Instruction Manual

Power Supply

WSE-3500

PowerStation HC

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Made in Tokyo

SupportingLifeResearch

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Introduction

Thank you very much for purchasing our ATTO scientific unit, WSE-3500 PowerStation HC. We are providing this instruction manual and unit for a better user experience.

We would like to ask both fresh users and experienced users to read through this manual thoroughly before beginning using this unit.

If you have any other questions about your purchased product or this instruction manual, please do not hesitate to contact us. Our contact information is listed at the end of this manual.

Safety precautions

Correct operation is prerequisite in order to use this unit safely. Please read through this instruction manual before use, and do not use the unit until you fully understand the contents. How to use and the safety precautions listed on this manual are specific to usage of this particular unit only. Never use the unit for other purposes than those listed on this Manual. Any other usages of this unit than those listed on this manual would be strictly at your own responsibility.

The first-time user is asked to receive guidance from a person with correct knowledge and understand principle and method before use. Both the fresh users and experienced users keep this manual at hand for effective use. The only way to avoid electric shock and malfunction of the unit is to operate it correctly in accordance with this manual.

Feel free to contact us for any questions about principle of electrophoresis, operation, maintenance and inspection.

Safety Notation

The following signs are used on this instruction manual and on the product main body for your safe use and maintenance of the unit. Please ensure your understanding of the meaning of these signs and follow each item correctly.

Symbol	Description
⚠ **Danger**	This indicates that a high risk of human death or serious injury is likely occurring if handled incorrectly or by neglecting this indication.

Warning	This indicates that human death or injury is possible if handled incorrectly or by neglecting this indication.
Caution	This indicates that the risk of property damage is expected if mishandled or by neglecting this indication.
	This indicates information related to the important portion.
	This indicates some hint related to operation.
	This indicates prohibited activities.

Use Precautions

These are precaution items to prevent fire, electrical shock, other type of accident and failure. Please be sure to follow and understand these items.

Danger

Grounding	Never use this unit unless connecting the unit to the ground. There might be a risk of electrical shock or death. Please connect the power cable attached to this unit to the 3-pole ground outlet.
Power connection	Please check visually if any deformation or corrosion exists on an electrode terminal or power plug, any blemish on the power cable, or any peel-off of the insulating sheath before actuating the unit. These might cause fire because of poor contact or electrical shock. In such a case, please contact us after stopping the use of the unit and unplugging the power plug from the outlet. Be sure to turn off the power switch, firmly hold the power plug itself, and unplug it without pulling the cable.
No wet hand	Never operate the unit with wet hands. In addition, never touch the power plug or connecting terminal with wet hands. These can cause electrical shock or failure. Never use the unit in wet condition. These can cause electrical shock or failure.

Main body	Never remove the top lid of the main body nor the rear panel. These can cause electrical shock or failure.
Fuse	Please turn off the power switch and unplug the power cable when you replace the fuse. This can cause electrical shock.
Main body	Never put foreign materials into the airflow orifice. This can cause an electrical shock or failure.
Maintenance	Please quit using the unit immediately if anything abnormal happens during unit usage or if any abnormality/failure is suspected. Also, do not use the unit if you find any failure at inspection. These can cause electrical shocks or damage to the unit. Contact us if you detect any abnormality, trouble or failure.

Warning

Installation location	Please avoid installation on places such as a wobbling table, tilted location, or heavily vibrating place. Install the unit on horizontal places with safe and hard surfaces, such as a lab bench.
Main body	This unit is not an explosion-proof structure. Install this unit away from any places with the possibility of exposure to fire or flammable gasses.
Migration	Never move the unit during operation. Cords may get entangled, which might cause rollover. Or, cords may be damaged, which might cause fire or electrical shock. Please make sure to turn the unit power switch OFF, and pull out the power cable and all wiring cables before migration.
Maintenance	Please be sure to turn the unit power switch OFF and pull out the power cable before performing maintenance and cleaning. These might cause electrical shock. Please ask us for periodical maintenance, inspection and calibration so as to maintain good performance and safety of the unit.
Disassemble prohibition	Never disassemble or modify the unit. Adjustment and repair work of the product should be done by our service staff in charge. When adjustment or repair is required, please ask our company. Any accident caused by your disassembling or modification would be outside of our responsibility.

Fuse	Never use other fuses than those specified by this manual or items written on the rear panel. Failure to follow instructions may cause fire at the time of failure.
Seals	Never peel off the Warning Seal. The seals indicate dangerous areas. If any seal comes off, please contact us.

Caution

Power cable	If the unit is used outside of Japan, please prepare a power cable complies with the standard of the country where the unit is used. Use of a non-standard power cable could cause excessive heat and/or fire. If you have any questions, inquire our sales agent or company.
Dew condensation	When the unit is quickly moved from a low-temperature area (low- temp. room, cold outdoor, etc.,) to a high-temperature area (warm room, etc.,), there is possibility of [Condensation], i.e. moisture in the air becomes water drops. If condensation happens within the unit, some parts may short out. When the unit is moved from a low-temperature area to a high- temperature area, set the unit where there is plenty of ventilation and away from direct sunlight, and turn the unit power on AFTER the unit gets to the same temperature as the room temperature.

Notice

Seals	Never peel off nameplate seals. These indicate important information for maintenance and control of the unit.

Other precautions

Application

WSE-3500 PowerStation HC is the power supply dedicated to electrophoresis unit and blotting equipment. Never use the unit for other applications.

Export

Export of specific work and cargo are controlled by Foreign Exchange Laws and Cabinet Order/Ministerial Orders of Foreign Trade Control Laws and those controls are applied to this unit.

Even if the unit is not applicable to the Cabinet Order, it is required to submit documents accordingly and if it is applicable, then obtain export license from the Ministry of Economy, Trade and Industry, and then submit the license to the customs office.

When you export our product, please confirm with your supplier or our customer service department in advance.

Trademarks and copyright

Copyright approval is required when you make copy/reprint a part or whole of the instruction manual. Specifications of the unit and contents of the instruction manual may be changed without an advanced notice.

1. Overview

1.1. Purpose of use

PowerStation HC is the power supply unit for electrophoresis that can be connected to electrophoresis and blotting equipment(s).

2. Unpacking

2.1. Confirmation when unpacking

Upon arrival of the product, please confirm whether the main body and accessories are packed correctly or if any defects exist.

In case there is any inadequacy, deficiency, etc., please inform your supplier or our company immediately.

Please perform your confirmation as above at the time of unpacking within one week upon arrival of the unit. Confirmation after more than one week may result in not receiving compensation for defects or missing articles.

