WARRANTY

SUN-MAR Corp. warrants the original purchaser that this toilet is free from defects in material and workmanship under normal house or cottage use. SUN-MAR Corp. will furnish new parts for any part that falls within three years and five years on the fiberglass tank, provided that our inspection shows that such failure is due to defective material or workmanship. Any part supplied by us to replace another part is warranted for the balance of the original warranty period.

This warranty does not cover:
1. Damage resulting from neglect, abuse, accident or alteration; or damage caused by fire, flood, acts of God or any other casualty.
2. Parts and accessories not sold or manufactured by SUN-MAR Corp. or any damage resulting from the use of such items.
3. Damage or failure resulting from failure of the purchaser to follow normal operating procedure outlined in the Owner’s Manual or in any other printed instructions.
4. Labour and service charges incurred in the removal and replacement of any parts found defective under the terms of this warranty.
5. All returns to the factory must be made freight prepaid. All shipments from the factory are made F.O.B. the factory.

This warranty is in lieu of all other warranties expressed or implied, and no person is authorized to enlarge our warranty responsibility, which is limited to the terms of this certificate. The Company reserves the right to change, improve or modify its products without obligation to install these improvements on equipment previously manufactured.

EXCEL

OWNER’S MANUAL

RATED CAPACITY

Residential & Continuous Use
EXCEL 2 Adults or a family of 3 or
EXCEL NE Units; 3 Adults or families of 5

Weekend & Vacation Use
EXCEL 6 Adults or families of 8 or
EXCEL NE Units; 5 Adults or families of 7

Certified to NSF/ANSI Standard 41

Standard 41
Certified for liquid containment, odours, and solid end products in both residential and cottage use

600 Main St.
Tonawanda, N.Y.
14150-0888 U.S.A.

5370 South Service Rd.
Burlington, ON
L7L 5L1 CANADA

Product Info: (905) 332-1314       Fax: (905) 332-1315       Tech. Service: (888) 341-0782 Ext 218
E-mail: compost@sun-mar.com       http://www.sun-mar.com

PO-MANU0-0603XX
Feb 2011
Rev D7
Models for which the manual applies:

- CSEL-01001 Excel Bone 115w
- CSEL-01001W Excel White 115w
- CSEL-01001-230 Excel Bone 230w
- CSEL-01001W-230 Excel White 230w
- CSNL-01101B Excel NE Bone
- CSNL-01101W Excel NE White

Metal tools will damage the toilet.

**EXCEL SPECIFICATIONS**

**EXCEL EXPLOSION DIAGRAM & PART NUMBERS**

<table>
<thead>
<tr>
<th>Part</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Toilet Seat</td>
</tr>
<tr>
<td>2</td>
<td>Bowl Liner</td>
</tr>
<tr>
<td>3</td>
<td>Front Cover</td>
</tr>
<tr>
<td>4</td>
<td>Handle Swivel</td>
</tr>
<tr>
<td>5</td>
<td>Plastic Drum Door</td>
</tr>
<tr>
<td>6</td>
<td>EXCEL Tank</td>
</tr>
<tr>
<td>7</td>
<td>Footrest Channel</td>
</tr>
<tr>
<td>8</td>
<td>Drum Locker</td>
</tr>
<tr>
<td>9</td>
<td>Finishing Drawer</td>
</tr>
<tr>
<td>10</td>
<td>Footrest</td>
</tr>
<tr>
<td>11</td>
<td>EXCEL Heater Tray (Electric)</td>
</tr>
<tr>
<td>12</td>
<td>Heating Element (Electric)</td>
</tr>
<tr>
<td>13</td>
<td>Electric Box (Electric)</td>
</tr>
<tr>
<td>14</td>
<td>Thermostat Assembly (Electric)</td>
</tr>
<tr>
<td>15</td>
<td>Emergency Drain</td>
</tr>
<tr>
<td>16</td>
<td>Air Intake Vent</td>
</tr>
<tr>
<td>17</td>
<td>Drum Screen</td>
</tr>
<tr>
<td>18</td>
<td>EXCEL Drum</td>
</tr>
<tr>
<td>19</td>
<td>EXCEL SS Shaft Assembly</td>
</tr>
<tr>
<td>20</td>
<td>Nylon Drive Gear</td>
</tr>
<tr>
<td>21</td>
<td>EXCEL Top</td>
</tr>
<tr>
<td>22</td>
<td>Fan Assembly (Electric)</td>
</tr>
<tr>
<td>23</td>
<td>4&quot; (100mm) Inlet Pipe (NE)</td>
</tr>
</tbody>
</table>

**Electrical Specifications**

<table>
<thead>
<tr>
<th>Excel</th>
<th>115V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Amps</td>
<td>2.4</td>
</tr>
<tr>
<td>Fan Watts (Required)</td>
<td>35 req.</td>
</tr>
<tr>
<td>Heater Watts (When on)</td>
<td>260</td>
</tr>
<tr>
<td>Average Power Use In Watts (Heater on 1/2 time)</td>
<td>150</td>
</tr>
</tbody>
</table>
COMPACT SPECIFICATIONS

1. PP-TDLS-0306DX Toilet Seat White
2. PP-TDLS-0306BX Toilet Seat Bone
3. PP-BOWL-0216BX Bowl Liner
4. PP-FRONC-0755BX Top Front Cover White
5. PP-FRONC-0755XX Top Front Cover Bone
6. PP-SEALS-0750XX Seal Kit Bone
7. PP-BEARP-0758XX Front Bearing Plate
8. PP-SCRE0-0664XX Drum Locker Release Button
9. PP-SCRE0-0580XX Toilet Seat Screw
10. PP-GASK0-0188CX Rubber U Channel
11. PP-SCRE0-0640XX Drain Locker Release Button
12. PP-SCRE0-0640XX Compact Drum Washer
13. PP-SCRE0-0640XX Compact Drum Washer
14. PP-HEATC-07560X Heater Tray Bone
15. PP-HEATC-07560X Heater Tray White
16. PM-ALUMS-0742BX Aluminum Sheet
17. AD-THERM-0001AX Thermostat
18. AD-NITR-0002BX Heating Element
19. AD-DRIEC-0001AX Electric Box
20. PP-SEALS-0750XX Seal Kit White
21. PP-TOP0C-0767BB Compact Top White
22. PP-TOP0C-0767XX Compact Top Bone
23. AO-THERA-0001AX Thermostat
24. AO-HEATE-0002BX Heating Element
25. AO-ELECB-0001AX Electric Box
26. AO-SMALL-0440XX Nylon Drive Gear
27. AO-FAN_A0315KX Fan & Motor Kit Bone
28. AO-FAN_A0315KX Fan & Motor Kit White

Electrical Specifications

<table>
<thead>
<tr>
<th>Component</th>
<th>Compact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Amps</td>
<td>2.0</td>
</tr>
<tr>
<td>Fan Watts (Required)</td>
<td>35 req.</td>
</tr>
<tr>
<td>Heater Watts (When on)</td>
<td>200</td>
</tr>
<tr>
<td>Average Power Use (Heater on 1/2 time)</td>
<td>125</td>
</tr>
</tbody>
</table>

OWNER’S MANUAL

CONTENTS

How Composting Works 2
The Excel 3
The Patented Bio-Drum 3
Compost Finishing Drawer 3
Evaporation Chamber 3

Inspection 4
Check for Damage 4
Whats in the Box 4
Check for Parts and Functionality 4
Attaching the Footrest 4

Installation 5-7
EXCEL Rough in Dimensions 5
Excel Electric Installation 6
Space requirements 6
Vent Piping Location 6
Leading the vent through the Roof 7
The Diffuser 7
Drain Installation 7
Handling Effluent 7
Electrical Considerations 7
Excel NE Installation 8
Space requirements 8
Vent Piping Location 8
Leading the vent through the Roof 9
The Diffuser 9
Drain Installation 9
Handling Effluent 9

Start-Up and Use 10
Ongoing Toilet Maintenance 11

Spring Time Start Up 12
Winter Use 12
Removing Compost from the Bio-Drum 13
Compost 14
Troubleshooting 14
Compost Too Wet 14
Waste not Breaking Down 14
Large Lumps In Drum 14
Drum Too Full 14
Files Present 14

Mechanical Troubleshooting 15-17
Urine Odor In Washroom 15
Occasional Urine Odor Outside 15
Sewage Odor when drum turns 15
Fan Noisy 15
Fan Not Working 16
Liquid Buildup/ 16
Lack of Evaporation 16
Liquid Overflow 16-17
Heating System Not Working 17
Liquid in Finishing Drawer 17
Drum Will Not Turn 17
Drum Door Not Opening/ Closing 17

Basic Instructions 18
Composting Toilet Accessories 19
Compact Specifications 20
Excel Specifications 21

Basic Instructions 18
Composting Toilet Accessories 19
Compact Specifications 20
Excel Specifications 21
**HOW COMPOSTING WORKS**

Composting is the natural process of decomposition that can be helped along by providing the ideal conditions to help your composting toilet work at peak performance. The ideal conditions for decomposition to occur depend on several factors: oxygen, temperature, moisture content, and the carbon/nitrogen ratio.

**Oxygen**

Oxygen is very important in composting. Your compost should be aerated in order to encourage aerobic bacteria growth. Aerobic bacteria are bacteria that grow and live in the presence of oxygen and are very efficient in breaking down waste. To aerate the compost and encourage the growth of these bacteria, the compost drum should be turned three times per week (6 complete turns of the drum).

**Temperature**

Temperature is another important consideration when composting. Optimal composting temperatures range between 70-100 °F (21-38 °C). If the compost becomes too cold (below 55 °F or 13 °C), decomposition will slow significantly or stop completely. If you are in an area that experiences temperatures below 55 °F (13 °C) additional heat is required if the composting toilet will be used continually or frequently. If used for intermittent cottage application (3 - 4 weekends throughout the cold season) no additional heat is required. The unit will function as a holding tank until the temperature warms up.

**Moisture**

Moisture is necessary to achieve a good compost. Your compost should always be damp, like your garden after you have watered it. This moisture allows the bacteria to travel around in the compost so that they can speed decomposition by digesting the waste. If the compost is too dry, the bacteria cannot survive and decomposition will slow or cease. When adding water to the compost, you are aiming for a damp compost, not saturated. Too much liquid in the compost limits the amount of oxygen that aerobic bacteria require to survive. If normal urination is not enough to maintain the correct moisture level in the compost, we encourage you to add additional water to the drum.

**Carbon/Nitrogen Ratio**

Almost all organic material will compost. The proper bulking material and human waste should be added to the composting toilet. In order to maintain a good balance between carbon-rich materials (SUN-MAR Compost Sure Green) and nitrogen-rich human waste only.
Excel Basic Operating Instructions

The toilet should be cleaned with hot water or bio-degradable products only to avoid damage to the compost. ‘Compost Quick or Baking Soda can be used diluted in hot water.

Regular Maintenance

1. Rotate the drum 6 rotations (36 turns of the handle) every second day while you are there and using the toilet.

2. When finished rotating, fold the handle in under the seat. This will mean that the drum is open and ready to receive waste.

3. After each bowel movement, one cup (250ml) of Compost Sure Green should be added to the unit to cover the bowel movement, whichever is greater. Do Not Turn the drum after each use.

