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PowerEase™ Touch 350W Power Supply

Catalog Numbers PS0350 (115 VAC), PS0351 (230 VAC), PS0352 (230 VAC Australia), PS0353 (230 VAC China)

Publication Number MAN0019503

Revision A.0

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 For descriptions of symbols on product labels or product documents, go to **thermofisher.com/symbols-definition**.

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1 Product information

Product description

The PowerEase™ Touch 350W Power Supply is a high throughput power supply that uses a touch-screen user interface. This power supply is ideal for DNA/RNA electrophoresis, SDS-PAGE, and native PAGE.

The power supply unit has the following features:

- Touch screen LCD display and user interface with clear menu prompts for easy use by hand or stylus
- Maximum output of 300 V, 3 A, and 350 W (for complete specifications, see Product Specifications)
- Four sets of output terminals allow running of multiple electrophoresis units
- Pop-up feet allow change to screen viewing angle
- Sturdy polyurethane feet and stackable housing design allow stacking of power supplies
- Running modes include Constant Voltage, Constant Power, or Constant Current
- Programming capabilities for limiting voltage (V), current (mA) and power (W)
- Method programming flexibility (up to 100 methods, 20 steps per method, 999 minutes per step)
- Pause button for editing method parameters during run
- User adjustable device settings such as beep volume, screen brightness and sleep mode duration
- Automatic safety features such as No Load, Over Temperature, Over Voltage, Over Current, Load Change, and Ground Leak detection

This manual describes the setup and operation of the PowerEase™ Touch 350W Power Supply and includes important information on safety and maintenance of the unit.

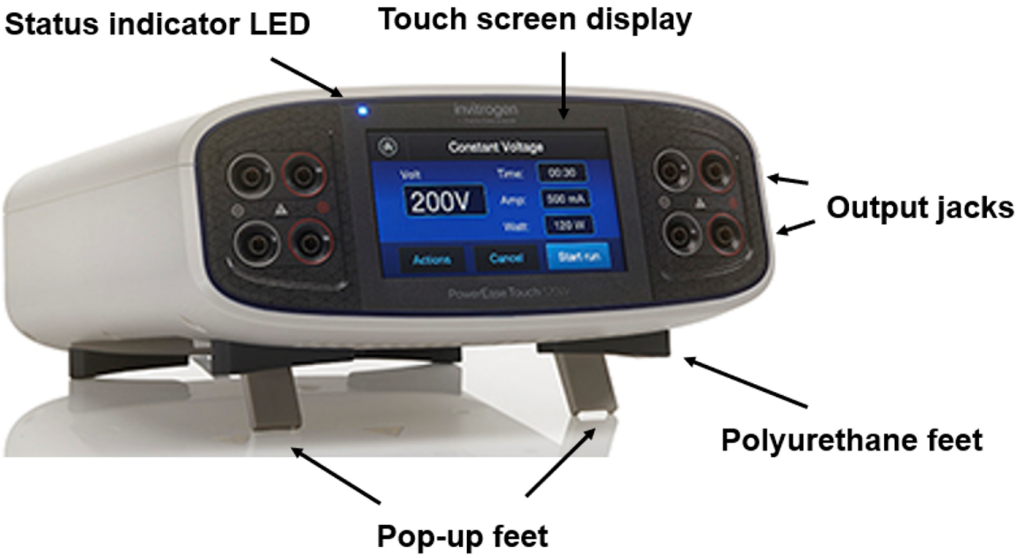


Figure 1 Front view of PowerEase™ Touch 350W Power Supply

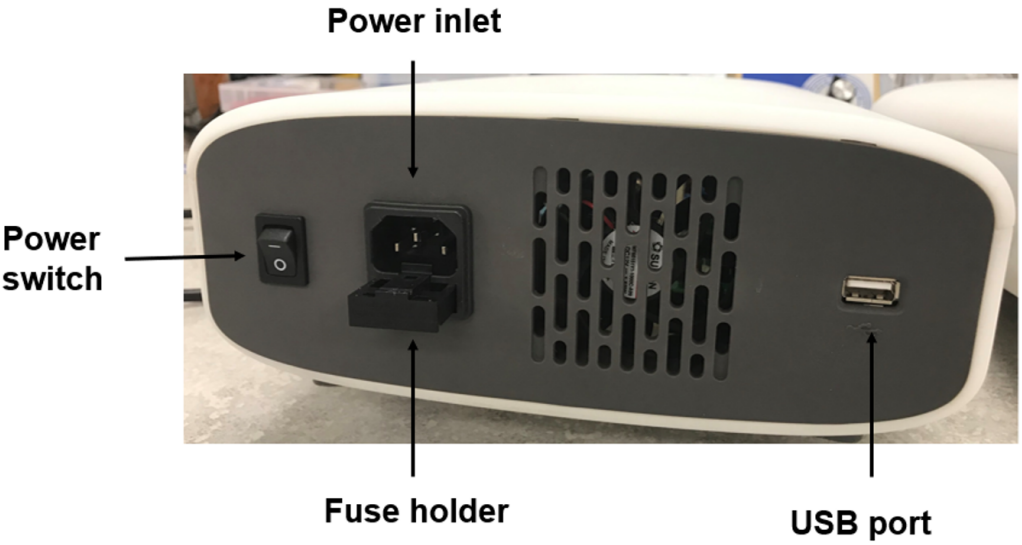


Figure 2 Rear view of PowerEase™ Touch 350W Power Supply

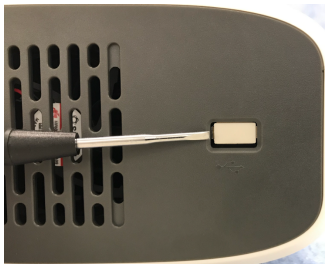


Figure 3 USB port dust cover (Rear view of PowerEase™ Touch 350W Power Supply)

The USB port is shipped with a plastic dust cover for protection during shipment. This cover must be removed prior to port use. Remove by gently prying off with a small flat blade screwdriver.

Product contents

On receipt, examine the unit carefully for any damage incurred during transit. Any damage claims must be filed with the carrier, and keep the supplied box for inspection. The warranty does not cover in-transit damage.

IMPORTANT! Some of the power cords appear similar; users should utilize the cord approved for their country/region. North America customers should use the Type B power cord; Japan customers should use the JIS 8303 power cord; China customers should use the GB 15934-2008 power cord; Australia/New Zealand customers should use the Type I power cord.