2.2. Product component

Main body

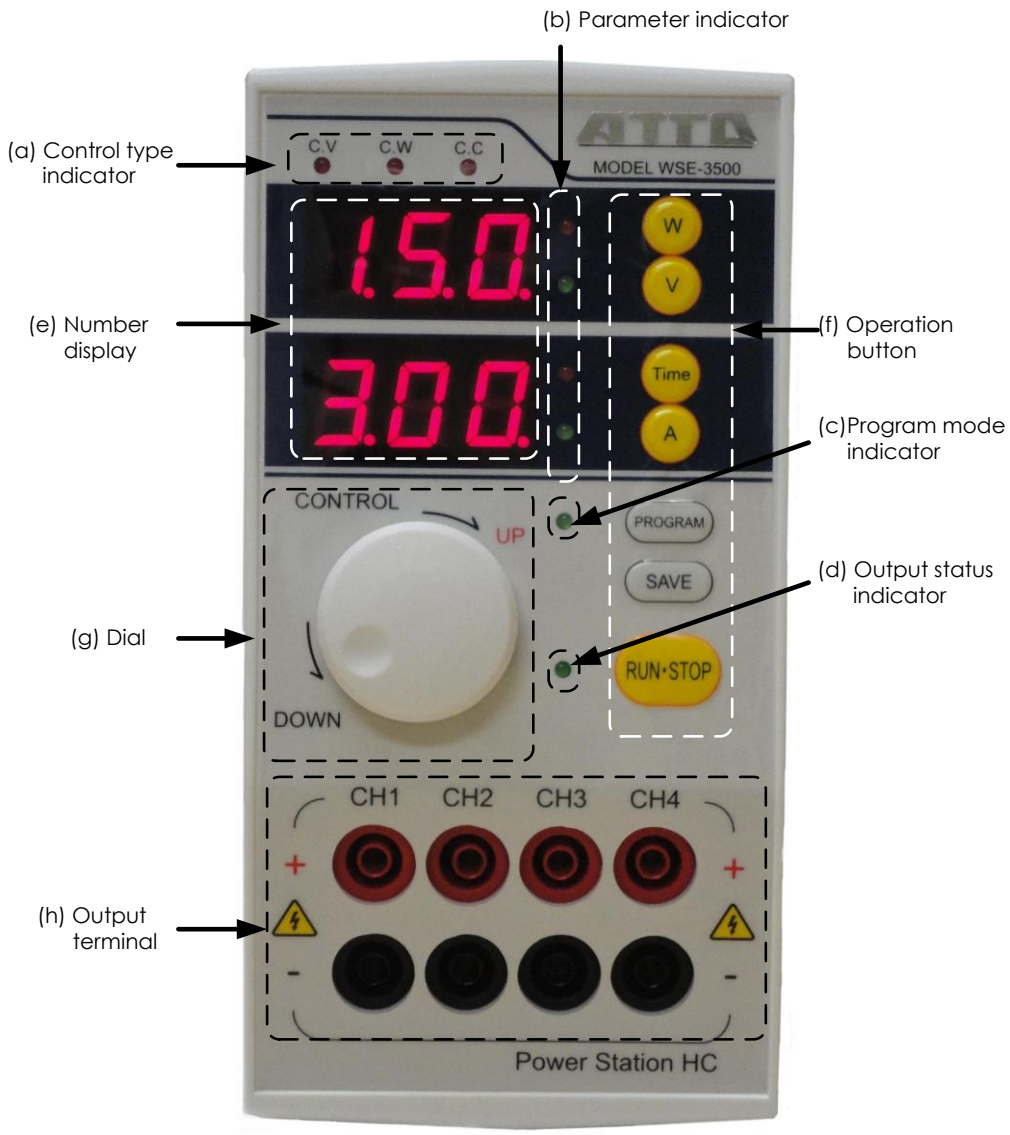
Product name	Quantity
WSE-3500 PowerStation HC	1

Accessories

Part Name	Quantity
Instruction manual, WSE-3500 PowerStation HC	1
Power cable	1
Preset mode parameter list	1
Clear case for preset mode parameter list	1
Double-sided tape	2

3. Name and function of each parts

3.1. Front panel



(a) Control type indicator

Voltage, wattage or current of electrical output is controlled to keep it at a preset value. When output exceeds preset parameters, output correction is done by the power source

controller inside to resume set values. The control type indicator shows which electrical parameter is under control.

C.V	Constant Voltage Control: The LED is ON when output is under control for constant voltage. If the output cannot be controlled with the set parameter value due to the low resistance value, the output is performed at the lowest voltage. In this case, the LED will blink.
C.W	Constant Wattage Control: The LED is ON when output is under control for constant wattage
C.C	Constant Current Control: The LED is ON when output is under control for constant current

Also crossover function is activated with these controls. The crossover function is that the controlled type will be changed automatically depending on electrophoresis conditions and electrical load.

(b) Parameter indicator

The parameter indicator shows which kind of value is displayed on the number display.

Red	W	Power value is displayed. Unit is wattage [W].
Green	V	Voltage value is displayed. Unit is voltage [V]
Red	Time	Time is displayed. Unit is minute [m]
Green	A	Current value is displayed. Unit is ampere [A]

(c) Program mode indicator

PowerStation HC has four ways how electrophoresis parameters are defined. The program mode indicator shows which way is selected as below.

Indicator	Mode	Description
○	Manual mode (Extinction)	This mode is used when parameters for W, V, Time and A are required to be set arbitrarily.

Green	●	Preset mode (Lights-up)	Parameters corresponding to electrophoresis and condition to be used when connecting the unit to ATTO electrophoresis equipment.
Green	●	User mode (Lights-up)	This mode is used when saving/retrieving conditions that were set by user.
Green	●	Chain mode (Lights-up)	The Chain Mode is used when the user-set condition is executed continuously in order.

(d) Output status indicator

The output status indicator shows the status of the unit.

Indicator		Status	Description
	○	Output stop status (extinct)	Status becomes this way when there is no output. LED is turned off.
Green	☀	Output halt status (flashes)	The status becomes this way when the status changes from output to halt. The LED flashes.
Green	●	Status under output (Lights-up)	The status becomes this way when it is in output status. The LED is lit.

(e) Number display

Number display shows preset parameters, actual output values and error status.

Upper line

When W parameter indicator lights, Power value [W] is displayed.

When V parameter indicator lights, Voltage value [V] is displayed.

When preset mode is selected, Selected preset parameter number is displayed.

When user mode is selected, Selected user-defined parameter number is displayed.

U00 - U20

When chain mode is selected, Selected chain mode number is displayed.

C01 - C10

Lower line

When T parameter indicator lights, Time value [minute] is displayed.

1 - 999, ---.

When A parameter indicator lights, Current value [A] is displayed.

001 - 300

When user ode is selected, the destination where the parameters are saved is displayed.

U00 - U20

When chain mode is selected, the destination where the parameters are saved is displayed.

C01 - C10

When error is occurred, Error number is displayed.

Er0 - Er9

Err

Refer to [3.8 Error indication function] for detail.

(f) Operation button

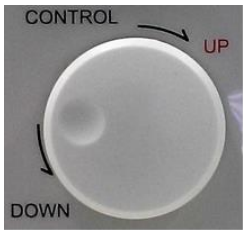
These buttons are used for setting parameter, selecting program mode, saving the parameter to internal memory and changing output conditions.

W	Power button	V	Voltage button
Time	Time button	A	Current button
PROGRAM	Program mode button	SAVE	Save button
RUN • STOP	Run/Stop button		

(g) Dial

Dial is used for changing parameter value or memory number by turning it. When you rotate the dial faster, the number changes at an accelerated pace.

Parameter value increases with CW rotation



Parameter value decreases with CCW rotation

(h) Output terminals

Connect lead wire from electrophoresis equipment or blotting equipment to output terminal. Maximum of four (4) sets can be connected.

Connector	Description
	Anode (+) terminal connected with RED lead wire
	Cathode (-) terminal connected with BLACK lead wire

!	Be careful of connecting multiple numbers of electrophoresis units because total output of the current amount cannot be made beyond 3.00A (the maximum output current allowable to PowerStation HC).

3.2. Rear panel

(a) Vent hole

This is an airflow opening to take in air for heat radiation.

(b) Power connector

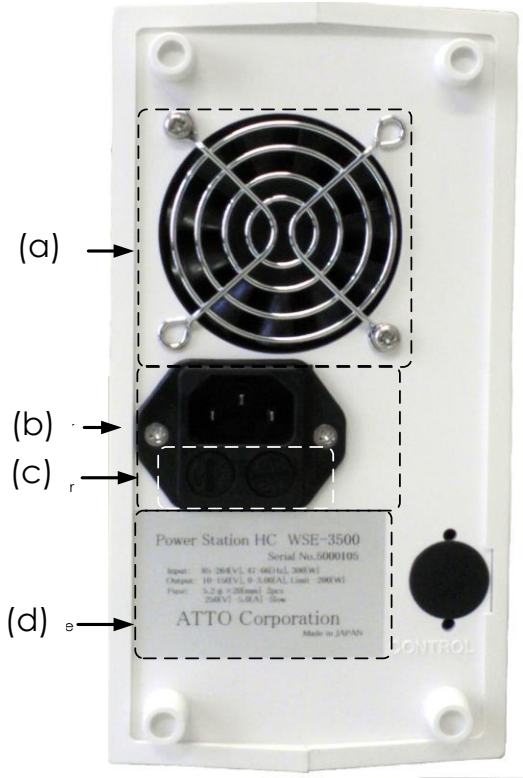
This is a connector to connect the attached power cable.

