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Preface
1. Document Revision History

Table 1. Revision History

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.9.0</td>
<td>April 21, 2017</td>
<td>Initial beta release of new manual.</td>
</tr>
</tbody>
</table>
2. Intended Audience

This manual provides information on how to install, operate, maintain, and support the Revolution Series Digester high volume organic waste decomposition system.

This manual is intended for individual operations personnel who use and support the machine on a day-to-day basis.

Note

Please be sure to read all sections of this manual prior to installing, operating, or repairing the Digester.
3. Errors and Omissions

Please report any errors, omissions, or corrections to BioHiTech America.

BioHiTech America
80 Red Schoolhouse Road
Suite 101
Chestnut Ridge, NY10977
Phone: 888.876.9300
Email: support@biohitech.com

For more information about contacting BioHiTech America, see Appendix A, "Contacting BioHiTech Support."
Chapter 1. Introduction
1.1. Important Safety Notices

Moving parts can cause serious injury or death. Before attempting repairs, follow proper shutdown procedures and remove power before commencement of service.

Safety is of primary concern when installing, operating, or repairing the Revolution Series™ Digester. If you are unsure of how to proceed with a repair or adjustment, consult this manual, a qualified maintenance technician, or customer support. For more information about contacting BioHiTech America, see Appendix A, Contacting BioHiTech Support.

Only trained and experienced personnel should attempt installation, maintenance, or repair work on this equipment. Follow all safety procedures including lock-out/tag-out procedures carefully. Ensure that any loose fitting clothing or jewelry is tucked in or not worn to avoid being pulled into the machine.

Before attempting repairs, follow proper shutdown procedures and remove power before commencement of service. Never attempt to clean or service any area of the machine without removing power at the main disconnect. Read, follow, and obey these safety rules!
1.2. The Revolution Series Digester

The Revolution Series™ Digester is a high-volume organic waste disposal solution that breaks down food waste into wastewater than can be safely discharged into standard wastewater disposal systems. The Digester uses a highly refined formula of microorganisms to decompose carbon-based food waste in a short period of time, without odor or pests.

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

Table 1.1. Revolution Series Digester 24-Hour Capacity

<table>
<thead>
<tr>
<th>Model</th>
<th>Seed</th>
<th>Sprout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>500 lbs. (230 kg)</td>
<td>650 lbs. (300 kg)</td>
</tr>
</tbody>
</table>

Key Machine Components

The Revolution Series Digester is comprised of several key 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.

**Tower Lamp** - The tower lamp provides an easy-to-understand visual indicator for the status of the machine. For example, when the lamp is lit green, the machine has capacity available for more food. When the tower lamp is lit red, the machine is at full capacity.

**Load Cells** – A series of four high-resolution load cells continuously weigh the Digester and its contents. Weight tracking allows the machine to monitor its available capacity and is used for weight tracking purposes.

**Touchscreen** - A friendly, easy-to-use touchscreen allows operators to operate, configure, and monitor the Digester.

**High Pressure Washing Pump** - There are a series of 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.

**Integrated Computer System** - Each Digester is controlled by a state of the art computer that controls the configuration and operation of the Digester to create the ideal environment for microorganism performance.
**Internet Ready** - Finally, each Digester is Internet-capable, allowing the machine to send and receive data from BioHiTech Cloud to deliver real-time reporting and remote operational capabilities for end-users.
1.3. BioHiTech Cloud

BioHiTech Cloud™ is an advanced data and analytics solution that allows businesses to measure, track, and manage their food waste. BioHiTech Cloud provides web-based access to Digester utilization, performance, cost-savings, and environmental impact. BioHiTech Cloud provides a rich set of tools to allow you to roll-up, drill-down, and analyze the success of your organic food waste diversion efforts.


For more information about BioHiTech Cloud, please visit our web site at: biohitech.com/cloud
Chapter 2. Installation & Start-Up
2.1. Site Preparation

Please review the requirements outlined in this section before your Digester ships to your location.

**Note**

All work and costs associated with the site preparation phase are the responsibility of the *customer*.

**2.1.1. Location**

With guidance from the customer, BioHiTech recommends a location for the Digester that blends seamlessly into their current workflow and processes. Units are typically placed either at the food waste's point of generation, or its final point of collection.

Easy access to power, water, and drainage aids in determining a unit's location. Finding a location that has adequate and relatively easy access to power, water, and drainage helps minimize site preparation costs.

The optimal space for the machine has at least 3 feet (1 meter) of clearance on both sides of the machine. The additional room is necessary to help facilitate maintenance of the machine.

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

**Table 2.1. Machine Dimensions**

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimensions (W x H x D)</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>BioHiTech Seed™</td>
<td>30” x 48” x 30” 76 cm x 123 cm x 76 cm</td>
<td>535 lbs. 242 kg.</td>
</tr>
<tr>
<td>BioHiTech Sprout™</td>
<td>40” x 48” x 30” 102 cm x 123 cm x 76 cm</td>
<td>670 lbs. 303 kg.</td>
</tr>
</tbody>
</table>

**2.1.2. Power**
Power requirements may vary by country.

The following power requirements must be met in the United States:

- Access to a 15 Amp, AC 115V Power Outlet (NEMA 5-15).
- 15 Amp breaker required (minimum)
- Integrity of power source is vital; incoming power must supply consistent voltage

### 2.1.3. Water

Warm water is essential to the operation of the Revolution Series™ Digester.

The following water requirements must be met:

- A dedicated warm water source with a 3/4 inch male pipe fitting is also required within 5 feet (2 meters) of the left side of the machine.
- The water source should provide water at 90° to 110° F (32° to 43° C). Some customers may choose to use a mixing valve and a thermometer to ensure a proper temperature.

- The water source should be dedicated to machine operation only. Sharing the water source with other usage is not recommended.

### 2.1.4. Drainage

Proper drainage is essential for safe disposal of wastewater from the Digester into the sewer system.

The following drainage requirement must be met:

- Both Digester models (BioHiTech Seed™ and BioHiTech Sprout™) have an integrated pump which allows connection to any existing sanitary sewer line.
• The pump has over 10 feet (3 meters) of head. The pump should not pump greater than 10 feet (3 meters) of height.
• If processing large amounts of meat and dairy products, a grease interceptor should be considered.
2.2. Transportation

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

- **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.

- **Short Distance Moves** - In short distance moves, a forklift or pallet jack 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.

- **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.

<table>
<thead>
<tr>
<th>Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>
2.3. Installation

2.3.1. Installation Procedure

The following procedure is used to install the Revolution Series™ Digester:

1. Place the Digester in its desired location.
2. Adjust the legs to ensure that the machine is level.
3. Plug the Digester's power cable into the 115V AC power outlet.
5. Connect the Digester's drainage pipe into existing sewer hookup.
6. Connect the warm water source to the Digester.

2.3.2. Fixed Legs

Use the following procedure to move the Digester into place:

1. Use a pallet jack to raise unit off the floor to enable installation of the stationary legs. Install the legs and lower the Digester onto its legs.
2. Remove the pallet jack.
3. Check to make sure that the Digester is level. Do this by using a wrench to make sure that an equal amount of force is required to turn the screw under each leg. When complete, lock down the lock nut to make sure it does not move due to vibration. Use a level to confirm that the unit is level front-to-back and left-to-right.

Note

DO NOT use the rocking technique to check to see if the Digester is balanced.

2.3.3. Electrical Connection

Plug the Digester's power cable into a NEMA 5-15 115V AC power outlet.
2.3.4. Powering On

1. Remove the front panel of the Digester.

2. Open the electronics box located behind the front panel.

3. Inside of the electronics box, locate the circuit breaker on the far left. Move the blue lever into the UP position.

![Circuit Breaker]

2.3.5. Weight Test

The Digester's integrated real-time scale is important for the proper operation of the machine as well as for data collection and analytics to track machine utilization. Therefore, it is important to test the accuracy of the scale system before it is put into use. If the scale system is not accurate, re-calibration of the scale system will be necessary.

Locate the touchscreen on the front, left-hand side of the unit. After powering on the unit, the touchscreen display should be displaying the Dashboard.

The dashboard shows the current weight inside of the machine, similar to the screenshot below:

![Dashboard]

Using a known weight, test the accuracy of the Digester's weight scale by performing the following procedure:

1. Take note of the **Current Weight** parameter on the touchscreen display.

2. Place the known weight on top of the Digester. Typically something in the range of 20-50 lbs (10-25 kg.) will suffice.
3. Take note of the **Current Weight** parameter on the touchscreen display. The current weight should be reading an equivalent amount higher equal to the weight placed on top of the Digester.

4. Remove the weight from the Digester.

5. The Current Weight parameter on the touchscreen display should return back to its original value.

If the weight values are not consistent with the weight placed on top of the machine, use the touchscreen Display to re-calibrate the Digester's integrated load cell system.

For more information on how to perform a weight calibration, see Section 5.19, “Weight Configuration Screens”.

### 2.3.6. Drainage

The drainage hook-up can be found underneath the Digester.

![Drainage Connection](image)

Piping can be routed to the nearest sanitary sewer hookup. The pump inside of the Digester has 10 feet (3 meters) of head (height).

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>A gravity-based drainage system can be used, if the Digester's pump is first removed. Contact BioHiTech Support for more details.</td>
</tr>
</tbody>
</table>

### 2.3.7. Additional Hose Hookup

It is recommended to split the incoming water source to provide one line to feed the Digester and the other to give wash down (hose down) capability for washing down the inside of the Digester food chamber using a hose.

