

## 1. Usage

### 1. Product Overview

The G3NA series high-voltage permanent magnet vacuum switch (hereinafter referred to as the "switch") is suitable for power network systems with AC 50–60 Hz, a main circuit rated voltage of 12 kV, and rated currents ranging from 160A to 1250A. It is designed for remotely connecting and disconnecting, as well as frequently starting and controlling AC motors, transformers, capacitor banks, and other applications.

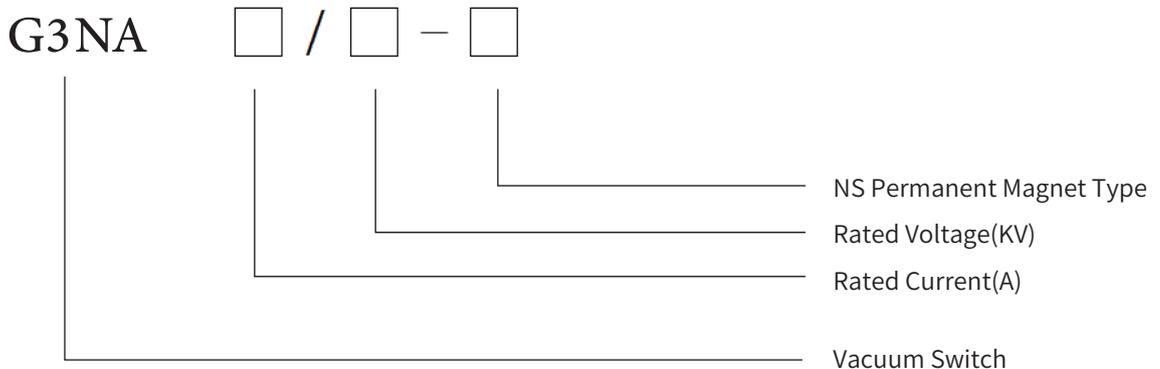
### 2. Environmental Conditions

- (1) Ambient temperature: -25°C to +40°C.
- (2) Installation site altitude not exceeding 2,000 meters.
- (3) Relative humidity of air: the monthly average maximum relative humidity of the wettest month is 90%, with the monthly average minimum temperature of +25°C, taking into account condensation on the product surface due to temperature changes.
- (4) Environment: Free from water intrusion, corrosive and flammable gases, and severe vibration.

### 3. Usage Requirements

- (1) Correctly select the technical parameters of the switch, including auxiliary switch contacts, to avoid overload use.
- (2) Ensure sufficient insulation space around and above the switch to guarantee safe operation.
- (3) If there is no response after activating the control power, immediately cut off the control power and investigate the cause to prevent burnout.
- (4) The switch is not suitable for series and parallel connection operations.
- (5) Main circuit connection principle: The upper end (static terminal) is the input, and the lower end (moving terminal) is the output.
- (6) Product specifications: Rated voltage: 12 KV. Rated current: 400A, 630A, and 800A.
- (7) When connecting the secondary control circuit, the power source must strictly distinguish between AC and DC operating power supplies; the closing, opening, and common terminal control connection terminals of our company's switches are all passive contacts, which only require short-term pulse signal control, and long-term energized control is not allowed, otherwise the control circuit may be burned out.
- (8) When performing closing/opening tests, ensure the capacitor in the secondary circuit is fully charged. The interval between closing and opening operations should be no less than 5 minutes.

### 4. Model Number Structure and Meaning



## 2. Product Structure and Working Principle

**1. Structure:** This series of switches consists of an insulated framework, transmission crank arm, electromagnetic system, auxiliary switches, vacuum interrupters, and other components. The design features a segregated configuration where high-voltage circuits and low-voltage control systems are arranged in separate upper and lower sections. This layout ensures an aesthetically pleasing appearance, enhanced safety, reliable operation, and ease of installation and maintenance.

### 2. Working Principle:

(1) Permanent Magnet Type:

This series of vacuum switches adopts the most advanced bistable permanent magnet operating mechanism currently available as the main driving component, featuring fewer operating elements, simple control, low closing and opening currents, and high safety and reliability; in both closing and opening states, the control circuit does not require long-term power supply energization, thereby achieving energy-saving and reliable effects.

