



‘THE WATER’S EDGE’

**Font’N-Aire
Aerating & Decorative Fountains
3/4 hp – 5 hp 50 hz
Operation & Maintenance Manual**



Commitment to Quality

Air-O-Lator Corporation is committed to providing customers with defect free products through our program of continuous improvement. Quality shall, in every case, take precedence over quantity.

NOTICE (NOTE)

All installations and associated wiring is to be in accordance with AS/NZS 3000:2000 (Australian/New Zealand Wiring Rules).

Cable selection with respect to voltage drop and current carrying capacity is to be in accordance with AS/NZS 3008.1.1:1998 (Electrical Installations-Selection of Cables)

In Australia and New Zealand you may need to be licensed or hold a restricted license to install, connect or disconnect an electrical appliance. Check with your state/regional electrical regulatory body first. Always use qualified trades people.

The use of Non submersible electrical drop cable does not conform to the Wiring Rules AS/NZS 3008 as confirmed by all eight States/Territories and New Zealand Electrical Authorities as of May 2011.

CONTENTS

SAFETY INSTRUCTIONS	Pages 1 - 3
ELECTRICAL APPLICATION SINGLE &THREE PHASE	Pages 4 - 5
ELECTRICAL APPLICATION SINGLE PHASE	Pages 6 - 7
ELECTRICAL APPLICATION THREE PHASE	Pages 8 - 11
EQUIPMENT INSTALLATION	Pages 12 - 20
START-UP AND OPERATION INSTRUCTION	Pages 21
MAINTENANCE AND TROUBLE SHOOTING	Pages 22 - 33
WARRANTY INFORMATION	Pages 35 – 38

SAFETY INSTRUCTIONS

WARNING

**IMPORTANT INFORMATION FOR INSTALLERS OF THIS EQUIPMENT!
READ THIS MANUAL BEFORE INSTALLING AND USING THIS EQUIPMENT, SAVE THIS
MANUAL FOR FUTURE REFERENCE**

THIS EQUIPMENT IS INTENDED FOR INSTALLATION BY TECHNICALLY QUALIFIED PERSONNEL. FAILURE TO INSTALL IT IN COMPLIANCE WITH NATIONAL AND LOCAL ELECTRICAL CODES, AND WITHIN MANUFACTURERS RECOMMENDATIONS, MAY RESULT IN ELECTRICAL SHOCK OR FIRE HAZARD, UNSATISFACTORY PERFORMANCE, AND EQUIPMENT FAILURE.

!WARNING

SERIOUS OR FATAL ELECTRICAL SHOCK MAY RESULT FROM FAILURE TO CONNECT THE MOTOR, CONTROL ENCLOSURES, METAL PLUMBING, AND ALL OTHER METAL NEAR THE MOTOR OR CABLE, TO THE POWER SUPPLY GROUND TERMINAL USING WIRE NO SMALLER THAN MOTOR CABLE WIRES. TO REDUCE RISK OF ELECTRICAL SHOCK, DISCONNECT POWER BEFORE WORKING ON

This manual is designed to aid in the installation; operation and maintenance of Air-O-Lator products. **Do not dispose of this manual!** Provide this manual to the owner.

The following information is provided to alert persons to potential personal injury hazards inherent with products.

! DANGER: Indicates an eminently hazardous situation which, if not avoided, will result in death or serious injury.

! WARNING: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

! CAUTION: Indicates a potentially hazardous situation which may result in minor or moderate injury.

! DANGER: RISK OF ELECTRIC SHOCK. DO NOT INSTALL THIS EQUIPMENT IN SWIMMING AREAS. THIS EQUIPMENT HAS NOT BEEN INVESTIGATED FOR USE IN SWIMMING AREAS. UNDER NO CIRCUMSTANCES SHOULD ANYONE ENTER THE WATER WITH THE ELECTRICAL EQUIPMENT CONNECTED AND /OR IN OPERATION.

! WARNING: DISCONNECT AND LOCK OUT ELECTRICAL POWER BEFORE SERVICE IS PERFORMED ON THIS DEVICE.

! WARNING: THE CONTROL PANEL AND UNIT MUST BE GROUNDED. FAILURE TO CONNECT TO A PROPER GROUND COULD RESULT IN PERSONAL INJURY OR DEATH.

! WARNING: BEFORE ATTEMPTING TO INSTALL, SERVICE OR MAINTAIN THE UNIT AND/OR FLOTATION IN ANY BODY OF WATER AN APPROVED PERSONAL FLOTATION DEVICE (PFD) MUST BE WORN. DO NOT USE BOATS THAT TIP EASILY FOR FOUNTAIN INSTALLATION. DO NOT USE WADERS IN DEEP PONDS/LAKES OR PONDS/LAKES WITH DROP-OFFS, DRASTIC SLOPES OR SOFT BOTTOM MATERIAL.

! WARNING: THE FLOTATION PROVIDED FOR THIS EQUIPMENT, HAS NOT BEEN INVESTIGATED AS A PERSONAL FLOTATION DEVICE.

! WARNING: DO NOT LIFT OR DRAG THE UNIT BY THE POWER OR LIGHT CORD.

! WARNING: POSSIBLE CUTTING HAZARD. ROTATING PROPELLER COULD RESULT IN SERIOUS INJURY. TURN OFF POWER AND LOCK OUT BEFORE INSTALLATION OR SERVICING.

! NOTICE: DO NOT OPERATE THIS EQUIPMENT OUT OF THE WATER.
IT WILL DAMAGE THE MOTOR AND CREATE A DANGEROUS SITUATION FOR THE OPERATOR.

(EXCEPTION) IT IS PERMISSABLE TO BUMP RUN THE CARNIVAL 3-PHASE EQUIPMENT OUT OF THE WATER TO VERIFY COUNTER CLOCKWISE PROPELLER ROTATION WITH A RAPID ON/OFF OPERATION.

ELECTRICAL APPLICATION INFORMATION

ALL ELECTRICAL CONNECTIONS SHALL BE WIRED PER LOCAL ELECTRIC CODES

! DANGER: RISK OF ELECTRICAL SHOCK. DO NOT INSTALL OR USE THIS DEVICE IN SWIMMING AREAS. THIS PUMP HAS NOT BEEN INVESTIGATED FOR USE IN SWIMMING AREAS.

! DANGER: ROTATING PROPELLER COULD RESULT IN SERIOUS INJURY. TURN OFF POWER BEFORE SERVICING MACHINE.

! WARNING: RISK OF ELECTRIC SHOCK. CONNECT ONLY TO A PROPERLY GROUNDED CONNECTION. FAILURE TO CONNECT TO PROPER GROUND COULD RESULT IN PERSONAL INJURY.

RCD Information

The electricity supply circuit must be fitted with a suitable fuse or a Residual Current Device (RCD), also known as a Residual Current Circuit Breaker (RCCB), with a tripping current not exceeding 30 mA. The RCD is used as an **Equipment Leakage Circuit Interrupter** device **only**. The RCD is **not** a circuit breaker nor should it be used as an on/off switch.

Selecting the correct gauge and length of power supply wire is mandatory to avoid any equipment malfunctions due to voltage loss on to small of a gauge of wire. WIRE PER LOCAL ELECTRIC CODES. Each unit is to be operated on individual circuits. Allow no more than 3 meters of exposed power cord.

Verification of Voltage

Verify that the voltage and phase of power available matches that of the equipment.

It is recommended that you have a qualified electrical installer provide the appropriate receptacle for the product purchased.

Transformer Capacity – Single Phase or Three Phase

Distribution transformers must be adequately sized to satisfy the JVA requirements of the submersible motor. When transformers are too small to supply the load, there is a reduction in voltage to the motor.

Table 1 references the motor horsepower rating, single-phase and three-phase, total effective KVA required, and the smallest transformer required for open or closed three-phase systems. Open systems require larger transformers since only two transformers are used.

Other loads would add directly to the KVA sizing requirements of the transformer bank.

TABLE 1 Transformer Capacity

Motor Rating		Total Effective KVA Required	Smallest KVA Rating-Each Transformer	
			Open WYE or DELTA 2-Transformers	Closed WYE or DELTA 3-Transformers
1.5	1.1	3	2	1
2	1.5	4	2	1.5
3	2.2	5	3	2
5	3.7	7.5	5	3

Use of Engine Driven Generators – Single or Three Phase

Table 2 lists minimum generator sizes based on typical 80° C rise continuous duty generators, with 35% maximum voltage dip during starting, for Franklin's three-wire motors, single or three phase.

This is a general chart. The generator manufacturer should be consulted whenever possible, especially on larger sizes.

There are two types of generators available: externally and internally regulated. Most are externally regulated. They use an external voltage regulator that senses the output voltage. As the voltage dips at motor start-up, the regulator increases the output voltage of the generator.

Internally regulated (self-excited) generators have an extra winding in the generator stator. The extra winding senses the output current to automatically adjust the output voltage.

Generators must be sized to deliver at least 65% of the rated voltage during starting to ensure adequate starting torque. Besides sizing, generator frequency is important as the motor speed varies with the frequency (Hz). A unit running at 1 to 2 Hz below motor nameplate frequency design will not meet its performance. Conversely, a unit running at 1 to 2 HZ above may trip overloads.

Generator Operation

Always start the generator before the motor is started and always stop the motor before the generator is shut down. The motor thrust bearing may be damaged if the generator is allowed to coast down with the motor running. This same condition occurs when the generator is allowed to run out of fuel.

Follow generator manufacturer's recommendations for de-rating at higher elevations or using natural gas.

TABLE 2 Engine Driven Generators

		Minimum Rating Of Generator			
Motor Rating		EXTERNALLY REGULATED		INTERNALLY REGULATED	
HP	KW	KW	KVA	KW	KVA
0.75	0.55	3	3.8	2	2.5
1	0.75	4	5	2.5	3.13
1.5	1.1	5	6.25	3	3.8
2	1.5	7.5	9.4	4	5
3	2.2	10	12.5	5	6.25
5	3.7	15	18.75	7.5	9.4

WARNING: To prevent accidental electrocution, automatic or manual transfer switches must be used any time a generator is used as standby or back up on power lines. Contact power company for use and approval.

ELECTRICAL APPLICATION SINGLE PHASE EQUIPMENT

3-Wire Control Boxes

Single-phase three-wire Franklin submersible motors require the use of control boxes. Operation of motors without control boxes or with incorrect boxes can result in motor failure and voids warranty. Control boxes contain starting capacitors, a starting relay, overload protectors and in some sizes running capacitors

CAUTION: Be certain that control box KW and voltage match the motor.

Cable for submersible motors must be suitable for submerged operation, and adequate size to operate within rated temperature and maintain adequate voltage at the motor. The 50HZ cable selections maintain motor voltage to at least 95% of supply voltage with maximum rated running amps, and maintain acceptable starting voltage and cable temperature. Tables 3 & 5 list the maximum recommended lengths in meters for square millimeter of copper cable sizes. The single-phase table applies to all three wire types, and control boxes. The portion of cable from service entrance to a three-phase controller should not exceed 25% of table maximum length to assure reliable starter operation.

