30175 Solon Industrial Pkwy, Solon, Ohio 44139
Phone: 800-941-9484 • Fax: 440-786-7664 • www.cbgbiotech.com

CBG
Pure Savings.

OPERATOR'S CHECKLIST

TechnoClean S-600

Harvest Health & Recreation

January 25th, 2019

General Comments:

1. It is preferable to begin recycling operations first thing in the morning. In this way, the Recycler will have had time to cool down from the previous recycling run.
2. Once begun, the recycling process is under control of the Timer and Temperature controls, making the recycling process virtually automatic. This includes "shut-down" at the end of the recycling process & "shut-down" in the event of an emergency.
3. Ensure all containers are properly and clearly labeled as to what solvents/product they contain. Containers should be easily and clearly distinguished from one another in order to avoid product mix-ups.
4. Many customers choose to locate the Recycler and collection containers within some sort of containment area in case an operator (i) accidentally spills some solvent/concentrate. (ii) forgets to replace a full collection container with an empty collection container, or (iii) forgets to put an empty collection container in place before beginning the next recycling run.
5. This Recycler is constructed with (i) Temperature Control Dial, (ii) Timer Dial, (iii) manual drain on the bottom of the boiling tank.
6. **The following sequence of steps is critical for a successful run:**
   a. Ensure the drain-valve on the bottom of the boiling tank is closed.
   b. Fully close (& lock) the lid on the boiling tank, after concentrate has been added. **(Do not exceed 6 gallons!)**
   c. Set the temperature control to the desired temperature, based on product type & desired process.
   d. Set the timer for the number of hours that the Recycler is to run. **The recycling process will begin as soon as the timer has been set.**
7. If it is necessary to stop the recycling process at any time before the end of a run cycle, simply turn the timer back to "0". Allow the Recycler several hours to cool down completely before attempting to open the lid on the boiling tank.

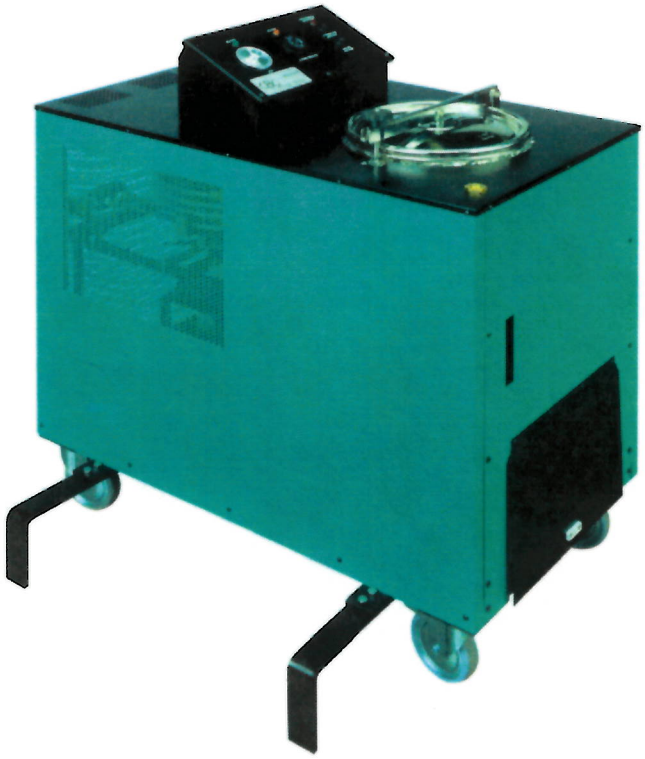
Caution: If the Recycler is not allowed to cool down before opening the lid, the operator runs the risk of vapor burn, asphyxiation, or fire.

Check List When Repeating an Ethanol Recycling Run:

1. Open the lid of the recycler and examine the contents of the bag. If the concentrate contains more than 10-15% of Ethanol, it may be desired to restart the unit-USING THE SAME TEMPERATURE SETTINGS, in 30-minute increments until the desired product consistency has been achieved.
2. Fill the disposable bag with concentrate to the 6-gallon mark, or to a lower level if a full 6-gallon run is not desired.
    a. If it has been opted to use a disposable bag liner (highly recommended), it is recommended to use a new bag on each run.
3. Close and lock down the lid on the boiling tank.
4. Perform the following: i.) set the temperature control to **125°C** ii.) set the timer to **6 hours**. If there is still excessive Ethanol left in the product at the end of the recycling run, raise the temperature in 5°C increments until the desired product consistency is achieved. If at any point, Ethanol vapor is being released into the surrounding area, lower the temperature in 5°C increments until solvent vapors have subsided.
    a. Exposing the concentrate/cannabis oil to excessive heat over time could result in undesired decarboxylation of the product.
    b. If a temperature increase is needed, try not to exceed 145°C if substantial decarboxylation is not the aim.
5. Once the timer has been set, nothing more needs to be done. The recycling process will end when the timer has expired.

CBG BIOTECH

TechnoClean S-600
Solvent Recycler
OPERATOR'S MANUAL



Rev 09/18

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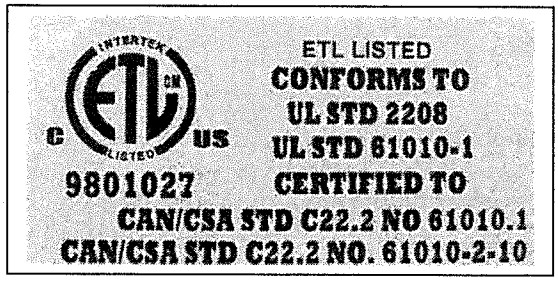
CBG BIOTECH TECHNOCLEAN S-600 SOLVENT RECYCLER

Thank you for purchasing this CBG Biotech TechnoClean Solvent Recycler! We are confident that you will find it easy to operate and will be very happy with your results.

The TechnoClean S-600 Solvent Recycler is ETL-Listed to UL 2208 and UL 61010 and CSA standard C22.2 for operation in a non-hazardous environment.



OVERVIEW:

Utilizing a simple distillation technology, CBG Biotech TechnoClean S-600 Solvent Recycler is capable of recycling many different solvents with boiling points up to 180°C (356°F), or higher if the machine is equipped with the optional Vacuum Assist feature. The optional Vacuum Assist should be used for processing solvents with a boiling point above 160°C (320°F), as well as with any solvent that has an auto-ignition temperature close to its atmospheric boiling point. Use of the Vacuum Assist option should reduce the boiling temperature by approximately 30% - 40%.

CAUTION: Do <u>not</u> attempt to recycle acid solutions or solvents containing acidic water without first contacting CBG Biotech for the proper technical information. Acids and other corrosive chemicals can attack and degrade the metals and other components of the Recycler.

WARNING: Do <u>not</u> attempt to process waste streams containing picric acid, colloidin (nitrocellulose), perchlorates, or azides as these materials can be explosive when heated and/or leave explosive residues upon evaporation.

NOTE: We suggest that you do not attempt to recycle any solvent or waste stream other than what was specified when the machine was ordered without first consulting your CBG Biotech representative. Failure to do this could result in dangerous conditions and/or damage to the machine due to possible incompatibilities.

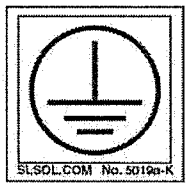
Warnings and Symbols:

 INSTRUCTION MANUAL SYMBOL. PLEASE REFER TO THE INSTRUCTION MANUAL FOR SPECIFIC WARNING OR CAUTION INFORMATION TO AVOID PERSONAL INJURY OR DAMAGE TO THE PRODUCT.

 INDICATES HAZARDOUS VOLTAGES MAY BE PRESENT.

 INDICATES A BURN HAZARD MAY BE PRESENT.

 INDICATES WARNING FLAMMABLE MATERIAL.



INDICATES PROTECTIVE EARTH SYMBOL.

 INDICATES SAFETY GLASSES REQUIRED

Standard Equipment and Ancillary Supplies:

Your TechnoClean S-600 should be shipped to you with the following items included:

One (1) TechnoClean S-600 Solvent Recycler
- Tubing for Recovery Line
- Tubing for Input and Output of Fill Pump (if ordered with Recycler)
- 11 ½" Tank Seal (INDTNK66)
- Heat Transfer Fluid (Thermal Oil) (CHEM040)
- Four (4) Stability Wings

One (1) Operator's Manual
One (1) Pack of 25 Bags (PP6N)
One (1) Bag Holder (BAG6)
Two (2) Ground Straps (SHP3001A)
One (1) Dribble-back Container Assembly (if Vacuum Feature is ordered with Recycler) (CN10007A)

OTHER SELECTED SUPPLY OPTIONS – to be ordered separately:

- Insulated Lid Cover (TD60018)
- Mist Deflector (MIS0093)
- Recovery Container – 8 Gallon (CN10037)
- Acetone-Resistant Tubing for Recovery and Fill Pump lines
- Service Manual (SM06)
- Gray Tote (CN10021)

Shipping Dimensions (base configuration)::

S-600 Recycler without Vacuum Feature:
- Palletized Shipment – 40 inches x 48 inches x 50 inches weighing 390 pounds
- PLUS: One (1) extra box of supplies – 12 inches x 12 inches x 16 inches weighing 19 pounds

S-600 Recycler with Vacuum Feature:
- Palletized Shipment – 40 inches x 48 inches x 50 inches weighing 456 pounds
- PLUS: Two (2) extra boxes of supplies
  Box #1: 12 inches x 12 inches x 16 inches weighing 19 pounds
  Box #2: 15 inches x 15 inches x 20 inches weighing 5 pounds

SPECIFICATIONS for TechnoClean S-600

Operating Capacity	6 Gallons / 23 Liters
Length	39 in / 99 cm (51 in/129 cm w/vacuum option fittings)
Width *(without stability legs)*	22¼ in / 57 cm
Width *(with stability legs)*	38 in / 96.5 cm
Height *(with wheels)*	44 in / 112 cm
Weight – Standard Model	290 lbs / 132 kg
Weight w/ Vacuum Option	356 lbs / 162 kg
Thermal Transfer Oil Volume	3.5 Gallons / 13 Liters

	240 V models	**120 V models**
Voltage	240 V, 1Ø, 60 Hz	120 V, 1Ø, 60 Hz
Wattage	2,800 VA	2,300 VA
Maximum Rated Load	11.1 A	18.5 A
Supply Fuse / Circuit Breaker	20 A	20 A
Immersion Heater – Qty.	1	1
Wattage	1,500 VA	1,500 VA
Amperage	6.25 A	12.5 A
Resistance per Element	19Ω	19Ω
Resistance in series	38Ω	N/A
Resistance in parallel	N/A	9.5Ω
Cooling Fan: Horsepower	1/2 HP	1/3 HP
RPM	1140 RPM	1725 RPM
Motor Supply Fuses	FNM-6 (6A, 250V)	FNM-8 (8A, 250V)
Vacuum *(if equipped)*		
Standard Venturi Pump (Air Supply Required)	7.8 CFM @ 80 PSI	7.8 CFM @ 80 PSI
Alternate Electric Pump	0.8 A @ 230V	4.5 A @ 120 V - ONLY AVAILABLE with separate electric circuit and power cord
Maximum Vacuum Capability	28 in. Hg	28 in. Hg
Fill Pump *(if equipped)*		
Electric		* ONLY AVAILABLE with separate electric circuit
Horsepower	1/2 HP	1/2 HP
Flow Rate	Up to 5 GPM	Up to 5 GPM
Pneumatic - (Air Supply Required)	80-120 PSI	80-120 PSI

FACILITY REQUIREMENTS

ELECTRIC SUPPLY

240 V Model: 240 VAC, 1Ø, 60 Hz with 20 amp breaker/fuse
120 V Model: 120 VAC, 1Ø, 60 Hz with 20 amp breaker/fuse

- NOTE: If your S-600 Recycler is configured for 120 V and has an electric vacuum pump option, the pump will have a separate power cord that must be plugged into a SEPARATE electrical circuit, as the normal 20 amp circuit will not be sufficient to run both the Recycler and the vacuum pump.

