Pro Logic Version
Rev. 4.45
Diagnostics Manual

Turbo Cell & Control Electronics

Table of Contents

HAYWARD®

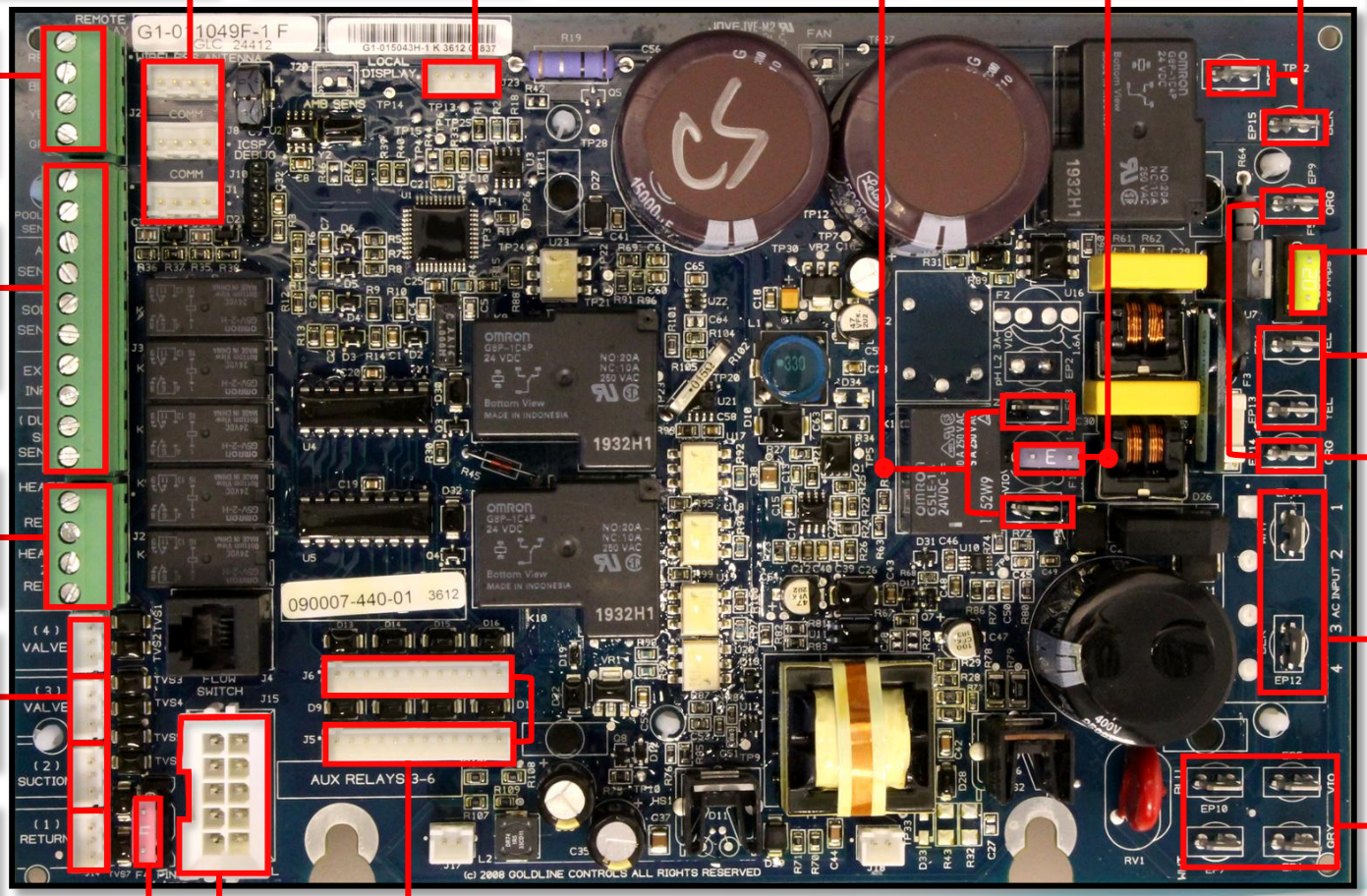
Pro Logic Version 4.40 Diagnostics

High Voltage Electrocution Hazard

Hazardous voltage can shock, burn, cause serious injury and or death. To reduce the risk of electrocution and or electric shock hazards:

- Only qualified technicians should remove the panel
- Replace damaged wiring immediately
- Insure panel is properly grounded and bonded

Pro Logic Board Layout Diagram



Plugs for S&D control module, base antenna and CL module.

Plug for the local display.

Dispense power circuit; output 120VAC.

Three amp fuse, protects S+D circuit.

(Red & Black) Chlorinator circuit, 18-33 VDC output from rectifiers.

Remote display communication terminal block.

20 amp fuse; protects chlorinator circuit.

Temperature sensor / external input terminal block.

(Yel) Chlorinator circuit 24 VAC from the transformer.

Heater 1 and 2 terminal block

(Org) Chlorinator circuit 24 VAC to the rectifiers.

Valves 1-4 harness plugs for actuators

VAC input from the breaker terminal block.

Four amp fuse protects actuator circuit

(Blu, Wht, Vio, Gry) Chlorinator circuit 24 VAC delivered to the transformer.

Cell plug

Auxiliary relays plug (top = Filter, Lights, A1 and A2) (bottom= A3-A6)

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Check System Light On:

1. No Cell Power 1 or No Cell Power 2

'No Cell Power' means the current chlorinator cycle has been interrupted due to no voltage being detected when the cell power relay was turned on.

Go to Step 1A, page 4.

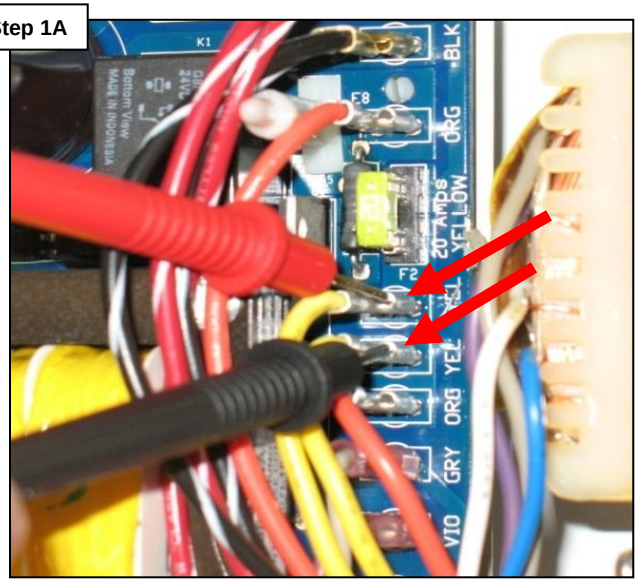
Replace main board PCB

1. Check System Light On:
No Cell Power & Low Volts Message Diagnostics

'No Cell Power' means the current chlorinator cycle has been interrupted due to no voltage being detected when the cell power relay was turned on.

Verify that 20-24 Volts AC is present between the two yellow wires.

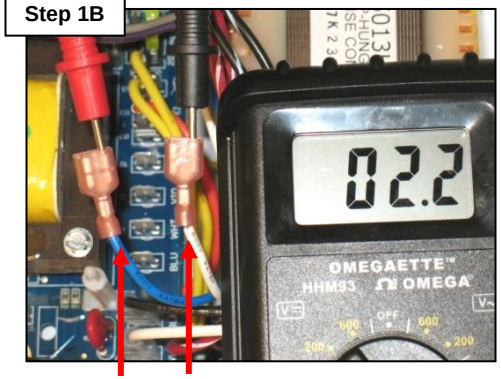
Step 1A



If no voltage is measured, continue to step 1B. If the Voltage is OK go to step 1C.

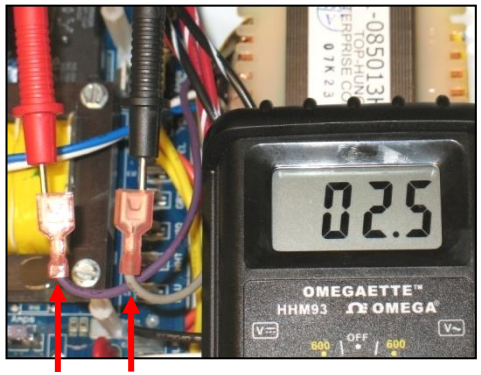
Turn off power to the controller. Disconnect the blue, white, gray and violet wires from main board and take the following measurements:

Step 1B



BLU WHT

Insert probes between the blue and white wires and measure resistance. 2.0 to 2.9 Ohms is correct reading.



VIO GRY

Insert probes between the violet and grey wires and measure resistance. 2.0 to 2.9 Ohms is correct reading.

If the readings on either of these two measurements are outside of the 2.0 – 2.9 Ohms reading, the transformer is faulty and should be replaced. If the measurements are OK, go to step 1C.

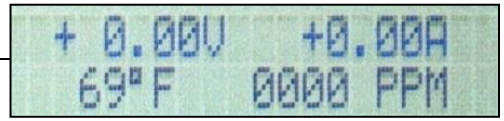
1. Check System Light On

No Cell Power & Low Volts Message Diagnostics

Verify the chlorinator is not in an ‘off’ cycle. If it is, reverse polarity and proceed, with the filter pump on.

Step 1C

Press the ‘MENU’ key until ‘Diagnostic Menu’ is displayed. Then press right arrow key.

