ROCKWILL

THREE PHASE MECHANICALEL ECTRONIC SECTIONALIZER

User Manual



RDK-15/300

ZHEJIANG ROCKWILL ELECTRIC GROUP CO., LTD

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Overview

The three phase mechanical electronic sectionalizer is a high-voltage switchgear independently developed by our company to meet domestic and overseas market demands and adopt the latest international technologies. It is applicable to three-phase AC power systems with rated voltages ranging 15 kV and rated frequency of 50/60 Hz. As an automatic protective switch, it coordinates with reclosers (or circuit breakers equipped with autoreclosing functions) to automatically isolate faulty line segments while maintaining normal power supply to fault-free sections.

The sectionalizer features memory and reset functions， memory time is the duration during which the sectionalizer records the number of fault current occurrences, reset time is the time required for the sectionalizer to restore to its initial pre-counting state after each counting cycle.

Upon line faults, the sectionalizer distinguishes between transient and permanent faults. When preset conditions are met, it automatically trips via cutout action to isolate faulty segments, ensuring continuous power supply to unaffected line sections and enhancing overall power supply reliability.

This AC high-voltage cutout sectionalizer adopts microcomputer control and trip opening mechanism, featuring self-power supply without external auxiliary power and maintenance-free operation.

Revision History

Revision No.	Date	Description
V2.1.0	July. 2026	Initial version

Introduction

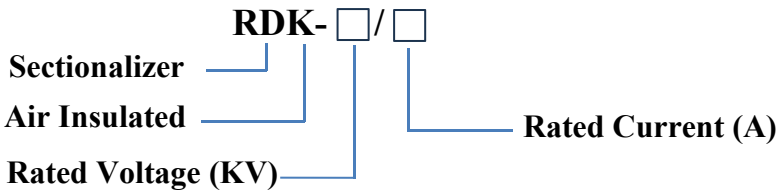
Principle and Operation Instructions

After closing the sectionalizer with an operating stick, the electronic controller inside the sectionalizer starts counting once the line current exceeds the set pickup current. When the upstream switch trips and the line loses load current, and the preset counting cycles (1, 2, 3 or 4) are completed, the controller outputs an actuating signal to energize the mechanism coil. The coil drives the moving armature of the pre-charged energy storage mechanism to release the trip detent, triggering tripping. The conductive assembly drops down to isolate the faulty line segment. The recloser (or autoreclosing circuit breaker) then successfully recloses to restore power to fault-free sections, confining power outages to the minimal scope and ensuring normal operation of healthy feeders. In case of a transient fault, the sectionalizer will revert to its pre-fault initial state upon expiry of the memory time.

Service Conditions

1. Ambient temperature: -40℃ ~ +60℃.
2. Altitude: 2000 m maximum.
3. Wind pressure: not more than 700 Pa.
4. External insulation pollution class: Class IV.
5. Ice coating thickness: not exceeding 1 mm.

Model and Nomenclature Explanation

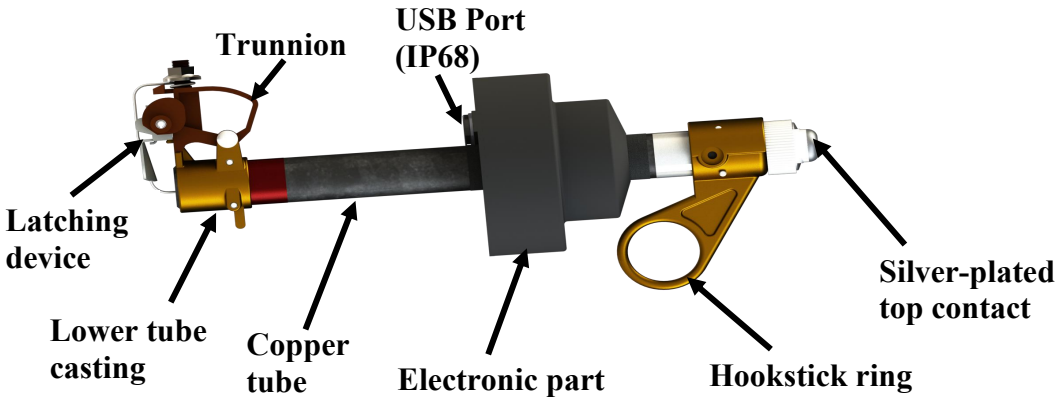


Technical Parameters

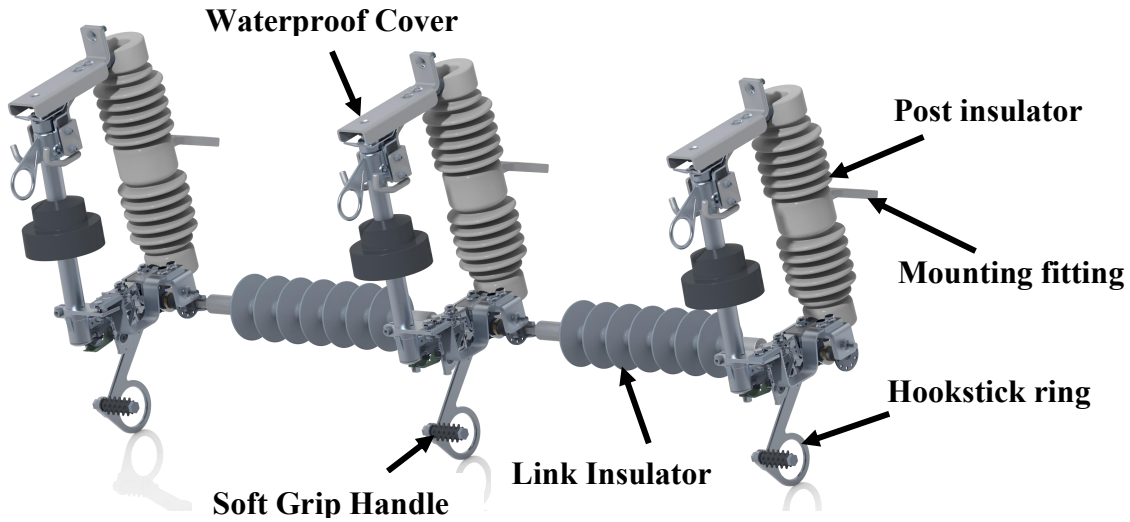
Rated Power Frequency	50 Hz / 60 Hz Selectable (60Hz default)
Rated Voltage	15 kV
Rated Continuous Current	300 Amps
Minimum Line Current*	10 Amps
Current Measurement Accuracy	± 5%
Main Circuit-resistance	≯300μΩ
Minimum Actuating Current	Programmable between 16A and 480A
Number of Counts	Programmable for 1, 2, 3, 4
Reset Time	Programmable, 30 sec. to 300 sec. with resolution of 1 second
Deadline detection	≤200mA
Types of Inrush Currents Detected	Symmetrical and Asymmetrical
Total execution time	130msec (±20msec)
Short Time Current Withstand, 15 Cycle (at 60Hz)	8600 Amps Symmetrical
1 Second	4000 Amps Symmetrical
3 Seconds	3200 Amps Symmetrical
Momentary Current Rating	12kA Amps Asymmetrical
Surge Current Withstand	65KA

