



Eco-Safe Digester

Engineering Manual

For: Installation | Operation | Maintenance | Repair

Version 4.0.2 – August 14, 2015



Table of Contents

1	Introduction.....	4
1.1	Audience.....	4
1.2	Errors and Omissions.....	4
1.3	Basics.....	4
1.4	BioHitech Cloud™.....	5
2	Site Preparation.....	6
2.1	Space.....	6
2.2	Power source.....	6
2.3	Water and Drain.....	6
2.4	Internet Connectivity (Optional).....	7
2.5	Checklist.....	8
3	Transporting and Leveling Your Machine.....	9
4	Installation Procedure.....	10
4.1	Machine Installation.....	10
4.2	Network Installation and Configuration.....	10
5	Digester Start-up Procedure.....	12
6	Feeding the Eco-Safe Digester.....	22
6.1	Overview.....	22
6.2	Feeding the Eco-Safe Digester.....	22
6.3	Acceptable Food Types.....	23
6.4	Feeding Schedule.....	23
6.5	The Traffic Light.....	24
7	Touch Screen Operation.....	25
7.1	System Status.....	26
7.2	Main Menu.....	27
7.3	Auto Working.....	28
7.4	Manual Working.....	30
7.5	Time Settings.....	31
7.6	Monitoring.....	32
7.7	Weight Monitoring.....	33
7.8	Function Settings.....	34
7.9	Alarm Message.....	35
7.10	Networking.....	36
7.10.1	Networking Main Menu.....	36
7.10.2	Network Test.....	36
7.10.3	Networking Settings and Configuration.....	37
8	Routine Maintenance.....	39
8.1	Core Mechanical Components.....	39
8.2	Lock-Out / Tag-Out (Shutdown) Procedure.....	40
8.3	Replenishment.....	42
8.3.1	Microorganisms.....	42
8.3.2	Media.....	43
8.3.3	Deodorizer.....	43

9	Troubleshooting	45
10	Appendix A - Best Practices	47
11	Appendix B - Contacting BioHitech Customer Support	48
12	Appendix C - Maintenance Chart	49
13	Appendix D - Network Connectivity	50
13.1	Network Connectivity Options	50
13.2	Network Configurations	50
13.3	Firewall Considerations	50
13.4	Bandwidth Utilization	51
13.5	SSL Proxies	51
14	Appendix E - Repair	52
14.1	Parts Cut Sheet	52
14.2	Motor Removal	53
14.3	Chain Removal	54
14.4	Servicing the Chain Tensioner	55
14.5	Bearing/Sprocket Removal and Replacement	56
14.6	Food Hatch Door Bearing Assembly	57
14.7	Paddle Arm Removal and Replacement	58
14.8	Agitator Shaft Removal and Replacement	59
14.9	Gas Piston Replacement and Caster Replacement	60
14.10	Replacing Deodorizer & Showering Nozzles	61
14.11	Replacement Food Hatch Sensors	62
14.12	Replacing Liquid Level Sensors	63
14.13	FloJet Pump Replacement	64
14.14	Replacing Electric Actuator Valves	65
14.15	Replacing Silicon Food Hatch Gasket	66
14.16	Light Bulb Replacement	67

1 Introduction

1.1 Audience

This engineering manual is intended to provide you with information to help you learn how to install, operate, maintain, and support your new Eco-Safe Digester high volume organic waste decomposition system for optimal performance. This manual is intended for individual operations personnel who support the machine on a day-to-day basis.

This manual is a complete super set of the *Eco-Safe Digester Supervisor's Manual*.

1.2 Errors and Omissions

Any errors or omissions in this manual may be reported to BioHitech America. Please direct any errors, corrections, and omissions to BioHitech America at the e-mail address **support@biohitech.com**. Alternatively, Customer Support can be contacted following the procedure outlined in Appendix B – Contacting BioHitech Customer Support

1.3 Basics

The Eco-Safe Digester uses a highly refined formula of microorganisms to decompose carbon based food waste into a non-toxic liquid that is safely disposed into standard wastewater disposal systems.

The capacity of the machine refers to the average weight of food waste digested in a 24-hour period. It is important to note that while each Eco-Safe Digester model has a standardized maximum capacity specification, capacity can vary based on usage trends.

Figure 1-1 - Eco-Safe Digester 24-Hour Capacity

Model	400	800	1200
Capacity	800 lbs.	1,500 lbs.	2,500 lbs.

Each machine is controlled by a state of the art CPU (Central Processing Unit) that controls the chamber's parameters to create the ideal environment for microorganism performance. A touchscreen display provides an easy to-use graphical user interface to operate, configure, and monitor the Eco-Safe Digester.

NOTE: Please be sure to read all sections of this manual prior to operating your new Eco-Safe Digester.

1.4 BioHitech Cloud™

BioHitech Cloud™ is an optional offering from BioHitech America. BioHitech Cloud provides web-based access to Digester utilization, performance, and cost-savings. Managers, supervisors, and operators to report on your corporate and on-location waste diversion performance can use this feature.

If BioHitech Cloud is purchased, this manual should also be used to understand how to setup and configure your Eco-Safe Digester for BioHitech Cloud.

Please refer to the *BioHitech Cloud User's Manual* or *BioHitech Cloud Administrator's Manual* for information regarding the usage or configuration of BioHitech Cloud.

2 Site Preparation

Site preparation is simple. However, it is important to ensure that all physical requirements are met before installing the Eco-Safe Digester. This section will review these requirements.

2.1 Space

The optimal space for the Eco-Safe-Digester has at least 5 feet of clearance on both sides in addition to the machine's width. This additional room is necessary to help facilitate maintenance of the machine. Due to the weight and size of the machine, we strongly recommend that these criteria be met. In the event this space is not available, a custom application may be necessary. Variation in space will occur depending on which Eco-Safe Digester model is installed.

See the chart below on the Eco-Safe Digester's physical dimensions, based on the model.

Figure 2-1 - Eco-Safe Digester Physical Dimensions by Model

Model	400	800	1200
Length	43 "	57"	67"
Width	36 "	44"	44"
Height	48 "	52"	52"

Note: All dimensions in the above table are measured in inches.

2.2 Power source

The required power for the machine is AC 220V +/- 10V, 3 phase, 1 ground at 30A. The power source with a circuit breaker must be within 5 feet of the desired installation location and on the left side of the machine. A minimum voltage of 220 must be dedicated solely to the operation of the machine and must be maintained at the installation location.

2.3 Water and Drain

A dedicated warm water source (104° F) with a ¾ male pipefitting is also required within 5 feet of the left side of the machine. The water source should be dedicated to machine operation only. Sharing the water source with other usage is not recommended.

The drain must be an open floor drain and should be connected to the machine with a 3-inch drain pipe (PVC or Copper). Please minimize any changes in flow direction from the machine to the drain hole. An elbow fitting should not be used more than 2 times. A pitch must be maintained at least 1/4-inch declination for every 2 feet length.

2.4 Internet Connectivity (Optional)

If the optional BioHitech Cloud package is purchased, then Eco-Safe Digester will require Internet connectivity. BioHitech Cloud provides end-user reporting on machine and waste utilization as well as providing service technicians with remote diagnostics information to help resolve issues in the field.

Please coordinate with your IT (Information Technology) department to ensure that proper network connectivity is available to your Eco-Safe Digester.

There are two methods to provide network connectivity to the Digester:

1. **Hardline** - You can provide an Ethernet RJ45 jack near the Digester that will allow outbound Internet access by the Digester. Note: This jack should be located relatively close to the Eco-Safe Digester.
2. **Cellular Wireless** - You can purchase a cellular data modem from BioHitech America which will provide wireless cellular data access. Note: The location of the Digester must have proper cellular data reception.

Note: Customers may also provide their own wireless routers or wireless bridges into which the Digester can plug. These solutions will likely work; however they are not officially supported by BioHitech America.

Please refer to *Appendix D (Networking Connectivity)* for detailed networking information and requirements for your IT department.

2.5 Checklist

Please see table below and prepare the checklist before machine installation.

Figure 2-2 - Site Preparation Check List

Type	Requirement	Check List
Space	Left: 5 feet space Right: 5 feet space Not including machine size	<input type="checkbox"/>
Power	220 volt (+/- 10%), 3 phases at 30A (T, R, S, and Ground)	<input type="checkbox"/>
Water	Warm water (40°C) ¾ inch male pipe fitting Easy access to the machine	<input type="checkbox"/>
Drainage	4 inch open floor drain Must be within 5ft of machine site	<input type="checkbox"/>
Network (optional)	RJ45 Jack with outbound Internet Access or wireless cellular modem provided by BioHitech. Only required if BioHitech Cloud is being used.	<input type="checkbox"/>

3 Transporting and Leveling Your Machine

Please review the following guidelines when transporting and leveling your Eco-Safe Digester:

1. **Forklift** - In the event your machine must be moved with a forklift, be sure to lift it at the base frame between the left and right casters at the bottom of the machine. Extreme caution is necessary to avoid damaging the external cover.
2. **Crane / Winch** - In the event your machine must be lifted with a crane or winch, be sure to use the left and right eye bolts attached on the top of the machine and lift it carefully.
3. **Vehicle Transportation** - In the event your machine is going to be transported in or on a vehicle, be sure to turn the screw handles of all four casters located under the machine to allow the fixing pads to contact the floor. Do not skip this step or your machine may be damaged in transport.
4. **Securing with a Bar or Belt** - In the event a bar or belt is used to secure the machine during transport, be sure to avoid contact with the top cover of the machine. Use a base frame or caster parts on the lower part of the machine without any excessive force to secure the machine.
5. **Short Distance Moves** - In short distance moves, a forklift is strongly advised to move the machine after the machine is unloaded. Movement of the machine using the casters may cause excessive vibration that can damage certain electrical components. Movement of the machine using the casters should be avoided at all times except for adjustments to the machine at the final installation location.
6. **Leveling** - The final location of the machine should be a level surface. The positioning legs will be installed at each corner of the machine and may be used as a level adjuster.

CAUTION

Excessive vibration or rough handling may cause loosening of machine elements and/or electrical devices, which may impair installation and performance. A qualified service technician should be used for all service and installation requirements.

4 Installation Procedure

4.1 Machine Installation

The following procedure should be used to install your Eco-Safe Digester:

1. When the machine is placed in its final location, turn the screw handles of all fixing pads so contact with the floor is made. Be sure to level the fixing pads so that the machine is grounded. If the machine rocks or shakes, this may be an indication that the fixing pads have not made contact with the floor, and that the machine may not be level.
2. Connect the water supply hose to the water supply valve exposed at the front-left part of the machine so that it is secure.
3. Open the cover on the right side of the machine and connect the drainpipe or hose to allow for proper drainage of the effluent to the designated floor drain.
4. Before connecting the power lines, be sure to check if it is suitable for 220V, 3 phases.
5. Open the front cover and the door of the electrical panel and connect the power lines to the main breaker.
6. Before turning the main switch to the ON position, be sure to tighten any loose connections on each terminal within the electrical panel.
7. Check to see if there are any loose fitting bolts or nuts on the pipes of the machine.
8. BioHitech calibrates all mechanical parameters.
9. Turn all switches, including the main power switch, to the ON position. The machine is now ready to use in the factory setting mode.

4.2 Network Installation and Configuration

If the Eco-Digester will be using the optional BioHitech Cloud offering, then the Eco-Safe Digester must be connected to the Internet.

1. Open the front cover of the Eco-Safe Digester, and locate the black “BioBrain” computer.

-
2. The back of the computer will have a standard Ethernet RJ45 network cable connected to it. Plug the other end of this cable into an Ethernet RJ45 network jack or into the RJ45 network jack of cellular modem.

Note: If using the cellular modem, please place the antennas in a location that receives optimal cellular wireless connectivity. BioHitech America is not responsible for poor cellular wireless reception.

-
-
3. Use the Touch Screen panel on the Digester to configure and test your network settings.

5 Digester Start-up Procedure

The following detailed procedure can be used to turn on your Eco-Safe Digester for the first time.

Note: Your touch screen images may be slightly different than the ones depicted in this manual.

1. Prior to turning on the Digester using the power key, make sure all breakers in the digester are in the on position (**they are located inside the electrical box on the left hand side**).

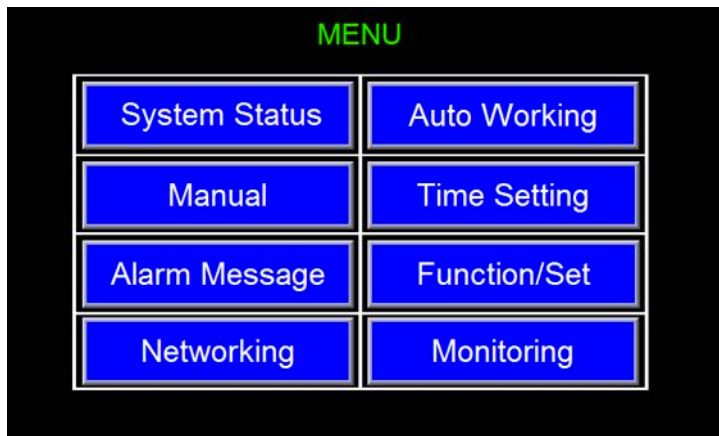
Upon turning on the Eco-Digester you will see the Start Up Screen. Note: Your screen may differ slightly.