(c) Fuse holder

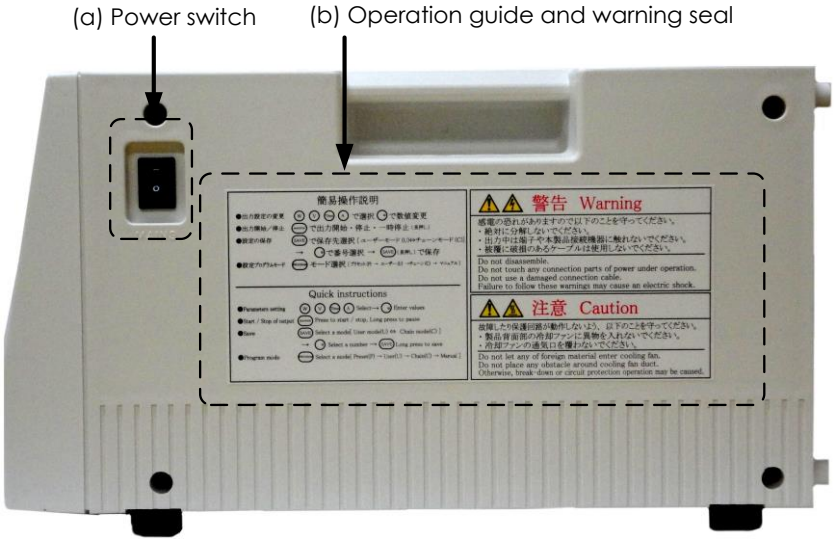
Fuses are housed here.

(d) Nameplate

This is the label where model number, production number, power consumption, input voltage condition, input frequency condition, company name and manufacturing country are indicated.



3.3. Right side



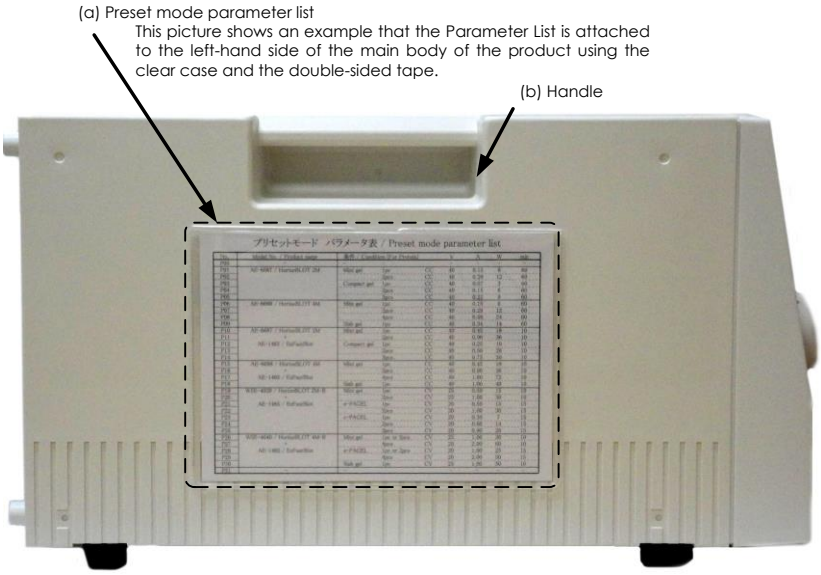
(a) Power switch

Use this button to turn power for PowerStation HC ON/OFF.

(b) Operation guide and warning seal

Operation guide of PowerStation HC, warnings and cautions are described on this seal.

3.4. Left-hand side



(a) Preset mode parameter list

Front surface is a correspondence table between Preset Mode Memory Numbers and Parameter Setting of ATTO Electrophoresis Equipment.

The table where parameter settings for User Mode/Chain Mode can be entered is printed on the rear surface.

(b) Handle

Handle to hold PowerStation HC.

3.5. Accessories

WSE-3500 PowerStation HC Instruction Manual

Power cable

This is the cable which connects the PowerStation HC main body to the power outlet.

Preset mode parameter list

This is an example table in which you can write a list of parameters in a preset mode saved in the power source itself, and parameter information related to user mode and chain mode.

Front side

プリセットモード　パラメータ表 / Preset mode parameter list

No.	Model No. / Product name	条件 / Condition (For Protein)			V	A	W	min
P00	–	–	–		–	–	–	–
P01	AE-6687 / HorizeBLOT 2M	Mini gel	1pc	CC	40	0.15	6	60
P02			2pcs	CC	40	0.29	12	60
P03		Compact gel	1pc	CC	40	0.07	3	60
P04			2pcs	CC	40	0.15	6	60
P05			3pcs	CC	40	0.22	9	60
P06	AE-6688 / HorizeBLOT 4M	Mini gel	1pc	CC	40	0.15	6	60
P07			2pcs	CC	40	0.29	12	60
P08			4pcs	CC	40	0.58	24	60
P09		Slab gel	1pc	CC	40	0.34	14	60
P10	AE-6687 / HorizeBLOT 2M	Mini gel	1pc	CC	40	0.45	18	10
P11	+		2pcs	CC	40	0.90	36	10
P12	AE-1465 / EzFastBlot	Compact gel	1pc	CC	40	0.25	10	10
P13			2pcs	CC	40	0.50	20	10
P14			3pcs	CC	40	0.75	30	10
P15	AE-6688 / HorizeBLOT 4M	Mini gel	1pc	CC	40	0.45	18	10
P16	+		2pcs	CC	40	0.90	36	10
P17	AE-1465 / EzFastBlot		4pcs	CC	40	1.80	72	10
P18		Slab gel	1pc	CC	40	1.00	40	10
P19	WSE-4020 / HorizeBLOT 2M-R	Mini gel	1 or 2pcs	CV	25	1.00	30	10
P20	+	e-PAGEL	1 or 2pcs	CV	20	1.00	30	15
P21	AE-1465 / EzFastBlot	e-PAGEL	1, 2 or 3pcs	CV	20	0.90	20	15
P22	WSE-4040 / HorizeBLOT 4M-R	Mini gel	1 or 2pcs	CV	25	1.00	30	10
P23	+		4pcs	CV	25	2.00	60	10
P24	AE-1465 / EzFastBlot	e-PAGEL	1 or 2pcs	CV	20	1.00	25	15
P25			4pcs	CV	20	2.00	50	15
P26		Slab gel	1pc	CV	25	1.00	30	10
P27	AE-6500,6530 / Mini PAGE	Tris-Glycine	1 or 2pcs	CV	150	0.08	12	80
P28	AE-7340 / Compact PAGE	Tris-Glycine	1 or 2pcs	CV	150	0.07	11	35
P29	–	–	–	–	–	–	–	–
P30								
P31								

Rear side

ユーザーモード・チェーンモード パラメータ表 / User mode and Chain mode parameter list

No.	V	A	W	Time	Note	No.	V	A	W	Time	Note
U00						U16					
U01						U17					
U02						U18					
U03						U19					
U04						U20					
U05						Chain mode					
U06						C01					
U07						C02					
U08						C03					
U09						C04					
U10						C05					
U11						C06					
U12						C07					
U13						C08					
U14						C09					
U15						C10					

Clear case for preset mode parameter list

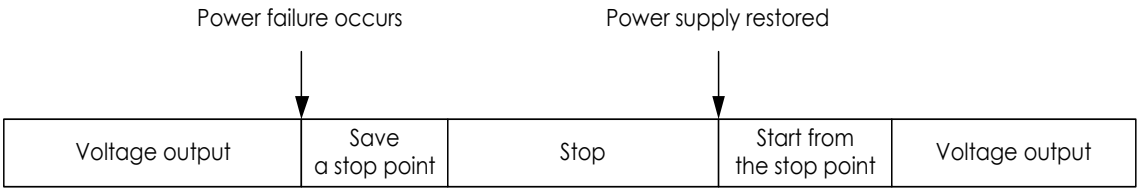
This is the case to house preset mode parameter list for PowerStation HC.

Double-sided tape: Two (2) sheets

This is an adhesive tape to paste the case onto the left-hand side of the PowerStation HC main body.

3.6. Automatic recovery from power failure

When power failure is detected during output, PowerStation HC will save a stop point and automatically start from the stop point after power is recovered.



⚠ **Warning**	Please confirm whether any abnormality exists at the power input and output sides when power failure occurs.

