

OPERATORS MANUAL FOR  
***BIO-35R***  
**BIOLOGICAL RECYCLING  
SYSTEM**



**CAUTION**

**RISK OF INJURY!**

**READ MANUAL BEFORE OPERATING!**

**This manual is an important part of the Biological Recycling System  
and must remain with the unit when you sell it!**

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## **⚠ WARNING**

**⚠ WARNING:** This product can expose you to chemicals including Lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

## **⚠ WARNING**

**⚠ WARNING:** This product can expose you to chemicals including carbon monoxide, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

## **! IMPORTANT !**

### **ALUMINUM TANK AND CHEMICAL USE**

The chemicals listed below should not be used in any aluminum tank because of reactions with the alloy. These chemicals may cause premature failure of your tank. Use of any of the listed chemicals will void any warranty expressed or implied by the manufacturer with regard to your water treatment system.

#### **CHEMICALS TO AVOID:**

**Aluminum Chloride, Ammonia, Ammonia Hydroxide, Barium Salts, Calcium Chloride, Carbon Tetrachloride, Caustic Soda, Chlorine, Chloroform, Hydrochloric Acid, Hydrogen Peroxide, Methyl Chloride, Oxalic Acid, Ozone, Perchloric Acid, Phosphoric Acid, Potassium Carbonate, Potassium Hydroxide, Sodium Carbonate, Sodium Chloride, Sodium Hydroxide, Sulfuric Acid, Trichloro-acetic Acid, Zinc Chloride.**

**If you are unsure about a chemical reacting with your aluminum tank, please consult with your customer service representative.**

# INTRODUCTION

Congratulations on the purchase of your new Biological Recycling System! You can be assured your Biological Recycling System was constructed and designed with quality and performance in mind. Each component has been rigorously tested to ensure the highest level of acceptance.

This operator's manual was compiled for your benefit. By reading and following the simple safety, installation, operation, maintenance and troubleshooting steps described in this manual, you will receive years of trouble free operation from your new Biological Recycling System. The contents of this manual are based on the latest product information available at the time of publication. The manufacturer reserves the right to make changes in price, color, materials, equipment, specifications or models at any time without notice.

## ! IMPORTANT !

These paragraphs are surrounded by a "SAFETY ALERT BOX". This box is used to designate and emphasize Safety Warnings that must be followed when operating this Biological Recycling System.

Accompanying the Safety Warnings are "signal words" which designate the degree or level of hazard seriousness. The "signal words" used in this manual are as follows:

**DANGER:** Indicates an imminently 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, if not avoided MAY result in minor or moderate injury.



The symbols set to the left of this paragraph are "Safety Alert Symbols". These symbols are used to call attention to items or procedures that could be dangerous to you or other persons using this equipment.

**ALWAYS PROVIDE A COPY OF THIS MANUAL TO ANYONE USING THIS EQUIPMENT. READ ALL INSTRUCTIONS BEFORE OPERATING THIS BIOLOGICAL RECYCLING SYSTEM AND ESPECIALLY POINT OUT THE "SAFETY WARNINGS" TO PREVENT THE POSSIBILITY OF PERSONAL INJURY TO THE OPERATOR.**

Once the unit has been uncrated, immediately write in the serial number of your unit in the space provided below.

**SERIAL NUMBER** \_\_\_\_\_

Inspect for signs of obvious or concealed freight damage. If damage does exist, file a claim with the transportation company immediately. Be sure that all damaged parts are replaced and that the mechanical and electrical problems are corrected prior to operation of the unit. If you require service, contact your customer service representative.

Please have the following information available for all service calls:

1. Model Number
2. Serial Number
3. Date and Place of Purchase

# CONTENTS OF THE BIOLOGICAL RECYCLING SYSTEM

Carefully unpack your new Biological Recycling System. Check the contents against the packing list. Contact the freight line if a damage claim is required on any component. The following items are the basic equipment sent with your Biological Recycling System.

1. Sump pump
2. Blue float for sump pit (protects sump pump low level)
3. Biological Recycling System Platform
  - A. Transfer Pump
  - B. Pressurized water storage tank
  - C. Cartridge filter
  - D. Aerator Pump
  - E. Ozone Generator (Optional)
  - F. Ozone Pump (Optional)
4. Manual

## SPECIFICATIONS

MODEL	BIO-35R
Maximum Flow	35 GPM
Electrical	230 Volt 1Phase 25Amps
Sump Pump	1/2 HP
Operating Capacity	2244 gallons
Biological Media	6480 sq. ft.
Transfer Pump (centrifugal)	2 HP
Aerator Pump	1 HP
Dimensions L x W x H (ft.)	12 x 7 x 5
Net Weight	1900 lbs.

## PURPOSE

The Mi-T-M Biological System was designed to offer a solution to waste disposal that is economical, efficient and foremost, *environmentally safe*. As we make progress through the 21st century, environmental waste codes are becoming more and more strict. Surcharges and fines are being mandated to companies that are unable to operate within acceptable guidelines. Chemicals used to treat waste water often create by-products which in themselves cause additional code violations. Mi-T-M Corporation has solved this problem by engineering a Bio-System that utilizes *microbes*, not chemicals, to literally feed off of the waste in the water allowing the final output to be cleansed of any hazardous by-products. We at Mi-T-M realize the need to protect and respect our environment and therefore, our Bio-Systems operate under specific microbe guidelines, utilizing microbes that (1) is natural, not genetically formulated and (2) will not cause disease.

Mi-T-M has been involved in water products for over twenty-eight years. Our commitment to quality is passed on to our customers, our commitment to the environment is passed on to our children.




# IMPORTANT SAFETY WARNINGS



WARNING: When using this product, basic precautions should always be observed, including the following:

## READ ALL SAFETY WARNINGS BEFORE USING BIOLOGICAL RECYCLING SYSTEM

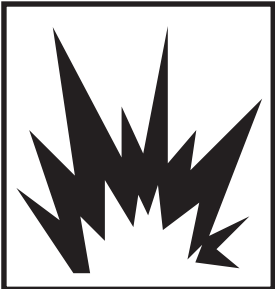

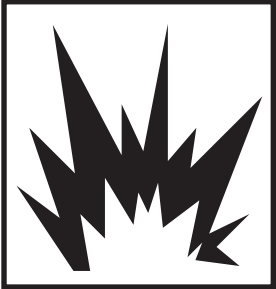

HAZARD	POTENTIAL CONSEQUENCE	PREVENTION
<p data-bbox="180 268 534 327"><b>RISK OF ELECTRIC SHOCK OR ELECTROCUTION</b></p> 	<p data-bbox="561 268 974 485">Serious injury or death could occur if the Biological Recycling System is not properly grounded. Your Biological Recycling System is powered by electricity and may cause electric shock or electrocution if not installed properly.</p> <p data-bbox="561 1087 974 1171">Electrical shock may occur if Biological Recycling System is not operated properly.</p> <p data-bbox="561 1325 974 1409">Serious injury or death may occur if electrical repairs are attempted by unqualified persons.</p>	<p data-bbox="995 268 1528 352">Installation of this unit, including all electrical connections, must comply with all local, state and national codes.</p> <p data-bbox="995 369 1528 541">This product must be grounded. Connect to a GFCI circuit breaker when available. If the unit should malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. Do not ground to a gas supply line.</p> <p data-bbox="995 558 1528 701">Improper connection of the equipment-grounding conductor can result in a risk of electrocution. Check with a qualified electrician or service personnel if you are in doubt as to whether the system is properly grounded.</p> <p data-bbox="995 718 1528 861">Always be certain the unit is receiving proper voltage (+/- 5% of the voltage listed on the nameplate). Before installing electrical connections, be certain the power switches are in the "OFF" position.</p> <p data-bbox="995 877 1528 909">Keep all connections dry and off the ground.</p> <p data-bbox="995 926 1528 1068">Do not touch pump, pump motor, discharge piping or water when the unit is connected to the power supply; regardless of whether the unit is operating correctly or experiencing an operation failure.</p> <p data-bbox="995 1085 1528 1169">DO NOT allow metal components of the Biological Recycling System to come in contact with live electrical components.</p> <p data-bbox="995 1186 1528 1308">Never operate the Biological Recycling System with safety guards/covers removed or damaged. Ensure all electrical covers are securely in place when unit is operating.</p> <p data-bbox="995 1325 1528 1446">Any electrical wiring or repairs performed on this Biological Recycling System should be done by Authorized Service Personnel in accordance with National and Local electrical codes.</p> <p data-bbox="995 1463 1528 1795">Before opening any electrical enclosure, always shut off the Biological Recycling System and drain the water. Disconnect the Biological Recycling System from the power source. If the power disconnect is not in sight, lock it in the open position and tag it to prevent power usage. (Never assume the Biological Recycling System is safe to work on just because it is not operating, it could restart at any time! Always disconnect from the power source.) Allow the Biological Recycling System components to cool down.</p>



