

I. Overview

The HHD3E-PL motor protector (hereinafter referred to as "protector") is suitable for AC circuits with a frequency of 50Hz and a rated operating voltage of AC380V or below. It forms a motor control circuit together with switching electrical appliances such as AC contactors. When abnormal operating conditions (such as phase failure, overload, three-phase imbalance, locked rotor, etc.) occur in the motor's main circuit, it promptly opens the contacts of the switching electrical appliances to disconnect the motor's three-phase power supply, so as to quickly and reliably protect the motor. The protector adopts a potentiometer quantitative setting method, and the setting of the protective action current can be directly performed according to the rated current value marked on the motor nameplate, which makes the non-quantitative setting method and the setting method for motors requiring starting more convenient, intuitive and accurate. The protector utilizes continuously adjustable starting delay technology, and the overload has excellent inverse time-delay performance, which can meet the needs of various motors from light-load starting to heavy-load starting. It can also directly drive the meter head. This protector has an invention patent. This series of protectors meets the requirements of the GB/T 14048.4 standard.

II. Normal Working Conditions and Installation Conditions

- Altitude: Not exceeding 2000m.
- Ambient air temperature: -5 ~ +40 , and the average value within 24 hours shall not exceed +35 .
- Atmospheric conditions: When the maximum temperature is +40 , the relative humidity of the air shall not exceed 50%; at lower temperatures, a higher relative humidity is allowed (for example, at +20 , the air humidity can reach 90%). Special measures shall be taken for condensation occasionally generated due to temperature changes.
- The inclination of the mounting surface relative to the vertical plane shall not exceed $\pm 5^\circ$.
- Pollution degree: 3.
- In places without significant shaking, impact or vibration.
- Enclosure protection class: IP40.
- Tripping class: 10A class.

1

- EMC Environment: A.

III. Main Technical Parameters

- Main Circuit: Rated insulation voltage U_i : AC400V; rated frequency: 50Hz; rated impulse withstand voltage U_{imp} 4kV.
- Auxiliary Circuit: Rated insulation voltage U_i : AC400V; rated frequency: 50Hz; usage category: AC-15; U_e : AC380V/3A, AC220V/3A; rated limited short-circuit current matching SCPD model: RT28-32 (fuse rating: 16A).

Table 1

Parameter	Model				
	HHD3E-ATPL	HHD3E-APL	HHD3E-BPL	HHD3E-CPL	HHD3E-DPL
Rated power supply voltage	AC380V 50Hz; AC220V 50Hz (Other voltage levels available on order)				
Rated current setting range	1A~5A	2A~10A	8A~40A	20A~100A	40A~160A
Matched DC meter range	0~5A	0~10A	0~50A	0~100A	0~200A
Starting avoidance	Adjustable from 2s to 60s (to avoid phase failure and three-phase imbalance input during this period; other functions not activated)				
Phase failure action time	6s (When the current of any phase in the three-phase power supply is zero, the phase failure indicator lights up)				
Three-phase current imbalance	6s (When the current difference between any phase and the other two phases reaches 40%~60%, the phase failure indicator flashes)				
Overload action time	Class 10A (see Table 2 for time; other classes customizable; overload indicator lights up)				
Operation mode	6s±20% (When the operating current reaches 3 times the rated current or above, the overload indicator flashes)				
Reset mode	Automatic reset (and the interval for restarting shall be 10s)				
Relay capacity	AC220V 3A; AC380V 3A				
Installation method	Device type by default (rail type to be specified on order)				Device type

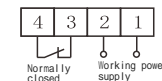
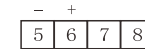
2

Table 2: Action Time Table

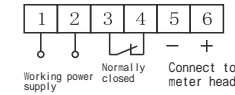
Tripping Class	Action Time				
	1.05 times	1.2 times	1.5 times	2 times	3 times
2	No tripping within 2h	$\leq 75s$	$\leq 32s$	$\leq 16s$	$\leq 6s \pm 20\%$
10A		$\leq 180s$	$\leq 80s$	$\leq 38s$	
10		$\leq 350s$	$\leq 150s$	$\leq 80s$	
15		$\leq 500s$	$\leq 240s$	$\leq 120s$	
20		$\leq 700s$	$\leq 300s$	$\leq 160s$	
25		$\leq 850s$	$\leq 390s$	$\leq 200s$	
30		$\leq 1000s$	$\leq 470s$	$\leq 240s$	

