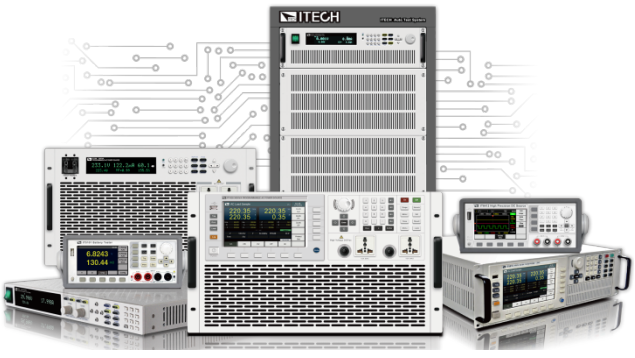
Programmable DC Electronic Load

Series IT8800 User's Manual



Model: IT8813/IT8813B/IT8813C/IT8814/IT8814B/
IT8814C/IT8816/IT8816B/IT8816C/IT8817/
IT8817B/IT8817C/IT8818/IT8818B/IT8818C/
IT8818D/IT8830/IT8830B/IT8830H/IT8831/
IT8831B/IT8831H/IT8832/IT8832B/IT8832H/
IT8833/IT8833B/IT8833H/IT8834B/IT8834H/
IT8835B/IT8835H/IT8836B/IT8836H/IT8837B/
IT8837H/IT8838B/IT8838H/IT8839B/IT8839H/
IT8819H

Revision: V3.3

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Safety Statement

CAUTION

“Caution” signs indicate danger. It is required to pay attention to the contents of these signs during implementation of operations.
The damage to the product or loss of important data may be caused in case of improper operation steps or failure to follow operation steps. Do not continue to implement any improper operation indicated in “Caution” signs when the specified conditions are not fully understood or these conditions are not satisfied.

WARNING

“Warning” indicates danger. It is required to pay attention to the contents of these signs during implementation of operation steps. Personal casualties may be caused in case of improper operation steps or failure to follow these operation steps. Do not continue to implement any improper operation indicated in “Warning” signs when the specified conditions are not fully understood or these conditions are not satisfied.

NOTE

“Instructions” indicates operation instructions. It is required to refer to the contents of these signs during operation steps. These signs are used for providing tips or supplementary information for operators.

Certification and Quality Assurance

IT8800 series electronic load completely reaches nominal technical indicators in the manual.

Warranty service

ITECH Company will provide one-year warranty services for the product materials and manufacturing (excluding the following limitations).

- When warranty service or repair is needed, please send the product to the service unit specified by ITECH Company.
- When the product is sent to ITECH Company for warranty service, the customer must pay the one-way freight to the maintenance department of ITECH, and ITECH will be responsible for return freight.
- If the product is sent to ITECH for warranty service from other countries, the customer will be responsible for all the freight, duties and other taxes.

Limitation of Warranty

Warranty service does not apply to the damage caused in the following circumstances:

- Damage resulting from customer-wired circuits or customer-supplied parts or accessories;
- Product which has been modified or repaired by the customer;
- Damage caused by the circuit installed by the customer or damage caused by operation of the product in non-specified environment;
- The product model or serial number is altered, deleted, removed or made illegible by customer;
- Damage caused by accidents, including but not limited to lightning, water, fire, abuse or negligence.

Safety signs

	DC power		ON (with the power switched on)
	AC power		OFF (with the power supply switched off)
	Both DC and AC power supply		Power supply switching-on status
	Protective grounding terminal		Power supply switching-off status
	Grounding terminal		Reference terminal
	Danger sign		Positive terminal
	Warning sign (refer to specific "Warning" or "Caution" information in the manual)		Negative terminal
	Ground wire connection end sign	-	-

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Safety Precautions

General safety precautions below must be followed in each phase of instrument operation. In case of failure to follow these precautions or specific warnings in other parts of the manual, violation against the safety standards related to the design, manufacture and purpose of the instrument will occur. If the user does not follow these precautions, ITECH will bear no responsibility arising there from.

WARNING

- The electronic load is provided with a three-core power line during delivery and should be connected to a three-core junction box. Before operation, be sure that the electronic load is well grounded.
- Use electric wires of appropriate load. All loading wires should be capable of bearing maximum short-circuit of electronic load without overheating.
- Ensure the voltage fluctuation of mains supply is less than 10% of the working voltage range in order to reduce risks of fire and electric shock.
- To prevent burnout, please pay special attention to positive and negative polarities of electronic load during connection!
- Do not use damaged equipment. Please check the housing before using the equipment. Check whether the instrument is subject to cracking or is lack of plastic. Do not operate the instrument in the environment with explosive gas, steam or dust.
- Observe all tags on the equipment before connection.
- Do not install alternative parts on the instrument or perform any unauthorized modification.
- Do not use the equipment when the removable cover is dismantled or loose.
- Please use the power adapter supplied by the manufacturer to avoid accidental injury.
- We do not accept responsibility for any direct or indirect financial damage or loss of profit that might occur when using the instrument.
- This instrument is used for industrial purposes. Do not apply this product to IT power supply system.
- Do not use the equipment on the life support system or other equipment with safety requirements.

CAUTION

- If the equipment is not used in the manner specified by the manufacturer, its protection may be damaged.
- Always use dry cloth to clean the equipment housing. Do not clean the inside of the instrument.
- Do not block the air vent of the equipment.

Environmental conditions

The IT8800 series electronic load can only be used indoors or in low condensation areas. The following table shows general environmental requirements for this instrument.

Environmental conditions	Requirement
Operating temperature	0°C～40°C 0°C - 40°C
Operating humidity	20% - 80% (non condensing)
Storage temperature	-20°C - 70 °C

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Altitude	Operating up to 2,000 meters
Installation category	II
Pollution degree	Pollution degree 2

NOTE

In order to ensure the accuracy of measurement, it is recommended to operate the instrument half an hour after start-up.

Regulation tag

CE	The CE tag shows that the product complies with the provisions of all relevant European laws (if the year is shown, it indicates that the year when the design is approved).
	This instrument complies with the WEEE directive (2002/96/EC) tag requirements. This attached product tag shows that the electrical/electronic product cannot be discarded in household waste.
	This symbol indicates that no danger will happen or toxic substances will not leak or cause damage in normal use within the specified period. The service life of the product is 10 years. The product can be used safely within the environmental protection period; otherwise, the product should be put into the recycling system.

Waste electrical and electronic equipment (WEEE) directive

Waste electrical and electronic equipment (WEEE) directive, 2002/96/EC

The product complies with tag requirements of the WEEE directive (2002/96/EC). This tag indicates that the electronic equipment cannot be disposed of as ordinary household waste.

Product Category

According to the equipment classification in Annex I of the WEEE directive, this instrument belongs to the "Monitoring" product.

If you want to return the unnecessary instrument, please contact the nearest sales office of ITECH.

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Compliance Information

Complies with the essential requirements of the following applicable European Directives, and carries the CE marking accordingly:

- Electromagnetic Compatibility (EMC) Directive 2014/30/EU
- Low-Voltage Directive (Safety) 2014/35/EU

Conforms with the following product standards:

EMC Standard

IEC 61326-1:2012/ EN 61326-1:2013 [1][2][3]

Reference Standards

CISPR 11:2009+A1:2010/ EN 55011:2009+A1:2010 (Group 1, Class A)
IEC 61000-4-2:2008/ EN 61000-4-2:2009
IEC 61000-4-3:2006+A1:2007+A2:2010/ EN 61000-4-3:2006+A1:2008+A2:2010
IEC 61000-4-4:2004+A1:2010/ EN 61000-4-4:2004+A1:2010
IEC 61000-4-5:2005/ EN 61000-4-5:2006
IEC 61000-4-6:2008/ EN 61000-4-6:2009
IEC 61000-4-11:2004/ EN 61000-4-11:2004

1. The product is intended for use in non-residential/non-domestic environments. Use of the product in residential/domestic environments may cause electromagnetic interference.
2. Connection of the instrument to a test object may produce radiations beyond the specified limit.
3. Use high-performance shielded interface cable to ensure conformity with the EMC standards listed above.

Safety Standard

IEC 61010-1:2010/ EN 61010-1:2010

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Content

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Chapter1 Acceptance and Installation

1.1 Confirm package contents

Open the package and check the articles within package box before operation. In case of any non-conformity, missing or appearance wearing, please contact ITECH immediately.

Table 1-1 Package box contents (to a machine as a reference standard)

Device name	Quantity	Model	Remarks
Electronic load	1	IT8800 series	IT8800 series include: IT8813/IT8813B/IT8813C/ IT8814/ IT8814B/ IT8814C/ IT8816/ IT8816B/ IT8816C/ IT8817/ IT8817B/ IT8817C/ IT8818/ IT8818B/ IT8818C/ IT8830/ IT8830B/ IT8830H/ IT8831/ IT8831B/ IT8831H/ IT8832/ IT8832B/ IT8832H/ IT8833/ IT8833B/ IT8833H/ IT8818D/IT8834B/IT8834H/ IT8835B/IT8835H/IT8836B/ IT8836H/IT8837B/IT8837H/ IT8838B/IT8838H/IT8839B/ IT8839H/IT8819H
Power cord	x	IT-E171/IT-E172/ IT-E173/IT-E174	Number of the power cords vary depending on the model. The User may select different power lines based on local outlet specification. For detailed specifications, refer to 1.3 Installation of Power Line.
Red and black test lines	x		The test lines are the standard accessories for the model the power of which is greater than or equal to 10KW. Please refer to Table 1-2 for the test line specifications.
CD	1	-	Comprising user manual and documents related to programming and grammatical guidelines.
Factory alignment	1	-	Test report before delivery.

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report			
USB communication line	1	-	-

NOTE

After confirming that package contents are consistent and correct, please appropriately keep package box and related contents. The package requirements should be met when the instrument is returned to factory for repair.

Table 1-2 Test lines specifications

Colour	Specification (Length: 2 meters)
Red	120A
Black	
Red	240A
Black	
Red	360A
Black	
Red	350-500A
Black	
Note: The number of test cables shipped with different models are different, subject to the actual product.	

1.2. Installation position

The instrument should be installed at well-ventilated and rational-sized space. Please select appropriate space for installation based on the electronic load size.

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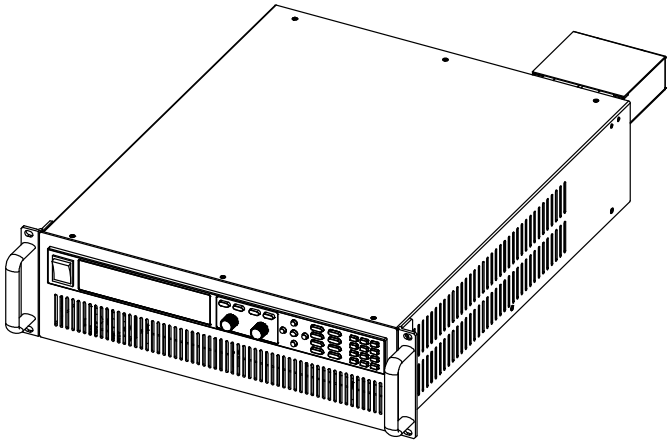

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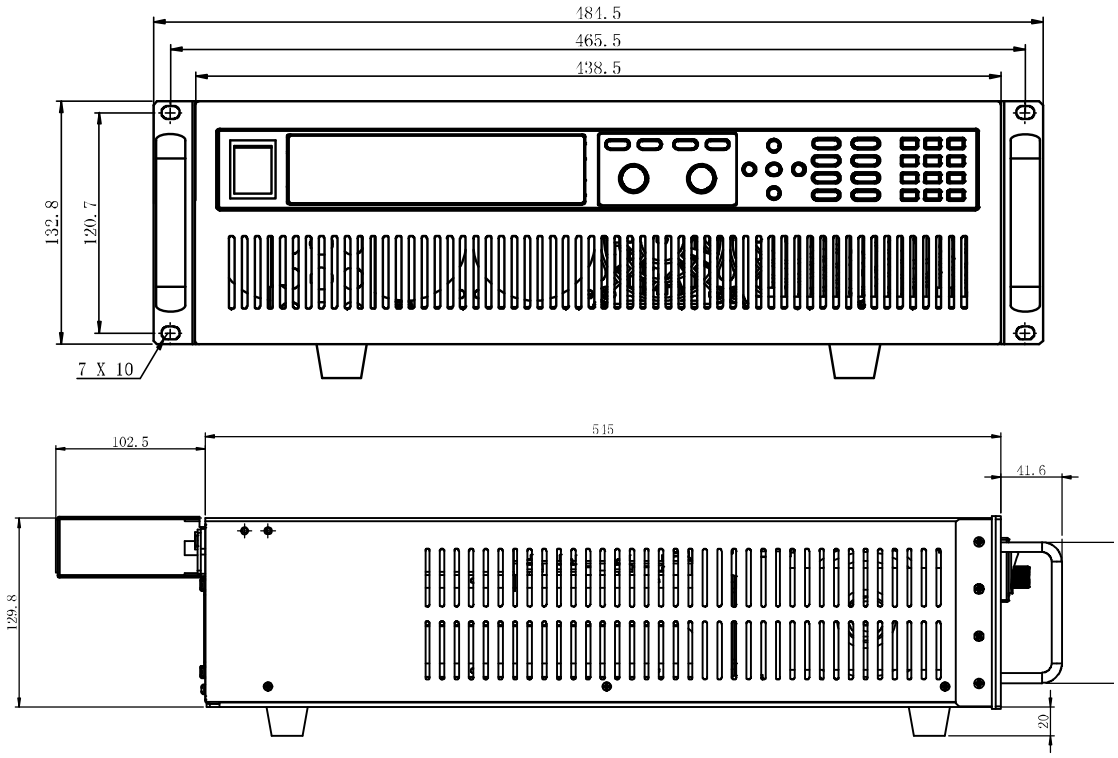
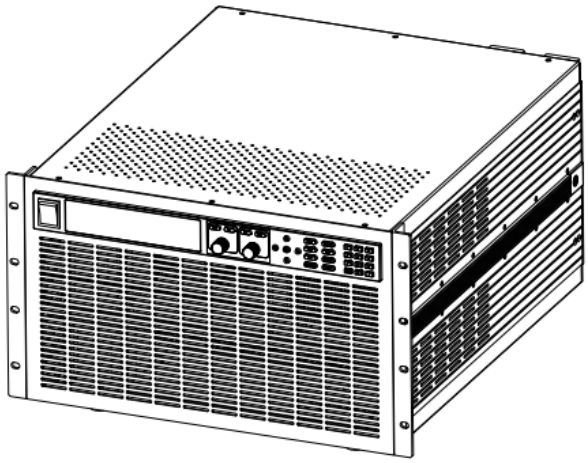
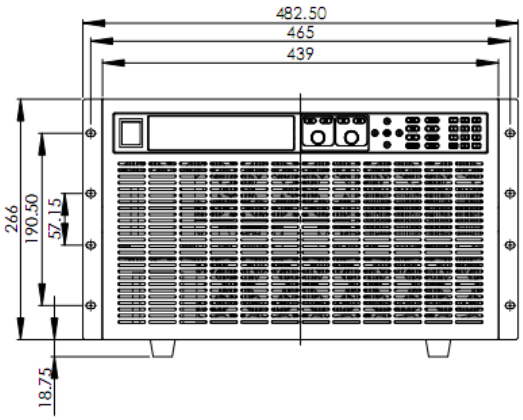
Detailed dimensional drawings

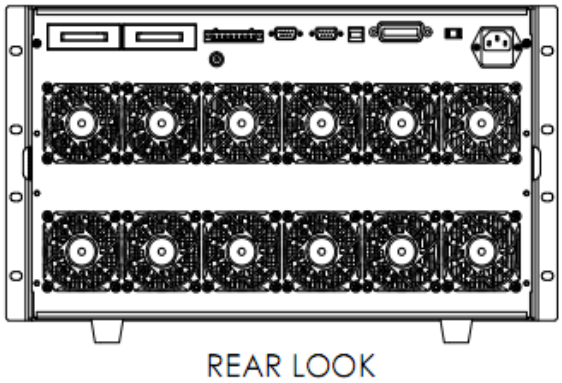


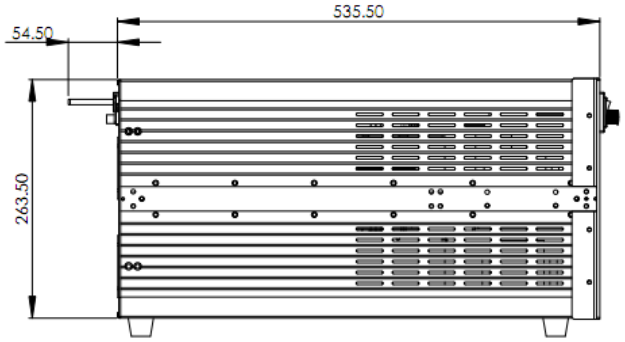
Model: IT8817/IT8817B/IT8817C/IT8818/IT8818B/IT8818C/IT8818D



Detailed dimensional drawings







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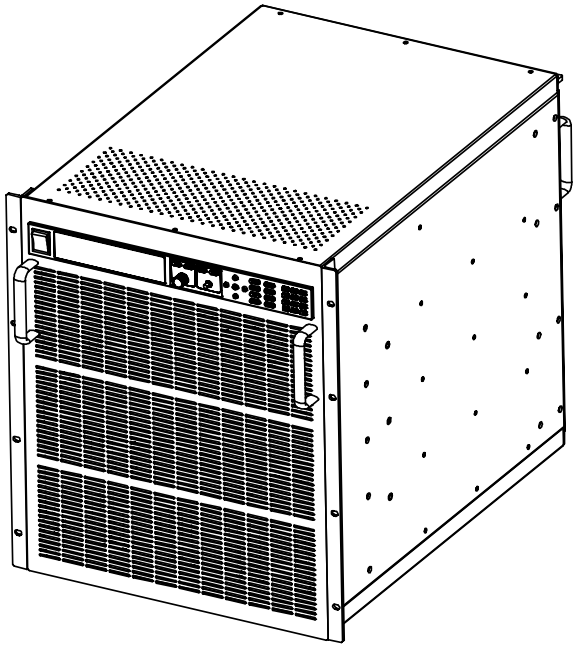
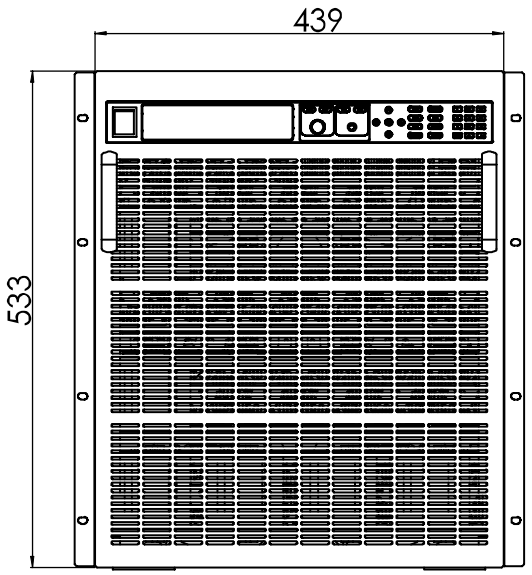
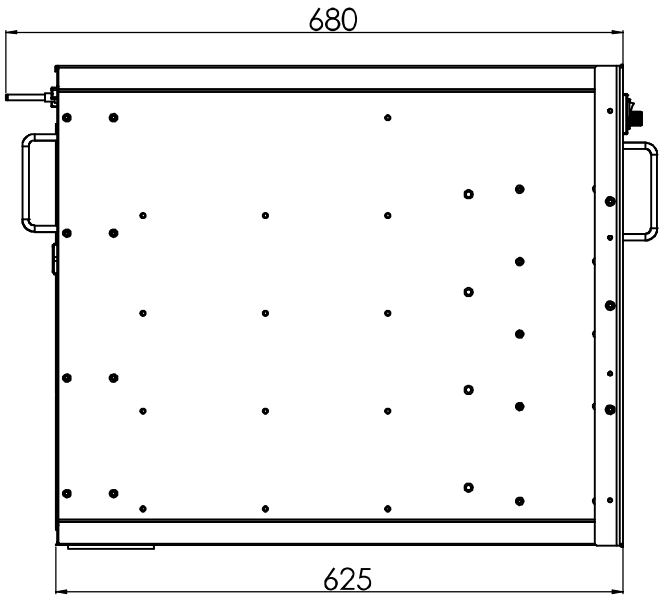
Model: IT8819H/IT8830/IT8830B/IT8830H

