



LIXOR[®] Submerged Aeration System Installation & Service Manual

FOR USE WITH

LIXOR[®] 0.5, 1.0, 2.0, 3.0, 4.0, 4.0XD, 6.0, 6.0XD, 8.0 & 8.0XD



LIXOR[®] SYSTEM INSTALLATION & SERVICE MANUAL

GENERAL INFORMATION

All LIXOR[®] products are ETL certified for safety. The ETL certification mark can be found on the LIXOR[®] control panel or inside the blower housing. If you have questions regarding any Bio-Microbics product please contact us at:

1-800-753-FAST (3278) or (913)422-0707



Only authorized service personnel should service a septic system and its components. Deadly hazards such as lethal gases and high voltage electricity are associated with the system.

DELIVERY INSPECTION

LIXOR[®] systems are carefully manufactured, checked and tested at the factory before shipment. Before and after uncrating the unit, check the packaging for signs of shipping damage. If there is evidence of damage or abuse, notify Bio-Microbics, Inc. at (800) 753-3278 or (913)422-0707.

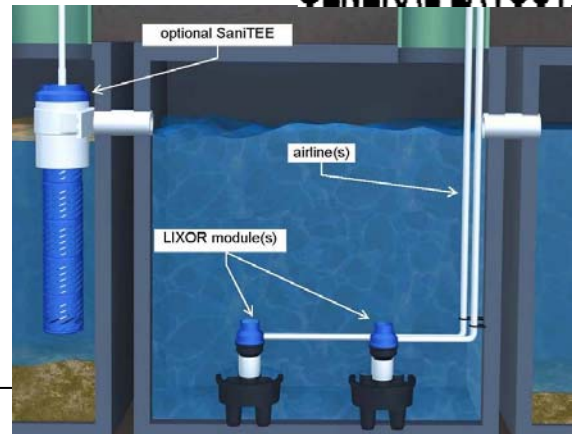
THE LIXOR[®] SUBMERGED AERATION SYSTEM

The LIXOR[®] submerged aeration system is a highly efficient aeration and mixing device that is designed to be used in conjunction with other technologies such as the Bio-Microbics FAST[®] wastewater treatment systems.

The LIXOR[®] process provides dissolved oxygen into a wastewater treatment system. Usually the LIXOR system is installed prior to the primary treatment or settling area. When used in this manner it helps to initiate the biological breakdown of solid material that the biomass cannot process and bacteria that die, settle in LIXOR[®] tank for pump-out removal.

The LIXOR[®] submerged aeration system consists of the LIXOR[®] module(s) and the air blower (piping and electrical components provided by others).

GENERAL LAYOUT



Dear LIXOR[®] Owner,

Thank you for purchasing a Bio-Microbics LIXOR[®] submerged aeration system. The LIXOR[®] system is engineered and manufactured to meet the highest industry standards by the leader in onsite wastewater equipment.

The LIXOR[®] System is at the forefront of green technology. Based on environmentally sound and simple scientific principles, the LIXOR[®] system is our continued commitment to improve small onsite treatment capabilities. You can take pride in knowing that, with Bio-Microbics products you will help ensure a clean environment for future generations.

Please take time to thoroughly read this manual, its important safety precautions and detailed information on the proper use and maintenance of your LIXOR[®] Submerged Aeration system.

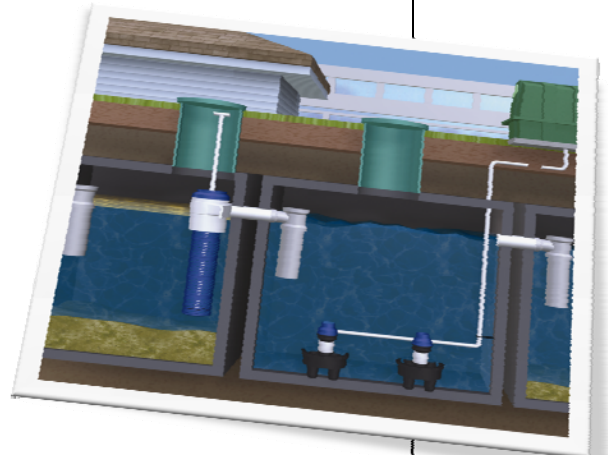
Things you can do to prolong the life of your system:

1. Have the entire system inspected and tank pumped as necessary.
2. Keep track of the substances entering your system, please review the list of Do's & Don'ts (Owner's Manual for poster).
3. Keep the LIXOR[®] System operating - do not turn off the blower.
4. Care for your drain field or irrigation system (if applicable).

