



# SpeedVac™ SPD1030/2030

## Vacuum Concentrator

### Installation and Operation

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**IMPORTANT** Read this instruction manual. Failure to follow the instructions in this manual can result in damage to the unit, injury to operating personnel, and poor equipment performance.

**CAUTION** All internal adjustments and maintenance must be performed by qualified service personnel.

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# Introduction

Thermo Scientific Integrated SpeedVac™ Systems are complete systems for solvent evaporation, sample concentration and drying. SPD systems use a technique that combines centrifugal force, vacuum and applied heat to eliminate sample bumping and foaming. Application of thermal energy to the sample during concentration counteracts the natural evaporative cooling effect that slows the drying rate.

SPD1030 and SPD2030 systems integrate a SpeedVac™ concentrator, an oil-free vacuum pump, and a refrigerated vapour trap into a single compact package. The SPD2030 is a high capacity system for processing up to four 500 ml samples. The SPD1030 features a smaller chamber capable of processing up to four 100 ml samples. Both units feature an advanced front panel with dual timer for automatic or manual control of run conditions, it also features preset and user defined programs which enables user to retrieve and store application protocols for future use.

# Safety Precautions

In this manual, the following symbols and conventions are used:



This symbol when used alone indicates important operating instructions which reduce the risk of injury or poor performance of the unit.



**CAUTION:** This symbol, in the context of a CAUTION, indicates a potentially hazardous situation which if not avoided could result in minor to moderate injury or damage to the equipment.



**WARNING:** This symbol, in the context of a WARNING, indicates potentially hazardous situations which, if not avoided, could result in serious injury or death.



This symbol indicates situations where dangerous voltages exist and potential for electrical shock is present.



The snowflake symbol indicates extreme low temperatures and high risk of frostbite. Do not touch bare metal or samples with unprotected body parts.



This symbol indicates possible pinch points which may cause personal injury.



This symbol indicates a need to use gloves during the indicated procedures. If performing decontamination procedures, use chemically resistant gloves.



Before installing, using or maintaining this product, please be sure to read the manual and product warning labels carefully. Failure to follow these instructions may cause the product to malfunction, which could result in injury or damage.



This symbol represents protective conductor terminal.

Below are important safety precautions that apply to this product:



**WARNING:** Disconnect the unit from all power sources before cleaning, troubleshooting, or performing other maintenance on the product or its controls.



**WARNING:** Do not use this device in radioactive, highly reactive or explosive atmosphere.

Do not use this device to process any explosive, radioactive, highly reactive or explosive atmosphere creating substances.

# Operating Standards

## Product Specifications

	<b>SPD1030</b>	<b>SPD2030</b>
Capacity	Moderate	Large
Operative Power*	115 VAC; 60 Hz; 12 amps 230 VAC; 50 Hz; 6 amps	220 VAC; 60 Hz; 8 amps 230 VAC; 50 Hz; 8 amps
Vacuum Chamber	TEFLON® coated aluminium casting	TEFLON® coated aluminium casting
Cover	Powder coated steel - includes a safety interlock	Powder coated steel - includes a safety interlock
Induction Motor	Maintenance free	Maintenance free
Chamber temperature	35°C to 80°C, 5°C increments	35°C to 80°C, 5°C increments
Refrigerated trap	-50°C (approx.) 4 litre CFC-free	-50°C (approx.) 4 litre CFC-free
Vacuum Pump Displacement (50/60 Hz)	30/36 litres/min	30/36 litres/min
Maximum vacuum	<10 Torr (13 mbar, 1.3 kPa)	<10 Torr (13 mbar, 1.3 kPa)
Vacuum Level Control	30 to 5.1 Torr in 0.1 increments	30 to 5.1 Torr in 0.1 increments
Vacuum Ramp Setting	1 to 5	1 to 5
Weight	158 lbs 72 kg	205 lbs 93 kg
Size (W x D x H)	25 in x 26 in x 16 in 64 cm x 66 cm x 41 cm	31 in x 28 in x 21 in 79 cm x 71 cm x 53 cm
Fuse	12 A, 250 VAC, Time-lag 6 A, 250 VAC, Time-lag	8 A, 250 VAC, Time-lag 8 A, 250 VAC, Time-lag

\*Dependent upon ambient temperature, line voltage fluctuation, and load capacity.

# Environmental Conditions

Indoor use only, in the absence of hoarfrost, dew, percolating water, rain and solar radiation.

Maximum altitude	2000 meters above mean sea level
Ambient temperature range	17°C to 32°C
Humidity	20% to 80% non-condensing
Pollution degree	2

Main supply voltage fluctuations not to exceed  $\pm 10\%$  of the nominal voltage.

Transient overvoltages per Installation Categories II.