The photo below shows a typically incoming water feed:
2.3.8. Water Feed

Connect the incoming water supply to the Digester. Because the Digester has a male pipe fitting, the end of the water feed connection should be a $\frac{3}{4}$" female pipe fitting as shown below:

![Female Pipe Fitting]

On the Seed and Sprout models, this water connection can be found on the bottom side of the Digester.
2.4. Start Up

2.4.1. Start-Up Procedure

Once the Digester is installed, the following procedure can be used to start up the machine:

1. Power up the machine.
2. Test the components.
3. Ensure accurate weight configuration.
4. Add the consumables.

2.4.2. Powering On

To power on the Digester, refer to Section 2.3.4, “Powering On”.

2.4.3. Start-Up Test

Now that the unit is power on, a series of tests can be performed to ensure that all components are working properly:

1. Locate the touchscreen display to the right of the food door hatch. The touchscreen display should be displaying the Dashboard Screen as shown below:

   ![Dashboard Screen]

   **Mode:** Auto  
   **Current Weight:** 326 lbs  
   **Available Capacity:** 52 lbs  
   **Keep Feeding**

2. Touch the Main Menu button on the upper-right corner of the touchscreen to access the main menu.

3. You will be prompted to enter your Digester password. Please use the password provided to you by your installer. If you have forgotten your password, please contact Customer Support for assistance.
4. After entering your password, the Main Menu will be displayed as shown below.

Press the **Operation** button to get to the *Operation Screen*. Confirm that the unit is in Manual Mode. If the Digester is in Automatic Mode, then press the **Switch to Manual** button to place the machine into manual mode.

5. Once the machine is in manual mode, press the **Manual Controls** button so that the various machine components can be individually tested.
6. From the Manual Controls screen, test the individual components of the Digester, including Agitator, Shower, Wash, and Tower Lamp. Note that you can use the Back and Next buttons at the top of the screen to navigate through all of the controls and components for testing.

The following components should be tested:

- **Agitation** - Ensure that the agitator can properly run in forward and reverse. Note that the food hatch door must be closed for the agitator to spin. You will need to perform this test with the food hatch door closed and then re-open the door to see if the paddle arms have moved from their original position.

- **Shower** - Ensure that the shower function is operating. While the shower cycle is running, water should be spraying into the food chamber from the top. Note: Ensure sure that there are no water leaks around, underneath, or inside of the machine.

- **Washing** - Ensure that the washing function is operating. While the washing cycle is running, water should be spraying in the drain pan underneath the food chamber. Note: Ensure sure that there are no water leaks around, underneath, or inside of the machine.

- **Lamp Test** - Ensure that the tower lamp can cycle through both colors (green and red).

If any components fail to work properly, please contact Customer Support for assistance.

7. Use the Back button at the top of the screen to navigate back to the Operation Screen and press the Switch to Auto button to place the machine back into automatic mode.

**Congratulations!**

Component testing is now completed.
2.4.4. Weight Configuration

The following procedure can be used to verify and configure the various weight parameters of the Digester:

1. After the Digester has been powered on, the touchscreen should be displaying the Dashboard Screen as shown below.

   Touch the Main Menu button on the upper-right corner of the touchscreen to access the main menu.

2. You will be first prompted to enter your Digester password. For new machines, this password is 4150. If this password does not work, please contact Customer Support for assistance.

3. After entering your password, the Main Menu will be displayed as shown below.
From the Main Menu, touch the **Configuration Menu** button to show the **Configuration Menu** as shown below.

4. From the **Configuration Menu**, press the **Weights** button to go to the **Weight Configuration Menu**.

5. From the **Weight Configuration Menu**, press the **Unit of Measure** button to optionally change the Digester’s default unit of measure.
From the *Weight Configuration Menu*, press the **Operation Levels** button to review (and optionally change) the operation levels.

The operation levels, vary by model (size) of Digester:

**Table 2.2. Operation Levels Parameters**

<table>
<thead>
<tr>
<th>Model</th>
<th>Tower Red</th>
<th>Shutdown</th>
</tr>
</thead>
<tbody>
<tr>
<td>BioHiTech Seed™</td>
<td>200 lbs (90 kg)</td>
<td>250 lbs (115 kg)</td>
</tr>
<tr>
<td>BioHiTech Sprout™</td>
<td>250 lbs (115 kg)</td>
<td>300 lbs (135 kg)</td>
</tr>
</tbody>
</table>

Press the **Save** button to save your changes.

Optionally, from the *Configuration Menu*, press the **Re-Tare** button to appropriately tare the machine to zero (empty).

If the machine is empty, the **Tare to Zero** button can be used to set the machine’s tared weight to 0. Press the **Save** button to save your changes.
Otherwise, the machine's tare weight can be explicitly set in the *New Tare Weight* field. Press the **Save** button to save your changes.

### 2.4.5. Machine Consumables

Now that all utilities have been connected and all components tested, the Digester can be loaded with Bio-Media and microorganisms.

Perform these steps to complete the machine start-up process:

1. **Load Bio-Media** - Open the food hatch door and dump the contents of the Bio-Media bag into the food chamber. Close the food hatch door. Do *not* place the bag itself into the food chamber.

2. **Introduce Microorganisms** - Before introducing microorganisms into the machine, place a small amount of food waste (typically 30 lbs or 15 kg) into the machine as a primer.
   a. Close the food hatch door and allow the machine to run for ten minutes.
   b. After ten minutes, open the door and place the two water-soluble microorganism packets into the Digester.
   c. Close the food hatch door.
Digester start up is now completed. The machine is now ready for use.
Chapter 3. Usage
3.1. How the Digester Works

3.1.1. Aerobic Digestion

The Digester uses a process called *aerobic digestion* to naturally break down organic food waste into wastewater that can be safely discharged into the sanitary sewer system. Since the digested food waste is converted into wastewater, it is natural to use the municipal sewer systems to transport that water to treatment facilities where it will be recovered.

Aerobic digestion uses *oxygen* and *microorganisms* to naturally breakdown food waste. Microorganisms are microscopic, living, single-celled organisms called bacteria. Most microorganisms in the world are very beneficial, as they are the housekeepers of the planet; they remove toxins from water and soil and degrade organic matter from dead plants and animals. Without microorganisms, life would be impossible.

Microorganisms perform their work by producing enzymes. Microorganisms are really quite smart – they can detect the organics present in waste and produce only the enzymes that are needed to break down the organics. There are thousands of strains of microorganisms, each with unique characteristics that are important to the organic waste digestion process. BioHiTech partners with companies and industry experts to determine the optimal mix of microorganisms that will breakdown any specific waste profile that your facility may have. Regardless of waste profile, BioHiTech can provide the perfect mix of microorganisms for your application.

The Digester itself provides the optimal environment for the microorganisms to break down food waste. The agitator and paddle arms inside of the Digester constantly aerates the food waste inside of the machine, providing a constant source of oxygen for the microorganisms. No grinding or pre-processing of food is necessary for the Digester. The natural aerobic digestion process will breakdown the food.

Enzymes created by microorganisms to breakdown the food particles during the digestion process produce wastewater. As the digestion process continues, these digested food particles become smaller and smaller. When the food particles become small enough, they will pass through the Digester screen, exiting the Digester and into the sanitary sewer system. This wastewater has a greatly reduced organic component, making it safe for discharge. BioHiTech America works to manage and reduce key regulated discharge components, including: Biological Oxygen Demand, Chemical Oxygen Demand, total suspended solids, oils, grease, and pH. BioHiTech America works with you to make sure that all local regulatory requirements are met.

3.1.2. Digester Features

The Digester provides the optimal environment for the aerobic digestion process to naturally break down food waste. As such, there are many key features of the Digester:
• **Food Habitat** - The food habitat inside of the Digester provides an optimal environment of moisture and warmth for aerobic digestion to naturally breakdown food waste. The bottom of the food habitat consists of a screen with small holes. As food waste is broken down, the waste will pass down the holes where it can pass into the sewer system.

![Food Habitat](image1)

**Agitator and Paddle Arms** - The food habitat also consists of an array of paddle arms. When the food hatch door is closed, the agitator will make the paddle arms rotate inside of the habitat, constantly churning the food waste and introducing the food waste to oxygen. This constant introduction of oxygen is important to the aerobic digestion process.

![Paddle Arm](image2)

**Microorganisms** - The microorganisms do all of the work to break down the organic content in food waste. Microorganisms are introduced into the Digester through the use of water-soluble packets. They are occasionally replenished.
**Bio-Media** - A collection of specially engineered plastic media is introduced into the Digester at start-up. This media provides an enhanced habitat for the microorganisms. It does not degrade during the digestion process and remains in the habitat.

**Tower Lamp** - The tower lamp provides a quick visual indicator for the state and capacity of the machine.

**Touchscreen Display** - The touchscreen display, located to the right of the food door hatch, provides a detailed machine status. The touchscreen display can be used to operate, manage, and configure the machine.

**Showering Nozzles** - Inside the top of the food habitat are a series of shower nozzles that routinely spray warm water into the food habitat chamber. This showering feature helps keep the food waste warm and moist, which is an optimal environment for aerobic digestion.
**Usage**

**Washing Nozzles** - Underneath the screen of the food habitat are a series of high pressure water nozzles that spray water into the bottom screen of the Digester. These washing nozzles help keep the screen clean as well as the discharge tray in the bottom of the Digester.