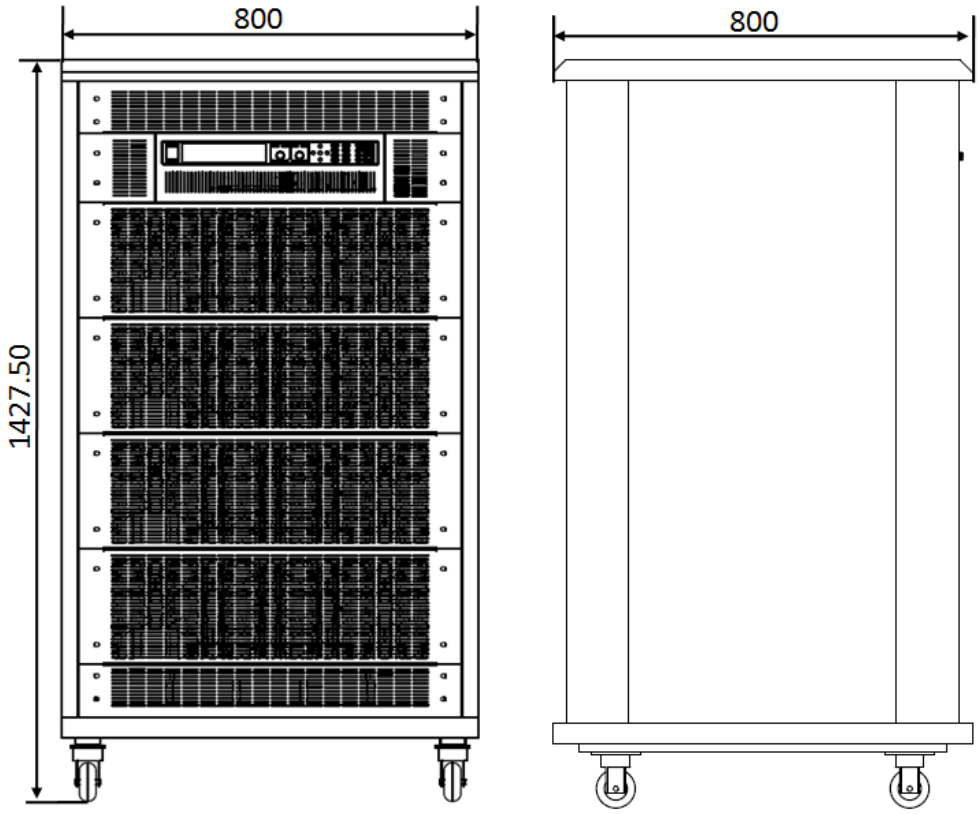


Detailed dimensional drawings

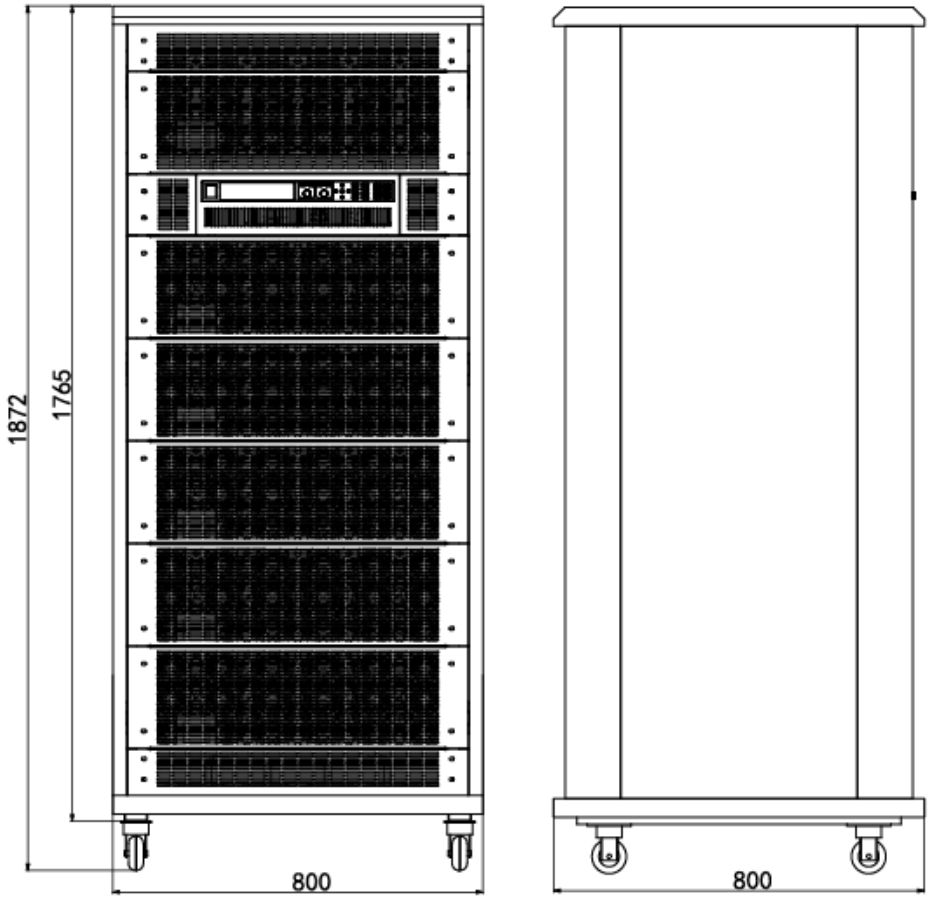




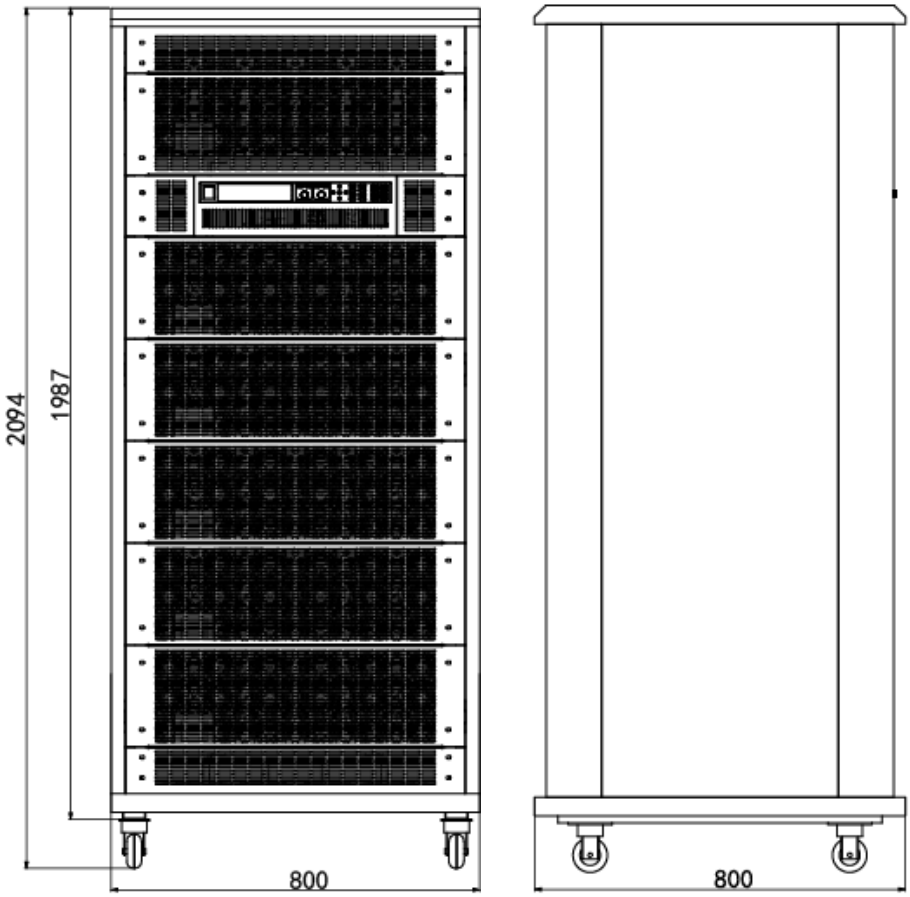
- **Model:** IT8831/IT8831B/IT8831H/IT8832/IT8832B/IT8832H/IT8833/ IT8833B/ IT8833H/IT8834B/IT8834H, Refer to the following dimension drawing:



- **Model:** IT8835B/IT8835H/IT8836B/IT8836H/IT8837B/IT8837H, Refer to the following dimension drawing:



- **Model:** IT8838B/IT8838H/IT8839B/IT8839H, Refer to the following dimension drawing:



1.3 Installation of power line

Connect power line of standard accessories and ensure that the electronic load is under normal power supply.

AC power input level

Working voltage of IT8800 series includes 110V and 220V (which can be selected by the switch on rear board of load). When IT8800 series load power is greater than or equal to 35KW, the 110V AC power input is not supported. AC power input level:

- Option Opt.1: 220Vac 50Hz/60Hz
- Option Opt.2: 110Vac 50Hz/60Hz

Categories of power lines

Please select appropriate power lines appropriate to local voltage based on the specifications of power lines below. If purchased model fails to meet local voltage requirements, please contact distributor or factory for change.

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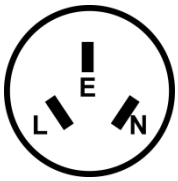
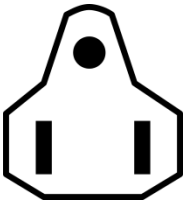


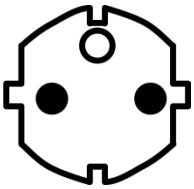
China

IT-171



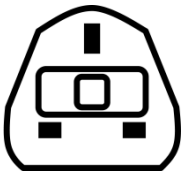
America, Canada, Japan

IT-E172



Europe

IT-E173



Britain

IT-E174

Chapter2 Quick Start

This Chapter will introduce power-on check steps of IT8800 Series to ensure normal start-up and usage under initialization status of the load. Besides, to facilitate usage, this part also displays the functions of front board, rear board and keyboard keys as well as display functions of VFD (Vacuum Fluorescent Display) to a quick view of load appearance, structure and key usage functions before operation.

2.1 Brief introduction

IT8800 Series is a single-input programmable DC electronic load. Built in with RS232, USB and GPIB communication interfaces, this series of programmable DC electronic load provides a multi-purpose solution to meet different design and test requirements.

This Series delivers special functions and advantages at international level, including:

- High-visibility vacuum fluorescent display (VFD)
- Dynamic mode: up to 25KHz
- Voltage measurement dissolution rate: up to 0.1 mV Current 0.01 mA (10 uA)
- Voltage and current measurement speed: up to 50 KHz
- Four operation modes: constant voltage, constant current, constant resistance and constant power.
- Rotary coding switch for easy and quick operation
- Remote sense function
- Battery test function
- OCP test, OPP test
- Auto test function
- CR-LED test
- Memory capacity: 100 groups
- Short-circuit function
- Dynamic test function
- Portable and robust enclosure equipped with skid resistant foot stand
- Intelligent fan control
- Built-in Buzzer, for warning
- Outage backup memory
- Built-in GPIB, USB and RS232 communication interfaces

Model Selection Table for IT8800 Series:

Model	Voltage	Current	Power	Height
IT8813	120V	60A	750W	3U
IT8813B	500V	30A	750W	3U
IT8813C	120V	120A	1500W	3U
IT8814	120V	120A	1500W	3U
IT8814B	500V	60A	1200W	3U

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Model	Voltage	Current	Power	Height
IT8814C	120V	240A	1500W	3U
IT8816	120V	240A	3000W	3U
IT8816B	500V	100A	2500W	3U
IT8816C	120V	480A	3000W	3U
IT8817	120V	360A	4500W	6U
IT8817B	500V	120A	3600W	6U
IT8817C	120V	600A	4500W	6U
IT8818	120V	480A	6000W	6U
IT8818B	500V	150A	5000W	6U
IT8818C	120V	720A	6000W	6U
IT8818D	60V	700A	6000W	6U
IT8819H	800V	80A	7500W	12U
IT8830	120V	500A	10KW	12U
IT8830B	500V	200A	10KW	12U
IT8830H	800V	100A	10KW	12U
IT8831	120V	750A	15KW	27U
IT8831B	500V	300A	15KW	27U
IT8831H	800V	150A	15KW	27U
IT8832	120V	1000A	20KW	27U
IT8832B	500V	400A	20KW	27U
IT8832H	800V	200A	20KW	27U
IT8833	120V	1500A	25KW	27U
IT8833B	500V	500A	25KW	27U
IT8833H	800V	250A	25KW	27U
IT8834B	500V	600A	30KW	27U
IT8834H	800	300A	30KW	27U
IT8835B	500V	700A	35KW	37U
IT8835H	800V	350A	35KW	37U
IT8836B	500V	800A	40KW	37U
IT8836H	800V	400A	40KW	37U
IT8837B	500V	900A	45KW	37U
IT8837H	800V	450A	45KW	37U
IT8838B	500V	1000A	50KW	42U
IT8838H	800V	500A	50KW	42U
IT8839B	500V	1100A	55KW	42U
IT8839H	800V	600A	55KW	42U

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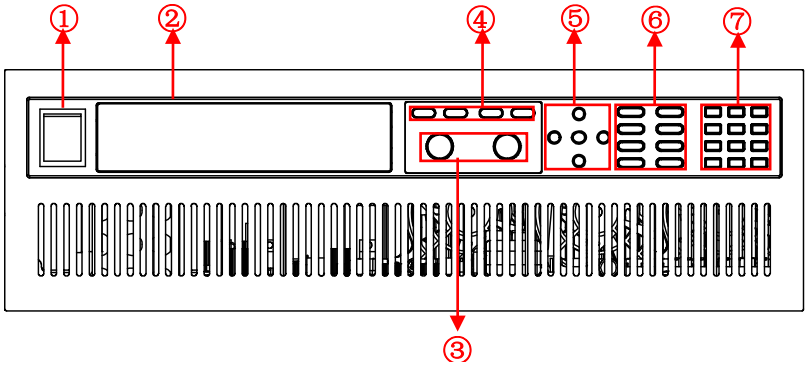
2.2 Introduction of front panel

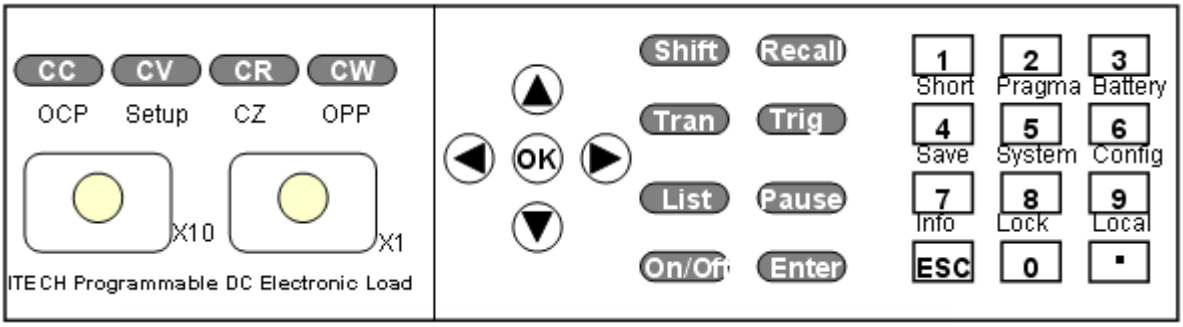
Front panel introduction of IT8813/IT8814/IT8816/IT8813B/IT8814B/IT8816B/ IT8813C/ IT8814C/IT8816C, and front panel introduction of IT8817/IT8817B/ IT8817C/IT8818/IT8818B/IT8818C/ IT8818D/IT8819H/IT8830/IT8830B/ IT8830H/IT8831/IT8831B/IT8831H/IT8832/IT8832B/IT8832H/IT8833/IT8833B/ IT8833H/IT8834B/IT8834H/IT8835B/IT8835H/IT8836B/IT8836H/IT8837B/IT8837H/IT8838B/IT8838H/IT8839B/ IT8839H as below except cooling window.



1. Power switch
2. VFD screen
3. Adjusting knob
4. Function keys
5. Numeric keys, Esc keys and composite keys
6. Arrow Keys and Enter Key

2.3 Introduction to the keypad

The keypad of IT8800 series is shown in the next figure.



The following table explains the keys and buttons on the keypad.

Shift	Enables access to secondary functions.
Recall	Recalls stored instrument setting.
Tran	Configures transient parameters.
Trig	Sets the load to trigger mode for list and transient function.
List	Configures list parameters.
Pause	To pause operation during automatic test.
CC	Sets the load to CC mode and configures the current value.
CV	Sets the load to CV mode and configures the voltage value.

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CR	Sets the load to CR mode and sets the resistance value.
CW	Sets the load to CW mode and configures the power value.
Enter	Confirms settings.
On/Off	Turns the instrument on or off.
△	Up key, to select menu items during menu operation.
▽	Down key, to select menu items during menu operation.
▷	Right key, to adjust the cursor to the specified location to set the value.
◁	Left key, to adjust the cursor to the specified location to set the value.
OK	Confirms settings.
0-9	Enters numeric values for various parameters.
.	Decimal point.
ESC	Cancels the current action and returns to the previous menu.
×10	Rotary knob to adjust the setups by 10 stepping.
×1	Rotary knob to adjust the setups by 1 stepping.

2.4 Fast function key

A combination of front board keys and Shift composition keys in IT8800 Series can realize functions marked at key bottom. For details, see table below.

Shift+1 (Short)	To start or end short circuit test.
Shift +2 (program)	Auto test function.
Shift +3 (Battery)	Battery test function.
Shift +4 (Save)	To save existing setting load parameter values, e.g., voltage, current and power.
Shift +5 (System)	To set system menu.
Shift +6 (Config)	To configure system menu.
Shift +7 (Info)	To display model, version number and serial number of electronic load.
Shift +8 (Lock)	Keyboard locking function.
Shift +9 (Local)	LOCAL key, to shift local and remote operation.
Shift + CC (OCP)	OCP test function.
Shift + CV (Setup)	To set specific parameters of constant voltage, constant current, constant resistance and constant power.
Shift + CW (OPP)	OPP test function.

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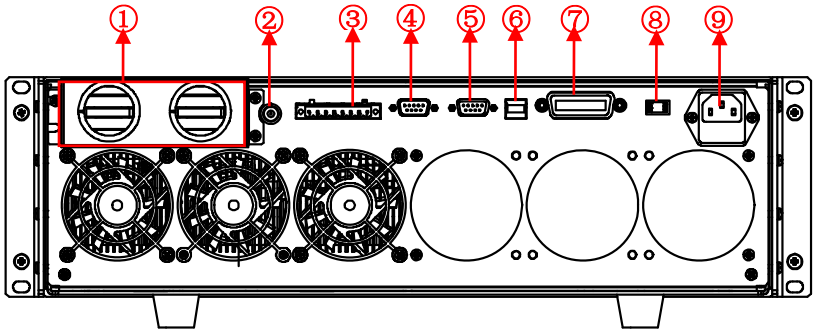
2.5 Function description of VFD status indicators

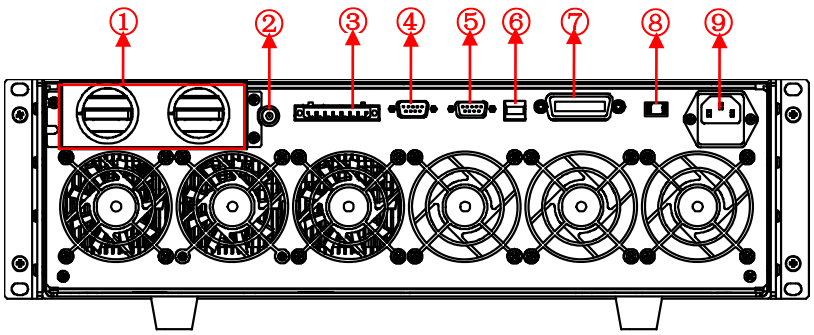
OFF	The load is off.	**Error**	The load has error.
CC	The load is under constant current mode.	**Trig**	The load is waiting for triggering signal.
CV	The load is under constant voltage mode.	**Sense**	The load is under remote sense input mode.
CR	The load is under constant resistance mode.	**Prot**	The load is under software over-current protection status.
CW	The load is under constant power mode.	**Rear**	Start external analog quantity function.
Rmt	The load is under remote operation mode.	**Auto**	Start automatic voltage range.
Addr	Send command under remote operation.	*	Start keyboard locking function
SRQ	Serial request query.	**Shift**	Shift key is pressed.
LRV	LRV will be displayed on the screen when the load input reverses polarity.	**-**	-

2.6 Introduction of rear panel

- Rear panel of IT8813/IT8814/IT8813B/IT8814B/IT8813C/IT8814C.



- Rear panel of IT8816 /IT8816B/IT8816C.



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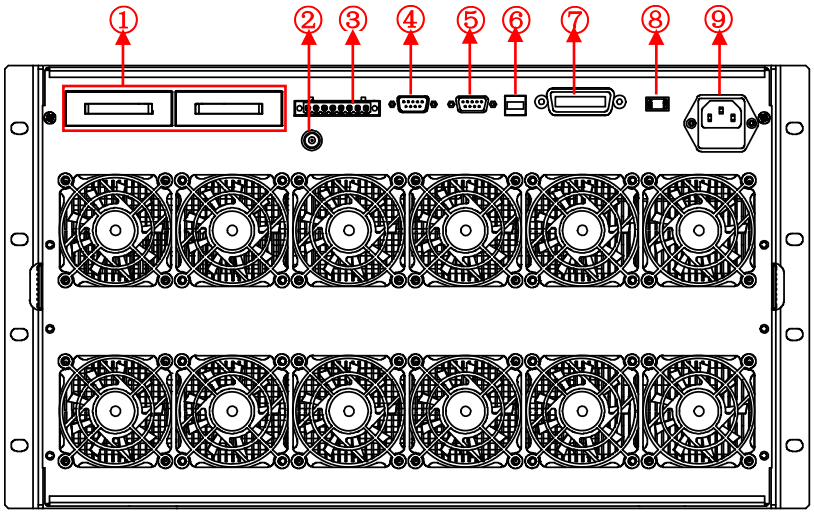
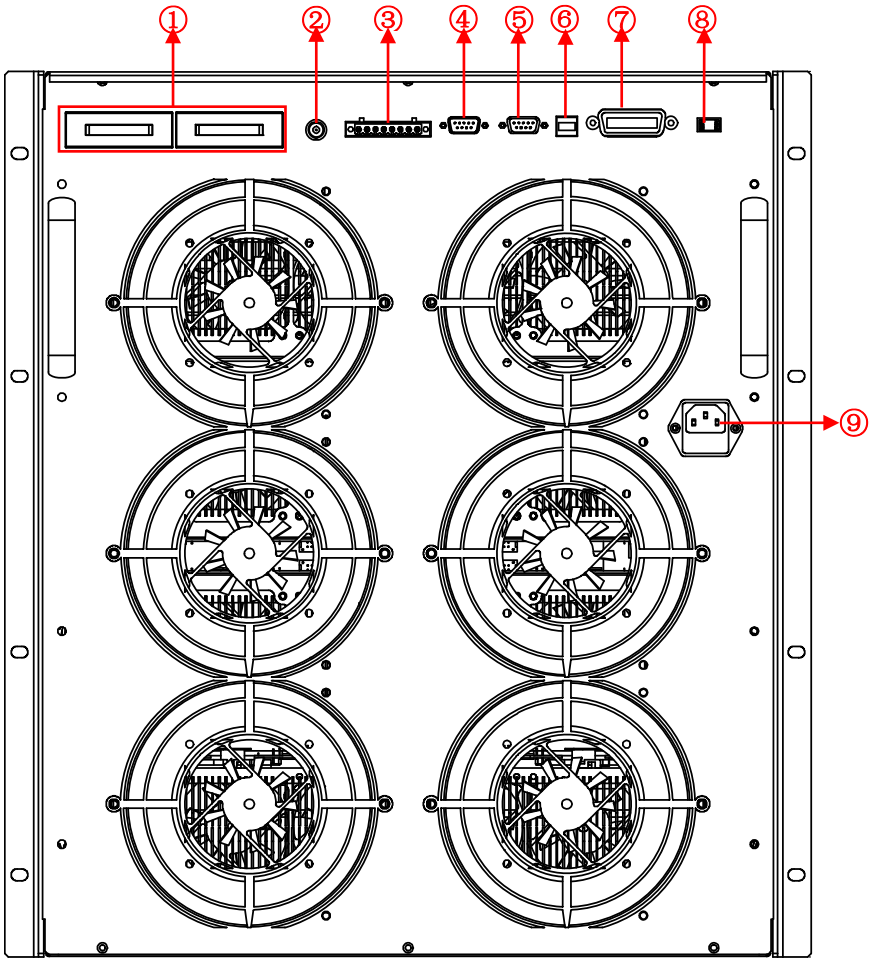
- Rear panel of IT8817/IT8817B/IT8817C/IT8818/IT8818B/IT8818C/ IT8818D.

