

INSTRUCTION MANUAL REGULATED LAB DC POWER SUPPLY PSL SERIES



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CONTENTS

1. INTRODUCTION	- - - - -	1
2. SPECIFICATION	- - - - -	2
2-1. General	- - - - -	2
2-2. Constant Voltage Operation	- - - - -	3
2-3. Constant Current Operation	- - - - -	3
2-4. Indicator Meter	- - - - -	3
2-5. Insulation	- - - - -	3
3. PRECAUTIONS BEFORE OPERATION	- - - - -	4
3-1. Unpacking the Switching Power Supply	- - - - -	4
3-2. Checking the Line Voltage	- - - - -	4
3-3. Environment	- - - - -	5
3-4. Equipment Installation and Operation	- - - - -	5
4. OPERATION INSTRUCTIONS	- - - - -	8
4-1. Precaution	- - - - -	8
4-2. Setting Current Limit	- - - - -	10
4-3. Constant Voltage / Constant Current Crossover	- - - - -	
Characteristic	- - - - -	11
4-4. Operation Mode : Voltage Operation Mode	- - - - -	12
4-5. Remote Sensing	- - - - -	12
5. MAINTENANCE	- - - - -	14
5-1. Fuse Replacement	- - - - -	14
5-2. Internal Adjustment	- - - - -	14
5-3. Cleaning	- - - - -	16

1. INTRODUCTION

The Advantek 'PSL' series DC power supplies are a light weight and small sized power supply using switching technology.

These supplies provide to a load 1080 Watts

The output voltage is controlled by two variable resistors with coarse and fine regulation for more handy and precise adjustment.

Features :

- Smaller and lighter compared with the units controlled by output of power in series
- Excellent stability of voltage.
- Constant voltage and current operation
- Voltage compensate function is line drop sense at load
- 3 digit LED digital display for voltage and current
- Coarse and fine voltage adjustment

2. SPECIFICATIONS

2-1. General

Main Supply : AC230V±10% 50/60Hz

MODEL	MAX. RATING	
	Voltage	Current
PSL 1290	12V	90A
PSL 1860	18V	60A
PSL 3630	36V	30A
PSL 6018	60V	18A

Input Rating : 1500 Watts / 2800 VA
Fuse Style & Rating : -- T15A 250V

Weight : About 7.5kg

Dimension : 210 x 163 x 430 mm

WARNING: Voltage over 60V DC is a lethal shock hazard to the user.
Be careful when connecting power supplies in series to achieve voltage higher than 60V DC totally or 60V DC between any connection And earth ground.

Operation Environment : Indoor use
Altitude up to 2000m

Operation Temperature & Humidity : 0℃ to 40℃, <80%
Storage Temperature & Humidity : -15℃ to 70℃, <70%
Standard Accessory : Instruction Manual, Spare Fuse
AC Power cord

2-2. Constant Voltage Operation

(1) Output Voltage ranges from 0 to rating voltage with continuous adjustment.

(2) Voltage regulation : line regulation ≤ 50 mV
load regulation ≤ 50 mV

(3) Recovery time $\leq 500\mu s$ (50% load change, minimum load 0.5A)

(4) Ripple & Noise ≤ 50 mV

(tested by 20MHz oscilloscope)

2-3. Constant Current Operation

(1) Output current ranges from 0 to rating current with continuous adjustment

(2) Current regulation : line regulation \leq
load regulation \leq

2-4. Indicator Meter

(1) Voltage

Display : 3 digits 0.4" Red LED display

Accuracy : $\pm(0.5\%$ of rdg + 2 digits)

(2) Current

Display : 3 digits 0.4" Red LED display

Accuracy : $\pm(1.0\%$ of rdg + 8 digits)

2-5. Insulation

Between Chassis and Output Terminal : $\geq 20M\Omega$ (DC500V)

Between Chassis and AC Cord : $\geq 30M\Omega$ (DC500V)

3. PRECAUTIONS BEFORE OPERATION

3-1. Unpacking the Switching Power Supply

The instrument has been fully inspected and tested before shipping from the factory. Upon receiving the instrument, please unpack and inspect it to check if there is any damages caused during transportation. If any sign of damage is found, notify the bearer and/or the dealer immediately.

3-2. Checking the Line Voltage

The instrument can be used with line voltages shown in the table below. Before connecting the power plug to an AC line outlet, make sure the voltage selector of the rear panel is set to the correct position and the proper fuse installed corresponding to the line voltage. The unit may be damaged if connected to the wrong AC line voltage.