Table 1 Cat. No. PS0350 (115 VAC)

Component	Quantity	Regulatory mark(s) on electrical plug
PowerEase™ Touch 350W Power Supply	1 each	
Extra Fuse	1 each	
Type B Power Cord	1 each	CSA
JIS 8303 Power Cord	1 each	PSE
USB Cover	1 each	
Quick Reference Card	1 each	
Certificate of Performance	1 each	

Table 2 Cat. No. PS0351 (230 VAC)

Component	Quantity	Regulatory mark(s) on electrical plug
PowerEase™ Touch 350W Power Supply	1 each	
Extra Fuse	1 each	
Type G Power Cord	1 each	ASTA
Type CEE 7/7 Power Cord	1 each	CE
USB Cover	1 each	
Quick Reference Card	1 each	
Certificate of Performance	1 each	

Table 3 Cat. No. PS0352 (230 VAC Australia)

Component	Quantity	Regulatory mark(s) on electrical plug
PowerEase™ Touch 350W Power Supply	1 each	
Extra Fuse	1 each	
Type I Power Cord	1 each	NSW 18392
USB Cover	1 each	
Quick Reference Card	1 each	
Certificate of Performance	1 each	

Table 4 Cat. No. PS0353 (230 VAC China)

Component	Quantity	Regulatory mark(s) on electrical plug
PowerEase™ Touch 350W Power Supply	1 each	
Extra Fuse	1 each	
Type GB 15934-2008 Power Cord	1 each	CCC
USB Cover	1 each	
Quick Reference Card	1 each	
Certificate of Performance	1 each	

2 Methods

Procedural guidelines

We recommend that you carefully review these guidelines before operating the instrument.

- To ensure safe, reliable operation, always operate the PowerEase™ Touch 350W Power Supply in accordance with the manufacturer's instructions.
- Avoid exposing the power supply to liquids as these may damage the unit and void the warranty.
- **IMPORTANT!** Do not use the PowerEase™ Touch 350W Power Supply at its maximum electrical load limits. Variations in buffer conditions can result in exceeding the power supply's maximum voltage, current, or power output capacity and produce undesirable variations in performance.
- When using this or any electrophoresis product, we recommend that you adhere to the protocols given in the electrophoresis product manuals.

For best results:

- We recommend using the **Constant Voltage Mode** for protein gels or blots.

  Note: For most electrophoresis methods, resistance increases throughout the run. Limiting the voltage allows for an improving margin of safety over time because the current and power decrease through the run. Also, the same voltage can be used regardless of the number or the thickenss of gels being electrophoresed.
- Avoid running samples of widely differing salt concentrations or sample buffers at the same time or on the same gel.

  Note: Variations in conductivity due to differences in buffer salt concentrations can affect the run of all the samples run at the same time.
- Properly prepare your samples.

Install the power supply

1. Check the label located on the bottom of the power supply to ensure that the unit is compatible with locally provided voltage.
2. Place the power supply on a level laboratory bench and position it such that the On/Off switch and the AC inlet at the rear of the power supply are easily accessible. Keep the area around the power supply clear to ensure proper ventilation of the unit.
3. Ensure the On/Off switch located at the rear of the power supply is in the Off position.
4. Attach the power cord to the AC inlet of the power supply.
5. Plug the power supply into an appropriate electrical outlet (use properly grounded AC outlets and power cords).
6. Connect the leads from the electrophoresis unit to the power supply by inserting the positive lead (+) into the red output jack and the negative lead (-) into the black output jack.
7. Turn the AC power switch at the back of the power supply On.

Programming options

The PowerEase™ Touch 350W Power Supply can be programmed to run single-step and multi-step methods. Up to 100 user defined methods can be saved; up to 20 steps can be saved for each multi-step method.

This power supply is also equipped with several pre-programmed gel electrophoresis and transfer methods. These methods include voltage and time parameters required to run and transfer many pre-cast gel products from Thermo Fisher Scientific.

This power unit has a touch sensitive screen, so the selection of on-screen buttons and parameters is accomplished by touching the screen at the location of the item to be selected.

Menu navigation

The PowerEase™ Touch 350W Power Supply uses several screen icons that simplify menu navigation.

Icon	Description
	The Home icon returns to the **Home** screen (Figure 4).
	The back arrow returns to the previous screen.
	Left and right arrows indicate that an additional screen is available. Touch the arrow todisplay the additional screen.
	Touch this icon to close the current screen
	Touch this icon to navigate to the **Settings** screen (available on the **Home** screen only).

Homescreen

On power up, the **Home** screen is displayed (see Figure 4).

The **Set up run** option will appear on the **Home** screen when the power supply is switched on for the first time or it if is switched on after running an unsaved custom method (see below).

The **Last run** option will appear on the **Home** screen when the power supply is switched on after having previously run a saved custom method or a pre-programmed method. It will also be shown after an un-saved custom method is run until the power supply is shut off.

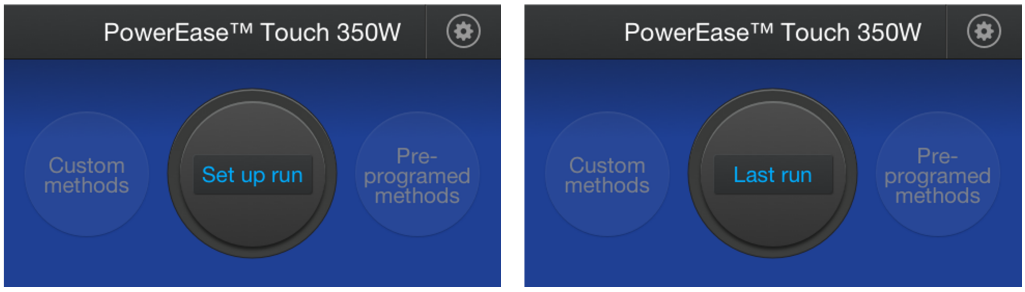


Figure 4 Home screens

The following options can be selected from the **Home** screen:

- Select **Set up run** to program a new run method.
- Select **Custom methods** to choose a previously saved run method.
- Select **Pre-programmed methods** to choose a pre-loaded run method.

Set up a run

1. Switch the power switch located at the rear of the unit to the **On** position.
2. Touch **Set up run**.
3. In the **Method Type** screen touch either **Constant voltage**, **Constant current**, or **Constant power**.

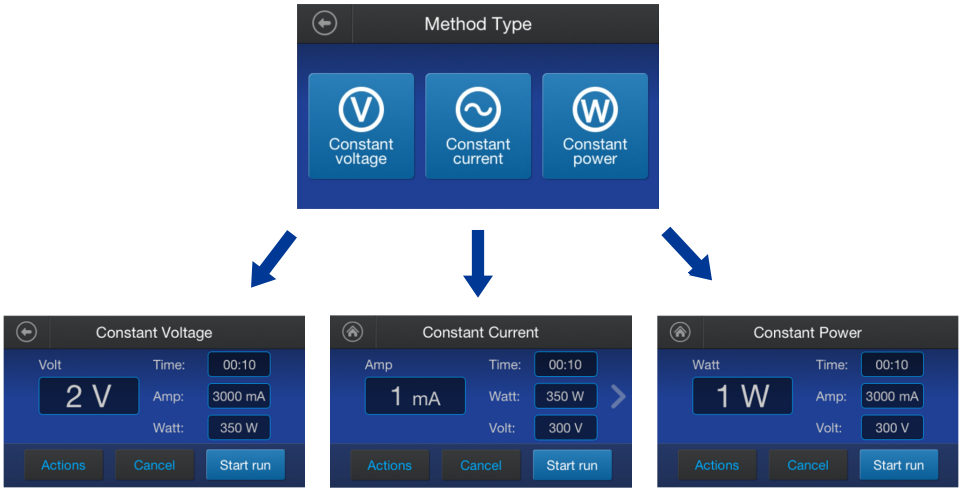


Figure 5 Method Type screens

4. Edit the run parameters (Volts, Time, Amps, and Watts) by touching the parameter on the screen to bring up the **Run parameter edit** screen.