Bulking Material

When you run out of our Compost Sure bulking material, more Compost Sure through your Sun-Mar dealer, on line at www.sun-mar.com. Do not use 100% peat moss as this will clog your drum screen and drains.

Periodic Maintenance

Rake out evaporation chamber with rake provided (the area below the finishing drawer). Clean the drum screen. Remove the bowl liner and lift the toilet seat. Turn the handle 3 revolutions to bring the drum screen to the top of the drum. Access can be gained by reaching through the hole under the toilet seat. Spray the drum screen with Compost Quick and let sit for 15 minutes (this will help to loosen the debris if the screen is not too encrusted). Scrub the screen vigorously with a wire brush. If brushing the screen does not clear it and liquid is still not draining through the screen, use a screwdriver or nail to puncture each hole in the drum screen.

Attention: the EXCEL electric model must remain plugged in to an electrical outlet continuously to function odorlessly. If you will be away from the residence where the composting toilet is installed for longer than three days, the power may be disconnected while the composting toilet lays dormant.

The EXCEL

The key to the success of the EXCEL lies in its three chamber design. Each of the three chambers; patented Bio-drum, compost finishing drawer, and evaporation chamber, have their own independent environments for optimum efficiency.

The EXCEL electric version has a thermostatically controlled heater and fan assembly to help evaporate liquid and should be used where there is a constant electrical supply. The EXCEL NE (non-electric) version is for use where there is no continuous electric supply. The EXCEL NE has no fan or heater. Odorless operation is achieved by a 4” vent which acts like a chimney creating a partial vacuum within the unit.

The patented Bio-Drum

Unique to Sun-Mar, the patented bio-drum provides the necessary mass to maintain good compost and allows easy aeration of the compost by simply turning the drum. Excess liquid will exit through a screen in the bottom of the drum into the evaporation chamber. Mixing the Bio-drum is accomplished by rotating the handle in a clock-wise direction. Compost is removed from the drum by pulling out the white drum lock button (under the footrest) and rotating the handle in a counter clock-wise direction.

The Compost Finishing Drawer

The compost finishing drawer sits in an opening under the footrest. Compost in the drawer is isolated from mixing with new waste while resting for 4 weeks so that it can finish composting.

The Evaporation Chamber

The evaporation chamber is the floor of the unit under the compost finishing drawer. This is the area where any excess liquid will gather for evaporation. A safety drain exits from the back of the composting toilet which will drain over-flow liquid that is not evaporated to an approved facility.
We recommend an inspection of the EXCEL prior to installation and to make sure you have received all of the parts required as listed below.

**Inspecting the unit for damage**

1. **If there is any visible damage to the carton-**
   - The contents of the carton should be inspected before signing the bill of lading. Damaged units should be refused. Call Sun-Mar immediately.

2. **If the shipper has left-**
   - Report the damage immediately to the transport company and call Sun-Mar.

3. **Soon after delivery, remove the EXCEL carefully from the carton-**
   - If there is hidden damage, or for any service questions, contact Sun-Mar to determine the best course of action.

**What's in the Box**

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owners Manual</td>
<td>1</td>
</tr>
<tr>
<td>Warranty Card</td>
<td>1</td>
</tr>
<tr>
<td>Excel Hardware Kit</td>
<td>1</td>
</tr>
<tr>
<td>Footrest</td>
<td>2</td>
</tr>
<tr>
<td>1&quot; x 8'/4&quot; Drain Hose(NE)</td>
<td>1</td>
</tr>
<tr>
<td>Compost Sure Green</td>
<td>1</td>
</tr>
<tr>
<td>1-1/2&quot; Roof Flashing (Electric)</td>
<td>1</td>
</tr>
<tr>
<td>1&quot; Bowl Liner</td>
<td>1</td>
</tr>
<tr>
<td>1&quot; Rake</td>
<td>1</td>
</tr>
<tr>
<td>1-6&quot; Diffusor(NE)</td>
<td>1</td>
</tr>
<tr>
<td>3-4&quot;x31&quot; Vent Pipes(NE)</td>
<td>1</td>
</tr>
<tr>
<td>2&quot; Pipe Insulation (Electric)</td>
<td>1</td>
</tr>
<tr>
<td>4&quot; Diffusor (Electric)</td>
<td>1</td>
</tr>
<tr>
<td>4-2&quot;x31&quot; Vent pipe (electric)</td>
<td>1</td>
</tr>
<tr>
<td>1/2&quot; Roof Flashing (NE)</td>
<td>1</td>
</tr>
<tr>
<td>4&quot; Roof Flashing (NE)</td>
<td>1</td>
</tr>
<tr>
<td>1 1/2&quot; Roof Flashing (Electric)</td>
<td>1</td>
</tr>
<tr>
<td>1&quot; Roof Insulation (Electric)</td>
<td>1</td>
</tr>
<tr>
<td>1&quot; Diffusor</td>
<td>1</td>
</tr>
<tr>
<td>2&quot; Pipe Insulation (Electric)</td>
<td>1</td>
</tr>
<tr>
<td>4&quot; Diffusor</td>
<td>1</td>
</tr>
<tr>
<td>2&quot;x31&quot; Vent pipe (electric)</td>
<td>1</td>
</tr>
<tr>
<td>1&quot; Diffusor (Electric)</td>
<td>1</td>
</tr>
<tr>
<td>4&quot;x31&quot; Vent Pipes(NE)</td>
<td>1</td>
</tr>
</tbody>
</table>

**Familiarise Yourself with the EXCEL**

1. **i)** Turn the drum handle clockwise to rotate the patented Bio-Drum for mixing and aeration. (The drum rotates counter-clockwise and the drum door closes). This is how you will rotate the drum during regular operation.
2. **ii)** Pull the drum locker button, (located under the footrest) and turn the handle counter-clockwise to simulate removal of compost. This is how you will remove compost during regular operation.
3. **iii)** Plug the unit's electrical cord (Electric) into a standard three-prong electrical outlet, and feel the air movement from the vent outlet at the front of the unit to ensure the vent system is working properly.
4. **iv)** Pull out the compost finishing drawers at the bottom right of the unit. After the unit has been plugged in for ten minutes, place a hand on the floor of the evaporating chamber (the area under the finishing drawer) to check it is warm to the touch, and that the heater is working properly.

**Inspecting the unit for damage**

1. **If there is any visible damage to the carton-**
   - The contents of the carton should be inspected before signing the bill of lading. Damaged units should be refused. Call Sun-Mar immediately.

2. **If the shipper has left-**
   - Report the damage immediately to the transport company and call Sun-Mar.

3. **Soon after delivery, remove the EXCEL carefully from the carton-**
   - If there is hidden damage, or for any service questions, contact Sun-Mar to determine the best course of action.

**What's in the Box**

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owners Manual</td>
<td>1</td>
</tr>
<tr>
<td>Warranty Card</td>
<td>1</td>
</tr>
<tr>
<td>Excel Hardware Kit</td>
<td>1</td>
</tr>
<tr>
<td>Footrest</td>
<td>2</td>
</tr>
<tr>
<td>1&quot; x 8'/4&quot; Drain Hose(NE)</td>
<td>1</td>
</tr>
<tr>
<td>Compost Sure Green</td>
<td>1</td>
</tr>
<tr>
<td>1-1/2&quot; Roof Flashing (Electric)</td>
<td>1</td>
</tr>
<tr>
<td>1&quot; Bowl Liner</td>
<td>1</td>
</tr>
<tr>
<td>1&quot; Rake</td>
<td>1</td>
</tr>
<tr>
<td>1-6&quot; Diffusor(NE)</td>
<td>1</td>
</tr>
<tr>
<td>3-4&quot;x31&quot; Vent Pipes(NE)</td>
<td>1</td>
</tr>
<tr>
<td>2&quot; Pipe Insulation (Electric)</td>
<td>1</td>
</tr>
<tr>
<td>4&quot; Diffusor (Electric)</td>
<td>1</td>
</tr>
<tr>
<td>4-2&quot;x31&quot; Vent pipe (electric)</td>
<td>1</td>
</tr>
<tr>
<td>1/2&quot; Roof Flashing (NE)</td>
<td>1</td>
</tr>
<tr>
<td>4&quot; Roof Flashing (NE)</td>
<td>1</td>
</tr>
<tr>
<td>1-1/2&quot; Roof Flashing (Electric)</td>
<td>1</td>
</tr>
<tr>
<td>1&quot; Roof Insulation (Electric)</td>
<td>1</td>
</tr>
<tr>
<td>1&quot; Diffusor</td>
<td>1</td>
</tr>
<tr>
<td>2&quot; Pipe Insulation (Electric)</td>
<td>1</td>
</tr>
<tr>
<td>4&quot; Diffusor</td>
<td>1</td>
</tr>
<tr>
<td>2&quot;x31&quot; Vent pipe (electric)</td>
<td>1</td>
</tr>
<tr>
<td>1&quot; Diffusor (Electric)</td>
<td>1</td>
</tr>
<tr>
<td>4&quot;x31&quot; Vent Pipes(NE)</td>
<td>1</td>
</tr>
</tbody>
</table>

**Familiarise Yourself with the EXCEL**

1. **i)** Turn the drum handle clockwise to rotate the patented Bio-Drum for mixing and aeration. (The drum rotates counter-clockwise and the drum door closes). This is how you will rotate the drum during regular operation.
2. **ii)** Pull the drum locker button, (located under the footrest) and turn the handle counter-clockwise to simulate removal of compost. This is how you will remove compost during regular operation.
3. **iii)** Plug the unit's electrical cord (Electric) into a standard three-prong electrical outlet, and feel the air movement from the vent outlet at the front of the unit to ensure the vent system is working properly.
4. **iv)** Pull out the compost finishing drawers at the bottom right of the unit. After the unit has been plugged in for ten minutes, place a hand on the floor of the evaporating chamber (the area under the finishing drawer) to check it is warm to the touch, and that the heater is working properly.

**Inspecting the unit for damage**

1. **If there is any visible damage to the carton-**
   - The contents of the carton should be inspected before signing the bill of lading. Damaged units should be refused. Call Sun-Mar immediately.

2. **If the shipper has left-**
   - Report the damage immediately to the transport company and call Sun-Mar.

3. **Soon after delivery, remove the EXCEL carefully from the carton-**
   - If there is hidden damage, or for any service questions, contact Sun-Mar to determine the best course of action.