3-Wire Cable, 50Hz (service entrance to motor – maximum length in meters) (Table 3)

Motor Rating	Metric Cable Size - 70°C Insulation - Copper Wire Square Millimeters												
VOLTS	KW	HP	1.5	2.5	4	6	10	16	25	35	50	70	95
220V,50Hz	0.55	0.75	80	140	230	350	580	900	1360	1830	2450	3210	4020
220V,50Hz	0.75	1	60	110	180	270	440	690	1050	1430	1930	2550	3230
220V,50Hz	1.1	1.5	40	70	120	190	310	490	750	1020	1390	1860	2380
220V,50Hz	1.5	2	30	60	100	150	250	400	620	850	1180	1590	2070
220V,50Hz	2.2	3	20	40	60	100	170	270	410	560	770	1030	1320
220V,50Hz	37	5	0	0	40	60	110	170	260	370	520	710	930

Single Phase Motor Specifications (50Hz), 2875 RPM, 1.0 SERVICE FACTOR (Table 4)

Motor Model Prefix	Nameplate Rating					Full Load Watts	Line to Line (1) Resistance (Ohms)		Efficiency %			Power Factor %			Locked Rotor Amps	Circuit Breakers of Fuse Amps Typical Submersible	
	KW	HP	Volts	Line Volts	Amps		Main	Start	F.L.	3/4	1/2	F.L.	3/4	1/2		Nontime Delay (std) Fuse or Circuit Breaker	Dual Element Time Delay Fuse
244557			230	220	6	925			63	59	52	0.69	0.59	0.48			
g***	0.55	0.75		230	6.5	950	3.7-4.6		61	56	49	0.65	0.57	0.46	36.1	20	7
214 758			230	220	7.3	1250	3.5-	14.8-	60	59	53	0.79	0.71	0.59			
1***	0.75	1		230	7.3	1240	4.3	8.0	61	58	51	0.76	0.67	0.55	26.6	20	9
224 750			230	220	8.6	1590	2.6-		69	68	63	0.87	0.8	0.69			
1***	1.1	1.5		230	8.6	1615	3.2	7.0-8.5	68	67	60	0.84	0.76	0.65	41.3	20	12
224 751			230	220	10.6	2125	2.0-		71	71	66	0.91	0.85	0.75			
1***	1.5	2		230	10.4	2120	2.4	5.3-6.4	71	70	64	0.88	0.81	0.69	55.4	30	15
224 752			230	220	15.9	2990	1.3-		74	73	67	0.76	0.86	0.91			
1***	2.2	3		230	16.6	3025	1.6	3.8-4.6	73	70	63	0.69	0.8	0.88	74.5	50	25
224 753			230	220	22.7	4770			78	77	72	0.98	0.99	0.99			
1***	3.7	5		230	22.4	4775	1.0-1.3	2.4-2.9	77	76	70	0.96	0.98	0.99	101	70	30

	3 Wire	
	EUR/AUS	USA
Main/Run Winding	Blue/Grey	Black
Start/Aux	Black	Red
Common	Brown	Yellow

(1) Main/Run Winding Brown to Blue/Grey
Start/Aux Winding Brown to Black

Performance is typical, not guaranteed, at specified Voltages and specified capacitor values.

Two or More Different Sizes Can Be Used

Depending on the installation, any number of combinations or cable may be used as long as you do not exceed 100% of the total allowable usage. If you exceed 100%, the voltage drop will not meet the ASNZ3000 recommendations.

For example, you are installing a new aerator or fountain and there is existing power cable already installed from the service entrance to the location of the controls or where the connection of the submersible cable will be connected at the water's edge.

From the service entrance to the controls (located at the water's edge) is 40 meters of buried 4mm². A new 2.2 kW, 220-volts, single-phase unit is being installed. The unit is being installed 40 meters into the water from the location of the controls located at the water's edge. The pond is 5 meters deep so you will need to add a total of 10 meters to compensate for the depth for a total of 50 meters of cable needed for the aerator or fountain. The question is what size cable do I need to order with my unit, since I already have 40 meters of 4mm² cable installed?

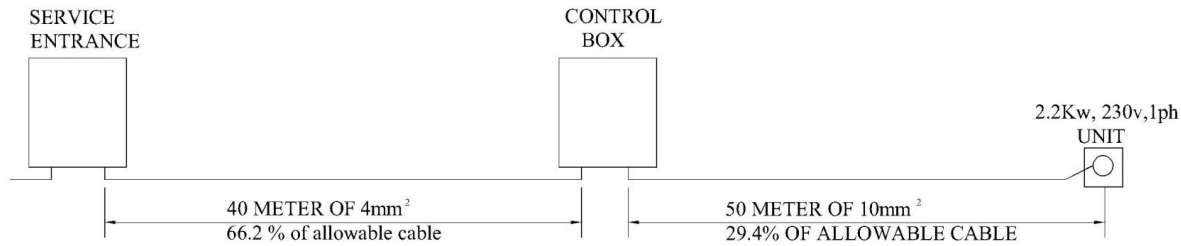
From Table 1, a 2.2 kW, 220-volt, single-phase motor can use up to 60 meters of 4mm² cable. The application has 40 meters of 4mm² copper wire already installed.

Using the formula below, 40M (actual) divided by 60M (max allowable) is equal to 0.666. This means 66.6% (0.66 x 100) of the allowable voltage drop occurs in this wire. This leaves us 33.4% (1.00 – 0.666 = 0.334) of some other wire size to calculate what size wire to use on the aerator or fountain.

FIRST EXAMPLE: The table shows that on a 2.2kW motor 6mm² copper wire is good for 100 meters. Using the formula again, 50M needed, divided by 100 meters (allowed) = 0.5 adding this to the 0.666 determined earlier, 0.666 + 0.5 = 1.16. This combination is greater than 1.00, so the voltage drop will not meet the ASNZ3000 recommendations.

SECOND EXAMPLE: The table shows that on a 2.2kW motor 10mm² copper wire is good for 170 meters. Using the formula, 50 divided by 170 = 0.294, and using these numbers, 0.666 + 0.29 = 0.96, which is less than 1.00 and will meet the ASNZ30000 recommended voltage drop.

$$\text{Formula: } \frac{\text{Actual Length}}{\text{Max Allowed}} + \frac{\text{Actual Length}}{\text{Max Allowed}} = 1.00$$



ELECTRICAL APPLICATION THREE PHASE EQUIPMENT

Overload Protection of Three-Phase Equipment

Motor protection, selection of thermal overload relays.

Characteristics of submersible motors differ from standard motors and special overload protection is required. In order to provide sufficient protection against overload and locked rotor, the relay has to be of the following characteristic:

- Conform to European standard e.g. VDE providing trip time < 10 sec. at 500% I_N (name plate current) based on cold bimetal
- Protection against single phasing
- Must trip at 120% I_N (name plate current)
- Temperature compensated to avoid nuisance tripping

Cable Selection For 3-Phase (380 volt / 415 volt) (Service entrance to motor) Table 5

Motor Rating		Metric Cable Size, Square Millimeters, - 70°C Insulation - Copper Wire													
KW	HP	1.5	2.5	4	6	10	16	25	35	50	70	95	120	150	185
0.55	0.75	630	1050	1670	2500	4100	6440	9790							
0.75	1	490	820	1300	1950	3200	5020	7620							
1.1	1.5	340	570	910	1360	2240	3520	5350	7280	9890					
1.5	2	260	430	700	1040	1720	2700	4120	5630	7690					
2.2	3	170	290	460	700	1150	1810	2770	3790	5190	6950	8950			
37	5	100	170	270	410	680	1080	1650	2260	3090	4140	5340	6420	7540	8750

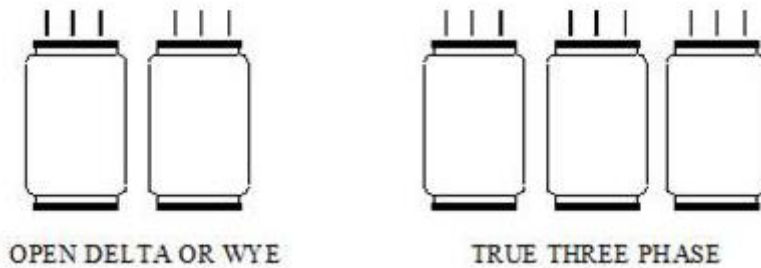
Three Phase Motor Specification Chart 50HZ, 2875 RPM, 1.0 SF Table 6

TYPE	Motor Model Prefix	Nameplate Rating					Full Load Watts	Line To Line (1) Resistance (Ohms)	Efficiency %			Power Factor %			Locked Rotor Amps	Circuit Breakers or Fuse Amps/ Typical Submersible	
		KW	HP	Volts	Line Volts	Amps			F.L.	3/4	1/2	F.L.	3/4	1/2		Nontime Delay (std) Fuse or Circuit Breaker	Dual Element Time Delay Fuse
4 inch	234762	0.55	0.75	380-415	380	1.6	810	41.0-52.0	68	64	57	0.79	0.71	0.60	7.7	15	1.8
					400	1.6	810		68	63	55	0.74	0.65	0.53			
					415	1.7	840		65	60	50	0.70	0.61	0.50			
4 inch	234 763	0.75	1	380-415	380	2	1065	22.2-27.2	70	69	63	0.81	0.73	0.61	10.9	15	4
					400	2	1075		70	68	61	0.77	0.68	0.55			
					415	2.1	1085		69	66	58	0.73	0.63	0.5			
4 inch	234 724	1.1	1.5	380-415	380	2.8	1490	13.8-16.8	74	73	68	0.82	0.75	0.63	16.7	15	3
					400	2.8	1490		74	72	66	0.78	0.69	0.57			
					415	2.9	1510		73	70	64	0.74	0.65	0.52			
4 inch	234 725	1.5	2	380-415	380	3.9	2035	10.9-13.4	73	72	67	0.83	0.74	0.62	21.5	15	4.5
					400	3.9	2035		73	71	65	0.78	0.68	0.55			
					415	4	2060		72	69	62	0.73	0.63	0.5			
4 inch	234 726	2.2	3	380-415	380	5.4	2925	6.8-8.3	75	75	71	0.82	0.74	0.6	30.9	15	7
					400	5.5	2930		75	74	69	0.77	0.66	0.52			
					415	5.8	2970		74	72	65	0.72	0.61	0.47			
4 inch	234 727	3.7	5	380-415	380	8.8	4725	3.7-4.5	78	79	75	0.83	0.75	0.62	54.3	25	10
					400	9	4745		78	77	73	0.78	0.69	0.54			
					415	9.3	4785		77	76	70	0.73	0.63	0.49			

Three Phase Power Unbalance

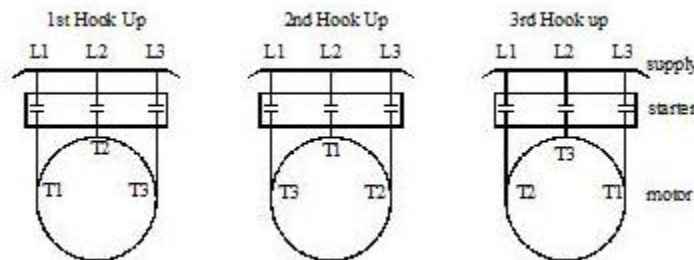
A full three-phase supply is recommended for all three-phase motors, consisting of three individual transformers or one three-phase transformer. So-called “open” delta or wye connections using only two transformers can be used, but are more likely to cause problems, such as poor performance, overload tripping or early motor failure due to current unbalance.

Transformer rating should be no smaller than listed in Table 1 for supply power to the motor alone.



- 1, To establish correct motor rotation, change rotation by exchanging any two of the three motor leads. The rotation that gives the most water flow is always the correct rotation.

2. After correct rotation has been established, check the current in each of the three motor leads, and calculate the current unbalance as explained in 3 below.
If the current unbalance is 2% or less, leave the leads as connected.
If the current unbalance is more than 2%, current readings should be checked on each leg using each of three possible hook-ups. Roll the power leads across the starter in the same direction to prevent motor reversal.
3. To calculate percent of current unbalance:
 - A. Add the three line amps values together.
 - B. Divide the sum by three, yielding average current.
 - C. Pick the amp value which is further from the average current (either high or low).
 - D. Determine the different between this amp value (furthest from average) and the average.
 - E. Divide the difference by the average. Multiply the result by 100 to determine percent of unbalance.
4. Current unbalance should not exceed 5% at full load. If the unbalance cannot be corrected by rolling the leads, the source of the unbalance must be located and corrected. If, on the three possible hookups, the leg farthest from the average stays on the same power lead, most of the unbalance is coming from the power source. However, if the reading farthest from average moves with the same motor lead, the primary source of unbalance is on the “motor side” of the starter. In this instance, consider a damages cable, leaking splice, poor connection, or faulty motor winding.



EXAMPLE:

T1 = 51 amps	T3 = 50 amps	T2 = 50 amps
T2 = 46 amps	T1 = 49 amps	T3 = 48 amps
<u>+ T3 = 53 amps</u>	<u>+ T2 = 51 amps</u>	<u>+ T1 = 52 amps</u>
Total = 150 amps	Total = 150 amps	Total = 150 amps
 <u>150</u>	 <u>150</u>	 <u>150</u>
3 = 50 amps	3 = 50 amps	3 = 50 amps

Phase designation of leads for CCW rotation viewing shaft end.

To reverse rotation, interchange any two leads.

Phase 1 or "A: - T1, or U1

Phase 2 or "B: - T2, or V1

Phase 3 or "C" –T3 or W1

NOTICE: Phase 1, 2 and 3 may not be L1, L2 and L3.