   Default maximum values are 300 V, 3,000 mA, and 350 W.

   Note: When using constant voltage or constant power, it is recommended that the maximum default settings not be changed to avoid unwanted power limitations during the run.
5. Enter the parameter value required, then touch **Enter** to advance with the newly changed run parameter displayed.
6. *(Optional)* Add or delete extra steps by touching **Actions**.

7. Touch **Start run** to begin the run. When the run begins, the **Run** screen will display (See Figure 12).

   Note: If the run needs to be stopped or paused before completion, touch **Stop** or **Pause**. If run parameters need to be edited during the run, pause the run, enter changes, then touch **Resume**. When resumed, the run time will continue from where it was paused.

8. When the run is complete, the **Run Complete** screen will be displayed (see Figure 13).

   If the method used is a custom method that has not yet been saved, the **Run Complete** screen will display a **Save as** option. If the method is a saved or pre-programmed method, the **Save as** option will not be present. This screen also displays an option to navigate to the **Home** screen or to repeat the method.

Constant current

Discontinuous buffer systems and, to a lesser extent, continuous systems increase resistance during the run. With the current limiting setting on the PowerEase™ Touch 350W Power Supply, the voltage will increase as resistance increases to satisfy Ohm's law (V=IR). If no voltage limit is set and a local fault condition occurs, such as a poor connection, very high local resistance may cause the voltage to increase to the maximum capacity of the power supply. This may lead to local overheating and damage to the electrophoresis cell or create unsafe conditions.

Note: When operating under constant current conditions, it is recommended to set a voltage limit on the power supply slightly above the maximum expected for the run.

Constant Power

Power is a function of voltage and current P=IV. For a typical gel run at constant power, the current will decrease during the run, causing the voltage to increase. The power limiting function may be used when running sequencing gels to remove the ammonium persulfate from the wells and to heat the gel to an optimal temperature for DNA separations.

Custom methods

Select **Custom Methods** on the **Home** screen to bring up the **Custom Methods** screen. From here, the **Saved Methods** or **Method Type** screen can be selected (see Figure 6).

The **Saved Methods** screen displays methods that have been previously saved (shown in alphabetical order). Selecting a method brings up the run screen for the method, allowing the method to be run or edited. The saved method can be edited by touching any of the run parameter fields.

The **Method Type** screen displays method types that can be entered (see Figure 5).

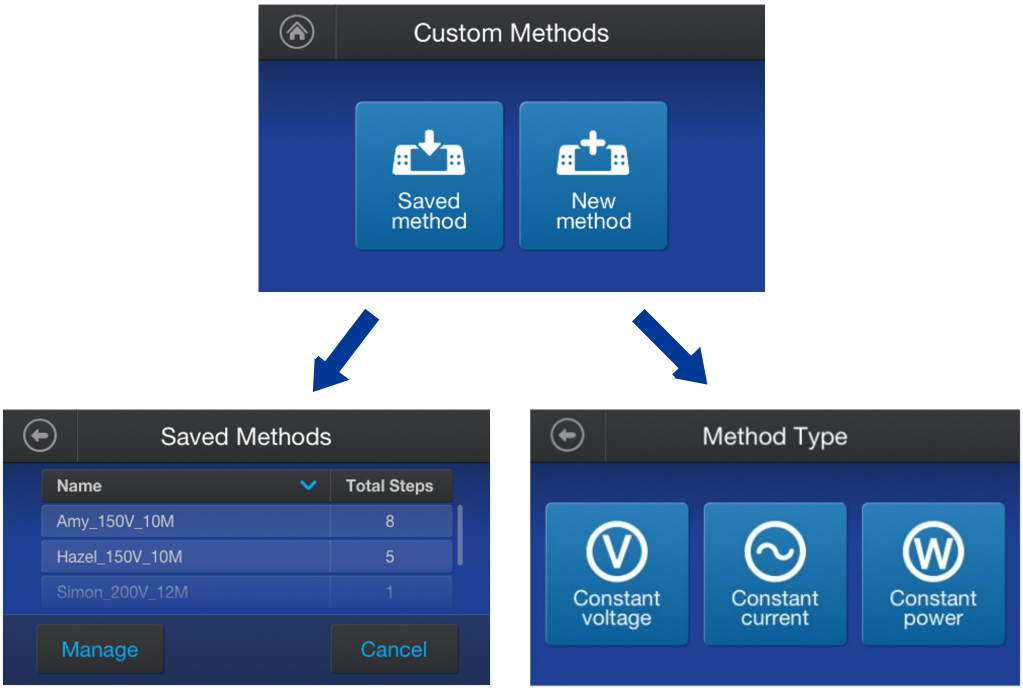


Figure 6 Custom Methods screen options

Select a pre-programmed method

1. On the **Home** screen touch **Pre-programmed Methods**.
2. In the **Pre-programmed Methods** screen, touch either **Mini gels**, **Midi gels**, or **Western blots** (see Figure 7).
   - Selecting Mini gels brings up a list of preloaded methods for electrophoresing mini gels sold by Thermo Fisher Scientific, Inc.
   - Selecting Midi gels brings up a list of preloaded methods for electrophoresing midi gels sold by Thermo Fisher Scientific, Inc.
   - Selecting Western blots brings up a list of preloaded methods for transferring above gels to Western blots
3. To view method options not available on the first screen, gently swipe up with your finger as you would with a smart phone.
4. Touch a method to bring up the **Run** screen for that method.

   These screens display default running conditions (voltage, and time) for the pre-programmed method selected. The current and power settings shown are the power supply maximums.

5. Edit the method by touching **Edit**, then save the method using a new name (see Figure 9) or begin the run by touching **Start run**.

   Note: For a pre-programmed method, only the run time can be edited until it is saved as a custom method.

   IMPORTANT! For a given gel buffer type (Tris-Glycine, Bis-Tris, etc.) and run voltage, gel run times are dependent on several factors. Factors such as running buffer concentration and temperature, type of gel tank used (because of the electrical path distance between anode and cathode wires), gel separation gradient and level of running buffer above the wells can affect run times to some degree. So, the exact run time for your gel may be slightly different than the default value given by the pre-programmed method. The default run times shown in mini gel pre-programmed methods assume the use of the Mini Gel Tank (Thermo Scientific™ (Cat. No. A25977)). Midi gel run times assume the use of the SureLock™ Tandem Midi Gel Tank (Thermo Scientific™ (Cat. No. STM1001)).