**What's in the Box**

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owners Manual</td>
<td>1</td>
</tr>
<tr>
<td>Warranty Card</td>
<td>1</td>
</tr>
<tr>
<td>Excel Hardware Kit</td>
<td>1</td>
</tr>
<tr>
<td>Footrest</td>
<td>2</td>
</tr>
<tr>
<td>1&quot; x 8'/4&quot; Drain Hose(NE)</td>
<td>1</td>
</tr>
<tr>
<td>Compost Sure Green</td>
<td>1</td>
</tr>
<tr>
<td>1-1/2&quot; Roof Flashing (Electric)</td>
<td>1</td>
</tr>
<tr>
<td>1&quot; Bowl Liner</td>
<td>1</td>
</tr>
<tr>
<td>1&quot; Rake</td>
<td>1</td>
</tr>
<tr>
<td>1-6&quot; Diffusor(NE)</td>
<td>1</td>
</tr>
<tr>
<td>3-4&quot;x31&quot; Vent Pipes(NE)</td>
<td>1</td>
</tr>
<tr>
<td>2&quot; Pipe Insulation (Electric)</td>
<td>1</td>
</tr>
<tr>
<td>4&quot; Diffusor (Electric)</td>
<td>1</td>
</tr>
<tr>
<td>4-2&quot;x31&quot; Vent pipe (electric)</td>
<td>1</td>
</tr>
<tr>
<td>1/2&quot; Roof Flashing (NE)</td>
<td>1</td>
</tr>
<tr>
<td>4&quot; Roof Flashing (NE)</td>
<td>1</td>
</tr>
<tr>
<td>1-1/2&quot; Roof Flashing (Electric)</td>
<td>1</td>
</tr>
<tr>
<td>1&quot; Roof Insulation (Electric)</td>
<td>1</td>
</tr>
<tr>
<td>1&quot; Diffusor</td>
<td>1</td>
</tr>
<tr>
<td>2&quot; Pipe Insulation (Electric)</td>
<td>1</td>
</tr>
<tr>
<td>4&quot; Diffusor</td>
<td>1</td>
</tr>
<tr>
<td>2&quot;x31&quot; Vent pipe (electric)</td>
<td>1</td>
</tr>
<tr>
<td>1&quot; Diffusor (Electric)</td>
<td>1</td>
</tr>
<tr>
<td>4&quot;x31&quot; Vent Pipes(NE)</td>
<td>1</td>
</tr>
</tbody>
</table>

**Familiarise Yourself with the EXCEL**

1. **i)** Turn the drum handle clockwise to rotate the patented Bio-Drum for mixing and aeration. (The drum rotates counter-clockwise and the drum door closes). This is how you will rotate the drum during regular operation.
2. **ii)** Pull the drum locker button, (located under the footrest) and turn the handle counter-clockwise to simulate removal of compost. This is how you will remove compost during regular operation.
3. **iii)** Plug the unit's electrical cord (Electric) into a standard three-prong electrical outlet, and feel the air movement from the vent outlet at the front of the unit to ensure the vent system is working properly.
4. **iv)** Pull out the compost finishing drawers at the bottom right of the unit. After the unit has been plugged in for ten minutes, place a hand on the floor of the evaporating chamber (the area under the finishing drawer) to check it is warm to the touch, and that the heater is working properly.
<table>
<thead>
<tr>
<th>Symptom</th>
<th>Cause</th>
<th>Remedial Action</th>
<th>Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan Not Working</td>
<td>Debris in fan or mechanical failure.</td>
<td>Remove the fan assembly from the unit and vacuum any dust out of the fan blades. Check the power source. If this does not remedy the problem, have your serial number ready and call SUNMAR.</td>
<td>The fan is a continuously moving part which will eventually have to be changed. Do Not turn on and off daily.</td>
</tr>
<tr>
<td>Liquid Build up/Lack of Evaporation</td>
<td>Increased usage.</td>
<td>The amount of liquid varies substantially between installations. The overflow drain needs to be installed.</td>
<td>Install the overflow drain.</td>
</tr>
<tr>
<td></td>
<td>Climatic conditions</td>
<td>Evaporation rates vary substantially with climatic conditions. Expect faster evaporation rates during warm dry weather.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mineral salts may have accumulated in the evaporation chamber over time, reducing evaporation rates.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquid Overflow</td>
<td>Drains Blocked</td>
<td>To remove these, fill the evaporation chamber with very hot water and 1/3 bottle of “Compost Quick” enzyme liquid. Leave overnight. - Drain all liquid through the overflow drain by tipping the unit up (make sure overflow is hooked up first)</td>
<td>1. Rake peat moss away from the safety drains. This is the “build up” area. If drains are still clogged, proceed to step 3.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Check drain line for kinks, blockages or upward bends. Remove and flush if blockages present, unlink if bent and ensure that the drain pipe is sloping downward. If your drain pipe is in order, proceed to step 3.</td>
<td>1. A clogged drain is not very likely to happen if you rake your evaporating chamber every 3-4 months.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Use a wire to poke blockage out of the drain assembly. You will notice if this is clogged because you will see a brown spot through the opaque assembly.</td>
<td>2. Use premium 1”ID hose for the drain line. A good hose will be less likely to kink. Use elbows or fittings around bends to prevent kinks.</td>
</tr>
</tbody>
</table>

**Installation**

**EXCEL and EXCEL NE ROUGH IN DIMENSIONS**

- Diagram of the EXCEL and EXCEL NE ROUGH IN DIMENSIONS with specific dimensions and measurements.
EXCEL Electric Installation

Space Required and Other Installation Considerations

1) Compost will be removed from the finishing drawer. Ensure that there is at least 15” in front of the EXCEL so that the drawer may be removed from the unit.
2) Install the unit in a location where the safety drain can be connected if required. This drain exits from the back of the unit and must slope downward at all points.
3) Install in a location where the vent pipe can be attached as per the instructions listed below.
4) Install in a location that is not air tight.
5) Ensure that there is a three-pronged plug with a GFI (ground fault interrupter) installed within 5 feet of the unit.
6) Ensure the EXCEL is protected from precipitation.

Vent Pipe Location

1) If running a vent through a wall, it should be done at a 45° angle to prevent condensation from accumulating in the vent pipe, causing a constriction. THERE SHOULD BE NO HORIZONTAL SECTIONS OF VENT. Venting should be installed vertically.
2) All vent pipe that is exposed to the outside or in a non-heated space should be insulated if using the unit during cold weather.
3) INSTALL VENT SO THAT IT TERMINATES 24” - 30” ABOVE HIGHEST PEAK OF THE ROOF.
4) If you will be installing venting on a steeply pitched roof where snow shear may occur: Install a heavier pipe through the roof and feed the enclosed vent through the heavier pipe. Seal between the pipes with expandable foam or other such water-tight substance. The heavier pipe should be able to withstand the weight of sliding snow.
5) If there is more than 36” of vent needed above the roof line to reach 24-30” above the highest peak of the roof (diffuser included in measurement), use guy wires to secure the vent above the roof.
6) Limit bends in the vent stack to no more than 4 that have a combined total of 180°.
7) The vent must be installed separately from ALL other household vents. Venting cannot be merged with other venting. Doing so will prevent the unit from operating odorlessly.
8) All connectors in the vent pipe should be sealed. Use silicone caulking to seal the connection between the vent and the fan. PVC cement may be used all other vent connections.
9) The diffuser should be glued vertically on to the top of the vent pipe. This assembly helps draw air up the vent pipe.

Possible venting configurations for the 2” electric vent pipe.

MECHANICAL TROUBLE SHOOTING

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Cause</th>
<th>Remedial Action</th>
<th>Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urine Odour in Washroom</td>
<td>Horizontal runs or downward slopes on vent pipe</td>
<td>Re-install the vent so there are no horizontal or low points where condensation can collect.</td>
<td>Install wall brackets on vent pipe to prevent vent settling. DO NOT install horizontal runs as liquid will collect and block ventilation, causing odour.</td>
</tr>
<tr>
<td>Fan has failed</td>
<td>Have your serial number ready and call SUN-MAR for a replacement. Instructions are included with the replacement fan.</td>
<td>-</td>
<td>The fan is a constantly moving part and has a finite service life.</td>
</tr>
<tr>
<td>Downdraft</td>
<td>If you believe that there may be a downdraft outside of the building, it may be a good idea to remove your fan assembly prior to installation and set the fan gate to ‘O’ to prevent urine odor in the bathroom. (electric)</td>
<td>Install a 12 volt fan in vent pipe. (NE)</td>
<td>-</td>
</tr>
<tr>
<td>Competing appliances</td>
<td>Wood stoves or furnaces installed in a tightly sealed room with the composting toilet may draw air in causing a vacuum in the room. This will draw air down the vent pipe.</td>
<td>Install an air intake to the competing appliance from the outside.</td>
<td>-</td>
</tr>
<tr>
<td>Occasional Urine Odor Outside</td>
<td>1. Vent stack not installed above peak of roof. 2. If vent stack is installed above roof line, natural obstructions, such as tall trees, being located in a valley or close to a hill may be causing downdraft.</td>
<td>1. Check that the vent is installed above the peak of the roof. If not, extend the vent. Guide wires may be necessary. 2. Add line to the evaporation chamber - as much as you think necessary. You will have to rake more often if you do this.</td>
<td>Downdraft is dependent on wind direction as well as natural obstructions etc. Initially, install the vent above the peak of the roof. If symptoms occur, add line or a filter box.</td>
</tr>
<tr>
<td>Strong Sewage Odor</td>
<td>Compost is anaerobic.</td>
<td>1. If it is rattling, it may need to be cleaned or the bearings are worn and the fan needs to be replaced.</td>
<td>Follow “Ongoing Maintenance” and use proper bulking material.</td>
</tr>
<tr>
<td>Fan Noisy</td>
<td>Fan damaged in shipping or bearings are beginning to wear.</td>
<td>1. A hum is the normal sound the fan will make. If you are in a very quiet setting it will be more noticeable. If this is the case, consider purchasing a fan speed control so that the fan may be turned down.</td>
<td>Clean the fan with a small brush and/or compressed air nozzle once a year. To do this, remove the fan assembly by taking off the snap cap covers and unscrewing the screws which hold it in. The entire assembly will then simply slide out. This will prevent wear and lengthen the life of your fan.</td>
</tr>
</tbody>
</table>
Compost Troubleshooting

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Cause</th>
<th>Remedial Action</th>
<th>Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compost Too Wet</td>
<td>Compost porosity is poor</td>
<td>Change bulking material to Compost Sure Green.</td>
<td>Use Sun-Mar Compost Sure Green</td>
</tr>
<tr>
<td></td>
<td>Drum screen clogged</td>
<td>Spray the drum screen with Compost Quick. Scrub the drum screen with wire brush.</td>
<td></td>
</tr>
<tr>
<td>Waste not Breaking Down at all</td>
<td>Insufficient moisture in compost</td>
<td>A moisture content of 40-60% is ideal for aerobic microbes to thrive.</td>
<td>Add water to patented bio-drum</td>
</tr>
<tr>
<td></td>
<td>Insufficient microbes</td>
<td>Add Sun-Mar Microbe Mix.</td>
<td>Be sure to add microbe packet at start up</td>
</tr>
<tr>
<td></td>
<td>Room temperature under 55 °F/13 °C</td>
<td>Install heat source to increase temperature. Temperature should be kept above 55°F/13°C constantly to ensure the composting action does not stop completely.</td>
<td>Install unit in warm area. The warmer the area, the better your compost will be!</td>
</tr>
<tr>
<td>Large Lumps in Compost</td>
<td>Compost Too Dry</td>
<td>Add 1/2 to 1 gallon of warm water to compost in order to bring it up to appropriate moisture level. Remove lumps or break them apart.</td>
<td>Use proper bulking material and add warm water if necessary.</td>
</tr>
<tr>
<td>Drum Too Full</td>
<td>Compost not emptied into finishing drain in a timely fashion</td>
<td>Remove compost until drum is only half full or less. Floatate compost thoroughly to aerate and add compost accelerant (Compost Quick and Microbe Mix) if available.</td>
<td>When drum is 1/2 full, remove some compost to the finishing drawer. Do NOT let drum get up above 1/2 full. This will lead to lack of aeration, and anaerobic compost.</td>
</tr>
<tr>
<td>Kitchen/Garden Waste added</td>
<td>We do not recommend adding kitchen or garden scraps.</td>
<td>Do Not add kitchen or garden waste.</td>
<td></td>
</tr>
<tr>
<td>Flies Present</td>
<td>Compost too dry</td>
<td>1. To eliminate flies, you can use any pesticide that is used on your garden. Pesticides used for garden use are not anti-bacterial so are safe to use on your compost. 2. The alternative to using pesticides is to completely clean the toilet out, wash the inside with soap and water IMPORTANT: Application of a pesticide in a SUN-MAR toilet is not a health concern because all SUN-MAR units are vented. If using pesticides, avoid spilling on the outer shell of the compost.</td>
<td>1. Keep compost moist. In order to determine a good level of moisture, shine a flashlight into the drum. The compost should have a slight gloss or shine. If it does not, add warm water to it until it reaches this consistency. Fungus grows tend to be attracted to a dry compost, due to the fungus which begins to form on the surface when it dries out. A good, moist compost will not be attractive to flies. 2. Do not add tooil from the ground, composted matter, or kitchen scraps to the toilet. Flies may be present in, or attracted to these items. 3. Use “Compost Sure Green”.</td>
</tr>
</tbody>
</table>

