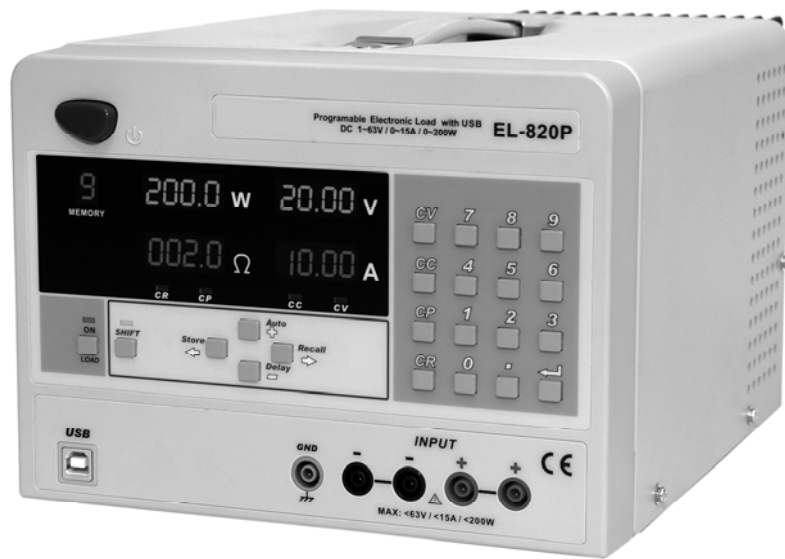


Programable Electronic Load (With USB)

可程式電子負載

EL-820P

DC 1~63V / 0~15A / 0~200W



INSTRUCTION MANUAL

使用說明書

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EL-820P

Programable Electronic Load

Safety Precautions:



Normal use of test equipment exposes a certain amount of danger from electrical shock. Because testing must sometimes be performed where exposed high voltage is present. An electrical shock causing 10 milliamps of current to pass through the heart will stop most humans heartbeats. Your normal work habits should include all accepted practices to prevent contact with exposed high voltage and to steer current away from your heart in case of accident contact with high voltage. You will significantly reduce the risk factor if you know and observe the following safety precaution.

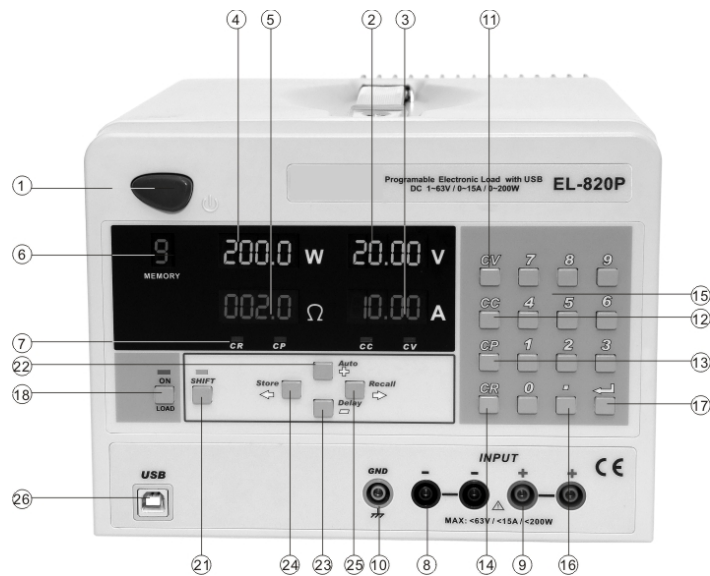
- (1) Don't expose high voltage needlessly. Remove housings and covers only when necessary. Turn off equipment while making test connections in high voltage circuits. Discharge high voltage capacitors after removing power.
- (2) If possible. Familiarize yourself with the equipment being test and the location of its high voltage points. However, remember that high voltage may appear at unexpected points in defective equipment.
- (3) Use an insulated floor material or large insulated floor to stand on and an insulated work surface on which to place equipment and make certain such surface are not damp or wet.
- (4) Use the time proven "one hand in the pocket" technique while handling an instrument probe. Be particularly careful to avoid contacting a nearby metal object that could provide a good ground return path.
- (5) When testing AC power equipment, remember that AC line voltage is usually present on some power input circuits such as the on-off switch, fuse, power transformer etc. ant time the equipment is connect to an AC outlet, even if the equipment is turned off.
- (6) Some equipment with a two-wire AC power cord, including some with polarized power plugs, is the "hot chassis" type. A plastic wooden cabinet insulates the chassis to protect the customer. When the cabinet is removed for servicing, a serious shock hazard exists if the chassis is touched.