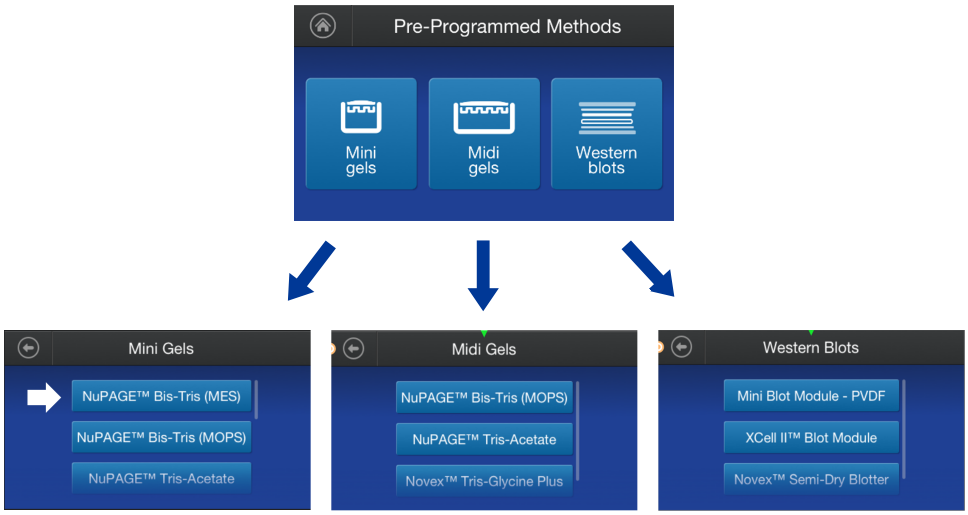


Figure 7 Pre-programmed Methods Screens

For example: The pre-programmed method for running NuPAGE™ Bis-Tris gels with MES running buffer is shown in Figure 8.

Once the run has started, the **Run** screen will display real time parameter values. To view run parameters as they were set, touch the **right** arrow to view the **Method Settings** screen (see Figure 12).

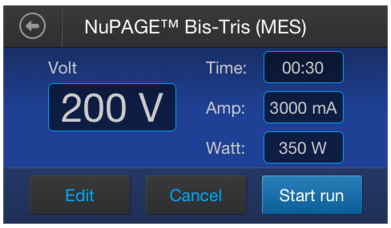


Figure 8 Pre-programmed Method for NuPAGE™ Bis-Tris Mini Gels

Manage methods

New custom methods can be saved and pre-programed methods can be edited and then saved under a new (custom) name. Methods can be single step or have up to 20 steps per method. Up to 100 custom methods can be saved (Figure 10).

Save a method

1. Save a new method by touching **Actions** on the **Method Run** screen (see Figure 9).
2. Save an edited pre-programmed method by touching **Edit**.
3. Touch the **Name of method** field in the **Save As** screen to bring up a keyboard that will allow entry of the method name.

   Method names can contain a maximum of 14 characters. Keyboards displaying numbers and lower-case letters are accessed using buttons in the lower left corner of the screen.
4. Enter the name, touch **Enter**, then touch **Save**.

   Note: Do not save custom methods with the same name as a pre-programmed method.

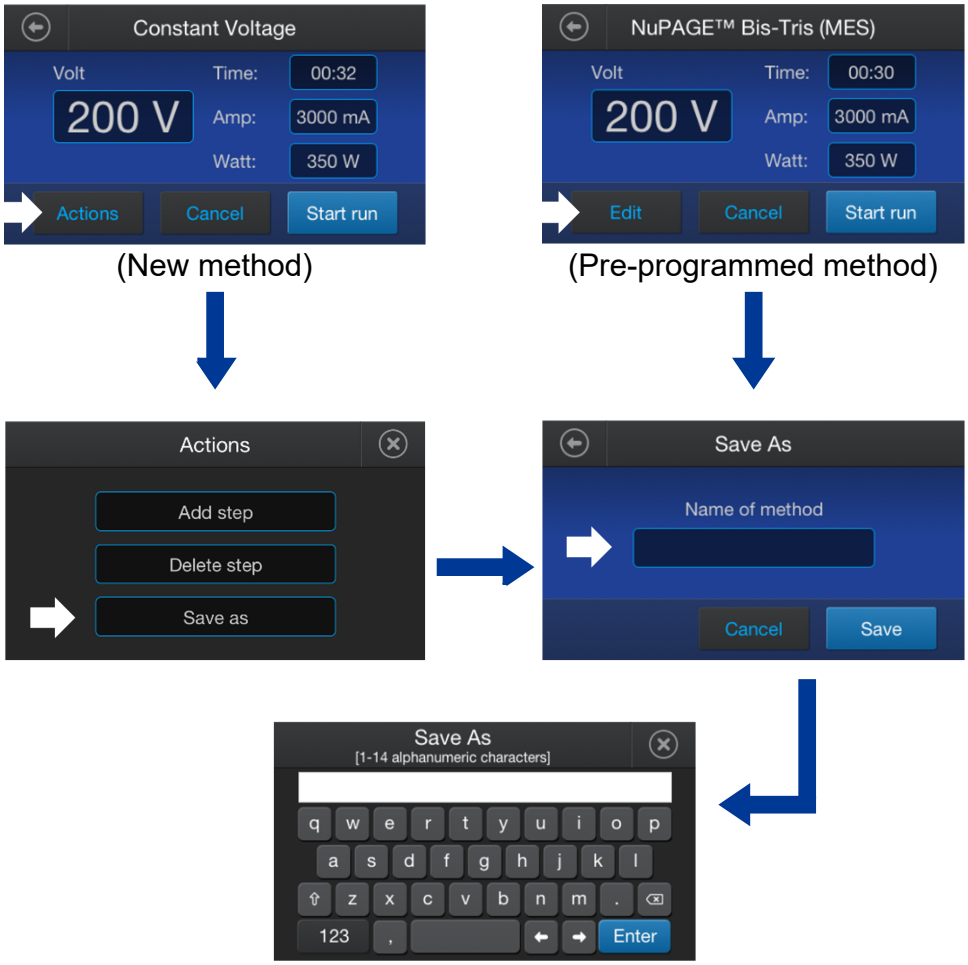


Figure 9 Screens for saving methods

Edit a method

1. To change any of the run parameters in a method, touch the data field for the parameter you wish to change. Selecting a run parameter will bring up its **Edit** screen.

2. Enter the parameter value required, then press **Enter**.

   Note: Do not save custom methods with the same name as a pre-programmed method.

Delete a method

1. On the **Home** screen, touch **Custom methods**, then touch **Saved methods** (Figure 4).

   This will bring up the **Saved Methods** screen.

