

User Manual

HDCK-09~95

AC Contactor

Complied Standard: IEC/EN 60947-4-1

□Please carefully read the User Manual before the Installation and use of the products, keep it properly as backup.



HDCK-09~95 AC Contactor

User Manual

Safety Instructions

Please read the instructions carefully before installing, operating, running, maintaining and inspecting the product. Please install and use the product accurately based on the contents specified in the instructions.

⚠ Danger:

- Do not operate the contactor with wet hands;
- Do not touch live conductive parts during operation;
- Ensure that the product is completely de-energized during maintenance and servicing;

⚠ Caution:

- Please install and maintain the product by professionals only;
- Confirm whether the product voltage, current, frequency and use type conform to the requirements prior to use;
- First connect the control circuit and perform a no-load operation test; only after confirming no abnormality, connect the load;
- Periodically tighten the wiring terminals and remove accumulated dust;
- Prevent any foreign matters from entering the product;
- If accessories are required, please use the matching accessories provided by the Company;
- If the product is damaged or produces abnormal sound after unpacking, do not use it and contact the supplier;
- When disposing of the product, please properly handle the product waste. Thank you for your cooperation.
- It is not recommended to use the main contacts of the contactor for AC loads with a capacity lower than 72 VA or DC loads with a power lower than 72 W (such as direct control by PLC output, etc.). If such use is necessary, the built-in auxiliary contacts of the product, the F4 auxiliary contact block, the JZC4s contactor relay, or the CDZ9 miniature electromagnetic relay can be used to achieve better performance.

Introduction to HDCK-09~95 Product

- Panel Introduction

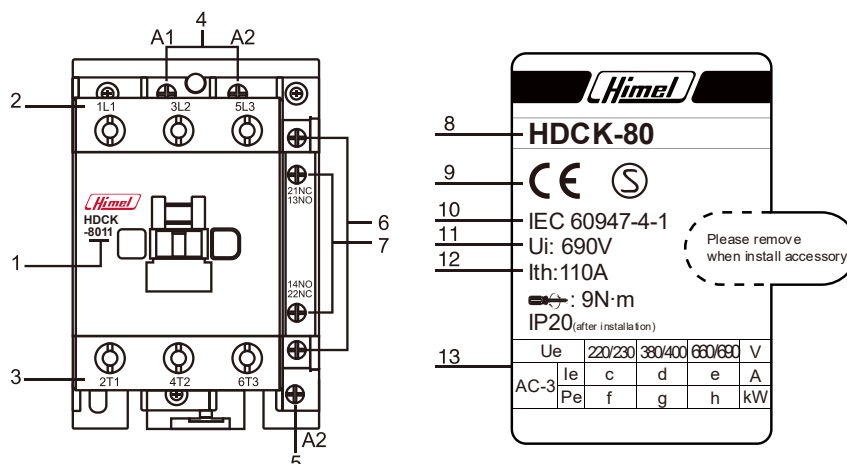


Figure 1 Schematic Diagram of the Product



Explanation: 1 - Product model and specification
 2 - Main circuit line terminals 1/L1, 3/L2, 5/L3
 3 - Main circuit load terminals 2/T1, 4/T2, 6/T3
 4 - Coil ingoing terminal A1, outgoing terminal A2 5 - Coil outgoing terminal A2
 6 - Normally closed auxiliary wiring terminal 7 - Normally open auxiliary terminal
 8 - Product model 9 - Certification mark
 10 - Applicable standards: GB/T14048.4, IEC60947-4-1
 11 - Insulation voltage U_i : 690V 12 - Conventionally rated free air thermal current
 13 - Rated operating current, voltage and power

See Table 1 for specific parameters.

Table 1

Model	Ith A	AC-3 usage category						AC-4 usage category					
		Ie A			Pe kW			Ie A			Pe kW		
		220/ 230V	380/ 400V	660/ 690V	220/ 230V	380/ 400V	660/ 690V	220/ 230V	380/ 400V	660/ 690V	220/ 230V	380/ 400V	660/ 690V
HDCK-09	25	9	9	6.6	2.2	4	5.5	3.5	3.5	1.5	0.6	1.5	1.1
HDCK-12		12	12	8.9	3	5.5	7.5	5	5	2	1.1	2.2	1.5
HDCK-18		18	18	12	4	7.5	10	7.7	7.7	3.8	1.5	3.3	3
HDCK-25	32	25	25	18	5.5	11	15	8.5	8.5	4.4	2.2	4	3.7
HDCK-32	40	32	32	22	7.5	15	18.5	12	12	7.5	3	5.4	5.5
HDCK-38	50	38	38	22	9	18.5	18.5	14	14	8.9	4	5.5	6
HDCK-40	50	40	40	34	11	18.5	30	18.5	18.5	9	5.5	7.5	7.5
HDCK-50	70	50	50	39	15	22	33	24	24	12	6	11	10
HDCK-65	80	65	65	42	18.5	30	37	28	28	14	7.5	15	11
HDCK-80	110	80	80	49	22	37	45	37	37	17.3	11	18.5	15
HDCK-95	120	95	95	49	25	45	45	44	44	21.3	14	22	18.5
Rated operational frequency for intermittent periodic duty with a duty factor of 40%													
HDCK-09~25	AC-3	220/380V: 1200 times/h 660V: 300 times/h						AC	380V: 300 times/h 660V: 120 times/h				
HDCK-32~95		220/380V: 600times/h 660V: 300 times/h											

See Table 2 for the permitted utilization categories and their codes for the main circuit and auxiliary circuit of the contactor.