FONT'N-AIRE FLOATING FOUNTAINS

ASSEMBLY AND INSTALLATION INSTRUCTIONS

! WARNING: DO NOT INSTALL OR USE THIS DEVICE IN SWIMMING AREAS

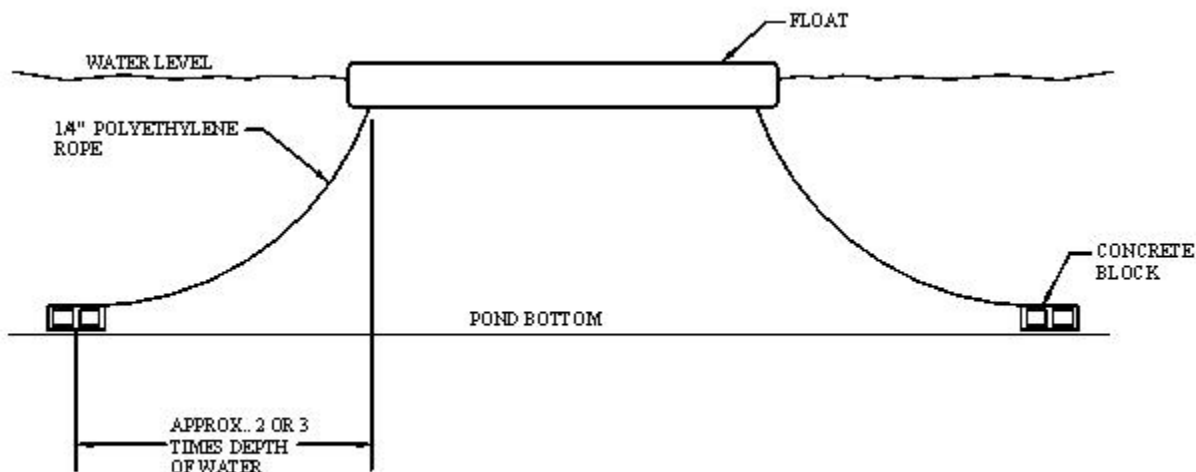
The FONT'N-AIRE floating fountain is a reliable, efficient and trouble-free product. Requirements for a long operational life are simple. They are: 1. A suitable operating environment, 2. An adequate supply of electricity, 3. An adequate flow of water, and 4. An appropriate amperage draw. All considerations of application, installation, and maintenance of the fountains relate to these four areas. This manual will acquaint you with these needs and assist you if service or maintenance is required.

Remove the Font'N-Aire unit from the shipping cartons and inspect for any damages that may have occurred in shipping. Verify that all components received are correct. **Do not dispose of the shipping container and packing in the unlikely event of return for service. SAVE THE PACKAGING!**

Float Installation

!WARNING: DO NOT USE AS A PERSONAL FLOTATION DEVICE.

- STEP 1 To anchor: Cut 4 lengths of 1/4" polyethylene rope, allowing for 1 to 2 meters of rope for every meter of water depth. Most commonly the unit is anchored by four 8" x 8" x 16" concrete building blocks (one per corner). See the enclosed suggested mooring drawing. This type of anchor allows the anchor to bury itself in the mud or lake bottom.
- STEP 2 Insert one rope end into one of the mooring holes in the float and tie off. Do the same on each of the corners.
- STEP 3 The mooring ropes, as an alternative, may be tied off to the shore. Be certain to allow for variations in water level when determining shore mooring rope length.

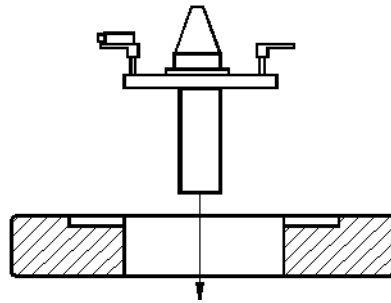


Unit Installation

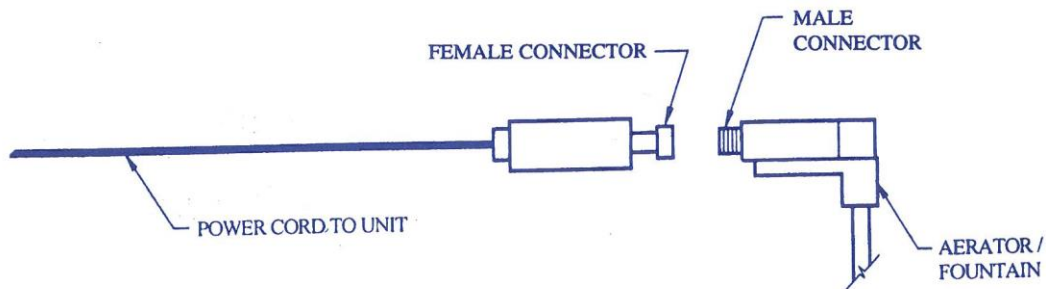
Place the unit into the center of the float with motor end first and the mounting supports positioned into the square molded areas in the float. No mounting hardware or tools are needed.

Note: On the CARNIVAL three phase equipment, check rotation of the propeller before installing the unit in the water. When looking down into the three inch opening of the nozzle. The correct propeller rotation is counter clockwise. If the rotation is incorrect you will need to reverse two (2) of the input power legs at the controller.

On the centrifugal pump type fountains if the rotation is incorrect the spray pattern and volume will not meet the proper height, diameter and volume. Again to change rotation you must reverse two (2) of the input power legs at the controller.



Power Cable Installation



Connect the power cable to the unit. For those products that use an electrical disconnect a packet of dielectric grease has been provided. Apply the dielectric grease into the water tight connectors to aid in the installation of the connectors and to provide moisture resistance. Insert the female connector of the power cord into the male connector on the unit and tighten the jam nut hand tight. (Do not over tighten as damage can occur).

Selecting the correct gauge and length of power supply wire is mandatory to avoid any equipment malfunctions due to voltage loss on too small of a gauge of wire. (WIRE PER LOCAL ELECTRIC CODES) Each unit is to be operated on individual circuits. CAUTION: DO NOT leave power cable lying on the ground exposed. The power cable should be in conduit and buried.

3-Wire Cable, 50 HZ (Service Entrance to Motor – Maximum Length in Meters)

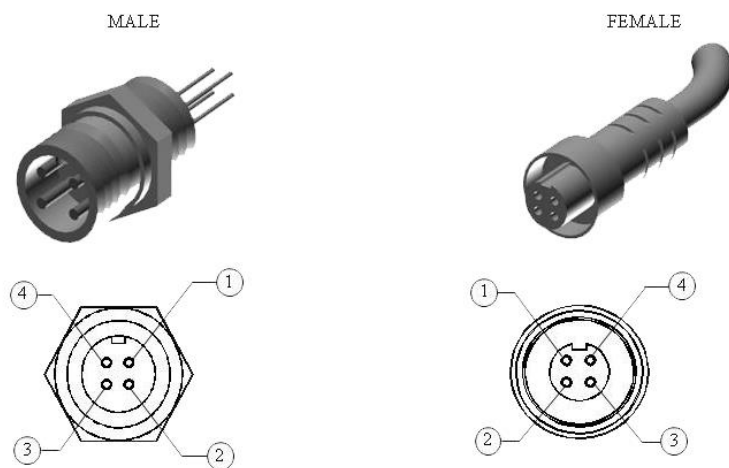
Cable must be suitable for submerged operation, and adequate in size to operate within rated temperature and maintain adequate voltage at the motor. The 50 Hz cable selections maintain motor voltage to at least 95% of supply voltage with maximum rated running amps, and maintain acceptable starting voltage and cable temperature.

Minimum Square Millimeter cable for each rating is based on IEC Publication 364-5-523 (1983 Edition). Jacketed cable is based on Table 52-B1, Installation Method C in Table using Column C in Table 52-C3 (70°C). Individual conductor is based on Table 52-B2, Installation Method G using Column 6 in Table 52-C10 (70°C).

Minimum AWG Cable sizes are based on the National Electrical Code in Table 430-150 for 75°C Cable in 30°C Maximum Ambient. Use Larger Cable if Local Codes or Higher Temperatures Require It. Lengths in Bold Meet IEC and NEC Ampacity only For Individual Conductor Cables in air or water, not in conduit.

Tables 3 & 5 on pages 6 & 8 list the maximum recommended lengths in meters for square millimeter of copper cable sizes. The single-phase table applies to all three wire types, and control boxes where required, may be at any point in the cable length. The portion of cable from service entrance to a three-phase controller should not exceed 25% of table maximum length to assure reliable starter operation.

Quick Disconnect Lead Configuration Diagram



	USA	EUR/AUS
1	Black	Blue/Grey
2	Ground	Ground
3	Red	Black
4	White	Brown

! CAUTION: If there is a probability of animals being present that could cause damage to occur to the fountain power cable that is supplied, it is suggested that at this time a protective flexible corrosion resistant conduit be implemented to minimize possible damage to the unit power cable.

Control Panel Installation

Attach the Control Panel to a suitable support, i.e., post or wall.

NOTE: A RCD circuit breaker must be installed at the circuit breaker panel for safety.

1. Control Box and Panel Environment

Franklin Electric control boxes are designated IP 23. They are suitable for indoor and outdoor applications within temperatures of -10°C to 50°C. Operating control boxes below -10°C can cause reduced starting torque and loss of overload protection when overloads are located in control boxes.

Control boxes and panels should never be mounted in direct sunlight or high temperature locations. This will cause shortened capacitor life and unnecessary tripping of overload protectors. A ventilated enclosure painted white to reflect heat is recommended for an outdoor, high temperature location.

A humid location accelerates component failure from voltage breakdown and corrosion.

Control boxes with voltage relays are designed for vertical upright mounting only. Mounting in other positions will affect the operation of the relay.

2. Grounding Control Boxes and Panels

Electrical Codes require that the control box or panel grounding terminal always be connected to supply ground. If the circuit has not grounding conductor and no metal conduit from the box to supply panel, use a wire at least as large as line conductors and connect as required by the Electrical Code, from the grounding terminal to the electrical supply ground.

Connect earth grounds to control boxes and panels per local and national codes or regulations.

!WARNING: Failure to ground the control frame can result in a serious or fatal electrical shock hazard if a circuit fault occurs.

3. Grounding Surge Arrestors

An above ground surge arrestor must be grounded, metal to metal, all the way to the water strata for the lightning arrestor to be effective. **GROUNDING THE ARRESTOR TO THE SUPPLY GROUND OR TO A DRIVEN GROUND ROD PROVIDES LITTLE OR NO PROTECTION FOR THE MOTOR.**

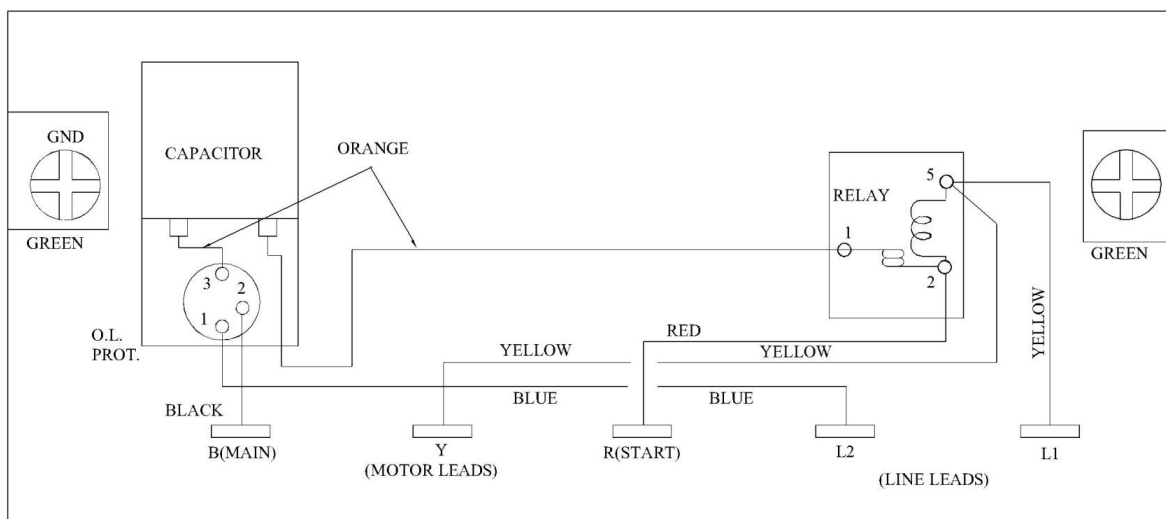
Connect Power Cable

Connect the power cable to the appropriate control panel power out terminals to the fountain.