### 3.1.3. Exterior Components

The following diagram highlights key components visible on the exterior of the Digester:

- **A** - Tower Lamp
- **B** - Food Hatch Door
- **C** - Food Hatch Door Handle
- **D** - Touchscreen Display
- **E** - Emergency Stop Button
- **F** - Side Panel (Removable)
- **G** - Front Panel (Removable)
- **H** - Pedestal Legs (Adjustable)
3.2. Feeding the Digester

3.2.1. Feed Procedure

The following procedure should be used to load organic waste into the Digester:

1. **Check Tower Lamp** - Check the tower lamp to ensure that it is okay to place waste into the Digester:
   - If the tower lamp is **green**, you may feed the machine.
   - If the tower lamp is **red**, the machine is full and should NOT be fed.

![Tower Lamp]

2. **Open Hatch Door** - Open the food hatch door by pulling upward on the food hatch door handle.

![Door Handle]

3. **Visual Inspection** - Perform a quick visual inspection to ensure that the machine is not too full, or contains foreign objects.

   **Caution**
   - If foreign objects are found inside of the 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 for assistance.

4. **Load Waste** - Load your food waste into the Digester. If placing a large volume of waste into the machine, please note the status of the tower lamp. If the light turns red, stop loading waste into the Digester.

5. **Close Hatch Door** - Close the food hatch door firmly.

Once the food hatch door is closed, the Digester will resume its agitation and water cycles to provide the optimal environment for the microorganisms.
3.2.2. Acceptable Food Waste

**Food Types** - The general rule of thumb is that the 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 Digester.

<table>
<thead>
<tr>
<th>OK to put in the Digester</th>
<th>DO NOT put in the Digester</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Meat (raw or cooked)</td>
<td>• Excessive baked items at one time</td>
</tr>
<tr>
<td>• Poultry (raw or cooked)</td>
<td>• Big bones</td>
</tr>
<tr>
<td>• Fish (raw or cooked)</td>
<td>• Clam or mussel shells</td>
</tr>
<tr>
<td>• Fruit</td>
<td>• Coconut Shells</td>
</tr>
<tr>
<td>• Vegetables</td>
<td>• Pineapple tops, cores, and skins</td>
</tr>
<tr>
<td>• Rice</td>
<td>• Corn husks and cobs</td>
</tr>
<tr>
<td>• Pasta</td>
<td>• Fruit seeds over ½ inch diameter (such as mango, avocado, peach)</td>
</tr>
<tr>
<td>• Bread and baked goods</td>
<td>• Raw dough and pure flour</td>
</tr>
<tr>
<td>• Grains</td>
<td>• Oil, grease, and fats</td>
</tr>
<tr>
<td>• Eggshells</td>
<td>• ANY type of non-organic waste (such as cardboard, plastic, silverware, shrink wrap, etc.)</td>
</tr>
<tr>
<td>• Dairy products</td>
<td></td>
</tr>
<tr>
<td>• Coffee grinds</td>
<td></td>
</tr>
</tbody>
</table>

**Food 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.

3.2.3. Feed Schedule

Ideally, the Digester should be fed every one to four hours. More often (hourly) feeding is preferred. Refer to the table below for optimal feeding sizes.

**Table 3.1. Feeding Schedule and Load Size**

<table>
<thead>
<tr>
<th>Model</th>
<th>Seed</th>
<th>Sprout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily Capacity</td>
<td>500 lbs (230 kg)</td>
<td>650 lbs (300 kg)</td>
</tr>
<tr>
<td>Feed Size (every 4 hours)</td>
<td>85 lbs (35 kg)</td>
<td>110 lbs (50 kg)</td>
</tr>
<tr>
<td>Feed Size (hourly)</td>
<td>20 lbs (9 kg)</td>
<td>25 lbs (12 kg)</td>
</tr>
</tbody>
</table>

The tower lamp on the Digester will indicate whether or not the machine can be fed. See the section below for more information about the tower lamp.
**Caution**

**Overloading** – The maximum feeding capacity should not exceed the agitator shaft. Do not overload the machine.

**Note**

**Overloading** – Oxygen is essential to microorganism performance; overloading the machine will cause the microorganisms to perform inefficiently. Feed scheduling is highly recommended.

### 3.2.4. The Tower Lamp

The Digester continuously monitors its weight. If the weight becomes too high, then the Digester is full and should no longer be fed organic waste. The tower lamp on the back of the machine informs the machine operator of the weight status of the machine.

Please check the status of the tower lamp before placing organic waste into the Digester.

<table>
<thead>
<tr>
<th>Light</th>
<th>Status</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid Green</td>
<td>The Digester has plenty of available capacity.</td>
<td>Feed the Digester.</td>
</tr>
<tr>
<td>Solid Red</td>
<td>The Digester is full.</td>
<td>Do NOT feed the Digester.</td>
</tr>
<tr>
<td>Flashing Red</td>
<td>There is a fault condition.</td>
<td>Use the touchscreen to view alerts. Correct the fault condition.</td>
</tr>
<tr>
<td>Colors Cycle</td>
<td>The Digester is in Manual Mode.</td>
<td>Keep the Digester in Manual Mode if that is the desired state, or change it back into Auto Mode.</td>
</tr>
<tr>
<td>No Lights</td>
<td>There may be a wiring issue or a burned out light bulb.</td>
<td>Check wiring or replace bulb.</td>
</tr>
</tbody>
</table>

### 3.2.5. Best Practices

- Observe the tower lamp when feeding the Digester. Only add waste when the light is green. **If the tower lamp is red, do NOT add more waste.**
- Do not leave the hatch door open for extended periods of time.
- Feed the Digester frequently throughout the day.
- A mixed diet containing produce, dairy, bakery items, fish, meat, and poultry should be introduced throughout the day.
- The smaller the food item size, the better, as digestion will occur at a faster rate. Chopping of larger items such as watermelons and squash is recommended.
- Avoid adding large quantities of baked goods at one time.
- Avoid adding frozen items; allow them time to thaw. Food will digest best at room temperature.
• Keep the machine clean and free from all debris, particularly around the hatch seal area.

• Make sure that the inside of the machine is hosed off daily. Remove non-organic debris from the inside of the Digester.

• Refer to the Acceptable Materials decal on the machine for what should and should not be added to this Digester.

• **DO NOT** add any cleaning agents, chemicals, or boiling water as they will kill the microorganisms.

• **DO NOT** add any cardboard, china, glass, paper, plastic, rubber bands, or silverware as these non-organic items will cause damage to the machine.

• **DO NOT** add large meat bones (T-bones, ham, and shank bones) as they will cause damage to the machine.

• **DO NOT** add grease, fat, or fryer oil. The Digester is not intended for this purpose.

• **DO NOT** hose down the outside of the machine. The touchscreen display must not get wet.
3.3. Emergency Stop

For your safety, the Digester is equipped with an emergency stop button to instantly shutdown the machine in case of an emergency.

Examples of such an emergency include:

1. Smoke or fire near the machine or from the machine
2. Overflow and spillage of water or food waste
3. Something placed inside of the Digester habitat which may cause damage to the machine

The emergency stop button is located to the right of the food door hatch and is bright orange in color.

To engage the emergency stop button, simply press down on the button. The Digester is equipped with safety relays to ensure that all aspects of the machine should come to an instant stop.

**Note**

When the emergency stop button is engaged (pressed down), an orange led light should be illuminated on the button.

To disengage the emergency stop button, simply twist the button clockwise. The button should pop-up, and the orange led light should no longer be illuminated.

**Warning**

Users of the machine should exercise caution. If the emergency stop button cannot be safely reached or pressed, the user should exercise caution and evacuate to safety.
3.4. Basic Touchscreen Operation

The touchscreen display on the Digester can be used to control, manage, and troubleshoot issues with the machine. While most users of the Digester will never need to use the touchscreen display, understanding its purpose and features are key to successful operation and management of the machine.

The touchscreen is located on the left side of the machine, to the left of the food door hatch:

![Touchscreen Display](image)

3.4.1. Dashboard

The *Dashboard Screen* is typically displayed when the machine is running. The screenshot below shows an example of the Dashboard.

![Dashboard](image)

The *Dashboard Screen* will show useful information such as:

- **Operating Mode** - the machine's current mode of operation (*Auto* or *Manual*).
- **Current Weight** - the amount of food waste inside of the food drum.
- **Available Capacity** - how much food waste can go inside of the machine until it is considered full
- **Instructional Messages** - an instructional message will be displayed at the bottom of the screen
Press the **Main Menu** button at the top of the screen to access more touchscreen functionality, including machine operation, configuration, and information on alerts.

If something requires your immediate attention, the *Dashboard Screen* will normally display informational text at the bottom of the screen, as shown below.

![Dashboard - With Alerts](image)

For more information about the *Dashboard Screen*, visit Section 5.7, “Dashboard Screen”.

### 3.4.2. Touchscreen Password

In order to access any touchscreen functionality beyond what is readily available on the *Dashboard Screen*, you will be asked to enter your touchscreen password as shown below.

![Password Entry](image)

Your password should have been provided to you during machine installation. You can change your password at any change. For more information on changing your password, see Section 5.15, “Password Configuration Screen”.

### 3.4.3. Operating Modes

The Digester has two modes of operation:

- **Manual Mode** - When the Digester is running in *Manual* mode, the machine will not run any of its pre-configured cycles (for agitation, showering, and washing). However, the machine may be manually operated using the touchscreen.
Manual mode is typically used for servicing, repair, and troubleshooting.

- **Auto Mode** - When the Digester is running in Auto mode, the machine will automatically agitate and dispense water upon pre-configured cycles.

  Note that a machine can be in two different states while running in Auto mode, including:

  1. Auto Running - the machine is normally running its cycles.
  2. Auto Stop - the machine is temporarily stopped from its normal running cycles due to an alert or fault condition.

