

AC480V-2006kW
LOW VOLTAGE LOAD BANK
OPERATION MANUAL

FUJIAN DEPCO POWER GENERATION CO.,LTD.

1 PRECAUTIONS

1.1 Terms and Conditions

! DANGER Since The High Temperature Of The Resistive Load May Cause Burns Or Flammability, Please Strictly Abide By The Following Items.

When using this equipment, the equipment generates high temperatures. It is strictly forbidden for personnel to approach the air outlet with flammable and explosive materials.

! Pay Attention To The Wiring Method Before Loading Test.

When connecting, the auxiliary power supply must be connected first, followed by the test power supply. When removing test leads and auxiliary power leads, disconnect the test power supply first and then the auxiliary power supply.

◆ Please read the manual carefully before using this machine, operate it in the correct way, and keep the manual properly for reference.

◆ Due to the need for technical upgrades, the appearance and functions of the final product may be different from the illustrations and descriptions in the manual. Please refer to the actual product.

◆ The paragraphs marked "Danger" in the instructions are important warnings, the paragraphs marked "Caution" are general warnings, and the paragraphs marked "Instructions" are reference suggestions or usage examples. Please read them carefully and pay attention to them.

◆ When using this machine, you should strictly abide by the relevant safety operating procedures and read all the precautions in this chapter to ensure the safety of personnel and equipment. The operator shall bear the consequences of any accident caused by failure to comply with the precautions.

◆ This machine needs to be stored in a safe, clean, dry and moderate temperature environment. During storage, all protective doors should be closed and locked, and covered with a rain cover to ensure that it is waterproof and dustproof, and to avoid moisture inside the machine.

◆ It is strictly prohibited to work in wet conditions! In case of rainy days, or when there is water accumulation at the work site, the water must be cleaned up, and without connecting the test cable, only let the fan of the machine run to remove the moisture in the case and confirm that all components are dry before proceeding. Work.

◆ This machine should be operated in an environment free of corrosive, acidic, alkaline, flammable, explosive and other dangerous goods. Before use, you must carefully check whether the machine is intact. If there is water or dust, clean it first, and then Put into use.

◆ This machine should be operated in an open space that is flat, clean, dry, well-ventilated, and has a moderate temperature. There should be no obstacles within 3-5 meters in front of the equipment inlet/outlet.

◆ When this machine is working, you must avoid unsafe environments such as scorching sun, lightning, rain, stagnant water, vibration, headwinds, etc. to avoid damage to the equipment.

◆ If this machine is equipped with cables, plugs or other accessories when it leaves the factory, you must use the original accessories when working. Use of incompatible accessories can damage the device.

◆ The load power input, working power input and grounding terminals are closely related to system safety. It is strictly prohibited to power on the machine before they are connected correctly.

◆ After the machine is powered on, do not touch the internal components of the machine or any potentially conductive objects. It is strictly prohibited to disassemble, assemble, plug and unplug various cables and accessories while power is on to avoid electric shock to personnel or damage to equipment.

◆ After loading, do not change the state of the control mode selection switch to avoid losing control of the load.

◆ After the work is completed, the fan must continue to run for about 3-5 minutes, and then shut down after the residual heat in the case has dissipated.

◆ After shutting down, all cables must be removed and all protective doors must be closed to return the machine to its storage state.

1.2 Work Site Safety Rules

◆ Except for the equipment under test and this machine, no other irrelevant equipment can be added to the test loop.

◆ Regardless of whether the work site is powered on or off, unrelated personnel are strictly prohibited from entering the work area at will.

◆ Keep the work area clean and orderly, strictly prohibit messy cables and components, and exclude all potentially conductive objects. Do not throw away items at will while working.

◆ Carefully check whether the cables used during work are intact and whether they are damaged or exposed to avoid the risk of leakage. And check whether there is water or dust in the relevant equipment, and clean it before putting it into use.

◆ Before formal work, operators should receive relevant professional training and be fully familiar with the use of the machine and the equipment to be tested, as well as the working principles and processes.