*The Electronic Mechanical Sectionalizer requires a line current greater than 5A in order to be fully charged during at least 15 seconds. After the condition of the device is fully charged the line current can vary as low as 3A and it will continue to be operative. Once current falls below 3 A, the internal energy- storage capacitor discharges gradually. With zero- current condition, power- off takes place in about 30s.

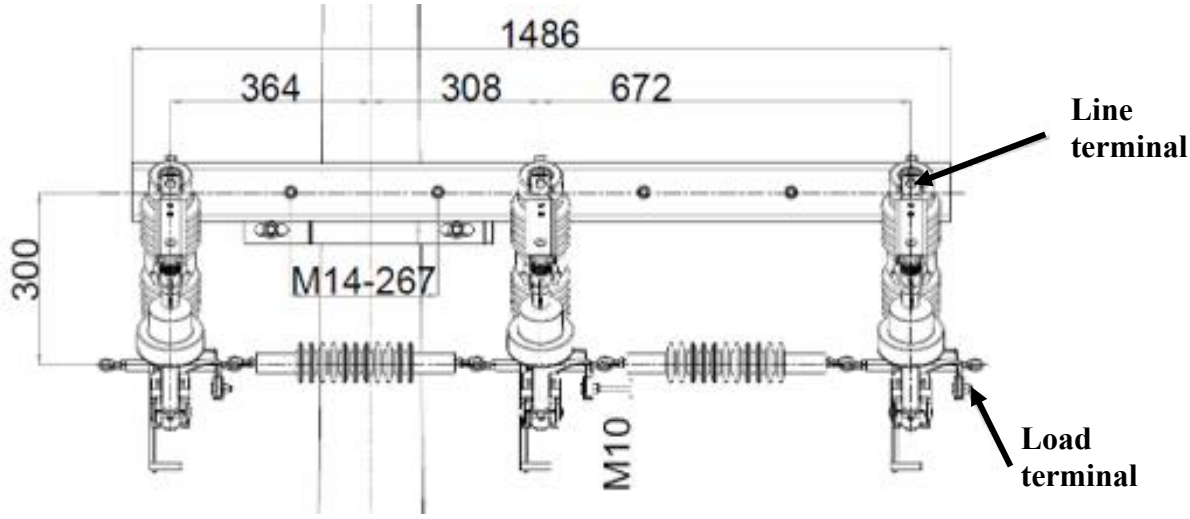
Appearance and Dimensions



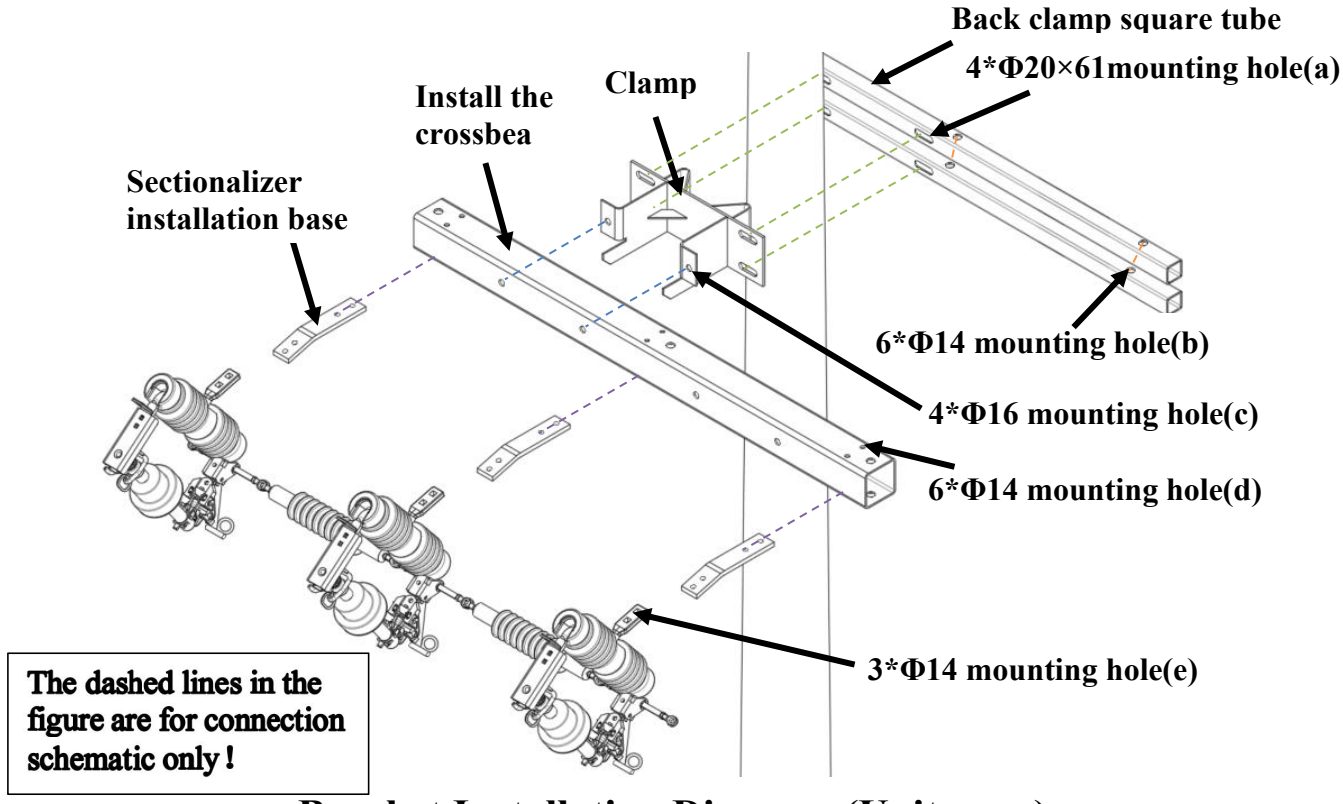
Copper tube diagram



Three-Phase interlock device diagram



Mounting and dimension diagram (Unit: mm)



