

I. Applications and Features

HHD5-F and HHD5-G Phase Failure, Phase Sequence, Under-Voltage and Over-Voltage Protection Relays (hereinafter referred to as protection relays) form a protection circuit together with switching devices such as AC contactors. They provide effective protection against faults (including over-voltage, under-voltage, phase failure, and phase sequence misconnection) that may occur in non-reversible three-phase AC motors and transmission equipment (e.g., pumps, fans, conveyors, air compressors, feeding lines). These protection relays are widely used in 50Hz three-phase AC, 380V low-voltage power distribution systems in industrial, agricultural, and service sectors. Adopting an advanced voltage detection principle, the protection relays use high-quality imported integrated circuits as main components. They feature reliable performance, fault indication, strong anti-interference capability, small size, and easy installation & operation. Besides, they are not affected by the power rating of the protected equipment.

This protection relay complies with the relevant requirements of GB/T 14048.4.

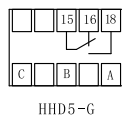
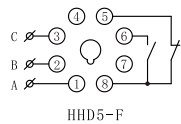
II. Main Technical Parameters

- Power supply voltage range: AC 50Hz, three-phase 300V ~ 460V
- Contact capacity: 3A AC250V (resistive load)
- Protection functions: Phase loss protection, phase sequence protection, over-voltage & under-voltage protection
- Status indication functions: Power indicator, UP operation indicator light (illuminated)
 - For HHD5-F: ON power indicator and UP operation indicator light are illuminated
 - For HHD5-G: Indicator light displays fault status
- Over-voltage protection:
 - For HHD5-F: Adjustable 399V ~ 460V, delay time 0.2s
 - For HHD5-G: Adjustable 380V ~ 460V, delay time adjustable 0.5s ~ 5s
- Under-voltage protection:
 - For HHD5-F: Adjustable 300V ~ 361V, delay time 0.2s
 - For HHD5-G: Adjustable 300V ~ 380V, delay time adjustable 1s ~ 10s
- Phase loss & phase sequence protection action time 0.2s

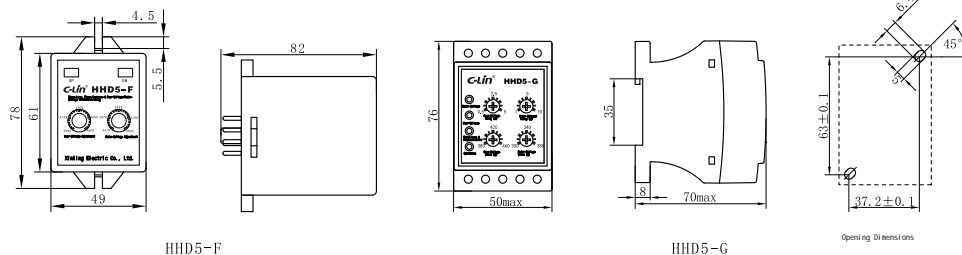
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- Ambient temperature: $-5^{\circ}\text{C} \sim 40^{\circ}\text{C}$
- Altitude: Not exceeding 2000m
- Humidity: When the maximum temperature at the installation site is 40°C , the relative humidity of the air shall not exceed 50%. At lower temperatures, higher relative humidity is allowed (e.g., up to 90% at 20°C). Special measures shall be taken for condensation occasionally caused by temperature changes.
- Mounting method: Panel-mounted, 35mm DIN rail-mounted

III. Wiring Diagrams



IV. Outline and Mounting Dimensions (mm)



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V. Operating Instructions

1. Wiring & Precautions

Refer to the circuit example in Section VII: Connect the protection relay to the power control circuit to enable protection. Phase loss before the A, B, C three-phase voltage sampling terminals of the protection relay (on the three-phase power grid side) will trigger protection, while phase loss after these terminals will not be protected.

2. Phase Sequence & Phase Loss Protection

If the motor fails to start: Swap the positions of any two phases in the A, B, C three-phase power supply input to the protection relay, then press the start button again. If the motor starts normally, the phase sequence of the protection relay is confirmed. If the phase sequence changes later, the protection relay will activate protection. If the motor still fails to start, check the three-phase circuit for phase loss.