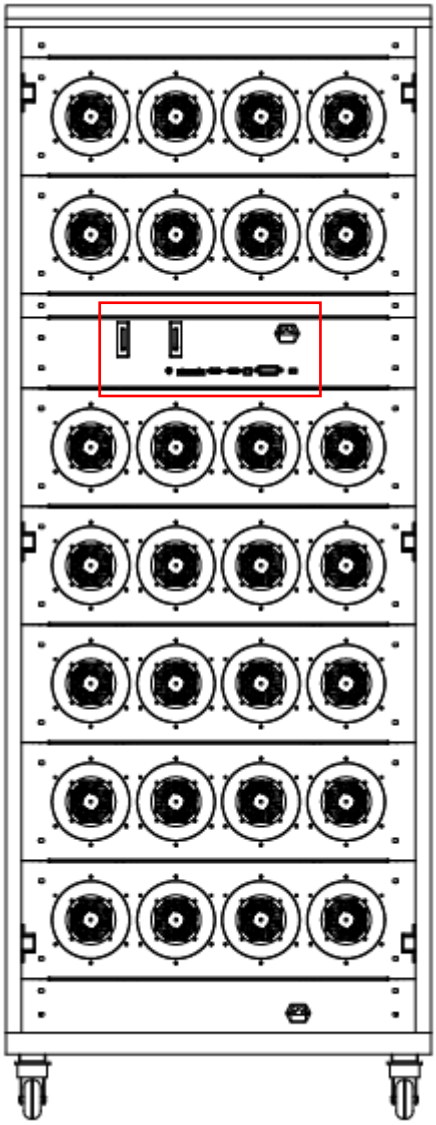


- Rear panel of IT8819H/IT8830/IT8830B/IT8830H.

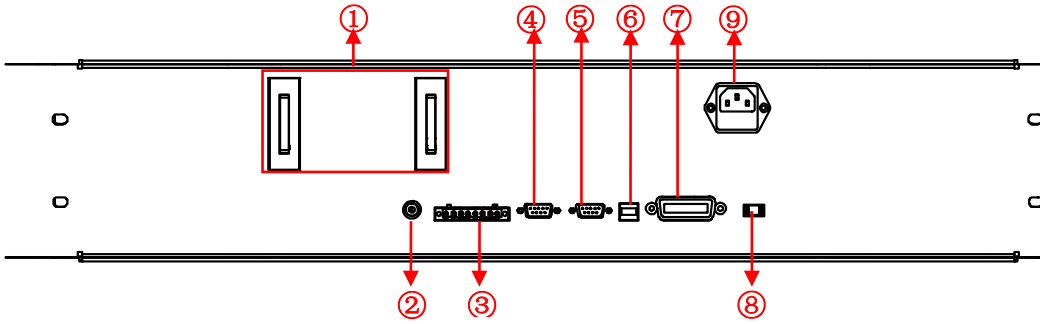


- Rear panel of IT8831/IT8831B/IT8831H/IT8832/IT8832B/IT8832H/IT8833/IT8833B/IT8833H/IT8834B/IT8834H/IT8835B/IT8835H/IT8836B/IT8836H/IT8837B/IT8837H/IT8838B/IT8838H/IT8839B/IT8839H.

  (Take IT8839H as an example, for other types, the number of fans and the position of the red box marked in the following figure are different.)



The detail of the red box in the figure above is as shown as follows:



1. Input terminal
2. Current detection terminal

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3. Remote sense compensation terminal, external triggering terminal and external analog 0-10V control terminal
4. External signal control interface
5. RS232 communication cable interface
6. USB communication cable interface
7. GPIB communication cable interface
8. AC power switch key
9. AC power input socket (including fuse)

2.7 Power-on selftest

A successful self-test indicates that the purchased load product meets delivery standards and is available for normal usage.

Before operation, please confirm that you have fully understood the safety instructions.

WARNING

- **To avoid burning out, be sure to confirm that power voltage matches with supply voltage.**
- **Be sure to connect the main power socket to the power outlet of protective grounding. Do not use terminal board without protective grounding. Before operation, be sure that the electronic load is well grounded.**
- **To avoid burning out, pay attention to marks of positive and negative polarities before wiring.**

Self-test steps

Normal self-test procedures:

1. Correctly connect the power line. Press **Power** key to start up.
   The VFD screen of electronic load displays software version number "**BOIS Ver. 1.10**".
2. After approximate 1s, the system is under self-test and the VFD display shows "**System Self-test…**"
3. After self-test, the VFD display information below.
   0.0000V 0.0000A
   0.00W CC=0.000A
   Information description:
   - The first line displays actual input voltage and current values.
   - The second line displays setting values of actual power value and current (voltage, power and resistance).
4. Press **[Shift]** + 7 (Info), the electronic load VFD screen displays related information of the product. Press △ ▽ key to switch display of product model, product serial number and software version number.

Model: IT88XX
Ver.: 1.XX-1.XX
SN: XXXXXXXXXXXXXXXXX

Exception handling

If the electronic load cannot start normally, please check and take measures by reference to steps below.

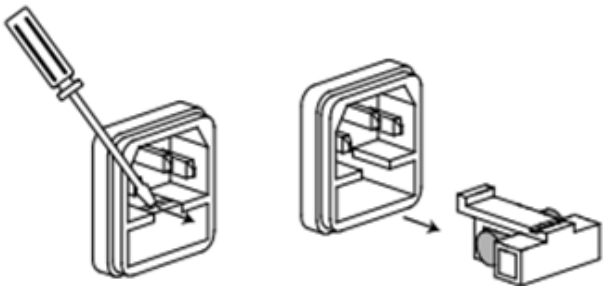
1. Check whether the power line is correctly connected and confirm whether the electronic load is powered.
   Correct wiring of power line => 2
   Incorrect wiring of power line => Re-connect the power line and check whether the exception is removed.

2. Check whether the power in On. **Power** key is under "|" On status.

   Yes => 3
   No => Please check the **Power** key to start power and check whether the exception is removed.

3. Check whether set power voltage of electronic load is larger than the power supply voltage. If set power voltage is 220 V and the supply voltage is 110V, the electronic load cannot start.

4. Check whether the fuse of electronic fuse is burned out.
   If yes, change fuse. Detailed steps:
   1) Pull out power line and take out the fuse box at power line jack with a small screw driver. As shown below.



   2) If the fuse is fused, please change fuse of same specification based on machine model. See the table blow for matching information of fuse and machine model.

Products	Specification (110VAC)	Specification (220VAC)
IT8813/13B/13C	T 3.15A 250VAC	T 1.6A 250VAC
IT8814/14B/14C	T 3.15A 250VAC	T 1.6A 250VAC
IT8816/16B/16C	T 3.15A 250VAC	T 1.6A 250VAC
IT8817/17B/17C	T 5A 250VAC	T 2.5A 250VAC
IT8818/18B	T 5A 250VAC	T 2.5A 250VAC
IT8818C/18D	T 5A 250VAC	T 2.5A 250VAC
IT8831/31B/31H	T 6.30A 250VAC	T 3.15A 250VAC
IT8832/32B/32H	T 6.30A 250VAC	T 3.15A 250VAC
IT8833/33B/33H	T 6.30A 250VAC	T 3.15A 250VAC
IT8834B/34H	T 6.30A 250VAC	T 3.15A 250VAC

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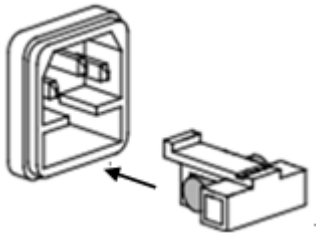
IT8835B/35H	Does not support 110VAC input	T 3.15A	250VAC
IT8836B/36H	Does not support 110VAC input	T 3.15A	250VAC
IT8837B/37H	Does not support 110VAC input	T 3.15A	250VAC
IT8838B/38H	Does not support 110VAC input	T 3.15A	250VAC
IT8839H/39H	Does not support 110VAC input	T 3.15A	250VAC

3) After replacement, install the fuse box back to original position, as shown below.



Chapter3 Function and Features

This Chapter will give a detailed description of functions and features of the electronic load. It is divided into the following parts:

- Switching of local/remote operation modes
- Constant-status operation mode
- Input control function
- Keyboard locking function
- Dynamic simulation function
- System menu function
- Configuration menu function
- Triggering function
- Dynamic test function
- OCP test function
- OPP test function
- Battery discharge test function
- CR-LED function
- Measurement of voltage rise time
- Save function
- VON function
- Protective function
- List function
- Terminal function of rear board
- Auto test function

3.1 Switching of local/remote operation modes

The electronic load is provided with local and remote operation modes. These two modes can be switched through communication commands. At initialization, the electronic load is defaulted under local operation mode.

- **Local operation mode:** for operating related functions through keys on the electronic load machine.
- **Remote operation mode:** for operating related functions of the electronic load on PC through a connection between the electronic load and PC. Under remote operation mode, except **[Shift]** + 9 (Local) keys, other keys on the board are disabled. The **[Shift]** + 9 (Local) key can be used for switching to local operation mode.

3.2 Constant-status operation mode

The electronic mode can work under the 4 constant-state operation modes:

- Constant current operation mode (CC)
- Constant voltage operation mode (CV)
- Constant resistance operation mode (CR)

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- Constant power operation mode (CW)

3.2.1 Constant current operation mode (CC)

Under CC mode, the electronic load will consume constant current in regardless of whether the input voltage changes or not, as shown in Fig. 3-1.

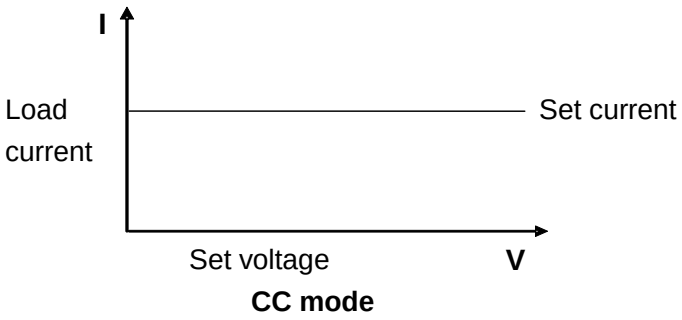

Fig. 3-1 Voltage-Current Relation Schema under CC Mode

Under CC mode, the electronic load provides three ways to set constant current.

- Under CC mode, rotate the pulse knob to change constant current value.
- Under CC mode, directly input numeric key and press **[Enter]** key for confirmation to change constant current value.
- Under CC mode, move the cursor with Left/Right Key and press Left/Right Key to adjust value at corresponding position.

Operation steps

1. Press **[CC]** key and **[Shift]** + **[CV]** to enter parameter setting screen.
   Constant Current
   Range=0.000A
2. Set maximum working current value and press **[Enter]** key.
   Constant Current
   Range =1.000A
3. Set maximum voltage value and press **[Enter]** key.
   Constant Current
   High=0.00V
4. Set minimum voltage value and press **[Enter]** key for confirmation.
   Constant Current
   Low=0.000V
5. Set high and low rate and press **[Enter]** key for confirmation.
   Constant Current
   High-Rate Low-Rate
6. Set ascending slope and press **[Enter]** key for confirmation.
   Constant Current
   Rise up=0.000A/uS
7. Set descending slope and press **[Enter]** key for confirmation.

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Constant Current
Rise down=0.000A/uS

8. Complete parameter setting.
   10.0000V 0.0000A
   0.00W CC=1.000A

NOTE

If the above method is for editing auto test step (as mentioned below), constant current range can also be set.

3.2.2 Constant voltage operation mode (CV)

Under CV mode, the electronic load will consume sufficient current to maintain the input voltage at setting voltage. As shown in Fig. 3-2.

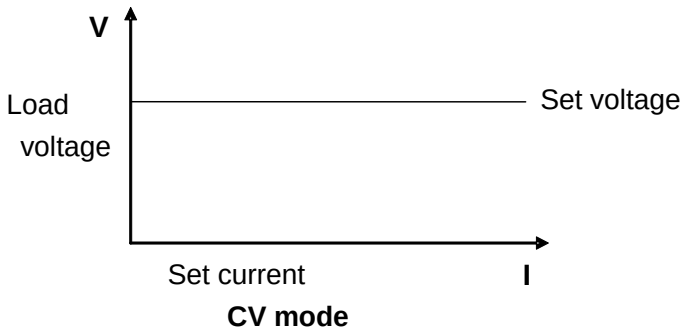

Fig. 3-2 Voltage-Current Relation Schema under CV Mode

Under CV mode, the electronic load provides three ways to modify constant voltage.

- Under CV mode, rotate the pulse knob to change constant voltage value.
- Under CV mode, directly input numeric key and press **[Enter]** key for confirmation to change constant voltage value.
- Under CV mode, move the cursor with Left/Right Key and press Left/Right Key to adjust value at corresponding position.

Operation steps

1. Press **[CV]** key and **[Shift]** + **[CV]** to enter parameter setting screen.
   Constant Voltage
   Range=120.00V
2. Set maximum working voltage value and press **[Enter]** key for confirmation.
   Constant Voltage
   Range=2.33V
3. Set maximum current value and press **[Enter]** key for confirmation.
   Constant Voltage
   High=66.000A

4. Set minimum current value and press **[Enter]** key for confirmation.
   Constant Voltage
   Low=0.0000A
5. Complete parameter setting.
   10.0000V 0.0000A
   0.00W CV=2.33V

NOTE

If the above method is for editing auto test step (as mentioned below), constant voltage range can also be set.

3.2.3 Constant resistance operation mode (CR)

Under CR mode, the electronic load is equivalent to a constant resistance (as shown below) and will give linear change of current with input voltage change. As shown in Fig. 3-3:

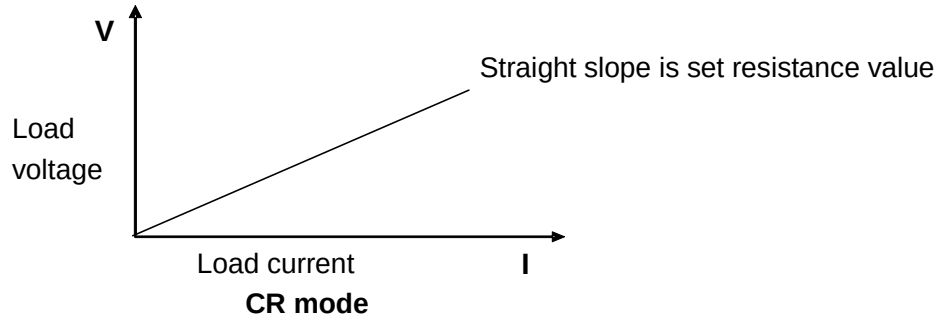

Fig. 3-3 Voltage-Current Relation Schema under CR Mode

Under CR mode, the electronic load provides three ways to modify constant resistance.

- Under CR mode, rotate the pulse knob to change constant resistance value.
- Under CR mode, directly input numeric key and press **[Enter]** key for confirmation to change constant resistant value.
- Under CR mode, move the cursor with Left/Right Key and press Left/Right Key to adjust value at corresponding position.

Operation steps

1. Press **[CR]** key and **[Shift]** + **[CV]** to enter parameter setting screen.
   Constant Resistance
   Range=7500.0Ω
2. Set maximum working resistance value and press **[Enter]** key.
   Constant Resistance
   Range =2Ω
3. Set maximum voltage value and press **[Enter]** key.

Constant Resistance
High=130.0V

4. Set minimum voltage value and press **[Enter]** key for confirmation.
   Constant Resistance
   Low=0.000V
5. Complete parameter setting.
   10.0000V 0.0000A
   0.00W CR=2.000Ω

NOTE

If the above method is for editing auto test step (as mentioned below), constant resistance range can also be set.

3.2.4 Constant power operation mode (CW)

Under CW mode, the electronic load will consume a constant power, as shown below. If input voltage rises, the input current decreases and power P (= V * I) will maintain at setting power. As shown in Fig. 3-4:

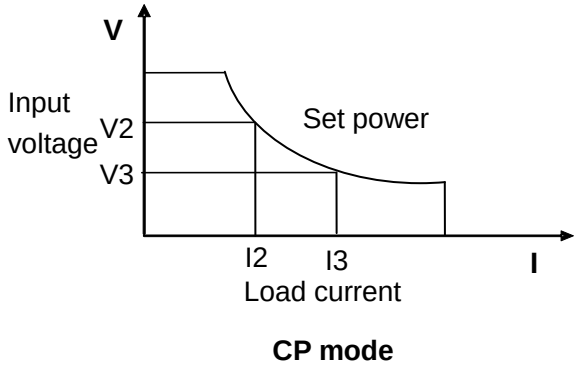

Fig. 3-4 Voltage-Current Relation Schema under CW Mode

Under CW mode, the electronic load provides three ways to modify constant power.

- Under CW mode, rotate the pulse knob to change constant power value.
- Under CW mode, directly input numeric key and press **[Enter]** key for confirmation to change constant power value.
- Under CW mode, move the cursor with Left/Right Key and press Left/Right Key to adjust value at corresponding position.

Operation steps

1. Press **[CW]** key. Press **[Shift]** + **[CV]** to enter parameter setting screen.
   Constant Power
   Range=400.00W
2. Set maximum working power value and press **[Enter]** key.
   Constant Power

Range =1.00W

3. Set maximum voltage value and press **[Enter]** key.
   Constant Power
   High=130.00V
4. Set minimum voltage value and press **[Enter]** key.
   Constant Power
   Low=0.000V
5. Complete parameter setting.
   10.0000V 0.0000A
   0.00W CW=1.00W

NOTE

If the above method is for editing auto test step (as mentioned below), constant power range can also be set.

3.3 Input control function

Control input switch of the electronic load by pressing **[On/Off]** key on the front board. If **[On/Off]** lamp is on, the input is on; and if **[On/Off]** lamp is off and the input is off. When the electronic load is on, the VFD working status indicator is OFF.

3.4 Keyboard locking function

Press the composite key **[Shift]** + **8** to lock the instrument board key, and the VFD displays *. Under this function status, the setting value cannot be changed and the mode cannot be switched. Press this key again to cancel locking.

3.5 Short-circuit analog function

The load can analog a short circuited circuit at input terminal. Under board operation, press the **[Shift]** + **1** key to switch short circuit status. The short circuit status does not influence existing setting value. When the **[Shift]** + **1** are pressed again, the load returns back to original setting status.

Actual current value consumed by load at short circuit depends on the existing working mode of load and current range. Under CC, CW and CR modes, maximum short-circuit current is 110% of current range. Under CV mode, short circuit current is equivalent to that constant voltage value of load is 0 V.

3.6 System menu function (System)

Press **[Shift]** + **5** to enter system menu setting (SYSTEM MENU).

Initialize	INITIALIZE SYSTEM?	

	NO	Keep existing configurations
	YES	Recover all configurations to factory set values
Power-ON	POWER-ON PARAMENT	
	RST(default)	Set the input status of load at powering on as "status as delivered"
	SAV0	Set the input status of load at powering on as SAVE 0 value
Buzzer	BUZZER STATE	Set the buzzer status
	On (default)	Set the buzzer as ON status.
	Off	Set the buzzer as OFF status.
Knob	LOAD ON KNOB MODE	Set the pulse knob
	Update(default)	Real-time update
	Old	Not update
Trigger	TRIGGER SOURCE	Set triggering mode
	Manual (Def)	Manual trigger
	External	External signal trigger mode
	Hold	Trig: IMM valid
	Bus	GPIB bus trigger mode
	Timer	Timer trigger mode
Memory	MEMORY	Operated with Recall button to recall 100 groups memories.
	Group=(0-9)	0: represent group 1-10, 1: represent 11-20, and so on.
Displ	DISPLAY ON TIMER	Screen displays loading time
	On	Start function
	Off (default)	Stop function
Communication	COMMUNICATION	Select the interface for communication with a computer
	RS232 After interface entry, press the Arrow Key to select RS232 configuration	4800, 8, N non parity check, 1, NONE
		9600 E even parity check CTS/RTS
		19200 O odd parity check XON/XOFF
		38400
		57600
		115200
	USBTMC	
	GPIB	Address (0-31)
Protocol	PROTOCOL	
	SCPI (Default)	SCPI protocol
	Extend-Table	Expand SCPI protocol for compatibility of other machines

3.7 Configuration menu function (Config)

Press **[Shift]** + **6** (Config) keys to enter menu configuration.