Bracket Installation Diagram (Unit: mm)

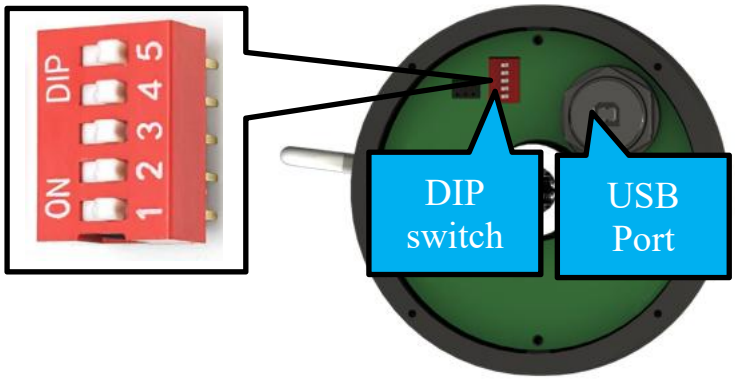
Screw Allocation Specification

a: M18x350-4 pcs
b: M12x130-3 pcs
c: M14x130-2 pcs
d: M12x230-6 pcs
} Packed separately

e: M12x50-6 pcs (Already mounted on porcelain insulator fittings)

Switch Gear Description

The RDK series sectionalizer supports USB configuration mode (the factory default) and DIP switch mode. First, use a Phillips screwdriver to loosen the four M3 screws, then use the supplied wrench to unscrew the USB waterproof cap. Pick up the cover plate, a red DIP switch can be observed inside the device, it is equipped with five white slide toggles on its surface. As shown in the figure below:



① DIP switch mode is provided as a backup function. Do not frequently remove the outer cover to avoid compromising waterproof performance!

② It shall only be used in emergency situations!

③ Use USB mode as the priority!

Slide toggle to ON side = ON (Closed); Slide toggle to number side (1-5) = OFF (Open)

1. USB Mode (Default, SW3/SW4/SW5 combination)

   SW3=OFF, SW4=OFF, SW5=OFF

   Device enters USB mode, SW1/SW2 count settings are disabled.

2. Count Function (Effective in non-USB mode, 4 options. SW1/SW2 combination)

   Count 1 time: SW1=OFF, SW2=OFF Count 2 times: SW1=OFF, SW2=ON

   Count 3 times: SW1=ON, SW2=OFF Count 4 times: SW1=ON, SW2=ON

3. Gear Mode (7 Gears, SW3/SW4/SW5 combination)

   Gear 1: SW3=OFF, SW4=OFF, SW5=ON

   Gear 2: SW3=OFF, SW4=ON, SW5=OFF

   Gear 3: SW3=OFF, SW4=ON, SW5=ON

   Gear 4: SW3=ON, SW4=OFF, SW5=OFF

   Gear 5: SW3=ON, SW4=OFF, SW5=ON

   Gear 6: SW3=ON, SW4=ON, SW5=OFF

   Gear 7: SW3=ON, SW4=ON, SW5=ON

Use the Drop-out Sectionalizer Config Tool for gear-related parameter setup, usage instructions are provided in the subsequent chapter.

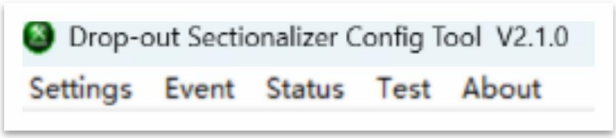
After configuration, ensure the USB waterproof cap and screws are securely fastened!

Drop-out Sectionalizer Config Tool

1. Double-click to launch the Drop-out Sectionalizer Config Tool, then enter your username and password. The default username is **admin** and the default password is **123**. Chinese or English language can be selected on this interface simultaneously. As shown in the figure below:



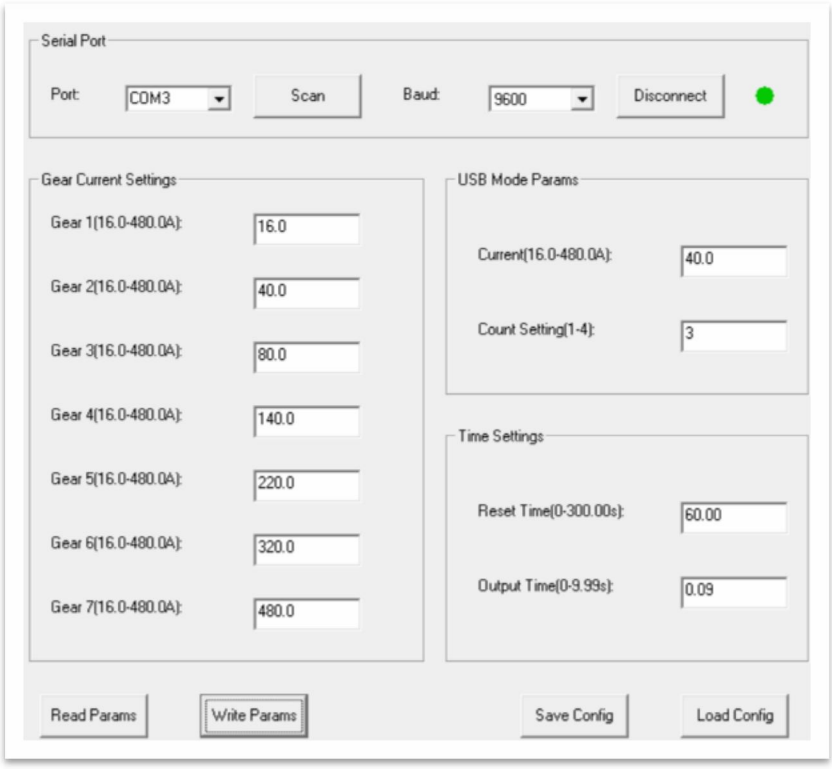
2. The maintenance tool consists of four menu tabs: Setting, Status, Test and About. The setting menu contains Parameters (**Home Tab**), Change Password and Language Switch options. The Event tab is used for viewing the report. The Status tab is used for viewing real-time operating status. The Test tab contains items for device testing and message viewing. The About tab displays the software version number and brief operating instructions.



