

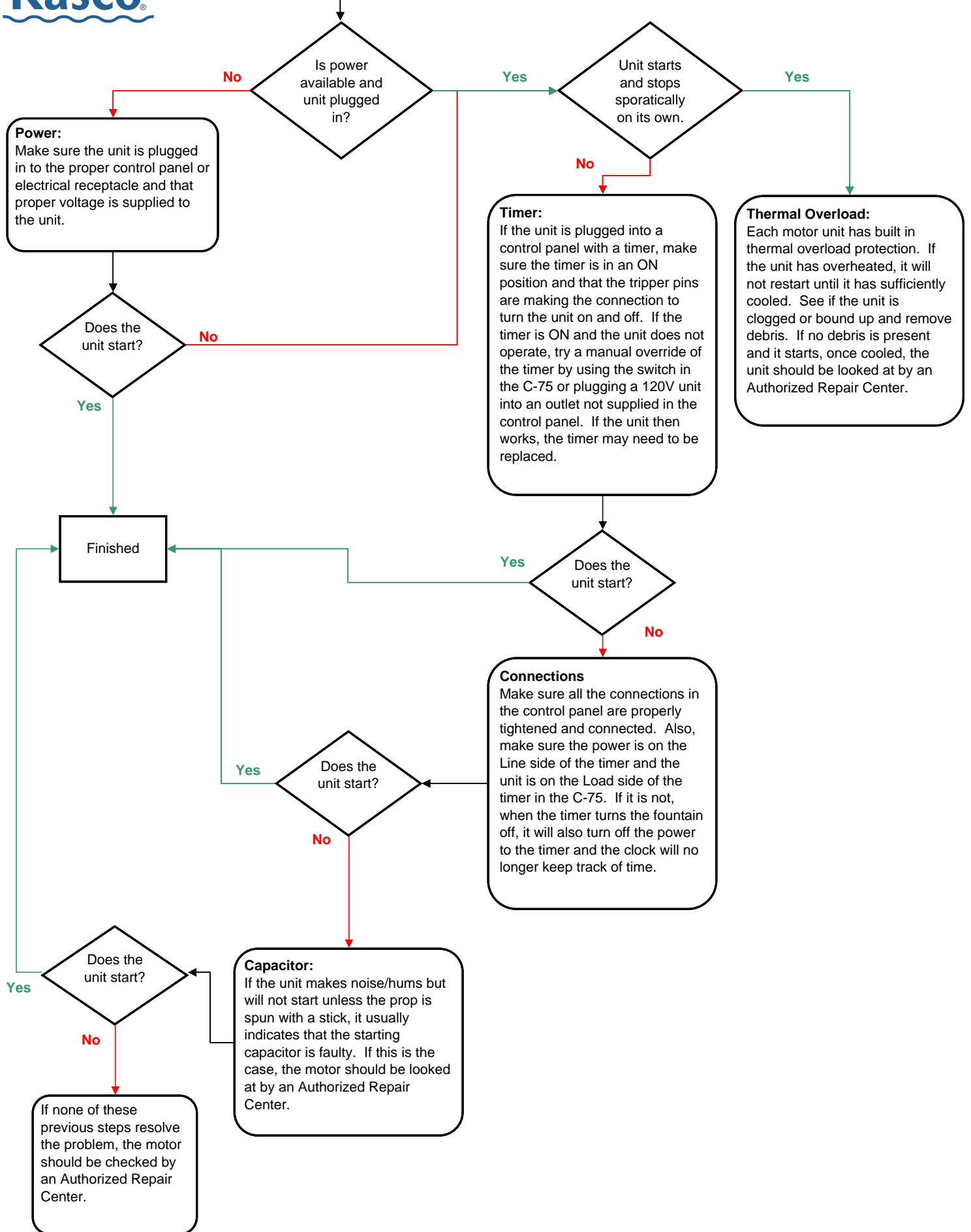


Troubleshooting &
Electrical Reference Guide

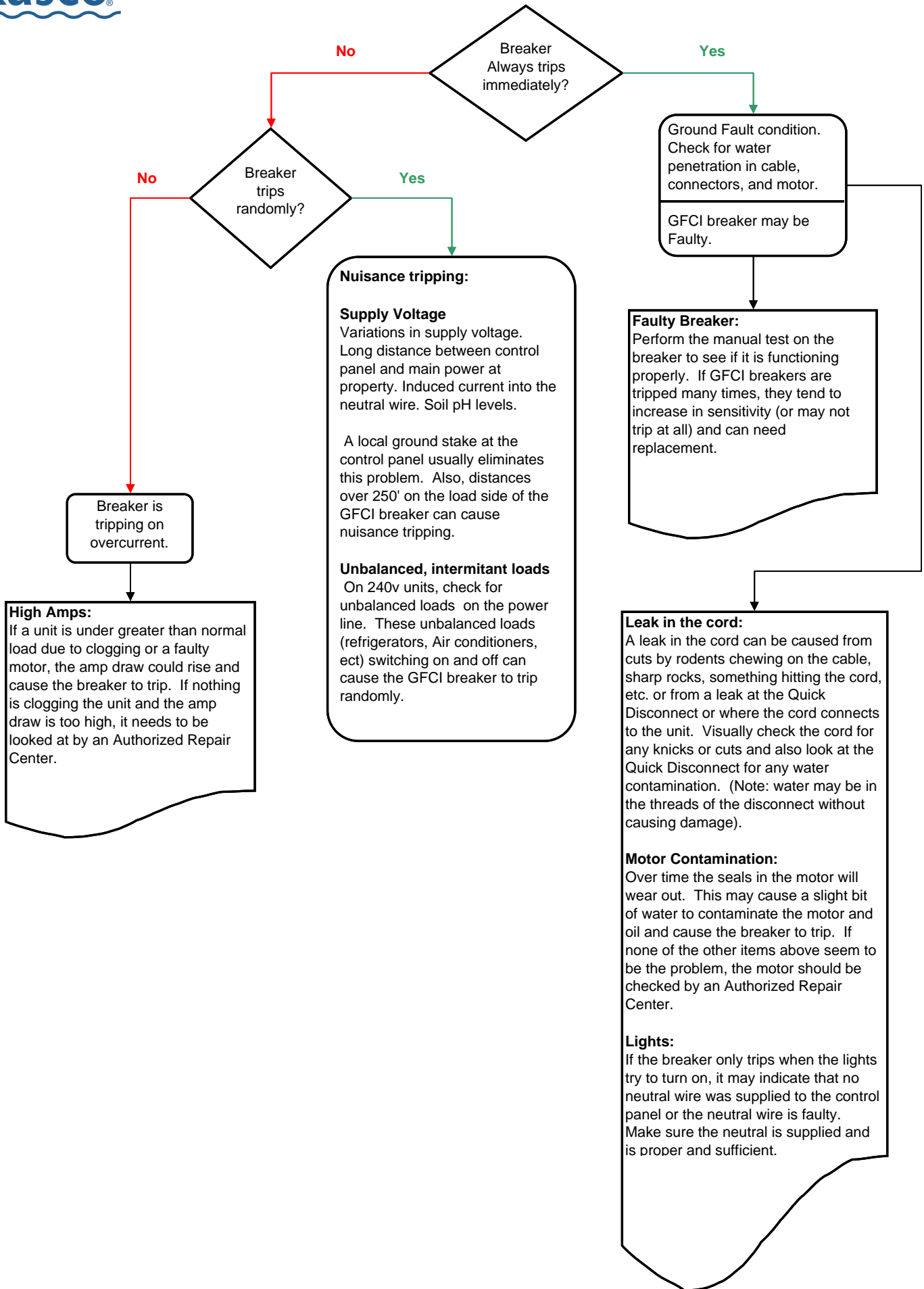
General troubleshooting steps:

1. Ask the owner... What is it doing?
 - Have you tried to re-start it? and how long does it run?
 - Does it always stop at the same time or randomly?
 - How long has it been installed? (new installation or existing)
 - How long has it not worked properly?
 - Anything new installed or changed? (lighting, other equipment)
2. Inspect and visualize the electrical installation
3. Look for tripped circuit breakers & GFCIs: Both Feed breakers & Kasco breakers
4. Look for damage: burned wires, lightning arrestor, etc.
5. Measure voltages feeding the Kasco panel
6. Turn the unit on and monitor to see if it trips – measure Amps
7. Ensure the timer(s) advance.
8. Light kit? Energize the light kit. Does it trip? Disconnect light kit, will the unit now operate without lights.
9. Quick Disconnect: disconnect motor and cap the cord; energize the cord in the water.(Look for water in the disconnect)
10. Look for cord damage, Animal chew, fish hooks, weed whip damage
11. Look for leaking Oil. (bad seals = water in the motor) Fishing line around shaft, plastic bag around shaft.
12. Pull the unit and inspect on shore.
13. Does the motor shaft spin free?
14. Turn the unit upside down and Meg ohm test.
15. **9, 10, 11 can be verified with a Meg ohm test as well.**