If you should desire any further assistance, please contact Bio-Microbics by e-mail at sales@biomicrobics.com or call us at 800-753-FAST (3278).

Thank you again for using LIXOR[®]!

Sincerely, Bio-Microbics Team



LOCATION

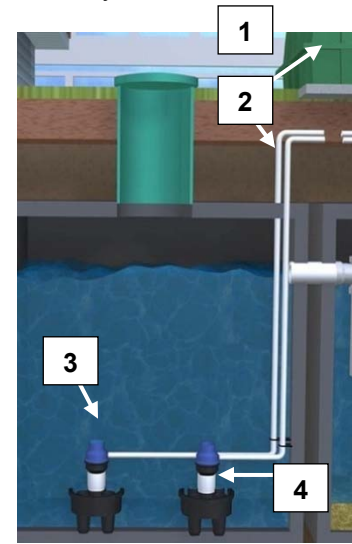
WARNING Always have all utility lines and equipment marked by a locating service prior to performing any work. Failure to do so could result in severe bodily injury or death.

WARNING Hazards exist in confined spaces such as a septic tank. All confined space precautions must be followed if entering a tank. Always keep tank openings covered during storage and installation

The LIXOR submerged aeration system can be placed inside any septic tank. Be sure the tank has adequate access for inserting the LIXOR module into the tank (min. 15 in [38 cm] opening). Follow all other applicable requirements/precautions when installing any tank containing the LIXOR system.

SUPPLIED EQUIPMENT		
	COMMON NAME	PART NUMBER
1	Blower housing	dependant on model
	Louver	045-LVR4
2	Blower	dependant on model
	Blower I/O piping, inlet filter assembly, screws for blower and housing	dependant on model
	Inlet filter element	dependant on model
3	LIXOR top	010-DIFTOP
4	LIXOR base	010-DIFBASE

OPTIONAL EQUIPMENT		
5	Control panel (not shown)	dependant on model



MATERIALS REQUIRED FOR INSTALLATION

1. Septic tank that meets all applicable requirements and standards.
2. Non-corrosive pipe clamps, anchor bolts and fender washers, or other commercially available anchoring system to secure: module to tank, air line to tank and the riser and blower housing to a concrete base.
3. 2" or 3" Schedule 40 pipe and fittings.
4. Appropriate pipe sealant.
5. All necessary electrical equipment and materials to ensure proper installation as per all applicable codes.
6. Non-corrosive brackets for securing air line to the tank (Each LIXOR unit comes with a minimum quantity).
7. Concrete base for blower assembly. See individual model specifications for dimensions.

BLOWER INSTALLATION

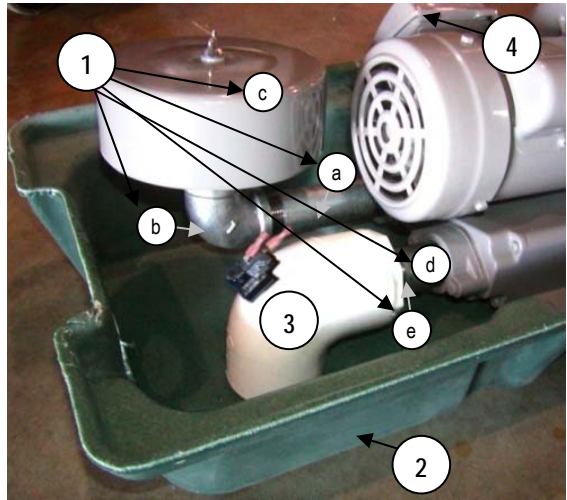


WARNING All electrical work shall be properly performed by a qualified electrician per all applicable codes. Failure to do so may result in severe bodily injury or death.

The blower housing must be placed on a concrete slab. All conduit/piping should pass through the concrete slab from below.