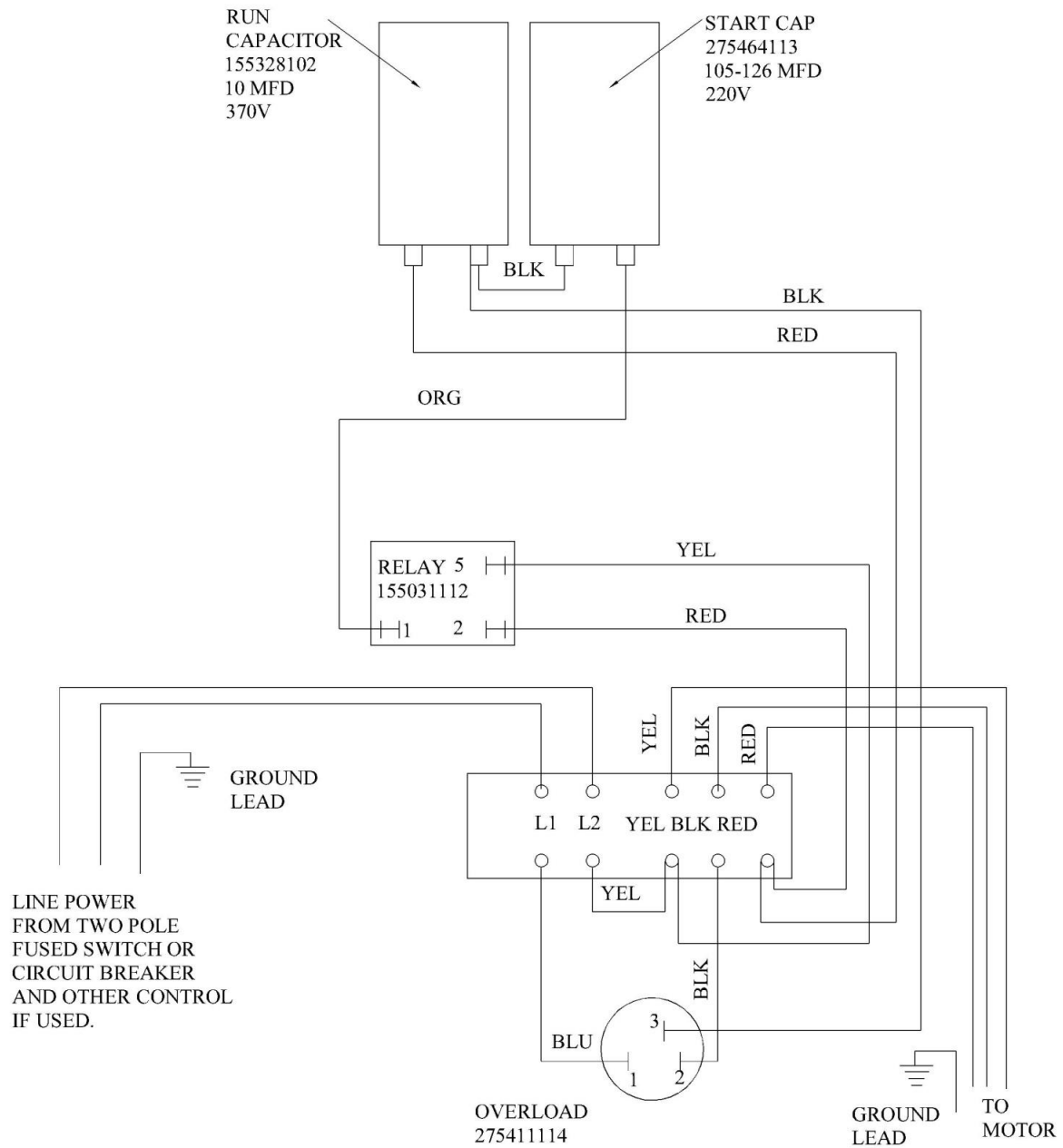
	3-Wire	
	EUR/AUS	USA
Main/Run Winding	Blue/Grey	Black
Start/Aux Winding	Black	Red
Common	Brown	Yellow/White

Control Box Wiring Diagrams

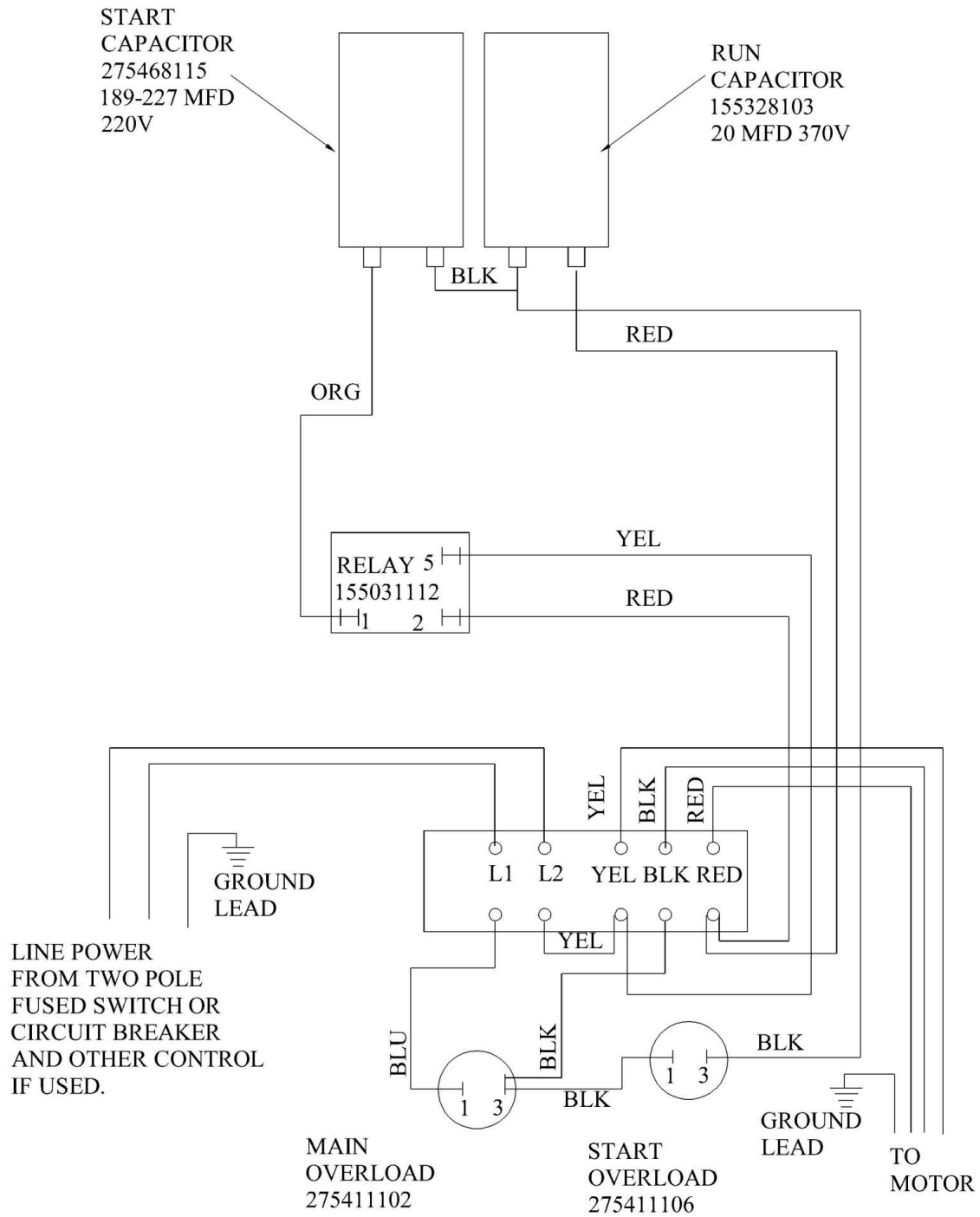
1-Horsepower, 230-Volt, 1-Phase, 50-Hz, CRC Box



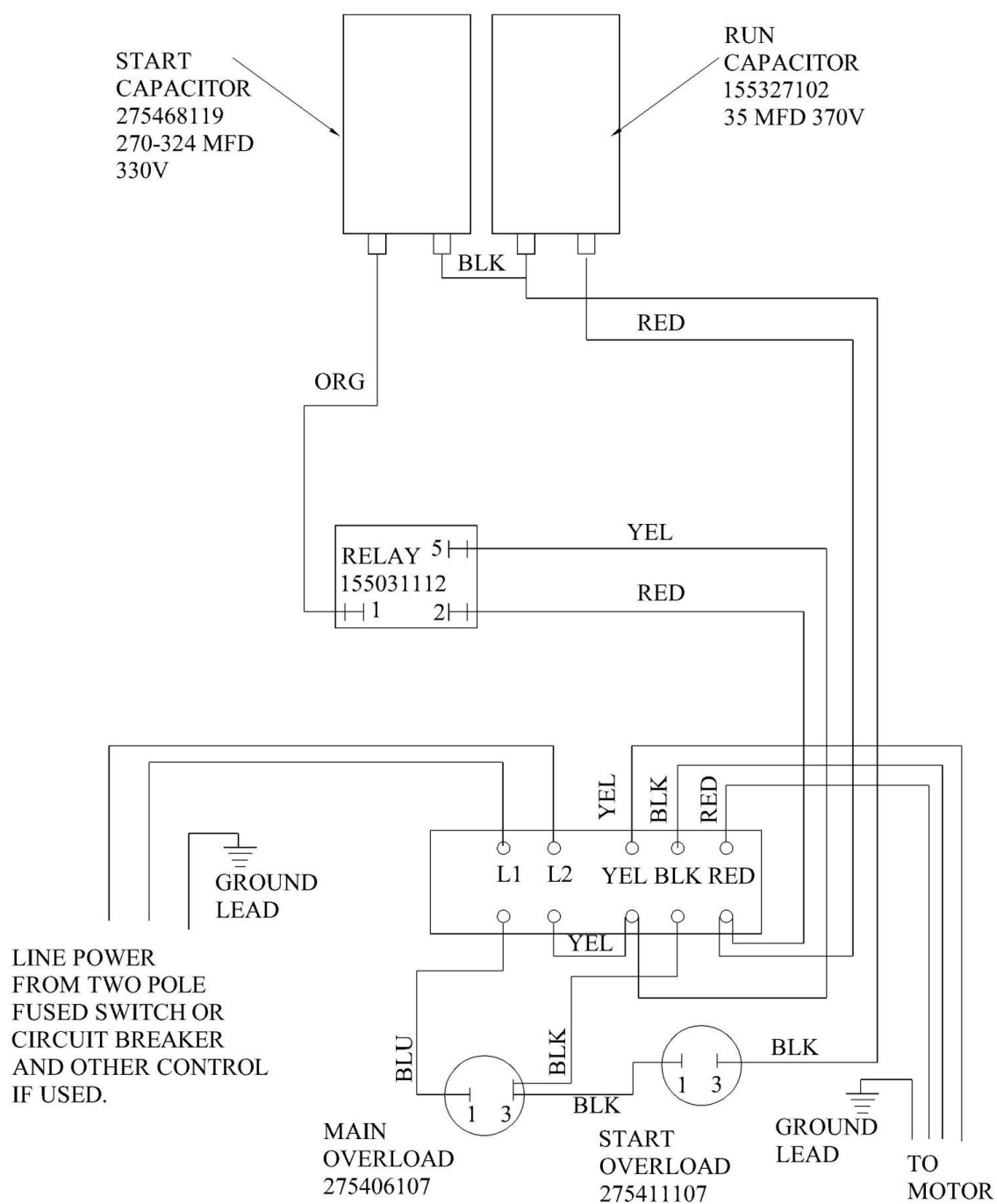
1.5 Horsepower, 230-Volt, 1-Phase, 50-Hz, Control Box



