

Serial No. \_\_\_\_\_

# Sun-Mar

## SELF CONTAINED TOILET OWNER'S MANUAL



EXCEL



EXCEL NE



COMPACT



Certified to NSF/ANSI Standard 41

Models for which the manual applies:

CSEL-01001W Excel  
CSEL-01001W-230 Excel 230 V  
CSNL-01101W Excel NE  
CSEM-01400WB Compact  
CSEM-01400WBB Compact 230 V

**RATED CAPACITY**

Residential & Continuous Use

EXCEL 3 Adults or a family of 5  
EXCEL NE 2 Adults or families of 3  
COMPACT 1 Adult

Weekend & Vacation Use

EXCEL 6 Adults or families of 8  
EXCEL NE 5 Adults or families of 7  
COMPACT 3 Adults or families of 4

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**Do NOT stand on the toilet.**

**Electric toilets must be installed so that electrical components of the toilet are protected from water/liquid/rain/flooding and melting snow.**

**Do NOT power wash electric toilets.**

**Using metal tools for cleaning purposes will damage the toilet.**

**Safety Drains should be installed if toilet is to be used over capacity, even for short periods.**



## The SUN-MAR SELF CONTAINED TOILET

The key to the success 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 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 non-electric version is for use where there is no continuous electric supply, and has no fan or heater.

### 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 compost in the Bio-drum™ is accomplished by rotating the handle in a clock-wise direction. Compost is removed from the drum by pulling out the drum lock button and rotating the handle in a counter clock-wise direction.

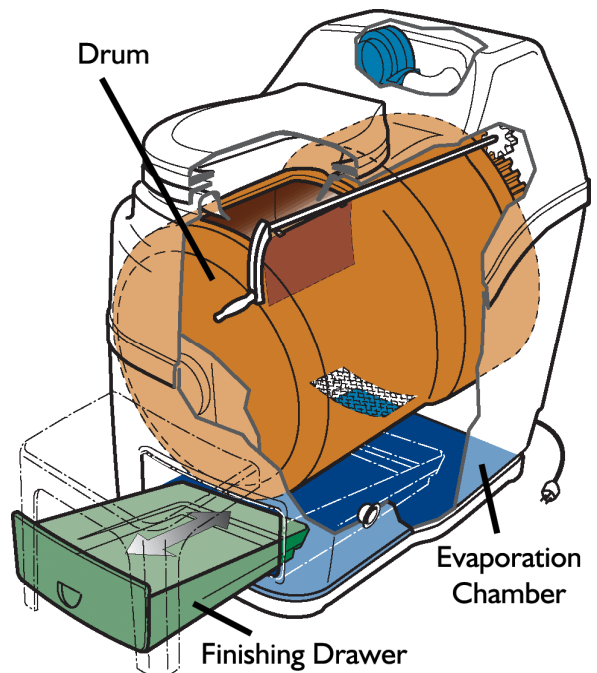
### The Compost Finishing Drawer

The compost finishing drawer sits below the Bio-drum™ of the toilet. Compost moved to the finishing drawer will have newer, as well as composted material deposited in the finishing drawer. Compost in the finishing drawer is isolated from mixing with new waste while resting for 4 weeks so that it can finish composting, at which time it is emptied, and refilled.

### 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. It is quite normal to see liquid in this area. If the unit has recently had a lot of use, the liquid may be up to 4 cm (1.6") deep. If the safety drain is connected, the liquid will start to flow out of the safety drain when the level of liquid in the evaporation chamber has reached 4 cm (1.6") deep.

The Excel and Compact have a heating element in a separate, sealed department, which is located under the evaporation chamber which will assist with evaporation.



# HOW COMPOSTING WORKS

Composting waste in a composting toilet is much like any other compost pile with the exception that you are composting human waste. Like all other composts, you need to have the proper conditions present for decomposition to occur. You may have seen other composters that are a bin type, where waste collects in a central chamber for decomposition with little or no mixing. This type of compost is anaerobic. Since there is very little mixing of the waste, aerobic bacteria will die off and anaerobic bacteria will take its place. Anaerobic bacteria are not as desirable as they break down organic matter much slower than aerobic bacteria and produce gasses such as methane as part of their digestion. This leads to compost that does not reduce in size quickly and is very smelly when disturbed.

Although we have touched on other types of composting, we will focus on aerobic composting which is what we achieve in Sun-Mar products. The Sun-Mar Bio-drum™ provides perfect conditions for aerobic composting. The Bio-drum™ allows the entire compost pile to be mixed and aerated and so encourages the growth of aerobic bacteria. The correct conditions will help your waste to decompose quickly so that you have a constant supply of compost. 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 to encourage aerobic bacteria growth. Aerobic bacteria grow and live in the presence of oxygen, are very efficient in breaking down waste and do not produce sewer gasses as a by-product of their digestion. Sun-Mar Bio-drums™ turn the entire pile mixing air into the compost. The addition of Compost Sure adds porosity to the pile, creating small air pockets throughout your compost.

## 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/13 C), decomposition will slow or stop completely.

## Moisture

Moisture is necessary to achieve good compost. Your compost should always be damp, like your garden after you have lightly watered it. This moisture allows the bacteria to travel around in the compost. 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 damp, not saturated compost. Too much liquid in the compost limits the amount of oxygen that aerobic bacteria require to survive.

## Carbon/Nitrogen Ratio

Almost all organic material will compost and this includes human waste. All organic matter is made up of substantial amounts of carbon (C) combined with lesser amounts of nitrogen (N). The balance of these two elements in an organism is called the carbon-to-nitrogen ratio (C:N ratio). For best performance, the compost pile, or more to the point the composting microorganisms, require the correct proportion of carbon for energy and nitrogen for protein production. The fastest way to produce fertile, sweet-smelling compost is to maintain a C:N ratio somewhere around 25 to 30 parts carbon to 1 part nitrogen, or 25-30:1. If the C:N ratio is too high (excess carbon), decomposition slows down. If the C:N ratio is too low (excess nitrogen) you will end up with a unbalanced compost pile. Human waste is high in nitrogen so requires the addition of Compost Sure to supply the carbon needed to achieve the proper C:N ratio for your compost.