Unit will not start or operate

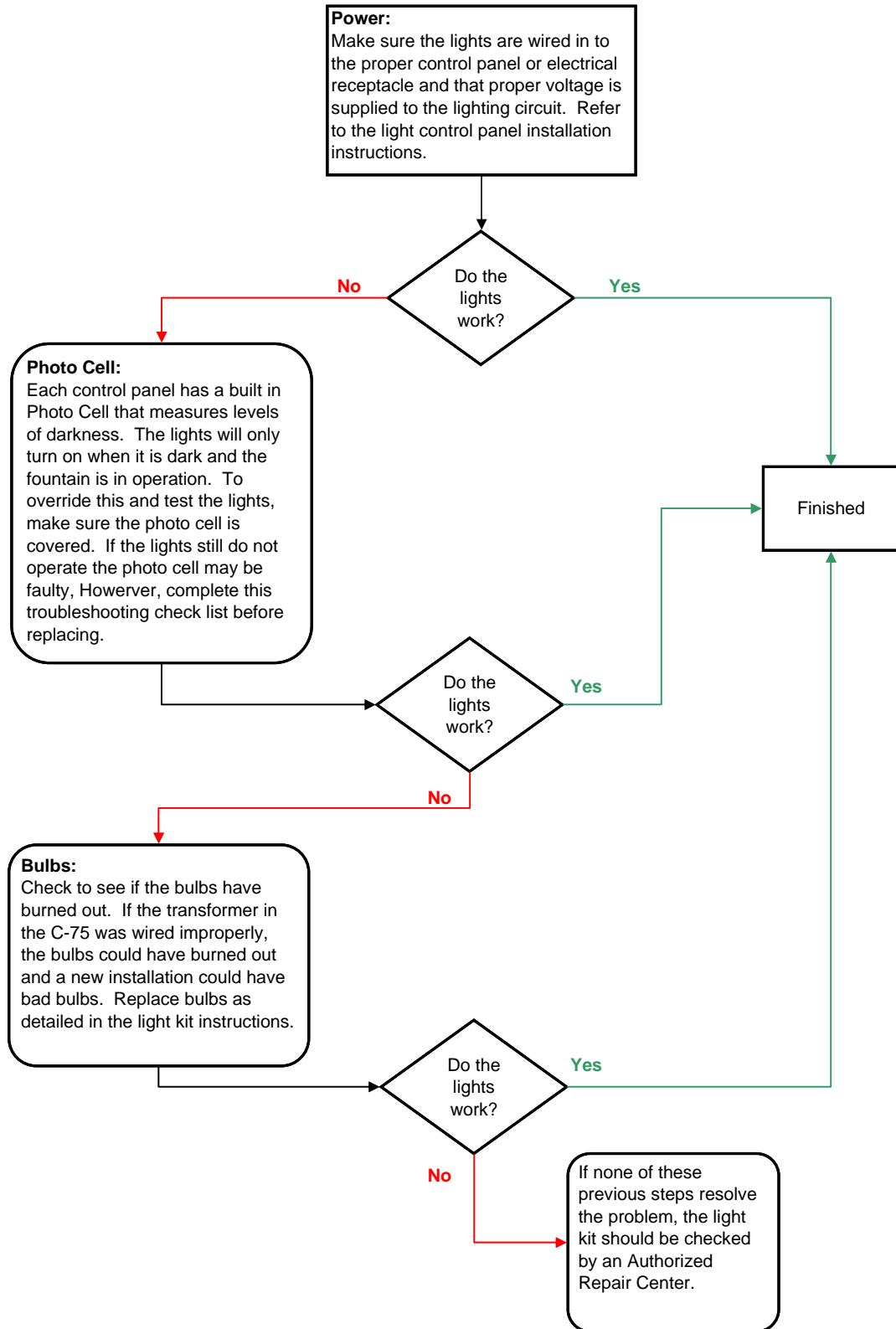


GFCI Breaker Tripping



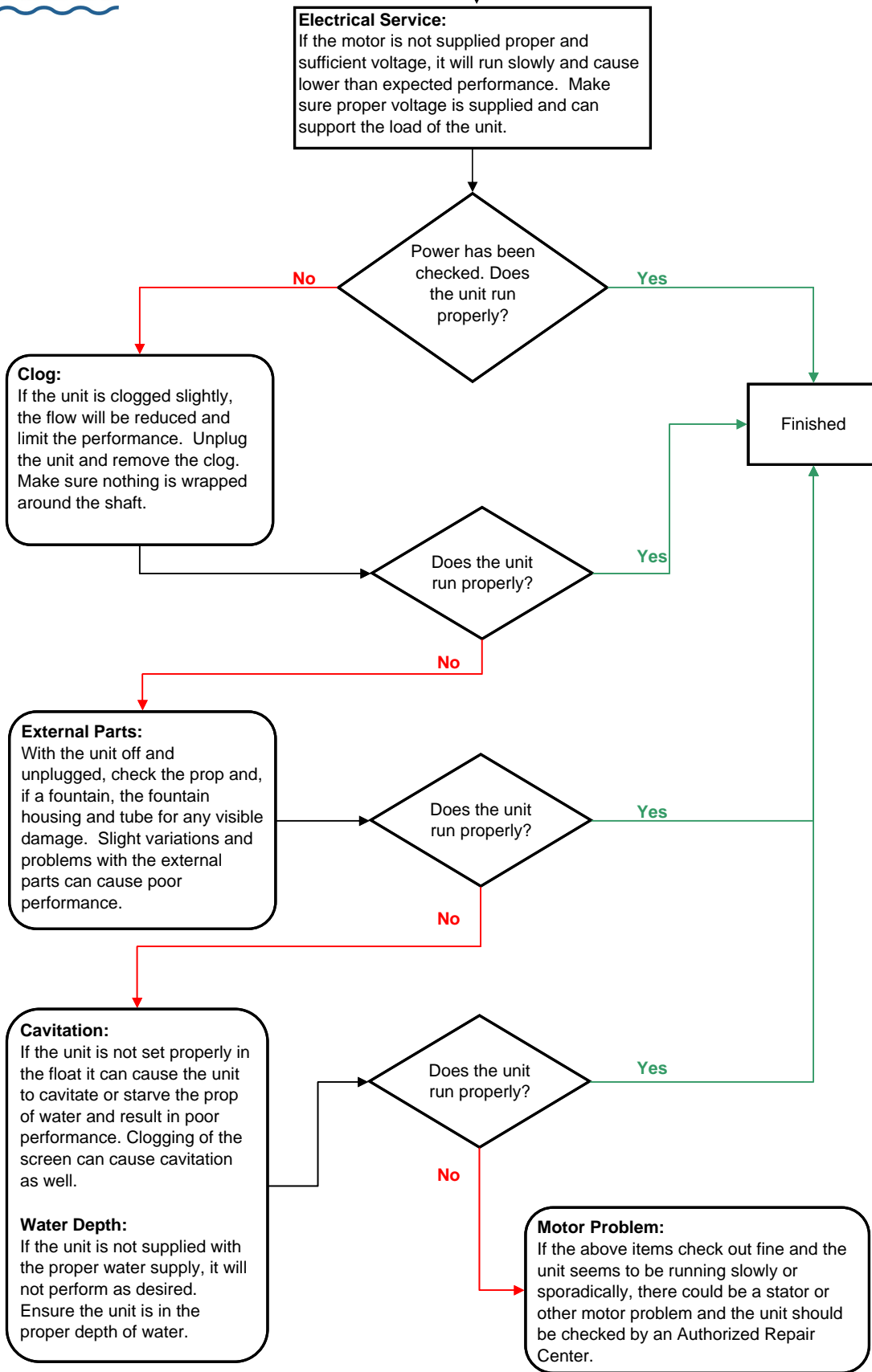


Lights will not operate

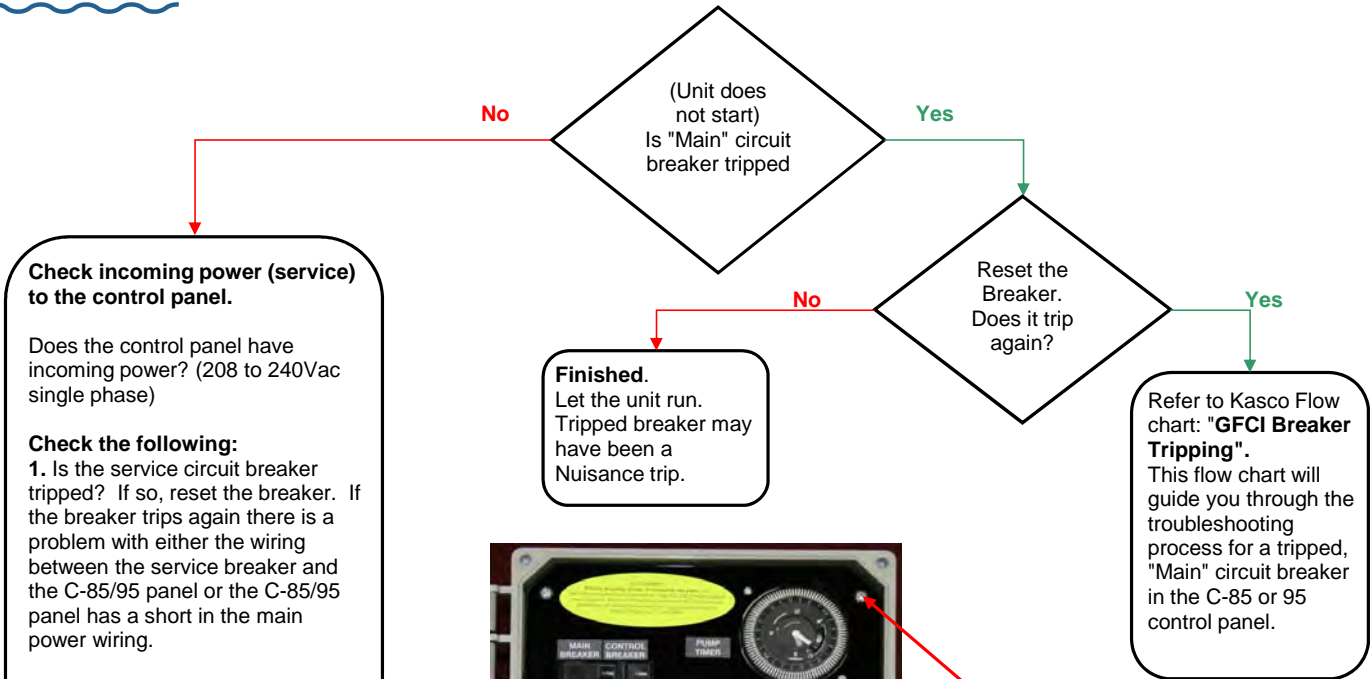




Reduced performance



Non-metallic C-85/95 Troubleshooting - Incoming Power (service)



Check incoming power (service) to the control panel.

Does the control panel have incoming power? (208 to 240Vac single phase)

Check the following:

1. Is the service circuit breaker tripped? If so, reset the breaker. If the breaker trips again there is a problem with either the wiring between the service breaker and the C-85/95 panel or the C-85/95 panel has a short in the main power wiring.

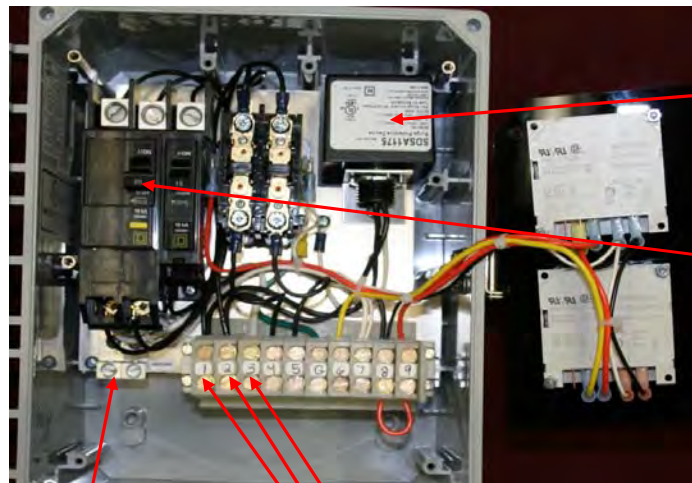
2. With the service circuit breaker turned off (power removed from this panel). Remove the black cover plate and disconnect the lightning arrestor from the incoming power terminals (retighten the terminals). Reapply power to the panel. If the service breaker does not trip then the Lightning arrestor needs to be replaced. If the service circuit breaker still trips, then inspect the internal wiring of this panel. Look for any burn marks, or shorted wiring. If all wiring checks out then a problem may exist in the service.

3. Check the voltage of the incoming power: (L1, L2, N, G)
 L1 to L2 = 208 to 240Vac
 L1 to N = 120Vac
 L2 to N = 120Vac
 L1 to G = 120Vac
 L2 to G = 120Vac

If any of these voltage checks are not correct then a problem may exist in the service.



Remove 4 screws to lift off black cover plate.



Lightning Arrestor

Main circuit breaker

G (ground) Lugs

N (neutral) Terminal #3
 L2 (line 2) Terminal #2
 L1 (line 1) Terminal #1

Non-metallic C-85/95 Troubleshooting - GFCB Tripping

This panel has one main Ground fault circuit breaker (GFCB) to detect and protect the equipment from ground faults.

This breaker will trip if a ground fault is sensed in either the pump unit or the light kit.

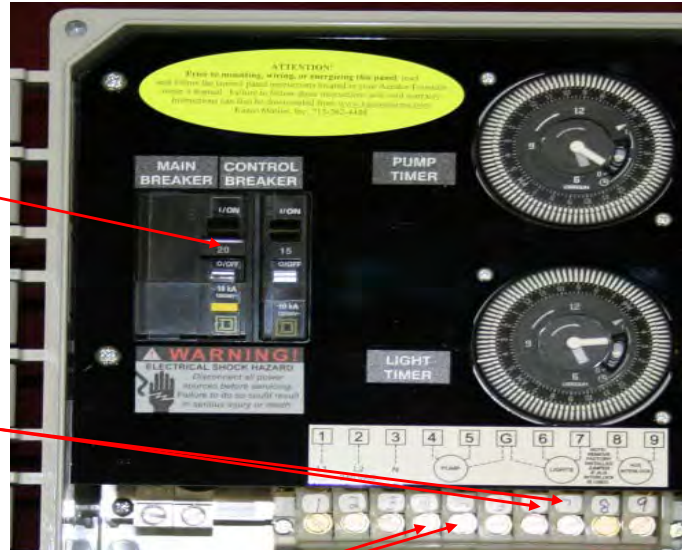
Perform the following to diagnose which piece of equipment is causing the GFCB to trip.

With power turned OFF to the panel. Disconnect the light kit power cord from terminals #6 & #7.

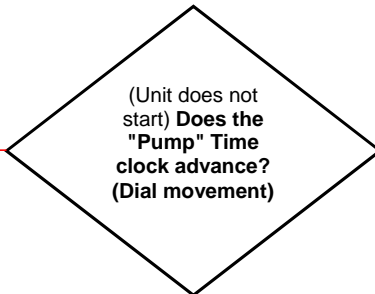
Re-energize the panel and operate the pump. If the GFCB trips again then there is a problem in the pump unit or the power cord to the pump unit.

There could still be a problem with the light kit. Next, (With power turned OFF to the panel) reconnect the light kit to Terminals #6 & #7 and disconnect the pump unit from Terminals #4 & #5. Re-energize the panel and turn on the pump and light timers (time clocks). If the GFCB does not trip then the problem is only in the pump unit. If the GFCB trips then there may be a problem with the light kit.

If you disconnect both the pump unit and the light kit from the panel terminals and the GFCB trips the GFCB may be defective.



Non-metallic C-85/95 Troubleshooting - Pump circuit (circuit breakers & time clock)



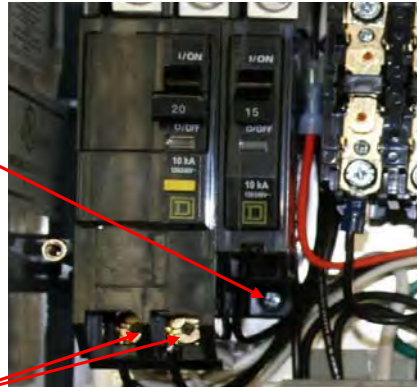
Time Clock Power:

Ensure both circuit breakers are in the on position (up).

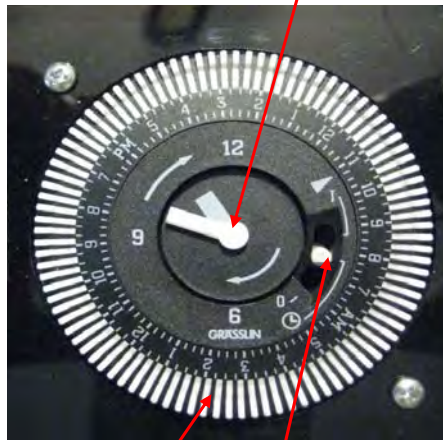
The 15amp "control" circuit breaker supplies 120Vac to the timer motors. Remove the Black cover plate and (with a volt meter) measure 120Vac from the bottom lug of the breaker to Neutral terminal block. (If no voltage is present then the 15amp circuit breaker is not allowing voltage to pass)

The 2 pole Ground fault circuit breaker (Main) must also be on to supply voltage to the 15amp control circuit breaker. On the bottom lugs, measure the voltage output of this breaker. Measure the voltage between the two lugs. It should be the same voltage as the source. (208Vac or 240Vac),.

If voltage is present on the output of both breakers, measure for 120Vac across the timer's power input terminals. If 120Vac is present, and the time clock does not advance then replace the timer.



Dial movement



Trippers

Off-Auto-On switch

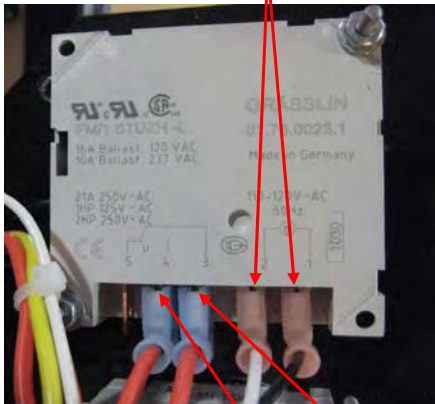
Off - Auto - On switch (On time clock):
The time clock has a built in Off-Auto-On switch for setting the timer mode. Ensure the switch is set to the Auto mode.

Trippers:
Ensure the time clock trippers are set. If the trippers are not set the time clock will not turn the load contacts on. Refer to the timer instructions in the owners manual for details on setting the time clock and it's functions

Check Load terminal voltage:
With the time clock Off-Auto-On switch set to the ON position, using your volt meter - measure for 120VAC between Neutral and time clock terminal #3.
If no voltage is present then ensure the orange jumper wire is installed between panel terminals #8 & #9. If this jumper is removed the panel will not operate the pump or the lights.

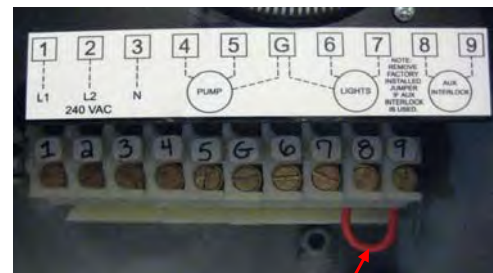
Next measure for 120Vac on time clock terminal #4 to Neutral. If voltage is not present then the timer is not switching to turn on the pump contactor (motor contactor).

If the above steps do not resolve the issue, then continue to the next troubleshooting flow chart "Pump circuit-2"



120Vac into Terminal #3

Time clock Output Terminals 120Vac output Terminal #4



Orange Jumper must be installed between terminals #8 & #9

Non-metallic C-85/95 Troubleshooting - Motor circuit (motor contactor and output terminals)

Motor (pump) contactor:

Measure the input voltage to the contactor. This should be 208 -240Vac. (source voltage).

Ensure the Main breaker is turned on.

With the timer clock output turned on, measure for voltage between the contactor coil terminals. (the voltage should be 120Vac). If you measure 120Vac and the contactor is not energized (pulled in). Then the contactor may need replaced.

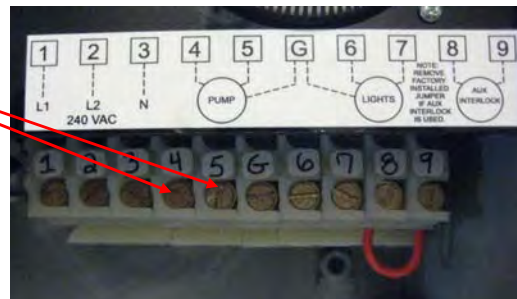
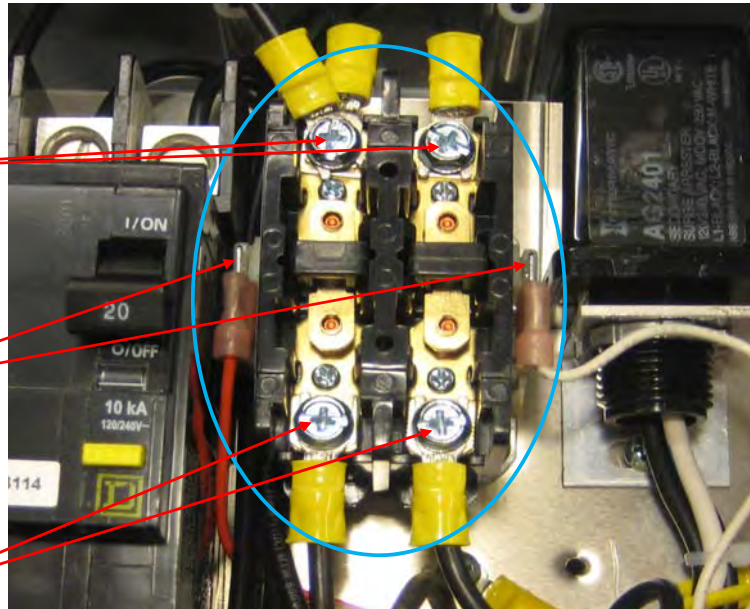
Pump output terminals:

The pump time clock's output sends voltage to the motor contactor coil. When the contactor energizes it will send voltage to the pump terminals (#4).

measure the output voltage of the contactor. It should be 208 - 240Vac.

Next measure the voltage between the pump terminals (#4). this should also be 208 - 240Vac.

If voltage is present on the Pump terminals the problem may be in the power cord to the pump or in the pump itself.



C-85 Troubleshooting - Lighting circuit

Pre-check:

This panel does not use a Photo Cell for controlling the lights. It has a separate time clock for the lights. Pump time clock must be turned on for the lights to operate.

