Rek®

Meiruike Instruction Manual

RK2681 SERIES HIGH
RESISTANCE METER

SHENZHEN MEIRUIKE ELECTRONIC TECHNOLOGY CO.,LTD.

CONTENTS

Chapter 1 Overview

1．1．Product Summary

　　Rk2681/2681A type Insulation Resistance Tester is a measurement which can measure the insulation of the electronic parts, dielectric material, and machines. It has the function of test quickly, good stability, easy operation and determine the eligibility of the product.

　　The instrument is correspond with the requirements and conditions of Group Ⅱof Ministry of Electronics Industry Standards GB6587.1 «environmental testing of electronic measuring instruments master>>：

　　A： Temperature：**0~40℃**

　　B： Relative Humidity：**<70%**

　　C： Atmospheric pressure：**86~106kPa**

1．2．Confirmed Accessories　before using

　　After receipt of this tester, please confirm the following items as shown in order to safeguard your interests:

　　A： Whether the　appearance of the product is good.

　　B： Standard accessories in the table below, make sure about them.

　　If there have some damage or lack of attachments，Please contact with us or the agents where you buy them so that we can give you the best service.

Name	Quality	Notes
Power Cable	1	
Testing wire	1	Generally testing wire
Manual	1	
Calibration certificate	1	
Product certificate	1	

1．3．Environmental requirements

　　1．3．1．Operating temperature 0 ℃ ~ 40 ℃, relative humidity：≤ 70%. Do not let the tester place at dust, muti-vibration, as well as direct sunlight or corrosive gases environment.

　　1．3．2．In order to prevent this instrument internal temperature rises too much, please take the　instrument and the surrounding objects in more than 10 cm distance, and do not block the right ventilation holes to protect the good of the instrument accuracy.

　　1．3．3．Although this instrument has been design for the interference with AC power supply.. But also please use it in the environment where the interference is little if possible. Please install some power supply filtering device if the interference can't be avoided.

　　1．3．4．Storage Temperature of the instrument is **-25℃~+70℃**.If the instrument will not be used for a long time. Please send it into the box and place it where no direct sunlight and dry place, in order to ensure accuracy.

1．4．Power input

　　Please make sure the power switch is in **OFF** before contact with the AC power, and make sure the voltage input is AC **220V±10%,50Hz** or **60Hz**.

1．5．Fuse

There is a fuse is at the back panel,please note when change it:

1．5．1．Please take the switch of the power in **OFF** and then cut off the power.

1．5．2．The Resistance of the fuse is 15Ω,if not, it is broken. Please don't check it by your eyes.

1．5．3．Please use a little Screwdriver to take the broken fuse out.

1．5．4．Replace the new fuse (as same as the broken one) and put it into the AC socket.

1．6．Warm-up Time

You can use all the functions of this tester after power is turned on. However, to achieve the target within the accuracy, please warm more than 30 minutes.

Chapter 2 Specifications

2．1．**Test voltage：**

Rk2681:

10VDC	**Voltage magnification×0.1**
25 VDC	**Voltage magnification×0.25**
50 VDC	**Voltage magnification×0.5**
100 VDC	**Voltage magnification×1**
250 VDC	**Voltage magnification×2.5**
500 VDC	**Voltage magnification×5**

Rk 2681A:

10VDC	**Voltage magnification×0.1**
50VDC	**Voltage magnification×0.5**
100VDC	**Voltage magnification×1**
250VDC	**Voltage magnification×2.5**
500VDC	**Voltage magnification×5**
1000VDC	**Voltage magnification×10**

Accuracy：**±2%**(when the test port is turn off)；the measured voltage of the load is over **95%**

2．2．Test range

Rk 2681：		**100KΩ ～ 5TΩ** (10^5~5×10^{12}Ω)
10V：	**100 KΩ ～ 100GΩ**	
25V：	**250 KΩ ～ 250GΩ**	
50V：	**500 KΩ ～ 500GΩ**	
100V：	**1MΩ ～ 1TΩ**	
250V：	**2.5MΩ ～ 2.5TΩ**	
500V：	**5MΩ ～ 5TΩ**	
Rk 2681A：		**100KΩ ～ 10TΩ** (10^5~10^{13}Ω)
10V：	**100 KΩ ～ 100GΩ**	
50V：	**500 KΩ ～ 500GΩ**	
100V：	**1MΩ ～ 1TΩ**	
250V：	**2.5MΩ ～ 2.5TΩ**	
500V：	**5MΩ ～ 5TΩ**	
1000V：	**10 MΩ ～ 10TΩ**	

2．3．Accuracy：

Impedance　<1GΩ　　　　　　±3%±0.5 digits.