Bacteria is an important asset to your compost. To encourage good bacteria growth, we recommend Microbe Mix should be added twice per month. To use Microbe Mix, simply add one or two tablespoons every other week to recharge your compost. Another source of bacteria for your compost can come from existing compost. We do not recommend adding top soil as you also risk adding insects to your toilet. When you first start composting, it takes approximately 6 weeks (at optimum temperatures) to reach sufficient numbers of bacteria for consistent decomposition to occur.

## What's in the box?

### EXCEL

1-Owner's Manual  
1- Rake  
4 - 2"x31" Vent pipes (PVC  
Central Vacuum Tubing)  
1- 4" Diffusor  
1- Compost Sure Green  
1- Hardware Kit  
1- Bowl Liner  
1- Footrest

### EXCEL NE

1- Owner's Manual  
1- Rake  
3 - 4"x31" Vent pipes (PVC  
Schedule 20)  
1- 6" Diffusor  
1- Compost Sure Green  
1- Hardware Kit  
1- Bowl Liner  
1- 1" x 8' Drain Hose  
1- Footrest

### COMPACT

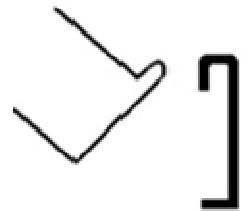
1-Owner's Manual  
1-Rake  
4 - 2"x31" Vent pipes (PVC)  
Central Vacuum Tubing)  
1- 4" Diffusor  
1- Compost Sure Green  
1- Hardware Kit  
1- Bowl Liner

## Parts and Functionality

### *Familiarize yourself with your new toilet*

- **Congratulations on your purchase of a Sun-Mar composting toilet.**
- Carefully unbox your new composting toilet (do not use the safety drain to lift the toilet from the carton).
- Inspect your new toilet to ensure that it functions properly before you install.
- If your unit is electric, plug your unit into an electrical outlet. The fan assembly is located at the upper back of the toilet. Ensure that you can feel air blowing from the fan assembly. Remove the finishing drawer and place your hand inside the unit where the finishing drawer fits into the unit. You should be able to feel heat rising from the floor of the unit. This is the evaporation chamber, where liquid will gather.
- Pull the handle out from under the toilet seat. Turn the handle in a **clockwise** direction. Ensure that the Bio-drum™ turns as you turn the handle. This is how you will turn the Bio-drum™ to mix the compost. When not turning the Bio-drum™, the opening in the Bio-drum™ should always be centered under the toilet seat.
- Pull the drum locker button (located on the upper left side of the finishing drawer). While holding the button out, turn the handle in a **counter clockwise** direction. There should be NO resistance when you do this. If you do feel resistance, the drum lock button has not been pulled out enough. This is how you will remove compost from the Bio-drum™.
- Attach and detach the footrest (Excel and Excel NE) 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° 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 use.**



## Installation FAQ

### 1) Must I install the vent?

**Yes**, in order to ensure odorless operation.

### 2) Can the vent go straight through the wall?

**No**. When you are installing the vent pipe, **completely avoid any downward sloping or horizontal runs**, no matter how small.

### 3) How many bends can I put in the vent pipe?

**Electric toilet: No more than four 45° bends.** There **should not** be any **horizontal** runs (no matter how small) or downward slopes of the pipe. Fasten your pipe with brackets to prevent settling.

**Non-Electric: No more than two 45° bends.** If bends are used in the vent, a 12v fan is available for purchase from Sun-Mar and if necessary, should be installed.

### 4) Can I merge the toilet vent with an existing plumbing vent?

**No**. We realize that this will make your installation easier, but if the toilet is not installed with its own vent, it will hamper the airflow, and will lead to **odors**. In addition, other plumbing fixtures connected to the same vent will start to smell of ammonia. **The toilet needs to be installed with its own vent in order to function odorlessly.**

### 5) Where does the diffuser go?

On top of the vent stack.

### 6) I have a metal roof, an obstruction or a steeply pitched roof. Must I have the vent above the peak of the roof?

**Yes**. If the vent ends under the eave, the air from the vent may downdraft over the property, possibly causing a urine smell to occur. The vent should be installed 24-30 inches above the peak of the roof to prevent downdraft. See pages 7 and 8 for complete instructions.

### 7) How will I secure the stack if I need go to 24-30 inches above the peak of the roof?

Guy wires. These should be available at your local hardware store.

### 8) Can I use venting other than what is supplied?

**No**, always use the recommended venting. Schedule 40 venting has a smaller inside diameter that will reduce venting capacity, and may result in odor. **Flexible venting should not be used in any application**, as this will result in odor around the toilet.

### 9) Do I need to plug in my electric toilet?

**Yes**. Your composting toilet should be plugged in continuously unless it will not be used for 3 or more consecutive days.

### 10) Will I need a safety drain on the Excel, Excel NE, or Compact?

The Excel and Compact toilets are designed to evaporate all liquids when used according to their rated capacity. As a precautionary measure Sun-Mar recommends that the safety drains on all toilets be connected. For Excel NE toilets the safety drain must be connected.

### 11) Do I really need a safety drain with a non-electric toilet?

**Yes**. You will have overflow liquid, even with limited usage. **If the drain is not connected, the evaporation chamber will overflow.**