# Installation

## Contents

1. Thermo Scientific Savant SPD1030/SPD2030 SpeedVac™ Concentrator
2. Cover Lock Emergency Release Tool
3. Line Cord

**Unpacking.** Open the shipping cartons. Carefully remove the instrument and accessories. **Lift and carry with two people, holding securely underneath with both hands. Use proper lifting technique (lift with the legs, not the back) to avoid personal injury.** Compare the contents with the packing list. If there is a discrepancy, call Thermo Scientific technical service.

**Inspection.** Inspect the unit and accessories for damage that may have occurred during shipment. Should there be any damage, report it to the carrier and contact Thermo Scientific immediately. Make sure the carrier inspects the damage and leaves an inspection report. Register any claims for shipping damage against the carrier or his agent. Save the shipping carton in the event a return is necessary. Call Thermo Scientific technical service for further assistance.

**Site preparation.** The SPD1030/SPD2030 requires a stable, level surface for proper operation. The SPD1030 units configured for 115 VAC, 60 Hz, should be plugged into a circuit rated for at least 12 amps. The SPD1030 units configured for 230 VAC, 50 Hz, should be plugged into a circuit rated for at least 6 amps. The SPD2030 units are configured for 220 VAC, 60 Hz, or 230 VAC, 50 Hz, operation. Both configurations require a circuit rated for at least 8 amps.



**CAUTION:** Be sure to leave at least 4 inch clearance on all sides of the unit. Verify that the unit is on a levelled and stable platform. Level operation is important to ensure proper flow of refrigerant. If necessary, move the unit to a more suitable location.



**WARNING:** Before connecting the unit to an electrical outlet, make certain that voltage, frequency, and amperage match the requirements indicated on the product label/ name plate of the instrument. Use sockets with a protective earth conductor and correct mains cable.

**Note:** Do not use any detachable power cord that is not adequately rated for the unit.

**IMPORTANT NOTE:** Before operating the unit, read Section **Operation**, and Section **Application** Information, to determine your specific application requirements.

# Operation

Connect the power cord to the power inlet on the right side of the unit and plug it into the appropriate outlet. Turn on the main power switch located on the front of the unit in the lower right to energize the unit. The safety lid locking mechanism will automatically disengage. Do not attempt to open the lid unless the unit is plugged in.



**CAUTION:** Immediately verify by touch that the product is drawing air through the vent on the right side. If you cannot feel the air suction, switch the product **OFF** at once. Operating the product without a working fan, or with the air flow blocked, will damage the refrigeration system.

**Start-of-day procedure.** At the start of each day, ensure that the refrigerated trap contains a clean, dry, Glass Condensation Flask (GCF400) and that the supply of Thermo Scientific CryoCool™ Heat Transfer Fluid is sufficient.

The CryoCool™ in the refrigerated trap must be cold before drying runs can begin. Turn unit on at least 45 minutes before starting the drying run.

For best results, maintain electrical power to the system (the main power switch on the front of the unit in the lower right is “ON” and the front display is illuminated) at all the times to keep the refrigerated trap cold and ready for use.



**CAUTION:** Do not switch **OFF** and **ON** with in a short period of time as this could cause pressure to build up within the system and lock the system that could trigger the fuse. After switching **OFF**, allow sufficient time (minimum 15 minutes) for the pressure to stabilize before switching the system **ON** again.



**CAUTION:** Use appropriate Thermo fisher Scientific designed rotors recommended for the Product.

**Rotor installation.** Open the lid of the rotor chamber. Visually align the pin on the drive shaft with the groove on the bottom of the rotor. Carefully lower the rotor onto the drive shaft. Rotate the rotor by hand to ensure alignment of the pin with the groove. Secure the assembly by screwing the retaining knob into the drive shaft above the rotor. Tighten it firmly but not excessively.



**CAUTION:** Load the rotor and close the lid. Always balance rotor loads. An imbalanced rotor causes vibration that will damage the system’s bearings and equipment. Load the rotor symmetrically. There need not be a tube in each holder, but the load must be evenly distributed. When using a rotor with aluminium tube holders, insert all the tube holders.

**Glass Condensation Flask Installation.** Prepare the refrigerated stainless steel trap chamber by adding approximately 750 ml of CryoCool™ Heat Transfer Fluid. A line scribed on the wall of the stainless-steel trap indicates the minimum appropriate level. CryoCool™ conducts heat away from the Glass Condensation Flask, allowing vapours to condense on the flask walls. Gently put a clean Glass Condensation Flask into the refrigerated chamber. As you press the flask into the chamber, the CryoCool™ level rises. Verify that the final CryoCool™ level is 10 to 15 mm below the rubber seal. If low, carefully pour more CryoCool™ into the chamber while holding down the flask.

Immediately wipe clean any CryoCool™ that spills onto the rubber seal.