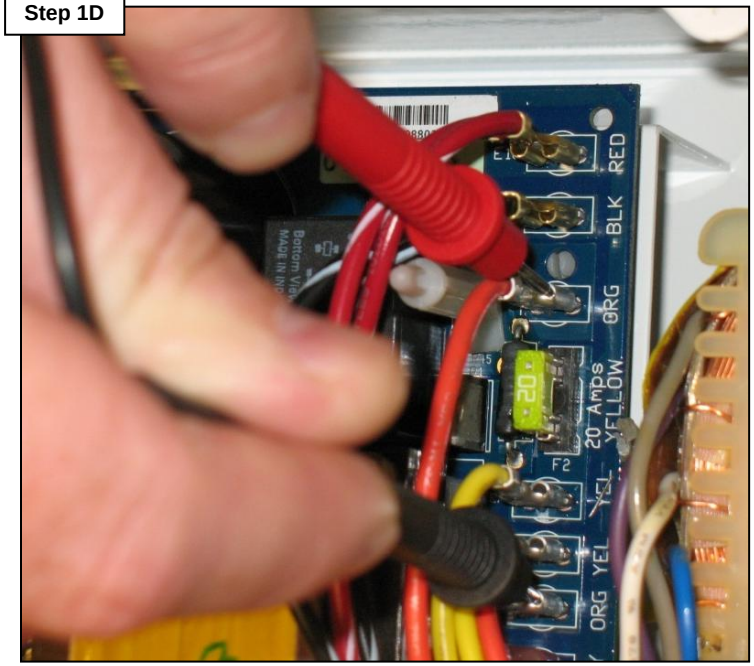


All zeros, except temperature means the chlorinator is off. Press the plus (+) or minus (–) key.

The chlorinator will conduct a 15 second count down prior to starting. Go to Step 1D.

Verify that 20-24 Volts AC is present between the two orange wire connections.

Step 1D



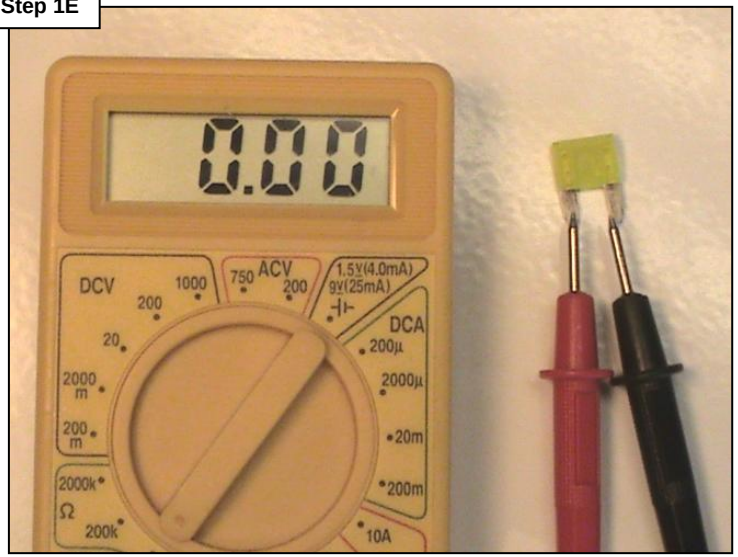
If the voltage is low or not present go to step 1E. If the voltage is OK, go to step 1F.

1. Check System Light On

No Cell Power & Low Volts Message Diagnostics

Test the 20 amp (yellow) fuse, using an Ohm reading and not just a visual test.

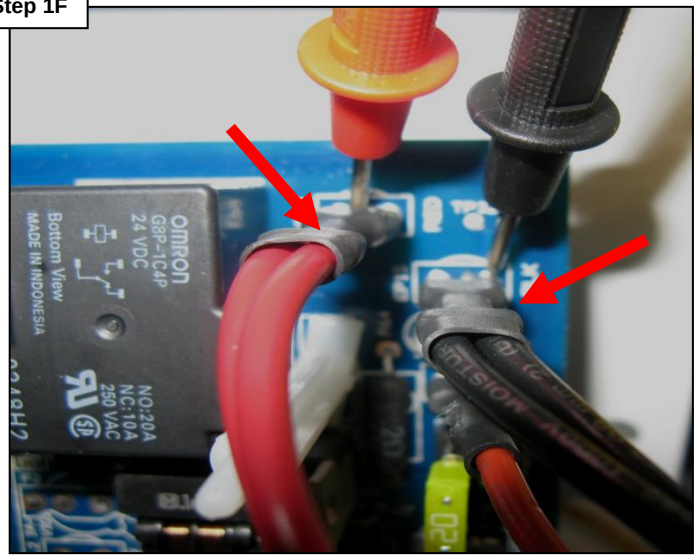
Step 1E



Replace the fuse if blown. If the fuse is OK, replace the Main Circuit Board (PCB).

Verify that 18-33 Volts DC is present between the black and red wire connections.

Step 1F



Note: The red & black wires cannot be reversed, this will also cause a 'No Cell Power' message.

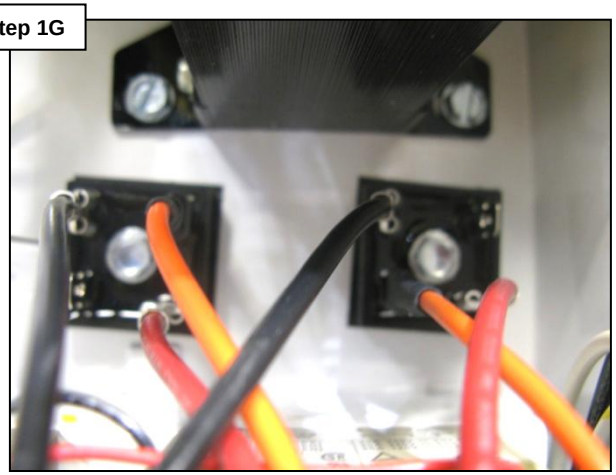
If no/low voltage is present, replace the rectifiers, go to step 1G . If the voltage is OK, go to step 1H.

1. Check System Light On

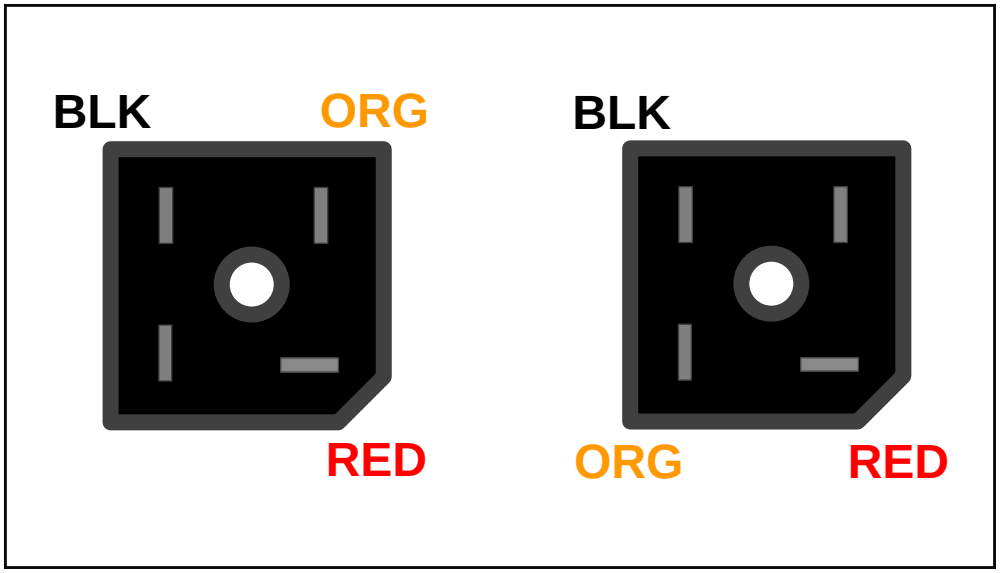
No Cell Power & Low Volts Message Diagnostics

The rectifiers are both located beneath the transformer. It is important, when replacing the rectifiers to connect the wires in accordance with the instructions.

Step 1G



Note: The bottom right corner of each rectifier should be cutoff. If this is not correct, loosen them and rotate each block until they appear like the diagram below.



1. Check System Light On:
No Cell Power & Low Volts Message Diagnostics

Remove the cell and clean per Hayward's cleaning instructions (pages 18-20). Reinstall the cell and check (see note below). If the 'No Cell Power' message remains, replace the cell.

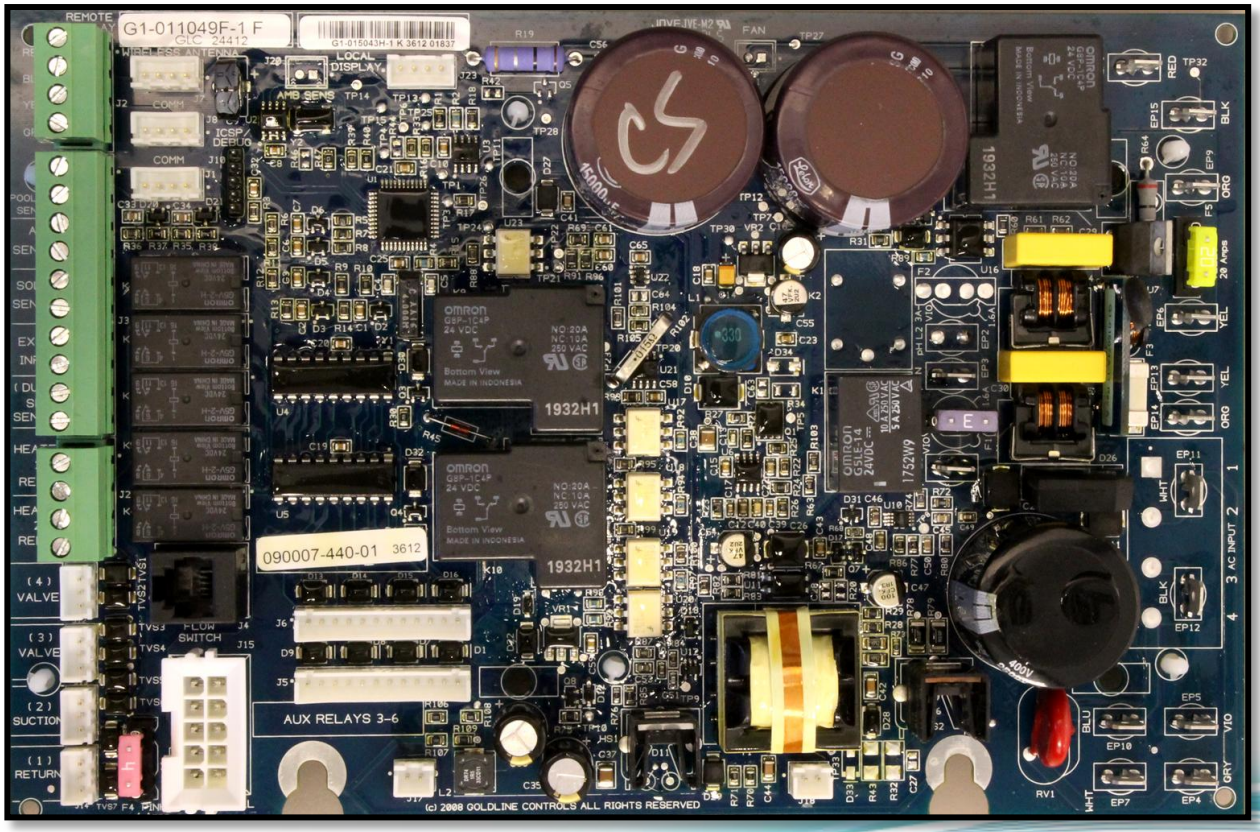
Step 1H

Note: If the controller is still powered when unplugging the cell and then the cell is subsequently plugged back in, it may display a 'Low Temp' fault message and the 'Check System' light may still illuminate. Turn the filter pump on. You must reset the system by entering the 'Diagnostic Menu' and then hitting the right arrow key once and then pushing the plus (+) key once. This should reset the light and message. Lastly, follow the instructions on page 16 to reset the salt level after cleaning the cell.