### 12) What should the safety drain be connected to?

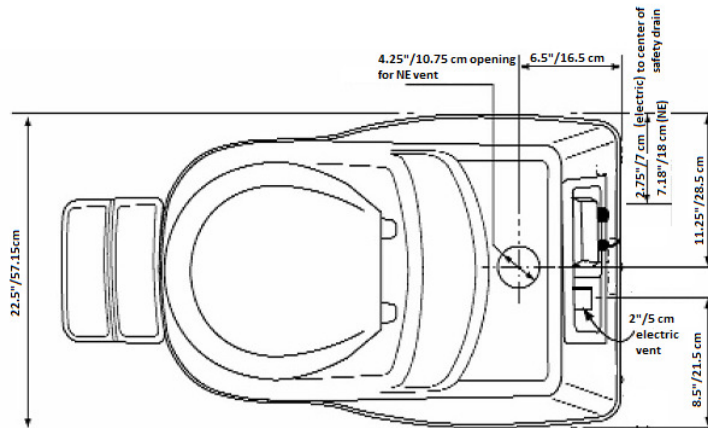
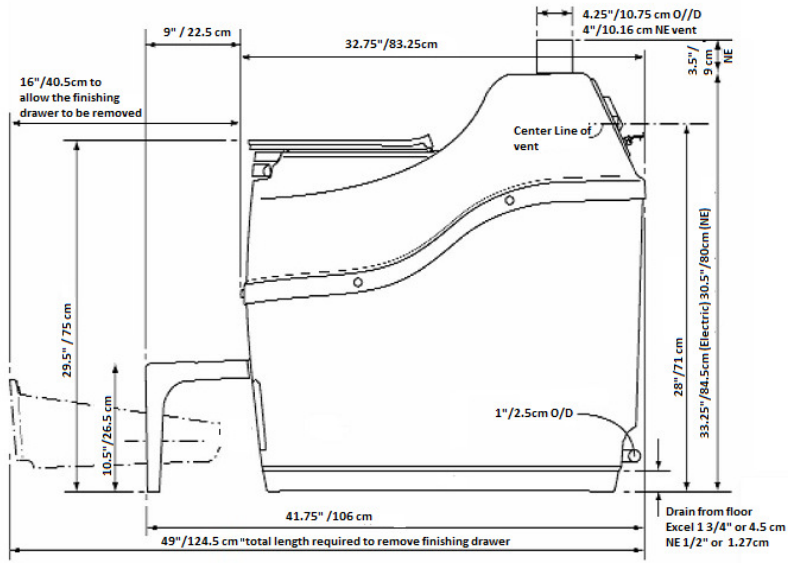
Collect and/or treat excess liquid in an approved facility such as a recycling bed, old septic system, holding tank or drain pit. All installations should conform to local regulations.

### 13) My bathroom can get below 55° F/13°C at times. Will this affect composting?

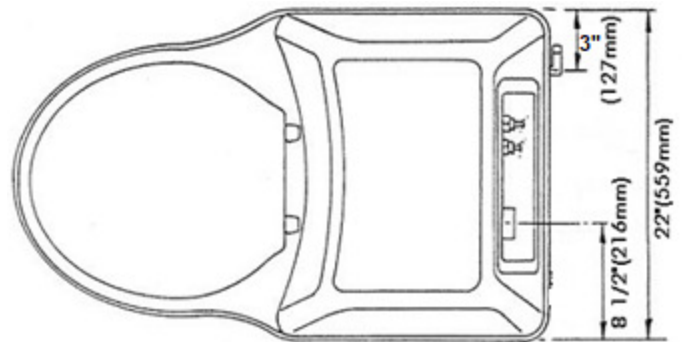
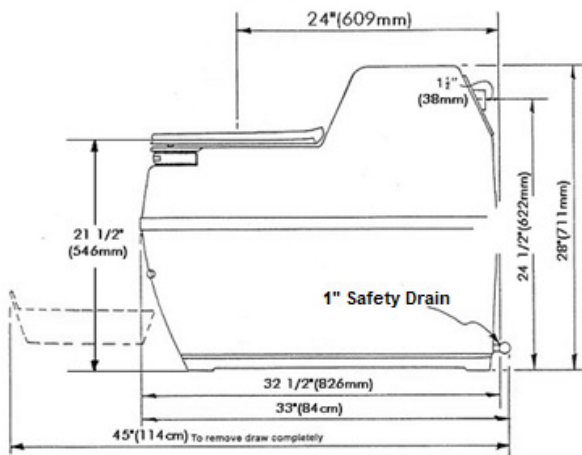
**Yes**. If the toilet is being used continuously, you will need to install an additional heat source, or leave the heat on in the area where the toilet is located. If you are only using it three or four weekends during this time, see page 13 for further details.

# Installation

## EXCEL AND EXCEL NE ROUGH IN DIMENSIONS



## COMPACT ROUGH IN DIMENSIONS

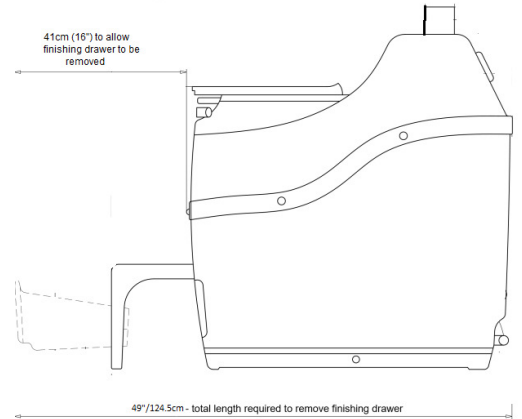




# Installation Specifications

## Space Required and other Installation Considerations

- 1) It is recommended to install/use a GFI plug where the unit is installed. This should be installed for any electric appliances that are used in a bathroom setting (**EXCEL and COMPACT**).
- 2) As an extra precaution, it is advisable to protect your electric toilet if you are in a location that experiences fluctuations in the power supply by using a surge protector. This will shut down the power to your toilet in the event of electrical surges (**EXCEL and COMPACT**).
- 3) Ensure that your toilet is installed on a completely level surface. Water will run to the lowest point so if your unit is lower in the front, the liquid will collect at the front and may overflow.
- 4) To remove compost, you must be able to remove the drawer from the front of the unit. You will require at least 41 cm (16").
- 5) The safety drain **MUST** be connected in all the following installations:
  - (**EXCEL NE**), all installations.
  - (**EXCEL, COMPACT**), if this is a primary, residential toilet installation.
  - (**EXCEL, COMPACT**), if the toilet will be used over capacity (even for short periods of time). (See page 8).
- 6) The fan will run 24 hours a day while you are in residence where the toilet is installed. As such, the room where the toilet is installed should not be air tight (**EXCEL, COMPACT**). For **EXCEL NE** installations, competing appliances (ie. wood stove) may need an air intake installed from the outdoors. Competing appliances draw a lot of air and may cause your composting toilet vent to draw air into the building rather than venting to the outside. A 12V fan may be required if you have a woodstove, a bend in the vent, or downdraft from prevailing winds.
- 7) (**EXCEL, COMPACT**) The heating element located in a separate, sealed tray located directly below the evaporation chamber should be protected from exposure to any liquid. Although the heating element is water resistant, the toilet should not be installed in an area where there will be liquid on the outside of the unit as it will eventually enter the heater tray.
- 8) (**EXCEL, EXCEL NE, COMPACT**) Ensure that the toilet vent can be installed as per specifications outlined on page 7.
- 9) (**EXCEL and Compact**) Venting consists of 2" PVC central vacuum tubing. Schedule 40 pipe cannot be substituted as it has a smaller inside diameter and will cause odor.
- 10) (**EXCEL NE**) Venting consists of 4" PVC sewer pipe. Schedule 40 pipe should not be substituted as it is too heavy to be supported by the top of the unit.