WARNING : To avoid electrical shock, the power cord protective grounding conductor must be connected to ground.

When line voltages are changed, replace the required fuses shown below.

Line Voltage	Range	Fuse
230V	207-253V	T15A 250V

WARNING : To avoid personal injury, disconnect the power cord before removing the fuse holder.

3-3. Environment

The normal ambient temperature range of this instrument is from 0°C to 40°C (32°F to 104°F). Operation of the instrument above this temperature range may cause damage to the circuits. Do not use the instrument in a place where strong magnetic or electric field exists as it may disturb the measurement.

3-4. Equipment Installation and Operation

Ensure there is proper ventilation for the vents in the PSL power supply case. If this equipment is used in a manner not according to the specification, the protection provided by the equipment may be impaired.

WARNING : This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

FRONT & REAR PANEL

- (1) Power Switch : ON/OFF switch
- (2) Volt meter : Indicating the output voltage
- (3) Current meter : Indicating the output current
- (4) CV Indicator : Lights when the power is on and constant voltage operation
- (5) CC Indicator : Lights when in constant current operation
- (6) Current Adjust : For the adjustment of the output current
- (7) Voltage fine : For the fine adjustment of the output voltage
- (8) Voltage coarse : For the coarse adjustment of the output voltage
- (9) "+" output terminal : Positive polarity (RED)
- (10) "GND" terminal : Earth and chassis ground (BLACK)
- (11) "-" output terminal : Negative polarity (WHITE)

* The main output terminal are on the rear panel.

And front panel of terminal used for monitoring by the used output current less than 5 Ampere.

- (12) Short Bar
- (13) Sensing ON/OFF : Sensing on/off switch
- (14) S+ sense terminal : A positive input voltage remote sense terminal
- (15) S- sense terminal : A negative input voltage remote sense terminal
- (16) Fuse Holder
- (17) Power input terminal
- (18) Fan : Cooling Fan

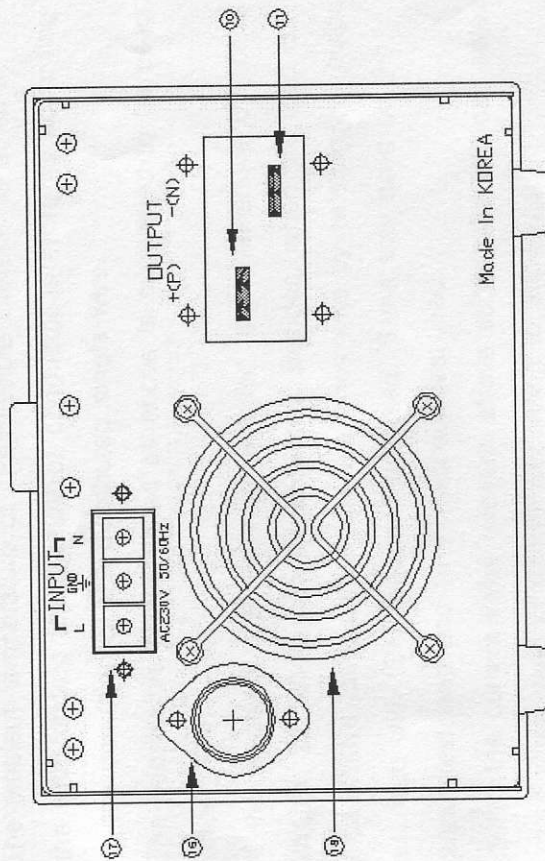
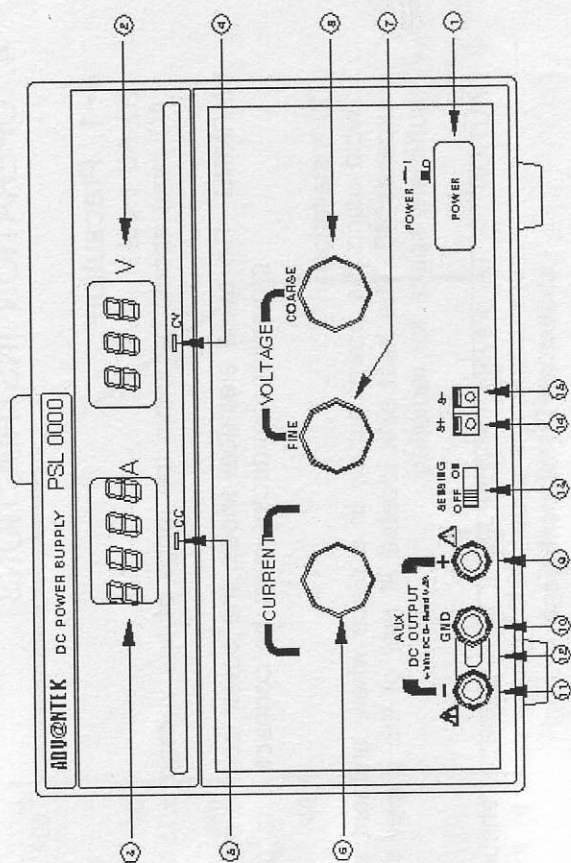