2. Check System Light On:
Cell Power Error Message

'Cell Power Error' means the current chlorinator cycle has been interrupted and cell voltage was detected when cell power relay was turned off.

Main board PCB is the only cause, replace with GLX-PCB-PRO.

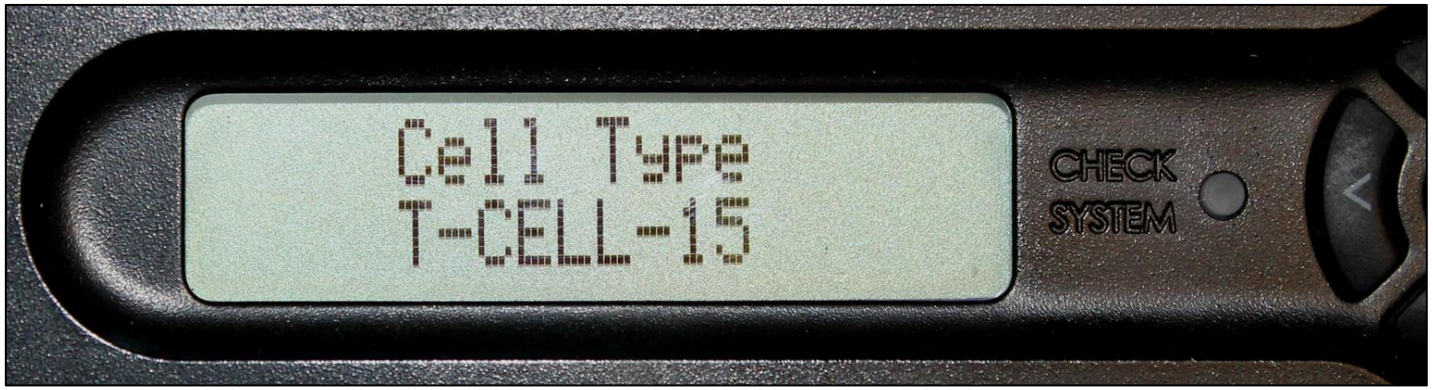


Main board PCB

3. Chlorinator Off:
Test Salt Level Message

Verify the system is configured for correct model cell. (Page 18).

If the incorrect cell is chosen, the system will inaccurately interpret the salt level in the pool and the system may turn the chlorinator off.



Maximum Current (Amps) before shutdown

T-CELL-3	5.50	T-CELL-9	10.00
T-CELL-5	6.75	T-CELL-15	10.00

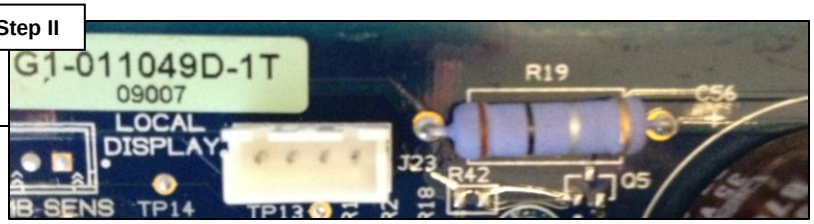
4. Local Display:
Blank/No Lights

If the local display shows a blank display or no lights are illuminated an abrupt power outage may have been the cause, resetting the unit may correct this problem.

Step I

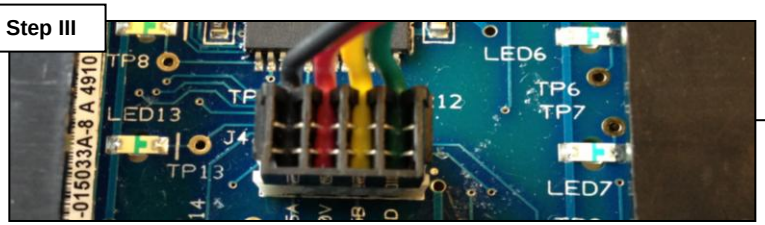
If no information appears on the display start by turning off the breaker responsible for sending power to the main circuit board.

Step II



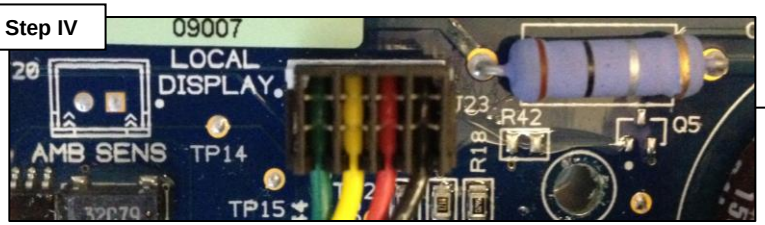
When the power is off, disconnect the local display from the main circuit board.

Step III



With the power still off check the connection on the back of the local display to make sure the wiring harness is snugly attached.

Step IV

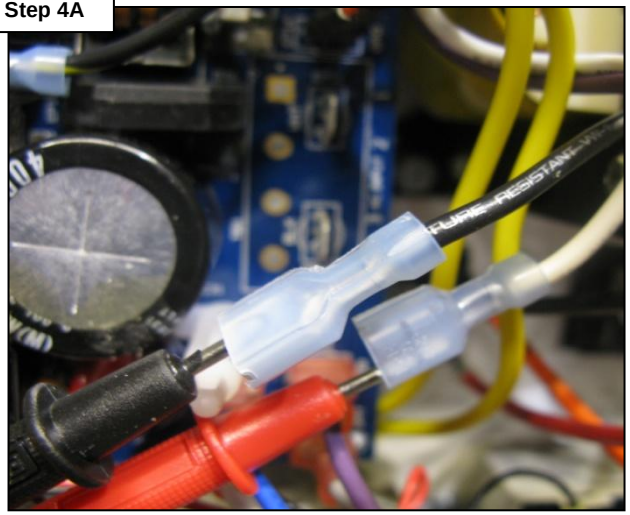


Plug the local display wiring harness back into the board and turn the breaker back on. If the local display shows the default menu then the problem should be resolved. If the display is still blank proceed to step J.

4. Local Display:
Blank/No Lights

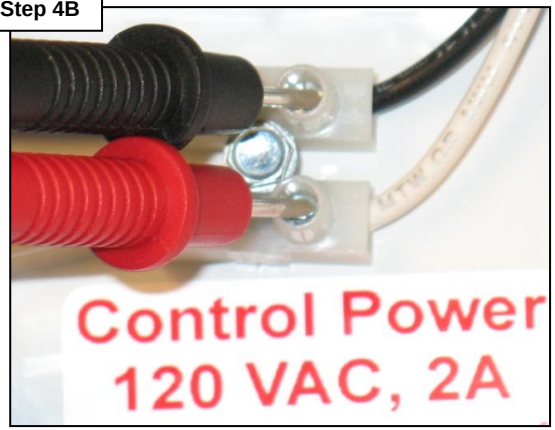
Remove the black and white wires (from the incoming power). Verify that 115-120 Volts AC is present across these leads.

Step 4A



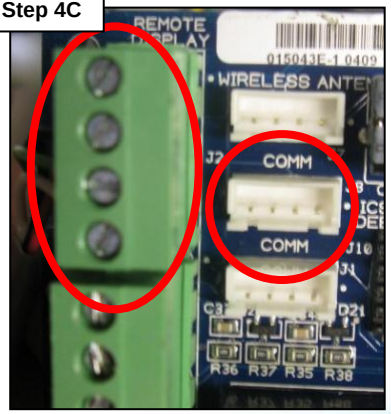
If no/low voltage is measured, check connections at the terminal block. Confirm breaker, within the system's sub-panel and main power source, are both turned on. If no voltage is still present, go to Step 4B. If proper voltage is present, go to Step 4C.

Step 4B



Measure 110-120 Volts AC at the terminal block coming from the breaker. If under 110-120 Volts AC then check the breaker. If the breaker is faulty replace and go back to step 4C.

Step 4C

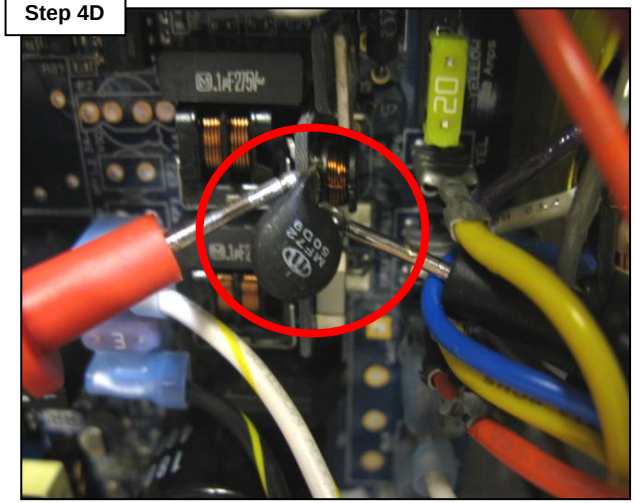


Unplug the bus strip for 'Remote Display' as well as the wireless antennae (base station) if applicable. Shut the system down and power back up. If the display returns, plug each connector back in, one at a time, to determine which is affecting the display. Repair or replace any device(s) or wiring that affects the display. If this does not correct the issue, go to Step 4D.