To change operation modes, go to the **Operation Screen** to toggle between Auto and Manual mode. See Section 5.14, “Operation Screens” for more information.

![Operation Screen - In Auto Mode](image)

When a machine is in Auto mode, you can use the **System Status Screen** to see which cycles are running at any given time. See Section 5.16, “System Status Screen” for more information.

![System Status Screen](image)

When a machine is in Manual mode, you can use the **Operation Screen** to manually control the machine. See Section 5.14, “Operation Screens” for more information.
3.4.4. Alerts

Periodically, it will be necessary to deal with various types of alerts that occur with the Digester.

Some alerts will be informational only. The machine will be running normally, but something may require your attention. The screen shot below illustrates an alert where the operation of the machine is not impacted:

Some alerts will stop the operation of the machine. These alerts should be dealt with immediately. The screenshot below illustrates an alert where the machine has stopped:
In both cases, simply touch the Alert button to view more information about the alerts and clear the alerts. For more information on the Alerts Screen, see Section 5.2, “Alerts Screen”. For more information on alerts in general, see Section 4.4, “Touchscreen Alerts”.

3.4.5. Configuration

All configuration of the Digester can be performed from the touchscreen by selecting the Configuration button from the Main Menu.

Configuration Menu

The configuration menu can be used to calibrate the weight scale system, configure tower lamp levels, and customize agitations and water cycles. For more information on configuration, see Section 5.5, “Configuration Menu Screen”.
Chapter 4. Maintenance and Troubleshooting
4.1. Routine Maintenance

Routine maintenance is key to keep a Digester performing optimally.

4.1.1. Daily Cleaning and Inspection

The following activities should be performed on a daily basis:

- Clean the inside of the machine. Using a hose, clean the paddle arms, shaft, and back wall of the inside food drum.

  ![Using a hose to clean the interior](image)

- Clean the outside of the machine. Using a wet towel, wipe down and clean the external face of the machine. Be cautious of using any soap or cleaning solution that might get inside the food drum.

  ![Using a hose to clean the interior](image)

  **Caution**
  Never use a hose to clean the exterior of the machine. The hose may harm the touchscreen electronics.

- Inspect the interior food drum for inorganic materials or prohibited food items. Using a gloved hand and utensil, remove the materials from the food drum. It is important to remove these items as prohibited items may cause damage to the machine.
Using a hose to clean the interior

Caution
Use caution when handling inorganic materials retrieved from the food drum.

- Ensure that the paddle arms are fasten to the shaft. If the paddle arms are flapping or rattling, contact BioHiTech Support.
- Ensure that the incoming water temperature remains between 105° and 120° F (40° and 50° C).

4.1.2. Microorganism Replenishment

Microorganisms should be replenished every two months.

Replenishing the Microorganisms is simple:

1. Open the Digester hatch door.
2. Toss in 2 water-soluble pouches containing the microorganisms.
3. Close the hatch door.

The microorganisms will be thoroughly incorporated into the media after five minutes. Feedings can resume.

Microorganisms can be ordered directly from BioHiTech. Visit us at biohitech.com and click the CUSTOMER button at the top of the web page.
4.1.3. Bio-Media Replenishment

Plastic Bio-Media should be replaced every 12 months.

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

To replace the Bio-Media in the Digester, use the following procedure:

1. Using the touchscreen display, place the Digester into Manual Mode.
2. Open the Digester food hatch.
3. Using an external water source, hose out and clean the remainder of the internal Digester. Using a shovel, dig out the existing Bio-Media and waste from the Digester. Dispose of the old Bio-Media and waste.
   BioHiTech recommends removing waste from the front of the Digester. While the unit is in Manual Mode, the Agitator can be moved, helping to move the paddle arms out of the way to make removal of waste easier.
4. Using an external water source, hose out and clean the remainder of the internal Digester drum.
5. When compete, load the new media into the machine.
   Do not forget to add a new batch of microorganisms!

Bio-Media can be ordered directly from BioHiTech. Visit us at biohitech.com and click the CUSTOMER button at the top of the web page.

4.1.4. Lock-Out / Tag-Out (Shutdown) Procedure

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

1. Unlock and remove the front panels of the Digester. To remove the panels, pull forward and upward.
2. Unlock and open the Digester's electrical panel door (note that there are two locks). Open this door.
3. Inside of the electrical panel, turn off the circuit breaker (switch in the *DOWN* position).

4. Unplug the Digester from its power source.

   The unit is now free of any electrical flow.

5. 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 Bio-Media and existing food waste from the Digester.

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

The following maintenance schedule is recommended for the Digester.

**Table 4.1. Recommended Maintenance Schedule**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Every two months</td>
<td>Add new microorganisms</td>
</tr>
<tr>
<td>Every six months</td>
<td>Full machine inspection</td>
</tr>
<tr>
<td>Every twelve months</td>
<td>Habitat clean out; new Bio-Media and microorganisms</td>
</tr>
</tbody>
</table>
4.3. Troubleshooting

Bad Odors

Bad odors are a symptom of the aerobic digestion process not occurring properly.

Follow these steps to troubleshoot an odor issue:

1. Make sure that the machine is running in Auto mode.
2. Make sure that ALL paddle arms are turning inside of the food habitat.

   **Note**
   The paddle arms will not turn while the food hatch door is opened, so it will be necessary to periodically open and close the food hatch door to see if the paddle arms are changing position.

3. Inspect the food habitat and remove any inorganic material from inside of the machine (such as towels, napkins, cloths, and plastic wrap).

   **Note**
   Be sure to inspect the paddle arms and the agitator shaft. It is common for inorganic materials such as towels, napkins, cloths, and plastic wrap to get wrapped around the paddles arms or the shaft.

4. Remove any food debris on the walls of the inside of the food habitat using a hose. Make sure to hose down any food debris sitting on the top of the side and back walls.

5. Check the incoming water temperature. The water temperature should be between 105°F - 120°F (40°C - 50°C).

6. Ensure that the shell temperature (food habitat temperature) is above 100°F (37°C).

7. Inspect the drain for any types of blockages or back ups.

8. If processing acidic foods, add baking soda (one box).

9. Add one pack of microorganisms.

10. Consider a complete clean out of the machine.

Slow Digestion

Slow digestion may result in the machine constantly being full with low throughput.

Follow these steps to troubleshoot an issue with slow or poor digestion:

1. Make sure that the machine is running in Auto mode.

2. Make sure that there is no forbidden food inside of the Digester, including: husks, shells, big bones, raw rices, inorganic material, etc..

3. Check the incoming water temperature. The water temperature should be between 105°F - 120°F (40°C - 50°C).
4. Ensure that the shell temperature (food habitat temperature) is above 100°F (37°C).

5. Make sure that **ALL** paddle arms are turning inside of the food habitat.

**Note**
The paddle arms will not turn while the food hatch door is opened, so it will be necessary to periodically open and close the food hatch door to see if the paddle arms are changing position.

6. Ensure that microorganisms have been replenished within the last two months.

7. Ensure that food mixture is not too dry or too wet (the food mixture should not be soupy).

8. Ensure that a healthy mixture of food types. Mix proteins, carbohydrates, and small amounts of fats when feeding.

9. Check the pH of the effluent. If below 5, consider adding baking soda.

**Other Issues**
The following troubleshooting chart lists common problems and their solutions.

If an alert appears on your touchscreen display, refer to Section 4.4, “Touchscreen Alerts” for more information.

If further assistance is required, please contact BioHiTech America or a qualified service technician for further assistance. For more information about contacting BioHiTech America, see Appendix A, *Contacting BioHiTech Support*.

**Table 4.2. Troubleshooting Guide**

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>No power</td>
<td>Check that unit is plugged in, breakers are on, and power key is turned on.</td>
</tr>
<tr>
<td>No water is entering Digester</td>
<td>Check that main water supply is available.</td>
</tr>
<tr>
<td></td>
<td>Check both electronic water valves to ensure they are opening and closing properly.</td>
</tr>
<tr>
<td>Shell temperature is low</td>
<td>Check water supply; make sure hot water is available.</td>
</tr>
<tr>
<td></td>
<td>Check heating system, make sure it is on, and set to proper temperature.</td>
</tr>
<tr>
<td>Tower lamp is not working</td>
<td>Check the LEDs inside the tower lamp; change if needed.</td>
</tr>
<tr>
<td>Tower lamp is red and the unit won't run</td>
<td>Check the weight. If unit is overfed, remove excess weight and press the Error Reset button on the Auto Working screen.</td>
</tr>
<tr>
<td>Unit has power but will not function</td>
<td>Check manual over ride button, if it has been pressed, reset it. Check temperature, it must be at least 15° Celsius to function.</td>
</tr>
<tr>
<td></td>
<td>Check food hatch and make sure it is completely closed.</td>
</tr>
<tr>
<td></td>
<td>Check alarm message screen for details, if assistance is needed, contact a BioHiTech Support representative.</td>
</tr>
<tr>
<td>Load cells not displaying the proper weight</td>
<td>Make sure nothing is resting or leaning on the Digester.</td>
</tr>
<tr>
<td></td>
<td>Make sure that the unit is level and balanced, with all four legs firmly on the floor.</td>
</tr>
<tr>
<td></td>
<td>Ensure that there is no water in the electronics cabinet.</td>
</tr>
<tr>
<td></td>
<td>Re-calibrate the load cells weighing system using the touchscreen display.</td>
</tr>
<tr>
<td>Agitator is not spinning smoothly and quietly</td>
<td>Make sure bearings are tightly fastened, greased, and free of rust.</td>
</tr>
<tr>
<td>Noise coming from inside</td>
<td>Make sure all paddle arms are tightly fastened to shaft of mixing chamber.</td>
</tr>
<tr>
<td></td>
<td>Check mixing chamber and remove any debris (e.g., cutlery, pits, etc.)</td>
</tr>
<tr>
<td>No data seen in BioHiTech Cloud</td>
<td>Go the to Networking Menu on the touchscreen and run a networking test.</td>
</tr>
<tr>
<td>Networking Test fails</td>
<td>Contact your IT Networking department to confirm the IT Networking settings.</td>
</tr>
<tr>
<td>Problem</td>
<td>Solution</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>If using an RJ45 wall jack, contact your IT Networking department to</td>
<td>confirm that the wall jack is appropriately set up.</td>
</tr>
<tr>
<td>confirm network connectivity.</td>
<td>If using a cellular modem, please refer to the documentation of the modem to confirm network connectivity.</td>
</tr>
</tbody>
</table>
### 4.4. Touchscreen Alerts

The Digester may occasionally generate an alert if it detects an issue that requires attention. Alerts are displayed on the Touchscreen Display on the Dashboard Screen and the Alerts Screen. Use the table below to assist in resolving the alert.