Leading the vent through the roof

As shown in the installation, the vent stack should end about 30” above the peak of the roof so that it is less subject to downdraft. Where the pipe is taken through the roof, the roof flashing provided should be used to seal the installation. Insert the vent into the bell of the roof flashing and slide the roof flashing down until it lays evenly on the roof. Slip the upper edge or the roof flashing flange under the shingles. Outline the flashing on the roof. Raise the roof flashing and apply silicone sealant or roofing tar inside the outline. Slide the flashing back into place and firmly press onto the sealant. The flashing is properly placed when the top part of the roof flashing flange is tucked under the shingles and the lower portion is sealed on top of the shingles so that water sheds easily. Secure the flashing with corrosion resistant nails at each corner and along the sides. Any exposed nails should be sealed with silicone caulking.

If you are in an area where snow shear is a danger, you may wish to install a heavier pipe around the vent pipe where it exits from the roof. If you do choose to do this, ensure that you seal the area between the pipes with a waterproof substance to prevent leaks.

The Diffusor

The diffusor provided with the unit is a simple device to be installed at the top of the vent stack with the larger pipe protruding above the smaller. To install, simply glue the diffusor vertically on the topmost section of vent pipe. The diffusor design encourages updraft, and discourages wind and weather from going down the vent stack. We do not recommend installing anything else on the top of the vent as it could impede the venting. Unlike wind turbines, diffusers are less likely to freeze in winter, and are more effective in calm weather.

Drain Installation

The safety drain should be connected as it will be required. - Remove the orange cap from one side of the overflow drain assembly. - Place a 1” hose clamp over the end of the drain hose that will be connected to the overflow drain assembly. - Push the drain hose over the ribbed end of the over-flow drain and clamp with the 1” SS hose clamp. - Connect the 1” hose to an approved drainage facility. - Pull drain hose over the ribbed end of the over-flow drain and clamp with the 1” SS hose clamp. - Install heat source to increase temperature. - Install unit in warm area. The warmer the area, the better your compost will be! - Use Sun-Mar Microbe Mix. - Add Sun-Mar Compost Sure Green.

Handling Effluent

The following are possible options to take care of the liquid:
- Feed into a lined pit filled with gravel and sand. Such a recycling bed also ensures a closed loop system.
- Feed into a small cesspit or “french drain”.
- Feed into a small cesspit or “french drain”.
- Feed into a small cesspit or “french drain”. - Connect the 1” hose to an approved drainage facility. Installation should be in accordance with applicable local regulations.

Electrical Considerations

A ground fault interrupter (GFI) circuit is recommended for any unit installed in an environment where it will be exposed to moisture. This may be installed directly on the wall socket or at the circuit breaker. If you are in an area where you experience power fluctuations, you may wish to install a surge protector.
EXCEL NE Installation

Space Required and other Installation Considerations

1) Compost will be removed from the finishing drawer. Ensure that there is at least 15" in front of the EXCEL NE so that the drawer may be removed from the unit.
2) Install the unit in a location where the safety drain can be connected. This drain exits from the back of the unit and must slope downward at all points. **THE DRAIN IS REQUIRED PRIOR TO OPERATION.**
3) Install in a location where the vent pipe can be attached as per the instructions listed below.
4) Install in a location that is not air tight.
5) Competing appliances (ie. wood stove) may need a air intake installed from the outdoors. The EXCEL NE has a passive vent. Competing appliances draw alot of air and may cause your composting toilet vent to draw air into the building rather than venting to the outside. A 12 volt fan will be required.
6) Bends in the vent, installation near hills or overhanging trees may cause downdraft. A 12 volt fan may be required.

Vent Pipe Location

1) All vent should be vertically installed.
2) Limit bends in the vent stack to no more than 2 - 45° bends. **THERE SHOULD BE NO HORIZONTAL SECTIONS OF VENT.**
3) INSTALL VENT SO THAT IT TERMINATES 24" - 30" ABOVE HIGHEST PEAK OF THE ROOF. If the vent is being installed on a steeply pitched roof where snow shear may occur; Install a heavier pipe through the roof and feed the enclosed vent through the heavier pipe. Seal between the pipes with expanding foam or other such water-tight material. The heavier pipe should be able to withstand the weight of sliding snow.
4) If there is more than 36" of vent needed above the roof line to reach 24-30" above the highest peak of the roof (diffusor included in measurement), use guy wires to secure the vent above the roof.
5) The vent must be installed separately from ALL other household vents. Venting cannot be merged with other venting. Doing so will prevent the unit from operating odorlessly.
6) All connectors in the vent pipe should be sealed. **Use silicone caulking to seal the connections.**
7) The diffusor should be glued vertically on to the top of the vent pipe. This assembly helps draw air up the vent pipe.

Inlet Coupling

Place the vent inlet coupling into the hole for the 4" vent so that the 1" of smaller diameter pipe is protruding into the hole in the top of the unit. This is the first piece of the venting. Once you have finished assembling the vent, you should run a bead of silicone around the inlet coupling to prevent odor from escaping.

Removing Compost from the patented Bio-Drum

The level of compost in the Bio-drum should never be more than half full. As a guide, the compost in the drum should be at least 4 inches from the bottom of the drum door. Compost must be removed from the drum by following the steps outlined in this section.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pull the drum lock button</strong></td>
<td>Remove the footrest from the front of the toilet. Pull the drum lock button out and hold it out while turning the handle.</td>
</tr>
<tr>
<td><strong>Turn the handle counter-clockwise</strong></td>
<td>While holding the drum lock button out, turn the handle counterclockwise for three revolitions of the handle. Release the drum lock button and continue to turn the handle counter-clockwise until the handle hits a hard stop.</td>
</tr>
<tr>
<td><strong>Level the compost in the drawer</strong></td>
<td>Open the drawer and use your rake to level the compost. Levelling the compost will prevent the compost from soiling the patented bio-drum.</td>
</tr>
<tr>
<td><strong>Allow the compost to rest</strong></td>
<td>Compost should now be allowed to rest in the drawer for 3 - 4 weeks to finish the composting process. This compost will be isolated from any new waste and should be left in the drawer for a minimum of 4 weeks or longer to finish composting.</td>
</tr>
</tbody>
</table>

Compost maybe be removed at any time that you may need more space in the drum and will need to be removed more frequently for heavily used units or where the EXCEL is the primary residential toilet.
Seasonal Use and Spring time Start Up

Empty Compost from Last Season
Before your first use of the unit, extract compost from the drum by releasing the drum locker (located on the handle side of the unit), then rotate the handle counter-clockwise giving the drum one complete revolution only. Compost from the drum will drop into the finishing drawer. Empty the drawer and repeat this procedure until most of the compost is removed, leave 4-6 inches of compost. This will be your “starter base” for the coming season.

Rake
Remove the finishing drawer completely and use the rake tool to rake any loose material from the floor of the unit. Pay careful attention to the left two corners of the unit (near the safety drain) to ensure that your drains do not get clogged.

Add Water & Microbe Mix
Add some warm water to the remaining compost, enough to ensure that it is quite moist. Also, add some Sun-Mar Microbe Mix (two of scoops) to give the compost pile a “kick-start” and rotate the drum several times to mix. If your composting toilet is electric, plug it in and use for another season.

Winter Use
No Winter Use
Just add water. Lots of water. Soak the compost in the drum to prevent it from drying out before Spring. Make sure to unplug the unit if electric. If you have a non-electric unit, it may be a good idea to place something over the diffuser to prevent animals (who are looking for a home at this time of year) from getting in.

Occasional Winter Use
If the unit will be used for 3-4 weekends throughout the winter season then it is considered occasional use. All of the same considerations should be taken with these units to wintertize them. When the temperature dips below 55 °F (13 °C), composting activity will decrease dramatically. These units do not need to be kept warm and will act only as a holding tank during the winter months until they warm up enough in the spring to begin composting again. During the winter, the compost will freeze into a solid mass so the drum should not be turned as it may damage the composting toilet. With this in mind, it is a good idea to remove enough compost before it gets too cold to make room in the drum for winter use.

Heavy or Residential Winter Use
These units should be kept in a heated area and all winterization tips should be followed, including the following:

1. Vent Pipe - electric models: All 2” vent pipe should be insulated if they are exposed to the outside or in an unheated area. If you are in an area that experiences extreme winter conditions, we recommend that heat tape should be applied to the exposed vent pipe to prevent ice blockages.
2. Safety Drain - all models; We recommend that the safety drain be installed and insulated above the frost line. There will be less evaporation in the winter so this will help with any excess liquid. If possible, heat tape can be applied to the safety drain to prevent ice blockage.
3. Keep it warm; If the composting toilet is used frequently in the winter then the composting part of the unit should be kept in a warm place. Below 55 °F (13 °C), composting actions slow dramatically so if it is in a place that falls below this temperature, a source of heat should be provided for the unit so that it can keep up with constant use.

Leaving the vent through the roof
As shown in the installation, the vent stack should end about 30” above the peak of the roof so that it is less subject to down-draft. Where the pipe is taken through the roof, the roof flashing provided should be used to seal the installation. Insert the vent into the bell of the roof flashing and slide the roof flashing down until it lays evenly on the roof. Slip the upper edge or the roof flashing flange under the shingles. Outline the flashing on the roof. Raise the roof flashing and apply silicone sealant or roofing tar inside the outline. Slide the flashing back into place and firmly press onto the sealant. The flashing is properly placed when the top part of the roof flashing flange is tucked under the shingles and the lower portion is sealed on top of the shingles so that water sheds easily. Secure the flashing with corrosion resistant nails at each corner and along the sides. Any exposed nails should be sealed with silicone caulking.