Impedance　>=1GΩ　　　　　　±5%±0.5 digits.

Impedance >100GΩ　　　　　　±10%±0.5 digits.

2．4．Charge Time

Electronic machinery, media materials, resistive elements：Charge Time <0.1seconds.

Capacitor：Charge Time 0.5～10 seconds.

2．5．Preset range

（1.0～9.9）×Voltage magnification×Rate Switch（MΩ),Accuracy：±0.3%±0.5 digits.

2．6．Judge and select

This instrument can judge and select，you can set a value with the preset switch first. If the testing value is less than it, the light will bright, and the buzzer will ring. It means that the parts be measured is not good. And if the testing value is over than the preset value, it means it is good.

2．7．Panel instructions

When Set/Measure button has not been press down , the display of the panel is Preset values.

When Set/Measure button has been press down，the display of the panel is the measured values.

2．8．Discharge

When the witch is turn to 放电，it will discharge to the measured parts，Resistance of discharge is depended on the testing voltage. There is no output voltage at the test port。

2．9．User guide：

　2．9．1．Temperature 0～40℃，Relative Humidity：≤70%。

　2．9．2．Storage Environment：-25℃～70℃。

　2．9．3．Power input：220V±5%。

　　　　　　Frequency：50Hz/60Hz。

　　　　　　Power：≤30V

　2．10．Volume and weight

　2．10．1．Volume：360mm（L）×360mm（W）×135mm（H）

　2．10．2．Weight：7Kg
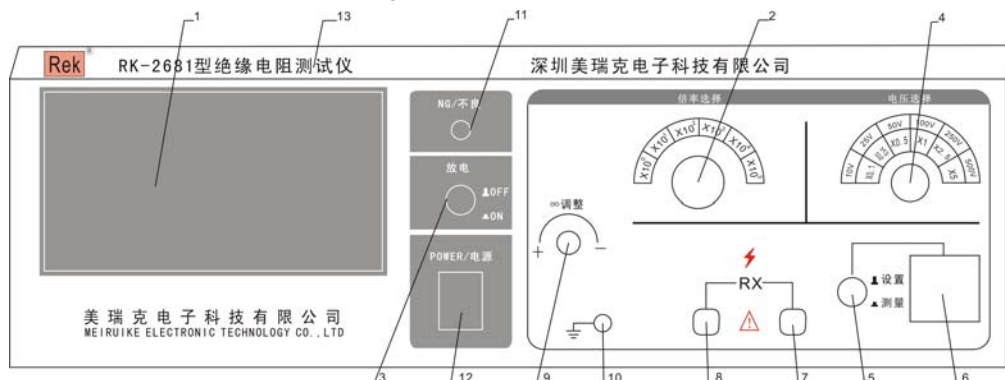
Chapter 3 Function Description

3.1. Panel：**Rk2681/2681A**typeInsulation Resistance meter（**100μA** panel）。

3.2. Magnification switch：there are six times stalls：$\times 10^0$, $\times 10^1$, $\times 10^2$, $\times 10^3$, $\times 10^4$, $\times 10^5$。

3.3. Discharge switch：when you put the switch in Discharge , the instrument discharge the tested parts.

3.4. Voltage choose switch：there are six voltage stalls：

RK2681：10V/25V/50V/100V/250V/500V
RK2681A：10V/50V/100V/250V/500V/1000V

3.5. Set/Measure switch：The switch of the panel state；

Set/Measure When turn it to setting，the display is Setting value；

Set/Measure When turn it to testing,，the display is measured value.

3.6. Dial setting
Composed by two **8421 to sort the resistance.**

3.7. Voltage output port：
Negative high voltage output，which connect with one port of the testing wire. Please be careful with it because there have high voltage.

