ATTEN

CP Series

Programmable Power Supply

English Operation Manual

SHENZHEN ATTEN TECHNOLOGY CO., LTD

Contents

Copyright Information

The design of this product (including internal software) and its accessories is under the protection of relevant state laws. Any violation of the relevant rights of our company will be subject to legal sanctions. Users shall consciously abide by the relevant state laws when using this product.

Read the precautions in this Manual

If you purchase the power supply without related functions, please ignore the description of related functions, such as the communication, external control, etc.

Description of Common Icons

Thank you for using our products. Before using the product, please read this manual carefully and pay attention to the relevant warnings and cautions mentioned in this manual.

⚠	Warn you to prevent possible electric shock.
⚠	Warn you to prevent possible personal injury.

Safety Precautions

Precautions for use

[Warning:] Use and operation of the product while ignoring the operating methods in this Operation Manual might damage the protection function of the product and even cause personal injury;
Before use, users should have basic electrical knowledge and fully understand the content of the Manual and are confirmed safe. If the operator does not have related electrical knowledge, personal injury might be caused during the operation of the machine, so please use the product under the supervision and guidance of the person who has related electrical knowledge.
Please use the product within the specified scope of application. The product should only be used in an industrial product environment.
When the product is connected to the mains supply, please use the attached power line. This product complies with IEC over-voltage class-II standard instrument (the equipment that obtains energy from fixed equipment).
Please be sure to use the power supply within the rated input power supply voltage range.
The fuse of the product on which the fuse holder is installed on the outside can be replaced. When replacing the fuse, please use the fuse that conform to this product's specification and performance. For details, please refer to corresponding pages of the Operation Manual.
The internal parts of instrument might imply a risk on personal safety. Please do not dismantle the shell without permission.

This product complies with IEC standard Safety Class-I instrument (the instrument equipped with the protective conductor port for grounding). To prevent electric shock, please be sure to connect the protection port of the product to the grounding wire which meets the requirements of electrical equipment technical standard D.
In the event of product fault or anomaly, please stop using it immediately, and disconnect the external input circuit of power supply.
Please do not dismantle and change the product without permission. If you need to change it, please contact our dealer or our company.

Precautions for routine maintenance
To guarantee continuous and high−performance operation of the product, it is advised to repair and inspect the product regularly.
To prevent electric shock, before conducting maintenance and inspection, please ensure to pull out the plug or disconnect the power input circuit.
Please check regularly whether the outer layer of power line is damaged.
When cleaning the display screen surface, wipe it gently with soft cloth dipped with clean water.
The product has been strictly calibrated before delivery. To guarantee the performance of product, it is advised to calibrate it regularly. The product should be calibrated by the dealer or relevant personnel of our company.
If the product needs to be modified or adjusted, it shall be performed by our company's technicians.
Please do not tear up the warning labels attached on the outside of the product.
Precautions for product installation.

Do not use the product in flammable environment.
Do not put the product at high temperature or in the places where it is exposed to direct sunlight; please do not put the product near the heat generating equipment and heating equipment, and places with sudden temperature changes.
Please do not install the product near high−humidity places such as water heaters, humidifiers, etc.
The product might be condensed within the operating temperature range. In such case, please do not use the product before it is completely dry.
As the product is designed and manufactured according to indoor use, please ensure to use it indoors.
Please do not put the product in corrosive environment such as environment riich in sulfuric acid content. Otherwise, it will lead to corrosion of internal conductor or poor contact of connector, and may cause machine fault or fire.
Please do not put the product in dusty locations.
Please do not put the product in locations with poor ventilation, and ensure the surroundings of the product are well ventilated during the use.
Please do not put the product on any object, or on tilted surfaces or vibrating places.
Please do not use the product in the places where there is strong magnetic field or the waveform of input power supply is seriously disrupted and the noise is severe.

Precautions when moving the equipment

Disconnecte the input power supply before moving the product.
Dismantle all connecting wires of the product.
Use safe packaging materials in transit.
Attach the operation manual.

Disclaimer

We will take no responsibility for the damage of product or any personal injury or property damage incurred due to the user's failure to operate according to this Operation Manual in the process of use.

This manual is elaborately organized, compiled and released by SHENZHEN ATTEN TECHNOLOGY CO., LTD. according to the latest product features. Please contact us if you have any question or find any mistake. Besides, the Manual will be subject to changes in future improvements of the product and this Manual without prior notice. .

[Note:] To avoid damaging the machine and in order to keep the safety of the operating environment, please read the Operation Manual carefully before use, and keep it properly for future reference.

Packing List

Power supply host	1 unit
Power line	1 piece
Operation Manual	1 book

Functional Characteristics

Support multiple communication interfaces: RS232, USB; communication control supports IEEESTD488.2−1992 and SCPIspecification1999.0.

With the function of presetting multiple groups of set value, at most three groups of output set values (combination of voltage and current) can be saved, and it is not required to reset every time before use, thus facilitating user's quick operation.

Support external direct control, convenient for industrial management.

Have the line loss compensation function (restricted to the output line loss voltage within 0−4V), and ensure the voltage outputted to the load end achieves the user's expected effect.

With multiple protection function (under−voltage protection, overvoltage protection, over−current protection, overheating protection, and short circuit protection), ensure that both product and personal safety are maintained.

Layout and Control Panel

Preview of front panel and introduction to operating keys of panel

CP600
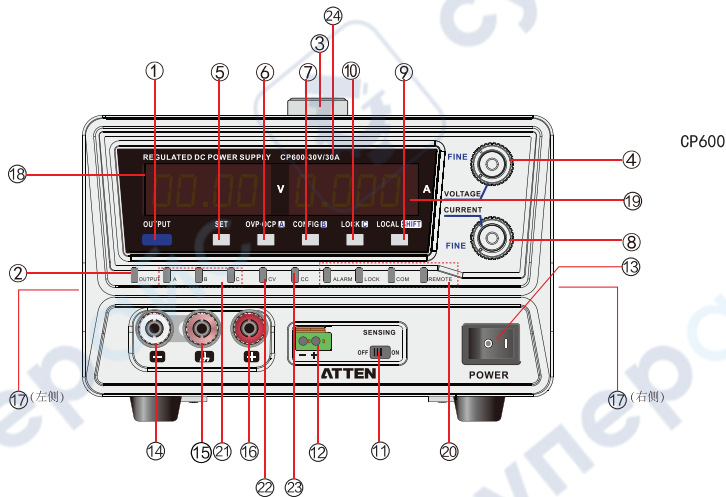
Description of key functions on front panel:

No.	Part Name	Functional Description
①	OUTPUT key	ON/OFF key of power output
②	Output status indicator lamp	It will be lit on only when outputting power supply (green)
③	Handle	The handle used to move the whole machine
④	VOLTAGE rotary knob	Adjust the set value of voltage, or select the set item number of system configuration
		Finely adjust the voltage (press LOCAL and then adjust VOLTAGE rotary knob) (additional function)
⑤	SET key	Confirmation key for set value of voltage and current (with built-in LED lamp)
		Remove the protection state (press LOCAL and then press SET key); (additional function)
⑥	OVP · OCP key	Set the trigger value of over-voltage protection and over-current protection.
		Save the presetting function or recall the position A (additional function)
⑦	CONFIG key	Enter the system settings.
		Save the presetting function or recall the position B (additional function)