# IMPORTANT SAFETY WARNINGS



## READ ALL SAFETY WARNINGS BEFORE USING BIOLOGICAL RECYCLING SYSTEM



HAZARD	POTENTIAL CONSEQUENCE	PREVENTION
<p><b>RISK OF EXPLOSION OR FIRE</b></p>  	<p>Serious injury or death could occur from an explosion or fire caused by a system electric spark.</p>	<p>This unit must be placed in an area that is well ventilated, free of flammable vapors, combustible dust, gases or other combustible materials.</p>
<p><b>RISK OF BURSTING</b></p> 	<p>Serious injury or death could occur from bursting caused by excessive pressure in the system.</p> <p>Serious injury may occur if attempting to start the Biological Recycling System when the pump is frozen.</p>	<p>Do not mistreat the pressure gauges on the system. Pressure gauges will malfunction if they are subjected to excessive pressure, vibration, pulsation or temperature or if they are placed in an environment which causes corrosion of parts. Incorrect readings on a pressure gauge could mislead the operator and place him in a dangerous working condition.</p> <p>Do not use a booster pump or any type of additional pumping system. Pressurizing the suction of the pump may cause the pump body to explode.</p> <p>Do not use this Biological Recycling System to pump flammable material! An explosion could occur from a gas vapor buildup inside the system.</p> <p>In freezing temperatures, the unit must always be warm enough to ensure there is no ice formation in the pump. Do not start the Biological Recycling System if it has been in a freezing environment without first allowing the pump to thaw.</p>
<p><b>RISK OF BURNS</b></p> 	<p>Serious injury may occur from touching the electrical motor. This area can remain hot for some time after the Biological Recycling System is shutdown.</p>	<p>Never allow any part of your body to contact the electrical motor until cooled.</p>



# IMPORTANT SAFETY WARNINGS



READ ALL SAFETY WARNINGS BEFORE USING BIOLOGICAL RECYCLING SYSTEM

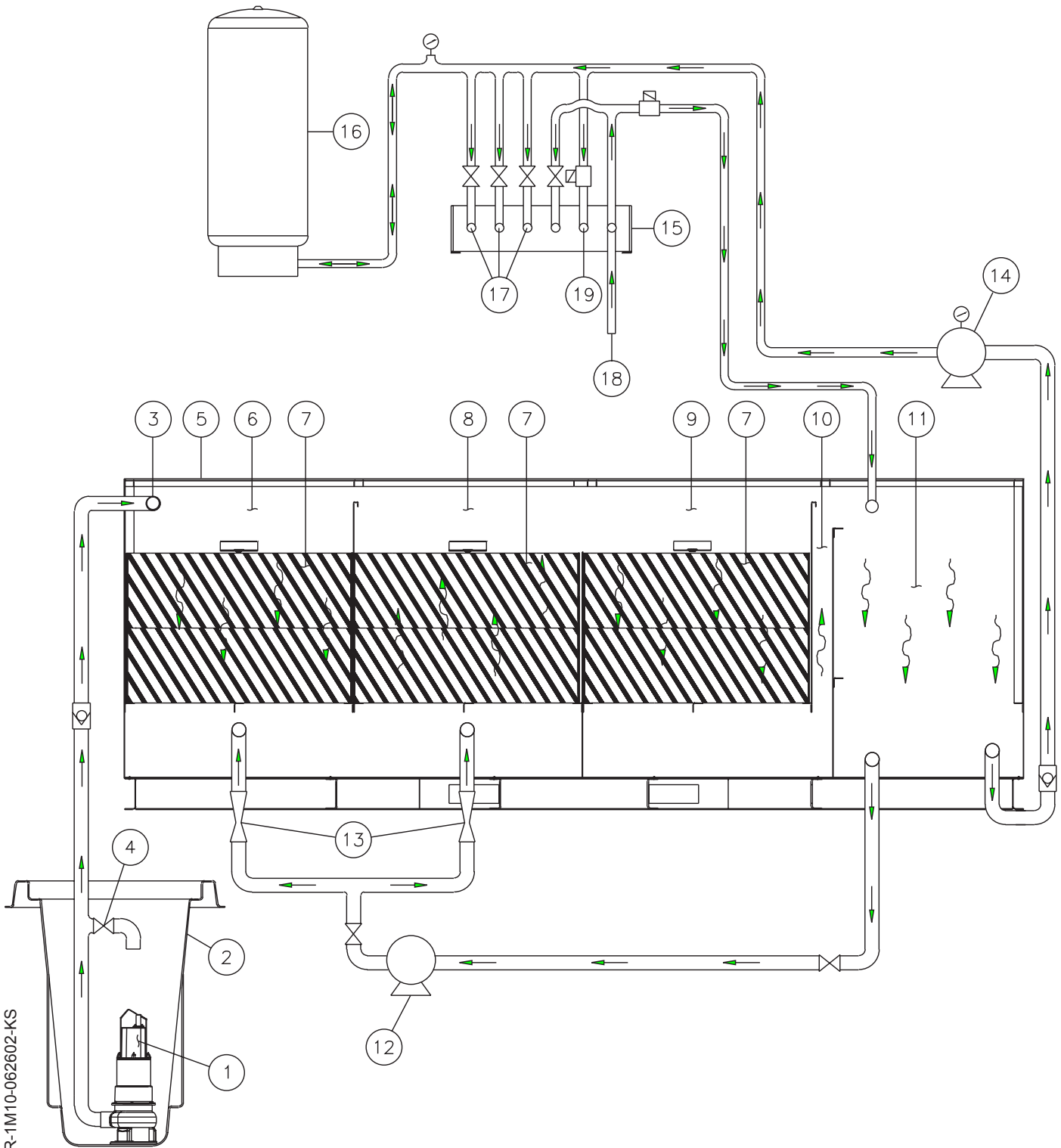
HAZARD	POTENTIAL CONSEQUENCE	PREVENTION
<p><b>RISK FROM MOVING PARTS</b></p> 	<p>Serious injury may occur to the operator from moving parts on the Biological Recycling System.</p>	<p>Do not operate the unit without all protective covers in place.</p> <p>Follow the maintenance instructions specified in the manual.</p>
<p><b>RISK OF BODILY INJURY</b></p> 	<p>Injury may occur from the Biological Recycling System.</p>	<p><b>DO NOT DRINK THE WATER IN THE BIOLOGICAL RECYCLING SYSTEM!!</b> This is non-potable water and is not suitable for consumption.</p> <p>DO NOT allow children to operate this unit.</p> <p>DO NOT overreach or stand on unstable support.</p> <p>Wet surfaces can be slippery, wear protective foot gear and keep good footing and balance at all times.</p> <p>Know how to stop the Biological Recycling System. Be thoroughly familiar with controls.</p> <p>Before servicing components, ALWAYS shut off the Biological Recycling System.</p> <p>Consult Material Safety Data Sheets (MSDS) for safe handling of system, especially oxidizers and acids.</p>



