INSTALLATION & OPERATION MANUAL

FOR USE WITH
ABC®-N 0.5, 1.0, 1.5, 3.0, 4.5, 9.0

DELIVERY INSPECTION
The ABC®-N system has been designed and inspected to meet stringent quality assurance standards prior to shipment. Check the packaging for signs of shipping damage before and after uncrating the unit. If there is evidence of damage or abuse or if you have questions regarding any Bio-Microbics products, please contact us at:

800-753-FAST (3278) or (913) 422-0707
e-mail: onsite@biomicrobics.com

About ABC®-N:
The ABC® (Anoxic Biofilter Clarifier-Nitrogen)-N denitrification device is designed primarily for use as a denitrification (nitrate reducing) device when exceptional levels of nitrogen reduction are required. A carbon feed system (by others) supplies a carbon source, and the ABC®-N promotes the growth of bacteria that denitrifies nitrified wastewater from most wastewater flows.

The ABC®-N system combines naturally occurring bacteria (biomass) with an external carbon source to denitrify wastewater that has been nitrified by an upstream aeration system such as FAST®. This is a continuous process provided; the biomass is supplied with food (carbon) and oxygen (nitrate molecule) in a suitable environment.

The ABC®-N process consists of the treatment module with re-circulation pump and assembly. The re-circulation pump and assembly mixes nitrates (NO₃⁻) and carbon throughout the media inside the tank. Bacteria grows on the media and uses the nitrates as oxygen, thereby transforming the nitrates into harmless nitrogen gas (N₂). Dead bacteria and non-biodegradable waste settle and accumulate in the bottom of the septic tank as sludge for periodic removal.

*PLEASE NOTE:
There will be equipment associated with your system: blowers, pumps, carbon feed system, disinfection system, irrigation system, remote alarm, auto dialer, etc.

WARNING
Only qualified service people 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 physician. Failure to do so could result in severe sickness or death.
LOCATION

**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.

ABC®-N systems are designed to be located in the same position relative to the house and water supply as any conventional septic system. However, some basic guidelines must be followed:

1. The ABC®-N system is designed for use AFTER a wastewater treatment system (such as FAST®) that reduces ammonia nitrogen. Do not place the tank in a location where it could be subjected to traffic or additional weight.

2. The ABC®-N system must be mounted in a tank that meets all the specifications in Bio-Microbics’ product drawings and conforms to all applicable regulations.

3. The ABC®-N system requires a suitable mounting and storage area for the carbon feed system and substance (supplied by others). Refer to the carbon feed system’s instructions for detailed information on this topic.

4. The method and arrangement for effluent discharge must not interfere with the ABC®-N system’s operation.

5. Avoid locating the BioSTEP® tank in high groundwater areas where the tank could possibly float up and become dislodged.

### INSTALLATION PROCEDURE

#### EQUIPMENT

<table>
<thead>
<tr>
<th>COMMON NAME</th>
<th>PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump</td>
<td>dependant on model</td>
</tr>
<tr>
<td>Lifting Cable</td>
<td>096-CABLESS18 096-SLEEEVE18</td>
</tr>
<tr>
<td>Recirculation Header</td>
<td>dependant on model</td>
</tr>
<tr>
<td>Carbon Feed System</td>
<td>BY OTHERS</td>
</tr>
<tr>
<td>4” Outlet Gasket</td>
<td>050-GSKT4</td>
</tr>
<tr>
<td>Foot Top</td>
<td>010-FT</td>
</tr>
<tr>
<td>Foot Bottom</td>
<td>010-FB</td>
</tr>
</tbody>
</table>
Hazard 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. Persons coming in contact with wastewater, must immediately wash all exposed areas with disinfecting cleaner and contact your personal physician.

Before installation may begin, check the tank to ensure it is level within ±1/2” [12 mm].