3.8. Testing port：the port with connect with another port of the testing wire.

3.9. "∞" Adjustment potentiometer
"∞" Adjust the potentiometer and the magnification ranges to make the pointer of the meter to "∞".

3.10. Ground port.

3.11. When the light is well bright，it means the resistance of the measured element is less than the preset. And the measured element is not good.

When the light is not bright，it means the resistance of the measured element is over the preset. And the measured element is good.

3.12. Power switch.

3.13. Model，Name，Brand
Model：**Rk2681 or Rk2681A**
Name：Insulation Resistance Tester
Brand：**Rek**

Chapter 4 Operation Manual

Please read this manual carefully first to know the test method and the basic principles.

4.1. Test Method:
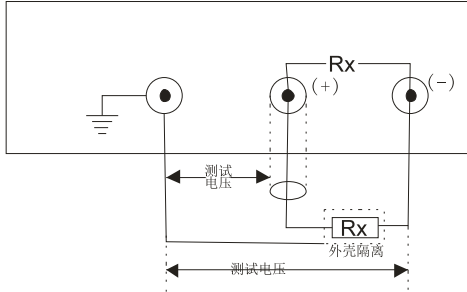

!!!
—— Note! ——

1. Please be careful while testing, there have high voltage on the tested thing.
2. If the component has polarity, please note the correct polarity connection.
3. Isolated test environment and control the temperature and humidity to ensure the accuracy and stability.
4. Don't let the Shield of Test port （＋）touch to the shell of the instrument.

4.2. You must to know before Setting the Test parameters.
4.2.1
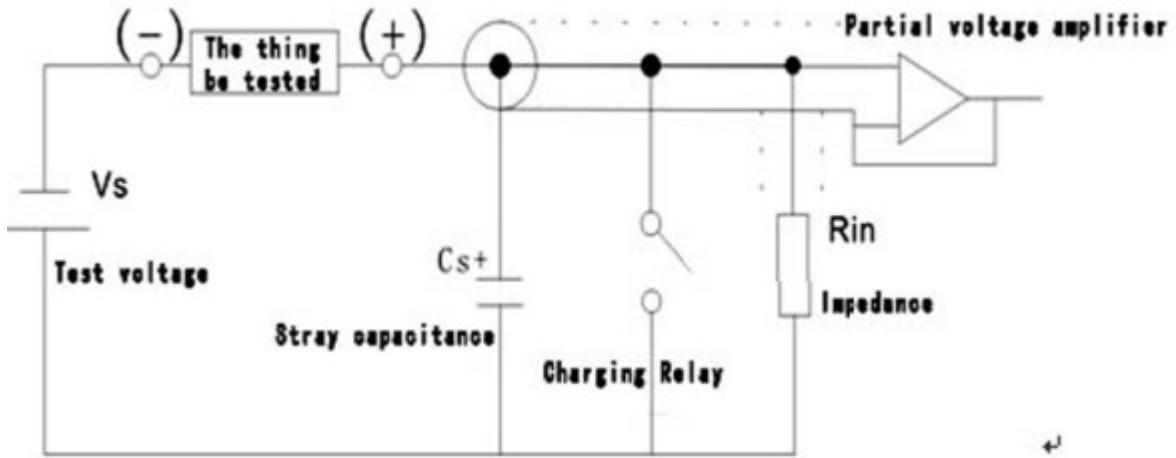
Equivalent circuit

Magnification	Impedance Input
10^0	1K Ω
10^1	10 K Ω
10^2	100 K Ω
10^3	1 M Ω
10^4	10 M Ω
10^5	100 M Ω

4.2.2. The figure shows the relationship between the input impedance and the magnification of the equivalent circuit. The test ranges of the measured part or machine and the relationship of the voltage and the magnification the following table:

4.2.3. Adjust every potentiometer s of the instrument，the pointer should pointer to the "∞" always.

When the range is over $\times 10^5$：

    a. When there is no testing fixer or the testing cable，the pointer of the panel should point to "∞";

    b. When the test port has been connected the testing fixture or the testing cable, and have not been connected with the measured part Rx, the pointer of the panel is allow to have a drift. Because the resistance at this time is about 100MΩ. It said that this testing cable just like a "antenna" which can receive the signal outside.