3.7. Output control and crossover function

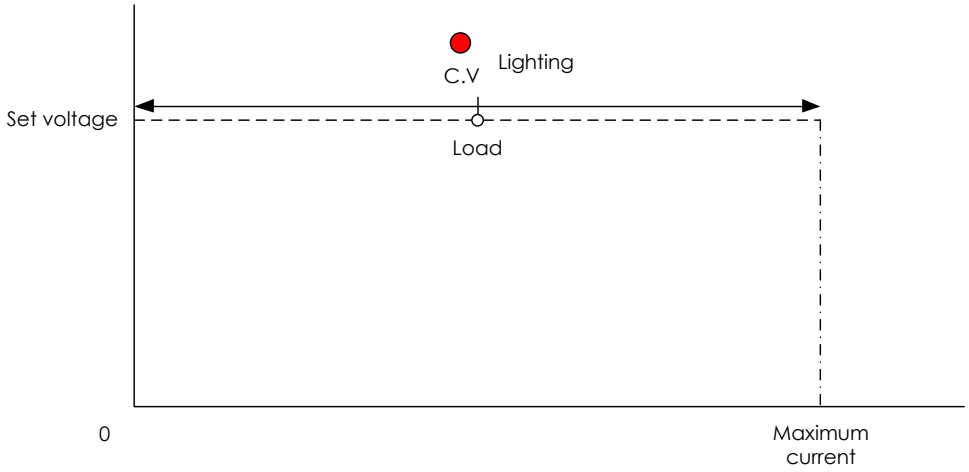
Voltage, wattage or current of electrical output is controlled to keep it at a preset value. When output exceeds preset parameters, output correction is done by the power source controller inside to resume set values.

C.V	Constant Voltage Control: The output is controlled to keep constant voltage at preset value.
C.W	Constant Wattage Control: The output is controlled to keep constant wattage at preset value.
C.C	Constant Current Control: The output is controlled to keep constant current at preset value.

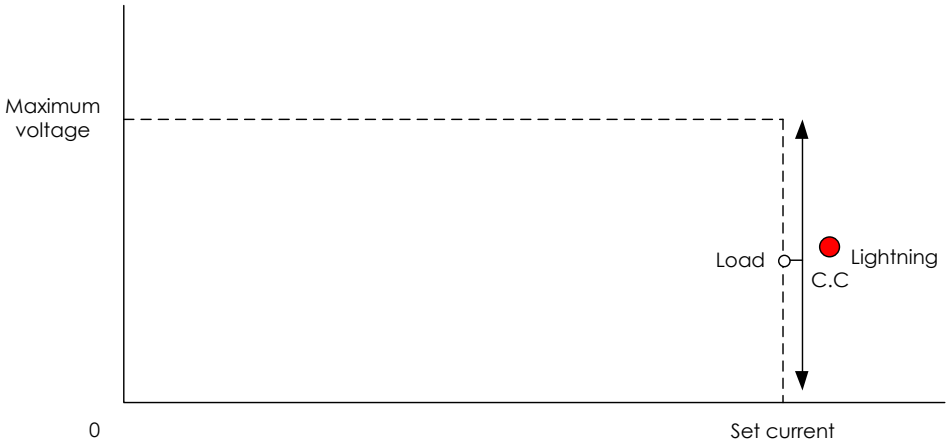
Also crossover function is activated with these controls. The crossover function is that the controlled type will be changed automatically depending on electrophoresis conditions and electrical load.

PowerStation HC controls voltage, current and wattage of output while electrophoresing samples because electrical resistance of buffer liquid varies depending on its composition. Three type of control method which PowerStation HC supports are described below.

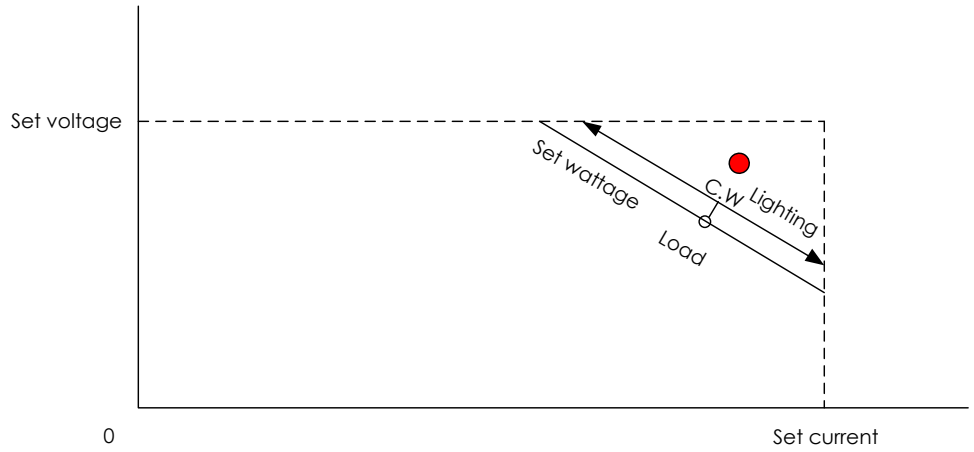
The C.V control keeps constant output of set voltage even if the load varies, when the load connected the set voltage does not exceed the maximum current (set current). The maximum current is limited by the maximum output power (200W) of power supply.



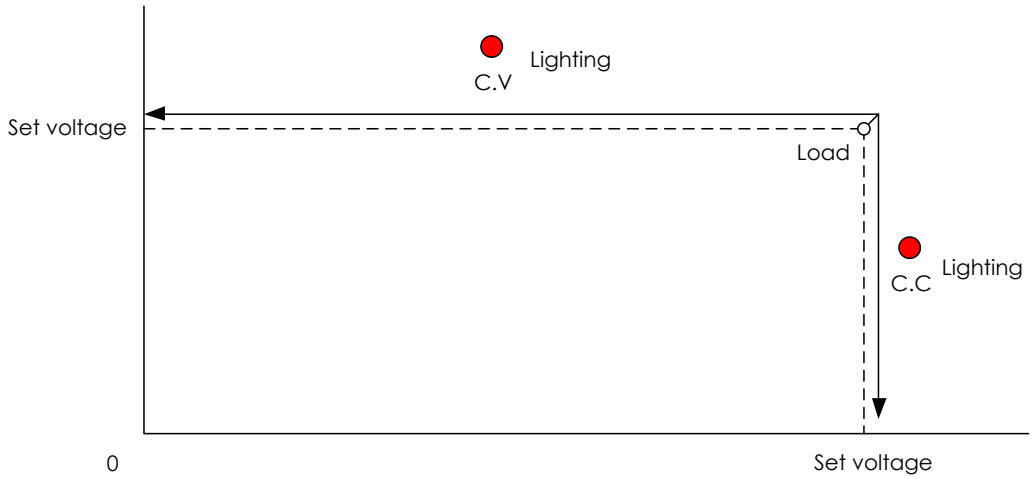
The C.C control keeps constant output of set current even if the load varies, when the load connected to the set current does not exceed the maximum voltage (set voltage). The minimum voltage is 10V.



C.W control keeps constant output of the set power even if the load varies, when the load connected to a set power does not exceed the maximum power (200W). Power limitation comes into effect if power setting (W) becomes lower than Set Voltage [V] x (Set Current [A]). If you want nullify power limitation, please set the value at the maximum (200W).



The crossover function refers to switching the corresponding function automatically if the load variation is large and the voltage and current are set at low values.



3.8. Error indicator

PowerStation HC generates error signs and alarm sound if the main body detects abnormality and wrong setting.

Err	Parameter not entered yet.	Displayed on pressing the [RUN/STOP] button, even though parameters are not entered yet in the selected user mode or chain mode. Enter parameters completely.
Er0	Short Circuit	Displayed when load short-circuit is detected when outputting. Turn off power switch. Please inspect and confirm whether short circuit exists in equipment connected or lead wire using a multimeter.
Er1	Electric Leakage	Displayed when leaking exists at unit. This indicates the current flows to the ground from the connected power source. Turn off the power switch. Visually confirm whether any breakage exists with the power cord.
Er2	Sudden Load Variation	Displayed when load suddenly varied. Turn off the power switch. Please inspect to see if wire disconnection in the connected equipment and lead wire, bad contact, lack of buffer liquid, etc. exists.
Er3	Open Circuit	Displayed when open load is detected when outputting. This indicates high resistance. Turn off the power switch. Please inspect to see if wire disconnection in the connected equipment and lead wire, bad contact, lack of buffer liquid, etc. exists.
Er4	Discharge (Arc)	Displayed when arc discharge occurs during output. This indicates a large current/voltage variation in a short time. Turn off the power switch. Please inspect to see if wire disconnection in the connected equipment and lead wire, bad contact, lack of buffer liquid, etc. exists.
Er5	Power Failure (Auto recovery not possible)	Displayed when power failure occurs during output and automatic recovery is not possible. Turn off the power switch. Please inspect to see if voltage supplied to the unit is normal (100 to 240V).