COMPRESSED AIR SUPPLY (only required for certain vacuum and fill pump options)

Venturi Vacuum Pump: 7.8 CFM @ 80 PSI. The air supply should be able to maintain 7.8 CFM @ 80 PSI throughout the processing cycle for optimum performance of the Venturi vacuum pump. If the PSI and/or CFM fall below these specifications it will adversely affect the vacuum, which could therefore increase the processing time or prevent the output of recovered solvent altogether.

Pneumatic Fill Pump: 3/8" pump: 80-120 PSI. It is expected to produce a flow rate of 5 GPM.

VENTILATION OUTPUT (optional for Recyclers with vacuum feature)

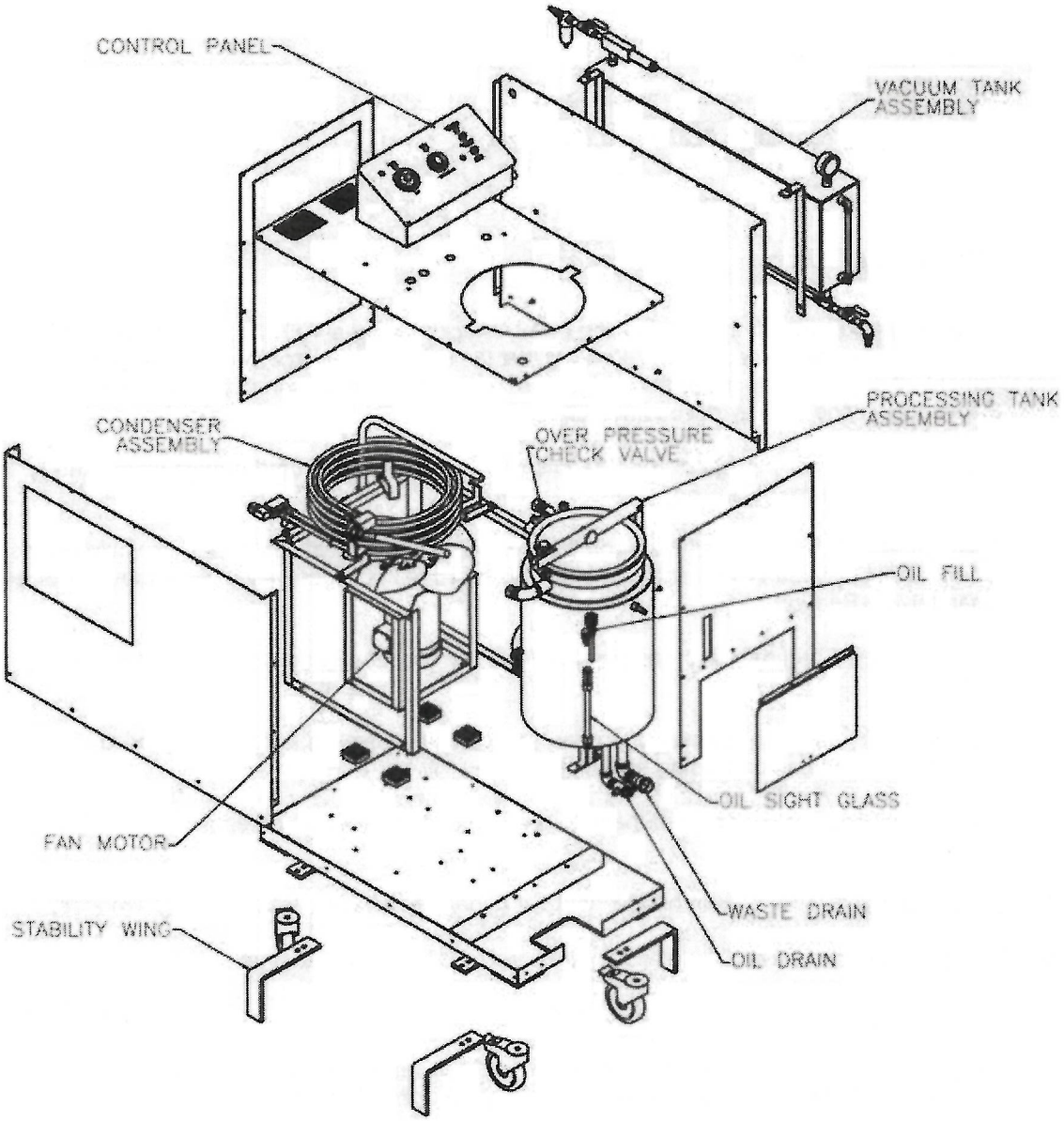
The vacuum pump exhaust will discharge into the facility unless it is directed either outside (e.g. via piping) or into the facility's ventilation system.

AMBIENT AIR TEMPERATURE

The Recycler is air-cooled, unless a liquid-cooled condenser option was chosen. For an air-cooled Recycler, operating efficiency is reduced as the surrounding air temperature increases. The optimal ambient air temperature for a Recycler is 10°C to 24°C (50°F to 75°F), with a maximum rating of 30°C (86°F).

MAJOR COMPONENTS IDENTIFICATION

S-600 Recycler
Base Configuration with Vacuum Option



SETTING UP YOUR TECHNOCLEAN S-600 RECYCLER

TOOLS REQUIRED

- Assorted screwdrivers
- Combination wrenches
- Adjustable ("Crescent") wrenches
- Small pipe wrench
- Socket set
- Pliers, including adjustable ("Channel Lock") pliers
- Hex ("Allen") wrenches

PRE-SETUP INSPECTION

Before unpacking the Recycler from the shipping pallet, check any Tip-n-Tell / Drop-n-Tell indicators that may have been attached to the packaging. Confirm that the unit was not excessively tipped or dropped during shipment. If any indicators have been triggered, be extremely thorough in your inspection as damage to some components may not be immediately noticeable.

After the Recycler has been unpacked from the shipping pallet, it should be thoroughly checked for any shipping damage or problems, including:

1. Packing List - Confirm that all items on the Packing List were actually received. (In some cases additional supplies/parts are shipped with the recycler, in other cases they may be shipped separately via FedEx.).

2. Exterior Panels/Shrouds – No shipping damage; no loose/missing screws, bolts, nuts or other fasteners.

3. Casters – No shipping damage; proper rolling and swiveling; proper operation of locking mechanisms; no loose or missing bolts/nuts.

4. Power Cord/Plug – No shipping damage to cord or plug; correct plug for application (240 V vs. 120 V).

5. Tank Drain Valve – Tank drain handle not bent or damaged; drain valve operates smoothly.

6. Oil Drain - Oil drain valve closed and plugged; no evidence of oil leakage.

7. Oil Level Sight Glass – Oil at proper level; no evidence of oil leakage; sight glass not damaged.

8. Tank, Lid, Hinge, Clamp, Seal – No damage to seal and sealing surfaces; clamp operates smoothly and is properly adjusted; hinge operates smoothly through full range of motion.

9. Controls – No damage to buttons, knobs, dials or switches; all controls operate smoothly.

10. Product Output – No damage to fittings or tubing.

11. Fill Pump *(if equipped)* – No damage to external fittings; no damage to switch.

12. Vacuum System *(if equipped)* – No damage to vacuum tank, gauge, pump, fittings or connections.

13. Tighten As Needed: All bolts, nuts, compression fittings, sheet metal screws, clamps and fasteners should be checked and tightened as needed.

SITE PREPARATION

Before setting up and operating the Recycler, the installation site must be fully prepared, including the following:

- Electric Supply – Any necessary supply lines, outlets, breaker boxes and fuse panels should be in place and operational.
- Compressed Air *(if required)* – If the Recycler requires compressed air (e.g. for a Venturi vacuum pump), all lines and connections must be in place and operational.
- Ventilation Output (*optional for Recycler with vacuum feature*) - The vacuum pump exhaust will discharge into the facility unless it is directed either outside (e.g. via piping) or into the facility's ventilation system.

See Facility Requirements (p. 1) for details on electric and air supply specifications

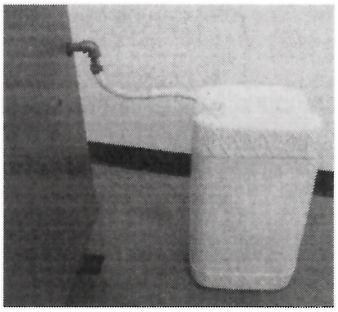
BASIC SETUP

Once the Pre-Setup Inspection and Site Preparation are complete, the Recycler can be set up for operation.

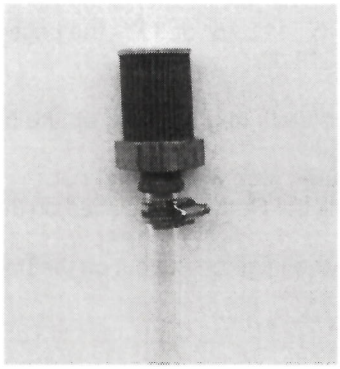
1. **DO NOT** plug in power cord or turn on power until all other preliminary setup items are complete.
2. Locate the Recycler and provide convenient access to the recovery containers, as well as for repairs and maintenance.
    - A minimum of 1 foot (30 cm) is required between the Recycler and the closest wall to provide adequate ventilation.
    - A minimum of 10 feet (3 m) is recommended between the Recycler and potential sparking sources.
3. For a standard Recycler configuration with wheels, attach four (4) Stability Wings to bottom of Recycler to ensure optimal stability.
4. If your Recycler has a leg option instead of wheels – either 5.5", 11", 15" or 30" – the Legs will need to be attached.
    - With the Recycler safely supported and lifted, attach each Leg by lining up the holes with those in the frame tubes on the bottom of the Recycler.
        - Each hole should have a ½" bolt with a washer, lock washer and nut.
    - Do not firmly tighten all the bolts against the Legs until the Recycler is placed on the ground and allowed to settle.
    - Once safely on the ground, tighten all Leg bolts first, then tighten the nut on the bolt against each Leg firmly.