If you are in an area where snow shear is a danger, you may wish to install a heavier pipe around the vent pipe where it exits from the roof. If you do choose to do this, ensure that you seal the area between the pipes with a waterproof substance to prevent leaks.

The Diffuser
The diffuser provided with the unit is a simple device to be installed at the top of the vent stack with the larger pipe protruding above the smaller. To install, simply glue the diffuser vertically on the topmost section of vent pipe. The diffuser design encourages updraft, and discourages wind and weather from going down the vent stack. We do not recommend installing anything else on the top of the vent as it could impede the venting. Unlike wind turbines, diffusers are less likely to freeze in winter, and are more effective in calm weather.

Drain Installation
The safety drain should be connected as it will be required.
- Remove the orange cap from one side of the overflow drain assembly.
- Place a 1” hose clamp over the end of the drain hose that will be connected to the overflow drain assembly.
- Push the drain hose over the ribbed end of the overflow drain and clamp with the 1” SS hose clamp.
- Remove the orange cap from one side of the overflow drain assembly.

Handling Effluent
The following are possible options to take care of the liquid:
- Feed into a lined pit filled with gravel and sand. Such a recycling bed also ensures a closed loop system.
- Feed into a small cesspit or “french drain”.
- Plumb into an existing septic or holding tank line.

Installation should be in accordance with applicable local regulations.
Start Up and Use

Initially, when starting up your EXCEL, follow these steps. These steps are only used when starting up your EXCEL for the first time or when you have emptied the drum and need to re-start the compost.

After installation is completed do the following:

**Step 1**: Spray Compost Quick: Remove the finishing drawer and spray the whole inner floor of the unit under the finishing drawer. Spray Compost Quick into the patented Bio-drum and the inside of the finishing drawer.

**Step 2**: Pour one half bag of Compost Sure Green into a bucket and add 2 quarts of warm water. Add 1/2 of the Microbe Mix packet to the bucket. Allow the Compost Sure Green to absorb the water (about an hour).

**Step 3**: Scoop the Compost Sure Green mixture into the patented Bio-Drum through the access door on the EXCEL. Rotate the drum to mix.

**Step 4**: If the unit is electric, plug it in to a three prong electrical outlet. The fan will run continuously 24 hours per day while the unit is being used. The opening in the drum must remain open under the waste pipe. The EXCEL is now ready for use.

When you first start up the EXCEL, it will take approximately 6 weeks at optimum temperatures (70-90 ° F) before you will have sufficient quantities of microbes in the drum to actually achieve a good compost. During this time, the contents of the patented Bio-Drum start out as Compost Sure Green and waste. Over the first 6 weeks, you will notice that the compost will hold moisture and will become more uniformly dark in colour. During the first 6 weeks, you may notice that some Compost Sure Green has fallen through the drum screen onto the evaporation chamber to the left of the finishing drawer. This should be raked out and removed with the rake tool provided with the unit.

---

Ongoing Toilet Maintenance

Once your EXCEL is installed and you have gone through the initial start-up procedure, follows the steps outlined below to keep your composting toilet working optimally.

<table>
<thead>
<tr>
<th><strong>Activity</strong></th>
<th><strong>Frequency</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Add one cup of Compost Sure Green per person per day of use</td>
<td>Every day</td>
</tr>
<tr>
<td>Spray Compost Quick on the surface of the compost</td>
<td>Every second day before turning the handle, spray 3-4 sprays of Compost Quick on the surface of the compost. Compost Quick is an enzyme that will speed up the composting process.</td>
</tr>
<tr>
<td>Turn the handle clockwise every second day to mix the compost</td>
<td>Turn the handle in a clockwise direction to mix and aerate the compost. When mixing, ensure that the drum rotates 6 complete revolutions (36 turns of the handle).</td>
</tr>
<tr>
<td>Make sure that the opening in the drum is centered under the waste pipe.</td>
<td>The hole in the drum must be open under the toilet seat, ready to receive waste.</td>
</tr>
<tr>
<td>Every two weeks</td>
<td>Add one scoop of Microbe Mix to the patented bio-drum to 'recharge' the pile. This will help to ensure your microbe colony stays constant and healthy.</td>
</tr>
<tr>
<td>Every three months</td>
<td>Rake the evaporation chamber: Remove the finishing drawer. Rake any solid debris from the floor of the unit under the drawer (evaporation chamber), paying extra attention to the two back corners of the unit as this is where debris may accumulate. Remove the solid debris.</td>
</tr>
<tr>
<td>Twice per year</td>
<td>Clean the drum screen. Spray the drum screen with Compost Quick and let sit for 15 minutes (this will help to loosen the debris if the screen is not too encrusted). Scrub the screen vigorously with the wire brush. If brushing the screen does not clear it and liquid is still not draining through the screen, you may have to resort to having to use a screwdriver or nail to puncture each hole in the drum screen.</td>
</tr>
<tr>
<td>Periodic maintenance</td>
<td>Remove compost from the drum. When the drum is half full (even with the middle of the drum hub at the front of the drum) it is time to remove compost. To remove compost from the drum: 1) Remove the footrest. 2) Pull the drum lock button located below the footrest on the EXCEL. 3) While holding out the white drum lock button, turn the handle in a counter-clockwise direction for one complete revolution of the drum.</td>
</tr>
</tbody>
</table>

---

**CAUTION**

1. Do NOT add or clean the toilet bowl liner with chemicals. Chemicals will kill the bacteria. **INSTEAD**, clean the bowl liner with Compost Quick.
2. Do NOT add plastic, glass, metal, cleaning fluids, cigarettes. Add only waste and bulking material.
3. Kitchen or garden waste are **NOT** recommended.
4. Do NOT add baby wipes, diapers or feminine paper as they will not compost.
Start Up and Use

Initially, when starting up your EXCEL, follow these steps. These steps are only used when starting up your EXCEL for the first time or when you have emptied the drum and need to re-start the compost.

After installation is completed do the following:

Step 1: Spray Compost Quick: Remove the finishing drawer and spray the whole inner floor of the unit under the finishing drawer. Spray Compost Quick into the patented Bio-drum and the inside of the finishing drawer.

Step 2: Pour one half bag of Compost Sure Green into a bucket and add 2 quarts of warm water. Add 1/2 of the Microbe Mix packet to the bucket. Allow the Compost Sure Green to absorb the water (about an hour).

Step 3: Scoop the Compost Sure Green mixture into the patented Bio-Drum through the access door on the EXCEL. Rotate the drum to mix.

Step 4: If the unit is electric, plug it in to a three prong electrical outlet. The fan will run continuously 24 hours per day while the unit is being used. The opening in the drum must remain open under the waste pipe. The EXCEL is now ready for use.

When you first start up the EXCEL, it will take approximately 6 weeks at optimum temperatures (70-90 °F) before you will have sufficient quantities of microbes in the drum to actually achieve a good compost. During this time, the contents of the patented Bio-Drum start out as Compost Sure Green and waste. Over the first 6 weeks, you will notice that the compost will hold moisture and will become more uniformly dark in colour.

During the first 6 weeks, you may notice that some Compost Sure Green has fallen through the drum screen onto the evaporation chamber to the left of the finishing drawer. This should be raked out and removed with the rake tool provided with the unit.

Ongoing Toilet Maintenance

Once your EXCEL is installed and you have gone through the initial start-up procedure, follows the steps outlined below to keep your composting toilet working optimally.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Every week</td>
<td>Add one cup of Compost Sure Green per person per day of use</td>
</tr>
<tr>
<td>Every second day</td>
<td>Before turning the handle, spray 3-4 sprays of Compost Quick on the surface of the compost. Compost Quick is an enzyme that will speed up the composting process.</td>
</tr>
<tr>
<td>Every two weeks</td>
<td>Add one scoop of Microbe Mix to the patented bio-drum to ‘recharge’ the pile. This will help to ensure your microbe colony stays constant and healthy.</td>
</tr>
<tr>
<td>Every three months</td>
<td>Rake the evaporation chamber: Remove the finishing drawer. Rake any solid debris from the floor of the unit under the drawer (evaporation chamber), paying extra attention to the two back corners of the unit as this is where debris may accumulate. Remove the solid debris.</td>
</tr>
<tr>
<td>Twice per year</td>
<td>Clean the drum screen. Spray the drum screen with Compost Quick and let sit for 15 minutes (this will help to loosen the debris if the screen is not too encrusted). Scrub the screen vigorously with the wire brush. If brushing the screen does not clear it and liquid is still not draining through the screen, you may have to resort to having to use a screwdriver or nail to puncture each hole in the drum screen.</td>
</tr>
</tbody>
</table>
| Periodic        | Remove compost from the drum. When the drum is half full (even with the middle of the drum hub at the front of the drum) it is time to remove compost. To remove compost from the drum:  
  1) Remove the footrest.  
  2) Pull the drum lock button located below the footrest on the EXCEL.  
  3) While holding out the white drum lock button, turn the handle in a counter-clockwise direction for one complete revolution of the drum. |

CAUTION

1. Do NOT add or clean the toilet bowl liner with chemicals. Chemicals will kill the bacteria. INSTEAD, clean the bowl liner with Compost Quick.
2. Do NOT add plastic, glass, metal, cleaning fluids, cigarettes. Add only waste and bulking material.
3. Kitchen or garden waste are NOT recommended.
4. Do NOT add baby wipes, diapers or feminine paper as they will not compost.
Seasonal Use and Spring time Start Up

Empty Compost from Last Season
Before your first use of the unit, extract compost from the drum by releasing the drum locker (located on the handle side of the unit), then rotate the handle counter-clockwise giving the drum one complete revolution only. Compost from the drum will drop into the finishing drawer. Empty the drawer and repeat this procedure until most of the compost is removed, leave 4-6 inches of compost. This will be your “starter base” for the coming season.

Rake
Remove the finishing drawer completely and use the rake tool to rake any loose material from the floor of the unit. Pay careful attention to the left two corners of the unit (near the safety drain) to ensure that your drains do not get clogged.

Add Water & Microbe Mix
Add some warm water to the remaining compost, enough to ensure that it is quite moist. Also, add some Sun-Mar Microbe Mix (two of scoops) to give the compost pile a “kick-start” and rotate the drum several times to mix. If your composting toilet is electric, plug it in and use for another season.

Winter Use

No Winter Use
Just add water. Lots of water. Soak the compost in the drum to prevent it from drying out before Spring. Make sure to unplug the unit if electric. If you have an non-electric unit, it may be a good idea to place something over the diffuser to prevent animals (who are looking for a home at this time of year) from getting in.

Occasional Winter Use
If the unit will be used for 3-4 weekends throughout the winter season then it is considered occasional use. All of the same considerations should be taken with these units to winterize them. When the temperature dips below 55 ° F (13 ° C), composting activity will decrease dramatically. These units do not need to be kept warm and will act only as a holding tank during the winter months until they warm up enough in the spring to begin composting again. During the winter, the compost will freeze into a solid mass so the drum should not be turned as it may damage the composting toilet. With this in mind, it is a good idea to remove enough compost before it gets too cold to make room in the drum for winter use.