- (7) On test instruments or any equipment with 3-wire AC power plug use only 3-wire outlet. This is a safety feature to keep the housing or other exposed elements at earth ground.

Features:

1. Digital button control and easy operation.
2. High resolution(20mV,1mA,0.1W,0.1Ω).
3. Overload protect function.
4. 9 sets programmable memory.
5. 4 digital real time display. Voltage / Current / Power / Ohm
6. Voltage range: 1V~63V.
7. Current range: 10mA~15A.
8. Maximum power: 200W.
9. Operation mode: constant voltage(CV), constant current(CC), constant power(CP) and constant resistance(CR).
10. Built in USB/RS-232 interface.
11. Overvoltage Category II.

Front Panel Description:



Control/Indicator Description:	
①	Power button: Power On/Off.
②	Voltage display: Indicate V setting or testing voltage value
③	Current display: Indicate A setting or testing current value.
④	Power display: Indicate W setting or testing power value.
⑤	Ohm display: Indicate Ω setting or testing ohm value.
⑥	Memory display: Indicate the present data location number in memory.
⑦	Status display: Indication the operation state.
⑧	- Input BNC connector: Negative input terminal.
⑨	+ Input BNC connector: Positive input terminal.
⑩	GND BNC connector: Ground terminal.
⑪	CV: Enter constant voltage mode.
⑫	CC: Enter constant current mode.
⑬	CP: Enter constant power mode.
⑭	CR: Enter constant resistance mode.
⑮	0~9: Data input.
⑯	“ • ”: Float point
⑰	“↵”: Execute
⑱	LOAD button: Push to turn on loading switch and LED, push again to turn off.
⑲	SHIFT button: To shift the secondary function.
⑳	↑ (Auto): ↑ : Increase the setting value. Auto: Push [SHIFT][↑] to change to Auto function.
㉑	↓ (Delay): ↓ : Decrease the setting value. Delay: Push [SHIFT][↓] to change to Delay function.

<p>②④ ⇐ (Store):</p> <p>⇐ : Change digit to left one.</p> <p>Store: Push [SHIFT][⇐] to change to Store function.</p>
<p>②⑤ ⇒ (Recall):</p> <p>⇒ :Change digit to right one.</p> <p>Recall: Push [SHIFT][⇒] to change to Recall function.</p>
<p>②⑥ USB / RS-232 terminal.</p>

Rear Panel Description:



Control/Indicator Description:	
②⑦	Heat sink: Heat dissipation for power transistor
②⑧	Ventilation Fan: 8" 24V DC fan
②⑨	Power input socket.
③①	▲ The input power voltage indicator.
③①	Fuse Holder and input voltage selector.

Operating Instruction:

NOTE:

If the input power over 63V or 200W. The input switch will "OFF" automatically and the LED will sparkle. Please turn off the power switch and remove the input source. Then re-start the EL-820P again.

1. Constant Voltage Setting:

Constant voltage setting:

Push [CV], number key, [↵] key to set input voltage limit.

Example:

Setup input voltage limit 10.5V.

Push [CV][1][0][.][5][↵].

If input voltage more than limit voltage, EL-820 will pull down input voltage and equal as limit voltage unless input power over 200W.

2. Constant Current Setting:

Constant current setting:

Push [CC], number key, [↵] key to set input current limit.

Example:

Setup input current limit 3.05A.

Push [CC][3][.][0][5][↵].

If input current less than limit current, EL-820 will pull down input voltage until input current equal to limit current or input power over 200W.

3. Constant Power Setting:

Constant power setting:

Push [CP], number key, [↵] key to set input power limit.

Example:

Setup input power limit 110W.

Push [CP][1][1][0][↵].

4. Constant Resistance Setting:

Constant resistance setting:

Push [**CR**], number key, [**↵**] key to set loading resistance value.

Example:

Setup loading resistance value 510Ω.