5. Attach recovery output tubing to recovery output fitting using the included clamps. This fitting is labeled "Product Output".

6. Place the recovery container in proper position.

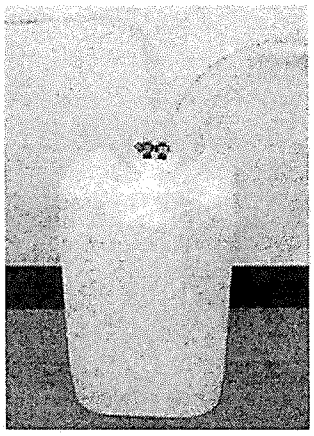


7. *(Recyclers with Fill Pump)* Attach Fill Pump hoses to their fittings using the included clamp(s). Fill Pump input and output fittings are labeled "Fill Pump Input" and "Fill Pump Output", respectively. The input hose requires the Fill Suction Strainer to be installed on the outer end.



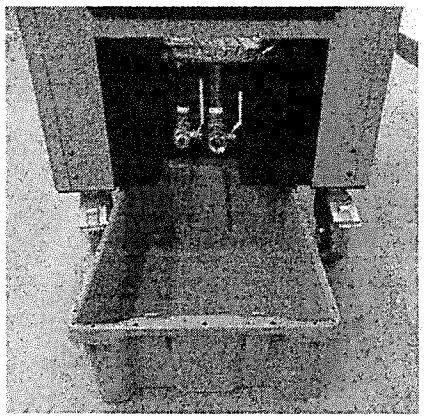
Caution: *Do not use the Fill Pump without the Suction Strainer as this can allow waste solids to enter the Fill Pump and Processing Tank, which could cause clogs and blockages, disrupt the fill and/ or recycling processes and possibly damage the Fill Pump.*

8. *(Recyclers with Vacuum system)* Attach Vacuum Exhaust hose to the output side of the vacuum pump using the included clamp. Route the Vacuum Exhaust hose to the Dribble-back Container and attach it with the included clamp. Then, it is recommended that you route the second Vacuum Exhaust Hose from the Dribble-back Container (attached with the included clamp) either (a) outdoors or (b) to the facility's ventilation system. NOTE: The discharge pipe leading from the Recycler or the Dribble-back Container should not in any way obstruct or constrict the vacuum pump exhaust (so as to avoid back-pressure in the system) and should be equal to or larger than the inside diameter of the vacuum pump exhaust outlet, which generally is 3/8".

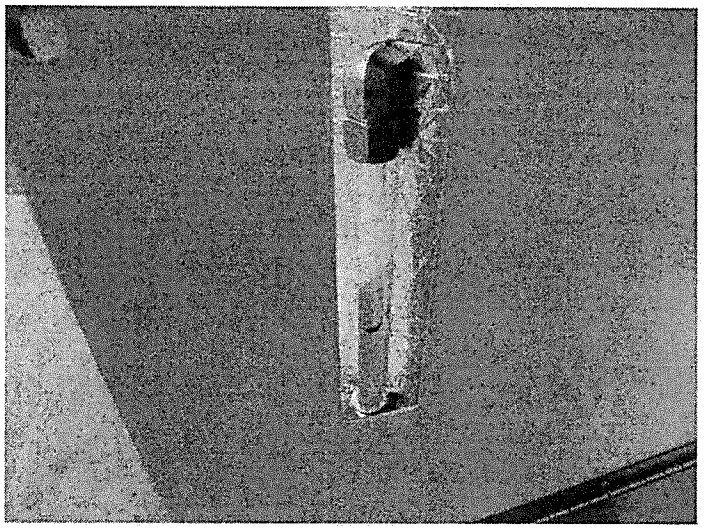


Note: *Be sure to check and comply with any applicable Federal, State, and/or local regulations for such exhaust.*

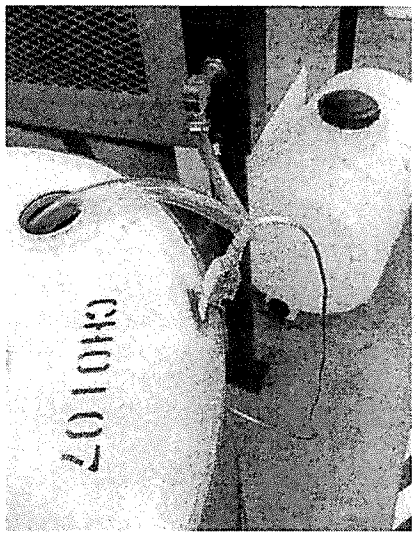
9. Consider placing a waste collection container under tank drain. As the tank drain is manually operated, this is not necessary until the tank drain is to be opened.



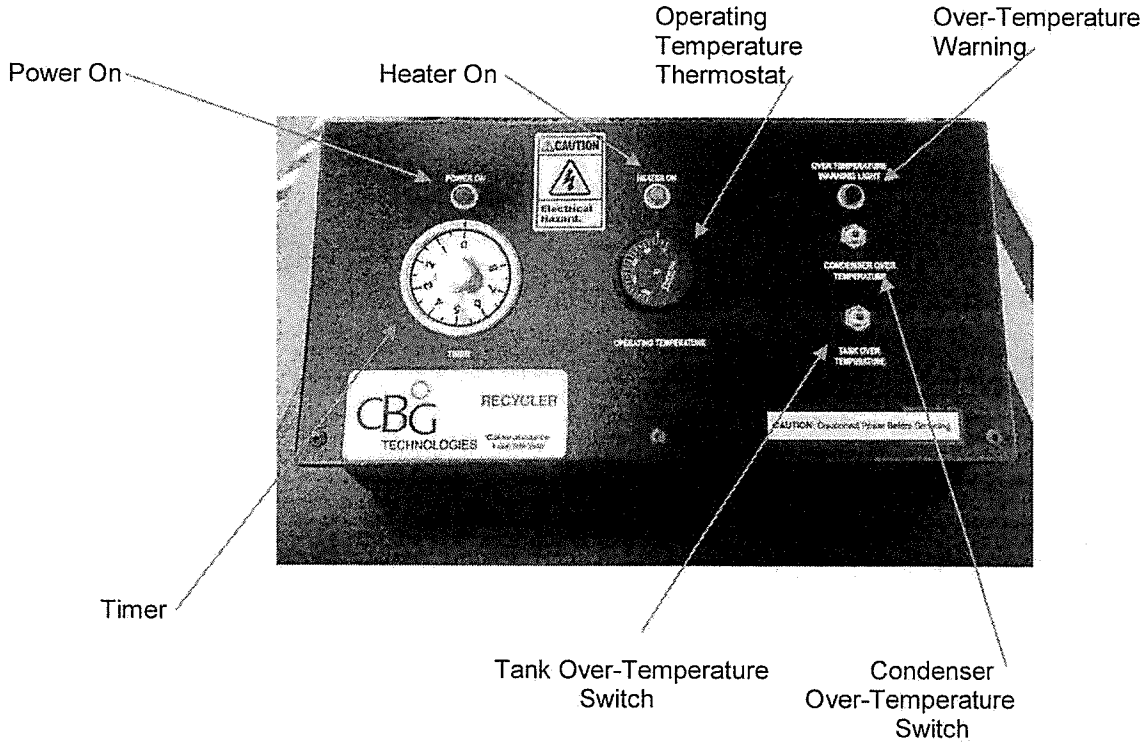
10. Check thermal oil level in sight glass. Correct level is minimum 2" – maximum 2.5" above bottom of the glass. ***Note:*** *Check level with oil at normal room temperature, 65°F–75°F. When heated the oil expands and if too cold the oil will contract below the sight glass. Either extreme will give a false reading in the sight glass.* Proper thermal oil level is necessary to ensure effective heat transfer to the processing tank and its contents.



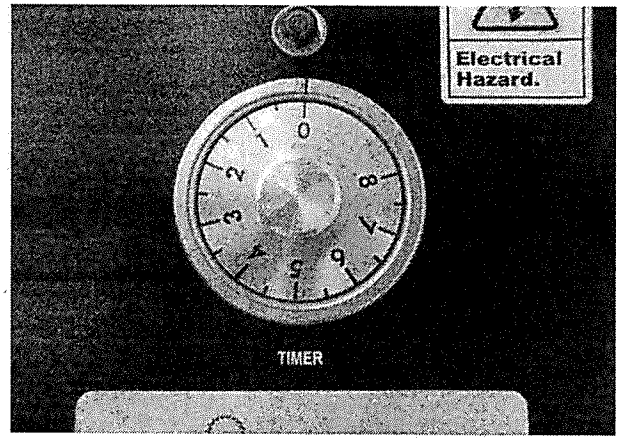
11. If the recovery container is metal or there is a metal fill container being used (e.g. as a reservoir from which the waste solvent is to be pumped), then please note that these containers may build up static electric charges from the movement of solvent through them unless properly grounded. To do so, CBG can supply a Ground Strap, which has clips on both ends. One end should be affixed to the metal container (e.g. on a protruding lip or the handle) and the other end should be attached to an earth ground.



12. When all other setup is complete plug in the recycler and/or turn on the power. The green "Power On" LED should now be lit.



13. Confirm that 0 on the Timer dial aligns with the mark on the top of the outer ring when the dial is turned completely counter-clockwise.

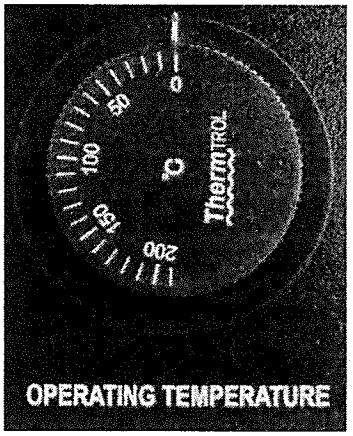


- If 0 does not line up with the mark see Troubleshooting, page 19.

14. Turn the Timer dial clockwise from 0. The fan should begin running immediately.

    - If the fan does not begin immediately the Timer may need to be recalibrated. *(See Troubleshooting, page 23.)*
    - The Timer adjustment is always set at the factory so it should not need any readjustment but on rare occasions it may become jostled out of alignment during shipping.

15. Check the Operating Temperature Thermostat to confirm that 0 on the dial aligns with the mark at the top of the outer ring when the dial is turned completely counter-clockwise.