Figure 5-1 - Start-up Screen



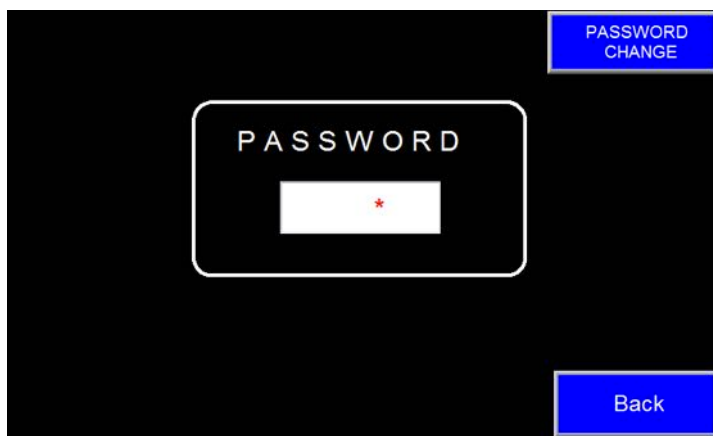
2. Press the **arrow** in the top-right corner, which will bring you to the "**Main Menu Screen**".

Figure 5-2 - Main Menu Screen



3. Press the **Function Settings** button. You will be prompted for a password, type “2005” and press “ENT” for enter. Note: If this password does not work, please contact BioHitech America for assistance.

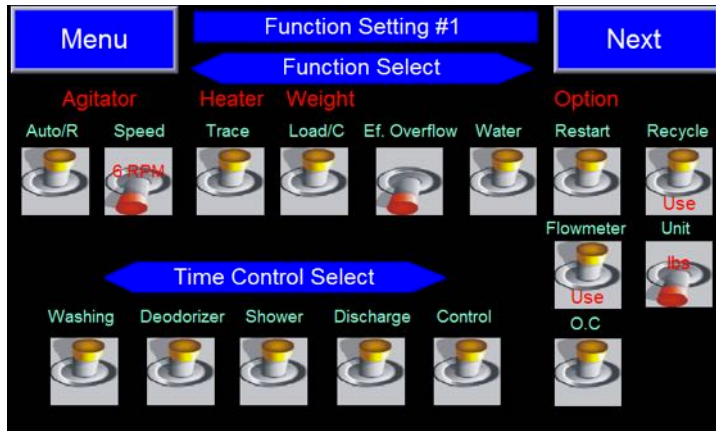
Figure 5-3 - Entering the Password



4. After entering the password you will see “**Function setting #1**” screen. Press the **Next** button in the top-right corner.

Note: The toggle switches on this page will be set already, **do not alter anything on this screen unless instructed by Biohitech America!**

Figure 5-4 - Function Setting #1 Screen



5. You will now see the **“Function Setting #2”** screen, at this time press the **Reset** button in the bottom-left corner; this will prepare the scale system for the “zeroing out” process.

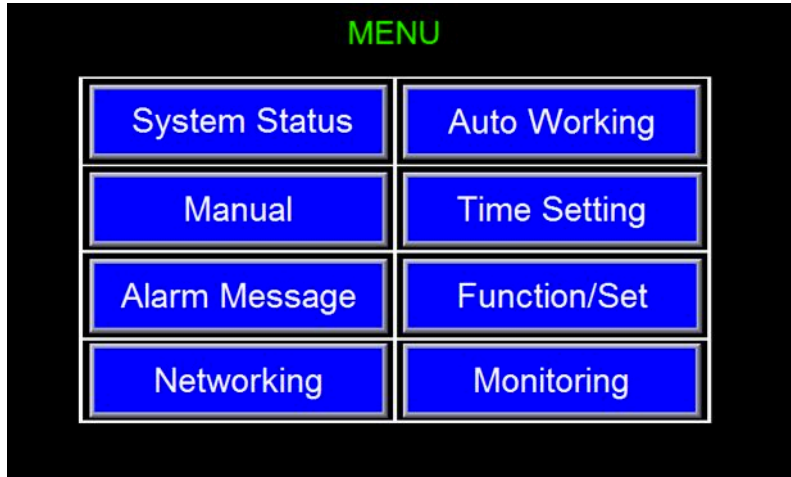
Now add the plastic chips into the food chamber. Once added, press the **Tare** button in the bottom-left corner.

Figure 5-5 - Function Setting #2 Screen



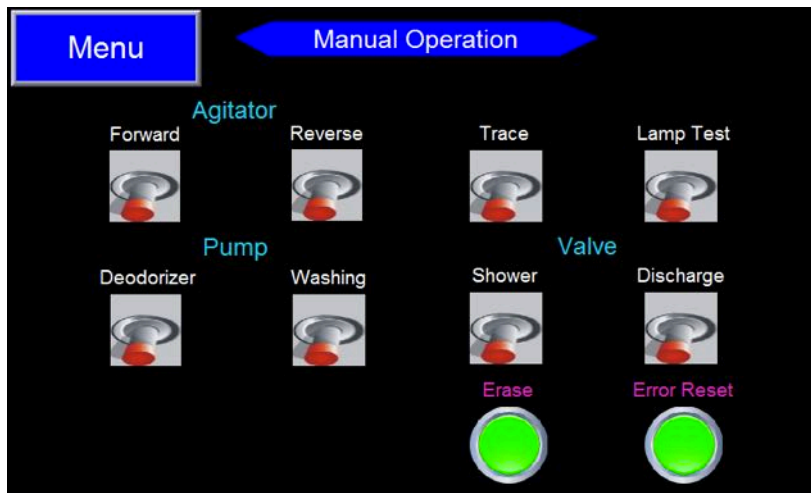
6. Press the **MENU** button in the top-left corner. This will take you back to the **“Main Menu Screen”**.

Figure 5-6 - Main Menu Screen



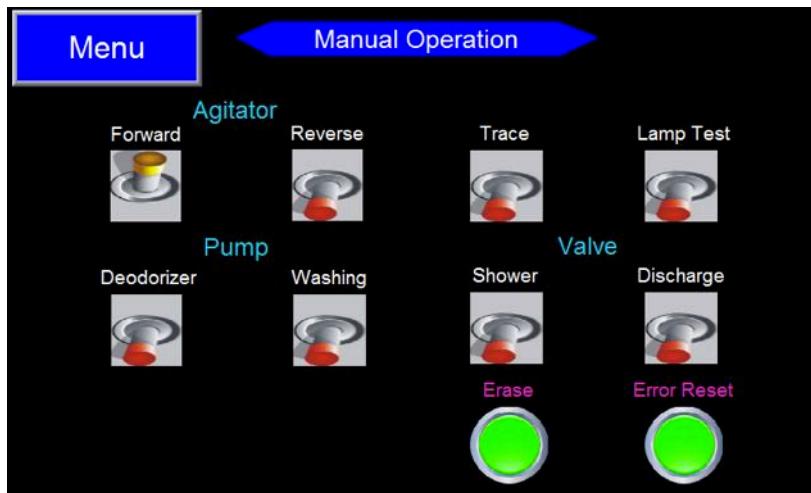
7. Press the **“Manual”** button. If prompted for a password enter the same password from step #3 and then press **“ENT”** for enter. This will take you to the **“Manual Working Screen”**.

Figure 5-7 - Manual Working Screen (All Switches off - Red/Down)



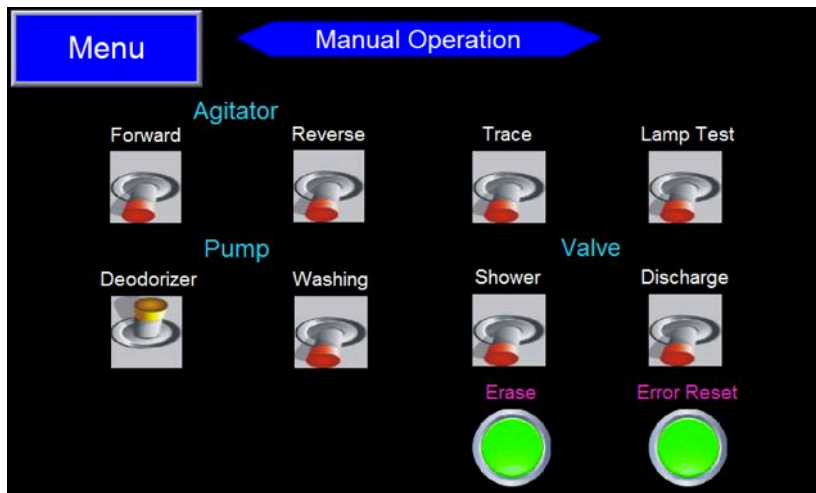
8. Press the **“Agitator Fwd”** toggle switch (up to yellow) and visually check that the agiator arms are spinning freely; do this by opening the food hatch door. Once confirmed, turn the switch back to red, which will turn off the agitator.

Figure 5-8 - Turning the Agitator On (Yellow/Up)



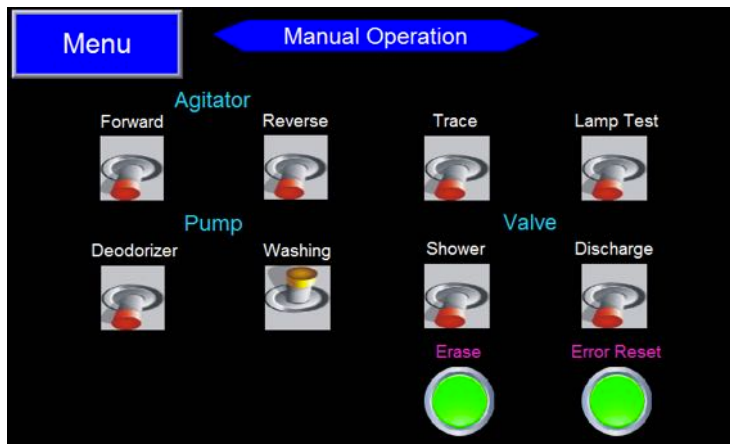
9. Press the **“Deodorizer”** toggle switch. This will cause the deodorizer pump to activate; a fine mist should be spraying from the green nozzles located at the top of the food hatch area inside the feeding chamber.

Figure 5-9 - Turning the Agitator Off (Red/Down) and Turning on the Deodorizer (Yellow/Up)



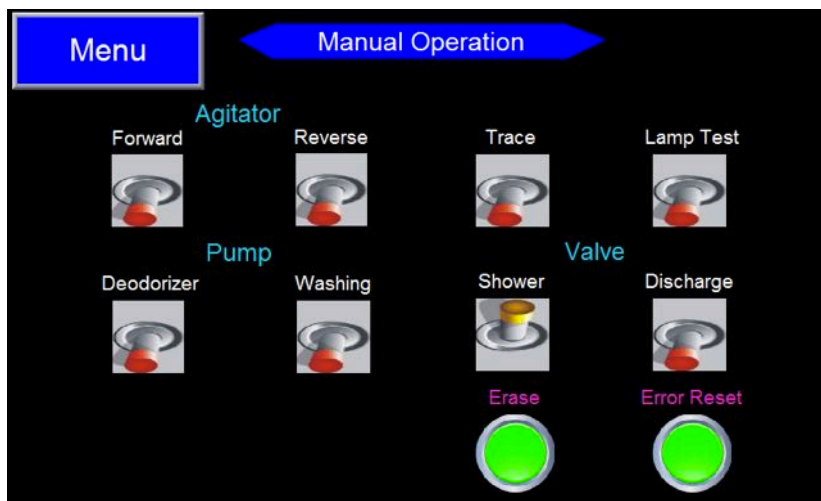
10. After turning off the **“Deodorizer”** toggle, turn on the **“Washing”** toggle switch. Once turned on the washing pump should be spraying water into the drain pan, confirm this is happening by viewing water exiting the drainpipe.

Figure 5-10 - Turning on the Washing Cycle (Yellow/Up)



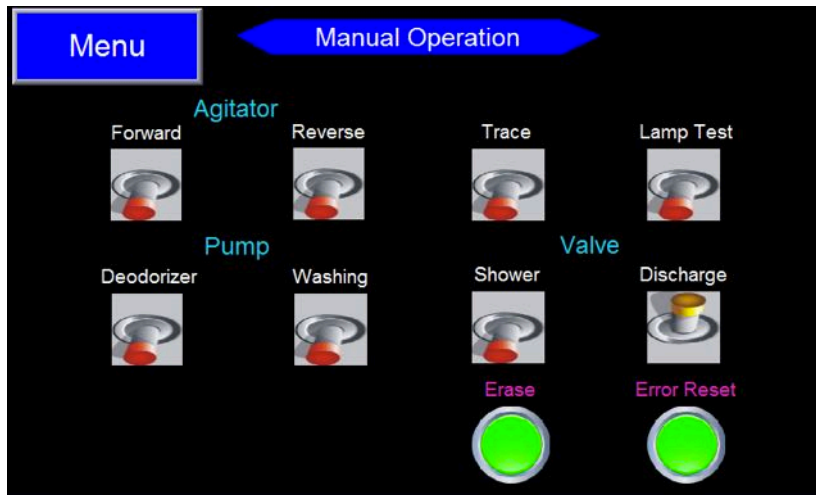
11. After turning off the **“Washing”** toggle, turn on the **“Shower”** toggle switch. Once turned on you should see water spraying into the feeding chamber. Once confirmed, turn off the **“Shower”** toggle switch.

