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Chapter 1 Security

1.1 General Provisions

Thank you for using our safety compliance products! Before using the analyzer, please carefully read the user manual and strictly follow the instructions.

The test instrument must be properly grounded!

During testing, do not touch the terminals on the rear panel of the test system. Operators should take anti-static precautions. The test workstation should be laid with an insulating mat, and operators should wear insulating gloves to prevent electric shock!

When testing, the device under test (DUT) should be well electrically isolated from the ground and surrounding equipment. This is especially important when operating on an assembly line: the DUT should be well electrically isolated from the assembly line itself!

When connecting or disconnecting the test system wiring, always disconnect the power supply first!

1.2 Safety warning signs

Please pay close attention to the following safety warning signs used in the testing system:



High Voltage Warning Mark. This mark is located next to the high voltage output terminal on the rear panel of the system, indicating that there is a high voltage output between the terminals. When operating the instrument, please follow the instructions in the user manual to avoid high voltage electric shock.



Warning/Attention Mark. This mark is placed in areas of this user manual where attention is required.



EARTH protective conductor terminal marking. This marking is located next to the protective grounding terminal on the rear panel of the test system main unit. Please follow the grounding requirements in the user manual.



Warning label. This label reminds operators that any operation, application, or condition being performed is dangerous and may result in personal injury or even death. It should be placed in the relevant section of the user manual where such warnings are required.



Cautionary label. This label reminds operators that any operation, application, or condition performed is hazardous and may damage the test system or cause loss of data stored within it. This label is located in a relevant section of the user manual. Repair and replacement of instruments damaged due to such negligence are not covered under the manufacturer's warranty.

1.3 Operators

1.3.1 Personnel Qualification

The testing system outputs high voltage during testing. Incorrect operation during the testing process could cause injury or even endanger lives. Therefore, operators must undergo rigorous training.

1.3.2 Safety Rules

Operators must be educated and trained at all times to understand the importance of various operating rules and to operate the analyzer in accordance with safety regulations.

1.3.3 Clothing regulations

Operators must not wear clothing with metal decorations, or metal jewelry and watches, to avoid accidental electric shock.

1.3.4 Medical regulations

Persons with heart disease or those wearing heart rate regulators or pacemakers are prohibited from operating the analyzer.

1.4 Test Workstations

The location of the test workstation must be in an area not frequently accessed by general personnel, keeping non-staff members away from the workstation. If this is not possible due to production line arrangements, the workstation must be isolated from other facilities and clearly marked "High Voltage Test Workstation, No Entry for Non-Special Personnel." If the workstation is very close to other workstations, special attention must be paid to safety. During testing, it must be clearly marked "Danger! Testing in Progress, No Approach for Non-Staff Members!"

1.5 Power Supply

The test system operates on 220VAC $\pm$ 10%, 50Hz/60Hz $\pm$ 5% single-phase power. Before powering on, always check and use the correct voltage to ensure it matches the input power supply voltage; otherwise, system damage and personal injury may occur.

The fuse is located on the power input cable base. Before replacing the fuse, the input power cable must be disconnected before opening the fuse box. The fuse used in the test system is 5A.

The test system must have proper grounding to ensure personnel safety. In case of an emergency, immediately shut off the power before proceeding with emergency procedures.

1.6 Test safety operating rules



During the test, you must never touch the test object or any object connected to the test object.

1.6.1 Do not frequently turn the machine on and off.

There should be an interval of more than 10 seconds between each power-on and power-off cycle.

1.6.2 Precautions during testing

1. Because the test system outputs high voltage, ensure the test system casing is properly grounded when powered on.
2. Operate the test system carefully after powering it on.
3. If any abnormal sounds are heard during testing, immediately stop the test, turn off the power, carefully check for faults, and only continue testing after troubleshooting.
4. Never touch the test piece or any conductive parts connected to it during the test process.
5. Test personnel must take necessary protective measures, such as wearing protective gloves and using insulating mats.

Chapter 2 Introduction

2.1 Features



JK7136 is a series of safety performance analyzers developed by our company.

This series features large capacity, powerful functions, high accuracy, fast speed, ease of use, easy maintenance, easy expansion, easy upgrades, and a high degree of information technology integration.

This series strictly adheres to testing standards. It has a withstand voltage of 5000V x 100mA and supports short-term peak output of 5000V x 200mA. 1MHz leakage current bandwidth, 6 human body network types;

All models feature touchscreens with graphical help instructions for simpler operation;

Functions include grounding, insulation, AC withstand voltage, DC withstand voltage, dynamic leakage, static leakage, low-start-up, and power testing;

Combined testing of grounding, withstand voltage, and power; Comprehensive protection functions including ground wire detection, leakage protection, and overcurrent protection;

High precision, with a basic safety standard accuracy of 1%;

Fast testing, with test item switching time of approximately 0.1 seconds;

Intelligent, with intelligent self-testing of functional circuits down to the chip level;

Modular design, with all circuits modularized for tool-free assembly and disassembly; Lifetime functional module upgrade service;

Embedded user help documentation, accessible from any interface;

Standard configuration includes functional interfaces for test power supplies, barcode scanners, PLC systems, and fully automated inspection fixtures;

Local storage of test data;

Remote data storage services based on RS232 and CAN.