(2) Vacuum Interrupter (Vacuum Arc-Extinction Chamber):

The vacuum interrupter is the core component of the switch; it is a sealed cavity composed of upper and lower cover plates, a glass or ceramic shell, a bellows, and moving and fixed conductive rods, which is evacuated to a high vacuum state. A pair of contacts made of wear-resistant current-interrupting material are welded to the electrical ends of the moving and fixed conductive rods, forming high-performance breaking contacts, while the bellows serves the function of isolating the atmosphere and enabling the contacts to move up and down.

Due to the vacuum cavity, the vacuum interrupter must not be subjected to external impact, and the bellows must not be subjected to rotational torsion either—otherwise, air leakage and damage may occur.

## 3. Technical Parameters

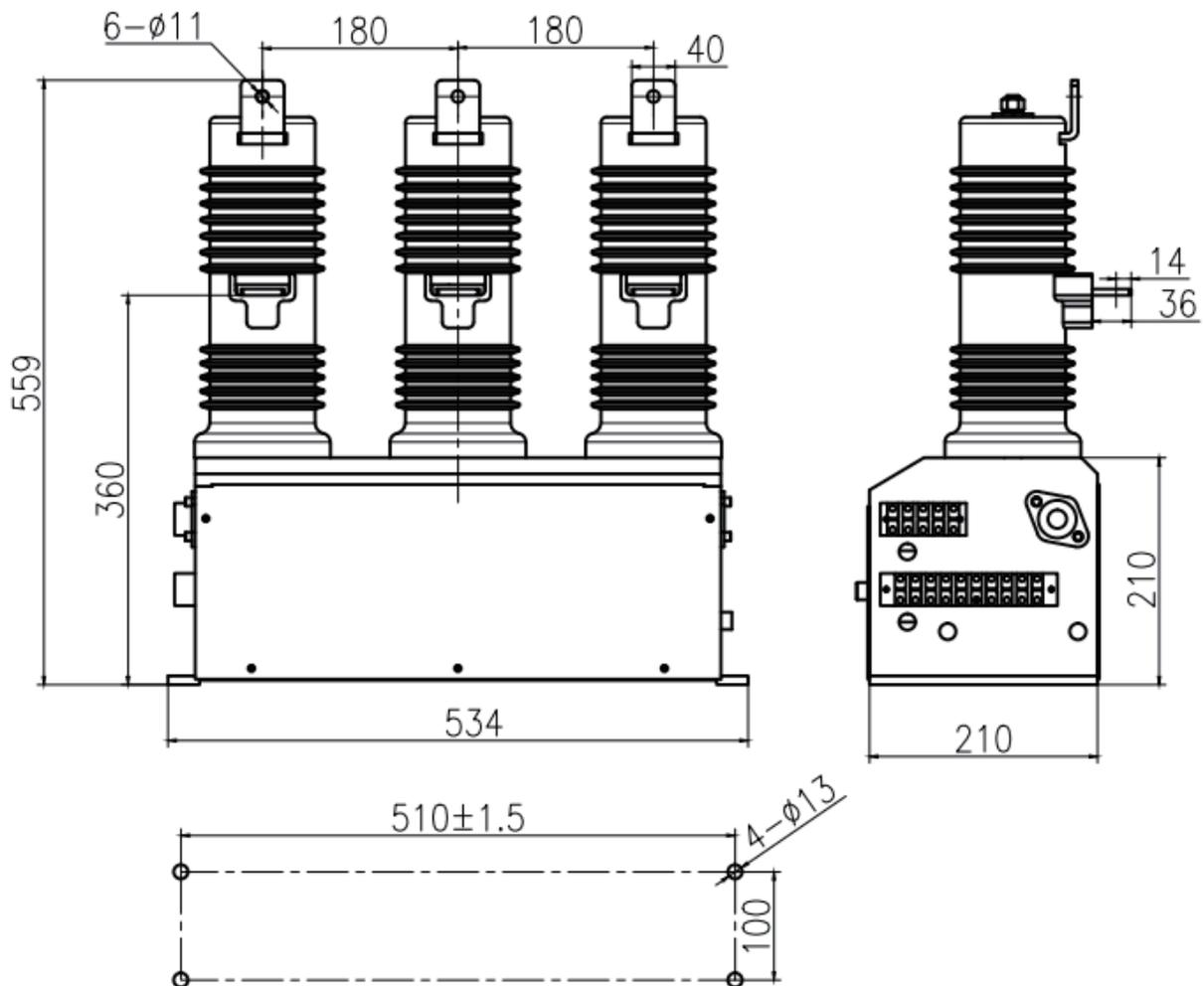
- 1、 Main Technical Characteristics: Refer to Table 1.
- 2、 Main Circuit Poles: Three poles.
- 3、 Control Power Supply Voltage: AC or DC 220V. (Note: 110V requires special specification.)
- 4、 Secondary Circuit Schematic Diagram: Refer to attached Figure 2.
- 5、 Thermal Current of Auxiliary Switch Contacts: 5A.
- 6、 Rated Duty Cycle: Intermittent long-time duty cycle, and repetitive short-time duty cycle (rated duration of 40%).

