



FAST[®] Installation Manual

FOR USE WITH

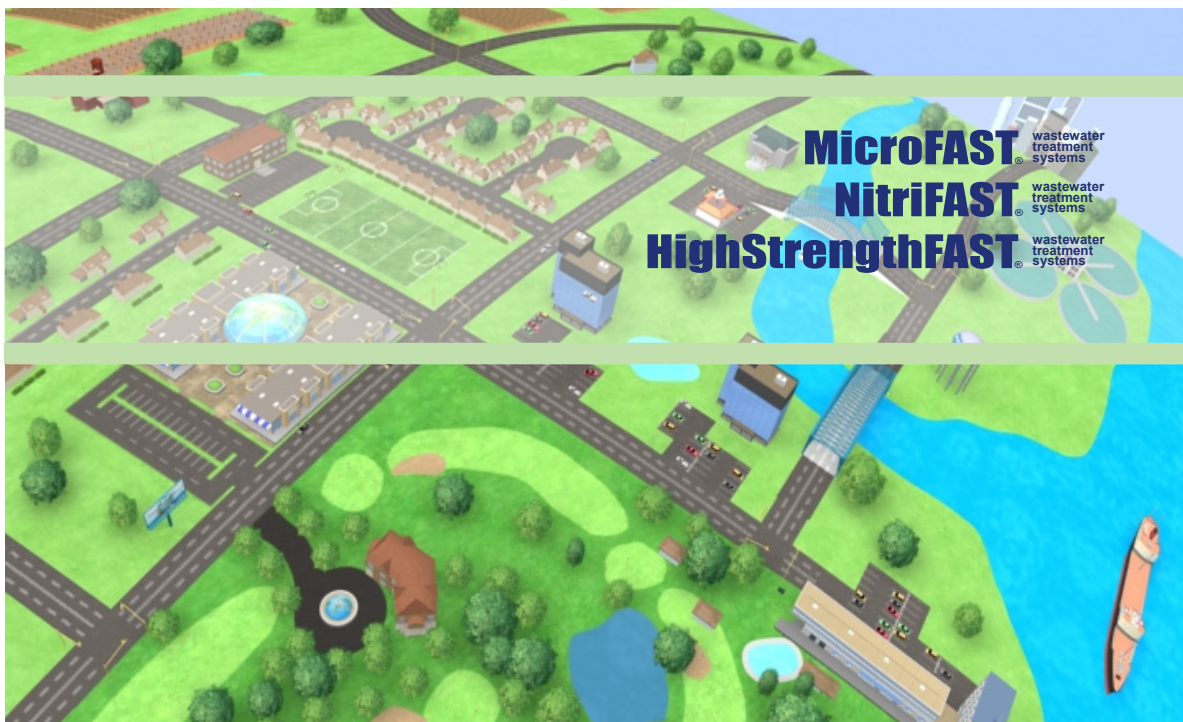
(NSF/ANSI Std 40 & 245)
(non-NSF certified)

MicroFAST[®] 0.5, 0.625, 0.75, 0.9, 1.5

MicroFAST[®] 3.0, 4.5, 9.0

NitriFAST[®] 0.5, 0.625, 0.75, 0.9, 1.5, 3.0, 4.5, 9.0

HighStrengthFAST[®] 1.0, 1.5, 3.0, 4.5, 9.0



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INSTALLATION MANUAL

GENERAL INFORMATION

All FAST® products are ETL certified for safety (electrical, environmental, etc.). One or more of the following patents protects this process: 3,966,599; 3,966,608; 3,972,965; 5,156,742. Certified by NSF International, the MicroFAST® 0.5, 0.625, 0.75, 0.9 and 1.5 systems meets NSF/ANSI Standard 40, Class 1 and Standard 245 certifications for wastewater treatment devices. If you have questions regarding any Bio-Microbics products, please contact us:

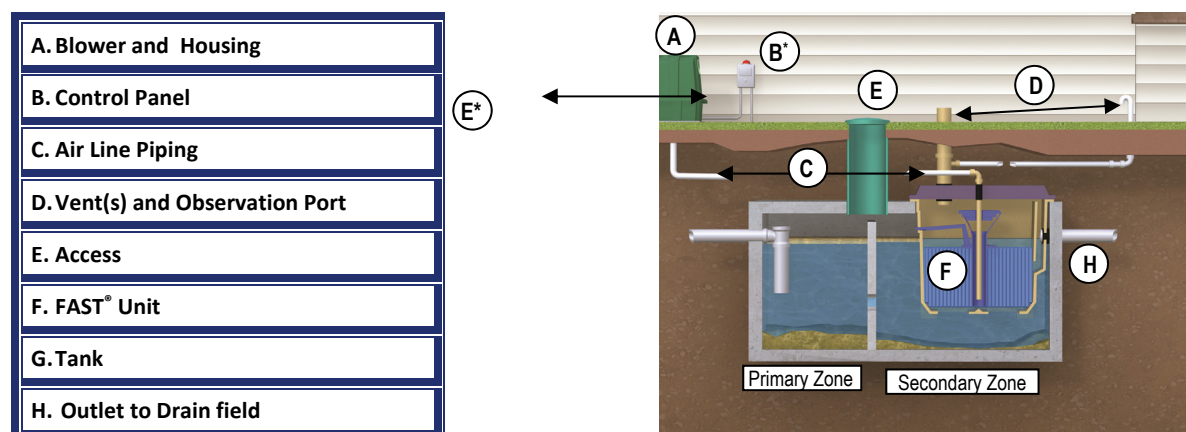
1-800-753-FAST (3278) or +1- (913) 422-0707

e-mail: onsite@biomicrobics.com

About FAST®: The FAST® (Fixed Activated Sludge Treatment) system uses naturally occurring bacteria (biomass) to treat sewage for dispersal into the environment. This continuous process provides the biomass with waste (food) and air in a suitable environment. Dead bacteria and non-biodegradable waste settle and accumulate in the bottom of the tank for periodic removal.

The FAST® process consists of the treatment module and blower. The blower provides air to the system via the air supply pipe. The air supply pipe and draft tube create an air lift. The air lift mixes oxygen and waste throughout the media inside the tank. Bacteria grows on the media and digests the waste. A vent pipe expels harmless vapors created by the process.

GENERAL LAYOUT



***PLEASE NOTE:** Adequate pump out must be provided for primary and secondary zones. There may be ancillary equipment associated with your system: pump(s) (before and/or after the FAST® unit), a distribution box, a disinfection system, an irrigation system, a remote alarm, or auto dialer, etc.



WARNING

Only qualified service personnel should open access ports and/or covers to a septic tank. Infectious organisms exist in a septic tank. If any contact with wastewater occurs, immediately wash and disinfect all exposed areas and contact personal physician. Failure to do so could result in severe sickness or death. DO NOT use an open flame or cause a spark near a septic tank's access points. Gases emanating from septic tanks can explode if ignited or deadly if inhaled.

