

N6200 Series Wide Range Medium Power DC Electronic Load

User Manual

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1 Preface

Dear Customers,

First of all, we greatly appreciate your choice of N6200 series DC electronic load (N6200 for short). We are also honored to introduce our company, Hunan Next Generation Instrumental T&C Tech. Co., Ltd. (NGI for short).

About Company

NGI is a professional manufacturer of intelligent equipment and test & control instruments, committed to developing, manufacturing battery simulators, power supplies, electronic loads, and many more instruments. The products can be widely used in the industries of battery, power supply, fuel cell, consumer electronics, new energy vehicle, semiconductor, etc.

NGI maintains close cooperation with many universities and scientific research institutions, and maintains close ties with many industry leaders. We strive to develop high-quality, technology-leading products, provide high-end technologies, and continue to explore new industry measurement and control solutions.

About User Manual

This manual is applied to N6200 series DC electronic load, including installation, operation, specifications and other detailed information. The copyright of the manual is owned by NGI. Due to the upgrade of instrument, this manual may be revised without notice in future versions.

This manual has been reviewed carefully by NGI for the technical accuracy. The manufacturer declines all responsibility for possible errors in this operation manual, if due to misprints or errors in copying. The manufacturer is not liable for malfunctioning if the product has not correctly been operated.

To ensure the safety and correct use of N6200, please read this manual carefully, especially the safety instructions.

Please keep this manual for future use.

Thanks for your trust and support.

2 Safety Instructions

In the operation and maintenance of the instrument, please strictly comply with the following safety instructions. Any performance regardless of attentions or specific warnings in other chapters of the manual may impair the protective functions provided by the instrument.

NGI shall not be liable for the results caused by the neglect of those instructions.
















2.1 Safety Notes

- **Confirm the AC input voltage before supplying power.**
- **Reliable grounding:** Before operation, the instrument must be reliably grounded to avoid the electric shock.
- **Confirm the fuse:** Ensure to have installed the fuse correctly.
- **Do not open the chassis:** The operator cannot open the instrument chassis. Non-professional operators are not allowed to maintain or adjust it.
- **Do not operate under hazardous conditions:** Do not operate the instrument under flammable or explosive conditions.
- **Confirm the working range:** Make sure the DUT is within N6200's rated range.

2.2 Safety Symbols

Please refer to the following table for definitions of international symbols used on the instrument or in the user manual.

Table 1

Symbol	Definition	Symbol	Definition
	DC (direct current)	N	Null line or neutral line
	AC (alternating current)	L	Live line
	AC and DC	I	Power-on
	Three-phase current		Power-off
	Ground		Back-up power
	Protective ground		Power-on state
	Chassis ground		Power-off state
	Signal ground		Risk of electric shock
WARNING	Hazardous sign		High temperature warning
Caution	Be careful		Warning

3 Product

3.1.1 Brief Introduction

N6200 series is developed based on NGI's years of experience in testing for power supply and battery. It is with high accuracy, high reliability and high cost performance. N6200 series is with high power density and elegant appearance, which is available for benchtop use or installation in 19 inch rack.

3.1.2 Features

- High power density, minimizing space occupation
- Stable and reliable CR/CP function supported by hardware
- Editable rise and fall slew rate
- Supporting Ethernet, serial communication and SCPI commands
- Powerful charging & discharging control function mode, convenient for battery and supercapacitor test
- Built-in ESR test function, supporting multiple industry standards and saving much cost for battery and supercapacitor users (Optional)
- Dynamic mode up to 20kHz
- Remote/local sense
- Power-off memory function
- Programmable sequence test function(SEQ), up to 100 groups sequence files, up to 50 steps per file
- Editable Von/Voff, reducing test accidents
- Short-circuit simulation
- LCD screen for data display
- Built-in auto test function, one-button operation for complex test tasks
- Analog programming interface(APG), current monitoring interface, remote/local trigger function to realize complex function control and monitoring
- Standard 19-inch 2U, available for rack installation

3.2 Overview

3.2.1 N6200 Series Lineup

Table 2

Model	Specification	Model	Specification
N6206-60-10	600W/60V/10A	N6212-150-100	1200W/150V/100A
N6206-60-50	600W/60V/50A	N6212-600-20	1200W/600V/20A
N6206-150-50	600W/150V/50A	N6218-60-150	1800W/60V/150A
N6206-600-10	600W/600V/10A	N6218-150-90	1800W/150V/150A
N6212-60-100	1200W/60V/100A	N6218-600-30	1800W/600V/30A

3.2.2 Package Contents and Accessories

After receiving N6200, please check the instrument according to the following steps:

1. Check whether the instrument is damaged during transportation. If any severe damage to the package, please contact our authorized distributor or NGI.
2. Check accessories.
3. Make sure the the following accessories are attached.

Table 3

N6200 Accessories	Instructions
Power cord and fuse	For AC power connection
RS232 cable	For RS232 communication
Ethernet cable	For Ethernet connection
USB flash drive	User manual, software & technical information

If any loss or damage, please contact NGI.

4. Check the whole instrument. If N6200 chassis is damaged or has abnormal operation, please contact our authorized distributor or NGI.

3.2.3 Appearance & Dimension

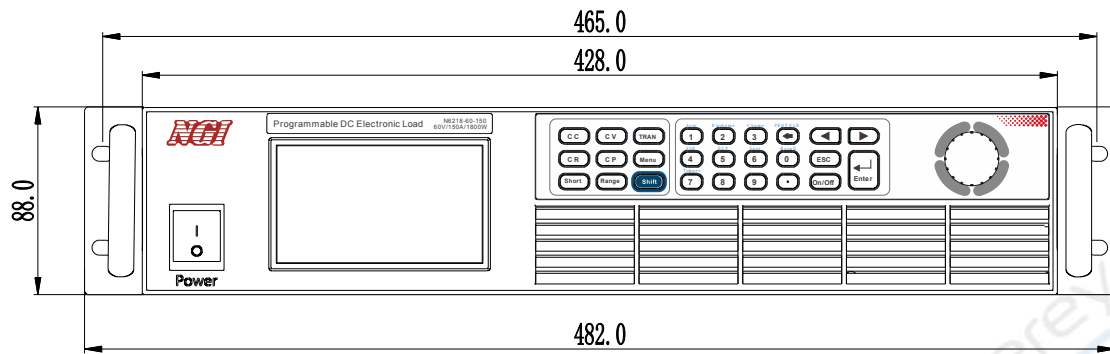


Figure 1 Front Panel Dimension(mm)

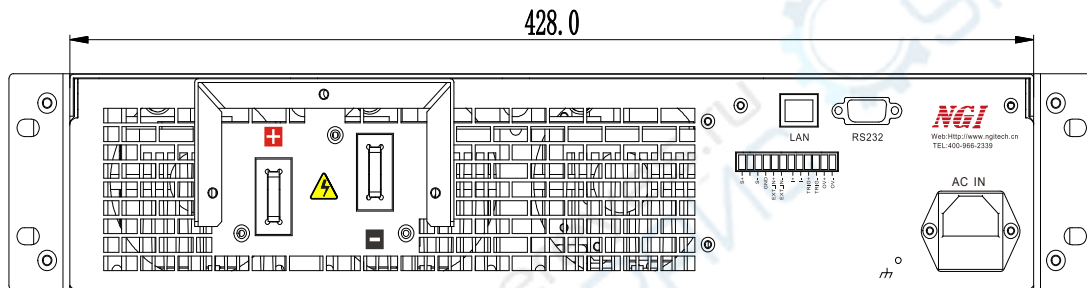


Figure 2 Rear Panel Dimension(mm)

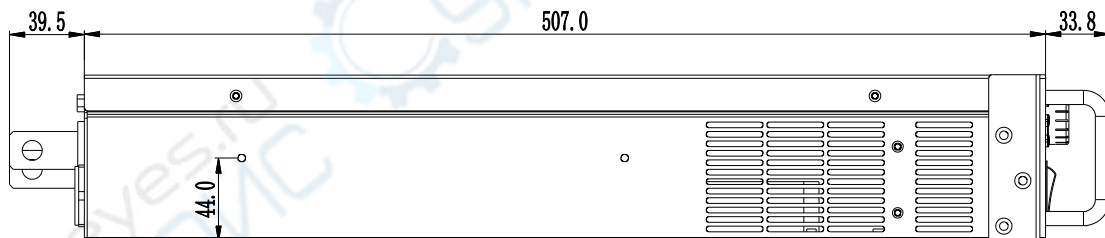


Figure 3 Side Dimension(mm)

3.3 Panel Introduction

3.3.1 Front Panel Introduction

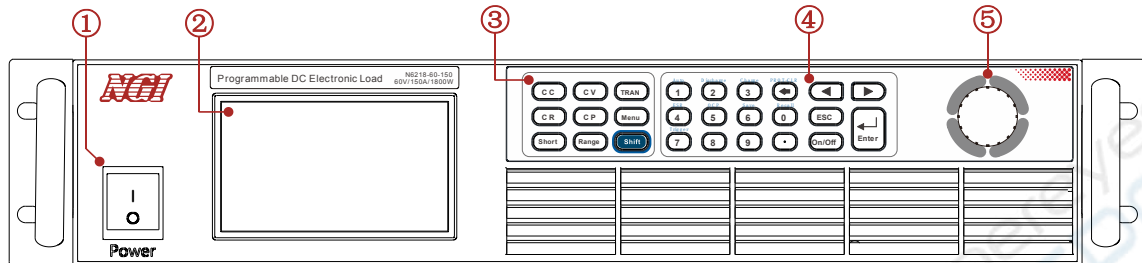


Figure 4 Front Panel

Table 4

Number	Name
1	Power switch
2	Screen
3	Function buttons
4	Numeric buttons
5	Knob

3.3.2 Rear Panel Introduction

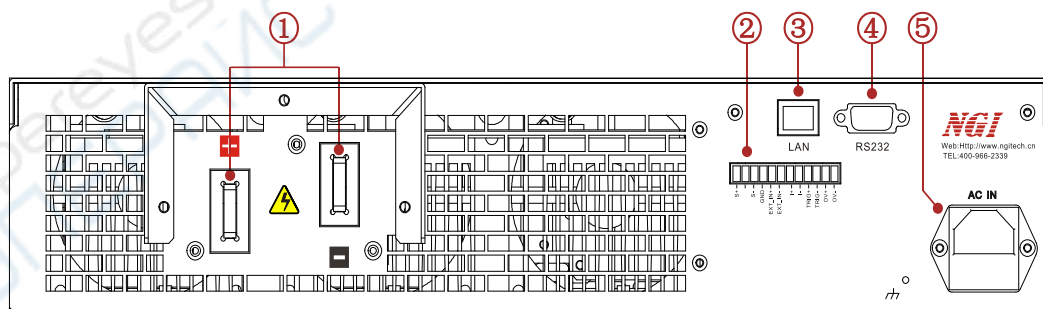


Figure 5 Rear Panel

Table 5

Number	Name
1	Input terminal (+, -)
2	Control signal terminal
3	LAN port

4	RS232 interface
5	AC power socket

3.4 Installation Instruction

N6200 dissipates heat through the built-in fans. When installing, please make sure there is a gap of at least 20cm between N6200 and other objects for air circulation.