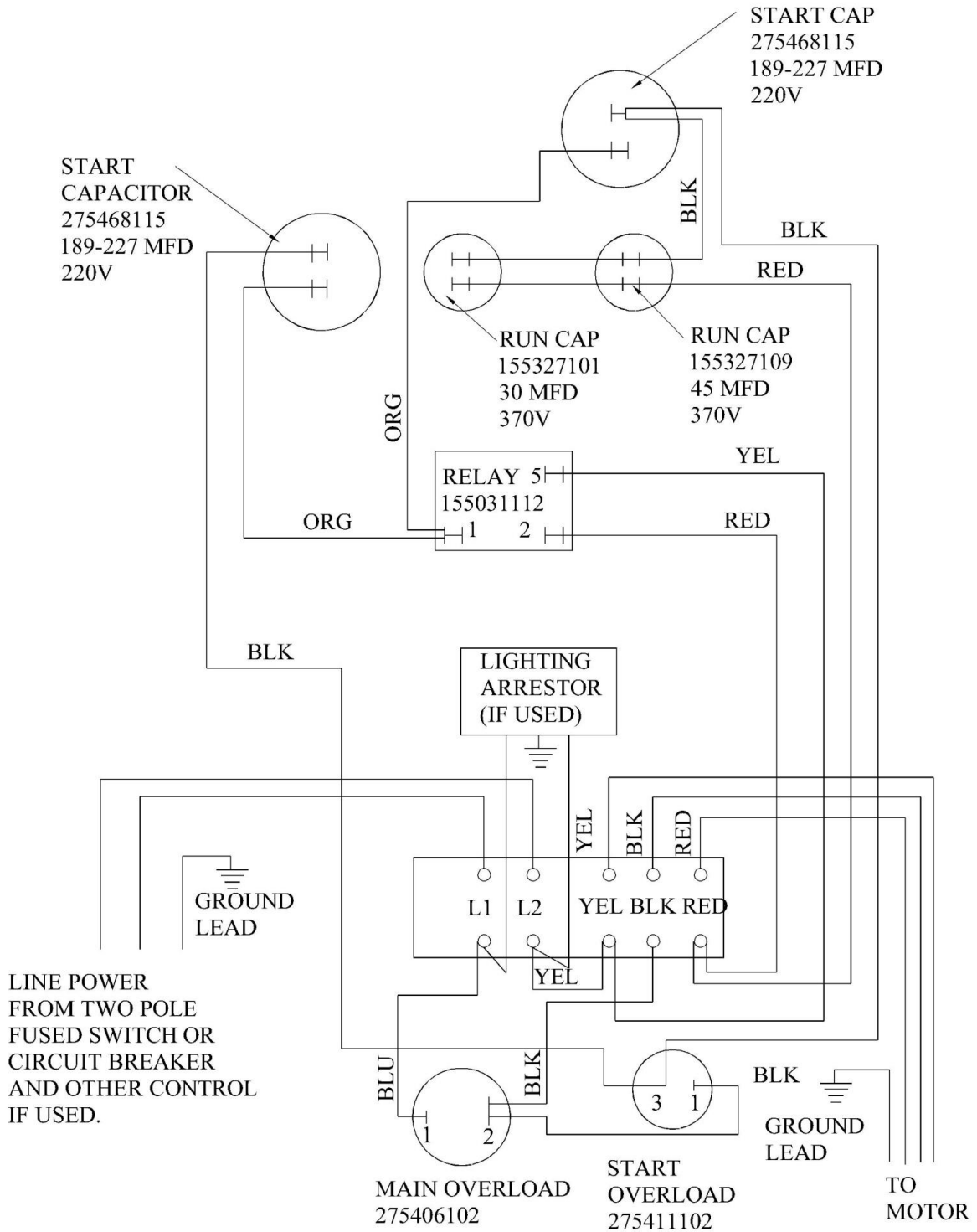
2-Horsepower, 230-Volt, 1-Phase, 50-Hz Control Box



3-Horsepower, 230-Volt, 1-Phase 50-Hz Control Box



5-Horsepower, 230-Volt, 1-Phase, 50-Hz Control Box



START-UP AND OPERATION INSTRUCTIONS

! CAUTION: DO NOT OPERATE THE FOUNTAIN OUT OF THE WATER

System Start-Up

Submersible Pump Installation Check List

1. Motor Inspection
 - A. Verify that the model, KW, voltage, phase and hertz on the motor nameplate match the installation requirements.
2. Power Supply and Controls
 - A. Verify that the power supply voltage, hertz, and KVA capacity match motor requirements.
 - B. Verify control box KW and voltage matches motor (3-wire only)
 - C. Check that the electrical installation and controls meet all safety regulations and match the motor requirements, including fuse or circuit breaker size and motor overload protection. Connect all metal electrical enclosures to the power supply ground to prevent shock hazard. Comply with national and local codes.
3. Lightning and Surge Protection
 - A. Use properly rated surge (lightning) arrestors on all installations. Motors 3.7 KW and smaller, which are marked "Equipped with Lightning Arrestors:", contain internal arrestors.
4. Electrical Cable
 - A. Use submersible cable size in accordance with local regulations and the cable charts, see Pages 6 and 7.
5. Motor Cooling
 - A. Ensure at all times the installation provides adequate water flow for cooling.
6. After Installation
 - A. Check all electrical connections before starting the units.
 - B. On three phase equipment check rotation.
 - C. Start the unit and check motor amps and water flow. If normal, continue to run the unit. If three phase delivery is low, it may be running backward. Rotation may be reversed (with power off) by interchanging any two motor lead connections to the power supply.
 - D. Check three-phase motors for current balance within 5% of average, using motor manufacturer instructions. Imbalance over 5% will cause higher motor temperatures and may cause overload trip, vibration, and reduced life.
 - E. After at least 15 minutes running time, verify that the unit is producing correct flow, check amperage and voltage.

DEBRIS MANAGEMENT INFORMATION

The factory has included on Aquarian Commercial aerators, Enterprise aspirating mixer, Font'N-Aire Legacy, Ready, Platinum, and Gulf Stream fountains a "propeller guard or in the case of the Enterprise and fountain a propeller/impeller shroud" to protect the propeller/impeller from damage from a foreign object and yet maintain a maximum flow of water for performance and cooling the motor.

An optional propeller guard may be purchased for the Aquarian Professional and the Aquarian Aquaculture aerators. There is no propeller guard for the Quantum aerator.

The shroud or guard is **only** to be considered a best-placed effort to minimize an object or debris from damaging or fouling the aerator or fountain and is **not** a guarantee that debris will not come in contact with the moving propeller or impeller.

The shroud or guard is **NOT** to be considered a safety device.

In certain situations it may be desired to add a debris screen to the aerator or fountain equipment.

Material that should be considered for a debris screen is a plastic or non-corrosive metal mesh (nothing smaller than ¼ inch opening) material. The material should be installed on the float within the unit-mounting hole located in the center of the float. There are eight (8) ¼ -20 brass inserts molded on the inside circumference of the hole in the center of the float. These inserts are provided to mount a debris screen.

DO NOT Attach the debris screen to the aerator or fountain. This could cause damage to the unit and will make it more difficult to remove the aerator or fountain from the float for service or storage.

DO NOT Install a bottom in this type of debris screen. This is for two (2) reasons. First, in the event that the screen becomes clogged from debris, water flow will be restricted to the aerator or fountain. Second in the event that an object or animal falls through the top of the float, it will not become entrapped in the debris screen.

After all this has been said it is important to realize that if a debris screen is to be effective. The screen will have to be cleaned and serviced periodically as well as the unit and propeller/impeller.

Debris management, cleaning and service is your responsibility.

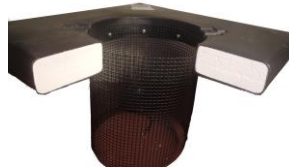
Example of suggest debris screen

- Step 1. Measure the inside circumference of the hole in the center of the float. Cut the mesh material (nothing smaller than 1/4 inch opening) the measurement of the circumference plus two (2) inches. Cut the length of the mesh material to at least the length of the bottom of the motor when installed in the float. Do Not attach a bottom or top to the mesh cylinder.
- Step 2 Roll the mesh into a cylinder and overlap the edges approximately two (2) inches and secure with ty-raps along the length of the mesh.

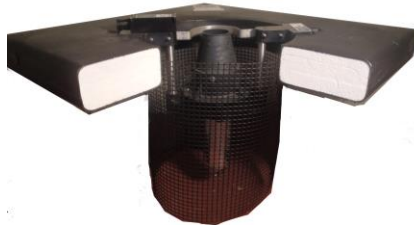


- Step 3 Attach the mesh cylinder hole in the center of the molded into the float to debris screen with screw and a 1/4 inch

to the inside circumference of the float. There are 1/4-20 brass inserts attach the debris screen. Secure the stainless steel 1/4-20 x 1/2 inch hex head stainless steel washer.



This completes the installation of the debris screen to the float





MAINTENANCE AND TROUBLE SHOOTING PROCEDURE

Due to the engineering and design of the Air-O-Lator products and the minimal maintenance required there is consequently a limited amount of trouble shooting to be sought.

A volt ohmmeter is required to complete the following trouble shooting checks.

Maintenance

Prior to performing any service, turn the power off. Be certain that the power will not come back on.

The product is virtually maintenance free. The Franklin motor (identified as the silver cylindrical device) is water cooled and water lubricated. The motor is sealed (there is no circulation of water through the motor) and filled with a solution of de-ionized water and Propylene Glycol (a non-toxic antifreeze). There is no oil or replaceable components within the motor to service or replace. Do not attempt to disassemble the motor as this will damage the motor and void any warranty.

We recommend that you remove the unit from the water periodically (a minimum of once a year) to visually inspect for damaged, cracked, loose and/or worn parts. Remove any debris that has collected in and around the assembly. Clean the exterior of the motor. The motor housing is the surface that dissipates heat from the motor into the water any build up of algae, calcium and debris will reduce the life of the motor. Check the electrical cable and connections for cuts and/or abrasions in the jacketing. Operating equipment should be observed on a regular basis for any variation in performance or sound. It is also recommended that the voltage and amperage be checked periodically for any changes from the initial start-up.

Maintenance Check List

1. Inspect for unit for damage (cracks, loose hardware, and/or worn parts.
Tighten any loose hardware; replace any worn or damaged parts.
2. Remove any debris.
3. Clean the motor housing and exterior parts.
4. Check the propeller or impeller for nicks, wear or broken blades
Replace propeller/impeller
5. Check the electrical cable for cuts and/or abrasions in the jacketing.
Replace any damaged cable.

Hardware Torque Values

Suggested Max Torque Values – a guide based upon Harper Test on dry products wiped clean. Values thru 1” diameter are stated in inch pounds; over 1 inch diameter, in foot pounds.

Bolt Size	18-8 SS	Brass	316 SS
Values are stated in Inch Lbs.			
1/4"	75.2	61.5	78.8
5/16"	132	107	138
3/8"	236	192	247
7/16"	376	317	393
1/2"	517	422	542
9/16"	682	558	713
5/8"	1110	907	1160
3/4"	1490	1220	1558
7/8"	2318	1895	2420
1"	3110	2545	3250
Values are stated in Foot Lbs.			
1-1/8"	390	318	408
1-1/4"	480	394	504
1-1/2"	703	575	732

Nozzle Removal for Cleaning & Service

The nozzle plenum torque values should be 50 in/lbs. If the spray pattern changes from the original configuration, inspect for and remove any foreign matter that may be present within the pump and nozzle areas. The primary location to look for these obstructions or foreign materials would be within the nozzle.

Centrifugal Pump Nozzles

Font’N-Aire centrifugal pump units are provided with removable PVC nozzles. This is provided for convenience of cleaning or replacement.

The, Diana, North Star, Solace and Nova nozzles are held into the water plenum by two 10-24 x ½ inch machine screws.

The Galaxy nozzle is held in place by two 10-24 x 1 inch machine screws. It is necessary to center the Galaxy nozzle in the water plenum. This is achieved by using two nylon spacers on the 1-inch nozzle screws between the plenum wall and the nozzle, thus centering the nozzle within the plenum. Do not misplace the screws or spacers necessary for centering and holding within the plenum.

All of the centrifugal pump unit nozzles (except for the Galaxy) use an o-ring to prevent leakage, replace if damaged.

Propeller Pump Nozzle

The propeller pump nozzle is held in place by two ¼-20 screws. Loosen the screws just enough to be able to turn the nozzle, counter-clockwise and slide off of the throat.

Access to the flow straightner and propeller is now possible and will permit the removal of any foreign debris. Reinstall in the reverse order of removal and tighten no more than 50 Inch/Lbs.