Von	VON LATCH	Start judgment voltage of load
	On	Start LATCH function
	Point= 2V	Set load voltage
	Off	Stop LATCH function
	Point= 2V	Set load voltage
Protect	PROTECT MENU	
	Max-p	Set hardware power protection
	MAX POWER	
	Point=149.99W	Set hardware protective power value
	A-Limit	Set software current protection
	CURRENT LIMIT	
	On	Start function
	Point=30A	Set software current protective value
	Delay= 3S	Set software current protective delay
	Off	Stop function
	P- Limit	Set software power protection
	POWER LIMIT	
	Point=150W	Set software power protective value
	Delay= 3S	Set software power protective delay
	Time	Set LOAD ON timer
	ON-TIMER	
	On	Start function
	Delay=10S	Set LOAD ON timer value
	Off	Stop function
Measure	MEASURE MENU	
	V-Range	Auto switch function of voltage range
	VOLTAGE AUTO RANGE	
	On	Start auto voltage range
	Off	Stop auto voltage range
	TimeV1	Measure voltage rise/drop time
	TIMER VOLTAGE1	
	Point=0.000V	Set starting voltage value
	TimeV2	Measure voltage rise/drop time
	TIMER VOLTAGE2	
	Point=120.00V	Set stop voltage value
	FILTER	Smoothing function

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	Average Count=2^(2~16)		Set of average count
CR-LED	CR LED MODE	Analog LED lamp function (under CR mode)	
	On		Open function (Under CR mode, press **[Shift]** + **[CV]** to set Vd value)
	Off		Stop function
Remote-Sense	REMOTE SENSE STATE		Remote sense compensation measurement
	On		Start remote sense compensation function
	Off		Stop remote sense compensation function
Ext-Program	EXTNAL PROGRAM		External analog quantity function
	On		Start external 0-10V analog quantity control function
	Off		Stop external 0-10V analog quantity control function

3.8 Triggering function

Triggering function is necessary to operate dynamic pulse output and list output. There are five triggering methods to synchronously trigger the tested instrument.

Optional triggering sources of triggering function of electronic load comprise:

- **Key ([Trig] key) trigger:** when key trigger is valid, press **[Trig]** key and the load will trigger an operation.
- **External trigger signal (TTL):** TRIG on the rear board is the triggering input terminal. When external trigger signal method is effective, after applying a low pulse (> 10 us), the load will trigger an operation.
- **Bus trigger:** when the bus trigger is valid, after the load receives a trigger command (GET or *TRG) from GPIB port, the load will trigger an operation.
- **Timing trigger:** when the timing trigger is valid, the load will automatically trigger an operation at intervals.
- **Trigger holding:** when trigger holding is valid, only when the load receives trigger command (TRIG: IMM), the load will trigger an operation.

Select the triggering sources as follows:

Operation steps

1. Press **[Shift]** + **5** (system) to enter system menu setting screen.
   Initialize Power-ON Buzzer
2. Press Left/Right key and move to Trigger. Press **[Enter]** to enter triggering source selection screen.
   Manual (Def) External Hold
3. Press Left/Right key to select trigger method. Press **[Enter]** to complete setting.

Manual (Def): Manual trigger

External: external signal trigger

Hold: special command trigger

Bus: BUS command trigger

Timer: timer trigger

4. Press **[Esc]** to exit setting. The system displays original values under different modes.

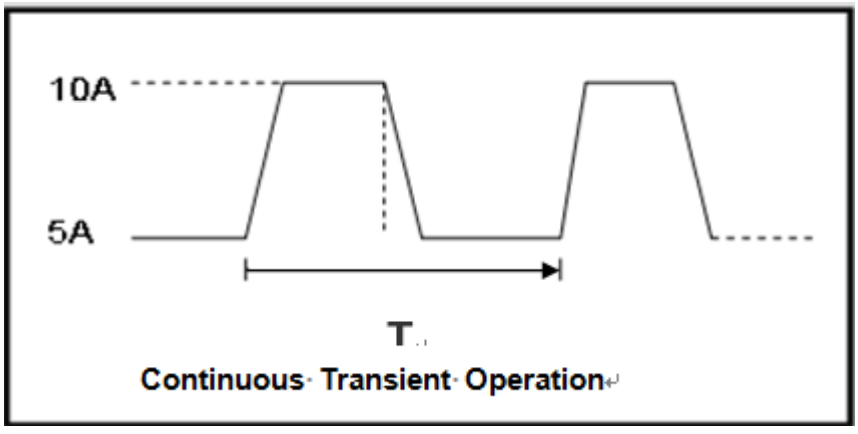
3.9 Dynamic test function

Through dynamic test operation, the electronic load can be switched between two setting parameters based on setting rules. This function can be used to test dynamic performances of power supply. For dynamic test operation, press **[Tran]** key on the front board to enter the dynamic setting menu. Before test, firstly, set parameters related to dynamic test operation, including dynamic test mode, A value, B value, pulse width time, frequency, duty ratio, etc. Under CC mode, current ascending and descending slopes should be set for dynamic test.

The dynamic test mode can be divided into continuous mode, pulse mode and toggle mode.

3.9.1 Continuous mode

Under continuous mode, after enabling dynamic test operation, the load will be switched continuously between A value and B value.



Taking CC mode as example (operations under other modes are similar), when output voltage and current of the tested instrument are 10V and 3A respectively, the load current will switch from 1A and 2A. Set the dynamic test parameters and perform the test as follows:

1. Press **[Tran]** key. Operate Left/Right key. Move to On and press Enter for confirmation.

   TRANSITION

   On Off

2. Select Continuous, Press **[Enter]** key (The Trig lamp that indicates VFD

screen status is on).

TRANSITION

Continuous Pulse Toggle

3. Operate Left/Right key and select high rate and low rate. Move to the High-Rate and press **[Enter]** key.

   TRANSITION

   High-Rate Low-Rate

4. Set ascending slope and press **[Enter]** key.

   TRANSITION

   Rise up=2.000A/uS

5. Set descending slope and press **[Enter]** key for confirmation.

   TRANSITION

   Rise down=2.000A/uS

6. Set A value and press **[Enter]** key for confirmation.

   TRANSITION

   Level A=1A

7. Set B value and press **[Enter]** key for confirmation.

   TRANSITION

   Level B=2A

8. Set frequency value and press **[Enter]** key for confirmation.

   TRANSITION

   Frequency=50Hz (0.01-25000Hz)

9. Set duty ratio and press **[Enter]** key for confirmation.

   TRANSITION

   Duty=98% (0.1%-99.9%)

10. Start dynamic test and operate Left/Right key. Move to On and press **[Enter]** key for confirmation.

    TRANSITION

    On Off

11. Enter the dynamic test mode.

    10.0000V 0.0000A

    0.00W 0 TRAN

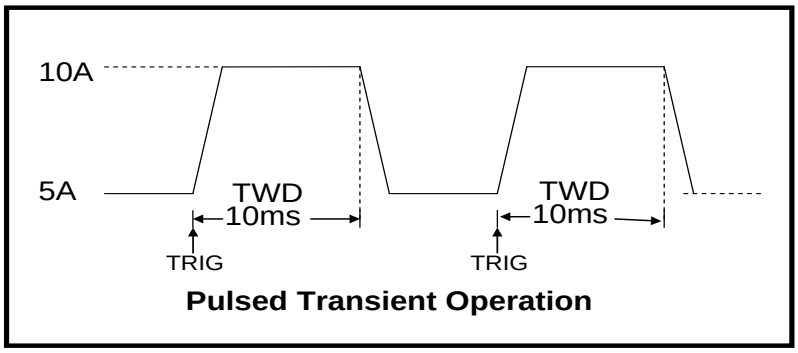
12. Press **[On/Off]** key and press **[Trig]** key.

    The load will continuously switch between A and B value. Time of operations is shown at bottom right.

13. Press CC/CV/CR/CW key or any composite function key to exit dynamic test function. Repeat Steps 1-12 to continue parameter setting and operation of dynamic test.

3.9.2 Pulse mode

Under pulse mode, after enabling dynamic test operation, the load will switch to A value after receiving of a trigger signal. Then the load will switch back to B value and be constant at B value after maintaining A for pulse width time.



Pulsed Transient Operation

Taking CC mode as example (operations under other modes are similar), when output voltage and current of the tested instrument are 10V and 3A respectively, the load current will switch from 1A and 2A. Set the dynamic test parameters and perform the test as follows:

1. Press **[Tran]** key. Operate Left/Right key. Move to On and press **[Enter]** for confirmation.
   TRANSITION
   On Off
2. Select Pulse, Press **[Enter]** key (The Trig lamp that indicates VFD screen status is on).
   TRANSITION
   Continuous Pulse Toggle
3. Operate Left/Right key and select high rate and low rate. Move to the High-Rate and press **[Enter]** key.
   TRANSITION
   High-Rate Low-Rate
4. Set ascending slope and press **[Enter]** key.
   TRANSITION
   Rise up=2.000A/uS
5. Set descending slope and press **[Enter]** key for confirmation.
   TRANSITION
   Rise down=2.000A/uS
6. Set A value and press **[Enter]** key for confirmation.
   TRANSITION
   Level A=1A
7. Set B value and press **[Enter]** key for confirmation.
   TRANSITION
   Level B=2A
8. Set time width and press **[Enter]** key for confirmation.
   TRANSITION
   Pulse Width=5S (0.00002-3600S)
9. Start dynamic test and operate Left/Right key. Move to On and press **[Enter]** key for confirmation.
   TRANSITION
   On Off
10. Enter the dynamic test mode.

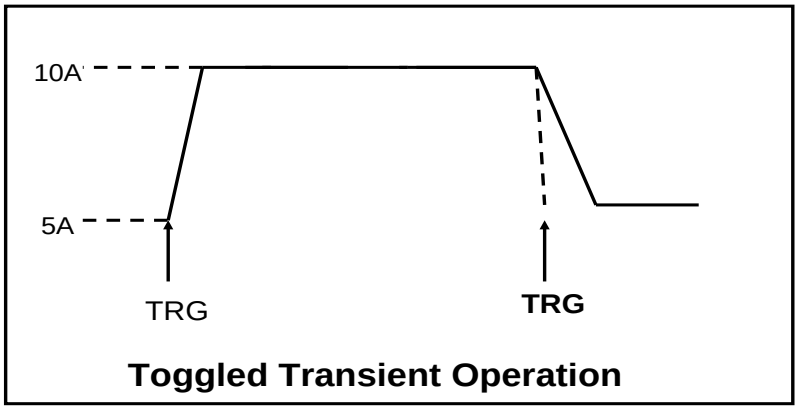
10.0000V 0.0000A

0.00W 0 TRAN

11. Press **[On/Off]** key to open input and press **[Trig]** key (Triggering key) The load will switch after receipt of every trigger signal. The load will continuously switch between A and B value. Time of operations is shown at bottom right.
12. Press CC/CV/CR/CW key or any composite function key to exit dynamic test function. Repeat Steps 1-11 to continue parameter setting and operation of dynamic test.

3.9.3 Toggle mode

Under toggle mode, after enabling dynamic test operation, the load will be switched continuously between A value and B value after receipt of every trigger signal.



Toggled Transient Operation

Taking CC mode as example (operations under other modes are similar), when output voltage and current of the tested instrument are 10V and 3A respectively, the load current will switch from 1A and 2A. Set the dynamic test parameters and perform the test as follows:

1. Press **[Tran]** key. Operate Left/Right key. Move to On and press **[Enter]** for confirmation.

   TRANSITION

   On Off
2. Select Toggle, Press **[Enter]** key (The Trig lamp that indicates VFD screen status is on).

   TRANSITION

   Continuous Pulse Toggle
3. Operate Left/Right key and select high rate and low rate. Move to the High-Rate and press **[Enter]** key.

   TRANSITION

   High-Rate Low-Rate
4. Set ascending slope and press **[Enter]** key.

   TRANSITION

   Rise up=2.000A/uS
5. Set descending slope and press **[Enter]** key for confirmation.

TRANSITION

Rise down=2.000A/uS

6. Set A value and press **[Enter]** key for confirmation.

   TRANSITION

   Level A=1A

7. Set B value and press **[Enter]** key for confirmation.

   TRANSITION

   Level B=2A

8. Start dynamic test and operate Left/Right key. Move to On and press **[Enter]** key for confirmation.

   TRANSITION

   On Off

9. Enter the dynamic test mode.

   10.0000V 0.0000A

   0.00W 0 TRAN

10. Press **[On/Off]** key to open input and press **[Trig]** key (Triggering key).

    The load will switch after receipt of every trigger signal. The load will switch between A and B value for one time. Time of operations is shown at bottom right.

11. Press CC/CV/CR/CW key or any composite function key to exit dynamic test function. Repeat Steps 1-10 to continue parameter setting and operation of dynamic test.

3.10 OCP test function

The IT8800 series electronic load is provided with over-current protection test function (OCP). Under OCP test mode, when input voltage reached Von value, delay for a while for the electronic load to latch. Ascend value by step value at regular interval. At the same time, check the load input voltage and judge whether it is higher than standard voltage value. If higher, it indicates that OCP does not occur. Repeat current stepping operation till the load operates to the cutoff current; if lower, it indicates that OCP does occur. Check whether the existing current value is within target scope again. If yes, PASS the test.

Press **[Shift]** + **[CC]** (OCP) keys to enter OCP test function setting screen.

OCP TEST	Run	OCP TEST	
			Operate OCP test documents
	Recall	OCP TEST	
		Recall OCP File=1	Recall OCP test documents (1-5)
	Edit	OCP TEST	
		1:Voltage on level=0.000V	Set Von voltage value
		2:Voltage on Delay=0.00S	Set Von voltage delay time
		3:Current Range=0.000A	Set working current range
		4:Start Current=0.000A	Set initial current value
		5:Step Current=0.000A	Set step current value
		6:Step Delay=0.00S	Set step delay time
		7:End Current=0.000A	Set cutoff current value

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		8:OCP Voltage=0.000V	Set OCP value
		9:Max Trip Current=0.000A	Set over-current range (maximum value)
		10:Min Trip Current=0.000A	Set over-current range (minimum value)
		Save OCP File=1 (1-5)	Save OCP test documents

Operating steps:

1. Press **[Trig]** key to start OCP test. If within range, PASS the test and the board will display as follows:

```
9.9973V                0.0005A
0.01W   5.100A  PASS   STOP
```

If not, there is FAULT and the board will display as follows:

```
9.9973V                0.0005A
0.01W   5.100A  FAULT  STOP
```

2. End test. The User should return back to setting screen for resetting.

NOTE

If the set OCP voltage value is higher than the power voltage value, the OCP will fail to operate and the board will display as follows:

```
9.9990V        0.0009A
0.01W      0.100A      FAULT     STOP
```

3.11 OPP test function

The IT8800 series electronic load is provided with overpower protection test function (OPP). Under OPP test mode, when input voltage reached Von value, delay for a while for the electronic load to latch. Ascend value by step value at regular interval. At the same time, check the load input voltage and judge whether it is higher than standard voltage value. If higher, it indicates that OPP does not occur. Repeat power stepping operation till the load operates to the cutoff power; if lower, it indicates that OPP does occur. Check whether the existing power value is within target scope again. If yes, PASS the test.

Press **[Shift]** + **[CW]** (OPP) keys to enter OPP test function setting screen.

OPP TEST	Run	OPP TEST	
			Operate OPP test documents
	Recall	OPP TEST	
		Recall OPP File=1	Recall OPP test documents (1-5)
	Edit	OPP TEST	

		1:Voltage on level=0.000V	Set Von voltage value
		2:Voltage on Delay=0.00S	Set Von voltage delay time
		3:Current Range=0.000A	Set working current range
		4:Start Power=0.000W	Set initial power value
		5:Step Power=0.000W	Set step power value
		6:Step Delay=0.00S	Set step delay time
		7:End Power=0.000W	Set cutoff power value
		8:OPP Voltage=0.000V	Set OPP value
		9:Max Trip Power =0.000W	Set overpower range (maximum value)
		10:Min Trip Power =0.000W	Set overpower range (minimum value)
		Save OPP File=1 (1-5)	Save OPP test documents

Operating steps:

1. Press **[Trig]** key to start OPP test. If within range, PASS the test and the board will display as follows:

```
9.996V          0.0007A
0.01W   49.10W  PASS    STOP
```

If not, there is FAULT and the board will display as follows:

```
9.996V          0.0007A
0.01W   48.6W   FAULT   STOP
```

2. End test. The User should return back to setting screen for resetting.

NOTE

If the set OPP voltage value is higher than the power voltage value, the OPP will fail to operate and the board will display as follows:

```
9.996V              0.0007A
0.01W       0.1W    FAULT   STOP
```

3.12 Battery discharge test function

In the IT8800 series electronic load, constant current mode is applied for capacity test with programmatic setting of cutoff level/capacity/discharging time If cutoff level is set as the stop condition, the system determines whether the battery is about to reach the set threshold value or unsafe status when the battery voltage is low, and if yes, an automatic stop will be activated. During the test, the voltage, time and discharged capacity of the battery can be observed. Battery discharge test is a necessary step before battery replacement for it can reflect reliability and remaining life of battery.

Enter **[Shift]** + **3** to enter function testing screen of battery discharge test.

STOP CONDITION	Voltage	STOP Condition	
		Stop Voltage	Set cutoff voltage
	Capability	STOP Condition	
		Stop Capability	Set battery cutoff capacity
	Timer	STOP Condition	
		Stop Timer	Set discharge time

Operation method:

1. Press **[On/Off]** key to cut off load input status. Connect the battery to be tested. Under CC mode, press **[Shift]** + **3** keys to enter battery discharge function menu and select one of the three methods for test based on actual requirements.
2. Set discharge stopping conditions:
   - Type I: Press **[Shift]** + **3** keys and select Capability. Press **[Enter]** key and the VFD displays Cutoff Capability =Ah(0~999.999Ah). Set battery stop capacity. Press **[Enter]** key for confirmation. When set battery capacity is reached, the load input status will automatically be OFF.
   - Type II: Press **[Shift]** + **3** keys and select Voltage. Press **[Enter]** key and the VFD displays Stop Voltage=V. Set cutoff voltage and press **[Enter]** key to start discharge test. When the battery voltage drops to cutoff voltage, the load input status will automatically be OFF.
   - Type III: Press **[Shift]** + **3** key and select Timer. Press **[Enter]** key and the VFD displays Stop Timer=S(0~99999S). Set discharge time. When the set stop time is reached, the load input status will automatically be OFF.
3. Press **[Trig]** key to start testing. The board will display discharge voltage, current discharge time and capacity (AH).
4. Press **[Esc]** key to exit battery capacity test mode in any three methods.

3.13 CR-LED test function

With adding of diode break-over voltage setting in the IT8800 series electronic load under conventional CR mode, the electronic load only works when voltage applied at its both ends is higher than the diode break-over voltage to give a real simulation of diode working principle, i.e., the ripple current at real LED test.

The I-V curve of LED is as shown below. Under conventional CR mode, the electronic load only simulates the static working point of diode as shown in the red circle of the following figure. It is unable to verify the dynamic characteristics of LED under normal working conditions, and the status of accurate ripple current.

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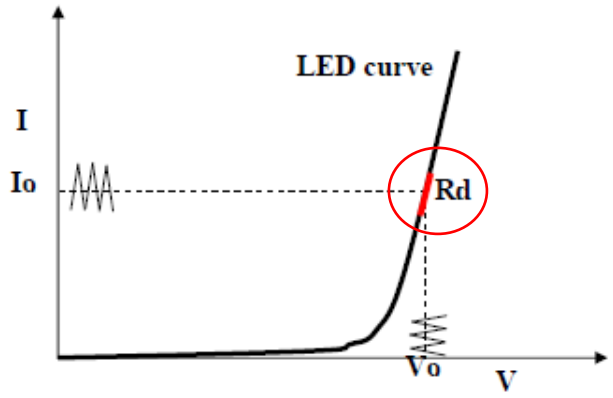

Setting CR-LED Mode

Example: LED driver specification

The output current is 200mA and the range of output voltage is from 45V to 62V.

Operating steps:

1. **Start CR-LED function.**
   1) Press **[Shift]** + **6** keys to enter configuration menu.
   2) Press Right Key and select “CR-LED”. Press **[Enter]** key for entry. Select “on” and press **[Enter]** key.
   3) Press **[Esc]** key to exit.
2. **Set CR mode and Vd value**

   For example, the output voltage of LED driver is 50V, verify that whether the output current of LED is rated current 200mA.
   1) Press **[CR]** key and set corresponding constant resistance. (Set CR=50Ω)
   2) Press **[Shift]** + **[CV]** keys for a series of related setting: range=7500.0, high=130V, low=0V, which may remain the original values. Vd will be set based on the calculation below. (Set Vd=40V)
   3) Press the **[Enter]** key to save the settings.
3. **Press [On/Off] key to turn on load input.**

Calculation method of Vd and R:

Definition:

- Vo: constant working voltage of load LED of LED constant current source;
- Io: output current of LED constant current source;
- Vd: break-over voltage of diode (string);
- R: constant resistance.

V-I curve of LED is as shown below.

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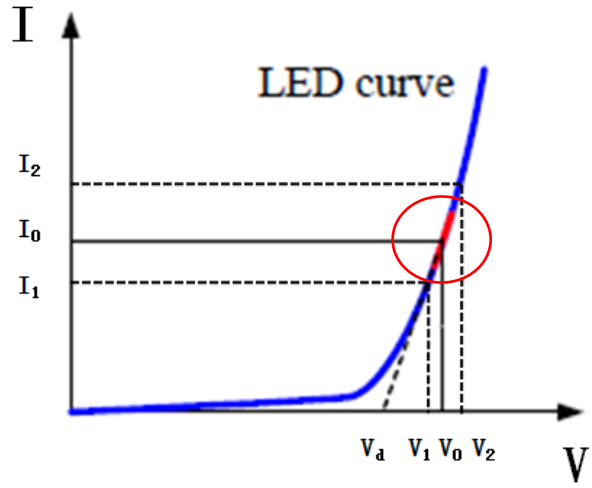


According to four parameters above and the V-I curve of LED, you can calculate the value of R and Vd.

$$R = \frac{V_2 - V_1}{I_2 - I_1}$$

$$V_d = V_o - (I_0 \times R)$$

NOTE

The value of V2, V1, I2 and I1 should be close to the static working point of LED as shown in the red circle above.