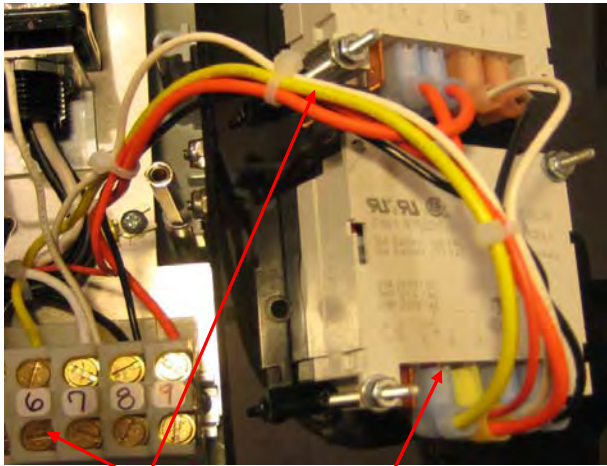
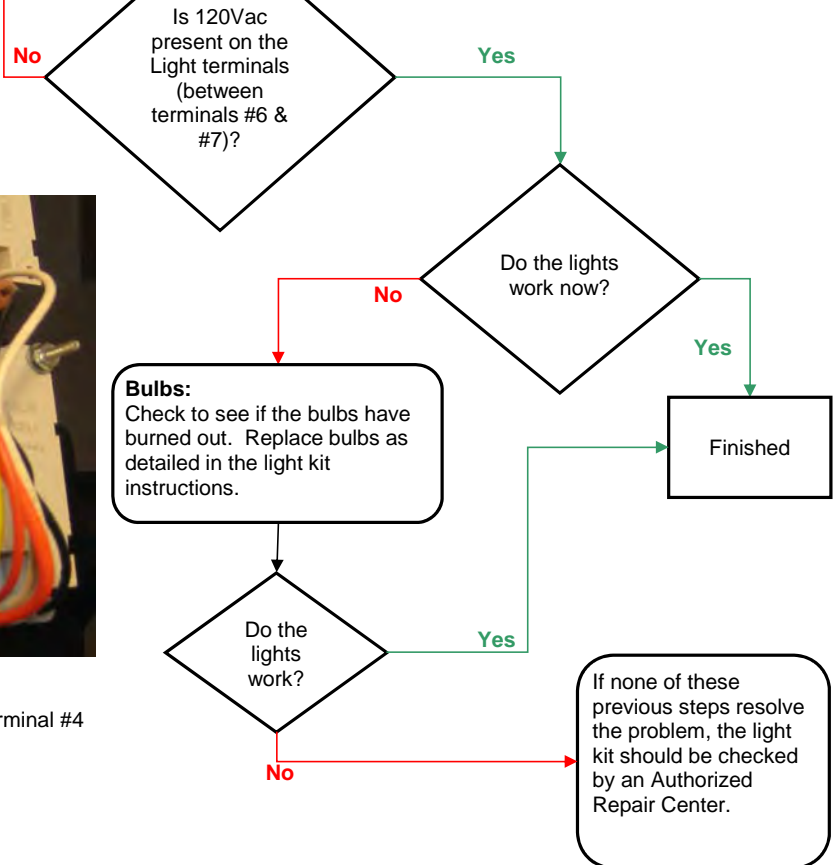
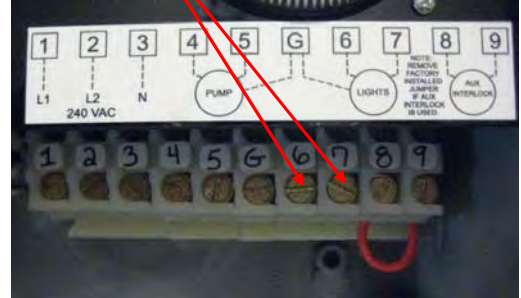
Both time clocks are turned ON. The circuit breakers are in the ON positions. Measure voltage across the Light kit terminals. you should measure 120Vac.

Time clock operation:

The pump time clock and the light time clock must both be ON to energize the light kit terminals (#6 & #7). This prevents the lights from operating when the fountain is off.

With both time clocks turned on check for voltage on the back side of the light time clock (remove black cover plate). The light time clock terminal #4 should measure 120Vac to Neutral. If voltage is not present the time clock may need replaced.

If voltage is present on time clock terminal #4 and at the Light Kit panel terminals (#6 & #7) then you need to check the light kit for bad bulbs or possible damage.



Yellow wire to Terminal #6

120Vac output Terminal #4

NON Metallic C-85 and C-95 control panel Volt & Amp measurements

C-85 panel# 176005

C-95 panel# 176090



INCOMING VOLTAGE

L1 TO L2 = 208 - 240V
L1 TO N = 120V
L2 TO N = 120V

L1 (1)
L2 (2)
N (3)

VOLTAGE TO LIGHT KIT

6 TO 7 = 120V

VOLTAGE TO PUMP MOTOR

4 TO 5 = 208 - 240V

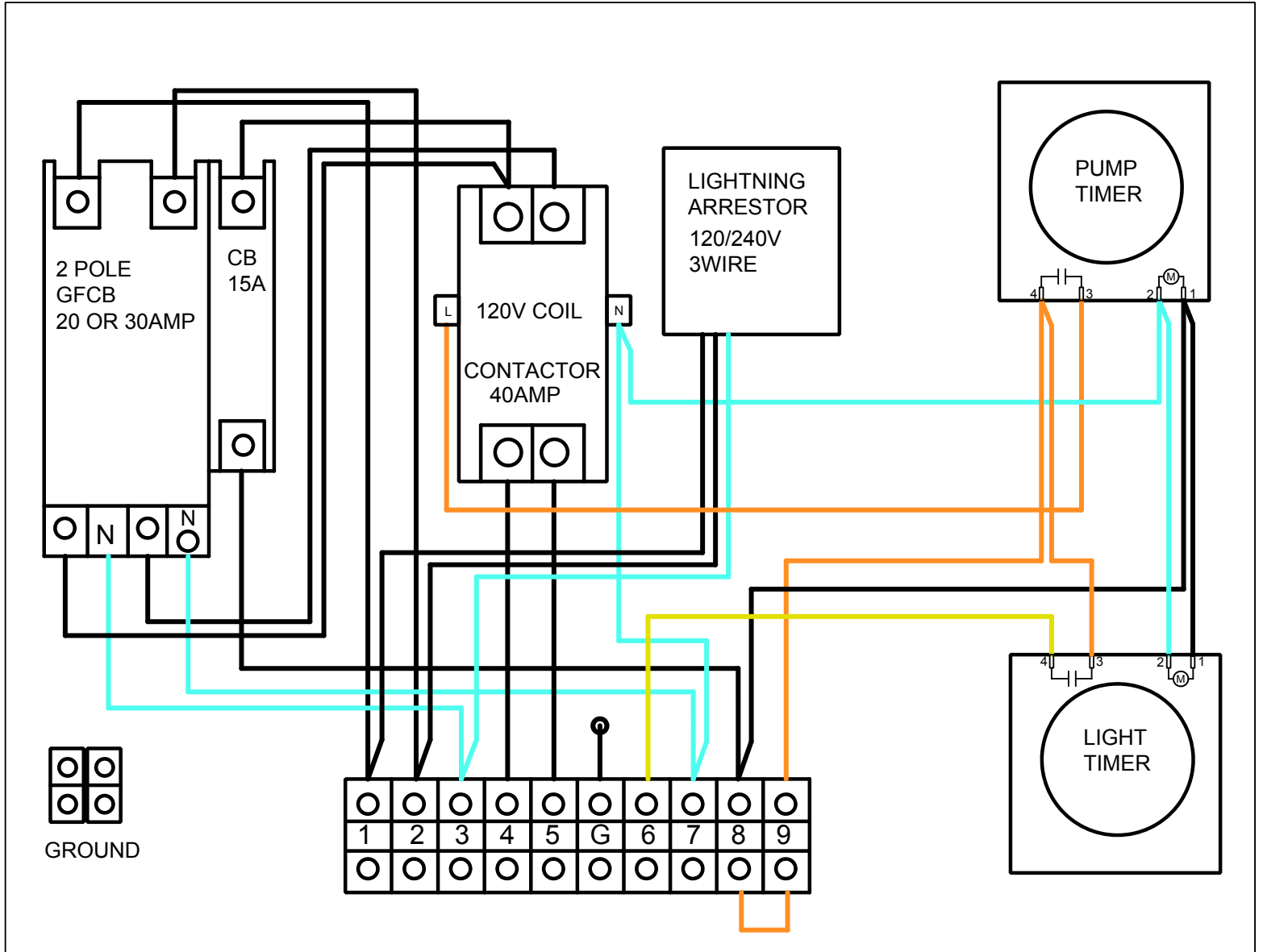
AMP DRAW OF MOTOR

TO MEASURE AMPS OF MOTOR
PLACE CLAMP-ON AMP METER AROUND
ONE LEAD TO THE MOTOR.
CHOOSE EITHER LEAD FROM TERMINALS 4 OR 5

**VOLTAGE AND AMP DRAW CAN BE MEASURED WITH A CLAMP ON MULTIMETER.
THIS TYPE OF METER WILL MEASURE BOTH AC VOLTAGE AND AMPERAGE**

Extech example





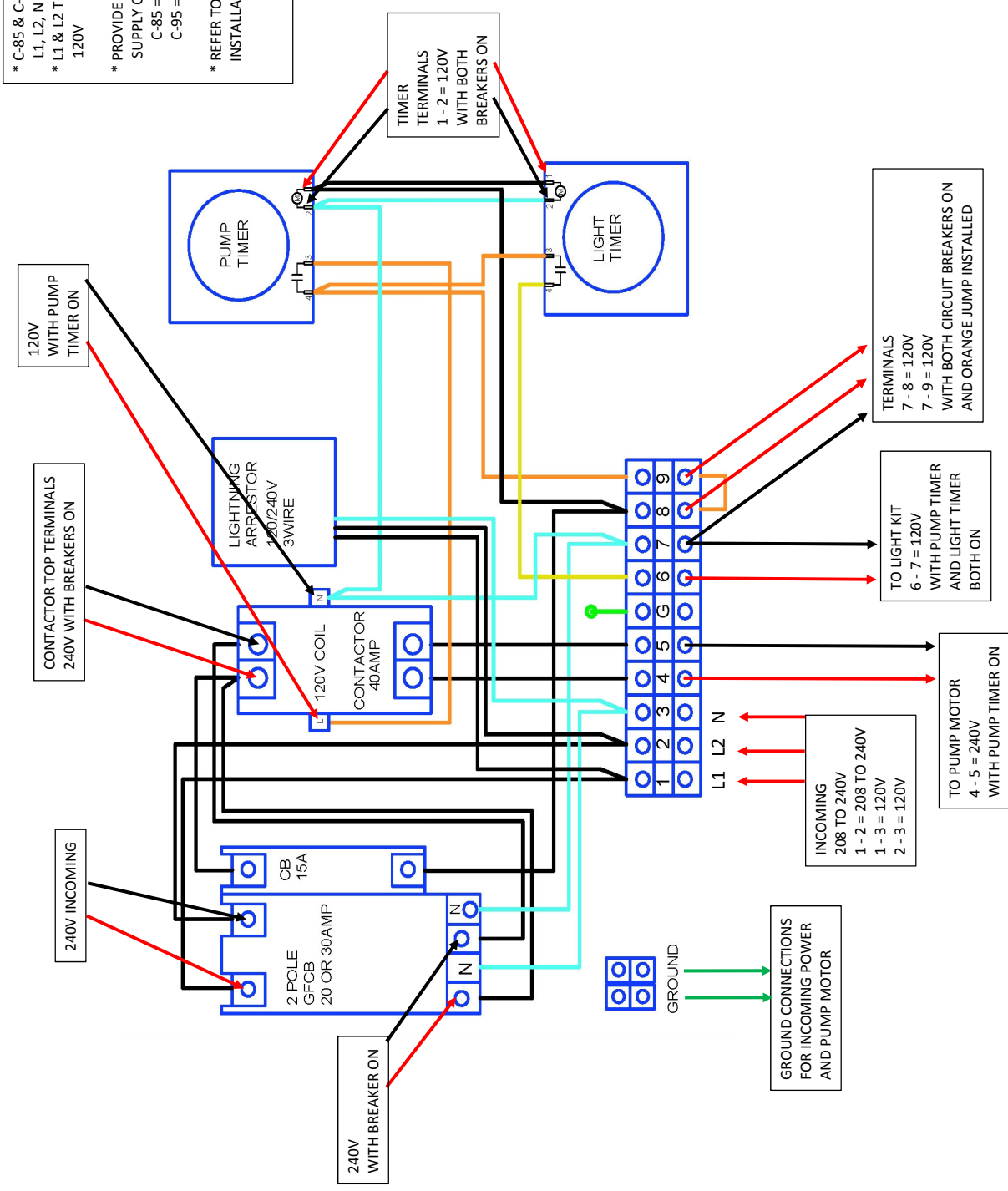
Kasco C-85 & C-95 VOLTAGE MEASUREMENTS

* C-85 & C-95 REQUIRE 4 WIRE SERVICE:
L1, L2, N & G

* L1 & L2 TO NEUTRAL MUST MEASURE 120V

* PROVIDE A NON-GFCI BREAKER ON THE SUPPLY CIRCUIT TO THIS CONTROL PANEL
C-85 = 30AMP BREAKER
C-95 = 40AMP BREAKER

* REFER TO AERATOR OWNER'S MANUAL FOR INSTALLATION INSTRUCTIONS



120V WITH PUMP TIMER ON

CONTACTOR TOP TERMINALS 240V WITH BREAKERS ON

240V INCOMING

240V WITH BREAKER ON

TIMER TERMINALS 1 - 2 = 120V WITH BOTH BREAKERS ON

INCOMING 208 TO 240V
1 - 2 = 208 TO 240V
1 - 3 = 120V
2 - 3 = 120V

TO PUMP MOTOR 4 - 5 = 240V WITH PUMP TIMER ON

TO LIGHT KIT 6 - 7 = 120V WITH PUMP TIMER AND LIGHT TIMER BOTH ON

TERMINALS 7 - 8 = 120V
7 - 9 = 120V WITH BOTH CIRCUIT BREAKERS ON AND ORANGE JUMP INSTALLED

GROUND CONNECTIONS FOR INCOMING POWER AND PUMP MOTOR

NON Metallic C-85 and C-95 control panel Replacement part #s

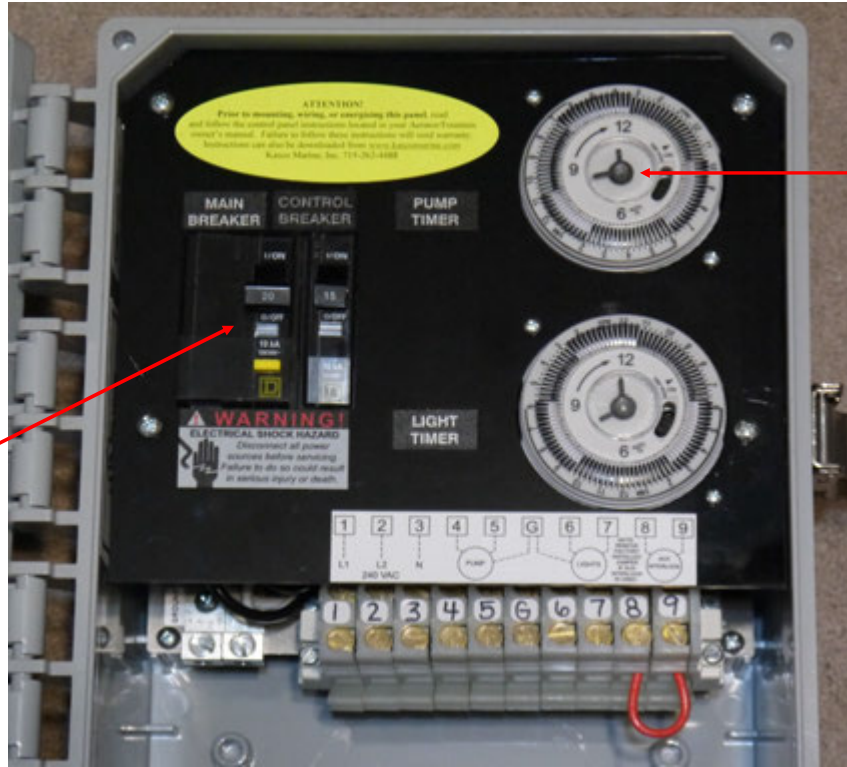
C-85 panel# 176005

C-95 panel# 176090

987220
20amp GFCB (C-85)