3.4.1 AC Input

The power cord is a 3-core wire with grounding protection. Please use a suitable socket for operation. The power cord also matches your local voltage and plug type. If it is not matched, please contact NGI.

3.4.2 Power-on Self Test

Before power-on, please make sure the following.

- 1) The nominal voltage of the AC input socket should be in the correct range.
- 2) The power cord is plugged into AC input socket.



Warning: The three-core power cord provides chassis grounding. Before operating on N6200, please make sure N6200 is well grounded.

After switched on, N6200 will start power-on self test. If no error is found, the LCD screen will display the below CC interface.



Figure 6 CC Interface

In case of test failure, please record the error information and contact NGI for support.


If N6200 cannot be started properly, please refer to the following steps.

- 1) Check whether the power cord is properly connected.
- 2) Check whether the power is switched on.
- 3) Check whether the fuse is burned out.
 - ◆ If yes, please replace it.
 - ◆ Please use the proper fuse.
 - ◆ When replacing, please open the plastic cover at the AC power socket.

For more support, please contact NGI.

3.5 Connection

3.5.1 Input Connection

 Warning: To meet safety requirements, the load connection wires should be capable of bearing the maximum short-circuit current which the load can bear, to avoid t overheating.

Input connection refers to connecting the DUT to +&- terminals on N6200's rear panel. The major concerns for input connection are the wire diameter, length and polarity. The wire diameter should be big enough to ensure measurement accuracy.

Meanwhile exceeding heating may cause safety accidents. It is recommended to use standard copper wire with bigger diameter and less length to ensure the voltage drop should be less than 0.5V while N6200 is working.

Notice: To meet higher slew rate load specification and performance, the inductance of the wire between DUT and N6200 should be less than 5.0μH.

3.5.2 Control Connection

At the rear panel, there are terminals for remote sense, external programming input, etc.

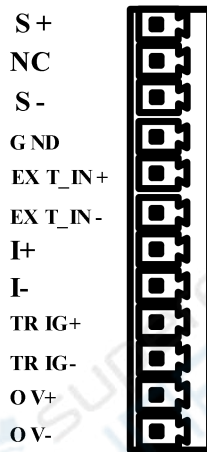


Figure 7 Control Signal Terminal

Table 6 Terminal Definition

Terminal	Definition
S+	Sense +
S-	Sense -
GND	Ground
EXT_IN+	External programming input +
EXT_IN-	External programming input -
I+	Current monitoring output +
I-	Current monitoring output -
TRIG +	Trigger signal input +, compatible with 5V TTL level
TRIG -	Trigger signal input -
OV+	Reserved terminal
OV-	Reserved terminal

Note: The input voltage range for external programming is 0 ~ 10V. Input voltage below 0V or above 10V may cause abnormal operation or even damage to N6200.

3.5.3 Sense Connection

N6200 provides two types of sense: local sense and remote sense. User can select sense mode on the screen under **Application** on the menu.

◆ Local sense

It is used when the load current is not very high.

◆ Remote sense

Remote sense is also four-wire sense. When N6200 is working, it will cause a voltage drop in the leads between the DUT and terminals of N6200, which will affect the voltage measurement accuracy of the load. When working under CV, CR and CP mode, to ensure accurate measurement, it is recommended to use remote sense. During remote sensing, terminals S+ and S- are directly connected to the output of the DUT.

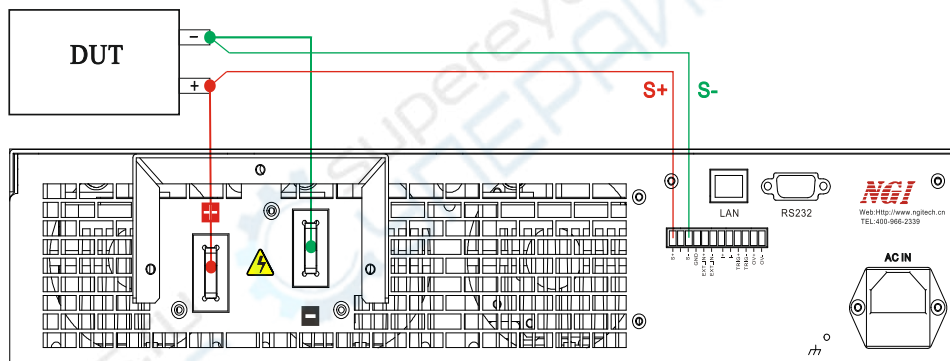


Figure 8 Remote Sense Connection

3.5.4 Low Voltage Test Connection

Please refer to the technical data sheet for the minimum operating voltage of each model. If lower voltage at full current needs to be tested, users can connect a DC power supply in series mode to compensate the minimum operating voltage. The DC power supply will provide a fixed voltage to ensure a high test voltage at N6200 input terminal.

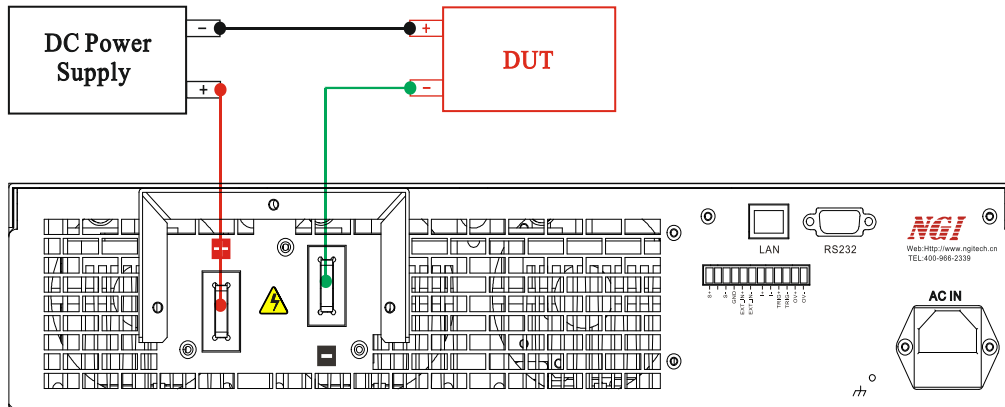


Figure 9 Low Voltage Test Connection

4 Functions and Features

This chapter mainly describes the functions and features of N6200 series.

N6200 provides two control modes: local control and remote control. Under local control mode, users can set and operate through N6200 buttons on front panel, and check N6200 status, parameters and readback data via the LCD screen. By remote control mode, it can realize most functions of local control.

4.1 Constant Current Mode (CC Mode)

Under CC mode, N6200 consumes constant current no matter how the input voltage changes.

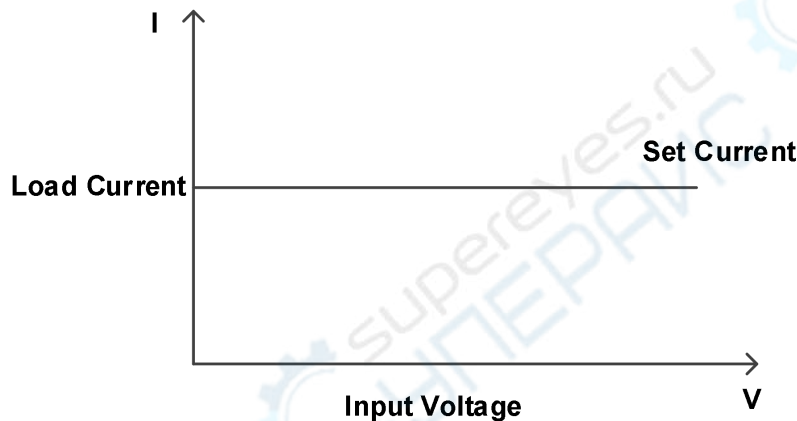


Figure 10 CC Mode

Current range

There are two ranges under CC mode: high and low, which can be selected by



on the front panel. By low range, it can realize high accuracy and resolution for input control. By high range, it can realize high input range.

4.2 Constant Voltage Mode (CV Mode)

Under CV mode, N6200 consumes enough current to maintain the input voltage at the set value.

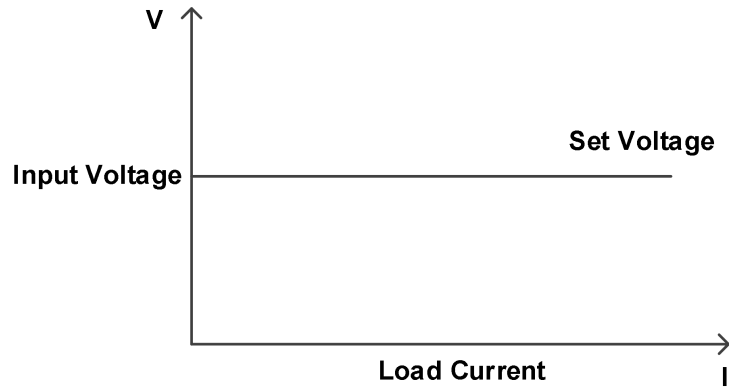



Figure 11 CV Mode

Voltage range

There are two ranges under CV mode: high and low, which can be selected by  on the front panel.

4.3 Constant Resistance Mode (CR Mode)

Under CR mode, N6200 is equivalent to a constant resistance. The input current will adjust as the input voltage changes.

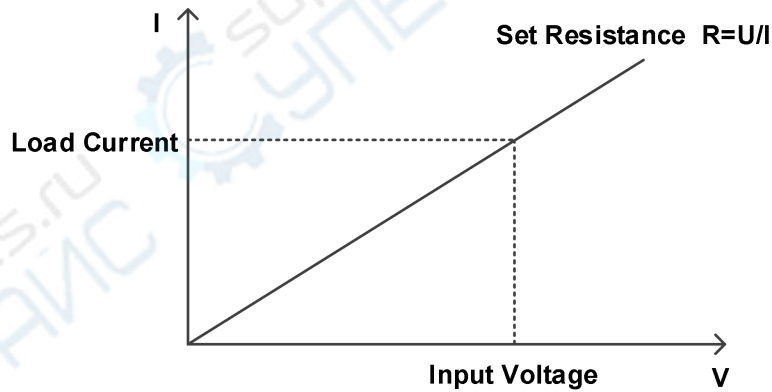



Figure 12 CR Mode

Resistance range

There are two ranges under CR mode: high and low, which can be selected by  on the front panel.