2. Touch **Manage** to bring up the **Manage Saved Methods** screen.

   The methods are listed in alphabetical order.

3. Select the method to be deleted by touching its row in the list of displayed methods, then press **Delete**.

   If several methods have been saved, swipe up as you would with a smart phone to scroll down the list.

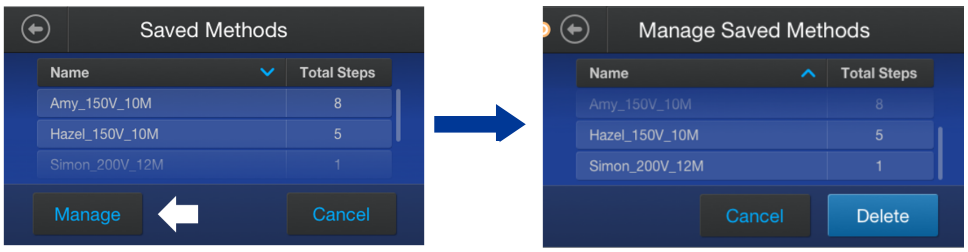


Figure 10 Managing saved methods

Change the name of a saved method

1. Touch **Actions**, then **Save As** (see Figure 9).

   This will bring up the **Save As** screen with the current method name as the header.

2. Touch the method name and use the keyboard to change the name.

3. Touch **Enter** to save.

Add a step

1. Touch **Actions**, then **Add step** (see Figure 9).

   This will bring up the **Constant Voltage**, **Constant Current**, or **Constant Power** screen, depending on the method type selected for the method (see Figure 5).

2. Repeat for additional steps.

   The step number will be displayed below the constant parameter value (see Figure 11). To view adjacent steps when viewing the constant parameter screen, touch the left arrow (previous step) or right arrow (next step).

3. When all of the steps have been entered, touch **Start run** to initiate the run.

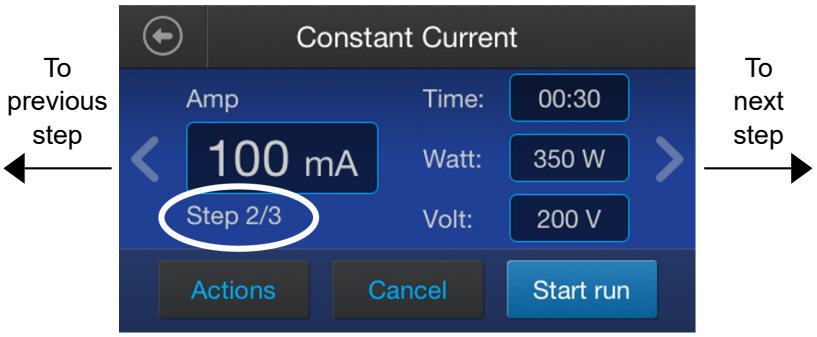


Figure 11 Method step number location

Delete a step

1. Navigate to the step to be deleted using the **left** and **right** arrows on the **Constant parameter** screen (see Figure 11).

2. Touch **Actions**, then **Delete step**.

Save a program

1. Touch **Actions**, then **Save As**.

2. Touch the name field in the **Save As** screen to bring up the keyboard, then enter the method name.

3. Touch **Enter**, then touch **Save**.

Instrument display during a run

After touching **Start run**, the run is initiated, and the **Run** screen is displayed for the selected method.

As an example, a **Run** screen and a **Method Settings** screen for a constant voltage custom method is shown in the following figure:

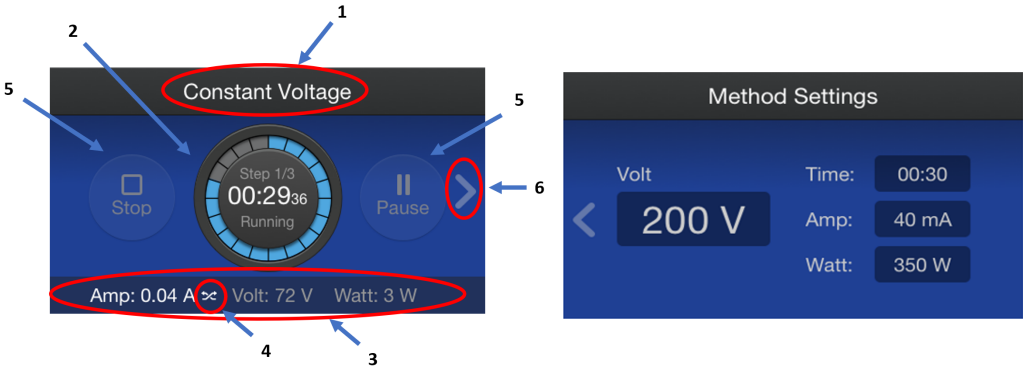


Figure 12 Run screen and Methods Settings screen

1. Method name
2. Center dial with digital timer countdown, step number and visual countdown indicator
3. Real time output parameters (A, V, W)
4. Crossover indicator
5. Stop and Pause buttons
6. Right arrow for navigation to method settings screen

Run screen features

Method name

The name of the method will be displayed at the top of the screen. If the method is an un-named custom method, the name displayed will be the method type (Constant Voltage, Constant Current, or Constant Power). The method displayed in Figure 12 is a custom constant voltage method.

Center dial

The center dial displays:

- Countdown timer in hours, minutes, and seconds (example: $01{:}27_{35}$ = 1 hour, 27 minutes, 35 seconds). The timer resets for each step in a multi-step method.
- A colored visual indicator for time remaining in the method
- “Running” status
- The method step currently being run (for multistep methods only)

Real time output parameters

Electrical output parameters (A, V, and W) will be displayed in real time in a bar at the bottom of the screen. The method parameter being held constant will be in highlighted font.

Crossover indicator

When electrical output is limited by a non-constant method parameter or by a power supply output maximum, the automatic crossover feature is activated. The crossover icon (⤮) will then be displayed to the right of the new limiting parameter and that parameter will be in highlighted font.

As an example: If the method uses constant voltage of 200 V, but the power supply reaches 3 A (the power supply maximum) before 200 V is reached, the power supply will automatically switch to a constant current of 3 A with the voltage floating. If at some point conditions of the run change (resistance increases and current drops) such that 200 V can be delivered with less than the power supply maximum current (3 A), the power supply will automatically revert back to the set method constant parameter (200 V in this case) and the crossover icon will no longer be displayed. Figure 12 shows a run with crossover to A and current limited to 0.04 A. For additional details, see Appendix A, “Troubleshooting”.

Stop and Pause buttons

The run can be stopped or temporarily paused by touching **Stop** or **Pause**. The method can be edited when paused.

Right navigation arrow

Touch this arrow to display the **Method Settings** screen (Figure 12). This screen shows parameter settings for the step currently being run. From this screen, touch the **left** arrow to return to the **Run** screen.