Or you can roughly calculate the value of R and Vd with the following equation.
V_d=V*0.8 R=0.2V/I
Where:

- V: constant working voltage of load LED of LED constant current source;
- I: output current of LED constant current source;
- V_d: break-over voltage of diode (string);
- R: constant resistance.

In the example: Vd=50V*0.8=40V R=（0.2*50V）/0.2A=50Ω.

3.14 Measurement of voltage rise time

The IT8800 series electronic load is provided with special voltage rise/drop time measurement function. This function gives a simple analog of voltage rise/drop speed of oscilloscope test power.
Operation methods:
Set initial voltage and final voltage

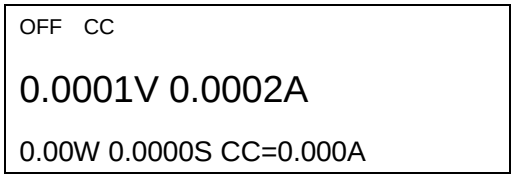
1. Press **[Shift]** + **6** keys to enter configuration menu. Press Right key. Select “Measure” and press **[Enter]** key.
2. Press Left/Right Key to select “TimeV1”. Press **[Enter]** key. Press numeric keys to set initial voltage value and press **[Enter]** key.
3. Press Left/Right Key to select “TimeV2”. Press **[Enter]** key. Press numeric

keys to set final voltage value and press **[Enter]** key.

4. Press **[Esc]** to exit setting.

Start timer function

5. Press **[Shift]** + **5** keys to enter system menu. Press Right key till “Displ” flicks and press **[Enter]** key.
6. Press Left/Right Key to select “On”. Start timer function and press **[Enter]** key.
7. Press **[Esc]** to exit setting.
8. VFD second line will display time 0.0000S between power value and set value.



Measurement of rise time

9. Connect DC power to be tested to the input terminal of the electronic load. The power is set with a value that is higher than the set final voltage value. Keep power output in OFF status.
10. Set a constant current value on the load and open the load input.
11. Open power output.
12. The electronic load timer starts timing. After ending, time will keep stable, which is rise time of voltage.
13. Close the power output. The electronic load VFD will display voltage drop time.

3.15 Configuration save function

The electronic load can save some commonly-used parameters in 100-group (0-99) NVM for convenient and fast usage. Saving parameters comprise working mode, voltage, current, etc. The Save key can be used for saving parameters. The RECALL key is for quick invoking.

Operation steps

If the operator needs to save configured parameter values for direct recall in follow-up operation, refer to the steps below:

e.g., power supply 6V and 3A. The electronic load works under constant current (CC) 1A. Save "CC 1A" in register 9 for recall.

- **SAVE**

1. Set parameters and press **[Shift]** + **4** (Save) to save data. Press **9** key (to select in which group the data is to be saved).

   5.8949V 0.99994A
   5.89W SAVE 9

2. Press **[Enter]** key for confirmation.

   5.8949V 0.99994A
   5.89W cc=1.000A

- **RECALL**

1. Press **[Recall]** key and press **9** (to select from which group the data is recalled).

   5.8949V 0.99994A
   5.89W cc=1.000A

Memory function

When you want to recall the data saved in the memory, you should set memory group in the system menu first.
Group 0 means you can recall data saved in 0-10 groups. Group 1 means you can recall data saved in 11-20 groups. Group2-Group 9 can be concluded in the same manner.

3.16 VON function

When testing some power products with slow voltage rise speed, if the electronic load input is opened before power, the power may latch protection. In this way, the user may set VON value. The electronic load only latches when power voltage is higher than this value.
Press **[Shift]**+ **6** keys to enter configuration menu. Set voltage value in Voltage on under configuration menu to control on/off status of electronic load. When VON LATCH function is started, it indicates that Von Point latches load status.


NOTE

Please confirm whether it is necessary to set loading voltage, a step that provides convenience for limiting working voltage value. If not necessary, do not set the loading voltage without authorization to prevent unnecessary trouble from failure of loading.

If the instrument cannot load, please firstly check whether the VON function is set. If yes, reset the Von value to minimum value (which may be directly set as 0. If minimum voltage value of instrument is not 0, press 0 for confirmation and the menu will automatically set the value as minimum value).

This function is invalid under CV mode.

When VON LATCH function is started, the load starts load test only when the power voltage rises and is higher than Von Point loading voltage. When the power voltage drops and is lower than Von Point unloading voltage, the load will not unload.

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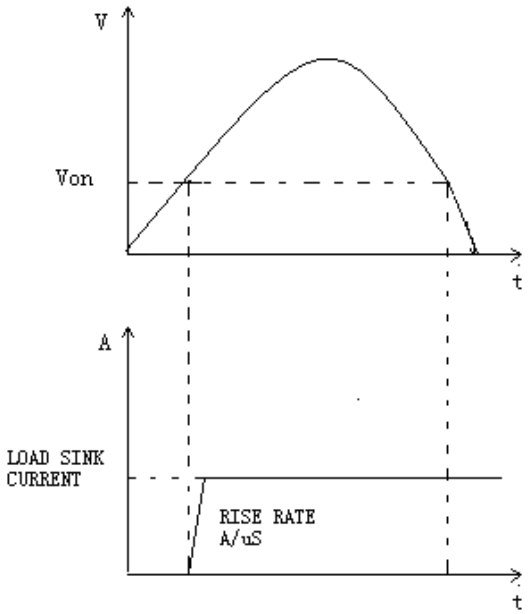


Load working range when VON LATCH is started

3.17. Protective function

The load is provided with following protective functions: overvoltage protection (OVP), over-current protection (OCP), over-power protection (OPP) and over-temperature protection (OTP).

If any one of the above protections is enabled, the load will have corresponding actions. Press any key on the front board to reset protection functions. For example, in case of over-temperature protection, the load will give alarm and the input will automatically switch to OFF status. The load VFD will display OTP.

3.17.1 Over-voltage protection (OVP)

The load will be immediately OFF and the buzzer will sound if the overvoltage circuit is triggered. OV and VF bits of the status register will be set and OVP will be displayed on the screen of the load till resetting. In case of overvoltage protection, the VF pin of the 8-pin connector on rear board of the load outputs TTL high level and the VF pin can be used for controlling output status of the power to be tested.

Clear overvoltage protection status:

Inspect whether voltage of object under test is within load rated voltage or set protection voltage range. If not, disconnect the object. Press any key on front board (or send command to PROTection:CLEar), the load front board (OVP) word will get cleared and the load will exit OVP protection status.

3.17.2 Over-current protection (OCP)

The electronic load is provided with two kinds of over-current protections:

hardware over-current protection and software over-current protection.

- Hardware over-current protection: maximum load current of the electronic load is limited within about 110% of the existing current range by hardware. When the hardware triggers over-current protection, OC bit of the status register will be set; when such protection is removed, the OC bit will be reset. The existing On/Off status of load will not be changed by the hardware over-current protection.
- Software over-current protection: the user can set load software over-current protection value following steps: press **[Shift]**+ **5** key >Protect> A-limit (set as ON). A point is set as OCP current value and A delay set as pre-alarm delay time. When software over-current protection function is on, if the loading current value exceeds delay of such over-current protection set value, the load will automatically be OFF and the VFD will display OCP. At the same time, OC and PS bits of the status register will be set and keep till reset.

Clear over-current protection status:

Inspect whether current of object under test is within load rated current or set protection current range. If not, disconnect the object. Press any key on front board (or send command to PROTection:CLEar), the load front board (OCP) word will get cleared and the load will exit OCP protection status.

3.17.3 Over-power protection (OPP)

The electronic load is provided with two kinds of overpower protections: hardware over-power protection and software overpower protection.

- Hardware over-power protection: the user can set load hardware overpower protection. Load overpower will be limited to existing power value. The existing On/Off status of load will not be changed by the hardware overpower protection.
- Software overpower protection: the user can set load software overpower protection value following steps: **[Shift]** + **5** >Protect>Point Set power value. P-limit is set as pre-alarm delay time. If the loading power value exceeds delay of such overpower protection set value, the load will automatically be OFF and the VFD will display OPP. At the same time, OP and PS bits of the status register will be set and keep till reset.

Clear overpower protection status

Inspect whether power of object under test is within load rated power or set protection power range. If not, disconnect the object. Press any key on load front board (or send command to PROTection:CLEar), the load front board (OPP) word will get cleared and the load will exit OPP protection status.

3.17.4 Over-temperature protection (OTP)

When internal power device of load is higher than about 85 °C, the load is under temperature protection. At this time, the load will automatically be OFF and VFD will display OTP. At the same time, OT and PS bits of the status

register will be set and keep till reset.

Clear over-temperature protection

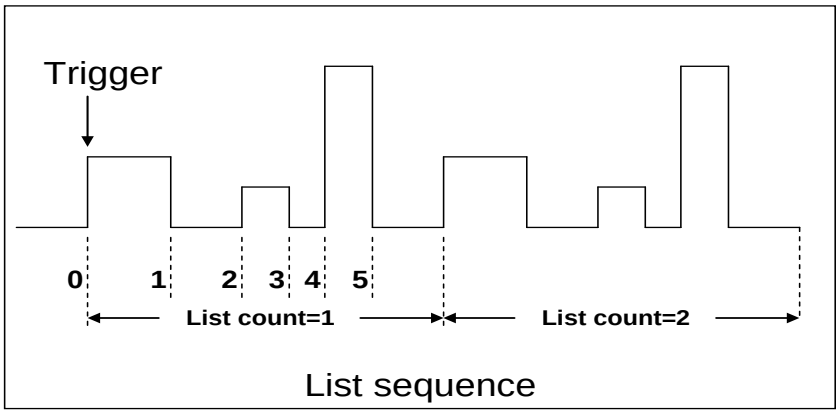
When load temperature is decreased to protection point, press any key on front board (or send command to PROTection:CLEar), the load front board (OTP) word will get cleared and the load will exit OTP protection status.

3.18 List operation (LIST)

LIST mode provides an accurate, fast and low-cost way to complete any complicated current change mode, which enables synchronization of internal or external signals in multiple quasi-bit load precision tests.

When different trigger sources are selected, the LIST function will form a variety of complex sequences by editing step value, pulse width and slope of each step to meet complicated test requirements. LIST parameters comprise designation of input list file, input step count (2-84 steps at maximum), step time (0.00002 s – 3600 s) as well as setting value and slope of each step. The list file can be stored in non-volatile RAM available for a quick output in case of usage. The user can edit 7 groups of list files at maximum.

If the load operation mode is at List operation, the load will start List operation, when it receives a trigger signal till completion or receipt of another trigger signal. Before List operation, be sure to edit List operation files and save them in load non-volatile RAM. Refer to examples below to know how to execute List operation through board. It is assumed that output voltage and current of the tested instrument are 10V and 3A respectively and the load is under CC mode.



Edit the LIST file and trigger to operate this file. Operation steps:

Operation steps

1. Press **[List]** key. Operate Left/Right key. Move to Edit and press **[Enter]** key.

   LIST

   On Recall Edit
2. Operate Left/Right key and move to the High-Rate and press **[Enter]** key.

   EDIT LIST

   High-Rate Low-Rate
3. Set CC range and press **[Enter]** key.

EDIT LIST

Current Range=3A

4. Edit number of steps. Press **2** key to edit two steps. Press **[Enter]** key for confirmation.

   EDIT LIST

   File Step=2 (2-84)

5. Edit current value in step 1And press **[Enter]** key for confirmation.

   EDIT LIST

   Step 001 Level=1A

6. Edit slope in step 1And press **[Enter]** key for confirmation.

   EDIT LIST

   Step 001 Rate=0.1A/uS

7. Edit time in step 1And press **[Enter]** key for confirmation.

   EDIT LIST

   Step 001 Width=5S

8. Edit current value in step 2And press **[Enter]** key for confirmation.

   EDIT LIST

   Step 002 Level=2A

9. Edit slope in step 2And press **[Enter]** key for confirmation.

   EDIT LIST

   Step 002 Rate=0.1A/uS

10. Edit time in step 2And press **[Enter]** key for confirmation.

    EDIT LIST

    Step 002 Width=5S

11. Edit repeat count and press **[Enter]** key for confirmation.

    EDIT LIST

    Repeat Count=3

12. Save all edited files and press **[Enter]** key for confirmation.

    EDIT LIST

    Save List File=1(1-9)

13. Operate Left/Right key and move to On. Press **[Enter]** key (The Trig lamp that indicates VFD screen status is on). Press **[Esc]** key to exit setting.

    LIST

    On Recall Edit

    List operation running

15. Press CC/CV/CR/CW key or any composite function key to exit List test function.

For direct recall of existing List files and triggering of List operation, refer to steps below:

Operation steps

1. Press **[List]** key and ensure that ON lamp flicks. If not, press **[Enter]** before operating Left/Right key. Move to **[Recall]** and press **[Enter]** key.

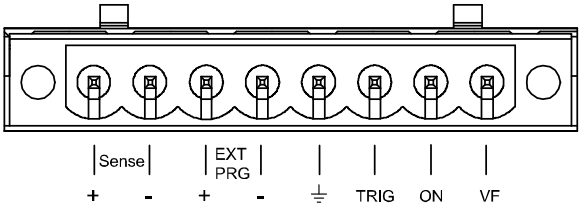
   LIST

On Recall Edit

2. Select edited files and press **[Enter]** for confirmation.
   Recall List File=1
3. Operate Left/Right key and move to On. Press **[Enter]** key (The Trig lamp that indicates VFD screen status is on). Press **[Esc]** key to exit setting.
   LIST
   On Recall Edit
4. Press **[On/Off]** key to open input and press **[Trig]** key (Triggering key)
   List operation running.

3.19 Terminal function of rear board

Terminals on IT8800 rear board comprise remote sensor terminal, external trigger terminal, external analog control terminal, voltage fault indication terminal, external On/Off control terminal and current monitoring terminal. Terminal schematic (as shown below):



Pin	Pin function
Sense+, Sense-	Remote sense terminal
EXT PRG+, EXT PRG-	External analog control terminal
⏚	Negative input terminal for TRIG, ON and VF
TRIG	Positive input terminal for trigger
ON	Positive input terminal for external On/Off control
VF	Positive input terminal for voltage fault indication

3.19.1 Remote sense compensation functions

Under CC, CV, CR or CW mode, if the load consumes large current, a large voltage drop will be detected in connection line between tested instrument and load terminal. To ensure measurement accuracy, a remote sense measurement terminal is provided at load rear board to compensate voltage drop lost in wire.

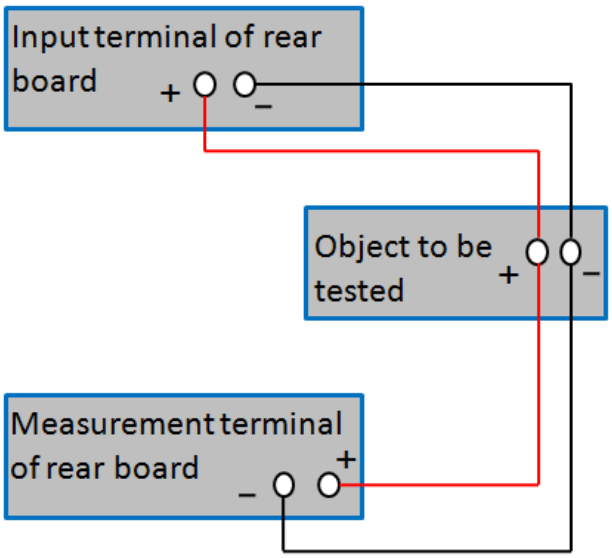
Remote sense operation: SENSE (+) and **SENSE (-)** are remote input terminals. To avoid voltage drop caused by long input wire of load, the remote sense allows direct measurement at input terminal source so as to improve measurement accuracy.

Before using the remote sense measurement function, the user must set the load in remote sense measurement mode.

Setting procedures:

Press **[Shift]** + **6** to enter menu. Move Left/Right key and select Remote-Sense. Press **[Enter]** key and select ON to start Sense function.

Wiring Diagram of Remote Sense



3.19.2 External trigger operation

When rear board triggering mode is selected, firstly, set the trigger source as External and the triggering signal is input from the rear board TRIG terminal.

Set the triggering sources as follows:

Press **[Shift]**+ **5** keys to enter system menu. Click Right key till Trigger appears and flicks. Press **[Enter]** to entry and press ◀ ▶ to select External. Press **[Enter]** for confirmation. Press **[Esc]** to exit the menu.

When external trigger is selected, the positive and negative TRIG terminals will generate trigger signal and the low pulse is valid.

Input corresponding to one trigger can be used for triggering dynamic test, LIST test and auto test.

3.19.3 External analog quantity test

Loading voltage or current of the electronic load can be controlled by EXT PRG (positive and negative) analog quantity terminals on rear board. Connect 0-10V adjustable voltage at the EXT PRG terminal to analog input from 0- full range so as to adjust input voltage and current of load (10V corresponds to voltage or current of load at full range).

3.19.4 External On/Off Control

The load input switches can be controlled by the external TTL electrical level. During external input control, the on/off key will become invalid and the load input switches can only be controlled by the external TTL electrical level. The load input will be switched on in case of low level external input; and the load input will be switched off in case of high level external input.

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3.19.5 Voltage fault indication terminal

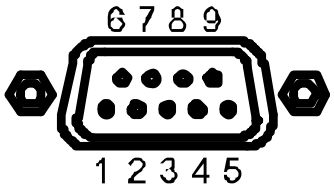
When load is under overvoltage protection or terminal reverse polarity protection, VF pin voltage fault indication terminal outputs high level.

3.19.6 Current monitoring (I Monitor)

The 0-10V analog quantity output signal of current monitoring output terminal represents input current to which the terminal belongs from 0 to full range. An external voltmeter or oscilloscope can be connected to display input current change.

3.20 External Signal Control Interface

Besides the RS232 communication interface, the rear panel is also equipped with a DB-9 COM interface, which is the external signal control interface used in auto test. The pin definitions are as follows.



Pins of Plug

Base pin number	Description
1	The auto test runs last step.
2	The auto test starts to run.
3	During the auto test, the input is turned on.
4	Output the failure signal of the auto test.
5	GND
6	The auto test runs next step.
7	The auto test pauses.
8	The auto test outputs via signal.
9	The warning tone signal of auto test outputs.

You can control the auto test process and test results by transmitting input/output signals through external signal control interface. Different pins of the interface control different functions. Detailed instructions are listed on the above table.

Under external analog quantity control mode, you can switch CC mode through pin 1 of the interface and switch CV mode through pin 6.

3.21 Auto test function

The IT8800 series electronic load delivers strong auto test functions, which can analog several tests. A total of 10 groups of test files can be edited, and each group test file has 10 steps. Therefore, a maximum of 100 steps can be edited and saved in EEPROM (address).

Edit test files following the steps below:

NOTE

In the following editing procedures, “Y” indicates selected status. To cancel selected status, press numeric key of corresponding step again.

Operation steps

1. Press **[Shift]** + **2** (Program).

   PROGRAM

   Run Recall Edit

2. Operate Left/Right key and move to Edit. Press **[Enter]** key to enter editing test files.

   EDIT PROGRAM

   Active Sequence=0987654321

3. Press numeric key to select required testing steps. The Active Sequence =09876543YY indicates that 1/2 steps have been selected. Press **[Enter]** key for confirmation.

   EDIT PROGRAM

   Active Sequence=09876543YY

4. Select whether pause is necessary for these two steps. If step 2 is to be paused, press **2** key. If not, directly press **[Enter]** key for confirmation.

   EDIT PROGRAM

   Pause Sequence=□□□□□□□□Y1

5. Select whether short-circuit test is necessary for these two steps. If step 1 is to be tested, press **1** key. If not, directly press **[Enter]** key for confirmation.

   EDIT PROGRAM

   Short Sequence=□□□□□□□□2Y

6. Set loading time of step 1. If 2S is required, directly press **2** key on the board. Press **[Enter]** key for confirmation.

   EDIT PROGRAM

   SEQ01 On Time=2S

7. Set unloading time of step 1. If 2S is required, directly press **2** key. Press **[Enter]** key for confirmation.

   EDIT PROGRAM

   SEQ01 Off Time=2S

8. Set test delay time of step 1. If 1S is required, directly press **1** key. Press **[Enter]** key for confirmation. Tpf is delay time before measurement.

   EDIT PROGRAM

   SEQ01 P/F Delay Time=1S

9. Set loading time of step 2. If 2S is required, directly press **2** key on the board. Press **[Enter]** key.

   EDIT PROGRAM

   SEQ02 On Time=2S

10. Set unloading time of step 2. If 2S is required, directly press **2** key. Press **[Enter]** key.

    EDIT PROGRAM

    SEQ02 Off Time=2S

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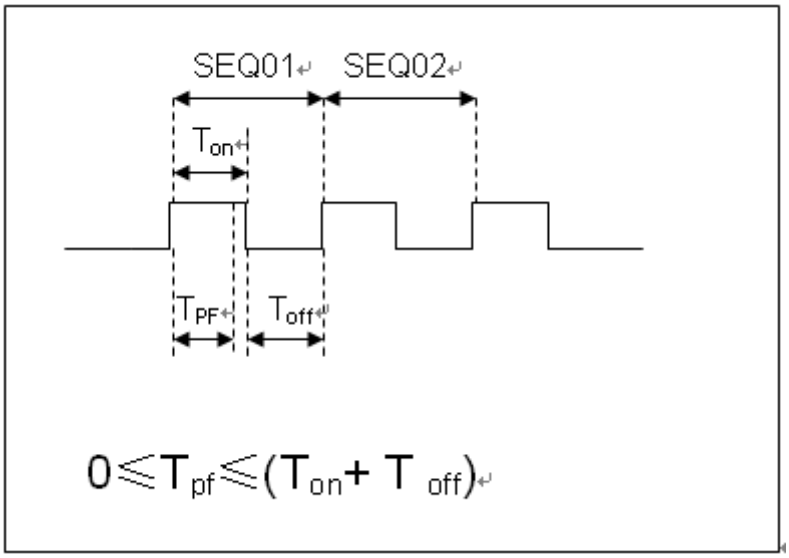
11. Set test delay time of step 2. If 1S is required, directly press **1** key. Press **[Enter]** key. Tpf is delay time before measurement.

