

# Compost Tea System500 *Operating Manual*



**Growing Solutions**  
INCORPORATED

Distributed by

**Martin Lishman**

# Compost Tea System500

**PLEASE READ COMPLETE INSTRUCTIONS BEFORE ASSEMBLY AND REFER TO THEM REGULARLY TO ENSURE OPTIMAL PERFORMANCE AND SAFETY.**

## **CAUTION**

Special care should be taken when operating any equipment using electricity. To avoid possible electric shock or risk to personal safety, please observe all electrical safety rules and tips:

- The System500 is designed solely for producing compost tea. Use of the System500 for any other purpose may cause damage, injury or death and is not covered by the product warranty.
- Do not expose the System500 to excessive moisture or rain.
- Do not operate the System500 if it has a damaged electrical cable or plug, if it is not working properly, or if it has been damaged or dropped.
- To prevent any personal injury, or damage to the System500, operate it only in its fully assembled state.
- Close supervision is required when operating the System500 in the vicinity of children.
- The use of attachments not recommended or sold by Growing Solutions or Martin Lishman may cause unsafe operating conditions and voids warranty.
- Always unplug your System500 prior to cleaning or maintenance. Grasp plug to remove power cord from electrical outlet. Do not unplug by pulling on the power cord.
- Only use your System500 with a Residual Current Device (RCD) connected to a 230V 13amp power supply to prevent risk of electrical shock or equipment damage.
- Compost tea is not intended for human consumption.

**DO NOT DRINK. KEEP AWAY FROM CHILDREN.**

- The Electricity at Work Regulations 1989 require that any electrical equipment that has the potential to cause injury is maintained in a safe condition.

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# Compost Tea System500

## Compost Tea System500 Parts Identification

<b>No.</b>	<b>Description</b>	<b>Qty</b>
1	System Drain Valve	1
2	Power Switch / Overload protection	1
3	Tank Lid	1
4	Power Supply Cord	1
5	Air System Purge Valve	1
6	Tank Stand	1
7	Air Blower Shelf Lid	1
8	Air Blower Shelf	1
9	Fill Port	1
10	Aeration Disk	18
11	Aeration Disk Pressure Gauge	1
12	Basket Bulkheads	6
13	Compost Basket	6
14	Basket Air Supply Valves	2
15	Basket Cam Lock (for basket removal)	6
16	Plastic Plug	18
17	Air Blower	1
18	2000 litre (500 gallon) tank	1
19	Aeration Disk Manifold	1
20	Plastic Cap	18

