RW ENERGY

Product Manual

http://www.rw-relay.com

# RWK-252H

## CAP-Switch Controller

6kV···40.5kV...

Precise control

High reliability

Wide range of adaptability

Intelligent monitoring and analysis


Comply with IEC / CEI /GB/JB/DL standards

Provided customized manufacture

Whole solutions for design, assembly, test...

Accountable solution for safety and reliability

Wide range offering, easy business and convenient installation

Please read this chapter carefully before using this product!

This chapter introduces the safety precautions before using this product. Please make sure the content of this chapter is fully read and understood before installation and usage. Our company will not undertake any responsibilities for any damage or injury caused by improper operations because of ignoring relevant warning in this operation instruction.
Before operating this device, relevant professional personnel shall read this instruction carefully and well understand the content.

Operation instructions and warnings:

The following standard definitions will be adopted in this operation instruction.
Danger! Ignoring of safety precautions may cause personal death, serious personal injury or serious equipment damage.
Caution! Ignoring of safety precautions may cause a slight personal injury or equipment damage, especially the damage of device or the equipment protected by the device.
Danger!When the primary system is live working, secondary open circuit for the current transformer connected to the device is absolutely forbidden, and the open of this circuit may cause extremely dangerous high voltage.
Warning!Some parts of the device may have high voltage when the electrical device is running. Improper operation may cause serious personal injury or equipment damage.
Only qualified professional personnel are allowed to operate the device or work nearby the device. The operators professional shall well understand the precautions, working flows and safety regulations mentioned in this instruction.
Caution!Grounding terminals of the device shall be firmly grounded.The device is only permitted to run in atmospheric environment that specified in the technical specifications, and abnormal vibrations shall be avoided in its running environment.
When connect the AC voltage current circuit or power circuit, please make sure they conform to the rated parameters of the device.
When the output terminals of the device are connected to external circuit, please check carefully the voltage of external power to prevent overheating of the circuit.
Carefully check the cable connected to the device, preventing applying too much external force on it.

Zhejiang Rockwill Energy Technology Co., Ltd. is a technology enterprise specializing in providing complete solutions for power automation system and related automation system supporting equipment.

The company has a long-term strategic cooperation with internationally renowned middle and high voltage electrical equipment R & D and manufacturing companies and research institutes, and has jointly developed a series of high-quality automation products,. The company has also married with the provincial intelligent high-voltage switch laboratory to jointly develop a new generation of intelligent synchronous switch measurement and control devices, electronic transformers, voltage sensor processing units, etc., and has achieved some fruitful technical achievements and accumulated a large number of industry professional and technical elites with excellent experience.Solid talent base, advanced production equipment, perfect quality system, strict testing means, is a strong guarantee for the company's product quality alone.

In addition to providing a rich choice of products, we can provide you with technical solution support services, you only need to tell us your needs, our technical staff will be tailored for you to design a complete set of product solutions

The company is renowned at home and abroad for providing high-quality products and services. In addition to the domestic market, the products are currently exported to South America, Central Asia, the Middle East, Central Europe, Southeast Asia, Africa and other places.We always adhere to the belief of growing together with customers, and strive to provide safer, more reliable, more advanced and more humane automation system solutions and equipment.

ROCKWILL®, China. Provide with best support.

If you have any question please consult below:

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https://www.rw-relay.com/

ROCKWILL® Energy strives to bring our customers the latest technology and competitive pricing and best service for distribution automatic.

RWK-252H capacitor switch controller cooperate with reactive power compensation device or manual operation, to implement the switch of the capacitor. The controller can record self-inspection event, device start time, device action event.

RWK-252H series is suitable for up to 35kV outdoor switch gear using, include: vacuum circuit breakers, oil circuit breakers and gas circuit breakers.

RWK-252H capacitor switch controller control the permanent magnet circuit breaker, with fast response speed and stable performance.