Er6	Insufficient Voltage Supply	Displayed when voltage supplied to the unit is less than 85V. Turn off the power switch. Please inspect to see if voltage supplied to the unit is normal (100 to 240V).
Er7	Excessive Voltage Supply	Displayed when voltage supplied to the unit is more than 265V. Turn off the power switch. Please inspect to see if voltage supplied to the unit is normal (100 to 240V).
Er8	Fan Trouble	Displayed when cooling fan at rear part of the unit has trouble. Turn off the power switch once. Turn on the switch again and confirm the fan actuation.
Er9	Rising Temperature	Displayed when normal operation is not possible due to high temperature in the unit. Turn off the power switch. Turn on the switch again.
ErA	Memory Trouble	Displayed when memory information in the unit crashes. Please contact us.

4. Preparation

4.1. Installation environment

Place of use	Indoor use only Location where direct sunlight is shut.
Temperature	0°C - +40°C
Humidity	20 - 90%RH, free from condensation

⚠ **Warning**	Never install the unit in the atmosphere of flammable gases. This can cause explosion or fire since the unit is not of an explosion-proof structure. Install the unit in the environment where no flammable gas is contactable. Never install the unit in a corrosive gas atmosphere. This can cause conductor corrosion or bad connector contact in the product. This, in turn, may cause malfunction, trouble or fire. Never install the unit in an environment where a lot of dust and dirt exist. Dust and dirt will stick to the unit and can cause electrical shock, fire or other problems.

⚠ **Caution**	Never use the unit in areas where strong magnetic or electric field exists or where a lot of waveform distortion or noise exists. These might cause malfunction. Never install the unit where a direct sunlight hit, temperature suddenly varies or humidity is high. Never use it if condensation happens. Use the unit inside the room. This product has been designed to ensure safety and performance under the environment described in the Environment for Use.

4.2. Cable Connection

Power cable type

The cable attached to the product is the cable usable in Japan. Please prepare power cable that is applicable to the standard of the country where used.

The power connector of PowerStation HC satisfies the following specification:

Standard	Shape
IEC 60320-C13, 250V, 10A	

Power cable connection

Confirm the power switch at the right-hand side of the main body is OFF before connecting the cable. The sign [o] means OFF.

Connect attached power cable to the power connector located on the back of PowerStation HC. Connect power plug to power outlet that has the ground terminal.

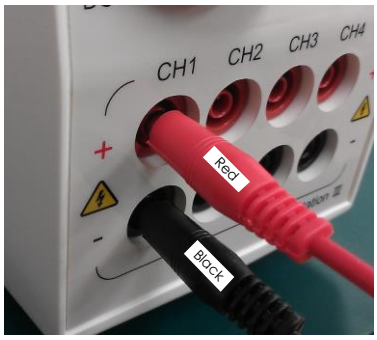
Warning	Connect to power outlet with ground terminal. Never use PowerStation HC without ground connection. This can cause electrical shock and accident.

Caution	The power cable attached to PowerStation HC is for Japanese domestic use. Please use the power cable applicable to the standard of the country where it is used.

Connection of electrophoresis power lead

Confirm that the power switch at right-hand side of the main body is OFF before connecting the cable. When the circle [o] is pressed, that means OFF.

Connect the + (anode) side lead wire to the red terminal on the output terminal board located on the front side of PowerStation HC and the - (cathode) side lead wire to the black terminal, respectively.



⚠ **Warning**	Never use lead wire having blemish on insulation. This can cause electrical shock and accident.

5. Operation

5.1. Start up

Turn on the power switch located at the right-hand side of the main body. When [-] is pressed, that means ON.

The number display located on the front side of the main body lights up. Voltage value set when previously used is shown on the upper line of the number display. Current value set when previously used is shown on the lower line.

1.1.1.	○ (Extinct)	W
	○ (Extinct)	V
2.2.2.	○ (Extinct)	Time
	○ (Extinct)	A

5.2. Selecting program mode

Manual mode

User can set parameters freely using this mode.

Preset mode (for calling only)

Preset parameters suitable to ATTO electrophoresis products are saved in PowerStation HC. The parameters for our products can be set easily by calling the memory number only using this mode.

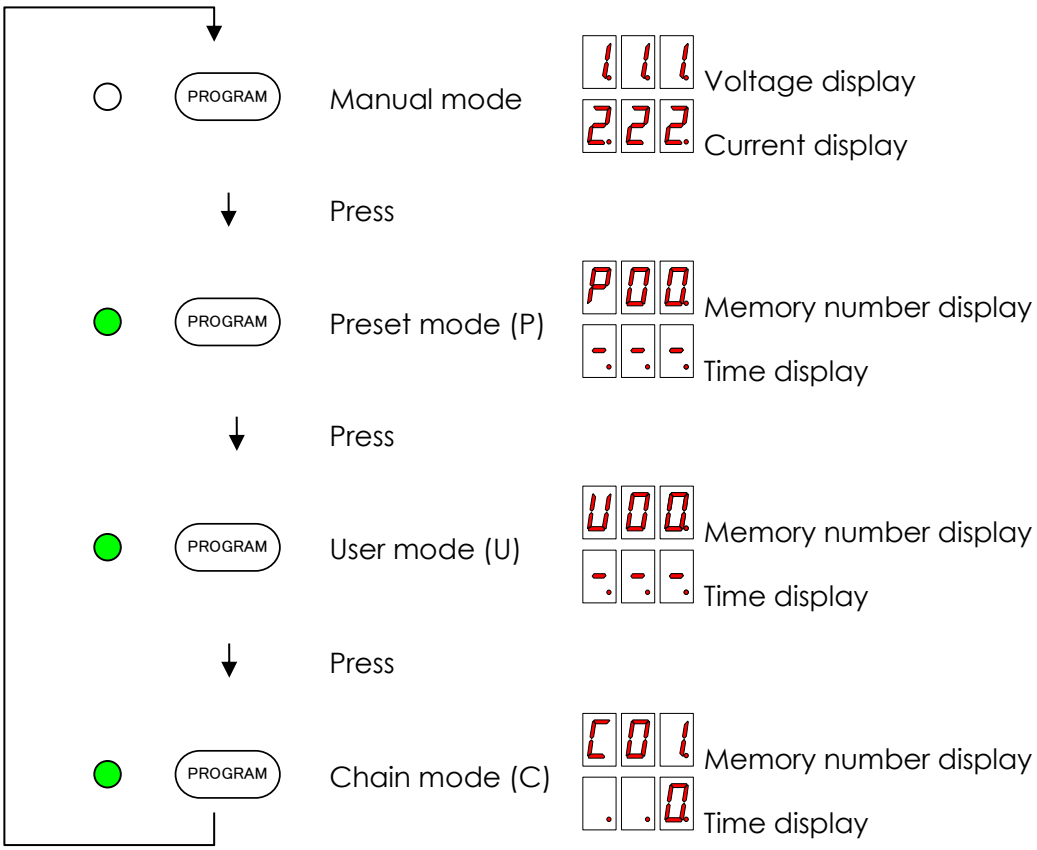
User mode (save and calling)

User defined parameters in the manual mode can be saved in PowerStation HC. Frequently used parameters can be set easily by calling the memory number using this mode.

Chain mode (save and calling)

This mode is used if it is required to execute in sequence automatically by changing output settings.

Select program mode by pressing [PROGRAM] button.



5.3. Manual mode

User uses this mode by setting voltage, current, wattage and time arbitrarily.

A) Constant current control

(1) Set wattage

	1) Press [W] button.
	2) Select [200] by tuning dial (Unit: W)

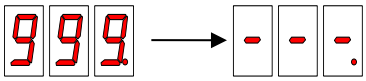
(2) Set voltage

	1) Press [V] button
	2) Select the required value by tuning dial. (Unit: V)

Voltage value differs depending on conditions such as buffer, gel, etc. Please refer to Parameter List, ATTO Product. [5.4 Preset Mode]

Example) Voltage is 40V in the case of EzBlot buffer system using Mini-gel (80mm W x 90mm L x 1mm T) with constant 0.15A.