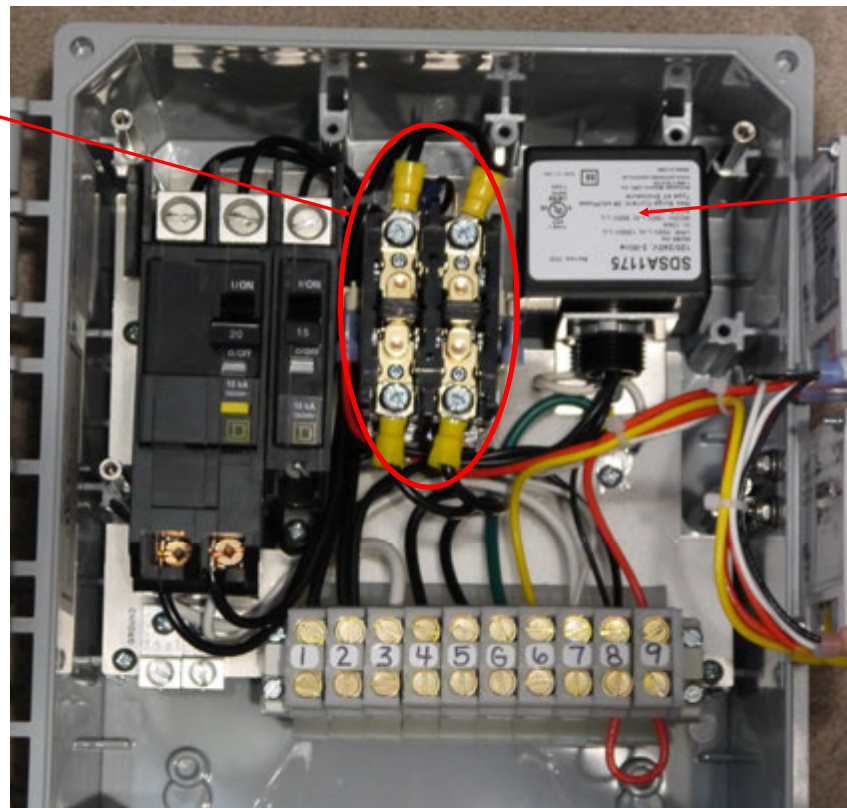
987230
30amp GFCB (C-95A)

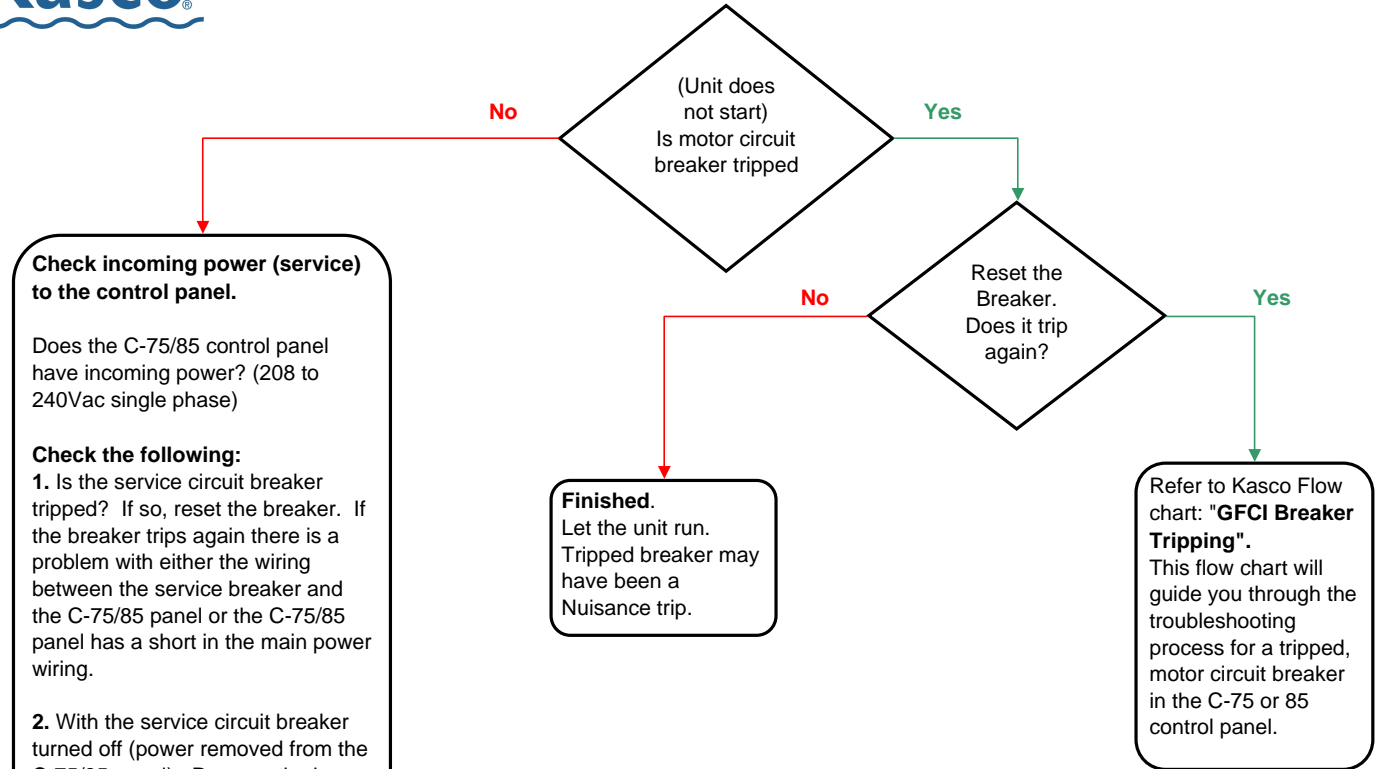
987140
Timer used in C-85, C-95
and all three phase
control panels



987100
Contactor
used in C-85 & C-95

987200
Lightning Arrestor
used in C-85 & C-95





Check incoming power (service) to the control panel.

Does the C-75/85 control panel have incoming power? (208 to 240Vac single phase)

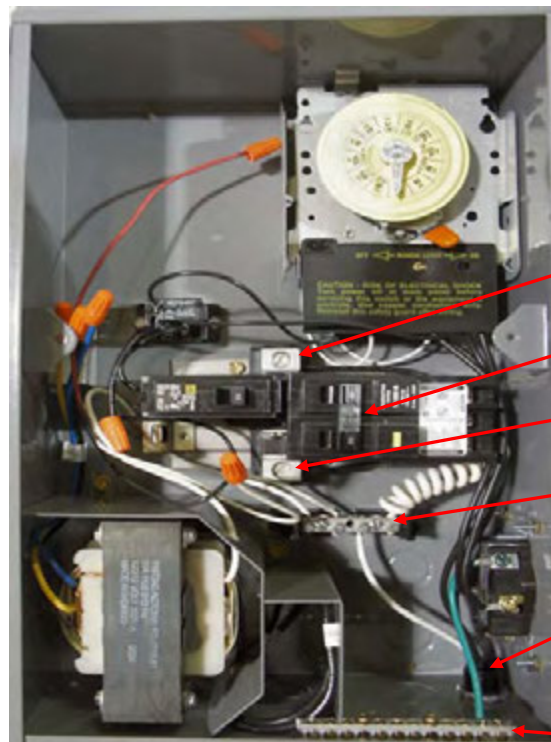
Check the following:

1. Is the service circuit breaker tripped? If so, reset the breaker. If the breaker trips again there is a problem with either the wiring between the service breaker and the C-75/85 panel or the C-75/85 panel has a short in the main power wiring.

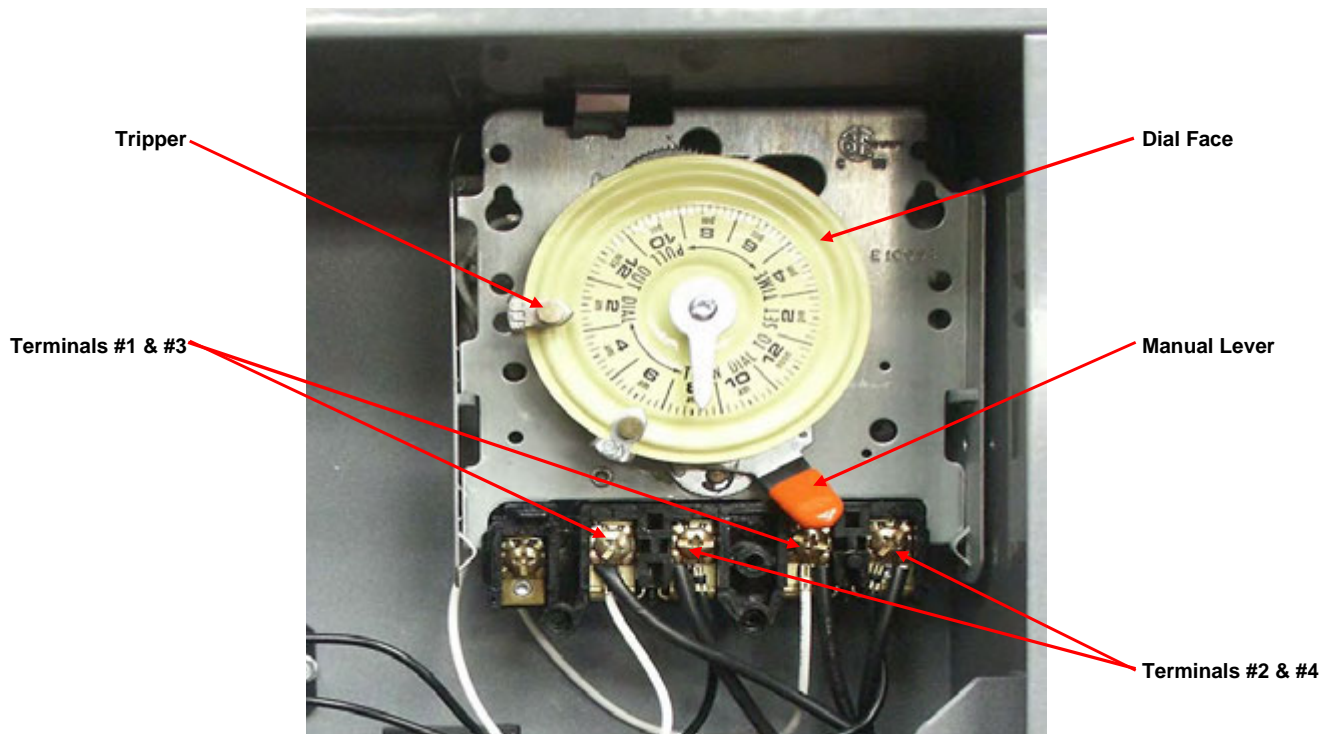
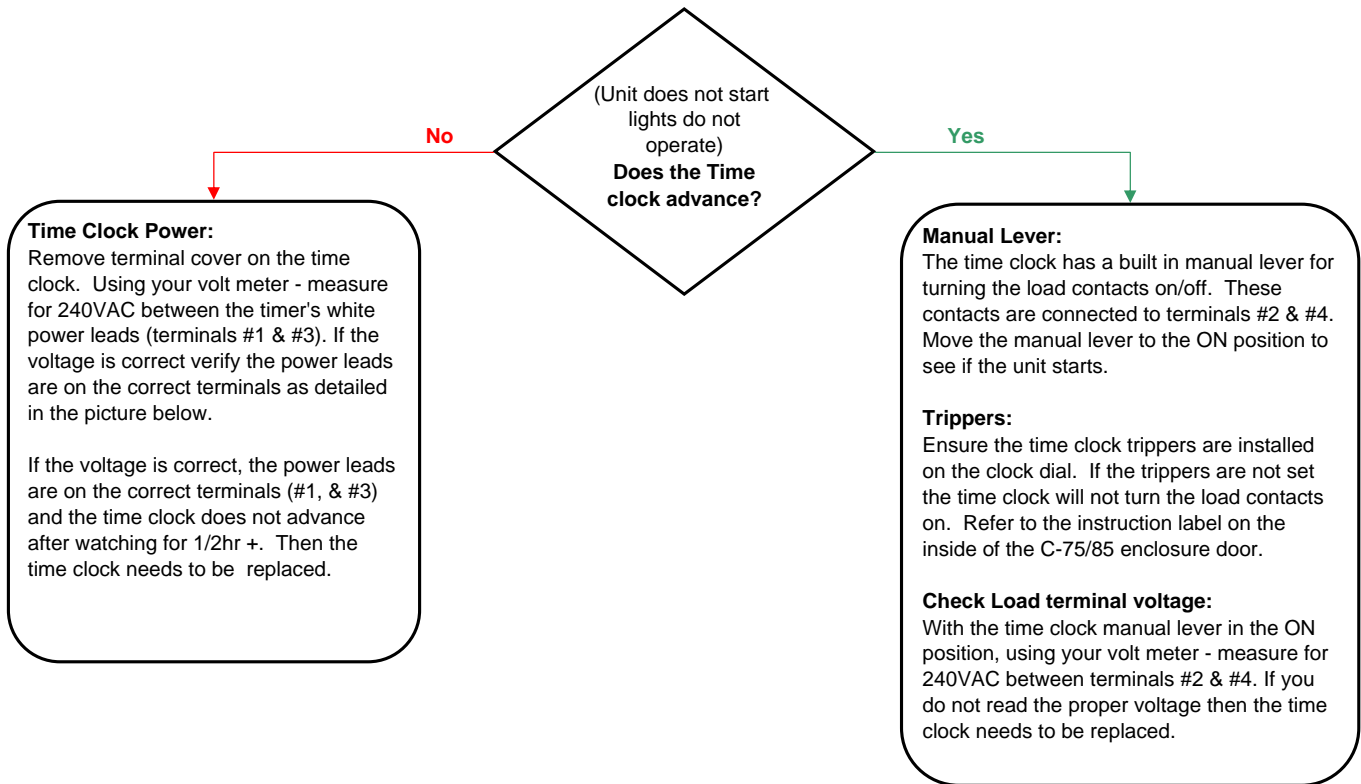
2. With the service circuit breaker turned off (power removed from the C-75/85 panel). Remove the inner metal cover and disconnect the lightning arrestor in the C-75/85. Reapply power to the panel. If the service breaker does not trip then the Lightning arrestor needs to be replaced. If the service circuit breaker still trips, then inspect the internal wiring of the C-75/85 panel. Look for any burn marks, or shorted wiring. If all wiring checks out then a problem may exist in the service.

3. Check the voltage of the incoming power: (L1, L2, N, G)
 L1 to L2 = 240Vac
 L1 to N = 120Vac
 L2 to N = 120Vac
 L1 to G = 120Vac
 L2 to G = 120Vac

If any of these voltage checks are not correct then a problem may exist in the service.



- L1 (line 1) Lug
- Motor circuit breaker
- L2 (line 2) Lug
- N (neutral) Bar
- Lightning Arrestor (extends through bottom of enclosure. Leads are connected to L1, L2, & N)
- G (ground) Bar



C-85/95 Troubleshooting - Lighting circuit

Pre-check:

Time clock is in the ON position. The 15amp circuit breaker is in the ON position. Cover the photo eye (may take several minutes to register darkness). Measure the voltage on the 120Vac GFCI receptacle.

15amp Circuit Breaker:

With the circuit breaker on; measure the voltage on the breaker lug. You should measure 120Vac. If you do not measure any voltage the breaker needs to be replaced. (ensure the panel is energized)

Relay:

The relay is used to switch 120Vac power to the photo-eye. Coil power to the relay is from the time clock load terminals. Measure the voltage on the relay coil terminals. The voltage should read 240Vac. Measure the voltage on each of the relay contact terminals to the Neutral bar. You should measure 120Vac on both terminals with the relay coil energized. If you do not then the relay needs to be replaced. If you do not measure 120Vac on either of the contact terminals then the 15amp circuit breaker should be checked.