LOCATION

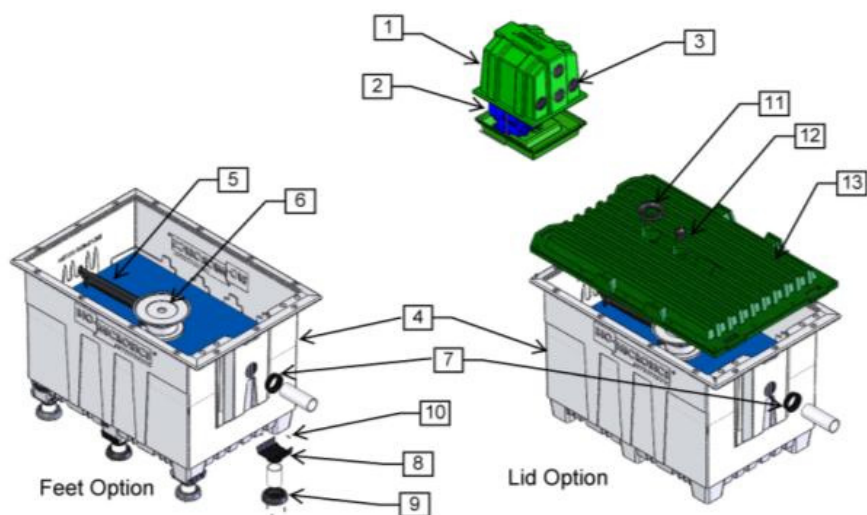


Always have all utility lines and equipment marked by a locating service prior to performing any work. Failure to do so could result in severe bodily injury or death.

FAST® systems may be located in the same position relative to the house and water supply as any conventional septic system. However, some basic guidelines should be followed:

1. The FAST® system lid is designed to withstand a burial depth of up to 3 feet (0.9 meters). Do not place the tank in a location where it could be subjected to traffic or additional weight. A professional engineer should be consulted if additional loading conditions are expected. FAST® with feet option should be considered.
2. The FAST® system must be located so that sufficient slope ($\geq 2\%$, ¼ inch/foot) is provided for the influent and effluent lines.
3. Excessive back pressure must not be placed on the blower. Follow all installation guidelines.
4. The method and arrangement for effluent discharge must not interfere with the treatment plant's operation.

SYSTEM COMPONENTS



OPTIONAL EQUIPMENT		
8	Foot Top	010-FT
9	Foot Bottom	010-FB
10	Foot Screws	085-SSD141

SUPPLIED EQUIPMENT		
COMMON NAME		PART NUMBER
1	Blower housing	Depending on model
2	Blower	Depending on model
Blower I/O Piping, Inlet Filter Assembly, Screws		Depending on model
Inlet Filter Element		Depending on model
3	Louver	390-LVR4
4	Liner	Depending on model
5	Recirculation Trough	Depending on model
6	Air Lift	Depending on model
7	4" Outlet Gasket	412.1-GSKTM4
11	6" Obs. Port Gasket	412.1-GSKTDT6
12	2" Air Line Gasket	412.1-GSKTD2
13	Lid (Not available with MCF 4.5 & 9.0)	Depending on model

**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.

**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

Before installation may begin, check the tank to ensure it is level within $\pm 1/2"$ [12 mm].

MATERIALS REQUIRED FOR INSTALLATION

Note: other tools may be needed to complete installation.

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Septic tank that meets all applicable requirements & standards 2. Safe lifting mechanism 3. Anchor bolts for securing FAST® unit to the tank and blower housing to the concrete base. 4. Piping for observation/vent port, air lines, and vent lines (check installation procedures, specs, and plans to determine the size and type of pipes needed). | <ol style="list-style-type: none"> 5. PVC saw 6. Pipe lubricant/soap 7. PVC primer and glue (weather appropriate) 8. Concrete base for blower assembly 9. Mounting screws for control panel 10. Electrical conduit, fittings and specified wires 11. Hammer drill and masonry bits |
|--|---|

MODULE INSTALLATION

There are two options available for mounting the FAST® module into a tank.

Option A uses FAST's plastic lid and hangs the module from the concrete tank.

Option B uses leg extensions to stand the unit up on the bottom of tank.

COMPLETE MODULE WEIGHTS						
MODULE SIZE	0.5	0.625, 0.75, 0.9, 1.0	1.5	3.0	4.5	9.0
WEIGHT (lbs)	165	275	525	725	1600	2300



CAUTION Use safe lifting techniques to set module in tank. Be sure all lifting equipment is clear of obstructions such as power lines and trees.