TROUBLE SHOOTING PROCEDURES

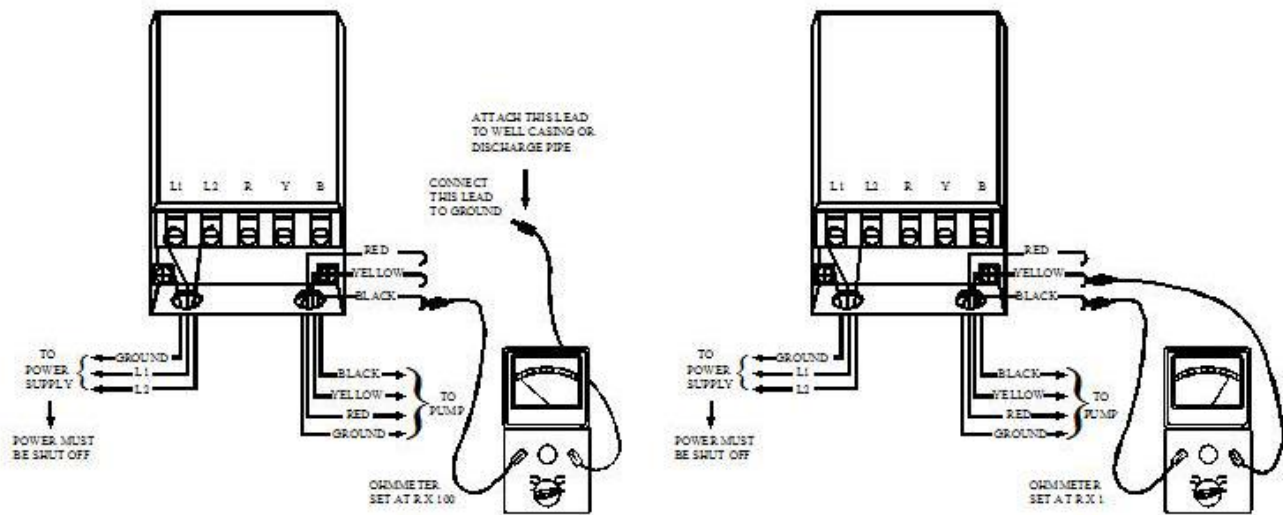
! DANGER: Electric shock hazard. Disconnect and lockout the electrical power before servicing.

Motor Does Not Start		
Possible Cause	Checking Procedures	Corrective Action
A. No power or incorrect voltage.	Check voltage at line terminals. The voltage must be +/- 10% of rated voltage	Contact power company if voltage is incorrect.
B. Fuses blown or circuit breakers tripped.	Check fuses for recommended size and check for loose, dirty or corroded connections in fuse receptacle. Check for tripped circuit breakers.	Replace with proper fuse or reset circuit breakers.
C. Control box malfunction.	For detailed procedure, see pages 22 - 24	Repair or replace
D. Defective wiring	Check for loose or corroded connections	Correct faulty wiring or connections.
E. Defective cable or motor.	For detailed procedure, see pages 21 - 23	Repair or replace
Motor Runs But Overload Protector Trips		
Possible Cause	Checking Procedures	Corrective Action
A. Incorrect voltage.	Using voltmeter, check the line terminals.	Contact power company if voltage is incorrect.
B. Overhead protectors.	Direct sunlight or other heat source can raise control box temperature causing protectors to trip. The box must not be hot to touch.	Shade box, provide ventilation or move box away from source.
C. Defective control box.	For detailed procedures, see pages 22 - 24	Repair or replace.
D. Defective motor or cable.	For detailed procedures, see pages 21 - 23	Repair or replace.
E. Worn motor.	Check running current, See tables 4 & 6	Replace motor

TEST PROCEDURES

Table 7 Tests – All sizes Single and Three-Phase

Test	Procedure	What It Means
Insulation Resistance	1. Open Master breaker and diconnect, all leads from control box or pressure switch (QD type control, remove lid) to avoid electric shock hazard and damage to the meter.	1. If the ohms value is normal (Table 8), the motor is not grounded and the cable insulation is not damaged.
	2. Set the scale meter to R X 100K and set the ohmmeter on zero.	2. If the ohms value is below normal, either the windings are grounded or the cable insulation is damaged. Check the cable at the well seal as the insulation is sometimes damaged by being pinched.
	3. Connect one ohmmeter lead to any one of the motor leads and the other lead to ground.	
Winding Resistance	1. Open master breaker and disconnect all leads from control box or pressure switch (QD type control, remove lid) to avoid electric shock hazard ana damage to the meter.	1. If all ohms values are normal (Tables 4 & 6 the motor windings are neither shorted nor ioen, and the cable colors are correct.
	2. Set the scale lever to R X 1 for values under 10 ohms. For values over 10 ohms, set the scale lever to R X 10. "Zero" the ohmmeter.	2. IF any one value is less than normal, the motor is shorted.
	3. On 3-wire motors measure the resistance of yellow to black (main winding) and yellow to red (Start winding).	3. If any one ohm value is greater than normal, the winding or the cable is open, or there is a poor cable joint or connection.
	Three-phase motors measure the resistance line to line for all three combinations	



INSULATION AND RESISTANCE READINGS

Table 8 Normal Ohm and Megohm Values Between All Lead and Ground

Condition of Motor and Leads	Ohms Value	MEGOHM Value
A new motor (without drop cable)	200,000,000 (or more)	200 (or more)
A use motor which can be reinstalled.	10,000,000 (or more)	10 (or more)
Motor installed. Readings are for drop cable plus motor		
New motor	2,000,000 (or more)	2.0 (or more)
Motor in good condition.	1,000,000-2,000,000	1.0
Insulation damage, locate and repair	Less than 1,000,000	Less than 1.0

Insulation resistance varies very little with rating. Motors of all KW, voltage, and phase rating have similar values of insulation resistance. Table 8 is based on readings taken with a megohm meter with a 500VDC output. Readings may vary using a lower voltage ohmmeter.

Resistance of Drop Cable (Ohms)

The values below are for copper conductor. If aluminum conductor drop cable is used, the resistance will be higher. To determine the actual resistance of the aluminum drop cable, divide the ohm readings from this chart by 0.61. This chart shows total resistance of cable from control to motor and back.

Winding Resistance Measuring

The winding resistance measured at the motor should fall within the values in Tables 4, & 6. When measured through the drop cable, the resistance of the drop cable must be subtracted from the ohmmeter readings to get the winding resistance of the motor. See table below.

Drop Cable Resistance

DC Resistance in Ohms per 100 meters of wire (two conductors) @ 10°C

Square millimeter			1.5	2.5	4	6	10	16
Ohms			2.630	1.576	0.977	0.651	0.374	0.238
25	35	50	70	95	120	150	185	240
0.153	0.108	0.075	0.053	0.040	0.031	0.025	0.021	0.016

Single-Phase Control Boxes

Checking and repairing Procedures (Power On)

!WARNING: Power must be on for this test.
Do not touch any live parts.

A. Voltage Measurements

Step 1. Motor off

1. Measure voltage at L1 and L2 of pressure switch or the line contactor.
2. Voltage Reading: Should be +/- 10% of motor rating.

Step 2. Motor Running

1. Measure voltage at load side of pressure switch or line contactor with pump running.
2. Voltage Reading: Should remain the same except for slight dip on starting. Excessive voltage drop can be caused by loose connections, bad contacts, ground faults, or inadequate power supply.
3. Relay chatter is caused by low voltage or ground faults.

B. Current (Amp) Measurements

1. Measure current on all motor leads.
2. Amp Reading: Current in Black lead should momentarily be high, then drop within one second to values on Table 4. This verifies relay operation. Current in Blue and Brown leads should not exceed values shown on Table 4.
3. Relay failures will cause black lead current to remain high and overload tripping.
4. Open run capacitor(s) will cause amps to be higher than normal in the blue and brown motor leads and lower than normal in the black motor lead.
5. A bound pump will cause locked rotor amps and overload tripping.
6. Low amps may be caused by pump running at shutoff, worn pump or stripped splines.
7. Failed start capacitor or open relay are indicated if the red lead current is not momentarily high at starting.

!CAUTION: The tests in this manual for components such as capacitors, and relays should be regarded as indicative and not as conclusive. For example, a capacitor may test good (not open, not shorted) but may have lost some of its capacitance and may not longer be able to perform its function.

To verify proper operation of relays, refer to Section B, this page.

Ohmmeter Tests

QD Control Box (Power Off)

A. Start Capacitor

1. Meter Setting: R x 1,000
2. Connections: Capacitor terminals.
3. Correct meter reading: Pointer should swing toward zero, then back to infinity.

B. Potential (Voltage) Relay

Step 1. Coil Test

1. Meter setting: R x 1,000.
2. Connection #2 & #5.
3. Correct meter readings:
For 220-240-Volt Boxes 4.5-7.0 (4,500 to 7,000 ohms).

Step 2. Contact Test

1. Meter setting: R X 1.
2. Connections: #1 & #2.
3. Correct meter reading: Zero for all models.

Ohmmeter Tests

Integral Horsepower Control Box (Power Off)

- A. Overloads (Push reset buttons to make sure contacts are closed.)
 - 1. Meter Setting: R X 1
 - 2. Connections: Overload terminals
 - 3. Correct meter reading: Less than 0.5 ohms

- B. Capacitor (Disconnect leads from one side of each capacitor before checking.)
 - 1. Meter Setting: R X 1,000
 - 2. Connections: Capacitor terminals.
 - 3. Correct meter reading: Pointer should swing toward zero, then drift back to infinity, except for capacitors with resistors, which will drift back to 15,000 ohms.

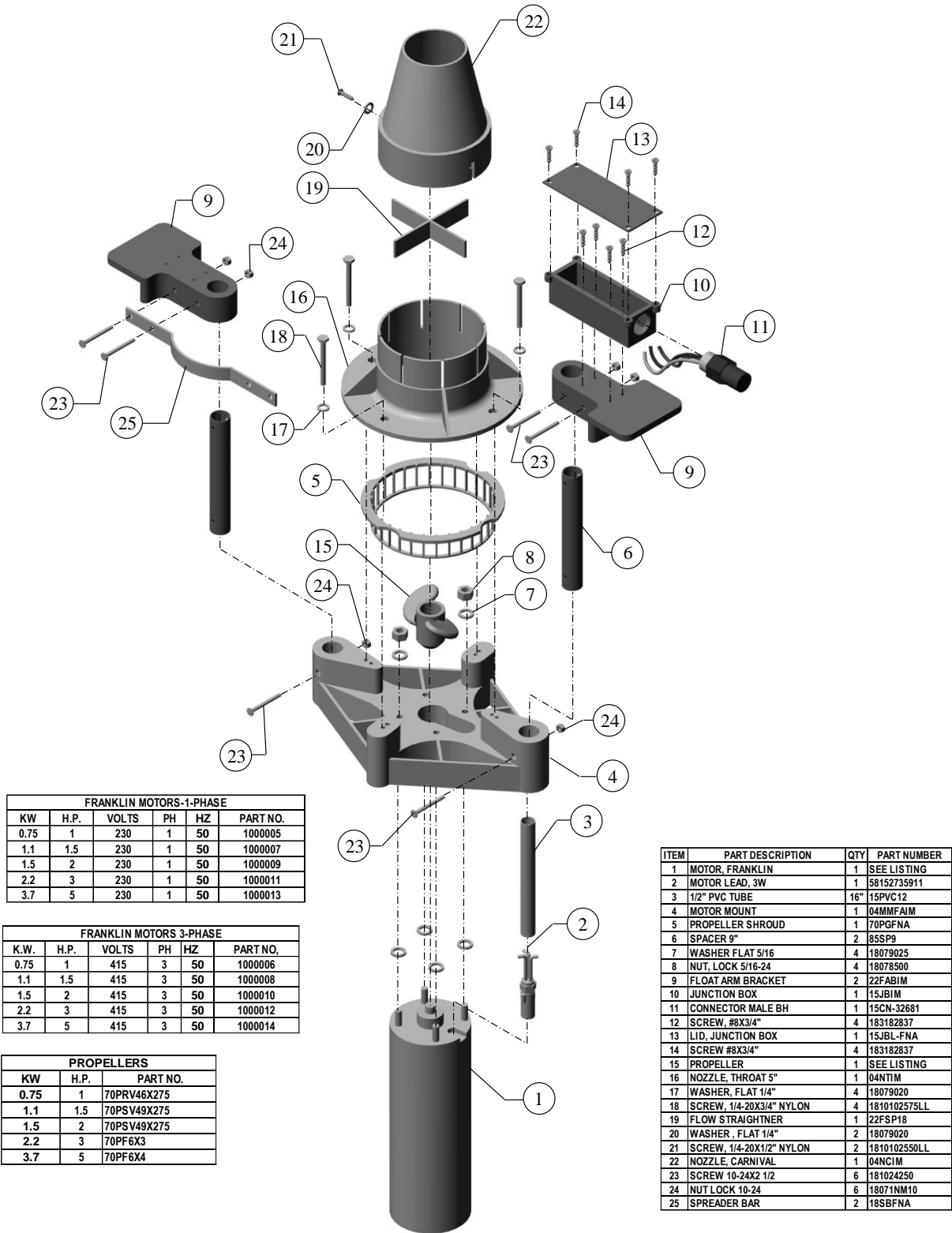
- C. Relay Coil (Disconnect lead from Terminal #5)
 - 1. Meter Setting: R X 1,000
 - 2. Connections: #2 & 5
 - 3. Correct meter readings: 4.5-07 (4,500 to 7,000 ohms) for all models.

