Enviro-Genie™

Operating Instructions

Models SI-1200, SI-1201, SI-1205

ENVIRO-GENIE™
Environmentally Controlled Benchtop
5-in-1 Refrigerator / Incubator / Rotator / Rocker / Stirrer

The Enviro-Genie™ is a Refrigerator / Incubator / Rotator / Rocker / Stirrer for the study of micro-organisms and tissue cell growth under strictly controlled conditions of temperature and agitation. Designed to provide the security of precise temperature control and uniformity for demanding incubation/refrigeration applications without taking up a great deal of space. It performs membrane-based assays/washings and hybridizations more efficiently. Chamber air is gently and continuously circulating at a rate that ensures the temperature consistency and uniformity of all test samples. Shatter resistant viewing window allows for inspection of samples without affecting the chamber environment.

Microprocessor control easily achieves desired rotating, rocking, and stirring speed; temperature; and time; all of which are shown on large, easy to read displays for accurate reproducible conditions. Timer displays elapsed time or remaining time until programmed off - up to 96 hours. Visible and audible alarms for both temperature and time.

FEATURES:

- 4°C to 75°C precise temperature range
- Thermo-electric (Peltier) refrigeration & heating – no compressor
- Microprocessor controls allow for accurate, reproducible conditions
- Economical, space-saving, and secure

SPECIFICATIONS:

Temperature:
- Heating: to 75°C
- Cooling: to 4°C
- Accuracy: ± 0.2°C
- Uniformity: ± 0.5°C
- Resolution: 0.1°C
- Stability: ± 0.1°C

Rocking:
- 2-70 cycles per minute

Rotating:
- 1-35 RPM

Stirring:
- Capacity: 2 Containers (up to 1 Liter each)
- Speed: 1-2000 RPM
- Stir Reversing: variable from 1-60 seconds

Size:
- Overall: 25" x 20" x 15"
  (635mm x 500mm x 375mm)
- Chamber: 10" x 14.5" x 10.3"
  (255mm x 360mm x 260mm)
- Volume: 24 Liters
- Weight: 75lb. (34kg)

Electrical:
- 100Volt AC, 5 Amp
- 115 Volt AC, 5 Amp
- 240 Volt AC, 2.5 Amp

(Nominal voltages: Not to vary by more than 10%)

ETL Listed
Conforms to UL Std. 3101-1

ETL Listed
Certified to CAN/CSA C22.2

2-Year Warranty

CE

This symbol on ⚠ the Enviro-Genie™ means: Attention: Refer to accompanying documents.

OPERATING INSTRUCTIONS:

⚠ **CAUTION! Failure to follow operating instructions can compromise the user's safety.**

Temperature Control: Enviro-Genie™ can be set from 4°C to 75°C

Power on the Enviro-Genie (front rocker switch). After initializing and displaying the software version number in the temperature display window, the current temperature in the chamber is displayed. Temperature is not yet being controlled.

Set the temperature desired by pressing the temperature up or down arrows. The first button press will display the commanded temperature, as well as, start the fans to create airflow in the unit. Fan circulation insures homogenous temperature in the unit. Subsequent button presses (within three seconds of first button press) will increase (up arrow) or decrease (down arrow) the commanded temperature by 0.1°C. Pressing and **holding down** the up or down arrow key will increase or decrease commanded temperature by even 1°C increments. The temperature display window will return to displaying the current chamber temperature when neither the up or down arrow has been pressed for three seconds.

Active temperature control (Peltier power) is temporarily suspended while temperature is being changed. Peltier power is suspended when temperature arrow is pressed, until neither arrow is pressed for three seconds.

Temperature can be varied from 4°C to 75°C in 0.1°C increments.

Temperature Alarm:

The Enviro-Genie™ temperature alarm is intended to notify you if the chamber temperature deviated from your set temperature for any reason. Reasons for temperature deviation include leaving the door ajar or excessive heat generation by a sample in the chamber. *The alarm is not loud enough to disrupt your laboratory environment. It is simply an indicator to warn you of excessive temperature deviation, as set by the user.*

Pressing the temperature alarm button cycles the temperature alarm through three states: No alarm (no LED's), ± 3°C (± 3°C LED lit), and ± 1°C (± 1°C LED lit).