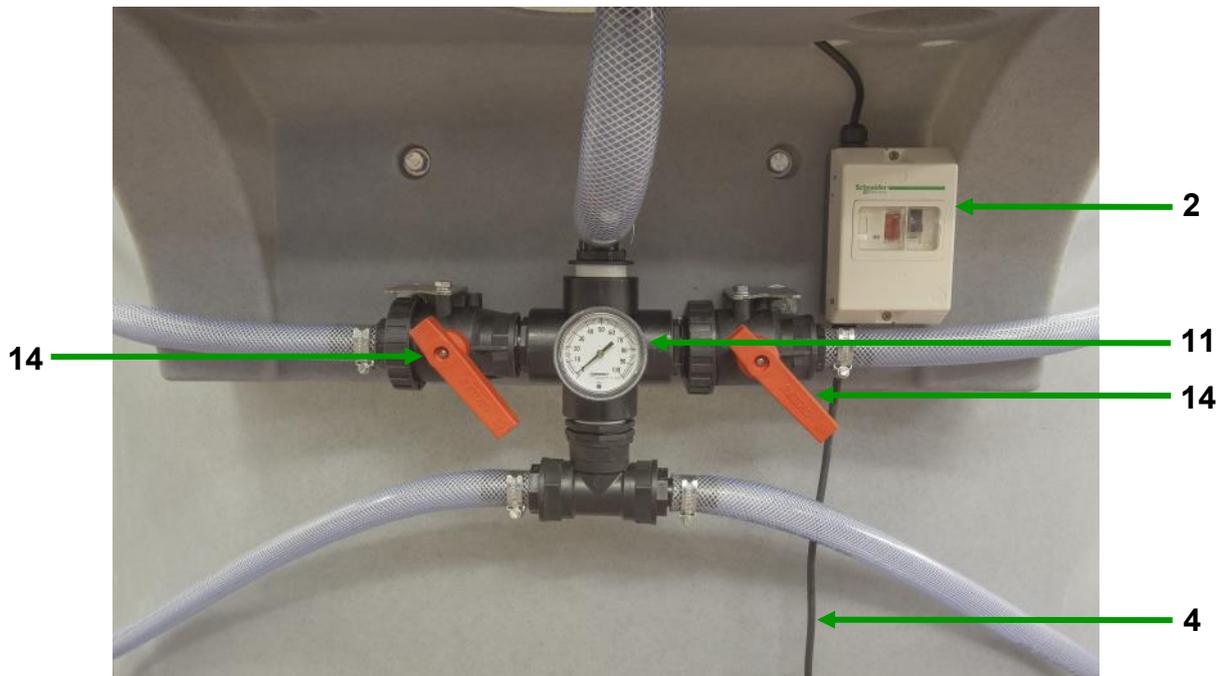
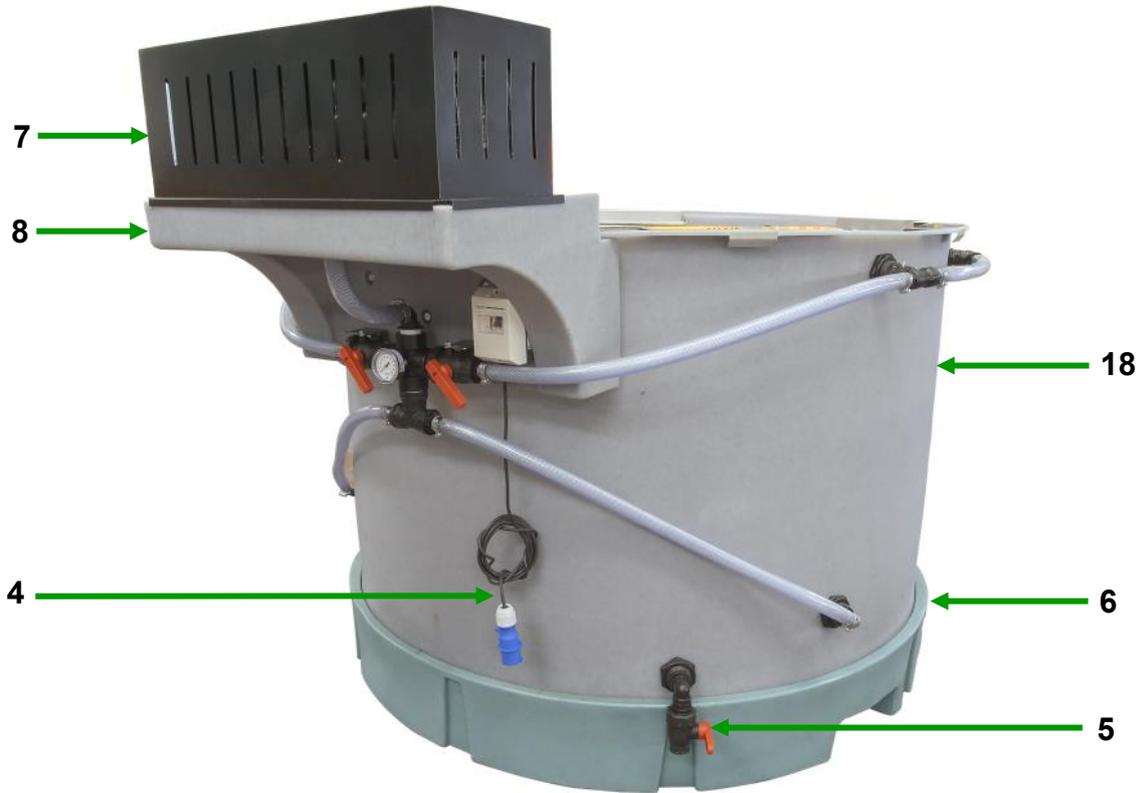
# Compost Tea System500

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# Compost Tea System500

## Compost Tea Production

- STEP 1** Place the System500 in a location that has a level surface and that allows for easy access to electric controls and plumbing valves. Location should be well ventilated and protected from weather, especially sunlight.

Placing the unit on a raised platform will make it much easier to empty the unit directly into a sprayer or application system. If a platform is used, it must be capable of carrying a weight load of at least 2250Kg.