4.4 Constant Power Mode (CP Mode)

Under CP mode, N6200 will consume a constant power. The input current will be linearly adjusted with the input voltage to ensure that the power consumption remains unchanged.

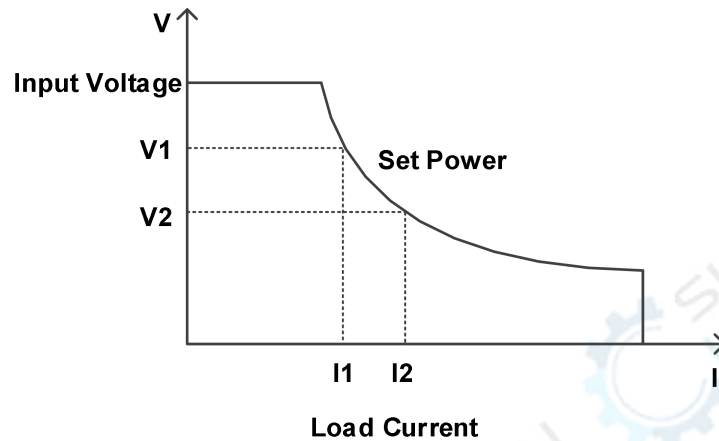





Figure 13 CP Mode



4.5 Dynamic Mode (TRAN)

The dynamic test function can allow N6200 to switch between main value and transient value, which is suitable for the test of power supply dynamic characteristics.

Please press  on the front panel to enter the dynamic mode. After setting the parameters, please press  to turn on/off the dynamic mode.

The dynamic mode supports CC,CV and CR functions. Under static mode, please press  to enter the corresponding dynamic mode.

N6200 provides three modes for dynamic: continuous(CONT), pulse(PULSE) and toggle(TOGGLE). Among them, pulse mode and toggle mode require trigger signal.

Trigger signal operation can be achieved by pressing  +  (Trigger), using together with trigger terminals at the rear panel.

4.5.1 Continuous (CONT)

Under continuous mode with dynamic test enabled, N6200 continuously switches between main value and transient value according to the set pulse width. Unless the dynamic mode is turned off or N6200 is switched off, N6200 will continue to operate according to the set parameters. This mode is not affected by the trigger signal. Under continuous mode, the setting range of pulse width is: 0.025 ~ 60000ms.

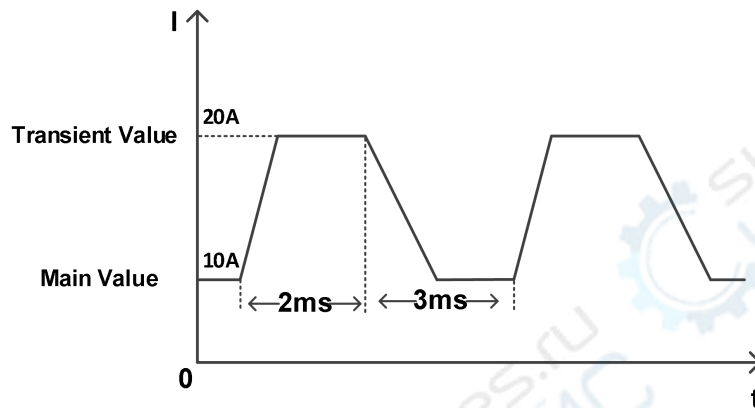


Figure 14 Continuous Mode

4.5.2 Pulse (PULSE)

Under pulse mode with dynamic test enabled, if the trigger signal is received, N6200 will immediately switch from main value to transient value, and then returns to main value after maintaining the pulse width time. The setting range of pulse width is: 0.025 ~ 60000ms.

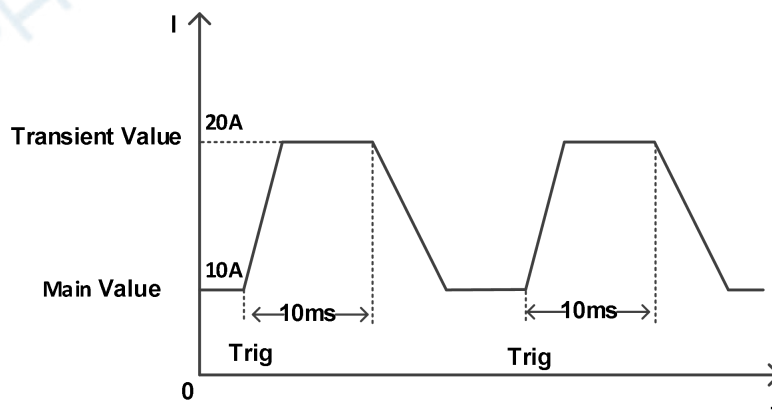


Figure 15 Pulse Mode

Note: Within the pulse width time of transient value, N6200 will not respond to the received trigger signal.

4.5.3 Toggle (TOGGLE)

Under toggle mode with dynamic test enabled, if the trigger signal is received, N6200 will switch between main value and transient value. The switching time is decided by slew rate.

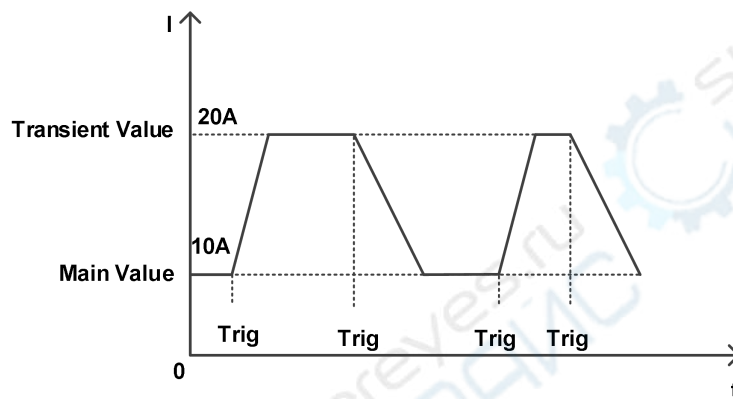


Figure 16 Toggle Mode

4.6 Auto Test Function

The auto test can be used to simulate waveform. This function can improve the test efficiency and can be achieved by SEQ function on the menu. The sequence file can be edited under **SEQ Edit**. Up to 100 sequence files editing is supported. Each file can support 50 steps.

When the sequence file runs, starting from step one, N6200 will load according to the parameters in the test step. When the step dwell ends, N6200 will conduct specification check (checking if the sampling voltage/current/power is within the range). Then N6200 will switch to next step. After all test steps are completed, N6200 automatically shuts the input, stops the test, and presents the test results.

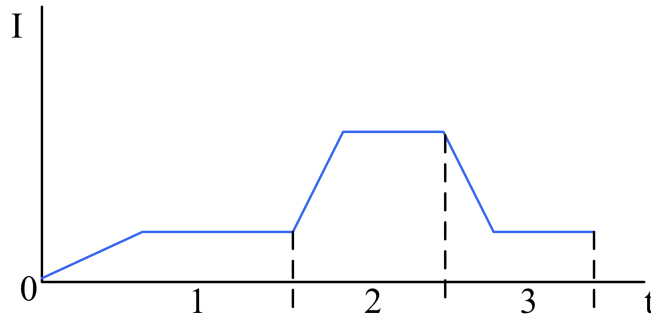


Figure 17 Auto Test

4.7 Discharge Test

The discharge test function is used to discharge batteries or supercapacitors. During the test, voltage of the battery or capacitor continues to decrease. When the voltage is lower than end voltage, N6200 shuts the input and stops discharging.

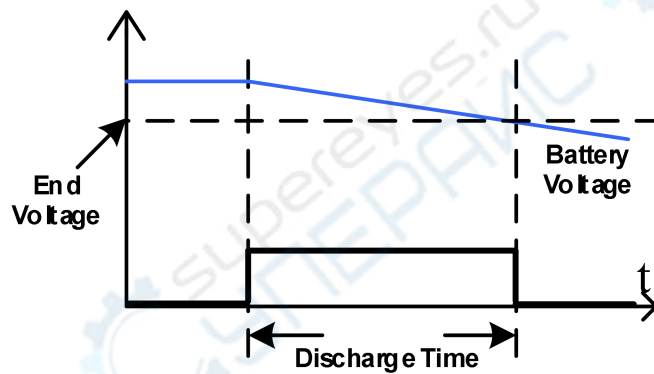


Figure 18 Discharge Test

4.8 Charge Test

The charge test function is used to charge batteries or supercapacitors. Except charging under CC mode, N6200 also provides charging from CC to CV to meet the customer's demand of charging quality (to charge as fully as possible).

The charge test function requires to connect a DC power supply and battery or supercapacitor in series, and to use remote sense.

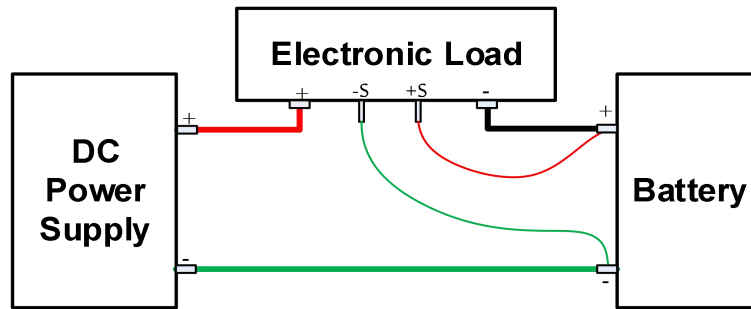


Figure 19 Charge Test

4.9 ESR Measurement (Optional)

ESR is a principal electrical parameter of battery or supercapacitor. With ESR measurement, N6200 absorbs current from the DUT under CC mode. When the current changes, the NGI internal resistance sensing circuit can accurately capture the voltage drop of DUT, and then calculate ESR value according to Ohm's law.


4.10 Over Current Protection Test (OCP Test)

N6200 provides a rise current to test whether the voltage of DUT can reach the end voltage and judge whether the OCP protection is normal. This test checks the output response of DUT under overload.

During OCP test, N6200 will load under CC mode and check whether the DUT voltage is lower than end voltage. If lower, N6200 will record the present loading current as the test result and shut the input to stop the test. If the DUT voltage is higher than end voltage, N6200 will increase the loading current until the DUT voltage is lower than end voltage or it reaches the Max. loading current.

4.11 Input Control




4.11.1 On/Off

Press  to turn on or off N6200.

4.11.2 Short-circuit

Under CC, CV, CR, CP and dynamic modes, N6200 can simulate short-circuit to test the protection performance of the DUT. The current consumed by N6200 during short-circuit depends on present N6200 operation mode and current range. Under CC and CP modes, the Max. short-circuit current is the Max. value of the present range. Under CV mode, short-circuit operation is equivalent to setting the CV value to 0V. Under CR mode, short-circuit operation is equivalent to setting the minimum value of the present range. The short-circuit operation does not change the present setting value. When exiting short-circuit operation, N6200 returns to the previous state.