    - If 0 is not aligned the Operating Temperature Thermostat will need to be recalibrated. *(See Troubleshooting, page 23 for description of similar recalibration procedure for Timer.)*
    - The Operating Temperature Thermostat adjustment is always set at the factory so it should not need any readjustment but on rare occasions it may become jostled out of alignment during shipping.

16. Once it is determined that the Timer and Operating Temperature Thermostat are properly calibrated, turn the Operating Temperature Thermostat clockwise past 100°C. Then slowly turn the Timer past 0. The Timer dial is marked in 30-minute increments.

    - From 0 to 30 minutes the fan should be the only operation running and only the "Power On" LED should be lit.
    - When the Timer dial passes the 30-minute mark the heater should turn on and the amber "Heater On" LED should now be lit.

17. Slowly turn the Timer dial back toward 0.

    - At the 30-minute mark the amber "Heater On" LED should go out, indicating that the heater has been turned off, but the fan should continue running until the dial reaches 0.

18. If the red "Over-Temperature Warning" LED comes on at any time remove the plastic caps from the "Condenser" and "Tank Over-Temperature" switches and check if the center push-rod in either one has popped out.

    - Their normal position is flush or nearly flush with the switch body.
    - If one has popped out it will extend approximately ¼" past the switch body.
    - If so push it back in to reset the switch and then replace the caps.

- If one of the switches immediately pops again then there is a direct short in the system that must be repaired before continuing.

19. Check tank lid clamp adjustment. The clamp(s) should be snug enough to seal the lid and not allow any leakage to occur, but not so tight as to distort and/or damage the lid and/or seal.

20. If the Recycler requires a Tank Liner Bag due to the type of waste stream being processed, confirm that the Bag Retaining Ring is in good condition and fits snuggly around the inner circumference of the tank.

    - If the Retaining Ring does not fit snugly enough it may be carefully bent outward just slightly every 4" – 6" to increase the tension and conform more closely to the tank wall. ***Caution:*** *Do not attempt to adjust the Retaining Ring by grasping the two ends and pulling outward in opposite directions, as this could cause the Retaining Ring to bend too sharply in the middle and make the problem worse and/or damage the Retaining Ring.*

21. Once all of these checks are complete, the Recycler is ready to be filled and run.

OPERATING YOUR TECHNOCLEAN S-600 RECYCLER

Prior to any processing run, but especially the very first one, it is a good practice to perform a quick inspection of the Recycler, including the following:

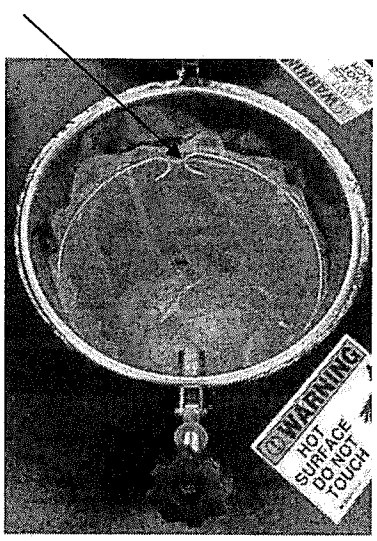
- All electrical connections are in good condition – no loose connections or damage that could cause an electrical short or any arcing or sparking.
- Any compressed air connections *(if required)* are in good condition – no damage or leakage. Any attached filters/driers have been drained of condensation.
- Control panel is in good condition – no damage of any kind.
- All external tubing is attached and in good condition, all clamps are tight.
- **The recovery container is empty, in good condition and in its proper position. Be sure that the recovery container is clearly labeled as to what solvent is expected to be recovered.**
    - **If you utilize a metal vessel to collect or hold solvent or any waste in the vicinity of the Recycler, you should connect such containers to ground to avoid static electricity risk by utilizing the Ground Straps sent with the Recycler.**
- The connection between the recovery container and the incoming tubing is vapor tight
- Tank lid and seal are in good condition – no nicks, cuts, or damage of any kind that could allow a leak.
- Processing tank is drained and clean. If any waste residue is baked onto the inner tank wall it can act as an insulator, reducing the efficiency of the recycling process. Any such residue should be removed prior to refilling the tank.

CAUTION: *When working with solvents and waste streams of any kind it is imperative that the appropriate Personal Protective Equipment (PPE) be used, such as safety glasses or face shields, gloves, lab coats and/or aprons. Failure to use the appropriate PPE could result in personal injury.*

(1) Use of Bag Liner for Processing Tank.

- Most applications with waste residue that flows easily do not require a tank liner bag. *(If in doubt, consult CBG Biotech)* The dirty solvent is poured or pumped directly into the processing tank.
- Applications with waste residue that does not flow easily will require the use of a tank liner bag. The dirty solvent is poured or pumped into the bag at the beginning of the recycling process and is processed while in the bag.
- ***NOTE:*** *While the tank liner bag can tolerate high temperatures, we do not recommend using a tank liner bag should the operating temperature exceed 185°C due to breakage and brittleness at such temperatures.*

- If a tank liner bag is required this bag must be inserted into the processing tank before filling the tank with dirty solvent.



(a) To properly install a bag in the processing tank, you must ensure that the bottom of the bag is pushed all the way to the bottom of the tank.

(b) You must also ensure that the sides of the bag are pushed all the way out around the inside circumference of the tank so that there is as much surface contact as possible between all parts of the bag below the Bag Holder ring and the inside of the tank.

- There should be no air gaps between the bag and the processing tank.
- If the bag is not pushed all the way down and out in this manner then it could pull away from the Bag Holder ring and possibly tear when dirty solvent is poured into the bag.
- Any air gaps between the bag and the processing tank can adversely affect heat transfer to the waste stream and thereby reduce the efficiency of the Recycler and possibly reduce recovery output.
- ***Note:*** *Be careful to not tear the bag when inserting it into the processing tank.*

(c) Once the bag is properly inserted squeeze the two ends of the Bag Holder ring together and place the Bag Holder ring inside the bag, allowing it to rest on the continuous support ring or studs welded to the inside of the processing tank.

- Let go of the ends of the Bag Holder ring to allow its spring tension to hold it in place.
- The bag should be captured between the Bag Holder ring and the tank wall and the continuous support ring.
- Fold any excess bag height over the Bag Holder ring to the inside of the processing tank.

CAUTION: *It is critical that no part of the bag covers any portion of the recovery output opening to the condenser and/or the emergency tank relief opening as this can cause, at the least, loss of recovery output, or, worse, a high pressure situation in the processing tank. If any part of the bag blocks any part of either opening use a razor knife or scissors to cut away just enough of the bag to keep the opening clear. Cut the bag only above the Bag Holder ring - do not cut any part of the bag below the Bag Holder ring.*

(2) Filling of Processing Tank.

(a) *MODELS WITHOUT FILL PUMP*:

(i) Open the tank lid and carefully pour the dirty solvent into the processing tank, being careful to not splash the solvent onto yourself or the recycler's controls.
- Clean up any splatters before they dry and cause permanent staining or paint damage.

(ii) The correct fill level is 2" below the Bag Holder ring or, if no bag is used, 2" below the continuous support ring (or studs) in the tank wall where the Bag Holder ring would rest.
- However, please note that solvents expand in volume as they are heated. Depending upon your particular waste solvent mixture, you may need to reduce the volume of waste solvent placed into the processing tank to ensure that there is no overflow into the condenser during heating and boiling of the waste solvent mixture.

(b) *MODELS WITH FILL PUMP*:

(i) Make sure the Fill Pump input and output hoses are attached and clamped to their fittings.

(ii) Make sure the Suction Strainer is attached and clamped to the outer end of the Fill Pump Input Hose.
- Make sure the Suction Strainer is clean, not clogged with anything that could prevent the pump from pulling solvent through the strainer.

(iii) Open the tank lid and place the Fill Pump Output Hose into the processing tank, being careful to aim it away from the recovery output and emergency tank relief openings.

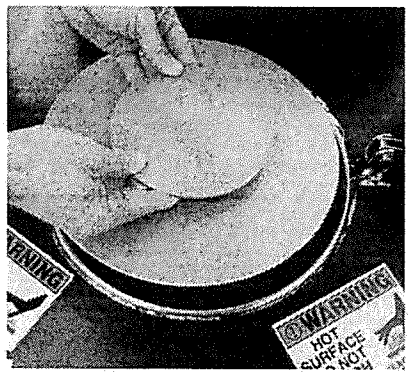
(iv) Hold the Fill Pump Output Hose while pumping to prevent the end of the hose from spraying dirty solvent anywhere but inside the processing tank.

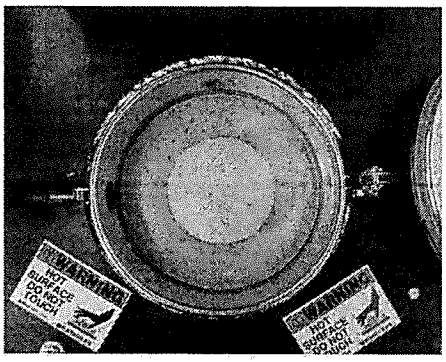
(v) Press and hold the Fill Pump Switch Button on the control panel to operate the pump.
- The switch is 'momentary' so the pump will stop if you let go of the switch.
- NOTE: The pump will only work if the recycler is plugged in, power is turned on, and the timer dial is set to 0. If the timer dial is turned past 0 the fill pump switch is locked out.

(vi) Hold both the switch button and the Fill Pump Output Hose until the processing tank is filled to the proper level.
- Be careful to not splash any solvent onto yourself or the recycler's controls.
- Clean up any splatters before they dry and cause permanent staining or paint damage.

(vii) The correct fill level is 2" below the Bag Holder ring or, if no bag is used, 2" below the continuous support ring (or studs) in the tank wall where the Bag Holder ring would rest.
- However, please note that solvents expand in volume as they are heated. Depending upon your particular waste solvent mixture, you may need to reduce the volume of waste solvent placed into the processing tank to ensure that there is no overflow into the condenser during heating and boiling of the waste solvent mixture.

(3) Mist Deflector. If an optional Mist Deflector is used, insert it on top of the Bag Holder ring once the processing tank is filled.

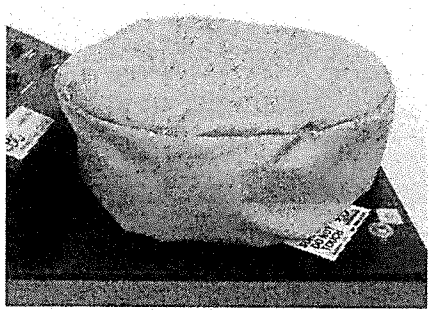




(4) Close Lid. Close the processing tank lid, making sure that the lid and/or seal are centered for proper sealing.