## Service environment

| | |
|---|---|
| Operating Temperature Range: | -10°C -+55° |
| Storing temperature Range: | -40°C - +70°C |
| Operational Humidity test: | 56 days at 40°C and 93% relative humidity |

## 1.Inputs and Outputs:

### Auxiliary Supply

| | |
|---|---|
| AC Voltage | On request |
| Power consumption | ⩽300W |

### Binary Inputs

| | |
|---|---|
| Number | 6 |
| Operating Voltage | 24V DC |
| Maximum dc current for operation | 2mA |

### Binary Outputs

| | |
|---|---|
| Number | 2 |
| Operating Voltage | DC220V |
| Operating Mode | Pulsed |
| Operating Time from Energizing Binary Input | <20ms |

## 2.Unit Design:

| | |
|---|---|
| Indication | 16 Character 4 line Display & 9 LEDs |
| User Interface | 12 Navigation Keys |
| Weight | ＜15kg |

## 3.Data Storage:

| Events | Number |
|---|---|
| Trip | 100 times |
| Start | 100 times |
| Alarm | 100 times |
| Singal | 150 times |

4.Mechanical Tests ：

Vibration (Sinusoidal) --- IEC 60255-21-1 Class I

| Type | Level | Variation |
|---|---|---|
| Vibration response | 0.5gn | ≤5% |
| Vibration withstand | 1.0gn | ≤5% |

Shock and Bump --- IEC 60255-21-2 Class I

| Type | Level | Variation |
|---|---|---|
| Shock response | 0.5gn, 11ms | ≤5% |
| Shock withstand | 15gn, 11ms | ≤5% |
| Bump test | 10gn,16ms | ≤5% |

Shock and Bump --- IEC 60255-21- 3 Class I

| Type | Level | Variation |
|---|---|---|
| Seismic response | X-plane-3.5mm<br>Displacement below<br>crossover freq (8-9Hz)<br>1gn and above<br>Y-plane-1.5mm<br>Displacement below<br>crossover freq (8-9Hz)<br>0.5gn above | ≤5% |

5.Mechanical Classification：

| | |
|---|---|
| Durability | >10000 operations |

6.Electrical Tests：

Insulation --- IEC 60255-5

| Type | Level |
|---|---|
| Between any terminal and earth | 2.0 kV AC RMS for 1 min |
| Between independent circuits | 2.0 kV AC RMS for 1 min |
| Across normally open contacts | 2kV AC RMS for 1 min |

High Frequency Disturbance --- IEC 60255-22-1 Class III

| Type | Level | Variation |
|---|---|---|
| Common (longitudinal) mode | 2.5 kV | ≤5% |
| Series (transverse) mode | 1.0 kV | ≤5% |

High Frequency Disturbance --- IEC 60255-22-2 Class IV

| Type | Level | Variation |
|---|---|---|
| Contact discharge | 4.0 kV | ≤5% |

Fast Transients --- IEC 60255-22-4 Class A (2002)

| Type | Level | Variation |
|---|---|---|
| 5/50 ns 2.5 kHz repetitive | 2 KV | ≤5% |

Surge Immunity --- IEC 60255-22-5

| Type | Level | Variation |
|---|---|---|
| Analog Inputs:Line to Earth | 2.0 kV | ≤10% |
| Case, Aux Power & I/O: Line to Earth | 2.0 kV | ≤10% |
| Analog Inputs:Line to Line | 1.0 kV | ≤10% |
| Case, Aux Power & I/O: Line to Line | 1.0 kV* | ≤10% |

* Note 45ms DTL pick-up delay applied to binary inputs.