(3) Set the timer

	1) Press [Time] button
	2) Select the required value by tuning dial. (unit: minute)
	When you do not use the timer, turn dial beyond 999 to display "- - -"

(4) Set current

	1) Press [A] button
	2) Select the required value by tuning dial. (Unit: A)

When using a blotting buffer with a low resistance value

(In the case of blotting where the voltage value does not reach 5V (minimum output value of PowerStation HC))

Even if a numerical value is input so that constant current control is performed using a blotting buffer with a low resistance value, if it does not reach 5V, a constant voltage output at 5V is performed and the C.V LED blinks.

At this time, the current value becomes higher than the set value.

To output at a constant current, increase the resistance value between the positive and negative electrodes by increasing the number of filter papers.

(5) Start output

1) Pressing [RUN/STOP] button
Output status indicator lights up during output.

B) Constant voltage control

(1) Set wattage

1) Press [W] button.

2) Select [200] by tuning dial (Unit: W).

(2) Set voltage

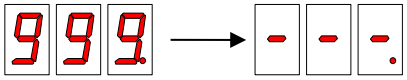
1) Press [V] button.

2) Select the required value by tuning dial (Unit: V).

(3) Set the timer

1) Press [Time] button.

2) Select the required value by tuning dial (unit: minute).



When you do not use the timer, turn dial beyond 999 to display "- - -"

(4) Set the current value

1) Press [A] button.

2) Transfer to required value by tuning dial (Unit: A).

Current value differs depending on conditions such as buffer, gel, etc. Please refer to Parameter List (5.4 Preset Mode) of ATTO products.

Example) Current value is 0.50A in the case of EzFastBlot buffer system using 1 sheet of mini-gel (80mm W x 90mm L x 1mm T), with constant 25V.

When used with SDS-PAGE

(When electrophoresis is performed under conditions where the current output is less than 0.1 A, such as mini gel size or less)

(1) In electrophoresis, high resistance may be detected and an open error may occur due to the low output current. Make sure that the electrophoresis tank, gel, buffer, and lead wires are normal and that the operation is correct, and then set the current value to 0.09A or less to avoid error detection.

(2) The current output display value may be low or "0.00A" may be displayed. This is the operation within the specifications of PowerStation HC. This unit is designed as a power supply for high current output, and there is a limit to the display resolution of low current. Since the current display accuracy is ± 0.05A, even if the current value is actually output normally, the display below 0.1A cannot accurately reflect the actual output.

(5) Start output

1) Pressing [RUN/STOP] button.
Output status indicator lights up during output.

C) Constant wattage control

(1) Set wattage

1) Press [W] button.

2) Select the required value by tuning dial (Unit: W).

(2) Set voltage

1) Press [V] button.

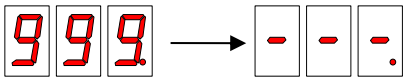
2) Select the required value by tuning dial (Unit: V).

Voltage setting is calculated by the formula below:
Voltage setting [V] = wattage setting [W] / current setting [A]

(3) Set the timer

1) Press [Time] button.

2) Select the required value by tuning dial (unit: minute).



When you do not use the timer, turn dial beyond 999 to display "- - -"

(4) Set the current value

1) Press [A] button.

2) Select the required value by tuning dial (Unit: A).

(5) Start output

1) Press [RUN/STOP] button.
Output status indicator lights up during output.

5.4. Preset mode

(1) Select preset mode

1) Press [PROGRAM] button

(2) Select memory number

1) Select the required memory number by tuning dial.

Refer to the preset mode parameter table (next page) for the setting value of each memory number.

Each parameter can be changed with [W] / [V] / [A] / [Time] buttons. When parameter is changed, mode goes to manual mode automatically. However, the change cannot be saved in preset mode. Please save parameter in the memory number of user mode. (Refer to 5.7 Save into Memory)

(3) Start output

1) Press [RUN/STOP] button to start output.
Output status indicator lights during output.

Preset mode parameter list is shown below:

No.	Model	Product	Experoment	Condition	Setting	Voltage (V)	Current (A)	Wattage (W)	Time (min.)
P00	-	-	-		-	-	-	-	-
P01	AE-6687	HorizeBLOT 2M	Semi-dry blotting	C.C.	1pc mini-gel	40	0.15	6	60
P02				C.C.	2pcs mini-gel	40	0.29	12	60
P03				C.C.	1pc compact-gel	40	0.07	3	60
P04				C.C.	2pcs compact-gel	40	0.15	6	60
P05				C.C.	3pcs compact-gel	40	0.22	9	60
P06	AE-6688	HorizeBLOT 4M	Semi-dry blotting	C.C.	1pc mini-gel	40	0.15	6	60
P07				C.C.	2psc mini-gel	40	0.29	12	60
P08				C.C.	4pcs mini-gel	40	0.58	24	60
P09				C.C.	1pc slab-gel	40	0.34	14	60
P10	AE-6687	HorizeBLOT 2M	Semi-dry blotting	C.C.	1pc mini-gel	40	0.45	18	10
P11	+	+		C.C.	2psc mini-gel	40	0.90	36	10
P12	AE-1465	EzFastBlot		C.C.	1pc compact-gel	40	0.25	10	10
P13				C.C.	2pcs compact-gel	40	0.50	20	10
P14				C.C.	3psc compact-gel	40	0.75	30	10
P15	AE-6688	HorizeBLOT 4M	Semi-dry blotting	C.C.	1pc mini-gel	40	0.45	18	10
P16	+	+		C.C.	2pcs mini-gel	40	0.90	36	10
P17	AE-1465	EzFastBlot		C.C.	4pcs mini-gel	40	1.80	72	10
P18				C.C.	1pc slab-gel	40	1.00	40	10
P19	WSE-4020	HorizeBLOT 2M-R	Semi-dry blotting	C.V.	1 or 2pcs mini-gel	25	1.00	30	10
P20	+	+		C.V.	1 or 2pcs e-PAGEL	20	1.00	30	15
P21	AE-1465	EzFastBlot		C.V.	1, 2 or 3pcs c-PAGEL	20	0.90	20	15
P22	WSE-4040	HorizeBLOT 4M-R	Semi-dry blotting	C.V.	1 or 2pcs mini-gel	25	1.00	30	10
P23	+			C.V.	4pcs mini-gel	25	2.00	60	10
P24	AE-1465	EzFastBlot		C.V.	1 or 2pcs e-PAGEL	20	1.00	25	15
P25				C.V.	4pcs e-PAGEL	20	2.00	50	15
P26				C.V.	1pc slab-gel	25	1.00	30	10
P27	AE-6500, 6530	Mini PAGE	Electrophoresis	C.V.	1 or 2pcs Tris-Glycine	150	0.08	12	80
P28	AE-7340	Compact PAGE	Electrophoresis	C.V.	1 or 2pcs Tris-Glycine	150	0.07	11	35
P29	-	-	-	-	-	-	-	-	-
P30	-	-	-	-	-	-	-	-	-
P31	-	-	-	-	-	-	-	-	-

5.5. User mode

(1) Select user mode

1) Press [PROGRAM] button.

(2) Select memory number

1) Select the required memory number by tuning dial.

Each parameter can be changed with [W] / [V] / [A] / [Time] buttons and dial. When parameter is changed, mode goes to manual mode automatically.

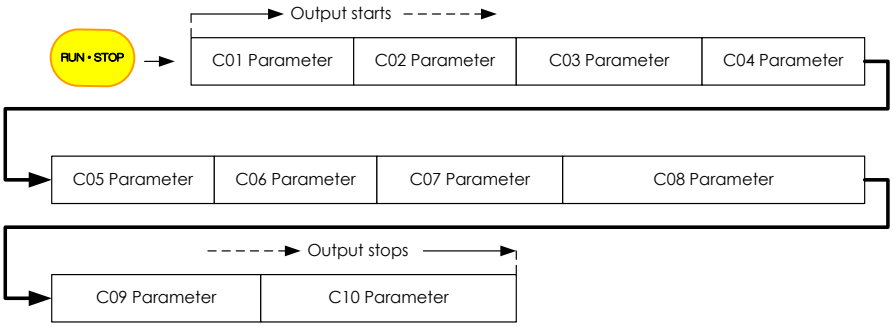
(3) Start output

1) Press [RUN/STOP] button to start output.
Output status indicator lights during output.