2.2 Model and Function

Series	Desktop					Cabinet		
	3U Portable			5U Informatization		Variable frequency power supply		Transformer
	External power supply	External power supply	Built-in power supply	External power supply	Built-in power supply	Regular	Informatization	Informatization
Model	JK7126A	JK7126	JK7126H	JK7136	JK7136H			
Touchscreen	7'	7'	7'	10.4'	10.4'	10.4'	10.4'	10.4'
Safety Accuracy	1%	1%	1%	1%	1%	1%	1%	1%
Electrical Parameter Accuracy	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Test type	Single phase	Single phase	Single phase	Single phase	Single phase	Single phase	Single phase	Single/Three-phase
AC withstand voltage	●	●	●	●	●	●	●	●
Withstand voltage capacity	100VA	500VA	500VA	500VA	500VA	200VA	500VA	500VA
DC withstand voltage	○	●	●	●	●	○	●	●
Arc detection	●	●	●	●	●	●	●	●
Insulation resistance	●	●	●	●	●	●	●	●
Grounding resistance	●	●	●	●	●	●	●	●
Dynamic leakage	●	●	●	●	●	●	●	●
Static leakage	●	●	●	●	●	●	●	●
Human network	6 types	6 types	6 types	6 types	6 types	6 types	6 types	6 types
Power testing	●	●	●	●	●	●	●	●
Low-voltage startup	●	●	●	●	●	●	●	●
Parallel testing	●	●	●	●	●	●	●	●
Local storage	●	●	●	●	●	●	●	●
Local query	●	●	●	●	●	●	●	●
Wifi function	●	●	○	○	○	○	○	○
Barcode scanning	●	●	●	●	●	●	●	●
USB	●	●	●	●	●	●	●	●
LAN	○	○	●	●	●	●	●	●
Isolation transformer	○	○	○	○	○	○	○	3-phase 20KVA
Internal power supply	○	○	0.5KVA	○	0.5KVA	6KVA	6KVA	○
External power supply	Optional	Optional	○	Optional	○	○	○	○
Automatic inspection	○	○	○	Optional	Optional	Optional	Optional	Optional
Testing software	Optional	Optional	Optional	Optional	Optional	Optional	Optional	Optional
Fault self-diagnosis	●	●	●	●	●	●	●	●
Modularization	●	●	●	●	●	●	●	●
Size mm	132×284×470			220×440×470		1330×530×530		
Weight Kg	17	18	20	25	27	About 120Kg		

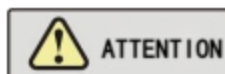
Chapter 3 Test Preparation

3.1 Installation location

The testing system should be kept away from flammable, explosive, and corrosive media, such as alcohol, thinner, and sulfuric acid.

The testing system is a general-purpose instrument as specified in 4.7.1 of GB/T 6587-2012 General Specification for Electronic Measuring Instruments, belonging to Group II instruments. Its operating environment must meet the following requirements:

Temperature	Storage conditions	-40°C~60°C
	Extreme conditions	-10°C~50°C
	Operating conditions	0°C~40°C
Humidity	Storage conditions	<90%RH
	Operating conditions	(20~90) %RH



The testing system must not be used when condensation occurs.

Keep the testing system away from sources of strong electromagnetic interference;

Keep the testing system away from significant vibration and impact;

The testing system should be placed in a clean, dust-free, and well-ventilated working environment;

The testing system uses natural air cooling; poor ventilation can easily damage the system.

3.2 Unpacking and Inspection

3.2.1 Unpacking test system

If the packaging box is damaged upon receipt of the test system, please check the machine for any deformation, scratches, or panel damage. If any damage is found, please notify our company or its distributor, and retain the packaging box and foam to determine the cause of the damage. We will repair or replace the machine for you. Please do not return the product immediately without notifying our company or its distributor.

Unpack the analyzer and remove the materials used for shipping. Keep the packaging box and materials safe for future repackaging of the analyzer.

3.2.2 Check the contents of the packaging box

If the contents of the packaging box do not match the packing list, please contact our company or agent.

To prevent accidental electric shock, please do not open the cover yourself.

3.3 Transportation Environment

3.3.1 Original packaging

Please retain all original packaging materials. If the instrument must be returned for repair, please pack it in the original packaging materials and contact our company in advance. When sending it for repair, please be sure to return all accessories, including the power cord and test leads, and please indicate the fault description.

3.3.2 Other packaging

If original packaging materials cannot be found, please pack the system according to the following steps:

- 1) First, wrap the test system in plastic sheeting;
- 2) Then place the test system in a wooden crate or multi-layered cardboard box that can withstand 20 kg;
- 3) The test system must be surrounded by shock-absorbing material with a thickness of approximately 70-100 mm. The test system's panels must first be protected with thick foam plastic.
- 4) Properly seal the box and mark it "Fragile, Handle with Care"

3.4 Power supply and fuse

Before using the test system, please check and confirm that the input voltage specifications meet the analyzer's power input requirements, and that the correct fuse is used. Before replacing the fuse, the input power must be turned off and the power cord unplugged to avoid danger.

Power Cord: The test system uses a three-core power cord with a ground wire.