Figure 5-11 - Turning on the Shower (Yellow/Up)



12. After turning off the **“Shower”** toggle, turn on the **“Discharge”** toggle switch. Once turned on you should see water exiting the drainpipe. Once confirmed turn of the **“Discharge”** toggle switch.

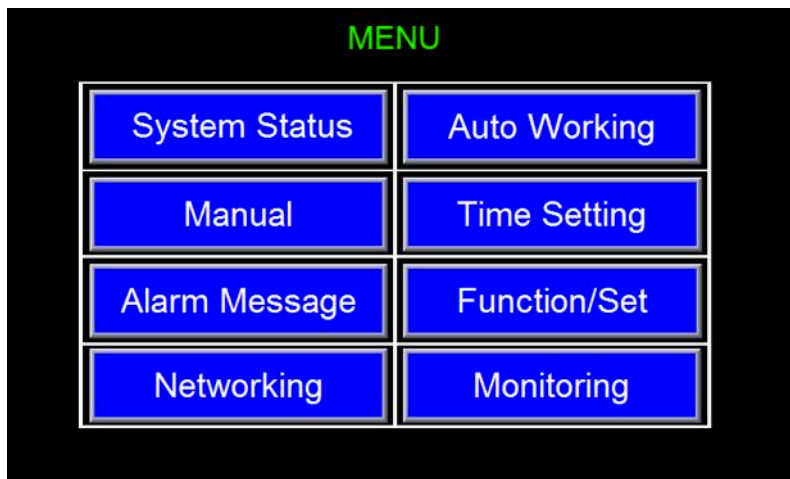
Figure 5-12 – Turning on the Discharge (Up/Yellow)



Completing steps 7 – 12 concludes the independent tests of all systems!

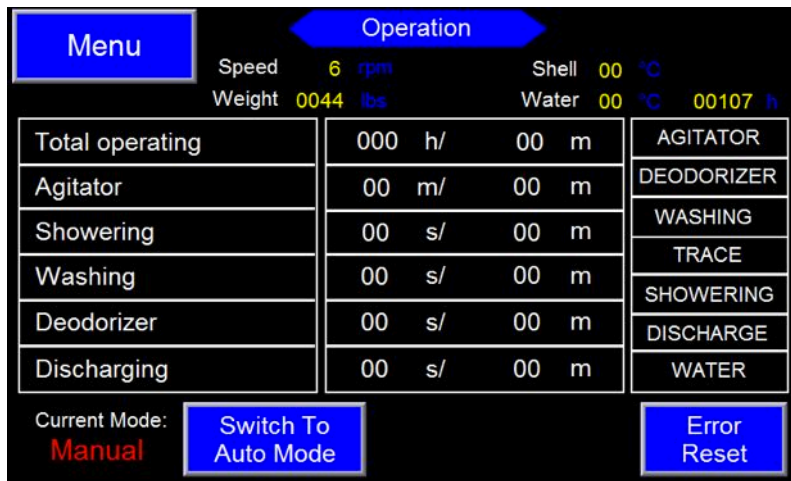
When done, press the **Menu** button to take you to the main menu screen.

Figure 5-13- Main Menu Screen



13. Press the **Auto Working** button to take you to the Auto Working Screen.

Figure 5-14 - Auto Working Screen



14. Now press the **Error Reset** button **3** times. After pressing the **Error Reset** button, the traffic light system on top of the digester should now be glowing green.

Figure 5-15 - The Traffic Light



15. After confirming the traffic light system is glowing green, open the food hatch door and toss in the **2 water soluble** pouches containing the microorganisms. Once tossed in, close the food hatch door.

Figure 5-16 - Microorganisms



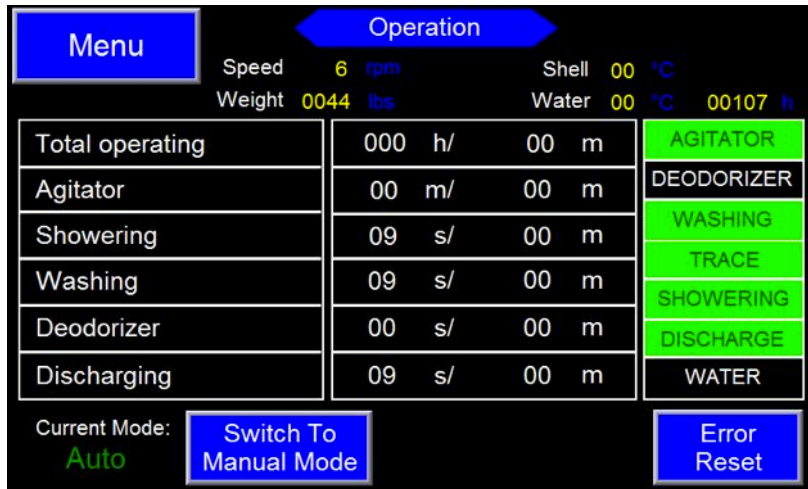
16. Now press the blue **“Switch to Auto Mode”** button in the bottom-left corner. Once pressed, it should turn it's Current Mdoe to **“Auto”** (in green), in the lower-left corner.

Figure 5-17 - After Pressing “Switch to Auto Mode” Button

Menu		Operation			
Speed	6 rpm	Shell	00 °C		
Weight	0044 lbs	Water	00 °C	00107 h	
Total operating	000 h/	00 m	AGITATOR		
Agitator	00 m/	00 m	DEODORIZER		
Showering	00 s/	00 m	WASHING		
Washing	00 s/	00 m	TRACE		
Deodorizer	00 s/	00 m	SHOWERING		
Discharging	00 s/	00 m	DISCHARGE		
			WATER		
Current Mode:	Auto	Switch To Manual Mode	Start	Error Reset	

17. Now press the green **Start** button, once pressed it, the green **Start** button should disappear.

Figure 5-18 – After Pressing the Green Start Button



18. Within 5 minutes the microorganisms will be thoroughly incorporated in the bio-media and feedings can commence.

Congratulations! The start-up process is now complete!

6 Feeding the Eco-Safe Digester

6.1 Overview

The digestion process of the Eco-Safe Digester machine is similar to the human digestion process. The machine will accept organic foods that are acceptable for human consumption. Figure 6-1 is an example of acceptable and unacceptable items for the machine.

It is important to note that all chemicals, metals, and foreign objects are not suitable for the machine and may cause permanent damage and/or void your warranty.

6.2 Feeding the Eco-Safe Digester

The following procedure should be use to load organic waste into the Eco-Safe Digester:

1. Check the Traffic Light to ensure that it is okay to place waste into the Eco-Safe-Digester.
2. Open the door to the Eco-Safe Digester.
3. (OPTIONAL) – Some sites may be configured to classify all waste dumped into the machine. In this case, the Touch Screen panel may instruct the user to make a selection to classify the waste (either by waste type or by department). Please make a selection before dumping waste into the machine.
4. Perform a quick visual inspection to ensure that the machine is not too full, or contains foreign objects.

NOTE: If foreign objects are found inside of the Eco-Safe Digester, **carefully** and **safely** remove them before adding more waste. If you are unsure about the safety of removing the objects, please contact your supervisor or contact BioHitech America for assistance.

5. Dump your organic waste into the Eco-Safe Digester. Please read below on acceptable types of organic wastes, feeding schedule, and traffic light indicators.
6. Close the door firmly.

6.3 Acceptable Food Types

Food Types - The general rule of thumb is that the Eco-Safe Digester can consume any organic waste that can be consumed by a human. However, please read and understand the types of materials that may or may not be placed into the Eco-Safe Digester.

Figure 6-1 - Acceptable and Unacceptable Foods for the Eco-Safe Digester

OK to put into the Digester	DO NOT put into the Digester
<ul style="list-style-type: none"> • Meat (raw or cooked) • Poultry (raw or cooked) • Fish (raw or cooked) • Fruit • Vegetables • Rice • Pasta • Bread and baked goods • Grains • Eggshells • Dairy products • Coffee grinds 	<ul style="list-style-type: none"> • Excessive baked items at one time • Big bones • Clam or mussel shells • Pineapple tops, cores, and skins • Corn husks and cobs • Fruit seeds over ½ inch diameter (such as mango, avocado, peach) • Raw dough and pure flour • Oil, grease, and fats • ANY type of non-organic waste (cardboard, plastic, silverware, shrink wrap, etc.)

Temperature – Items deposited into the Digester should be at room temperature. Avoid throwing in frozen food or very hot foods (like hot soup). Extreme food waste temperatures can have a negative impact on the microorganism habitat, decreasing performance and possibly killing the microorganisms.

Non-Organic Materials – It is important to note that all chemicals, metals, and foreign objects are not suitable for the machine and may cause permanent damage and/or void your warranty.

6.4 Feeding Schedule

Ideally, the Digester should be fed on an hourly to every-4-hour schedule. More often (hourly) feeding is preferred. Refer to Figure 5-2 below for optimal feeding sizes.

Figure 6-2 – Feeding Schedule and Load Size

Model	400	800	1200
Daily Capacity	800 lbs.	1600 lbs.	2400 lbs.
Feed Size (every 4 hours)	135 lbs.	265 lbs.	400 lbs.
Feed Size (hourly)	35 lbs.	65 lbs.	100 lbs.

The traffic light on the Eco-Safe Digester will indicate whether or not the machine can be fed. See the section below for more information about the traffic light.

CAUTION

Overloading – The maximum feeding capacity should **not** exceed the agitator shaft. Do **not** overload the machine. NOTE: Oxygen is essential to microorganism performance; overloading the machine will cause the microorganisms to perform inefficiently. Input scheduling is highly recommended.

6.5 The Traffic Light

The Eco-Safe Digester continuously monitors its weight. If the weight becomes too high, then the machine is full and should no longer be fed organic weight. The traffic light on the back of the machine informs the machine operator of the weight status of the machine.

Please check the status of the traffic light before placing organic waste into the Eco-Safe Digester.

Figure 6-3 - Traffic Light Status

Light	Status	Action
Solid Green	The machine has plenty of available capacity	Feed the machine.
Solid Yellow	The machine is close to being full but has available capacity	Feed the machine.
Solid Red	The machine is full	Do NOT feed the machine.
Flashing Red	There is a fault condition	Use the touchscreen to view the alerts. Correct the fault condition.
Colors Cycle	The unit is in Manual Mode	Keep the unit in manual mode (if that is the desired state), or change it back into auto mode.

7 Touch Screen Operation

The Eco-Safe Digester has a Touch Screen panel that can be used to fine-tune the operation and configuration of the machine.

In general, the Eco-Safe Digester can be placed into one of two different operating modes:

Auto Working Mode – Auto Working is the mode in which the machine normally starts. The machine stays in Auto Working Mode for normal day-to-day operation. In Auto Working mode, the computer inside of the Digester controls normal cycles for agitation, showering, deodorizing, etc.

Manual Working Mode – Manual Working is the mode that the machine is placed into when performing maintenance or troubleshooting. In general, a machine is normally not placed into Manual Working mode (and left in Manual Working mode) unless instructed to by BioHitech America or a qualified service technician. Manual Mode allows the operator to manually control the functions such as agitation, showering, deodorizing, etc.

7.1 System Status

The touchscreen should normally be displaying the “**System Status**” screen, as seen below.

Figure 7-1 - The System Status Screen



This screen displays high-level information about the state of the Digester, including:

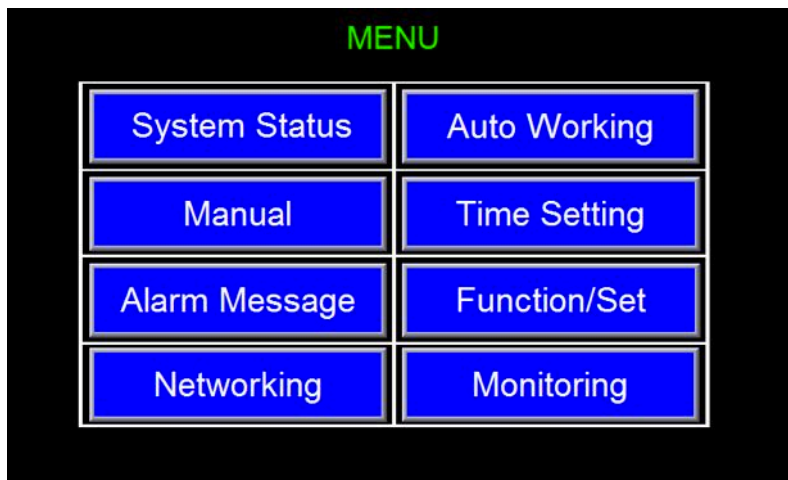
- **Operating Mode** – Manual or Auto
- **Current Weight** inside of the machine
- **Available Capacity** in the machine (the weight that can be added to the Digester until it goes into a Tower Red state)
- **Messages** – emergency messages or operational messages that require attention

Pressing the **Menu** button at any time will take you to the “**Main Menu**” screen.

