UNPACKING

Carefully remove the equipment from the shipping crate. Check each item against the packing slip. In case of damage, notify the carrier immediately and make sure that the carrier inspects and leaves an inspection report. Register any claims for shipping damage against the carrier or his agent. It is always advisable to hold the shipping carton until equipment has been inspected and checked, as on rare occasions it has been necessary to return equipment for repair.

DESCRIPTION

The SpeedVac Concentrator Model SVC200H was designed for rapid evaporation and solidification of biological solutions in microtubes by centrifugal force in a vacuum. The combined action concentrates the biochemical solute in minimum volume and in minimum time. The sample material does not settle on the sides of the tube so that the smallest amount of diluent is required to recover the sample. This instrument contains an internal chamber thermostatically at 45°C.

Up to 200 sample tubes capacity for preparing dry extracts of tissue cells. (H₂O, TCA, NH₄OH, Organic Solvents.) Volume reduction and sample concentration without loss of solute for amino acid, gas chromatography, mass spectrometry, sensitive analytical, clinical and screen procedures. Use with special bottom tapered tubes, regular test tubes, minivials, and silylation vials.
SPECIFICATIONS

INPUT POWER: 115 Volt 50/60Hz (220 Volt Optional)
INPUT FUSED: 2 AMP. (115 Volt) Slo-Bio 3 AG Type
VACUUM LINE: 1/2" Hose Fitting allows connection to any commercial 150 Litre/Min (minimum) HI-Vac pump and 4 Litre — 60° C (minimum) trap.
VACUUM CHAMBER: Chemical resistant coated aluminum casting.
COVER: Transparent 1-1/4 Inch plexiglass (with safety interlock). CAUTION: NEVER APPLY HEAT TO THIS COVER OR SERIOUS DEFORMATION WILL RESULT.
DRIVER: Permanent Spill capacitor AC Motor—1725 RPM, with magnetic coupling to rotor drive shaft.
ROTORS: See catalogue for variety of rotors available. Consult factory for custom rotors.
HEATER: Thermostatically controlled at 45° C with over temperature safety shutoff.
WEIGHT: 97 lbs. (43 KG) Approximately
DIMENSIONS: 18" W x 18" D x 15-7/8" H (46 cm W x 46 cm D x 40 cm H)

OPERATION

Place SpeedVac in a convenient location with access to a vacuum source. Lift lid and check the interior of the chamber for packing material, dirt, or any foreign items that may have accumulated due to shipping. Clean out the chamber and follow the setup procedure outlined below. NOTE: Prior to setup and periodically thereafter, lightly coat drive shaft and aluminum rotor center with vacuum grease. This will prevent corrosive vapors from attacking surfaces and allow easy removal of rotors. CAUTION: Do not lubricate seal at top of chamber. If it is damaged, replace it.

1. To install rotor in chamber, visually align the drive shaft pin and mating recess on rotor bottom. Then carefully lower rotor onto the drive shaft and firmly press into place.
2. Secure this assembly with the retaining knob bolt by screwing it into the drive shaft which is threaded to accept this assembly. Tighten firmly but not excessively.
3. When using the tube holder type rotors, insert the aluminum test tube holders into all the positions. NOTE: When placing test tubes into rotors, care must be taken to load uniformly with consideration given to balancing rotor. An unbalanced load will not only cause vibration, but this vibration will seriously reduce the life of the bearing assembly. Care must be taken when placing tubes or vials into plastic rotors. Tubes must fit snugly.
4. Check the 1/2" I.D. Hose vacuum fitting on the rear of the chamber to insure that it is tight. This fitting connects to your condensation trap/vacuum pump.
5. Plug linecord into a properly rated electrical receptacle. If heat is required for evaporation of sample, turn "heater" switch to the "on" position at least 15 minutes prior to running sample. This will allow the chamber to reach its operating temperature of approximately 45° C. The BTH tube holders transfer heat directly to glass sample tubes. If no heat is required, leave the "heater" switch in the "off" position.
6. Load samples in rotor and close lid. Switch "on" power by turning the front panel switch to the "on" position. The centrifuge will start rotating and within 30 to 45 seconds will be up to the rated speed. When the rotor is up to speed, then and only then, do you turn on your vacuum source. This allows the solution to gravitate to the bottom of the tube before the vacuum starts evacuation of the solvents. There is no specific rule for the time required for processing. It usually is easily determined by the investigator with a little experience.
7. When the samples are effectively evaporated, turn the vacuum source off and SLOWLY bleed air back into the system. If vacuum is allowed to dissipate too quickly, condensation will form in the dried tubes. Then, turn the front panel switch to the "off/brake" position. This position dynamically brakes the rotor so that it will coast to a stop in approximately 45 seconds. The brake circuit will actuate for approximately 60 seconds then turn off. This happens in the "on" position as well as when the cover is lifted. NOTE: In some cases the rotor will not come to a complete stop till the brake mechanism turns off, this is normal.
8. Make sure the rotor has stopped, then lift the lid. CAUTION: Never lift cover until instrument is turned off, and rotor has stopped rotating. Raise cover till latch actuates, latch is on right hand side and is used to secure cover in the open position. To release latch, pull latch forward while pushing cover back and then down.
9. Maintaining a clean instrument is most important. Spills must be cleaned out immediately, since dried solvents can build up and impair rotation of the rotor. Periodic cleaning of the chamber will prevent operating problems. A detergent solution on sponge or gauze should be used to clean and then make certain the chamber is thoroughly wiped dry.
EVAPORATION TIMES FOR TYPICAL SOLVENTS