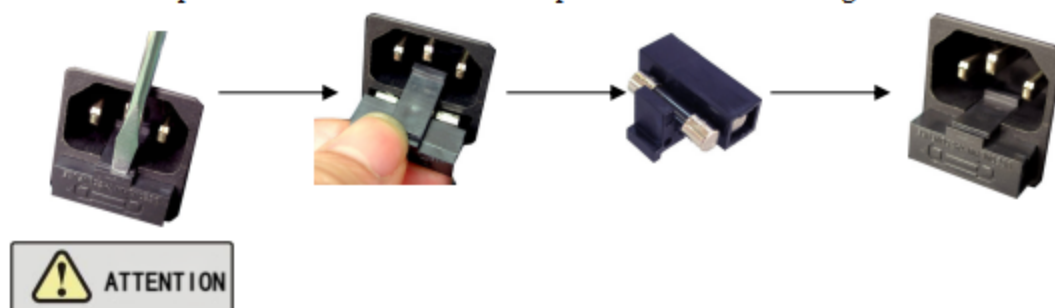
Fuse: The test system uses a 5A fast-acting fuse. Spare fuses are installed in the spare fuse slot of the fuse box inside the power outlet for user replacement. ◦



spare fuse tube

How to replace a fuse:

Using a tool, gently pull the fuse box outwards. → remove the fuse box → Remove the damaged fuse → Install the spare fuse → Reinstalled into the power outlet box. The diagram is as follows:



When removing a damaged fuse, first check if the inside of the fuse tube is blackened. If it is blackened, it usually means that the analyzer has experienced a large overcurrent or that some internal components have been damaged. Please contact our after-sales service first. If the inside of the tube is clean, it is usually due to fatigue melting caused by repeated high current impacts. You can restore normal operation by using a spare fuse tube.

3.5 Grounding



Before connecting to the power supply, it is essential to ensure that the test system is properly grounded; otherwise, it may lead to misinterpretation of test data or even damage to the machine.

The test system has two grounding methods:

1. Power Cord Grounding

The test system uses a three-core power cord. Grounding the chassis is complete when the power cord is plugged into a grounded socket.

2. Grounding via Rear Panel Grounding Terminal

Connect the grounding terminal on the rear panel of the test system to the grounding terminal of the workstation using a wire.

3.6 Test Power Supply

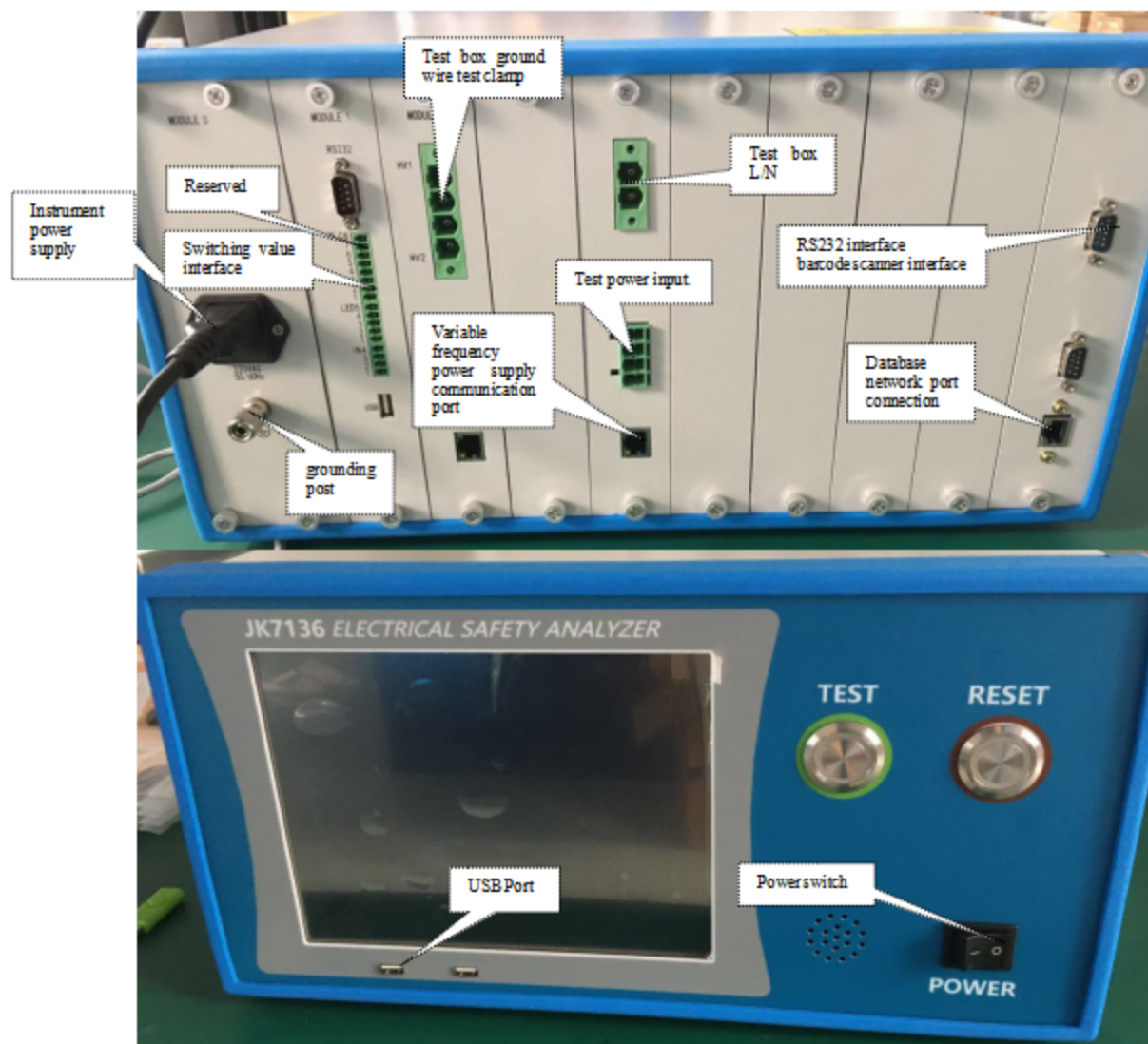
Users need to equip the instrument with a test power supply. The JK7136 supports multiple test power supplies. The communication protocols for these power supplies are integrated within module 3, and the test power supply selection is available in the system settings interface. For this type of product, the steps for connecting the frequency converter power supply are as follows:

- 1) Power off the machine and use a dedicated communication cable (RJ45 terminal/D-SUB9 terminal communication cable) to connect the CAN/RS232 interface of module 3 to the RS232 port of the power supply;
- 2) Connect the power supply output to the test power input port of module 3;
- 3) In the system interface, select the power supply type;

Chapter 4 Basic operations

4.1 External Wiring

4.1.1 External Wiring Diagram of a Benchtop Integrated Analyzer



The test system operates on $AC220V \pm 10\%$ (AC-142H 85~245VAC), 50Hz/60Hz.

At least one of the ground or EARTH terminals of the test system power socket must be reliably grounded.

Module 1's Wi-Fi antenna is a general-purpose 2dB gain antenna.

Module 1's IN digital labels 1-4 are digital inputs/outputs. Refer to the test interface's help manual for digital input/output definitions.

Module 1's LED is connected to an alarm light.

Module 1's PLC digital labels 1-8 are digital outputs. When the instrument is in test, pass, or fail state, 1 is connected to 2, 3, and 4 respectively.

5678 interface of PLC is reserved.

Module 1's RS232 provides communication/barcode scanner functionality expansion. Refer to the test interface's help manual for barcode scanner start-up test settings or RS232 start-up test settings.

Module 2's RS232/CAN functionality is retained.

Module 2's CUR/VOLT port connects to the test box's 4-pin terminal.

Module 3's RS232/CAN provides extended test power functionality. Refer to the analyzer's test power interface help manual for usage instructions.

Module 3's test power input interface, connect the test power input. When the instrument power supply is set to transformer, for low-start, the instrument test power is input via low-start and common terminal; for power, the instrument test power is input via power and common terminal; for leakage, the instrument test power is input via leakage and common terminal. When the instrument power supply is set to other options, the test power is input via power and common terminal.

Module 3's L/N port connects to the test box's 2-pin terminal.

4.2 Power on

After correctly wiring, press the power switch on the front panel of the test system to power it on.

The test system will perform self-tests on each functional module upon power-on. If a module malfunctions, the analyzer will display fault information. Record the fault information and contact our customer service. If all functional modules are functioning normally, the test system will remain on the power-on screen for 5 seconds before proceeding to the test interface.

4.3 Usage and Status

When the analyzer is not in test mode, pressing the help icon will bring up the help documentation for the current interface. Please refer to the help documentation for basic operations of each interface.

When the analyzer is in standby mode on the test interface, the start button indicator light will flash, indicating a valid start signal.

When the analyzer is in a pass state, the start button indicator light will be constantly on, indicating a valid start signal.

When the analyzer is in test mode, the stop button indicator light will flash; either a stop or start signal can abort the test.

When the analyzer is in a fail state, the stop button indicator light will be constantly on; a stop signal can clear the fail state.

When the analyzer is in a fault state, both the start and stop button alarm lights will illuminate simultaneously.

The analyzer provides multiple start/stop control methods, including buttons, foot switches, PLC signals, RS232, and barcode scanners. The start signal enable is available in the system settings interface. In test mode, pressing any button will terminate the current test using any start/stop control method.

4.4 Power off

For safety reasons, turn off the power switch and allow the analyzer to wait for its internal energy storage to deplete before shutting down. Do not repeatedly turn the power on and off during this process.

Chapter 5 Testing Functions and Technical Specifications

JK7136 product provides testing functions for grounding resistance, insulation resistance, AC withstand voltage, DC withstand voltage, normal-state contact current (dynamic leakage), fault-state contact current (static leakage), low-voltage start-up, and power. To improve testing efficiency, JK7136 series offers multi-functional combined testing solutions such as grounding + AC withstand voltage, grounding + power, AC withstand voltage + power, and grounding + AC withstand voltage + power.

JK7136 analyzer continuously monitors the temperature of its internal power devices. The analyzer terminates the test when the internal power device temperature reaches the analyzer's protection limit of 85°C.

The switching time between test items and the power polarity switching time for leakage current on the JK7136 analyzer are both <0.1s. The switching time includes the protection time for functions such as discharge protection of the test item.

Some high-end models of the JK7136 analyzer support built-in inspection fixtures. For details on the use and measurement of the inspection fixtures, please refer to the help documentation embedded in the analyzer.