Steps for short-circuit:

1. Select operation mode: CC/CP/CV/CR.
2. Press  and select ON.
3. Press  for short-circuit; press  again to exit short-circuit.

Note: It is not allowed to change operation mode and range during short-circuit.

4.11.3 Von/Voff

The Von latch function has two modes to meet your various test needs: enabled and disabled.

Disabled: When the input voltage is higher than Von, N6200 starts to sink current. When the input voltage is lower than Von, it stops sinking current.

Enabled: When the input voltage is higher than Von, N6200 starts to sink current. When the input voltage is lower than Voff, N6200 stops sinking current. After that, it will not sink current automatically even the input voltage is higher than Von again.

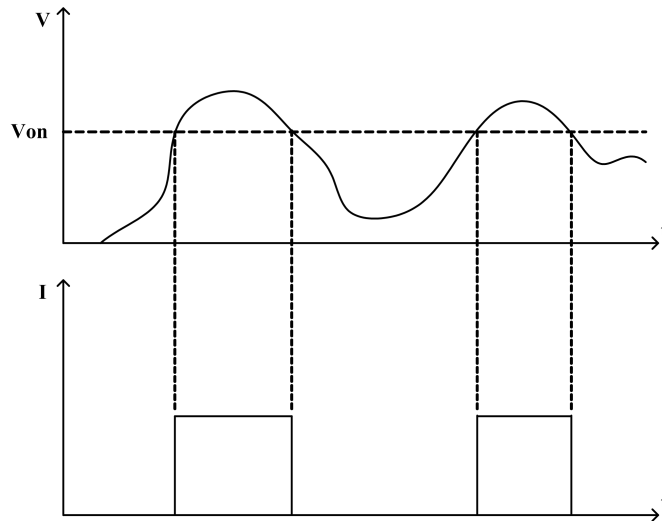


Figure 20 Von Disabled

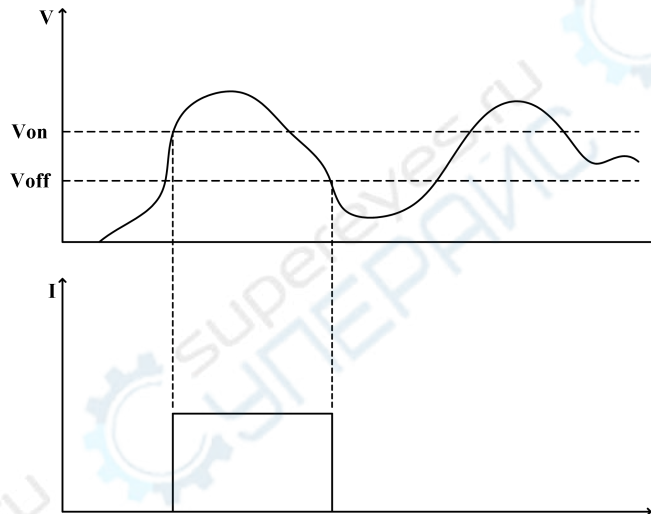


Figure 21 Von Enabled












Note 1: Von value should be higher than Voff value. Otherwise the operation will be abnormal.

Note 2: The setting of Von is only effective in CC, CV, CR and CP test functions.

4.11.4 Load Time

N6200 provides load time setting. When the load time reaches the set value, N6200 will stop loading, which can realize accurate control of the load time. For example, if the load time is set to 20s, N6200 will stop loading after 20s.

Steps for load time setting:

1. Press  to enter menu interface.
2. Press   or rotate  to select **Protection**.
3. Press  or  to enter **Protection**.
4. Press   or rotate  to select **Load Time**.
5. Set the required load time.
6. Press  or  to complete setting.

4.11.5 Programmable Protection

To protect the safety of the DUT, N6200 provides programmable protection. The protection includes current limit, over voltage, over current and over power.

◆ **Current Limit**

By this parameter, it can control the input current and ensure the current is below **I-Limit**.

◆ **OVP**

When the voltage exceeds OVP, N6200 will shut the input. Alarm **OVP** will be displayed on the screen.

◆ **OCP**

When the input current exceeds OCP, N6200 will shut the input. Alarm **OCP** will be displayed on the screen.

◆ **OPP**

When the input power exceeds OPP, N6200 will shut the input. Alarm **OPP** will be displayed on the screen.

4.12 Protection Function

N6200 provides multiple protection: OCP, OVP, OPP, RV, OTP, etc.

◆ **Over Current Protection (OCP)**

When the input current is 105% of rated current, OCP will occur.

◆ Over Voltage Protection (OVP)

When the input voltage is 105% of rated voltage, OVP will occur.

◆ Over Power Protection (OPP)

When the input power is 101% of rated power, OPP will occur. OPP is used to protect the hardware and prevent the components from being aged and damaged due to long time over-power.

◆ Reverse Polarity Warning (RV)

When the DUT polarity is incorrectly connected, RV will be displayed on the screen and an alarm will sound. At this time, N6200 will be in a conductive state. The maximum reverse current allowed is the same as the rated current of N6200. If the reverse current exceeds the rated current, it may cause damage to N6200.

◆ Over Temperature Protection (OTP)

There is a temperature detection circuit built in N6200. When the internal temperature exceeds the limit, N6200 shuts the input and prompts OT on the screen. Meanwhile, the fan works at full load to cool N6200.

◆ Power Module Over Temperature (MOT)


There is a temperature control switch on each power module. When the temperature exceeds the limit, the switch closes. N6200 shuts the input and prompts MOT on the screen, and an alarm will sound. Meanwhile, the fan works at full load to cool N6200.

◆ Temperature Sensor Failure (TSF)

When temperature sensor is damaged, N6200 shuts the input. TSF will be displayed on the screen.

◆ Power Module Missing (MISS)

Each power module communicates with the master through a communication cable and regularly reports its own status. If the cable fails to send information or other abnormalities cause communication interruption, N6200 shuts the input and prompts MISS on the screen, and an alarm will sound.

 Warning: Do not connect the output terminal of the AC power supply to the input terminal of N6200. Meanwhile, please make sure the input voltage is within the rated input voltage of N6200.

4.13 Slew Rate and Minimum Transition Time

Slew rate is defined as the change of voltage or current per unit of time. When the slew rate is set to the maximum value, the transition time between the main value and transient value will be the shortest.

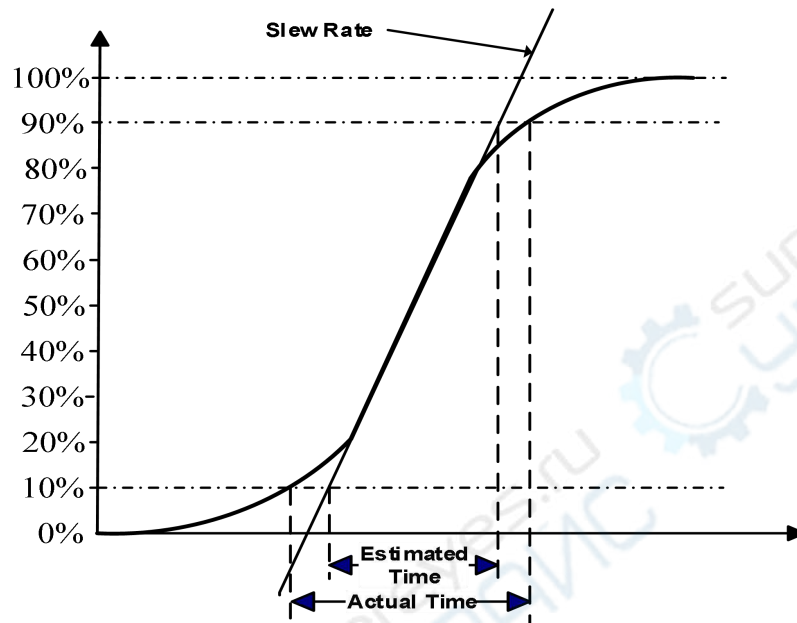


Figure 22 Slew Rate and Transition Time

Note: When N6200 switches from low voltage/current to high voltage/current, the minimum transition time is equal to the voltage/current difference divided by slew rate. When N6200 switches from high voltage/current to low voltage/current, the minimum transition time will be longer than the time calculated by the formula, due to the low range bandwidth limitation of N6200.











4.14 Save and Recall

N6200 can save 20 groups of general parameters into EEPROM, which is easy for users to recall. These parameters include CC, CV, CR, CP and TRAN setting values.









By pressing **Shift** + **6** or **Shift** + **0** on the front panel, it can save or recall. If

Fast Recall function is turned on, users can directly press the numeric button **0** ~ **9** to recall the first 10 groups of saved data. Number zero corresponds to the 10th group data.

Steps to turn on Fast Recall:

1. Press  to enter menu interface.
2. Press   or rotate  to select **System**.
3. Press  or  to enter **System**.
4. Press   or rotate  to select **Fast Recall**.
5. Select ON for **Fast Recall**.
6. Press  twice to exit.

Take CR mode for example to describe save and recall operation:

1. Set parameters under CR mode. And press  +  to enter save interface.
2. Press numeric button, for example . And press  to save the parameters in group number 2.
3. If **Fast Recall** is ON, press  directly and recall. If **Fast Recall** is OFF, press  +  +  to recall.

Note: If there is no data in the save area, recall operation will be invalid.











4.15 Power-off Memory

N6200 provides power-off memory function, which can save the data when turning off N6200 or in power failure. This function can be enabled by selecting ON for **Poweroff Memory** in **Application**.

4.16 Language

N6200 provides two options for language: Chinese and English.

Steps to select language:

1. Press  to enter menu interface.
2. Press   or rotate  to select **System**.
3. Press  or  to enter **System**.
4. Press   or rotate  to select **Language**.
5. Select Chinese or English.
6. Press  twice to exit.

4.17 Control and Monitor

The control and monitor can be realized by the control signal terminal at N6200's rear panel. The terminal definition can be found in chapter 3.5.2.

4.17.1 Remote Sense

Terminals S+ and S- are for remote sense, which are used to provide a remote voltage signal for the internal measurement system in N6200.

When working under CV, CR and CP mode, to ensure accurate measurement, it is recommended to use remote sense. During remote sense, terminals S+ and S- are directly connected to the output of the DUT.

Note: If remote sense is selected in **Sense Mode** under **Application**, and S+ & S- are not connected to DUT output, N6200 will not be able to measure voltage correctly. Meanwhile, CV, CR, and CP mode will not operate properly.

4.17.2 Current Monitoring Output

The current output terminal provides 0 ~ 10V voltage output signal, which is used to indicate the input current of 0 to full scale. The input current is proportional to the output voltage. For example, if the current value is 30A, the voltage of current monitoring output terminal is 1V. If the current value is 300A, the voltage of current monitoring output terminal is 10V.