⑧	CURRENT rotary knob	Adjust the set value of current, or select the set item value of system configuration
		Finely adjust the voltage (press LOCAL and then adjust CURRENT rotary knob) (additional function)
⑨	LOCAL key	Switch between LOCAL / remote two states.
		When used in combination with other keys, it enables additional key functions
⑩	LOCK key	Switch between enabled and disabled state of locking function.
		Save the presetting function or recall the position C (additional function)
⑪	SENSING switch*1	Switch for line loss compensation function (line loss sampling compensation)
⑫	SENSING interface	Interface for line loss compensation function
⑬	POWER switch	Machine power switch; press (I) side to turn on the power supply, and press (o) side to turn off the power supply.
⑭	DC output cathode port	Connect the load cathode
⑮	Chassis port	Connect the output port (cathode) and earth port
⑯	DC output anode port	Connect the load anode
⑰	Air suction port	Air suction port (used for internal cooling)
⑱	Voltage display area	Display the voltage value, set item number of system, and alarm symbol.
⑲	Current display area	Display the current value, set item value of system, and the causes of alarm.
⑳	Status indicator lamp	ALARM: It will be lit on (red) when the protection function is triggered; LOCK: It will be lit on (green) when the panel is locked. REMOTE: It will be lit on (green) when the remote sensing control is enabled;
㉑	Preset key status indicator lamp	A: It will be lit on (green) when saving / recalling the preset position A; B: It will be lit on (green) when saving / recalling the preset position B; C: It will be lit on (green) when saving / recalling the preset position C;
㉒	CVLED	It will be lit on (green) when outputting direct voltage.
㉓	CCLED	It will be lit on (red) when outputting direct current.
㉔	Power supply machine model	CP series specific model

*1 Only the machine with the rated output voltage of 60V and below has the compensation function.

Preview of Rear Panel and Introduction to Each Part

Label on at the rear of machine

Product serial number
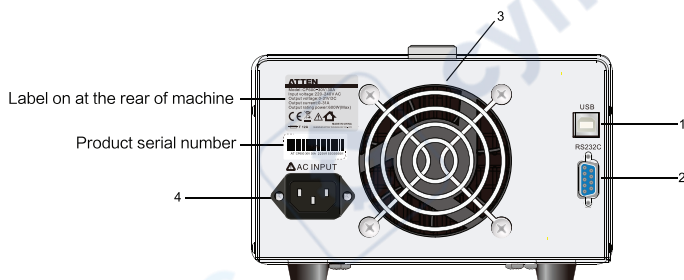
No.	Part Name	Function
1	USB interface	Interface for connecting USB cable
2	RS232C interface	Interface for connecting RS232C cable
3	Exhaust port	Exhaust port (used for cooling)
4	Input power line interface	AC input interface

Preparatory Work before Use:

Precautions for connection of power line
[Warning:] This product complies with IEC over-voltage class-II standard instrument (the energy-consuming instrument that obtains energy from fixed equipment), so beware of electric shock.
[Warning:] This product complies with IEC standard Safety Class-I instrument provided with protective conductor parts. To prevent electric shock, be sure to connect the machine to a ground terminal.

If the power line in the accessories cannot be used due to its shape or other reasons, please contact the dealer or ATTEN to obtain new power line.
Please do not use the attached power line of this instrument on other products
Steps for connecting power line
1. Confirm whether the connected power line is suitable for the input socket of the product;
2. Confirm the power switch is in OFF state;
3. The external input power line has been connected to AC input port of rear panel;
4. Connect the power line plug to the power supply circuit;
Turn on the power switch
[Note:]Through the system settings, the user can set the operating parameters of the machine after the power switch is turned off. If the user sets the output of system startup to ON, and does not set correct OVP and OCP value, the user's loading equipment might be damaged when turning on the machine switch.
When the user uses the machine for the first time, after turning on the power switch, the machine will be started according to the factory settings. After the machine is used for the second time, it will be started according to previous settings.

Steps for Turning on the Machine Switch and Machine Output

1. Confirm whether the power line is connected correctly;
2. Put the machine switch in ON (I) position;
After all LEDs are lit on once, the voltage display unit and current display area display the following at an interval of 1 sec.: rated voltage, rated current and version information. After all the above contents are displayed, the machine will enter the standby state (the output value is displayed).

Display rated voltage and rated current

Display version information

※ The above is diagram, and the real object will prevail.

[Note:] When turning on the power switch, it will generate impact current. When several machines are used, if the power switches are set to ON at the same time, please pay attention to the power supply circuit.
Turn off the machine switch
Put the machine switch in OFF (O) position;
The product can save various parameter settings (except ON/OFF state of OUTPUT) of the machine before the system is shut down, but some set parameters cannot be saved.
[Note:] Please do not frequently switch ON/OFF state of switch and ensure the time interval of switching is greater than 10sec; frequently switching the machine switch might damage the machine easily.

Precautions for connection of loads:
When connecting the following loads, output instability might occur, so please pay attention to the loads through which the peak and pulse current passes.
The voltage and current value displayed by the product is average value. The measured value of current displayed on the panel might be less than the set value, and the actual peak current is greater than the set value. Then the output voltage of instantaneous direct current action will become small. For such type of load, it is required increase the set value of direct current, or increase the capacitance.

Set value of direct current
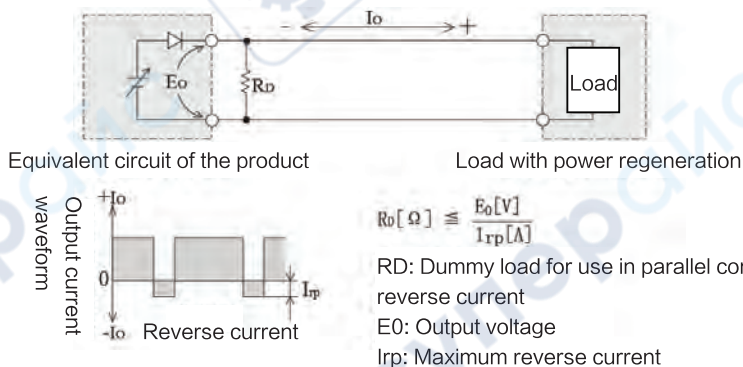Displayed value of current (average value)

Peak load current
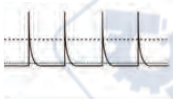
Set value of direct current
Set value of direct current
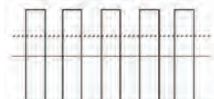
Pulse load current

Load which generates reverse current to power supply
This product cannot absorb the reverse current from the load. When the product is connected to the load which might generate reverse current (inverter, converter, transformer, etc), the output will become unstable and cause fault. For such type of load, a shown in the figure below, connect the resistor (RD), shunt the reverse current, but the current flowing to the load will decrease by Irp.

Equivalent circuit of the product　　　　　　　Load with power regeneration

Output current waveform

Reverse current

$$R_D[\Omega] \leq \frac{E_0[V]}{I_{rp}[A]}$$

RD: Dummy load for use in parallel connection of reverse current
E0: Output voltage
Irp: Maximum reverse current

[Note:] Please select the resistor RD with enough rated power. If the rated power of resistor in the circuit is not big enough, RD might be burnt down.

Load with stored energy

When connecting the load with energy storage effect, the current might flow to the internal circuit of the product from the load, and it might damage the product or reduce the service life of the load. For such type of load, as shown in the figure below, connect it in series to a diode (in the position of DRP) to prevent reverse current between the product and load.

Drp: Diode for prevent reverse current

The product　　　　　Load with stored energy
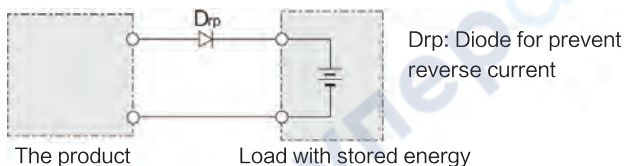
[Note:]

To prevent the product and load, please use Drp which conforms to the following standards.

Reverse voltage tolerance: Over twice the rated output voltage of the product.

Forward current capacity: Three to ten times of rated output current of the product.

Please use low-loss elements only.

As Drp can generate heat, please ensure proper heat dissipation. If the heat dissipation is not good, Drp might be burnt down.

Reverse current from external voltage source

When external voltage source is directly connected to the product, due to the reverse current generated by internal voltage divider current of the product, the product might be damaged, and the service life of load might be reduced. For such type of reverse current, it is required to connect the diode for preventing reverse current to the wire on the load or use the switch or other element to disconnect the load from the product with the wire.