# The Safety Drain Hose

The safety drain **MUST** be connected in all **EXCEL NE** installations. The safety drain must be connected in all **EXCEL and COMPACT** installations if the toilet is used as a primary residential toilet, or if the toilet will be used over capacity (even for short periods). As a precautionary measure, Sun-Mar recommends that the drains on all toilets should be connected.

*\*The safety drain is a gravity fed, trickle drain, and so, must slope downward at all points. Do not merge sinks bathtub, or any other drains to the safety drain.*

## The drain cap

**(EXCEL NE)** The safety drain **MUST** be connected in all installations. The toilet is supplied with one drain cap which can be placed on either side of the drain assembly.

**(EXCEL, COMPACT)** The toilet will evaporate all liquids under normal operation. If used as a primary residential toilet, or if the unit will receive use over the recommended capacity the safety drain should be connected. Remove one cap and connect the safety drain hose.



## Connect the drain hose

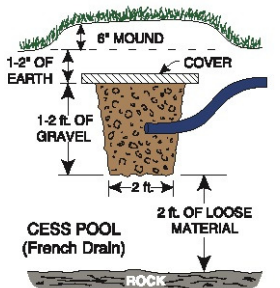


**(EXCEL NE)** As the safety drain is required, this toilet is supplied with 8'/2.4m of hose.

**(EXCEL, COMPACT)** If a safety drain is required, a good quality 1'/2.5cm interior diameter hose and a 1"/2.5cm stainless steel hose clamp will be required (can be purchased at a local building supply store). Carefully push the drain hose over the barbed end of the drain assembly so that the drain hose will overlap the drain assembly by 1'/2.5cm and tighten the hose clamp to secure.

## Ensure the drain hose is lower than the safety drain

The safety drain assembly is a gravity fed, trickle drain. Ensure that the drain hose is lower than the drain assembly at all points, as the liquid is not under pressure so can only run in a downward motion. To ensure that the drain hose is lower, may necessitate clamping the drain hose to the floor.



All installations should conform to local regulations.

## Effluent Handling

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.

## Initial Start-Up

When you are initially starting up your Sun-Mar composting toilet, or restarting the compost after completely emptying the drum, follow these guidelines.

### Place Compost Sure Green into a bucket

**(EXCEL, EXCEL NE)** Pour ½ a bag into the bucket. **(COMPACT)** Pour 1/3 a bag into the bucket.

Add 2 quarts/litres of water and 2 tablespoons/30 ml of Compost Quick to the bucket. Allow the Compost Sure Green time to absorb the water (about an hour).



### Scoop the Compost Sure Green into the Bio-Drum™ through the opening under the toilet seat.

Rotate the drum to mix. Ensure the opening in the drum remains under the toilet seat at all times when using the toilet.

### **(EXCEL, COMPACT)** Connect the electric plug into a 3-prong GFI

The fan should run continuously 24 hours a day when installed in a residential setting. If away from the residence for 3 days or longer, disconnect the toilet from the power supply.

**230 Volt Use:** The toilet must use a main plug with an earth connection.

Replacement of electrical components (including the power cord and main plug) must be performed by a qualified person to avoid electrical hazard.



### The toilet is now ready for use!

Over the first 6 weeks you will notice that the compost will hold moisture and become more uniformly dark in color.

Compost Sure Green may have fallen through the drum screen into the evaporation chamber. This should be raked out and removed with the rake tool provided with the toilet.

### Throw your toilet paper in the toilet!

There is no special toilet paper required with a Sun-Mar composting toilet. All toilet paper is made in such a way as to decompose easily and is another source of carbon for your compost. If the compost is moist enough, toilet paper should disappear rapidly.



# Ongoing Toilet Maintenance

## Daily

One cup of Compost Sure Green should be added per person per day of use, even if it was only used for urination. Add the Compost Sure Green through the hole under the toilet seat.



When you poop add a scoop!



## Weekly

Every other day turn the handle in a clockwise direction to mix and aerate the compost. When mixing, ensure that the drum rotates 6 complete revolutions which is 42 turns of the handle. Before turning the handle, add 2 teaspoons of Compost Quick on the surface of the compost. Compost Quick is an enzyme that will speed up the composting process.

## Bi - Weekly

Add two tablespoons of Microbe Mix to the Bio-drum™ to 'recharge' the compost. This will help to ensure your microbe colony stays constant and healthy.





### Quarterly

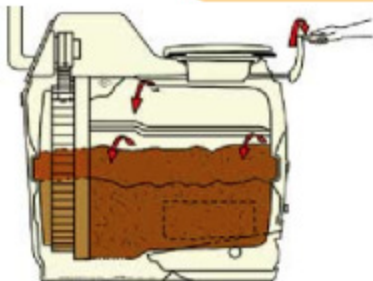
Every 3 months you should rake the evaporation chamber. You can do this by removing the finishing drawer. Rake any solid debris from the base of the toilet under the evaporation chamber (drawer), paying extra attention to the two back corners of the toilet as this is where debris may accumulate. Remove and safely dispose of the solid debris.

### Bi-Annual

Twice a year you should clean the drum screen. Spray the Bio-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, you may have to use a screwdriver or nail to clear the holes in the screen.



Rotate the drum in reverse 1 complete revolution which is 7 turns of the handle.



### Periodically

Remove compost from the Bio-drum™. When the Bio-drum™ is half full (level with the middle of the drum hub at the front of the Bio-drum™) it is time to remove compost.