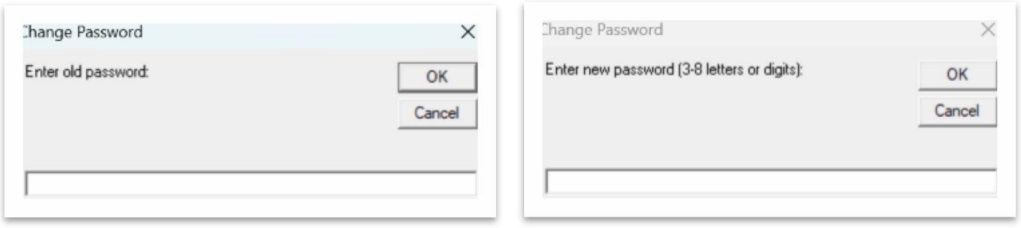
3. At the top of each page, connect the USB cable to the USB port and install the driver accordingly. The driver will be installed automatically on some computers; if automatic installation fails, install the driver using the supplied driver package. Click **Scan** in the Port column of the maintenance tool. After the COM port is automatically detected, click **Connect**. If the connection is established successfully, the status indicator will change from red to green. As shown in the figure below:



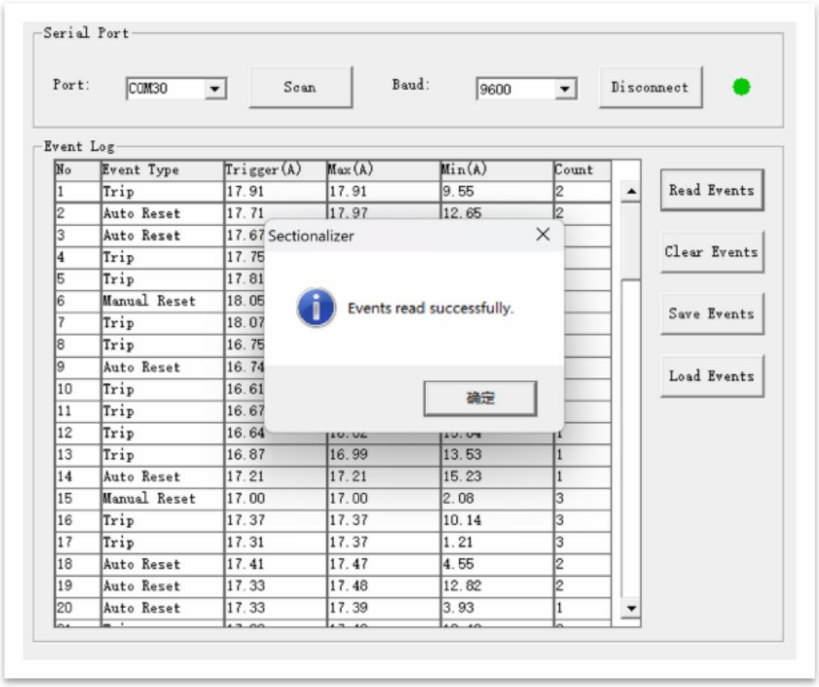
4. All configurable parameters are listed below. **Gear Current Settings** on the left side corresponds to the current configuration for Gear 1 to Gear 7. The upper area on the right is used to set the **current value** and **count times** under USB mode, while the lower area on the right is for configuring the reset time and output control time.
Firstly, click the **Read Params** button at the bottom. Modify the parameters after a successful read prompt is displayed, then click **Write Params** once configuration is finished. The buttons in the lower right corner are used to save and load parameter files for device configuration management. Click **Save Config** to export the parameters as a file to your local computer; click **Load Config** to import parameter files from the computer. Finally, click **Write Params** to write the loaded parameters into the device.
Note: It is not recommended to modify the Output time normally.



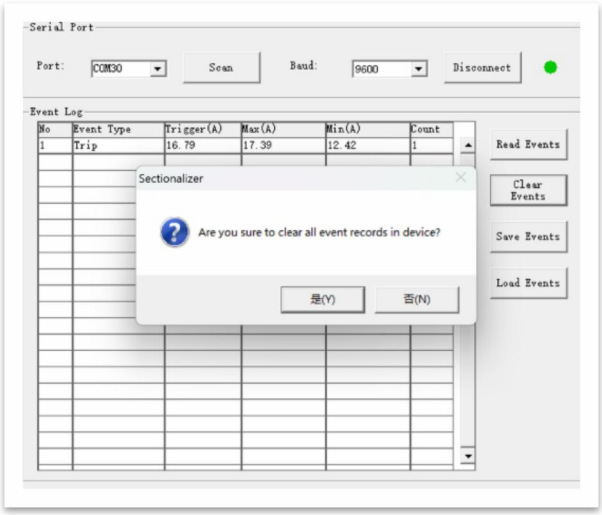
5. Click **Change Password** under **Settings**. In the pop-up window, enter your old password and click OK. A second pop-up window will appear for you to input your new password (Twice input). New password requirements: 3–8 characters, consisting of numbers and letters, passwords are case-sensitive.

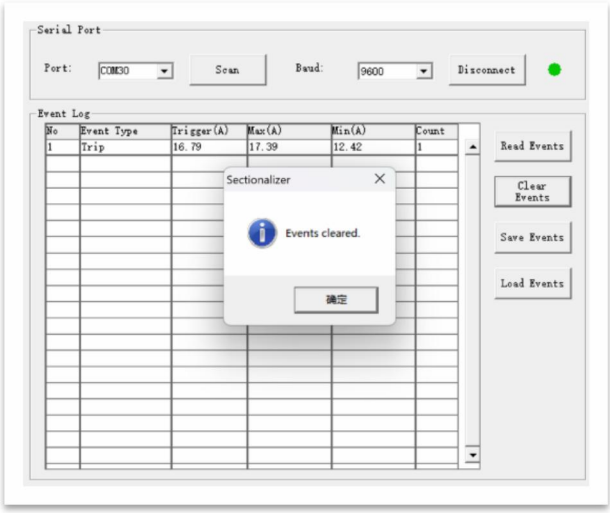


6. Click **Event** to enter the second interface. On this interface, you can read, clear, save and load event records. Up to 100 records are storable, Record information covers event types (Trip, Auto Reset, Manual Reset), last trigger current, maximum measured current, minimum measured current and cycle count. Click the **Read Events** to retrieve all event records from the device, see figure below. Serial numbers in ascending order represent events chronologically.



