

Five defenses or Five-proof one-way

High voltage live line indicator, short circuit and earth fault indicator are widely used for “Five defenses” or “Five-proof one-way”:

As early as 1990, the requirements of the "five defenses" of electrical equipment were proposed, since China's power system was then in the face of countless blood lessons. Combined with the practice of Chinese and foreign electrical operation, in order to effectively prevent personal and major equipment accidents caused by the misoperation of operating electrical equipment, the rules govern the management, operation, design and use of electrical error prevention. The "interlocking" of the high-voltage switchgear is an important measure to ensure the safe operation of the power grid, ensure the safety of equipment and personnel, and prevent misoperation. GB3906-1991 "3-35 kV AC metal-enclosed switchgear" clearly stipulates this. Generally, the "interlock" is described as: preventing mis-separation and mis-closing the circuit breaker; preventing the separation and closing of the load switch; preventing the grounding (closing) grounding wire (grounding switch); preventing the grounding (switching) from closing; preventing Mistaken into the charging interval. The above five items to prevent electrical misuse are referred to as "five defenses". "Five-proof" devices can be generally divided into three categories: mechanical, electrical and microcomputer.

Five defenses usually refer to the "five-proof" of high-voltage switchgear or the "five-proof one-way" of the power distribution room. “One way”is keeping in good ventilation. The design principle of the anti-misoperation device is that all high-voltage electrical equipment that may cause misoperation should be equipped with anti-fault devices and corresponding anti-fault electrical locking circuits. High voltage indicators, short circuit and earth fault indicators are key parts for "five-proof".

The switchgear should have the functions of five defenses as follows:

- a When the circuit breaker is in the closing position, the circuit breaker trolley cannot be pulled out.
- b When the circuit breaker is closed, the circuit breaker trolley cannot be pushed in from the experimental position.
- c When the circuit breaker trolley is in the running position, the grounding switch cannot be closed.
- d When the grounding switch is closed or the opening is not in place, the circuit breaker trolley cannot be pushed in from the experimental position.
- e Circuit breaker hand truck is not in place, the circuit breaker cannot be closed
- f The circuit breaker cannot be closed when the circuit breaker handcart is moving.
- g The circuit breaker trolley and control circuit plug should be blocked. When the circuit breaker trolley is in the working control loop, the plug cannot be pulled out.
- h When the grounding switch is in the closed state, the circuit breaker trolley cannot

advance from the test position.

i The cable compartment door can be opened when the grounding switch is in the closed state; the cable compartment door is not allowed to open when it is energized.

j Live display and grounding open lock.

k Circuit breakers should have anti-jump function and can only be closed once under one command.