GND is the ground terminal.

4.17.3 External Programming Input

The CC mode can be continuously controlled by inputting an external voltage signal (DC or AC) at the terminal EXT_IN +. The external programming input voltage range is 0 ~ 10V, which corresponds to zero to full scale of CC mode.






EXT_IN- is the ground terminal.

Note:

1. External programming is valid under CC and CV mode only.
2. It is not allowed to input voltage over 10V for external programming. If over 10V, it may cause N6200 input voltage or current to exceed rated range. In this case, N6200 will take protection.
3. To enable external programming, select ON for **Ext-Prog** in **Application**.

4.18 Factory Reset

Steps to do factory reset:

1. Press  to enter menu interface.
2. Press   or rotate  to select **Factory Reset**.
3. Press  to do factory reset.

Note:

1. The sequence file and parameters saved in EEPROM will not be cleared after factory reset.
2. The load should be restarted after factory reset.

5 Local Operation

This chapter mainly describes the button operation and LCD screen display information.

5.1 Button

N6200 buttons are composed of three areas: function, numeric and knob.

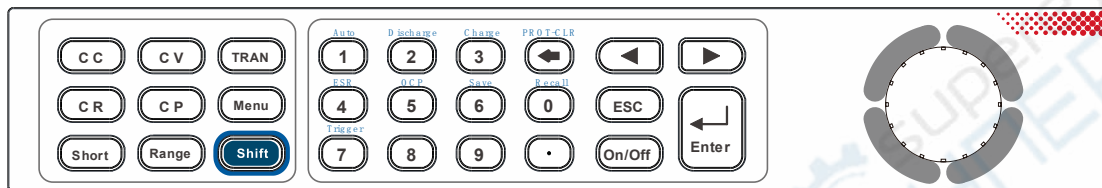


Figure 23 Buttons

5.1.1 Function Button

Table 7

Button	Function
	To enter constant current mode (CC mode)
	To enter constant voltage mode (CV mode)
	To enter dynamic/transient mode
	To enter constant resistance mode (CR mode)
	To enter constant power mode (CP mode)
	To enter the main Menu
	To enter short-circuit function
	Range switch
	Back to previous page
	Compound button

5.1.2 Compound Button

Table 8

Compound Button	Function
	To enter auto test
	To enter discharge test function
	To enter charge test function
	To clear the protection
	To enter ESR test
	To enter OCP test
	To enter save interface
	To enable trigger signal
	To enter recall interface

5.1.3 Numeric Button

Table 9

Button	Function
	Digit input
	Decimal point
	To delete
	1. To shift or select the required item in menu 2. To control the cursor scrolling when setting parameter
	To enter the required item, confirm the input, exit from setting or remote operation

5.1.4 Knob

Table 10

Knob	Function
	By rotating: to select the desired item, adjust the parameter By pressing: to enter the edit interface, confirm the input

5.2 LCD Screen

5.2.1 Monitor Interface



Figure 24 Monitor Interface

- ① Load specification
- ② Readback area
- ③ Status information
- ④ Setting area
- ⑤ Operation mode

5.2.2 Status Information



Figure 25 Status Information

Table 11









Number	Definition
1	N6200 operation mode and working range: CCH, CCL, CVH, CVL, CVBH, CVBL, CRH, CRL and CP. The range can be switched by pressing  .
2	Under external programming
3	Alarm information: OPP, OCP, OVP, OTP, TSF, MISS and MOT
4	Under remote sense
5	On/off state


Table 12

Alarm	Definition
OPP	Over power protection
OCP	Over current protection
OVP	Over voltage protection
OTP	Over temperature protection
TSF	Temperature sensor failure
MISS	Power module missing or loose wiring connection
MOT	Power module over temperature

5.3 Menu

Steps to enter menu:

1. Press  on the front panel.
2. Press   or rotate  to select the required function.
3. Press  or  to enter the required parameter.
4. Press  to return to previous page.

Note: There are three pages for the menu. Users can press  to switch to next page.

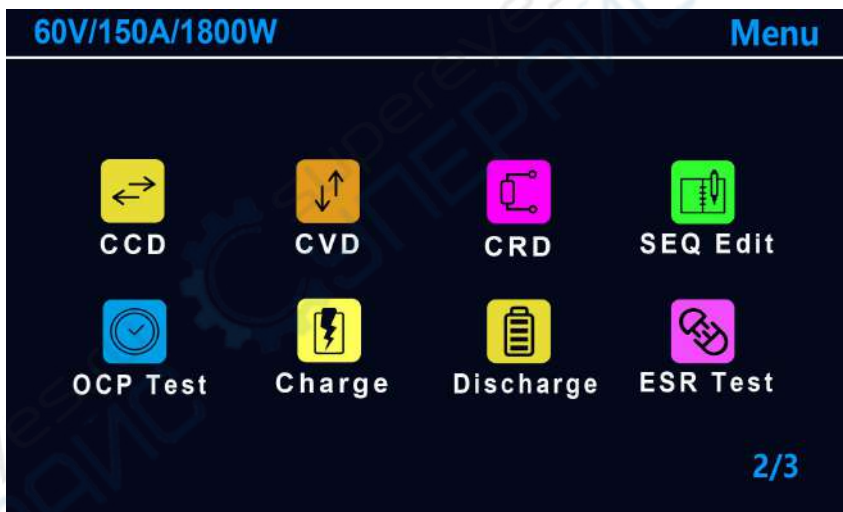










Figure 26 Menu

5.4 Setting

5.4.1 System Setting

Steps to enter **System**:

1. Press  on the front panel.
2. Choose **System** by pressing   or rotating .
3. Press  or  on **System**.

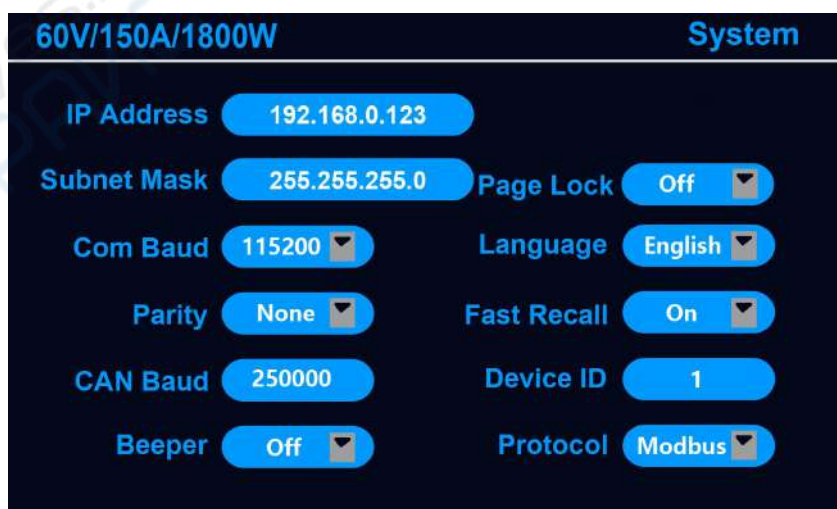


Figure 27 System Setting

Table 13

Parameter	Function
IP Address	To set communication IP address
Subnet Mask	To set communication subnet mask
Com Baud	To set baud rate for RS232 communication
Parity	Parity options: none, odd, even
CAN Baud	To set baud rate for CAN communication
Beeper	To set the button sound
Page Lock	To lock the present operation mode
Language	To select the display language
Fast Recall	To turn on/off fast recall
Device ID	To set device ID
Protocol	To set communication protocol, protocol options: Modbus or SCPI

5.4.2 Application Setting

Steps to enter **Application**:

1. Press on the front panel.
2. Choose **Application** by pressing or rotating .
3. Press or on **Application**.



Figure 28 Application Setting

Table 14

Parameter	Function
Sense Mode	To set local or remote
Ext-Control	External trigger source, options: Toggle, Hold and Off
Ext-Prog	To turn on/off external programming
CV Mode	To set charge or discharge, for battery or capacitor charge & discharge test
CV Rate	This parameter is for setting CV rate. The options are slow, medium and fast. The rate is related to the response speed of external power supply. If the response speed of external power supply is high, CV rate should be set to High.
Test Duration	ESR single pulse test time is 10ms-50ms. Default is 10ms.
Poweroff Memory	This function is to save the data when turning off N6200 or in power failure.
Turnon Load	When this function is set to ON, N6200 will automatically load after power-on, according to the previous setting before power-off.
Work Mode	The options are fast and precision. Fast option provides high response speed. Precision option internally compensates for accuracy errors caused by fast response.
CV Range	To set current range under CV mode, options: CCH and CCL
CP/CR Mode	The options are fast and precision.

5.4.3 Protection Setting

Steps to enter **Protection**:







1. Press  on the front panel.
2. Choose **Protection** by pressing   or rotating .
3. Press  or  on **Protection**.



Figure 29 Protection Setting

Table 15

Parameter	Function
I-Limit	To set the programmable current limit
OCP	To set the programmable current protection threshold, 0A for disabling this function
OVP	To set the programmable voltage protection threshold, 0V for disabling this function
OPP	To set the programmable power protection threshold, 0W for disabling this function
Von Latch	ON means N6200 will sink current when input voltage reaches Von. OFF means N6200 will stop loading when input voltage is below Von.
Von	To set the programmable voltage limit
Voff	When input voltage is below Voff, N6200 will stop loading immediately. To disable this function, please set it to 0V.
Load Time	This parameter is to set load time. When the time reaches, N6200 will stop loading. The programmable range is 0-60,000s. To disable this function, please set it to 0s.

5.4.4 Factory Reset

Steps to do factory reset:

1. Press  to enter menu interface.






2. Press   or rotate  to select **Factory Reset**.
3. Press  to do factory reset.
4. Press  to cancel.



Figure 30 Factory Reset

6 Operation Guideline

This chapter mainly describes N6200 operation procedures.

6.1 Static Operation

N6200 static mode includes CC, CV, CR and CP.

6.1.1 Constant Current (CC)

6.1.1.1 CC Mode Selection

Methods to enter **CC**:

Method 1: Press  on the front panel directly.







Method 2: Press  → Choose **CC** by pressing   or rotating  → Press  or .



Figure 31 CC Interface

Table 16


Parameter	Description
Range	To select the operation range
I-Set	To set the current











Rise Slew	To set the rise slew rate
Fall Slew	To set the fall slew rate

6.1.1.2 Range Selection

There are two options for range: CCH and CCL. It is recommended to select CCL for 0 to 10% of maximum current, and select CCH for over 10% of maximum current. This will ensure the measurement accuracy.








Methods to select range:











Method 1: Press  on the front panel directly to switch the range.