◆ Without the consent of the person in charge, the work flow, system wiring method and the status of each switch are not allowed to be changed.

◆ The number of operators must be at least two, and they must maintain a high degree of attention during operation.

◆ Operators should wear insulating protective equipment (such as insulating gloves, insulating shoes) and other necessary safety protective equipment (such as hard hats).

◆ Before the test begins, adjust the output voltage of the device under test to zero. After the test begins, slowly increase it. After the test is completed, the voltage must be returned to zero.

◆ Before increasing the voltage, please carefully check whether all equipment and instruments are in normal condition. Only with the consent of the supervisor can the operator increase the voltage.

◆ If any abnormality occurs during work, the voltage should be immediately cut off and the power should be reported to the supervisor.

◆ After the work is completed, the voltage should be reduced first, the working power supply should be cut off, and then the equipment should be grounded and discharged. Make sure the device is not powered before approaching and touching it and removing all wiring.

◆ After the work is completed, please clean the site carefully, restore it to its original condition before work, close and lock all protective doors of the machine, and use a rain cover to cover it to prevent rain and dust during storage.

CAUTION!	Please strictly follow the operating methods in the manual when using it. Losses caused by violating the correct operating methods, precautions or warnings will not be covered by the warranty!
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2 PRODUCT DESCRIPTION

2.1 Introduction

Thank you for using the DPCLB-1500KW-AC400V load box. This machine can perform factory testing, type testing, etc. on equipment below 2006KW. The load power is adjustable and can realize loading and unloading functions of different power loads. Local panel control is available, making it extremely easy to use. The load works in an energy-consuming manner, and forced air cooling is used for heat dissipation.

2.2 Data Sheet

NO.	ITEM	TECHNICAL INDICATORS
1.	MODEL	DPCLB-1500KW-AC400V
2.	NAME	INTELLIGENT LOAD TESTING SYSTEM

3.	RATED VOLTAGE	3PHASE 4 WIRES (3P4W) , 3 PHASE AC415V/50HZ、AC480V/60HZ
4.	RATED ACTIVE POWER	1500kW (AC415V/50HZ) 、 2006kW (AC480V/60HZ)
5.	POWER FACTOR	1
6.	LOAD TAP POSITION	AC415V: 10kW、20kW、20kW、50kW、100kW*14, total 18 gears, 1500kW; AC480V: 13.4kW、26.8kW、26.8kW、66.9kW、133.8kW*14, total 18 gears, 2006kW;
7.	LOAD CONTROL	CONTACTOR EXECUTION (LOCAL MANUAL PUSH BUTTON CONTROL)
8.	POWER FREQUENCY WITHSTAND VOLTAGE	AC2000V/50Hz 1min, NO BREAKDOWN OR FLASHOVER PHENOMENON
9.	INSULATION RESISTANCE	≥10MΩ BETWEEN MAIN CIRCUIT AND SHELL(DC1000V MEGGER)
10.	LOAD CHARACTERISTICS	RESISTIVE LOAD
11.	PROTECTION ALARM	LOAD SHORT CIRCUIT, FAN AIR VOLUME, HIGH TEMPERATURE FAULT(ADJUSTABLE TEMPERATURE, RESISTANCE, ELECTRICAL CHANNEL), OVER-CURRENT UNLOADING PROTECTION;
12.	INGRESS PROTECTION	IP23
13.	LOAD DEVIATION	≤±3%
14.	MEASUREMENT AND CONTROL PARAMETERS	DISPLAY BASIC FUNCTIONS SUCH AS VOLTAGE, CURRENT, POWER, RUNNING TIME, ETC.
15.	MEASUREMENT AND CONTROL FUNCTION	LOAD LOADING AND UNLOADING CONTROL AND SUDDEN LOADING AND UNLOADING CONTROL
16.	DIMENSION	2100*3500*2100 (Width*Depth*Height mm)
17.	WORKING WAY	CONTINUOUSLY WORKING
18.	COOLING METHOD	AIR INLET FROM THE SIDE AND VERTICAL AIR OUTLET FROM THE TOP FOR FORCED AIR COOLING;
19.	ACCURACY	ACCURACY 0.5 LEVEL
20.	POWER SUPPLY	EXTERNAL POWER SUPPLY AC380V/50Hz, WITH PHASE SEQUENCE PROTECTION AND AUTOMATIC PHASE SEQUENCE SWITCHING FUNCTION
21.	WORKPLACE	OUTDOOR
22.	WEIGHT	4000KG
23.	LOAD EXPANSION	MULTIPLE UNITS WITH THE SAME LEVEL OF LOAD CAN BE OPERATED IN PARALLEL TO EXPAND AUTOMATIC LOAD RECOGNITION AND SYNCHRONOUS CONTROL.
24.	INSTALLATION AND TRANSPORTATION	EQUIPPED WITH FORKLIFT HOLES AT THE BOTTOM
25.	COLOR	BLUE RAL5005, WHITE RAL9003