IV. Wiring Diagram

Connect to meter head



HHD3E-ATPL、APL、BPL、CPL

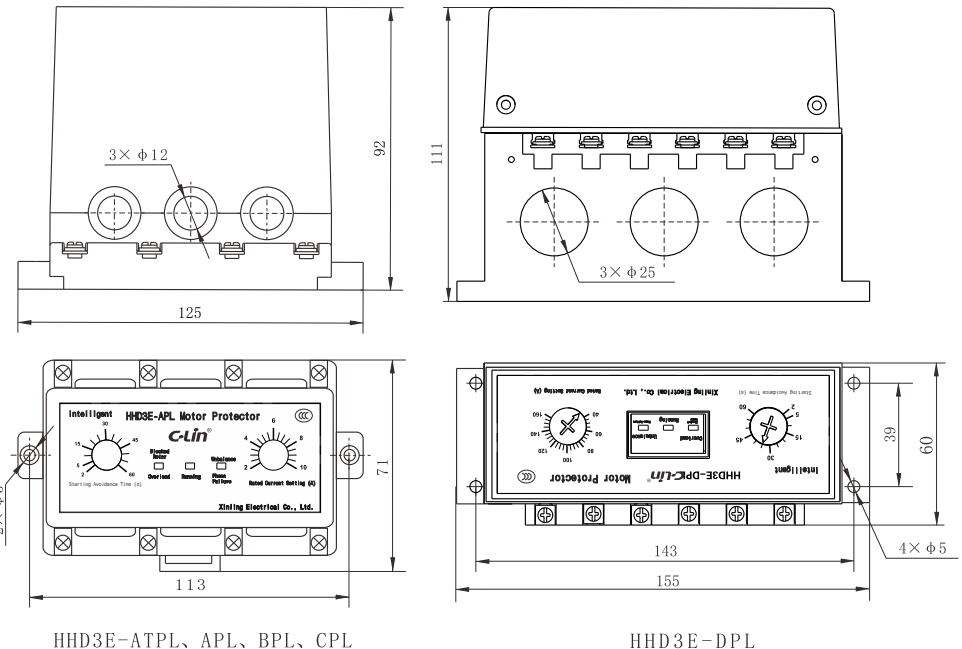


HHD3E-DPL

Note: For DC meter head configuration: Internal resistance is 156 , full scale is 1mA, and the range is as shown in Table 1.

3

V. Outline Dimensions (mm)

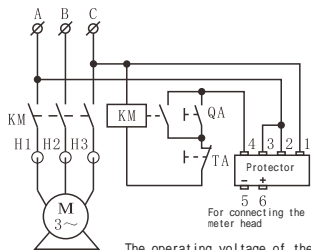


HHD3E-ATPL、APL、BPL、CPL

HHD3E-DPL

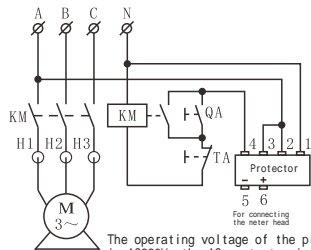
4

VI. Application Circuit Examples



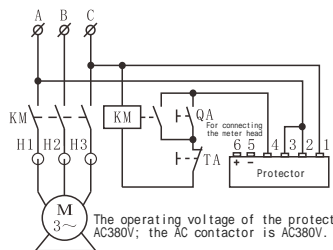
The operating voltage of the protector is AC380V; the AC contactor is AC380V.

HHD3E-ATPL, APL, BPL, CPL

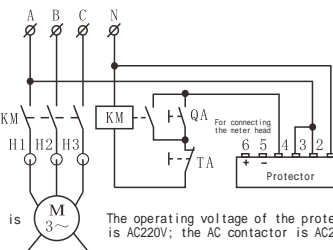


The operating voltage of the protector is AC220V; the AC contactor is AC220V.