**!SAVE THESE INSTRUCTIONS!**



# BIOLOGICAL RECYCLING SYSTEM FLOW CHART



FLOW DIA. BIO-25R-35R-1M10-062602-KS



## BIOLOGICAL RECYCLING SYSTEM FLOW CHART

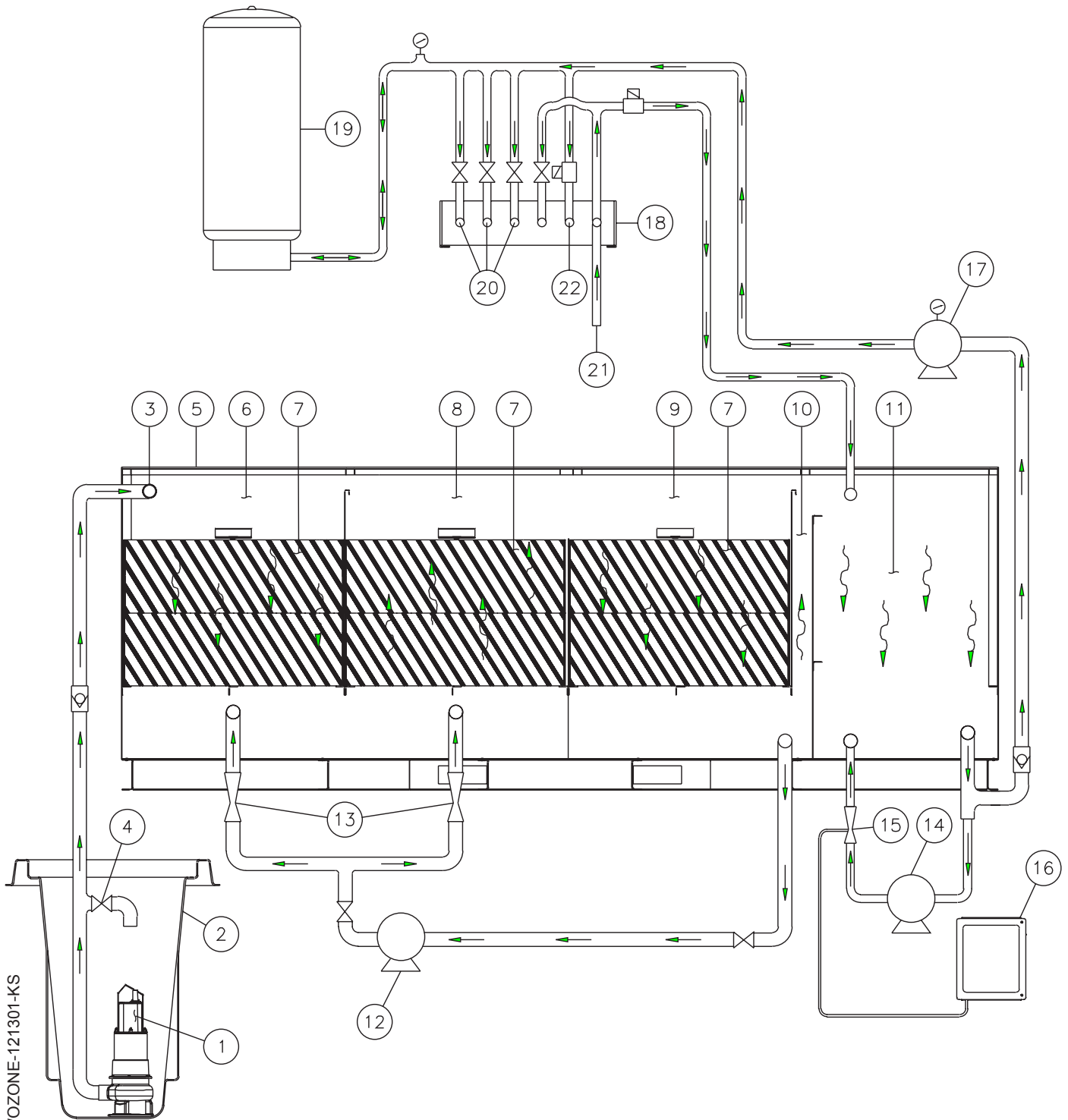
The **Sump Pump (1)** draws water from the **Sump Pit (2)** and brings it to the **Inlet (3)** of the Biological Recycling System. The **Inlet Flow Control Valve (4)** can be used to control the flow of water into the unit. The **Biological Recycling Tank (5)** is made up of several sections that are separated by weirs. The wastewater enters the top of the **First Chamber (6)** and moves down through the **Biological Media (7)**. The media packs provide a surface for the microbes to live on. As water passes through the **Biological Media (7)**, the microbes feed off of the organic compounds in the water, producing by-products of carbon dioxide and water.

From the **First Chamber (6)**, the wastewater moves under the weir, into the **Second Chamber (8)**, rising up through the **Biological Media (7)** and over the weir into the **Third Chamber (9)**. The wastewater then flows down through the **Biological Media (7)** for a final cleansing before moving into the **Water Level Control Tank (10)**. This very small section has a weir positioned to control the level of water in the **Biological Recycling Tank (5)**. The water moves over this final weir and into the **Product Tank (11)**.

Microbes also need air to live; an **Aerator Pump (12)** pumps water for the **Product Tank (11)** to two **Air Injectors (13)** that use venturis to pull air into the water. From there the air bubbles move up through the **Biological Media (7)**. Without the air in the Biological Recycling System, the microbes will not be able to live.

Water is also pulled from the **Product Tank (11)** by the **Transfer Pump (14)** and moved into the **Manifold (15)** and the **Pressure Tank (16)**. This tank holds water at 40-60 PSI (2.8-4.1 BAR) until needed. When water is needed for washing, water is sent from the **Manifold (15)** to the **Water Outlets (17)** and then to a pressure washer or garden hose. If the **Product Tank (11)** water level is low, water is added through the **Fresh Water Makeup (18)** to the **Product Tank (11)**. If the **Biological Recycling Tank (5)** water level is too high, treated water is sent to the **Rain Water Overflow (19)** and disposed of.

# BIOLOGICAL RECYCLING SYSTEM FLOW CHART W/OZONE



FLOW DIA. BIO-25R-1M10 W/OZONE-121301-KS

## BIOLOGICAL RECYCLING SYSTEM FLOW CHART W/OZONE

The **Sump Pump (1)** draws water from the **Sump Pit (2)** and brings it to the **Inlet (3)** of the Biological Recycling System. The **Inlet Flow Control Valve (4)** can be used to control the flow of water into the unit. The **Biological Recycling Tank (5)** is made up of several sections that are separated by weirs. The wastewater enters the top of the **First Chamber (6)** and moves down through the **Biological Media (7)**. The media packs provide a surface for the microbes to live on. As water passes through the **Biological Media (7)**, the microbes feed off of the organic compounds in the water, producing by-products of carbon dioxide and water.

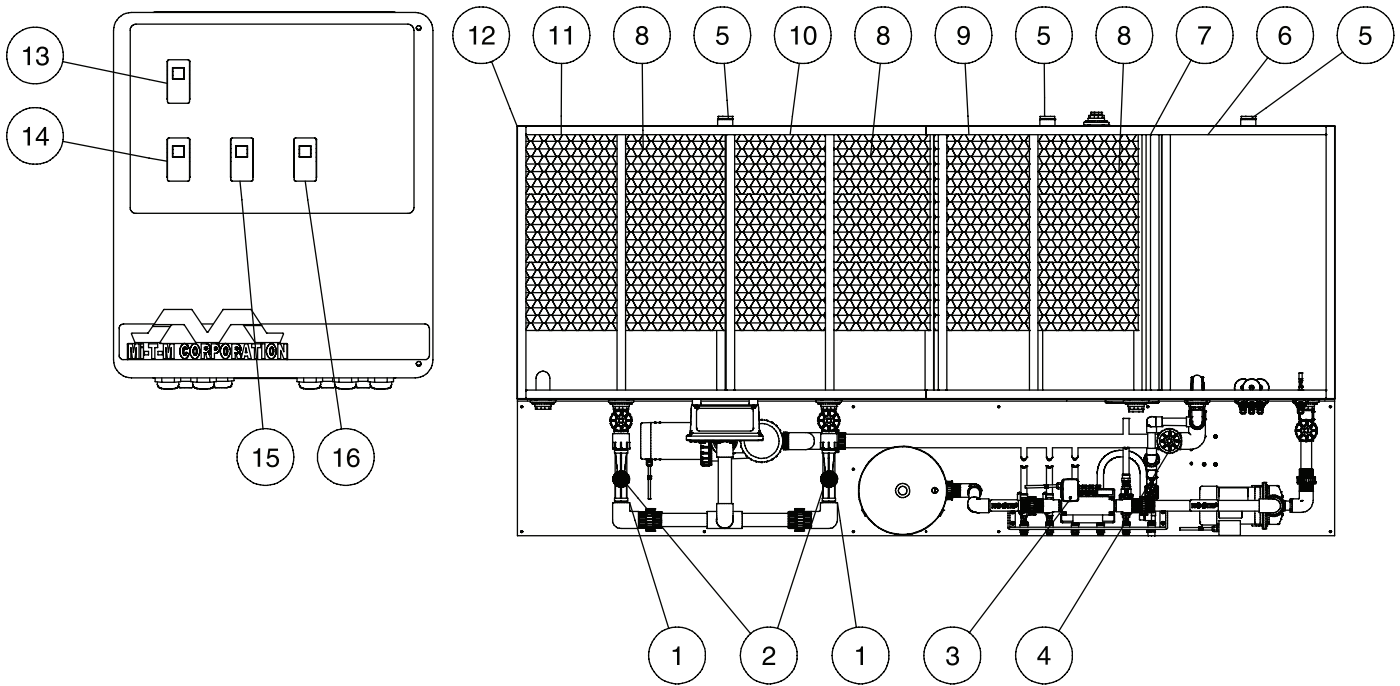
From the **First Chamber (6)**, the wastewater moves under the weir, into the **Second Chamber (8)**, rising up through the **Biological Media (7)** and over the weir into the **Third Chamber (9)**. The wastewater then flows down through the **Biological Media (7)** for a final cleansing before moving into the **Water Level Control Tank (10)**. This very small section has a weir positioned to control the level of water in the **Biological Recycling Tank (5)**. The water moves over this final weir and into the **Product Tank (11)**.