    When contact with **Rx**，there will be no interference signal disappears. And it will not affect the accuracy.

Rk 2681: Units Ω

倍率 范围 电压	10^0	10^1	10^2	10^3	10^4	10^5
10V	100K～1M	1M～10M	10M～100M	100M～1G	1G～10G	10G～100G
25V	250K～2.5M	2.5M～25M	25M～250M	250M～2.5G	2.5G～25G	25G～250G
50V	500K～5M	5M～50M	50M～500M	500M～5G	5G～50G	50G～500G
100V	1M～10M	10M～100M	100M～1G	1G～10G	10G～100G	100G～1T
250V	2.5M～25M	25M～250M	250M～2.5G	2.5G～25G	25G～250G	250G～2.5T
500V	5M～50M	50M～500M	500M～5G	5G～50G	50G～500G	500G～5T

Rk 2681A: Units Ω

倍率 范围 电压	10^0	10^1	10^2	10^3	10^4	10^5
10V	100K～1M	1M～10M	10M～100M	100M～1G	1G～10G	10G～100G
50V	500K～5M	5M～50M	50M～500M	500M～5G	5G～50G	50G～500G
100V	1M～10M	10M～100M	100M～1G	1G～10G	10G～100G	100G～1T
250V	2.5M～25M	25M～250M	250M～2.5G	2.5G～25G	25G～250G	250G～2.5T
500V	5M～50M	50M～500M	500M～5G	5G～50G	50G～500G	500G～5T
1000V	10M～100M	100M～1G	1G～10G	10G～100G	100G～1T	1T～10T

M:10^6 G:10^9 T:10^{12}

The parameter about Voltage, magnification

4. 3. Test parameter setting

    4. 3. 1. Voltage Setting

        Place the switch of the voltage band on the corresponding voltage profile, accordance with the relevant technical requirements. Please note at that the testing fixture has been put on electricity. Don't touch it to avoid an electric shock.

    4. 3. 2. Magnification Setting

    Please set the magnification according to the 4. 2. 2

    4. 3. 3. Maximum setting

    According to different technical requirement of the products set different values with the dial switch, the point display on the panel must meet the value on the dial switch. If the value be set is 2. 0, the point display on the panel should be 2. 0, but the lower limited insulation resistance value should not be 2. 0. For example, the voltage you set is 250V, the magnification is $\times 10^2$, the value on the dial switch is 2.0, then the lower limit set value is **$(2.0\times 10^2\times 2.5)M\Omega=500\ M\Omega$**

    4. 3. 4. Charge time setting

     a. When the part which be tested is a pure resistance, it does not need to be charge. You can read the insulation resistance directly.

     b. When the part which be tested is a pure **capacitance**, the charge time is not only depended on the capacitance and its quality, but also, but also be affected by the speed of testing.

     c. The discharge The current be discharged is constant current , the speed of discharge is depend on the voltage of the testing port and the capacity of itself,

J_{charge}=KCU。

4. 4. Examples

       If there have a manufacturer need to sort a group of metalized film capacitors, the model is CBB-250V-2.2μF, insulation resistance Rx> 100G.

4. 4. 1. Turn the Power switch at ON, connected to power, the power indicator light, you can test after preheating for 15 minutes.

    4. 4. 2. Adjust the voltage range to the **250V**, then the voltage output is **250V**, Take the magnification switch to$\times 10^4$, According to 4.2.2 the table. If the lower limited value at **100GΩ**, the data you must set is :

        $100\times 10^9/(2.5\times 10^4\times 10^6)=4.0$

    4. 4. 3. Set the appropriate charging time: **T=KCU**

        If **K=5000, C=2.2μF, U=250V**

        Then **T=5000$\times$2.2$\times 10^6$=2.75** seconds, the charge time is about 3 seconds.

    4. 4. 4. You can test with the testing fixer or the testing cable.

    4. 4. 5. Discharge to the measured capacitance, Please do that out of the machine. Because when the testing voltage is 250V, the resistor of the discharge in the machine is about 2.5KΩ, it needs some time to discharge.