1. **CONNECT PIECES (as shown)**
 - a. Longest pipe
 - b. Elbow
 - c. Air filter assembly
 - d. Shortest pipe
 - e. Reducer bushing

NOTE: USE TEFLON SEALANT TAPE ON ALL PIPE CONNECTIONS.



2. Secure blower assembly to base using four (4) #14 x 1½" self-tapping screws (supplied w/ unit). Drill screws directly into blower base
3. Install air line (supplied by contractor) from blower outlet to LIXOR® unit using required piping (≥2" Ø Sched 40 PVC for LIXOR 0.5, 1.0, 2.0 & (≥3" Ø steel pipe for LIXOR 3.0, 4.0, 4.0XD, 6.0, 6.0XD, 8.0, 8.0XD). Any piping inside the LIXOR tank must be non-corrosive to at least 18" [46 cm] below the water line. It is critical to stabilize the air line with non-corrosive clamps ≤ every 24" [61 cm] inside the LIXOR tank. A minimum number of clamps is provided with each LIXOR unit. Blower piping to LIXOR® may not exceed 100 ft (30.5 m) total length and use a maximum of 6 elbows. **ALL CONNECTIONS MUST BE WATER-AIR-TIGHT AND PERMANENT.** Keep all debris out of air line.

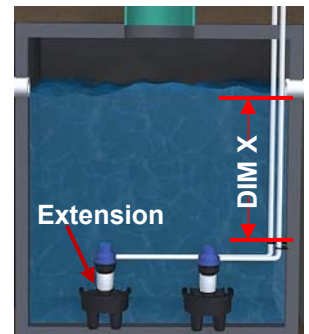
diagrams of each blower. If using 3 phase power and blower turns anti-clockwise then switch any two of the incoming power leads.

LIXOR® MODULE INSTALLATION



CAUTION Always have all utility lines and equipment marked by a locating service prior to performing any work. Failure to do so could result in severe bodily injury or death.

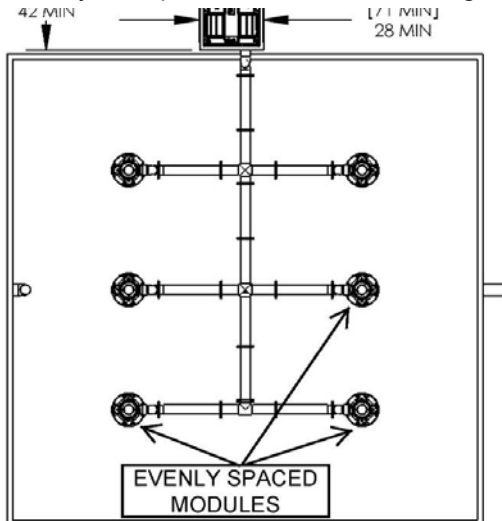
1. LIXOR units work best when the guidelines for release depth, mixing volume and spacing are followed (see diagrams). The specific LIXOR unit's requirements are also detailed in its specification sheets and the specific project engineered plans.



2. Attach the base piece of the module to the base of the tank with minimum of two non-corrosive anchor bolts and fender washers (provided by others).

3. If LIXOR is installed deeper than the maximum listed depth in the chart below (based on , then an extension may be added to the LIXOR. To add an extension cut the proper length of 4" diam. schedule 40 PVC pipe to length (extension may not be >18 in. [45 cm], insert the extension pipe 2" into the center of the base piece and solvent weld to the base piece.

4. Wire the blower to accept the proper voltage for your specific location according to the



DO NOT extend the extension pipe any further than 2" into the base piece.

60 Hz POWER SUPPLY			
MODEL	DIM X (Release Depth)		MAX. MIXING VOLUME (gal)
	MIN. (in)	MAX. (in)	
Lixor 0.5	36	54	2,000
Lixor 1.0	48	72	3,000
Lixor 2.0	48	96	6,000
Lixor 3.0	48	96	9,000
Lixor 4.0	48	96	12,000
Lixor 4.0XD	48	132	12,000
Lixor 6.0	48	96	15,000
Lixor 6.0XD	48	132	15,000
Lixor 8.0	48	96	24,000
Lixor 8.0XD	48	132	24,000

4. Install the top portion of the LIXOR by aligning the 1 ½" air inlet with the desired location for the air supply line. Secure the top portion to the bottom (or pipe extension) by solvent welding (PVC primer & glue) them together.