Click the **Clear Events** to clear all the report of the device, the system will prompt a confirmation window for clearing records, please operate with caution.





After successful clearing, historical records cannot be retrieved. In addition, once the storage capacity of 100 records is reached, earlier records will be overwritten.
Events are saved as .CSV files for later review.

7. Click **Status** to enter the third interface. This page displays the communication status between the device and maintenance software (green indicates normal communication), real-time current, accumulated counting times, current detection status, configured gear levels, as well as the specific setting values of corresponding current and count parameters.



8. Under the **Test** menu, there are several functions which are generally not required for regular use. Their respective functions are introduced below:

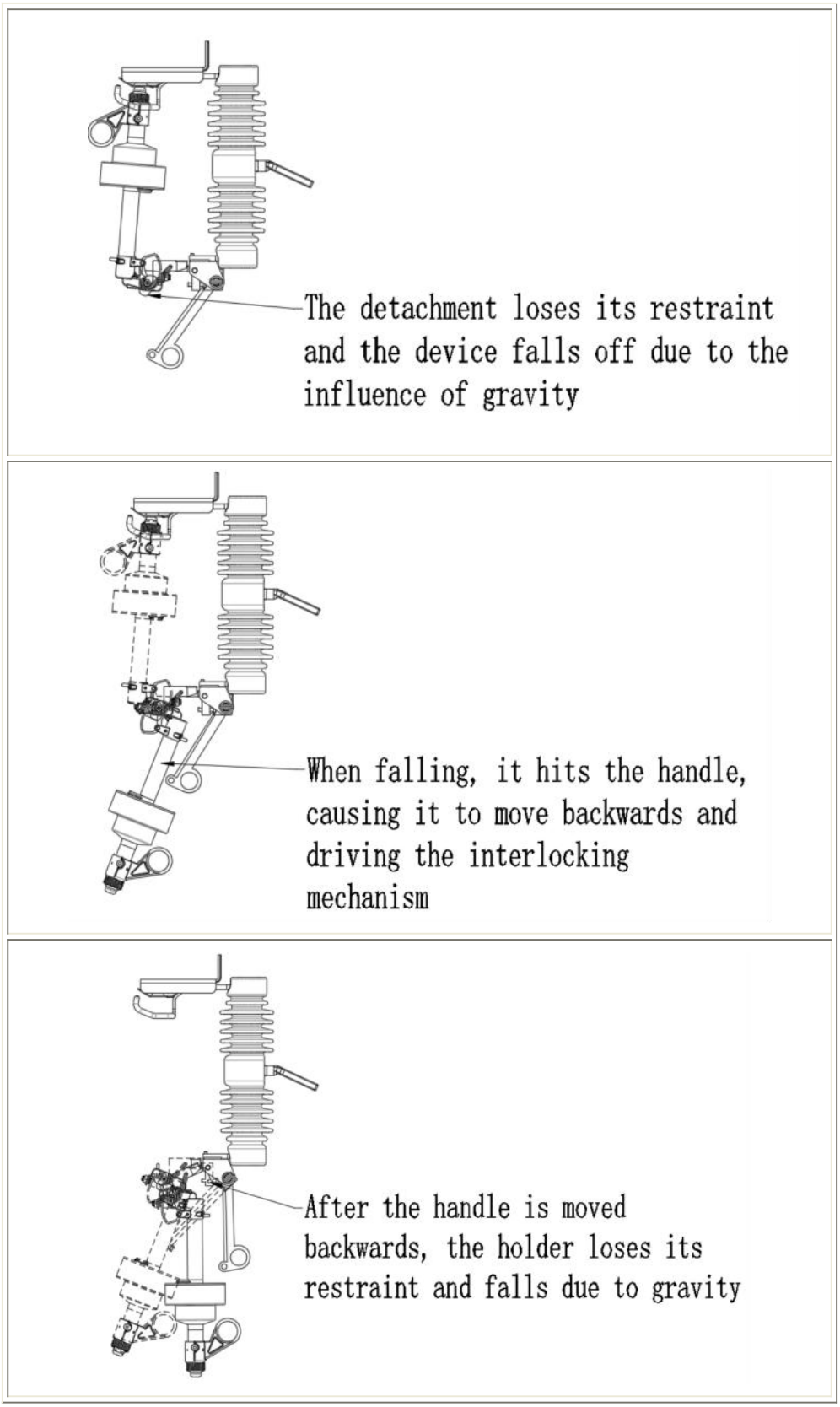
Trip Test	Trigger a single trip of the device (for test purposes only)
Calibration	For calibration before factory delivery, access requires a dedicated password
Reset Count	Used to clear accumulated counting times during testing
Stop Report	Disconnect communication between the maintenance tool and the device
Frame Monitor	Open the message frame, which provides view, save and clear messages

9. Under the **About** menu, you may access **Help** to view the quick operation guide for maintenance functions, and open **DIP Guide** to check the brief instructions for DIP switches.