Method Settings screen features

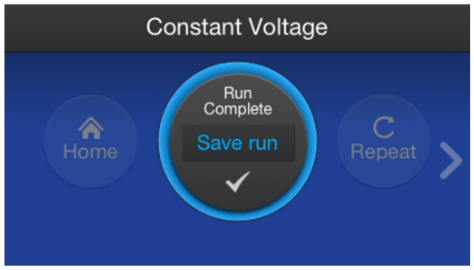
The **Method Settings** screen (see Figure 12) displays voltage, current, power, and run time for the method. Time is shown in hours : minutes format. If the method has more than one step, there will be a separate method screen for each step. Use the **right** and **left** arrows to move between screens for individual steps.

Note: Method settings are not real-time numbers. They do not change during the run. Real-time run parameters are shown on the **Run** screen.

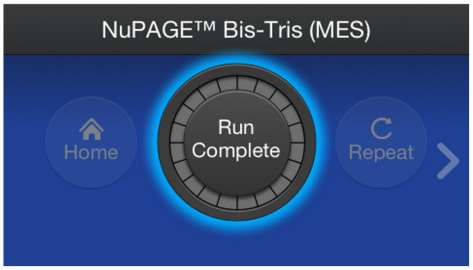
Instrument display after run completion

When the run is complete, a **Run Complete** screen with be displayed with options to **Repeat** the method or return to the **Home** screen.

If an unsaved custom method was run, a **Save run** option will be displayed in the center dial (see Figure 13). To save the method, touch **Save run**. This will bring up the **Save As** screen. Touching the right arrow will display a summary of steps used for the method. If a pre-programmed or saved custom method is used, the **Save run** option will not be displayed.



Screen for non-saved custom methods



Screen for saved or pre-programmed methods

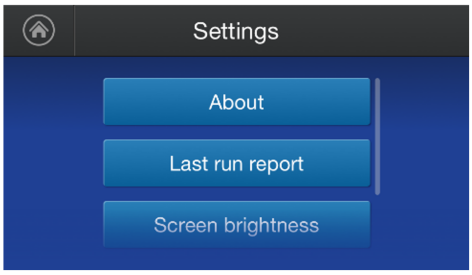
Figure 13 Run complete screens

Settings

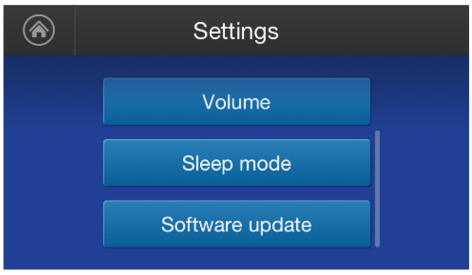
The PowerEase™ Touch 350W Power Supply is equipped with a number of user adjustable settings (see Figure 14). The settings menu is accessed from the **Home** screen by touching the **Settings** icon (see “Menu navigation” on page 11). To view settings options not available on the first screen, gently swipe up with your finger as you would with a smart phone.

Options available from the settings menu are:

- About
- Last run report
- Screen brightness
- Volume
- Sleep mode
- Software update



Settings screen 1



Settings screen 2

Figure 14 Power supply settings

Settings screen features

About

Displays the power supply serial number and software version

Last run report

Displays run parameters of the last run (time, volts, mA, watts, step). Run parameters are recorded at the beginning of the run and every two minutes thereafter. This report can be exported to a USB device by touching **Export**. The name of the text file exported contains the method name and power supply serial number.

Note: This report is available only until the power supply is switched off.

Screen brightness

Allows adjustment of screen brightness. Press **+** to increase brightness or **-** to reduce brightness.

Volume

Allows adjustment of beeper volume. Press **+** to increase volume or **-** to reduce volume.

Sleep mode

Allows adjustment of the inactivity time before the screen enters sleep mode (screen dark). The default sleep mode setting is **Enable** and set to 2 minutes (see Figure 15).

1. To turn sleep mode off, move the slider left to the **Disable** position.
2. To adjust the sleep inactivity time, touch **Next** to bring up the sleep mode timer screen.
3. Touch the time field and use the **Edit Time** screen to adjust the time (see Figure 15), then touch **Done**.

   Note: The power supply continues to run while the screen is in sleep mode.

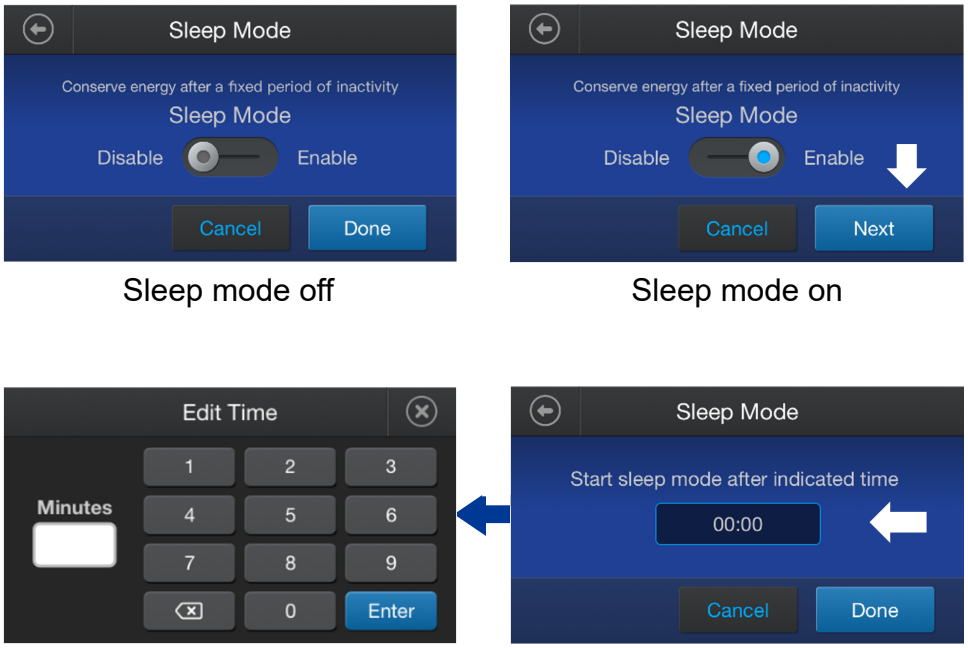


Figure 15 Sleep mode settings

Software update

To update the power supply user interface software perform the following steps:

1. Insert a USB drive that contains the appropriate software update files into the USB port on the back of the power supply.

   Note: The USB drive must use FAT32 format and have a maximum capacity of 32 GB.

2. On the **Settings** screen, touch **Software update** (see Figure 14).

   The power supply will search for update files on the USB drive. This will take several seconds.

3. When the updated software has been found, touch **Update** on the displayed screen.

   The update may take a couple of minutes to install.