4. Local Display:
Blank/No Lights

Turn off power and test the 2 amp non-replaceable fuse. An Ohm measurement should be taken and not just a visual test.

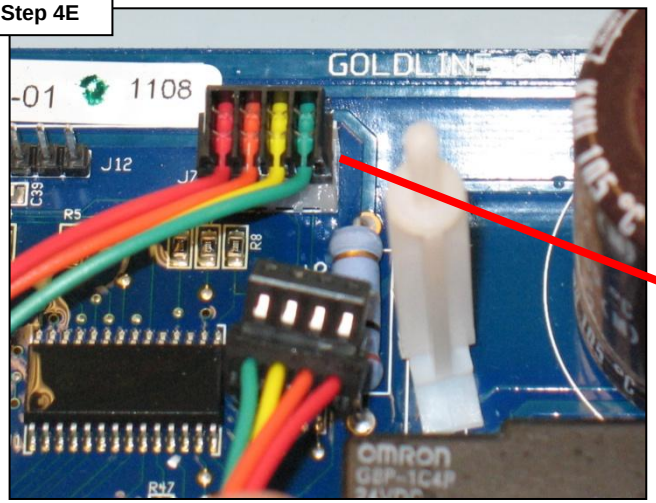
Step 4D



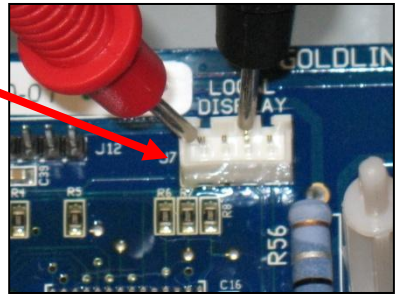
If blown, replace the board, if this fuse is OK, turn the power back on and go to step 4E.

Measure for 9-10 Volts <u>DC</u> across pins 1 and 3 (red and yellow wires).

Step 4E



If no/low voltage is present, replace PCB, if the voltage is OK, replace the local display.



Unplug harness. Check across pins 1 (red) & 3 (yellow) for 5-10VDC.

Check System Light On:

Low Temperature Error Message

'Chlorinator Off Low Temperature' means the current chlorinator cycle has been interrupted due to a cell temperature reading of less than 50° F.

1. Check the water temperature. If the temperature is below 50° F the system will shut the cell down under normal circumstances.

2. If the controller is still powered, when unplugging the cell and then the cell is subsequently plugged back in, it may display a 'Low Temp' fault message and the 'Check System' light may still illuminate. Turn the filter pump on. You must reset the system by entering the 'Diagnostic Menu' and then hitting the right arrow key once and then pushing the plus key once. This should reset the light and message.

3. Replace the cell.

High Temperature Error Message

'Chlorinator Off High Temperature' means the current chlorinator cycle has been interrupted due to a cell temperature reading of more than 140° F.

1. Check the water temperature. Temperature above 140° F the system will shut the cell down under normal circumstances.

2. Replace the cell.

Check System Light On:

Low Salt Error Message

A low salt error means the average salt level is less than or equal to 2600 PPM. Cell is still operating.

1. Test the salt level in the pool using a suitable tester. Be sure the tester has been calibrated and is clean. Add salt as needed to bring up to the 3200 PPM level.
2. Remove and clean cell per the Hayward's cleaning instructions. Be sure to 'reset' the average salt by following the instructions on page 16. Replace cell if message is still displayed after cleaning.

Very Low Salt Error Message

A very low salt error means the average salt level is less than or equal to 2300 PPM. Cell has shut down.

1. Test the salt level in the pool using a suitable independent tester. Be sure the tester has been calibrated and is clean. Add salt as needed to bring up to the 3200 PPM level.
2. Check to make sure system is configured for correct model cell (page 18).
3. Remove and clean cell per the Hayward cleaning instructions. Be sure to 'reset' the average salt by following the instructions on page 16. Replace cell if message is still displayed after cleaning.

Resetting (Average) Salt Reading

The salt reading displayed in the 'Default – Menu' is actually an average salt reading. This average is calculated by using previous instant salt readings over a period of time. When diagnosing and repairing faults relating to high or low salt readings, it will be necessary to 'reset' the average salt by replacing it with the instant value in order to prevent the same fault from appearing at startup. Resetting will flush out any previously stored values and start averaging using the instant salt reading as the first value. For example, imagine if the system faulted on a very low salt reading and the fault was because the cell was dirty. The cell is then cleaned and reinstalled. The average salt reading that prompted the fault is still in the memory. When the clean cell is installed, it will once again consider this low average and fault again, it may take 48 hours before the average rises to the correct levels with the clean cell. By resetting to the instant level, we avoid this problem.

Filter pump on

Step I

To display the 'Diagnostic Menu', press the 'MENU' key until 'Diagnostic Menu' appears. Then press right arrow key one time.

Step II

If all zeros or if 'Chlorinator Off Percentage Met' appears, it is in an off cycle. Press plus (+) or minus (–) key. The system will keep the chlorinator off due to a short start delay. If, after the short start delay, the display does not show zeros again refer to step 3.

Step III

The above is an example of the updated salt reading in PPM. If this instant salt reading varies from the average press the right arrow key one time.

Step IV

Press the plus (+) key to save the instant salt reading and this will start the average process over again. Press the left arrow key to return to the data display and you will see an updated salt level in PPM on the display.

Adjusting Chlorinator Output

If using Sense and Dispense™ chlorinator output will be adjusted by 'Chemistry Config. Wizard' under the 'Configuration Menu'. Please refer to the Sense & Dispense™ manual for details.

Step I

To display the 'Settings Menu', press the 'MENU' key until 'Settings Menu' appears. Then press the right arrow key.

Step II

Use the plus (+) or minus (-) key to turn super chlorinate on or off. Then press the right arrow key.

Step III

Use the plus (+) or minus (-) key to adjust the desired chlorinator output for spa. Then press the right arrow key.

Step IV

Use the plus (+) or minus (-) key to adjust the desired chlorinator output for pool. Then press the right arrow key.

Note: If the chlorine level does not increase within 24 hours after increasing output, test the water with independently to determine the current salt, stabilizer, phosphate, and nitrate levels.

Note: Output is scaled back to 20% of desired output setting between 60˚ F and 51˚ F.

Configuring Cell Type

It is important to verify which cell type is being used and to make sure the system is configured for the correct model cell.

Step I

Press the 'MENU' key until the 'Configuration Menu-Locked' appears on the screen. To unlock the 'Configuration Menu' press and hold the left and right arrow keys for five to ten seconds.

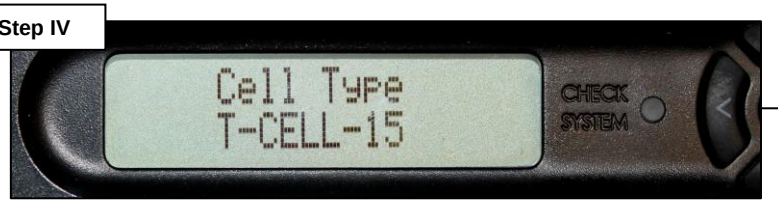
Step II

Once the 'Configuration Menu' is unlocked press the right arrow key once. 'Chlor. Config. + to view/change' should appear on the display. Press the plus (+) key to enter.

Step III

The display should show 'Chlorinator Enabled' if not, press the plus key to 'Enable' it. Then scroll to the right two times.

Step IV



The 'Cell Type' display will indicate the model of cell the system is expecting. If this screen is not configured for the correct cell type press the plus (+) or minus (-) key until the appropriate cell is expressed.

Note: If the 'Cell Type' option does not appear in the 'Chlor. Config.' menu, then review the system's model number to identify the type of cell that should be used with the system. Some earlier board revisions could not be configured for different cell types.

Check System Light On:

High Salt/Amps Error Message

1. Test the salt level in the pool using a suitable tester. Be sure the tester has been calibrated and is clean. If it is determined that the salt level in the pool exceeds 3400ppm, slowly drain and replenish with fresh water until salt levels are between 2700ppm – 3400ppm.

2. Check to make sure the system is configured for correct model cell (page 18).

3. If this fault only occurs during Spa mode, this may indicate that high water temperatures may be a contributing factor. High water temperatures, as commonly seen in spas, combined with higher salt levels can possibly cause this fault. To verify this is the problem, switch the unit to pool mode for 10 minutes and attempt to clear the fault. If the problem persists and is a nuisance, the salt level will have to be reduced to the lower ranges.

4. Remove and clean cell per the Hayward cleaning instructions. Be sure to 'reset' the average salt by following the instructions on page 16. Replace cell if the message is still displayed after cleaning.

Inspect Cell Message

For optimum operation, you will need to inspect the chlorinator cell approximately every 3 months (500 operational hours) and clean the cell if necessary. The Pro Logic will automatically remind you when it is time and display 'Inspect Cell, + to reset' as part of the rotating 'Default Menu'. Clean the cell per the Hayward instructions and then press the plus (+) key during the 'Inspect Cell' display to reset the cell.

Cell Cleaning Instructions:

Cell cleaning frequency is dependent on several factors; pH and calcium levels in the water are the two that have the greatest effect on how often the cell requires cleaning. Maintaining pH at the levels recommended in the operating instructions (7.2 - 7.8) should result in the cell being cleaned 3-4 times a year in areas with hard water. Cells may be cleaned less frequently in soft water areas.