AC withstand voltage test			
	Range	Resolution	Accuracy
Output voltage	300~5000VAC	1V	± (1% rdg+5V)
Output frequency	50/60Hz		
Breakdown current	0~100.00mA Short-term 200mA peak	0.001mA/0.01mA	± (1% + 0.002mA)
Slow-up time	0~999.9s	0.1s	± (1% + 0.1s)
Slow-down time	0~999.9s	0.1s	± (1% + 0.1s)
Test time	0.5~999.9s	0.1s	± (1% + 0.1s)
Current compensation	0~99.999 mA	0.001mA/0.01mA	
Arc detection	0~100.00mA	0.01mA	± 5%
DC withstand voltage test			
	Range	Resolution	Accuracy
Output Voltage	300~6000VDC	1V	± (1% rdg+5V)
Breakdown Current	0~9.999mA	0.001mA	± (1% + 0.002mA)
Slow-up time	0~999.9s	0.1s	± (1% + 0.1s)
Slow-down time	0~999.9s	0.1s	± (1% + 0.1s)
Test Time	0.5~999.9s	0.1s	± (1% + 0.1s)
Insulation resistance test			
	Range	Resolution	Accuracy
Output voltage	100~3000V	1V	± (1% rdg+5V)

Chapter 5 Testing functions and technical specifications

Insulation resistance	0.5M~100GΩ	0.01M/0.1M/1M/10M/100M/1G	0.60M~9.99M ± (1% rdg+0.03M) 10.0MΩ~99.9MΩ ± (3% rdg+0.3M) 100MΩ~9999MΩ ± (5% rdg+3M) 10.0GΩ~100GΩ ± (15% rdg+ 0.8G)
Slow-up time	0~999.9s	0.1s	± (1% + 0.1s)
Slow-down time	0~999.9s	0.1s	± (1% + 0.1s)
Test time	0.5~999.9s	0.1s	± (1% + 0.1s)
Delay time	0~999.9s	0.1s	± (1% + 0.1s)
Grounding resistance test			
	Range	Resolution	Accuracy
Output current	1.0~32.0A	0.1A	± (1% rdg+0.2A)
Output frequency	50/60Hz		
Grounding resistance	10~600.0mΩ (Voltage not exceeding 12V)	0.1 mΩ	± (1% rdg+2.0mΩ)
Resistance compensation	0~600.0mΩ	0.1 mΩ	± (1% rdg+2.0mΩ)
Test time	0.5~999.9s	0.1s	± (1% + 0.1s)
Leakage current test			
	Range	Resolution	Accuracy
Output Voltage	30.0~300.0V	0.1V	± (0.2% rdg+0.5V)
Output Current	0~2.000/30.000A	0.001A	± (0.2% + 0.005A)
Leakage Current	0.0050~12.000mA	0.0001/0.001 mA	± (1% + 3uA)
Test Time	1.0~999.9s	0.1s	± (1% + 0.1s)
Human Body Network	Six types are standard, with optional US standard medical equipment.		
Current Compensation	0.0050~12.000mA	0.0001/0.001 mA	± (1% + 3uA)
Power test			
	Range	Resolution	Accuracy
Voltage	30.0~300.0V	0.1V	± (0.2% rdg+0.5V)
Current	0~2.000/30.000A	0.001A	± (0.2% + 0.005A)
Power	0~500W/9000W	0.1W	0~99.9W ± (0.3% + 0.3W) >99.9W ± (0.3% + 4.0W)
Test Time	0.5~999.9s	0.1s	± (1% + 0.1s)
Low-voltage start-up test			
	Range	Resolution	Accuracy
Voltage	30.0~300.0V	0.1V	± (0.2% rdg+0.5V)
Current	0~2.000/30.000A	0.001A	± (0.2% + 0.005A)
Power	0~500W/9000W	0.1W	0~99.9W ± (0.3% + 0.3W) >99.9W ± (0.3% + 4.0W)
Test Time	0.5~999.9s	0.1s	± (1% + 0.1s)
Parallel testing			

Chapter 5 Testing functions and technical specifications

Standard	Grounding + AC withstand voltage
Optional	Grounding + withstand voltage + power (cabinet type)
Built-in power supply	
Built-in power supply	0.5KVA/3KVA/6KVA
Isolation transformer	6KVA

5.1 Grounding resistance

The grounding resistance test measures the grounding continuity resistance, which is the resistance between the accessible metal part of the device under test (DUT) and the ground wire. Primarily, it measures the resistance between the DUT's casing and the power supply interface ground wire.

Grounding resistance is significantly affected by the tooling. The accuracy of the grounding test is based on a 4-wire connection. Aging test boxes and clamps may introduce a few milliohms of testing error.

5.2 Insulation resistance

The insulation resistance test measures the resistance between the accessible metal parts of the device under test (DUT) and the DUT's power supply terminals. This primarily measures the resistance between the DUT's housing and the power supply interfaces (L, N).

The JK71X6 series analyzer can measure resistances up to 1000G under 1000V conditions, ensuring reliability within 15%.