Microbes also need air to live; an **Aerator Pump (12)** pumps water for the **Product Tank (11)** to two **Air Injectors (13)** that use venturis to pull air into the water. From there the air bubbles move up through the **Biological Media (7)**. Without the air in the Biological Recycling System, the microbes will not be able to live.

To inject ozone into the system, water is pulled from the **Product Tank (11)** by the **Ozone Pump (14)** and pushed through a venturi in the **Ozone Injector (15)**. The oxygen from the air is converted into ozone by the **Ozone Generator (16)**.

Water is also pulled from the **Product Tank (11)** by the **Transfer Pump (17)** and moved into the **Manifold (18)** and the **Pressure Tank (19)**. This tank holds water at 40-60 PSI (2.8-4.1 BAR) until needed. When water is needed for washing, water is sent from the **Manifold (18)** to the **Water Outlets (20)** and then to a pressure washer or garden hose. If the **Product Tank (11)** water level is low, water is added through the **Fresh Water Makeup (21)** to the **Product Tank (11)**. If the **Biological Recycling Tank (5)** water level is too high, treated water is sent to the **Rain Water Overflow (22)** and disposed of.

# BIOLOGICAL RECYCLING SYSTEM FEATURES

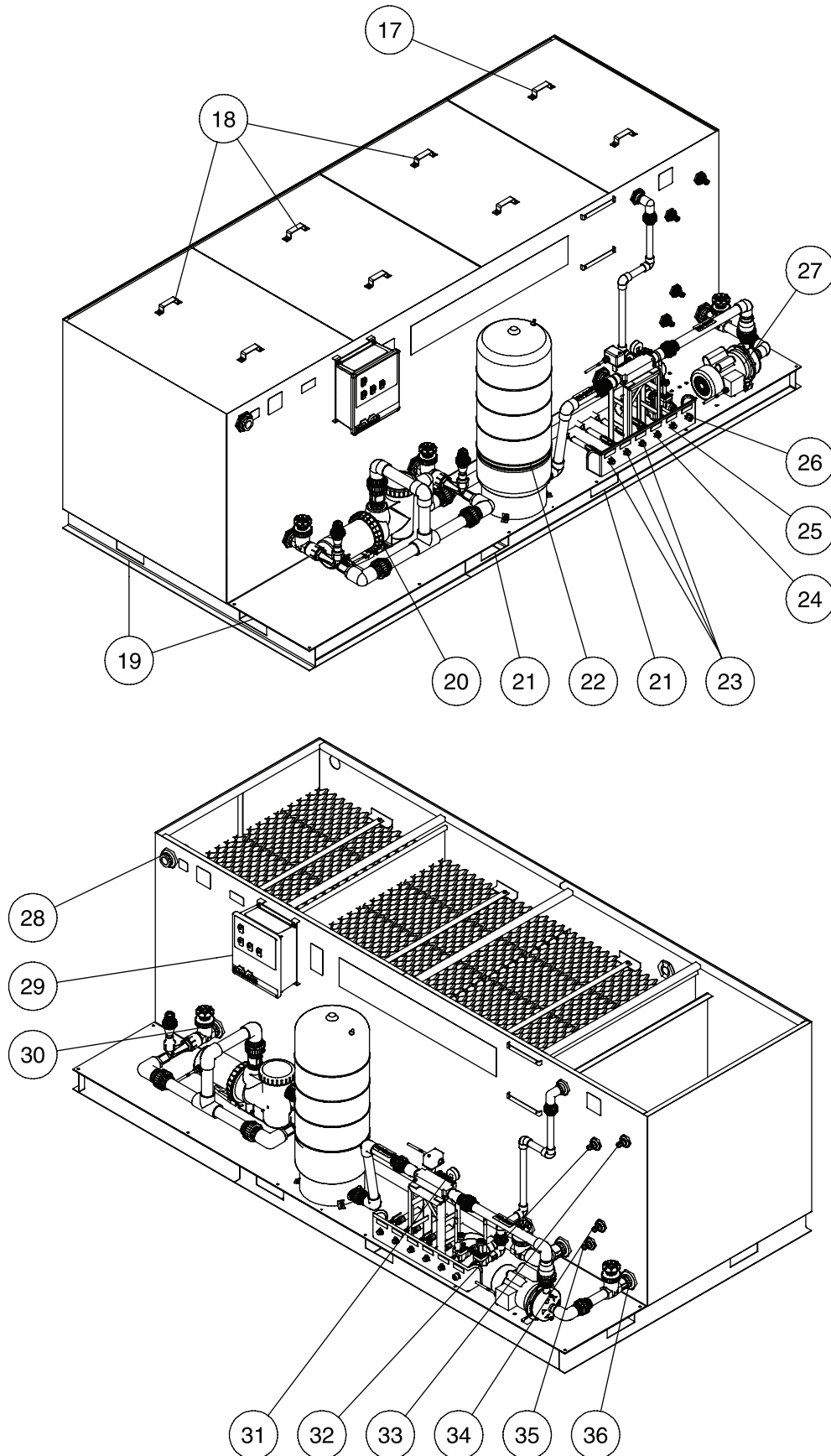


**BIO-35R FEATURES**

REF. #	DESCRIPTION	REF. #	DESCRIPTION	REF. #	DESCRIPTION
1	Air Injector	13	Master Switch	25	Rain Water Overflow
2	Air Intake (Aerator)	14	Sump Pump Switch	26	Fresh Water Make-up
3	Pressure Switch	15	Aerator Pump Switch	27	Transfer Pump
4	Aerator Pump Inlet Valve	16	Transfer Pump Switch	28	Inlet
5	Drain Port	17	Product Tank Lid	29	Control Panel
6	Product Tank	18	Tank Lid	30	Aerator Pump Outlet Valve
7	Water Level Control Tank	19	End Fork Lift Holes (6' or greater fork required.)	31	Pressure Guage
8	Biological Media	20	Aerator Pump	32	Rain Water Overflow Float
9	Third Chamber	21	Side Fork Lift Holes	33	Level Limit Switch
10	Second Chamber	22	Pressure Tank	34	Fresh Water Make-up Float
11	First Chamber	23	Water Outlet	35	Transfer Pump Float
12	Biological Tank	24	Rinse Water	36	Tank Outlet