50 Hz POWER SUPPLY			
MODEL	DIM X (Release Depth)		MAX. MIXING VOLUME (L)
	MIN. (mm)	MAX. (mm)	
Lixor 0.5	91	137	7,500
Lixor 1.0	122	183	11,300
Lixor 2.0	155	620	22,700
Lixor 3.0	155	620	34,000
Lixor 4.0	155	620	45,000
Lixor 4.0XD	155	851	45,000
Lixor 6.0	155	620	56,800
Lixor 6.0XD	155	851	56,800
Lixor 8.0	155	620	91,000
Lixor 8.0XD	155	851	91,000

ELECTRICAL CONNECTION

All electrical work shall be properly performed by a qualified electrician per all applicable codes. Failure to do so may result in severe bodily injury or death.



CONTROL PANEL INSTALLATION (OPTIONAL)

All LIXOR® units including all electrical parts are ETL (UL equivalent) certified for electrical safety. The control panel meets NEMA4X standards for use in all weather conditions (not explosive or submerged environments). Bio-Microbics also manufactures other control panels that can control UV systems and sewage pumps. The TRACK system (or other auto-dialers) can also be connected to the panels.

1. Examine wiring directions inside the supplied LIXOR® control panel
2. A dedicated breaker is required in the building master electrical panel. Make connections between the master panel and the LIXOR® control panel.
3. Make connections between the blower and the control panel as per the electrical diagrams at the end of this manual, and all applicable codes (wiring should be run through electrical conduit).
4. Wire the blower to accept the proper voltage for your specific location according to the diagrams of each blower (some blowers come pre-wired to accept 220V).

VENTING

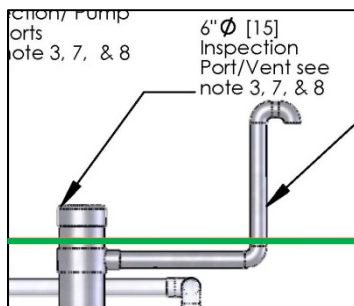
If LIXOR is inside an enclosed tank then a venting method must be created. Three of the most common solutions are mentioned here. The vent system must be sized properly to avoid excessive backpressure in the system (see table below). It also must not allow surface water to enter the system and must allow internal condensation to drain.



DIRECT VENT

1. **DIRECT VENT:** The LIXOR tank's manhole(s) may be able to directly accommodate a vent provided the minimum vent opening is met (see chart). Any cap must be installed so as to prevent unauthorized access. The vent structure(s) should prevent foreign material from entering the system.

REQUIRED VENT SIZES		
LIXOR® model	Min vent pipe diam in/mm	Min vent opening in ² /mm ²
0.5	2/5	0.75/4.8
1.0	2/5	0.75/4.8
2.0	3/7.6	3.2/20.5
3.0	3/7.6	3.2/20.5
4.0	4/10.2	7/45
6.0	6/15.2	12.5/80.6
6.0XD	6/15.2	12.5/80.6
8.0	6/15.2	12.5/80.6
8.0XD	6/15.2	12.5/80.6



REMOTE VENT

2. **REMOTE VENT:** Branch off of manhole bell the vent pipe to the desired location and terminate above grade. The vent structure(s) should prevent foreign material from entering the system. Water accumulating in the vent piping MUST be drained to prevent back pressure.

3. **BIOFILTER:** This method may require design by a qualified engineer. Run a significant amount of perforated vent line in a trench. Cover the trench with shredded bark mulch. DO NOT cover the mulch with soil. The biofilter vent must not allow moisture to drain back into the treatment system.

FINAL INSPECTION & START UP

It is the responsibility of the installer to ensure that the tank will not float due to hydraulic conditions at the site. Your local Bio-Microbics distributor may provide installation inspection services. If you have any questions, call Bio-Microbics at 1-800-753-FAST or 913-422-0707.