The insulation resistance test accuracy of JK71X6 is divided into current segments:

100.0uA~1.500mA	$\pm (1\% \text{ rdg} + 0.2\text{uA})$
10.00uA~99.99uA	$\pm (3\% \text{ rdg} + 0.05\text{uA})$
100.0nA~9.999uA	$\pm (5\% \text{ rdg} + 0.3\text{uA})$
10.0nA~99.9nA	$\pm (15\% \text{ rdg} + 8\text{nA})$

The analyzer has the following accuracy when the test voltage is 1000V:

0.60M~9.99M	$\pm (1\% \text{ rdg} + 0.03\text{M})$
10.0M Ω ~99.9M Ω	$\pm (3\% \text{ rdg} + 0.3\text{M})$
100M Ω ~9999M Ω	$\pm (5\% \text{ rdg} + 3\text{M})$
10.0G Ω ~100G Ω	$\pm (15\% \text{ rdg} + 0.8\text{G})$

Insulation resistance is significantly affected by the testing fixture. When testing insulation resistance above 50G using an analyzer, special testing fixtures must be used. Comparing the insulation resistance test results before and after removing the fixture allows analysis of the fixture's insulation performance.

Compensation testing can reduce the influence of the fixture on the test results. However, the insulation performance of the fixture is significantly affected by the environment and is not a stable value. Therefore, compensation testing will affect the accuracy of the insulation resistance test, and its results are only valid for a short time. When compensation testing is effective, the analyzer displays a "Compensated" indicator in the lower right corner of the display interface. Changing the test set or restarting the analyzer will clear the compensation test results.

During insulation testing, the analyzer provides leakage protection. During insulation testing, the analyzer's output current flows through the analyzer's ground wire or chassis, not the return line. If the return current exceeds the national standard, the analyzer determines there is a leakage risk and terminates the test.

After insulation testing, the analyzer performs discharge protection on the test piece to eliminate residual charge.

5.3 AC withstand voltage

The AC withstand voltage test measures the AC withstand voltage performance between the accessible metal parts (or housing) of the device under test (DUT) and the DUT's power supply terminals. This primarily involves applying voltage between the DUT's housing and the power supply interface and measuring the breakdown current.

To meet special testing needs, when the AC withstand voltage upper limit is set to 0, the withstand voltage function can provide short-term overload output, but no judgment is provided during the test. In this case, the analyzer can provide a continuous withstand current output with a peak value of not less than 200mA and an effective value of not less than 142mA. Overload output during the withstand voltage test will cause a rapid rise in the temperature of the internal power devices. When the power device temperature reaches the analyzer's protection limit, the analyzer terminates the test.

The high-end analyzer's AC withstand voltage function provides peak arc current measurement in the range of 0–100.00mA. When the arc upper limit is 0, arc judgment is disabled. For arc settings, please refer to the analyzer's help documentation.

Leakage protection is also provided during the AC withstand voltage test.

After the AC withstand voltage test, the analyzer performs discharge protection on the test piece to eliminate residual charge.

5.4 DC withstand voltage

The DC withstand voltage test measures the DC withstand voltage performance between the accessible metal parts (or housing) of the device under test (DUT) and the DUT's power supply terminals. This primarily involves applying voltage between the DUT's housing and the power supply interface and measuring the breakdown current.

During the DC withstand voltage test, leakage current protection is provided.

After the DC withstand voltage test, the analyzer performs discharge protection on the DUT to eliminate any residual charge.

5.5 Low-voltage start-up/power

The low-voltage start-up test measures the electrical performance parameters of the device under test (DUT) when the supplied voltage is lower than its rated voltage. The voltage value is 0.85 times the rated voltage of the DUT.

The power test measures the electrical performance parameters of the DUT under normal operating conditions. It is based on the voltage and current values of the DUT under normal operating conditions.

The analyzer's low-voltage start-up test and power test have the same technical specifications.

The analyzer's low-voltage start-up test and power test provide short-circuit protection. If the DUT is short-circuited at the start of the low-voltage start-up test or power test, the analyzer will activate the short-circuit protection function and stop the test.

The analyzer's power test allows users to select multiple power levels according to their needs. This is preset at the factory according to the contract. If the user has not customized this function, the "Multi-level Test" field is preset to "Off"; even if the user changes it to "Power Supply Switching," this function remains disabled and may lead to misjudgments in normal power tests.

5.6 Leakage current

The leakage current (some standards have renamed it contact current) test measures the leakage current between the accessible metal parts of the device under test (DUT) and the DUT's power supply terminals (L and N). A test power supply is provided to the DUT, typically with a voltage 1.06 times the DUT's operating voltage, and the current value is measured. If the applied test power supply voltage is below 50V, the measured leakage current value is meaningless.

Leakage current testing operates in two states: dynamic leakage (the normal state contact current test and dynamic leakage test are the same) and static leakage (the fault state contact current test and static leakage test are the same). Dynamic leakage current is the leakage current value measured under normal operating conditions, while static leakage current is the leakage current value measured when the DUT is not operating (one of the neutral or live wires is disconnected).