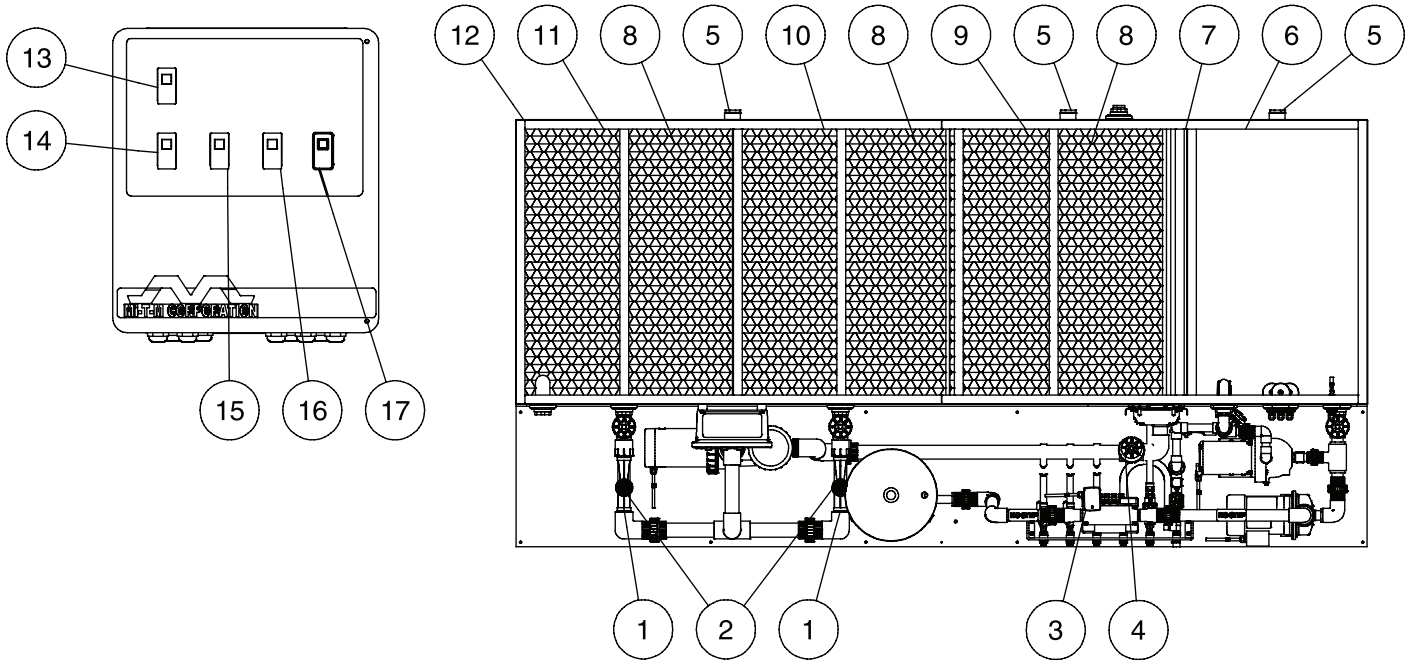
BIO-35R-0M10 FEATURES TOP VIEW-071206-PJH

# BIOLOGICAL RECYCLING SYSTEM FEATURES



BIO-35R-0M10 FEATURES SIDE VIEW-071206-PJH

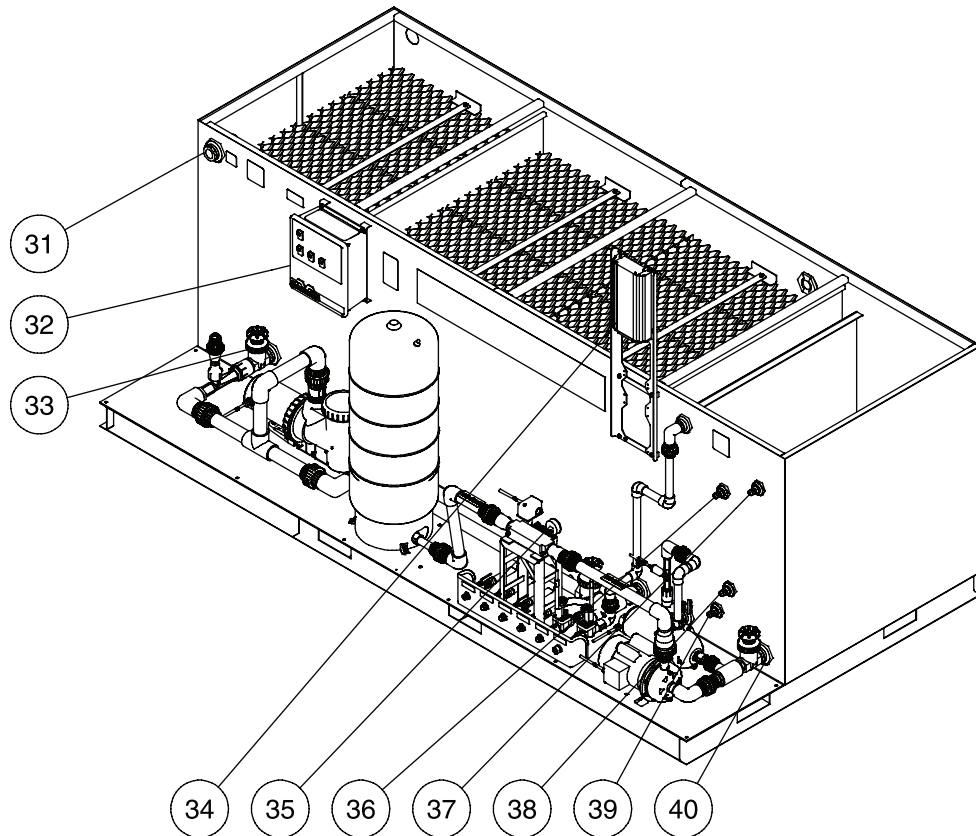
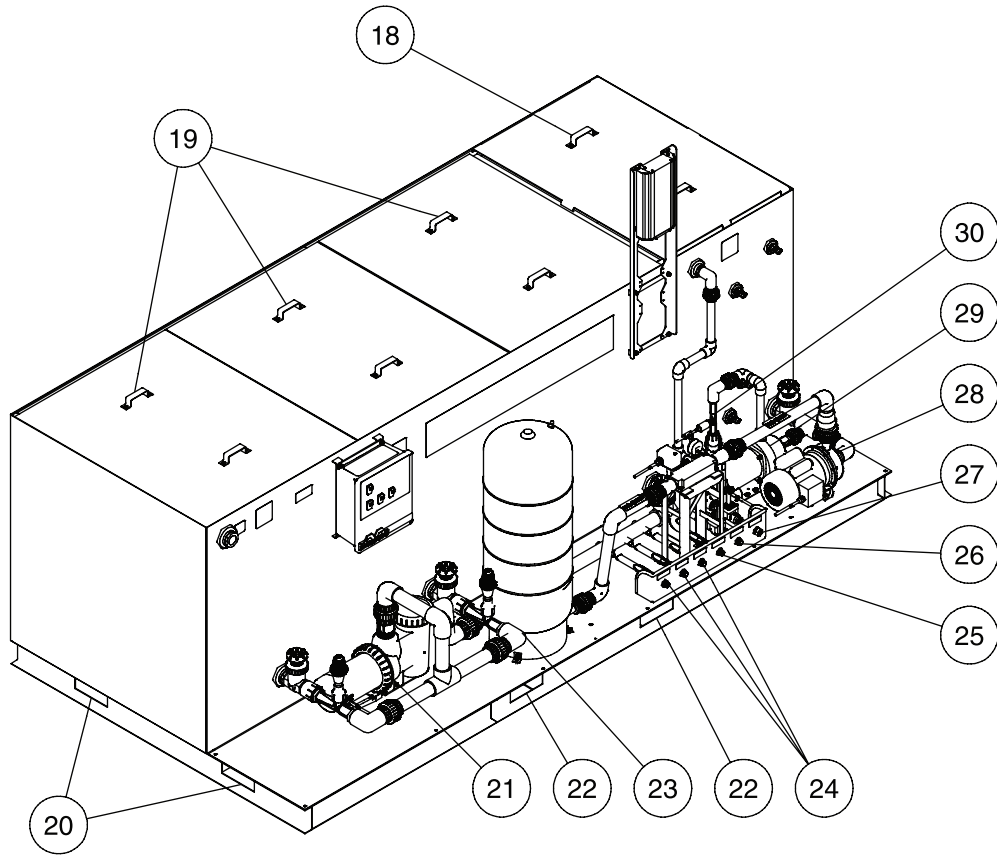
# BIOLOGICAL RECYCLING SYSTEM FEATURES W/OZONE



BIO-35R FEATURES W/OZONE					
REF. #	DESCRIPTION	REF. #	DESCRIPTION	REF. #	DESCRIPTION
1	Air Injector	15	Aerator Pump Switch	29	Ozone Pump
2	Air Intake (Aerator)	16	Ozone Pump Switch	30	Ozone Injector
3	Pressure Switch	17	Transfer Pump Switch	31	Inlet
4	Aerator Pump Inlet Valve	18	Product Tank Lid	32	Control Panel
5	Drain Port	19	Tank Lid	33	Aerator Pump Outlet Valve
6	Product Tank	20	End Fork Lift Holes (6' or greater fork required.)	34	Pressure Guage
7	Water Level Control Tank	21	Aerator Pump	35	Ozone Generator
8	Biological Media	22	Side Fork Lift Holes	36	Rain Water Overflow Float
9	Third Chamber	23	Pressure Tank	37	Level Limit Switch
10	Second Chamber	24	Water Outlet	38	Fresh Water Make-up Float
11	First Chamber	25	Rinse Water	39	Transfer Pump Float
12	Biological Tank	26	Rain Water Overflow	40	Tank Outlet
13	Master Switch	27	Fresh Water Make-up		
14	Sump Pump Switch	28	Transfer Pump		