Fit the white insulating Flask Seal over the glass flask to secure the flask in the chamber. Its bevelled side faces upward to admit the Flask Cap.

Snap the black rubber Flask Cap over the mouth of the glass flask. This provides easy tubing connection and a vacuum seal while also securing the Glass Condensation Flask and insulating Flask Seal in the refrigerated chamber.

**Glass Condensation Flask Defrosting and Cleaning.** Thermo Scientific Glass Condensation Flasks should be defrosted and cleaned after each day’s use, or more often if greater than one-fourth the rated volume has condensed on the walls. Failure to follow this procedure can prevent the system from achieving high vacuum levels and could cause flask breakage. Flasks with cracks shall not be used.

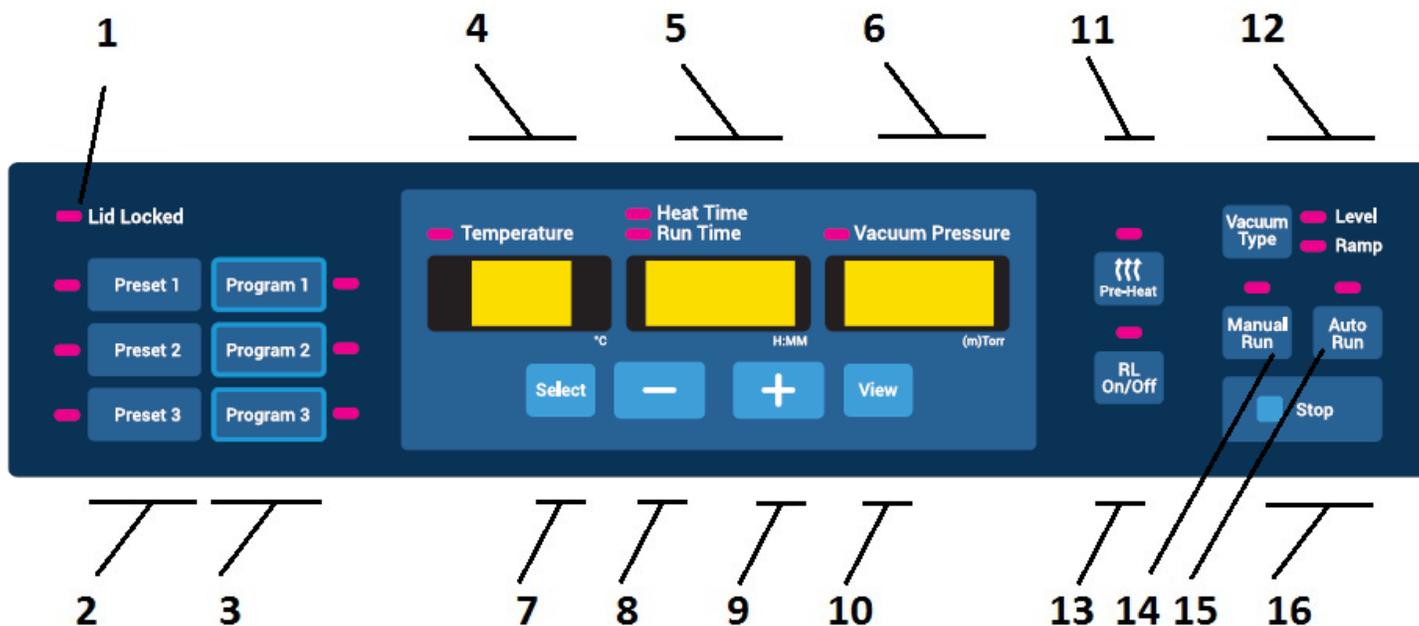


## CAUTION:

1. Use gloves while handling Glass condensation flask to avoid pain, local frostbites due to extreme low temperature.
2. Handle fully filled Glass condensation flask with care to avoid risk of injury.
3. Use face masks if required while cleaning the flask for protection against toxic chemicals and bio hazards.



# Description of Control Panel



1. **Lid locked** - Indicates whether or not the lid of the concentrator is locked, the indicator will be illuminated when locked.

2. **Preset buttons** - Preset programs that are not modifiable.

Loading a preset is achieved by pressing the corresponding **Preset** button. The following parameters are automatically loaded on to the screen.

- Temperature set point
- Heat time
- Run time
- Vacuum pressure
- Vacuum ramp

3. **Program buttons** - 3 programs that are modifiable.

Loading a user-defined program is achieved by pressing the corresponding **Program** Button. The following parameters are automatically loaded on to the screen.

- Temperature set point
- Heat time
- Run time
- Vacuum pressure
- Vacuum ramp

Saving a user defined program is achieved by pressing and holding down corresponding **Program** button for 3 seconds. The parameters displayed in the screen are stored into the program and can be loaded for use at a later time.