WARNING *Persons coming in contact with wastewater, must immediately wash all exposed areas with disinfecting cleaner and contact your personal physician. Failure to do so could result in severe sickness or death.*

BEFORE THE UNIT IS BACKFILLED:

- A. Fill the tank to the normal operating level.
- B. Check for leaks in all water-tight seals.
- C. Turn the blower ON and observe the operation of the unit. A robust boiling action should be present.
- D. Check for excessive back pressure (if applicable): Seal all access covers, place hand about 8 inches [20 cm] from LIXOR® vent, if air flow is felt then excessive back pressure exists and the system's vent must be upgraded.
- E. Check for proper alarm function (if applicable). Turn OFF the blower circuit breaker and wait for the alarm to sound. If the alarm does not sound after 30 seconds, then review the electrical installation procedures.
- F. Turn the blower back ON.
- G. Backfill the excavation.
- H. Lastly, record the LIXOR® unit's serial number in this manual.

Do's & Don'tsWhat can I put down the drain?

CAUTION Only qualified service persons should open any access port on a septic system. Infectious organisms exist in a septic tank. Persons coming in contact with wastewater must immediately wash and disinfect all exposed areas and contact their personal physicians.

Please refer to the list below for important information on how to help keep your treatment system performing, as it should.

Do not put these items down the drain:

ANIMAL BONES/SKIN	EGG SHELLS	PESTICIDES
AUTOMOTIVE FLUIDS	FILM DEVELOPING WASTE	PLASTICS
BANDAGES	FLOOR STRIPPER	RAGS
CAT LITTER	HERBICIDES	RV WASTE
CAUSTIC CLEANERS	HOME BREWERY WASTE	SANITARY NAPKINS
CIGARETTE BUTTS	MELON RINDS	SOLVENTS
COFFEE GROUNDS	METAL OBJECTS	STICKS
CONDOMS	MODELING CLAY	STRING
CORN COBS	PAINT	THINNERS
DISPOSABLE DIAPERS	PAPER TOWELS	WET WIPES

RECORD KEEPING Keep copies of all system drawings/plans of the site/installed equipment/service records with all other home appliance documents. Record all applicable information.

LAUNDRY/WATER USAGE Spread wash loads throughout the week. Instead of liquid fabric softener, dryer sheets should be used. Use low-suds, biodegradable and low phosphate detergents, like Mighty Mike® from Scienco/FAST (www.sciencofast.com).

LEAKY FIXTURES Large quantities of water are added to your wastewater system when you have leaking fixtures. Timely detection and repair can help to maximize the life of your system, especially the drain field.

SEPTIC TANK ADDITIVES / ENZYMES The wastewater in the system contains all the required bacteria for proper operation. Additional enzymes are unnecessary; and may do more harm than good.

PAPER PRODUCTS Use single- or double-ply, non-quilted, white toilet paper products. Some color dyes in the paper cannot be eaten by natural bacteria. Non-bleached paper (brown in color) takes longer to break down and can therefore increase your biosolids pump out frequency. Avoid flushing paper towels, napkins, or other thicker paper material.

WATER SOFTENERS The FAST® process may tolerate discharge from demand initiated regeneration softeners (vs. timer regeneration). However, these discharges can possibly damage other parts of the septic system.

FOOD WASTES Garbage disposal waste is acceptable - if allowed by your local regulatory authority. However, it may lead to more frequent removal of solids. For large quantities of food, please dispose of in the garbage.

Fats, Oils & Grease (FOG) Be aware too much grease (i.e. animal fats, vegetable oils, lard, etc) down the drain may overload or prevent the bacteria from fully breaking down the waste.

DISINFECTANTS / CLEANERS Use citric acid, chlorite, and/or other biodegradable cleaners according to the manufacturer's recommendations. Products containing quaternary ammonia or oil-based cleaners should not be used. Use drain cleaners as a last resort to unclog pipes.