Conducted Radio Frequency Interference --- IEC 60255-22-6

| Type | Level | Variation |
|---|---|---|
| 0.15 to 80 MHz | 10 V | ≤5% |

Radiated Radio Frequency --- IEC 60255-25

| Type | Limits at 10 m, Quasi-peak |
|---|---|
| 30 to 230 MHz | 40 dB(μV) |
| 230 to 10000 MHz | 47 dB(μV) |

Conducted Radio Frequency

| Type | Limits | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15 to 0.5 MHZ | 79 dB(μV) | 66 dB(μV) |
| 0.5 to 30 MHZ | 73 dB(μV) | 60 dB(μV) |

Radiated Immunity --- IEC 60255-22-3 Class III

| Type | Level |
|---|---|
| 80 MHz to 1000 MHz Sweep | 10 V/m |
| 1.4GHz to 2.7GHz Sweep | 10 V/m |
| 80,160,380,450,900,1850,2150 MHz Spot | 10 V/m |

7.Climatic Tests:

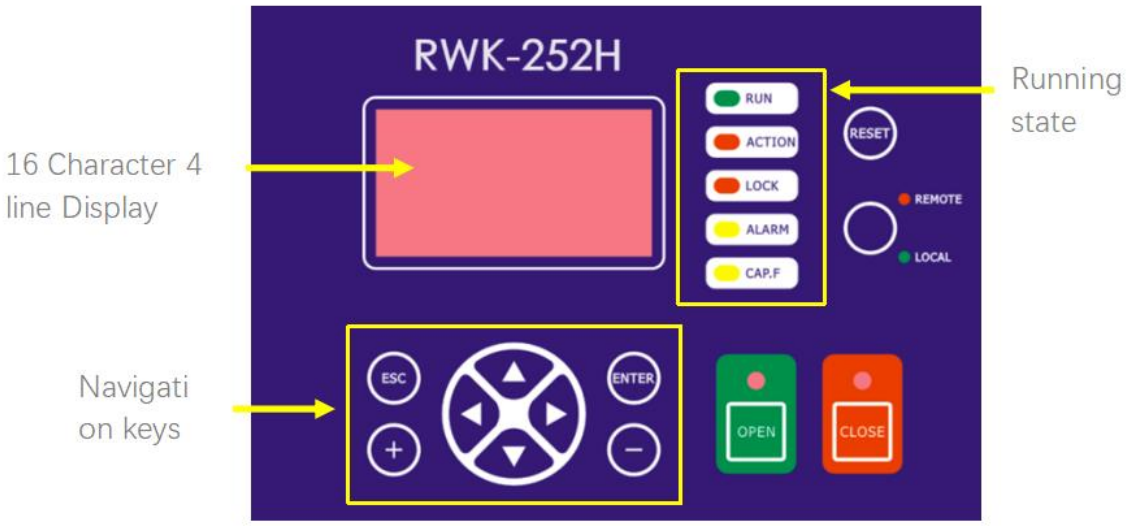
Temperature --- IEC 60068-2-1/2

| Operating Range | -10°C to +55° |
|---|---|
| Storage range | -25°C to +70° |

Humidity --- IEC 60068-2-78

| Operational test | 56 days at 40°C and 93% relative humidity |
|---|---|

The operator interface is designed to provide a user friendly method of controlling, viewing menus, entering settings and retrieving data from the relay. Eight buttons are provided for navigation around the menu structure.



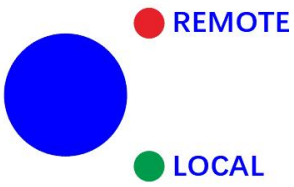

1.LEDs:

| | |
|---|---|
| **RUN** used to indicate that the system is currently running normally. |  |
| **ACTION** used to indicate that the operation has occurred. | |
| **LOCK** used to indicate that the device is locked. During the Trip dead time, the device will be locked and unable to continue operation. | |
| **ALARM** used to indicate that the device has alarm information. | |
| **CAP.F** used to indicate insufficient power supply voltage for operation | |

2.Pushbuttons:

| Button | Function |
|---|---|
| RESET | Clear trip-latched targets Action, Alarm |
| ENTER | Select displayed option or setting. |
| ESC | Cancel command edit or escape to upper command level. |
| ▲ | Scroll up on display. |
| ▼ | Scroll down on display. |
| ◀ | Scroll left on display. |
| ▶ | Scroll right on display. |
| ✚ | increment value. |
| ▬ | decrement value. |