Push [**CR**][5][1][0][**↵**].

5. Data Storage and Recall:

(1) Data Storage:

Push [**SHIFT**][**↵**], number key, [**↵**] key to save both two channel setting value in target memory location.

Example:

Save CV/CC/CP/CR setting to memory location 5.

Push [**SHIFT**][**↵**][5][**↵**]

(2) Data Recall:

Push [**SHIFT**][**⇒**], number key, [**↵**] key to recall all setting value in target memory location.

Example:

Recall memory location 2 back.

Push [**SHIFT**][**⇒**][2][**↵**]

6. Automatic Execution and Delay Time:

(1) Auto Execution:

Push [**SHIFT**][**↑**][**↵**] key to execute automatically and according to storage setting location 1 to location 9.

Example:

Execute Automatic input function

Location 1 setting: Constant Voltage = 5V

Delay time = 10000 seconds

Location 2 setting: Constant Voltage = 60V

Delay time = 20000 seconds

Push [**SHIFT**][↑][↵]

Loading: Voltage limit = 5V

After 10000 seconds, loading change according to Location 2 setting and become to 60V input voltage limit.

(2) Delay Time:

Push [**SHIFT**][↓], number key, [↵] key to set delay time in current memory location.

Example:

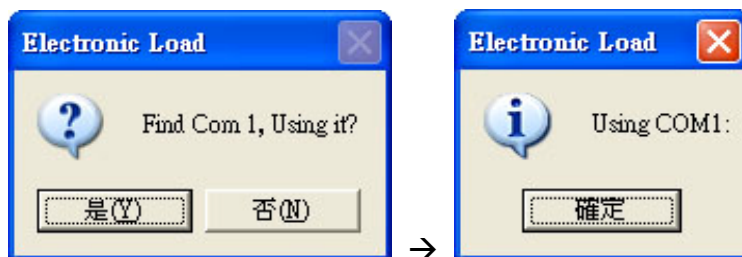
Save delay 1000 seconds in present memory location.

Push [**SHIFT**][↓][1][0][0][0][↵]

Default delay setting is 0 second.

7. RS-232 or USB control:

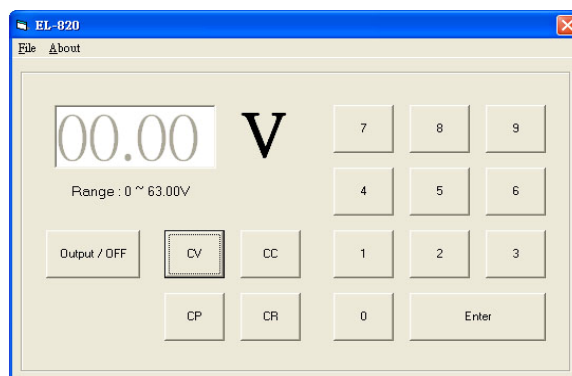
- (1) Open the EL-820P program disk and execute setup.
- (2) The setup program will guide program installation. EL-820 program support OS system, Windows 9X, Windows ME, Windows XP.
- (3) EL-820P program will confirm com port. If com 1 has been used, it'll select com 2. If both com 1 and com 2 been used. It'll show " **No communication port can use**".





- (4) Connect the RS-232 or USB terminal of EL-820P and your computer by RS-232 or USB lead.
- (5) Enter the EL-820P control format. The computer will display the following Fig.1, You can control EL-820P by your PC or on the front panel of EL-820. If you'll stop the RS-232 or USB control. Disconnect the RS-232 or USB lead.

Fig.1

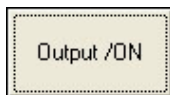


- (6) RS-232 or USB operation (refer Fig.1).

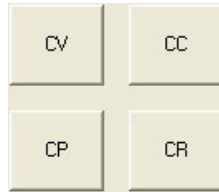
NOTE:

The output was designed at “OFF” position. It'll be set at “OFF” position on each setup.

- a. Click the “**Output**” to switch on the output.



b. Click “**CV**”, “**CP**”, “**CC**”, “**CR**” to select the operation mode.



c. Click the number panel to input the voltage you need (0 – 63.00V).
(The decimal point bee fixed)



d. Click “**Enter**” to key in the operation mode and the desire voltage to the EL-820P.