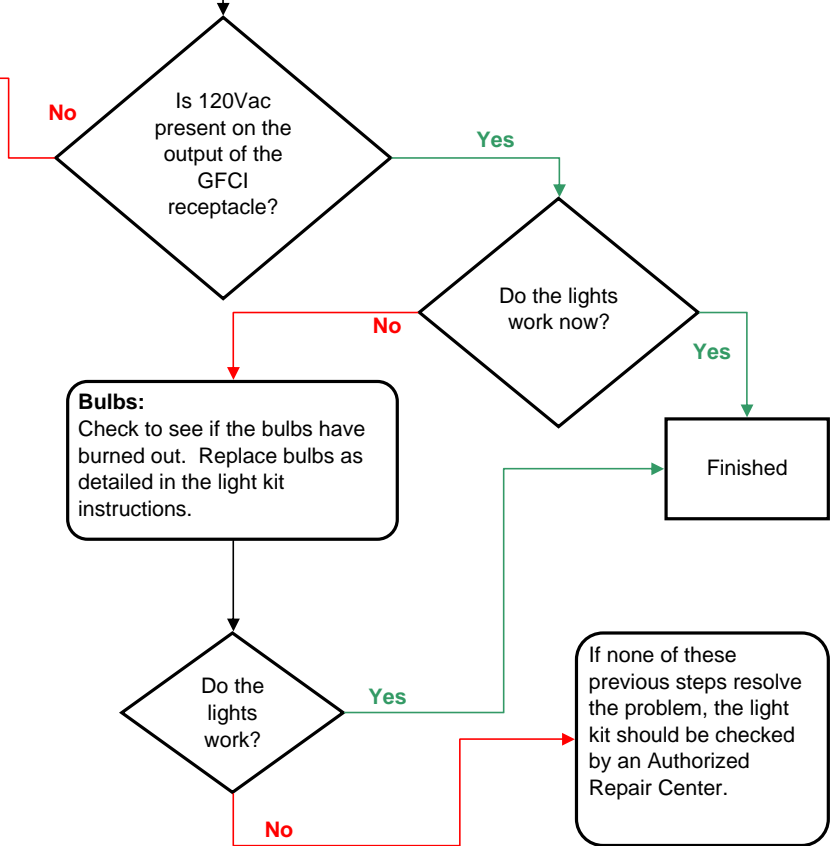
Photo Cell:

Each control panel has a built in Photo Cell that measures levels of darkness. The lights will only turn on when it is dark and the fountain is in operation. To override this and test the lights, make sure the photo cell is covered. (may take several minutes) If the lights still do not operate the photo cell may be faulty. To check the output of the photo cell disconnect the red wire from the photo cell and measure the AC voltage between it and the neutral bar. With the photo cell ON it should be 120Vac. If not, the Photo cell needs to be replaced. Make sure you turn off the power to the panel when disconnecting / reconnecting any wiring.

GFCI Receptacle reset:

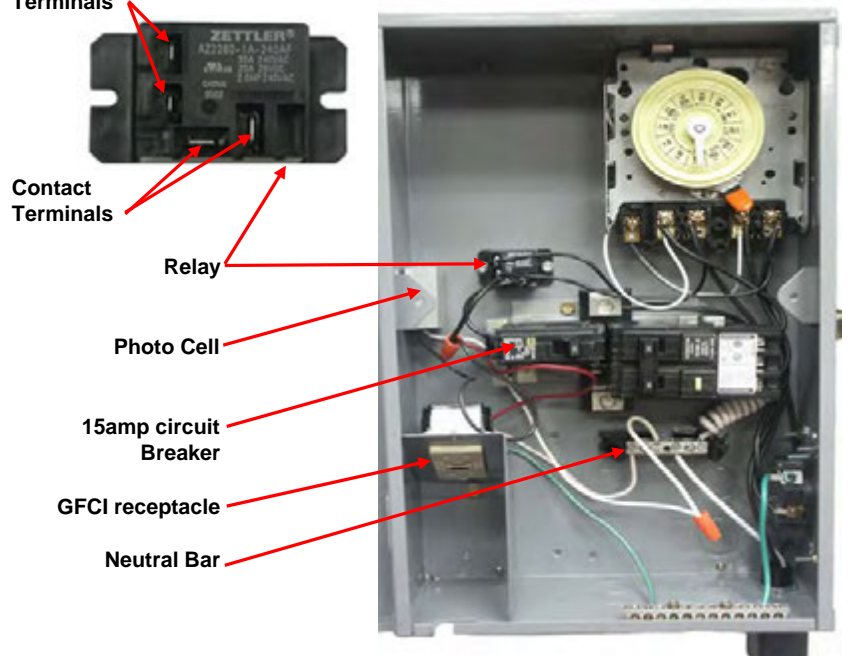
The GFCI receptacle has a built in reset button. If the receptacle is tripped (with the light kit unplugged) press the reset. If the GFCI does not reset then the receptacle needs to be replaced.

If the receptacle resets and then trips out when the light kit is plugged in, then the problem is in the light kit and should be checked by an Authorized Repair Center.



Coil Terminals

Contact Terminals



C-75 Troubleshooting - Lighting circuit

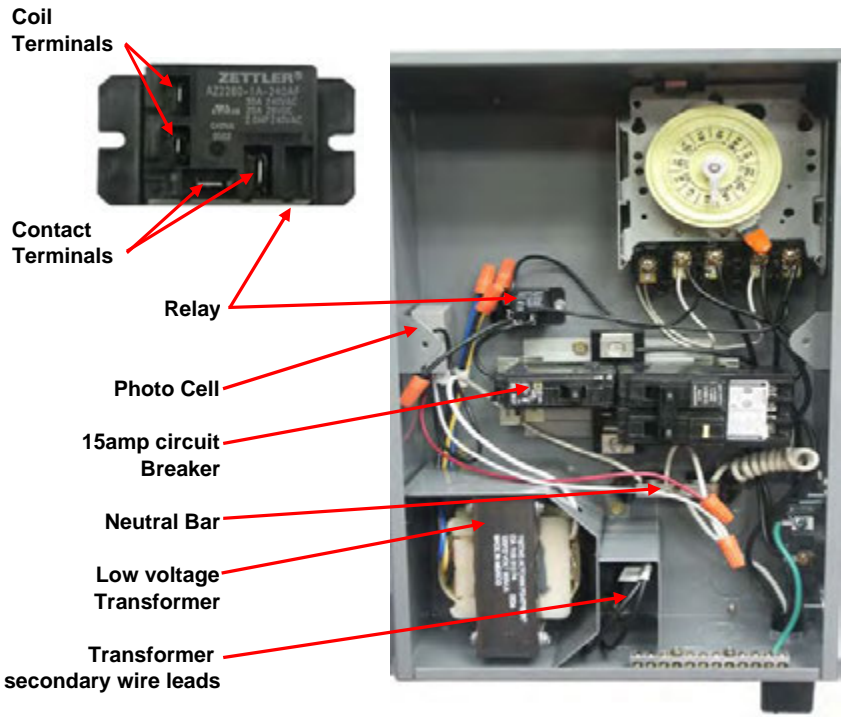
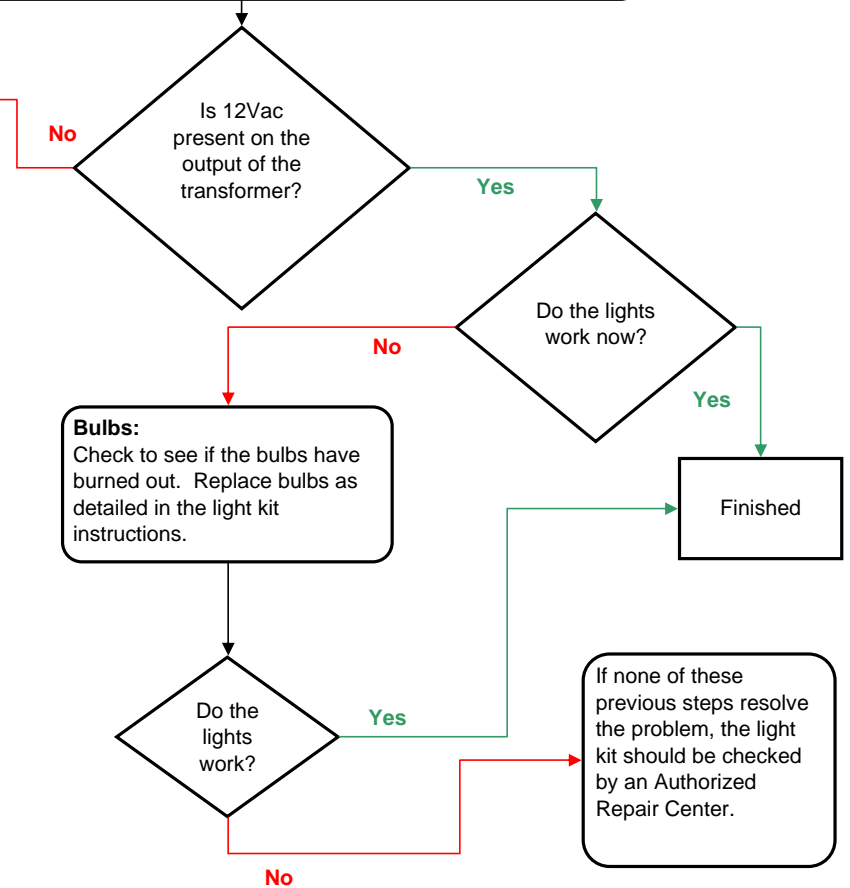
Pre-check:
Time clock is in the ON position. The 15amp circuit breaker is in the ON position. Cover the photo eye (may take several minutes to register darkness). Measure the voltage on secondary of the transformer (12 - 14Vac)

15amp Circuit Breaker:
With the circuit breaker on; measure the voltage on the breaker lug. You should measure 120Vac. If you do not measure any voltage the breaker needs to be replaced. (ensure the panel is energized)

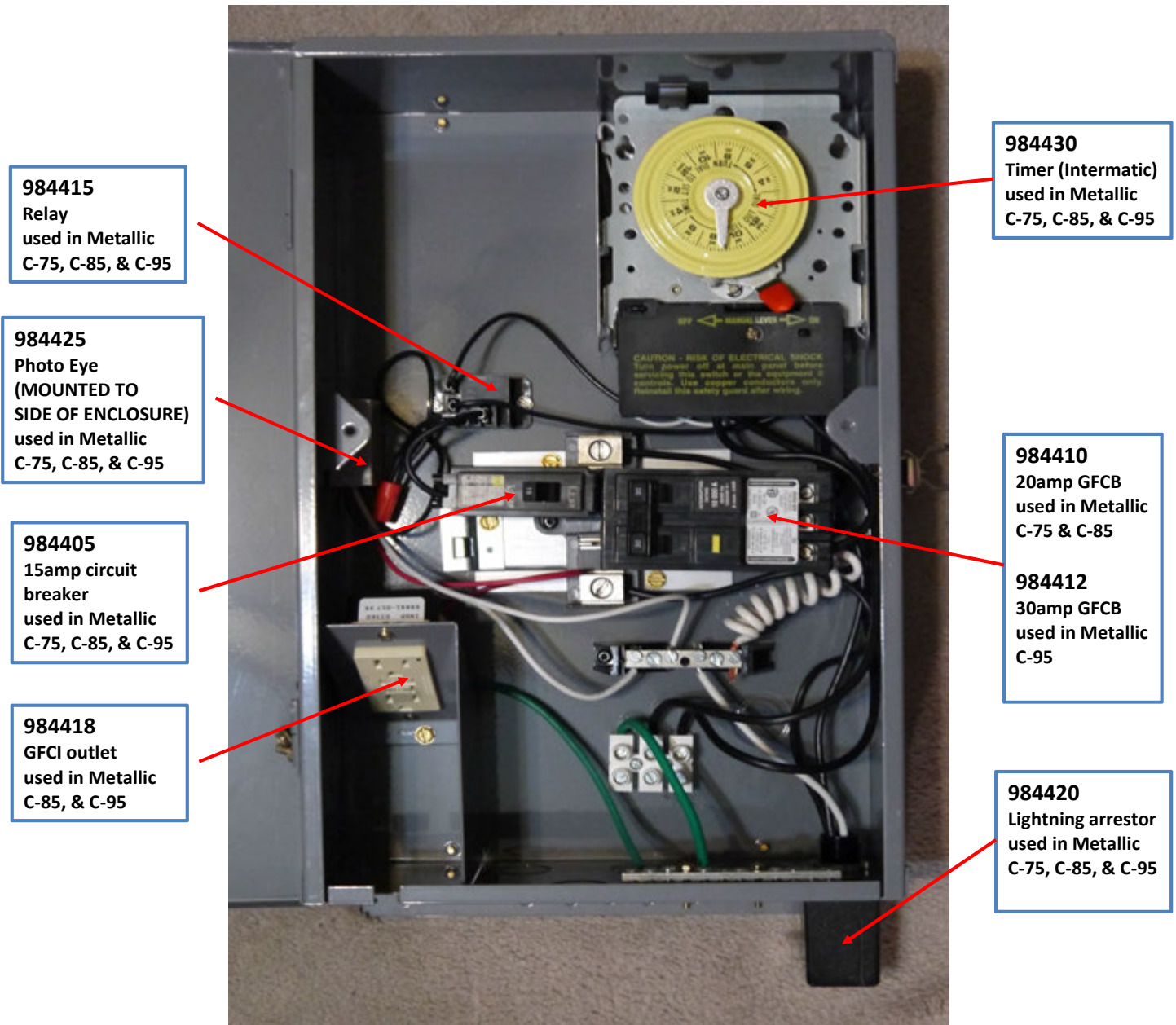
Relay:
The relay is used to switch 120Vac power to the photo cell. Coil power to the relay is from the time clock load terminals. Measure the voltage on the relay coil terminals. The voltage should read 240Vac. Measure the voltage on each of the relay contact terminals to the Neutral bar. You should measure 120Vac on both terminals with the relay coil energized. If you do not, then the relay needs to be replaced. If you do not measure 120Vac on either of the contact terminals then the 15amp circuit breaker should be checked.

Photo Cell:
Each control panel has a built in Photo Cell that measures levels of darkness. The lights will only turn on when it is dark and the fountain is in operation. To override this and test the lights, make sure the photo cell is covered. (may take several minutes) If the lights still do not operate the photo cell may be faulty. To check the output of the photo cell disconnect the red wire from the photo cell and measure the AC voltage between it and the neutral bar. With the photoeye on it should be 120Vac. If not, the Photo cell needs to be replaced. Make sure you turn off the power to the panel when disconnecting / reconnecting any wiring.

Low Voltage Transformer:
The low voltage transformer supplies 12, 13, or 14Vac to the low voltage light kits. To check the secondary voltage of the transformer measure AC volts between the two black wire leads. (these are the leads that connect to the light kit). With everything turned on (time clock, 15amp breaker, relay, photo cell) you should measure 12,13, or 14Vac. If not the transformer needs to be replaced.