**MATERIALS REQUIRED FOR INSTALLATION**

*Please note that other tools may be needed to complete installation.*

1. Septic tank with required access ports that meets all applicable requirements
2. Safe lifting mechanism
3. Anchor bolts for securing ABC®-N unit to the tank.
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).
5. Pipe lubricant/soap
6. PVC primer and glue (weather appropriate)
7. Mounting screws for control panel (optional)
8. Electrical conduit, fittings and specified wires
9. Hammer drill and masonry bits

### MODULE INSTALLATION

<table>
<thead>
<tr>
<th>MODULE SIZE</th>
<th>ABC-N 0.5</th>
<th>ABC-N 1.0</th>
<th>ABC-N 1.5</th>
<th>ABC-N 3.0</th>
<th>ABC-N 4.5</th>
<th>ABC-N 9.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEIGHT (lbs)</td>
<td>165</td>
<td>220</td>
<td>505</td>
<td>690</td>
<td>1500</td>
<td>2200</td>
</tr>
</tbody>
</table>

**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.

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. Creating lateral stability for the ABC®-N system is also recommended by use of non-corrosive materials.

**NOTE:** If legs are >18” [45.7 cm] tall then Sch 80 PVC or stronger pipe must be used. Consult factory to extend legs >48” [122 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 of each other.

3. **RECIRCULATION ASSEMBLY**
   
   A. Connect the recirculation head and piping to the pump discharge nipple (some systems may come with this step completed)
   
   B. Using PVC primer & glue. Be sure to use primer & glue that is weather appropriate. Follow ALL directions supplied with the primer & glue.
   
   C. Use the supplied pump’s lifting cable – DO NOT LIFT THE PUMP BY THE ELECTRICAL CORD – to lower the pump into the center of the ABC®-N unit. Be sure to place pump & recirculation assembly at bottom of ABC®-N liner. The recirculation assembly’s square head should be ~ 1” above the media.
   
   D. Bring pump’s lifting cable and electrical cord to the top of the access port.

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

5. **CARBON FEED SYSTEM** *(not supplied by Bio-Microbics)* should have the carbon feed system components and type of carbon supplement specified (i.e. Micro-C, diluted methanol, sugar water, etc.). Directly feed the carbon supplement to the reaction chamber of ABC®-N system.

   **CAUTION** Follow ALL directions supplied with the carbon feed system and carbon supplement. Some substances may be hazardous to your health and/or explosive.
ELECTRICAL – PUMP & PANEL

**WARNING** All electrical work shall be performed by a qualified electrician per all applicable codes. 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.

All ABC®-N system’s electrical parts are UL/CSA listed for electrical safety. The control panel meets NEMA4X standards for all weather use (not explosive or submerged environments).

1. Properly connect wiring from the source power to the ABC®-N’s pump. Be sure to examine the wiring directions supplied with the ABC®-N pump. Many electrical codes require a disconnect switch within visual line of site of the ABC®-N system.

2. If a control panel is required to run the ABC®-N system, then be sure to connect it in between the ABC®-N pump and source power per the panel’s supplied directions, all applicable codes and plans.

Bio-Microbics manufactures control panels for UV systems and sewage pumps. The TRACK® Electronic Monitoring System 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 distributor may provide installation inspection services. If you have questions, call Bio-Microbics at 800-753-FAST (3278) or (913) 422-0707.

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 pump ON and observe the operation of the recirculation header. A vigorous swirling action should be observed. NO SPLASHING should be present.

D. Check for proper water level over the media. The normal water line should be ~2” [5 cm] over the media.

E. Backfill the excavation.

F. Lastly, record the ABC®-N unit’s serial number at the end of this manual.

**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.

Frequency of service on the items listed below will vary depending on the application. Only properly trained and licensed operators should operate the treatment plant. All plant operations must be performed in accordance with all applicable regulations.

**ABC®-N Settling Zone**

**SETTLING ZONE SLUDGE LEVELS** Sludge removal frequency depends on the size and design of the ABC®-N tank. Check the level using a sludge-measuring instrument. If sludge is 8” deep in any area of the tank then sludge must be wasted from this zone. To pump the sludge out, follow this recommended procedure:

1) Open the access ports/cover(s) and insert the hose. Be sure to **pump out both settling and treatment chambers** of the system.