3. Over-Voltage & Under-Voltage Value Setting

The voltage scales on the protector panel are indicative. For accurate setting, adjust the potentiometer knobs before official use, and take the actual measured value as the standard. The voltage scales on the protector panel are indicative. For accurate setting, adjust the potentiometer knobs before official use, and take the actual measured value as the standard. Set the "over-voltage value" knob to a value slightly lower than the maximum allowable operating voltage upper limit of the protected equipment. Set the "under-voltage value" knob to a value slightly higher than the minimum allowable operating voltage lower limit of the protected equipment.

4. Over-Voltage & Under-Voltage Delay Setting (for HHD5-G only)

"Over-voltage delay": The time elapsed from when the operating voltage exceeds the set value to when the protection relay activates its protection function. "Under-voltage delay": The time elapsed from when the operating voltage drops below the set under-voltage value to when the protection relay activates its protection function.

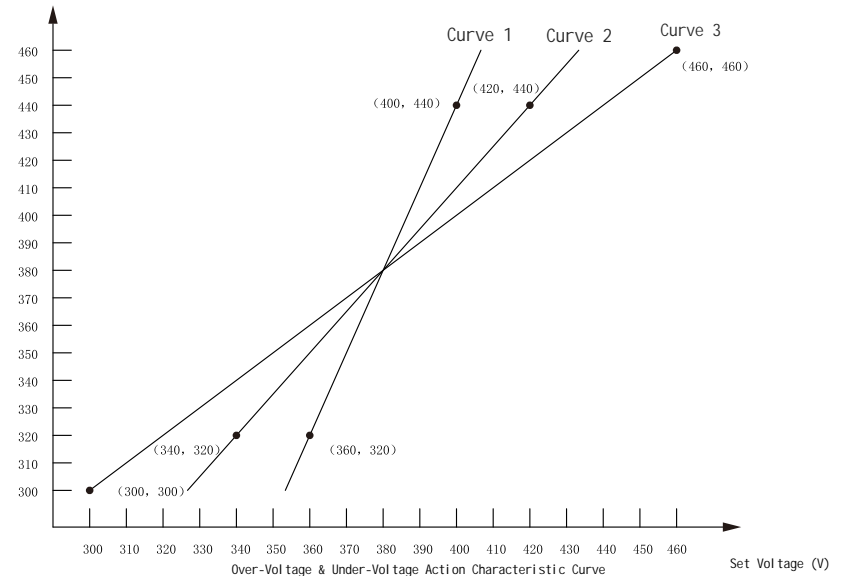
5. Contact & Indicator Light Status

For the HHD5-F protection relay: Power-off state: Contacts 8 & 5 are closed; Contacts 8 & 6 are open. Normal operation state: Contacts 8 & 5 are open; Contacts 8 & 6 are closed; Both the ON and UP indicator lights are illuminated. Protection state: Contacts 8 & 6 are open; Contacts 8 & 5 are closed; The UP indicator light goes out. For the HHD5-G protection relay: Power-off state: Contacts 15 & 16 are closed; Contacts 15 & 18 are open. Normal operation state: Contacts 15 & 16 are open; Contacts 15 & 18 are closed. Protection state: Contacts 15 & 16 are closed; Contacts 15 & 18 are open; The indicator light displays the fault type.

6. Over-Voltage & Under-Voltage Action Characteristic Curves

The over-voltage & under-voltage action characteristic curves of the protection relay are shown in the figure below: Curve 1: Applies to single-phase over-voltage/under-voltage, Curve 2: Applies to two-phase over-voltage/under-voltage, Curve 3: Applies to three-phase over-voltage/under-voltage

Power Supply Voltage (V)

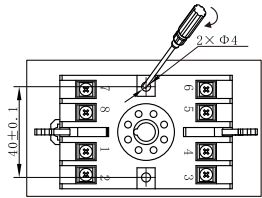


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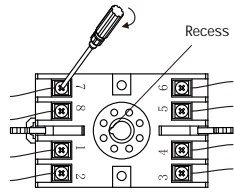
VI. Installation and Disassembly Methods (Taking HHD5-F as an Example)

1. Panel-mounted installation sequence: (1) (2) (3) (4)
2. Panel-mounted disassembly sequence: (5) (6) (7)
3. DIN rail-mounted installation sequence: (8) (9) (10) (11)
4. DIN rail-mounted disassembly sequence: (12) (13) (14) (15)

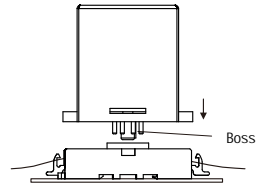
Note: The main circuit power supply must be disconnected before installation or disassembly.