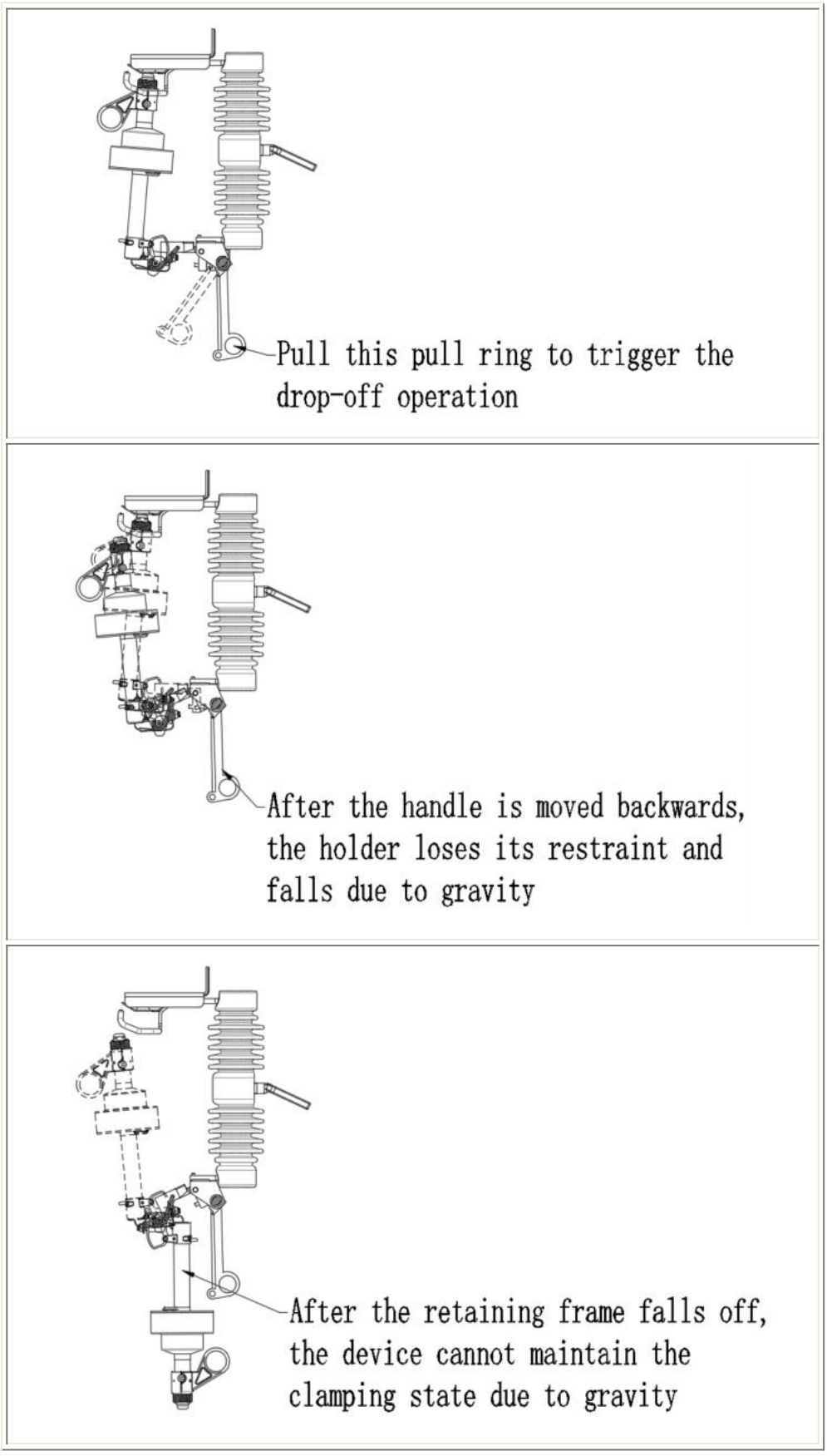
Note: The **Calibration** menu is generally used for factory settings.