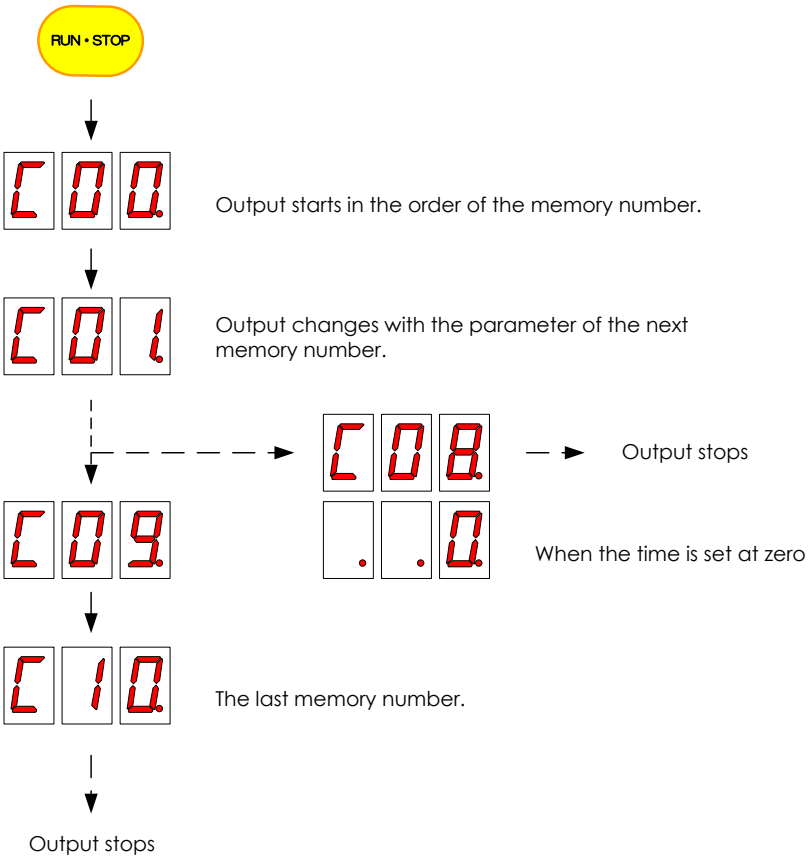
5.6. Chain mode

Chain Mode is used if it is required to execute in sequence automatically by changing output setting.

Operation sequence in chain mode is shown below.



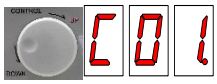
Output is defined to stop at the specified memory number where the timer is set at zero.



(1) Select chain mode

1) Press [PROGRAM] button

(2) Select memory number



1) Select the required memory number by tuning dial.

Each parameter can be changed using [W] / [V] / [A] / [Time] buttons and dial. When parameter is changed, mode goes to manual mode automatically.

(3) Start output

1) Press [RUN/STOP] button to start output.
Output status indicator lights during output.

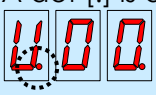
5.7. Saving into memory

Parameters selected in manual mode can be saved into the internal memory. Memory number is selected in user mode or chain mode.

A) In User mode

SAVE	1) Press [SAVE] button after setting parameter in either manual mode or preset mode.
	2) Select memory number of the destination for saving by turning dial.
SAVE (Press more than 2 seconds)	3) Press [SAVE] button for more than 2 seconds.

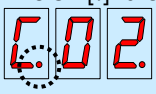
A dot [.] is attached to the initial character of the memory number in use.



B) In Chain mode

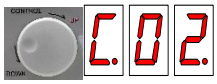
SAVE (2 times)	1) Press [SAVE] button 2 times after setting parameter in manual mode or preset mode.
	2) Select memory number of the destination for saving by turning dial.
SAVE (Press more than 2 seconds)	3) Press [SAVE] button for more than 2 seconds.

A dot [.] is attached to the initial character of the memory number in use.



C) To delete the parameter in Chain mode memory

By deleting the parameter in the specified Chain mode memory number, automatic execution stops at the cleared memory number.

SAVE (2 times)	1) Press [SAVE] button 2 times after setting parameter.
	2) On turning dial, select memory number which you want to clear.
SAVE and Time	3) While pressing [SAVE] button, press [Time] button at the same time.
	4) Parameter of the selected memory number will be cleared.

5.8. Display / operation during output

Actual output voltage and current are displayed during output by default. Other values and settings can be displayed by the following steps.

Actual wattage and setting

W		1) Press [W] button during output.
9	● ○	2) Actual wattage is indicated only while the [W] button is pressed.
.10	● ○	3) When [W] button is released, setting is indicated for 5 seconds.
25	○ ●	4) Then actual output voltage is indicated.

Actual voltage and setting

V		1) Press [V] button during output
.25	○ ●	2) The setting is indicated while the [V] button is pressed and for 5 seconds after released.
24	○ ●	3) Then actual output voltage is indicated.

Remaining time and setting

Time		1) Press [Time] button during output.
10	● ○	2) Remaining time is indicated only while the [Time] button is being pressed.
.15	● ○	3) When [Time] button is released, the setting is indicated for 5 seconds.
0.50	○ ●	4) Then actual current is indicated.

Actual current and setting

A		1) Press [A] button during output.
0.50	○ ●	2) The setting is indicated while the [A] button is being pressed and for 5 seconds after released.

0.49	○ ●	3) Then actual current is indicated.

Selected memory number

PROGRAM		1) Press [PROGRAM] button during output.
C01	○ ○	2) Memory number is displayed while [PROGRAM] button is being pressed and for 5 seconds after released.
18	○ ●	3) Then actual current is indicated.

Pause

☀	RUN • STOP	Press [RUN/STOP] button for more than two (2) seconds Output state indicator flashes during pause. When pressed once again, output resumes.

Stop

When timer is ON, the run automatically stops after setting time has elapsed.

○	RUN • STOP	000	○ ○	Number display indicates completion of the timer
		End	○ ○	

When timer is OFF, the run stops manually.

○	RUN • STOP	Press [RUN/STOP] button. Output state indicator is turned off.

6. Troubleshooting

This chapter explains about trouble shooting.

If you are unable to solve the problem, please contact us upon confirming your model and serial numbers listed on the rear side panel. (Refer to the end of Manual for enquiry.)

6.1. PowerStation HC doesn't work

Confirm the following:

- Please confirm visually that the main body and outlet are properly connected with power cable, and plugged completely.
- Please get the fuse out from the fuse holder on the rear surface of the unit and visually confirm that the fuse is not blown. If the fuse is blown, please contact us. (Refer to the end of Manual for enquiry.)

	1) Insert a flat-head screwdriver in the concave of power connector inlet (white circles on the left) located on rear side of main body, and turn it CCW. (2 places)
	2) Confirm the fuse installed on the fuse holder. If the fuse is blown, replace it and equip the fuse holder into inlet.

Fuse Specification: 5.2Ø x 20mm, 250V-5A Slow-Blow Type, 2 pieces

6.2. Error Indication

Err	Parameter not yet entered	Displayed on pressing the [RUN/STOP] button, even though parameters are not entered yet in the selected user mode or chain mode. Enter parameters completely.
Er0	Short circuit	Displayed when a load short-circuits during output is detected. Turn off power switch. Inspect to see whether short circuit has occurred in the equipment connected or the lead wire, using a multi-meter.
Er1	Leakage	Displayed when leakage occurs in unit. This indicates that current has flowed into ground from power source connected. Turn off the power switch. Visually inspect to see if any breakage exists with power cord.
Er2	Sudden load variation	Displayed when load suddenly varies. Turn off the power switch. Inspect to see whether wire disconnection or bad contact exists in equipment connected or lead wire or buffer liquid is insufficient.
Er3	Open circuit	Displayed when open load is detected during output. This indicates high resistance. Turn off the power switch. Inspect to see whether wire disconnection or bad contact exists in equipment connected or lead wire or buffer liquid is insufficient.
Er4	Arc discharge	Displayed when arc discharge occurs during output. This indicates a large variation of current/voltage within a short period of time. Turn off the power switch. Inspect to see whether wire disconnection or bad contact exists in equipment connected or lead wire or buffer liquid is insufficient.
Er5	Power Failure (Auto recovery unavailable)	Displayed when power failure happens during output and won't recover. Turn off the power switch. Inspect and confirm whether supply voltage to the unit is normal (100 - 240V).
Er6	Insufficient supply voltage	Displayed when supply voltage to the unit is less than 85V.