4. **Temperature display** - Indicates the set temperature or the actual temperature during run in °C. The temperature set point can be set from 35°C to 80°C at a 5°C interval. In addition, it is possible to set the temperature to “no” which means that heating will not be applied during the run. The temperature setting of “no” can be reached under 35°C or over 80°C.

5. **Time display** - Indicates the heat timer or the run timer set points. During a run, it indicates the elapsed or remaining run time or the remaining heat time left. The range for these timers is from 0.01 [1 min.] to 9.59 [9 hours, 59 minutes] at a 1-minute interval. In addition, it is possible to set the heat time to “CCC” (continual heating), which represents a continuous heating throughout the execution of a run.

The setting of “CCC” can be reached under 0.01 [1 min.] or over 9.59 [9 hours, 59 minutes].

6. **Vacuum display** - Indicates either the vacuum pressure set point (in torrs or millitorr) or the selected vacuum ramp based on the vacuum type setting (see **point 12**). During a run, it indicates either the actual vacuum pressure or the selected vacuum ramp.

**Note:**

- The atmospheric pressure is represented by “HPr”
- A decimal point indicates a vacuum pressure in Torr
- No decimal point indicates a vacuum pressure in mTorr

7. **Select** - Press this button to select the parameters to be modified. The selection is from left to right, in a cyclic manner. The selected parameters are shown by the corresponding indicator that is illuminated.

8. **Minus (“-”)** - Decrements the value of the selected parameter.
9. **Plus (“+”)** - Increments the value of the selected parameter.
10. **View** - During a run, pressing view shows the set run parameters. When no run is ongoing, pressing view displays the actual live parameters. The time display shows either "0.00" or the end status of the last executed run (e.g. “End”, “Err”).
11. **Pre-heat** - Use to pre-heat the chamber to 45°C prior to beginning a run or between runs. Once a run is initiated, the pre-heat automatically stops.

Note that the pre-heat function is only enabled if the temperature set point is different than “No”.

12. **Vacuum Type** - Select either “Level”, or “Ramp”, in the vacuum display.

Level: Allows users to select a preset vacuum level. During a run, the vacuum level will be automatically regulated and maintained at the select preset value.

Ramp: The rate at which vacuum is achieved can be set for preventing bumping. There are 5 adjustable levels that can be set as required, depending upon your solvent.

Setting	Vacuum Rate (Approximate)
5	70 Torr/min (Maximum setting)
4	50 Torr/min
3	40 Torr/min
2	30 Torr/min
1	5 Torr/min

13. **RL (Radiant Lamp) on/off** - Adds radiant heat to chamber by activating the radiant lamp of the concentrator. The radiant lamp can be activated and deactivated manually by pressing the button at any point during a run. If enabled, the radiant lamp will remain powered as long as the heat timer has not expired. The indicator will be illuminated when the radiant lamp is on. Note that this feature is disabled if the temperature set point is set to “no”.



**CAUTION:** Do not use radiant heat with microplates. Improper use may result in melting or deformation.

14. **Manual run** - Starts a “Manual” run based on the parameters loaded in the screen, use manual run function if you do not want to set a fixed run time.
15. **Auto run** - Starts an “Automated” run based on the parameters loaded in the screen, use auto run function if

you want to set a fixed run time.

16. **Stop** - Terminates a “Manual” or “Auto” run.

## Audible Notification

The concentrator will play tones depending on the user actions. Below is a description of these tones.

**Table 1. Audible Notifications**

Event	Sound Description
Start-up	5 beeps
Starting a run (manual or automatic)	1 single beep
Manually stopping a manual or automatic run	3 beeps
Automatically stopping an automatic run	1 beep that is repeated until the user pushes the <b>Stop</b> button or opens the cover of the concentrator
Program saved	3 beeps
User input error	1 long beep that lasts for 1 second
System error	1 long beep that lasts for 1 second and that is repeated until the user pushes the <b>Stop</b> button or opens the cover of the concentrator

## Manual Run

1. Connect the unit to its required voltage.
2. Turn the power switch located on the front of the UNIT, to the **ON** position, (light on switch indicates ON). The cover lock, disengages, allowing the top cover to be opened.