WORKING ENVIRONMENT PARAMETERS	
OPERATING TEMPERATURE	-20℃ ~ +50℃
RELATIVE HUMIDITY	≤95% (+20℃)
ALTITUDE	≤1500 米
INSTALLATION	THE INCLINATION BETWEEN THE VERTICAL INSTALLATION AND THE VERTICAL SURFACE SHALL NOT EXCEED 5 DEGREES.
PLACE OF USE	OUTDOOR

2.3 Measurement And Control Function

(1) LOAD TEST: You can load the gears and match the power according to your needs, and measure and display steady-state three-phase voltage, current, active power, frequency, running time and other parameters.

(2) LOCAL CONTROL: The control panel has various load opening and closing displays, fan start and stop displays, and resistor room temperature displays.

(3) REMOTE CONTROL: Reserve the following control signals to the terminal block: ① Load cabinet fan start and stop signal ② 18-level control signal ③ Voltage secondary signal ④ Current secondary signal ⑤ Comprehensive alarm output signal

(4) LOCAL INSTRUMENT DISPLAY DATA: Display basic functions such as voltage, current, power, running time, etc.

2.4 Protective Function

(1) EMERGENCY STOP: It can be forced to unload manually with one click. It cannot be loaded in the emergency stop state, and an audible and visual alarm will sound.

(2) DOOR LOCK PROTECTION: The air outlet is equipped with limited protection. It cannot be loaded when it is not opened, and there is an alarm prompt.

(3) SHORT CIRCUIT PROTECTION: The load circuit is equipped with a fuse to unload the load in case of short circuit.

(4) TEMPERATURE PROTECTION: There is a temperature inspection instrument on the load box control panel, which displays the temperature in the load box. When the temperature exceeds the safety threshold, it will automatically and gradually unload and alarm.

(5) SMOKE PROTECTION: There is a smoke alarm placed in the chassis. When smoke is detected, it will automatically and gradually uninstall and alarm.

(6) FAN INTERLOCK PROTECTION: The load cannot be loaded before the fan power switch is turned on.

(7) FAN AIR VOLUME PROTECTION: When the air volume of any fan is insufficient, it will automatically and gradually unload and alarm.

(8) FAN THERMAL OVERLOAD PROTECTION: When any fan fails to operate normally, it will automatically and gradually unload and alarm.

(9) FAN PHASE SEQUENCE AUTOMATIC CONVERSION PROTECTION: When the control power cord is not connected in the correct phase sequence, the three-phase fan can also run in the normal direction.

3 INSTALLATION

3.1 Installation And Inspection

(1) INSTALLATION: Check the installation environment of the machine. The machine should be placed in an open, flat and safe environment. The four corners of the bottom should be padded with flat and strong sleepers to reduce vibration during operation and improve grounding reliability.