Metallic C-75, C-85 & C-95 control panel Replacement part #s



984415
Relay
used in Metallic
C-75, C-85, & C-95

984425
Photo Eye
(MOUNTED TO
SIDE OF ENCLOSURE)
used in Metallic
C-75, C-85, & C-95

984405
15amp circuit
breaker
used in Metallic
C-75, C-85, & C-95

984418
GFCI outlet
used in Metallic
C-85, & C-95

984430
Timer (Intermatic)
used in Metallic
C-75, C-85, & C-95

984410
20amp GFCB
used in Metallic
C-75 & C-85

984412
30amp GFCB
used in Metallic
C-95

984420
Lightning arrester
used in Metallic
C-75, C-85, & C-95

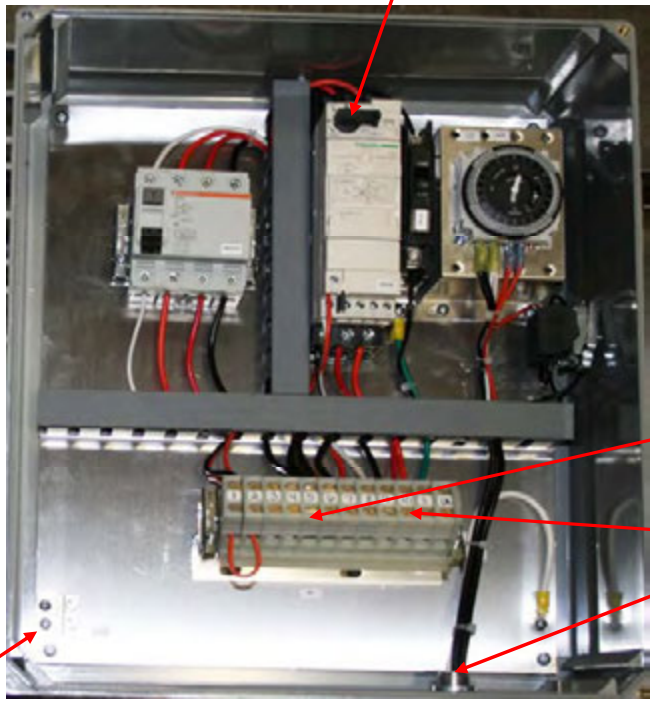
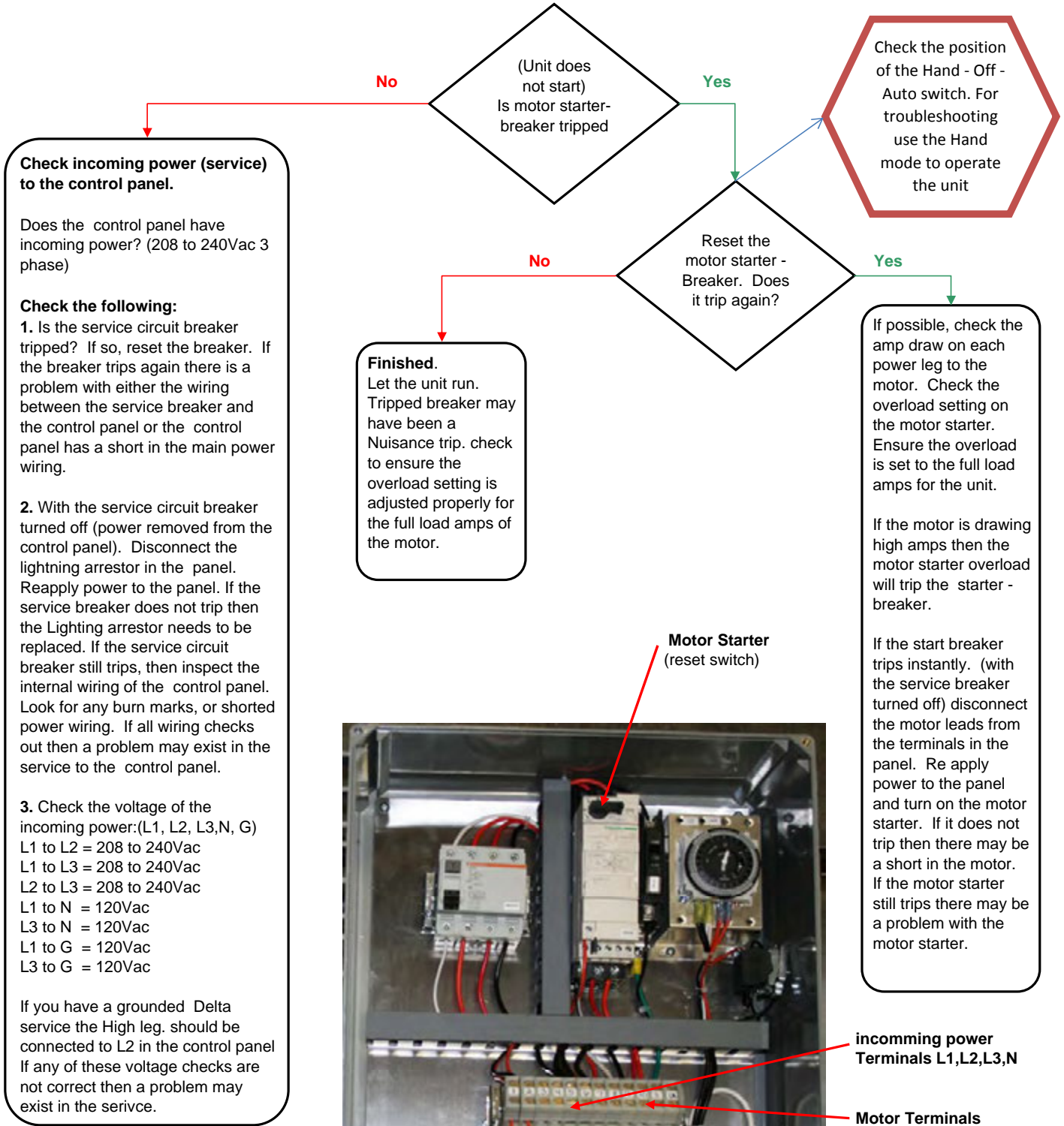
Other parts available for replacement

- 984440** Clip/Bracket to hold timer (metallic)
- 984500** C-85 Timer Clips (metallic)
- 984460** Weatherproof Cover and inserts

bracket that hold the timer in the enclosure
clips used on the timer to set on/off times
outlet cover used on the C-75 and C-85 panels for fountain connection

3phase control panel - Incoming Power - Motor starter

Refer to electrical schematic included with the control panel
And startup procedure included in the panel & owners manual



G (ground) Bar

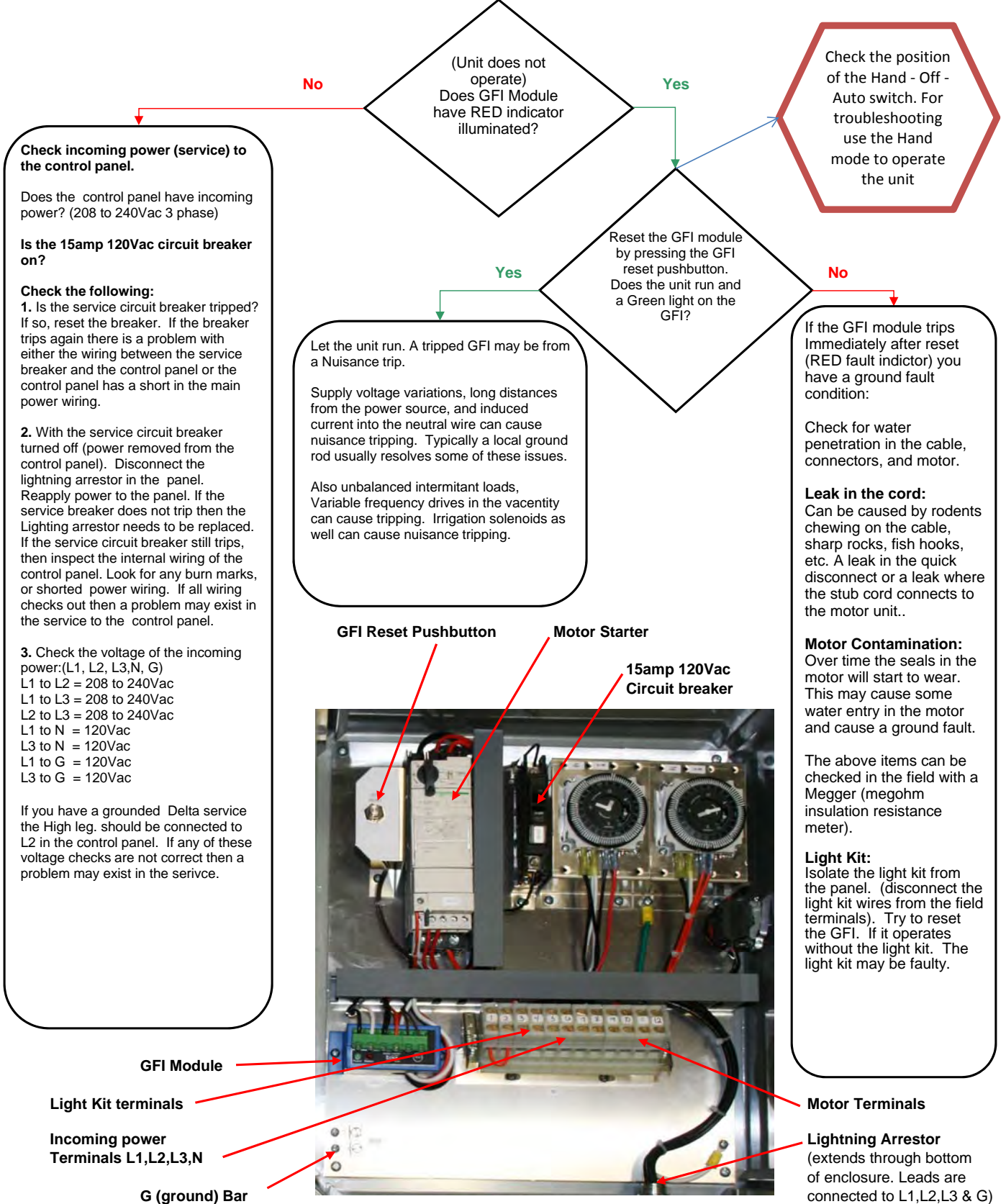
incoming power Terminals L1,L2,L3,N

Motor Terminals

Lightning Arrester (extends through bottom of enclosure. Leads are connected to L1,L2,L3 & G)

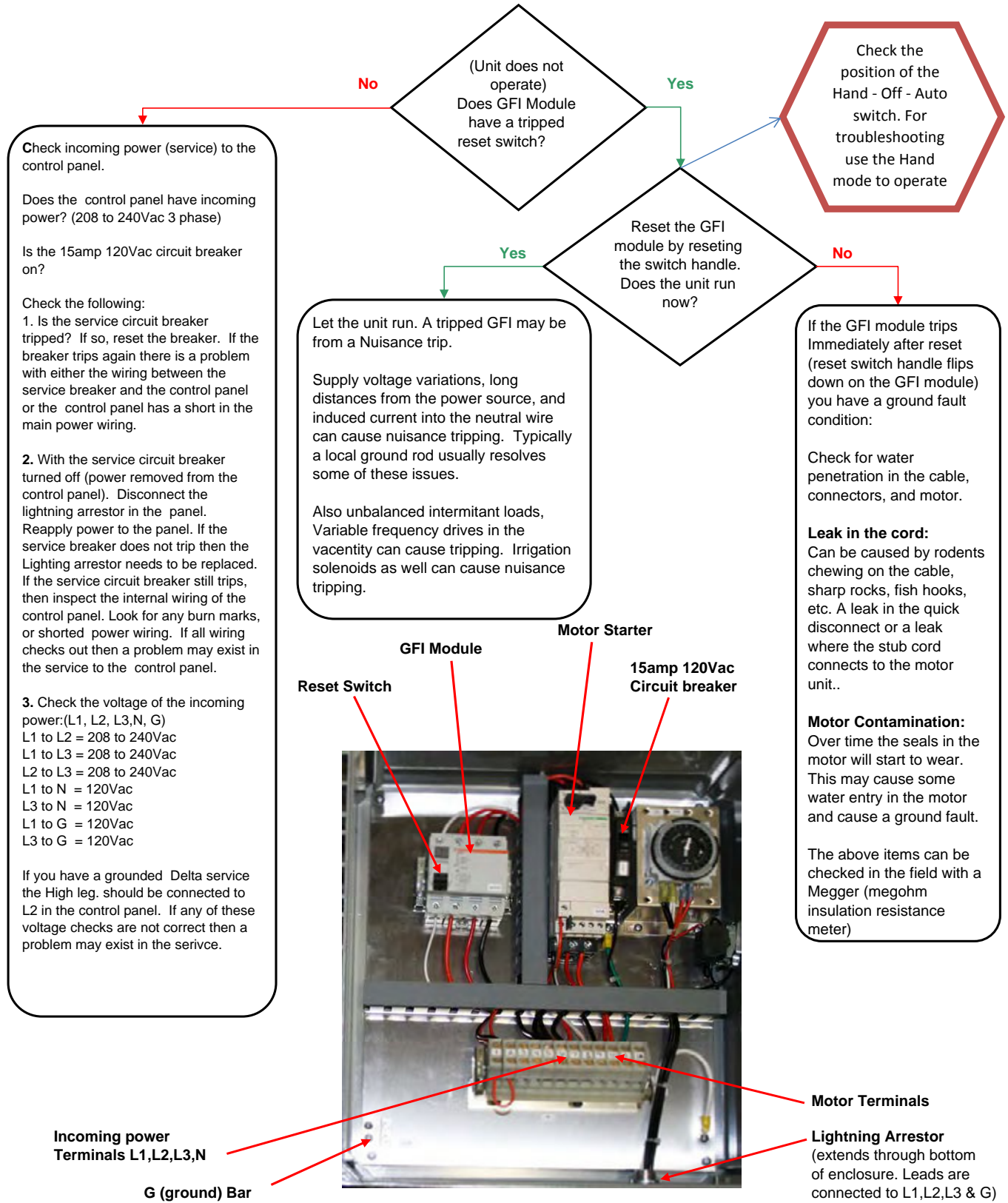
3phase Fountain control panel - GFI Module Troubleshooting

Refer to electrical schematic included with the control panel
And startup procedure included in the panel & owners manual