**Table 1 G3NA Series High-Voltage Vacuum Switch Technical Parameters**

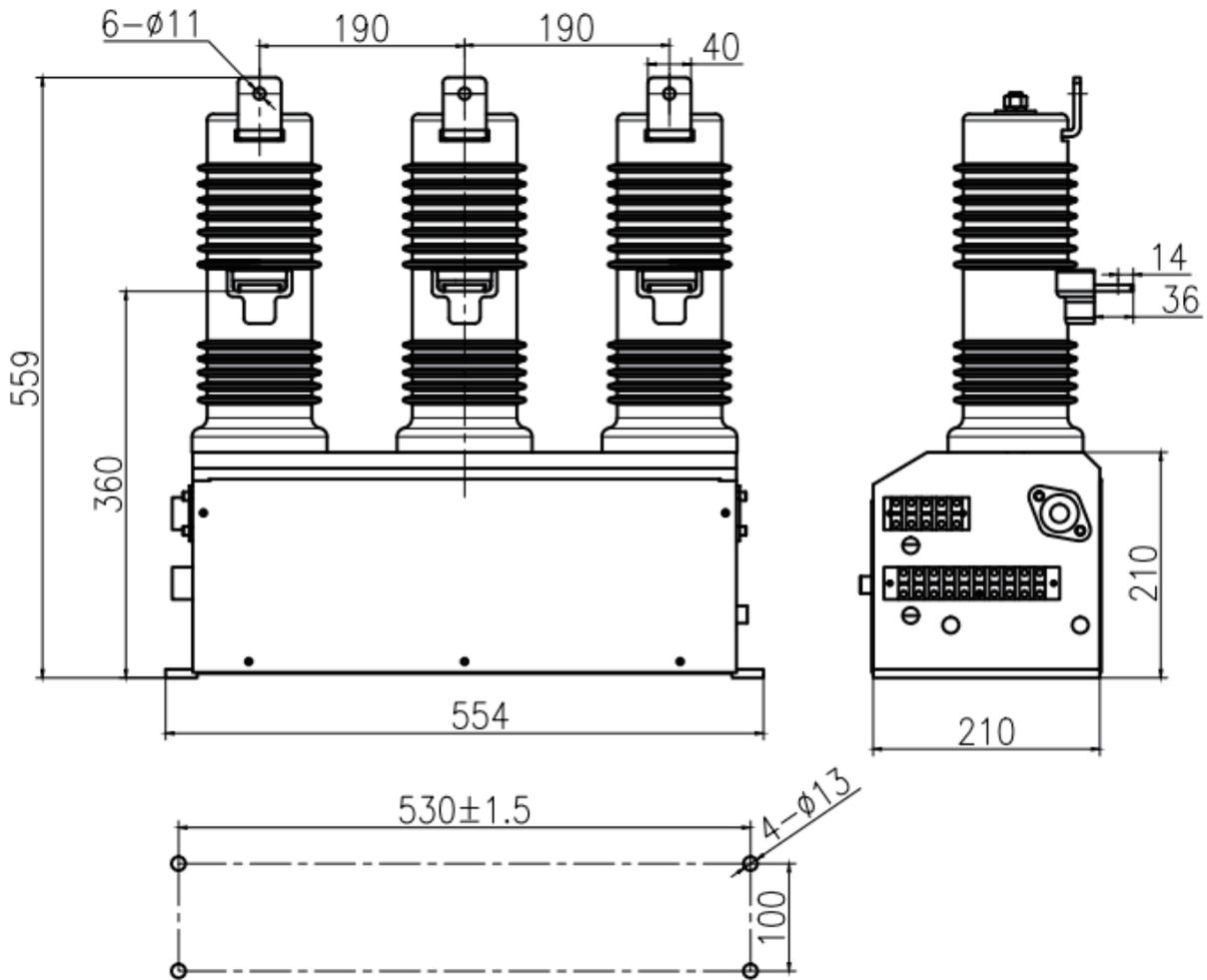
Technical Characteristics Parameter Name	Model	400A	630A	800A	1000A	1250A
	Rated Main Circuit Voltage (KV)		12	12	12	12
Rated Main Circuit Current (A)		400	630	800	1000	1250
Rated Short-Circuit Breaking Current (KA)		16	16	16	16	16
Rated Short-Circuit Making Current (KA)		31.5	31.5	31.5	31.5	31.5
Rated Peak Withstand Current (KA)		20	20	20	20	20
Mechanical Life (10,000 Times)		25	25	25	25	25
Power Frequency Withstand Voltage (Break) (KV)		42	42	42	42	42