The reverse current when connecting the external voltage source may be different according to POWER OFF or OUTPUT OFF state. The reverse current is small when the output voltage is small, and there is almost no reverse current near the voltage of 0V.

Wire for connecting load

[Warning:]

Please use the wire with enough current capacity (meeting the requirements of rated output current of the product) to connect the loads.

High temperature might be generated near the output end, and the heat resistance temperature of external insulating layer of wire should be greater than 85℃.

Beware of the danger of electric shock.

Please use the wire with the rated voltage higher than the to-ground insulation voltage of the product to connect the load.

The allowed current of wire is related to the maximum allowable heat resistance temperature of insulator.

The temperature of wire is subject to the electric heat temperature caused by the current. When the heat tolerance temperature of insulating layer of wire is low, the surrounding ambient temperature is greater than 30℃, the wires are bundled and the heat dissipation effect is poor, the capacity of output current should be lowered appropriately.

Controlling the noise

When arranging the wires with the same heat resistance temperature, the wires should be set apart as much as possible so as to radiate the heat and increase the flow of wire current. However, when the output line (anode) and output line (cathode) are close to each other or the wires are arranged in bundles, it will facilitate elimination of noise.

Restriction of line loss compensation function

Owing to the resistance of wire, the longer the wire is or the higher the current is, the bigger the voltage drop will be , and there will be more the reduction of voltage applied to the load is. For such type of voltage drop, the maximum automatic induction voltage compensation of the product is 1.2V. If the voltage drop exceeds such value, please select the wire with big sectional area.

Connect the output port.

[Warning:]
Beware of the danger of electric shock.
When touching the output port, put POWER in OFF position.
Connecting steps:
1. Please put POWER in OFF position.
2. Connect the crimping terminal to the load wire.
3. Dismantle the rotary knob on output port cover, and connect the load to the output port with the wire.
4. Install (Tighten) the rotary knob on output port cover.

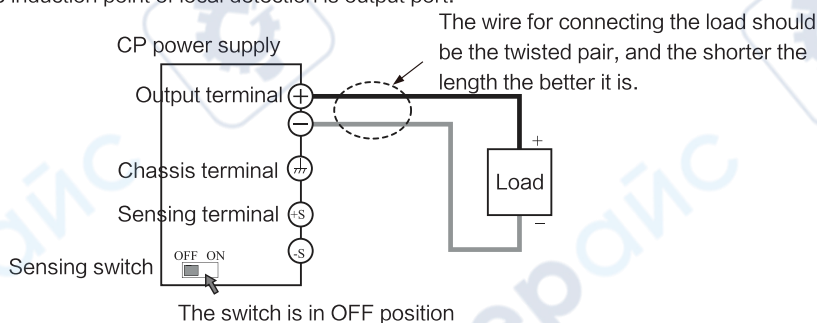The output port diagram of the machine with rated output voltage of 30V and 60V:

Output port

Rotary knob

Automatic line loss compensation function

The line loss compensation function of the product falls into two types, namely, local compensation function and remote sensing compensation function. The product is set to local sensing when leaving the factory.
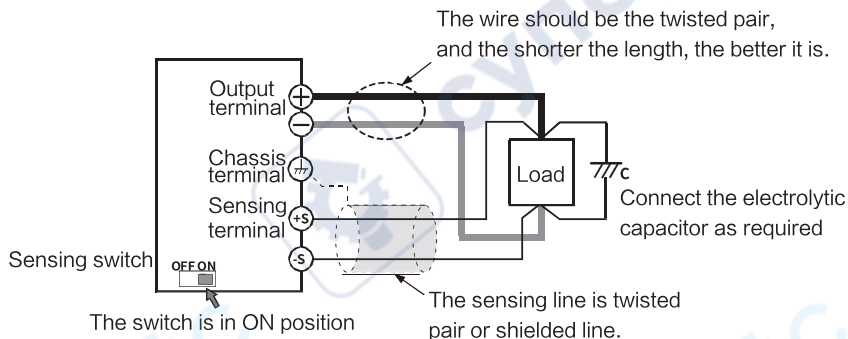
Local induction compensation

Apply when the wire for load is short. The local compensation function cannot be used to compensate the voltage drop of the wire for load. Therefore, please use such function when the load current is small and it is not required to consider the voltage variation of load. The induction point of local detection is output port.

The wire for connecting the load should be the twisted pair, and the shorter the length the better it is.

CP power supply
Output terminal
Chassis terminal
Sensing terminal
Sensing switch
OFF ON
Load

The switch is in OFF position

Remote sensing compensation

Apply when the wire for connecting the load is long. As the user reduces the impact of voltage drop caused by wire resistance, the actual output voltage of load end is stable. The maximum remote line loss compensation of the product is 1.2V. Please select appropriate wire to prevent the compensation of wire voltage drop from exceeding the maximum compensation voltage. In the remote line loss compensation, the voltage of line loss compensation point (load end) cannot exceed the rated output voltage. When line loss sensing compensation operates near the maximum output voltage, the output of output port will be restricted to the maximum output voltage (105% of rated output voltage). In the place of sensing point (load end), it might be required to add the electrolytic capacitor. To reduce the impact of noise, please use the twisted pair, or two−core shielded wire. When using the shielded wire, please connect the shield to the earth line of product or load.

The wire should be the twisted pair, and the shorter the length, the better it is.

Output terminal

Chassis terminal

Sensing terminal

Load

Connect the electrolytic capacitor as required

Sensing switch

OFF ON

The switch is in ON position

The sensing line is twisted pair or shielded line.
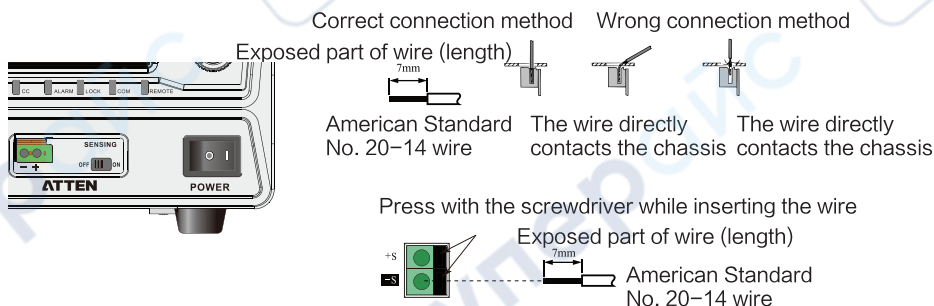
Connect the sensing line

[Warning:]

Connecting the sensing line arbitrarily might cause electric shock and damage of internal circuit.
Before connecting the sensing line, put POWER in OFF position.
Please use the wire with the rated voltage higher than the to−ground insulation voltage of the product. For the exposed shielding part, protect it with the withstanding voltage insulation sleeve with the rated voltage greater than the to−ground insulation voltage of the product.

[Note]
If the sensing line comes off, the output voltage of load end will become unstable, and will apply extremely high voltage to the load. If setting appropriate OVP trigger point, it can be triggered through OVP to prevent extremely high output voltage. When the line loss sensing compensation is not used, please switch to local sensing.

Correct connection method   Wrong connection method

Exposed part of wire (length)

7mm

American Standard No. 20−14 wire

The wire directly contacts the chassis

The wire directly contacts the chassis

CC   ALARM   LOCK   COM   REMOTE

SENSING

OFF   ON

+   −

ATTEN

POWER

Press with the screwdriver while inserting the wire

Exposed part of wire (length)

7mm

+S

-S

American Standard No. 20−14 wire

Steps for connecting the line loss compensation line:
1. Put the power switch in OFF position;
2. Set the line loss sensing switch of front panel to ON;
3. Remove the wire sheath, connect cathode of sensing line to "−", and connect the anode to "+".
4. Put the power switch in ON position again.