4. After software installation, the power supply will automatically reboot to the **Home** screen.

A

Troubleshooting

Observation	Possible cause	Recommended action
The LCD screen remains blank and the fan does not run when the power is turned on	AC power cord is not connected.	Check AC power cord connections at both ends.
	The fuse has blown.	Replace the fuse (see Appendix E).
Operation stops with alarm: Display shows “No Load”	Electrophoresis leads are not connected to the power supply or to the electrophoresis unit(s), or there is a broken circuit in the electrophoresis cell.	Verify connections to the power supply and to the electrophoresis cell. Then press **Restart** to restart the run.
		Verify the condition of wires in the electrophoresis unit. Then press **Restart** to restart the run.
	Tape covering the gel foot has not been removed	Remove tape from the gel foot and re-insert the gels. Then press **Restart** to restart the run.
	Buffer concentrations are too low.	Use correct running buffer concentrations.
	Buffer volume too low	Add running buffer so that wells are covered at all times during electrophoresis. Then press **Restart** to restart the run.
	Current has dropped below the minimum acceptable level (0.01 A).	Verify voltage settings, cable connections, and buffer levels, then press **Restart** to restart the run.
Operation stops with alarm: Display shows “Over Voltage”	Output voltage was too high and the power supply stops the output.	Verify cable connections.
		Verify that the gel and buffers are correct.
		Press **Restart** to restart the run.
Operation stops with alarm: Display shows “Ground Leak”	Ground leak detected during run	Check the electrophoresis system for improper grounding. Press **Restart** to restart the run.
Operation stops with alarm: Display shows “Over Temperature”	Power supply is overheating	Turn off power supply. Check for sufficient air flow around the power supply fan. After cooling down, restart the power supply by turning the power switch on.
		If you cannot restart the instrument, turn off the power, disconnect the power cord from the outlet, and contact Technical Service.
Operation stops with alarm: Display shows “Over Current”	Output current was too high, and the power supply stops the output.	Verify cable connections and running buffer level. Verify that gel and buffer are correct. Press **Restart** to restart the run.
Operation stops with alarm: Display shows “Power Interruption”	Power to the power supply was interrupted during the run.	Verify cable connections and running buffer level. Press **Resume** to continue the run or **Restart** to restart the run.

Observation	Possible cause	Recommended action
Operation stops with alarm: Display shows “Incomplete Run”	Run was stopped before run completion.	Verify cable connections and running buffer level. Press **Resume** to continue the run or **Restart** to restart the run.
Operation stops with alarm: Display shows “Load Change”	Electrophoresis systems were added or removed during the run.	Do not add or remove an electrophoresis system (tank or blot module) from the power supply while running.
	Buffer leaking during a run.	Correct source of leak and add buffer. Press **Resume** to continue the run or **Restart** to restart the run.
	Excessive temperature increase during a run.	Ensure electrophoresis settings and buffer concentration is correct. Ensure wire connections are intact. Press **Resume** to continue the run or **Restart** to restart the run.
	Excessive buffer evaporation.	Ensure electrophoresis settings and buffer concentration is correct. Ensure wire connections are intact. Press **Resume** to continue the run or **Restart** to restart the run.
	Loose connection in a connected system.	Ensure cable connections are intact. Press **Resume** to continue the run or **Restart** to restart the run.
Change in constant mode (Crossover)	Current set too low. Current setting hit and constant mode changed to A. **Note:** Voltage (V) or power (W) change to current (A) - (mA becomes highlighted on run screen).	Increase current to 3,000 mA.
	Voltage set to low. Voltage setting hit and constant mode changed to volts. **Note:** Current (A) or power (W) change to voltage (V) - (volts becomes highlighted on run screen).	Increase voltage to 300 V.
	Power set to low. Power setting hit and constant mode changed to watts. **Note:** Current (A) or voltage (V) change to power (W) - (watts becomes highlighted on run screen).	Increase power to 350 W.

B Repair and maintenance

The PowerEase™ Touch 350W Power Supply requires no periodic maintenance other than an occasional dry wipe-down of the instrument.

Encountering Problems

Check the troubleshooting section, see Appendix A, “Troubleshooting”.

Contact Technical Support, see Appendix F, “Documentation and support”

If the unit must be shipped back for repair, contact support for a Return Authorization Number and shipping instructions; see Appendix F, “Documentation and support”.

Replace the fuse

One extra fuse is supplied with the PowerEase™ Touch 350W Power Supply. For additional fuses, contact support; see Appendix F, “Documentation and support”

1. Turn off the power switch and detach the power cord at the rear of the power supply unit.
2. Open the fuse compartment located inside the power inlet by inserting a small flat blade screwdriver into the slot on top of the fuse compartment. Turn the screwdriver to gently pry open the fuse compartment.

   Note: The fuse compartment will not open with the power cord in place.
3. Pull the fuse holder out of the compartment and inspect the fuse. If the fuse is burned or there is a break in the fuse element, replace the fuse with an identical type of fuse (8 A/250 V) as provided in the fuse holder (see Figure 16).
4. Place the fuse holder back into the compartment.

5. Snap the cover closed and re-attach the power cord.

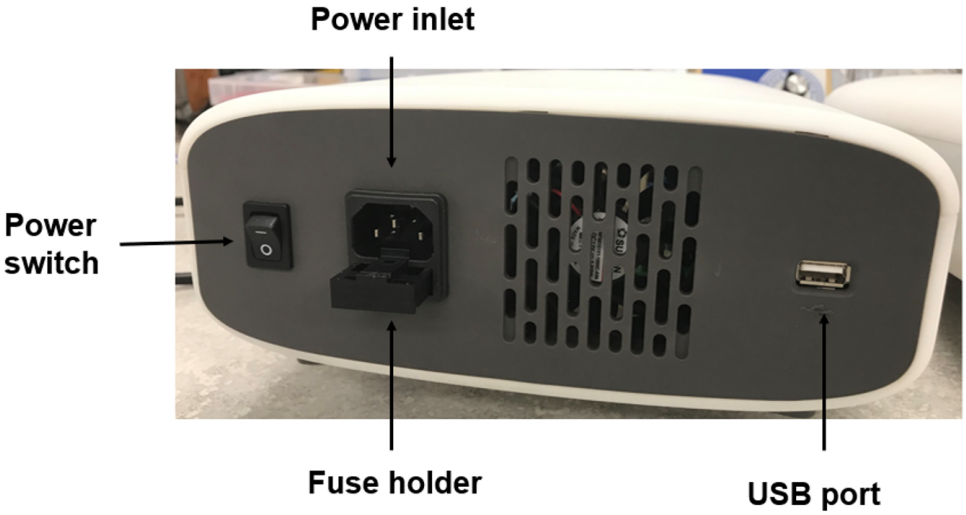


Figure 16 Rearview of PowerEase™ Touch 350W Power Supply

C Electrical parameters for electrophoresis

Ohm's Law and Joule's Law

Electrophoresis is the migration of a charged particle under the influence of an electrical field. The power supply output parameters voltage, current, and power are related by the following two equations:

- Voltage (V) = Current (I) x Resistance (R); (V=IR)
- Power (P) = Current (I) x Voltage (V); (P=IV)

Resistance

Resistance of the assembled electrophoresis cell is dependent on the conductivity of the running buffer, gel buffer, the thickness of the gel, and the number of gels being run. Although the resistance is determined by the gel system, the resistance can vary over the course of an electrophoretic separation. For instance, in the Tris-Glycine buffer system, the fast moving, highly conductive chloride ions in the gel are gradually replaced by the slower moving, less conductive glycine ions from the running buffer as the gel runs. As a result, the resistance of the gel increases as the chloride/glycine front moves down the gel.