## CAUTION

- 1) **Do NOT** add chemicals, plastics, glass, metals, diapers or feminine hygiene products to the compost.
- 2) **Do NOT** add plastic, glass, metal, cleaning fluids, cigarettes. Add only waste and Compost Sure bulking material.
- 3) **Do NOT** add Kitchen or garden waste, as they may attract pests.
- 4) **Do NOT** add baby wipes, diapers or feminine paper products.

# Removing Compost from the Patented Bio-drum™

Periodically you will need to remove compost from the Bio-drum™. When the Bio-drum™ is half full (level with the middle of the drum hub inside of the front of the Bio-drum) it is time to remove some compost.

**Pull the drum locker button out as far as possible (located at the top of the finishing drawer).**

The drum locker button is attached to a bar that sits in a molded depression in the drum. When the button is pulled, the bar is pulled out of the depression, which allows the drum to turn counter-clockwise. There should be no resistance on the handle when turning the handle counter-clockwise. If you feel resistance, stop turning and pull the button out further.



**Turn the handle in a counter-clockwise direction.**

While holding the drum locker button out, turn the handle counter-clockwise for one full revolution of the drum. The drum door will stay open allowing compost to fall into the finishing drawer. There will now be fresh, as well as composted material deposited into the finishing drawer.



**Level the compost in the finishing drawer.**

Open the finishing drawer and use the rake to level the compost. Levelling the compost will prevent the compost from soiling the Bio-Drum™



**Allow the compost to finish.**

The finishing drawer is an isolated chamber into which the compost drops. Here the compost can be left to complete the composting and sanitation process (3-4 weeks minimum) isolated from exposure to new waste. Once complete, compost is easily removed by sliding out the finishing drawer.



Compost may be removed at any time that you need more space in the Bio-drum™ and will need to be removed more frequently for heavily used units or where the toilet is a primary residential toilet.

# Springtime Start Up [Seasonal Users]

## Empty Compost from Last Season

Before your first use of the toilet, extract compost from the Bio-drum™ by releasing the drum locker, 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" 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 back two corners of the unit (near the safety drain), to ensure that your safety drain does not get clogged.

## Add Water and Microbe Mix

Add some warm water to the remaining compost, enough to ensure that it is quite moist. Also, add some Microbe Mix (two tablespoons) to give the compost 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

Add a few cups of water to the Bio-drum™ before closing the cabin/cottage for the season. Soak the compost in the drum to prevent it from drying out before Spring. Make sure to unplug the toilet if it is electric. If you have a non-electric toilet, 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 toilet will be used for 3-4 weekends throughout the winter season then it is considered occasional use. All of the same considerations as above [No Winter Use] should be taken with these toilets to winterize them. When the temperature dips below 55° F/13° C, composting activity will slow dramatically. These toilets 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 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 listed below should be followed:

- 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; as a precautionary measure 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 toilet is used frequently in the winter then the toilet should be kept in a warm place. Below 55° F/13° C, composting activity will slow dramatically so if it is in a place that falls below this temperature, a source of heat should be provided for the toilet so that it can keep up with constant use.



# Compost Troubleshooting

## Compost is too wet or soupy.

The drum screen has become clogged. Turn the handle 3 complete turns in a clockwise direction and slide the handle back in place under the seat. The opening in the drum will no longer be visible. Lift the toilet seat and remove the black bowl liner. Locate the Bio-drum™ screen. The Bio-drum™ screen will now be positioned under the “hump” behind the toilet seat. Spray the Bio-drum™ screen well with Compost Quick and allow to sit for 15 minutes.



With a long-handled wire brush, slide your hand into the opening under the toilet seat and along the top of the Bio-drum™. Vigorously scour the Bio-drum™ screen with the wire brush. If the drum screen is severely encrusted with debris, it may be necessary to use a nail or screwdriver to clear the holes in the Bio-drum™ screen.



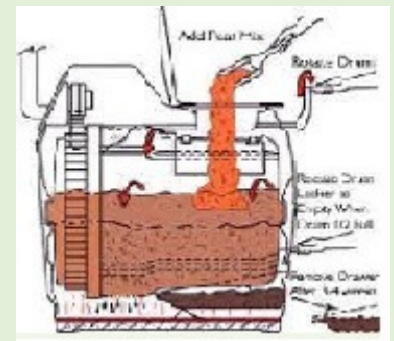
## Waste not breaking down or large lumps in compost.

The compost should be moist and loamy looking. Moisture is needed if there are large lumps present, the compost is light brown, there is a lot of toilet paper visible, or waste is not breaking down. The microbes in your compost need moisture to travel in the compost and digest the waste.

Insufficient heat can also prevent the compost from breaking down quickly. Optimum composting temperatures are from 21-32°C/70-90°F. As the temperature drops, composting will slow and stop below 13°C/55°F. Ensure that the ambient temperature is within optimal composting range for best results.

## Sewer odor when the drum is turned.

Oops, your compost has gone anaerobic. This can happen if the Bio-drum™ is too full, if improper bulking material is used, the drum screen is blocked, or the Bio-drum™ is not turned frequently enough. Ensure that the contents of the Bio-drum™ do not get over half full and that Compost Sure Green is used for the very best results. To keep those aerobic bacteria happy, rotate the Bio-drum™ every second day, as directed.



## Flies are present in the Bio-drum™



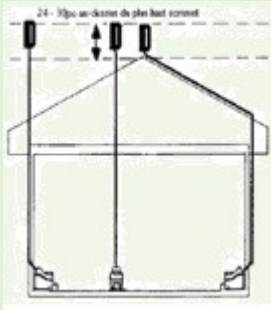
A good healthy compost does not have flies, but lately you have noticed small flies exiting the Bio-drum™. This can generally happen if the Bio-drum™ is too dry, the Bio-drum™ is over-full, insects have been inadvertently added, or an incorrect bulking material has been used. Once flies have taken up residence in the compost, you will have to treat the compost in order to kill them. There are several products that are effective for killing insects in the compost that will not slow down the composting action. Contact Sun-Mar customer service department for more information.