    EDIT PROGRAM

    SEQ02 P/F Delay Time=1S



Tpf is delay time before measurement.

12. Set conditions for stop test. COMPLETE means to stop after all tests are completed and FAILURE means to stop in case of test error. Press **[Enter]** key for confirmation.

    PROGRAM

    Complete-Stop Failure-Stop

13. Determine whether to link to next group of test file. If it is to link to second group, press **2** . 0 means not to link to other test files. Press **[Enter]** key for confirmation.

    PROGRAM

    Chain Program File=0 (0-10)

□Correspondence Table of Auto Test Files and Step Parameter Saving

Program 1 Sequence	1	2	3	4	5	6	7	8	9	10
Save Group	1	2	3	4	5	6	7	8	9	10
Program 2 Sequence	1	2	3	4	5	6	7	8	9	10
Save Group	11	12	13	14	15	16	17	18	19	20
:										
:										
Program 10 Sequence	1	2	3	4	5	6	7	8	9	10
Save Group	91	92	93	94	95	96	97	98	99	100

14. Save the programmed files in EEPROM. A total of 10 groups of files can be saved. If it is to save edited files in group 1, press **1** key. Press **[Enter]** key for confirmation.

    PROGRAM

    Save Program File=1 (1-10)

15. Press ESC key to exit editing menu.

The above steps only set entire framework of auto tests. Additional setting is required for specific parameters in each step. This design will facilitate modification of parameters in a single step.

16. Select required working mode. Set working voltage/current/power/resistance. Press **[Shift]** + **[CV]** to enter parameter setting.

    10.0000V 0.0000A

    0.00W CC=1.000A

17. It is assumed that step 1 edits CC mode as follows: current: 2A, maximum voltage value: 10V, and minimum voltage value: 2V; and step 2 edits CV mode as follows: voltage: 3V, maximum current value: 5A, and minimum current value: 0A. After parameter setting in each step, press **[Esc]** to exit menu setting. And press **[Shift]** + **4** for saving. Setting at each step should be saved. The saving position is same as that of step number. **Settings at each step should be independently saved. Refer to the "Correspondence Table for Auto Test Files and Single-Step Parameter Saving Positions".**
18. It is necessary to recall test files for running after editing auto test files.

Recall test file for running

To recall edited test files from EEPROM quickly after re-energizing instrument, refer to the method below.

1. Press **[Shift]** + **2**.

   PROGRAM

   Run Recall Edit
2. Move Left/Right Key and select **[Recall]** key. Press **[Enter]** key for confirmation.

   RECALL PROGRAM

   Recall Program File=1
3. Move Left/Right Key and select Run. Press **[Enter]** key for confirmation.

   PROGRAM

   Run Recall Edit
4. Display auto test file 1.

   PRG01 STOP
5. Press **[Trig]** key.

   Operate auto test file 1. Press **[Pause]** key on board to pause auto test. Press Move key for next step.

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Chapter4 Technical Specifications

4.1 Major technical parameters

Model		IT8813		IT8813B	
Rated value (0-40 °C)	Input voltage	0~120V		0~500V	
	Input current	0~6A	0~60A	0~3A	0~30A
	Input power	750W		750W	
	Min. operating voltage	0.1V/6A	1.0V/60A	0.36V3A	3.6V/30A
Constant voltage mode	Range	0.1~18V	0.1~120V	0.1~50V	0.1~500V
	Resolution	1mV	10mV	1mV	10mV
	Accuracy	±(0.025%+0.05%FS)			
Constant current mode	Range	0~6A	0~60A	0~3A	0~30A
	Resolution	0.1mA	1mA	0.1mA	1mA
	Accuracy	±(0.05%+0.05%FS)			
Constant resistance mode *1	Range	0.02Ω~10Ω	10Ω~7.5KΩ	0.15Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit		16bit	
	Accuracy	0.01%+0.08S *2	0.01%+0.0008S	0.01%+0.08S *2	0.01%+0.0008S
Constant power Mode *3	Range	750W		750W	
	Resolution	10mW		10mW	
	Accuracy	0.2%+0.2%FS		0.2%+0.2%FS	
Dynamic mode					
CC mode					
T1&T2		20uS~3600S /Res:1 uS		20uS~3600S /Res:1 uS	
Accuracy		5uS±100ppm		5uS±100ppm	
Ascending/descending slope*4		0.0001~0.25A/uS	0.001~2.5A/uS	0.0001~0.1A/uS	0.001~1A/uS
Minimum rise time *5		≒20uS	≒20uS	≒20uS	≒20uS
Measuring range					
Read-back voltage	Range	0~18V	0~120V	0~50V	0~500V
	Resolution	1 mV	10 mV	1 mV	10 mV
	Accuracy	±(0.025%+0.025%FS)			
Read-back current	Range	0~6A	0~60A	0~3A	0~30A
	Resolution	0.1mA	1mA	0.1mA	1mA
	Accuracy	±(0.05%+0.05%FS)		±(0.05%+0.05%FS)	
Read-back power	Range	750W		750W	
	Resolution	10mW		10mW	
	Accuracy	±(0.2%+0.2%FS)		±(0.2%+0.2%FS)	
Protection range					
Overpower protection		≒760W		≒760W	

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Overcurrent protection		≒6.6A	≒66A	≒3.3A	≒33A
Overvoltage protection		≒130V		≒530V	
Overtemperature protection		≒85℃		≒85℃	
Specification					
Short circuit	Current (CC)	≒6.6A	66A	≒3.3/3A	≒33/30A
	Voltage (CV)	0V	0V	0V	0V
	Resistance (CR)	≒15mΩ	≒15mΩ	≒120mΩ	≒120mΩ
Input terminal impedance		300KΩ		1MΩ	
Dimension		W439*H133.3*D580（mm）			
Weight		7.05KG		7.05KG	

Model		**IT8814**		**IT8814B**	
Rated value (0-40 °C)	Input voltage	0~120V		0~500V	
	Input current	0~12A	0~120A	0~6A	0~60A
	Input power	1500W		1200W	
	Min. operating voltage	0.12V at 12A	1.2V at 120A	0.36V at 6A	3.6V at 60A
Constant voltage mode	Range	0.1~18V	0.1~120V	0.1~50V	0.1~500V
	Resolution	1mV	10mV	1mV	10mV
	Accuracy	±(0.025%+0.05%FS)			
Constant current mode	Range	0~12A	0~120A	0~6A	0~60A
	Resolution	1mA	10mA	0.1mA	1mA
	Accuracy	±(0.05%+0.05%FS)			
Constant resistance mode ***1**	Range	0.01Ω~10Ω	10Ω~7.5KΩ	0.1Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit		16bit	
	Accuracy	0.01%+0.08S *2	0.01%+0.0008S	0.01%+0.08S *2	0.01%+0.0008S
Constant power Mode *3	Range	1500W		1200W	
	Resolution	100mW		100mW	
	Accuracy	0.2%+0.2%FS		0.2%+0.2%FS	
Dynamic mode					
CC mode					
T1&T2		20uS~3600S /Res:1 uS		20uS~3600S /Res:1 uS	
Accuracy		5uS±100ppm		5uS±100ppm	
Ascending/descending slope*4		0.001~0.25A/uS	0.01~2.5A/uS	0.0001~0.1A/uS	0.001~1A/uS
Minimum rise time *5		≒30uS	≒30uS	≒20uS	≒20uS
Measuring range					

Read-back voltage	Range	0~18V	0~120V	0~50V	0~500V
	Resolution	1 mV	10 mV	1 mV	10 mV
	Accuracy	±(0.025%+0.025%FS)			
Read-back current	Range	0~12A	0~120A	0~6A	0~60A
	Resolution	1mA	10mA	0.1mA	1mA
	Accuracy	±(0.05%+0.05%FS)		±(0.05%+0.05%FS)	
Read-back power	Range	1500W		1200W	
	Resolution	100mW		100mW	
	Accuracy	±(0.2%+0.2%FS)		±(0.2%+0.2%FS)	
Protection range					
Overpower protection		≒1550W		≒1250W	
Overcurrent protection		≒13.2A	≒132A	≒6.6A	≒66A
Overvoltage protection		≒130V		≒530V	
Overtemperature protection		≒85℃		≒85℃	
Specification					
Short circuit	Current (CC)	≒13.2A	132A	≒6.6/6A	≒66/60A
	Voltage (CV)	0V	0V	0V	0V
	Resistance (CR)	≒10mΩ	≒10mΩ	≒60mΩ	≒60mΩ
Input terminal impedance		300KΩ		1MΩ	
Dimension		W439*H133.3*D580（mm）			

Model		**IT8816**		**IT8816B**	
Rated value (0-40 °C)	Input voltage	0~120V		0~500V	
	Input current	0~24A	0~240A	0~10A	0~100A
	Input power	3000W		2.5KW	
	Min. operating voltage	0.12V/24A	1.2V/240A	0.3V/10A	3V/100A
Constant voltage mode	Range	0.1~18V	0.1~120V	0.1~50V	0.1~500V
	Resolution	1mV	10mV	1mV	10mV
	Accuracy	±(0.025%+0.05%FS)			
Constant current mode	Range	0~24A	0~240A	0~10A	0~100A
	Resolution	1mA	10mA	1mA	10mA
	Accuracy	±(0.05%+0.05%FS)			
Constant resistance mode ***1**	Range	0.01Ω~10Ω	10Ω~7.5KΩ	0.03Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit		16bit	
	Accuracy	0.01%+0.08S *2	0.01%+0.0008S	0.01%+0.08S *2	0.01%+0.0008S
Constant power Mode *3	Range	3000W		2.5KW	
	Resolution	100mW		100mW	
	Accuracy	0.2%+0.2%FS		0.2%+0.2%FS	

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Dynamic mode					
CC mode					
T1&T2		20uS~3600S /Res:1 uS		20uS~3600S /Res:1 uS	
Accuracy		5uS±100ppm		5uS±100ppm	
Ascending/descending slope*4		0.001~0.25A/uS	0.01~2.5A/uS *	0.001~0.1A/uS	0.01~1A/uS *
Minimum rise time *5		≒60uS	≒60uS	≒80uS	≒80uS
Measuring range					
Read-back voltage	Range	0~18V	0~120V	0~50V	0~500V
	Resolution	1 mV	10 mV	1 mV	10 mV
	Accuracy	±(0.025%+0.025%FS)			
Read-back current	Range	0~24A	0~240A	0~10A	0~100A
	Resolution	1mA	10mA	1mA	10mA
	Accuracy	±(0.05%+0.05%FS)		±(0.05%+0.05%FS)	
Read-back power	Range	3000W		2.5KW	
	Resolution	100mW		100mW	
	Accuracy	±(0.2%+0.2%FS)		±(0.2%+0.2%FS)	
Protection range					
Overpower protection		≒3050W		≒2550W	
Overcurrent protection		≒26.4A	≒264A	≒11A	≒110A
Overvoltage protection		≒130V		≒530V	
Overtemperature protection		≒85℃		≒85℃	
Specification					
Short circuit	Current (CC)	≒26.4A	≒264A	≒11A	≒110A
	Voltage (CV)	0V	0V	0V	0V
	Resistance (CR)	≒5mΩ	≒5mΩ	≒30mΩ	≒30mΩ
Input terminal impedance		300KΩ		1MΩ	
Dimension		W439*H133.3*D580（mm）			

Model		IT8813C	
Rated value (0-40 °C)	Input voltage	0~120V	
	Input current	0~12A	0~120A
	Input power	750W	
	Min. operating voltage	0.12V/12A	1.2V/120A

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Constant voltage mode	Range	0.1~18V	0.1~120V
	Resolution	1mV	10mV
	Accuracy	±(0.025%+0.05%FS)	±(0.025%+0.05%FS)
Constant current mode	Range	0~12A	0~120A
	Resolution	1mA	10mA
	Accuracy	±(0.05%+0.1%FS)	±(0.05%+0.1%FS)
Constant resistance mode *1	Range	0.02Ω~10Ω	10Ω~7.5KΩ
	Resolution	16 bit	
	Accuracy	0.01%+0.08S *2	0.01%+0.0008S
Constant power Mode *3	Range	750W	
	Resolution	100mW	
	Accuracy	0.2%+0.2%FS	
Dynamic mode			
CC mode			
T1&T2		20uS~3600S /Res:1 uS	
Accuracy		5uS±100ppm	
Ascending/descending slope *4		0.001~0.25A/uS	0.01~2.5A/uS *
Minimum rise time *5		≒30uS	≒30uS
Measuring range			
Read-back voltage	Range	0~18V	0~120V
	Resolution	1 mV	10 mV
	Accuracy	±(0.025%+0.025%FS)	±(0.025%+0.025%FS)
Read-back current	Range	0~12A	0~120A
	Resolution	1mA	10mA
	Accuracy	±(0.05%+0.1%FS)	
Read-back power	Range	750W	
	Resolution	10mW	
	Accuracy	±(0.2%+0.2%FS)	
Protection range			
Overpower protection		≒760W	
Overcurrent protection		≒13.2A	≒132A
Overvoltage protection		≒130V	
Overtemperature protection		≒85℃	
Specification			
Short circuit	Current (CC)	≒13.2A	132A
	Voltage (CV)	0V	0V
	Resistance (CR)	≒10mΩ	≒10mΩ
Input terminal impedance		300KΩ	
Dimension		W439*H133.3*D580（mm）	

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Model		IT8814C	
Rated value (0-40 °C)	Input voltage	0~120V	
	Input current	0~24A	0~240A
	Input power	1500W	
	Min. operating voltage	0.15V/24A	1.5V/240A
Constant voltage mode	Range	0.1~18V	0.1~120V
	Resolution	1mV	10mV
	Accuracy	±(0.025%+0.025%FS)	±(0.025%+0.05%FS)
Constant current mode	Range	0~24A	0~240A
	Resolution	1mA	10mA
	Accuracy	±(0.05%+0.1%FS)	±(0.05%+0.1%FS)
Constant resistance mode *1	Range	0.01Ω~10Ω	10Ω~7.5KΩ
	Resolution	16 bit	
	Accuracy	0.01%+0.08S *2	0.01%+0.0008S
Constant power Mode *3	Range	1500W	
	Resolution	100mW	
	Accuracy	0.2%+0.2%FS	
Dynamic mode			
CC mode			
T1&T2		20uS~3600S /Res:1 uS	
Accuracy		5uS±100ppm	
Ascending/descending slope *4		0.0001~0.25A/uS	0.001~2.5A/uS *
Minimum rise time *5		≒60uS	≒60uS
Measuring range			
Read-back voltage	Range	0~18V	0~120V
	Resolution	0.1 mV	1 mV
	Accuracy	±(0.025%+0.025%FS)	±(0.025%+0.025%FS)
Read-back current	Range	0~24A	0~240A
	Resolution	1mA	10mA
	Accuracy	±(0.05%+0.05%FS)	
Read-back power	Range	1500W	
	Resolution	100mW	
	Accuracy	±(0.2%+0.2%FS)	
Protection range			
Overpower protection		≒1550W	
Overcurrent protection		≒26.4A	≒264A
Overvoltage protection		≒130V	
Overtemperature protection		≒85℃	

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Specification			
Short circuit	Current (CC)	≒26.4A	264A
	Voltage (CV)	0V	0V
	Resistance (CR)	≒6mΩ	≒6mΩ
Input terminal impedance	300KΩ		
Dimension	W439*H133.3*D580（mm）		

Model		**IT8816C**	
Rated value (0-40 °C)	Input voltage	0~120V	
	Input current	0~48A	0~480A
	Input power	3000W	
	Min. operating voltage	0.2V/48A	2V/480A
Constant voltage mode	Range	0.1~18V	0.1~120V
	Resolution	1mV	10mV
	Accuracy	±(0.025%+0.05%FS)	±(0.025%+0.05%FS)
Constant current mode	Range	0~48A	0~480A
	Resolution	1mA	10mA
	Accuracy	±(0.05%+0.1%FS)	±(0.05%+0.1%FS)
Constant resistance mode ***1**	Range	0.01Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit	
	Accuracy	0.01%+0.08S *2	0.01%+0.0008S
Constant power Mode *3	Range	3000W	
	Resolution	100mW	
	Accuracy	0.2%+0.2%FS	
Dynamic mode			
CC mode			
T1&T2		20uS~3600S /Res:1 uS	
Accuracy		5uS±100ppm	
Ascending/descending slope *4		0.001~0.25A/uS	0.01~2.5A/uS *
Minimum rise time *5		≒100uS	≒100uS
Measuring range			
Read-back voltage	Range	0~18V	0~120V
	Resolution	1 mV	10 mV
	Accuracy	±(0.025%+0.025%FS)	±(0.025%+0.025%FS)
Read-back current	Range	0~48A	0~480A
	Resolution	1mA	10mA
	Accuracy	±(0.05%+0.1%FS)	
Read-back power	Range	3000W	
	Resolution	100mW	
	Accuracy	±(0.2%+0.2%FS)	
Protection range			

Overpower protection	≒3050W		
Overcurrent protection	≒52.8A		≒528A
Overvoltage protection	≒130V		
Overtemperature protection	≒85℃		
Specification			
Short circuit	Current (CC)	≒52.8/48A	≒528/480A
	Voltage (CV)	0V	0V
	Resistance (CR)	≒4mΩ	≒4mΩ
Input terminal impedance	300KΩ		
Dimension	W439*H133.3*D580（mm）		

Model		**IT8817**		**IT8818**	
Rated value (0-40 °C)	Input voltage	0~120V		0~120V	
	Input current	0~36A	0~360A	0~48A	0~480A
	Input power	4500W		6KW	
	Min. operating voltage	0.15V/36A	1.5V/360A	0.15V/48A	1.5V/480A
Constant voltage mode	Range	0.1~18V	0.1~120V	0.1~18V	0.1~120V
	Resolution	1mV	10mV	1mV	10mV
	Accuracy	±(0.025%+0.05%FS)			
Constant current mode	Range	0~36A	0~360A	0~48A	0~480A
	Resolution	1mA	10mA	1mA	10mA
	Accuracy	±(0.05%+0.1%FS)			
Constant resistance mode ***1**	Range	0.01Ω~10Ω	10Ω~7.5KΩ	0.005Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit		16bit	
	Accuracy	0.01%+0.08S *2	0.01%+0.0008S	0.01%+0.08S *2	0.01%+0.0008S
Constant power Mode *3	Range	4500W		6KW	
	Resolution	100mW		100mW	
	Accuracy	0.2%+0.2%FS			
Dynamic mode					
CC mode					
T1&T2		20uS~3600S /Res:1 uS			
Accuracy		5uS±100ppm			
Ascending/descending slope *4		0.001~0.25A/uS	0.01~2.5A/uS	0.001~0.25A/uS	0.01~2.5A/uS
Minimum rise time *5		≒100 uS	≒100 uS	≒120 uS	≒120 uS
Measuring range					
Read-back	Range	0~18V	0~120V	0~18V	0~120V

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voltage	Resolution	1 mV	10 mV	1 mV	1 0mV
	Accuracy	±(0.025%+0.025%FS)			
Read-back current	Range	0~36A	0~360A	0~48A	0~480A
	Resolution	1mA	10mA	1mA	10mA
	Accuracy	±(0.05%+0.05%FS)			
Read-back power	Range	4500W		6KW	
	Resolution	100mW		100mW	
	Accuracy	±(0.2%+0.2%FS)			
Protection range					
Overpower protection		≒4550W		≒6050W	
Overcurrent protection		≒39.6A	≒396A	≒52.8A	≒528A
Overvoltage protection		≒130V		≒130V	
Overtemperature protection		≒85℃		≒85℃	
Specification					
Short circuit	Current (CC)	≒39.6A	≒396A	≒52.8A	≒528A
	Voltage (CV)	0V			
	Resistance (CR)	≒4mΩ		≒3mΩ	
Input terminal impedance		300KΩ			
Dimension		W439*H266*D590（mm）			

Model		**IT8817B**		**IT8818B**	
Rated value (0-40 °C)	Input voltage	0~500V		0~500V	
	Input current	0~12A	0~120A	0~15A	0~150A
	Input power	3.6KW		5KW	
	Min. operating voltage	0.3V/12A	3V/120A	0.3V/15A	3V/150A
Constant voltage mode	Range	0.1~50V	0.1~500V	0.1~50V	0.1~500V
	Resolution	1mV	10mV	1mV	10mV
	Accuracy	±(0.025%+0.05%FS)			
Constant current mode	Range	0~12A	0~120A	0~15A	0~150A
	Resolution	1mA	10mA	1mA	10mA
	Accuracy	±(0.05%+0.05%FS)			
Constant resistance mode ***1**	Range	0.03Ω~10Ω	10Ω~7.5KΩ	0.03Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit		16bit	
	Accuracy	0.01%+0.08S *2	0.01%+0.0008S	0.01%+0.08S *2	0.01%+0.0008S