Heavy or Residential Winter Use
These units should be kept in a heated area and all winterization tips should be followed, including the following:
1. Vent Pipe - electric models: All 2” vent pipe should be insulated if they are exposed to the outside or in an unheated area. If you are in an area that experiences extreme winter conditions, we recommend that heat tape should be applied to the exposed vent pipe to prevent ice blockages.
2. Safety Drain - all models: We recommend that the safety drain should be installed and insulated above the frost line. There will be less evaporation in the winter so this will help with any excess liquid. If possible, heat tape can be applied to the safety drain to prevent ice blockage.
3. Keep it warm; If the composting toilet is used frequently in the winter then the composting part of the unit should be kept in a warm place. Below 55 ° F (13 ° C), composting actions slow dramatically so if it is in a place that falls below this temperature, a source of heat should be provided for the unit so that it can keep up with constant use.

Handling Effluent
- Feed into a small cesspit or “french drain”.
- Push the drain hose over the ribbed end of the overflow drain and clamp with the 1” SS hose clamp.
- Place a 1” hose clamp over the end of the drain hose that will be connected to the overflow drain assembly.
- Remove the orange cap from one side of the overflow drain assembly.
- Connect the 1” hose to an approved drainage facility.
- Turn the handle counter-clockwise giving the drum one complete revolution only. Compost from the drum will drop into the finishing drawer.
- Push the drain hose over the ribbed end of the overflow drain and clamp with the 1” SS hose clamp.
- Remove the finishing drawer completely and use the rake tool to rake any loose material from the floor of the unit.
- Pay careful attention to the left two corners of the unit (near the safety drain) to ensure that your drains do not get clogged.
- If you are in an area that experiences extreme winter conditions, we recommend that heat tape should be applied to the exposed vent pipe to prevent ice blockage.
- If the unit will be used for 3-4 weekends throughout the winter season then it is considered occasional use. All of the same considerations should be taken with these units to winterize them.
- When the temperature dips below 55 ° F (13 ° C), composting activity will decrease dramatically. These units do not need to be kept warm and will act only as a holding tank during the winter months until they warm up enough in the spring to begin composting again. During the winter, the compost will freeze into a solid mass so the drum should not be turned as it may damage the composting toilet. With this in mind, it is a good idea to remove enough compost before it gets too cold to make room in the drum for winter use.
- Heavy or Residential Winter Use
- These units should be kept in a heated area and all winterization tips should be followed, including the following:
  1. Vent Pipe - electric models: All 2” vent pipe should be insulated if they are exposed to the outside or in an unheated area.
  2. Safety Drain - all models: We recommend that the safety drain should be installed and insulated above the frost line.
  3. Keep it warm; If the composting toilet is used frequently in the winter then the composting part of the unit should be kept in a warm place. Below 55 ° F (13 ° C), composting actions slow dramatically so if it is in a place that falls below this temperature, a source of heat should be provided for the unit so that it can keep up with constant use.

Leading the vent through the roof
As shown in the installation, the vent stack should end about 30” above the peak of the roof so that it is less subject to down-draft. Where the pipe is taken through the roof, the roof flashing provided should be used to seal the installation. Insert the vent into the bell of the roof flashing and slide the roof flashing down until it lays evenly on the roof. Slip the upper edge of the roof flashing flange under the shingles. Outline the flashing on the roof. Raise the roof flashing and apply silicone sealant or roofing tar inside the outline. Slide the flashing back into place and firmly press onto the sealant. The flashing is properly placed when the top part of the roof flashing flange is tucked under the shingles and the lower portion is sealed on top of the shingles so that water sheds easily. Secure the flashing with corrosion resistant nails at each corner and along the sides. Any exposed nails should be sealed with silicone caulking.

The Diffusor
The diffusor provided with the unit is a simple device to be installed at the top of the vent stack with the larger pipe protruding above the smaller pipe. To install, simply glue the diffusor vertically on the topmost section of vent pipe. The diffusor design encourages updraft, and discourages wind and weather from going down the vent stack. We do not recommend installing anything else on the top of the vent as it could impede the venting. Unlike wind turbines, diffusors are less likely to freeze in winter, and are more effective in calm weather.

Drain Installation
- The safety drain should be connected as it will be required.
  - Remove the orange cap from one side of the overflow drain assembly.
  - Place a 1” hose clamp over the end of the drain hose that will be connected to the overflow drain assembly.
  - Pull the drain hose over the ribbed end of the over-flow drain and clamp with the 1” SS hose clamp.
  - Connect the 1” hose to an approved drainage facility.

The following are possible options to take care of the liquid:
- Feed into a lined pit filled with gravel and sand. Such a recycling bed also ensures a closed loop system.
- Feed into a small cesspit or “french drain”.
- Plumb into an existing septic or holding tank line. Installation should be in accordance with applicable local regulations.
Space Required and other Installation Considerations

1) Compost will be removed from the finishing drawer. Ensure that there is at least 15" in front of the EXCEL NE so that the drawer may be removed from the unit.
2) Install the unit in a location where the safety drain can be connected. This drain exits from the back of the unit and must slope downward at all points. THE DRAIN IS REQUIRED PRIOR TO OPERATION.
3) Install in a location where the vent pipe can be attached as per the instructions listed below.
4) Install in a location that is not air tight.
5) Competing appliances (ie. wood stove) may need a air intake installed from the outdoors. The EXCEL NE has a passive vent. Competing appliances draw alot of air and may cause your composting toilet vent to draw air into the building rather than venting to the outside. A 12 volt fan will be required.
6) Bends in the vent, installation near hills or overhanging trees may cause downdraft. A 12 volt fan may be required.

Vent Pipe Location

1) All vent should be vertically installed.
2) Limit bends in the vent stack to no more than 2 - 45 ° bends. THERE SHOULD BE NO HORIZONTAL SECTIONS OF VENT.
3) INSTALL VENT SO THAT IT TERMINATES 24" - 30" ABOVE HIGHEST PEAK OF THE ROOF. If the vent is being installed on a steeply pitched roof where snow shear may occur; Install a heavier pipe through the roof and feed the enclosed vent through the heavier pipe. Seal between the pipes with expanding foam or other such water-tight material. The heavier pipe should be able to withstand the weight of sliding snow.
4) If there is more than 36" of vent needed above the roof line to reach 24-30" above the highest peak of the roof, use guy wires to secure the vent above the roof.
5) The vent must be installed separately from ALL other household vents. Venting cannot be merged with other venting. Doing so will prevent the unit from operating odorlessly.
6) All connectors in the vent pipe should be sealed. Use silicone caulking to seal the connections.
7) The diffusor should be glued vertically on to the top of the vent pipe. This assembly helps draw air up the vent pipe.

Inlet Coupling

Place the vent inlet coupling into the hole for the 4" vent so that the 1" of smaller diameter pipe is protruding into the hole in the top of the unit. This is the first piece of the venting. Once you have finished assembling the vent, you should run a bead of silicone around the inlet coupling to prevent odor from escaping.

EXCEL NE Installation

Removing Compost from the patented Bio-Drum

The level of compost in the Bio-drum should never be more than half full. As a guide, the compost in the drum should be at least 4 inches from the bottom of the drum door. Compost must be removed from the drum by following the steps outlined in this section.

<table>
<thead>
<tr>
<th>Pull the drum lock button</th>
<th>Remove the footrest from the front of the toilet. Pull the drum lock button out and hold it out while turning the handle.</th>
<th>The drum lock button is attached to a bar that sits in a molded depression in the drum. When you pull the button, you pull the bar out of the depression which allows you to turn the drum in the opposite direction.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turn the handle counter-clockwise</td>
<td>While holding the drum lock button out, turn the handle counterclockwise for three revolutions of the handle. Release the drum lock button and continue to turn the handle counterclockwise until the handle hits a hard stop.</td>
<td>The drum door will stay open allowing compost to fall into the finishing drawer. Fresh and composted material will be deposited into the drawer.</td>
</tr>
<tr>
<td>Level the compost in the drawer</td>
<td>Open the drawer and use your rake to level the compost.</td>
<td>Levelling the compost will prevent the compost from soiling the patented bio-drum.</td>
</tr>
<tr>
<td>Allow the compost to rest</td>
<td>Compost should now be allowed to rest in the drawer for 3 - 4 weeks to finish the composting process.</td>
<td>This compost will be isolated from any new waste and should be left in the drawer for a minimum of 4 weeks or longer to finish composting.</td>
</tr>
</tbody>
</table>

Compost maybe be removed at any time that you may need more space in the drum and will need to be removed more frequently for heavily used units or where the EXCEL is the primary residential toilet.
### Compost Troubleshooting

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Cause</th>
<th>Remedial Action</th>
<th>Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compost Too Wet</td>
<td>Compost porosity is poor.</td>
<td>Change bulking material to Compost Sure Green.</td>
<td>Use Sun-Mar Compost Sure Green</td>
</tr>
<tr>
<td></td>
<td>Drum screen clogged</td>
<td>Spray the drum screen with Compost Quick. Scrub the drum screen with wire brush.</td>
<td></td>
</tr>
<tr>
<td>Waste not Breaking Down at all</td>
<td>Insufficient moisture in compost</td>
<td>A moisture content of 40-60% is ideal for aerobic microbes to thrive.</td>
<td>Add water to patented bio-drum</td>
</tr>
<tr>
<td></td>
<td>Insufficient microbes</td>
<td>Add Sun-Mar Microbe Mix.</td>
<td>Be sure to add microbe packet at start up</td>
</tr>
<tr>
<td></td>
<td>Room temperature under 55 °F/13 °C</td>
<td>Install heat source to increase temperature. Temperature should be kept above 55°F/13°C constantly to ensure the composting action does not stop completely.</td>
<td>Install unit in warm area. The warmer the area, the better your compost will be!</td>
</tr>
<tr>
<td>Large Lumps in Compost</td>
<td>Compost Too Dry</td>
<td>Add 1/2 to 1 gallon of warm water to compost in order to bring it up to appropriate moisture level. Remove lumps or break them apart.</td>
<td>Use proper bulking material and add warm water if necessary.</td>
</tr>
<tr>
<td>Drum Too Full</td>
<td>Compost not emptied into finishing drawer in a timely fashion</td>
<td>Remove compost until drum is only half full or less. Floatate compost thoroughly to aerate, and add compost accelerator (Compost Quick and Microbe Mix) if available.</td>
<td>Do Not add kitchen or garden waste.</td>
</tr>
<tr>
<td></td>
<td>Kitchen/Garden Waste added</td>
<td>We do not recommend adding kitchen or garden scraps.</td>
<td></td>
</tr>
<tr>
<td>Flies Present</td>
<td>- Compost too dry</td>
<td>1. To eliminate flies, you can use any pesticide that is used on your garden. Pesticides used for garden use are not anti-bacterial so are safe to use on your compost. 2. The alternative to using pesticides is to completely clean the toilet out, wash the inside with soap and water. IMPORTANT: Application of a pesticide in a SUN-MAR toilet is not a health concern because all SUN-MAR units are vented. If using pesticides, avoid spilling on the outer shell of the compost.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Compost anaerobic</td>
<td>1. Keep compost moist. In order to determine a good level of moisture, shine a flashlight into the drum. The compost should have a slight gloss or shine. If it does not, add warm water to it until it reaches this consistency. Fungus grats tend to be attracted to a dry compost, due to the fungus which begins to form on the surface when it dries out. A good, moist compost will not be attractive to flies. 2. Do not add topsoil from the ground, composted matter, or kitchen scraps to the toilet. Flies may be present in, or attracted to these items. 3. Use &quot;Compost Sure Green&quot;.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Kitchen/garden waste added</td>
<td>1. Remove the orange cap from one side of the overflow drain assembly.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Foreign material added</td>
<td>1. Install heat source to increase temperature.</td>
<td></td>
</tr>
</tbody>
</table>

### Leading the vent through the roof
As shown in the installation, the vent stack should end about 30” above the peak of the roof so that it is less subject to downdraft. Where the pipe is taken through the roof, the roof flashing provided should be used to seal the installation. Insert the vent into the bell of the roof flashing and slide the roof flashing down until it lays evenly on the roof. Slip the upper edge or the roof flashing flange under the shingles. Outline the flashing on the roof. Raise the roof flashing and apply silicone sealant or roofing tar inside the outline. Slide the flashing back into place and firmly press onto the sealant. The flashing is properly placed when the top part of the roof flashing flange is tucked under the shingles and the lower portion is sealed on top of the shingles so that water sheds easily. Secure the flashing with corrosion resistant nails at each corner and along the sides. Any exposed nails should be sealed with silicone caulking.