After removing the Turbo Cell from the plumbing of your pool; inspect the cell for white deposits between the plates inside of the cell. Please remember that even if you cannot see visible deposits in the chamber, it still may require cleaning. If no deposits are found (picture to the left), the cell may have to be held towards ample amounts of light and angled in different directions to reveal smaller white deposits deeper within the nest of the cell.

Hold to light to look for small deposits

Cell is dirty. Note the deposits.

ALWAYS ADD ACID TO WATER, NEVER WATER TO ACID. ALWAYS WEAR PROPER EYE PROTECTION AND PROTECTIVE GLOVES. USE IN A WELL VENTILATED AREA. MURIATIC AND OTHER ACIDS CAN CAUSE SEVERE INJURY, BURNS AND RESPIRATORY PROBLEMS IF NOT HANDLED PROPERLY. REFER TO THE MANUFACTURER'S DIRECTIONS FOR SAFE HANDLING.

CAUTION

Cell Cleaning Instructions:

Cleaning instructions using a container.

Mix 1 part acid to 4 parts water. Stand the cell vertically in the solution. The level of the solution should be slightly over the product label. Let the cell stand in the solution for 15 minutes (Fig. 6A to the right), then flip the cell over and let stand on the other end (Fig. 6B to the right) for an additional 15 minutes. Although the cord can be submerged, be sure that the connector does not come in contact with the solution.

Inspect the cell after both sides have soaked. If there are no deposits after soaking, rinse with water and reinstall. If there are still deposits after soaking, repeat the soaking procedure until clean. The water/muriatic acid mixture can be stored for later use or it can be disposed. Follow chemical manufacturer's recommendations when storing or disposing the water/acid solution.

After you inspect the cell (and clean, if necessary) press the plus (+) key during the 'Inspect Cell' display to reset the light.

Cell Cleaning Instructions:

Using the Hayward T-Cell Cleaning Stand

Follow the same safety and mixing instructions as described when using a container (pages 20 and 21). Mix enough solution to fill the inside of the cell (Approximately 1.5 qts).

Fasten the cell to the T-Cell Cleaning Stand with the cord side down (Fig. 6C below). Before filling cell with muriatic acid solution, put a container underneath to avoid any spills damaging the surrounding area. Fill the cell to the top with the solution (mix 1 part acid to 4 parts water) and let soak for 15 minutes (Fig. 6D below). Empty the cell and inspect. If the cell is clean, rinse with water and reinstall. If there are still deposits after soaking, repeat the soaking procedure until clean. The water/muriatic acid mixture can be stored for later use or it can be disposed of. Follow the chemical manufacturer's recommendations when storing or disposing the water/acid solution.

After you inspect the cell (and clean, if necessary) press the plus (+) key during the 'Inspect Cell' display to reset the light. If the cell was cleaned because a fault was indicated, such as 'low salt', or 'very low salt', be sure to reset the average salt reading by following the instructions on page 16.

5. Comm Error 1 and Comm Error 2

‘Comm Error 1’ is usually a false error caused by an abrupt power outage.

‘Comm Error 2’ is usually a misplaced wire in the sensor terminal block, a failing wired remote, a failing local display or a failing main circuit board.

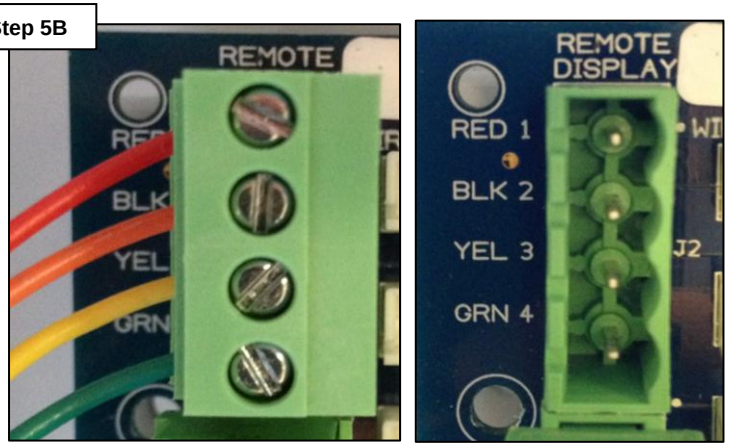
Turn the system’s main power breaker off, leave off for 2 minutes, then turn back on and check the display.

Step 5A

If the communication error is gone then the problem should be resolved. If the problem still exists turn the breaker off again and proceed to step 5B.

Unplug the terminal block labeled ‘Remote’ then turn the breaker back on (with the block still removed).

Step 5B

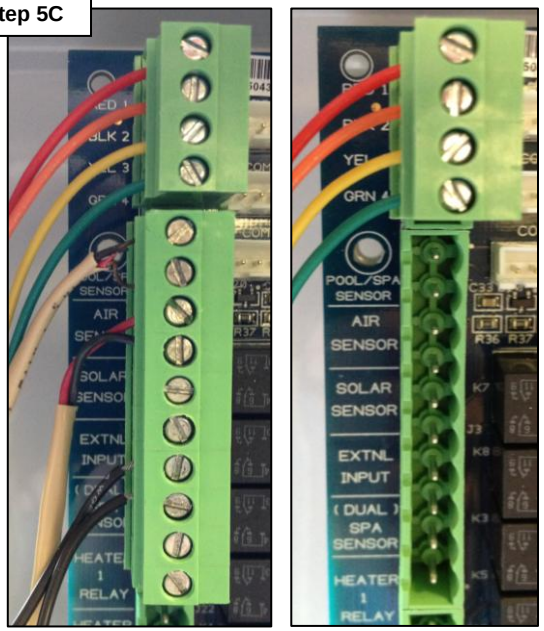


If the problem disappears when the block is removed the remote wiring is faulty, the block is bad, the remote is failing or the remote is not in the same family as the local display. If problem still persists turn the breaker off again and proceed to step 5C.

5. Comm Error 1 and Comm Error 2

Unplug green terminal block that contains all the sensors then turn the breaker back on (with the block still removed).

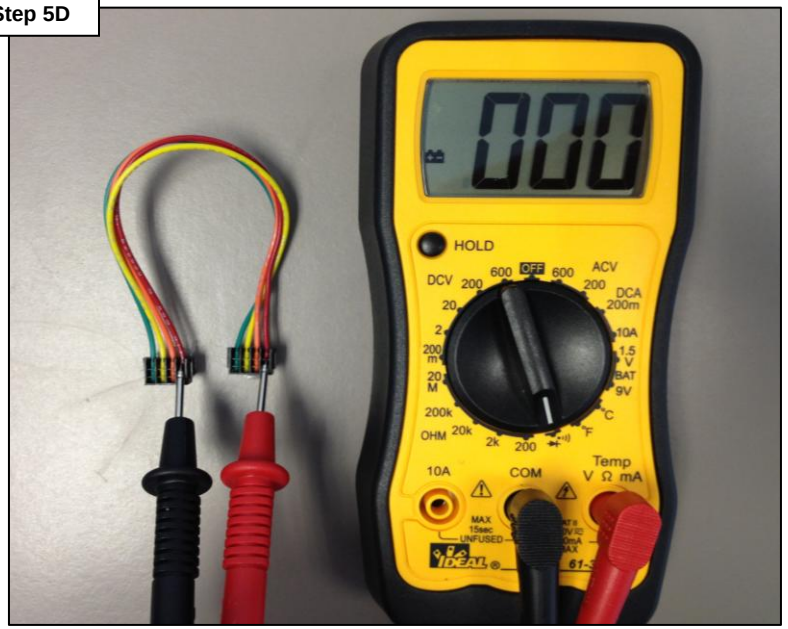
Step 5C



If the communication error disappears then check everything wired into the sensor terminal block. If the problem still exists proceed to step 5D.

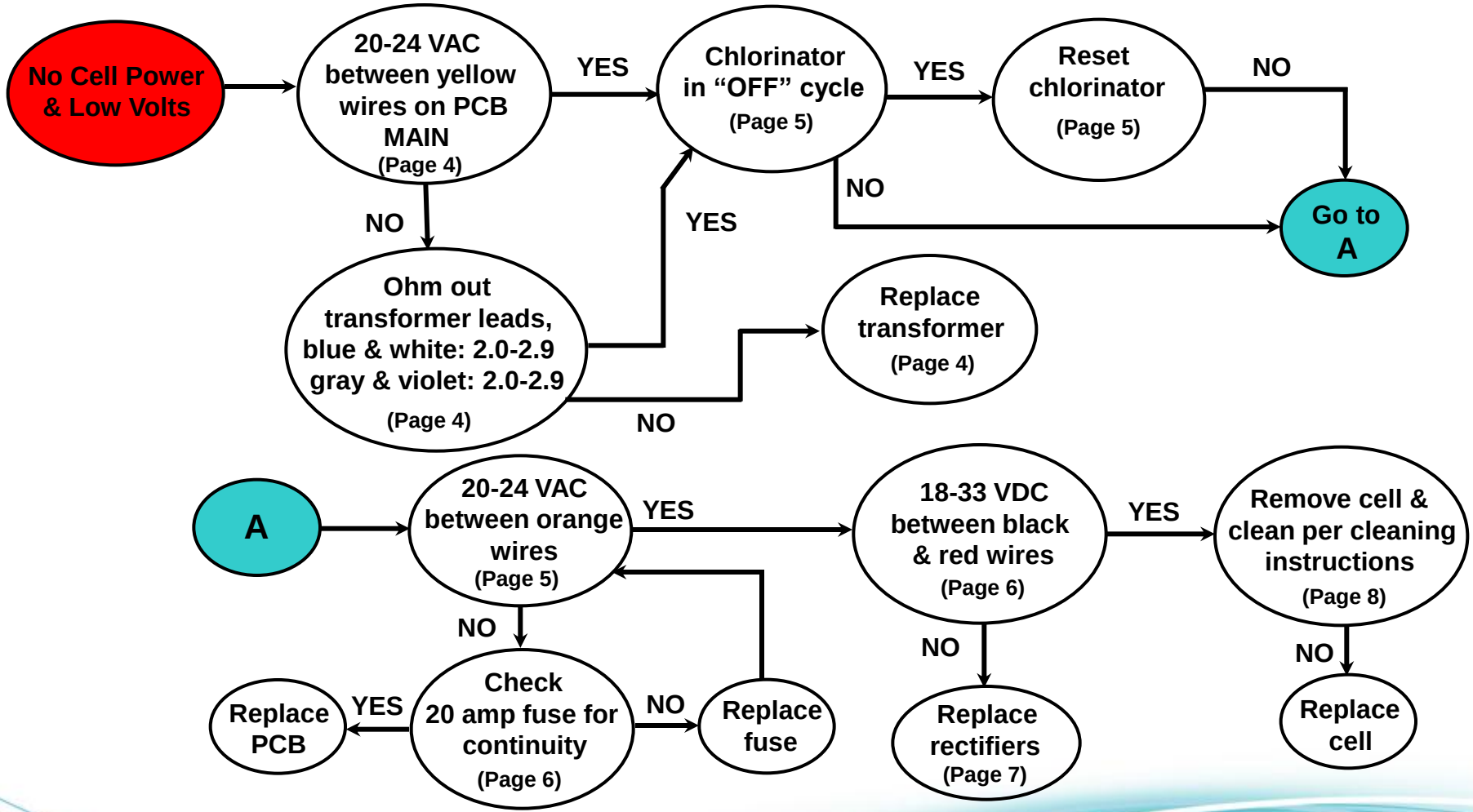
Check the local display wiring harness for continuity.