#### Table 4.3. Digester Touchscreen Alerts

<table>
<thead>
<tr>
<th>Alert</th>
<th>Type</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door Sensor Error</td>
<td>Error</td>
<td>Inspect door sensors located on the inside lip of the hatch. Ensure that sensors are clean and free of debris. Open and close hatch door firmly. Contact BioHiTech Support if problem persists.</td>
</tr>
<tr>
<td>Drive Communication Error</td>
<td>Error</td>
<td>Contact BioHiTech Support. Machine should not be used.</td>
</tr>
<tr>
<td>Drive Fault</td>
<td>Error</td>
<td>Examine Drive Fault Code.</td>
</tr>
</tbody>
</table>

#### Table 4.4. Digester Fault Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Fault Type</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Power Loss</td>
<td>Monitor incoming power to motor for low voltage or line disruption. Check fuses. Reduce load. Contact BioHiTech for assistance.</td>
</tr>
<tr>
<td>5</td>
<td>Over Voltage</td>
<td>Monitor incoming power to motor. Correct voltage. Contact BioHiTech for assistance.</td>
</tr>
<tr>
<td>7</td>
<td>Motor Overload</td>
<td>Ensure that there is not too much waste inside of the Digester. Check inside of Digester and ensure that nothing is obstructing the paddle arms. Clear alerts and retry. If problem persists, contact BioHiTech Support. Machine should not be used.</td>
</tr>
<tr>
<td>59</td>
<td>Safety Relay Fault</td>
<td>Power cycle the Digester. Contact BioHiTech if continues.</td>
</tr>
<tr>
<td>111</td>
<td>Safety Relay Fault</td>
<td>Power cycle the machine with the door open. Once turned back on close the door. Contact BioHiTech if continues.</td>
</tr>
<tr>
<td></td>
<td>Drive Torque Limit Exceeded</td>
<td>Ensure that there is not too much waste inside of the Digester. Check inside of Digester and ensure that nothing is obstructing the paddle arms. Clear alerts and retry. If problem persists, contact BioHiTech Support. Machine should not be used.</td>
</tr>
<tr>
<td></td>
<td>Drum Overflow</td>
<td>Remove excess weight from inside of the Digester. Check drum for any clogs. Clear alerts and ensure that the unit is in Auto Mode to resume normal operation.</td>
</tr>
<tr>
<td></td>
<td>Emergency Stop Pressed</td>
<td>Resolve any issue that caused the Emergency Stop button from being pressed. Depress the Emergency Stop button and clear alerts to resume normal operation.</td>
</tr>
<tr>
<td></td>
<td>Machine Overweight</td>
<td>Remove excess weight from inside of the Digester. Clear alerts and ensure that the unit is in Auto Mode to resume normal operation.</td>
</tr>
<tr>
<td></td>
<td>Motor Overload</td>
<td>Remove excess weight from inside of the Digester. Clear alerts and ensure that the unit is in Auto Mode to resume normal operation.</td>
</tr>
<tr>
<td></td>
<td>Safety Relay Error</td>
<td>Contact BioHiTech Support. Machine should not be used.</td>
</tr>
<tr>
<td></td>
<td>Shell Temperature Low</td>
<td>Check temperature of incoming water as incoming water can impact shell temperature; adjust if necessary. Check temperature target settings. Ensure that large quantities of frozen organic waste is not being placed into the Digester.</td>
</tr>
<tr>
<td></td>
<td>Shell Temperature High</td>
<td>Check temperature of incoming water as incoming water can impact shell temperature; adjust if necessary. Check temperature target settings.</td>
</tr>
<tr>
<td></td>
<td>Water Temperature Low</td>
<td>Check temperature of incoming water; adjust if necessary.</td>
</tr>
<tr>
<td></td>
<td>Water Temperature High</td>
<td>Check temperature of incoming water; adjust if necessary.</td>
</tr>
</tbody>
</table>
Chapter 5. Touchscreen Reference
5.1. About Screen

The About Screen shows useful information about the Digester's software version numbers. This screen is normally not required to be accessed by the end user. This screen is usually accessed by a BioHiTech Support Technician. This screen is accessed from the Main Menu.

![About Screen Image](Image)
5.2. Alerts Screen

The *Alerts Screen* shows the most recent alerts generated by the Digester. The Digester may generate alerts when it detects a mechanical, electrical, or hardware problem. This screen is accessed from the *Main Menu Screen* as well as from the *Dashboard Screen* when alerts are active:

![Dashboard Screen with alert message]

Alerts are listed on this screen, along with the date and time that the alert was first generated by the Digester. Alerts that are still active are highlighted in bright green. For more information on alerts in general, see Section 4.4, “Touchscreen Alerts”.

![Alerts Screen with table]

Use the *Clear Drive Fault* button to clear a fault related to the drive/motor. To clear historical alert information, press the *Clear History* button.
5.3. BioBrain Screen

The *BioBrain Functions Screen* is used to monitor and control the embedded, smart computer that is located inside of the Digester; this computer is named the "BioBrain". This screen is normally not required to be accessed by the end user; only when directed by a BioHiTech Support Technician. This screen is accessed from the Network Configuration Menu.

The bottom of the screen shows two status indicators:

1. The status of the Ethernet Link for the BioBrain's Internet connection is displayed on the lower-left corner of the screen.

2. The status of the BioBrain itself is displayed in the lower-right corner of the screen.

There are three actions that can be taken on this screen:

1. Pressing the **Restart BioBrain Software** button will force the software on the BioBrain computer to restart. This is useful for BioHiTech Support Technicians to determine if there is a software problem with the unit.

2. Pressing the **Restart BioBrain Networking** button will force the BioBrain to restart all Networking Services. This is useful when troubleshooting issues with networking issues at the client site.

3. Pressing the **Reboot BioBrain** button will force the BioBrain computer to restart. This is useful for BioHiTech Support Technicians to determine if there is a software or hardware problem with the unit.
5.4. Category Selection Screen

An optional feature of the Digester allows users to classify waste as it is being placed into the machine. This feature allows waste to be categorized by food type, department, cost-center, vendor, and tenant. This feature requires BioHiTech Cloud and may require additional configuration by BioHiTech. Please contact BioHiTech America for more information about waste categorization.

If waste categorization is enabled on the Digester, end users will be asked to categorize their food waste on the touchscreen when the food hatch door is opened. Simply use the touchscreen to select the desired category. At this point, waste may be placed into the Digester for accurate record-keeping.

Pressing the **New Load** button may be used to distinguish different categories of waste placed into the Digester during one feeding (door opening) or the Digester. Press this button between load categories.
5.5. Configuration Menu Screen

The Configuration Menu Screen displays all configuration options available for the Digester.

- Press **Weights** to configure and calibrate the weighing system of the Digester and to configure tower lamp weight levels for the tower lamp. See Section 5.19, “Weight Configuration Screens” for more information.

- Press **Cycles** to configure the agitation and water cycles used by the Digester. See Section 5.6, “Cycles Configuration Screens” for more information.

- Press **Networking** to monitor, test, and configure networking parameters for the Digester. See Section 5.13, “Network Configuration Screens” for more information.

- Press **Passwords** to change the touchscreen operator passwords. See Section 5.15, “Password Configuration Screen” for more information.

- Press **Other** to view more configuration options, as outlined below.

- Press **Functions** to configure miscellaneous functions of the Digester. See Section 5.9, “Functions Configuration Screen” for more information.

Press **Date/Time** to set the date and time on the Digester. See Section 5.8, “Date / Time Configuration Screen” for more information.

Press **Language** to set the language used for text displayed on the touchscreen. See Section 5.10, “Language Configuration Screen” for more information.
Press **Model** to designate the model of Digester being used. See Section 5.12, “Model Configuration Screen” for more information.
5.6. Cycles Configuration Screens

The *Cycles Configuration Screens* are used to adjust the various mechanical cycles of the Digester. These cycles include:

- **Agitation** - controls how often the paddle arms rotate inside of the drum.
- **Showering** - controls how often water is sprayed into the top of the drum.
- **Washing** - controls how often water is sprayed under the bottom of the drum.

The screenshot below shows the two cycle configuration screen. Use the *Edit* button to modify the settings for the agitator function, showering function, or the washing function.