[Note:] If the wire inductance is big, the following circumstances may occur:
①Generate oscillation. Due to the phase shift caused by the inductance and capacitance of wire, the longer the wire of load, the easier it will be to cause vibration.
②Changes in output. In case of rapid changes of pulse of load current, due to the inductance of wire, the output voltage will become high.
The user can connect the wire of load through the rotary knob, and the inductance will become small and the machine will become stable; if the situation cannot be improved, connect the electrolytic capacitor to the load end. Requirements for electrolytic capacitor: capacity: 0.1μF~100μF; voltage requirement: 120% of the rated output voltage of the product.
[Note:] When mechanical switch is connected between the product and load
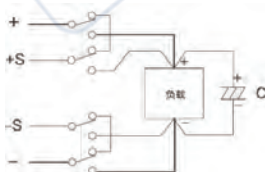
As shown in the above figure, if you want to use the line loss compensation function, the mechanical switch must be put in "ON" state. Before switching the mechanical switch, the OUTPUT (output switch) or POWER switch must be set to the closed state.

Basic Function Operation:

Display of measured value and set value
When displaying the current and voltage, there are two types of values: measured value and set value; the current and voltage display area can display the system parameters in addition to the voltage and current.

Display of measured value:

Current output voltage and output current. In such state, the SET key is in off state. Even when displaying the measured value, it is also allowed to change the output voltage and set the output current.

Display of set value:

Press SET key, and the LED (SET) will be lit on, and will display the current set value of output voltage and current. Press SET key once again, and it will display the measured value. When recalling the preset value, the panel will display the preset value.

Display of set value of over-voltage / over-current protection:

Press OCP / OVP key, and the LED (OCP / OVP) lamp will be lit on and will display the current trigger value of over-current and over-voltage protection.

Adjustment of parameters
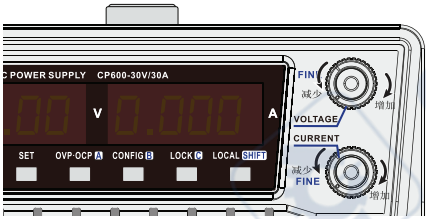
Rotate the voltage rotary knob, to change the voltage value; rotate the current rotary knob, to change the current value.
Regardless of the set state (ON/OFF) of OUTPUT (output), the valves can be changed.

Fine adjustment:

The user can make fine adjustment by pressing and holding (not releasing) SHIFT key and then adjust the voltage rotary knob or current rotary knob; in the fine adjustment, the displayed value might not change, which is because the adjustment value does not achieve the minimum precision of display; the table below shows the change value of each step in fine adjustment:

Rough adjustment: When the user needs to adjust the parameters quickly, rotate the rotary knob and the values will be adjusted in normal adjustment speed.

Output ON/OFF

|		Rough Adjustment	Fine Adjustment
ON	Current	100mA	1mA
	Voltage	100mV	1mV
OFF	Current	100mA	1mA
	Voltage	100mV	10mV
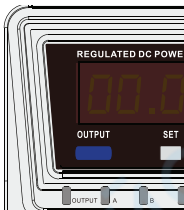
The user can press OUTPUT key to switch the output state.
When output is opened, LED (OUTPUT) lamp will be lit on;
When output is closed, LED (OUTPUT) lamp will be lit off;
As shown in the figure below:
At the same time, the user can control the output state through external control.

[Note:] In system configuration, the output state of machine when turning on the switch can be changed; if the output state of machine when turning on the switch is set to ON, the user must pay attention to the set value of OVP ☒ OCP, to prevent causing too high output voltage and thus damaging the load;

Direct−voltage and direct−current operation

The product can work in direct−voltage and direct−current mode, and even if the load changes, the output voltage and current can remain unchanged. The switching of direct−voltage and direct−current is determined by: the set value of output voltage, set value of output current, and load resistance. The above working principle is described below.

crossover point
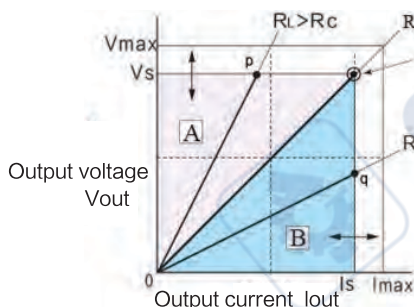
A = Range of CV mode
B = Range of CO mode

Vs = Set value of voltage
Is = Set value of current
Rc = Vs/Is (ohm's law)
RL = Load resistance
Vmax= = Maximum possible set voltage
Imax= = Maximum possible set current

Output voltage Vout

Output current Iout

The above figure shows various working modes of the product. Assuming the load resistance is RL, we can calculate the resistance value Rc (Rc = Vs/Is). Take the line of RL = Rc as the boundary, in Part A (in which RL is greater than Rc), the machine will be working in direct−voltage mode, and in Part B (in which RL is less than Rc), the machine will be working in direct−current mode. The line of RL = Rc means the load of which the output voltage is equal to the set voltage, and the output current is equal to the set current. When RL is equal to Rc, the machine will switch between direct voltage and direct current automatically, and regarding the point of RL = Rc as the crossover point.

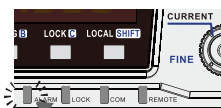Calculation example in direct−current and direct−voltage mode:
Assuming the current load resistance RL is 80Ω, and the output voltage and current are set to 30V and 0.5A respectively, then Rc = Vs/Is = 30/0.5 =60Ω, and since RL is greater than Rc, the machine is working in direct−voltage mode, and the maximum voltage in direct−voltage mode Vs = Is *RL =30V, therefore, the maximum voltage in direct−voltage mode is 30V. Raise the voltage and when it exceeds 30V, and achieves the crossover point, the machine will automatically switch to the direct−current mode. To maintain the direct−voltage mode, increase the set value of output current.
Assuming the current load resistance RL is 40Ω, and the output voltage and current are set to 30V and 0.5A respectively, then Rc = Vs/Is = 30/0.5 =60Ω, and since RL is less than Rc, the machine is working in direct−current mode, and the maximum current in direct−voltage mode Is = Vs/RL =0.75, therefore, the maximum current in direct−voltage mode is 0.75. Increase the current and when it exceeds 0.75, and achieves the crossover point, the machine will automatically switch to the direct−voltage mode. To maintain the direct−current mode, increase the value of output voltage.

Direct−voltage / Direct−current operation steps:
1. Put POWER switch in OFF position.
2. Connect the load to the output end;
3. Turn on the power switch;
4. Press OUTPUT key to open or close the output;
5. Press SET key, and the set value will be displayed;
6. Rotate VOLTAGE/CURRENT rotary knob to set the output; the adjustment range of voltage: 0~103% of rated voltage; adjustment range of current: 0~103% of rated current;
When the machine is working in direct−voltage output working mode, CV LED lamp will be lit on; when the machine is working in direct−current output working mode, CC LED lamp will be lit on.

Light on
OHP acts and the alarm is displayed

[Note]:
After entering the protection (the machine has OVP, OCP, and OHP three protection functions) state, the machine will: close the output, ALARM LED will be lit on, and the display screen will display the causes of fault, and it will output the alarm signal from No. 13 pin connected to J1;

Release of alarm:
After the alarm reason is eliminated, press LOCAL + SET key or turn on the power switch after turning off the power switch. If the alarm cannot be removed after the user has eliminated the alarm reason, there might be fault with the machine. Please contact ATTEN or our dealer in time.

I. Over−voltage protection (OVP) and over−current protection (OCP): Set the over−voltage protection / over−current protection. The over−voltage protection (OVP) is a protection mechanism used to prevent generating too high output voltage and thus damaging the load. The over−current protection (OCP) is a protection mechanism used to prevent generating too high output current and thus damaging the load. When connecting the load, the user should set correct OVP/OCP value; the user can set OCP/OCP trigger value through the following operation.