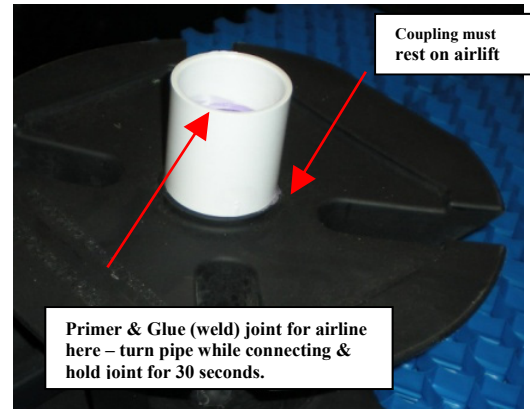
OPTION A: LID INSTALLATION (not available on any 4.5 or 9.0 unit)



1. Hang the FAST® liner from the opening on the top of the tank lid.
2. Place the unit lid on top of the FAST liner. Carefully line up the airline hole in the FAST® lid with the coupling at the top of the airlift inside the tank. Make sure the airline pipe stands perpendicular to the lid.
3. Using a hammer drill; drill holes for anchoring module to the tank using pre-formed holes in the module lid as guides.
4. Apply sealant to surface between liner and tank, and module lid.
5. Place module lid on top of liner and secure using holes drilled in step 2 and non-corrosive 3/8" anchor bolts.

6. **AIRLINE** Insert cut length of air supply pipe (see AIR LINE SIZING table) through factory provided airline gasket in module lid. Use 6" hole in the lid for access to connect and glue air supply to air lift coupling. Run the airline to the desired blower location using required piping. Be sure airline is properly bedded when installed. Air line piping to FAST® may not exceed 100 ft [30.5 m] total length with ≤ 4 elbows.

ALL CONNECTIONS MUST BE AIR/WATER-TIGHT AND PERMANENT.



AIR LINE SIZING			
MODEL	PIPE SIZE (O.D.)		AIR LINE MATERIAL
0.5, 0.625, 0.75, 0.9, 1.0, 1.5, 3.0	2" (2.375")	51mm (60.3 mm)	PVC
4.5, 9.0	3" (3.516")	78.5mm (90mm)	Steel (stainless steel inside FAST® tank to prevent corrosion)

7. **OBSERVATION / VENT PORT** (o/v port) Insert desired length of 6" pipe into factory provided gasket then into access hole in lid. Insert pipe until it stops.

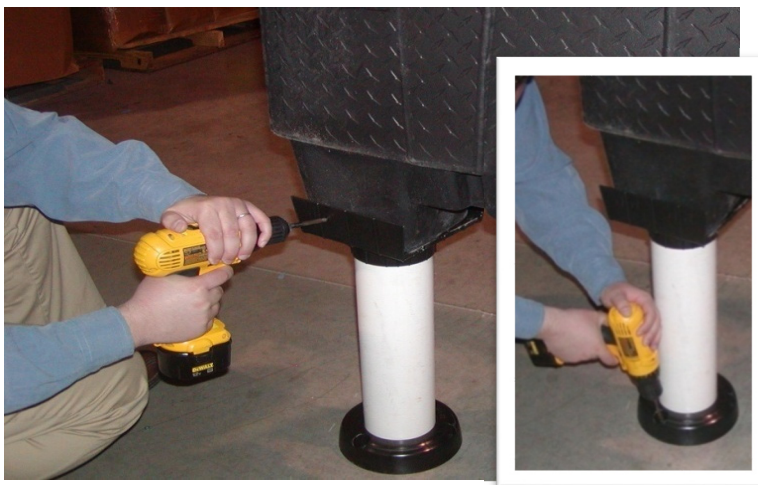


DO NOT PUSH PIPE TO MEDIA SURFACE!



OPTION B: LEG INSTALLATION

1. **BUILD LEGS** using 4" [101 mm] Sch 40 pipe cut to your desired length. Glue the pipe to the bottom and top



leg pieces. Attach the leg extensions to the module using supplied self-tapping screws. The use of non-corrosive materials is recommended to create lateral stability for the FAST system.

NOTE: If legs are > 18" [45.7 cm] tall then Sch 80 PVC or stronger pipe must be used. Consult factory to extend legs > 36" [90 cm].

2. **ATTACH LINER TO TANK** Attach leg extensions to the base of the tank with stainless steel anchor bolts (not provided). Two anchor bolts are required per leg

extension. Place the anchor bolts in the corners opposite each other.