# MECHANICAL TROUBLESHOOTING



## Urine or ammonia odor present in the bathroom.

Sun-Mar composting toilets are odorless if installed correctly. **(Excel, Compact)** Ensure that there are no horizontal sections in the vent pipe, the toilet is plugged into electricity, the fan is running, and all of the joints in the vent pipe are either glued or sealed with silicone caulking. **(Excel NE)** Check for competing appliances (i.e. wood stove), downdraft, a bend in the vent stack, or the vent is not installed above the highest peak of the roof. Refer to the installation instructions to ensure that your toilet is installed correctly.



## Occasional urine odor outside.

The vent stack is not installed above the highest peak of the roof or there may be natural obstructions such as tall trees or the toilet is installed in a valley, or close to a hill.

Add lime to the evaporation chamber – contact Sun-Mar customer service department for specific instructions.

## The fan is noisy or not working.

If the fan is becoming noisy, it could be due to debris clogging the fan blades, or the bearings on the fan motor are beginning to wear. Clean the fan with a soft brush and/or compressed air nozzle once a year. This will prevent wear and lengthen the life of your fan. If cleaning the fan blades does not remedy the issue, or the fan has completely stopped working, call Sun-Mar customer service department with the serial number of your toilet located on the front cover of this manual. The fan is a continuously moving part which will eventually have to be replaced.



### Liquid in the Bio-drum™ or finishing drawer.

The contents of the Bio-drum™ appear to be very moist or there is liquid in the finishing drawer that appears brown and dirty, is an indication that the Bio-drum™ screen has become blocked. Follow the instructions on page 14 to remedy this.

If the liquid in the finishing drawer is clear or yellowish, it is most likely urine. This can happen if the toilet is used without the bowl liner or if the Bio-drum™ opening is missed entirely during urination.



### Liquid overflow



If liquid is flowing out of the finishing drawer opening instead of the safety drains, the most likely cause(s) are that the toilet is not level, has been subject to excessive liquid use, the safety drain is not installed or is blocked, or excessive precipitation has entered via the vent stack.

If the safety drain is not installed, it is recommended to follow the instructions on page 8 and install the safety drain. If further information is required, contact Sun-Mar customer service department for more guidance.

### Lack of evaporation or heating element not working.

Pull the finishing drawer out and place your hand in the evaporation chamber area (NOT in the liquid). If there is no warmth rising from the base of the toilet, your heating element is not working. Call Sun-Mar customer service department with the serial number of your toilet which is located on the front cover of this manual.

A horizontal section of vent pipe will vastly reduce the evaporation rate. Install the vent pipe as per instructions.

A build up of debris in the evaporation chamber will reduce the evaporation rate. Follow raking instructions.



### The Bio-drum™ will not turn while turning the handle.



When mixing the Bio-drum™ the handle turns freely, but the drum does not move. The roll-pin that fastens the small gear to the stainless-steel shaft has broken. If compost is not removed from the Bio-drum™ in a timely fashion, it can cause the roll-pin to break.

The drum has dropped. If the drum is continuously over filled, it will strain the entire unit, causing failure.

Call Sun-Mar customer service department with the serial number of your toilet which is located on the front cover of this manual for further guidance.

### The Bio-drum™ door is only partially open.

This can happen if the Bio-drum™ is over-full, or the hinges on the Bio-drum™ door hinges contain dirt that is not allowing the Bio-drum™ door to swing freely. If the Bio-drum™ door is resting on the surface of the compost, then the Bio-drum™ is over-full. Compost will have to be removed manually until the Bio-drum™ door is able to swing freely.

If the Bio-drum™ door hinges are dirty, soak them in Compost Quick and scour with an old toothbrush. Gently work the Bio-drum™ door back and forth until it is able to swing freely.



### Condensation inside the toilet.



If you lift the toilet seat cover and the Bio-drum™ and the toilet seat cover seem “sweaty”, this is condensation and is due to insufficient air flow. This is usually due to a horizontal length of vent pipe, or the fan has stopped working. The heating element is evaporating liquid but the moisture is unable to escape through the vent pipe, so the moisture condenses inside the toilet and runs down into the evaporation chamber. To remedy this issue, reinstall the vent pipe as per the installation instructions, or call Sun-Mar customer service department with the serial number of your toilet which is located on the front cover of this manual for further guidance.

**If you have any questions, please call Sun-Mar’s customer service department, 1 888 341 0782 ext. 1018 before proceeding with any mechanical repairs. The serial number of your composting toilet will be required for warranty purposes, and to ensure that the correct part is provided for your toilet.**

## CLEANING THE EVAPORATION CHAMBER

Cleaning the evaporation chamber is required periodically for all composting toilet systems. This process prevents the accumulation of debris in the evaporation chamber that will possibly slow evaporation speeds or clog the safety drains that assist in evacuating effluent. If your system is only used for seasonal use, we recommend cleaning the evaporation chamber of debris at Spring time start up and part way through the season in August, whereas, if this is your primary toilet, this process will be recommended every 2 – 3 months to ensure your toilet functions at its best.

What Can I Expect To See In The Evaporating Chamber? Liquid, sometimes quite a lot of liquid, depending on use. In some units, the liquid can be up to 1 ½” deep. If you have an Excel NE, the liquid should be in a reservoir behind the finishing drawer. The liquid in the bottom of the unit is urine. It is usually brown in color because it has been strained through the compost. The liquid in the evaporation chamber may be quite thick. This is due to evaporation of liquid, causing a denser concentration of particulate matter. There may be an accumulation of mineral salts (crystals) from the evaporating urine. There may be loose compost debris scattered over the evaporation chamber or floating on the liquid. In the case of electric units, this area may be totally dry. All of the above scenarios are normal, depending on how the unit is used and how often the evaporation chamber is cleaned. You will not be able to see the drain assembly inside the unit as it is covered with a baffle. The drain enters the unit on the inside, right where the drain assembly on the outside is located.



The rake tool

Use the rake tool to rake out loose or floating debris. All loose debris should be removed to prevent clogs in the safety drain. When raking, make sure you rake the back corners of the evaporating chamber. If the compost debris is dry, you may rake the debris into the back of the finishing drawer while holding the drawer in front of the opening to the evaporation chamber, like a dust bin. If the evaporation chamber has liquid, use a kitty litter scoop to scoop up the floating debris and to deposit the debris into the finishing drawer. Once the debris is in the finishing drawer, replace the drawer into the unit. The compost debris can remain in the drawer until the next time it is necessary to remove compost.