The display lights up and shows the following in sequence:

- Name of the concentrator
- Software revision number
- Default values:
  - Temperature            45°C
  - Run Time                2.00 hours
  - Vacuum Pressure      5.1 Torr

3. Select a run configuration using one of the following method:
  - Load a present program
  - Load a user defined program
  - Directly modify values that are loaded on the screen, using the **Select** button and the “+”/ “-” buttons.
4. Set the temperature set point between 35°C and 80°C, or “no”, for no heat.
5. Using the **Select** button and the “+”/ “-” buttons select and modify “Heat Time” to between 0.01 and 9.59 hours or “CCC” (for continual heating). When the heat timer expires, the heater will shut off, no matter what the temperature set point reads (except if “CCC”).
6. Select Run Time: Since this a manual run no time adjustment is needed”.
7. To select a VACUUM LEVEL, press **Vacuum Type** to illuminate “Level” and “+”/ “-” buttons to set vacuum to desired level. To select a vacuum ramp rate, press **Vacuum Type** to illuminate "Ramp" and use the “+”/ “-” buttons to set a ramp rate (5=highest, 1=lowest).
8. Place sample tubes in rotor so load is balanced. Secure rotor with the supplied knob (hand tight). Close cover.
9. Pre-heat may be selected at this time, to apply a 45°C heat to the chamber.
10. Press the **Manual Run** button. The cover locks and the lid locker indicator is illuminated. The rotor starts spinning. The “Run Time” display counts up. The temperature rises to the set temperature. The “Heat Time” will count down if set point is not set to “CCC” and if the temperature set point is not “no” The vacuum will be applied to the chamber and the level begins falling.
 

**Note:** If the cover is not closed, the display will show “Lid” and the run will not start.
11. Press **RL On/Off** for radiant chamber heat. Press at any time to turn OFF and ON. (As long as there is time left in the heat timer and if the temperature set point is not set to “no”).
12. To end the manual run, press **Stop** button. The unit will sound three audible beeps. The display will show “End”, the valves will click, isolating the chamber from the vacuum pump and allowing air to bleed into the chamber.
13. After the rotor stops spinning, the cover lock disengages and the lid locked indicator is turned off. The display reverts to last set parameters.
14. Open the cover and remove samples.

GENERAL: During the run, display shows actual parameters. To check set parameters, press **View** button and **Select**. The display will revert temporarily to set points for approximately 5 seconds.

## Auto Run

1. Refer to the **Manual Run** section for start-up.
2. To execute an AUTOMATIC RUN, execute the following steps:
  - a. Use the **Select** button and the “+”/ “-” buttons to select and modify the Temperature, “Heat Time and “Run Time” parameters. The Run and Heat Time can be set from 0.01 to 9.59 hours (Heat Time also has “CCC” for continuous use).
  - b. To select a vacuum level, press **Vacuum Type** to illuminate “Level”. Use the “+”/ “-” buttons to set the vacuum to the desired level. To select a vacuum ramp rate, press **Vacuum Type** to illuminate “Ramp” and use the “+”/ “-” buttons to set a ramp rate (5=highest, 1=lowest).
3. Place the sample tubes in the rotor so that the load is balanced. Secure the rotor with the supplied knob (hand tight). Close the cover.
  - a. Press the **Auto Run** button to start the run. The cover locks and the lid locked indicator is illuminated. The rotor starts spinning. The run time display is counting down in 1 minute Intervals. The heat time is counting down if the set point is not set to “CCC” and if the temperature set point is not “no” (use the **Select** button to view “Heat Time”). The temperature rises in 1°C increments to set temperature. The vacuum pressure begins decrementing down from “HPr” (atmospheric pressure), after both SAV valves actuate, applying vacuum to the chamber.
  - b. The vacuum display will indicate vacuum pressure in the chamber.
 

**Note:** If the cover is not closed, the display will show “Lid” and the run will not start.

Press the **RL On/Off** for radiant chamber heat. Press at any time to turn OFF and ON. (As long as there is time left in the heat timer and if the temperature set point is not set to “no”).
  - c. Once the run time expires, the run will automatically stop, the display will show “End”, the SAV valves will click, also allowing air to bleed into the chamber. The unit will sound 1 beep that will be repeated until the user acts on it.
  - d. After the rotor stops spinning, the cover unlocks and the lid locked indicator is turned off. The display reverts to last set parameters.
  - e. Open the cover and remove samples.

GENERAL: During the run, display shows actual parameters. To check set parameters, press **View** button and **Select**

button. The display will revert temporarily to set points for approximately 5 seconds.

## Drying Rate

Thermal energy can be applied to the concentrator chamber to counteract the cooling effect of evaporation, maintain the samples in the liquid state, and accelerate the concentration run. Select 80°C if you desire accelerated drying. To ensure against over drying of samples, and possible denaturing, it is recommended that the Radiant heat timer be set for only a portion of the total run time (e.g., 50%–75% of total run time).

## Preset Program Settings

The table below shows the values attributed to the present programs parameters.

Preset	Application	Settings
Preset 1	Water	Temperature: 45°C Heat time: 0.30 Run time: 2.00 Vacuum level: 14 Torr Vacuum ramp: 5
Preset 2	“Low Boiling” ACN/MEOH	Temperature: 65°C Heat time: 0.30 Run time: 2.00 Vacuum level: 5.1 Torr Vacuum ramp: 5
Preset 3	HPLC H2O + Low Boil solvent +.1% acid	Temperature: “no” Heat time: 0.01* Run time: 2.00 Vacuum level: 5.1 Torr Vacuum ramp: 5

\*When the temperature is set to “no”, the heat time is defaulted to “0.00” while executing the run.