In "No Alarm" mode (neither LED lit), temperature alarm is disabled.
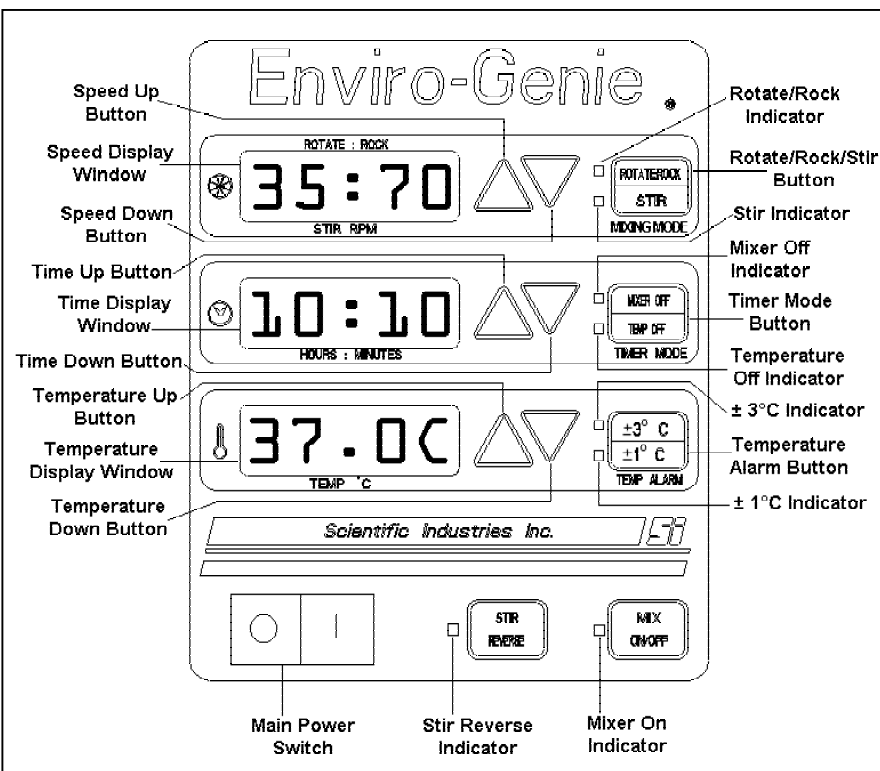
In "± 3°C" mode (top LED lit), an audible alarm will sound (two beeps every 15 seconds) if the temperature in the chamber varies from the commanded temperature by more than 3°C **AFTER** the unit has reached the commanded temperature for the first time. The alarm will continue to sound after the commanded temperature has been restored (i.e. door was closed). The alarm can be re-set by pressing the temperature alarm button once. Once the temperature alarm has been re-set, it will not sound again until the commanded temperature has been re-established in the chamber, and then a deviation of 3°C has been detected again.

In "± 1°C" mode it is identical to "± 3°C" mode, with the exception that a 1°C deviation will set off the alarm.

MIXING MODES:

Enviro-Genie™ may be used for Rocking, Rotating, Magnetic Stirring, or simply as an Environmental Chamber, with no mixing enabled.

Magnetic Stirring:

Enviro-Genie comes equipped with two magnetic stirring platforms, located at the bottom of the chamber. The stirrers are centered on the raised portions of the chamber bottom. The stirrers both operate at the same settings at all times. *If Rotating/Rocking Magnetic Platform is installed remove the platform prior to using magnetic stirrers (see rotating/rocking).*

Stirring Platforms

The Rotate/Rock/Stir button cycles the mixing mode between three states: Rotate/Rock (top LED lit), Stir (bottom LED lit), or No Mixing (no LED lit). Press the Rotate/Rock/Stir button until the bottom LED is lit. The magnetic stirring speed will be displayed in the speed display window.
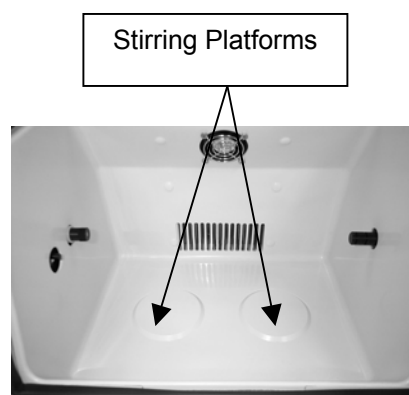
Pressing the speed up or down arrows will adjust the magnetic stirring speed. Single button presses will adjust the stir speed by 10 RPM (1RPM when under 10RPM). Pressing and holding an arrow button down will change speeds by 100 RPM increments at a time. Stirring speed may be changed while stirrer is on or off. Stirring speed can be adjusted from 1-2000 RPM. In general, the highest speeds can only be achieved with smaller stir bars with non-viscous liquids.

Start stirring by pressing the "Mix On/Off" button. The speed will flash while the stir bar is gently ramped up to speed. The speed will stop flashing when commanded stir speed has been achieved. Pressing "Mix On/Off" again will begin ramping of speed to zero.

Stir Reversing:

Enabling "Stir Reverse" causes the stir bar to reverse direction at a rate set by the user. The stir bar is gently ramped down in speed to a stop, then ramped up to speed in the opposite direction. Time between reversing is adjustable from 1 to 60 seconds.