(2) VENTILATION CHECK: Observe whether all the vents of the machine are normal and whether they are blocked by foreign objects. Whether the surrounding environment is clean and tidy. There should be no debris that hinders ventilation near the machine. Please ensure that the air ducts are unobstructed.

CAUTION!	Be sure to keep the air ducts clear, otherwise there is a risk of overheating!
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(3) SWITCH AND INTERFACE INSPECTION: Check all switches and interfaces to ensure that all protection switches of the machine are in the downward open state to enable the protection function to operate normally; all other switches are in the closed state to avoid abnormal start-up when power is turned on. If there is moisture or damage in the interface, please eliminate the hidden danger before proceeding with subsequent operations.

(4) WORKING CONDITION INSPECTION: Check whether the working conditions meet the needs. Prepare all tools that may be used during work, ensure that the work object is in normal condition, and ensure that the power supply is stable and can meet the maximum voltage and current required for work. In addition, the ambient temperature and humidity should be controlled within the normal range.

(5) AIR OUTLET: Before turning on the device, make sure there is no foreign matter blocking it to prevent damage to the internal parts of the device due to the inability of heat in the chassis to dissipate.

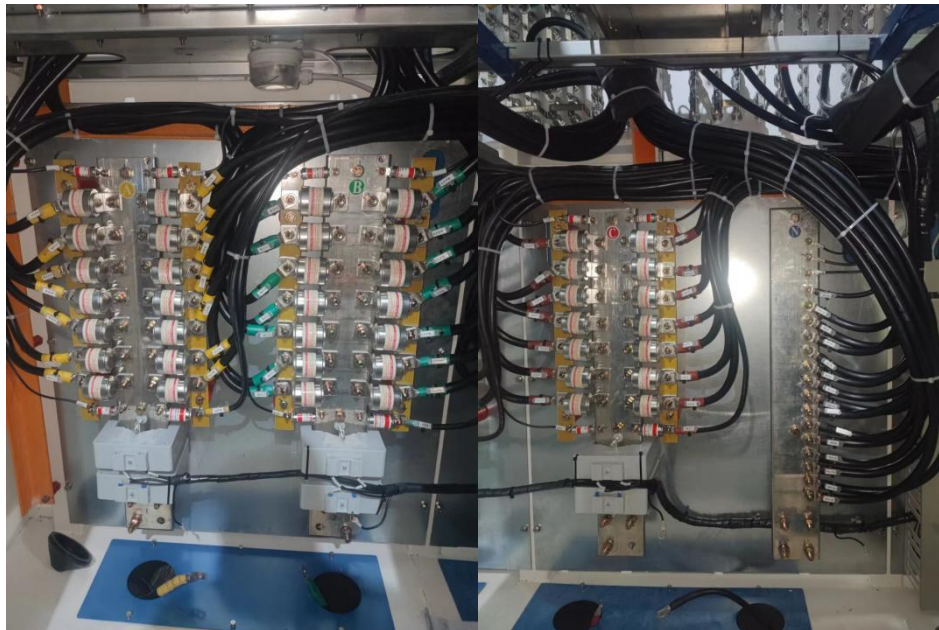
(6) AIR INLET: Before turning on the equipment, make sure there are no obstructions or objects that can easily be blown up within three meters of the air inlet to prevent insufficient air intake and the equipment from sucking in debris.

(7) GROUND BOLT: Ground the machine through this bolt.

3.3 MAIN POWER WIRING AND AUXILIARY POWER WIRING

3.3.1 Load Main Power Supply(4 Channels In Total) Input Terminals

A, B, C, N phases are connected to the load test cabinet through test cables.



(1) Open the door panel of the box inlet compartment, and you can see the three-phase four-wire incoming copper bars A, B, C, and N.

(2) The maximum current of the main circuit of the load box is 2413.6A. It is recommended to use five 240mm² cables per phase for the connecting wires and use bolt wiring for connection.

(3) Fix the cables to the three-phase copper bars A, B, C, and N in sequence.