Step 5D

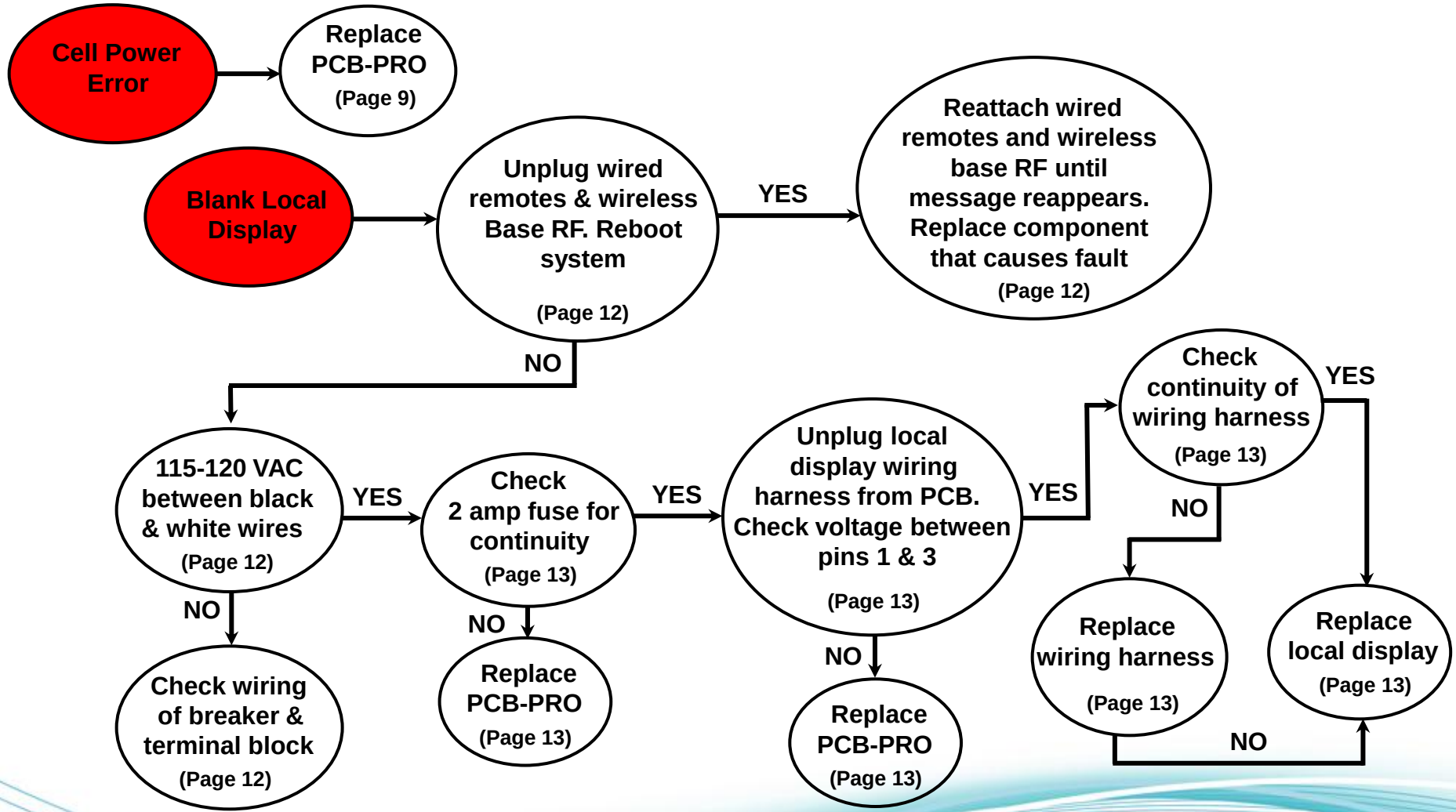


If the wiring harness does not show continuity through any of the four terminals, replace the wiring harness. If it is good then replace local display. If replacing the display does not correct problem then replace the main board.