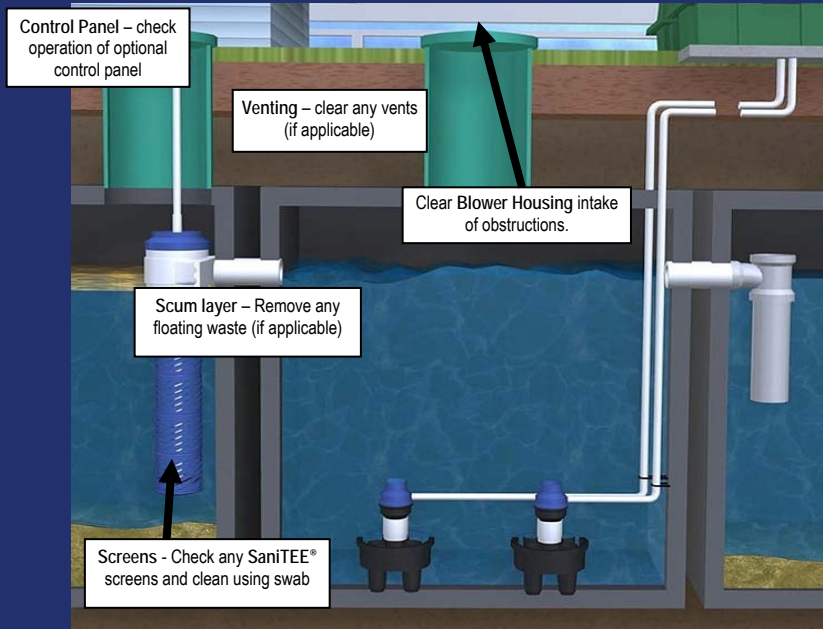
Drains fROm Garage and Workrooms Should be diverted away from your septic system. Items like petroleum-based oils, gas, and saw dust should never enter the system.

MEDICINES DO NOT FLUSH THEM DOWN ANY DRAIN. All antibiotic medicines are harmful to treatment quality. Unused medications should be returned to the pharmacy, doctor, or thrown away in the trash. NOTE: As the human body absorbs ≤20% of these medications, please notify your service provider of medicines in the house. This could reduce troubleshooting efforts and possibly your maintenance bill.

PLEASE BE AWARE OF THE FOLLOWING; FAILURE TO DO SO COULD RESULT IN SEVERE SICKNESS OR DEATH:

- Always secure all access covers of the tank, control panel and blower, so that people cannot enter without the use of proper tools.
- Gases emanating from septic tanks can explode if ignited or deadly if inhaled. DO NOT use flame or spark near a septic tank access points.
- Only qualified service persons should open any access port on a septic system.
- Infectious organisms exist in a septic tank. Persons coming in contact with wastewater must immediately wash and disinfect all exposed areas and contact their personal physicians.

Regular Maintenance of System



REGULAR MAINTENANCE CHECKLIST

⚠ WARNING Always secure all access covers in place so that people cannot enter the tank, control panel or blower without the use of proper tools. DO NOT use flame or spark near a septic tank's access points. Gases emanating from septic tanks can explode if ignited or deadly if inhaled.

⚠ WARNING Only qualified service persons should open any access port on a septic system. Infectious organisms exist in a septic tank. Persons coming in contact with wastewater must immediately wash and disinfect all exposed areas and contact their personal physicians. Failure to do so could result in severe sickness or death.

NORMAL OPERATING CONDITIONS

SOUND	The LIXOR® system's blower makes a constant humming noise, much like a household refrigerator. Under normal conditions, the blower should last 5+ years without need for service. If an unusual noise is heard, contact your local distributor or Bio-Microbics.
ODOR	A musty, earthy-type of odor is normal, when encountered at the LIXOR® system's vent. However, if a sewage odor (rotten egg) may be present due to system design.
SIGHT	A properly loaded and operated LIXOR® system will create a vigorous boiling action with brown waste inside the LIXOR tank.

- BLOWER OPERATION** DO NOT turn off the blower (unless testing alarm). Treatment quality will be reduced. Check the blower for proper function. Clean the blower's inlet air filter element. If the blower is malfunctioning for an unknown reason, please OUTSIDE
- OPTIONAL ALARM PANEL** The alarm has a ~10 second built-in delay. Test the audible alarm by turning the blower OFF. To silence the alarm, use the "RESET" button on the panel's front. If the alarm is activated for an unknown reason, please contact your local Bio-Microbics distributor for assistance.
- VENTS, ODORS, AND INTAKES** Clear the vent(s) and blower housing intakes of any obstructions. Contact your local Bio-Microbics distributor if you detect septic odors coming from the LIXOR® vent as this may indicate a problem with the system.
- BIO-SOLIDS (SLUDGE) LEVELS** Properly sized LIXOR systems should not accumulate sludge in the LIXOR tank, however floatable waste may collect over time. This floating waste should be removed periodically. *All stricter, applicable regulations supersede these operational directions.*

NOTICE: Avoid pumping down after periods of heavy rain or when the ground water is likely to be above the bottom of the concrete tank. Emptying the tank under these conditions could cause the tank to float up and become dislodged.