Specifications:

Function		Value
Operation limit	Voltage	63V
	Current	15A
	Power	200W
Constant Voltage	Range	1~63V
	Accuracy	$\pm(1\%+20\text{mV})$
	Resolution	20mV
Constant Current	Range	10mA~15A
	Accuracy : 10mA~1A 1A~6A 6A~15A	$\pm(0.5\%+1\text{mA})$ $\pm(0.5\%+10\text{mA})$ $\pm(1\%+100\text{mA})$
	Resolution: 10mA~1A 1A~15A	1mA 10mA
Constant Power	Range	1~200W
	Accuracy	$\pm 1\%+0.2\text{W}$
	Resolution	0.1W
Constant Resistance	Range	0.5~999 Ω
	Accuracy	$\pm 1\%+0.2\Omega$
	Resolution	0.1 Ω
Voltage Read back	Accuracy	$\pm 1\%+50\text{mV}$
	Resolution	20mV
Current Read back	Accuracy	$\pm 1\%+10\text{mA}$
	Resolution	10mA
Memory	Save address	1~9
Timer	Range	1~999999 sec
	Resolution	1 sec
Fuse	115V (100~120V)	1.0 A
	230V (220~240V)	0.6 A
Power Source	100V, 110V, 120V, 220V, 240, 250V 50/60Hz	

Maintenance:

1. Preventive Maintenance:

Please follow the following preventive steps to ensure the proper operation of your instrument.

- (1) Never place heavy object on the instrument.
- (2) Never place a hot soldering iron on or near the instrument.
- (3) Never insert wires, pins or other metal object into ventilation fan.
- (4) Never move or pull the instrument with power cord or input lead. Especially never move instrument when power cord is connected.
- (5) Do not obstruct the ventilation holes in the rear panel. As this will increase the internal temperature.
- (6) Clean and check the calibration of the instrument on a regular basis to keep the instrument looking nice and working well.
- (7) When the unit is not turning "**ON**". Check if the power switch is turned "**ON**". Or check the power cord. Make sure that the power is properly connected to the unit and ensure the AC supply at your site is the same as the mentioned at the rear chassis of the unit.

2. FUSE Replacement:

If the fuse blows, both LCD will not light and the instrument will not operate. Replace only with the correct value fuse. The fuse is located on the rear panel adjacent to the power cord receptacle.

- (1) Remove the fuse holder assembly as follows.
- (2) Unplug the power cord from the instrument.
- (3) Insert a small screwdriver in the fuse holder slot (location between fuse holder and receptacle).
- (4) Change the fuse and re-insert the holder.

NOTE:

When re-inserting fuse holder, be sure that the correct line voltage is selected.

3. Cleaning:

Remove any dirt, dust and grime whenever they become noticeable. Cleaning the outside cover with a soft cloth moistened with a mild cleaning solution.

EL-820P

可程式電子負載

使用安全須知：



日常生活中使用任何的電器產品都有可能會有觸電的危險。根據醫學報導，只要10mA的電流通過心臟，都有可能造成生命的危險。因此，我們將35V DC或35 V AC rms 以上都視為危險電壓，如使用不當都會影響生命安全。因此，請特別注意下列事項，以確保您自身的安全。