Use the *Up Arrow* and *Down Arrow* buttons to select a value between 1 and 5, Custom, or Off. Values between 1 and 5 represent standardized settings with pre-configured values. A value of 1 represents a lower cycle with less agitation/water up to a value of 5, which represents a much high cycle with must more agitation/water. Choosing the *Custom* option allows you to customize these settings exactly to your needs. Choosing the *Off* option turns off that cycle entirely.

To save the desired cycle settings, press the *Save* button. If a value of 0 is selected for the cycles, the custom cycle parameters will be displayed, as shown below:
When a **Custom** setting is chosen for a given cycle, you will have the ability to customize the cycle settings directly. The following parameters are used to customize the cycle:

- **Delay Time** - The amount of time (in seconds) before the cycle starts from the beginning of the period.

- **Active Time** - The amount of time (in seconds) that the cycle activity is active (agitation, washing, deodorizing) after it starts.

- **Period Time** - The total amount of time (in seconds) of the cycle period.

- **Reset on Load** - The amount of weight required for the cycle time to reset. This allows large loads to reset their cycle times immediately, running more often.

- **Weight Multiple** - The amount of weight required before a multiplier is applied to the Active Time. This allows large loads to have longer active periods.

- **Multiplier Increase** - The amount of multiplier increase seen for every Weight Multiple on a single load (feeding) of the machine.
5.7. Dashboard Screen

The Dashboard Screen is the screen that is typically displayed when the Digester is operating. The following information is normally displayed on this screen:

- **Mode** - The operating mode of the Digester (Manual or Auto).
- **Current Weight** - The current weight of the contents inside of the machine.
- **Available Capacity** - The available capacity of the machine, before the tower lamp turns red.
- **Instructional Message** - Green- or red-colored text may be displayed on the screen, such as "Keep Feeding", "Don't Feed", etc.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>If the Touchscreen is inactive for two minutes, the touchscreen will always reset back to the Dashboard Screen.</td>
</tr>
</tbody>
</table>

Press **Main Menu** to access the system menu, where the system can manually controlled and configured. See Section 5.11, "Main Menu Screen" for more information.

The screenshot below shows the Dashboard in its typical state. The machine is running in Auto Mode, with available capacity.

The screenshot below shows the Dashboard when the machine is full. Note that the machine is in Auto mode and still operating normally.
The screenshot below shows the Dashboard when the machine is full and overweight. Note that the machine is stopped. Alerts must be addressed. Use the View Alerts button to address these alerts. See Section 5.2, “Alerts Screen” for more information.

Dashboard with Alerts

The screenshot below shows the Dashboard when the machine has alerts. Note that the machine is in Manual mode and stopped. Alerts must be addressed. Use the View Alerts button to address these alerts. See Section 5.2, “Alerts Screen” for more information.

Dashboard - Stopped with Alerts

The screenshot below shows the Dashboard when the machine has Alerts and is running in Manual Mode. Alerts must be addressed. Use the View Alerts button to address these alerts. See Section 5.2, “Alerts Screen” for more information.

Dashboard - Manual Mode

To access any functionality in the touchscreen, you will be asked to enter your touchscreen password as shown below:
Enter system password in the field below.

Submit

Service Code: 5724

Password Entry
5.8. Date / Time Configuration Screen

The Date / Time Configuration Screen is used to set the date and time on the Digester. Date and time configuration is typically performed at system start up or when the machine has been powered down for an extended period of time.

Note

Not all models support manual setting of the date and time.

Use the **Year**, **Month**, and **Day** fields to set the current date as follows:

- **Year** - enter the 4-digit year
- **Month** - enter a value between 1 and 12 to denote the current month (1 for January, 2 for February, etc.)
- **Day** - enter a value between 1 and 31 to denote the current day of the month

Use the **Hour**, **Minute**, and **Second** fields to set the current time as follows:

- **Hour** - enter a value between 0 and 23 to represent the current hour. Note: Like military time, values greater than 12 represent PM hours.
- **Minute** - enter a value between 0 and 59 to denote the current minute.
- **Second** - enter a value between 0 and 59 to denote the current second.
5.9. Functions Configuration Screen

The *Functions Configuration Screen* is used to set various features and functions of the Digester.

These parameters are for controlling the variable speed drive (which drives the motor/agitator in the Digester):

- **Drive Torque Limit** - The maximum amount of torque on the motor before it stops. The values in in hundredths of Amps. For example: 150 would be equivalent to 1.50 Amps. This value should not be changed without consulting BioHiTech.

- **Drive Torque Retry Limit** - The maximum number of retries before the Digester generates a fault and stops the system.

**Warning**

These values should not be changed without consulting BioHiTech. Changing these parameters could damage the equipment.
5.10. Language Configuration Screen

The *Language Configuration Screen* is used to set the language that is used to display text on the touchscreen interface of the Digester.

Select the desired language from the list and press the *Save* button to save the desired selection.
5.11. Main Menu Screen

The Main Menu Screen is the starting point to access all touchscreen functionality on the Digester. To return to the Dashboard, press the Dashboard button at the top of the screen.

The following options are available from the main menu:

- **Operation** - allows you to control and operate the machine. See Section 5.14, “Operation Screens” for more information.

- **System Status** - shows the current status of various components of the machine. See Section 5.16, “System Status Screen” for more information.

- **Alerts** - allows you to view and reset machine alerts. See Section 5.2, “Alerts Screen” for more information.

- **Usage Report** - allows you quickly see daily, weekly, and monthly usage data of the machine. See Section 5.17, “Usage Report Screen” for more information.

- **Configuration** - allows you to manage the machine's configuration. See Section 5.5, “Configuration Menu Screen” for more information.

- **About...** - shows information about the machine software. See Section 5.1, “About Screen” for more information.

Pressing the Dashboard button in the upper-left part of the screen exits the main menu and returns you to the Dashboard Screen.
5.12. Model Configuration Screen

The Model Configuration Screen is used to designate the model of Digester being used.

Select the desired model from the list.
5.13. Network Configuration Screens

The *Network Configuration Screen* allows you to configure and test the network parameters of the Digester. Proper network configuration is vital for sending data to BioHiTech Cloud for reporting and analytics. Network configuration is also important for remote management and maintenance of the machine.

Pressing the Back button at the top of the screen will return you to the *Configuration Menu Screen*.

The following buttons are available on this screen:

- **Network Status** - displays the current network configuration parameters and Ethernet status of the machine.

- **Test / Diagnostics** - runs a thorough network test of the machine to ensure that the machine can properly transmit data over the Internet to BioHiTech Cloud.

- **Configure Network** - configures the network parameters on the Digester to access a local area network through static IP networking configuration or dynamic network configuration (DHCP).

- **BioBrain Functions** - used for troubleshooting, allows the BioBrain computer inside of the Digester to be restarted or reset.

The *Network Status Screen* shows information about the status of the current network configuration. Pressing the Back button at the top of the screen will return you to the *Network Configuration Menu Screen*.

The following fields are visible on the *Network Status Screen*:

- **Ethernet Link** - shows the current status (Up or Down) of the Ethernet link.

- **MAC Address**

- **Network Type** - Wireless (HU Dewberry)

- **IP Address** - 192.168.1.1

- **Route/Gateway** - 192.168.1.100

- **Net Mask** - 255.255.255.0

- **DNS Servers** - 8.8.8.8, 8.8.4.4
• **BioBrain** - shows the current status (Up or Down) of the BioBrain computer located inside of the Digester.

• **MAC Address** - shows the hardware MAC Address of the Digester.

• **Network Type** - shows the type of network configuration (DHCP or Static) currently being used by the Digester.

• **IP Address** - shows the IP Address of the Digester.

• **Route/Gateway** - shows the IP address of the primary route (gateway).

• **Net Mask** - shows the network mask being used by the Digester.

• **DNS Servers** - shows the IP address(es) of the Domain Name Service (DNS) servers being used for name resolution.

When changing the network configuration on the machine, you will be asked to confirm that you are interested in making configuration changes.

![Confirming Networking Configuration](image)

When configuring the networking settings, there are two options:

• **DHCP** - Dynamic Networking (DHCP). This setting is used when the network is setup to use DHCP or if a cellular data modem is used.

• **Static** - Static Networking. This setting is used when very specific, non-changing networking parameters are used.

**Note**

Contact your IT (Information Technology) Department if unsure of the networking parameters to use.
If static networking is selected, the **Static Network Parameters** screen will be displayed, where the individual network address parameters can be entered directly onto the touchscreen. When done, press the **Save** button to save the changes.

**Note**

Only IPV4 networking parameters are supported at this time. The system does not support IPV6.

- **IP Address** - the static IP address that should be assigned to the Digester.
- **Route/Gateway** - the IP address of the default route or gateway.
- **Net Mask** - the IP network mask that should be applied to the current local area network.
- **DNS Server 1** - the IP address of the primary DNS (Domain Name Service) server.
- **DNS Server 2** - the IP address of the secondary DNS (Domain Name Service) server. This field is optional.

After the networking configuration settings are saved, press the **Test Network** button to perform a network test.

The **Network Test Screen** allows you to run a comprehensive suite of networking tests to ensure that the BioBrain and Digester can successfully communicate over the Internet to BioHiTech Cloud.
Press the **Start Tests** button at the bottom to run the networking tests. Next to each of the eight tests, a green *Pass* status or a red *Fail* will be displayed. The networking tests is considered successful only if *all* networking tests pass.