LIMITED WARRANTY

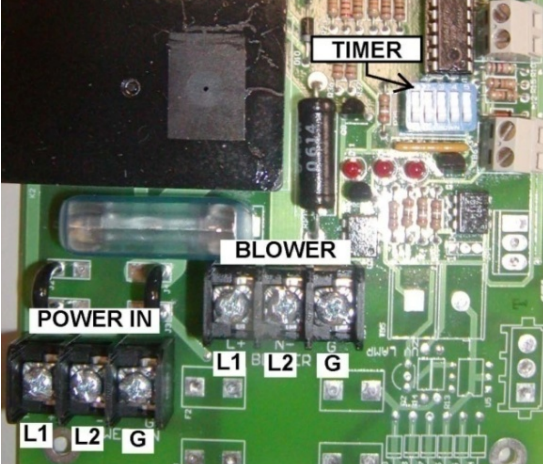
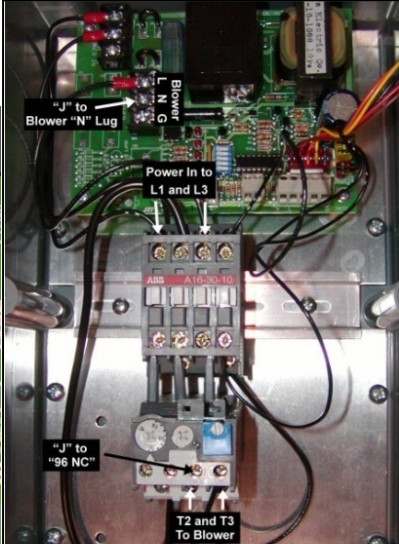
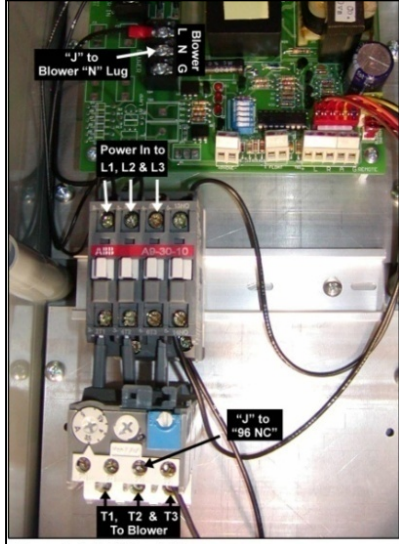
Bio-Microbics, Inc. warrants every new LIXOR® system against defects in materials and workmanship for a period of two years after installation or three years from date of shipment, whichever occurs first, subject to the following terms and conditions:

During the warranty period, if any part is defective or fails to perform as specified when operating at design conditions, and if the equipment has been installed and is being operated and maintained in accordance with the written instructions provided by Bio-Microbics, Inc., Bio-Microbics, Inc. will repair or replace at its discretion such defective parts free of charge. Defective parts must be returned by owner to Bio-Microbics, Inc.'s factory shipping pre-paid, if so requested. The cost of labor and all other expenses resulting from replacement of the defective parts and from installation of parts furnished under this warranty and regular maintenance items such as filters or bulbs shall be borne by the owner. This warranty does not cover aerator components which have been damaged by flooding or any components that have been disassembled by unauthorized persons, improperly installed or damaged due to altered or improper wiring or overload protection. This warranty applies only to the treatment plant and does not include any of the house wiring, plumbing, drainage, septic tank or disposal system. Bio-Microbics, Inc. reserves the right to revise, change or modify the construction and/or design of the LIXOR system, or any component part or parts thereof, without incurring any obligation to make such changes or modifications in present equipment. Bio-Microbics, Inc. is not responsible for consequential or incidental damages of any nature resulting from such things as, but not limited to, defect in design, material, or workmanship, or delays in delivery, replacements or repairs.