2) Once the unit has been pumped out, **immediately refill the tank with clean water** to reduce the risk of the tank floating and to minimize the impact on treatment. Close the access ports/cover(s) making sure it is watertight.

3) **Properly dispose of the solids** removed in compliance with local and state regulations.

**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.

**PUMP & RECIRCULATION SYSTEM** DO NOT turn off the pump (unless performing service). Treatment quality will be reduced. Check the recirculation system (pump & recirculation head) for proper function. The pump does NOT require oiling of any parts.

**WATER QUALITY** All ABC®-N systems are capable of exceptional nitrate reduction when the entire wastewater treatment facility is operated correctly.
OPTIONAL COMPONENTS:  

**OPTIONAL CONTROL PANEL.** The alarm has a ~10 second built-in delay. Test the audible alarm by turning the pump OFF. To silence the alarm, use the “RESET” button on the panel’s front.

## DO’S & DON’TS........What can I put down the drain?

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:

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

**RECORD KEEPING** Keep a copy of all pertinent literature (including this manual), plans and service records about your wastewater system along with other home appliance documents, which may include drawings/plans of the site and all installed equipment. Record all applicable information at the back of this manual.

**REGULAR MAINTENANCE** should be performed by a qualified service company. Regular, professional maintenance is the best method for ensuring long life for your system.

**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. Always follow manufacturer’s directions. A wastewater treatment system will perform most efficiently when water consumption is spread evenly throughout the week. Try to discharge water from large appliances (dish washer, clothes washer, hot tub, etc.) or water with toxins (water softener brine, bleach, household cleaners, etc.)

**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).

**WATER SOFTENERS** CAN HARM THE SYSTEM. The FAST® process may tolerate frequent, small discharges. However, these discharges can possibly damage other parts of the septic system.

**FOOD WASTES** from a garbage disposal is acceptable. Be aware too much food through the garbage disposal may overload the system. Scraping all dishes and putting excess food waste in the trashcan is a better practice. FOG (Fats, Oils, & Grease) may prevent the system from operating correctly. Both natural FOG (i.e. animal fat) and synthetic FOG (i.e. sunflower oil, canola oil, peanut oil, etc.) can prevent the bacteria from fully breaking down the waste.

**DISINFECTANTS/CLEANERS** Use manufacturer(s)’s recommendations. Cleaners that use sodium borate, sodium bicarbonate and sodium carbonate are suitable for use. Products containing quaternary ammonia (liquid fabric softener and commercial cleaners) or pine oil cleaners should not be used and, if possible, dispose of by other means. Use drain cleaners as a last resort to unclog pipes.

**PERSONAL CARE PRODUCTS** Be aware that some organic products add harmful oils to the system. Use anti-bacterial products and other personal cleaning products as instructed by the manufacturer. Many hair care products such as perm or dye kits should not be allowed to enter the system.

**MEDICINES** ALL antibiotic medicines are harmful to the treatment quality. Unused medications should be returned to your pharmacy or doctor. DO NOT FLUSH THEM DOWN A DRAIN. As the human body only absorbs ≤20% of these substances, please notify your service provider if a person in the house is using medicine. This could reduce troubleshooting efforts and possibly your maintenance bill.

**SEPTIC TANK ADDITIVES/ENZYMES** should not be used. These may do more harm than good. The natural sewage present in the system contains all required bacteria and enzymes for proper operation.

**HARSH CHEMICALS/TOXINS** Should NOT be put into the system. This includes, but is not limited to: floor stripper, paint, solvents, thinners, caustic cleaners, pesticides, herbicides, film processing waste, etc.

**PAPER PRODUCTS** Use 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 bio-solids pump out frequency.
LIMITED WARRANTY

Bio-Microbics, Inc. warrants every new residential ABC®-N 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 ABC®-N 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 ABC®-N 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 WARRANTIES EXPRESS OR IMPLIED. BIO-MICROBICS SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. 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.

Keep for your Records

Module 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: _________________________________

Maintenance Provider Name: ______________________

Maintenance Provider Phone: ______________________

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