Operation Instructions

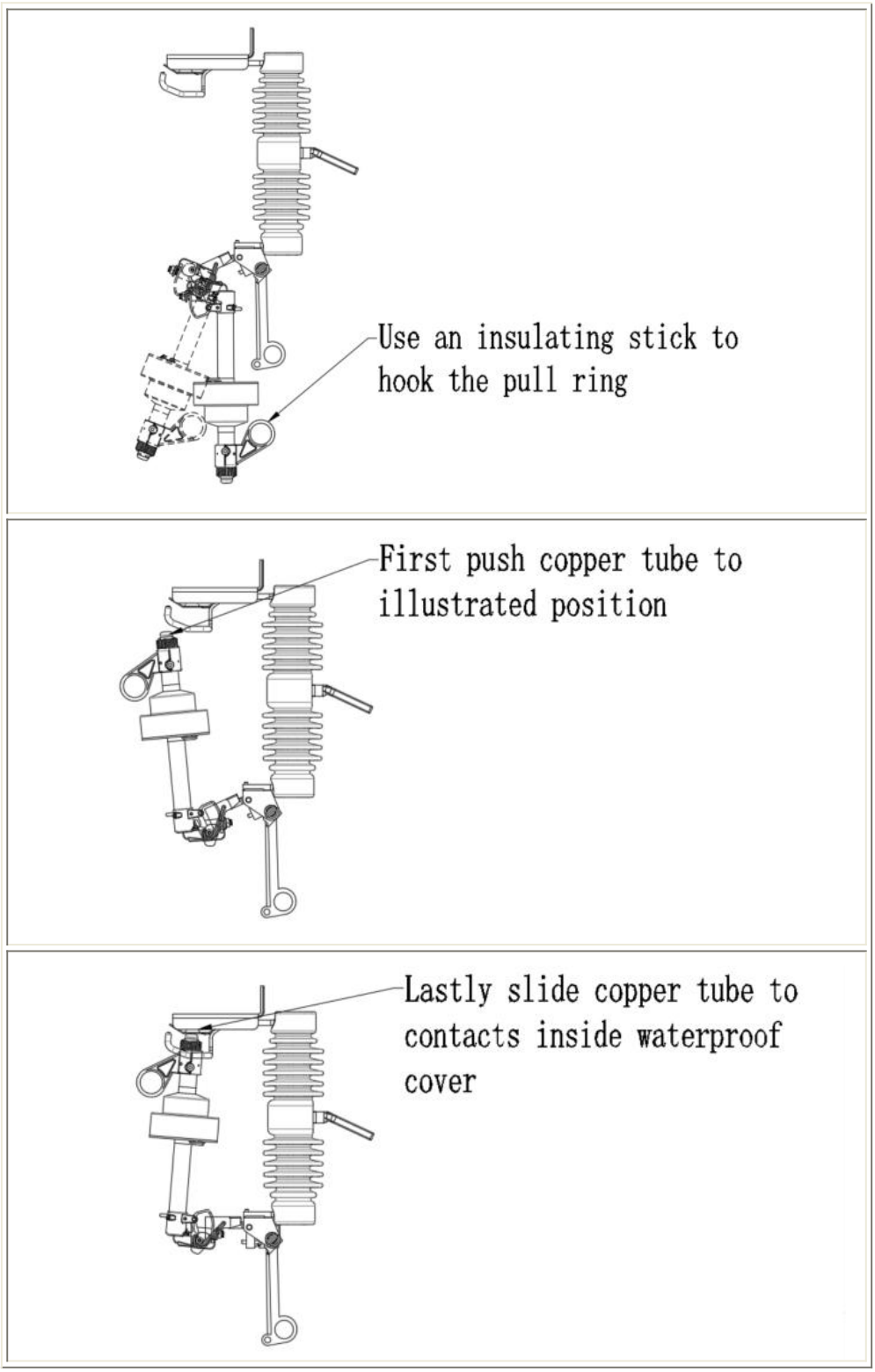
Electric open diagram



Manual open diagram



Manual close diagram



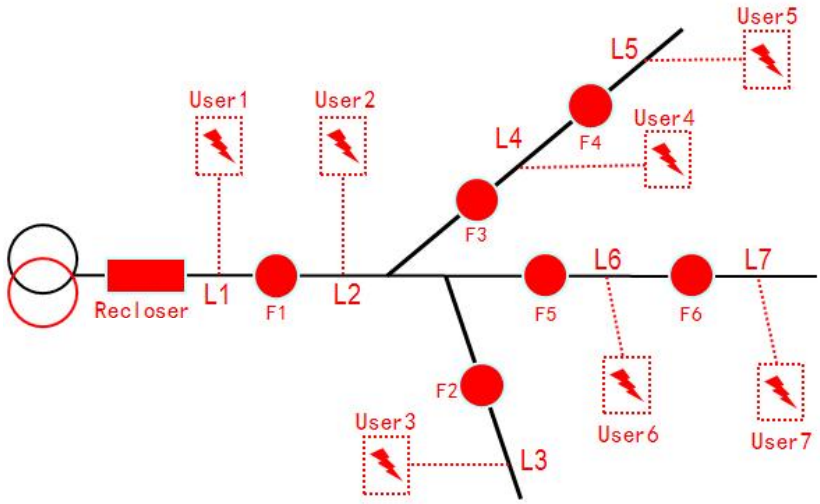
NOTE: Equipped with a return spring on the handle, the mechanical structure at the bottom of the sectionalizer automatically resets after dropout. Simply operate it in accordance with the manual close diagram.

Applications

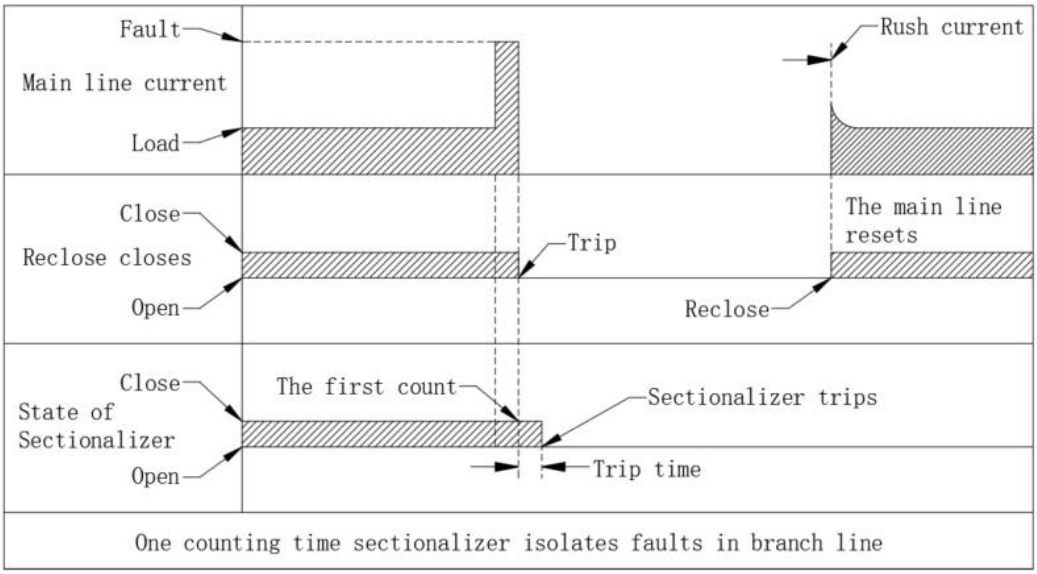
The sectionalizer coordinates with reclosers or circuit breakers.

A recloser is installed at the substation outlet with a protection sequence set as one fast trip and three delayed trips. Six sets of automatic drop-out sectionalizers F1, F2, F3, F4, F5 and F6 are deployed on branch feeders, dividing the line into seven segments L1, L2, L3, L4, L5, L6 and L7.

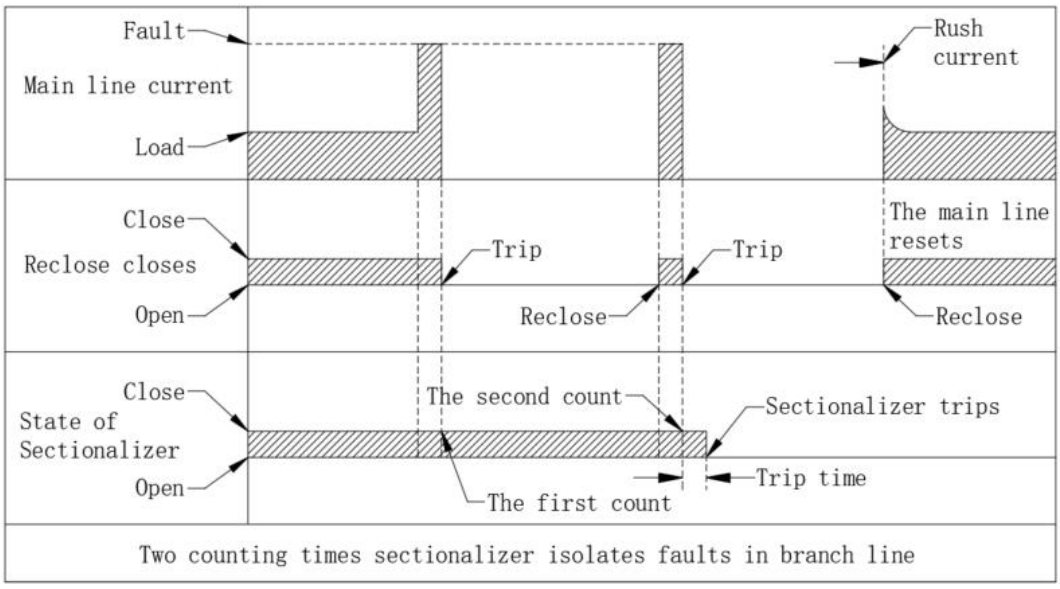
The rated pickup current of each sectionalizer shall coordinate with the pickup current of the upstream recloser. The counting setting of F1 is 3 times; F2, F3 and F5 are set to 2 times; F4 and F6 are set to 1 time. See the figure below:



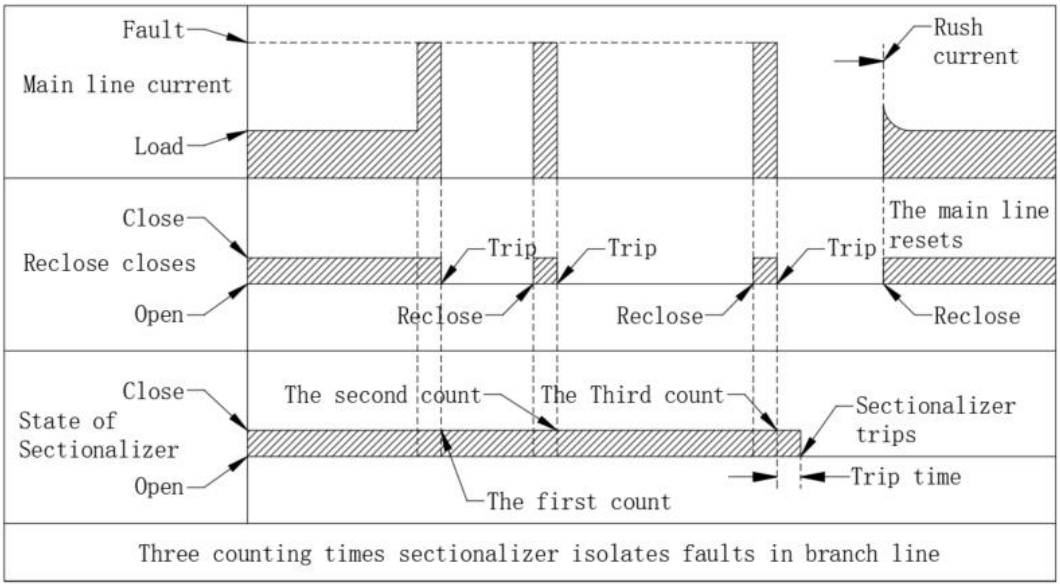
1. If fault E1 occurs on line segment L5, fault current will flow through the recloser and sectionalizers F1, F3 and F4. The recloser trips automatically, resulting in line de-energization. Sectionalizer F4 completes its preset counting cycle of 1 and trips with drop-out action to isolate faulty segment L5. After automatic reclosing of the recloser, power supply is restored to segments L1, L2, L3, L4, L6 and L7. The schematic diagram below illustrates fault isolation by the recloser and sectionalizer F4.



2. If fault E2 occurs on segment L6, fault current passes through the recloser as well as sectionalizers F1 and F5, and the recloser trips automatically. If this is a transient fault, the recloser will successfully reclose automatically to restore power supply, while F1 and F5 remain closed since their preset counting thresholds are not reached. If this is a permanent fault, the recloser fails to reclose and trips again, de-energizing the entire line. Sectionalizer F5 completes its preset 2 counting cycles and trips with drop-out motion to isolate faulty segment L6; F1 stays closed without reaching its counting setting. The recloser then recloses to resume power supply to segments L1, L2, L3, L4 and L5. The schematic diagram below shows fault isolation implemented by the recloser and sectionalizer F5.



3. If fault E3 occurs on segment L2, fault current flows through the recloser and sectionalizer F1, and the recloser trips automatically. In the event of a transient fault, the recloser performs successful automatic reclosing to restore power supply, and F1 remains closed as its preset counting threshold is not reached. In the event of a permanent fault, the recloser fails to reclose and trips, then fails to reclose a second time and trips again, de-energizing the line. Sectionalizer F1 completes its preset 3 counting cycles and trips with drop-out action to isolate faulty segment L2. The recloser then recloses to restore power supply to segment L1. The schematic diagram below illustrates fault isolation by the recloser and sectionalizer F1.



For the selection of automatic drop-out sectionalizers, units with a one-time counting setting are generally adopted at customer service entrances. Most faults occurring at customer substations are permanent faults, while 80% of overhead line faults are transient faults. Sectionalizers with a counting setting of 2 or 3 times shall be installed at overhead line branch points to facilitate coordination and optimal matching between sectionalizers.

Additional Explanations

Proper setting

In order to ensure a proper coordination between the sectionalizer and the upstream reclosers or breaker, the following requirements must be met:

- The actuating current of the sectionalizer must be set at least 20% below the actuating current of the recloser (both for phase fault and earth fault events). The set count of the sectionalizer must be at least one count less than the set count of the corresponding recloser or upstream device.
- Recloser opening time at the sectionalizer tripping selection must be on a slow curve to ensure sectionalizer opening without load, e.g. more than 0.5 seconds.
- The lifespan and proper operation of the sectionalizer greatly depends on the correct setting of the equipment and the waterproof sealing of the setting module. This operation should be performed by trained technicians that follow the recommendations included in the mounting and calibration instructions provided with the device.
- As with other manually operated devices, the sectionalizer has no load or fault closing rating. Opening the device under load is an operation that requires either a hookstick with loadbreak capabilities. At the same time, closing the device under load or fault is not recommended as it can translate into potential damage to the assets and/or to personnel.

Parts List

Name	Quantity	Description
User Manual	1	Please read it carefully before use the device
30mm open-end spanner	1	Used to remove and tighten USB waterproof cap
USB Disk	1	For storing electronic user manual, maintenance software and USB drive
USB Test Cable	1	For connecting maintenance tools to PC
Post Insulator (Copper Tube)	3	Main Body of Sectionalizer
Link Insulator	2	Three-phase interlocking device
Mounting Bracket (Set)	1	See Bracket Installation Diagram for details
Screws, spring washers, flat washers, nuts (Pack set)	1	See Bracket Installation Diagram for details