If you are in an area where snow shear is a danger, you may wish to install a heavier pipe around the vent pipe where it exits from the roof. If you do choose to do this, ensure that you seal the area between the pipes with a waterproof substance to prevent leaks.

### The Diffusor
The diffusor provided with the unit is a simple device to be installed at the top of the vent stack with the larger pipe protruding above the smaller. To install, simply glue the diffusor vertically on the topmost section of vent pipe. The diffusor design encourages updraft, and discourages wind and weather from going down the vent stack. We do not recommend installing anything else on the top of the vent as it could impede the venting. Unlike wind turbines, diffusers are less likely to freeze in winter, and are more effective in calm weather.

### Drain Installation
The safety drain should be connected as it will be required.
- Remove the orange cap from one side of the overflow drain assembly.
- Place a 1” hose clamp over the end of the drain hose that will be connected to the overflow drain assembly.
- Push the drain hose over the ribbed end of the overflow drain and clamp with the 1” SS hose clamp.
- Add Sun-Mar Microbe Mix.
- The safety drain should be connected as it will be required.
- Use proper bulking material and add warm water if necessary.
- Do not add kitchen or garden waste.
- We do not recommend adding kitchen or garden scraps.
- To eliminate flies, you can use any pesticide that is used on your garden. Pesticides used for garden use are not anti-bacterial so are safe to use on your compost.
- The alternative to using pesticides is to completely clean the toilet out, wash the inside with soap and water.
- Emana compost anaerobic
- Application of a pesticide in a SUN-MAR toilet is not a health concern because all SUN-MAR units are vented. If using pesticides, avoid spilling on the outer shell of the compost.
- Keep compost moist. In order to determine a good level of moisture, shine a flashlight into the drum. The compost should have a slight gloss or shine. If it does not, add warm water to it until it reaches this consistency. Fungus grats tend to be attracted to a dry compost, due to the fungus which begins to form on the surface when it dries out. A good, moist compost will not be attractive to flies.
- Do not add topsoil from the ground, composted matter, or kitchen scraps to the toilet. Flies may be present in, or attracted to these items.
- Use "Compost Sure Green".

### Handling Effluent
The following are possible options to take care of the liquid:
- Feed into a lined pit filled with gravel and sand. Such a recycling bed also ensures a closed loop system.
- Composted matter, or kitchen scraps to the toilet. Flies may be present in, or attracted to these items.
- Use "Compost Sure Green".

### Electrical Considerations
A ground fault interrupter (GFI) circuit is recommended for any unit installed in an area where it will be exposed to moisture. This may be installed directly on the wall socket or at the circuit breaker. If you are in an area where you experience power fluctuations, you may wish to install a surge protector.
EXCEL Electric Installation

Space Required and Other Installation Considerations

1. Compost will be removed from the finishing drawer. Ensure that there is at least 15” in front of the EXCEL so that the drawer may be removed from the unit.
2. Install the unit in a location where the safety drain can be connected if required. This drain exits from the back of the unit and must slope downward at all points.
3. Install in a location where the vent pipe can be attached as per the instructions listed below.
4. Install in a location that is not air tight.
5. Ensure that there is a three-pronged plug with a GFI (ground fault interrupter) installed within 5 feet of the unit.
6. Ensure the EXCEL is protected from precipitation.

Vent Pipe Location

1. If running a vent through a wall, it should be done at a 45° angle to prevent condensation from accumulating in the vent pipe, causing a constriction. **There should be no horizontal sections of vent.** Venting should be installed vertically.
2. All vent pipe that is exposed to the outside or in a non-heated space should be insulated if using the unit during cold weather.
3. **Install vent so that it terminates 24” - 30” above highest peak of the roof.**
4. If you will be installing venting on a steeply pitched roof where snow shear may occur; Install a heavier pipe through the roof and feed the enclosed vent through the heavier pipe. Seal between the pipes with expandable foam or other such water-tight substance. The heavier pipe should be able to withstand the weight of sliding snow.
5. If there is more than 36” of vent needed above the roof line to reach 24-30” above the highest peak of the roof (diffuser included in measurement), use guy wires to secure the vent above the roof.
6. Limit bends in the vent stack to no more than 4 that have a combined total of 180°.
7. The vent must be installed separately from all other household vents. Venting cannot be merged with other venting. Doing so will prevent the unit from operating odorlessly.
8. All connectors in the vent pipe should be sealed. **Use silicone caulking to seal the connection between the vent and the fan.** PVC cement may be used all other vent connections.
9. The diffuser should be glued vertically on to the top of the vent pipe. This assembly helps draw air up the vent pipe.

Possible venting configurations for the 2” electric vent pipe.

Symptom | Cause | Remedial Action | Prevention
--- | --- | --- | ---
Urine Odour in Washroom | Horizontal runs or downward slopes on vent pipe | Re-install the vent so there are no horizontal or low points where condensation can collect. | Install wall brackets on vent pipe to prevent settling. **DO NOT install horizontal runs as liquid will collect and block ventilation, causing odour.**
Fan has failed | Have your serial number ready and call SUN-MAR for a replacement. Instructions are included with the replacement fan. | The fan is a constantly moving part and has a finite service life.
Downdraft | If you believe that there may be a downdraft outside of the building, it may be a good idea to remove your fan assembly prior to installation and set the fan gate to ‘0’ to prevent urine odor in the bathroom. (electric) | Install a 12 volt fan in vent pipe. (NE) | Install an air intake to the competing appliance from the outside.
Competing appliances | Wood stoves or furnaces installed in a tightly sealed room with the composting toilet may draw air in causing a vacuum in the room. This will draw air down the vent pipe. | | | |Occasional Urine Odor Outside | 1. Vent stack not installed above peak of roof. | 1. Check that the vent is installed above the peak of the roof. If not, extend the vent. Guide wires may be necessary. | Downdraft is dependent on wind direction as well as natural obstructions etc. Initially, install the vent above the peak of the roof. If symptoms occur, add line or a filter box.
2. If vent stack is installed above roof line, natural obstructions, such as tall trees, being located in a valley or close to a hill may be causing downdraft. | 2. Add line to the evaporation chamber - as much as you think necessary. You will have to rake more often if you do this. | | Strong Sewage Odor | Compost is anaerobic | 1. If it is rattling, it may need to be cleaned or the bearings are worn and the fan needs to be replaced. | Follow “Ongoing Maintenance” and use proper bulking material.
Fan Noisy | Fan damaged in shipping or bearings are beginning to wear. | 2. A hum is the normal sound the fan will make. If you are in a very quiet setting it will be more noticeable. If this is the case, consider purchasing a fan speed control so that the fan may be turned down. | Clean the fan with a small brush and/or compressed air nozzle once a year. To do this, remove the fan assembly by taking off the snap cap covers and unscrewing the screws which hold it in. The entire assembly will then simply slide out. This will prevent wear and lengthen the life of your fan.

MECHANICAL TROUBLE SHOOTING
<table>
<thead>
<tr>
<th>Symptom</th>
<th>Cause</th>
<th>Remedial Action</th>
<th>Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan Not Working</td>
<td>Debris in fan or mechanical failure.</td>
<td>Remove the fan assembly from the unit and vacuum any dust out of the fan blades.</td>
<td>The fan is a continuously moving part which will eventually have to be changed. Do Not turn on and off daily.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check the power source. If this does not remedy the problem, have your serial number ready and call SUNMAR.</td>
<td></td>
</tr>
<tr>
<td>Liquid Build up/ Lack of Evaporation</td>
<td>Increased usage.</td>
<td>The amount of liquid varies substantially between installations. The overflow drain needs to be installed.</td>
<td>Install the overflow drain.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Expect faster evaporation rates during warm dry weather.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Evaporation rates vary substantially with climatic conditions.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>The amount of liquid varies substantially between installations. The overflow drain needs to be installed.</td>
<td>Install the overflow drain.</td>
</tr>
<tr>
<td>Liquid Overflow</td>
<td>Mineral salts may have accumulated in the evaporation chamber over time, reducing evaporation rates.</td>
<td>To remove these, fill the evaporation chamber with very hot water and 1/3 bottle of “Compost Quick” enzyme liquid. Leave overnight.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drain all Liquid through the overflow drain by tipping the unit up (make sure overflow is hooked up first)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>To remove these, fill the evaporation chamber with very hot water and 1/3 bottle of “Compost Quick” enzyme liquid. Leave overnight.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drain all Liquid through the overflow drain by tipping the unit up (make sure overflow is hooked up first)</td>
<td></td>
</tr>
</tbody>
</table>

### Installation

**EXCEL and EXCEL NE ROUGH IN DIMENSIONS**

![Installation Diagram](image-url)
Inspection

We recommend an inspection of the EXCEL prior to installation and to make sure you have received all of the parts required as listed below.

Inspecting the unit for damage

i) If there is any visible damage to the carton-
   The contents of the carton should be inspected before signing the bill of lading. Damaged units should be refused. Call Sun-Mar immediately.

ii) If the shipper has left-
    Report the damage immediately to the transport company and call Sun-Mar.

iii) Soon after delivery, remove the EXCEL carefully from the carton-
    If there is hidden damage, or for any service Questions, contact Sun-Mar to determine the best course of action.

What’s in the Box

1- Owners Manual
1- 1 1/2” Roof Flashing (Electric)
1- Warranty Card
1- Bowl Liner
1- Excel Hardware Kit
1- Rake
1- 1” x 8’4” Drain Hose (NE)
1- 4” Diffusor (Electric)
1- Footrest
1- 2” Pipe Insulation (Electric)
1- Compost Sure Green
4- 2’x31’ Vent Pipe (electric)

Familiarise Yourself with the EXCEL

i) Turn the drum handle clockwise to rotate the patented Bio-Drum for mixing and aeration. (The drum rotates counter-clockwise and the drum door closes). This is how you will rotate the drum during regular operation.

ii) Pull the drum locker button, (located under the footrest) and turn the handle counter-clockwise to simulate removal of compost. This is how you will remove compost during regular operation.

iii) Plug the unit’s electrical cord (Electric) into a standard three-prong electrical outlet, and feel the air movement from the vent outlet at the front of the unit to ensure the vent system is working properly.

iv) Pull out the compost finishing drawers at the bottom right of the unit. After the unit has been plugged in for ten minutes, place a hand on the floor of the evaporating chamber (the area under the finishing drawer) to check it is warm to the touch, and that the heater is working properly.