7.2 Main Menu

The “**Main Menu**” screen provides a list of operational and configuration activities.

Figure 7-2 - Main Menu



The following options are available from the Main Menu:

System Status – Push this button to display a high-level overview of the system status.
Note: After periods of inactivity (2 minutes), the touch screen will automatically go into this mode.

Auto Working – Push this button to see if your machine is in Auto-Working mode or Manual Working Mode and to see the state of the various cycles in the machine.

Manual - Push this button to control the machine if the machine is in Manual Working Mode.

Time Setting – Use this button to fine-tune the configuration of cycle time intervals.

Alarm Message – Push this button to view alert messages generated by the machine.

Function/Set – Use this button to configure (turn on and off): temperature, tower weights, temperatures.

Networking – Use this button to configure and test networking systems if your Eco-Safe Digester is connected to the Internet for the optional BioHitech Cloud offering.

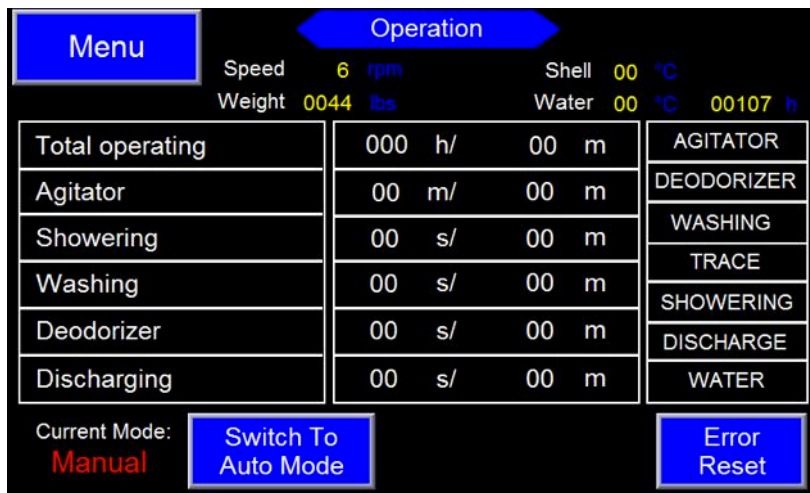
Monitoring – Push this button to view a graphical and interactive display of the status of the entire system as well as track weights of loads entered into the machine.

7.3 Auto Working

The figure below illustrates the Auto Working screen when the machine is in Manual Working mode. Push the **“Switch to Auto Mode”** button to place the machine into Auto Working mode. Then press the green **Start** button to start the machine.

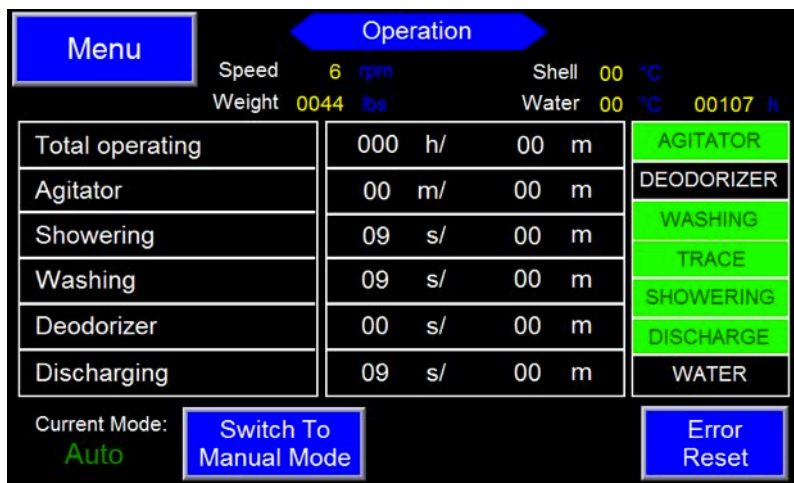
Note: if the **Start** button is not pressed, the machine will automatically start when the door is closed.

Figure 7-3 - Auto Working Screen (when machine is in Manual Working mode)



The figure below illustrates the Auto Working screen when the machine is in Auto Working mode. Press the **“Switch to Manual Mode”** button to place the machine into Manual Working Mode.

Figure 7-4 - Auto Working Screen (when machine is in Auto Working mode)



In addition, the **ERROR RESET** button can be used to reset any error states in the machine.

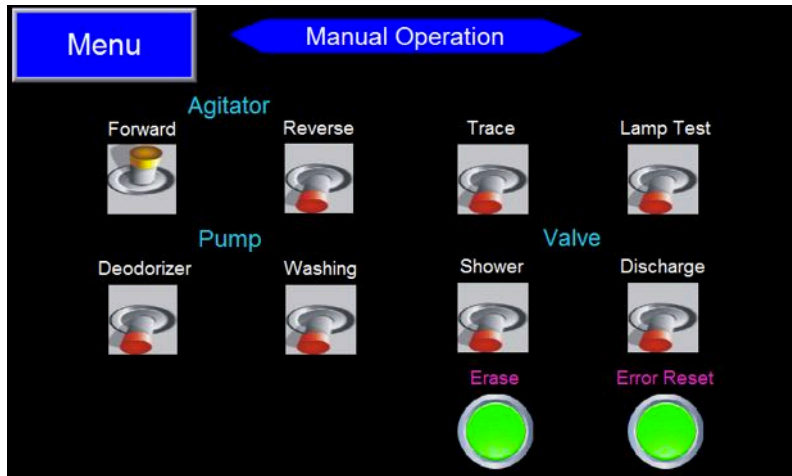
Additionally, information is displayed on the screen, such as the speed of the agitator (if running), the temperature inside of the shell of the machine, the current tare weight of the machine.

Finally, the middle of the screen shows the various functions, their cycle timings, and their current status. Green boxes mean that the function is currently ON. Black boxes mean be the function is currently OFF.

7.4 Manual Working

When the Eco-Safe Digester is in Manual Working mode, then the machine may be manually controlled by the operator using the touch screen toggle buttons. Press the **MANUAL WORKING** button to control the machine.

Figure 7-5 - Manual Working Screen



Note: Up and Yellow means ON. Down and Red means OFF.

The following buttons are available:

- **Agitator Fwd** - Starts and stops the agitator from rotating
- **Agitator Rev** - Starts and stops agitator in reverse rotation.
- **Trace** - Starts and stops the heating system.
- **Lamp Test** – Flashes all of the lights on the Tower Lamp (to test the lights)
- **Deodorizer** - Starts and stops deodorizer operation
- **Washing** - Starts and stops the washing nozzles located under the mixing chamber
- **Shower** - Starts and stops adding water to the mixing chamber
- **Discharge** - Starts and stops water discharging from the mixing chamber
- **Erase** – Erase stored data on the Digester Touchscreen display (such as daily and weekly weight totals)
- **Error Reset** – Resets errors

7.5 Time Settings

Pressing the **TIME SETTING** button on the Main Menu screen will take you to the Time Settings screen. You may be asked to enter a password before entering this section.

The Time Settings screen can be used to configure the operational intervals of various actions when the Eco-Safe Digester is running in Auto Working mode.

The settings may be displayed similar to the screen depicted in Figure 6.5 below.

Figure 7-6 - Time Settings Screen

Menu		Time Setting				Next	
descriptions	setting value						
Total operating	96	h/	0	m			
Agitator operating	14	m/	15	m			
Showering	60	s/	15	m			
Washing	60	s/	15	m			
Deodorizer	10	s/	15	m			
Discharging	60	s/	15	m			
Filter Clean	60	s/	15	h			

The first number represents the operating time of the function, and the second number represents the total cycle length. For example a washing parameter setting of 20 s / 5 m represents a 20 second washing cycle every 5 minutes.

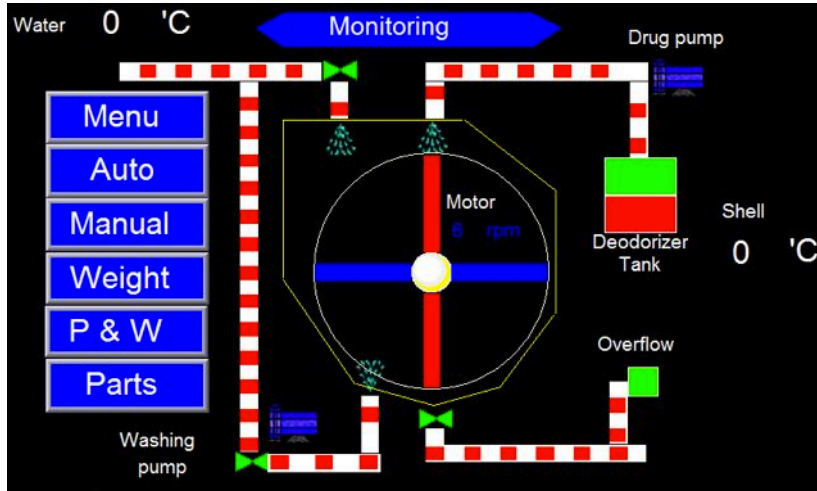
Press the **NEXT** button to change the settings.

BioHitech America does not recommend using these functions for machine operation unless the operator has extensive knowledge of each function. These functions are password protected.

7.6 Monitoring

Pressing the **Monitoring** button from the main menu will display a graphical rendition of the machine status as shown below in Figure 6.6.

Figure 7-7 - Monitoring Screen



Pressing the **AUTO** button will place the machine into Auto Working mode.

7.7 Weight Monitoring

Pressing the **Weight** button on the Total Operation screen allows you to see a daily and summarized listing of loads (feeds) processed by the digester as depicted below.

Figure 7-8 - Weight Monitoring Screen

MENU		< Data sample >							Check	SAVE
NO.	Week	Month	Day	Year	HH	MM	SS	Des	Lbs	°C
2	Mon	12	29	2014	13	59	4	PW	4	0
1	Mon	12	29	2014	13	58	57	PW	4	0

Reset	Yester Day	Last Week	Last Month	[Past historical data]	▲	0	▼
-------	------------	-----------	------------	--------------------------	---	---	---

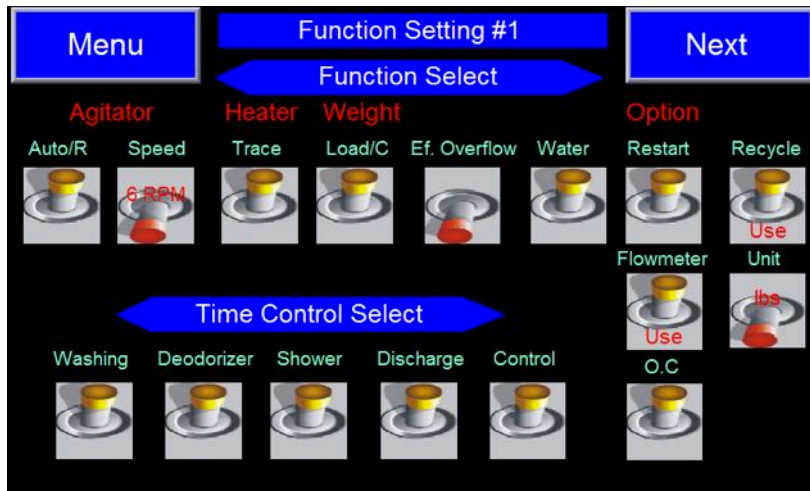
- The current weight is recorded when a user opens or closes the hatch. Date, door status (OP: open, CL: close), current total weight, and current temperature in Celsius are displayed on the screen.
- When the Yesterday Button is pressed, the user can see the total amount of weight that was consumed by the machine on the previous day. A daily record is calculated from 12:00 a.m. to 11:59 p.m.
- When the Last Week button is pressed, weekly amounts can be checked. A weekly record is based on the previous week starting from Sunday 12:00 a.m. to Saturday 11:59 p.m. regardless of what the current day is.
- When the Last Month button is pressed, monthly data from the 1st day to last day of the month is displayed. For example, if today is the 15th of September, last month's data will show August's total weight.
- Arrow buttons can be used to see more data lines.
- When pressed twice, displayed records are erased from the screen. Even if the data is deleted on the screen, real data is still in the memory to be used for weekly and monthly calculations.
- The Check button is used to check the monitoring system. A user can see the current weight even if the door status has not changed.