BIO-35R-0M10 FEATURES W- OZONE TOP VIEW-071206-PJH

# BIOLOGICAL RECYCLING SYSTEM FEATURES W/OZONE



BIO-35R-0M10 FEATURES W- OZONE SIDE VIEW-071206-PJH

# INSTALLATION

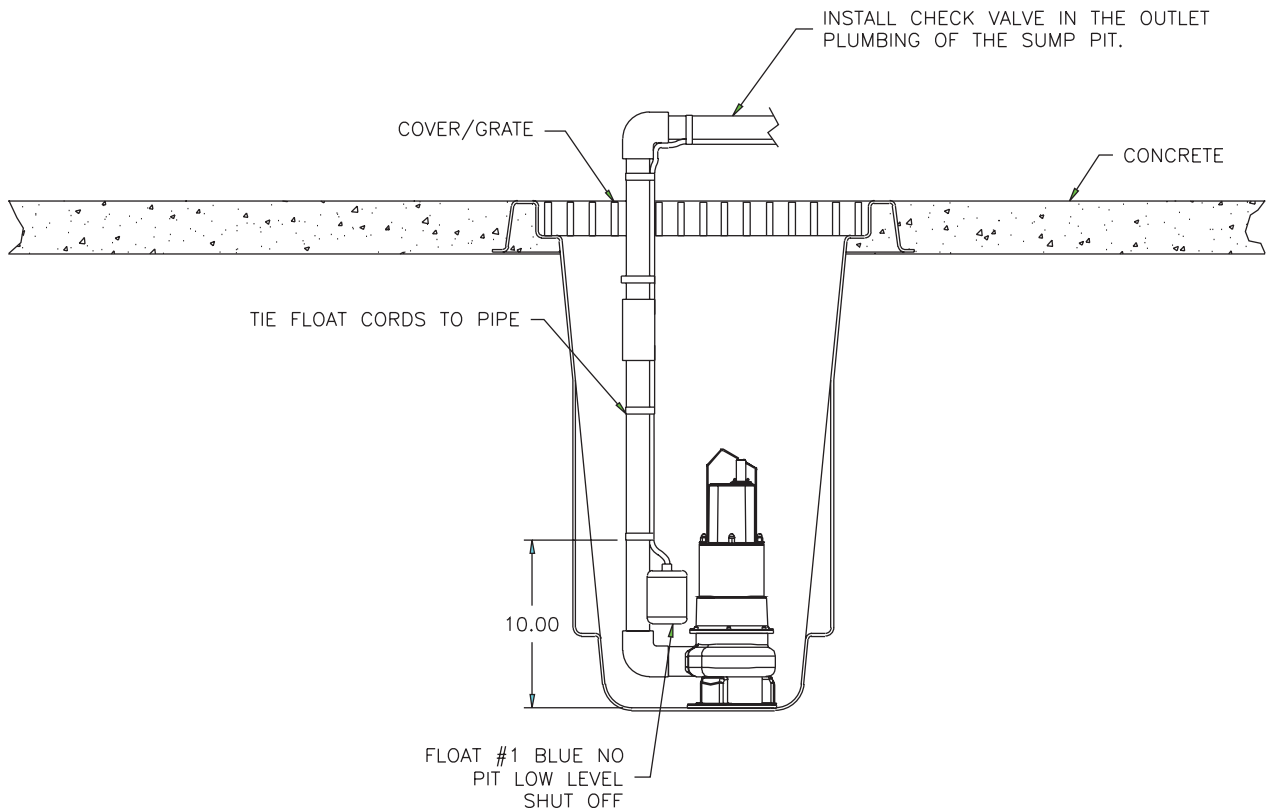
## ATTIRE:

1. Proper attire is essential to your safety. It is advised to utilize whatever means necessary to protect eyes, ears, and skin.

## INSTALLATION:

1. A Collection Pit System must already be an established structure before installing the Biological Recycling System. A well designed pit system is critical for the proper operation of the recycle system. Consult your dealer for installation requirements.
2. Place the Biological Recycling System platform on a hard, level surface in an area free of flammable vapors, combustible dust, gases or other combustible materials.
3. Set the unit so you have access to the Control Panel and Drain Ports.
4. Do not place unit in an area:
  - a. with insufficient ventilation.
  - b. where environmental hazards (i.e. rain and snow) can come in contact with the Biological Recycling System.
  - c. in a freezing environment.
5. Check all union connections for tightness.
6. Install schedule 80 PVC connections to the water inlet of the Biological Recycling System.
7. Install the Sump Pump in the Sump Pit as shown below.
8. Install plumbing from the Sump Pump using 1 1/2" minimum connection sizes.
9. Install the blue float in the Sump Pit. Attach the float 10" above the bottom of the Sump Pump. Allow a 2" tether and enough room for them to move freely without interfering with the plumbing.

SUMP PIT LAYOUT-BIO-022602-KS





# INSTALLATION



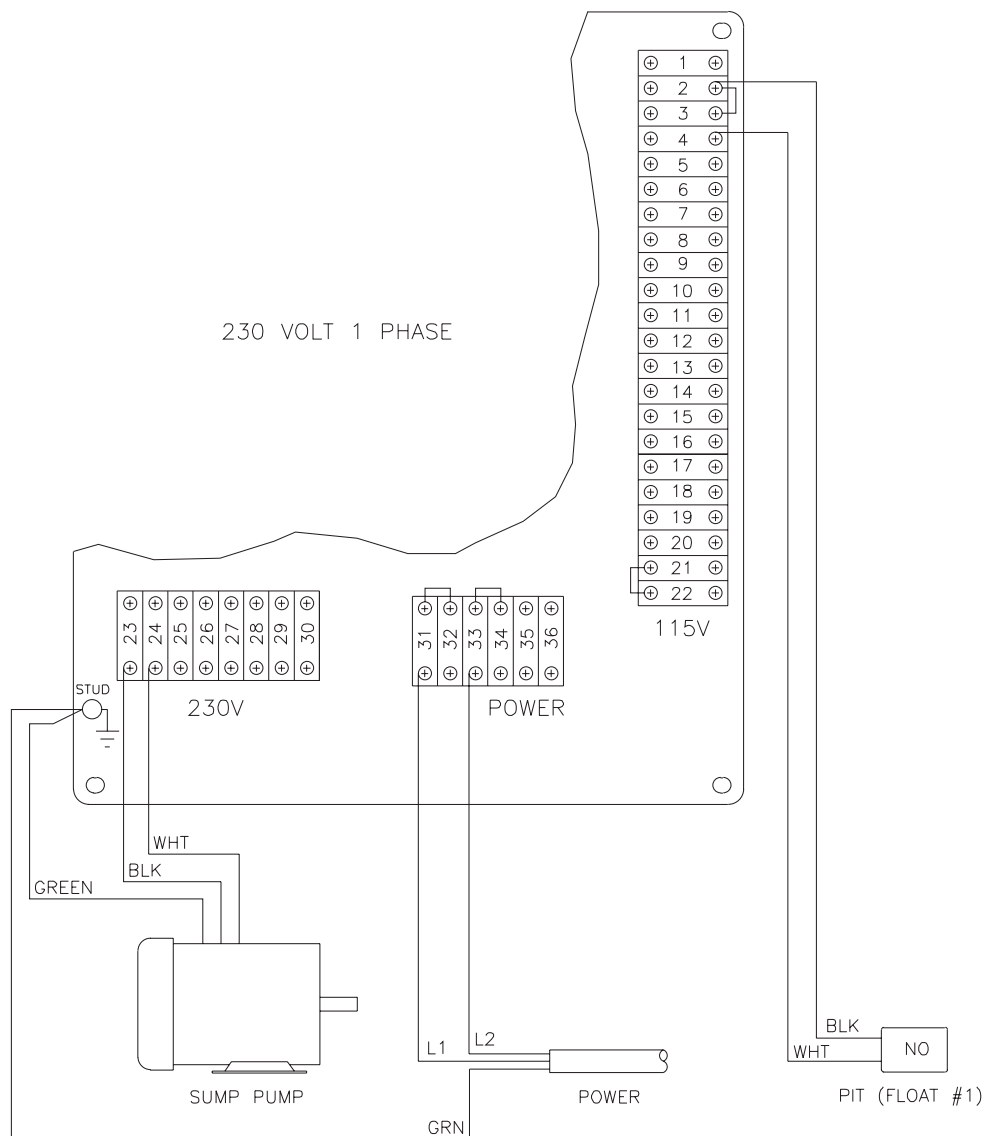
## WARNING

**RISK OF ELECTROCUTION! TO REDUCE THE RISK OF ELECTROCUTION, KEEP ALL CONNECTIONS DRY AND OFF THE GROUND.**

10. A qualified electrician must hook up the electrical system.
  - a. Verify the electrical supply at the power source is off.
  - b. Be certain all switches on the Control Panel are in the "OFF" position.
  - c. Run water tight conduit
    1. From the Sump Pump and Float to the Control Panel.
    2. From the local disconnect to the Control Panel. The electrician will need to drill holes in the Control Panel for the conduit.
  - d. Make connections to the terminal strips as shown in the wiring diagram on the following page.
11. Make the following piping connections:
  - a. From a pressurized water supply to the Fresh Water Makeup.
  - b. From the Pressure Washer Outlet to a pressure washer or garden hose.
  - c. From the Rain Water Overflow to storage tank for further processing or disposal. Do not send the water back to Sump Pit.