To enable stir reversing, press the "Stir Reverse" button while in stir mode. The stir reverse LED will flash. While the stir reverse LED is flashing the time display window displays the time (in seconds) between stir reversing. The display defaults to zero (no reversing). Reversing time is adjusted by pressing the time up and time down arrows. The stir reverse LED will stop flashing when the time arrow buttons have not been pressed for five seconds. The time display window will revert back to timer mode and stir reverse time has been set. If the stirrer was operating, it will begin to reverse direction at the set interval. If the stirrer was not operating, it will reverse when turned on.

Stir reversing may be cancelled by pressing the "Stir Reverse" button; the stir reverse LED will turn off.

NOTE: If a very short stir reversing time is used in conjunction with a very fast stir speed, the commanded speed may not be attained. The system will not have time to ramp up to speed.

Rotating/Rocking:

Enviro-Genie™ comes equipped with a magnetic platform that is used for rotating and rocking. Installing/removing the magnetic platform is easy, but may take a few times to get used to. Try the following technique.

Install the magnetic platform by first unscrewing the lock shaft until the end of the lock shaft is flush with the right hand side wall of the inside of the chamber.

Grab the magnetic platform with the label side up, so that you can read the label. Hold the platform in the chamber and insert the hex shaft on the left side of the chamber into the hex hole in the magnetic platform. You may need to rotate the platform slightly to align the shaft with the hole.


Now hold up the right side of the platform, while depressing the blue lock release. Screw the lock shaft into the hole in the magnetic platform making sure the blue lock release is depressed. When the lock shaft is screwed all the way in, let go of the lock release.

To remove the platform, reverse the above procedure.

To select rotating mode:
1. Press the lock release.
2. Shift the magnetic platform to the right.
3. While shifting the platform right, release the lock release and line up the hex shaft to engage the lock shaft properly.
4. The platform will lock in place when it reaches the correct position.
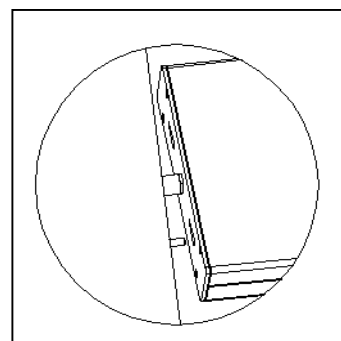
To select rocking mode:
1. Press the lock release.
2. Shift the magnetic platform to the left.
3. While shifting the platform left, release the lock release and rotate the platform to line up the pin and the pin slot in the end of the platform. Shift the platform onto the pin.
4. The platform will lock in place when it reaches the correct position.
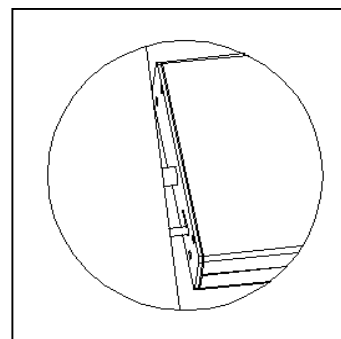
The versatile magnetic platform can be loaded in many ways using both sides of the platform:

1. To rock open trays or racks, center the metal rocker tray.

   NOTE: The metal rocker tray must be used in rocking mode only. It will not clear the housing if rotated.

2. To rotate or rock bags, select mode of operation (Rocking or Rotating); locate the bags in the desired position using 2 or 4 (depending on application) magnetic stainless steel mounting strips to hold them in place. Four mounting strips are supplied – more can be ordered (see Accessories).   The platform capacity for bags can also be expanded (see Accessories).

3. Various size tubes can be placed on the magnetic platform in different orientations to produce different motions within the tubes. First select the size clip plate required. The large clips hold 28-30mm dia. (50ml) tubes, the medium clips hold 15-17mm dia. (15ml) tubes and the small clips hold 10-13mm dia. (1.5-2.0ml) tubes. One clip plate of each size is supplied. The platform can hold up to eight plates (see Accessories). Push the tubes into the clips.

   - Positioning the plates as shown in will produce a rotating or rocking motion in the tubes.

   - Positioning the plates as shown in will produce a rolling or rocking motion in the tubes.

   - Positioning the plates as shown in will produce a combination rotating/rolling motion ("Figure 8" motion) in the tubes. Adjust the angle to achieve the desired motion.

   NOTE: When rotating tubes, rotate the magnetic platform by hand before starting, to check the clearance of the tubes to the chamber walls.

- Platform Capacity
      Centered on Axis: 4.5kg (10lb.)
      Offset: 2.3kg (5lb.)