- STEP 2** Plug the power supply cord into a 230 volt 13 amp power supply. If needed, an extension cable of suitable diameter should be used. Use only with a Residual Current Device (RCD).

- STEP 3** Make sure that the System Drain Valve (1) is closed. Start filling the tank with water, using the Fill Port (9) if desired. Switch on the air blower when water has reached the level of the aeration discs in the base. Continue filling the tank to the 2000 litre (500 gallon) mark indicated on the side of the tank. Be aware that when compost is placed in the baskets the water level will rise. Ensure the water level does not reach the Basket Bulkheads (12) located around the top of the tank.

*Leave the power to the air blower switched on until the brewing cycle has finished.*

*Important: See page 10 for information on water quality and temperature.*

- STEP 4** Using the scoop provided, add 4Kg of Compost Tea Catalyst directly into the water in the tank and allow it to disperse within the moving water.

- STEP 5** Ensure the Basket Air Supply Valves (14) are in the off position.



- STEP 6** Fill each compost basket until it is approximately 3/4 full. You will need about 60-100 litres per brew, depending on compost type and density. Compost should be filled loosely; compacting the compost will not allow adequate flow of air and water through the compost basket and could result in lower quality extraction.

*Important: See page 10 for more information on selecting compost.*

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## Compost Tea Production

**STEP 7** Hang the compost baskets on the tank rim and connect the Basket Cam Locks (15) as shown on Page 6. The baskets can be filled with compost when in position, but take care not to get compost into the main tank.

**STEP 8** Open the two Basket Air Supply Valves under the blower (14) to allow air flow to the basket discs. Adjust the valves to ensure the Pressure Gauge is reading approximately 50 inches H<sub>2</sub>O. This setting will depend on the volume of water in the tank and the density of the compost being used.



The aim is to create a low level of agitation and aeration in the compost and water in the baskets.



**STEP 9** Place the lid on the tank and leave the System to run for 24 hours. If foaming occurs during brewing add a few drops of vegetable oil to the water. When the lid is removed, to avoid the risk of distortion ensure it is placed on a flat surface.

## Compost Tea Removal

**STEP 1** After the brewing has completed, turn off the power to the air blower and allow the compost tea to stand for 30-60 minutes. This is to allow suspended particles in the compost tea to settle to the bottom of the tank before the tea is removed.

**STEP 2** Attach a hose or discharge pump to the System Drain Valve (1) and place the outlet end of the hose in the destination container.

**STEP 3** To discharge the tank, start by opening the System Drain Valve slowly. Check that sediment from the bottom of the tank is not being sucked out during emptying. If this is happening, reduce the flow by closing the valve until there is less turbulence generated. Allow the compost tea to flow freely until the tank is empty or until only sediment is being removed, then close the valve.

***Important:*** See page 11 for information on additional filtration techniques.

**STEP 4** When compost tea removal is complete, disconnect the power supply to the air blower. You should then begin the cleaning procedure as soon as possible.

# Compost Tea System500

## System500 Cleaning Procedure

Proper cleaning is essential to maintaining your System500 and making quality compost tea. It is normal for biologically active compost tea to produce *biofilm*, a thin, slimy film of bacteria that adheres to a surface. Routine cleaning is necessary to prevent an accumulation of biofilm within your System500. Never use soaps, bleach, harsh chemicals or abrasives. Always clean your System500 immediately after each use.

*ALWAYS unplug your System500 before cleaning.*

*NEVER submerge the air pump shelf assembly.*

*DO NOT spray water near the air blower and shelf or the power cord.*

### CLEANING (as soon as possible after every use)

#### **STEP 1: Remove and clean the compost baskets**

Remove the tank lid and place on a flat surface to prevent deformation. Unclip each basket cam lock and carefully lift the compost baskets from the tank. Tilt the opening of the compost basket slightly facing down and allow the compost to gradually slide out of the basket. The used compost can be added to your soil as a soil conditioner.

***Important:** Do not squeeze the sides of the basket or bang the end of basket to remove the compost as it may damage the mesh material.*

Remove each basket aeration disk and insert the Plastic Plug (16) supplied. Rinse the basket thoroughly with water and allow to dry. Some particles may remain in the mesh material and can be removed with a soft brush after the material has been allowed to dry.