Liquid Overflow (Cont’d)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Cause</th>
<th>Remedial Action</th>
<th>Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid Overflow</td>
<td>Overflow drain not hooked up</td>
<td>Connect overflow safety drain</td>
<td>Evaporation will slow during damp weather; make sure drain hose is installed.</td>
</tr>
<tr>
<td>Unit tipped forward</td>
<td>Check and ensure that the unit is level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heating System Not Working</td>
<td>Test to determine whether failure has occurred</td>
<td>Pull finishing drawer out and put your hand in the evaporation chamber (NOT in the liquid). If there is no warmth rising from the floor of the unit, your heating system is not working. It is most commonly the thermostat that has failed. If you notice a lack of evaporation, but there is still warmth in the heating chamber, see “Liquid Build up” for solutions.</td>
<td>A ground fault interrupter circuit is recommended to protect your EXCEL from power surges that could cause your heating system to malfunction.</td>
</tr>
<tr>
<td>Thermostat Failure</td>
<td>Have your serial number ready and call SUN-MAR for a replacement. (Detailed instructions are included with the replacement part)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heating Element Failure</td>
<td>Have your serial number ready and call SUN-MAR for a replacement. (Detailed instructions are included with the replacement part)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquid in Finishing Drawer</td>
<td>Drum Screen Clogged</td>
<td>Rotate drum 180° so that the drum screen is on top - you will just be able to see the edge of it if you take out the bowl liner. Scrub drum screen with a wire brush. You may want to hook up your overflow drain beforehand if there is a large liquid buildup in the drum.</td>
<td></td>
</tr>
<tr>
<td>Drum Will Not Turn</td>
<td>Set screw securing handle to shaft has broken</td>
<td>Remove the finishing drawer. The drum screen is located on the bottom of the patented Bio-drum, to the left of the drawer opening. Scrub drum screen with a wire brush.</td>
<td></td>
</tr>
<tr>
<td>Drum Door Not Opening/ Closing Properly</td>
<td>Drum too full</td>
<td>Have your serial number ready and call SUN-MAR for a replacement Small Gear Kit. (Instructions included.)</td>
<td></td>
</tr>
<tr>
<td>Hinges Stuck</td>
<td>Spray hinges with Compost Quick. Scrub hinges with toothbrush or other soft nylon bristled brush.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Attaching and Detaching the Footrest

The footrest attaches to the unit with the metal track above the finishing drawer opening. To attach the footrest, incline the footrest at a 45 degree angle to the floor as shown. Insert the round top edge of the track on the footrest into the round top edge of the metal track on the unit and then lower the footrest to the floor. Note: Footrest must be correctly attached before stepping on it.
Excel Basic Operating Instructions

The toilet should be cleaned with hot water or bio-degradable products only to avoid damage to the compost. Compost Quick or Baking Soda can be used diluted in hot water.

Regular Maintenance

1. Rotate the drum 6 rotations (36 turns of the handle) every second day while you are there and using the toilet.

2. When finished rotating, fold the handle in under the seat. This will mean that the drum is open and ready to receive waste.

3. After each bowel movement, one cup (250ml) of Compost Sure Green should be added to the unit to cover the bowel movement, whichever is greater. Do Not Turn the drum after each use.

Bulking Material

When you run out of our Compost Sure bulking material, more Compost Sure through your Sun-Mar dealer, or online at www.sun-mar.com. Do not use 100% peat moss as this will clog your drum screen and drains.

Periodic Maintenance

Rake out evaporation chamber with rake provided (the area below the finishing drawer). Clean the drum screen. Remove the bowl liner and lift the toilet seat. Turn the handle 3 revolutions to bring the drum screen to the top of the drum. Access can be gained by reaching through the hole under the toilet seat. Spray the drum screen with Compost Quick and let sit for 15 minutes (this will help to loosen the debris if the screen is not too encrusted). Scrub the screen vigorously with the wire brush. If brushing the screen does not clear it and liquid is still not draining through the screen, use a screwdriver or nail to puncture each hole in the drum screen.

Attention: the EXCEL electric model must remain plugged in to an electrical outlet continuously to function odorlessly. If you will be away from the residence where the composting toilet is installed for longer than three days, the power may be disconnected while the composting toilet lays dormant.

The EXCEL

The key to the success of the EXCEL lies in its three chamber design. Each of the three chambers; patented Bio-drum, compost finishing drawer, and evaporation chamber, have their own independent environments for optimum efficiency.

The EXCEL electric version has a thermostatically controlled heater and fan assembly to help evaporate liquid and should be used where there is a constant electrical supply. The EXCEL NE (non-electric) version is for use where there is no continuous electric supply. The EXCEL NE has no fan or heater. Odorless operation is achieved by a 4” vent which acts like a chimney creating a partial vacuum within the unit.

The patented Bio-Drum

Unique to Sun-Mar, the patented bio-drum provides the necessary mass to maintain good compost and allows easy aeration of the compost by simply turning the drum. Excess liquid will exit through a screen in the bottom of the drum into the evaporation chamber. Mixing the Bio-drum is accomplished by rotating the handle in a clock-wise direction. Compost is removed from the drum by pulling out the white drum lock button (under the footrest) and rotating the handle in a counter clock-wise direction.

The Compost Finishing Drawer

The compost finishing drawer sits in an opening under the footrest. Compost in the drawer is isolated from mixing with new waste while resting for 4 weeks so that it can finish composting.

The Evaporation Chamber

The evaporation chamber is the floor of the unit under the compost finishing drawer. This is the area where any excess liquid will gather for evaporation. A safety drain exits from the back of the composting toilet which will drain over-flow liquid that is not evaporated to an approved facility.
**HOW COMPOSTING WORKS**

Composting is the natural process of decomposition that can be helped along by providing the ideal conditions to help your composting toilet work at peak performance. The ideal conditions for decomposition to occur depend on several factors: oxygen, temperature, moisture content, and the carbon/nitrogen ratio.

### Oxygen

Oxygen is very important in composting. Your compost should be aerated in order to encourage aerobic bacteria growth. Aerobic bacteria are bacteria that grow and live in the presence of oxygen and are very efficient in breaking down waste. To aerate the compost and encourage the growth of these bacteria, the compost drum should be turned three times per week (6 complete turns of the drum).

### Temperature

Temperature is another important consideration when composting. Optimal composting temperatures range between 70-100 °F (21-38 °C). If the compost becomes too cold (below 55 °F or 13 °C), decomposition will slow significantly or stop completely. If you are in an area that experiences temperatures below 55 °F (13 °C) additional heat is required if the composting toilet will be used continually or frequently. If used for intermittent cottage application (3 - 4 weekends throughout the cold season) no additional heat is required. The unit will function as a holding tank until the temperature warms up.

### Moisture

Moisture is necessary to achieve a good compost. Your compost should always be damp, like your garden after you have watered it. This moisture allows the bacteria to travel around in the compost so that they can speed decomposition by digesting the waste. If the compost is too dry, the bacteria cannot survive and decomposition will slow or cease. When adding water to the compost, you are aiming for a damp compost, not saturated. Too much liquid in the compost limits the amount of oxygen that aerobic bacteria require to survive. If normal urination is not enough to maintain the correct moisture level in the compost, we encourage you to add additional water to the drum.

### Carbon/Nitrogen Ratio

Almost all organic material will compost. The proper bulking material and human waste should be added to the composting toilet. In order to maintain a good balance between carbon-rich materials (SUN-MAR Compost Sure Green) and nitrogen-rich human waste only.

---

**ACCESSORY ITEMS FOR THE EXCEL**

SUN-MAR has developed a number of composting accessory items over the years in response to frequent requests from users. These items may serve to improve composting speeds under some circumstances.

<table>
<thead>
<tr>
<th><strong>Name</strong></th>
<th><strong>Description</strong></th>
<th><strong>Container</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>“Compost Quick”</td>
<td>Specially selected natural enzyme solution designed to help the aerobic bacteria convert waste to compost. Also very effective as a cleaner for bowl liners 454g (16oz) bottle with spray cap</td>
<td></td>
</tr>
<tr>
<td>“Microbe Mix”</td>
<td>Specially selected dried microbes and enzymes designed to start and accelerate composting in all Sun-Mar composting toilet and toilet systems. Microbe Mix also contains citronella to discourage insects. 500g/16 oz. jar with scoop</td>
<td></td>
</tr>
<tr>
<td>“Compost Sure”</td>
<td>Bulking material containing a mix of coarse peat moss, and chopped hemp stalk. Designed to maintain porosity and hold oxygen and moisture in the compost while keeping the compost well supplied with carbon. 30 Litre/8 Gallon Bag</td>
<td></td>
</tr>
<tr>
<td>DC Vent Kit</td>
<td>Kit required for conversion of electric units to also operate in non-electric or 12 volt mode. For use with EXCEL systems. Includes a 12 volt fan.</td>
<td></td>
</tr>
<tr>
<td>AC Fan Speed Control</td>
<td>Designed for electric units only, the control kit allows users to adjust the speed of the fan. Ideal for installations where the toilet is used in winter applications or in bunkies where the toilet may be in close proximity to sleeping quarters.</td>
<td></td>
</tr>
</tbody>
</table>

**Note:**

Use “Compost Sure Green” for optimum results.
Models for which the manual applies:

- CSEL-01001  Excel Bone 115w
- CSEL-01001W Excel White 115w
- CSEL-01001-230 Excel Bone 230w
- CSEL-01001W-230 Excel White 230w
- CSNL-01101B Excel NE Bone
- CSNL-01101W Excel NE White

Metal tools will damage the toilet.
SUN-MAR Corp. warrants the original purchaser that this toilet is free from defects in material and workmanship under normal house or cottage use. SUN-MAR Corp. will furnish new parts for any part that fails within three years and five years on the fiberglass tank, provided that our inspection shows that such failure is due to defective material or workmanship. Any part supplied by us to replace another part is warranted for the balance of the original warranty period.

This warranty does not cover:
1. Damage resulting from neglect, abuse, accident or alteration; or damage caused by fire, flood, acts of God or any other casualty.
2. Parts and accessories not sold or manufactured by SUN-MAR Corp. or any damage resulting from the use of such items.
3. Damage or failure resulting from failure of the purchaser to follow normal operating procedure outlined in the Owner’s Manual or in any other printed instructions.
4. Labour and service charges incurred in the removal and replacement of any parts found defective under the terms of this warranty.
5. All returns to the factory must be made freight prepaid. All shipments from the factory are made F.O.B. the factory.

This warranty is in lieu of all other warranties expressed or implied, and no person is authorized to enlarge our warranty responsibility, which is limited to the terms of this certificate. The Company reserves the right to change, improve or modify its products without obligation to install these improvements on equipment previously manufactured.