Environmental Chamber Only:

By Pressing the Rotate/Rock/Stir Button until the speed display is blank, all mixing is disabled and the Enviro-Genie™ becomes a temperature chamber only. A wire rack is included to increase the capacity of the chamber. An additional rack (sold separately) may be stacked on the first rack to further increase capacity (see Accessories).

TIMER:

The Timer function of Enviro-Genie™ can be used to end mixing (Stirring, Rotating, Rocking), end temperature control, or simply as a timer with alarm. As with most Enviro-Genie functions, the Timer function may simply be ignored when timing is not important.

Pressing the "Timer Mode" button cycles the Timer Mode through four states: Mixer Off (top LED lit), Temperature Off (bottom LED lit), both Mixer and Temperature Off (both LED's lit), and Timer Only (no LED's lit).

In "Mixer Off Mode", when the time reaches zero, mixing (Stirring, Rotating, or Rocking) will stop. An alarm will sound (three rapid beeps) every 15 seconds. Time will begin to count upward from zero to let you know time elapsed since completion. Pressing any time button (up arrow, down arrow or Timer mode button) will clear the alarm and reset time to zero.

"Temperature Off Mode" acts the same as above, except temperature control is turned off instead of time. Chamber temperature will gradually return to ambient.

Mixer and Temperature Off Mode" combines both of the above. Both mixing and temperature control are turned off when the time reaches zero.

In "Timer Only Mode", nothing is turned off when time reaches zero. The alarm will sound until cleared.

Setting Time:

Time is set in hours and minutes by pressing the time up and time down buttons. Single button presses increase (up arrow) or decrease (down arrow) time. Time reaches zero in one-minute intervals. Pressing and holding an arrow button changes time by one-minute intervals for five one-minute changes. Thereafter, continuing to hold down the arrow button causes the time to change in 15-minute increments.

Pressing the "Mix On/Off" button begins the Timer counting down (as well as, starting the mixing, if in Stir, Rotate, or Rock modes). The "Mix On" LED will light.

Pressing the "Mix On/Off" LED button again stops the Timer (as well as, stops mixing, if in Stir, Rotate, or Rock modes).

ADVANCED FEATURES:

Setting Defaults:

Enviro-Genie™ is shipped from the factory with its default settings on power-up to be:
- Rotate/Rock Mode at 10/20 RPM/Cycles per second.
- Timer only (No mixer Off or Temperature Off).
- Temperature set to 20°C with no Temperature Alarms.

These Power-Up Settings May Be Changed.
Simply set the unit up to the configuration desired, and press and hold the Stir Reverse Button for five seconds. The unit will beep three times very quickly. The values are now stored. If for example, you routinely stir at 10 RPM at 37°C with temperature alarms at ± 3°C, simply set the unit to these settings and save them as the defaults by holding down the Stir Reverse Button until the three quick beeps are heard. Enviro-Genie™ will now default to the settings on power-up.

Lockouts:

Lockouts are used to prevent inadvertent changes to Enviro-Genie's settings. A locked out value (i.e. Temperature, Speed or Time) cannot be changed by pressing the front panel buttons until the Lockout is cleared.

To set Lockouts, press and hold the Mix On/Off Button for five seconds. The unit will beep three times very quickly indicating that it is in Lockout mode. Lockout mode is exited if no button is pressed within ten seconds.

Pressing the Rotate/Rock/Stir Button within ten seconds locks out speed changes. The last decimal point (furthest to the right) of the speed display will appear to indicate that speed is locked out. The speed Lockout disables changing speed (Up and Down Arrows) as well as mode changing (Rotate/Rock to Stir or Stir to Rotate/Rock). Pressing Rotate/Rock/Stir again (while in Lockout mode) clears the Lockout.

Pressing the Timer Mode button locks out time. The last decimal point in the time display appears to indicate that time is locked out. The Time Lockout disables the Time Up and Down buttons (arrows). Pressing the Timer Mode Button again (while in Lockout mode) clears the Lockout.

Pressing the Temperature Alarm button locks out changes in temperature. The last decimal point in the temperature display appears to indicate that temperature is locked out. The temperature Lockout disables the Temperature Up and Down buttons (arrows). Pressing the Temperature Alarm button again (while in Lockout mode) clears the lockout.

Pressing no buttons at all for ten seconds exits Lockout mode.

Calibration:

The Enviro-Genie™ is electronically factory calibrated and should not need calibration, nor is it recommended. However, should the need arise, the unit may be "Single Point" calibrated.

In order to calibrate, you will need to make an independent measurement of the chamber temperature. Make sure the thermometer is accurate! Generally speaking, glass thermometers found around the lab will be less accurate than your Enviro-Genie™. Good, certified glass or digital thermometers are available from laboratory supply dealers. A thermocouple wire may be passed through the door seal and will not affect performance.