*NOTE: In most cases, you must have a permit to legally dispose recycled water.*

FIELD WIRING DIAGRAM-BIO25R-35R-062102-KS



# STOP

**TO ENSURE YOUR WATER RECYCLE TREATMENT SYSTEM OPERATES SAFELY AND EFFICIENTLY, COMPLETE THE PRE-OPERATION CHECKLIST BEFORE PROCEEDING.**

## PRE-OPERATION CHECKLIST

Before proceeding, answer all the questions on this checklist.	YES	NO
<b>CODES:</b>		
1. Does the electrical wiring meet all codes?		
2. Does plumbing meet all codes?		
<b>LOCATION:</b>		
1. Is the unit located on a hard level surface free of flammable vapors, combustible dust, gases or other combustible materials?		
2. Is the unit located in a large ventilated area?		
<b>ELECTRICAL:</b>		
1. Is the unit properly grounded?		
2. Does the power supply, voltage and amperage match the data plate?		
<b>PLUMBING:</b>		
1. Is the plumbing sized correctly?		
2. Are all plumbing connections secure?		
<b>GENERAL:</b>		
1. Have all operators using this unit read and understood this entire manual?		
2. Has the unit been installed by qualified service people who followed the instructions listed in this manual?		

**IF "NO" WAS MARKED TO ANY OF THESE QUESTIONS, CORRECT THE SITUATION BEFORE OPERATING.**

# PREPARATION

## PRESTART PROCEDURES:

1. Position the valves on the Biological Recycling System in the "Start-up Mode".
    - A. Aerator Pump Inlet Valve: Turn valve open.
    - B. Aerator Pump Outlet Valve: Turn valve closed.
    - C. Water Outlet Valves: Turn valves closed.
  2. Be certain all plumbing/hoses are tight and properly connected.
  3. Be certain the incoming air to the Air Injectors is not obstructed.
  4. Be certain all switches on the Control Panel are in the "OFF" position.
- 

## START-UP:

1. Ensure all Hold Down Angles are fastened into Biological Tank
2. Turn power from main disconnect "ON".
3. Turn on the Master Switch, water from the Freshwater Inlet will start filling the Product Tank.
4. When the Product Tank is full, prime the Transfer Pump by opening the union immediately after the Transfer Pump until water starts to flow out, then retighten union.
5. Turn on the Transfer Pump Switch to pressurize the Manifold and Pressure Tank.
6. Turn on the Sump Pump Switch.

### OZONE OPTION ONLY:

- a. Prime the Ozone Pump by opening the union immediately after the Ozone Pump until the water starts to flow out, than retighten the union.
  - b. Turn on the Ozone Pump Switch.
  - c. Turn on the Ozone Generator.
7. Operate the Biological System for one hour before adding Mi-T-M microbes

## OPERATION

### ADDING MICROBES:

1. Add inoculations of the Mi-T-M prepackaged microbes into the first chamber of the Biological System.
2. Begin your normal cleaning operation.
3. Continue inoculations on a weekly basis to ensure the Bio-System is operating at optimum efficiency.
4. Monitor the system closely the first few days to ensure smooth operation. See Troubleshooting if problems occur.

The Mi-T-M microbes are most active and effective when the water temperature is between 70°F and 100°F. For climates where freezing temperatures are experienced, the Biological System should be enclosed in a heated room.

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## MAINTENANCE

### ROUTINE MAINTENANCE:

1. Pits should be kept free from large amounts of sludge.
2. For most applications, four 500 mL bottles of microbes should be added to the system each 30 days to ensure a healthy colony growth in the Biological System. The media pack should feel "slimy" to the touch when the microbe colony is established. (Some applications may require more or less microbes depending on the contaminant level.)
3. The pH of the water should not be lower than 5.5 or higher than 8.5 at any given time.
4. If soap is necessary for washing, the soap should be of a neutral pH (approximately 7).

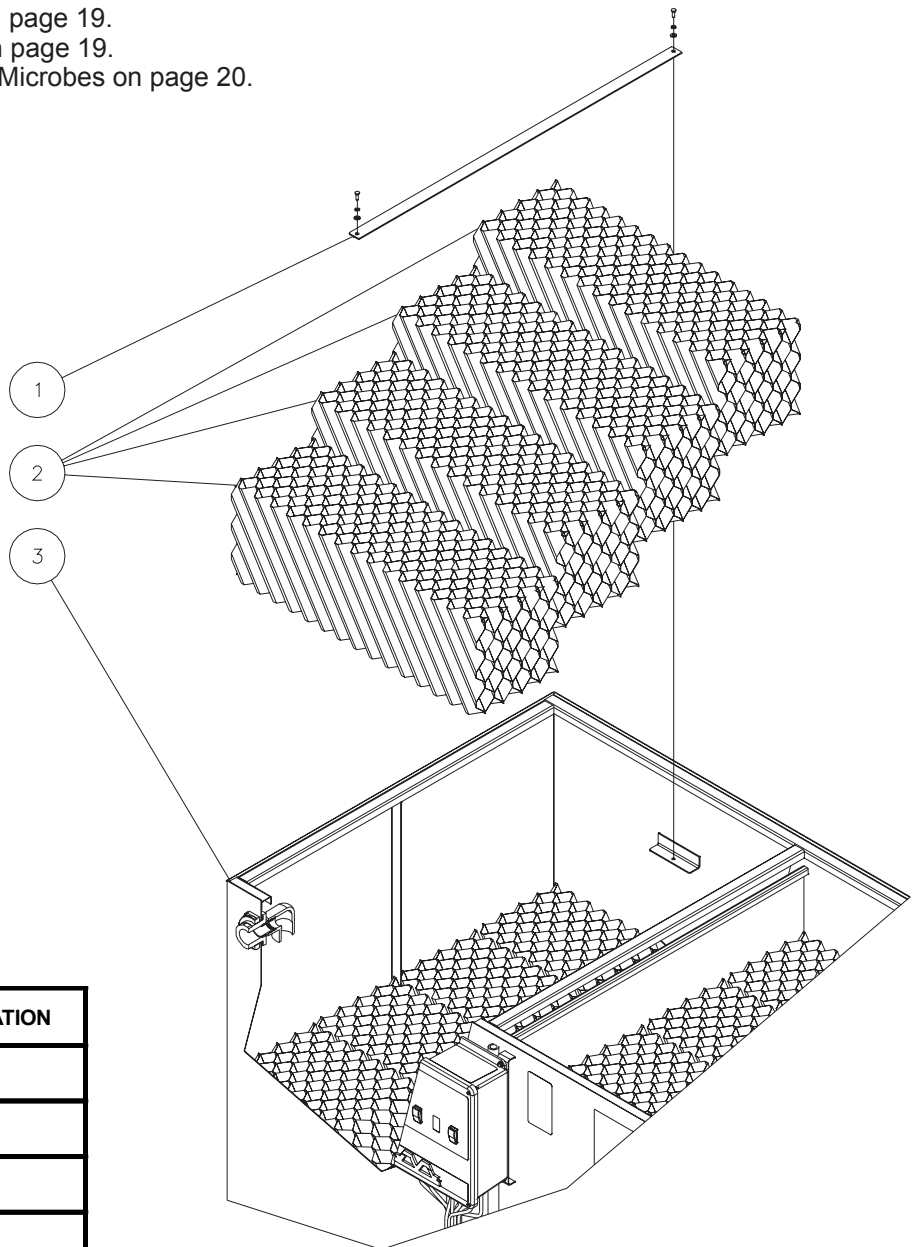
# MAINTENANCE

## WINTERIZING:

1. Turn all switches on the Control Panel to the off position and disconnect power to the Control Panel.
2. Shut off all water connections to the Biological Recycling System
3. Remove the drain plug from the Transfer Pump.
4. Remove the drain plugs from the Biological Tank, clean the tank and Biological Media and wipe down the system.
5. Open all valves on the Manifold.
6. Loosen the Freshwater Make-up connection, Pressure Washer Outlet connection, Rainwater Overflow connection and Tank Inlet connection.
7. Open the check valve near the Sump Pit and drain the water transport line. Remove the Sump Pump from the Sump Pit.
8. Store all chemicals at room temperature.