<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Gateway Ping</td>
<td>Pass</td>
</tr>
<tr>
<td>#2</td>
<td>DNS Test</td>
<td>Pass</td>
</tr>
<tr>
<td>#3</td>
<td>Connect to 54.208.204.191:443</td>
<td>Pass</td>
</tr>
<tr>
<td>#4</td>
<td>Connect to biohitechcloud.com:443</td>
<td>Pass</td>
</tr>
<tr>
<td>#5</td>
<td>Connect to data.biohitechcloud.com:443</td>
<td>Pass</td>
</tr>
<tr>
<td>#6</td>
<td>Connect to digester-salt-master:443</td>
<td>Pass</td>
</tr>
<tr>
<td>#7</td>
<td>Connect to digester-ssh:443</td>
<td>Pass</td>
</tr>
<tr>
<td>#8</td>
<td>Send Test Event</td>
<td>Pass</td>
</tr>
</tbody>
</table>

**Network Configuration Test**

Normally all networking tests can be completed in under twenty seconds. If there are problems with the networking configuration, it may take as long as ten minutes to complete all of the tests.
5.14. Operation Screens

The Operation Screen is used to toggle the Digester between Auto and Manual mode. The machine should normally be in Auto mode. Manual mode is typically reserved for manual machine operation, troubleshooting, or if a fault condition occurs on the machine. See Section 3.4.3, “Operating Modes” for more information about the automatic and manual operating modes of the Digester.

The screenshot below shows the Operation Screen when it is in Auto mode. Press the Switch to Manual button to change the operating mode to Manual mode.

![Operation Screen - In Auto Mode](image)

The screenshot below shows the Operation Screen when it is in Auto mode. However, in this screenshot the machine is not in a running state due to critical alerts that need to be addressed. Press the Switch to Manual button to change the operating mode to Manual mode. Press the View Alerts button to view, address, and reset the machine alerts.

![Operation Screen - In Auto Mode (Not Running)](image)

The screenshot below shows the Operation Screen when it is in Manual mode. Press the Switch to Auto button to change the operating mode to Auto mode. Press the Manual Controls button manually control the machine. This feature is only available when the machine is in Manual mode.
The screenshot below shows the Manual Controls Screen #1. Note that there are three manual controls screens. Press the Next button to go to Operation Screen.

The following features are available on Manual Controls Screen #1:

- **Agitator** - press the Turn On or Turn Off button to manually control operation of the agitator.

  **Note**
  
  On some models, the agitator can only be turned on if the food hatch door is closed.

  **Caution**
  
  Using the agitator while the food hatch door is open should only be performed by trained service personnel.

- **Agitator Rotations** - The agitator can be used to spin the paddle arms by a quarter, half, or full rotation by pressing the 1/4, 1/2, or 1 button. This feature is useful when cleaning the machine, inspecting the paddle arms, or checking the food habitat for debris.

- **Agitator Speed** - The agitator speed can be changed by pressing the Lo, Med, or Hi button. Note that this feature is not available on the Eco-Safe 4 model.

- **Agitator Direction** - The agitator direction can be changed by pressing the Fwd or Rev button.

- **Shower** - press the Turn On or Turn Off button to turn on or turn off the top showering function.

The screenshot below shows the Manual Controls Screen #2. Press the Back button to go back to Operation Screen #1. Press the Next button to go back to Operation Screen #3.
The following features are available on Manual Controls Screen #2:

- **Wash** - press the Turn On or Turn Off button to turn on or turn off the bottom washing function.

- **Lamp Test** - press the Turn On or Turn Off button to turn on or turn off the traffic lamp test cycle. During the traffic lamp test cycle, all lights on the lamp will alternate in illumination. This test is a good way to confirm that all bulbs are functioning properly.
5.15. Password Configuration Screen

The Passwords Configuration Screen is used to set the passwords on the Digester. One of these passwords must be entered in order to access the Main Menu from the Dashboard.

There are three passwords available on the Digester:

1. **Operator Password** - If this password is entered, the user has limited access to the touchscreen functions. Specifically, the user will be unable to access the Configuration Menu.

2. **Administrator Password** - If this password is entered, the user will have full access to all features in the main menu.

3. **Service Password** - This is a password reserved for BioHiTech support personnel.

   **Note**

   Depending on your current level of access, you may not see all of these options. You will only see the passwords that you have the ability to change.

The screenshot below shows the Password Configuration Menu Screen. Touch one of the buttons to change the appropriate password.

![Password Configuration Menu Screen](image)

The screenshot below shows the Password Configuration Screen.

![Password Configuration Screen](image)

Touch inside the New Password input box and use the onscreen keypad to enter a new password. Passwords should be between 4 and 6 digits (numbers). Touch the Save button when finished.
Remember Your Password

Please take note of your password. Forgetting your password will prevent you from managing the Digester and may incur a service visit to have the password reset.
5.16. System Status Screen

The System Status Screen displays the status of the Digester and its various sensors and mechanical components.

At the top of the screen, the operating mode (Auto or Manual), the current weight (inside the drum), and available capacity is displayed.

The bottom half of the screen displays the state of the following components, including:

- **Door State** - denotes whether the food hatch door is currently open or closed.
- **Agitator State** - denotes whether the agitator is currently on or off.
- **Agitator Direction and Speed** - denotes direction (forward or reverse) and the speed of the agitator.
- **Shower** - denotes whether the top shower function is currently on or off.
- **Wash** - denotes whether the bottom washing function is currently on or off.
- **Tower Lamp** - denotes whether the green or red lamp is illuminate on the tower.
5.17. Usage Report Screen

The *Usage Report Screen* displays utilization data for various time periods. Utilization is a measure of how much organic waste was placed into the Digester over a given time frame.

The screenshot below shows an example usage report.

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Weight (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Today</td>
<td>525</td>
</tr>
<tr>
<td>Yesterday</td>
<td>853</td>
</tr>
<tr>
<td>This Week</td>
<td>2,525</td>
</tr>
<tr>
<td>Last Week</td>
<td>3,232</td>
</tr>
<tr>
<td>This Month</td>
<td>12,345</td>
</tr>
<tr>
<td>Last Month</td>
<td>13,656</td>
</tr>
</tbody>
</table>

The Usage Report will show utilization metrics for the following time periods:

- **Today** - utilization for the current day, starting at 12:00am.
- **Yesterday** - utilization for the prior day, starting at 12:00am and ending at 11:59pm.
- **This Week** - utilization for the current week, starting with Sunday at 12:00am.
- **Last Week** - utilization for the prior week, staring Sunday at 12:00am and ending on Saturday at 11:59pm.
- **This Month** - utilization for the current month, starting at 12:00am on the first day of the month.
- **Last Month** - utilization for the prior month, starting at 12:00am on the first day of the month and ending at 11:59pm on the last day of the month.
5.18. USB Data Screens

The *USB Data Screens* are displayed when performing a data capture from the Digester using a USB thumb drive.

**Note**

USB data retrieval is an optional feature. Contact your local sales representative for details.

The screenshot below demonstrates when a data retrieval is in progress. Do not remove the USB drive while this screen is displayed, as data is being actively copied to the USB drive.

![Data Upload In Progress]

The screenshot below is displayed when data is done copying to the USB drive. At this time the USB drive may be safely removed.

![Data Upload Completed]

The screenshot below is displayed if there is an error copying data to the USB drive. Take note of the error code and contact BioHiTech customer support.
An error occurred during data upload to the USB drive.

Message: Operation Timed Out.
Code: 0

Data Upload error
5.19. Weight Configuration Screens

The Weight Configuration Screens allow for the configuration of all aspects of the weight scale system built into the Digester. The Digester has four load cells, placed in the four corners of the Digester above the machine's four foot pedestals. A load cell indicator reads the stress of the four load cells and translates those signals into a weight for the entire Digester and its contents. These configuration screens allow you to calibrate this weight translation, the tare weight (so that the weight of the Digester itself is subtracted to the weight), and the various weight levels used by the tower lamp (such as "Tower Red").

The screenshot below shows the Current Weight Configuration Screen. This screen shows the current weight parameters currently being used by the Digester.

The screen will show the following values:

- **Current Weight** - shows the current weight of the Digester, which incorporates the tare weight.
- **Tare Weight** - shows tare weight.
- **Tower Red** - shows the weight level required for the machine's red tower lamp to turn on.
- **Shutdown** - shows the weight level required for the machine to become "overweight" and shutdown.

To change any of these settings or to re-calibrate the weight scales, press the Configure button. When this button is pressed, the Weight Configuration Menu will be displayed as shown below.

The following options are available on this screen:
• **Calibrate** - Press this button to calibrate the weight scale system.

• **Operation Levels** - Press this button to configure the tower lamp and shutdown levels.

• **Re-Tare** - Press this button to re-tare the weight scale.

• **Units of Measure** - Press this button to set the weight unit of measure.

When the **Calibrate** button is pressed, the touchscreen will walk you through the process of calibrating the weight scale system of the Digester. To perform this task, you will need an object that is of a known weight (the heavier, the better). You will also need to know the weight of the Digester itself, refer to Appendix B, *Machine Specifications* for more information. Finally, this process is normally done when the food chamber is empty, otherwise you will need to estimate the amount of food waste inside of the Digester as well.

The four screen shots below illustrate the weight calibration procedure.
The screen shot below illustrates the *Operation Levels Screen*. Use this screen to set the various operational weight levels of the Digester.

The following operational levels can be set on this screen:

- **Tower Red** - shows the weight level required for the machine's red tower lamp to turn on.
- **Shutdown** - shows the weight level required for the machine to become "overweight" and shutdown.