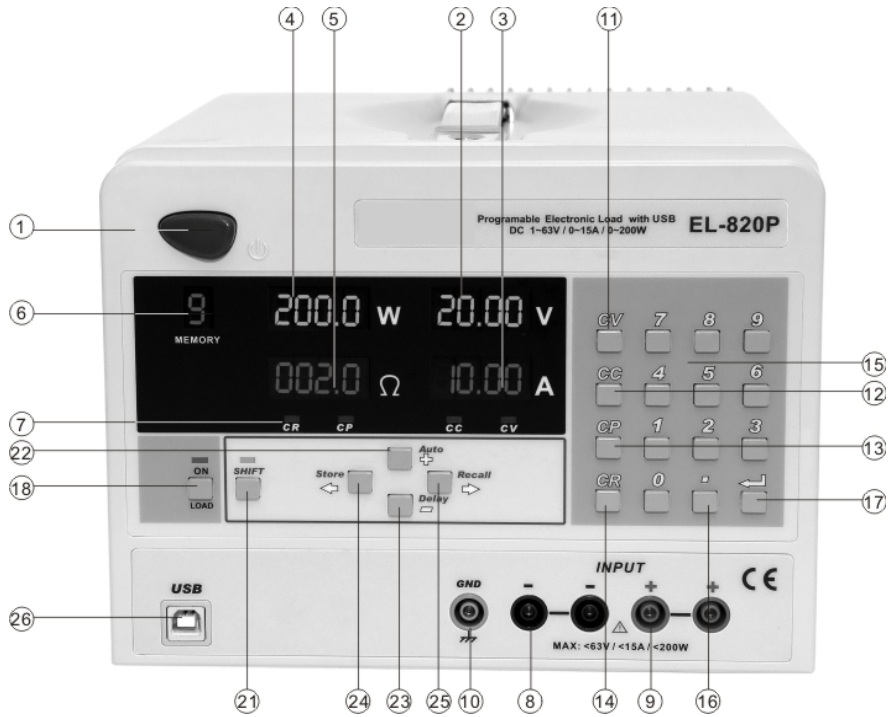
- (1) 非必要時，請避免靠近高壓電源，只在需要使用時才能將高壓電的遮蔽蓋打開。測試高壓電路前，也必須先將電源切斷，待測試棒接妥後，再打開電源。如果有高壓電容，在測試中會充電，因此斷電後，也須另外進行放電步驟。
- (2) 儘可能先熟悉設備中高壓電的位置，這是避免觸電的方法之一，但是在故障的設備中，高壓電可能會亂竄，因此任何地方都有危險性。
- (3) 修理設備時，請在絕緣地板上或是有大塊面積的絕緣材料上工作，並注意是否潮濕或破損。
- (4) 在測量電路時，請習慣用單手操作，另一隻手請放在口袋中且勿接觸機器本身或其它導體，這樣可以避免電流通過心臟。
- (5) 使用 AC 電源設備時，更應注意自身的安全保護。因為 AC 電源會隨著導體電線等傳遞，就算將電源開關撥到 OFF，某些地方仍然會帶電，如變壓器、電源開關等，除非將插頭確實移開插座才能完全斷電。
- (6) 大部分的儀器設備所配用的電源線有 3 個接觸端子，其中一個端子是接地，可以避免設備的外殼帶電，但是也有一些例如家電設備等裝置只配用 2 個接觸端子的電源線，但大部分都會有塑膠外殼作為絕緣保護；當需要維修測試，必須除去塑膠外殼時，請特別注意其危險性。
- (7) 當使用3線電源插頭時，請勿將接地端拆除，因為只有將接地線牢牢接妥才能避免機殼漏電。

特點：

1. 數位按鍵控制與簡單易懂功能
2. 高解析度(20mV,1mA,0.1W,0.1Ω).
3. 具有過載保護功能
4. 9 組可程式記憶模組

5. 4 組即時顯示區
6. 電壓範圍：1V~63V
7. 電流範圍：10mA~15A
8. 最大負載功率：200W
9. 操作模式：定電壓(CV),定電流(CC),定功率(CP) 定電阻(CR)
10. 內建 USB 傳輸介面

前面板說明:



說明:	
①	電源按鍵: 電源開/關。
②	電壓數字: 顯示 CV 的電壓設定值或電壓量測值。
③	電流數字: 顯示 CC 的電流設定值或電流量測值。
④	功率數字: 顯示 CP 的功率設定值或功率量測值。
⑤	阻抗數字: 顯示 CR 的阻抗設定值或阻抗量測值。
⑥	記憶欄位: 顯示目前記憶欄位值。
⑦	狀態顯示: 顯示執行狀態。
⑧	- 接頭: 負端輸入接頭。
⑨	+ 接頭: 正端輸入接頭。
⑩	GND 接頭: 對地接頭。
⑪	CV 按鍵: 進入定電壓設定模式。
⑫	CC 按鍵: 進入定電流設定模式。
⑬	CP 按鍵: 進入定功率設定模式。
⑭	CR 按鍵: 進入定阻抗設定模式。
⑮	0~9: 數值輸入按鍵。
⑯	“.”: 小數點按鍵。
⑰	“↵”: 執行按鍵。
⑱	LOAD 按鍵: 按一下則 LED 發亮, 同時開啓輸入開關, 再按一下則關閉 LED 及輸入。
㉑	SHIFT 按鍵: 執行第二按鍵功能。
㉒	↑ (Auto) 按鍵: ↑: 增加設定數值。 Auto: 按 [SHIFT][↑] 進入自動執行模式。
㉓	↓ (Delay) 按鍵: ↓: 減少設定數值。 Delay: 按 [SHIFT][↓] 進入延遲時間設定模式。