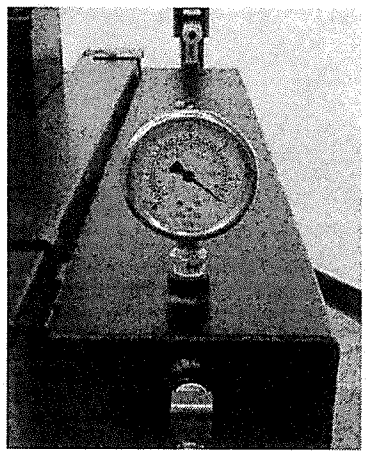
(a) Tighten the clamp so that the tank lid is sealed tightly enough to prevent leaks but not so tight that it is distorted. DO NOT OVERTIGHTEN the tank lid clamps, as this may damage the tank lid and/or the clamp(s).

(b) Place the insulated lid cover (if equipped) over the tank lid. While not required, we recommend using an insulated lid cover in order to conserve heat, reduce operating costs and prevent possible operator burns.

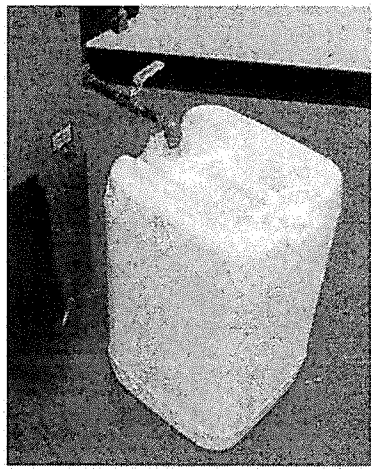


(5) If Recycler has Optional Vacuum Feature.

(a) Make sure the vacuum gauge on top of the Vacuum Tank reads 0 when the vacuum is 'Off'.
- If the needle does not rest at 0 when the vacuum is 'Off' the gauge must be recalibrated or replaced.



(b) Confirm that the output spigot on the Vacuum Tank is closed and that the recovery container is empty and in its proper position.

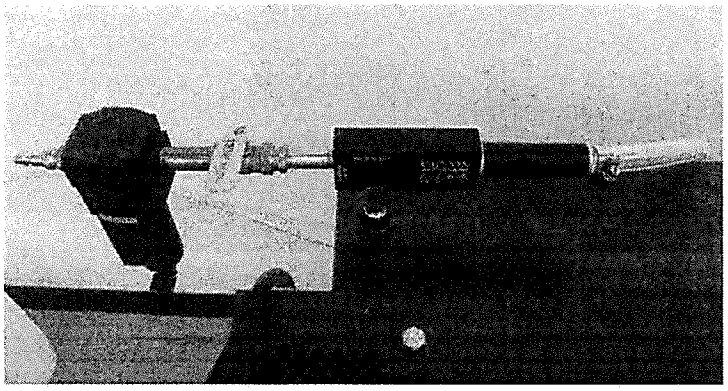


(c) Check for any liquid in the Dribble-back Container and empty if necessary.

(d) Venturi Pump

- Check the compressed air condensation filter/collector and drain any condensation that has collected in the bowl.

- Connect the air line to the quick-connect fitting on the filter/ collector but leave the air supply ball valve lever in the 'Off' position until the recycler has been started.



- If your Recycler has an alternate electric vacuum pump, leave the vacuum switch on the control panel 'Off' until the recycler has been started.

(6) Run the Recycler!

You may have received with your TechnoClean S-600 Recycler a separate Check List/Instruction Sheet with operating instructions and details for time and temperature settings specific to your application.

- Otherwise, you normally would set the operating temperature 40°C or so above the expected boiling point of the waste solvent mixture.
    i. Running the waste solvent mixture at too low an operating temperature may not achieve the desired flow rate for recovered solvent.
    ii. Running the waste solvent mixture at too high an operating temperature may increase the vapor production beyond the capacity of the condenser to re-condense it.
    iii. If you are utilizing the Optional Vacuum Feature - the boiling point of a solvent will be much lower under vacuum than at normal atmospheric pressure.

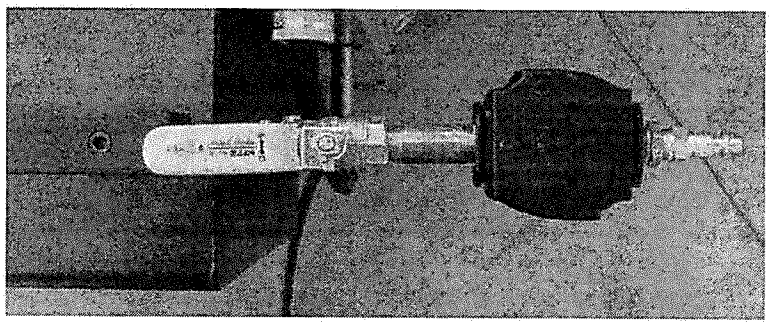
- The amount of time required will be determined by you as you gain experience over the first several runs. Run times vary with (i) the type of solvent in the waste mixture; (ii) the contaminants present and (iii) the volume of solvent being recycled. You can start with a setting of one (1) hour per gallon of waste solvent and subsequently adjust the time up or down depending on your results.

(a) Set the Operating Temperature Thermostat to the proper temperature, keeping in mind that the thermostat dial is marked in degrees Celsius. The maximum temperature setting is 210°C.

(b) Set the Timer dial for the proper running time. The dial is marked in 30-minute increments to a maximum of 8:00 hours.

- As soon as you set the Timer dial, the Recycler will turn on. Do not set the Timer until you actually are ready to run the Recycler.

(c) On models with a Venturi vacuum pump, the Air Supply Ball Valve can now be opened.



- On models with the alternate electric vacuum pump, the vacuum switch on the control panel can now be turned "On".

Nothing further needs to be done until the Recycler has completed the processing run.

CAUTION: Do <u>not</u> attempt to open the tank lid while the Recycler is operating. The processing tank will be full of boiling solvent and vapors that will cause serious injury upon contact, as well as pose flammability and explosion risks.

(7) <u>End of Cycle</u>. At the end of the processing cycle, there is a 30-minute cool-down period in which the heater is turned off but the fan continues to run.

- For example, if the timer was set for 5 hours the heater will be on for 4½ hours and then be turned off for the final 30 minutes while the fan continues to run.
- During this cool-down period the Insulated Lid Cover *(if equipped)* can be removed to facilitate the overall cooling process.
- Ideally, the tank should be allowed to cool before opening the lid.
    - At a minimum the tank should be allowed to cool at least 20°C below the boiling point of the waste solvent mixture before opening the lid.
    - This may take several hours or more, depending on how hot the operating temperature was set during the cycle and how much waste remains in the processing tank.
- The tank lid will still be hot during this cool-down process, so care must be taken while working around the lid until the lid and tank have cooled sufficiently.

Note: *While the tank is still hot it is possible that some recovered solvent may continue to drip from the recovery output hose until the tank has cooled to a point well below the boiling point of the solvent. It is best to allow the tank to cool enough that there is no more dripping before moving and emptying the collection container.*

CAUTION: *Use caution when opening the tank lid; even when the tank is cool opening the lid can release vapors and odors. Make sure there is sufficient ventilation in the room before the tank lid is opened.*

(8) <u>Collection of Recycled Solvent</u>. When the run has completed (the timer dial has returned to 0) the recovery container can be emptied of the clean, recovered solvent.

(a) The recovered solvent should be transferred to your storage container for recycled solvent.

(b) The recovery container should be placed back in its proper position at the Recycler to be ready for the next run.

(9) <u>Emptying the Waste Residue</u>.

(a) Upon opening the lid inspect the waste that is left in the tank or bag.

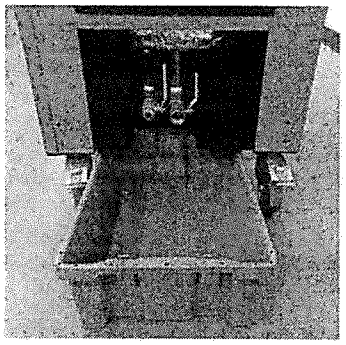
- This waste may range from being liquid to gel-like to a hard "cake" to a dried powder, depending on the type of solvent and waste that was processed.
- If the leftover waste appears to contain too much solvent then adjustments may have to be made to the operating temperature and/or running time to obtain a more efficient recovery.
    i. Keep in mind, though, that some wastes are liquid and will remain so after the recycling process.
- As every application has its own variables it can often take several trial runs to determine the best settings for processing your particular solvent/waste mix.

(b) *MODELS WITHOUT BAG*:

(i) Waste residue left in the processing tank is removed from the processing tank via the drain valve.

(ii) Make sure the waste collection container is an appropriate size, empty and in position, then simply rotate the waste drain valve handle to open the waste drain valve and allow the processing tank to drain.

(iii) Be sure to close the valve again when the processing tank has completely drained.



(c) MODELS WITH BAG: Depending on the condition of the bag and the type and amount of waste residue, it may or may not be possible to use a bag more than once.

(i) Check the amount of waste left in the bag and the condition of the bag.

(ii) If the amount of waste material in the bag exceeds 20% of the volume of the bag it should be removed and disposed of.

(iii) If the bag itself has been torn or shows any sign of damage it must be replaced.

- If the bag has become brittle or has noticeably darkened as if slightly charred, it should be replaced.

(iv) <u>Remove the Bag.</u>

a. Squeeze the ends of the Bag Holder ring together and remove the Bag Holder ring from the processing tank.

b. Carefully lift the bag out of the processing tank, being careful to not tear the bag.

- The Beg Holder ring is not a completely airtight seal so there will often be a small amount of solvent that seeps between the bag and the processing tank wall during the boiling process.
- This can sometimes cause the bag to stick to the processing tank wall so care must be taken when removing the bag so that it is not torn during removal, especially if the waste is still somewhat liquid or gel-like.

(10) Cleaning the Processing Tank.

(a) Inspect the processing tank's inner wall to make sure there is no residue built up or baked onto the wall.

- Excessive build-up of such residue can act as an insulator which will inhibit heat transfer to the solvent and reduce the recycler's efficiency.

(b) If the processing tank needs to be cleaned of such residue, often all that is necessary is a small amount of clean solvent and a scrubbing pad (Scotch-Brite or similar).

- In some cases a wire brush or putty knife may be necessary if a scrubbing pad will not remove the residue.
- In some extreme cases soaking the tank with acetone can help soften the residue enough to be able to scrub or scrape it out.
  - If this is done be sure to flush the system before recycling again so that your next batch of recycled solvent is not contaminated with acetone.

Keeping the processing tank clean on a regular basis will allow the Recycler to be more efficient in reclaiming your solvent. It is always easier to do a small amount of cleaning regularly than to have to do a major cleaning because residue has been allowed to build up extensively.

(11) Flushing.

(a) When switching from one waste solvent mixture to another, a flush is often recommended to remove all remaining material from the last solvent mixture that was run.