3.3.2 Working Power Supply Terminal Block

A, B, C, N, PE wire connection, connected to AC380V, 50Hz power supply to power the machine.

- (1) Open the control incoming door panel and find the labeled auxiliary control power incoming terminal block;
- (2) The control loop uses one cable of more than 35mm² per phase.
- (3) Connect A, B, C, N, and PE to the auxiliary control power terminals



3.3.3 Reserved Communication Line For Multi-Function Instrument

Reserve the RS485 communication line of Qingzhi 8961F2 instrument and lead it to the three-core aviation plug.

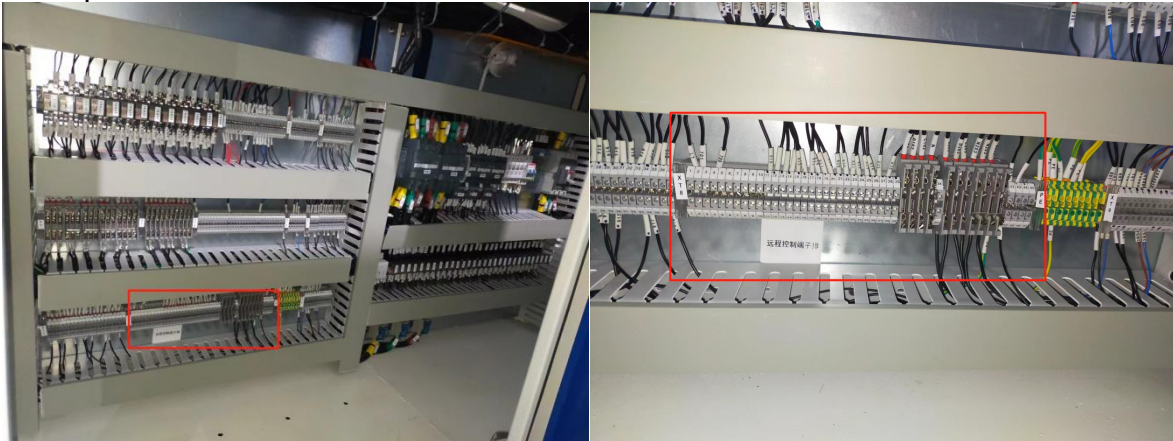


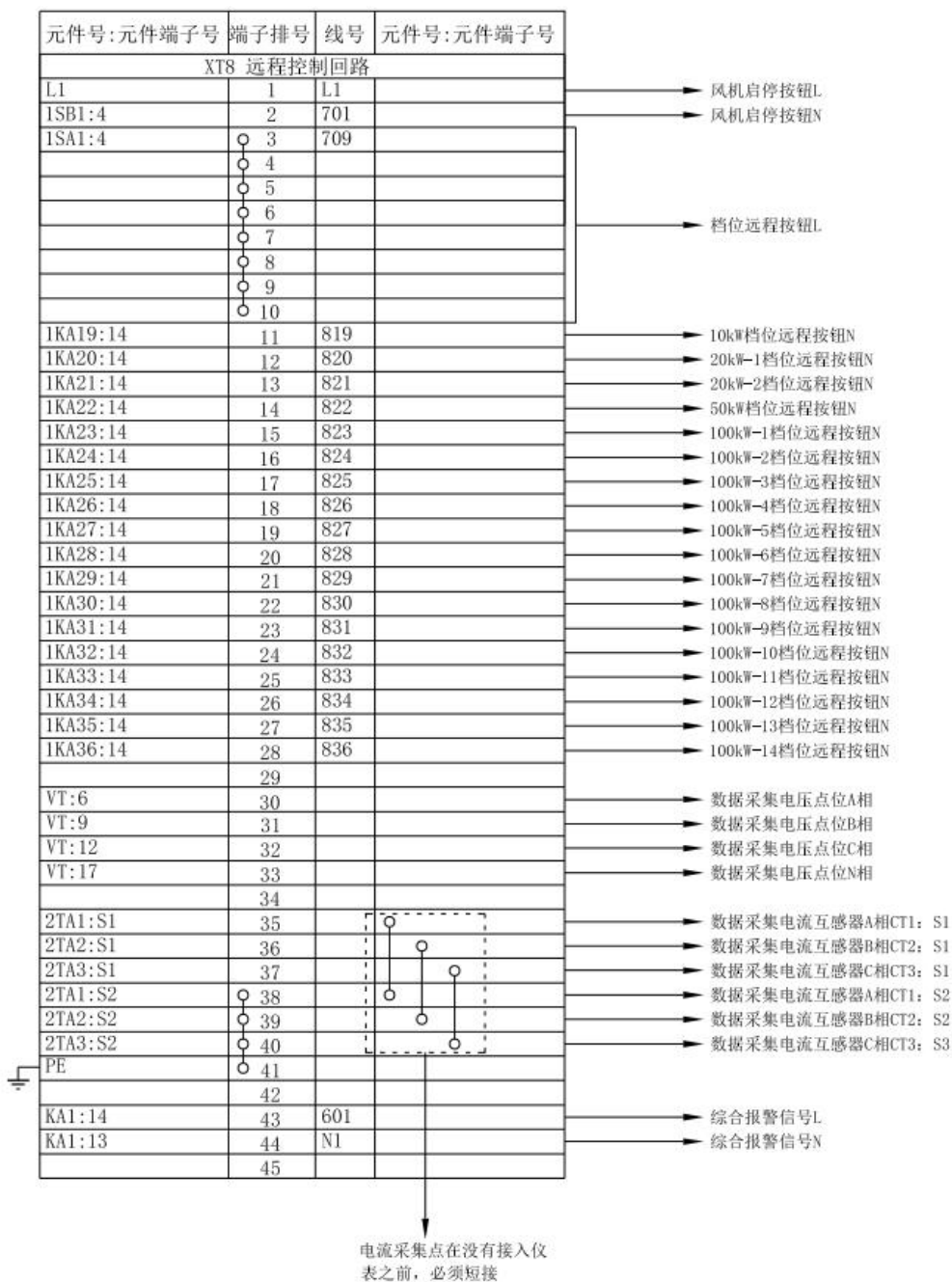
3.3.4 Reserved Terminals For Remote Control

Reserve the following control signals to the terminal block: ① Load cabinet fan start and stop signal ② 18-level control signals ③ Voltage secondary signal ④ Current secondary signal ⑤ Comprehensive alarm output signal

(1) Open the control incoming door panel and find the remote control terminal strip with the logo on it;

(2) According to the drawing, the corresponding remote terminal will be connected as required.