3. **SECURE FAST® LINER TO TANK (4.5 & 9.0 Units Only)** Use the supplied stainless steel braces to secure the top of the FAST® liner to the tank at the proper locations.
 - a. Use at least three (3) sets of stainless steel hardware (bolts, matching nuts, lock washers and flat washers) to secure each cross brace to the FAST® liner.
 - b. Use stainless steel anchor bolts to secure each cross brace to the tank sidewall.



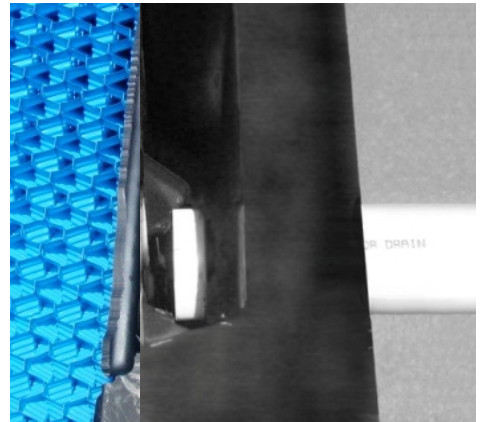
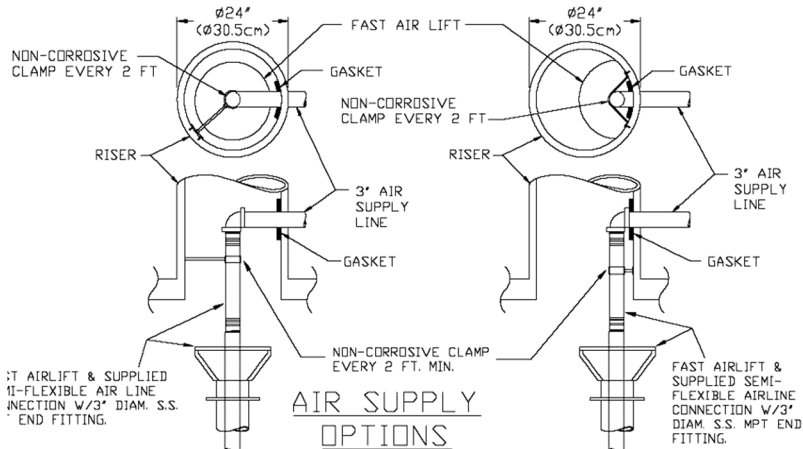
4. **AIR LINE** Join the air supply line to the air lift connection using required piping (see AIR LINE SIZING table). Blower piping to FAST® may not exceed 100 ft [30.5 m] total length with ≤ 4 elbows.

AIR LINE SIZING			
MODEL	PIPE SIZE (O.D.)		MATERIAL
0.5, 0.625, 0.75, 0.9, 1.0, 1.5, 3.0	2" (2.375")	51mm (60.3 mm)	PVC (Schd 40 or 80)
3.0	2" (2.375")	51mm (60.3 mm)	PVC (Schd 80)
4.5, 9.0	3" (3.516")	78.5mm (90mm)	Steel (stainless inside FAST® Tank)

The air supply line inside the tank must be secured with non-corrosive clamps every 2 ft. [0.6 m] to prevent breaking.

OUTLET INSTALLATION

Insert 4" Sch 40 PVC pipe for use as an effluent line. Insert through tank wall and into 4" outlet gasket in the liner. Push pipe to baffle stops.