Chapter 5 Calibration Inspection and maintenance

5.1. Generation and been testing of DC Power supply

5.1.1. Generation of the 10 V DC Power

It generate by **resistance R9** , **R18** and Potentiometer**W1**，adjust Potentiometer **W1** you can adjust the accuracy.

5.1.2. Generation of the other DC Voltage (**Rk2681A**,for example)

The voltage generated by V20 regulator tube is 5V.And the voltage generated by N1 is 0V.The current generated by R17 and W2 is constant current. Adjust W2，let it generate1mA constant current. The voltage generated by R51、R52、R53、R54、R55、R56、R57、R58， are different voltages. For example,R51generate50Vvoltage，R52generate100Vvoltage， R53 and R54generate250Vvoltage ， R55 and R56generate500Vvoltage，R57 and R58 generate 1000V voltage.

5.1.3. If there is too much error of the voltage or there is no voltage, please check each circuit elements of the 5.1.2, and check is there damage about the circuit elements N1, V27, V28, V29 and peripheral resistance of diode, check and replacement.

5.1.4. Please check the connection with the following figure. Its test should meet to 2.1, if not satisfied, check the components and accuracy of the components with5.1.1-5.1.3.
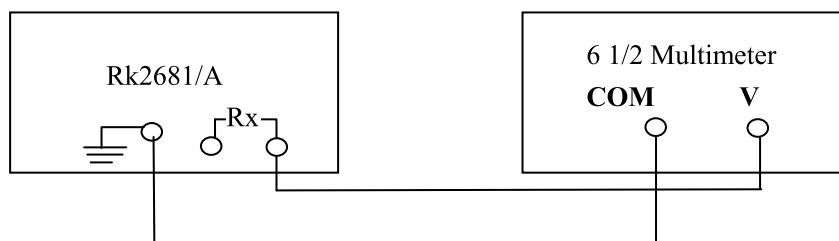

5.2. The testing of the Max charge current

5.2.1. The charge current is constant current when the tester discharge to the parts, the current I=20mA.It depend on the circuit N2，R44，R25，R2 所，I=R2*Vcc/（R12*R44）.

5.2.2. The testing of the Max discharge following figure，put the voltage switch at **100V，** put on the switch **K** less than 10 seconds ,turn off **K** after testing.

If the charge current is error too much, please check it according to 5.2.1.You can also amend the charge current according to 5.2.1, you just need to amend the ratio of the R2 and R25 resistor.

Rk2681/A

Rx

6 1/2 Multimeter

COM   I

K
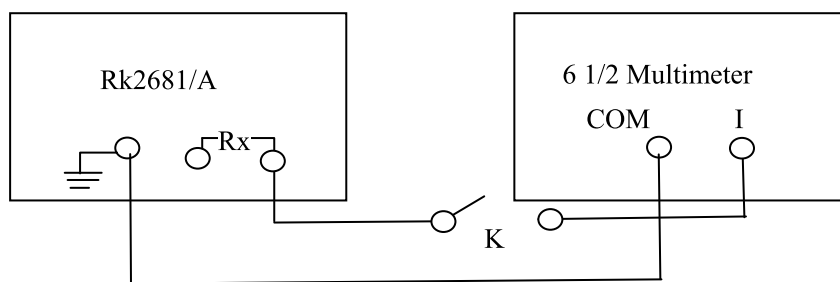
5. 3. 1. Connect the standard resistor at the testing port and test it according to the following table. The error should meet to the 2.3 requirements.

Test voltage	Standard Resistance	Measured resistance
100V	1M	
	10M	
	100M	
	1G	
	10G	
	100G	

Standard Resistance	Test voltage	Measured resistance
100M	10V	
	25V	
	50V	
	100V	
	250V	
	500V	
	1000V	

Chapter 6 **Warranty**

Shenzhen Meiruike Electronic Technology Co., Ltd warrants this instrument to be free of maintenance for 1 year from the date of shipment. The user is responsible for repairing charges resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized maintenance during warranty period.

Scan the qr code with a browser.
Vsit our website for more product information.
SHENZHEN MEIRUIKE ELECTRONIC TECHNOLOGY CO.,LTD