CAUTION!	<ol style="list-style-type: none"> 1. It is strictly prohibited to perform live operations when wiring or unplugging! 2 The wiring terminals must be connected firmly. If they are loose, the cables may overheat! 3 The cable must be connected to the correct voltage, frequency, polarity or phase sequence! 4. The cables used during work must be able to withstand the passing current!
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4 LOCAL PANEL CONTROL

4.1 Panels And Controls



(1) **MULTIFUNCTIONAL MEASURING INSTRUMENT:** Display test data.

(2) **QINGZHI INSTRUMENT:** Displays test data.

(3) **8-CHANNEL INSPECTION INSTRUMENT:** Displays real-time temperature, and transmits an over-temperature signal when the test temperature exceeds the set value.

(4) **FAN START AND STOP:** Click the switch, the fan starts, and the button indicator lights up green when completed; press the fan again to stop, and the button indicator green goes out when completed.

(5) **EMERGENCY STOP BUTTON:** In case of emergency, press this switch to stop loading immediately. After the emergency is resolved, turn the switch clockwise to unlock and continue loading.

(6) **GEAR BUTTON:** AC415V is divided into 18 gears: 10kW, 20kW, 20kW, 50kW, 100kW, 100kW, 100kW, 100kW, 100kW, 100kW, 100kW, 100kW, 100kW, 100kW, 100kW, 100kW, 100kW, 100kW. Press the button for the corresponding gear as needed.