The table below should be used as a guide only. Each system is different depending on the type of vacuum pump, trap temperatures, firmness of fittings and connections, degree of system contamination, and other factors. The type and quantity of solutes in solution also affect the drying time. One can check the soundness of the system by running one of the following solvents.

A typical setup using a 25L/Min pump and a -60° C refrigerated condensation trap connected to a SpeedVac with a RH32-18-150 Rotor will give these evaporation times at approximately 150 micron vacuum, with vacuum gauge placed between pump and trap.

<table>
<thead>
<tr>
<th>SOLVENT</th>
<th>NUMBER OF GLASS TUBES</th>
<th>VOLUME/TUBE</th>
<th>TIME TO ABSOLUTE DRYNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>WATER</td>
<td>2</td>
<td>1 ml</td>
<td>NO HEAT 100 min.</td>
</tr>
<tr>
<td>ETHANOL</td>
<td>2</td>
<td>1 ml</td>
<td>WITH HEAT 40 min.</td>
</tr>
<tr>
<td>METHANOL</td>
<td>2</td>
<td>1 ml</td>
<td>35 min.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>20 min.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>25 min.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15 min.</td>
</tr>
</tbody>
</table>

(See Note 1)

Notes to the above table:

1. Heat refers to using the internal heater and black tube holders with glass test tubes. The black tube (BTH) holders are aluminum with a black hardcoat anodize finish. The finish will lighten if washed with methanol, use caution to retain black finish. The BTH holders are recommended for maximum efficiency with all tube holder type rotors and come in replaceable sets.

2. The number of tubes run at one time has some but very little effect on the total drying time, i.e. 10 tubes will evaporate to dryness in about the same as 4 tubes with the same volume per tube.

3. Solvents with greater volatility than methanol evaporate more rapidly and in general require no heat. Savant manufactures for this application a Water Jet Unit. Since organic volatile solvents evaporate quickly and need less vacuum, The Savant Water Jet supplies this vacuum down to 5 or 10 torr. This vacuum, plus the mixing of the evaporated solvents with water, keeps vapors to a minimum. Highly diluted solvents are then disposed of in sink drains. See Savant SWJ120 literature for more specific information.

CAUTION: NEVER APPLY HEAT THROUGH THE PLEXIGLASS COVER. IT ABSORBS THIS HEAT AND WILL DEFORM. PARTICULARLY UNDER VACUUM. ALWAYS KEEP COVER FREE AND CLEAR OF ANY CHEMICALS OR CONTAINERS. A GLASS SAFETY COVER (MODEL GSC200) IS AVAILABLE FOR INFRARED HEAT LAMP APPLICATIONS.

SERVICE AND MAINTENANCE

The Upper Magnetic Assembly is located in the vacuum chamber and is comprised of the rotor drive shaft, mounting plate, bearings, and a driven magnet assembly. This assembly can be serviced as follows:

1. Remove the hold down knob and rotor.
2. Remove the three Phillips head screws on the mounting plate.
3. Replace the hold down knob and lift straight up to break the magnetic attraction.
4. Rotate mounting plate by holding magnet rigid. If rotation is not smooth, then bearing needs replacement or it is possible to obtain from Savant a complete replacement or spare "upper magnet assembly", Model #UMA200.