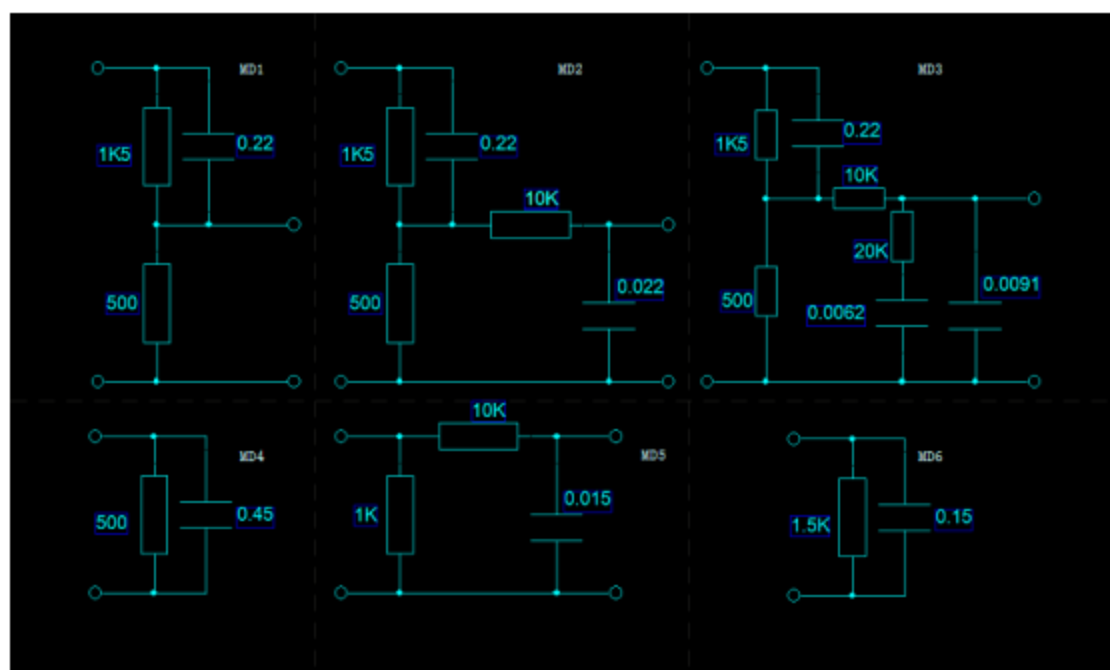
If the test time is set to exceed 1.4 seconds, the power supply polarity will switch during the leakage current test.

During the leakage current test, power voltage and power current are measured simultaneously.

If the leakage current exceeds the range when the leakage current test starts, the analyzer will activate the leakage current overcurrent protection, terminating the test.

The JK7136 analyzer's leakage current test circuit uses a true RMS testing scheme, and the test result is the leakage current in the DC to 1MHz range.

The high-end version of the JK7136 analyzer comes standard with 6 human body networks, while the low-end version only provides the MD2 network shown in the diagram below. The JK7136 analyzer does not provide leakage current testing for US standard medical devices.



5.7 Combined testing

The high-end version of the JK7136 analyzer offers combined testing of grounding resistance, withstand voltage, and power. During combined testing, multiple test functions operate simultaneously, with the test time being the set time of the first test item.

When a test item is part of a combined test, a "+" symbol will be added to its name, indicating that subsequent items are tested together with it.

During combined testing, test functions may interfere with each other. Grounding testing will increase the withstand voltage test error by less than 0.1mA. The influence between other test items is negligible.

Chapter 6 Data Storage

The JK7136 analyzer supports multiple self-storage data storage schemes.

6.1 Local Storage

In the system settings interface, setting the data server to local will store test data on the instrument.

Each time a test group is changed, the JK7136 analyzer records the change time and the changed test group parameters.

At the end of each test, the JK7136 analyzer records the test results.

The JK7136 analyzer can cache 30MB (approximately 66,000) test results. Cached data can be viewed locally. When the cache space is full, it will automatically be transferred to the backup space, which has a capacity of 32GB. Backup data can be exported to a USB flash drive via USB.

6.2 RS232/LAN Server

In the system settings interface, setting the data server to RS232/LAN will automatically upload test data via RS232/LAN.

Changing a test group will automatically upload the test group parameters and the call time.

At the start of the test, the analyzer automatically uploads the status (test state).

During the test, the analyzer automatically uploads the test results every 0.3 seconds.

At the end of the test, the analyzer automatically uploads the status (pass/fail).

Chapter 7 Data Upload

The JK7136 on this machine supports test data upload.

The protocol is compatible with external protocols.

Data upload can be selected via IP address or without upload.

When uploading data, the instrument acts as a client. The IP address and port number of the receiving server need to be set in the instrument system interface.

A successful connection will be displayed in the lower right corner. (See figure)

Connection status	
NO net	Network cable not connected
Net OK	Network cable connected, server not connected
UPLOAD OK	Server connected



7.1 data upload format

```
[11:04:32.468]收到{
  "time": "2000-01-01 00:08:08",
  "users": "manager",
  "group_num": "0",
  "group_name": "",
  "type": "GB",
  "para": "25.0A 100mohm 1.0s",
  "result": "0.00A999.7mohm",
  "judge": "NG",
  "type": "IR",
  "para": "500V 50.0Mohm 1.0s",
  "result": "499V263Gohm",
  "judge": "OK",
  "type": "DCW",
  "para": "1500V 5.00mA 0.00mA 1.0s",
  "result": "1502V0.000mA0.00arc",
  "judge": "OK",
  "type": "NONE",
  "type": "NONE",
  "type": "NONE",
  "type": "NONE",
  "type": "NONE"
}
```

项目	参数	结果	判定
接地	25.0A 1.0s	0.00A, 999.7mΩ	NG
绝缘	500V 1.0s	499V, 263GΩ	OK
直耐	1500V 1.0s	0.000mA, 0.00arc	OK
空项			
空项			
空项			
空项			
空项			

After the test, data is sent in json format to the designated IP address. The data includes the test time, user, test group name, test group number, overall test results, single-step test parameters, test results, and test judgments.