Method 2: Press   or rotate  to select **Range** → Press  or  on **Range** → Press   or rotate  to select the required range → Press  or  to complete selection.

6.1.1.3 Current and Slew setting

Methods to set I-Set/Rise Slew/Fall Slew under CC:

Method 1: Press   or rotate  to select the required parameter → Press  or  on the required parameter → Press numeric buttons to input the value → Press  or  to complete setting.

Method 2: Press   or rotate  to select the required parameter → Press  or  on the required parameter → Press   to move the cursor and rotate  to adjust the numeric → Press  or  to complete setting.

Note: To exit from CC, please press  or the function button required.

6.1.2 Constant Voltage (CV)

6.1.2.1 CV Mode Selection

Methods to enter **CV**:

Method 1: Press  on the front panel directly.







Method 2: Press  → Choose **CV** by pressing   or rotating  → Press  or .



Figure 32 CV Interface

Table 17

Parameter	Description
Range	To select the operation range
V-Set	To set the voltage
Rise Slew	To set the rise slew rate
Fall Slew	To set the fall slew rate

6.1.2.2 Range Selection

There are two options for range: CVH and CVL. It is recommended to select CVL for 0 to 10% of maximum voltage, and select CVH for over 10% of maximum voltage. This will ensure the measurement accuracy.

Methods to select range:

Method 1: Press on the front panel directly to switch the range.

Method 2: Press or rotate to select **Range**→ Press or on

Range→Press or rotate to select the required range→ Press or to complete selection.

6.1.2.3 Voltage and Slew setting

Methods to set **V-Set/Rise Slew/Fall Slew** under **CV**:

Method 1: Press or rotate to select the required parameter→Press or on the required parameter→Press numeric buttons to input the value→Press or to complete setting.

Method 2: Press or rotate to select the required parameter→Press or on the required parameter→Press to move the cursor and rotate to adjust the numeric→Press or to complete setting.

Note: To exit from **CV**, please press or the function button required.

6.1.3 Constant Resistance (CR)

6.1.3.1 CR Mode Selection

Methods to enter **CR**:

Method 1: Press on the front panel directly.

Method 2: Press → Choose **CR** by pressing or rotating → Press or .



Figure 33 CR Interface

Table 18

Parameter	Description
Range	To select the operation range
R-Set	To set the resistance
Rise Slew	To set the rise slew rate
Fall Slew	To set the fall slew rate

6.1.3.2 Range Selection

There are two options for range: CRH and CRL.

Methods to select range:

Method 1: Press on the front panel directly to switch the range.

Method 2: Press or rotate to select **Range** → Press or on

Range → Press or rotate to select the required range → Press or to complete selection.

6.1.3.3 Resistance and Slew setting

Methods to set R-Set/Rise Slew/Fall Slew under CR:

Method 1: Press or rotate to select the required parameter → Press or on the required parameter → Press numeric buttons to input the value → Press or to complete setting.

Method 2: Press or rotate to select the required parameter → Press or on the required parameter → Press to move the cursor and rotate to adjust the numeric → Press or to complete setting.

Note: To exit from CR, please press or the function button required.

6.1.4 Constant Power (CP)

6.1.4.1 CP Mode Selection

Methods to enter CP:

Method 1: Press on the front panel directly.

Method 2: Press → Choose CP by pressing or rotating → Press or .



Figure 34 CP Interface

Table 19

Parameter	Description
P-Set	To set the power
Rise Slew	To set the rise slew rate
Fall Slew	To set the fall slew rate

6.1.4.2 Power and Slew setting

Methods to set **P-Set/Rise Slew/Fall Slew** under **CP**:

Method 1: Press or rotate to select the required parameter → Press or on the required parameter → Press numeric buttons to input the value → Press or to complete setting.

Method 2: Press or rotate to select the required parameter → Press or on the required parameter → Press to move the cursor and rotate to adjust the numeric → Press or to complete setting.

Note: To exit from **CP**, please press or the function button required.

6.2 Dynamic Operation

Dynamic function can be used to test the dynamic characteristics of DUT. There are three modes for dynamic test: CCD, CVD and CRD. Dynamic functions offers three operation modes: continuous, pulse and toggle.

Take CCD for example to describe the operation procedures below.

6.2.1 CCD Mode Selection

Methods to enter CCD:

Method 1: In CC mode, press on the front panel directly and switch to CCD mode.

Method 2: Press → Choose CCD by pressing or rotating → Press or .



Figure 35 CCD Interface


Table 20

Parameter	Description
Range	To select the operation range
Mode	To select the operation mode
Current 1	To set main value
Current 2	To set transient value






Pulse Wid. 1	To set pulse width for main value, range: 0.025ms~60000ms
Pulse Wid. 2	To set pulse width for transient value, range: 0.025ms~60000ms
Rise Slew	To set the rise slew rate
Fall Slew	To set the fall slew rate

6.2.2 Range Selection

Methods to select range:

Method 1: Press  on the front panel directly to switch the range.






Method 2: Press   or rotate  to select **Range**→ Press  or  on

Range→Press   or rotate  to select the required range→ Press  or  to complete selection.

6.2.3 Operation Mode Selection








Steps to select operation mode:








Press   or rotate  to select **Mode**→ Press  or  on

Mode→Press   or rotate  to select the required mode→ Press  or  to complete selection.

6.2.4 Parameter Setting

Methods to set **Current 1/Current 2/Pulse Wid. 1/Pulse Wid. 2/Rise Slew/Fall Slew** under **CCD**:

Method 1: Press   or rotate  to select the required parameter→Press  or  on the required parameter→Press numeric buttons to input the value→Press  or  to complete setting.

Method 2: Press   or rotate  to select the required parameter→Press  or  on the required parameter→Press   to move the

cursor and rotate to adjust the numeric → Press or to complete setting.

Note: To exit from **CCD**, please press or the function button required.

6.3 Auto Test

The auto test allows users to edit a complex sequence of changes to simulate various changes at the load input.

6.3.1 SEQ Edit

Steps to enter **SEQ Edit**:

Press → Choose **SEQ Edit** by pressing or rotating → Press or .



Figure 36 SEQ Edit








Table 21











Parameter	Function
File No.	To set the sequence test file number
Total Steps	To set the total steps of SEQ file

Link to SEQ	To link to the required SEQ file after the present file is completed
Cycle	To set the number of cycles for the file under edit
Step No.	To set the step number for editing
Mode	Mode options: CCH, CCL, CVH, CVL, CVBH(constant voltage charge high range), CVBL(constant voltage charge low range), CRH, CRL, and CP. Different modes relate to different main values and slew rates.
I-Set	This parameter is for setting the main value. If CCH selected, I-Set should be set. If CRH selected, R-Set should be set.
Rise Slew	To set the rise slew rate
Fall Slew	To set the fall slew rate
Dwell	This parameter is for setting the single step delay time. The settable range is 0.0-100,000.0s. Zero means this function disabled.
Inspection	Options: OFF, Voltage, Current and Power. If time accuracy of the waveform is more focused, users can set it to OFF. If Voltage/Current/Power is selected, upper limit and lower limit should be set correspondingly.

6.3.1.1 Parameter Setting

Methods to set **File No./Total Steps/Link to SEQ/Cycle/Step No./I-Set/Rise Slew/Fall Slew/Dwell** under **SEQ Edit**:

Method 1: Press   or rotate  to select the required parameter → Press  or  on the required parameter → Press numeric buttons to input the value → Press  or  to complete setting.

Method 2: Press   or rotate  to select the required parameter → Press  or  on the required parameter → Press   to move the cursor and rotate  to adjust the numeric → Press  or  to complete setting.

6.3.1.2 Mode and Inspection Selection

Steps to select **Mode** and **Inspection**:

Press or rotate to select **Mode/Inspection** → Press or on **Mode/Inspection** → Press or rotate to select the required option → Press or to complete selection.

Note 1: To save the SEQ file, please press + .

Note 2: To exit from **SEQ Edit**, please press or the function button required.

6.3.2 Start Auto Test

Methods to enter **Auto Test**:

Method 1: Press first and then on the front panel.

Method 2: Press → Choose **Auto Test** by pressing or rotating → Press or .










Figure 37 Auto Test Interface











Table 22


Parameter	Function
File No.	To set the sequence test file number
Step No.	Displaying the present test step number

6.3.2.1 File No. Setting

Methods to set **File No.** under **Auto Test**:

Method 1: Press   or rotate  to select **File No.** → Press  or  on **File No.** → Press numeric buttons to input the value → Press  or  to complete setting.

Method 2: Press   or rotate  to select **File No.** → Press  or  on **File No.** → Press   to move the cursor and rotate  to adjust the numeric → Press  or  to complete setting.

Note 1: After setting the file No., users can press  to start auto test.

Note 2: The present step number will be displayed on the screen.

Note 3: N6200 will shut the input if the test is completed.

Note 4: PASS or FAIL will be displayed on the screen if voltage/current/power is selected for **Inspection** in **SEQ Edit**.

Note 5: To exit from **Auto Test**, please press  or the function button required.

6.4 Capacity Test

N6200 provides capacity test for battery, capacitor or other power supplies. Below is wiring sample of battery capacitance test.

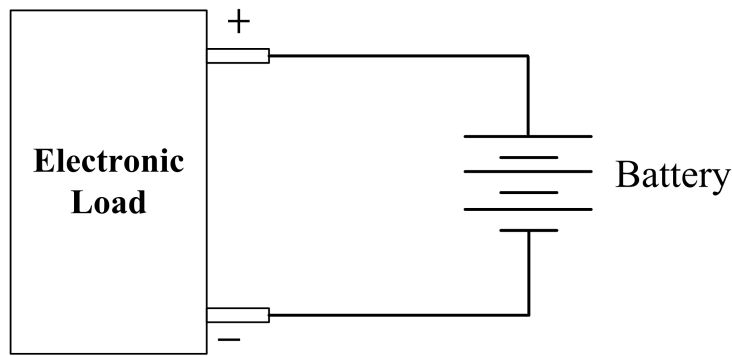


Figure 38 Battery Capacity Test Wiring

6.4.1 Discharge

Steps to operate discharge test:

1. Connect battery with N6200 properly.
2. Set CV mode.

Press → Choose **Application** by pressing or rotating → Press or to enter **Application** → Choose **CV Mode** by pressing or rotating → Press or on **CV Mode** → Choose **Discharge** by pressing or rotating → Press or to complete selection.

3. Enter discharge test interface.

Methods to enter **Discharge**:

Method 1: Press first and then on the front panel.

Method 2: Press → Choose **Discharge** by pressing or rotating → Press or .