The Lower Magnetic Assembly drive for the rotor is located outside the vacuum chamber. A ring magnet with 4 poles on its face, is bonded to an iron pole piece and mounted on the motor shaft of the lower magnetic assembly. The stainless steel closure plate that separates the two magnets and seals the chamber has very little effect on the magnetic field. The attraction between the two magnets establishes the coupling which has a gap of about 9/32". The drive magnet is 1/16" from the closure plate and is secured to the drive motor by two #8-32 set screws. Occasionally these screws may loosen during shipment and cause the magnet to slip on the shaft of the motor. This will produce either a rubbing sound or no drive. To repair, remove the bottom plate and the four screws that secure the motor mounting bracket. This allows the lower magnetic assembly to be removed from the bottom plate and the four screws that secure the motor mounting bracket. This allows the lower magnetic assembly to be removed for inspection and repair. Normal repair consists of setting gap and tighten the set screws.
The Heater Assembly for the vacuum chamber is located in the casting exterior surface under the chamber floor. This heater is a 12" diameter 690 Watt tubular heater with two thermostats in series with it to sense and control the temperature of the chamber. One thermostat senses and controls the chamber temperature at 45°C. The other thermostat is a thermal fuse for overtemperature safety protection should the control termostat fail. In that event, the safety thermal fuse will shut off the heater at 65°C. If chamber should reach that temperature, it is an indication that the control thermostat should be replaced immediately. Both must be replaced, the thermal fuse is not resettable once actuated.

There is no special maintenance required for the motor or electrical circuitry. If the fuse should blow for any reason, replace it the same type 3 AG 2 Amp Slo-Blo. The schematic diagram is shown for service personnel.

Liability
Savant Instruments, Inc. assumes no liability, express or implied, in connection with the use of this equipment.
Savant
INSTRUCTION MANUAL
Refrigerated Condensation Trap
Model RT-400A

UNPACKING INSTRUCTIONS
Carefully remove the equipment from the shipping crate. Check each item against the packing slip. In case of damage, notify the carrier immediately and make sure that the carrier inspects and leaves an inspection report. Register any claims for shipping damage against the carrier or his agent. It is always advisable to hold the shipping carton until equipment has been inspected and checked, as on rare occasions it has been necessary to return equipment for repair.

DESCRIPTION
The Model RT-400A Refrigerated Condensation Trap combines a new high speed small compressor and an ultra-low temperature refrigerant in a unique evaporator cabinet configuration. This combination provides maximum refrigeration capacity in a reliable compact package. The stainless steel chamber is refrigerated by the direct expansion of freon refrigerant and is insulated with polyurethane foam. The RT-400A can be used for acid or aqueous systems interchangeably depending on the option selected. CAUTION: An appropriate commercially available chemical trap should be inserted “Inline” between the RT-400A and the vacuum pump whenever corrosive chemicals are used. We recommend the Savant Model SCT-120 Chemical Trap for this application.
SPECIFICATIONS Model RT-400A

Input Power ........................................ 120 volts, 50/60 Hz (220 volts optional)

Trap Capacity ........................................ 4 AMP running current, 20 AMP starting peak surge.

Trap Temperature ..................................... 4 liter stainless steel container.

Controls .............................................. Ultimate operating temperature minus 60C with ambient not to exceed 32C.

Dimensions .......................................... One lighted rocker toggle switch for on/off control.

Weight .................................................. 12"W x 23"D x 12"H (30cm x 59cm x 30cm)

Approximately 55 lbs. (25KG) shipping weight.

ASSEMBLY OF RT-400A TRAP

The RT-400A Refrigerated Trap requires the attachment of the CP400 Closure Plate for the condensation of vapors in the stainless steel container; alternatively, one may insert the GIT-400 Glass Insert Trap for the condensation of vapors ... Note that the glass trap is definitely preferred for acid condensate and in general it is easier to dispose of the condensate since the glass trap is removable.

An alkali (soda lime) trap for acid vapors or a boric acid trap for alkaline vapors should be seriously considered to prevent corrosion of the vacuum pump. Such a trap is usually installed between the trap and the SpeedVac. The Savant SCT-120 is ideal for this application.

A charcoal trap may also be installed where one suspects the carryover of radio active isotope tagged vapors (e.g. 131I). The SCT-120 can also be loaded with large (4 to 8) mesh activated charcoal and used for this purpose.