The 'type' parameter sends the test items sequentially; an empty item is sent as 'NONE', and other

parameters are not sent.

The 'para' parameter consists of the test voltage or current, the maximum value of the test item, and the time.

The results include a combination of single-step test items such as voltage, current, resistance, and power.

The 'judge' parameter is the judgment for the single-step test results.

Chapter 8 Maintenance and Warranty

To prevent accidental electric shock, do not disassemble the analyzer yourself. If the analyzer malfunctions, please seek maintenance from our company.

8.1 Regular Maintenance

The input power cord, test leads, test sockets, and related accessories of analyzer should be carefully inspected and calibrated at least once a year to protect user safety and the machine's accuracy. If the analyzer is used in a production environment or other harsh conditions, it must be carefully inspected and calibrated every six months.

If the analyzer is not used for an extended period, it should be powered on periodically. Typically, it should be powered on once a month for at least 30 minutes.

To ensure the analyzer's accuracy and reliability, instrument calibration should be performed at least once a year.

8.2 Unauthorized Alterations

Users must not alter the analyzer's wiring or parts. If alterations are made, the analyzer's warranty will automatically expire, and our company will not be liable. The use of parts or accessories not approved by our company will also void the warranty. If an analyzer returned for repair is found to have been altered, our company will restore the analyzer's circuitry or parts to their original design state, and a repair fee will be charged.

To ensure the stability of the measurement circuit, some important circuits are sealed with adhesive. Our company will no longer provide maintenance for analyzers with delamination.

8.3 Daily Maintenance

The analyzer should be used in a well-ventilated, dry, dust-free environment, free from strong electromagnetic interference.

After prolonged operation (24 hours), the analyzer should be powered off for at least 10 minutes to maintain optimal operating condition.

Ensure the analyzer is properly grounded.

High-voltage lines, test clips, and power cords may experience poor contact or open circuits after prolonged use. Inspect these components before each use to ensure they are free from damage, cracks, or open circuits.

Please clean the analyzer with a soft cloth and a neutral detergent. Before cleaning, ensure the power is disconnected and the power cord is removed. Do not use thinners, benzene, or other volatile substances to clean the analyzer, as this may alter the analyzer casing color, erase markings, or cause the LCD display to become blurry.

8.4 Troubleshooting

When a functional module of the analyzer malfunctions, it can be replaced while the power is off. The debugging data for each function of the analyzer is stored on its respective module. Replacing a functional module does not require re-tuning.

When the tester displays an inaccurate calibration screen, please recalibrate the screen as follows:

(1) Desktop type operation steps: Continuously and quickly tap the non-touch area of the touchscreen (approximately 15 times in 5 seconds) until you hear the system buzzer. The system will then determine that it has entered the blue screen calibration page. Tap the three points on the screen in

sequence to calibrate the screen.

(2) Cabinet type operation steps: Press and hold the <RESET> button for approximately 20 seconds. The system will automatically enter the calibration page. Tap the five points on the screen in sequence to calibrate the screen.

Common Fault Symptoms	Possible causes of failure	Solution
LCD screen displays nothing	Fuse is blown or not	Replace the fuse
Insulation test fails	High humidity during rainy weather	First, perform compensation, then conduct an inspection.
Grounding test fails	Repeated plugging and unplugging of the test box socket may have caused the ground terminal to become loose	Replace the new socket terminal.
Power supply has no output	(1) Power is not connected (2) Power system short circuit protection	(1) Power on the power system. (2) Turn on the circuit breaker.

8.5 Precautions

1. High voltage and high current output occur during testing. Operators must strictly follow the user manual. Touching any live parts of the instrument or the housing of the device under test (DUT) is strictly prohibited to avoid electric shock.
2. The power supply of the testing system must be safely grounded.
3. During insulation and withstand voltage tests, the DUT should be well electrically isolated from the ground and surrounding objects.
4. If the relative humidity is greater than 60%RH, the measurement accuracy of insulation resistance greater than 100MΩ will be significantly affected.
5. For leakage, power, and low-voltage tests, it is recommended to use an external regulated power supply as the input source to achieve higher accuracy.
6. Regularly clean dust (mainly from the cabinet unit) to prevent short circuits and damage to components caused by dust.

8.6 Fuse Considerations

1. Input Voltage 1. AC220V±10%, 50HZ;
2. The power cord should have reliable grounding to avoid electric shock;
3. Fuse type: 5A/250V;
4. Confirm the fuse is installed before powering on;
5. To prevent fire, ensure the replacement fuse is of the specified specification;
6. Disconnect the power cord before replacing the fuse;
7. Confirm the cause of fuse blown before replacing the fuse.

8.7 Quality Assurance

Our company guarantees that all products manufactured undergo strict quality assurance. The warranty period for products leaving the factory is twelve months. During this period, any defects will be repaired free of charge.

Except for this warranty statement, our company makes no warranty of any kind, express or implied; Under no circumstances shall our company be liable for any indirect, special, or consequential damages.