- D. Relay Contact (Disconnect lead from Terminal #1)
 - 1. Meter Setting: R X 1
 - 2. Connections: #1 & #2
 - 3. Correct meter reading: Zero ohms for all models.

!CAUTION: The test in this manual for components such as capacitors, and relays should be regarded as indicative and not as conclusive. For example, a capacitor may test good, (not open, not shorted) but may have lost some of its capacitance and may no longer be able to perform its function.

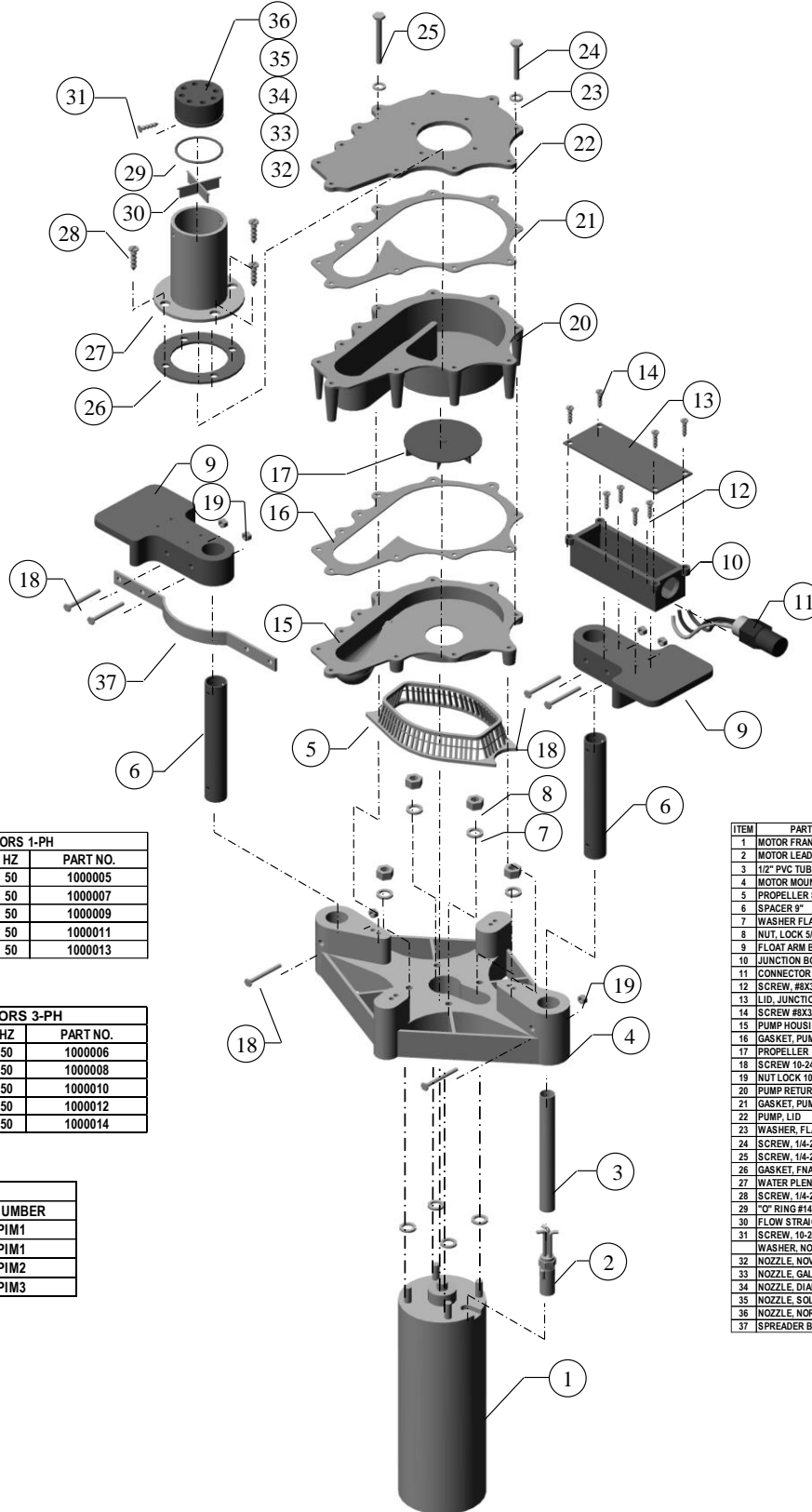
To verify proper operation of relays, refer to Section B, Page 29.

FONT'N-AIRE PROPELLER PUMP PARTS LIST



11/10/14

FONT'N-AIRE CENTRIFUGAL PUMP PARTS LIST



FRANKLIN MOTORS 1-PH				
KW	H.P.	VOLTS	HZ	PART NO.
0.75	1	230	50	1000005
1.1	1.5	230	50	1000007
1.5	2	230	50	1000009
2.2	3	230	50	1000011
3.7	5	230	50	1000013

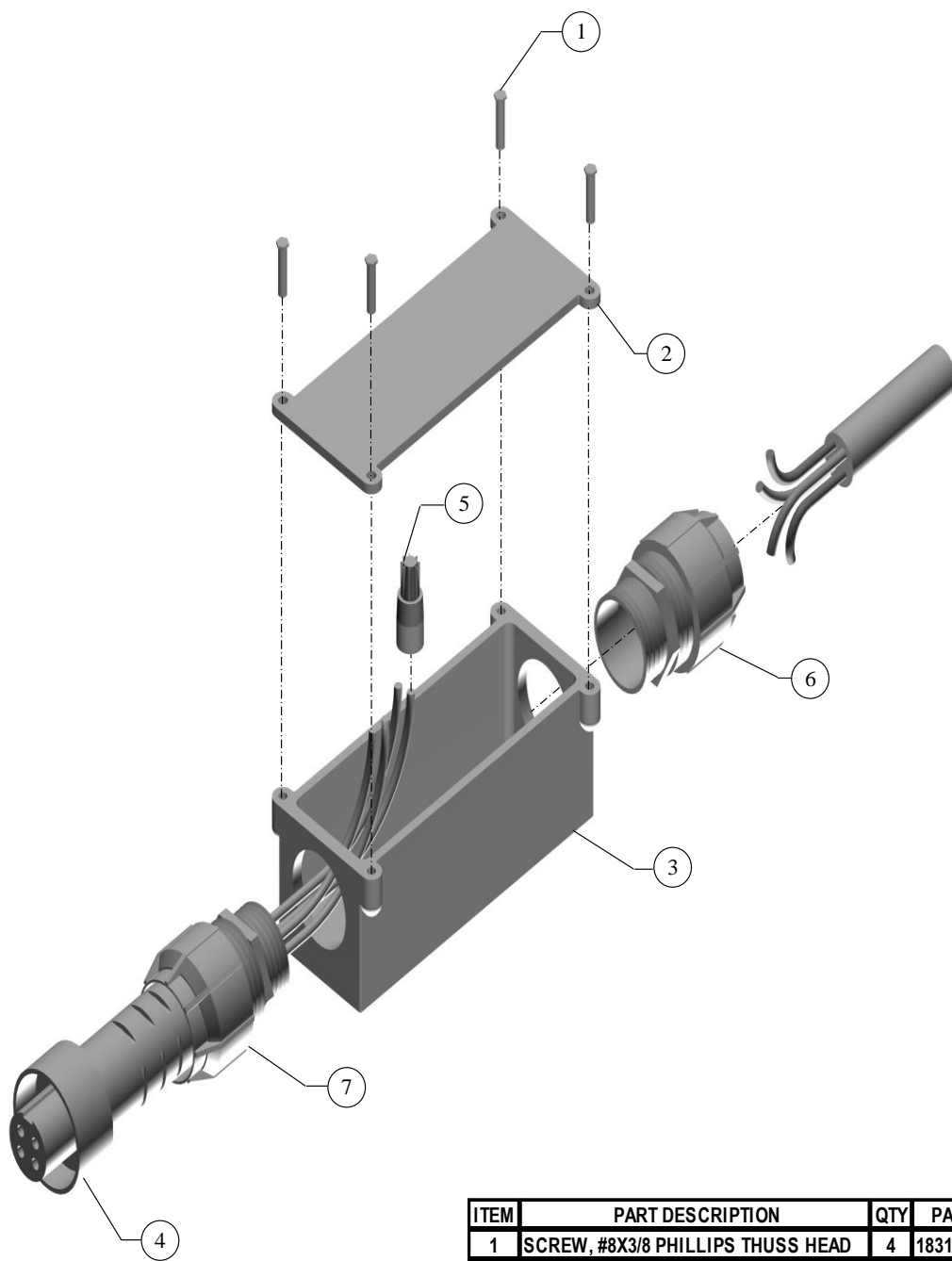
FRANKLIN MOTORS 3-PH				
KW	H.P.	VOLTS	HZ	PART NO.
0.75	1	415	50	1000006
1.1	1.5	415	50	1000008
1.5	2	415	50	1000010
2.2	3	415	50	1000012
3.7	5	415	50	1000014

IMPELLERS		
KW	H.P.	PART NUMBER
0.75	1	70CPIM1
1.1	1.5	70CPIM1
1.5	2	70CPIM2
2.2	3	70CPIM3

ITEM	PART DESCRIPTION	QTY	PART NUMBER
1	MOTOR FRANKLIN	1	SEE LISTING
2	MOTOR LEAD, 3W	1	58152735911
3	1/2" PVC TUBE	16"	15PVC12
4	MOTOR MOUNT	1	84MMFAM
5	PROPELLER SHROUD	1	70PGFNACP
6	SPACER 1"	2	85SP1
7	WASHER FLAT 5/16	4	18079025
8	NUT LOCK 5/16-24	4	18078500
9	FLOAT ARM BRACKET	2	22FABIM
10	JUNCTION BOX	1	15JBM
11	CONNECTOR MALE BH	1	15CN-32681
12	SCREW, #8X3/4"	4	183182837
13	LID, JUNCTION BOX	1	15JBL-FNA
14	SCREW #8X3/4"	4	183182837
15	PUMP HOUSING	1	64PH-PIMG
16	GASKET, PUMP HOUSING	1	64PHG2
17	PROPELLER	1	SEE LISTING
18	SCREW 10-24X2 1/2	6	181024250
19	NUT LOCK 10-24	6	18071NM10
20	PUMP RETURN	1	64PR-PIMG
21	GASKET, PUMP RETURN	1	64PRG2
22	PUMP, LID	1	64PRL-PIMG
23	WASHER, FLAT 1/4"	11	18079020
24	SCREW, 1/4-20X3-3/4 W/ NYLON	7	18101025375NP
25	SCREW, 1/4-20X3-3/4 W/ NYLON	4	18101025375NP
26	GASKET, FNA NOZZLE	1	64GFN
27	WATER PLENUM	1	64WPCP
28	SCREW, 1/4-20X1/2 NYLON	4	1830622550NP
29	"O" RING #147	1	29OR147
30	FLOW STRAIGHTENER (CPI)	1	64FSCP
31	SCREW, 10-24X1/2	2	1830621050
32	WASHER, NOT SHOWN	2	18ANR60C10L
33	NOZZLE, NOVA	1	67MPVCNOV
34	NOZZLE, GALAXY	1	67MPVCGAL
35	NOZZLE, DIANA	1	67MPVCDI
36	NOZZLE, SOLACE	1	67MPVCSOL
37	NOZZLE, NORTH STAR	1	67MPVCNST
38	SPREADER BAR	2	185BFNA