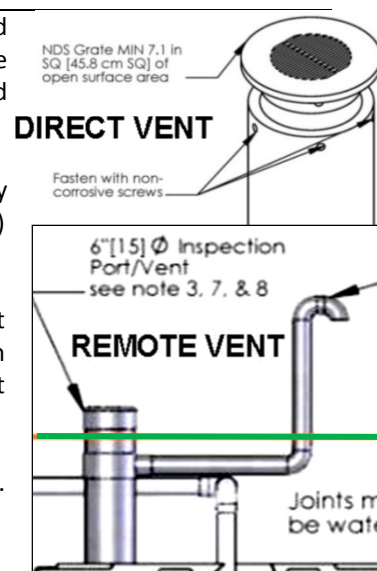
VENTING

Numerous options exist for proper venting. Three of the most common are mentioned here. The vent system must be sized properly to avoid excessive back pressure 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: The 6" o/v port can have holes drilled in it or a slotted cap put on it. Any cap must be fastened with screws to prevent unauthorized access. The opening(s) should prevent foreign material from entering the system.

REMOTE VENT: Branch off of the 6" o/v port or manhole below grade. Run the vent pipe to the desired location and terminate above grade. Cover opening with #4 mesh screen or similar. Water accumulating in the vent piping **MUST** be drained to prevent back pressure. **NOTE: The vent should not exceed 100 ft. [30.5m] in total length.**

BIOFILTER: Please contact Bio-Microbics for guidance on how to build this buried vent. **NOTE: A biofilter vent must not allow moisture back into the treatment system.**



REQUIRED VENT SIZES		
MODEL	MIN VENT DIAM in/mm	Vent Opening in in ² /cm ²
All 0.5, 0.625, 0.75, 0.9	3 / 76	7.0 / 45
All 1.5, HSF 1.0	4 / 102	9.1 / 59
All 3.0	6 / 152	19.5 / 126
All 4.5, 9.0	10 / 254	39 / 251

BLOWER INSTALLATION

CAUTION

Always have all utility lines and equipment marked by a locating service prior to performing any work.

WARNING

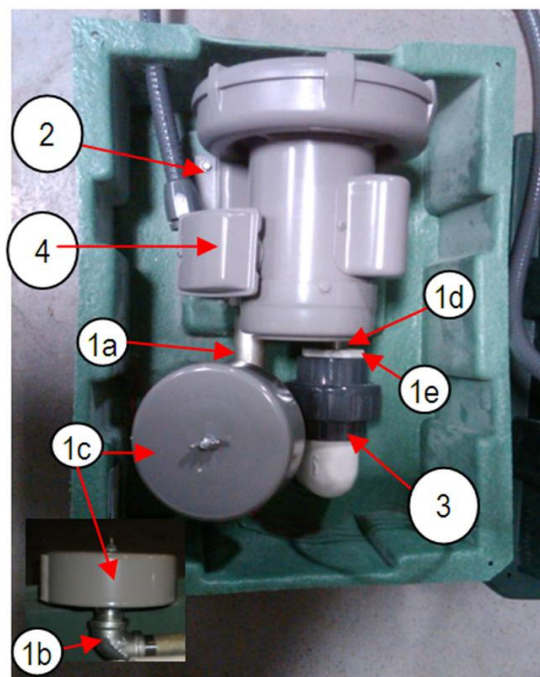
All electrical work shall be properly performed by a qualified electrician per all applicable codes. Failure to do so may result in severe bodily injury or death.

The blower and blower housing must be mounted on a solid base such as concrete to avoid settling. All conduit/piping should pass through the concrete slab from below.

- CONNECT SUPPLIED INITIAL PIECES (See picture to the right)
 - Longest pipe
 - Elbow (See Inset)
 - Air filter assembly
 - Shortest pipe
 - Reducer bushing

NOTE: ALL PIPE CONNECTIONS MUST BE AIR/WATER TIGHT.

- SECURE BLOWER assembly to housing base using four supplied #14 x 1½" self-tapping screws. Drill screws directly into blower base.
- CONNECT AIR LINE from FAST® unit to blower outlet using required piping (see chart). A "quick disconnect" is highly recommended to be installed at this location. Blower piping to FAST® may not exceed 100 ft. [30.5 m] total length and have ≤ 4 elbows. Keep all debris out of airline.



ALL CONNECTIONS MUST BE AIR/WATER-TIGHT.

