

# HYFK

## Series Low Voltage Composite Switch

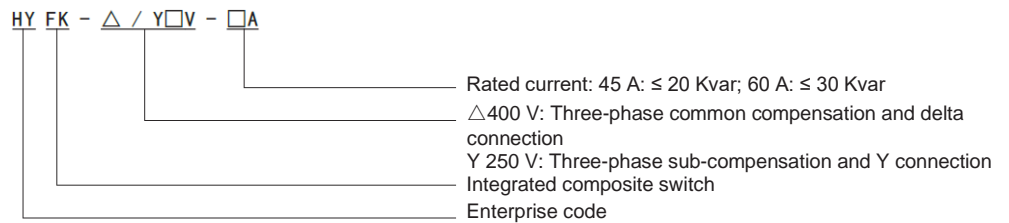


### I. Scope of Application

The HYFK Composite Switch is composed of three independent composite switches with the rated working voltage of AC 380 V and 220 V± 20%, and is suitable for on-off control over low-voltage reactive power compensation capacitor banks. The basic working principle of the composite switch is to connect the thyristor and the magnetic holding relay in parallel, so that the composite switch has the advantage of zero-crossing switching of the thyristor at the moment of turning on and off, and has the advantage that the contactor is switched without power consumption during the normal turning-on period.

The product complies with GB14048.4-2010 *Low-voltage Switchgear and Controlgear – Part 4-1: Contactors and Motor-starters (Including Motor Protector)*.

### II. Model Description



1. Product classification: Common compensation type (the connection method of capacitors is delta connection); Sub-compensation type (the connection method of capacitors is Y connection).
2. See the product model table in the following table

Model & Specification	Capacitor connection method	Rated current	Rated capacity
HYFK-Δ400-45A	Delta connection, common compensation	45 A	20 kvar
HYFK-Y250-45A	Y connection, sub-compensation	45 A	3×6.7 kvar
HYFK-Δ400-60A	Delta connection, common compensation	60 A	30 kvar
HYFK-Y250-60A	Y connection, sub-compensation	60 A	3×10 kvar

### III. Structural Features

1. Zero-crossing switching: The HYFK Composite Switch uses smart chips, digital circuits, etc. to be compounded with magnetic holding relays to realize voltage zero-crossing conduction and current zero-crossing cutoff, so that the switch realizes completely zero-crossing switching at the moment of turning on and off, and no overvoltage is generated. The switch is characterized by no inrush current, extremely low power consumption, long life, low failure rate and the like, and is widely applied in the field of low-voltage reactive power compensation.
2. Protection function: The microprocessor is adopted to monitor the operation conditions of switch relays, the input power supply and the load, which have a perfect protection function.
  - (1) Power grid overvoltage and undervoltage protection: When overvoltage or undervoltage occurs, it automatically turns off, and the power indicator flashes to warn.
  - (2) Lack-phase protection: When a phase loss occurs, it automatically turns off, and the power indicator flashes to warn.
  - (3) Power-off protection: In case of a sudden power failure after being turned on, it automatically turns off.
  - (4) No-load protection: When the load is not connected, it refuses to turn on, and the indicator light flashes to warn. The composite switch of the sub-compensation type continuously detects the phases in a cycle, and the indicator light scans and flashes in a cycle.
  - (5) Phase-splitting indication of switch status: It is normal when the power indicator is always on. Overvoltage, undervoltage or lack of phase happens when the power indicator flashes. The A/B/C phase status light is always on, which means that the switch turns on. A certain phase status light flashes, which means that a certain phase is faulty, or that the capacitor of the certain phase is in the process of discharging delay.
  - (6) Self-diagnosis fault: If any one of the phases fails, it will refuse to act, and the indicator light will flash to warn.
3. The composite switch does not need to be connected to the neutral wire (N wire).
4. Low power consumption: The magnetic holding relay only consumes power at the moment of switching, and usually almost consumes no power, so that energy saving and consumption reduction are realized.
5. The auxiliary contact with switch status feedback can be installed to bring convenience for the controller to collect the online status of the composite switch.
6. Work safety: All control input signals are safely isolated from internal circuits. Meanwhile, the advanced intelligent control technology is adopted. Compared with similar products, the switch has extremely high performance advantages in inrush current as well as safety and reliability. The input signals are optically isolated from the composite switch, the EMC protection measures are high, and the anti-interference ability is strong. Work is safe and reliable.

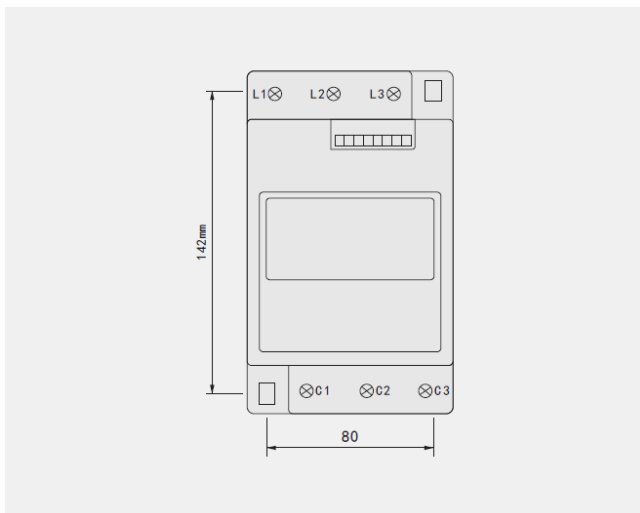
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## Series Low Voltage Compound Switch