7.8 Function Settings

Pressing the **Function Settings** button on the Main Menu Screen will take you to the Function Settings Screen.

Note: That buttons in the Up/Yellow position indicate that the function is turned on and buttons in the Down/Red position indicate that the function is turned off.

Figure 7-9 - Function Settings Screen



Pressing the **MENU** button will take you back to the Main Menu Screen.

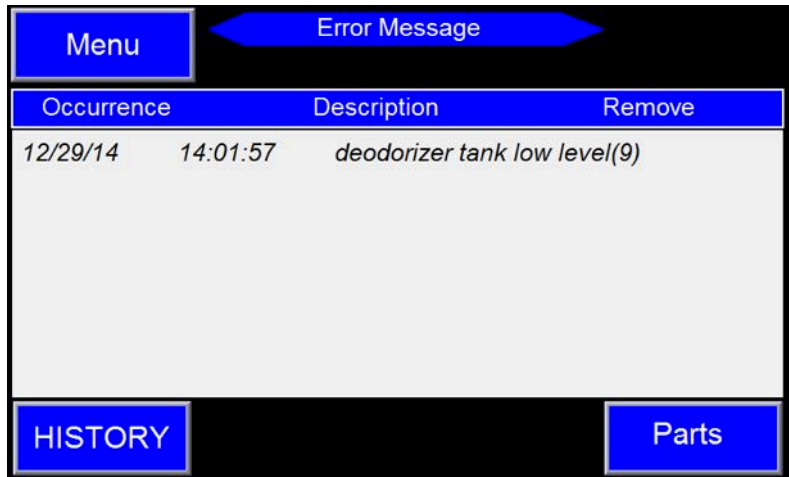
Pressing the **NEXT** button will take you to more settings.

BioHitech America does not recommend using these functions for machine operation unless the operator has extensive knowledge of each function. These functions are password protected. It is **NOT** recommended to change these settings without input from BioHitech America. Doing so may adversely affect the performance of your machine.

7.9 Alarm Message

If there is a beeping sound from the Eco-Safe Digester, you can easily check the machine status using by pressing the **Alarm Message** button from the Main Menu screen.

Figure 7-10 - Alarm Message Screen



If there is a message displayed on this screen, refer to procedure in Figure 6.10 that corresponds to the message displayed on screen

Figure 7-11 - Alarm Message Codes

Message Number	Description	Procedure
0	emergency open (0)	Emergency button pressed Release button
1, 2, 8	pump overload trip (1: washing, 2: deodorizer, 8: enzyme)	Pump overload Call customer service
3	agitator over current alert (3)	Agitator current overload Call customer service
4	inverter fault (4)	Motor inverter overload Call customer service
5, 6, 7	heater overload trip (5, 6, 7)	Heater overload Call customer service
9	water supply valve check (9)	Water supply valve error Call customer service
10	overflow sensor error (10)	Shell overflow alert Call customer service
11	deodorizer pump low level (11)	Deodorizer tank low level Fill deodorizer tank with deodorizer and water (Mix 1 cup of deodorizer with water at a time)
12	door sensor error (12)	The door is opened during auto working Close the door
13	chamber low level error (13)	Reservoir tank empty Check out water valve
14, 15	heating rising error (14, 15)	Heater error Call customer service

7.10 Networking

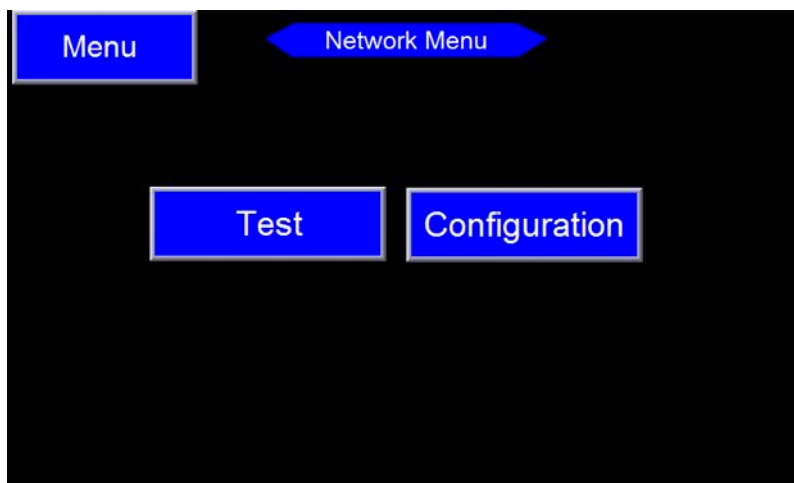
Push the **Networking** button on the “**Main Menu**” screen to configure and test your networking configuration settings for the Eco-Safe Digester.

Before using this feature, please make sure that all necessary networking configuration is in place and that the Eco-Safe Digester is plugged into an appropriate network jack or cellular data modem.

7.10.1 Networking Main Menu

Pressing the **Networking** button on the main menu will show the “**Networking Menu**” screen as shown below. Press the **Test** button to test your networking settings. Press the **Configuration** button to view or modify your networking settings.

Figure 7-12 - Networking Main Menu Screen

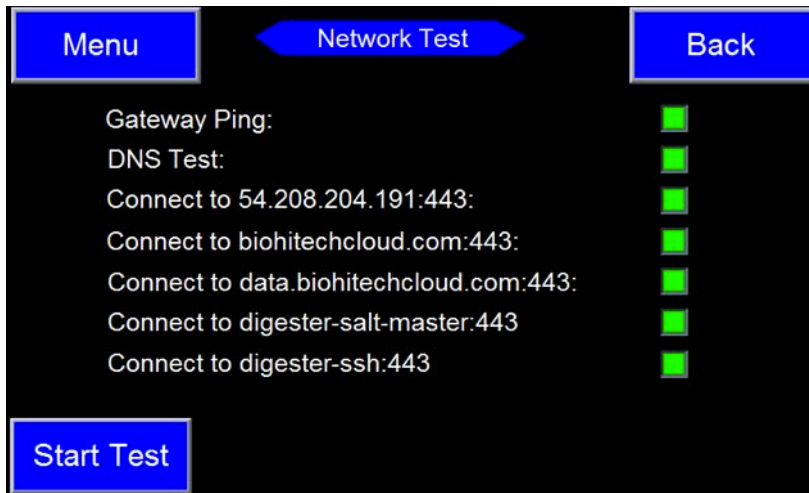


7.10.2 Network Test

Pressing the **Test** button from the “**Networking Menu**” screen will display the “**Networking Testing**” screen as shown below.

Press the **Start Test** button on the Network Test screen to start your networking test. Successful tests are indicated by a GREEN square. Unsuccessful tests are indicated by a RED square. In most cases, this test will fairly quickly (in about five seconds). In cases where there is a networking connectivity issue, the test may take several minutes.

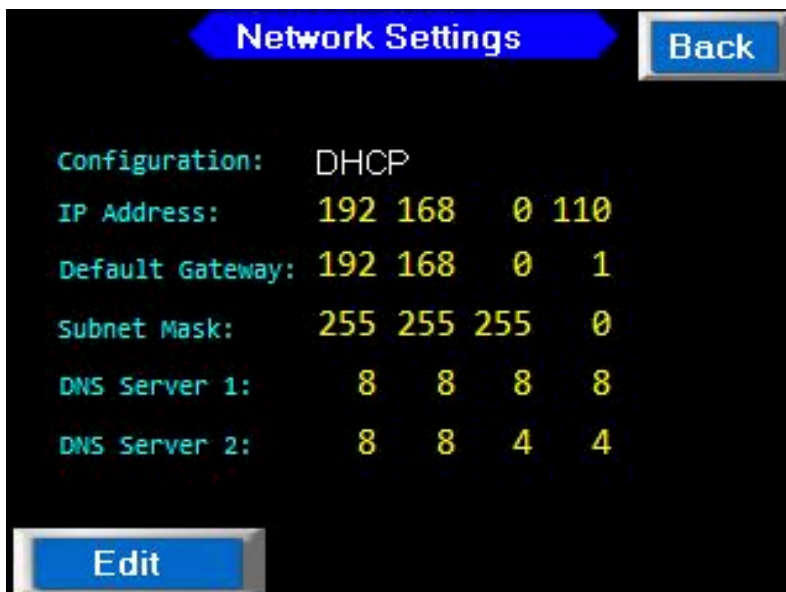
Figure 7-13 - Network Test Screen



7.10.3 Networking Settings and Configuration

When the **Configuration** button is pressed on the “**Network Menu**” screen, the current network settings will be displayed as depicted below. (Note: Your actual parameters may differ, depending on your network configuration).

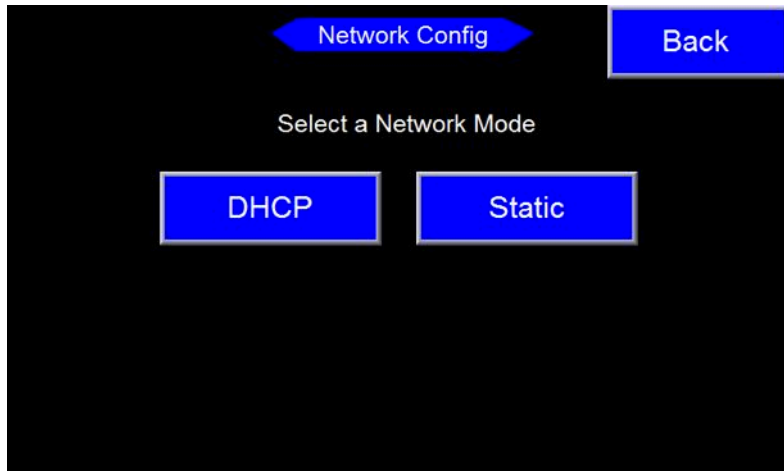
Figure 7-14 - Network Settings Screen (view)



Pressing the **Edit** button allows you to change the network configuration.

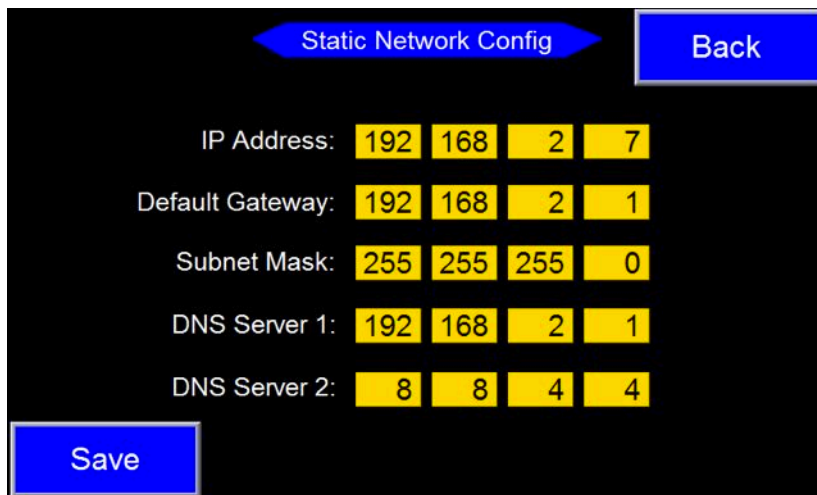
After pressing the **Edit** button, you will be asked whether or not you want to configure your digester for DHCP (Dynamic Host Configuration Protocol) or Static networking as depicted below.

Figure 7-15 - Network Type Configuration Screen



Pressing the **Static** button will prompt you to enter the detailed networking parameters as depicted below. To change a value, press one of the individual yellow squares. When done, press the **Save** button.

Figure 7-16- Static Network Configuration Settings



8 Routine Maintenance

8.1 Core Mechanical Components

Agitator - The agitator is used to aerate the food mixture inside the mixing chamber so that food digestion is effectively maintained. Aerating the food mixture also provides the microorganisms ample amounts of oxygen for optimum performance.

Trace Heater - The trace heater controls the temperature of the main chamber. In addition, it heats up the bottom of the machine to prevent oil coagulation.

Deodorizer Pump and Mist Nozzles - The deodorizer pump and mist nozzles are used to spray the deodorizer that is stored in the deodorizer tank. A deodorizing mist is activated each time the door is opened or closed. This system is designed to neutralize odor. In addition, it can be set to periodically spray during operation.

High Pressure Washing Pump - There are 12 high pressure washing pump nozzles within the drain discharge area that remove washing oil and fat residues to help prevent blockages in the perforated bottom of the mixing chamber.

Electric Solenoid Valves - These valves regulate the flow of water to various functions of the machine.

Load Cells - The load cells and load cell indicator work together in tandem to weigh the contents inside of the Digester. This weight is important - it can let the operator know when the machine is too full ("Tower Red"). The load cells can also be used to measure "loads" placed into the machine, for weight tracking purposes.

Refer to Appendix B for a replacement maintenance schedule for parts.

8.2 Lock-Out / Tag-Out (Shutdown) Procedure

Use the following procedure to shutdown your Eco-Safe Digester prior to maintenance or repair.