3. CONNECT INCOMING POWER to the blower at the blower junction box. Be sure to follow the supplied wiring diagram for the voltage at your specific location. All blowers are dual voltage and must be connected according to the proper diagram. Blower diagrams can be found on the blower's shipping box and/or at the end of this manual.

CONTROL PANEL INSTALLATION



CAUTION Always have all utility lines and equipment marked by a locating service prior to performing any work.



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.

All FAST® system electrical parts are ETL (UL equivalent) certified for safety. The control panel meets NEMA4X standards for all weather use (not explosive or submerged environments).

1. Examine wiring directions inside the supplied FAST® control panel
2. A dedicated breaker is required in the building's master electrical panel. Make connections between the master panel and FAST® control panel.
3. Make connections between blower and FAST® control panel per the electrical diagram.

Bio-Microbics manufactures control panels that control UV systems and sewage pumps. The TRACK system (or other auto-dialer) can also be connected to the panel.

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 FAST® Systems distributor may provide installation inspection services. If you have questions, call Bio-Microbics at 800-753-FAST (3278) or (913) 422-0707.



WARNING Always secure all access covers to prevent unauthorized people from entering the tank. Only qualified service personnel should open access ports and/or covers. Infectious organisms exist in a septic tank. If any contact with wastewater occurs, immediately wash and disinfect all exposed areas and contact personal physician. Failure to do so could result in severe sickness or death. DO NOT use an open flame or cause a spark near a septic tank's access points. Gases emanating from septic tanks can explode if ignited or deadly if inhaled.

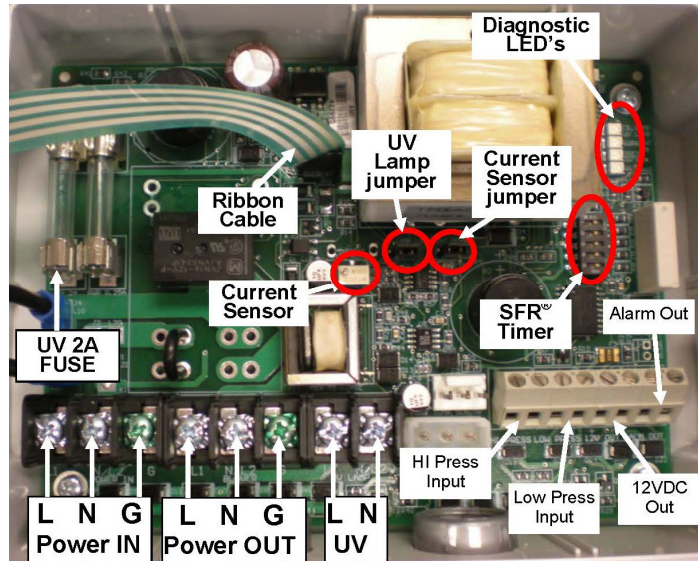
BEFORE THE UNIT IS BACKFILLED:

- 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 airlift. A robust splash should be present.
- D. Check for excessive back pressure: Seal all access covers, place hand about 8 inches [20 cm] from FAST® vent, if air flow is felt then excessive back pressure exists and the system's vent must be upgraded.
- E. Check for proper water level over the media. The normal water line should be ~2" [5 cm] over the media.
- F. Check for proper alarm function. 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.
- G. Turn the blower back ON.
- H. Backfill the excavation.
- I. Lastly, record the FAST® unit's serial number in the Service Manual.