3.Operator Controls:

| | |
|---|---|
| The key is used to choose the mode of remote and local, In remote mode, operations can be performed through the RF remote controller or remote input signal①; In LOCAL mode, operations can be performed through the button from the panel. |  |
| Press the Trip operator control pushbutton to open the controller (and take the control to the lockout state if the open dead time is set). Corresponding LED illuminates to indicate the reclose is opened.It must in LOCAL mode. |  |
| Press the CLOSE operator control pushbutton to close the controller (and take the control to the lockout state if the close dead time is set). Corresponding LED illuminates to indicate the reclose is closed. It must in LOCAL mode. |  |

① Remote input signal: The signal is connected externally. Please refer to the drawing for the specific connection method.

4.Default Display:

The LCD default display shows the state of the breaker, the operation counts, the remaining blocking time.

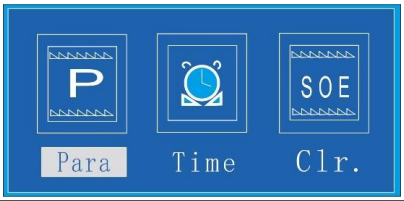
Note: The light of the LCD will turn off after five minutes, if you do not operator the reclosing.


Primacy Menu

5.Submenu:

Edit submenu

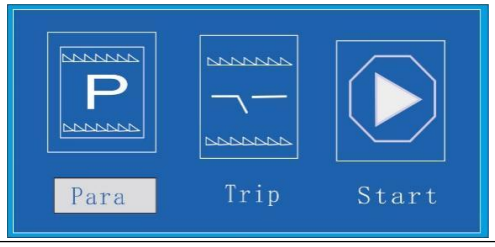
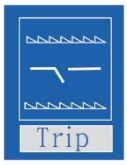
Chose the EDIT, the screen will enter the submenu of the edit menu, the sub-menu includes “Para”、“Time”、“Clr”、 “Fac.”.

| | |
|---|---|
|  |  |
| Submenu of edit | |
|  | Enter "Para" sub-menu, you can modify the parameters. Like over alarm count, close and trip pulse time, password,close and trip dead time.<br>The password is ”0099”. |
|  | Enter the "Time" submenu will modify or check the time. |
|  | Enter "Clr" sub-menu, you can clear out the trip report, the self-test report, remote reporting. The save password is ”0099”. |

| | |
|---|---|
|  | Enter "Fac." Sub-menu, it is used to modify operation counts (not allowed to be changed arbitrarily), device number, etc.<br>The password is "0102" and "0304", need to enter password twice. The save password is "0099". |

View submenu

Choose the VIEW, the screen will enter the submenu of the view menu, the sub-menu includes "Para", "Trip", "Start", "Alm.", "Sig.","Ver".

| | |
|---|---|
|  |  |
| View submenu | |
|  | Enter "Para" sub-menu, you can view the parameter value. |
|  | Enter "Trip" sub-menu, you can view the operation reports of the controller. |
|  | Enter "Start" sub-menu, you can view the controller start time. |
|  | Enter "Alm" sub-menu, you can view the alarm reports of the controller. |
|  | Enter "Sig. " sub-menu, you can view the signal changed information. |
|  | Enter "Ver" sub-menu, you can view the product model, serial number and date of manufacture. |

## 6.Password Interface:

According to the above operation, before entering each item will first enter a password input interface to prevent professional staff misuse. The device original password is “0099”, as shown below, press [←] and [→] keys to switch, press the [+] and [-] keys to increase and decrease the number of line with the correct password press “Enter” button to enter.

| | |
|---|---|
|  | Password interface |

## 7.Parameter Setting:

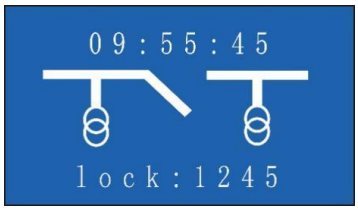
Select the “Para” in the Edit submenu item, press the function key “Enter” to enter the password screen, enter the correct password to enter the “Para” menu.