1. Using your Power Key, turn off the Digester. The Power Key is inserted into the Power Lock to the right of the touch screen display.

Figure 8-1 - Power Lock



2. Open the front panels of the Digester (left panel first, then right panel). These panels are magnetic and can be pulled forward and then upward.
3. Using a key, unlock the Digester's electrical panel door. Open this door.

Figure 8-2 - Electrical Panel Door Lock



4. On the far left of the electrical panel, turn the Digester's main breaker switch to the OFF position as shown below.

Figure 8-3 - Digester's main breaker switch (in the OFF position)



5. External to the Digester, place the High Voltage Disconnect to the OFF position.

Figure 8-4 - High Voltage Disconnect Box



6. The unit is now free of any electrical flow.
7. Following existing on-site tagging policies, tag the unit as shutdown and not available for use.

Note: If the unit will be turned off for more than 72 hours, it is recommended to clean out the media and existing waste from the Digester.

Additionally, it will be necessary to add new media and microorganisms when the machine is started back up again.

8.3 Replenishment

8.3.1 Microorganisms

Microorganisms should be replaced every 60 days. Simply place the bag of microorganisms into the Digester (the bag will biodegrade inside of the Digester).

Microorganisms can be ordered directly from BioHitech America. Visit us at www.biohitech.com and click the **CUSTOMER** button at the top of the web page.

Note: If you have an annual service contract, your service provider will perform these services.

Replenishing the Microorganisms is simple:

1. Open the food hatch door.
2. Toss in **2** water-soluble pouches containing the microorganisms.
3. Close the food hatch door.
4. The microorganisms will be thoroughly incorporated into the media after five minutes. Feedings can resume.

Figure 8-5 - Microorganisms



8.3.2 Media

Plastic or wood chip media should be replaced every 6 months.

Media can be ordered directly from BioHitech America. Visit us at www.biohitech.com and click the **CUSTOMER** button at the top of the web page.

Note: If you have an annual service contract, your service provider will perform these services.

To replace the media in the Eco-Safe Digester follow this procedure:

1. Using the Touch Screen display, place the Eco-Safe Digester into Manual Working Mode. Choose **Auto Working** from the Main Menu Screen, and then press the **Auto Stop** button at the bottom. The machine is now in Manual Working mode and the button at the bottom-left should say **Manual**.
2. Press the **MENU** button to go back to the Main Menu Screen, and then press the **Manual Working** button to go to the Manual Working Screen.
3. Open the food hatch. Using a shovel, dig the media and waste from the Digester. Dispose of the waste. Note: it is recommended to remove waste from the front of the Digester. After that waste has been removed, use the **FWD** agitation switch on the Manual Working Screen to move the remaining waste to the front. Repeat this procedure until all of the waste has been removed.
4. Using an external water source, hose out and clean the remainder of the internal Digester drum.
5. When complete, load the new media into the machine. Do not forget to add a new batch of microorganisms.

8.3.3 Deodorizer

The deodorizer tank can be refilled as needed. Examine the Deodorizer Level Gauge to determine if the more liquid deodorizer needs to be added to the Digester. The Deodorizer Level Gauge is located on the right side of the Front Panel of the Eco-Safe 8 and Eco-Safe 12 models. The Deodorizer Level Gauge is located on the Right Panel of the Eco-Safe 4 model.

Figure 8.6 – Deodorizer Level Gauge

To refill the deodorizer, simply lift the compartment door located on the bottom-right of the sloped face, unscrew the twist-off top, and begin pouring diluted liquid deodorizer into the tank until the tank is full. Note that the deodorizer is shipped as a concentrate, and needs to be diluted prior to refilling.

Figure 8.7 – Deodorizer Compartment

When deodorizer is refilled, use a 4:1 ratio – **4 parts water to 1 part liquid concentrate.**

Deodorizer can be ordered directly from BioHitech America. Visit us at www.biohitech.com and click the **CUSTOMER** button at the top of the web page.

9 Troubleshooting

The following Troubleshooting chart lists common problems and their solutions.

If further assistance is required, please contact BioHitech America or a qualified service technician for further assistance.

Figure 9-1 - Troubleshooting Matrix

Problem	Solution
No power	Check that unit is plugged in, breakers are on, and power key is turned on.
No water is entering unit	Check that main water supply is available. Check all three electronic water valves to ensure they are opening and closing properly.
Shell temperature is low	Check water supply; make sure hot water is available. Check heating system, make sure it is on, and set to proper temperature.
Traffic light is not working	Check the bulbs inside the traffic light; change if needed.
Traffic light is red and the unit won't run	Check the weight. If unit is overfed, remove excess weight and press the Error Reset button on the Auto Working screen.
Odors	Check mixing vessel for inorganic material; remove if present. Refill deodorizer tank with deodorizer. Periodically rinse down inside of unit and remove any debris build up.
Sluggish Digestion Rates	Check shell temperature, it should be between 30° - 39° Celsius. Make sure no harmful items were introduced into the mixing chamber (e.g., chemicals, boiling water, etc.). Make sure mixing chamber is not over filled. Over filling the machine reduces the amount of oxygen available for digestion process.
Unit has power but will not function	Check manual over ride button, if it has been pressed, reset it. Check temperature, it must be at least 15° Celsius to function. Check food hatch, make sure it is completely closed, and door sensors are free of debris. Check alarm message screen for details, if assistance is needed, contact a BHA representative.
Load cells not displaying the proper weight	Make sure nothing is resting or leaning on the unit.
Agitator is not spinning	Make sure bearings are tightly fastened, greased, and free of

smoothly and quietly	rust.
Noise coming from inside	Make sure all paddle arms are tightly fastened to shaft of mixing chamber. Check mixing chamber and remove any debris (e.g., cutlery, pits, etc.)
No data seen in BioHitech Cloud	Go the to Networking Menu on the Touch Screen and run a Networking Test.
Networking Test fails	Contact your IT Networking department to confirm the IT Networking settings. If using an RJ45 wall jack, contact your IT Networking department to confirm that the wall jack is appropriately set up. If using a cellular modem, please refer to the documentation of the modem to confirm network connectivity.

10 Appendix A - Best Practices

The following list outlines best practices when using the Eco-Safe Digester:

1. Observe the traffic light system. ONLY add waste when the light is green or yellow. IF LIGHT IS RED DO NOT ADD MORE WASTE.
2. Do not leave the hatch door open for extended periods of time.
3. Feed this machine frequently throughout the day.
4. A mixed diet containing produce, dairy, bakery items, fish, meat & poultry should be introduced throughout the day.
5. The smaller the food item size, the better, as digestion will occur at a faster rate. Chopping of larger items like watermelons, squash, etc. is recommended.
6. Avoid adding large quantities of baked goods at one time.
7. Avoid adding frozen items; allow them time to thaw. Food will digest best at room temperature.
8. Keep the machine clean and free from all debris particularly around the hatch seal area.
9. IF THE RED INDICATOR LIGHT ON THE FRONT OF THE UNIT IS ILLUMINATED CONTACT YOUR SUPERVISOR
10. Refer to the Acceptable materials decal on the unit for what should and should not be added to this digester.
11. DO NOT add any cleaning agents, chemicals or boiling water as they WILL kill the microorganisms.
12. DO NOT add any cardboard, china, glass, paper, plastic, rubber bands or silverware as these non-organic items WILL cause damage to the machine.
13. DO NOT add large meat bones (T-bones, ham and shank bones) as they WILL cause damage to the machine.
14. DO NOT add grease, fat or fryer oil. The machine is not intended for this.
15. DO NOT hose down the outside of the machine. The computer screen MUST NOT get wet.

11 Appendix B – Contacting BioHitech Customer Support

If you need assistance with your Eco-Safe Digester, please contact BioHitech America. BioHitech America can be reached 24 hours per day, 7 days per week.

For optimal customer support, please submit a support request online at biohitech.com (and click the CUSTOMER button at the top).

Optionally, BioHitech America may be reached by phone at: **888.876.9300**.

Customer Support can be used for:

- Replacement parts
- Ordering supplies
- Scheduling service
- Scheduling cleanings or habitat replacements
- Troubleshooting problems with the Eco-Safe Digester
- Getting assistance with BioHitech Cloud

Note: Depending on warranty and support plans purchased, additional charges may apply.

12 Appendix C – Maintenance Chart

Component	Part	Description	CYCLE TIME (Year)				
			1	3	5	10	10 +
MAIN MOTOR	SEW	1KW*4P,R67DT90S4/40/230(220/380V , 50/60HZ)				▲	
PUMP (JABSCO-FLOJET)	DEODORIZER	2100 SERIES D3735E7011 MAX7.6L/MIN6.9BAR 220V EPDM		▲			
	SHOWER D3732E5011	DUPLEX SERIES D3732E 5011 MAX6.1L/4.1BAR 220V EPDM		▲			
	ENZYME PR4	MAX 4L/HR 10mH 220V ,IPH ,50/60HZ		▲			
V/V(VALCON)	VALVE	VA15-1N				▲	
	HANDLER	AT24-3T			▲		
HEATER	FLANGE	220V*1.5KW (SUS304) USE WATER	2yr				
	THMP. S/W CASE	120°C			▲		
	THMP. S/W	120°C			▲		
NOZZLE (H.IKEUCHI)	USE WATER	1/4 MVVP 9010 PVDF POLYAMIDE			▲		
	DEODORIZER	1/4 MKBN 80125 TPACVM			▲		
	WASHING	1/4 MVVP 9005 PVDF			▲		
SENSOR	USE LEVEL	15A*4*43L		▲			
HOSE	FLUID PRESSURE	15A*1W*1500L			▲		
	250			▲			
	400			▲			
	1500			▲			
SILICON PACKING	USE DOOR	10*15(FOARNING)		▲			
GAS SPRING		KG15-200-I-13-466		▲			
CASTER		KC60F					▲
CHAIN	RS60x42T	Z42*DP254.85				▲	
	RS60x14T(TENSION)	Z14*DP 84.95				▲	
	RS60x14T(MOTOR)	Z14*DP84.95 I.D 40				▲	
	CHAIN RS60			▲			
	UNIT BEARING	UCF208(NSK)			▲		
BEARING	BALL BEARING	#6004(KBC)		▲			
HANDLE	USE DOOR	KA-781-400L, KH-117-1		▲			
COVER HINGE		KH-1037(R,L)					▲
COVER HANDLE		BY183-2CV					▲
DEODORIZER TANK	LEVEL INDICATORS	11351(ELESA)				▲	
	BREATHER CAPS(56281)	SFN 32A+F				▲	
OIL SEAL	D(TC)45-60-9			▲			
O-RING	G90			▲			
KEY	10x8x40(2R) SUS						▲
	10x8x50(1R)-SM45C						▲
PUNCHING CHAMBER				▲			

13 Appendix D – Network Connectivity

13.1 Network Connectivity Options

There are two connectivity options for the Eco-Safe Digester:

- An RJ45 Ethernet connection in close proximity to the Eco-Safe Digester
- A cellular modem purchased from BioHitech America

A dedicated hardline RJ45 Ethernet connection is the preferred network connection type due to the reliability of the hardline connection. However, in areas where providing access to an RJ45 Ethernet connection is not possible, a cellular modem may be purchased from BioHitech America.

Note: When using the cellular modem, be sure that adequate cellular coverage/connectivity is available at the location of the Eco-Safe Digester.

13.2 Network Configurations

If you are using the cellular modem purchased from BioHitech America, then no more network configuration is required. The Eco-Safe Digester will connect to the cellular modem via DHCP to the wireless cellular network.

For RJ45 Ethernet connections, additional network configuration may be necessary.

The Eco-Safe Digester can be used with both Dynamic/DHCP and Static IP configuration.

If static IP configuration is used, the Eco-Safe digester will require the following configuration parameters:

- **IP Address** – the IP address that you wish to assign to the Eco-Safe Digester
- **Net Mask** – The net mask of the network
- **Gateway IP Address** – the IP address of the gateway or router on your network
- **DNS Server(s)** – the IP address(es) of your DNS server(s). The Eco-Safe Digester can accept up to 2 IP addresses for DNS servers.

13.3 Firewall Considerations

The Eco-Safe Digester requires only outbound Internet Access on TCP port 443 (HTTPS, secure HTTP).

The Eco-Safe Digester communicates to the following public IP addresses:

- 54.221.243.115
- 54.209.122.209
- 54.209.181.132
- 54.208.204.191
- 54.85.105.167
- 54.85.142.150

Firewalls should be configured appropriately.

13.4 Bandwidth Utilization

Average bandwidth utilization is about 2MB to 3MB per day per Eco-Safe Digester.