Figure 3-4 Outline view

4. OPERATION INSTRUCTIONS

4-1. Precaution

(1) AC input

AC input should be within the range of line voltage $\pm 15\%$ 50/60Hz.

WARNING :To avoid electrical shock, the power cord protective grounding conductor must be connected to ground.

(2) Installation

Avoid using the power supply in a place where ambient temperature exceeds 40. The heat sink located at rear of the power supply must sufficient space for radiation.

CAUTION : To prevent the instrument from damage, ensure the working environment is under 40°C, please refer to the drawing shown as (3) of next page.

(3) Output Current / Temperature Cure Line Chart :

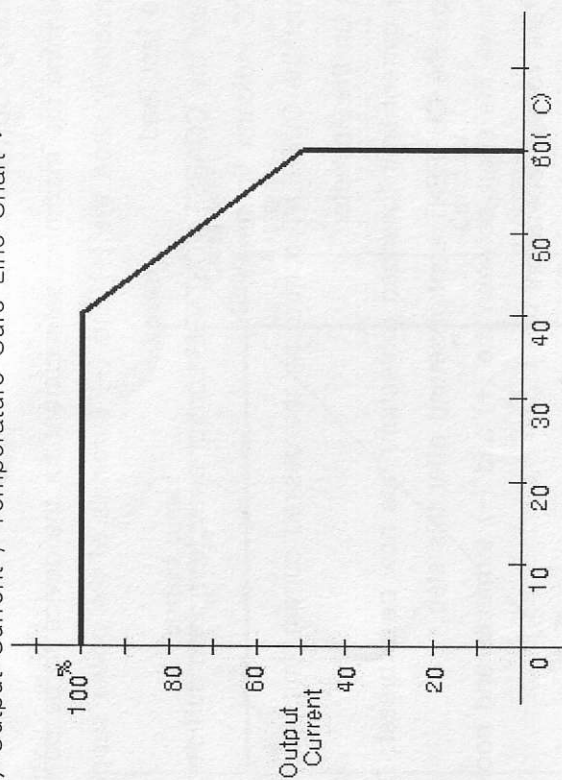


Figure 4-1 Environment Temperature

Remark :

1. The ambient temperature of "Permissible Current" is at 40°C, the withstanding temperature of conductor is at 105°C according to the condition of the distributed single wire.
2. The permissible current listed as above is suggested to be used under 70%.
3. If the feedback test leads are in need, the level above UL (CSA) AWG24, 22, 20.....can be accepted. Besides, when the load is a capacitive load, please use the twine wire by twisting (+) output test lead with (S+) feedback test lead. Same way used on (-) output test lead and (S-) feedback test lead.
4. When the current value exceeds above suggestive list, can select more wires used in parallel according to above list.

4-2. Setting Current Limit

- (1) Determine the maximum safe current for the device to be powered.
- (2) Temporarily short the (+) and (-) terminals of the power supply together with a test lead.
- (3) Rotate the COARSE VOLTAGE control away from zero sufficiently to have the CC indicator lightened.
- (4) Adjust the CURRENT control for the desired current limit. Read the current value on the Ammeter.
- (5) The current limit (overload protection) has now been preset. Do not change the CURRENT control setting after this step.
- (6) Remove the short between the (+) and (-) terminals and hook up for constant voltage operation.

4-3. Constant Voltage / Constant Current Crossover Characteristic

The working characteristic of this series is called a constant voltage /constant current automatic crossover type. This permits continuous transition from constant current to constant voltage modes in response to the load change. The intersection of constant voltage and constant current modes is called the crossover point. The figure of next page shows the relationship between this crossover point and the load.

For example, if the load is such that the power supply is operating in the constant voltage mode, a regulated output voltage is provided. The output voltage remains constant as the load increases, up until the point where the preset current limit is reached. At that point, the output current becomes constant and the output voltage drop is proportioned to further increases in load. The crossover point is indicated by the front panel LED indicators

The crossover point is reached when the CV indicator goes out and the CC indicator is ON.