ELECTRICAL WIRING DIAGRAMS

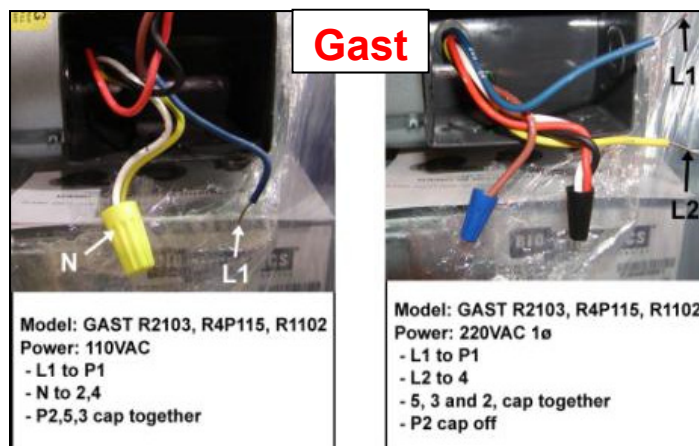
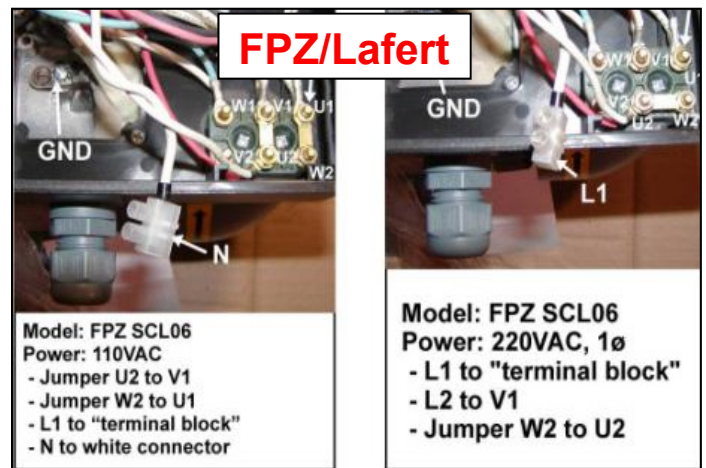
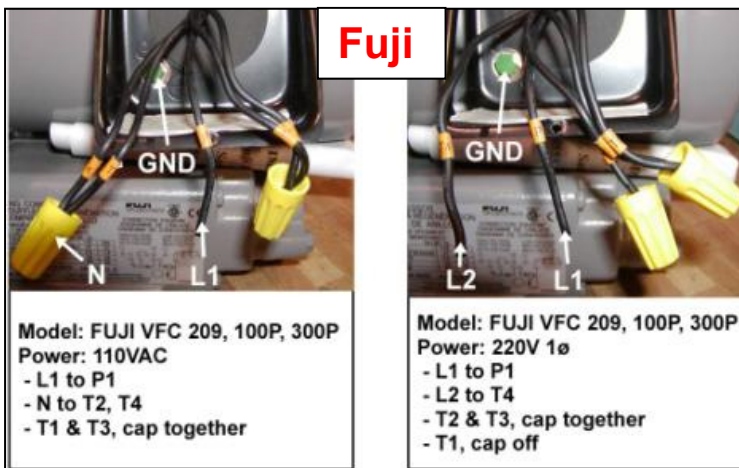
Only the MicroFAST® 0.5, 0.625, 0.75, and 0.9 system diagrams are displayed here. Information for larger FAST® systems accompanies those units and can be obtained from Bio-Microbics. A complete manual for wiring up the control panel is found within the control panel box.

TIMING MODES						BLOWER MINUTES	
DIP SW POS. (S1)						ON	OFF
5	4	3	2	1			
Off	Off	Off	Off	Off		30	15
Off	Off	Off	Off	On		15	15
Off	Off	Off	On	On		30	30
Off	Off	On	Off	Off		60	15
Off	Off	On	On	Off		60	30
Off	Off	On	On	On		120	30
On	On	On	On	Off		TEST	
On	On	On	On	On		∞	
TEST = 15 SEC ON, 20 SEC OFF							
∞ = ALWAYS ON							



BLOWER DIAGRAMS

ATTENTION: Please refer to side of shipping box for correct Blower.



LIMITED WARRANTY

Bio-Microbics, Inc. warrants every new residential FAST® system against defects in materials and workmanship for a period of two years after installation or three years from date of shipment, subject to the following terms and conditions, (Commercial FAST system for a period of one year after installation or eighteen months 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 postage 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 general system misuse, 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 structure 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 FAST 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.

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Contact your local distributor for parts and service.

Keep for Your Records



FAST® System 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: _____