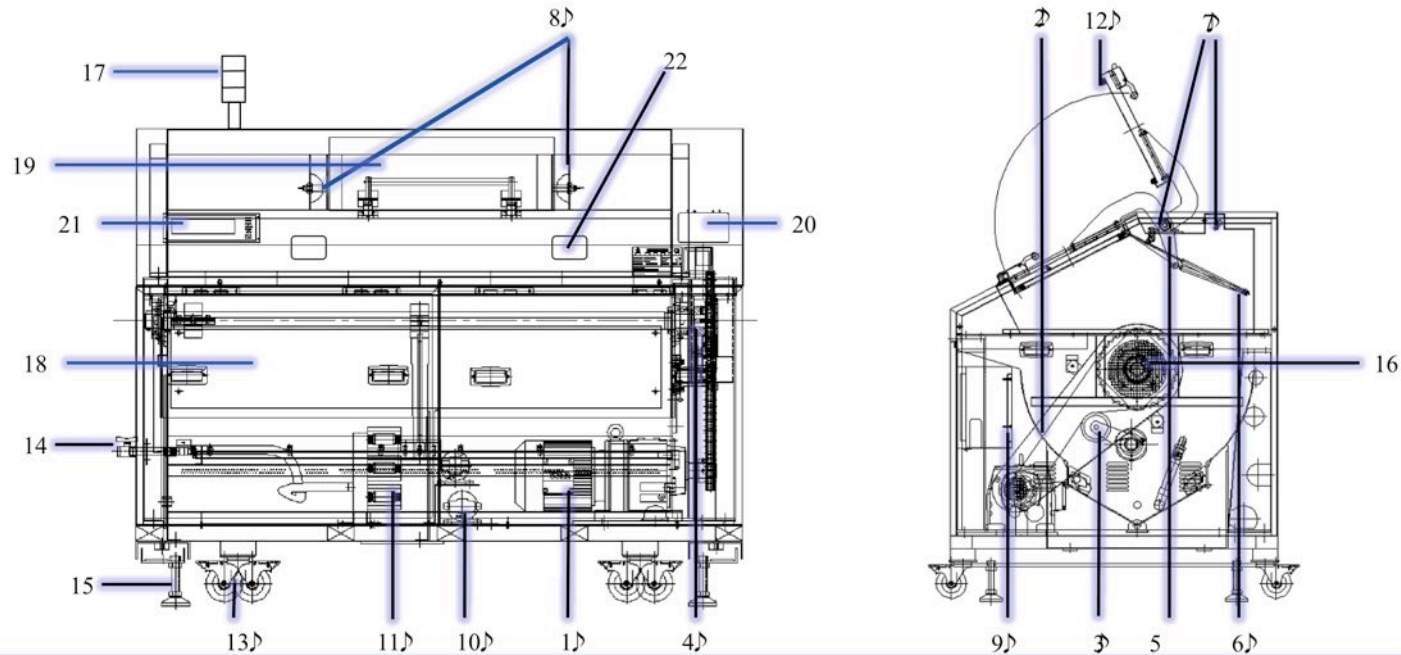
On average data is transmitted in batches, once every 10 minutes.

13.5 SSL Proxies

The Eco-Safe Digester does **not** support SSL/TLS proxy servers at this time.

14 Appendix E - Repair

14.1 Parts Cut Sheet



- | | | |
|--|---|------------------------------|
| 1. Motor | 9. Deodorizer Tank Level Indicators | 17. Traffic light assembly |
| 2. Chain | 10. Deodorizer & Washing Pumps | 18. Front door panels |
| 3. Chain tensioner | 11. Showering, Washing & Discharge Valves | 19. Food hatch door & handle |
| 4. Pillow Block Bearing (shaft assembly) | 12. Silicon Food Hatch Gasket | 20. Deodorizer reservoir |
| 5. Bearing (door mechanism) | 13. High Density Casters | 21. Touch Screen |
| 6. Gas Door Piston | 14. Water Inlet | 22. Paddle Arms |
| 7. Showering & Deodorizer Nozzles | 15. Fixed Legs | |

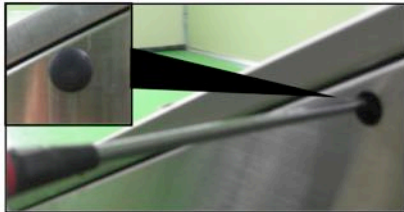
14.2 Motor Removal

Tools

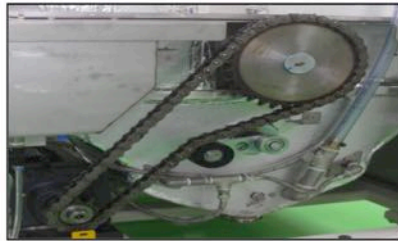
Allen Wrench (4mm, 5mm), Wrench/Socket(13mm,19mm), Screw driver, Rubber hammer

① Remove front & right side panels.

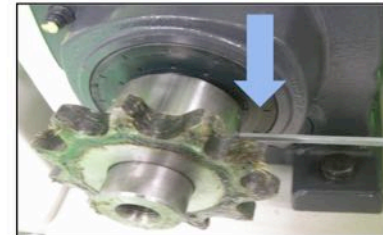
To remove the right side panel, remove 4 rubber caps, then unscrew the 4 Phillips screws.

**② Chain Removal.**

Follow removal instructions on page 4.

**③ Motor Sprocket Removal.**

Loosen 2 Allen set screws, then slide off sprocket.

**④ Bolt Removal.**

Remove 4 bolts securing the motor, Use a 19mm wrench/socket.

**⑤ Exchange Motor.**

Replace or Service the motor and reassemble.

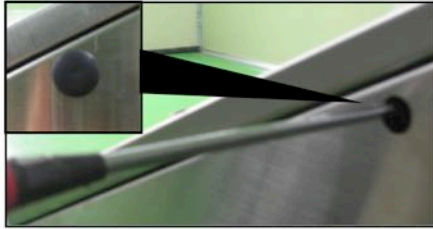
14.3 Chain Removal

Tools

Allen Wrench (4mm, 5mm), Phillips Screw Driver, Flat Head Screw Driver

① Remove Right Side Panel.

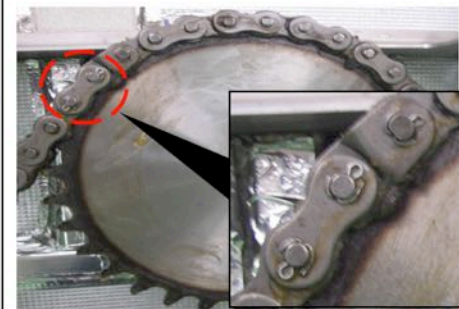
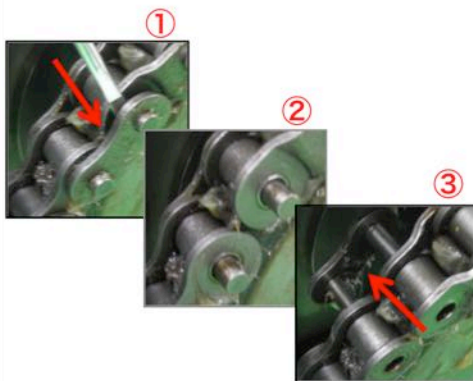
To remove the right side panel, remove 4 rubber caps, then unscrew the 4 Phillips screws.

**② Chain Guard Removal.**

Unscrew 3 Phillips or Allen screws.

**③ Remove connecting pins.**

Remove 2 cotter pins.

**4. Remove Master Link.****⑤ Remove & Replace Chain.**

Replace or repair the chain and then reassemble.

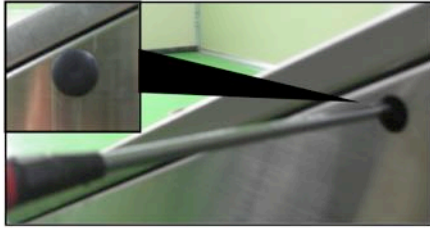
14.4 Servicing the Chain Tensioner

Tools

Allen Wrench (4mm, 5mm), Wrench or Socket (13mm), Phillips Screw Driver

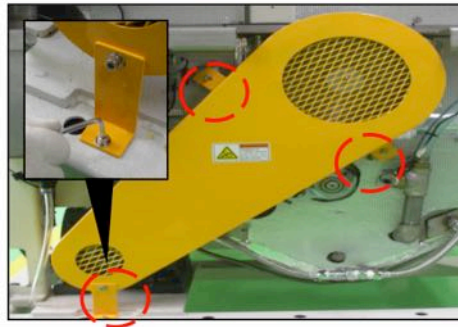
① Remove Right Side Panel

To remove the right side panel, remove 4 rubber caps, then unscrew the 4 Phillips screws.



② Remove Chain Guard

Unscrew 3 Phillips or Allen head screws.



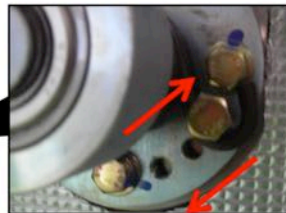
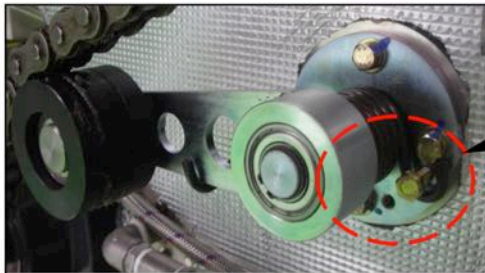
③ Chain Tensioner

Keeps the chain tightly fastened to the sprockets.



④ Changing the Tension Settings

Each tensioner has 3 unique settings, by relocating the set screw you can either add or subtract tension.



Set position
according to
chain condition

⑤ Reassembling

After adjustment is made, reassemble.

14.5 Bearing/Sprocket Removal and Replacement

Tools L Wrench-hex key (4mm, 5mm), Socket Wrench (13mm), Screw driver, Rubber hammer

① **Remove chain guard & chain.**
Remove chain guard and chain as depicted on page 4.




② **Sprocket Removal.** - Loosen 2 set screws on hub of sprocket, then utilizing **hydraulic puller**, pull the sprocket off the shaft.




Loosen 2 bolts

Removal Direction




③ **Bearing Removal.**
Loosen the 4 bolts and then slide bearing of shaft.




④ **Replace Bearing.**
Replace the bearing and reassemble.

! Grease Injection

Grease Fitting

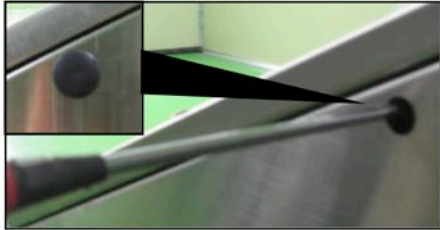


Periodically inject grease to maintain smooth operation.

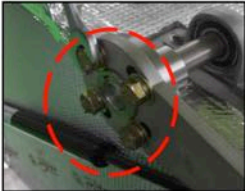
14.6 Food Hatch Door Bearing Assembly

Tools	Wrench (10mm, 13mm), Screw Driver
--------------	-----------------------------------


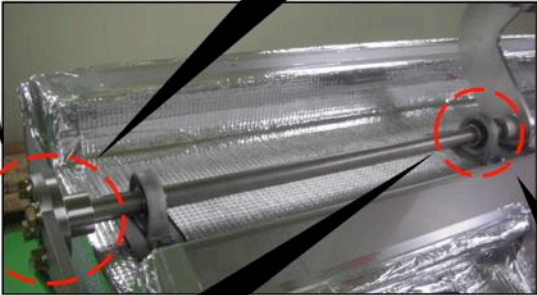
① Remove left & right side panels.
Remove 4 rubber caps, then loosen 4 Phillips head screws, remove panels.





② Remove 4 bolts




③ After removal of bolts, loosen 2 set screws and then remove the keyways

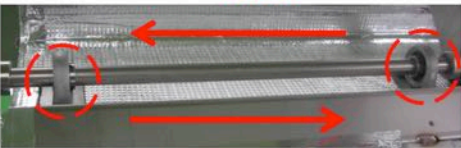
④ Remove 2 bolts



⑤ Remove bolts.




⑥ Replace Bearing Assembly .
Slide bearings off shaft, then replace.



14.7 Paddle Arm Removal and Replacement

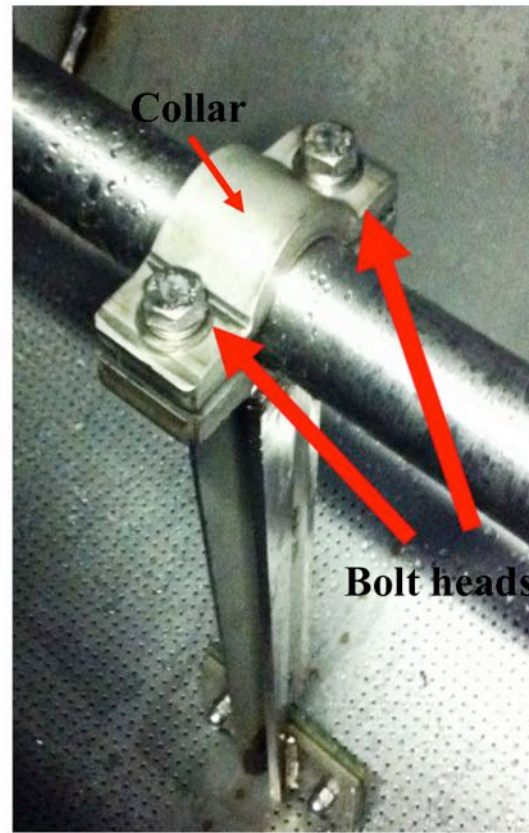
Tools

Socket Wrench (19mm)

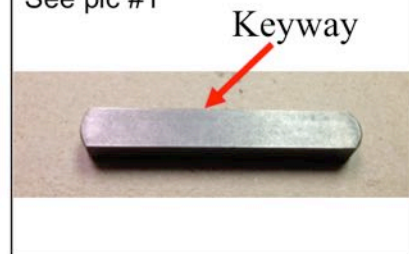
- ① Loosen the 19mm nuts on the back of the paddle arm collar.