Measure the temperature in the chamber via the thermometer or lab thermometer, after chamber temperature has been allowed to settle for twenty minutes. Note the difference in temperature between Enviro-Genie™ displayed temperature and your lab thermometer temperature (ex. Enviro-Genie™ display reads 37.5°C, lab thermometer reads 37.0°C; difference is –0.5°C). This difference is the calibration value to be entered.

Enter Calibration Mode by pressing the Temperature Alarm button and holding it down for five seconds. The unit will beep three times very quickly to indicate that it is in Calibration Mode. The temperature window displays the current user calibration value (0.0 as shipped from the factory). This value can be changed in .1°C increments by using the Temperature Up and Down buttons.

Calibration Mode is exited by not pressing any buttons for ten seconds. Calibration is then stored. The calibration value is then added to measured temperature. The calibration value will be saved even after the unit is turned off.

RS-232 Interface:

Enviro-Genie™ comes equipped with a serial interface for connection to a PC or other serial device. This interface can be used to record machine information (including temperature) for situations that require verification. It can also be used to send commands remotely to the Enviro-Genie™, either manually or automatically from a program in order to create profiles. Visit our website (www.scientificindustries.com) for a sample visual basic control program for the Enviro-Genie™.

The serial port is on the side of the unit and is a standard subminiature 9-pin male connector. Connection to a PC is via a straight through 9-pin female-female serial cable (P/N SI-1132).

- Baud Rate: 19,200
- Data Bits: 8
- Stop Bits: 1
- Parity: None

All communication is accomplished with ASCII Uppercase characters with a carriage return as the terminating character.

Control Commands are as follows:

TIME: Mixing and temperature control time. Enter commanded time as follows: To enter 7 Hrs. 23 Min. type "Time 723" followed by the enter key.

TON: Turn on data output. *Data is output once per second*. To turn on data output, type the following: "TON" followed by the enter key. The format of the data out from the TON command is as follows: Commanded Temperature, Time and Actual Temperature.

TOFF: Turn off data output. To turn off data output, type the following: "TOFF" followed by the enter key.

TEMP: Temperature command in degrees Celsius. *Will accommodate tenths of degrees*. To enter commanded temperature, type the following: "TEMP 250" followed by the enter key. This will return 25.0 degrees Celsius on the front panel. "TEMP 251" followed by the enter key will return 25.1 degrees Celsius. The numerical value is the temperature value in degrees Celsius in the range from 4° - 75°.

SPEED: Speed command in RPM. To enter commanded speed, type the following: "SPEED 500" followed by the enter key. The same ranges for Rock/Rotate (0-35 RPM) and Stirring (0-2000 RPM) entered on the keypad hold for RS-232 speed command.

MMODE: Mixing mode. To enter mixing mode type the following: "MMODE 1-3" followed by the enter key.

1. No Mix mode.
2. Rock/Rotate mode.
3. Stir mode.

TMODE: Timer mode. To enter timer mode type the following: "TMODE 1-4" followed by the enter key.
1. Nothing off.
2. Mixing off.
3. Temperature off.
4. Mixing and temperature off.

ALARM: Alarm mode. To enter alarm mode type the following: "ALARM 1-3" followed by the enter key.

1. No temperature alarm.
2. $\pm$ 3 Degree Centigrade alarm
3. $\pm$ 1 Degree Centigrade alarm

START: Start mixing/stirring. To start mixing or stirring, type the following: "START" followed by the enter key.

STOP: Stop mixing/stirring. To stop mixing or stirring, type the following: "STOP" followed by the enter key.

PELTON: To turn on heating/cooling control, type the following: "PELTON" followed by the enter key.

PELTOFF: To turn off heating/cooling control, type the following: "PELTOFF" followed by the enter key.

RESTOREE: Restore all factory preset values.

Windows Quickstart:

- Connect cable to Enviro-Genie™ and PC.
- Start Windows Hyperterminal (Start, Programs, Accessories, Communication, Hyperterminal).
- Double Click on Hyperterminal.
- Give the connection a name (i.e. "Enviro-Genie").
- Select the serial port you are connected to (usually COM1 or COM2).
- Select 19,200, 8, None, 1.
- You are now connected.

In order to have Windows scroll down after each line, check the box "append line feeds to incoming line ends."

Type commands to the unit in capital letters followed by the enter key.

In order to capture data in Windows hyperterminal select "Transfer", "Capture Text" (Don't forget to issue the command "TON" to start data flowing from Enviro-Genie™).

NOTE: Please check our website (www.scientificindustries.com) for any updates to this document.