## TO OPERATE UNIT AFTER WINTERIZING:

1. Follow Installation Instructions on page 16.
2. For ease of reinstalling Biological Media, place media at an angle. After media is replaced, the Hold Down Angles must be fastened into the Biological Tank before filling. This prevents the Biological Media from rising out of the tank and also supports the tank sides.
3. Follow Prestart Procedures on page 19.
4. Follow Start-up Procedures on page 19.
5. Follow Procedures for adding Microbes on page 20.



BIOLOGICAL MEDIA INSTALLATION	
REF. #	DESCRIPTION
1	Strap
2	Biological Media
3	Biological Tank

BIOLOGICAL MEDIA INSTALLATION-BIO-062602-KS

## TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSE	REMEDY
<b><i>ELECTRICAL</i></b>		
No power at Control Panel (26).	Power failure to Control Panel.	Check circuit breaker at power source or contact your local distributor.
Power Indicator Light (34) is OFF.	Blown fuses inside Control Panel on step down transformer.	Check fuses, replace if necessary. If fuses are OK, contact your distributor.
<b><i>SUMP PUMP</i></b>		
Sump Pump will not run.	Float is not adjusted correctly in the Sump Pit.	Readjust.
	Float 1 is defective.	Replace.
	Level Limit Switch in the Product Tank has flipped up.	Push Level Limit Switch down, or remove excess water in the Product Tank.
	Circuit overload/breaker has tripped.	Reset breaker or replace fuse at power source.
	Motor overload.	Allow motor to cool. Motor will automatically restart when cool.
Sump Pump motor starts and stops frequently during operation.	Motor is defective.	Replace motor.
	This is a common occurrence.	Allow pits to fill.
	Sump Pump impeller is clogged.	Disconnect power and unclog impeller.
	Motor overload.	Allow motor to cool. Motor will automatically restart when cool.
	Sump Pit is not large enough.	Expand size of pit.
Sump Pump runs, but there is little or no water discharge.	Water level is below pump inlet.	Ensure Float 1 is not caught in plumbing.
	There is an air lock in the Sump Pump.	Manually fill the inlet pipe with water. Turn the Sump Pump on and off several times.
	Low voltage.	Ensure wire size is capable of handling the rated amperage of the unit. If wire size is correct, contact your distributor.
	Sump Pump impeller is clogged.	Disconnect power and unclog impeller.
	Worn pump parts.	Contact your distributor.
Sump Pump will not turn off.	Defective switch inside Float 1.	Replace.
	Pump is air locked.	Cycle pump in one minute increments several times to clear air from pump. If system includes a check valve, a 3/16" hole should be drilled in the discharge pipe approximately 2" above the discharge connections.

## TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSE	REMEDY
<b>BIO-SYSTEM TANK</b>		
Water will not flow into the Bio-System Tank.	Sump Pump is not turned on.	Move Sump Pump Switch to "ON"
	Circuit breaker has tripped or is "OFF".	Reset or turn breaker "ON".
	Dirt is lodged in the inlet check valve.	Clean.
	Sump Pump impeller is clogged.	Disconnect power and clean.
	Lines or valves contain frozen water.	Allow to thaw. Inject with warm water if necessary.
	Freshwater Make-up solenoid malfunctioning.	Repair or replace.
	Freshwater Make-up Float #4 in Product Tank tangled or malfunctioning.	Repair or replace.
<b>TRANSFER PUMP</b>		
Transfer Pump will not run.	Circuit overload/breaker has tripped.	Reset breaker or replace fuse.
	Motor overload.	Allow motor to cool. Motor will automatically restart when cool.
	Transfer Pump Float #3 tangled or malfunctioning.	Repair or replace.
	Pressure Switch malfunctioning.	Replace.
Transfer Pump runs but there is no water discharge OR Transfer Pump cycles excessively.	Pump sucking air.	Eliminate leaks and tighten all connections on intake line.
	Check valve is leaking or stuck in closed position.	Clean or replace as necessary.
	Lines or valves contain frozen water.	Allow to thaw. Inject with warm water if necessary. Ensure the Sump Pit remains above freezing.
	Pump impeller is obstructed.	Contact your local distributor.
	Pump motor is operating below maximum RPM.	Contact your local distributor.
	Too much pressure in Pressure Tank.	Check PSI in Pressure Tank with no water in tank. Pressure should be 18 PSI / 1.24 Bar.
	Pressure Switch needs adjusting.	Pressure Switch should be set to start Transfer Pump at 20 PSI / 1.4 Bar.
Transfer Pump is hot or turns off.	Low voltage.	Ensure wire size is capable of handling the rated amperage of the unit. If wire size is correct, contact your local distributor.
	Motor overload.	Allow motor to cool. Motor will automatically restart when cool.

## TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSE	REMEDY
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### **SHAFT SEALS**

Water is leaking at <b>Transfer Pump</b> .	Damaged mechanical seal.	Seal ran dry. Ensure seal chamber is filled with liquid.
Short seal life.	Unexpected temperature and chemical usage.	Replace.

### **ODOR**

Excessive odor in water system.	Not enough microbes in the system to maintain water balance.	Increase the microbe inoculation.
	Too much waste water for microbes to digest.	Use of chemical injection or use of an additional Bio-System may be necessary.
	****Water remains dormant in the system too long causing bacteria buildup.	The Biological System and Aerator System should be on 24 hours per day.

### **WATER FLOW**

Air shoots from Water Outlet.	This is a common occurrence while pump is priming.	Air will stop shooting from the water outlet when pump is primed.
	Transfer Pump is sucking air at suction inlet.	Eliminate leaks or tighten connection.

### **SOLENOIDS**

Solenoid valve won't turn on.	Low or no water pressure.	Turn off water, switch solenoids between valves. Turn on water. If problem is corrected, replace faulty solenoid.
	No electrical contact to solenoid.	Contact your local distributor.
Solenoid valve leaks when turned off.	Solenoid is obstructed.	Turn off water, remove and clean solenoid.
	Damaged solenoid.	Replace.
	Solenoid o-ring is misaligned or damaged.	Realign or replace.
	Diaphragm seat is dirty.	Clean or replace.
	Diaphragm is damaged.	Replace.



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## NOTES

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## NOTES

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## STATEMENT OF WARRANTY

The manufacturer warrants all parts (except those referred to below) of your new Biological Recycling System to be free from defects in materials and workmanship during the following periods:

For One (1) Year from the date of original purchase.

Defective parts not subject to normal wear and tear will be repaired or replaced at the manufacturer's option during the warranty period. In any event, reimbursement is limited to the purchase price paid.

### EXCLUSIONS

1. The motor is covered under separate warranty by its respective manufacturer and is subject to the terms set forth therein.
2. Normal wear parts:

Seals	Filters	Gaskets
O-rings	Packings	Pistons
Valve Assembly	Brushes	Microbes
Sensors		
3. Parts damaged due to:
  - normal wear, misapplication, modifications/alterations, abuse,
  - operation at other than recommended speeds, pressures or temperature,
  - the use of caustic liquids,
  - chloride corrosion or chemical deterioration,
  - fluctuations in electrical or water supply,
  - operating unit in an abrasive, corrosive or freezing environment.
4. Parts damaged by failure to follow recommended:
  - installation, operating and maintenance procedures.
5. This warranty does not cover the cost of:
  - normal maintenance or adjustments,
  - labor charges,
  - transportation charges to Service Center,
  - freight damage.
6. The use of other than genuine manufacturer parts will void warranty. Parts returned, prepaid to manufacturer's factory or to an Authorized Service Center will be inspected and replaced free of charge if found to be defective and subject to warranty. There are no warranties which extend beyond the description of the face hereof. Under no circumstances shall the manufacturer bear any responsibility for loss of use of the unit, loss of time or rental, inconvenience, commercial loss or consequential damages.