| No. | Value | Name | Scp |
|---|---|---|---|
| 1 | Close pulse time | The time of close pulse | 020 ~ 999ms |
| 2 | Trip pulse time | The time of tirp pulse | 020 ~ 999ms |
| 3 | Close dead time | The lock time after close | 00000~60000S |
| 4 | Trip dead time | The lock time after trip | 00000~60000S |
| 5 | Over alarm count | The close operation times over count, the controller will display alarm | 00010~50000 |
| 6 | Operate password | The password to operate controller | 0000~0099 |
| 7 | Telesignal time | The time to confirm the telesignal | 0.005~0.999S |

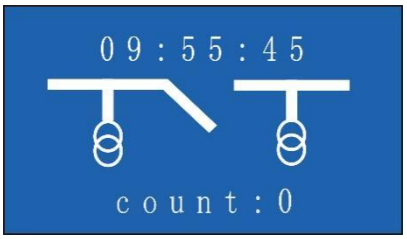
Use the “up” or ”down” button to page up or page down select the parameter value which you want to set, use the ”+” or ”-” button to edit the value.

If the trip dead time is set to 1800s, after open the switch, the controller will lockout. And the close operation will be locked in 1800 seconds. The same as close dead time.

The lock time will show in the default interface if it is in the lock state, after the seconds which show in the default interface the controller will be unlocked. The reset command (panel reset key or RF remote controller) can unlock the state.

| | |
|---|---|
|  | Lock interface |

In the unlock situation or after being reset, the interface will default to display the count of close operation.

| | |
|---|---|
|  | Count interface |

## 8.Report:

The following is an explanatory note of various reports:

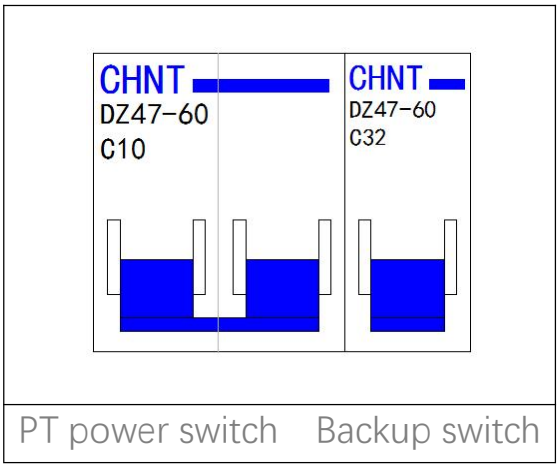
| No. | Report information | explanatory note |
|---|---|---|
| 1 | Switch off remote switch off<br>RF switch off | Local open from panel<br>remote open from input signal①<br>RF remote controller open |
| 2 | Switch onremote switch on<br>RF switch on | Local close from panel<br>remote close from input signal①<br>RF remote controller close |
| 3 | Alm: control loop break | Disconnect the breaker or breaker loop fault alarm |
| 4 | Alm: power under voltage | Insufficient power supply voltage for operation alarm |
| 5 | Alm: trip over count | The close operation times over count |

## 1.RF Remote Controller:

| | |
|---|---|
|  | Function of each key<br>A: Close<br>B: Trip<br>C: Unlock<br>D: Reset |

Note:
1. To prevent accidental movement, it is necessary to press the unlock button for 3 seconds before performing the operation.
2. The effective distance of RF remote controller is 30 meters.

## 2.Panel Switch:




Turn on the backup switch when using battery power and press activate button 1 seconds, turn on the PT power switch when using external PT power. After being put into use, both switches must be turned on simultaneously. If using DC screen power supply, it is necessary to explain in advance.