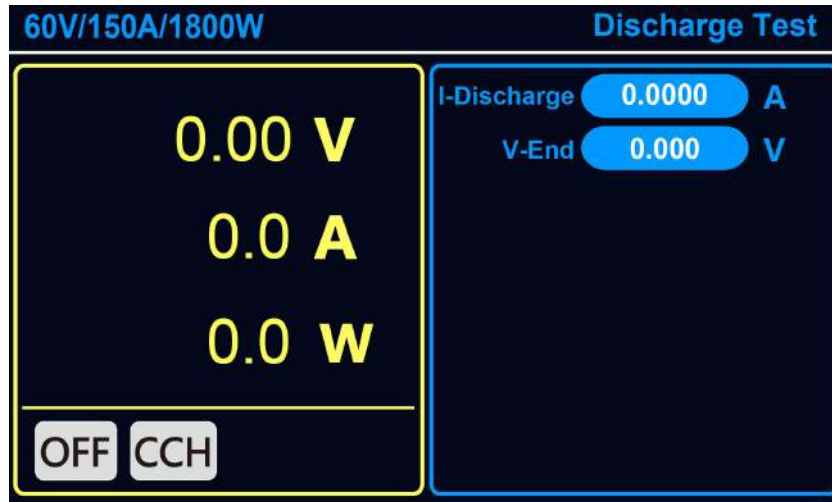


Figure 39 Discharge Test

Table 23

Parameter	Function
I-Discharge	To set the discharge current
V-End	To set the end voltage

4. Set **I-Discharge** and **V-End**.

Methods to set **I-Discharge/V-End**:

Method 1: Press or rotate to select the required parameter → Press or on the required parameter → Press numeric buttons to input the value → Press or to complete setting.

Method 2: Press or rotate to select the required parameter → Press or on the required parameter → Press to move the cursor and rotate to adjust the numeric → Press or to complete setting.

5. Clear the data.

N6200 records and accumulates the previous load time and discharge capacity.

Before testing, please press to clear the data.

6. Start discharge test.

Press to start test.

Note 1: When the battery voltage drops to V-End, the test is completed. The battery capacity (Ah) will be displayed on the screen.

Note 2: To exit from **Discharge**, please press or the function button required.

6.4.2 Charge

Steps to operate charge test:

1. Connect battery with N6200 properly.
2. Set CV mode.

Press → Choose **Application** by pressing or rotating →

Press or to enter **Application** → Choose **CV Mode** by pressing or

rotating → Press or on **CV Mode** → Choose **Charge** by pressing or

rotating → Press or to complete selection.

3. Enter charge test interface.

Methods to enter **Charge**:

Method 1: Press first and then on the front panel.

Method 2: Press → Choose **Charge** by pressing or rotating →

Press or .



Figure 40 Charge Test

Table 24

Parameter	Function
I-Charge	To set the charge current
V-Charge	To set the charge voltage
CV Time	To set the constant voltage operation time

4. Set I-Charge, V-Charge and CV Time.

Methods to set I-Charge/V-Charge/CV Time:

Method 1: Press or rotate to select the required parameter → Press or on the required parameter → Press numeric buttons to input the value → Press or to complete setting.

Method 2: Press or rotate to select the required parameter → Press or on the required parameter → Press to move the cursor and rotate to adjust the numeric → Press or to complete setting.

5. Clear the data.

N6200 records and accumulates the previous load time and charge capacity. Before testing, please press to clear the data.

6. Start charge test.

Press to start test.

Note 1: N6200 will firstly charge the battery at a constant current. After reaching V-Charge, it will charge at a constant voltage. Until the CV time reaches, it stops charging. The battery charge capacity (W) will be displayed on the screen.

Note 2: To exit from **Charge**, please press or the function button required.

6.5 ESR Test (Optional)

N6200 test battery and capacitor ESR through constant current discharge method.

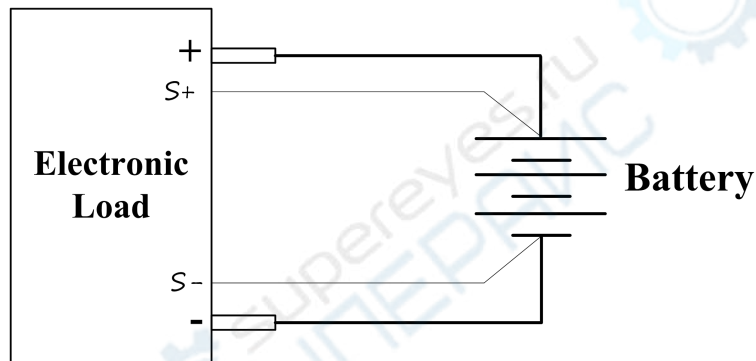


Figure 41 Battery ESR Test Wiring

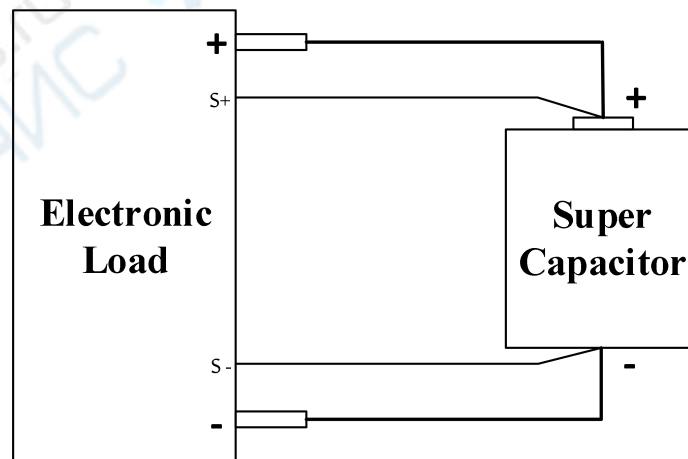


Figure 42 Capacitor ESR Test Wiring

Steps to operate ESR Test:

1. Connect battery or capacitor with N6200 properly.

2. Enter ESR Test interface.

Methods to enter **ESR Test**:

Method 1: Press first and then on the front panel.

Method 2: Press → Choose **ESR Test** by pressing or rotating → Press or .

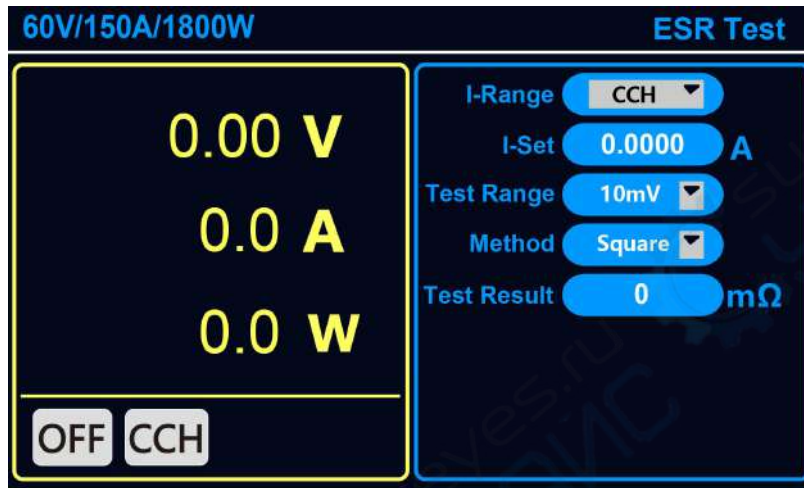


Figure 43 ESR Test

Table 25

Parameter	Function
I-Range	To select the current range, options: CCH and CCL. It is recommended to select CCL for 0 to 10% of maximum current, and select CCH for over 10% of maximum current.
I-Set	To set the discharge current
Test Range	To select the test range, options: 10mV/100mV/1000mV
Method	To select the test method, options: square and N-ms (monopulse)
Test Result	Displaying the rest result

3. Select the current range.

Methods to select range:

Method 1: Press on the front panel directly to switch the range.

Method 2: Press or rotate to select **I-Range** → Press or on

I-Range→Press or rotate to select the required range→
Press or to complete selection.

4. Set the discharge current.

Methods to set **I-Set**:

Method 1: Press or rotate to select **I-Set**→Press or on **I-Set**→Press numeric buttons to input the value→Press or to complete setting.

Method 2: Press or rotate to select **I-Set**→Press or on **I-Set**→Press to move the cursor and rotate to adjust the numeric→Press or to complete setting.

5. Select parameters for **Test Range/Method**.

Press or rotate to select **Test Range/Method**→ Press or on **Test Range/Method**→Press or rotate to select the required parameter→
Press or to complete selection.

6. Start ESR test.

Press to start test.

Note 1: During the test, a prompt will be displayed on screen if the wiring is incorrect.

Note 2: Please use high current for supercapacitor test to obtain accurate resistance, due to the small resistance of supercapacitor.

Note 3: To exit from **ESR Test**, please press or the function button required.

6.6 OCP Test

Steps to operate OCP test:

1. Connect DUT with N6200 properly.
2. Enter OCP Test interface.

Methods to enter **OCP Test**:

Method 1: Press first and then on the front panel.

Method 2: Press → Choose **OCP Test** by pressing or rotating → Press or .



Figure 44 OCP Test

Table 26

Parameter	Function
I-Start	To set the start current
I-Incr	To set the current increment
V-End	To set the end voltage
Dwell	To the dwell time for single step
Test Result	Displaying the rest result

3. Set parameters.

Methods to set **I-Start/I-Increment/V-End/Dwell**:

Method 1: Press or rotate to select the required parameter → Press or on the required parameter → Press numeric buttons to input the value → Press or to complete setting.

Method 2: Press or rotate to select the required parameter → Press or on the required parameter → Press to move the cursor and rotate to adjust the numeric → Press or to complete setting.

4. Start OCP test.

Press to start test.

Note: To exit from **OCP Test**, please press or the function button required.

6.7 MPPT Test

Steps to operate MPPT test:

1. Enter MPPT Test interface.

Steps to enter **MPPT**:

Press → Choose **MPPT** by pressing or rotating →
Press or .



Figure 45 MPPT Test

2. Select the mode.

Steps to select mode:

Press or rotate to select **Mode** → Press or on **Mode** → Press or rotate to select the required mode → Press or to complete selection.

3. Set the parameters.

Methods to set parameters:

Method 1: Press or rotate to select the required parameter → Press or on the required parameter → Press numeric buttons to input the value → Press or to complete setting.

Method 2: Press or rotate to select the required parameter → Press or on the required parameter → Press to move the cursor and rotate to adjust the numeric → Press or to complete setting.

4. Start MPPT test.

Press  to start test.

Note: To exit from **MPPT**, please press  or the function button required.



7 Maintenance and Self-inspection

7.1 Regular Maintenance

Clean the Device

Please wipe lightly the device with a dry or slightly wet cloth, and do not wipe the inside of it. Make sure the power is disconnected before cleaning.

 **Warning: Disconnect power before cleaning.**

7.2 Fault Self-inspection

Device Fault Self-inspection

Due to system upgrade or hardware problem, the device may break down. Please do the following necessary inspection to eliminate the troubles, which can save your maintenance and time cost. If the troubles cannot be recovered, please contact NGI.