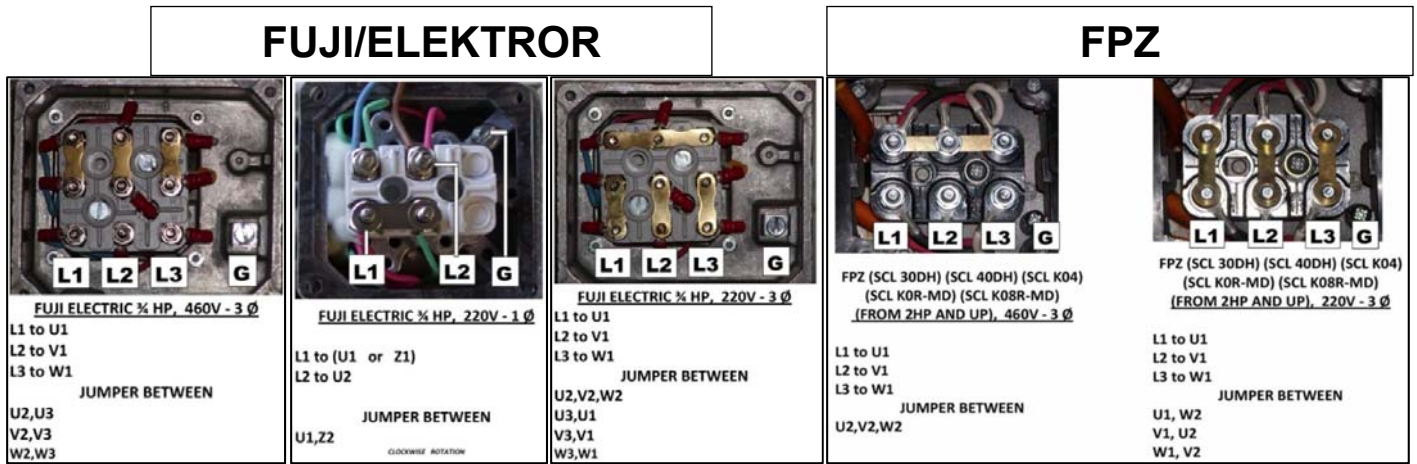
THIS WARRANTY IS IN LIEU OF ALL OTHER EXPRESSED WARRANTIES. ANY WARRANTY IMPLIED BY LAW, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, IS IN EFFECT ONLY FOR THE WARRANTY PERIOD SPECIFIED ABOVE. NO REPRESENTATIVE OR PERSON IS AUTHORIZED TO GIVE ANY OTHER WARRANTY OR TO ASSUME FOR BIO-MICROBICS, INC., ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF ITS PRODUCTS.

CONTACT YOUR LOCAL DISTRIBUTOR FOR PARTS AND SERVICE.

COMMON WIRING DIAGRAMS

220VAC, 1Ø, ≤ 2HP	220VAC, 1Ø, 3HP	ALL 3Ø PANELS
	 <ul data-bbox="685 1707 1081 1799" style="list-style-type: none"> - Power In to L1 and L3 - Remove existing wire between "96 NC" & Blower "N" Lug - Two "J" wires from blower: connect one to Blower "N" Lug, and the other to overload "96NC" Terminal - Power to Blower from T2 and T3 	 <ul data-bbox="1088 1707 1484 1799" style="list-style-type: none"> - Power In to L1, L2 and L3 - Remove existing wire between "96 NC" & Blower "N" Lug - Two "J" wires from blower: connect one to (Blower "N" Terminal), and the other to overload "96NC" Terminal - Power to Blower from T1, T2 and T3

BLOWER(S) WIRING DIAGRAM



All Wiring Diagrams are Available Upon Request



Lixor® Module Serial Number: _____

System Designer Name: _____

Designer Phone: _____

Health Official Name: _____

Health Official Phone: _____

Manufacturer Name: Bio-Microbics, Inc.

Manufacturer Phone: 1-800-753-FAST (3278)

Installed By: _____

Installer Phone: _____

Maintenance Provider Name: _____

Maintenance Provider Phone: _____



8450 Cole Parkway • Shawnee, KS 66227 • USA
 Ph: 913-422-0707 • Fax: 913-422-0808
 800-753-FAST (3278) • www.biomicrobics.com