(7) **TEMPERATURE ALARM:** When the load temperature exceeds the safety threshold, it will automatically unload and alarm.

(8) **DOOR LOCK ALARM:** When the load air inlet and outlet is not opened or

the maintenance door is not closed, it will automatically unload and alarm.

(9) SMOKE ALARM: When smoke is detected, it will automatically and gradually uninstall and alarm.

(10) FAN AIR VOLUME ALARM: When the air volume of any fan is insufficient, it will automatically and gradually unload and alarm.

(11) FAN THERMAL OVERLOAD ALARM: When any fan cannot operate normally, it will automatically and gradually unload and alarm.

(12) AUXILIARY POWER BREAKER SWITCH: Load auxiliary power breaker switch. When the switch is turned on, the machine starts and enters the running state.

4.2 Start Up

(1) START THE DEVICE UNDER TEST: After connecting all cables correctly, turn on the power of the device under test and prepare for testing.

(2) START THE MACHINE: Turn on the auxiliary power circuit breaker switch on the control panel door of the machine, and the machine will start and enter the running state.

4.3 Load

(1) START THE FAN: Press the <Fan Start/Stop> switch on the panel, wait until the fan is fully started, and the green indicator light will turn on. Make sure the fan is running normally before proceeding with subsequent operations.

(2) LOAD: Press the corresponding gear button to calculate the power value to be loaded according to the test needs. Press the corresponding <gear button> on the panel to combine the required power value. The machine will work according to the corresponding power value.

(3) UNLOAD: If you need to end the test, turn off all <gear buttons> and remove all loads.

4.4 Protection

(1) MANUAL EMERGENCY STOP: If the machine encounters an emergency during operation, immediately press the red <Emergency Stop> switch and the machine will stop loading. In this state, the loading function is locked and only the fan continues to operate. After the emergency situation is eliminated, you can turn the emergency stop switch clockwise to unlock and retest.

(2) ALARM PROTECTION: This machine has temperature protection, door lock protection, smoke protection, air volume protection, and fan thermal overload protection functions. When the load is over-temperature, the alarm indicator light will light up, an alarm will sound, and loading will automatically stop. The protection status

loading function is locked. Please find out the cause, eliminate the fault, and then retest after the alarm is cleared.

⚠ Note: In addition to the above functions, please do not perform other operations on the measuring instrument. Wrong settings will cause the instrument to be inaccurate.

⚠ Note: If the meter does not work properly or the data is inaccurate, please contact the after-sales service hotline. Do not modify or disassemble the meter at will.

4.5 Shunt Down

(1) SHUTDOWN: After uninstalling, after the fan runs for 5 minutes, click the <Fan Start/Stop> button on the panel, and the fan will automatically stop running. Then flip the auxiliary power breaker switch inside the control panel door downward to turn off the machine.

(2) UNWIRING: After shutting down, first remove the working power cord of the machine, turn off the output power of the device under test, then remove the test cable, and finally remove the remaining cables to restore the machine to its original state before working.

5 MAINTAINANCE

5.1 Inspect Before Each Use

① **GROUNDING:** Ensure that the box is effectively grounded;

② **COOLING FAN:** Good ventilation, no abnormal sound;

Before turning on the fan, make sure that all air inlets are unblocked and the air intake is good to avoid long-term back pressure burnout of the fan motor.

If the fan is found to have abnormal noise during operation, the motor is severely heated, the casing is electrified, the switch is tripped, and cannot be started, etc., the fan should be stopped immediately for inspection. In order to ensure safety, maintenance is not allowed while the fan is running. After inspection, a test run should be performed to confirm that there are no abnormalities before starting the fan.

The operating environment should always be kept tidy, the surface of the fan should be kept clean, there should be no debris at the inlet and outlet of the ventilation system, and dust and other debris in the fan and pipes should be removed regularly.