*Note:* If it is necessary to disinfect the basket, spray it with 3% hydrogen peroxide (or similar) and allow to sit for one hour. Rinse the basket when finished.

#### **STEP 2: Rinse the tank thoroughly**

Open the System Drain Valve (1). Use a hose with a spray nozzle to thoroughly rinse the inside of the tank until any remaining sediment has drained and the discharge water is clear. Be sure to spray the area around and underneath the aeration disks. Use a non-abrasive sponge or soft brush to wipe away any remaining biofilm or residue and rinse again. Store the system with the drain valve open.

#### **STEP 3: Remove and clean the aeration disks**

Remove the tank aeration disks from the Manifold (19) by turning them anti-clockwise. To avoid water getting into the air line, place the threaded plugs provided (16) into the holes revealed after removing the disks. To avoid any dirt getting inside the disks, attach the Plastic Cap provided (20) to the bottom of the aeration disk. With a spray nozzle and non-abrasive sponge, thoroughly clean and rinse the basket and tank aeration disks until any visible biofilm or residue is removed. *Carefully* re-thread the aeration disks onto their locations and hand tighten clockwise.

#### **STEP 4: Empty the air line drain**

After every compost tea production cycle, empty the air line drain of any moisture. This is controlled by the Air System Purge Valve (5). After the machine has been cleaned, turn the air blower back on and open the purge valve. Any water that has entered the air system, will be blown out through this valve.

# Compost Tea System500

## Tips for Making and Using Compost Tea

### What is compost tea?

Compost tea is a biologically active liquid extract of compost that contains three essential components:

- Micro-organisms (active and inactive)
- Plant nutrients (macro and micro-nutrients)
- Organic compounds (plant-growth compounds)
- 

The System500 is designed to provide optimal conditions for extracting these three components from compost.

### Factors affecting the quality of compost tea

#### Water quality and temperature

**Chlorine:** The ideal water for making compost tea is harvested rain water. This will be at or near ambient temperature and should be free of chemicals and additives. Chlorinated drinking water will inhibit microbial growth. If this is used, dissipate the chlorine by aerating the water in the tank for approximately an hour prior to adding the compost. Check if the chlorine has been driven off by smelling the aerating water.

**Temperature:** The optimum water temperature range for compost tea production is 21° - 24°C (70° - 75°F) . Lower temperatures result in slower microbial growth. Higher temperatures result in lower dissolved oxygen levels in the tea.

#### Microbial food source (Compost Tea Catalyst)

Growing Solutions Compost Tea Catalyst, a microbial food source, contains soluble kelp, fulvic acid, rock powder and a blend of botanical ingredients formulated for optimal microbial growth and diversity. Other ingredients can be added to compost tea, such as liquid seaweed extract or single species microbe additives, but these should be tank mixed with compost tea when production is finished.

#### Compost quality and type

Although any type of compost can theoretically be used to make compost tea, a number of important factors should be remembered:

- The compost must be properly prepared to ensure all harmful pathogens have been destroyed. Different countries have different standards, but typically the compost must have reached a temperature of 65°C sustained for 7 days. Anaerobic material must be completely absent, pH should be in the neutral range and salinity should be low.
- The balance of raw material used to make the compost will affect the microbial content and diversity of the compost tea. A balance of green and woody waste will usually produce the greatest diversity of bacteria and fungi and other microbes in the compost tea.
- The texture of the compost should be slightly coarse and not too fine so that it floats freely in the compost basket during the production cycle.
- If fine material such as Vermi-compost is used, additional filtration may be required to avoid blocking application equipment. See opposite for guidance.

Compost Tea Compost is available from Martin Lishman Ltd. This is compost specially made for compost tea production. It is a balanced, high quality compost, rich in bacteria, fungi and protozoa.

#### Using compost tea

There is no single recommended method of use of compost tea. It can be used at any frequency or rate to suit the growing situation. Compost tea can be applied as a soil drench, a foliar application or through irrigation systems. There is no risk of over-application because compost tea is completely natural and organic. Each grower will find the best application regime to suit their situation. Some typical examples are:

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## Tips for Making and Using Compost Tea

**Application frequency:** Apply compost tea throughout the growing season. It can be applied continuously at low concentration via irrigation systems or once a week at full strength in times of plant stress (known disease conditions, environmental stress, etc); but is more commonly applied at diluted strength every 3 or 4 weeks. Do not apply less than 7 days before harvesting edible produce. To minimise leaf run-off, avoid applying during very wet weather.