OVP/OCP

OVP trigger point

OCP trigger point

Light on
OVP / OCP Trigger Point

OVP / OCP Trigger Point

1. When the power supply is working normally (the output is closed), press OVP ⌷OCP key, and the display will display the previously set OVP / OCP trigger value. 2. Rotate VOLTAGE rotary knob or CURRENT rotary knob to change the OVP and OCP trigger value respectively. When pressing and holding SHIFT key, rotate the VOLTAGE / CURRENT rotary knob to adjust the parameters finely. 3. OVP setting range: 1% of rated output voltage ~ rated output voltage +1.5V; OCP setting range: 1% of rated output current ~rated output current +1.5A; 4. Press OVP ⌷OCP key again to exit the setting of OVP ⌷OCP trigger value;

OVP acts and the alarm is displayed
Light on

16

5. Confirm that correct OVP/COP trigger value has been set;
6. Confirm the power output is in opened state;
7. Rotate VOLTAGE / CURRENT rotary knob to the right to increase the output voltage to the OVP/OCP trigger value; if the machine has no fault, it will: close the output, ALARM LED will be lit on, and the fault reason will be displayed on the display screen.
8. Over-power protection: When the load power exceeds 600W or 900W, "OPP" will be flashing.

II. Over-temperature Protection
When the internal temperature of the machine exceeds a certain value, it will trigger the over-temperature protection; if turning on the power switch while the cause of over-temperature protection is not removed, the machine will enter the over-temperature protection again.

Saving presets
1. Press SET key, and the machine will display the previously set voltage and current value;
2. Rotate VOLTAGE / CURRENT rotary knob to change the set value of VOLTAGE / CURRENT respectively;
3. Press and hold SHIFT key, long press (press and not release) the preset key (any one among A/B/C) until the A/B/C LED lamp is lit on, and then the current and voltage combination setting can be saved.

Recalling p

The user can recall the preset values in the following two methods:
Press (not release) SHIFT and then press the preset key (any one among A/B/C) momentarily; corresponding stored preset values will be displayed on the screen and will be flashing, and after the preset value displayed on the screen is confirmed, press SET key, and such group of preset values will be recalled immediately. The current voltage and current set value will be replaced by the preset voltage and current value.
The default preset A: 3.3V 30A; B: 5.0V 30A; C: 12V 30A.

Panel Lock and Unlocking

Light on

To prevent user's faulty operation, the machine is designed with a locking function of the operation panel. Corresponding locking mode is provided. The user can lock the panel by means of: pressing and holding (not release) LOCK key until LOCK LED lamp is lit on; it means the machine has been in locked state. The user can unlock the machine by means of: pressing and holding LOCK key until LOCK LED lamp is lit on; means the machine has exited the locked state.

Switching of line loss compensation sensing and local compensation mode

Light on
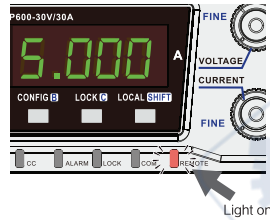
If the user needs to use the line loss compensation sensing function, first connect the communication interface, and then use corresponding command in desktop software to enable the remote sensing compensation function. Relevant commands can be seen in Appendix B; if the user needs to switch to the local mode, press LOCAL to switch to the local mode.

List of Initial Settings of the System

|	Set Item	Set Value
Common parameters	Output voltage	0V
	Output current	Rated output current +1A
	OVP (over−voltage protection)	Rated output voltage +1.5A
	OCP (over−current protection)	Rated output current +1.5A
	Preset value A/B/C	Voltage: 0V~rated voltage +1V; Current: 0~rated output current +1A; (The same for the three)

Note 1: LOW value: 0~0.5A, or the short−circuit state;

Specifications and Parameters

| Model and Specification of Programmable power supply		CP600−30V/30A	CP900−30V/30A
Input	Input voltage range	220−240V AC	220−240V AC
	Input frequency range	47−63Hz	47−63Hz
	Power factor	>0.98	>0.98
Output	Output power range	0−600W	0−900W
	Output voltage range	0−31V	0−31V
	Output current range	0−31A	0−31A
Working mode	Working mode	CV/CC/CP	CV/CC
Voltage	Voltage setting resolution	1mV	1mV
	Maximum set voltage	31V	31V
	Setting accuracy	0.05%set + 20mV	0.05%set + 20mV
	Transient response	100uS	100uS
	Power line regulation	0.01% +5mV	0.01% +5mV
	Load regulation	0.1% + 5mV	0.1% + 5mV
	Voltage display resolution	10mV	10mV
	Voltage display accuracy	±(0.05% of reading + 2digits)　at 23±5℃	
	Voltage ripple (rms)	100mVp−p/10mVrms	100mVp−p/10mVrms
	Voltage rise time	150mS	150mS
	Voltage drop time	150mS	150mS
	Temperature coefficient	100ppm/℃(TYP Value)	100ppm/℃(TYP Value)
Current	Current setting resolution	1mA	1mA
	Current setting resolution	31A	31A
	Setting accuracy	0.1% set +0.1% rating	0.1% set +0.1% rating
	Power effect	0.1%+10mA	0.1%+10mA
	Load effect	0.2%+10mA	0.2%+10mA
	Current ripple	50mA	50mA
	Temperature coefficient	200ppm/℃	200ppm/℃
	Current display resolution	0−10A: 1mA 10−31A: 10mA	0−10A: 1mA 10−31A: 10mA
	Current display accuracy	±(0.2% of reading + 30 digits)　at 23±5℃	
Protection	Protection mode OVP range: 0.3V−rated voltage +1.5V OCP range: 0.3A−rated current +1.5A	OVP、OCP、OHP、OPP、SCP (short circuit protection)	
Efficiency	Full load	≥85%	≥85%
Communication	Communication load	USB、RS232	USB、RS232

Overall Dimension Drawing:

337.34
317.52
14.74
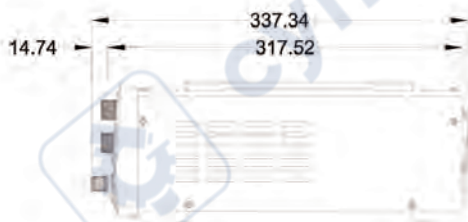
Diameter:21×4
(Rubber foot diameter)

M3 screw holes ×4
Max.screw insertion depth:4 mm(0.16 inches)

189.01
130.00
62.52
220.00

189.01
113.00
128.80
9.23
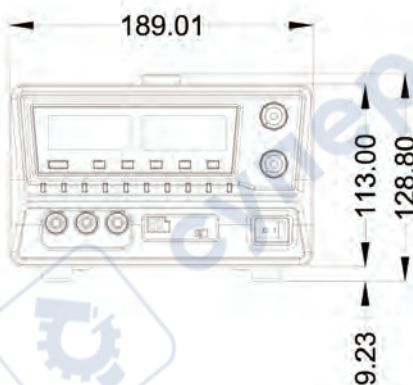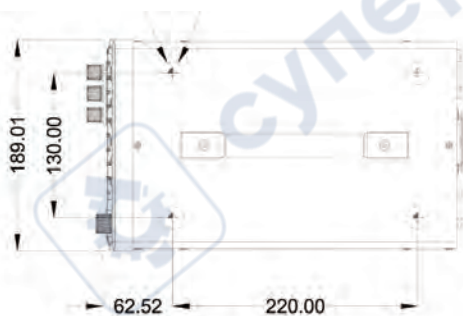
Appendix

Appendix A – Common Faults and Solutions

The following lists some common faults of the machine and simple solutions; if the user still fails to solve the faults after trying these simple solutions, please contact ATTEN or our dealer.

Poor contact of power supply

Fault Description	Trouble Shooting	Solutions
The machine does not respond after turning the power switch.	Whether the power line is connected to open circuit.	Please connect the power line correctly or replace the power line.