③ **RESISTOR:** Whether there is any foreign matter in the resistor box;

④ **OPERATION PART:** Whether the operation of each switch is flexible;

5.2 Regular Inspection (Once Every Three Months)

- ① Use a multimeter to measure the resistance of each gear: whether the resistance between each section is normal;
- ② Open the front panel and check whether the fixing screws of the electrical components are loose, and whether the terminals and pile heads are loose;
- ③ Start the fan, place the air volume tester to the air inlet and outlet on the outside of the box, and check whether the fan air volume is normal;

ROUTINE MAINTENANCE

(1) **CLEANING:** Before using the machine, maintenance personnel should clean and inspect the machine. In particular, dust and debris attached to the equipment must be cleaned up. You can use a brush or compressed air to clean the dust. Be careful not to damage equipment parts when cleaning. After cleaning, carefully check whether the equipment is intact. After everything is normal, turn on the working power supply and observe the display and fan status. If there are no abnormalities, it can be officially used.

(2) **VENTILATION:** Turn on the machine regularly and check the working condition of the cooling fan. If the cold circulating water is abnormal, it will affect the heat dissipation of the resistance module and cause damage to the electronic module. Improper operation of the fan or blockage of the air duct will cause the internal temperature of the chassis to be too high, causing the machine to not operate reliably.

(3) **DEHUMIDIFICATION:** Before connecting various cables, you must first confirm that there are no traces of water or moisture on the connectors and interfaces. If they are wet, they should be dried before being put into use to avoid short circuits caused by power on.

(4) **BLOCKING:** After the machine stops working, please put away all accessories and keep them properly. Do not expose various cables to sunlight for a long time.

(5) **OPERATION:** If the machine is idle for a long time (three months or more), please turn on the working power supply and supporting equipment regularly to allow the machine to run. Regular energization can use the component's own heat to dissipate moisture and ensure stable and reliable component performance. Especially in areas with high air humidity, regular power supply is an effective measure to reduce equipment failure.

(6) **CONSULTATION:** If you cannot accurately determine the cause of equipment failure, or encounter problems that cannot be solved, please contact our after-sales hotline in time and consult professional technicians.

NOTICE! 1. Be sure to disconnect all wiring when cleaning the machine! 2. Do not disassemble the chassis without authorization, otherwise the warranty will be lost! If you need to repair internal components, please contact the after-sales service hotline!

5.3 Common Troubleshooting Methods

Some common faults and solutions at work are shown in the table below. If the problem you encounter is not among them, please contact the after-sales service hotline for feedback.

FAILURE PERFORMANCE	POSSIBLE CAUSES	APPROACH
The machine cannot start	The working power is not connected	Check that the equipment is wired correctly and that the power supply powering the unit is powered on.
Automatically shut down after startup	Abnormal power supply	Check whether the power supply voltage supplying the unit matches the voltage required by the operating power supply.
The fan rotates abnormally and the speed is uneven	The working power supply is unstable	Provide a stable power supply environment for this machine.
Insufficient air volume from the fan and poor heat dissipation	Blockage in vents or fans	Check all vents and fan blades for dust and foreign objects, and clean them.
The loading switch cannot be turned on	Emergency stop or fan does not start or automatic protection locks the loading function	Check whether there is any alarm on the machine. After eliminating the dangerous situation, turn the emergency stop switch clockwise to release the lock.
Power is zero after loading	The test cable is not connected or the device under test is not powered on	Check whether the connection between this machine and the device under test is correct, and make sure that the device under test has started discharging.
The power cannot reach the set value	Loose cables or voltage issues	Check whether the test cable is connected falsely. Poor contact may cause abnormal current flow. Or check whether the voltage value is within the normal range. If the voltage is too low, the power value will be reduced accordingly.
After loading, the insulation resistance is zero	It may be that there is a problem with the grounding of the test system of the equipment under test (such as a generator set).	Use sleepers to prop up the four corners of the lower part of the machine and lift it off the ground.