line voltage to low for operation.

Conduct self test of front board and flow sensor replace as necessary.

If only code 170 appears on LCD test as stated above

8

no

yes

9

A
Is code 187 displayed with code 170?

- yes: Test all test points on back board except from 4 - 5, if they are normal, the front board power supply is either too high or too low.
  - Front board is defective replace front board.

- no: Is code 191 displayed with code 170?
  - yes: Test DC cell voltage, is it greater than 19 VDC?
    - no: Test cell current at upper left corner of front board, between test points "H" &"K" (as you look at the back of board). If reading is above 120 mv, replace front board.
    - yes: Replace front board.

- no: Is code 193 displayed with code 170?
  - yes: Front has measured significant cell current when the SCR's on the back board are turned off.
  - no: Replace front board.

Check cell and DC cord, clean the cell if needed, reinstall cell and restart unit, if 170 and 191 codes reappear replace front board.
Is code 195 displayed with code 170?

- yes: Conduct front board self test of salinity circuit, using the test buttons in the upper right corner of board.
  - yes: Does front board pass test?
    - yes: Replace flow sensor
    - no: Replace front board
  - no: Replace front board

- no: Code 171 appears alone
  - yes: Test all back board test points for proper input and output voltages.
    - yes: Output failure or improper voltages indicate the backboard needs to be replaced.
    - no: Replace flow sensor
  - no: Code 171 & 189 both appear
    - yes: Is the "Cell on" light on
      - yes: Test backboard points 1 - 8 and output voltage to cell, if no voltage to cell proceed.
      - no: If unit indicates the following, "Flow", 100%, and has a salinity reading in the normal range replace the front board.
    - no: Set unit at 100% production, if codes persist and "Cell on light" is not lit, no message is being sent to turn on the cell

Set unit at 100% production, if codes persist and "Cell on light" is not lit, no message is being sent to turn on the cell.
Is the "Cell on" light on

Set unit at 100% production, if codes persist and "Cell on light" and "Cell Reversing" light are not lit, no message is being sent to turn on the cell

Clean flow sensor with green scotchbrite pad or muriatic acid mixture

Code 172 appears alone

Test backboard points 1 - 8 and output voltage to cell, if no voltage to cell proceed.

If unit indicates the following, "Flow", 100%, and has a salinity reading in the normal range replace the front board.

Conduct self test of flow sensor using the front board, replace the defective part. Either the flow sensor or the front board.

Replace the flow salinity sensor.
Code 172 & 180 appear

Check for poor connection, or cable damage

Conduct self test of flow salinity sensor by using the front board self test circuits

Replace indicated failed part

Check salinity flow sensor for damage, or improper mounting.

Test sensor temperature readings. Press the temperature button, then press the salinity button and the production up arrow at the same time.

Did "HH" or 32 appear

Conduct self test of the front board to ensure the flow sensor is defective. Replace the failed part.

Remove and clean flow sensor. Restart unit and wait to see if codes reappear. If they do replace flow sensor.

Does the H-Temp read less than the Temperature

Do the temperatures ever read within 2 degrees of each other

B
Code 172 & 181 appear

- Check salinity flow sensor for damage, or improper mounting.
- Conduct self test of the front board to ensure the flow sensor is defective. Replace the failed part.

Code 172 appears with any of the following 183, 184, 185, or 186

- Remove and clean flow salinity sensor and restart unit. If codes return continue testing.
- Conduct self test of the front board to determine which sensor is defective.
- Replace flow sensor if test indicates it is defective, otherwise replace the front board.

Code 173 with 187, 188 appears

- Measure AC input voltage to unit 115 or 230
  - Make sure that unit is set-up for 115 VAC, if still factory wired convert to 115 VAC configuration
- Measure back board test points 1 - 8, and 2 - 7, to make sure transformer is working properly. If not replace transformer
Code 174 appears

- Check flow salinity sensor in relationship to heater or solar panels. The sensor located too close to the heat source will cause this code.

- Unit will resume operation when the flow sensor temperature drops below 108 degrees.

Code 175 appears with 182

- Remove and clean flow sensor, check for glue on the sensor probes. Inspect for damage.

- Has the salt been added to the pool?

- Is the sensor mounted in the proper position?

- Conduct self test on front board to determine failed part and replace.

- Add the proper amount of salt to pool and brush it until dissolved. Wait 24 hours and recheck unit.

- Mount the flow salinity sensor below the plumbing and/or in a position where it can't trap air against the sensor probes.
Step 4 - Blank Screen

LCD screen is blank, and the power light is on.

Make sure the audible alarm is functional.

Does the unit beep when the buttons are pressed

yes

Replace defective front board

no

Test AC voltages at back board test points for correct incoming voltage

wrong

correct incoming voltage problems

Correct

Codes

Correct