- ① Remove the 19mm bolts securing the collar to the paddle arm.



Prior to reinstalling the new paddle arm make sure the keyway is present and not misshapen and the void in the shaft is not damaged. See pic #1



*****After inspection simply reinstall the paddle arm Using the 19mm nuts and bolts. DO NOT over tighten the bolts, this will cause the lock washers to fail which leads to the paddle arm loosening***.**

14.8 Agitator Shaft Removal and Replacement

Tools

Socket Wrench, Allen Wrenches, Phillips & Flat Head Screw Driver, Bearing Puller

1. Remove all paddle arms from agitator shaft.
2. Remove drive chain from motor and main sprocket.
3. Remove both the left and right bearing and main sprocket.
4. Remove both bearing flanges. (See pic.1 & 2)
5. When all items are removed, extract the shaft through opening in either side wall.
6. To reinstall the shaft, reinsert new shaft through either opening in the side walls.
7. To complete the installation, simply reverse the removal process.
8. Prior to reinserting the new shaft inspect the rubber seals inside the bearing flanges, make sure they are intact and not worn down. (See Pic.1)
9. Once installation is complete, test unit for quiet and smooth operation.

Bearing flange

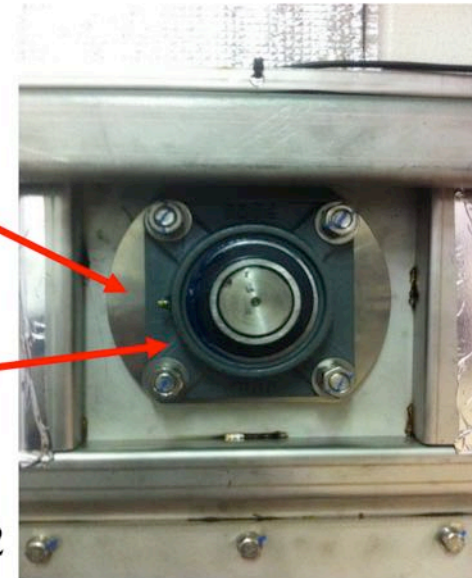
Seals (2pcs)



Pic #1

Bearing Flange

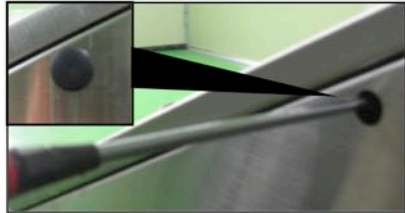


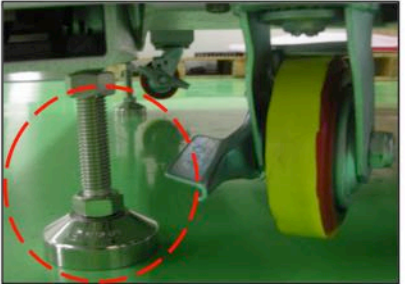

Bearing



Pic #2

14.9 Gas Piston Replacement and Caster Replacement

Tools	Wrench (13mm), Screw Driver, L wrench-hex key (6mm)
--------------	---


Gas Pistons	<p>① Remove Left & Right Side Panels. Remove 4 rubber caps, then loosen 4 Phillips head screws, remove panels.</p> 	<p>② Unscrew Gas springs . Threaded ends make for easy removal.</p> <div style="display: flex; justify-content: space-around;">   </div> <p style="text-align: center;">< Top portion > < Lower portion ></p>	<p>③ Replace Gas springs. Reattach gas springs by screwing them back into their original locations.</p>
Casters	<p>① Stabilize Digester. Secure machine from moving.</p> 	<p>② Disassemble Caster. Remove 4 bolts securing casters.</p> 	<p>③ Replace Casters. Exchange the Casters and reassemble.</p>

14.10 Replacing Deodorizer & Showering Nozzles

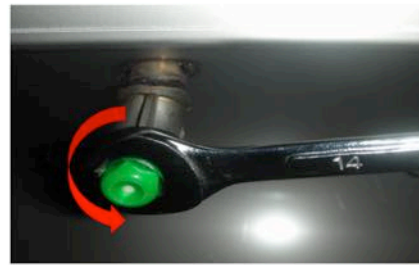
Tools	Wrench (14mm)
-------	---------------

Deodorizer


① Deodorizer Nozzles.
Open the food hatch door.



② Remove Deodorizer Nozzles.
Remove nozzles using wrench or Socket.



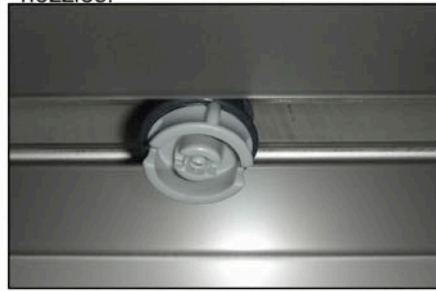
③ Replace / Clean Nozzles.
Nozzle function can be restored by clearing debris from filter, if not simply replace.

 **TIP**

Teflon tape can be used to eliminate leaks.

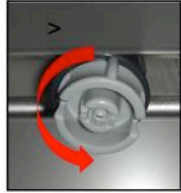
Showering

① Showering Nozzles.
Located behind the deodorizer nozzles.




② Remove Nozzles.
These are quick release nozzles, press inward and turn counter clockwise.

Before



After



③ Change / Clean Nozzles.
Clear debris from nozzles if present, If spray is still poor, replace as needed.


14.11 Replacement Food Hatch Sensors

Tools	Wrench (24mm)
-------	---------------


① **Remove protective covers.**



② **Loosen sensor .**
Loosen sensor using wrench.




③ **Disconnect quick connect clip.**



④ **Replace sensor if red l.e.d. is not illuminating on sensor when contact is made.**

Replace the sensor and reassemble.

 Warning
Gently remove the sensor, don't pull with excessive force.

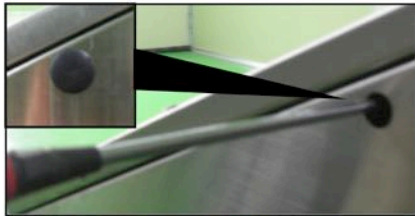
14.12 Replacing Liquid Level Sensors

Tools

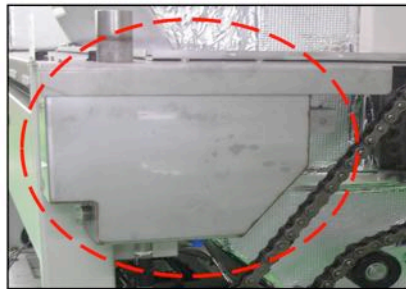
Wrench (27mm)

① Remove right side panel.

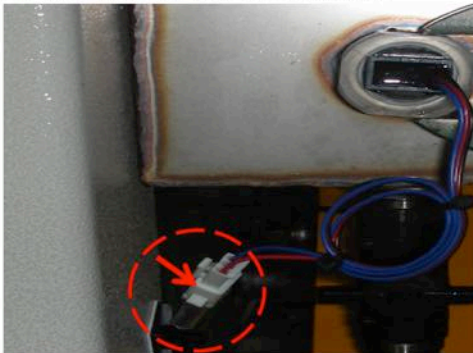
Remove 4 rubber caps, then Loosen 4 Phillips head screws, remove panels.

**② Tank for deodorizer.**

Use drain port on bottom of tank.

**③ Remove sensors.**

Remove upper and lower sensors using wrench.

**④ Disconnect quick connect plug.****⑤ Replace sensor**

Replace sensor and reconnect plug.

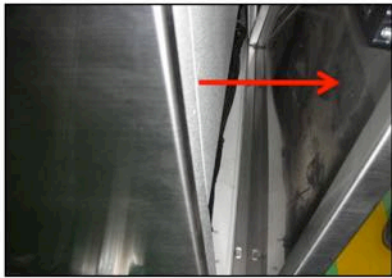
**TIP**

Teflon tape can be used to prevent leaks.

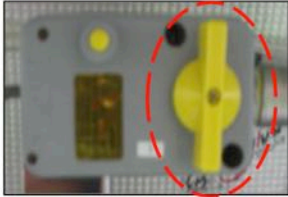
14.13 FloJet Pump Replacement

Tools	Wrench (19mm), Screw Driver
--------------	-----------------------------

① Remove left and right front panels.

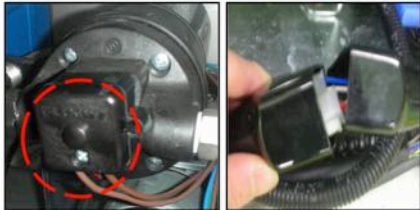


② Check electric actuator valves .
 Ensure washing valve is closed, if open water will flow from unit when hoses are disconnected from washing pump.




Locked Position


③ Disconnect electrical connections.
 Unscrew cap and disconnect leads, then separate quick connect plug.




④ Disconnect hoses.
 Remove input and output hoses.



⑤ Removing washing pump.
 Loosen 4 screws from base of pump, then remove pump.



 **Warning**

Some water may still reside in pump, when removing watch for leaking water.

Deodorizer Pump Removal

If necessary, repeat this process for the deodorizer pump. Please note there is NO deodorizer valve to close for this task.

14.14 Replacing Electric Actuator Valves

Tools

Phillips Screw Driver

- ① **Remove left and right front panels.**

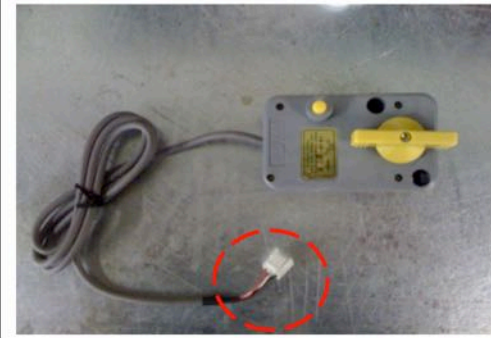


- ② **Remove electric actuators.**

Loosen 2 Phillips head screws, then remove electric actuator.



- ③ **Disconnect quick connect plug.**



- ④ **Reconnecting electric actuator.**

Reconnect quick connect plug or by stripping and splicing the wires, then refasten electric actuator by tightening 2 Phillips head screws.



- ⑤ **Completed replacement.**



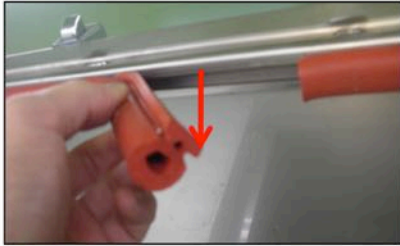
14.15 Replacing Silicon Food Hatch Gasket

Tools

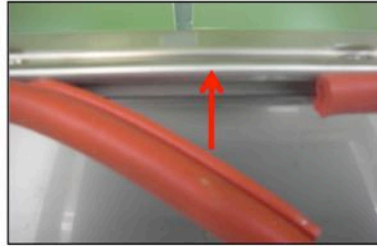
Screw Driver, Scissors

① Removing existing gasket.

Remove existing worn-out gasket by hand.

**② Reinsert new gasket.**

Push new gasket into the groove on the food hatch.

**③ Proper fitting.**

If necessary trim the gasket to ensure a tight seam.

**④ Final inspection.**

Check that there are no gaps, and that the door opens and closes with ease.

**Warning**

Making a proper seal will help ensure no heat is lost during the digestion process.

14.16 Light Bulb Replacement

Tools

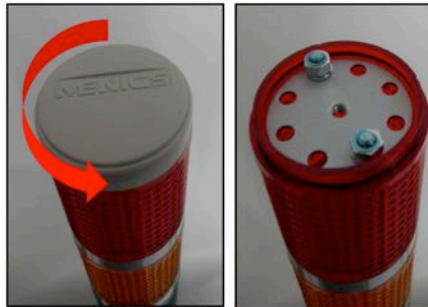
N/A

① Locate traffic light assembly.



② Removal of traffic light cap,

Unscrew cap counter clockwise.



③ Removal of traffic light lenses.

Remove lenses by sliding upwards.



④ Light bulb removal.

Gently depress bulb, then turn counter clockwise.



⑤ Light bulb replacement.

Reinsert bulb by gently depressing it into socket, then lock it in place by turning it clockwise.