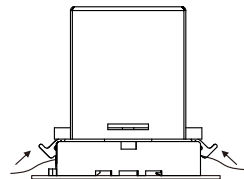
(1) Panel-mounted installation:
Tighten the mounting screws



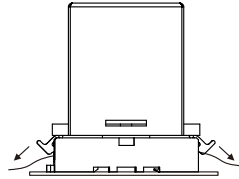
(2) Panel-mounted installation: Connect the wires according to the base serial numbers and tighten the terminal screws



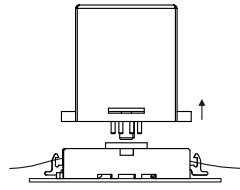
(3) Panel-mounted installation:
Install the protection relay, align the boss on the top plug with the recess of the base



(4) Panel-mounted installation:
Close the hooks



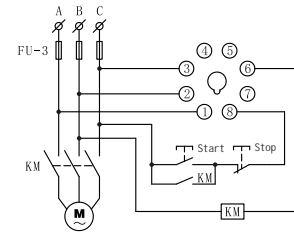
(5) Panel-mounted disassembly:
Open the hooks



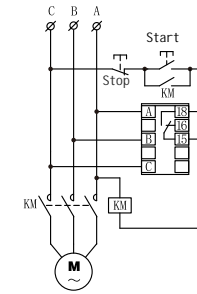
(6) Panel-mounted disassembly:
Pull out the relay

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VII. Application Circuit Examples



HHD5-F



HHD5-G

Note 1: KM refers to the AC contactor coil; the A1 and A2 terminals can be wired as shown in the example.

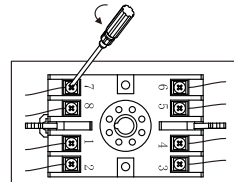
Note 2: In the example, the AC contactor coil voltage is AC380V; please pay attention to the voltage class of the selected AC contactor.

VIII. Ordering Information

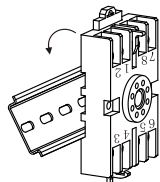
It is required to specify the product model, voltage class, and quantity. If there are special requirements, they should be noted separately.

Example: HHD5-G AC380V, 100 units

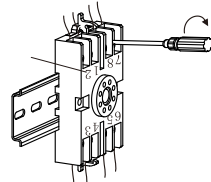
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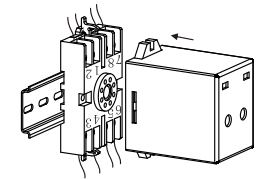
(7) Panel-mounted disassembly: Loosen the terminal screws and mounting screws



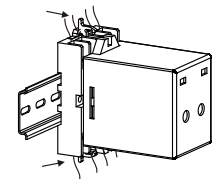
(8) DIN rail-mounted installation: Snap the base into the DIN rail



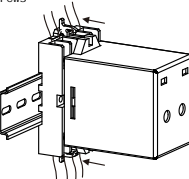
(9) DIN rail-mounted installation:
Connect the wires according to the base serial numbers and tighten the terminal screws



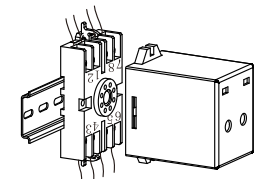
(10) DIN rail-mounted installation:
Install the protection relay, align the boss on the top plug with the recess of the base



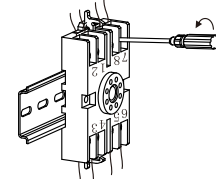
(11) DIN rail-mounted installation:
Close the hooks



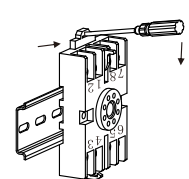
(12) DIN rail-mounted disassembly:
Open the hooks



(13) DIN rail-mounted disassembly:
Pull out the protection relay



(14) DIN rail-mounted disassembly:
Loosen the terminal screws



(15) DIN rail-mounted disassembly:
Remove the base

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Zhejiang Province, China, the Enterprise Standard

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使用说明书
Products Instructions

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HHD5-F, HHD5-G

Phase Failure, Phase Sequence, Under-Voltage and Over-Voltage Protection Relay

Thank you very much for using C-Lin brand protection relay! Please read the user manual before using the product!

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