**Note:** The preset programs are for convenience only. Prior to use, users are advised to conduct a risk assessment to confirm that the preset program parameters meet the user’s application specific needs and conditions. Users accept the risks associated with using the preset programs.

## Exporting Live Run Data

The unit is equipped with a USB port to enable communication with an external computer. The USB port is located on the rear panel of the unit and can be used to connect to a computer via a standard USB type A or B cable.



**CAUTION:** USB lead length less than 3 meters shall be used to connect to the computer.



When a run is ongoing, the unit exports the following information via the USB port every minute.

- The live temperature applied to the samples chamber
- The remaining heat time for the run (“CCC” indicates continuous heating)
- The remaining or elapsed run time, depending on the run type (manual or automatic)
- The vacuum pressure in the samples chamber

The data are sent at a fixed baud rate of 115200 and are comma-separated as shown in the format: **<temperature>**, **<heat time>**, **<run time>**, **<vacuum pressure>**

- The temperature is represented as a 2-digit integer in °C
- The heat time is expressed as a 3-digit integer in minutes (or “CCC” for continuous heating)
- The runtime is expressed as a 3-digit integer in minutes
- The vacuum pressure is represented as a floating-point number in Torr (or as “HPr” to represent a high pressure).



In case of a communication failure between the monitoring program of the computer and the product, user can re-establish the connection by disconnecting and reconnecting the USB cable.

**Note:** The following section details the step-by-step procedures for configuring Microsoft® HyperTerminal running on a host computer using Windows® XP. These instructions may need to be modified to be used with a different terminal emu-

lator program and/or operating system. Contact Technical Services if further assistance is required.

# HyperTerminal Configuration

1. Power up the host computer and close any running applications.
2. Open the HyperTerminal application by clicking on **Start** \ "Programs" \ "Accessories" \ "Communications" \ "HyperTerminal."
3. In the "Connection Description" box, enter the name "SPD1030 or SPD2030" based on the model and choose an icon and click **OK**.
4. Connect to the virtual COM port that is linked with the SpeedVac™ concentrator attached to the computer (USB virtual com port).
5. In the "COM Port Properties" box \ "Port Settings" folder select the following options:  
Bits per second: \_ 115200  
Data bits: \_ 8  
Parity: \_ None  
Stop bits: \_ 1  
Flow control \_ None  
After verifying the above settings, click **OK**.
6. In the main dialog box click on **File** \ **Save**.
7. Exit the program by clicking on **File** \ **Exit** \ **Yes**.
8. Verify the program was saved by going to **Start** \ "Programs" \ "Accessories" \ "Communications" \ "HyperTerminal" \ "SPD1030 or SPD2030" based on the model
9. This completes the configuration of HyperTerminal.
10. Turn on SpeedVac™ system and connect to the virtual COM port that is linked with the SpeedVac™ attached to the computer.
11. Start HyperTerminal by clicking on **SPD1030** or **SPD2030** based on the model.
12. Initiate the run and SpeedVac™ will screen print **<temperature>**, **<heat time>**, **<run time>**, **<vacuum pressure>**

## Lid Stay Mechanism

The unit is equipped with a lid-stay mechanism that will assist the user in opening and closing the cover of the unit. It will

secure the lid and maintain it open, allowing the user to operate the unit with both hands.

**Note:** The picture shown below is for SPD2030 and this would be slightly different in SPD1030 as it uses a different lid stay mechanism.



**WARNING:** Device lid can crush your fingers.

**Keep away:** Do not reach between the device and lid when opening or closing the device lid.

## Other Topics

**Chamber Cover.** The cover must be closed before beginning a run. If you press **Manual Run** or **Auto Run** and the cover is open, the display shows "lid" to remind you to close the cover. The run will start immediately after closing the cover.

If a user tries to open the lid at the start of the run, when the lid has already been locked, the unit will automatically abort the run and signal the user with the "Lid" message on the display and an error tone. Otherwise, during a run the user cannot open the cover due to vacuum in the concentration chamber. The cover is locked down at all times during a run and whenever power to the unit is interrupted.

The cover lock is an additional safety feature that reduces the risk of injury or damage from the spinning rotor. Do NOT bypass the cover lock to conduct a run with the cover open.

If removal of samples from the concentrator chamber during a power failure is required, insert cover lock emergency release tool into the vertical slot at the base of the front of the unit. Press the object gently into the slot until the lock releases. The cover can then be opened.