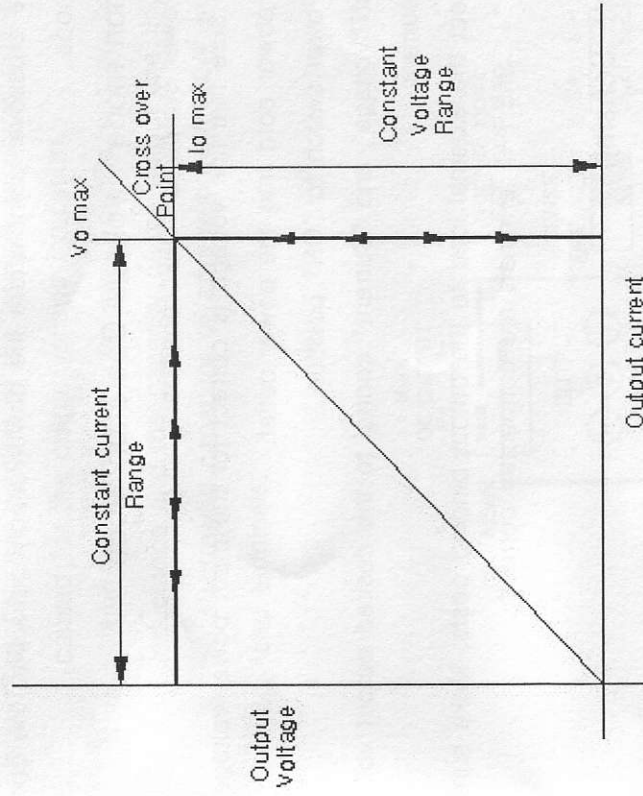


Figure for 4-3 : Constant Voltage / Constant Current Characteristic

Similarly, crossover from the constant current to the constant voltage mode automatically occurs from a decrease in load, a good example of this would be seen when charging a 12 volt battery. Initially, the open circuit voltage of the power supply may be preset for 13.8 volts

A low battery will place a heavy load on the supply and it will operate in the constant current mode, which may be adjusted for a 1 amp charging rate. As the battery becomes charged, and its voltage

approaches 13.8 volts, its load decreases to the point where it no longer demands the full 1 amp charging rate.
This is the crossover point where the power supply goes into the constant voltage mode.

4-4. Operation mode : Voltage Operation Mode

- Set Power switch to "OFF" position.
- Make sure that line voltage is correct for the input power voltage.
- Plug power cord into the power outlet.
- Set Power switch to "ON" position.
- Adjust "Voltage" and "Current" control to the desired output voltage and current.
- Connect the external load to the output binding posts. Make sure both "+" and "-" terminals are connected correctly.

4-5. Remote Sensing

- When a load is connected to this unit, the load terminal voltage fluctuates according to the voltage drop caused by the load terminal contact resistance and the connection wire conductor resistance. When fine setting of the load terminal voltage is required, insert connection cords into the panel output sensor terminals (+S) and (-S), connect them as shown the following Figure, and execute remote sensing.

- This unit can compensate remote sensing operation, do not set the sensing switch to ON and reverse polarity. When this switch is set to ON, the contact of the internal sensor is opened and an error is caused for the output voltage indication.

Note : When the load is too far away, oscillations may be caused by the inductance and the capacity of the output line. In this case, connect an electrolytic capacitor of approximately 100 μ F in parallel to the load terminals.

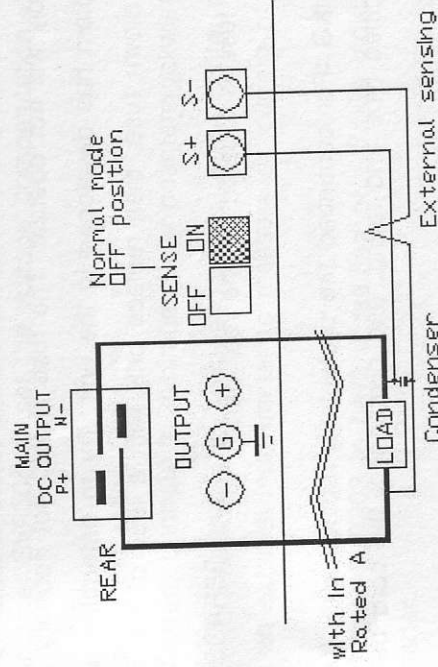


Figure for 4-5-1 : Remote Sensing

5. MAINTENANCE

WARNING:The following instructions are used by qualified personnel

only. To avoid electrical shock, do not perform any servicing other than the operating instructions of the manual unless you are qualified to do so.