The inspection steps are as below.

- ◆ Check whether the device is powered.
- ◆ Check whether the device can be turned on normally.
- ◆ Check whether the fuse has no damage.
- ◆ Check whether other connectors are correct, including wire cables, plug, etc.
- ◆ Check whether the system configuration is correct.
- ◆ Check whether all the specifications and performances are within the device working range.
- ◆ Check whether the device displays error information.
- ◆ Operate on a replacement device.

Calibration Intervals

It is suggested that N6200 series should be calibrated once a year.

8 Main Technical Data

Attention:

The measurement accuracy is identified by the following conditions: within one year after calibration, OTP temperature 85 °C, operating temperature 0-40 °C, full power operating temperature 0-25 °C, recommended operating temperature 18-28 °C, and the relative humidity up to 80%.

Please warm up the device for half hour to ensure the measurement accuracy.

Table 27

Model	N6206-60-10		N6206-60-50		N6206-150-50		N6206-600-10	
Voltage	60V		60V		150V		600V	
Current	10A		50A		50A		10A	
Power	600W							
Min. Operating Voltage	2V@10A		2V@50A		2V@50A		4.5V@10A	
CC Mode								
Range	0-1A	0-10A	0-5A	0-50A	0-5A	0-50A	0-1A	0-10A
Setting	0.01mA	0.1mA	0.08mA	0.8mA	0.08mA	0.8mA	0.01mA	0.1mA
Resolution								
Setting Accuracy(23±5 °C)	Low range:0.1%+0.1%F.S., High range:0.1%+0.15%F.S.							
CV Mode								
Range	0-6V	0-60V	0-6V	0-60V	0-15V	0-150V	0-60V	0-600V
Setting	0.1mV	1mV	0.1mV	1mV	0.25mV	2.5mV	1mV	10mV
Resolution								
Setting Accuracy (23±5 °C)	0.05%+0.1%F.S.							
CP Mode								
Range	0-600W							
Setting	10mW							
Resolution								
Setting Accuracy (23±5 °C)	0.5%+1%F.S							
CR Mode								
Range	0.12~600Ω	2.3Ω~6000Ω	0.03~120Ω	0.5Ω~1200Ω	0.06Ω~300Ω	1.2Ω~3000Ω	1.12Ω~6000Ω	22.4Ω~60000Ω
Setting	16bits							
Resolution								
Setting Accuracy	0.35%+5.2mS	0.35%+0.52mS	0.35%+26.04mS	0.35%+2.6mS	0.35%+10.41mS	0.35%+1.04mS	0.35%+0.52mS	0.35%+0.05mS



(23±5℃)								
Slew Rate								
Current	0.1-10A/ms	10-500A/ms	0.8-50A/ms	50-2500A/ms	0.8-50A/ms	50-2500A/ms	0.1-10A/ms	10-500A/ms
Voltage	0.5-25V/ms	25-250V/ms	0.5-25V/ms	25-250V/ms	10-60V/ms	60-600V/ms	5.0-250V/ms	250-2500V/ms
Power	0.1-10A/ms	10-500A/ms	0.8-50A/ms	50-2500A/ms	0.8-50A/ms	50-2500A/ms	0.1-10A/ms	10-500A/ms
Resistance	0.1-10A/ms	10-500A/ms	0.8-50A/ms	50-2500A/ms	0.8-50A/ms	50-2500A/ms	0.1-10A/ms	10-500A/ms
Accuracy (23±5℃)	(1+35%)*Setting value							
Voltage Measurement								
Range	0-6V	0-60V	0-6V	0-60V	0-15V	0-150V	0-60V	0-600V
Readback Accuracy (23±5℃)	0.05%+0.05%F.S							
Current Measurement								
Range	0-1A	0-10A	0-5A	0-50A	0-5A	0-50A	0-1A	0-10A
Readback Accuracy (23±5℃)	0.1%+0.1%F.S.							
Power Measurement								
Range	0-600W							
Readback Accuracy (23±5℃)	0.5%+1%F.S.							
Dynamic Mode								
T1&T2	1-60000ms							
Resolution	1ms							
Accuracy (23±5℃)	1ms+100ppm							
Others								
Interface	LAN/RS232							
AC Input	Single phase, please refer to the voltage mark at the rear panel.							
Temperature	Operating temperature: 0℃~40℃, storage temperature: -20℃~60℃							
Operating Environment	Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa							
Net Weight	Approx. 13kg							
Dimension	2U, 88.0(H)*482.0(W)*507.0(D)mm							

Table 28

Model	N6212-60-100		N6212-150-100		N6212-600-20	
Voltage	60V		150V		600V	
Current	100A		100A		20A	
Power	1200W					
Min. Operating Voltage	2V@100A		2V@100A		4.5V@20A	
CC Mode						
Range	0-10A	0-100A	0-10A	0-100A	0-2A	0-20A
Setting	1mA	10mA	1mA	10mA	0.1mA	1mA
Resolution						
Setting Accuracy (23±5℃)	Low range:0.1%+0.1%F.S., High range:0.1%+0.15%F.S.					
CV Mode						
Range	0-6V	0-60V	0-15V	0-150V	0-60V	0-600V
Setting	0.1mV	1mV	1mV	10mV	1mV	10mV
Resolution						
Setting Accuracy (23±5℃)	0.05%+0.1%F.S.					
CP Mode						
Range	0-1200W					
Setting	10mW					
Resolution						
Setting Accuracy (23±5℃)	0.5%+1%F.S					
CR Mode						
Range	0.02~60Ω	0.3Ω~600Ω	0.03Ω~150Ω	0.6Ω~1500Ω	0.56Ω~3000Ω	11.2Ω~30000Ω
Setting	16bits					
Resolution						
Setting Accuracy (23±5℃)	0.35%+52mS	0.35%+5.2mS	0.35%+20.8mS	0.35%+2.08mS	0.35%+1mS	0.35%+0.1mS
Slew Rate						
Current	1.6-100A/ms	100-5000A/ms	1.6-100A/ms	100-5000A/ms	0.3-20A/ms	20-1000A/ms
Voltage	0.5-25V/ms	25-250V/ms	10-60V/ms	60-600V/ms	5.0-250V/ms	250-2500V/ms



Power	1.6-100A/ms	100-5000A/ms	1.6-100A/ms	100-5000A/ms	0.3-20A/ms	20-1000A/ms
Resistance	1.6-100A/ms	100-5000A/ms	1.6-100A/ms	100-5000A/ms	0.3-20A/ms	20-1000A/ms
Accuracy (23±5℃)	(1+35%)*Setting value					
Voltage Measurement						
Range	0-6V	0-60V	0-15V	0-150V	0-60V	0-600V
Readback Accuracy (23±5℃)	0.05%+0.05%F.S					
Current Measurement						
Range	0-10A	0-100A	0-10A	0-100A	0-2A	0-20A
Readback Accuracy (23±5℃)	0.05%+0.1%F.S.					
Power Measurement						
Range	0-1200W					
Readback Accuracy (23±5℃)	0.5%+1%F.S.					
Dynamic Mode						
T1&T2	1-6000ms					
Resolution	1ms					
Accuracy (23±5℃)	1ms+100ppm					
Others						
Interface	LAN/RS232					
AC Input	Single phase, 220V AC±10%, frequency 47Hz~63Hz					
Temperature	Operating temperature: 0℃~40℃, storage temperature: -20℃~60℃					
Operating Environment	Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa					
Net Weight	Approx. 14.5kg					
Dimension	2U, 88.0(H)*482.0(W)*507.0(D)mm					

Table 29

Model	N6218-60-150		N6218-150-150		N6218-600-30	
Voltage	60V		150V		600V	
Current	150A		150A		30A	
Power	1800W					
Min. Operating Voltage	2V@150A		2V@150A		4.5V@30A	
CC Mode						
Range	0-15A	0-150A	0-15A	0-150A	0-3A	0-30A
Setting	1mA	10mA	1mA	10mA	0.1mA	1mA
Resolution						
Setting Accuracy (23±5℃)	Low range:0.1%+0.1%F.S., High range:0.1%+0.15%F.S.					
CV Mode						
Range	0-6V	0-60V	0-15V	0-150V	0-60V	0-600V
Setting	0.1mV	1mV	1mV	10mV	1mV	10mV
Resolution						
Setting Accuracy (23±5℃)	0.05%+0.1%F.S.					
CP Mode						
Range	0-1800W					
Setting	10mW					
Resolution						
Setting Accuracy (23±5℃)	0.5%+1%F.S					
CR Mode						
Range	0.01~40Ω	0.2Ω~400Ω	0.02Ω~100Ω	0.4Ω~1000Ω	0.38Ω~2000Ω	7.5Ω~20000Ω
Setting	16bits					
Resolution						
Setting Accuracy (23±5℃)	0.35%+78.12mS	0.35%+7.8mS	0.35%+31.25mS	0.35%+3.1mS	0.35%+1.56mS	0.35%+0.1mS
Slew Rate						
Current	2.5-150A/ms	150-7500A/ms	2.5-150A/ms	150-7500A/ms	0.5-30A/ms	30-1500A/ms
Voltage	0.5-25V/ms	25-250V/ms	10-60V/ms	60-600V/ms	5.0-250V/ms	250-2500V/ms



Power	2.5-150A/ms	150-7500A/ms	2.5-150A/ms	150-7500A/ms	0.5-30A/ms	30-1500A/ms
Resistance	2.5-150A/ms	150-7500A/ms	2.5-150A/ms	150-7500A/ms	0.5-30A/ms	30-1500A/ms
Accuracy (23±5℃)	(1+35%)*Setting value					
Voltage Measurement						
Range	0-6V	0-60V	0-15V	0-150V	0-60V	0-600V
Readback Accuracy (23±5℃)	0.05%+0.05%F.S					
Current Measurement						
Range	0-15A	0-150A	0-15A	0-150A	0-3A	0-30A
Readback Accuracy (23±5℃)	0.05%+0.1%F.S.					
Power Measurement						
Range	0-1800W					
Readback Accuracy (23±5℃)	0.5%+1%F.S.					
Dynamic Mode						
T1&T2	1-60000ms					
Resolution	1ms					
Accuracy (23±5℃)	1ms+100ppm					
Others						
Interface	LAN/RS232					
AC Input	Single phase, 220V AC±10%, frequency 47Hz~63Hz					
Temperature	Operating temperature: 0℃~40℃, storage temperature: -20℃~60℃					
Operating Environment	Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa					
Net Weight	Approx. 16kg					
Dimension	2U, 88.0(H)*482.0(W)*507.0(D)mm					

Note 1: For other specifications, please contact NGI.

Note 2: All specifications are subject to change without notice.