**CAUTION:**

**List of Solvent and Solvent Combinations:**

Solvent & Solvent Combination	SPD1030	SPD2030
Acetonitrile	Yes	Yes
Ethanol	Yes	Yes
Methanol	Yes	Yes
Methylene chloride	Yes	No
Water	Yes	Yes
Acetonitrile & Water	Yes	Yes
Methanol & Water	Yes	Yes

Typical Application- Both Models

1. HPLC fractions with water/0.1% trifluoroacetic acid
2. Reversed-phase SPE elements

In the event that your choice of solvents and applications are unique and not listed above, please contact Thermo Scientific Customer Support for advice.



**WARNING:** Do not use this device in radioactive, highly reactive or explosive atmosphere.

Do not use this device to process any explosive, radioactive, highly reactive or explosive atmosphere creating substances.



**CAUTION: Product Maintenance:**

Maintenance of product only permitted to be performed by trained service staff using suitable measuring and auxiliary equipment as well as detailed service instruction.



**CAUTION:** Wear gloves, eye protection, masks and lab coats while working on the system.

**Routine checks:**

1. Check all the hoses to ensure that they are secure.
2. Ensure all glass condensation flask in emptied, cleaned and checked for crack before every run.
3. Clean the cover, cover seal and chamber with a soft lint free cloth with one of the following
  - Mild detergent solution
  - Diluted Methanol (50%)
  - Diluted Ethanol (50%)



**WARNING: Burns due to hot device parts:**

When the concentrator is set to a temperature of 60°C and above the rotor and the sample tubes will be hot, do not touch the wall of the rotor chamber, use suitable auxiliary to remove the sample tubes

## Simple System Integrity Test

You can use this simple system test to verify periodically the operational integrity of the vacuum pump and refrigerated vapour trap.

1. Install a clean dry Glass Condensation Trap.
2. Allow the refrigerated vapour trap to operate for 45 minutes.
3. Open the chamber lid and remove the rotor.
4. Fill a plastic beaker that will fit in the chamber, with 50 ml of water and place it in the chamber. Close the lid.
5. Set the temperature to “no”.
6. Set the Run Time for 15 minutes.
7. Press the **Auto Run** button.
8. At the end of the run, immediately open the lid and measure the water sample temperature.

A properly functioning system will reduce the sample temperature to within the range of +3°C to +7°C (+37°F to +45°F).

# Application

## Devising Protocols/ Application

Test runs are necessary to determine the correct run times for given procedures. To obtain data for concentration, reducing a large volume to a small volume, and drying, you will need to conduct manual test runs using containers, solvent and volumes that will be used for actual samples. Interrupt the run every 15 minutes to measure remaining sample volume and sample temperature. Continue the test until the samples are completely dry or concentrated to an acceptable level. Conduct additional runs at different drying rates with and without the Radiant Lamp ON.

At the end of a run, you can determine your percentage solvent recovery by removing and measuring the volume of solvent captured in the Glass Condensation Flask.

As solvent evaporates, samples remain cool due to the effects of evaporative cooling. If you continue to apply radiant energy, the sample temperature rises. Therefore, a sample drying operation using an expendable batch sample should be run. Based on the results, determine an optimum time to shut OFF the Radiant Lamp before the end of a run.

Drying rates vary depending on the solvent being evaporated. Temperature, sample volume, number and type of tubes, vacuum level, vacuum ramp rate and other factors can all influence drying rate. The following chart provides a guide for determining approximate drying rates.

Heat Setting	OFF	45°C		65°C			
Initial Sample Volume	4 ml	20 ml	4 ml	20 ml	4 ml	20 ml	
Drying Rate (ml/hr/vessel)	WATER	0.35	2	0.5	2.5	1	5

## Secondary Vapor Trapping

When processing solvents with a lower freezing point of -55°C, it is recommended to install the Thermo Scientific SCT120 Chemical Trap on the exhaust port to capture residual evaporated solvent vapours. This trap, installed in addition to the integral refrigerated trap, provides more complete solvent trapping. The SCT120 accepts a variety of disposable cartridges that are designed to adsorb vapours that may exhaust from the SpeedVac™. The Thermo Scientific DTK120R Chemical Trap Kit, which includes the trap, a disposable cartridge (DC120R), tubing and fitting, has an activated-charcoal cartridge that traps radioactive vapours and is effective for containing residual quantities of organic solvent vapours. (This is the same medium commonly used in fume hoods). The DTK120A Chemical Trap Kit is recommended for low pH vapours from samples involving acid hydrolysis of peptides or other acidic samples. This kit contains trap, tubing, fitting, and DC120A cartridge to neutralize acids.

To install a trap on the SpeedVac™ exhaust, remove the muffler and the rubber tubing from the SOLVENT VAPOR EXHAUST PORT. Attach a piece of vacuum tubing to this fitting. Attach the other end to the chemical trap.