5-1. Fuse Replacement

If the fuse blown, the CV or CC indicators will not light and the power supply will not operate. The fuse should not normally blow unless a problem has developed in the unit. Try to determine and correct cause of the blown fuse, then replace only with a fuse of the correct rating and type.

The fuse is located on the rear panel.

WARNING :For continued fire protection, replace with 250V fuse of the specified type and rating, and disconnect the cord before replacing fuse.

5-2. Internal adjustments

The unit was accurately adjusted at the factory before shipment. So, readjustment is suggested only when the accuracy of circuit is affected by the repair, or when you have the reason to believe that the unit is out of accuracy. The recommended calibration device is a multi-meter with an accuracy of $\pm 0.1\%$ dcV or better.

If readjustment is required, please proceed the following procedure.

(1) Adjustment of the Rating Voltage

- A. Connect an accurate ($\pm 0.1\%$) external multi-meter to measure the dc voltage at output terminals of the power supply.
- B. Set the COARSE and FINE Voltage controls to maximum (fully clockwise).
- C. Adjust trimmer SVR301 for a reading on the multi-meter to be 18.50V for PSL-1860, 36.5V for PSL-3630, and 60.5V for PSL-6006, 12.5V for PSL-1230.
- D. Adjust trimmer pot SVR401 to set the reading value of voltmeter as same as the one shown on the multi-meter.
- E. Adjust trimmer SVR304 to set the voltage compensation value.

(2) Adjustment of the rating Current

- A. Set the Current controls to minimum (fully counterclockwise).
- B. Set the COARSE and FINE Voltage controls to the center position.
- C. Connect an external multi-meter to measure dc current of output terminal.
- D. Adjust trimmer SVR302 to have a reading of $-0.00A$ indicated on the current meter.
- E. Set the Current controls to maximum (fully clockwise).
- F. Adjust trimmer SVR303 for a reading on the multi-meter to be 60.1A for PSL-1860, 30.1A for PSL-3630, and 18.1A for PSL-6018, 90.1A for PSL-1290.
- G. Adjust trimmer SVR501 to set the reading value of Amp-meter as the same as the one shown on the multi-meter.

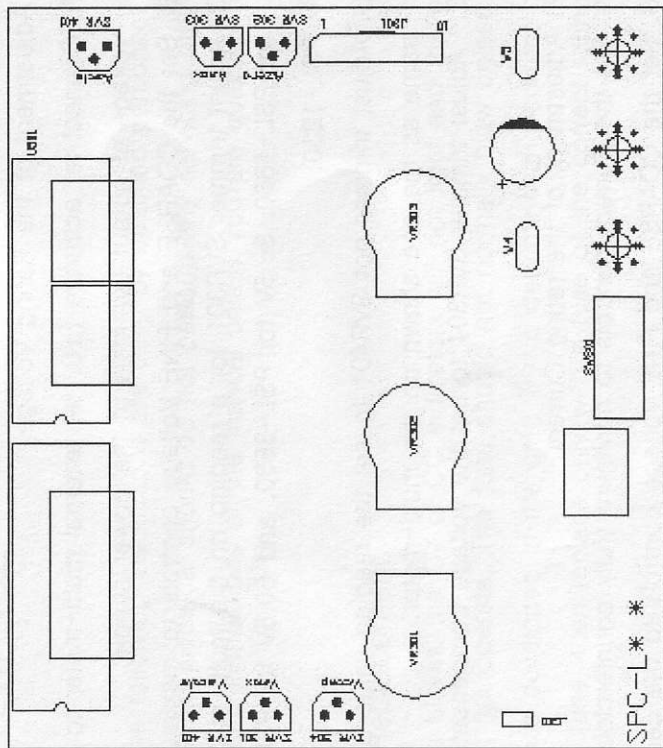


Figure for 5-2 : Internal Adjustment

5-3. Cleaning

To clean the power supply, use a soft cloth dampened in a solution of mild detergent and water. Do not spray cleaner directly onto the instrument, since it may leak into the cabinet and cause damage. Do not use chemicals containing benzene, toluene, xylene, acetone, or similar solvents. Do not use abrasive cleaners on any portion of the instrument.