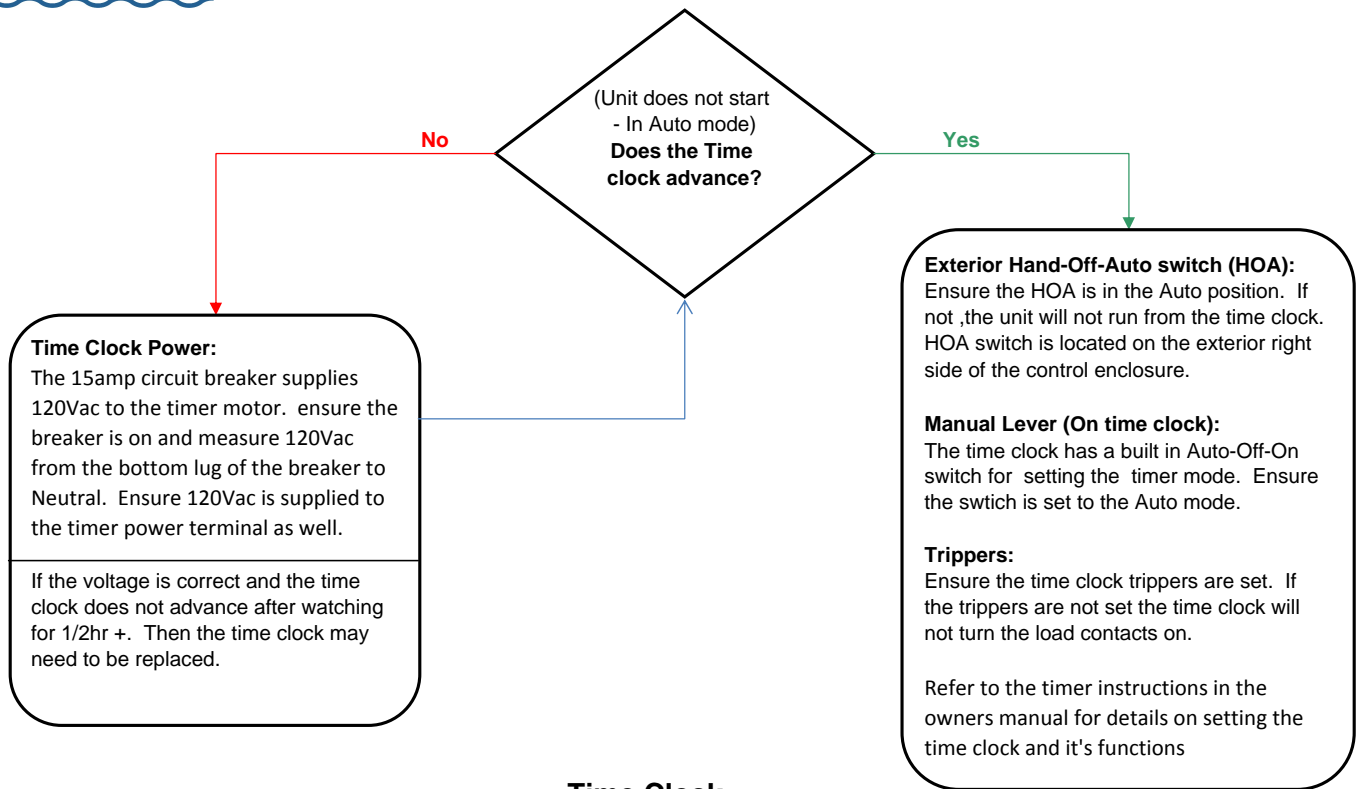


3phase Aerator control panel - GFI Module Troubleshooting

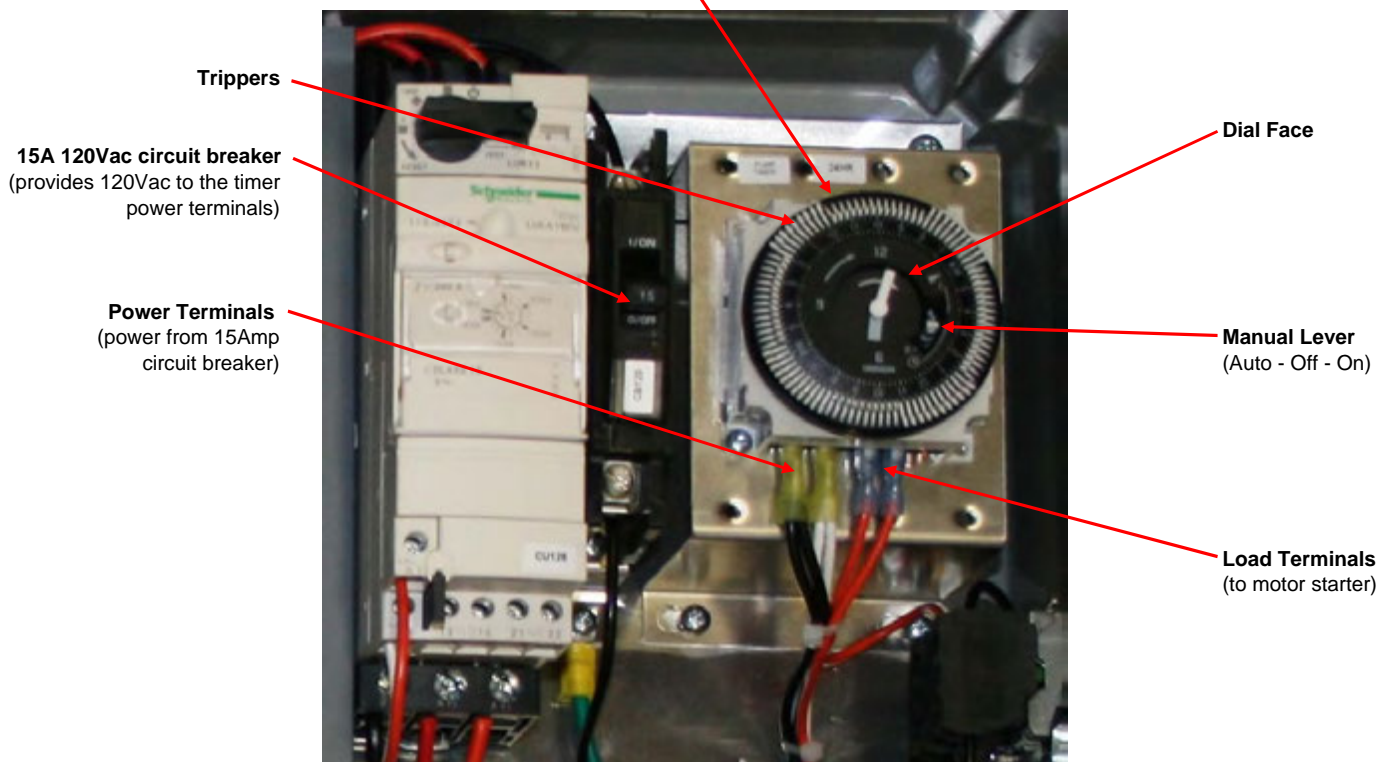
Refer to electrical schematic included with the control panel
And startup procedure included in the panel & owners manual

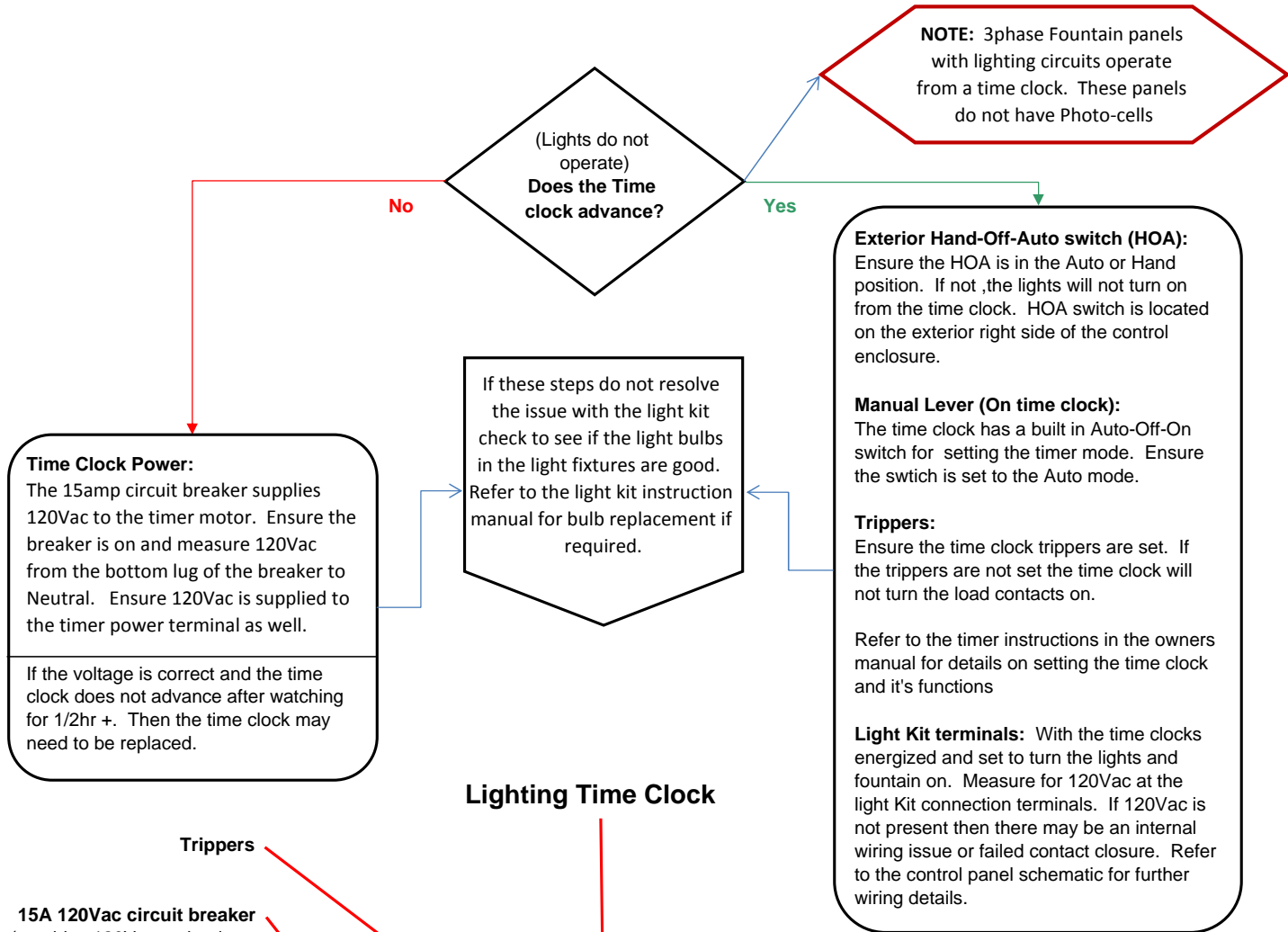


3phase panel - Unit Time clock Troubleshooting

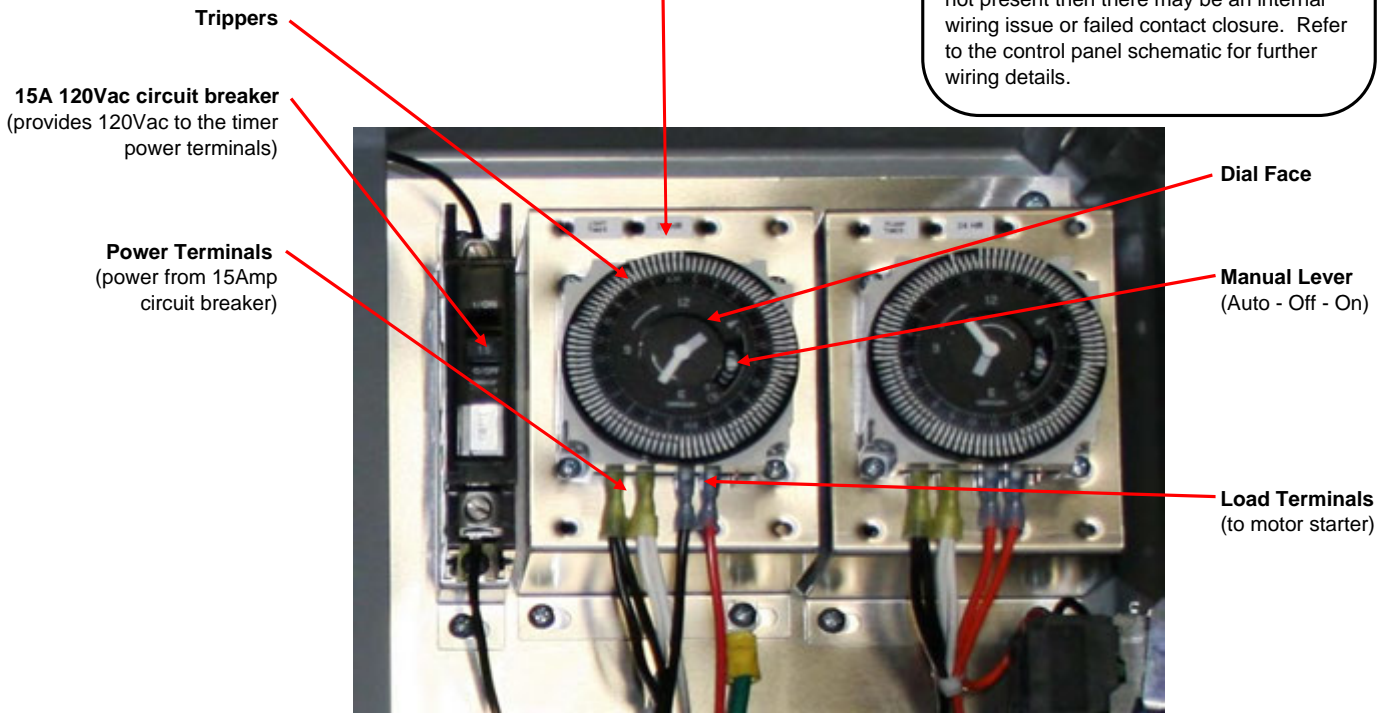


Time Clock





Lighting Time Clock



Megohm testing power cords and motors for insulation breaks

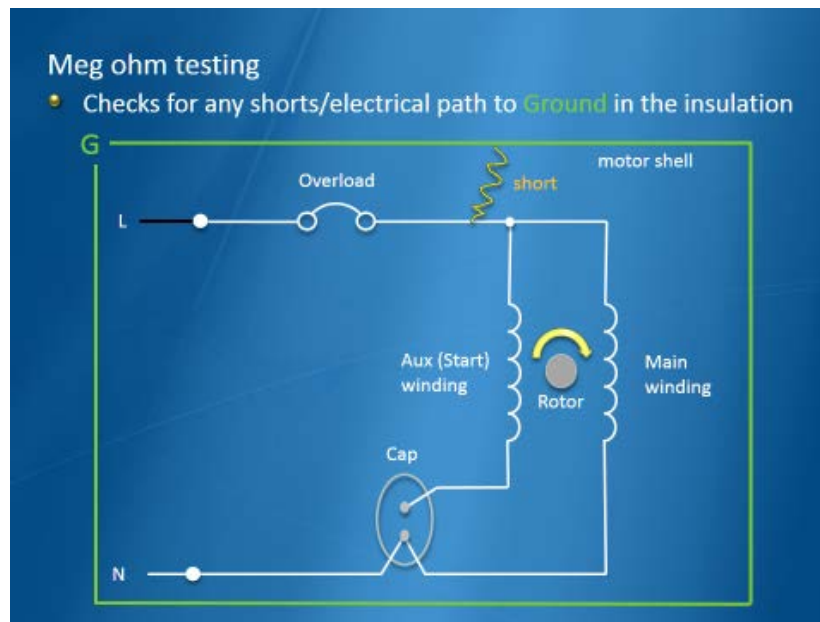
Power cords and motors can develop small breaks in their insulation and create a ground fault condition. This will trip a GFCI. Testing with a standard Digital Multi Meter (DMM) for continuity will not reliably detect a break in insulation. The main difference between the Megohm meter and a DMM is the voltage applied for the test. A standard DMM will use less than 9 volts to test for continuity. A Megohm meter will use; 250 volts, 500 volts, or 1000 volts. This “high” voltage test will cause voltage to jump through the insulation break and detect a faulty cable or motor unit.

Kasco motor testing should be performed using a 500 volt test range. Using a 1000 volt test range could cause damage to the motor windings.

In a typical test the motor frame is grounded and a megohm meter applies voltage to the motor windings. A good motor will produce readouts in hundreds or thousands of megohms resistance to ground.

In most applications, motors in the field that are in reasonable operating condition will show over 100 Megohms.

Note: New motor units from Kasco will typically be 1000Megohms of resistance from stub cord to ground (motor windings to ground). If a motor in the field reads below 100Megohms it may indicate water contamination in the oil.



Internal motor circuit diagram: During normal operation (no insulation breaks or water in the motor), the motor wiring (windings, capacitor, overload, wiring connections) will have no path to ground. Ground is connected to the metal frame of the motor, stainless steel can, and any other exposed metal part of the motor housing. If water enters the motor, or a failure occurs in the wiring. Then we will see a “short” or path to ground. This path will cause GFCI tripping.

Steps to checking a Kasco unit:

NOTE: Testing is performed with the unit disconnected from the control panel.

1. **First check the complete unit with power cord attached.** This test will detect if there is a problem with the unit over all. Disconnect the motor power cord from the control panel. Connect the Megohm meter to the power cord and perform the following tests: (See Fig. 4, 5, & 6 below)

L1 to Ground pin or Green conductor
L2 (Neutral 120v) to Ground pin or Green conductor L3
(3phase) to Green conductor

The Megohm meter typically will read over 100 Megohms for a “good” test.