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Constant power Mode *3	Range	3.6KW		5KW	
	Resolution	100mW		100mW	
	Accuracy	0.2%+0.2%FS		0.2%+0.2%FS	
Dynamic mode					
CC mode					
T1&T2		20uS~3600S /Res:1uS			
Accuracy		5uS±100ppm			
Ascending/descending slope *4		0.001~0.1A/uS	0.01~1A/uS	0.001~0.1A/uS	0.01~1A/uS
Minimum rise time *5		≒80uS		≒100 uS	
Measuring range					
Read-back voltage	Range	0~50V	0~500V	0~50V	0~500V
	Resolution	1 mV	10 mV	1 mV	10 mV
	Accuracy	±(0.025%+0.025%FS)			
Read-back current	Range	0~12A	0~120A	0~15A	0~150A
	Resolution	1mA	10mA	1mA	10mA
	Accuracy	±(0.05%+0.05%FS)			
Read-back power	Range	3.6KW		5KW	
	Resolution	100mW		100W	
	Accuracy	±(0.2%+0.2%FS)			
Protection range					
Overpower protection		≒3650W		≒5050W	
Overcurrent protection		≒13.2A	≒132A	≒16.5A	≒165A
Overvoltage protection		≒530V		≒530V	
Overtemperature protection		≒85℃		≒85℃	
Specification					
Short circuit	Current (CC)	≒13.2A	≒132A	≒16.5A	≒165A
	Voltage (CV)	0V			
	Resistance (CR)	≒25mΩ		≒20mΩ	
Input terminal impedance		1MΩ			
Dimension		W439*H266*D590（mm）			

Model		**IT8817C**		**IT8818C**	
Rated value (0-40 °C)	Input voltage	0~120V		0~120V	
	Input current	0~600A	0~600A	0~72A	0~720A
	Input power	4500W		6KW	
	Min. operating voltage	0.18V/60A	1.8V/600A	0.18V/72A	1.8V/720A
Constant	Range	0.1~18V	0.1~120V	0.1~18V	0.1~120V

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voltage mode	Resolution	1mV	10mV	1mV	10mV
	Accuracy	±(0.025%+0.05%FS)			
Constant current mode	Range	0~60A	0~600A	0~72A	0~720A
	Resolution	1mA	10mA	1mA	10mA
	Accuracy	±(0.1 %+0.1%FS)			
Constant resistance mode *1	Range	0.01Ω~10Ω	10Ω~7.5KΩ	0.005Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit		16bit	
	Accuracy	0.01%+0.08S *2	0.01%+0.0008S	0.01%+0.08S *2	0.01%+0.0008S
Constant power Mode *3	Range	4500W		6KW	
	Resolution	100mW		100mW	
	Accuracy	0.2%+0.2%FS		0.2%+0.2%FS	
Dynamic mode					
CC mode					
T1&T2		20uS~3600S /Res:1uS			
Accuracy		5uS±100ppm			
Ascending/descending slope *4		0.001~0.25A/uS	0.01~2.5A/uS	0.001~0.25A/uS	0.01~2.5A/uS
Minimum rise time *5		≒200uS			
Measuring range					
Read-back voltage	Range	0~18V	0~120V	0~18V	0~120V
	Resolution	1 mV	10 mV	1 mV	10mV
	Accuracy	±(0.025%+0.025%FS)			
Read-back current	Range	0~60A	0~600A	0~72A	0~720A
	Resolution	1mA	10mA	1mA	10mA
	Accuracy	±(0.05%+0.1%FS)			
Read-back power	Range	4500W		6KW	
	Resolution	100mW		100mW	
	Accuracy	±(0.2%+0.2%FS)			
Protection range					
Overpower protection		≒4550W		≒6050W	
Overcurrent protection		≒66A	≒66A	≒79.2A	≒792A
Overvoltage protection		≒130V			
Overtemperature protection		≒85℃			
Specification					
Short circuit	Current (CC)	≒66A	≒660A	≒79.2A	≒792A
	Voltage (CV)	0V			
	Resistance (CR)	≒3mΩ		≒2.5mΩ	
Input terminal impedance		300KΩ			
Dimension		W439*H266*D590（mm）			

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Model		IT8818D	
Rated value (0-40 °C)	Input voltage	0~60V	
	Input current	0~70A	0~700A
	Input power	6KW	
	Min. operating voltage	0.1V/70A	1V/700A
Constant voltage mode	Range	0.1~6V	0.1~60V
	Resolution	1mV	10mV
	Accuracy	±(0.05%+0.02%FS)	±(0.05%+0.025%FS)
Constant current mode	Range	0~70A	0~700A
	Resolution	1mA	10mA
	Accuracy	±(0.1%+0.1%FS)	±(0.1%+0.1%FS)
Constant resistance mode *1	Range	0.005Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit	
	Accuracy	0.01%+0.08S	0.01%+0.0008S
Constant power Mode *3	Range	6KW	
	Resolution	100mW	
	Accuracy	0.2%+0.2%FS	
Dynamic mode			
Dynamic mode	CC mode		
	T1&T2	20uS~3600S /Res:1 uS	
	Accuracy	1 uS±100ppm	
	Ascending/descending slope *4	0.0001~0.6A/uS	0.001~2.5A/uS
Measuring range			
Read-back voltage	Range	0~6V	0~60V
	Resolution	0.1 mV	1 mV
	Accuracy	±(0.025%+0.025%FS)	±(0.025%+0.025%FS)
Read-back current	Range	0~70A	0~700A
	Resolution	1mA	10mA
	Accuracy	±(0.05%+0.05%FS)	
Read-back power	Range	6KW	
	Resolution	100mW	
	Accuracy	±(0.2%+0.2%FS)	
Protection range			
Overpower protection	≒≒6KW		
Overcurrent protection	≒77A	≒770A	
Overvoltage protection	≒65V		
Overtemperature	≒85℃		

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protection			
Specification			
Short circuit	Current (CC)	≒77A	≒770A
	Voltage (CV)	0V	0V
	Resistance (CR)	≒1mΩ	≒1mΩ
Input terminal impedance	150KΩ		
Dimension	W439*H266*D590（mm）		

Model		**IT8819H**	
Rated value (0-40 °C)	Input voltage	0~800V	
	Input current	0~8A	0~80A
	Input power	7500W	
	Min. operating voltage	0.28V/8A	2.8V/80A
Constant voltage mode	Range	0.1~80V	0.1~800V
	Resolution	1mV	10mV
	Accuracy	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)
Constant current mode	Range	0~8A	0~80A
	Resolution	1mA	10mA
	Accuracy	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)
Constant resistance mode *1	Range	0.05Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit	
	Accuracy	0.01%+0.08S *2	0.01%+0.0008S
Constant power Mode *3	Range	7500W	
	Resolution	1W	
	Accuracy	0.2%+0.25%FS	
Measuring range			
Read-back voltage	Range	0~80V	0~800V
	Resolution	1mV	10mV
	Accuracy	±(0.025%+0.025%FS)	±(0.025%+0.025%FS)
Read-back current	Range	0~8A	0~80A
	Resolution	1mA	10mA
	Accuracy	±(0.05%+0.05%FS)	
Read-back power	Range	7500W	
	Resolution	1W	
	Accuracy	±(0.2%+0.25%FS)	
Protection range			
Overpower protection	≒7550W		
Overcurrent protection	≒8.8A		≒88A
Overvoltage	≒850V		

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protection			
Overtemperature protection	≒85℃		
Specification			
Short circuit	Current (CC)	≒8.8/8A	≒88/80A
	Voltage (CV)	0V	0V
	Resistance (CR)	≒35mΩ	≒35mΩ
Input terminal impedance	≒2MΩ		
Dimension	12U		

Model		**IT8830**	
Rated value (0-40 °C)	Input voltage	0~120V	
	Input current	0~50A	0~500A
	Input power	10KW	
	Min. operating voltage	0.1V/50A	1V/500A
Constant voltage mode	Range	0.1~18V	0.1~120V
	Resolution	1mV	10mV
	Accuracy	±(0.025%+0.05%FS)	±(0.025%+0.05%FS)
Constant current mode	Range	0~50A	0~500A
	Resolution	1mA	10mA
	Accuracy	±(0.05%+0.1%FS)	±(0.05%+0.1%FS)
Constant resistance mode ***1**	Range	0.005Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit	
	Accuracy	0.01%+0.08S *2	0.01%+0.0008S
Constant power Mode *3	Range	10KW	
	Resolution	1W	
	Accuracy	0.2%+0.2%FS	
Measuring range			
Read-back voltage	Range	0~18V	0~120V
	Resolution	1 mV	10 mV
	Accuracy	±(0.025%+0.025%FS)	±(0.025%+0.025%FS)
Read-back current	Range	0~50A	0~500A
	Resolution	1mA	10mA
	Accuracy	±(0.05%+0.05%FS)	
Read-back power	Range	10KW	
	Resolution	1W	
	Accuracy	±(0.2%+0.2%FS)	
Protection range			
Overpower	≒10.1KW		

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protection			
Overcurrent protection	≒55A		≒550A
Overvoltage protection	≒130V		
Overtemperature protection	≒85℃		
Specification			
Short circuit	Current (CC)	≒55A	≒550A
	Voltage (CV)	0V	0V
	Resistance (CR)	≒2mΩ	≒2mΩ
Input terminal impedance	300KΩ		
Dimension	12U		

Model		**IT8830B**	
Rated value (0-40 °C)	Input voltage	0~500V	
	Input current	0~20A	0~200A
	Input power	10KW	
	Min. operating voltage	0.3V/20A	3V/200A
Constant voltage mode	Range	0.1~50V	0.1~500V
	Resolution	1mV	10mV
	Accuracy	±(0.025%+0.05%FS)	±(0.05%+0.05%FS)
Constant current mode	Range	0~20A	0~200A
	Resolution	1mA	10mA
	Accuracy	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)
Constant resistance mode ***1**	Range	0.02Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit	
	Accuracy	0.01%+0.08S *2	0.01%+0.0008S
Constant power Mode *3	Range	10KW	
	Resolution	1W	
	Accuracy	0.2%+0.2%FS	
Measuring range			
Read-back voltage	Range	0~50V	0~500V
	Resolution	1mV	10 mV
	Accuracy	±(0.025%+0.025%FS)	±(0.025%+0.025%FS)
Read-back current	Range	0~20A	0~200A
	Resolution	1mA	10mA
	Accuracy	±(0.05%+0.05%FS)	
Read-back power	Range	10KW	
	Resolution	1W	

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	Accuracy	±(0.2%+0.2%FS)	
Protection range			
Overpower protection	≒10.1KW		
Overcurrent protection	≒22A		≒220A
Overvoltage protection	≒530V		
Overtemperature protection	≒85℃		
Specification			
Short circuit	Current (CC)	≒22A	≒220A
	Voltage (CV)	0V	0V
	Resistance (CR)	≒15mΩ	≒15mΩ
Input terminal impedance	1MΩ		
Dimension	12U		

Model		**IT8830H**	
Rated value (0-40 °C)	Input voltage	0~800V	
	Input current	0~10A	0~100A
	Input power	10KW	
	Min. operating voltage	0.3V/10A	3V/100A
Constant voltage mode	Range	0.1~80V	0.1~800V
	Resolution	1mV	10mV
	Accuracy	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)
Constant current mode	Range	0~10A	0~100A
	Resolution	1mA	10mA
	Accuracy	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)
Constant resistance mode ***1**	Range	0.05Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit	
	Accuracy	0.01%+0.08S ***2**	0.01%+0.0008S
Constant power Mode *3	Range	10KW	
	Resolution	1W	
	Accuracy	0.2%+0.2%FS	
Measuring range			
Read-back voltage	Range	0~80V	0~800V
	Resolution	1 mV	10 mV
	Accuracy	±(0.025%+0.025%FS)	±(0.025%+0.025%FS)
Read-back current	Range	0~10A	0~100A
	Resolution	1mA	10mA

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	Accuracy	±(0.05%+0.05%FS)
Read-back power	Range	10KW
	Resolution	1W
	Accuracy	±(0.2%+0.2%FS)
Protection range		
Overpower protection	≒10.1KW	
Overcurrent protection	≒11A	≒110A
Overvoltage protection	≒850V	
Overtemperature protection	≒85℃	
Specification		
Short circuit	Current (CC)	≒11A ≒110A
	Voltage (CV)	0V 0V
	Resistance (CR)	≒30mΩ ≒30mΩ
Input terminal impedance	2MΩ	
Dimension	12U	

Model		**IT8831**		**IT8832**	
Rated value (0-40 °C)	Input voltage	0~120V		0~120V	
	Input current	0~75A	0~750A	0~100A	0~1000A
	Input power	15KW		20KW	
	Min. operating voltage	0.15V/75A	1.5V/750A	0.15V/100A	1.5V/1000A
Constant voltage mode	Range	0.1~18V	0.1~120V	0.1~18V	0.1~120V
	Resolution	1mV	10mV	1mV	10mV
	Accuracy	±(0.05%+0.05%FS)		±(0.05%+0.05%FS)	
Constant current mode	Range	0~75A	0~750A	0~100A	0~1000A
	Resolution	1mA	10mA	10mA	100mA
	Accuracy	±(0.1%+0.1%FS)		±(0.1%+0.1%FS)	±(0.2%+0.1%FS)
Constant resistance mode ***1**	Range	0.005Ω~10Ω	10Ω~7.5KΩ	0.005Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit		16bit	
	Accuracy	0.01%+0.08S *2	0.01%+0.0008S	0.01%+0.08S *2	0.01%+0.0008S
Constant power Mode *3	Range	15KW		20KW	
	Resolution	1W		1W	
	Accuracy	0.2%+0.2%FS		0.25%+0.25%FS	
Measuring range					

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Read-back voltage	Range	0~18V	0~120V	0~18V	0~120V
	Resolution	1 mV	10mV	1 mV	1 0mV
	Accuracy	±(0.025%+0.025%FS)		±(0.025%+0.025%FS)	
Read-back current	Range	0~75A	0~750A	0~100A	0~1000A
	Resolution	1mA	10mA	10mA	100mA
	Accuracy	±(0.1%+0.1%FS)		±(0.1%+0.1%FS)	
Read-back power	Range	15KW		20KW	
	Resolution	1W		1W	
	Accuracy	±(0.2%+0.2%FS)		±(0.2%+0.25%FS)	
Protection range					
Overpower protection		≒15.1KW		≒20.1KW	
Overcurrent protection		≒82.5A	≒825A	≒110A	≒1100A
Overvoltage protection		≒130V		≒130V	
Overtemperature protection		≒85℃		≒85℃	
Specification					
Short circuit	Current (CC)	≒82.5A	≒825A	≒110A	≒1100A
	Voltage (CV)	0V	0V	0V	0V
	Resistance (CR)	≒2mΩ	≒2mΩ	≒1.5mΩ	≒1.5mΩ
Input terminal impedance		300KΩ		300KΩ	
Dimension		27U			

Model		**IT8833**	
Rated value (0-40 °C)	Input voltage	0~120V	
	Input current	0~150A	0~1500A
	Input power	25KW	
	Min. operating voltage	0.18V/150A	1.8V/1500A
Constant voltage mode	Range	0.1~18V	0.1~120V
	Resolution	1mV	10mV
	Accuracy	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)
Constant current mode	Range	0~150A	0~1500A
	Resolution	10mA	100mA
	Accuracy	±(0.1%+0.1%FS)	±(0.2%+0.1%FS)
Constant resistance mode ***1**	Range	0.005Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit	
	Accuracy	0.01%+0.08S *2	0.01%+0.0008S
Constant power Mode *3	Range	25KW	
	Resolution	1W	

	Accuracy	0.2%+0.2%FS	
Measuring range			
Read-back voltage	Range	0~18V	0~120V
	Resolution	1 mV	10mV
	Accuracy	±(0.025%+0.025%FS)	±(0.025%+0.025%FS)
Read-back current	Range	0~150A	0~1500A
	Resolution	10mA	100mA
	Accuracy	±(0.1%+0.1%FS)	
Read-back power	Range	25KW	
	Resolution	1W	
	Accuracy	±(0.2%+0.2%FS)	
Protection range			
Overpower protection	≒25.1KW		
Overcurrent protection	≒165A		≒1650A
Overvoltage protection	≒130V		
Overtemperature protection	≒85℃		
Specification			
Short circuit	Current (CC)	≒165A	≒1650A
	Voltage (CV)	0V	0V
	Resistance (CR)	≒1.2mΩ	≒1.2mΩ
Input terminal impedance	300KΩ		
Dimension	27U		

Model		**IT8831B**		**IT8832B**	
Rated value (0-40 °C)	Input voltage	0~500V		0~500V	
	Input current	0~30A	0~300A	0~40A	0~400A
	Input power	15KW		20KW	
	Min. operating voltage	0.25V/30A	2.5V/300A	0.25V/40A	2.5V/400A
Constant voltage mode	Range	0.1~50V	0.1~500V	0.1~50V	0.1~500V
	Resolution	1mV	10mV	1mV	10mV
	Accuracy	±(0.025%+0.05%FS)		±(0.025%+0.05%FS)	
Constant current mode	Range	0~30A	0~300A	0~40A	0~400A
	Resolution	1mA	10mA	1mA	10mA
	Accuracy	±(0.05%+0.05%FS)		±(0.05%+0.1%FS)	
Constant resistance mode ***1**	Range	0.01Ω~10Ω	10Ω~7.5KΩ	0.01Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit		16bit	
	Accuracy	0.01%+0.08S *2	0.01%+0.0008S	0.01%+0.08S *2	0.01%+0.0008S

Constant power Mode *3	Range	15KW		20KW	
	Resolution	1W		1W	
	Accuracy	0.2%+0.2%FS		0.2%+0.2%FS	
Measuring range					
Read-back voltage	Range	0~50V	0~500V	0~50V	0~500V
	Resolution	1mV	10 mV	1mV	10 mV
	Accuracy	±(0.025%+0.025%FS)		±(0.025%+0.025%FS)	
Read-back current	Range	0~30A	0~300A	0~40A	0~400A
	Resolution	1mA	10mA	1mA	10mA
	Accuracy	±(0.05%+0.05%FS)		±(0.05%+0.1%FS)	
Read-back power	Range	15KW		20KW	
	Resolution	1W		1W	
	Accuracy	±(0.2%+0.2%FS)		±(0.2%+0.2%FS)	
Protection range					
Overpower protection	≒15.1KW			≒20.1KW	
Overcurrent protection	≒33A		≒330A	≒44A	≒440A
Overvoltage protection	≒530V			≒530V	
Overtemperature protection	≒85℃			≒85℃	
Specification					
Short circuit	Current (CC)	≒33A	≒330A	≒44A	≒440A
	Voltage (CV)	0V	0V	0V	0V
	Resistance (CR)	≒8mΩ	≒8mΩ	≒6mΩ	≒6mΩ
Input terminal impedance	1MΩ			1MΩ	
Dimension	27U				

Model		**IT8833B**		**IT8834B**	
Rated value (0-40 °C)	Input voltage	0~500V		0~500V	
	Input current	0~50A	0~500A	0~60A	0~600A
	Input power	25KW		30KW	
	Min. operating voltage	0.25V/50A	2.5V/500A	0.3V/60A	3V/600A
Constant voltage mode	Range	0.1~50V	0.1~500V	0.1~50V	0.1~500V
	Resolution	1mV	10mV	1mV	10mV
	Accuracy	±(0.025%+0.05%FS)		±(0.025%+0.05%FS)	
Constant current	Range	0~50A	0~500A	0~60A	0~600A
	Resolution	1mA	10mA	1mA	10mA

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mode	Accuracy	±(0.05%+0.1%FS)		±(0.1%+0.1%FS)	
Constant resistance mode ***1***	Range	0.01Ω~10Ω	10Ω~7.5KΩ	0.01Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit		16bit	
	Accuracy	0.01%+0.008S *2	0.01%+0.0008S	0.01%+0.008S *2	0.01%+0.0008S
Constant power Mode *3	Range	25KW		30KW	
	Resolution	1W		1W	
	Accuracy	0.2%+0.2%FS		0.2%+0.2%FS	
Measuring range					
Read-back voltage	Range	0~50V	0~500V	0~50V	0~500V
	Resolution	1mV	10 mV	1 mV	10mV
	Accuracy	±(0.025%+0.025%FS)		±(0.025%+0.025%FS)	
Read-back current	Range	0~50A	0~500A	0~60A	0~600A
	Resolution	1mA	10mA	1mA	10mA
	Accuracy	±(0.05%+0.05%FS)		±(0.05%+0.1%FS)	
Read-back power	Range	25KW		30KW	
	Resolution	1W		1W	
	Accuracy	±(0.2%+0.2%FS)		±(0.2%+0.2%FS)	
Protection range					
Overpower protection		≒25.1KW		≒30.1KW	
Overcurrent protection		≒55A	≒550A	≒66A	≒660A
Overvoltage protection		≒530V		≒530V	
Overtemperature protection		≒85℃		≒85℃	
Specification					
Short circuit	Current (CC)	≒55A	≒550A	≒66A	≒660A
	Voltage (CV)	0V	0V	0V	0V
	Resistance (CR)	≒5mΩ	≒5mΩ	≒5mΩ	≒5mΩ
Input terminal impedance		1MΩ		1MΩ	
Dimension		27U			

Model		**IT8831H**		**IT8832H**	
Rated value (0-40 °C)	Input voltage	0~800V		0~800V	
	Input current	0~15A	0~150A	0~20A	0~200A
	Input power	15KW		20KW	
	Min. operating voltage	0.3V/15A	3V/150A	0.3V/20A	3V/200A
Constant voltage	Range	0.1~80V	0.1~800V	0.1~80V	0.1~800V
	Resolution	1mV	10mV	1mV	10mV