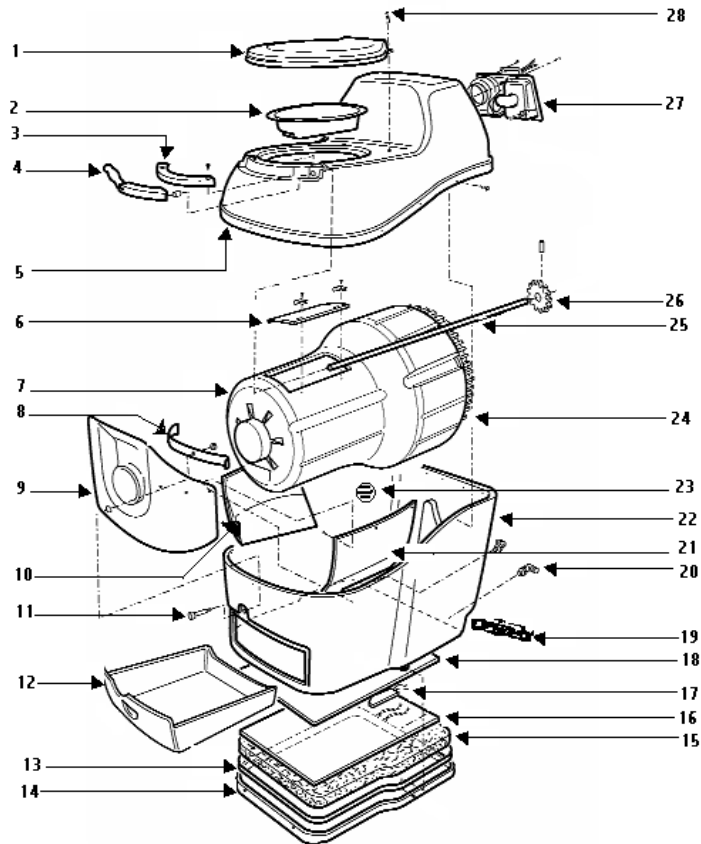


**Do Not Use Metal Tools To Chip Or Dig In The Evaporation Chamber!!!**

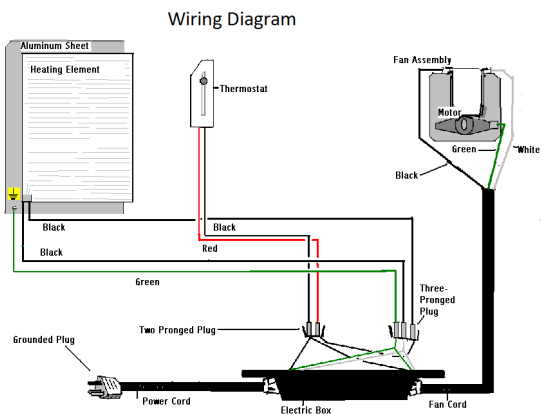
Remember, the lower portion of the unit is constructed of fiberglass. Metal tools will puncture the bottom (liquid containment) area of the composting toilet, causing a failure of the electrical parts which is not covered under any warranty. Pour approximately 4 -6 cups of boiling water and 1/3 of a bottle of Compost Quick into the evaporation chamber. Allow 30 – 45 minutes for the encrusted debris to soak and soften. Once the encrusted debris has softened, use the rake tool as indicated above to remove the debris to the finishing drawer.

# COMPACT SPECIFICATIONS

## COMPACT EXPLOSION DIAGRAM



- |                               |                             |                           |
|-------------------------------|-----------------------------|---------------------------|
| 1) Toilet Seat                | 11) Drum Locker Thumb Screw | 21) Right Humus Deflector |
| 2) Bowl Liner                 | 12) Finishing Drawer        | 22) Tank                  |
| 3) Handle Cover               | 13) Rubber U Channel        | 23) Air Intake Vent       |
| 4) Swivel Handle              | 14) Heater Tray             | 24) Large Bio-drum™ Gear  |
| 5) Top                        | 15) Insulation              | 25) SS Shaft              |
| 6) Drum Door                  | 16) Heating Element         | 26) Small Gear            |
| 7) Bio-drum™                  | 17) Thermostat              | 27) Fan Assembly          |
| 8) Drum Locker                | 18) Aluminum Sheet          | 28) Seat Screw            |
| 9) Drum Bearing Plate (Front) | 19) Power Box Assembly      |                           |
| 10) Left Humus Deflector      | 20) Safety Drain Assembly   |                           |

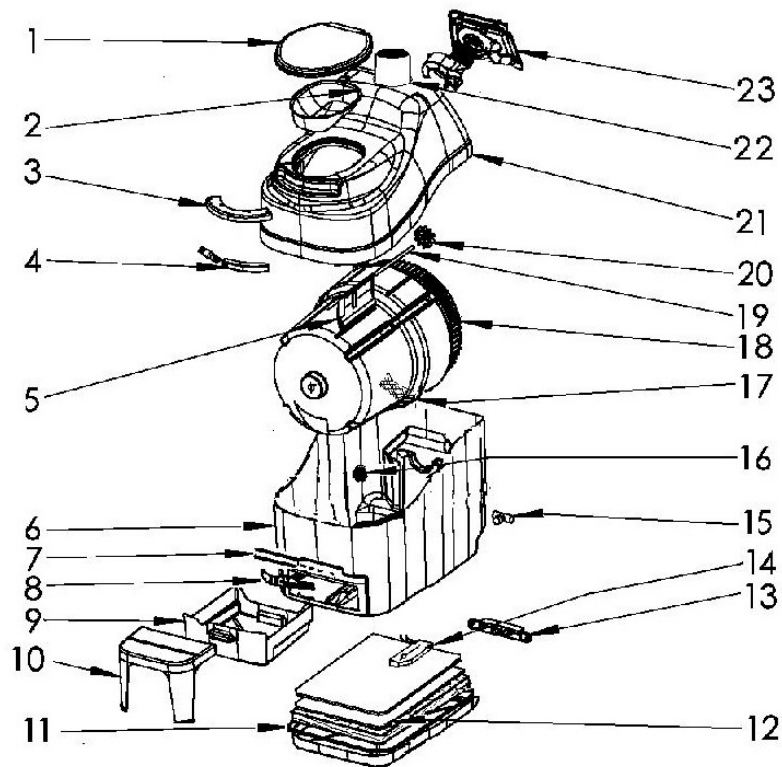


### ELECTRICAL SPECIFICATIONS

Toilet	Maximum Amps	Fan Power	Heater Power	Average Power
COMPACT (115V)	2.0 A	35 Req	200 W	125 W
COMPACT (240V)	1.0 A	35 Req	200W	125 W