Enviro-Genie™ Accessories
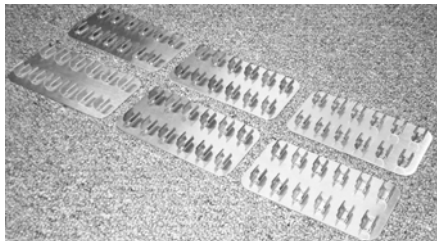
SI-1120 Small Tube Plates
Add extra small tube capacity! Each kit contains six 10-13mm diameter tube plates (12 tubes per plate). Ideal for microcentrifuge or other small tubes.
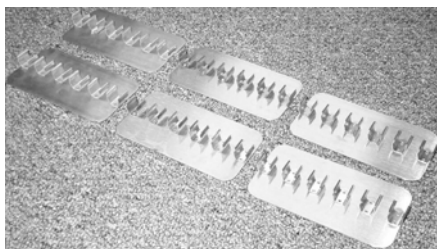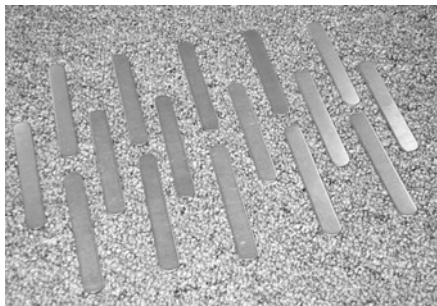
SI-1121 Medium Tube Plates
Add extra medium tube capacity! Each kit contains six 15-17mm diameter tube plates (6 tubes per plate). Ideal for 15ml centrifuge or other medium tubes.
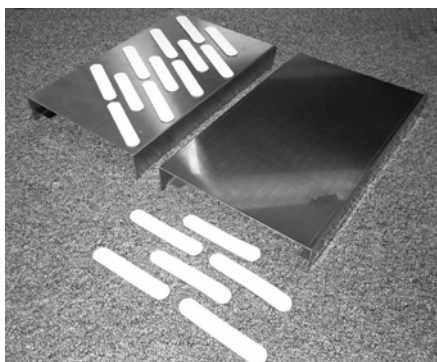
SI-1122 Large Tube Plates
Add extra Large Tube Capacity! Each kit contains six 28-30mm diameter tube plates (3 tubes per plate). Ideal for 50ml centrifuge of other larger tubes.

SI-1126 Bag Mounting Strips
Add extra bag capacity! Each kit contains sixteen magnetic stainless steel mounting strips. Ideal for bag washings of blots.

SI-1127 Bag Expansion Kit
Add even more Bag Capacity! Each kit contains two trays (for use on magnetic platform) and 24 flexible mounting strips.

SI-1130 Hybridization Tube Plates
Use your Enviro-Genie™ as a hybridization oven! Each kit contains two clips suitable for 42-45mm diameter tubes.

SI-1131 Extra Chamber Rack
Add extra capacity to your Enviro-Genie™! This extra rack will stack on top of your existing rack to increase shelf space.


SI-1132 Serial Cable
Connect your Enviro-Genie™ to a computer via a serial port. Perfect for data capture or program your computer for profiling. This is a standard 9-pin, female to female straight through serial cable.

ENVIRO-GENIE™

PARTS ASSEMBLY LIST
To order parts for the Enviro-Genie:
Call, fax or write your local distributor.
Please specify part #, quantity and voltage.

SERIAL NUMBER
PLATE LOCATION
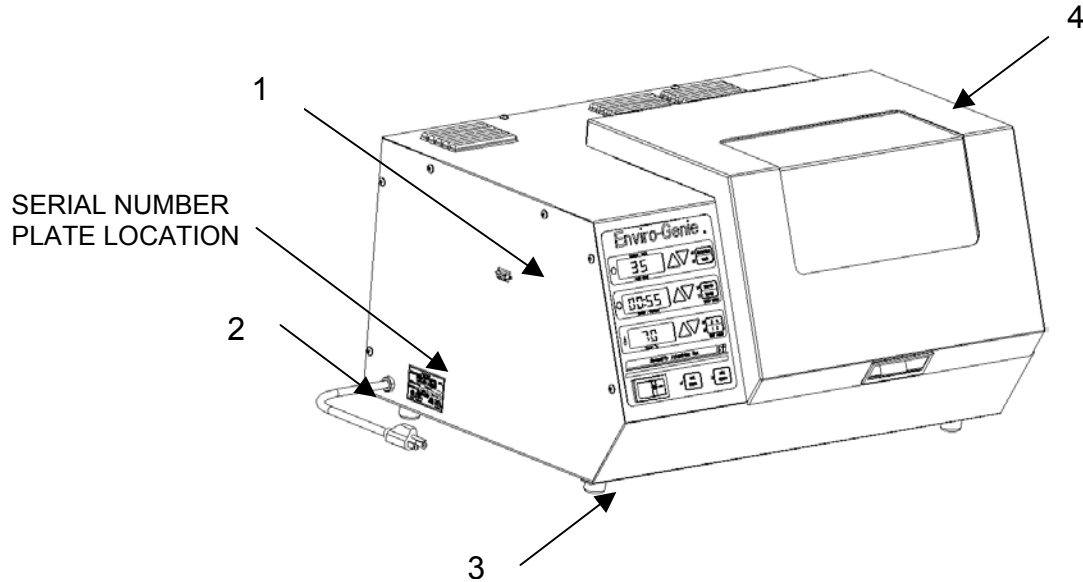
Indicator#	Part#	Description
1	0K-1200-916	KIT, RS232 CABLE, ENVIRO-GENIE
2A	318-0526-00	LINECORD 120V
2B	0A-1101-015	LINECORD, 240V W/O PLUG
2C	0A-1102-015	LINECORD, 240V EUROPEAN PLUG
2D	0A-1103-015	LINECORD, 240V BRITISH PLUG
2E	0A-1104-015	LINECORD, 240V SWISS PLUG
2F	0A-1105-015	LINECORD, 100V
3	HWP0034	BUMPER, 1"DIA X 1" LG.
4	0K-1200-915	KIT, DOOR, ENVIRO-GENIE