Voltage

The velocity with which an ion moves in an electric field will vary in proportion to the field strength (volts per unit distance between anode and cathode). The higher the voltage the faster an ion will move.

Current

Current is a function of the number of ions passing a given cross-section of the circuit at a given time. For a given gel/buffer system, at a given temperature, current will vary in proportion to the field strength (voltage) and/or cross-sectional area (number and/or thickness of the gels). Ions in solution and at a given voltage will move faster as the temperature increases, increasing current.

Power

The power in watts, or the rate of heat generated by the system, is directly proportional to voltage and current (P=IV).

D

General safety

WARNING! Protection impairment if used in a manner not specified by the manufacturer.

Instrument safety

Avoid electrical shock

The PowerEase™ Touch 350W Power Supply produces up to 3 A or 300 V outputs which are electrically isolated from ground to reduce the risk of electrical shock to the user. Follow the guidelines below to ensure safe operation of the unit.

The power supply unit has been designed for use with electrophoresis cells with shielded banana plugs, thus minimizing any potential shock hazard to the user. We recommend against the use of unshielded banana plugs.

To avoid electrical shock:

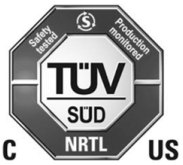
- NEVER connect or disconnect wire leads from the power jacks when the blue run indicator light is on or when **running** is displayed on the screen.
- WAIT at least 5 seconds after stopping a run before handling output leads or connected apparatus.
- ALWAYS make sure that hands, work area, and instruments are **clean** and **dry** before making any connections or operating the power supply.
- ALWAYS connect the power supply to a properly grounded AC outlet.

Avoid damage to the instrument

- For proper ventilation, leave at least 10 cm of space behind the instrument, and at least 5 cm of space on each side.
- Do not operate the power supply in high humidity environments (> 95%), or where condensation may occur.
- To avoid condensation after operating the power supply in a cold room, place the unit in a sealed plastic bag prior to removing the power supply from the cold room. After removing the power supply from the cold room, allow at least 2 hours for the unit to equilibrate to room temperature before removing the plastic bag and operating the unit.

Explanation of symbols and warnings

Symbols and warnings

Symbol	English	Français
	Caution, risk of electrical shock	Attention, risque de choc électrique
	Caution, risk of danger Consult the manual for further safety information.	Attention,risque de danger Consulter le manuel pour d'autres renseignements de sécurité.
	Do not dispose of this product in unsorted municipal waste. ⚠ **CAUTION!** To minimize negative environmental impact from disposal of electronic waste, do not dispose of electronic waste in unsorted municipal waste. Follow local municipal waste ordinances for proper disposal provision and contact customer service for information about responsible disposal options.	Ne pas éliminer ce produit avec les déchets usuels non soumis au tri sélectif. ⚠ **CAUTION!** Pour minimiser les consequences négatives sur l'environnement àla suite de l'élimination de déchets électroniques, ne pas éliminer ce déchet électronique avec les déchets usuels non soumis au tri sélectif. Se conformer aux ordonnances locales sur les déchets municipaux pour les dispositions d'élimination et communiquer avec le service à la clientèle pour des renseignements sur les options d'élimination responsable.
CE	Indicates conformity with European Union requirements for safety and electromagnetic compatibility.	Indique la conformité avec les prescriptions en matière de sécurité et de compatibilité électromagnétique de l'Union européenne.
	Indicates that the product complies with TUV SUD safety requirements. The "C" and "US" indicate that the product is certified for both Canadian and U.S. markets, to the applicable Canadian and U.S. standards.	

(continued)

Symbol	English	Français
	Indicates that the product meets the Australian and New Zealand compliance requirements specific to EMC, telecommunications and electrical safety.	
	Indicates that the product does not contain toxic and hazardous substances or elements above the maximum concentration values established by China RoHS.	

Product regulatory compliance

Federal Communications Commission Advisory

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their expense. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Environmental design compliance

This equipment is compliant with Directive 2011/65/EU - European Union "RoHS Directive" - Restriction of hazardous substances in electrical and electronic equipment.

E

Product specifications

Product specifications

Feature	Specifications
Input Power	115 VAC, 50/60 Hz 230 VAC, 50/60 Hz
Fuses	One T8A 250VAC, one extra fuse is provided
Output power in watts	350 W
Output voltage range	2 VDC - 300 VDC
Output current range	0.01 A – 3 A
Terminal pairs	4 (4 positive voltage and 4 negative voltage)
Operating Modes • Constant Voltage • Constant Current • Constant Power	• 1 V step • 1 mA step • 1 watt step
Timer	Up to 999 min per step
Crossover	Automatic
Display type	Backlit TFT-LCD Graphic type
Display area	95 mm x 54 mm (W x H) (4.3 inch)
Display colors	16.7M colors
Pause function	Yes
Safety features	No Load Detection Load Change Detection Overload Detection Ground Leak Detection
Programmable	Yes • Store up to 100 run methods • Program up to 20 steps per method

(continued)

Feature	Specifications
Stackable	Yes
Housing material	Polycarbonate
Housing size	230 x 303 x 102 mm (W x D x H)
Operating temperature	0°C–40°C
Environmental conditions	≤95% RH (non-condensing), 75 KPa–106 KPa, altitude not to exceed 2,000 meters
Weight	2.4 kg
Certifications	CE, cTUVus, RCM, China RoHs
Warranty	1 year

Documentation and support

Customer and technical support

Visit **thermofisher.com/support** for the latest service and support information.

- Worldwide contact telephone numbers
- Product support information
  - Product FAQs
  - Software, patches, and updates
  - Training for many applications and instruments
- Order and web support
- Product documentation
  - User guides, manuals, and protocols
  - Certificates of Analysis
  - Safety Data Sheets (SDSs; also known as MSDSs)

    Note: For SDSs for reagents and chemicals from other manufacturers, contact the manufacturer.

Limited product warranty

Life Technologies Corporation and/or its affiliate(s) warrant their products as set forth in the Life Technologies' General Terms and Conditions of Sale at **www.thermofisher.com/us/en/home/global/terms-and-conditions.html**. If you have any questions, please contact Life Technologies at **www.thermofisher.com/support**.

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