- Run one to two liters of the new waste solvent mixture.
- Set aside the recovered solvent, which is now contaminated with material from the previous solvent mixture (may be used for future flushing).
- Change recovery containers and proceed with recycling the new waste solvent mixture.

MAINTAINING YOUR TECHNOCLEAN S-600 RECYCLER

We are confident that your TechnoClean S-600 Recycler will continue to meet your expectations of providing convenient and economic recycling of your solvents, and therefore we have a continuing interest in the success of your investment in our equipment.

It is critical to recognize that there is normal wear and tear on this equipment which should be monitored and addressed on a regular basis. Listed below are our recommendations for regular maintenance:

Daily Monitoring (e.g. each time the Recycler is used):

1. **Damage**: Visually inspect the recycler for any damage, especially that which could cause problems with the operation of the unit. Repair as necessary.

2. **Thermal Oil Level**: Check thermal oil level in sight glass. Correct level is minimum ¼" – maximum 1" above bottom of the glass. ***Note:*** *Check level with oil at normal room temperature, 65°F–75°F. When heated the oil expands and if too cold the oil will contract below the sight glass. Either extreme will give a false reading in the sight glass.*

3. **Leaks**: Visually inspect the Recycler for evidence of any leakage – solvent or thermal oil.

4. **Tank Lid Seal**: Inspect the tank lid seal and its corresponding mating surfaces on the processing tank and lid for any nicks, cuts, or damage of any kind that could allow leakage past the seal. Clean the seal as necessary but do not use sharp objects or abrasive cleaners as this will damage the seal and it will need to be replaced. If necessary, replace the seal.

5. **Tank Lid Clamp**: Confirm that the tank lid clamp, as well as the hinge and pins, are mechanically sound and function correctly. Adjust clamps as necessary, especially if tank lid seal has been replaced.

6. **Clean Tank**: Clean any waste material or residue that may be building up on the inside of the processing tank and waste drain. Inspect and clean any openings or fittings inside the processing tank as well.

7. **Bag Holder**: If applicable, inspect the Bag Holder ring for any damage and for proper tension. If the Bag Holder ring is bent out of shape and/or will no longer hold the bag firmly in position inside the processing tank, it should be replaced.

8. **Protective Shields/Guards**: Confirm that all protective panels/shields/guards are in place and not damaged.

9. **All Tubing - Recovery, Vent, Fill *(if equipped)*, Vacuum Exhaust *(if equipped)*:** Inspect all tubing for any damage that could cause a leak. Repair or replace tubing as necessary. Confirm that all clamps are tight and that all tubing is routed correctly.

10. **Containers**: Confirm that all containers - collection, waste, vacuum dribble-back *(if equipped)* - are in good condition and in their proper positions.

11. **Power Cable / Plug**: Check power cable and plug (if applicable) for any damage that could cause an electrical short or arcing. Repair or replace as necessary.

12. **Grounding Cables *(if equipped)*:** Inspect any grounding cables used with metal containers for any damage or loose connections that could cause in interruption in the ground circuit. Repair or replace as necessary.

13. **Insulated Lid Cover *(if equipped)*:** Inspect Insulated Lid Cover for any damage, Repair or replace as necessary.

Monthly Maintenance: To include all daily items PLUS:

1. **Fill Pump *(if equipped)*:** Check fill pump operation. Confirm that there is no leakage at any fitting. Check suction strainer screen for dirt and/or blockage. Clean screen as necessary with a soft bristled brush.

2. **Vacuum System *(if equipped)***: Check vacuum pump operation to verify that sufficient vacuum (minimum 24" Hg, ideally 28" Hg) is achieved. Check vacuum gauge calibration - the needle should rest at 0 when no vacuum is present. Recalibrate if necessary.

3. ***Tighten As Needed:*** All bolts, nuts, compression fittings, sheet metal screws, clamps and fasteners should be checked monthly and tightened as needed.

Quarterly Maintenance: To include all daily and monthly items PLUS:

1. **Oil Leakage at Heater**: Check for any oil leakage at heater mounting threads. There should be no oil leakage at all, but if a leak is found contact the Service Department at CBG Biotech for assistance.

2. **Heater Current**: Check heater for proper amperage when the machine is operating. *(see Specifications, page iv)* If the amperage is more than 10% outside of specifications contact the Service Department at CBG Biotech for assistance.

3. **Clean Condenser Fins and Fan Blades: *Caution: Be certain that electric power cord is unplugged or otherwise disconnected before servicing fan.*** Inspect condenser fins and fan blades for any dust/dirt build-up that can impede air flow and cooling capabilities. Clean as necessary. Confirm that fan blade mounting screws are tight. ***Note:*** *If the recycler is operated in a very dusty environment this service should be performed more often, at least monthly.*

4. **Waste Drain**. Clean the waste drain and check for proper operation.

Annual Maintenance: To include all daily, monthly and quarterly items PLUS:

1. **Control Panel / Wiring**: ***Caution: Be certain that electric power cord is unplugged or otherwise disconnected before opening the control panel.*** Inspect all components, wiring and connections in control panel for dust, debris, loose connections, or evidence of arcing and/or overheating. Clean as necessary, tighten any loose connections and replace any damaged components.

2. **Over-Temperature Switches**: Located on the control panel below the red over-temperature LED. Remove plastic caps and make sure switches are not tripped – the center push rod should be nearly flush with the switch body. Check underside of switches for any loose connections, damage or evidence of arcing and/or overheating. Remove wires and test continuity across the terminals at room temperature. Replace if necessary.

3. **Thermal Devices (bulb and capillary):** Inspect the bulb/capillary devices on the Recycler for any damage – these are the temperature probes that measure the temperature of the thermal oil and the condenser. The capillaries should not be bent in a radius of less than ½" or kinking could occur which will cause false readings for the thermostat and/ or over-temperature switches. Confirm that

all capillaries and wiring are tied as far away from the fan blade and any exposed hot surfaces as possible. Confirm that both the condenser bulb mounted in the condenser junction block and the processing tank bulb mounted on the side of the processing tank above the heater are held in place by Permatex sealant.

4. **Replace Tank Lid Seal**: To maintain a good seal between the processing tank and the lid, CBG recommends replacing the seal annually. When removing the old seal care must be taken so that no damage occurs to any of the sealing surfaces on the processing tank or lid. When installing a new seal do not use sharp or pointed tools or anything that could damage the seal and cause it to leak.

5. **Change Thermal Transfer Oil**: The thermal transfer oil will begin to break down when heated and cooled numerous times - this is normal. CBG strongly recommends that the oil be changed every 1000 hrs to maintain proper operation of the tank heating system. See Specifications, page iv, for oil capacity. If the Recycler is used extensively or if it is operated regularly at temperatures in the upper range of the Recycler's capabilities, the thermal oil may need to be changed more frequently. There is an hours log located in the system parameters that should be checked and noted when changing the thermal oil. Please consult with your CBG service technician for hours log instructions.

6. **Oil Vent**: Inspect the oil chamber vent fittings on the processing tank and ensure that there is a clean clear path for air into the oil reservoir.

7. **Pressure Relief Valve**: Check the pressure relief valve for proper operation and to ensure that it seats cleanly.

8. **Labels**: Inspect all labels on the Recycler for damage and legibility. Confirm that all labels are adhering to the Recycler and have not begun to peel or fall off. Replace any damaged or missing labels.

9. **Training**: Over time you may have introduced new personnel to the responsibilities of operating and/or maintaining your TechnoClean S-600 Recycler. It is important to ensure that all current personnel have been properly trained for your unit. Without the proper training, there is an increased risk of incorrect operation of the Recycler which could result in less than satisfactory recovery results or potentially dangerous situations. We would expect that any existing trained personnel, using this Operator's Manual, would be able to train any new personnel in correct use of the Recycler. If, however, you have a need for a refresher course or additional training, please contact your CBG Sales Representative for details.

Preventative Maintenance Program

CBG Biotech offers a Preventative Maintenance program in which our factory-trained and authorized personnel will perform all of the above service along with a complete and thorough inspection of your Recycler, after which recommendations will be made for any further service that may be found to be necessary. Contact your CBG Sales Representative for details.

TROUBLESHOOTING

Please note that the following troubleshooting procedures provide some basic operational troubleshooting guidelines only - it is not intended to be a full Service Manual. If a complete Service Manual is desired please contact your CBG Sales Representative for details.

PROBLEM: ***'POWER ON' LED NOT LIT, MACHINE WILL NOT RUN.***	
POSSIBLE CAUSE(S):	ACTION(S):
Power cord not plugged in.	Plug cord into outlet.
No power at outlet	Check for proper voltage at outlet. Is circuit breaker turned on? Are any supply fuses blown?
Bad power cord or connections.	Check connections at power cord and plug; tighten if loose. Check continuity of power cord wires with an ohmmeter. Replace cord if any wire fails test.
Bad LED.	If Recycler runs but "Power On" LED is not lit, check label on LED to confirm proper voltage for machine - either 240 VAC or 120 VAC. Confirm proper voltage at LED terminals with a volt meter. If proper voltage is present, replace LED.

PROBLEM: 'POWER ON' LED IS LIT BUT FAN WILL NOT RUN.	
POSSIBLE CAUSE(S):	ACTION(S):
Timer dial loose on shaft or Timer not moving when knob is turned.	Confirm that fan turns 'On' immediately when Timer dial is turned past 0. If not, check that Timer knob set screw is tight and that dial is properly calibrated. When Timer dial is turned completely counter-clockwise, the '0' mark on the dial must align with the mark at the top of the outer ring. If not properly aligned, loosen the set screw, pull the knob from the shaft, turn shaft counter-clockwise as far as it will go, reinstall knob, align '0' on the dial with the mark at the top of the outer ring, and tighten set screw.

PROBLEM: 'POWER ON' LED IS LIT, FAN RUNS, BUT HEATER 'ON' LED IS NOT LIT	
POSSIBLE CAUSE(S):	ACTION(S):
Timer dial is under 30 minutes.	Confirm that Timer knob set screw is tight and that Timer shaft actually turns with knob. *(see above)*
Over-temp switch(es) tripped or bad.	Confirm that neither over-temp switch is tripped. If tripped, reset as necessary. Determine and repair cause of tripped switch before restarting Recycler.

PROBLEM: ***OVERTEMP (RED) LED IS LIT***	
POSSIBLE CAUSE(S):	ACTION(S):
Condenser Over-Temperature Switch tripped.	Condenser Temperature Switch overheated. Confirm that fan runs and fan blades are clean. Operating temperature may be set too high; condenser cooling fins may be clogged with dust/dirt; foreign material in waste stream may be causing temperature to spike; thermocouple capillary lead to condenser temperature probe may be damaged; or over-temperature switch or wires may be bad. Determine and repair cause of tripped switch before restarting Recycler.
Tank Over-Temperature Switch tripped.	Check for overheating at Tank Switch. Operating temperature may be set too high; foreign substance in waste stream may be causing temperature to spike; thermocouple capillary lead to tank oil temperature probe may be kinked or damaged; over-temperature switch or wires may be bad; thermostat may be bad; or wires and connections to thermostat may be bad. Determine and repair cause of tripped switch before restarting Recycler.