11/10/14

SPLICE BOX ASSEMBLY 3 WIRE
90SPBA3WAUS



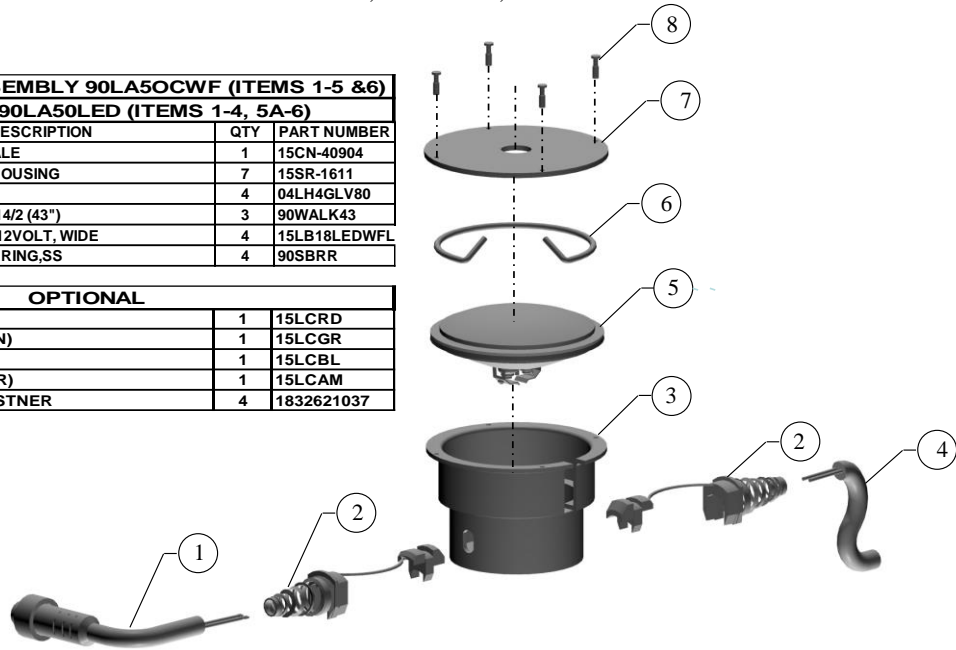
ITEM	PART DESCRIPTION	QTY	PART NUMBER
1	SCREW, #8X3/8 PHILLIPS THUSS HEAD	4	183182837
2	JUNCTION BOX LID FNA 2.5X5.50 I.M.	1	15JBL-FNA
3	JUNCTON BOX (splice box)	1	15JBIMNH
4	CONN,BH,3/4" FEMALE, 3W w/grnd. (PC)	1	15CN-32669
5	CONN, SILCONE FILLED	4	15CN-10444
6	SPLICE BOX CORD GRIP	1	NG-25
7	CONNECTOR, 3/4 (.500-.750)	1	15CC-2932NM

7-10-01

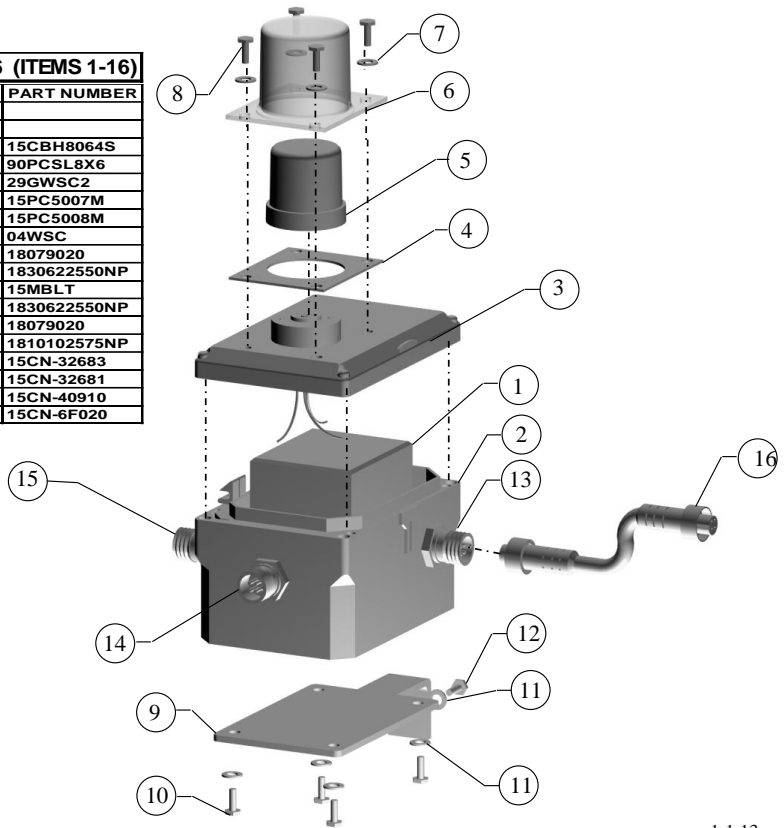
LIGHT KIT ASSEMBLY PARTS LIST
 94LK230AUS, 230 VOLT, 3 WIRE
 94LK460AUS, 415 VOLT, 3 WIRE

LIGHT STRING ASSEMBLY 90LA50CWF (ITEMS 1-5 &6)			
LIGHT STRING LED 90LA50LED (ITEMS 1-4, 5A-6)			
ITEM	PART DESCRIPTION	QTY	PART NUMBER
1	CONN., BH.,12-VOLT, MALE	1	15CN-40904
2	STRAIN RELIEF LIGHT HOUSING	7	15SR-1611
3	LIGHT HOUSING, GLV80	4	04LH4GLV80
4	WIRE ASSY. LIGHT KIT, 14/2 (43")	3	90WALK43
5	SEAL BEAM, LED, 18W, 12VOLT, WIDE	4	15LB18LEDWFL
6	SEAL BEAM RETAINING RING, SS	4	90SBRR

OPTIONAL			
7	LENS COVER (RED)	1	15LCRD
7	LENS COVER (GREEN)	1	15LCGR
7	LENS COVER (BLUE)	1	15LCBL
7	LENS COVER (AMBER)	1	15LCAM
8	LENS RETAINING FASTNER	4	1832621037



LIGHT TRANSFORMER ASSEMBLY 90TXA230306 (ITEMS 1-16)			
ITEM	PART DESCRIPTION	QTY	PART NUMBER
1	TRANSFORMER, 230V to 12V, 100VA	1	
1	TRANSFORMER, 415V TO 12V, 100VA	1	
2	ENCLOSURE, 8X6X4	1	15CBH8064S
3	PHOTO CELL SOCKET W/LID	1	90PCSL8X6
4	GASKET, WATER SHIELD COVER	1	29GWSC2
5	PHOTO CELL, 230-VOLT	1	15PC5007M
5	PHOTOCELL, 460-VOLT	1	15PC5008M
6	WATER SHIELD COVER	1	04WSC
7	WASHER, 1/4", FLAT	4	18079020
8	SCREW, HHCS, 1/4-20X1/2, NYLON	4	1830622550NP
9	POWER PACK MOUNTING BRACKET	1	15MBLT
10	SCREW, 1/4-20X1/2", W/NYL. PATCH	4	1830622550NP
11	WASHER, 1/4", FLAT	4	18079020
12	SCREW, 1/4-20X3/4", W/NYL. PATCH	1	1810102575NP
13	CONN., BH, FEMALE, 3W, 240V	1	15CN-32683
14	CONN., BH, MALE, 3W, 240V	1	15CN-32681
15	CONN., BH, FEMALE, 12V	1	15CN-40910
16	CONN., BH., 3/4" DOUBLE ENDED	1	15CN-6F020





WARRANTY

This product has been manufactured using only quality materials and accurate manufacturing processes to provide the highest satisfaction and long life. We provide a guarantee of 24 months from date of purchase on the pump motor. This guarantee does not cover parts subjected to natural wear and tear, such as impellers/propellers or any damages that result from misuse, tampering, negligence, damage and technical modification, or from not observing the General and Electrical Safety Instructions above.

We reserve the right to repair or replace the unit. No repairs or replacement will be undertaken for pumps that have not been properly maintained. The guarantee will be honored only if the unit is returned to your supplier complete, with your receipt or proof of purchase of the product.

A. Exceptions

Exceptions to the 24-month warranty are: equipment used in severe environments, which are not warranted, i.e., wastewater applications or where high concentrations of corrosive or abrasive material are present.

B. Registration and Operation Requirements

The Basic Warranty covers your Air-O-Lator product only if:

- It's operated and maintained in the manner described in your Owner's Manual.

C. Modifications That Will Void Your Warranty

Disconnecting, tampering with, or altering the electric control panels will void your warranty, unless you or your repairing technician follows Air-O-Lator's requirements for repairing or replacing the controls.

Removing and operating Air-O-Lator equipment without Air-O-Lator approved electrical controls will also void this warranty. Using any electric cable, connectors or splices not provided or authorized by Air-O-Lator will also void this warranty.

1.1 Environmental Factors Not Covered

This warranty does not cover damage caused by environmental factors such as, chemicals, and salt. Nor does your warranty cover damage caused by **windstorms, hailstorms, tornadoes, lightning, power surges, brownouts, floods, earthquakes debris and animals.**

1.2 Maintenance Costs Not Covered

This warranty does not cover the cost of repairing damage caused by poor or improper maintenance. This warranty does not cover the costs of your equipment's normal or scheduled maintenance i.e. annual propeller/impeller replacement, cleaning etc.

1.3 Incidental and Consequential Damages Not Covered

This warranty does not cover any incidental or consequential damages connected with Air-O-Lator products' failure, either while under warranty or afterward. Examples of such damages include:

- Lost time, Inconvenience; The loss of the use of equipment; The loss of personal or commercial property; The loss of revenue; and Delay

1.4 Certain Kinds of Corrosion Not Covered

This warranty does not cover the following:

- Corrosion caused by accident, damage, abuse, or alteration;
- Surface corrosion caused by such things as, sand, salt, stones and barnacles.
- Corrosion caused by the extensive or abnormal exposure of caustic materials like chemicals, acids, and fertilizers.

1.5 Freight:

Warranty shipping charges are to be pre-paid by the owner.

Warranty shipping charges are the responsibility of the owner.

2. How To Get Warranty Service

2.1 Contact our Australian agent – Water Quality Solutions Pty Ltd. for further instruction – Phone:1300 283 387

CUSTOMER REGISTRATION COPY

Owner Name_____	Model _____
Date Purchased_____	Serial No._____
Owner Address_____	Dealer Name_____
City_____	Address_____
State_____ Post Code_____	City_____
	State_____ Post Code_____

NOTE: This information should be retained for your file.



"THE WATER'S EDGE"

Water Quality Solutions Pty Ltd
P.O. Box 219 Bundoora Vic 3083

MAIL IN FORM

WARRANTY REGISTRATION

Purchase Date Mo. _____ Day _____ Year _____

Model No. _____ Serial No. _____

Owner Name _____ Dealer Name _____

Owner Address _____ Dealer Address _____

City _____ City _____

State _____ Post Code _____ State _____ Post Code _____



REPAIR RETURN FORM

To avoid delays in the repair of equipment in question, it is best to call Water Quality Solutions (Phone 1300 283 387) to determine what portion or portions of the equipment in question should be returned. **DO NOT DISASSEMBLE ANY PORTION WITHOUT PRIOR AUTHORIZATION!**

Shipping costs to and from the factory are the responsibility of the shipper as is the packaging. It is recommended to use of the original shipping container to minimize the possibility of shipping damage.

Upon the inspection of returned equipment, whether in warranty or not, contact by Water Quality Solutions, to proceed with repair will be made to the owner or agent with an explanation of the repairs and charges if any. **NO REPAIRS WILL BE MADE UNLESS AUTHORIZED BY THE OWNER OR AGENT.** If Water Quality Solutions is unable to contact the owner/agent within 30 days after receipt of the equipment for repair, a “signature required” notice will be forwarded to the owner or agent stating that disposal of the equipment will be made 30 days from the date of the notice.

Name_____

Address_____

Phone_____FAX_____E-Mail_____

E-mail_____ Equipment Serial #_____

Comments:_____