To change an operational level, touch the input box of the value to change. Use the onscreen numeric keypad to enter a new weight value. When the configuration parameters have been set, press the **Save** button to save your changes.
The screen show below illustrates the **Weight Tare Configuration Screen**. Use this screen to configure the system tare weight.

To enter a new tare weight, touch the input field for **New Tare Weight**. Use the onscreen numeric keypad to enter a new tare weight value. Press the **Save** button save your changes.

Optionally, if the food chamber inside of the Digester is empty, press the **Tare to Zero** to tare the weight system to zero.

The screenshot below shows the **Unit of Measure Configuration Screen**. Use this screen to toggle the weight units between imperial pounds (lbs) units and the metric kilograms (kg) units.
Appendix A. Contacting BioHiTech Support

If you need assistance with your Revolution Series™ Digester, please contact BioHiTech. BioHiTech can be reached 24 hours per day, 7 days per week.

Customer Support can be used for:

- Replacement parts
- Ordering supplies
- Scheduling unplanned maintenance or service
- Scheduling clean outs
- Assistance with troubleshooting problem with your Digester

**Note**

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

### Online Support

For optimal customer support, please submit a support request online at: [biohitech.com](http://biohitech.com). Customers should click the CUSTOMER button at the top of the web page.

Other benefits of using the Customer Portal include:

- Access to documentation
- Access to online training videos

### Phone Support

Alternatively, BioHiTech America phone support can be reached at 888.876.9300, Press Option 2 at the prompt.

### By Mail

Written correspondence may be directed to:

BioHiTech America
80 Red Schoolhouse Road
Suite 101
Chestnut Ridge, NY 10977
Phone: 888.876.9300
Email: support@biohitech.com
Appendix B. Machine Specifications

This section outlines the specifications of each machine model.

Table B.1. Machine 24-Hour Operational Capacities

<table>
<thead>
<tr>
<th>Model</th>
<th>24-Hour Capacity (lbs)</th>
<th>24-Hour Capacity (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed</td>
<td>535 lbs</td>
<td>242 kg</td>
</tr>
<tr>
<td>Sprout</td>
<td>670 lbs</td>
<td>303 kg</td>
</tr>
</tbody>
</table>

**Note**
The numbers above represent 24-hour capacities of machines operating in good conditions with a standard organic diet. Real world performance may vary based on organic diet, temperature, feeding schedule, hours of operation, etc.

Table B.2. Machine Dimensions

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimensions W x H x D (inches)</th>
<th>Dimensions W x H x D (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed</td>
<td>30” x 48” x 30”</td>
<td>76 cm x 123 cm x 76 cm</td>
</tr>
<tr>
<td>Sprout</td>
<td>40” x 48” x 30”</td>
<td>102 cm x 123 cm x 76 cm</td>
</tr>
</tbody>
</table>

Table B.3. Machine Weight

<table>
<thead>
<tr>
<th>Model</th>
<th>Weight (lbs)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed</td>
<td>535 lbs</td>
<td>242 kg</td>
</tr>
<tr>
<td>Sprout</td>
<td>670 lbs</td>
<td>303 kg</td>
</tr>
</tbody>
</table>

Table B.4. Daily Water Consumption

<table>
<thead>
<tr>
<th>Model</th>
<th>Consumption (gallons)</th>
<th>Consumption (liters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed</td>
<td>40 gal</td>
<td>150 l</td>
</tr>
<tr>
<td>Sprout</td>
<td>50 gal</td>
<td>190 l</td>
</tr>
</tbody>
</table>

**Note**
The numbers above represent typical daily water consumption. Real world consumption may vary based on machine utilization and water cycle configuration.

Table B.5. Typical Effluent Discharge

<table>
<thead>
<tr>
<th>Model</th>
<th>Daily Discharge (gallons)</th>
<th>Daily Discharge (liters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed</td>
<td>about 809-200 gal</td>
<td>about 375-750 l</td>
</tr>
</tbody>
</table>

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### Machine Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Daily Discharge (gallons)</th>
<th>Daily Discharge (liters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sprout</td>
<td>about 80-150 gal</td>
<td>about 300-570 l</td>
</tr>
</tbody>
</table>

**Note**

The numbers above represent typical daily effluent discharge. Real world discharge volumes may vary based on machine utilization, water cycle configuration, and organic diet.

### Table B.6. Monthly Power Consumption

<table>
<thead>
<tr>
<th>Model</th>
<th>Monthly Power Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed</td>
<td>70 - 150 kilowatt hours / month</td>
</tr>
<tr>
<td>Sprout</td>
<td>70 - 150 kilowatt hours / month</td>
</tr>
</tbody>
</table>

**Note**

The numbers above represent typical daily effluent discharge. Real world power consumption may vary based on machine utilization, typical machine load, and machine configuration.
**Revolution Series™**

**BioHiTech Seed™**

### Machine Specifications

<table>
<thead>
<tr>
<th>Utility Usage</th>
<th>[kg]</th>
<th>[cm]</th>
<th>[mm]</th>
<th>[in]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>5.5</td>
<td>30.5</td>
<td>11.9</td>
<td>12</td>
</tr>
<tr>
<td>Depth</td>
<td>30</td>
<td>12</td>
<td>4.7</td>
<td>1.8</td>
</tr>
<tr>
<td>Height</td>
<td>99</td>
<td>39</td>
<td>3.9</td>
<td>1.55</td>
</tr>
<tr>
<td>Width</td>
<td>99</td>
<td>39</td>
<td>3.9</td>
<td>1.55</td>
</tr>
</tbody>
</table>

**Effluent Discharge**
- \[gal\] (\[L\]) per day
- \[ft³\] (\[m³\]) per hour, month

**Power Consumption**
- \[W\] (\[kW\])

**Water Consumption**
- \[gal\] (\[L\]) per hour, day
Appendix C. Network Connectivity

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>These requirements are only necessary for Digesters that will be connected to the Internet for the BioHiTech Cloud™ service.</td>
</tr>
</tbody>
</table>

**Network Connectivity Options**

There are two network connectivity options for the Revolution Series Digester:

- An RJ45 Ethernet connection in close proximity to the Digester
- A cellular modem rented from BioHiTech America

A dedicated hard line 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.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>When using the cellular modem, be sure that adequate cellular coverage is available at the location of the Digester.</td>
</tr>
</tbody>
</table>

**Network Configurations**

If you are using the cellular modem purchased from BioHiTech, then no more network configuration is required. The Digester will connect to the cellular modem via DHCP (dynamic network) to the wireless cellular network.

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

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

If static IP configuration is used, the Digester will require the following configuration parameters:

- **IP Address** - the IP address that you wish to assign to the 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 Digester can accept used to two IP addresses for DNS servers.

**Firewall Considerations**

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

Firewalls should be configured to allow outbound Internet access on TCP port 443 to the following IP addresses:
Network Connectivity

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

If the BioBrain will be using default external DNS, then the following IP addresses should be allowed outbound Internet access on UDP port 53:
- 8.8.8.8
- 8.8.4.4

Optionally, the following IP address can be allowed outbound Internet access on UDP port 4321:
- 54.85.142.150

**Bandwidth Utilization**

Average bandwidth utilization is about 3MB per day per Digester.

**SSL Proxies**

The Digester does **not** support SSL/TLS proxy servers at this time.
Appendix D. Default Machine Parameters

This section will outline the default configuration parameters to be used for your Digester.

Cycles

The following parameters can be configured on the Cycles configuration section.

Table D.1. Cycles Configuration Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default Setting / Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agitator</td>
<td>5</td>
</tr>
<tr>
<td>Shower</td>
<td>3</td>
</tr>
<tr>
<td>Wash</td>
<td>3</td>
</tr>
</tbody>
</table>

Functions

The following parameters can be configured on the Functions configuration section.

Table D.2. Function Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default Setting / Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive Torque Limit</td>
<td>150</td>
</tr>
<tr>
<td>Drive Torque Retry Limit</td>
<td>3</td>
</tr>
</tbody>
</table>

Language

The default language of the system should be set to English.

Networking

If you are using a cellular data mode, then the system should be configured to use DHCP (dynamic) networking.

If you are using a wired connection, please contact the customer's IT (Information Technology) or Networking Department, who should be able to provide all configuration parameters.

Passwords

The following parameters can be configured on the Passwords configuration area.
Table D.3. Default Passwords

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default Setting / Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operator Password</td>
<td>3023</td>
</tr>
<tr>
<td>Administrator Password</td>
<td>4150</td>
</tr>
</tbody>
</table>

**Temperature**

The following parameters can be configured on the *Temperature* configuration area.

Table D.4. Temperature Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default Setting / Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Shell Temp</td>
<td>113 °F (45 °C)</td>
</tr>
<tr>
<td>Shell Temp Sensor</td>
<td>Enabled</td>
</tr>
<tr>
<td>Water Temp Sensor</td>
<td>Enabled</td>
</tr>
</tbody>
</table>

**Unit of Measure**

The default unit of measure can be set to either Imperial Units (United States) or Metric based on customer preference.

**Note**

Make sure to use values that reflect the appropriate units of measure when entering weights and temperatures.

**Weights**

The following parameters can be configured on the *Weights* configuration area. Note that these parameter vary by model.

Table D.5. Operation Levels Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Seed</th>
<th>Sprout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tower Red</td>
<td>200 lbs. (90 kg.)</td>
<td>250 lbs. (115 kg.)</td>
</tr>
<tr>
<td>Shutdown</td>
<td>250 lbs. (115 kg.)</td>
<td>300 lbs. (135 kg.)</td>
</tr>
</tbody>
</table>
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