**Application timing:** Apply compost tea in early morning or late afternoon to minimise the harmful effects of UV rays on the micro-organisms. Early morning application can take advantage of dew on the leaves. If morning dew is present, as it evaporates the compost tea is more readily drawn into the plant.

**Application and dilution rate:** Application and dilution rates depend on the growing situation and the application equipment. Compost tea can be used undiluted in situations of extreme disease pressure or diluted to provide adequate coverage or to suit the size of the sprayer. A typical application rate might be 250 litres/ha with a dilution of 1 part of compost to 3 parts of water, but in drip irrigation or dosing systems the dilution can be as high as 1 to 100. Users tend to find a rate and frequency to suit both their operation routines and the beneficial outcomes in terms of plant growth and disease suppression.

**Compost tea shelf life:** Compost tea should be used as soon as possible after the 24 hour production cycle, ideally within 12 hours and certainly within 48 hours. Exceeding this time will potentially allow the compost tea to become anaerobic and the diversity of micro-organisms will decrease. If not used immediately, keep your compost tea cool, out of sunlight in an open container and stir frequently until used. Do not store in a sealed container for an extended period of time.

**Filtration:** Compost tea can contain a varying degree of suspended particles and may require additional filtration after brewing has finished. The compost basket is designed with a mesh size (734 microns) that will allow fungal hyphae to pass from the compost into the water. There should not be any smaller size mesh restriction at this stage, but if vermi-compost is being used, a bag with the same size mesh can be placed inside the basket. Additional filtration can be used as the compost tea is being removed from the tank and in application equipment. Below is a table of recommended filter sizes that can be used:

Filtration point	Mesh size	Micron equivalent	Notes
Compost Basket	24	734	As supplied with the System
Filter bag	24	734	Place over System Drain Valve or inside the Compost Basket
Sprayer lid filter	18	1000	Use 2 filters, one on top of the other
Sprayer pump filter	50	297	
Nozzles	None	None	05 brown nozzles without filters

**Application equipment and procedure:** Any conventional type of crop sprayer, overhead glasshouse applicators, drip irrigation systems, backpack sprayers and even watering cans can be used to apply compost tea. Some changes to filtration and nozzle type may be required as detailed in the table above. A maximum spray pressure of 2-2.5 bar should be used to ensure microbes (especially fungi) are not damaged during application. If the application equipment has been previously used with chemical pesticides, these can be harmful to the micro-organisms contained in compost tea, so ensure that it has been thoroughly cleansed beforehand. If fungicides or other pesticides do need to be applied, follow up as soon as possible with an application of compost tea to help to restore the beneficial micro-life that may be destroyed by the chemical.

**Application types:** If compost tea is used as a foliar spray, thorough leaf coverage is important in order to maximise a disease suppression effect. Compost tea may also be used to accelerate the decomposition of plant litter. Soaking plug plants in compost tea prior to planting can also help in early growth stages. As a soil drench, apply compost tea with enough water to ensure it reaches the root zone.

# Compost Tea System500

SERIAL NUMBER: \_\_\_\_\_

DATE PURCHASED: \_\_\_\_\_

## LIMITED WARRANTY

Growing Solutions Incorporated (“GSI”) guarantees that for the period beginning on the date of purchase and ending 12 months after that date, this System500 (the “Product”) will be free from defects in material and workmanship. If a defect in material or workmanship is discovered during a period of this limited warranty, GSI, in its discretion, may either provide a new Product to the customer or repair the customer’s Product. If the Product is to be shipped for repair, shipping arrangements and expense shall be borne by GSI.

In order for this limited warranty to remain in force, the Product must be used only for agricultural purposes and related purposes and it must not be modified or altered in any way.

GSI does not warrant the suitability of the Product for the customer’s particular purposes. This warranty is limited to the repair or replacement of the product and in no event shall GSI’s liability be greater than the purchase price of the Product. GSI shall not be liable for consequential or special damages, for any damages relating to the use of the Product or any damages resulting from use of, or a customer’s inability to use the Product, including damages to plants, animals, persons or property. There are no warranties, express or implied, extending beyond those stated here.

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