No power output

Fault Description	Assumption of Fault Causes	Solutions
There is no output even after the power output is switched to the open state.	The output voltage or output current has been set to 0.	Rotate the rotary knob, and set the output voltage and output current to the required value.
	Whether the external control is used to adjust the output.	Close the external control or switch the output to ON through external control.
After the power output is switched to the open state, and the output is displayed for a short time, the power output is switched to the closed state immediately.	Whether the machine has been in over–voltage protection mode.	Set OVP to the value higher than the set voltage.
	Whether the machine has been in over–heating protection mode.	Confirm the temperature of operating temperature or the air suction port is blocked.

Unstable output

Fault Description	Assumption of Fault Causes	Solutions
When the power output is ON, when rotating VOLTAGE or CURRENT rotary knob, unstable output occurs.	Whether the machine is in the process of switching from CV to CC or from CC to CV.	Change the setting of CC or CV to make it higher than the current set value. If the set value has been the maximum value, use the power supply with higher output voltage or current.
The output voltage or output current is changing.	Whether the remote sensing function is enabled.	When not using the remote sensing function, put the sensor switch in OFF position.
	Whether both CV LED or CC LED lamps are lit on.	As oscillation occurs when remote sensing is used, please add the capacitor on the load end.The circuit might be in failure. if the error cannot be solved stop using this report and have it reported by the manufacturer or supplier.
	Whether the contact of sensing line and the wire for connecting the load is poor or the line is disconnected.	Please turn off the power switch and confirm the arrangement of wire.
	Whether the load current has peak value, and whether the load current is in pulse state.	The load current peak value might be greater than the set value of direct current. Please increase the set value of direct current, or increase the current capacity.

The output voltage has deviation from the output value when the power supply is just turned on.	Whether it exceeds 30min after turning on the power supply.	Please warm up (activate) the machine for at least 30min.

Big output ripple

Fault Description	Assumption of Fault Causes	Solutions
The ripple voltage may increase sometimes.	Whether the input voltage exceeds the range.	Please use the input voltage within the range.
High pulse value due to the change of installation site.	Whether there is generation source of strong magnetic field or electric field nearby.	Keep the product far away from the generation source, or solve the problem by twisting the load wire.
High output ripple when external control is used.	Whether the noise of external noise is very high.	Please take appropriate measures to eliminate the noise.
High pulse value after the wire for connecting the load is replaced.	Whether it is connected to the remote sensing line.	When not using the remote sensing, please dismantle the sensing line.

Failure to open the switch on the panel

Fault Description	Assumption of Fault Causes	Solutions
The switch on the panel cannot be operated	Whether LOCK LED is lit on.	Please unlock the panel, and long press LOCK key until the LOCK lamp is lit off.
	Whether REMOTE LED is lit on.	To operate the panel, please press LOCAL key to go back to local operation state.
	Whether it is controlled through RS232C and USB interface.	
Even after pressing LOCAL switch, it cannot be converted to local working state.	Whether the communication is disconnected.	After disconnecting the communication, press LOCAL key.

Solution to the alarm fault when the power output is ON

Fault Description	Assumption of Fault Causes	Solutions
ALARM is lit on when the power output is ON.	Whether the value of OVP is lower than the output voltage value.	Increase the value of OVP.
	Whether the value of OCP is lower than the output current value.	Increase the value of OCP.
	Whether the remote sensing function is enabled.	When not using the remote sensing function, put the sensor switch in OFF position.
	Whether both CVLED or CCLED lamp are lit on.	As oscillation occurs when remote sensing is used, please add the capacitor on the load end. Confirm the required remote sensing compensation value is not higher than the maximum value of remote sensing compensation (0.6V).
	Whether the polarity of sensing line is connected wrongly.	Confirm whether the polarity of sensing line is connected wrongly, or both ends are short circuited. Please confirm the wire for remote sensing is connected correctly.
	Whether the control line is connected correctly when external control is used.	Please connect it correctly.
	Whether the external voltage is too big when external control is used.	Please input appropriate voltage.
	Whether the internal temperature of the machine rises abnormally.	Check whether the machine is in thermal protection state, confirm the temperature of operating environment and whether the air suction port is blocked or the fan has stopped working.
Alarm is given only after the load is replaced.	Whether high voltage is applied externally from battery loads.	Check whether the machine has been in OVP / OCP state or whether the machine is overloaded.
	Whether the set voltage displayed on the panel is higher than the actual output voltage.	

Remote control failure

Fault Description	Assumption of Fault Causes	Solutions
Remote control cannot be enabled at the communication interface.	Wrong communication port is selected on the computer or host end.	Please select the communication interface which requires remote control.

Appendix B – Interpretation to RS232 / USBSCPI Commands

Introduction to communication
Communication interface: This series power supply is provided with one standard RS232 interface and one USB interface. USB interface adopts FT232R USB serial chip. If FT232 driver is not installed on the computer, you need to download a FT232 driver and install it in computer. RS – 232 communication parameters:

Baud rate	9600
Odd-even check	None (the parity bit is 0)
Data bit	8
Stop bit	1

Operating steps of communication test:
1. Install FT232 driver.
2. Connect the machine and the computer through serial port line or USB-B line.
3. Open your serial port tool, for example, serial assistant, etc.
4. Turn on Power switch, and make the power supply work.
5. Verify the setting of computer interface parameters (baud rate, odd-even check, etc.) is correct.
6. Send the character string *IDNCR to the power supply, and verify that the power supply sends the response of: ATTEN, CPXXX,V0.00; among which, ATTEN is the manufacturer, CPXXX is product series, and VX.XX is software version number; if the power supply does not respond correctly, check whether the cable connection is correct, and whether the communication parameters (baud rate, odd-even check, etc.) on power supply and host are consistent.

How the power supply processes the input:
1. Input: It means a character string which is sent from the host to the power supply.
2. Output: It means the character string which is sent from the power supply to the host through computer interface.
3. Input character string: It is the valid input character string which is processed and executed by the power supply and sent by the host. The valid input character string means a command of proper syntax, which is followed by an input ending character. When the power supply receives the input, it will store the input in a 120-byte input buffer; only when receiving one input ending character, or the input buffer is full, can the input character string which is received through RS-232 interface have the syntax inspected and executed. The power supply receives the uppercase and lowercase text characters, and if a certain command cannot be parsed, such command and other part in command line will be ignored.
4. Input ending character: Enter '\r' (0x0D) or line feed '\n' (0x0A) or character string "CR". For example, send '*', 'I', 'D', 'N', '\n', or '*', 'I', 'D', 'N', '\ r' or "*IDNCR", read the information about power supply.

How the power supply processes the output:
The power supply outputs the number or character to the outside in the form of character string, and ends it with the enter and line feed ending character (ASSII 0x0D, 0x0A). For example, send a measuring voltage command to the power supply:
MEASure: SCALar: VOLTage: DC?, Return +1.24E+01. It means the power supply voltage is 12.4V.

IEEE488.2 Common Command
- *CLS: This command is used to clear the following register:
  Event register, status register and signal status register
  Error code
  Command syntax: *CLS. Parameter: None

- *IDN? This command is used to read related information about power supply. The parameter returned by it contains four segments which are separated by comma.
  Query syntax: *IDN?
  Parameter: None
  Return parameter: <AARD> segment
  Describe ATTEN manufacturer
  CPXXX product series
  VX. XX software version

- *RST: This command is used to reset the power supply to the factory default status.
  Command syntax: *RST
  Parameter: None

- *SAV
  This command is used to save the current set value of power supply to the specified storage area.
  These parameters contain the set value of current, set value of voltage, set value of over-current and set value of over-voltage.
  Command syntax: *SAV <NRf>
  Parameter: 1~3. Example: *SAV3. Related command:
  *RCL

- *RCL: This command is used to restore the set value of power supply from the specified storage area.
  Command syntax: *RCL<NRf>
  Parameter: 1~3. Example:
  *RCL 3. Related command:
  *SAV

- SCPI system command
  SYSTem: ERRor[:NEXT]?
  This command is used to read error code and error message of power supply.
  Command syntax: SYSTem: ERRor?
  Parameter: None
  Return parameter: 〈NR1〉(0) There is no error.
  (1) Invalid command, the command spelling is wrong.
  (2) Invalid number, the number exceeds the range.