Phase-Phase/Phase-Ground Withstand Voltage (KV)	42	42	42	42	42
Lightning Impulse Withstand Voltage (KV)	75	75	75	75	75
Control Circuit Withstand Voltage (KV)	2.5	2.5	2.5	2.5	2.5
Terminal Pressure (N)	>800	>800	>800	>800	>1000
Contact Gap (mm)	8±1	8±1	8±1	8±1	8±1
Overtravel (mm)	2±0.5	2±0.5	2±0.5	2±0.5	2±0.5
Main Circuit Contact Resistance (μΩ)	≤150	≤100	≤100	≤100	≤100
Weight (kg)	30	30	35	35	35

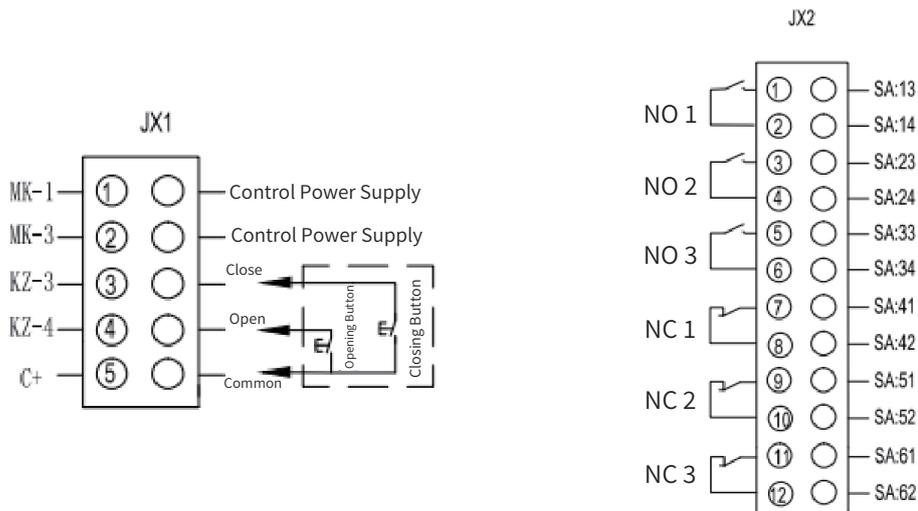
**Figure 1 G3NA Outline and Installation Dimension Diagram (Phase Spacing 180mm)**



**Figure 2 G3NA Outline and Installation Dimension Diagram (Phase Spacing 190mm)**



**Figure 3 Wiring Schematic Diagram of Secondary Control Circuit**



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