HHD3E-DPL



The operating voltage of the protector is AC380V; the AC contactor is AC380V.



The operating voltage of the protector is AC220V; the AC contactor is AC220V.

HHD3E-DPL

Explanation

- KM: AC Contactor
- QA: Start Button
- TA: Stop Button
- H1-H3: Threading Holes of the Protector

Note: The control power supplies of the protector and the AC contactor must be in the same phase.

6

d) When starting the motor, the "Running" indicator light and "Overload" indicator light of the protector turn on. After the start - up is completed and the motor enters the normal operating state, the "Overload" indicator light should go out, the "Running" indicator light remains on, and the meter head displays the current at this time. Then the entire adjustment process is finished.

2. Precautions:

- a) When the motor fails to start normally, the starting avoidance time can be extended. On the premise of ensuring normal starting, the avoidance time should be adjusted to be as short as possible. (When you select 2, it means you select the starting avoidance time as 2s. The starting avoidance time is adjustable from 2s to 60s.)
- b) After the motor is protected due to a fault, the cause of the fault must be eliminated before starting the motor (the interval between the protector's protection action and the second start should be 10s) to avoid losses.
- c) **The protector should be regularly subjected to manual overload and phase - failure protection action tests to verify whether the product functions normally.**
- d) The DC meter head needs to have an internal resistance of 156 and a full - scale value of 1mA, and the range is shown in Table 1. When replacing the meter head, attention should be paid to the internal resistance and positive/negative polarity.
- e) The rated current of the motor must be within the rated current range of the selected protector.

IX. Ordering Information

1. When selecting a protector, the model specification, power supply voltage, and quantity should be specified.

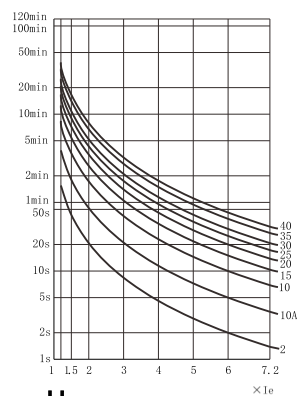
Example: HHD3E - CPL, 20A~100A, AC380V, 10 sets. It means 10 protectors with model HHD3E - CPL, current specification of 20A~100A, and voltage of AC380V.

2. The delivered products do not include an ammeter. If an ammeter needs to be equipped, the customer shall specify it when placing an order.

For example: HHD3E - CPL with a 69C17 meter head. When placing an order, specify: one 69C17 meter head for HHD3E - CPL. The meter head model can be customized according to the customer's hole opening (such as 6C2, 44C2, 85C17, etc.).

7

VII. Inverse Time - Limit Characteristic Diagram of Overload Protection



VIII. Instructions for Use

1. Installation and Adjustment:

- a) Correctly connect the protector to the control circuit by referring to the application circuit examples, and let the three - phase current wires pass through the three conduit holes of the protector in the same direction. The positive and negative poles of the meter head terminals on the protector should be connected corresponding to the positive and negative poles of the meter head.
- b) Perform static setting directly according to the rated current marked on the motor nameplate: Adjust the "rated current" knob so that its pointer aligns with the position corresponding to the motor's rated current value marked by current quantification on the panel.
- c) Adjust the starting avoidance time according to the allowable starting characteristics of the motor. When adjusting, consider the time required for the motor to go from starting to normal operation to avoid false protection of the protector caused by the large starting current when the motor starts.

8



C-Lin
欣灵电气股份有限公司
XINLING ELECTRICAL CO., LTD.

地址: 浙江省乐清经济开发区纬十九路328号
电话: 0577-62735555 传真: 0577-62722963
Http://www.c-lin.cn E-mail:xl@xinling.com
技术咨询: 0577-62731236



中国
浙江
乐清
欣灵
电气
股份
有限
公司

使用说明书
Products Instructions

HHD3E-□PL

Motor Protector

Thank you very much for using C-Lin brand motor protector. Please read the instruction manual before using the product!

07A088E12