Fig. 4

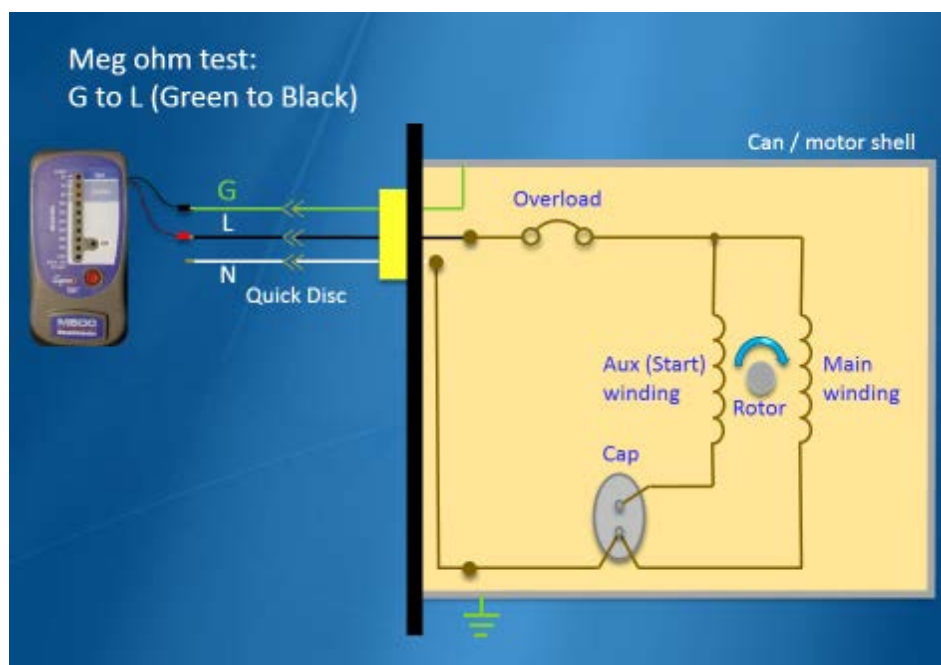


Fig. 5

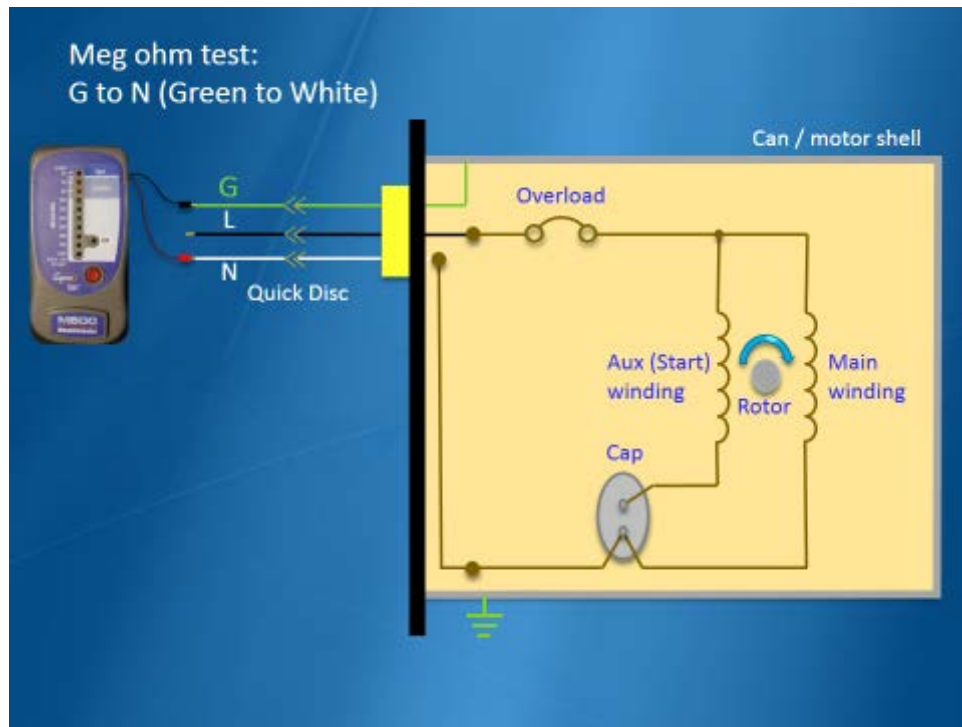


Fig. 6

If the tests in step 1 pass all checks then the unit does not have any insulation breaks. If the unit does not pass the checks then proceed with step 2.

2. **Remove the power cord from the motor unit.** With the cord removed perform these test steps on just the power cord. (Fig. 6) Testing the power cord alone should produce an infinite reading on the Megohm meter if the cord is good. (No conductive path between the conductors). Test the following:

- L1 to L2
- L1 to L3 (3phase)
- L2 to L3 (3phase)
- L1 to Ground pin or wire
- L2 to Ground pin or wire
- L3 to Ground pin or wire (3phase)

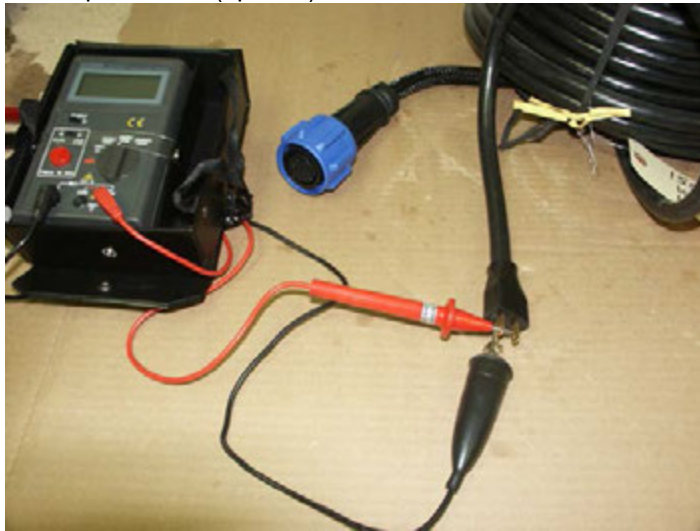


Fig. 6

If the power cord fails any of the checks then the cord should be replaced or repaired. (Replace quick disconnect?)

3. **Perform the same tests on just the motor unit as in Step 1.** The use of a stub cord with open leads will ease testing. (See Fig. 8)

L1 to Ground pin
L2 to Ground pin
L3 to Ground pin (3phase)



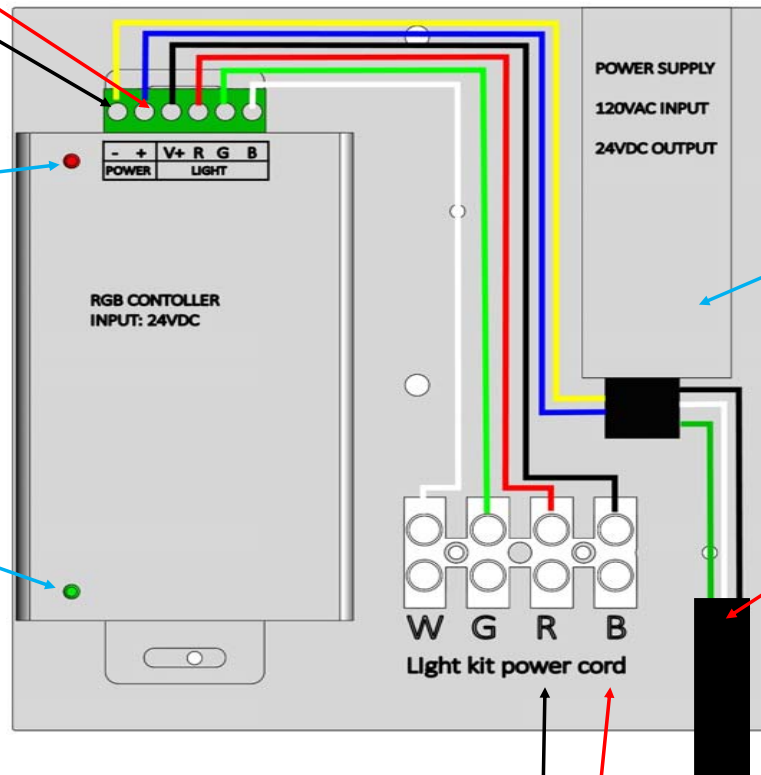
Fig. 8

During these tests the Megohm meter should typically read above 100 megohms.

MEASURE: 24VDC FROM
POWER SUPPLY
MEASURE BETWEEN
BLUE +, YELLOW -
SET YOUR METER TO DC VOLTS

POWER ON INDICATOR LED
IF THIS LED IS NOT ON. MEASURE
VOLTAGE AS NOTED ABOVE

SIGNAL LED INDICATOR: THIS LED
WILL FLASH WHEN THE REMOTE
CONTROL IS COMMUNICATING
WITH THE RGB CONTROLLER.
IF THIS LED DOES NOT FLASH WHEN
USING THE REMOTE. CHANGE THE
REMOTE COIN CELL BATTERY.



THE DC POWER SUPPLY HAS
A GREEN LED INDICATOR INTERNAL
TO THE CIRCUIT BOARD.
IF THIS LED IS NOT ON. THEN VERIFY
INCOMING AC VOLTAGE IS PRESENT.
IF INCOMING AC IS VERIFIED AND YOU DO
NOT HAVE 24VDC BETWEEN THE BLUE AND YELLOW
WIRES THE POWER SUPPLY MAY BE DEFECTIVE.

INCOMING POWER CORD:
120VAC NEMA 5-15 PLUG
BLACK TO WHITE = 120VAC
GREEN IS = EARTH GROUND
CONNECTS TO POWER SUPPLY
TERMINALS.

FIELD WIRING TERMINALS TO RGB5 LIGHT KIT
B = + DC VOLTAGE CONNECTION (COMMON ANODE)
R = RED LED - CATHODE CONNECTION
G = GREEN LED - CATHODE CONNECTION
W = BLUE LED - CATHODE CONNECTION

MEASURING BETWEEN B AND ANY COLOR TERMINAL
WILL SHOW A DC VOLTAGE VALUE FROM 0 TO 24VDC.
THIS VALUE WILL CHANGE WITH WHICH COLORS ARE ACTIVE
AND HOW BRIGHT THEY ARE TURNED ON.

Troubleshooting tips - LED light kit

The following is provided to help diagnose a probable source of trouble. It is a guideline only and may not show all causes for all problems. For additional troubleshooting help contact your local distributor or visit www.kascomarine.com for additional help.

NOTE: you may need to refer to your owners manual that was provided with your fountain for additional control panel settings and adjustments.


Problem	Possible Cause	Likely Remedy	
Light kit is installed and wired, but will not turn on.	Power is off or disconnected	Ensure control panel is connected to the electrical circuit. Verify circuit breakers, timers, and/or interlock switches are turned on and functional. Refer to your owners manual that was provided with the fountain.	
	Not dark enough for photo eye to activate	<p>C-25 control panel: The control panel has a photo eye on the left side of the enclosure exterior. This photo eye measures ambient light. To activate, the photo eye must not measure any ambient light for at least several minutes. Also, the C-25 timer must be turned on (fountain operating) to allow the light circuit to energize. Covering the photo eye with black electrical tape will activate the photo eye for testing.</p> <p>C-85, or C-95 control panel with GFCI outlet and photo eye control: The control panel has a photo eye on the left side of the enclosure exterior. This photo eye measures ambient light. To activate, the photo eye must not measure any ambient light for at least several minutes. Also, the fountain timer must be turned on (fountain operating) to allow the light circuit to energize. Covering the photo eye with black electrical tape will activate the photo eye for testing. While the photo eye is covered, the GFCI outlet can be reset if tripped.</p>	
	Timer not set properly	<p>C-85, or C-95 control panel (and all 3phase fountain control panels) with terminal connections and timer control for light kit: The control panel has a second timer for controlling the lights (No photo eye). Ensure the light timer is set to operate the lights. The timer has a built in Hand-Off-Auto switch. Ensure the switch is set properly. Ensure the fountain is turned on. The light timer will not energize the light kit unless the fountain circuit is energized.</p>	
	GFCI is tripped		<p>C-25 control panel: Reset the GFCI. If the GFCI does not reset it could be a ground fault in the fountain wiring, or the light kit wiring. Unplug both the fountain and light kit and reset the GFCI. If it resets, plug fountain then light kit back in and see which one trips the GFCI. If the GFCI does not reset with both unplugged, then the GFCI may be defective.</p>
			<p>C-85, or C-95 control panel with GFCI outlet and photo eye control: To reset the GFCI outlet the fountain timer must be turned on, and the photo eye must be activated. (black electrical tape can be wrapped around the photo eye to activate it). Once these are on, the GFCI reset button can be pressed. (unplug the light kit prior). Plug the light kit in and see if it operates. If the GFCI trips again then the light kit may be damaged. If the GFCI does not reset (with light kit unplugged) then it may be defective or the photo eye is not activated to send power to the outlet.</p>
<p>C-85, or C-95 control panel with terminal connections and timer control for light kit: For panels with a GFCB (ground fault circuit breaker) and timer controlled lights, simply reset the two pole breaker. This will turn the fountain and light kit back on if the timers are set to on! If it trips again, disconnect the light kit from the terminals and reset. WARNING! you must turn off power to the panel before disconnecting any wiring from the terminals! If the breaker trips with the light kit disconnected, then disconnect the fountain as well and reset. If the breaker continues to trip it may be a defective GFCB. If the breaker resets, then reconnect the fountain then the light kit to see which one trips the GFCB.</p>			
		<p>3phase fountain control panels: 3phase fountain panels have a ground fault sensing module that will trip if either the light kit or fountain has a ground fault. To reset the module, simply press the reset button in the panel. This will turn the fountain and light kit back on if the timers are set to on! If it trips again, disconnect the light kit from the terminals and reset. WARNING! you must turn off power to the panel before disconnecting any wiring from the terminals! If the GFI module trips with the light kit disconnected, then disconnect the fountain as well and reset. If the GFI module continues to trip it may be a defective module or an internal wiring issue with the panel. If the module resets, then reconnect the fountain then the light kit to see which one trips the module.</p>	
Light work. However, they are not as bright as when first installed.	Dirty lenses	Turn of power to the control panel and disconnect power cords to the fountain and the light kit. Bring the fountain to the shore and inspect the light lenses. Over time, algae growth and hard water deposits on the lenses can block light output. Clean the lenses with a soft brush and the light should be bright again.	

Full load amps by model type
 Locked Rotor (startup) Amps
 Shaft rotation


MODEL #	Voltage	Full Load Amps by model			Locked Rotor Amps	Motor Rotation Looking down @ shaft
	Volts	A/D/C	J	V		
1400	120	NA	3.1	NA	10	Counter Clockwise
2400SF	120	NA	7	NA	18	Counter Clockwise
2400	120	5.0	NA	5.6	12	Counter Clockwise
3400	120	6.7	7.3	7.3	18	Counter Clockwise
3400H	240	3.4	3.7	3.7	9	Counter Clockwise
4400	120	11.3	11	11.3	40	Counter Clockwise
4400H	240	5.7	5.5	5.7	20	Counter Clockwise
8400	240	9.0	10	11	40	Clockwise
3.1	240	10.7	13.4	NA	61	Clockwise
5.1	240	18	20	20	97	Clockwise
2.3	230	4.5	7.5	7.5	40	Clockwise
2.3H	460	2.3	3.6	3.6	24	Clockwise
3.3	230	8.2	10.3	NA	70	Clockwise
3.3H	460	4.1	5.1	NA	40	Clockwise
5.3	230	13	16	16	100	Clockwise
5.3H	460	6.5	7.8	7.8	49	Clockwise
7.3	230	NA	20	NA	100	Clockwise
7.3H	460	NA	10	NA	50	Clockwise

shaft will rotate as noted while looking down at the propeller

Counter clockwise



Clockwise



3 phase Rotation

* 3 phase motor Rotation must be checked on shore prior to installing the motor unit in water. Failure to check rotation prior to installing may damage the pump. This damage is not covered under warranty. Refer to the Kasco control panel and aerator owner's manual for complete startup instructions

Feeder wire size for Single phase Control Panels

All 208 / 240volt circuits require 4 wires: L1, L2, N, & G

120v circuits require: L, N, & G

The following chart is suggested copper conductor sizes.

Always consult a Licensed Electrician prior to any installation

and follow all National and Local electrical codes.

Kasco control panel	C-25	C-85	C-95		
Electrical service Voltage	120Vac	240Vac	240Vac		Use a Non GFI circuit breaker to feed Kasco control panel * Each column starts with the minimum allowed wire size per the National Electric Code. 240Volts helps reduce wire size as the lengths get long.
Recommended Feed breaker size	20amp	30amp	40amp		
Calculated FLA of control panel	14amps	17amps	25amps		
Feed wire length to kasco control panel	Recommended AWG Copper wire				
50ft	12AWG*	10AWG*	8AWG*		
100ft	12AWG	10AWG	8AWG		
150ft	10AWG	10AWG	8AWG		
200ft	8AWG	8AWG	6AWG		
250ft	8AWG	8AWG	6AWG		
300ft		8AWG	4AWG		
350ft		6AWG	4AWG		
400ft		6AWG	4AWG		
Electrical service Voltage		208Vac	208Vac	208Volt service will require larger wire sizes compared to a 240Volt service. This helps maintain a minimum voltage to the motor.	
50ft		10AWG	8AWG		
100ft		10AWG	8AWG		
150ft		8AWG	6AWG		
200ft		8AWG	6AWG		
250ft		6AWG	4AWG		
300ft		6AWG	4AWG		
350ft		4AWG	2AWG		
400ft		4AWG	2AWG		

The use of UF (underground feed) Flat cable is not recommended for Load connections from the Kasco panels