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mode	Accuracy	±(0.05%+0.05%FS)		±(0.05%+0.05%FS)	
Constant current mode	Range	0~15A	0~150A	0~20A	0~200A
	Resolution	1mA	10mA	1mA	10mA
	Accuracy	±(0.05%+0.05%FS)		±(0.05%+0.05%FS)	
Constant resistance mode ***1**	Range	0.02Ω~10Ω	10Ω~7.5KΩ	0.02Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit		16bit	
	Accuracy	0.01%+0.08S *2	0.01%+0.0008S	0.01%+0.08S *2	0.01%+0.0008S
Constant power Mode *3	Range	15KW		20KW	
	Resolution	1W		1W	
	Accuracy	0.2%+0.2%FS		±(0.2%+0.2%FS)	
Measuring range					
Read-back voltage	Range	0~80V	0~800V	0~80V	0~800V
	Resolution	1 mV	10 mV	1 mV	10 mV
	Accuracy	±(0.025%+0.025%FS)		±(0.025%+0.025%FS)	
Read-back current	Range	0~15A	0~150A	0~20A	0~200A
	Resolution	1mA	10mA	1mA	10mA
	Accuracy	±(0.05%+0.05%FS)		±(0.05%+0.05%FS)	
Read-back power	Range	15KW		20KW	
	Resolution	1W		1W	
	Accuracy	±(0.2%+0.2%FS)		±(0.2%+0.2%FS)	
Protection range					
Overpower protection	≒15.1KW			≒20.1KW	
Overcurrent protection	≒16.5A		≒165A	≒22A	≒220A
Overvoltage protection	≒850V			≒850V	
Overtemperature protection	≒85℃			≒85℃	
Specification					
Short circuit	Current (CC)	≒16.5A	≒165A	≒22A	≒220A
	Voltage (CV)	0V	0V	0V	0V
	Resistance (CR)	≒20mΩ	≒20mΩ	≒15mΩ	≒15mΩ
Input terminal impedance	2MΩ			2MΩ	
Dimension	27U				

Model		**IT8833H**		**IT8834H**	
Rated value (0-40 °C)	Input voltage	0~800V		0~800V	
	Input current	0~25A	0~250A	0~30A	0~300A
	Input power	25KW		30KW	
	Min. operating	0.3V/25A	3V/250A	0.3V/30A	3V/300A

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	voltage				
Constant voltage mode	Range	0.1~80V	0.1~800V	0.1~80V	0.1~800V
	Resolution	1mV	10mV	1mV	10mV
	Accuracy	±(0.05%+0.05%FS)		±(0.05%+0.05%FS)	
Constant current mode	Range	0~25A	0~250A	0~30A	0~300A
	Resolution	1mA	10mA	1mA	10mA
	Accuracy	±(0.05%+0.1%FS)		±(0.05%+0.1%FS)	
Constant resistance mode ***1**	Range	0.02Ω~10Ω	10Ω~7.5KΩ	0.01Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit		16bit	
	Accuracy	0.01%+0.08S *2	0.01%+0.0008S	0.01%+0.08S *2	0.01%+0.0008S
Constant power Mode *3	Range	25KW		30KW	
	Resolution	1W		1W	
	Accuracy	0.2%+0.2%FS		0.2%+0.2%FS	
Measuring range					
Read-back voltage	Range	0~80V	0~800V	0~80V	0~800V
	Resolution	1 mV	10 mV	1 mV	10 mV
	Accuracy	±(0.025%+0.025%FS)		±(0.025%+0.025%FS)	
Read-back current	Range	0~25A	0~250A	0~30A	0~300A
	Resolution	1mA	10mA	1mA	10mA
	Accuracy	±(0.05%+0.05%FS)		±(0.05%+0.05%FS)	
Read-back power	Range	25KW		30KW	
	Resolution	1W		1W	
	Accuracy	±(0.2%+0.2%FS)		±(0.2%+0.2%FS)	
Protection range					
Overpower protection	≒25.1KW			≒30.1KW	
Overcurrent protection	≒27.5A		≒275A	≒33A	≒330A
Overvoltage protection	≒850V			≒850V	
Overtemperature protection	≒85℃			≒85℃	
Specification					
Short circuit	Current (CC)	≒27.5A	≒275A	≒33A	≒330A
	Voltage (CV)	0V	0V	0V	0V
	Resistance (CR)	≒12mΩ	≒12mΩ	≒10mΩ	≒10mΩ
Input terminal impedance	2MΩ			2MΩ	
Dimension	27U				

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Model		IT8835B		IT8835H	
Rated value (0-40 °C)	Input voltage	0~500V		0~800V	
	Input current	0~70A	0~700A	0~35A	0~350A
	Input power	35KW		35KW	
	Min. operating voltage	0.3V/70A	3V/700A	0.3V/35A	3 V/350A
Constant voltage mode	Range	0.1~50V	0.1~500V	0.1~80V	0.1~800V
	Resolution	1mV	10mV	1mV	10mV
	Accuracy	±(0.025%+0.05%FS)		±(0.05%+0.05%FS)	
Constant current mode	Range	0~70A	0~700A	0~35A	0~350A
	Resolution	1mA	10mA	1mA	10mA
	Accuracy	±(0.1%+0.1%FS)	±(0.1%+0.1%FS)	±(0.05%+0.1%FS)	±(0.05%+0.1%FS)
Constant resistance mode ***1**	Range	0.01Ω~10Ω	10Ω~7.5KΩ	0.01Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit		16bit	
	Accuracy	0.01%+0.08S ***2**	0.01%+0.0008S	0.01%+0.08S ***2**	0.01%+0.0008S
Constant power Mode *3	Range	35KW		35KW	
	Resolution	1W		1W	
	Accuracy	0.2%+0.2%FS		0.2%+0.2%FS	
Measuring range					
Read-back voltage	Range	0~50V	0~500V	0~80V	0~800V
	Resolution	1 mV	10 mV	1 mV	10 mV
	Accuracy	±(0.025%+0.025%FS)			
Read-back current	Range	0~70A	0~700A	0~35A	0~350A
	Resolution	1mA	10mA	1mA	10mA
	Accuracy	±(0.05%+0.1%FS)		±(0.05%+0.05%FS)	
Read-back power	Range	35KW		35KW	
	Resolution	1W		1W	
	Accuracy	±(0.2%+0.2%FS)		±(0.2%+0.2%FS)	
Protection range					
Overpower protection		≒35.1KW		≒35.1KW	
Overcurrent protection		≒77A	≒770A	≒38.5A	≒385A
Overvoltage protection		≒530V		≒850V	
Overtemperature protection		≒85℃		≒85℃	
Specification					
Short circuit	Current (CC)	≒77/70A	≒770/700A	≒38.5/35A	≒385/350A
	Voltage (CV)	0V	0V	0V	0V
	Resistance (CR)	≒4mΩ	≒4mΩ	≒8.5mΩ	≒8.5mΩ
Input		1MΩ		2MΩ	

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terminal impedance		
Dimension	37U	37U

Model		**IT8836B**		**IT8836H**	
Rated value (0-40 °C)	Input voltage	0~500V		0~800V	
	Input current	0~80A	0~800A	0~40A	0~400A
	Input power	40KW		40KW	
	Min. operating voltage	0.3V/80A	3V/800A	0.3V/40A	3 V/400A
Constant voltage mode	Range	0.1~50V	0.1~500V	0.1~80V	0.1~800V
	Resolution	1mV	10mV	1mV	10mV
	Accuracy	±(0.025%+0.05%FS)		±(0.05%+0.05%FS)	
Constant current mode	Range	0~80A	0~800A	0~40A	0~400A
	Resolution	1mA	10mA	1mA	10mA
	Accuracy	±(0.1%+0.1%FS)	±(0.1%+0.1%FS)	±(0.05%+0.1%FS)	±(0.05%+0.1%FS)
Constant resistance mode ***1**	Range	0.01Ω~10Ω	10Ω~7.5KΩ	0.01Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit		16bit	
	Accuracy	0.01%+0.08S ***2**	0.01%+0.0008S	0.01%+0.08S ***2**	0.01%+0.0008S
Constant power Mode *3	Range	40KW		40KW	
	Resolution	1W		1W	
	Accuracy	0.2%+0.2%FS		0.2%+0.2%FS	
Measuring range					
Read-back voltage	Range	0~50V	0~500V	0~80V	0~800V
	Resolution	1 mV	10 mV	1 mV	10 mV
	Accuracy	±(0.025%+0.025%FS)			
Read-back current	Range	0~80A	0~800A	0~40A	0~400A
	Resolution	1mA	10mA	1mA	10mA
	Accuracy	±(0.05%+0.1%FS)		±(0.05%+0.05%FS)	
Read-back power	Range	40KW		40KW	
	Resolution	1W		1W	
	Accuracy	±(0.2%+0.2%FS)		±(0.2%+0.2%FS)	
Protection range					
Overpower protection	≒40.1KW			≒40.1KW	
Overcurrent protection	≒88A		≒880A	≒44A	≒440A
Overvoltage protection	≒530V			≒850V	
Overtemperature protection	≒85℃			≒85℃	
Specification					
Short circuit	Current (CC)	≒88/80A	≒880/800A	≒44/40A	≒440/400A

	Voltage (CV)	0V	0V	0V	0V
	Resistance (CR)	≒3.5mΩ	≒3.5mΩ	≒7.5mΩ	≒7.5mΩ
Input terminal impedance		1MΩ		2MΩ	
Dimension		37U		37U	

Model		**IT8837B**		**IT8837H**	
Rated value (0-40 °C)	Input voltage	0~500V		0~800V	
	Input current	0~90A	0~900A	0~45A	0~450A
	Input power	45KW		45KW	
	Min. operating voltage	0.3V/90A	3V/900A	0.3V/45A	3 V/450A
Constant voltage mode	Range	0.1~50V	0.1~500V	0.1~80V	0.1~800V
	Resolution	1mV	10mV	1mV	10mV
	Accuracy	±(0.025%+0.05%FS)		±(0.05%+0.05%FS)	
Constant current mode	Range	0~90A	0~900A	0~45A	0~450A
	Resolution	1mA	10mA	1mA	10mA
	Accuracy	±(0.1%+0.1%FS)	±(0.1%+0.1%FS)	±(0.05%+0.1%FS)	
Constant resistance mode ***1**	Range	0.005Ω~10Ω	10Ω~7.5KΩ	0.01Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit		16bit	
	Accuracy	0.01%+0.08S ***2**	0.01%+0.0008S	0.01%+0.08S ***2**	0.01%+0.0008S
Constant power Mode *3	Range	45KW		45KW	
	Resolution	1W		1W	
	Accuracy	0.2%+0.2%FS		0.2%+0.2%FS	
Measuring range					
Read-back voltage	Range	0~50V	0~500V	0~80V	0~800V
	Resolution	1 mV	10 mV	1 mV	10 mV
	Accuracy	±(0.025%+0.025%FS)			
Read-back current	Range	0~90A	0~900A	0~45A	0~450A
	Resolution	1mA	10mA	1mA	10mA
	Accuracy	±(0.1%+0.1%FS)		±(0.05%+0.05%FS)	
Read-back power	Range	45KW		45KW	
	Resolution	1W		1W	
	Accuracy	±(0.2%+0.2%FS)		±(0.2%+0.2%FS)	
Protection range					
Overpower protection		≒45.1KW		≒45.1KW	
Overcurrent protection		≒99A	≒990A	≒49.5A	≒495A
Overvoltage protection		≒530V		≒850V	
Overtemperature protection		≒85℃		≒85℃	
Specification					

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Short circuit	Current (CC)	≒99/90A	≒990/900A	≒49.5/45A	≒495/450A
	Voltage (CV)	0V	0V	0V	0V
	Resistance (CR)	≒3mΩ	≒3mΩ	≒6.5mΩ	≒6.5mΩ
Input terminal impedance	1MΩ			2MΩ	
Dimension	37U			37U	

Model		**IT8838B**		**IT8838H**	
Rated value (0-40 °C)	Input voltage	0~500V		0~800V	
	Input current	0~100A	0~1000A	0~50A	0~500A
	Input power	50KW		50KW	
	Min. operating voltage	0.3V/100A	3V/1000A	0.3V/50A	3 V/500A
Constant voltage mode	Range	0.1~50V	0.1~500V	0.1~80V	0.1~800V
	Resolution	1mV	10mV	1mV	10mV
	Accuracy	±(0.025%+0.05%FS)		±(0.05%+0.05%FS)	
Constant current mode	Range	0~100A	0~1000A	0~50A	0~500A
	Resolution	10mA	100mA	1mA	10mA
	Accuracy	±(0.1%+0.1%FS)	±(0.2%+0.1%FS)	±(0.05%+0.1%FS)	±(0.05%+0.1%FS)
Constant resistance mode *1	Range	0.005Ω~10Ω	10Ω~7.5KΩ	0.01Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit		16bit	
	Accuracy	0.01%+0.08S *2	0.01%+0.0008S	0.01%+0.08S *2	0.01%+0.0008S
Constant power Mode *3	Range	50KW		50KW	
	Resolution	1W		1W	
	Accuracy	0.2%+0.2%FS		0.2%+0.2%FS	
Measuring range					
Read-back voltage	Range	0~50V	0~500V	0~80V	0~800V
	Resolution	1 mV	10 mV	1 mV	10 mV
	Accuracy	±(0.025%+0.025%FS)			
Read-back current	Range	0~100A	0~1000A	0~50A	0~500A
	Resolution	10mA	100mA	1mA	10mA
	Accuracy	±(0.1%+0.1%FS)		±(0.05%+0.1%FS)	
Read-back power	Range	50KW		50KW	
	Resolution	1W		1W	
	Accuracy	±(0.2%+0.2%FS)		±(0.2%+0.2%FS)	
Protection range					
Overpower protection	≒50.1KW			≒50.1KW	
Overcurrent protection	≒110A		≒1100A	≒55 A	≒550A
Overvoltage	≒530V			≒850V	

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protection					
Overtemperature protection	≒85℃			≒85℃	
Specification					
Short circuit	Current (CC)	≒110/100A	≒1100/1000A	≒55/50A	≒550/500A
	Voltage (CV)	0V	0V	0V	0V
	Resistance (CR)	≒3mΩ	≒3mΩ	≒6mΩ	≒6mΩ
Input terminal impedance	1MΩ			2MΩ	
Dimension	42U			42U	

Model		**IT8839B**		**IT8839H**	
Rated value (0-40 °C)	Input voltage	0~500V		0~800V	
	Input current	0~110A	0~1100A	0~60A	0~600A
	Input power	55KW		55KW	
	Min. operating voltage	0.3V/110A	3V/1100A	0.3V/60A	3 V/600A
Constant voltage mode	Range	0.1~50V	0.1~500V	0.1~80V	0.1~800V
	Resolution	1mV	10mV	1mV	10mV
	Accuracy	±(0.025%+0.05%FS)		±(0.05%+0.1%FS)	
Constant current mode	Range	0~110A	0~1100A	0~60A	0~600A
	Resolution	10mA	100mA	1mA	10mA
	Accuracy	±(0.1%+0.1%FS)	±(0.2%+0.1%FS)	±(0.05%+0.1%FS)	±(0.05%+0.1%FS)
Constant resistance mode ***1**	Range	0.005Ω~10Ω	10Ω~7.5KΩ	0.01Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit		16bit	
	Accuracy	0.01%+0.08S ***2**	0.01%+0.0008S	0.01%+0.08S ***2**	0.01%+0.0008S
Constant power Mode *3	Range	55KW		55KW	
	Resolution	1W		1W	
	Accuracy	0.2%+0.2%FS		0.2%+0.2%FS	
Measuring range					
Read-back voltage	Range	0~50V	0~500V	0~80V	0~800V
	Resolution	1 mV	10 mV	1 mV	10 mV
	Accuracy	±(0.025%+0.025%FS)			
Read-back current	Range	0~110A	0~1100A	0~60A	0~600A
	Resolution	10mA	100mA	1mA	10mA
	Accuracy	±(0.1%+0.1%FS)		±(0.05%+0.1%FS)	
Read-back power	Range	55KW		55KW	
	Resolution	1W		1W	
	Accuracy	±(0.2%+0.2%FS)		±(0.2%+0.2%FS)	
Protection range					
Overpower	≒55.1KW			≒55.1KW	

protection				
Overcurrent protection	≒121A	≒1210A	≒66A	≒660A
Overvoltage protection	≒530V		≒850V	
Overtemperature protection	≒85℃		≒85℃	
Specification				
Short circuit	Current (CC)	≒121/110A	≒1210/1100A	≒66/60A	≒660/600A
	Voltage (CV)	0V	0V	0V	0V
	Resistance (CR)	≒3mΩ	≒3mΩ	≒5mΩ	≒5mΩ
Input terminal impedance	1MΩ		2MΩ	
Dimension	42U		42U	

*1.The voltage/current input is no less than 10%FS (FS indicates the full scope).
*2.The scope of read-back resistance is (1/(1/R+(1/R)*0.01%+0.08),1/(1/R-(1/R)*0.01%-0.08)).
*3.The voltage/current input is no less than 10%FS.
*4.Ascending/descending slope: 10%-90% current ascending slope from 0 to maximum current
*5.Minimum rise time: 10%-90% current rise time

*The above specifications may be subject to change without prior notice.

4.2 Additional features

Memory capacity: 100 groups.
Recommended calibration frequency: 1 time/year.
Cooling method: fan.
Fan control temperature:

Temperature	40°C	50°C	70°C	85°C
Fan status	First gear	Second gear	Third gear	Temperature protection (OH) and load is shut off.

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Chapter5 References of Load Communication Interfaces

IT8800 series electronic load is provided with three communication interfaces to communicate with a computer for selection, including RS232, USB and GPIB.

5.1 RS232 interface

Cable connection load with both ends of COM interface (DB9) and computer. Composite key **[Shift]** + **5** on front board can be used to enter system menu for activation.

In RS-232 interface, all SCPI commands can be used for programming. If RS-232 interface is selected, in accordance with internal connection of data terminal equipment (DTE) and data communication equipment (DCE) as defined in EIA RS-232, the load is connected to another DTE (e.g., PC COM interface) with direct-connected Modem cable.

NOTE

The rear board of IT8800 series has two COM interfaces. The upper 9-pin COM interface connector is RS232 interface; and the lower 9-pin COM interface is external signal control interface.

RS-232 setting in procedure should be consistent with that in system menu of front board. Press composite key **[Shift]** + **5** to change (if necessary). Send a ^C or ^X character string to the load to pause data transmission. It will clear any uncompleted operation and waive any uncompleted output.

RS-232 data format

RS-232 data comprises start bit, odd and even parity check bit, stop bit and 8-bit data bit. Start bit and stop bit are not editable. However, next odd or even item can be selected by front board **[Shift]** + **5**. The odd and even items are saved in NVM.

Baud rate

Through front board **[Shift]** + **5**, the user may select one Baud rate saved in NVM: 4800 9600 19200 38400 57600 115200

RS-232 Connection

Use RS-232 cable with DB-9 interface because the RS-232 serial port can be connected controller (e.g. PC) serial port. Do not use modulating cable of air-conditioner. Refer to Table 2-2 for plug pin.

If your computer is provided with a RS-232 interface with DB-25 plug, a cable

and a adapter with DB-25 plug (one end) and DB-9 plug (the other end) are required (not the modulating cable of the air-conditioner).

RS232 Pins of Plug

Base pin number	Description
1	No conjunction
2	TXD, data transmission
3	RXD, data receiving
4	No conjunction
5	GND, grounding
6	No conjunction
7	CTS, clear to send
8	RTS, request to send
9	No conjunction

RS-232 troubleshooting:

In case of connection failure of RS-232, perform following check:

- Check if the computer and load are provided with same Baud rate, parity check bit, data bit and flow control. The power shall be configured with one start bit (fixed) and one stop bit (fixed).
- Just as described in the RS-232 connector, correct interface cable or adapter shall be adopted. Note: even if the cable is equipped with right plug, internal wiring may be incorrect.
- The interface cable must be connected to the correct serial port (COM1, COM2, etc.) of the computer.

Setting of communication

Before communication operation, be sure to match load and PC parameters (as follows).

Baud rate: 9600 (4800/9600/19200/38400/57600/15200). You may enter system menu through the board to set communication Baud rate.

Data bit: 8 bits

Stop bit: 1 bit

Check: (none, even, odd)

EVEN All all 8 data bits have even-parity check

ODD All all 8 data bits have odd-parity check

NONE All all 8 data bits have no check

Local address: (0-31, factory set value: 0)

Start Bit	Parity=None	8 Data Bits	Stop Bit

5.2 USB Interface

Connect the load and the computer using a cable with two USB interfaces

(each end). All functions of the load can be programmed via USB.

The functions of load USB488 interface are as follows:

- The interface is 488.2 USB488 Interface.
- The interface receives requests of REN_CONTROL, GO_TO_LOCAL and LOCAL_LOCKOUT.
- The interface receives the command MsgID=TRIGGER USBTMC and conveys the TRIGGER command to the functional layer.

The functions of load USB488 device are as follows:

- Capable to read all common SCPI commands.
- SR1 enabled.
- RL1 enabled.
- DT1 enabled.

5.3 GPIB interface

Firstly, connect load GPIB interface and computer GPIB card through IEEE488 bus and ensure sufficient contact. Tighten them with screws. Set address. Load address range: 0-31. Press **[Shift]** + **5** to enter system menu functions. Press Left/Right key to find Communication. Select GPIB and set address. Input address and press **[Enter]** for confirmation. The load works by setting GPIB address on front board. GPIB address is saved in NVM.

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Appendix

Specifications of Red and Black Test Lines

ITECH provides you with optional red and black test lines, which individual sales and you can select for test. For specifications of ITECH test lines and maximum current values, refer to the table below.

Model	Specification	Cross section	Length
IT-E301/10A	10A	-	1m
IT-E301/30A	30A	$6mm^2$	1.2m
IT-E301/30A	30A	$6mm^2$	2m
IT-E301/60A	60A	$20mm^2$	1.5m
IT-E301/120A	120A	$50mm^2$	2m
IT-E301/240A	240A	$70mm^2$	1m
IT-E301/240A	240A	$70mm^2$	2m
IT-E301/360A	360A	$95mm^2$	2m

For maximum current of AWG copper wire, refer to table blow.

AWG	10	12	14	16	18	20	22	24	26	28
The Maximum current value(A)	40	25	20	13	10	7	5	3.5	2.5	1.7

Note: AWG (American Wire Gage), it means X wire (marked on the wire). The table above lists current capacity of single wire at working temperature of 30°C. For reference only.

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Contact Us

Thanks for purchasing ITECH products. In case of any doubts, please contact us as follows:

1. Refer to accompanying data disk and relevant manual.
2. Visit ITECH website: www.itechate.com.
3. Select the most convenient contact method for further information.