A) CP-400 Closure Plate—The molded rubber gasket on top of the RT-400A should be very lightly coated with vacuum grease prior to installation of the closure plate. The (outside) ½ " outlet fitting should be connected to the vacuum pump tubing. The center ½ " fitting connects the tubing to the SpeedVac Concentrator. Securely clamp all tubing lines. Note: The stainless steel trap must be cleaned out and wiped dry after each use to minimize corrosion. Do not allow more than one and a half liter to be collected before cleanup.

B) GIT-400 Glass Insert Trap is recommended for condensing acids and corrosive solvents that could affect the standard stainless steel trap. The Glass Insert Trap should have 800ml of ethanol filling the gap between the outer glass wall and the stainless steel trap for maximum thermal conductivity. The outside ½ " port connects to the vacuum pump tubing line. The center ½ " inlet port connects to the SpeedVac Concentrator. When using the Glass Insert Trap, the vacuum gauge tube is connected in the pump line by using the TF-100 Tee Fitting. All tubing lines must be clamped. We strongly recommend the use of the Savant QFK-120-3 Tubing Package for all glass connections.

C) TP-120 Tubing and Valving Package provides interconnection for the SpeedVac condensation trap system. The four, four (4) foot lengths of tubing can be cut to convenient lengths to insert the bleed valve and the optional TF-100 Tee Fitting. All clamps are supplied for tubing connections. The ½ " inside diameter tubing connects the SpeedVac Concentrator to the condensation trap. This tubing should be cut at a convenient length to install the bleed valve. After cutting tubing to desired length, insert valve. A shorter length of tubing is required on the side of the Glass Insert Trap (4 to 6 inches) than that required for attaching to the Closure Plate ... Clamp all connections. See illustration on last page.

D) GBV-120 Glass Bleeder Valve is designed to bleed air into either side of the vacuum line. This is done by rotating the "BLEED" arrow on the stem to the tubing line to be bled. The through position is in line with the tubing connections on the barrel. To insure vacuum tight operation, make sure the barrel is kept lightly lubricated with vacuum grease.

E) QFK-120-3, "Quick-Fit" Tubing Kit provides "O" ring sealed polypropylene fittings for vacuum tubing connections. This package is recommended for glass trap connections. The fitting ends go on the trap connections. The union connectors supplied with this kit go between the bleeder valve and the glass trap (UC1212) and between the VP-100 and the TF-100 (UC1258). These convenient fittings provide quick hookup to the glass trap thereby simplifying removal and clean out. For closure plate operation the right angle "O" fittings (1RQAT) provides more convenient connection and tubing layouts than the straight connections. See illustration on last page for basic hookups.
The bleeder valve assembly is illustrated below for clarity.

**OPERATION**

Place the RT-400A in a working area with a minimum of 4 inch clearance in the rear. The refrigeration system is air cooled and pulls air across the refrigeration compressor and out the condenser openings in the rear. **CAUTION:** Inlet and outlet openings should never be blocked.

Plug linecord into properly rated receptacle, and turn power switch to it’s “on” position. Check air flow exiting from the rear vent to insure proper operation. If unit appears to vibrate excessively, check line voltage to insure that it is above 108 volts. Low line voltage will cause compressor to cycle on thermal overload. If unit is shut off after running for any length of time, and turned on again within a few minutes, it may vibrate. Shut the unit off and allow approximately 5 minutes for the compressor to stabilize before turning on again. The temperature of the steel trap should reach maximum low point in approximately 60 minutes. **CAUTION:** This refrigerated trap must be “on” at least one hour prior to vacuum pump being turned “on”. Always start with a clean dry trap. A chemical trap in addition to the cold trap must be used for corrosive vapors. Failure to comply will void warranty.

**SERVICE**

The Refrigerated Condensation Trap is a hermetically sealed freon system and does not require periodic maintenance. In the event of a refrigeration leak, a local refrigeration repair service familiar with low temperature systems can make the necessary repairs. Consult factory for proper refrigerant and any repair information.

**LIABILITY**

Savant Instruments’ warranty is limited only to defective construction and materials and is subject to our inspection. Savant Instruments, Inc., assumes no liability, express or implied, in connection with the use of this equipment.
TYPICAL SYSTEM WITH GLASS TRAP

This system is best suited for mineral and organic acids. The illustration below shows components required for this system. Refer to listings for prices of component parts.

We recommend the addition of an alkali trap to protect the pump from excessive acid that could escape the trap under some conditions.

TYPICAL SYSTEM WITH CLOSURE PLATE

This system should be used for non-corrosive solvent evaporation. The illustration below shows components required for this system. Refer to listings for prices of component parts.