Bad wires or connections to safety relay; bad relay	Confirm relay is activated when Recycler is plugged in or power turned on. Check all wires and connections to/from relay. Repair or replace wires or relay as necessary.

PROBLEM: ***LOW RECOVERY VOLUME***	
POSSIBLE CAUSE(S):	ACTION(S):
Low voltage at outlet.	Confirm proper voltage at outlet. Optimum efficiency will be achieved at rated voltage. The machine will run with lower voltage but with longer run times and reduced efficiency. At voltages more than 10% below rated voltage efficient operation will be questionable at best.
Low operating temperature.	Try increasing operating temperature by 10° increments per run to see if output increases. ***Caution:*** *Do not increase heat so high that waste residue "bakes" onto inside of tank.*
Insufficient operating time.	Try increasing operating time in 30 minute increments per run to see if output increases. ***Caution:*** *Do not increase time so high that waste residue "bakes" onto inside of tank.*
Solvent overly saturated with waste.	Recycle more frequently or, if using bags and waste has been allowed to build up in bag, change bags more often. Excess waste in solvent can absorb heat and/or act as an insulator, making machine less efficient. Use appropriate hydrometer to confirm that specific gravity of waste stream is no more than 2 points higher than specific gravity of "virgin" solvent.
Recovery and/or vent outlet in tank blocked or partially blocked.	Inspect recovery and vent outlets in tank and confirm that they are not blocked or partially blocked by any foreign object or substance, including tank liner bag (if used). Clean as necessary.
Oil level too low.	Low oil level can affect heat transfer to dirty solvent and reduce efficiency of recycling process. Confirm proper oil level in sight glass. Oil level should be checked at normal room temperature, 65°F - 75°F. If oil level is low check for possible leaks. Repair any leaks before refilling. Add oil to proper level. Use only approved thermal transfer oil (CBG part number CHEM040). ***Caution:*** *Do not overfill. The oil also contracts when cold so if*

	machine is kept in an unheated area in cold weather the oil level may appear low due to contraction. If oil is filled to full mark when unit is cold it will most likely expand to the point of leakage when heated.

OPTIONAL EQUIPMENT – VENTURI VACUUM SYSTEM:	
PROBLEM: LOW OR NO VACUUM	
POSSIBLE CAUSE(S):	ACTION(S):
Air shut-off valve closed.	Open shut-off valve.
Low air pressure supply to Venturi pump	Confirm proper air pressure is available vacuum to Venturi vacuum pump. *(see Facility Requirements, p. 1)*
Blockage or partial blockage in vacuum pump exhaust	Check vacuum pump exhaust outlet for blockage or partial blockage that could restrict vacuum. Check tubing for kinks that could cause blockage. Clean or repair as necessary.
Excess condensation in filter/drier assembly.	Drain condensation from filter after each use.
Leak in vacuum system.	Confirm boiling tank lid is clamped snug enough to seal properly but not so tight that lid is distorted. Inspect tank lid and seal for cuts, nicks, or any other damage that could allow a leak. Confirm that boiling tank waste drain valve is closed completely. Confirm that recovery outlet valve is closed completely. Confirm that all fittings and lines to/from boiling tank are tight. Confirm that all lines and fittings at vacuum collection tank are tight.
Vacuum gauge needs recalibrated; gauge bad.	Confirm that vacuum gauge reads 0 when no vacuum is present in system. Recalibrate or replace gauge as necessary. Contact the Service Department at CBG Biotech for assistance.

OPTIONAL EQUIPMENT – ELECTRIC VACUUM SYSTEM:	
PROBLEM: NO OR LOW VACUUM	
POSSIBLE CAUSE(S):	ACTION(S):
Vacuum switch not turned on.	Turn on vacuum switch on control panel.
Blockage or partial blockage in vacuum pump exhaust.	Check vacuum pump exhaust outlet for blockage or partial blockage that could restrict vacuum. Check tubing for kinks that could cause blockage. Clean or repair as necessary.
Leak in vacuum system.	Confirm processing tank lid is clamped snug enough to seal properly but not so tight that lid is distorted. Inspect tank lid and seal for cuts, nicks, or any other damage that could allow a leak. Confirm that processing tank waste drain valve is closed completely. Confirm that recovery outlet valve is closed completely. Confirm that all fittings and lines to/from processing tank are tight. Confirm that all lines and fittings at vacuum collection tank are tight.
Vacuum gauge needs recalibrated; gauge bad	Confirm that vacuum gauge reads '0' when no vacuum is present in system. Recalibrate or replace gauge as necessary. Contact the Service Department at CBG Biotech for assistance.

OPTIONAL EQUIPMENT - FILL SYSTEM:	
PROBLEM: FILL PUMP DOES NOT WORK	
POSSIBLE CAUSE(S):	ACTION(S):
Timer turned 'On'.	Confirm that timer dial is at '0' position. Fill pump is locked out if timer is turned past '0' position.
Fuse blown.	Check fuse F1 inside control panel; replace as necessary. ***Caution:*** *Use only the same size and type fuse as installed at the factory.*
Fill Pump Suction Strainer plugged.	Check Fill Pump Suction Strainer for blockage. Clean or replace as necessary. When cleaning use only a soft-bristle brush as the mesh is very fine and will tear easily if a wire brush or stiff-bristle brush is used.
Leak in fill system.	If little or no suction is present at fill pump inlet check inlet and outlet lines for blockage. Check fill pump for leakage at o-ring and/or shaft seals. Confirm that all lines and fittings are tight. Repair or replace any damaged or leaking components.

WARRANTY

The Equipment is warranted to be free of defects in materials and workmanship for twelve (12) months from the date of shipment. Should any such defects arise during the warranty period that cannot be readily addressed through remote technical support (telephone and/or e-mail), CBG Biotech will warrant the defective parts and, upon request, send the replacement part or parts to the Customer at no charge to the Customer. If service is required to address the warranted issue, the Customer should return the Equipment, freight prepaid, to CBG Biotech. If CBG Biotech determines that the problem is due to defective workmanship and/or materials, CBG Biotech will repair the Equipment (or, at our option, replace the Equipment) without charge and ship it back to the Customer at Customer's cost.

Should any on-site service be required in connection with the replacement of such parts, it would be an additional cost to be agreed upon separately between the Customer and CBG Biotech.

This warranty does not cover mechanical issues arising due to abuse, misuse or improper maintenance of the Equipment; arising due to alterations or repairs having been made or attempted by parties other than CBG Biotech; arising due to shipping damage subsequent to the initial shipment of the Equipment by CBG Biotech to Customer; arising due to the use of acidic or explosive chemicals with the Equipment; or normal wear and tear. Consumable parts and supplies are not covered by this warranty. Damage to the interior or exterior finish of the Equipment is not covered by this warranty. Further, this coverage will not apply to the Equipment if such equipment has been repaired or altered by the Customer in any way unless such repair or alteration first has been expressly approved in writing by CBG Biotech. In addition, this coverage will not be extended to a subsequent purchaser of the Equipment; however, this exclusion does not apply to a party that purchases or otherwise acquires the overall business of the Customer and continues to operate the Equipment in its facilities.

If a Customer has purchased an Extended Warranty option, such Extended Warranty will cover defective parts only during the Extended Warranty period (e.g. after the initial manufacturer's warranty period), subject to the same qualifications as set forth in the initial manufacturer's warranty.

This warranty does not cover a guarantee of performance of the Equipment with regard to any specific waste solvent mixture, as distillation processes will have varying degrees of separation of such mixtures, especially if any contaminants are volatile, regardless of whether the Equipment utilizes simple or fractional distillation.

THIS EXPRESS WARRANTY IS THE ONLY WARRANTY APPLICABLE TO THE EQUIPMENT AND IS IN LIEU OF AND EXCLUDES ALL OTHER EXPRESS OR IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

CERTAIN CRITICAL LABELS ON S-600 RECYCLER:

WASTE DRAIN
Turn handle counterclockwise to open, clockwise to close.
Do not open unless tank temperature is significantly below the boiling point of the contents. Wear appropriate safety equipment. Place an empty container below the drain of sufficient size to contain the tank contents safely.

CAUTION: To minimize vapors escaping into the immediate environment, any product output ports must be connected to collection vessels via a vapor tight connection. The product collection containers must be able to withstand the chemical properties and the normal operating temperatures of the waste stream being processed. If metal containers are used, they must be connected to an earth ground.

CAUTION: To minimize vapors escaping into the immediate environment, if the waste drain valve is being operated, it must be connected to a waste container via a vapor tight connection. The waste container must be able to withstand the chemical properties and the normal operating temperatures of the waste stream being processed. If a metal container is used, it must be connected to an earth ground.

Not for use with Picric acid or Nitrocellulose.

Caution: Disconnect Power Before Servicing.

Caution – To reduce the risk of fire or explosion, install, operate and maintain this equipment in accordance with the Operator's Manual. This unit is for use in an environment not to exceed 30°C (86°F). Under these conditions, the unit shall be spaced a minimum of 10 feet (3 meters) from potential sources of ignition such as receptacles, switches, pilot lights, fixtures, contacts and other similar equipment that can produce sparks. If the equipment is used in higher ambient temperatures, an increase in spacing to sources of ignition should be considered. This unit has been investigated for use with the solvents indicated in the Operator's Manual.

For units with a Vacuum Tank:

ATTENTION: Close product output valve when operating under vacuum. Be sure to open the valve when not operating under vacuum and place an empty collection container under valve.