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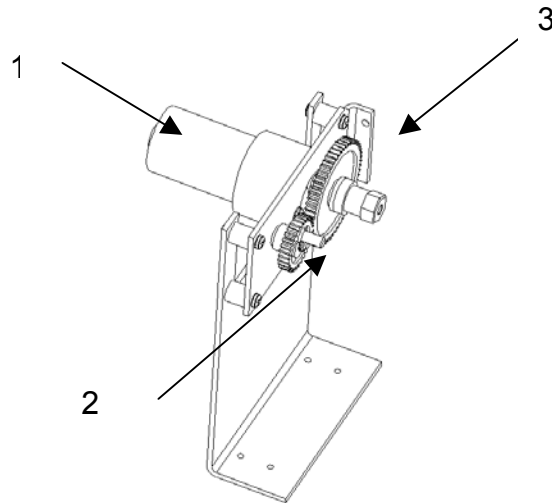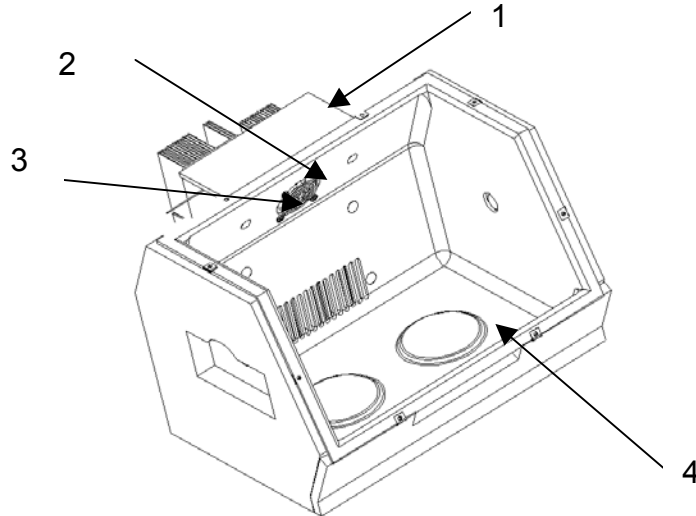Please specify part #, quantity and voltage.
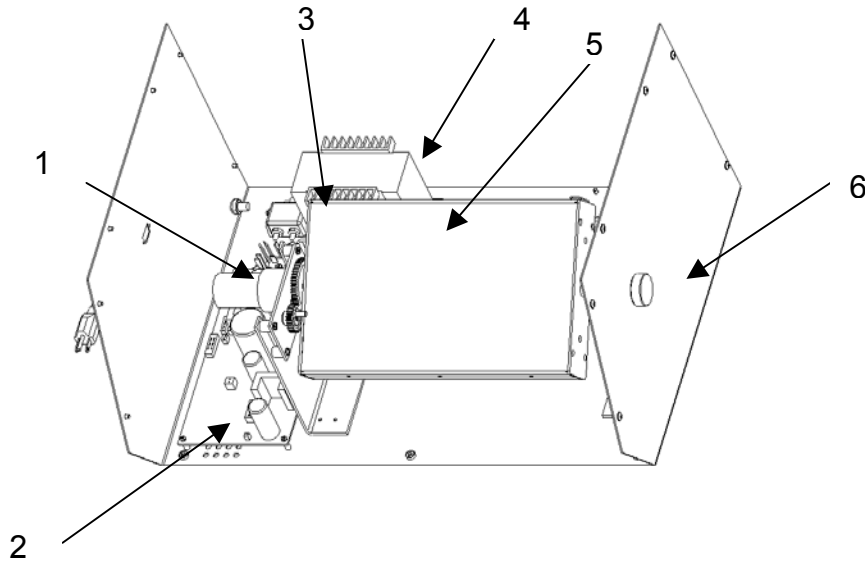
Indicator#	Part#	Description
1	0K-1200-911	KIT, MOTOR ASSEMBLY, ENVIRO-GENIE
2	0K-1200-921	KIT, POWER DISTRIBUTION BOARD, ENVIRO-GENIE
3	0K-1200-913	KIT, LINE FILTER, ENVIRO-GENIE
4	0K-1200-914	KIT, TRANSFORMER, ENVIRO-GENIE
5	0A-1100-030	PLATFORM ASSEMBLY
6	0M-1200-214	LOCKSHAFT, PLATFORM