### IV. Main Technical Parameters

1. Ambient temperature: -20°C—+55°C
2. Relative humidity: 20%–90% at 40°C
3. Rated voltage: 380 V/220 V three-phase four-wire AC 50Hz
4. Permissible deviation: The three-phase voltage synchronous change is not more than ±20%
5. Total harmonic distortion of voltage: Less than 5%
6. Rated frequency: 50Hz
7. Rated current: ≤ 60A
8. Service life: 100,000 times operations
9. Number of phases: Three-phase (Δ connection); single-phase (Y connection)
10. Three-phase control capacity: ≤ 30 Kvar
11. Single-phase control capacity: ≤ 10Kvar
12. Power consumption: ≤ 1.5VA
13. Contact voltage drop: ≤ 10mV
14. Contact pressure: > 1,600V
15. Response time: ≤ 1,000ms
16. Interval between turn-on and turn-off each time: ≥ 5s
17. Interval between two consecutive times of turn-on: ≥ 35s
18. Control signals: DC 12 V ± 20%; AC/Communication (optional)
19. Input impedance: ≥ 6.8K
20. Lead-through impedance: ≤ 0.003Ω
21. Inrush current: Less than 1.5 times of rated current
22. Rated current of feedback contact: 1A (input is turn-on)

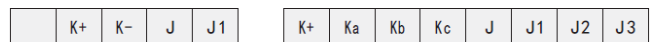
### V. Outline and Installation Dimensions



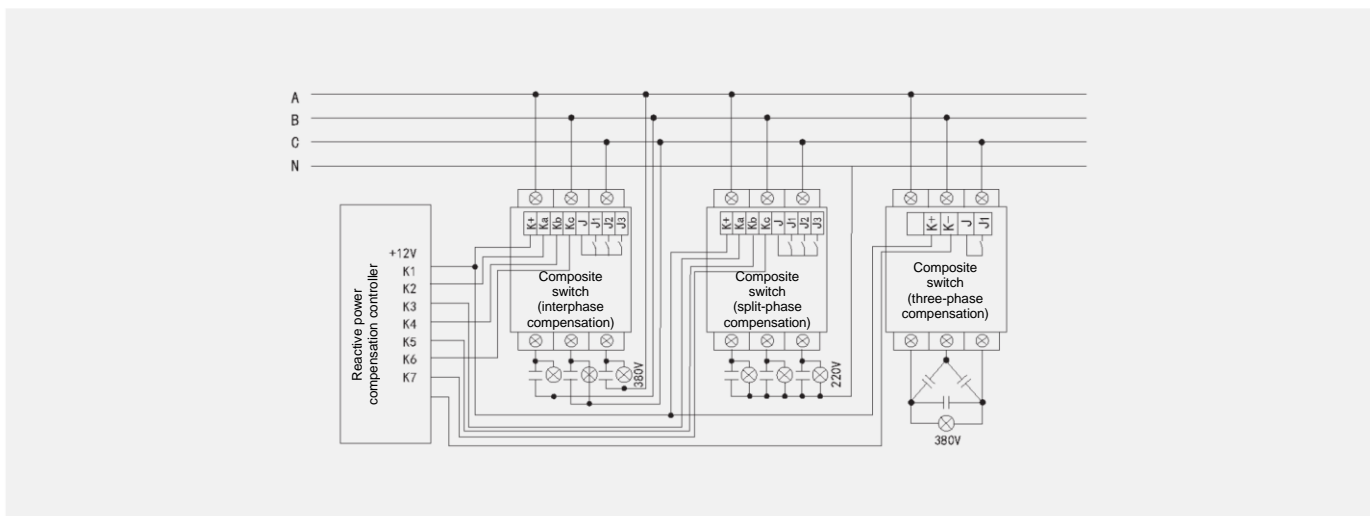
The incoming terminal wire of the composite switch shall choose the appropriate multi-core copper wire according to the total three-phase capacity of the product. If the total capacity is less than 30 Kvar, the multi-core copper wire of 10 square millimeters shall be used. If the total capacity is 30 Kvar or above, the multi-core copper wire of 16 square millimeters or with larger cross-section area shall be used. The screw must be tightened when crimping the terminal to confirm that it is very firm.

Outline dimensions (length, width and thickness)	Fixed hole distance (length and width)
160x96x95 mm	142x80 mm

Auxiliary contacts feedback the terminal status: When the composite switch is turned on, the common terminal J and the feedback terminal J1/J2/J3 is connected.



### VI. Wiring Diagram



For example: There is 1 group of interphase compensation and 1 group of split-phase compensation, and the following is the wiring of the common compensation as shown in the Figure above. K+ in the Figure is connected to the +12 V terminal of the dynamic reactive power compensation controller. K- or Ka, Kb and Kc are connected to the control output point (negative potential) of the dynamic compensator. J, J1, J2 and J3 are auxiliary contacts for switch status feedback.