- SYSTem: VERSion. This command is used to query the version number of software.
  For example: 1.02. Command syntax:
  SYSTem: VERSion?

Parameter: None
Return parameter: <NR2>
Output setting command.

- OUTPut[:STATe][:IMMediate]. This command is used to control opening or closing of power output.
Command syntax: OUTPut: STATe <NRf> Parameter: {ON|OFF|1|0}
*RST value: 0. Query syntax: OUTPut: STATe? Return parameter: {0|1}

- [SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude]
This command is used to set the current value of power supply.
Command syntax: CURRent: LEVel <NRf>
Parameter: <numeric>
Unit: A
*RST value: MAX
Example: CURRent: LEVel 1.24: set the current to 1.24A. Query syntax:
CURRent: LEVel? {MIN|MAX} Parameter: [MIN|MAX]
Return parameter: <NR2> Unit of return parameter: A
Example: CURRent: LEVel?, CURRent: LEVel? MIN, CURRent: LEVel? MAX.

- [SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude]
This command is used to set the voltage value of power supply.
Command syntax: VOLTage: LEVel <NRf>
Parameter: <numeric>
- Unit: V
*RST value: MIN
Example: VOLTage: LEVel 12.4: set the voltage to 12.4V. Query syntax:
VOLTage: LEVel? {MIN|MAX} Parameter: [MIN|MAX]
Return parameter: <NR2> Unit of return parameter: V
Example: VOLTage: LEVel?, VOLTage: LEVel? MIN, CURRent: LEVel? MAX. Clear the over−voltage, over−current protection and signal status.

- [SOURce:]CURRent: PROTection[:LEVel] This command is used to set the over−voltage protection value of power supply.
Command syntax: CURRent: PROTection: LEVel < NRf>
Parameter: {numeric}
Unit: A

*RST value: MAX
Example: CURRent: PROTection: LEVel 1.24. Set the over-voltage protection value to 1.24VA.

- Query syntax: CURRent: PROTection: LEVel? <NRf>
  Parameter: {MIN|MAX}
  Return parameter: <NR2>
  Unit of return parameter: A
  Example: CURRent: PROTection: LEVel?   Query the over-current protection value.
  CURRent: PROTection: LEVel?   MIN. Query the minimum over-current protection value.

- [SOURce:]VOLTage: PROTection[:LEVel] This command is used to set the over-voltage protection value of power supply.
  Command syntax: VOLTage: PROTection: LEVel < NRf> Parameter: <numeric>
  Unit: V
  *RST value: MIN
  Example: VOLTage: PROTection: LEVel 12.4. Set the over-voltage protection value to 12.4V.
  Query syntax: VOLTage: PROTection: LEVel? <NRf > Parameter: {MIN|MAX}
  Return parameter: <NR2> Unit of return parameter: V
  Example: VOLTage: PROTection: LEVel?   Query the over-voltage protection value.
  VOLTage: PROTection: LEVel?   MAX. Query the maximum over-voltage protection value.

- OUTPut: PROTection: CLEar. This command is used to clear the alarm.
  Command syntax: OUTPut: PROTection: CLEar Parameter: None
  Unit: None
  Return: None
  Measurement command

- MEASure[:SCALar]: VOLTage[:DC]?
  This command is used to read the output voltage of power supply.
  Command syntax: MEASure: SCALar: VOLTage: DC? Parameter: None
  Return parameter: 〈NR2〉 Unit of return parameter: V
  Example: MEASure: SCALar: VOLTage: DC?

- MEASure[:SCALar]:CURRent[:DC]?
  This command is used to read the output current of power supply.
  Command syntax: MEASure:SCALar:CURRent:DC? Parameter: None
  Return parameter: 〈NR2〉 Unit of return parameter: A
  Example: MEASure: SCALar: CURRent: DC?

System Configuration Commands

- OUTPut: PON[:STATe]
  Set the state of output switch when booting.
- Command syntax: OUTPut: PON: STATe{NR1}
  Parameter: {SAFE|AUTO|FORCe}
  Example: OUTPut: PON: STATe FORCe. The output switch is in ON state when the machine is forced to boot.
  Query syntax: OUTPut: PON: STATe?
  Parameter: None.
  Return parameter:{SAFE|AUTO|FORCe}
  Example: OUTPut: PON: STATe?

- MEMory: RECall: CONFirmation[STATe]. Configure whether the voltage, current, over−voltage and over−current value which are recalled from memory area need to be displayed through the front panel and to flash to remind the user to confirm it.
  Command syntax: MEMory: RECall: CONFirmation: STATe{NR1}
  Parameter: {ON|OFF|1|0}
  *RST value: 1
  Example: MEMory: RECall: CONFirmation: STATe ON. The voltage value, current value, over−voltage value and over−current value which are recalled from memory area need to be displayed and be confirmed through the front panel.
  Query syntax: MEMory: RECall: CONFirmation: STATe?
  Parameter: None
  Return parameter: {1|0} Example:
  MEMory: RECall: CONFirmation: STATe?

- SYSTem: KLOCk: MODE
  Set the lock key (LOCK) mode of front panel
  Command syntax: SYSTem: KLOCk: MODE
  Parameter: {LOC1| LOC2|LOC3}
  *RST value: 3
  Example: SYSTem: KLOCk: MODE   1. Set the lock key mode to 1
  Query syntax: SYSTem: KLOCk: MODE?
  Parameter: None
  Return parameter: { LOC1| LOC2|LOC3} Example:
  SYSTem: KLOCk: MODE?
  Table IV: Table of lock key mode   Value   Description
  1 Lock key mode 1: OUTPUT key can be operated, and the memory key A/B/C can be read.
  2 Lock key mode 2: Only OUTPUT key can be operated.
  3 Lock key mode 3: Lock all keys and encoders (before delivery).

- [SOURce:]CURRent: EXTernal: SOURce. Select if the direct current is controlled according to the external voltage/external resistance (J1 interface). Command syntax: CURRent: EXTernal: SOURce. Parameter: {NONE|VOLTage|RESistance}
  *RST value: NONE
  Example: CURRent: EXTernal: SOURce   VOLTage. Set to control the current by external voltage. Query syntax:
  CURRent: EXTernal: SOURce?
  Parameter: None. Return parameter:
  {NONE|VOLTage|RESistance}
  Example: CURRent: EXTernal: SOURce?

- [SOURce:]VOLTage: EXTernal: SOURce. Select if the direct voltage is controlled according to the external voltage/external resistance (J1 interface). Command syntax:
  VOLTage: EXTernal: SOURce. Parameter: {NONE|VOLTage|RESistance}
  Example: VOLTage: EXTernal: SOURce   RESistance. Set to control the voltage by the external resistance. Query syntax:
  VOLTage: EXTernal: SOURce?
  Parameter: None. Return parameter: {NONE|VOLTage|RESistance} Example:
  VOLTage: EXTernal: SOURce?

- OUTPut: EXTernal[:STATe]
  Setting of external control of output ON/OFF. Command syntax:
  OUTPut: EXTernal: STATe. Parameter: {ON|OFF|1|0}
  Example: OUTPut: EXTernal: STATe ON. Set to allow external control of the output switch. Query syntax:
  OUTPut: EXTernal: STATe?
  Parameter: None. Return parameter:
  {1|0}
  Example: OUTPut: EXTernal: STATe?