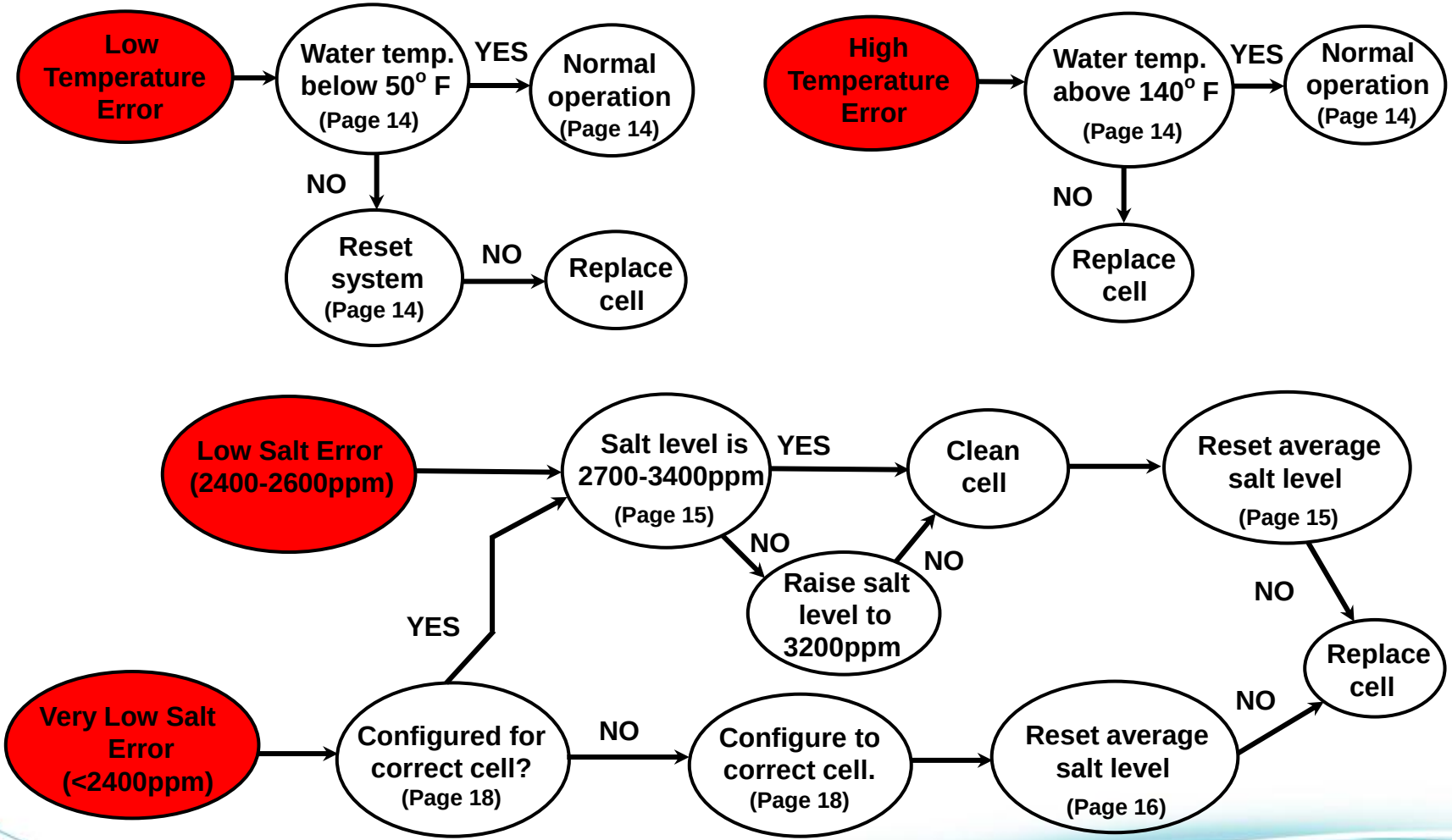
“Check System” Troubleshooting Charts



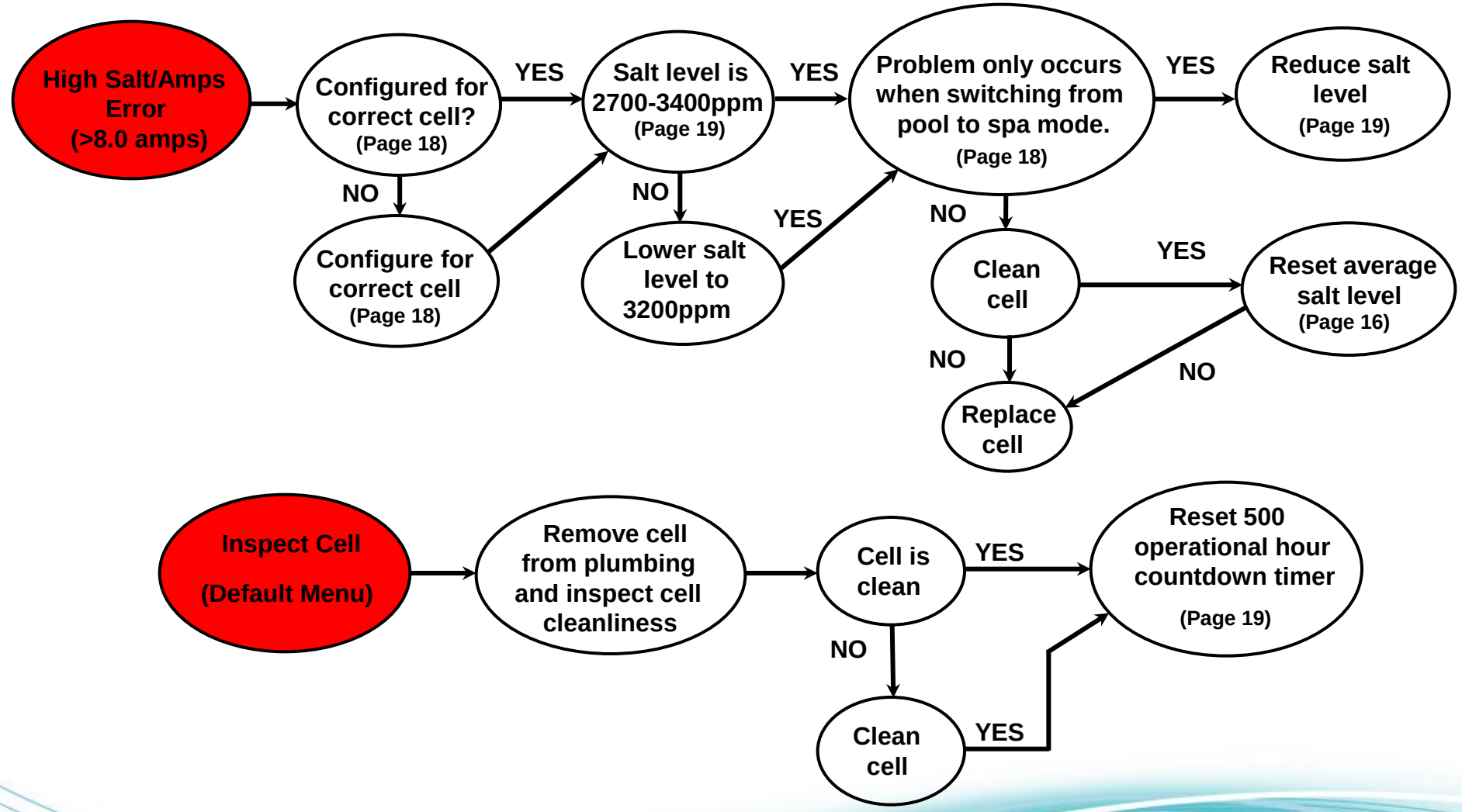
“Check System” Troubleshooting Charts



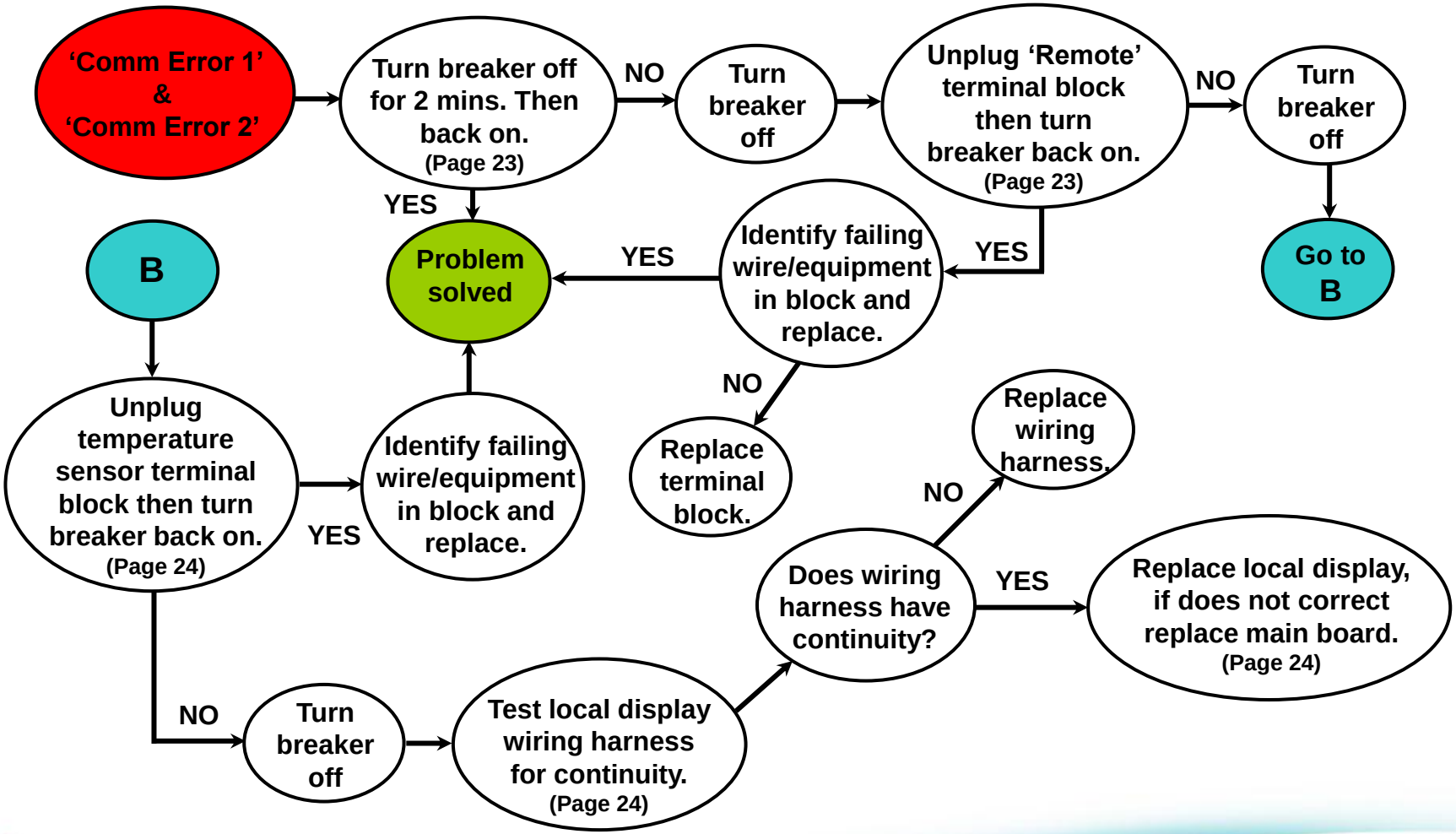
“Check System” Troubleshooting Charts



“Check System” Troubleshooting Charts



“Check System” Troubleshooting Charts



Additional “Check System” Errors

Note: If Variable Speed Pump is not being used, change Filter Pump type in the ‘Configuration Menu’ to remove these error codes

Below is a list of additional “Check System” error codes which relate to the Pro Logic’s operation with Hayward’s TriStar Energy Solution™ Variable Speed Pump & Control. All errors may be prefaced with Pool Filter (or Spa Filter (Dual Equipment) or Lights or Aux 1…14):

- VSP Comm Error
- VSP Drive Comm Error
- VSP Err: xx
- Mains voltage low
- Mains voltage high
- Rmt Stop is pressed
- Remote Stop: + to rst
- Prime Fail: + to rst
- Fail start: + to rst
- Pump stall: + to rst
- SVRS trip: + to rst
- Drv failure: See pump

Please refer to the pump service manual for detailed troubleshooting.

Additional “Check System” Errors

Note: If Sense & Dispense is not being used, disable the ‘Sensing System’ under the ‘Chemistry Config. Wizard’ in the ‘Configuration Menu’ to remove these error codes

Below is a list of additional “Check System” error codes which relate to the Pro Logic’s operation with Sense and Dispense™ Chemistry Automation:

- pH Calibration Error
- pH Probe Error
- pH Low-Check feeder
- pH High-Check feeder
- ORP Probe Error
- pH Timeout-Chk feedr, Press + to reset
- ORP Low-Check Chlor
- ORP High-Check Chlor
- ORP High-Chlor off
- ORP Timeout-Chlr off, Press + to reset
- CSM Comm Error

Please refer to the Sense and Dispense™ service manual for detailed troubleshooting.

Additional “Check System” Errors

Below is a list of additional “Check System” error codes which relate to open or shorted sensors:

- Cell Sensor Open
- Cell Sensor Short
- Wtr Sensor Open
- Wtr Sensor Short
- Pool Sensor Open
- Pool Sensor Short
- Spa Sensor Open
- Spa Sensor Short
- Air Sensor Open
- Air Sensor Short
- No Flow – Filter Pump
- Chk Flow Switch
- Solar Sensor Open
- Solar Sensor Short
- Ambient Sensor Open
- Ambient Sensor Short
- Cell Missing

‘Open sensor’, ‘Cell Missing’, and ‘Check Flow Switch’ errors should be checked by confirming sensors are plugged in correctly and wiring is not broken. Shorted sensor errors require Ohms check and matching resistance to temperature using chart (Page 33).