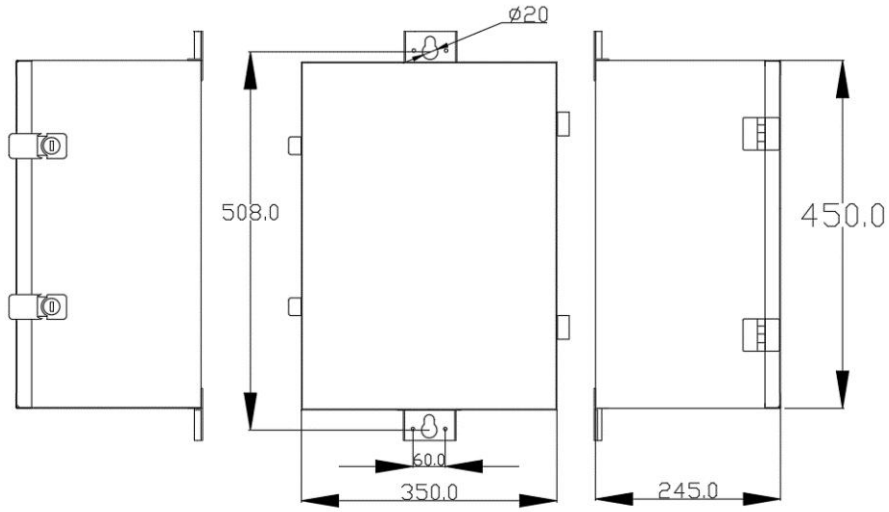
3.Surge Protector:


Surge protector

It can detect and limit voltage surges caused by lightning strikes, power faults, power switch operations, etc., thereby protecting electronic devices from damage.
When the indicator above changes color to red, it indicates that it has been damaged.

Danger:

The dangerous voltage with the device maybe caused in the permanent damage of equipment or personnel casualty during installing the controller. These voltages mainly distributes at terminal bar of device and circuits of AC current input, AC voltage input, digital input, IGBT output and operation power supply., etc. This device's installation, debugging and maintenance can only be operated by technical staff who has been authorized and trained strictly.




Dimensions

Installation of Box Body:

Please fasten it upon support shelf with matched M10 × 20 stainless bolts during installing the product. (Support shelf is provided by user, please point it out if needed to be provided by manufacturer)

As shown above, place it up side. Don't place it up side down or in slope.

The equipment must be reliably grounded.

## 1. Maintenance:

The equipment is prohibited from being placed flat outdoors or the external door has not been closed for a long time.

When the device is idle, it must be charged every 2 months for no less than 24 hours each time. When charging, inject the required power supply of the device and simultaneously turn on both switches on the panel.

The controller is not recommended to be idle for a long time.

## 2. Decommission:

Shut-down power supply, shut-down device power supply, turn off external power supply switch of the device. Disconnect all power cables. Disconnect all power cables connected to the device.

Danger: Before disconnecting all power cables connected to the device power module, it must confirm that the external power switch is turned off to avoid danger.

Danger: Disconnecting all power cables connected to the device alternating current module, it must confirm that the equipment corresponding to input alternating component has stopped operation to avoid danger.

When the above steps are completed, loosen the fix screws and dismantle the device from the display cabinet.

Danger: When neighboring equipment is in operation, it must strictly confirm the safety distance between the dismantled device and other device in operation and unskilled professional shall take particular caution.

## 3.Disposal:

When dispose decommissioned device, please follow relevant regulations of the country where the product is used for the disposal of scrapped electronic products.

Caution: It must strictly adhere to relevant regulations of the country where the product is used for the disposal of scrapped electronic products.

4.Parts Attached With The Device：

| Name | Quantity | Collocation | Usage or Description |
|---|---|---|---|
| Box door key | 2 | Standard | Open the box |
| User Manual | 1 | Standard | Please read it carefully before use the device, the wiring diagram is attached. |
| Inspection report | 1 | Standard | Factory inspection report |
| RF remote controller | 1 | Selectable | Telecontrol the close and trip of switch within 30 meters |
| Control Cable | 2 | Standard | Customizable length |

Field service operation and warranty issues:

ROCKWILL® can provide competent, well trained field service representatives to provide technical guidance and advisory assistance for the installation, overhaul, repair and maintenance of ROCKWILL® equipment, processes and systems.

ROCKWILL® service Tel: +86 (577) 27819965
Email: Support@rw-relay.com
Or check the website information: https://www.rw-relay.com/