- OUTPut: EXTernal: LOGic
  Trigger mode of external control of output ON/OFF. Command syntax:
  OUTPut: EXTernal: LOGic. Parameter: {LOW|HIGH}
  Example: OUTPut: EXTernal: LOGic   LOW. Set to trigger the output switch by falling edge when it allows external control
  Query syntax: OUTPut: EXTernal: LOGic?
  Parameter: None. Return parameter:
  {LOW|HIGH}. Example:
  OUTPut: EXTernal: LOGic?

Appendix C－Operating Instructions for RS232/USB Power Calibration

1. Enter the system correction program
2. Calibration of voltage and current setting precision:
2.1 SU−b −−−−−−−−−−−−−−−−−Low−end manual adjustment of CV setting
2.2 DU−b −−−−−−−−−−−−−−−−−Low−end manual adjustment of CV display
2.3 SU−t −−−−−−−−−−−−−−−−−High−end manual adjustment of CV setting
2.4 DU−t −−−−−−−−−−−−−−−−−High−end manual adjustment of CV display
2.5 OVPC−−−−−−−−−−−−−−−−OVP trigger error correction
2.6 SC−b −−−−−−−−−−−−−−−−−Low−end manual adjustment of CC setting
2.7 DC−b −−−−−−−−−−−−−−−−−Low−end manual adjustment of CC display
2.8 SC−t −−−−−−−−−−−−−−−−−High−end manual adjustment of CC setting
2.9 DC−t −−−−−−−−−−−−−−−−−High−end manual adjustment of CC display
2.10 OCPC−−−−−−−−−−−−−−−−OCP trigger error correction
Note 1: As the production status is provided with no special man−machine face−to−face rotary knob, it should be noted that, VOLTAGE rotary knob is used to switch calibration items, and CURRENT rotary knob is used to adjust the parameters.
Note 2: When adjusting the voltage or current output, corresponding values of current output voltage and current are displayed with four−digit hexadecimal data.
When adjusting the voltage or current display, four high−order digits represent the display of integer part , while four low−order digits represent the display of decimal part.
Note 3: When calibrating OVP/OCP, the program will automatically search the over−voltage and over−current protection values of minimum voltage and current and maximum voltage and current. Corresponding DA hexadecimal value of current OVP/OCP over−voltage/over−current protection point is displayed in the current display position.

Note 4: When rotating CURRENT rotary knob the display voltage and current state can be adjusted roughly; when necessary, press SHIFT key at the same time, to adjust finely.
Note 5: For each step of calibration, only when the output is opened, the related value can be adjusted with CURRENT rotary knob, otherwise, the value of this item will not change. Except OVP/OCP item, the other items can be judged as "calibrated" by the system only when CURRENT rotary knob is rotated. when Calibrating OVP/OCP, OVP/OCP corresponding points of low, high value will decrease gradually from the value range of maximum, when low, high output value is greater than the OVP/OCP setting, it will show the ALRAM lamp, after a pause, continue to the next item automatically.

Note 6: After each step of calibration, rotate VOLTAGE rotary knob to return to the previous step or go to the next step, or press SET key to save settings and exit the system. After calibration of each item, rotate VOLTAGE rotary knob clockwise for next calibration.

I. Enter the system correction program
Press and hold LOCAL+SET key at the same time, then turn on the power supply. When "SU−b" is displayed by the voltage display, it means the system has entered the correction program. Every time before the calibration and the output is in ON state, and only in that case, can the calibration parameters be adjusted; every time when the calibration item is changed, the output will be put in OFF state automatically.
II. Voltage and current setting and calibration of display accuracy:
1. SU−b (low−end manual adjustment of CV setting) <display the corresponding hexadecimal value of current low−end voltage output DA >
Low−end manual adjustment of output voltage. Connect the voltmeter to the output terminal of power supply, and open the power output. Adjust with CURRENT rotary knob to make the actual output voltage value within 1−5% of rated voltage.

2. DU−b (low−end manual adjustment of CV display) <display the current low−end voltage value>
Low−end correction of voltage display. Connect the voltmeter to the output terminal, and open the power output. At this moment, the actual voltage value should be within 1−5% of rated output voltage of power supply, otherwise, go back to the first step and correct the low−end output voltage. If the actual voltage value has been within such range, adjust with CURRENT rotary knob or make fine adjustment with SHIFT+CURRENT, to make the display voltage of power supply consistent with the voltmeter.

3. SU−t (high−end manual adjustment of CV setting) <display the corresponding hexadecimal value of current high−end voltage output DA >
High−end manual adjustment of output voltage. Connect the voltmeter to the output terminal of power supply, and open the power output. Adjust with CURRENT rotary knob to make the actual output voltage value within 100−110% of rated voltage.

4. DU−t (high−end manual adjustment of CV display) <display the current high−end voltage value>
High−end correction of voltage display. Connect the voltmeter to the output terminal, and open the power output. At this moment, the actual voltage value should be within 100−110% of rated output voltage of power supply, otherwise, go back to the third step and correct the high−end output voltage. If the actual voltage value has been within such range, adjust with CURRENT rotary knob or make fine adjustment with SHIFT+CURRENT, to make the display voltage of power supply consistent with the voltmeter.

5. OVPC (OVP trigger error correction) <display current over−voltage protection value in automatic calibration>
OVP trigger error correction. Before correction, please clear the load on the output terminal, then press the OUTPUT key to start correction; if the hexadecimal value of current OVP is displayed in the current display position during the correction, and it decreases continuously, it means the correction is ongoing, and it takes a certain time to finish searching OVP calibration points, so be patient. After the low−end and high−end correction is finished, ALARM lamp will display, and then it will go out automatically to enter the next step; when ALARM lamp goes out, it means the low−end and high−end correction process has finished respectively.

6. SC−b (low−end manual adjustment of CC setting) <display the corresponding hexadecimal value of current low−end current output DA >
Low−end manual adjustment of output current. Connect the ammeter to the output terminal of power supply, and open the power output. Adjust with CURRENT rotary knob to make the actual output current value within 1−5% of rated current.

7. DC−b (low−end manual adjustment of CC display) <display the present current value>
Low−end calibration of current display. Connect the ammeter to the output terminal of power supply, and open the power output. Adjust with CURRENT rotary knob or make fine adjustment with SHIFT+CURRENT, to make the displayed current value consistent with the displayed value of ammeter.

8. SC−t (high−end manual adjustment of CC setting) <display the corresponding hexadecimal value of current high−end current output DA >
High−end manual adjustment of output current. Connect the ammeter to the output terminal of power supply, and open the power output. Adjust with CURRENT rotary knob to make the actual output current value within 100−110% of rated current.

9. DC−t (high−end manual adjustment of CC display) <display the present current value>
High−end calibration of current display. Connect the ammeter to the output terminal of power supply, and open the power output. Adjust with CURRENT rotary knob or make fine adjustment with SHIFT+CURRENT, to make the displayed current value consistent with the displayed value of ammeter.

10. OCPC (OCP trigger error correction) <display present over−current protection value in automatic calibration>
OCP trigger error correction. Connect the ammeter to the output terminal of power supply, open the power output, and then press the OUTPUT key to start correction; if the hexadecimal value of current OCP is displayed in the current display position during the correction, and it decreases continuously, it means the correction is ongoing, and it takes a certain time to finish searching OCP calibration points, so be patient. After the low−end and high−end correction is finished, ALARM lamp will display, and then it will go out automatically to enter the high−end over−current calibration; and when ALARM lamp goes out, it means the low−end and high−end correction process has finished respectively.

11. Saving of calibration parameters
Press SET key to save the above calibrated parameters. After saving, the system will restart automatically.

After−sales Contact
Tel of After−sales Service Department: (+86) 755−2697 7372−817

SHENZHEN ATTEN TECHNOLOGY CO., LTD.

- Soldering iron ● Soldering station ● Hot air rework station
- Multi-function maintenance system
- Regulated DC power supply ● Switching DC power supply
- Programmable power supply

Engineer's partner