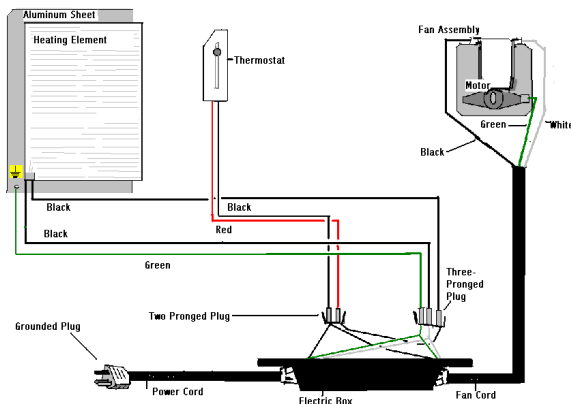
# EXCEL/EXCEL NE SPECIFICATIONS

## EXCEL/EXCEL NE EXPLOSION DIAGRAM



- |                     |                                    |                                |
|---------------------|------------------------------------|--------------------------------|
| 1) Toilet Seat      | 9) Finishing Drawer                | 17) Drum Screen                |
| 2) Bowl Liner       | 10) Footrest                       | 18) Bio-drum™                  |
| 3) Front Cover      | 11) Heater Tray (Electric)         | 19) Shaft Assembly             |
| 4) Handle Swivel    | 12) Heating Element (Electric)     | 20) Gear                       |
| 5) Drum Door        | 13) Electric Box (Electric)        | 21) Top                        |
| 6) Tank             | 14) Thermostat Assembly (Electric) | 22) 4" (100mm) Inlet Pipe (NE) |
| 7) Footrest Channel | 15) Safety Drain Assembly          | 23) Fan Assembly (Electric)    |
| 8) Drum Locker      | 16) Air Intake Vent                |                                |

Wiring Diagram



### ELECTRICAL SPECIFICATIONS

Toilet	Maximum Amps	Fan Power	Heater Power	Average Power
EXCEL (115V)	2.4 A	35 Req	260 W	125 W
EXCEL (230V)	1.25 A	35 Req	265W	125 W

# ACCESSORY ITEMS FOR THE TOILET



## Compost Sure Green

The ideal bulking agent for your Sun-Mar waterless toilet. Compost Sure Green is specially formulated to keep compost enriched with organic carbon, moist and maintain porosity ensuring maximum aeration.

## Compost Quick

Cleans and accelerates the composting action of your Sun-Mar composting toilet. Compost Quick is a specially selected natural enzyme solution that also assists aerobic decomposition of waste. Compost Quick is 100% natural and non toxic.



## Microbe Mix

100% natural product combining a blend of microbes and enzymes designed to start and accelerate composting in all Sun-Mar toilets.

## AC/DC Kit

**(Excel)** This kit allows the Excel to be converted to operate in a 12 volt or non-electric mode. When converted the toilet will have both an electric and non-electric vent stack (dual-vented).



## AC Fan Speed Control

**(Excel, Compact)** Designed to allow you to adjust the fan motor. If the unit is installed in close proximity to sleeping areas, this allows you to adjust the fan motor to continue air flow while reducing any distracting noise while you sleep.

## 12 Volt DC Fan

**(Excel NE)** Optional 12 Volt DC fan may be required if there are bends in the vent stack, competing appliances, or downdraft from prevailing winds.





# Sun-Mar



Product Info: (905) 332-1314 - Fax: (905) 332-1315 – Customer Service: 1-888-341-0782 Ext 1018  
E-mail: [compost@sun-mar.com](mailto:compost@sun-mar.com) [www.sun-mar.com](http://www.sun-mar.com)

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

5370 South Service Road  
Burlington, ON  
L7L 5L1  
CANADA

PO-MANU0-0601XX  
FEB 2024  
Rev.D31

# 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 fails within three years and five years on the fibreglass 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. **Labor 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.
6. Commercial use in excess of 90 days.

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.



## SUN-MAR WARRANTY REGISTRATION

Complete and return this warranty to register your unit in the Sun-Mar warranty database. Be sure to include your email address if you would like to receive Sun-Mar newsletters and promotions. You can also register online at [sun-mar.com/online-warranty-registration/](http://sun-mar.com/online-warranty-registration/)

Please indicate model purchased and serial #: \_\_\_\_\_

EXCEL		CENTREX 1000		CENTREX 3000	
EXCEL NE		CENTREX 1000 NE		CENTREX 3000 NE	
COMPACT		CENTREX 2000			
SPACESAVER		CENTREX 2000 NE			

Date purchased _____	Purchased from _____
----------------------	----------------------

Owner:

Name: \_\_\_\_\_ Street: \_\_\_\_\_

City: \_\_\_\_\_ State/Prov. \_\_\_\_\_ ZIP/PC: \_\_\_\_\_

Tel: \_\_\_\_\_ Email: \_\_\_\_\_

Location installed (circle selection):

Residence	Cabin/Cottage	Work	Resort	Other
-----------	---------------	------	--------	-------

Age (circle selection):

18 - 35	36 - 45	46 - 55	56 - 65	65+
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Owner introduced to Sun-Mar via (circle selection):

Dealer _____	Internet	Friend	Magazine _____	Show _____
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Please complete, then mail to:

Sun-Mar Corporation  
 5370 South Service Road  
 Burlington, Ontario L7L 5L1  
 Canada