Temperature vs. Resistance Chart

F°	Ohms	Volts	F°	Ohms	Volts	F°	Ohms	Volts	F°	Ohms	Volts	F°	Ohms	Volts	F°	Ohms	Volts	F°	Ohms	Volts	F°	Ohms	Volts
1	82,719	4.46	21	44,879	4.09	41	25,391	3.59	61	14,921	2.99	81	9,076	2.38	101	5,697	1.81	121	3,679	1.34	141	2,440	0.98
2	80,142	4.45	22	43,577	4.07	42	24,704	3.56	62	14,543	2.96	82	8,861	2.35	102	5,570	1.79	122	3,602	1.32	142	2,392	0.97
3	77,656	4.43	23	42,318	4.04	43	24,037	3.53	63	14,176	2.93	83	8,651	2.32	103	5,446	1.76	123	3,527	1.30	143	2,345	0.95
4	75,255	4.41	24	41,099	4.02	44	23,391	3.50	64	13,820	2.90	84	8,447	2.29	104	5,326	1.74	124	3,454	1.28	144	2,299	0.93
5	72,937	4.40	25	39,919	4.00	45	22,764	3.47	65	13,473	2.87	85	8,249	2.26	105	5,208	1.71	125	3,382	1.26	145	2,254	0.92
6	70,698	4.38	26	38,777	3.97	46	22,156	3.45	66	13,136	2.84	86	8,056	2.23	106	5,094	1.69	126	3,312	1.24	146	2,210	0.90
7	68,535	4.36	27	37,671	3.95	47	21,566	3.42	67	12,809	2.81	87	7,867	2.20	107	4,982	1.66	127	3,244	1.22	147	2,167	0.89
8	66,447	4.35	28	36,601	3.93	48	20,993	3.39	68	12,491	2.78	88	7,684	2.17	108	4,873	1.64	128	3,177	1.21	148	2,125	0.88
9	64,428	4.33	29	35,565	3.90	49	20,438	3.36	69	12,182	2.75	89	7,506	2.14	109	4,767	1.61	129	3,112	1.19	149	2,084	0.86
10	62,479	4.31	30	34,561	3.88	50	19,900	3.33	70	11,882	2.72	90	7,333	2.12	110	4,664	1.59	130	3,049	1.17	150	2,044	0.85
11	60,595	4.29	31	33,590	3.85	51	19,377	3.30	71	11,589	2.68	91	7,164	2.09	111	4,563	1.57	131	2,987	1.15	151	2,005	0.84
12	58,774	4.27	32	32,648	3.83	52	18,870	3.27	72	11,305	2.65	92	6,999	2.06	112	4,464	1.54	132	2,926	1.13	152	1,966	0.82
13	57,014	4.25	33	31,737	3.80	53	18,377	3.24	73	11,029	2.62	93	6,839	2.03	113	4,368	1.52	133	2,867	1.11	153	1,929	0.81
14	55,313	4.23	34	30,853	3.78	54	17,899	3.21	74	10,761	2.59	94	6,683	2.00	114	4,274	1.50	134	2,809	1.10	154	1,892	0.80
15	53,669	4.21	35	29,998	3.75	55	17,435	3.18	75	10,500	2.56	95	6,530	1.98	115	4,183	1.47	135	2,752	1.08	155	1,856	0.78
16	52,078	4.19	36	29,169	3.72	56	16,985	3.15	76	10,246	2.53	96	6,382	1.95	116	4,094	1.45	136	2,697	1.06	156	1,821	0.77
17	50,541	4.17	37	28,365	3.70	57	16,548	3.12	77	9,999	2.50	97	6,238	1.92	117	4,007	1.43	137	2,643	1.05	157	1,787	0.76
18	49,054	4.15	38	27,587	3.67	58	16,123	3.09	78	9,758	2.47	98	6,097	1.89	118	3,922	1.41	138	2,591	1.03	158	1,753	0.75
19	47,616	4.13	39	26,832	3.64	59	15,711	3.06	79	9,525	2.44	99	5,960	1.87	119	3,839	1.39	139	2,539	1.01	159	1,720	0.73
20	46,225	4.11	40	26,100	3.61	60	15,310	3.02	80	9,297	2.41	100	5,827	1.84	120	3,758	1.37	140	2,489	1.00	160	1,688	0.72

Compatibility Chart: Cell vs. Software Revision

	Aqua Rite Pro	Aqua Rite	Aqua Rite XL	Aqua Trol	Aqua Logic	Pro Logic	Swimpure Plus	Swimpure Plus w/Control	H40	SmartPure Sanitizer II	Splash CLEAR	SP40	Guardian	Nature Soft
T-CELL 3 & GLX-CELL-3-W (pools up to 15K Gal)	1.10 or later	1.50 or later	X	X	X	4.10 or later	1.50 or later	4.10 or later	X	X	X	X	X	X
GLX-CELL 5 & GLX-CELL-5-W (pools up to 25K Gal)	All Revisions	1.50 or later	X	All Revisions	All Revisions	All Revisions	1.50 or later	All Revisions	X	X	X	X	X	X
T-CELL 9 & GLX-CELL-9-W (pools up to 25K Gal)	1.10 or later	1.50 or later	X	X	X	4.10 or later	1.50 or later	4.10 or later	X	X	X	X	X	X
T-CELL 15 & GLX-CELL-15-W (pools up to 40K Gal)	All Revisions	All Revisions	All Revisions	X	All Revisions	All Revisions	All Revisions	All Revisions	All Revisions	All Revisions	All Revisions	All Revisions	All Revisions	All Revisions

If you have an Aqua Plus model # starting with AQL, refer to the Aqua Logic Column. If the model number starts with PL, refer to the Pro Logic column

Firmware Changes

Note: Firmware is software programmed into chips

Pages 35 – 39 outline the important firmware changes made to the Aqua Logic/Pro Logic.

Additions made prior to 4.10

- Added support for Chemistry Sense and Dispense.
- Added displaying if the Chlorinator is off because either the percentage or ORP set point has been met to the Chlorinator Diagnostic display.
- Added ability to change the ORP level to the Settings Menu.
- Added displaying if the Chlorinator is off because solar has been on for less than 3 minutes to the Chlorinator Diagnostic display.
- Increased the Chlorinator cycle time from 120 to 180 minutes.
- Increased the maximum ORP overfeed timeout to 96 hours.
- Added displaying Freeze Protection as a reason for the Chlorinator being off.

Firmware Changes – Cont'd

Rev. 4.10 (Requires new PC Board (G1-066061)) (10-27-2008)

Color Logic 4.0

- Added support for ColorLogic 4.0 lights.

Miscellaneous

- Added forcing the Average Salt level to 2800 ppm when resetting to the default Configuration values.
- Added ability to select Priority for Heater2 as a Heat Pump.
- Added the ability to check all Check System errors, not just the highest priority one.
- Added support for on-board pH dispense relays (freeing up an Aux).
- Added support for Pick 'n Mix and the new T-CELL-3 and T-CELL-9.
- Added allowing Solar to be used with Dual Equipment configurations (Uses new Dual Equipment Spa Sensor input instead of the Solar sensor for the Spa temperature)

Firmware Changes – Cont'd

Rev. 4.20 (Requires PC Board (G1-066061)) (10-22-2009)

Aqua Connect Home Network

- Added support for Aqua Connect Home Network.

Color Logic 4.0

- Added resetting any ColorLogic Aux brightness level to 100% when ColorLogic is reset to default values.
- Added ability to move forwards and backwards thru the ColorLogic Light Number assignment display.
- Added ability to have different minimum and maximum speeds for each ColorLogic program.

Firmware Changes – Cont'd

Rev. 4.30 (Requires PC Board (G1-066061)) (mm-dd-2010)

EcoStar VSP

- Added support for up to 8 EcoStar VSPs (Filter, Dual Equipment Spa Filter and up to 6 Lights/Auxes).
- Added VSP as a fourth possible Relay Type for each Light/Aux (up to 6, maximum).
- Added the ability to select the desired Filter and Spa Filter Speed when manually switching the filter from Off to On with the +/- keys (similar to setting the Dimmer On brightness).
- Added ability for a speed to be associated with each filter Time clock.
- Added Heater Minimum and Spa Filter Freeze Protection speeds when the Dual Equipment Spa Filter is configured for Variable Speed.
- Added the ability to set a Group speed for the Filter, Spa Filter and Lights/Aux VSPs.
- Added the ability of selecting % or RPM when displaying the VSP speed to the Configuration Menu.

Miscellaneous

- Added a third and fourth Filter Time clock.
- Added special Heater control logic when configured for Spa Only. It now operates more like the Pool Only configuration.

Firmware Changes – Cont'd

Rev. 4.40 (Requires PC Board (G1-066061)) (8-29-2012)

Universal Color Logic

- Added support for the Universal Color Logic (UCL) Light.

Miscellaneous

- Restricted an Aux Relay Type, other than Standard, to a function of Manual On/Off, Countdown or Time clock.

Rev. 4.45 (Requires PC Board (G1-066061)) (9-5-2013)

Aqua Connect

- Added support for direct temperature input via app.

Miscellaneous

- Allowed an Aux set as function Solar to have a relay type of VSP.

IMPORTANT !!!

More on Chlorine Output & Salt Levels

1. The 'Pool Chlorinator %' and 'Spa Chlorinator %' options under the Setting Menu, control the level of salt cell operation as a percent of the total operating time of the filter pump. A simple example is that if the pump/filter is programmed to operate a total of 8 hours in a given day and the 'Pool Chlorinator %' is set to 50% the salt cell will operate (and produce chlorine) approximately half the time, or 4 hours.
2. The salt level that is calculated (and displayed) in the system is determined from several variables. It is possible that the displayed salt level can be significantly different from the actual salt level (when measured in the water with a tester). This can happen as a result of a dirty cell or from a cell that has began aging. Low salt should always require a cell cleaning first and then an actual meter measurement of the salt level in the water. If the cell is clean and the level of salt measured in the water is correct, then the cell has began to age, which results in a lower calculated salt level. This is an acceptable situation, assuming the level of free chlorine in the pool is appropriate. NEVER add additional salt in this circumstance.
3. If the free chlorine is not appropriate and the steps in item 2 have been followed and addressed as needed, then the 'Pool Chlorinator %' or 'Spa Chlorinator %' needs to be increased in a 25% increment (for example from 50% to 75%) to allow for the salt cell to operate for a longer period (% of total operating time) in order to produce a sufficient amount of chlorine as the cell begins to age. Allow 24 hours and re-test free chlorine. Increase in increments of +10% if required. Keep in mind this is assuming the chemistry parameters are correct in the water and there is nothing that is creating a significant chlorine demand.
4. Super-chlorinate is an additional option to use in order to 'catch up' in chlorine production when making adjustments to the desired output level. Enable 'Super Chlorinate' under the Settings Menu.