<p>②④ ⇐ (Store) 按鍵:</p> <p>⇐ : 欲變動數值欄位左移一位。</p> <p>Store: 按 [Shift][⇐] 進入儲存設定模式。</p>
<p>②⑤ ⇒ (Recall) 按鍵:</p> <p>⇒ : 欲變動數值欄位右移一位。</p> <p>Recall: 按 [Shift][⇒] 進入恢復設定模式。</p>
<p>②⑥ USB / RS-232 接頭。</p>

背板說明:



說明:
②⑦ 散熱器。
②⑧ 散熱風扇: 8" 24V DC 風扇。
②⑨ 電源插座。
③⑩ 輸入電壓指示。
③① 保險絲蓋。

操作說明:

注意! 如果輸入電壓高於 63 伏或負載大於 200W, EL-820P 會自動關閉負開關, 同時所有 LED 會閃爍, 此時請先關閉電源並移除輸入負載然後重新啓動 EL-820P。

1. 定電壓設定:

按[CV], 數字按鍵, [↵]按鍵設定輸入上限電壓。

例如: 設定的輸入上限電壓為 10.5V, 按[CV][1][0][.][5][↵]。

若輸入電壓大於上限電壓, EL-820 將會將輸入電壓拉下直到等於上限電壓或者負載功率超過 200W。

2. 定電流設定:

按[CC], 數字按鍵, [↵]按鍵設定輸入上限電流。

例如: 設定的輸入上限電流為 3.05A, 按[CC][3][.][0][5][↵]。

若輸入電流小於上限電流, EL-820 將會將輸入電壓拉下直到等於上限電流或者負載功率超過 200W。

3. 定功率設定:

按[CP], 數字按鍵, [↵]按鍵設定輸入上限功率。

例如: 設定的輸入上限電流為 110W, 按[CP][1][1][0][↵]。

4. 定阻抗設定:

按[CR], 數字按鍵, [↵]按鍵設定輸入負載阻抗。

例如: 設定的輸入負載阻抗為 510Ω, 按[CR][5][1][0][↵]。

5. 數值儲存與恢復:

(1) 數值儲存:

按[SHIFT][↵], 數字按鍵, [↵]按鍵將 CH1 與 CH2 的設定值如入目標儲存欄位。

例如: 將 CV/CC/CP/CR 設定值存入記憶欄位 5,

按[SHIFT][↵][5][↵]。

(2) 數值恢復:

按[SHIFT][↵], 數字按鍵, [↵]按鍵將目標儲存欄位內的數值恢復為現有輸出設定。

例如: 恢復儲存欄位 2 的數值, 按[SHIFT][↵][2][↵]。

6. 自動執行與延遲時間:

(1) 自動執行:

按[SHIFT][↑][↵]按鍵將依照儲存欄位 1 到 9 的順序依序自動負載。

例如: 自動執行模式

儲存欄位 1: 定電壓 = 5V Delay time = 10000 秒

儲存欄位 2: 定電壓 = 60V Delay time = 20000 秒

按[SHIFT][↑][↵]

負載:定電壓 = 5V

10000 秒後變更為儲存欄位 2 數值負載定電壓 = 60V

(2) 延遲時間:

按[SHIFT][↓], 數字按鍵, [↵]按鍵設定當前儲存欄位內的延遲時間。

例如: 設定當前儲存欄位內的延遲時間為秒,

按[SHIFT][↓][1][0][0][0][↵]