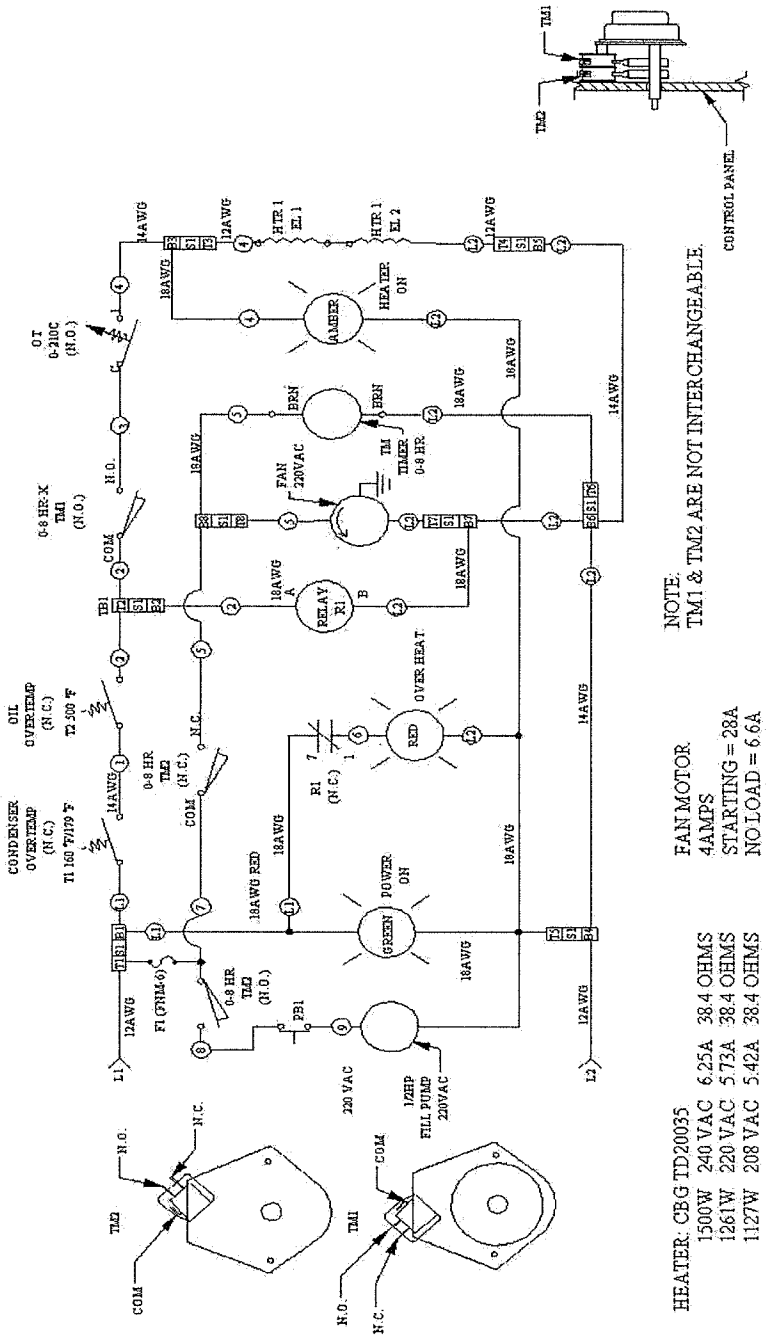
WARNING: Do not open spigot on Vacuum Holding Tank unless the Vacuum Gauge is reading "ZERO"

Distillation Parameters for Certain Solvents

Solvent	Boiling Point (°C)	Flash Point (°C)	Auto-Ignition Temperature (°C)
Acetone	56	-20	465
Chloroform	61	N/A	N/A
Ethanol	78	16.6	363
Hexane	69	-23	240
Formula 66	99 to 111	-7	280
Formula 83	113 to 145	10	250
Formula 52	161 to 176	42	257
Formula 78H	179 to 209	61	235 to 300
IPA	82	11	399
Methanol	65	12	464
MEK	80	-9	404
Naptha VM&P	118	10	232
Toluene	111	4	536
TPM	236	>93	N/A
Turpentine	165	35	253
Xylene	138	27	432 to 529

ELECTRICAL SCHEMATIC for TechnoClean S-600

240 V, 1 Ø



NOTE:
TM1 & TM2 ARE NOT INTERCHANGEABLE.

FAN MOTOR
4AMPS
STARTING = 28A
NO LOAD = 6.6A

HEATER: CBG TD20035
1500W 240 VAC 6.25A 38.4 OHMS
1261W 220 VAC 5.73A 38.4 OHMS
1127W 208 VAC 5.42A 38.4 OHMS

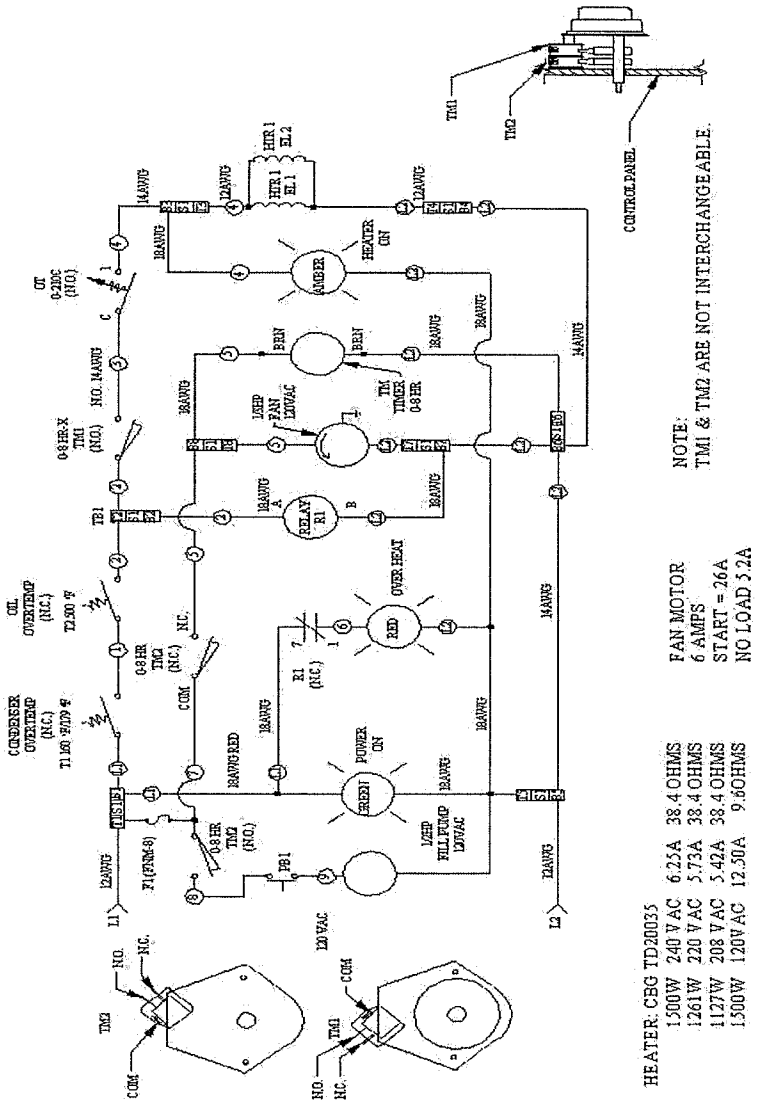
ELECTRICAL SCHEMATIC for TechnoClean S-600

240 V, 1 Ø – Bill of Materials for Control Circuits

CBG PART NO.	DESIGNATION	DESCRIPTION	QTY
ET60063	T1	160F BULB & CAPILLARY MANUAL RESET THERMOSTAT, 20 AMP 120/240 VAC. SPST SWITCH	1
ET60064	T2	500F BULB & CAPILLARY MANUAL RESET THERMOSTAT, 20 AMP 120/240 VAC. SPST SWITCH	1
ET60065	OT	0 TO 210C BULB & CAPILLARY ADJUSTABLE THERMOSTAT, 16 AMP 250 VAC. SPDT SWTICH	1
ET60066	TM	INTERVAL TIMER, 8 HOUR, 230 VAC 60 Hz W/2 20 AMP SWITCHES	1
		CAPILLARY SEAL FOR 1/4" DIA. BULB AND .039" DIA. CAPILLARY	1
		CAPILLARY SEAL FOR 1/4" DIA. BULB AND .056" DIA. CAPILLARY	2
ET60068	GREEN	INDICATOR LAMP, INTERNAL WITH SEPARATE WINDOW - GREEN- 250VAC	1
ET60069	AMBER	INDICATOR LAMP, INTERNAL WITH SEPARATE WINDOW - AMBER- 250VAC	1
ET60067	RED	INDICATOR LAMP, INTERNAL WITH SEPARATE WINDOW - RED- 250VAC	1
	TB	EIGHT POSITION TERMINAL BLOCK	1
ET30064	R1	RELAY 220 VOLT	1
ET30006	F1	FUSE - FNM-6	1
ET30012	FH1	FUSE HOLDER	1
ET40006		18AWG WIRE - RED	6 FT
INDET16		14AWG WIRE - BLACK	6FT
ET60060	PB1	MOMENTARY PUSHBUTTON	1

ELECTRICAL SCHEMATIC for TechnoClean S-600

ALTERNATE: 120 V, 1 Ø



ELECTRICAL SCHEMATIC for TechnoClean S-600

120 V, 1 Ø – Bill of Materials for Control Circuits

CBG PART NO.	DESIGNATION	DESCRIPTION	QTY
ET60063	T1	160F BULB & CAPILLARY MANUAL RESET THERMOSTAT, 20 AMP 120/240 VAC. SPST SWITCH	1
ET60064	T2	500F BULB & CAPILLARY MANUAL RESET THERMOSTAT, 20 AMP 120/240 VAC. SPST SWITCH	1
ET60065	OT	0 TO 210C BULB & CAPILLARY ADJUSTABLE THERMOSTAT, 16 AMP 250 VAC. SPDT SWTICH	1
ET70005	TM	INTERVAL TIMER, 8 HOUR, 120 VAC 60 Hz W/2 20 AMP SWITCHES	1
		CAPILLARY SEAL FOR 1/4" DIA. BULB AND .039" DIA. CAPILLARY	1
		CAPILLARY SEAL FOR 1/4" DIA. BULB AND .056" DIA. CAPILLARY	2
ET70068	GREEN	INDICATOR LAMP, INTERNAL WITH SEPARATE WINDOW - GREEN - 125VAC	1
ET70069	AMBER	INDICATOR LAMP, INTERNAL WITH SEPARATE WINDOW - AMBER - 125VAC	1
ET70067	RED	INDICATOR LAMP, INTERNAL WITH SEPARATE WINDOW - RED - 125VAC	1
ET10056	TB	EIGHT POSITION TERMINAL BLOCK	1
INDET13	R1	RELAY 120 VOLT	1
ET30024	F1	FUSE - FNM-8	1
ET30012	FH1	FUSE HOLDER	1
ET40006		18AWG WIRE - RED	6 FT
INDET16		14AWG WIRE - BLACK	6FT
ET60060	PB1	MOMENTARY PUSHBUTTON	1

AND, AS ALWAYS, SHOULD YOU HAVE ANY QUESTIONS OR CONCERNS ABOUT THE OPERATION AND/OR MAINTENANCE OF YOUR CBG BIOTECH SOLVENT RECYCLER, PLEASE DO NOT HESITATE TO CONTACT US.

CBG BIOTECH
30175 SOLON INDUSTRIAL PKWY
Solon, Ohio 44139 USA
+1-440-786-7667
+1-866-599-3940

service@cbgBiotech.com