**Note:** Refer to the manual shipped with each Chemical Trap Kit for full details and installation instructions.

**The chemical trap requires periodic checking and cartridge replacement to ensure its continued effectiveness.**



**CAUTION:** Risk to health from escaping substances, No vapours from toxic liquids and pathogenic germs must escape, ensure sufficient separation of vapor via correct chemical trap.

## Accessories

**DTK120R Chemical Trap.** for drying samples containing radiolabelled biomolecules, the chemical trap with activated carbon cartridge is strongly recommended. Attach to the vacuum pump exhaust recovery vessel. This set-up traps volatile radioactivity, preventing its release to the laboratory environment.

**ANT100 Ammonia Neutralizing Trap,** for drying samples such as synthetic oligonucleotides in ammonium hydroxide. The ANT100 includes a cup-mounting bracket, which attaches to the left side of the SPD SpeedVac™ at the exhaust port. The trap also includes four bottles of Ammonia Neutralizing Solution (ANS121/4). This trapping system effectively neutralizes ammonia gas, and eliminates exhaust of unpleasant odours.

**CC120/DX Deluxe Convenience Cart** is a space-saving accessory for the laboratory. When used with an SPD SpeedVac™, the system resides on the top shelf, while any additional trapping apparatus resides on the bottom shelf. Addition of the cart produces an easily portable concentration system.

**CryoCool™** (SCC1 or SCC5) for use in SPD1030 and SPD2030.



**CAUTION:** The use of accessories other than those recommended by Thermo fisher Scientific may impair the safety and function of the device. Thermo fisher Scientific cannot be held liable or accept any liability for damage resulting from the use of incorrect or non-recommended accessories and spare parts.

# Appendix 1: Troubleshooting Guide

**Table 2. Thermo Scientific SPD1030/SPD2030 SpeedVac™**

Symptom	Possible Causes	Solution/Explanation
No response	No current to the equipment.	Check line cord for proper connections.
	Power failure at source.	Check main circuit panel
System trips circuit breaker or main line fuse.	Short circuit to ground in one of the components.	Call Technical Service.
Sample does not dry, or noticeable change in the drying rate.	Flask cap plugged with ice.	Remove blockage and install a dry flask.
	Internal vacuum pump needs servicing.	Call Technical Service.
	Vacuum leak.	Check seal of cap on glass condensation flask. Check cover gasket on sample chamber.
	Insufficient thermal energy applied to the sample chamber.	Evaporative cooling retards evaporation: additional chamber heat counteracts this effect.
	Refrigerated trap not reaching operating temperature.	Call Technical Service.
	Condensation flask full past 3/4 mark.	Replace with new dry flask.

**Table 3. Thermo Scientific SpeedVac™ Chamber**

Symptom	Possible Causes	Solution/Explanation
Rotor does not rotate or makes a grinding noise.	No current to the equipment.	Check line cord for proper connections.
	Corroded upper magnetic assembly	Assembly requires replacement. Call Technical Service.
	Lower drive magnet bound up on the separation plate.	Call Technical Service.
Rotor makes a loud clattering noise on initial start-up.	Hold-down knob has been over-tightened.	Tighten knob only until it makes contact with rotor. <b>Do not over-tighten.</b>
Chamber does not seal properly.	Cracked or fouled cover gasket.	Clean or replace cover gasket.
	Automatic bleeder valve malfunction	Call Technical Service.
Chamber does not reach operating temperature.	Radiant lamp burned out.	Replace lamp or call Technical Service.
	Heater control or element malfunction.	Call Technical Service.

**Table 4. Refrigerated Condensation Trap**

<b>Symptom</b>	<b>Possible Causes</b>	<b>Solution/Explanation</b>
Refrigerated trap not cooling.	Insufficient air circulation.	Leave at least 4 inch clearance on all sides. Clear dust and debris from the condenser.
	Compressor system has lost its charge.	Call Technical Service.
Noisy vibration and/or excessive heat on top of cabinet.	Cabinet housing has become loose or circulation fan is rubbing an internal component.	Call Technical Service.
Glass condensation flask breakage.	Large ice build-up which expands during thawing.	Change and clean the glass condensation flask daily.
	Trap contents allowed to thaw and refreeze.	Leave the main power switch ON between runs and change the flask daily.
Glass condensation flask plugged with ice.	Excessive water and ice build-up in thermal transfer fluid.	Use CryoCool™ instead of ethanol.
		Remove the ice. <b>CAUTION:</b> Extreme cold may cause severe blistering.
Vacuum leak at flask cap.	Flask cap sealed improperly.	Verify that the cap is pressed securely over the mouth of the glass condensation flask.
	Flask cap worn or fouled.	Replace cap.

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