預設延遲時間為 0 秒。

7. RS-232 or USB 程式:

(1) 插入附件光碟到電腦中並執行。

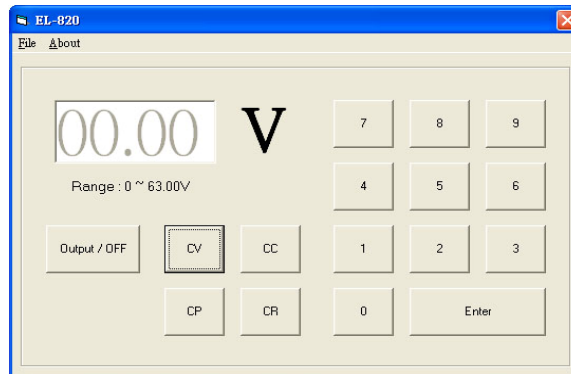
(2) EL-820 程式支援 OS 系統, WINDOW 9X, WINDOW ME, WINDOW XP。

(3) 執行程式後電腦會偵測是否存在適合的連接端, 並詢問使用者是否使用, 若不存在適合的連接端或者使用者皆不使用則會顯示警告並結束程式執行 “**No communication port can use**”, 使用者確認後會顯示所使用的連接端。

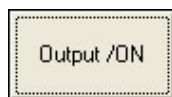


(4) 進入主執行畫面。

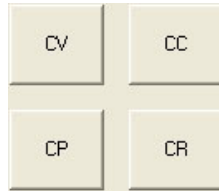
Fig.1



(5) 輸出按鍵(預設值為關閉)，點擊可開啓輸出，每次模式切換則會自動恢復為關閉。



(6) 模式切換按鍵，點擊可切換 CV、CC、CP、CR 四種模式。



(7) 數字按鍵(0~9)，點擊輸入所需數值，數值小數點位置已固定。



(8) 執行按鍵，將模式及使用者欲設定數值輸入到 EL-820。



規格:

功 能		數 值
最大負載	電壓	63V
	電流	15A
	功率	200W
定電壓	檔位	1~63V
	準確度	$\pm(1\%+20\text{mV})$
	檔位	20mV
定電流	檔位	10mA~15A
	準確度: 10mA~1A 1A~6A 6A~15A	$\pm(0.5\%+1\text{mA})$ $\pm(0.5\%+10\text{mA})$ $\pm(1\%+100\text{mA})$
	解析度: 10mA~1A 1A~15A	1mA 10mA
定功率	檔位	1~200W
	準確度	$\pm 1\%+0.2\text{W}$
	解析度	0.1W
定電阻	檔位	0.5~999 Ω
	準確度	$\pm 1\%+0.2\Omega$
	解析度	0.1 Ω
電壓讀數	準確度	$\pm 1\%+50\text{mV}$
	解析度	20mV
電流讀數	準確度	$\pm 1\%+10\text{mA}$
	解析度	10mA
記憶	儲存位址	1~9
延遲時間	檔位	1~999999 sec
	解析度	1sec
保險絲	115V (100~120V)	1.0 A
	230V (220~240V)	0.6 A
電源	100V,110V,120V,220V,240,250V 50/60Hz	

維護：

1. 注意事項：

- (1) 請勿在機器上面放置重物。
- (2) 請勿在機器上面或附近放至發熱物體。
- (3) 請勿將任何細線或針狀物插入散熱風扇孔。
- (4) 請勿拉扯電源線或測試線來移動機器，尤其是供電狀態下。
- (5) 請勿將散熱風扇孔阻擋。
- (6) 機器使用中請勿將上蓋打開。
- (7) 請定期校正機器以保持準確性並保持機器清潔。
- (8) 如果機器未能正常開啓，請確認電源開關是否在“開啓”狀態，或者請檢查電源線，確認電源線正確連接並且電壓亦正確符合機器設定。

2. 更換保險絲：

當機器接上電源並開機後，LED 無法顯示時，請更換保險絲。

- (1) 移去電源線，斷開電源。
 - (2) 以小一字起子掀開保險絲座蓋(在本機電源插座上)。
 - (3) 取出舊的保險絲並換上新的正確保險絲。
 - (4) 蓋回保險絲座。
 - (5) 重新接上電源線，開機即可。
- (註：如機器仍無法正常操作，請與指定之經銷商聯絡。)

3. 清潔：

請保持機器清潔，如需清除灰塵及髒污時，請使用輕軟乾淨的布沾上微量的中性清潔液輕輕的在產品外觀擦拭。

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