		Turn off the power switch. Inspect and confirm whether supply voltage to the unit is normal (100 - 240V).
Er7	Excessive supply voltage	Displayed when supply voltage to the unit is more than 265V. Turn off the power switch. Inspect and confirm whether supply voltage to the unit is normal (100 - 240V).
Er8	Fan trouble	Displayed when cooling fan at rear part of unit has trouble. Turn off the power switch. Turn on the switch again and check if the fan runs.
Er9	Temperature rise	Displayed when normal operation is not possible due to temperature rise in the unit. Turn off the power switch. Turn on the switch again.
ErA	Memory trouble	Displayed when memory information in the unit crashes. Please contact us.

Error Confirmation and Release

To release the [Err] sign

Error is released when appropriate parameters are set. (Refer to 5. Operation)

To release the [Er0] - [Er9] and [ErA] signs:

Please turn off power switch after confirming error indication number. And then please take appropriate action, referring to the list on the previous page.

Do NOT turn power switch ON until the cause of the error is resolved.

If you cannot inspect or confirm the error cause, or if the error continues to show, then please stop using the unit and inform us. (Refer to the end of the Manual for enquiry.)

6.3. "CV" indicated LED flashes

It cannot be controlled under the set conditions, and indicates that the output is performed at the constant voltage of the minimum output voltage of the PowerStation HC.

Even if a numerical value is input so that constant current control is performed using a blotting buffer with a low resistance value, if the minimum voltage value of this unit is not reached, constant voltage output is performed at the minimum output voltage value and the C.V LED Flashes.

The current value will be higher than the set value.

By increasing the resistance value between the positive and negative electrodes, such as by increasing the number of filter papers, it is possible to output under the set conditions (current control).

6.4. The current display value is incorrect

When output under conditions where the current is less than 0.1A at a constant voltage setting, such as when used for SDS-PAGE, the current output display value may be low or "0.00A" may be displayed.

This is the operation within the specifications of PowerStation HC.

The PowerStation HC is designed as a power source for high current output and has limited low current display resolution. Since the current display accuracy according to the specifications is ± 0.05A, even if the current value is actually output normally, the display below 0.1A cannot accurately reflect the actual output.

Even so, if SDS-PAGE is actually performed at 150 V CV and the electrophoresis time does not reach near the tip even if the mini gel outputs 80-100 minutes, it is possible that the output is low or not output due to high resistance. There is sex. After stopping the output, check that the electrophoresis tank and lead wires are not broken and that the buffer is appropriate.

7. Maintenance

7.1. Cleaning

⚠ Warning	Please clean the main body after turning off the power switch and pulling out the power cable.

Outer surface

When outer surface is dirty, please wipe it with a lint-free cloth dipped in thinned neutral detergent.

Vent Hole

When dust and dirt are attached to the vent hole, please remove them using a vacuum cleaner.

Power Cable

Make sure that there is no blemish on power cable.

7.2. Inspection

By doing periodical inspection, failures and accidents can be prevented before happens, and the unit can be used safely. Though it depends on usage frequency and amount of time used, we strongly recommend periodical inspection so as to maintain the unit's good performance. Please contact us for inspection work.

7.3. Maintenance and Repair

Our products come with a repair service period of 7 years from the date of delivery. Therefore, if you wish to have your product repaired, you will need to request it within this period. However, please note that we generally do not accept repair requests for products that have been in use for more than 7 years.

Furthermore, we store parts for discontinued products for a duration of 7 years after production has ceased. Please be aware that even within the repair service period, there may be cases where repair is not possible due to a lack of available parts.

We have full confidence in the quality of our products and provide them to our customers with the assurance that they can use them with peace of mind. However, depending on the usage environment and methods of use, malfunctions or defects may

occur. In such cases, we recommend that you request repairs within the repair service period.

If any abnormality or failure occurs while using the unit according to this instruction manual, or if you notice any problem during your maintenance/inspection work, please contact us after checking it according to the relevant [Trouble Shooting] item.

When repair is required, please send the unit back to our Technical Service Group, in principle. If on-site repair is requested, travel expense will be required in addition to the repair cost.

7.4. Warranty

ATTO Corporation warrants all its products subject to the terms and conditions set forth below.

1. This warranty covers all new products that are sold by ATTO Corporation (hereinafter called ATTO).
2. Expendable items are not covered by this agreement.
3. Claims under this warranty are limited to defects in material and workmanship of the products.
4. Malfunction and/or damage due to neglect, abuse, operation or repair contrary to specifications and/or instructions presented by ATTO are not warranted.
5. ATTO shall not be liable to consequential damage, labor, loss or expense directly or indirectly arising from use of the products.
6. Damage due to transit is not covered by this warranty.
7. The warranty period is one (1) calendar year from a date when the products are shipped from ATTO to an original purchaser.
8. This warranty is not applied to any defect that is reported to ATTO later than one (1) calendar month from a date of warranty termination.
9. ATTO Shall supply parts to replace faulty parts of defective products under this warranty, free of charge.
10. ATTO shall repair defective products under this warranty, which cannot be repaired at field, free of charge.
11. ATTO shall replace defective products under this warranty, which cannot be repaired, free of charge.
12. Freight charges for return and replacement shipments under this warranty are shared by ATTO and a purchaser, that is one way by either party and another way by another party.

13. Warranty period of repaired products and replacement products or parts is three (3) calendar months from a date when the said products or parts are shipped from ATTO, or a remaining term of an original warranty period of the defective products, whichever lasts longer.

14. Return of the products for credit or refund is not accepted unless otherwise agreed in writing by ATTO.

8. Specifications

8.1. Specifications

WSE-3500 PowerStation HC			
Output Voltage	5 - 150V	(Indication 0 <)	(200W, Max)
Output Current	0 – 3.00A	(Indication 0 <)	(200W, Max)
Output Wattage	0 – 200W	(Indication 0 <)	
Set Voltage	10 – 150V	1V step	
Set Current	0.01 – 3.00A 0.01A step Constant voltage operation below 0.09A		
Set Wattage	1 – 200W	1W step	
Output Terminal	4 group parallel output		
Timer	1 - 999 min, continuous	1 minute step	Count down
Control Function	Constant Voltage/Current/Wattage		Crossover
Controller Display	7-segment LED, 3-Digit, 2-Columns		
Setting	Dial		
External Control	NA		
Alarm Output	Electronic Buzzer When key input/error occurs: once; When time is over: 5 times		
Output Accuracy Voltage	For Set Value	10V - 150V	± 3% + 5 digits
Indication Accuracy: Voltage	Indicated Value ± (0.2% of rdg + 5 digits)		
Current	Indicated Value ± (0.5% of rdg + 5 digits)		
Wattage	Indicated Value ± (0.5% of rdg + 5 digits)		
Condition Storing: Preset	30 files, P01 – P30		
	21 files, U00 - U20		
Free	10 files, C01 - C10 (Chain File)		

Safety Functions: Output Short Detection	Short Current	Er0
Leak Detection	Leak Current to ground	Er1
Open Detection	Load Open	Er3
Arc Detection	Arc Discharge	Er4
Input HV Detection	Input Voltage above 265V	Er7
Fan Stop Detection	Fan Failure	Er8
Internal Temp. Detection	Unit Internal Temperature Rising	Er9
Countermeasure for Power Failure	After the power is restored, the unit automatically recovers back to the state before the power failure.	
Cooling Method	Forced Air Cooling by Built-in Fan	
Environment for Use Ambient Temp. for Operation	0°C - +40°C	
Ambient Humidity for Operation	20 - 90% RH, no condensation	
Input Voltage	85 - 264V, AC	
Frequency	47 - 63Hz	
Power Consumption	300W, Max.	
Safety Standard	Pursuant to Electrical Appliance and Material Safety Law	
Material	Case: ABS	
Dimensions	96 (W) x 325 (D) x 195 (H) mm	
Weight	2.2Kg, Max.	

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