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Call, fax or write your local distributor.
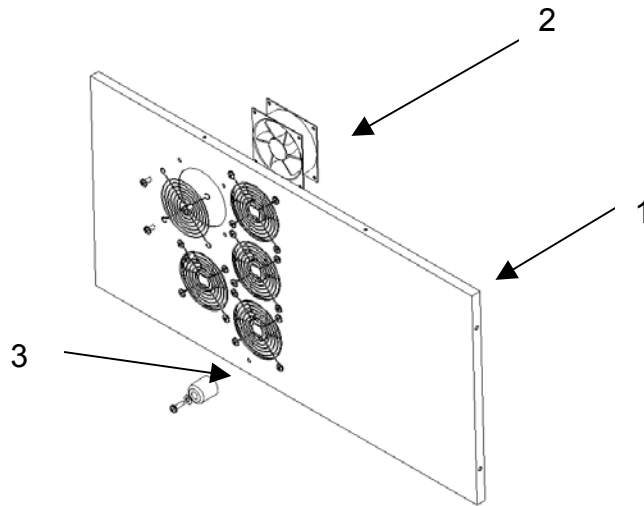Please specify part #, quantity and voltage.

Indicator#	Part#	Description
1	0K-1200-908	KIT, MOTOR DRIVE, ENVIRO-GENIE
2	0K-1200-909	KIT, SMALL GEAR, 30T, ENVIRO-GENIE
3	0K-1200-910	KIT, HEX SHAFT, ENVIRO-GENIE

ENVIRO-GENIE™

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Call, fax or write your local distributor.
Please specify part #, quantity and voltage.

Indicator#	Part#	Description
1	0K-1200-904	KIT, TEC, ENVIRO-GENIE
2	0K-1200-905	KIT, TEMPERATURE SENSOR, ENVIRO-GENIE
3	0K-1200-906	KIT, FAN TEC ASSEMBLY, ENVIRO-GENIE
4	0K-1200-907	KIT, MAGNETIC STIRRER, ENVIRO-GENIE

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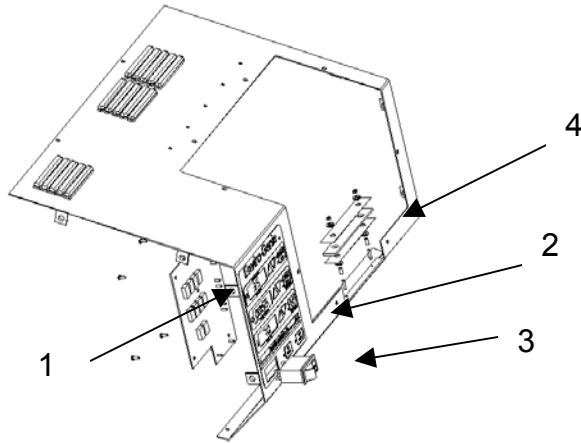Please specify part #, quantity and voltage.

Indicator#	Part#	Description
1	0M-1200-207	BACK PANEL, ENVIRO-GENIE
2	0K-1200-903	KIT, FAN, BACK PANEL, ENVIRO-GENIE
3	HWP0034	BUMPER, 1"DIA. X 1" LG.

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PARTS ASSEMBLY LIST
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Please specify part #, quantity and voltage.

Indicator#	Part#	Description
1	0K-1200-900	KIT, DISPLAY BOARD, ENVIRO-GENIE
2	0K-1200-901	KIT, DISPLAY KEYPAD, ENVIRO-GENIE
3A	ESP0006	SWITCH, ROCKER, 120V/100V 5A
3B	ESP0007	SWITCH, ROCKER, 240V 2.5A
4	0K-1200-902	KIT, DOOR LATCH, ENVIRO-GENIE

LTP0018

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