Table 2: Utilization categories and their codes for the main circuit and auxiliary circuit of the contactor

Model	Utilization category code	Typical application examples
Main circuit	AC-1	Non-inductive or slightly inductive loads, resistance furnaces
	AC-2	Starting and breaking of wound-rotor induction motors
	AC-3	Starting and breaking during running of cage induction motors
	AC-4	Starting, plug braking or reversing, inching of cage induction motors
Auxiliary circuit	AC-15	Control of AC electromagnet loads
	DC-13	Control of DC electromagnet loads



Normal Use, Installation, and Transportation Conditions

- Normal Use and Installation Conditions

- (1) Ambient air temperature is not higher than +40°C and not lower than -5°C, and the 24-hour average value does not exceed +35°C;
- (2) The altitude of the installation site shall be no higher than 2,000m;
- (3) The relative humidity of the atmosphere does not exceed 50% at the maximum ambient temperature of +40°C, and can be higher at lower temperatures, such as 90% at 20°C; protective measures shall be taken for condensation occasionally generated due to temperature changes;
- (4) The installation position shall be vertical, and the inclination in all directions shall not exceed $\pm 22.5^\circ$;
- (5) The installation site should be free of impact vibration and avoid rain and snow.
- (6) Pollution level: Level 3;
- (7) Installation category: Category III;
- (8) Rated impulse withstand voltage U_{imp} : 6000V;
- (9) Rated frequency: 50/60Hz;
- (10) Protection rating: IP20 (excluding wiring terminals);
- (11) Suitable for 8-hour duty, intermittent periodic duty, continuous duty, and short-time duty.

- Normal Storage and Transportation Conditions

- (1) Temperature: -25°C to +55°C, up to +70°C for short periods (within 24 hours);
- (2) Relative humidity: $\leq 95\%$;
- (3) Handle the product with care during transportation; do not put it upside down and avoid strong impacts;
- (4) The product shall not be exposed to rain or snow during transportation and storage.

Product Installation

- The contactor can be mounted either by screws or on a card track. HDCK-09~38 models can be mounted on a 35 mm standard card track, and HDCK-40~95 models can be mounted on a 35 mm or 75 mm standard card track. Before installation, check that the rated voltage and frequency of the coil match the control power supply. Do not use the contactor if it is damaged or not securely assembled. See Figures 2 and 3 for mounting and removal instructions.

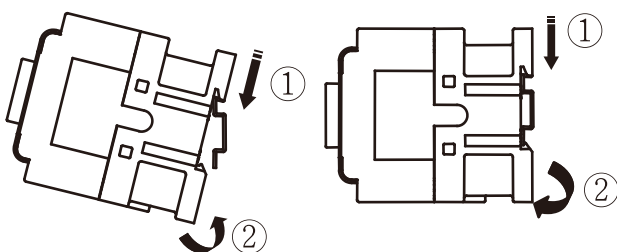


Figure 2 Mounting and removal instructions for HDCK-09~38

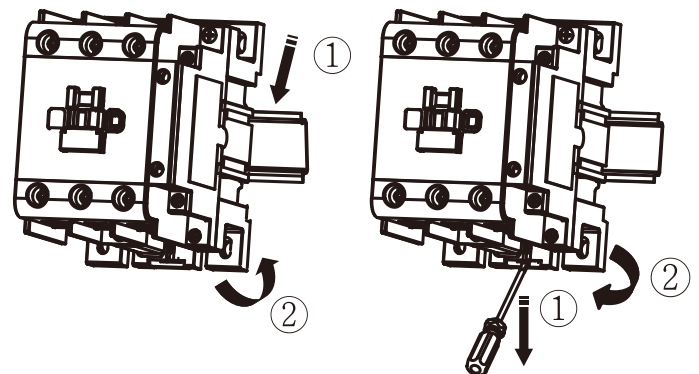


Figure 3 Mounting and removal instructions for HDCK-40~95

- See Figure 4 for product installation requirements.

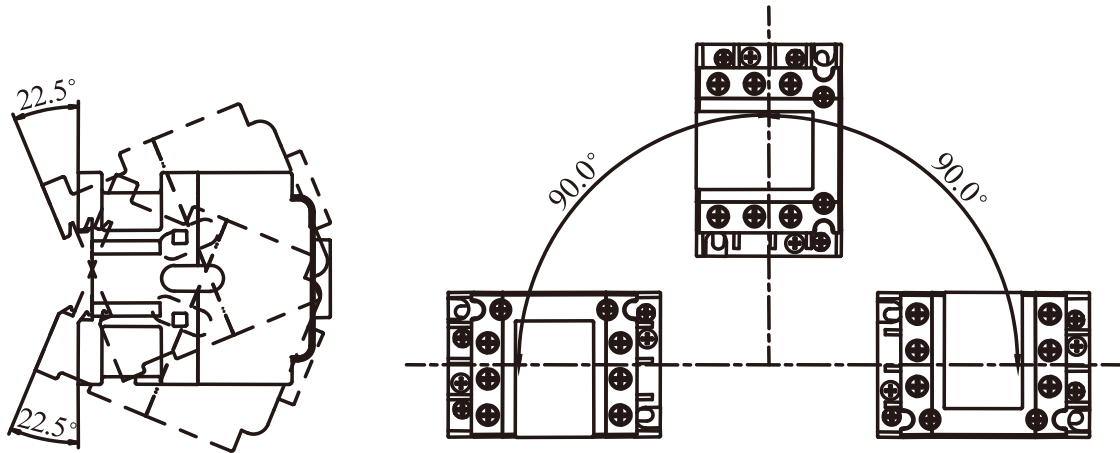


Figure 4 Installation requirements

- Refer to Figures 5 and 6 and Table 3 for the contactor dimensions and mounting dimensions.

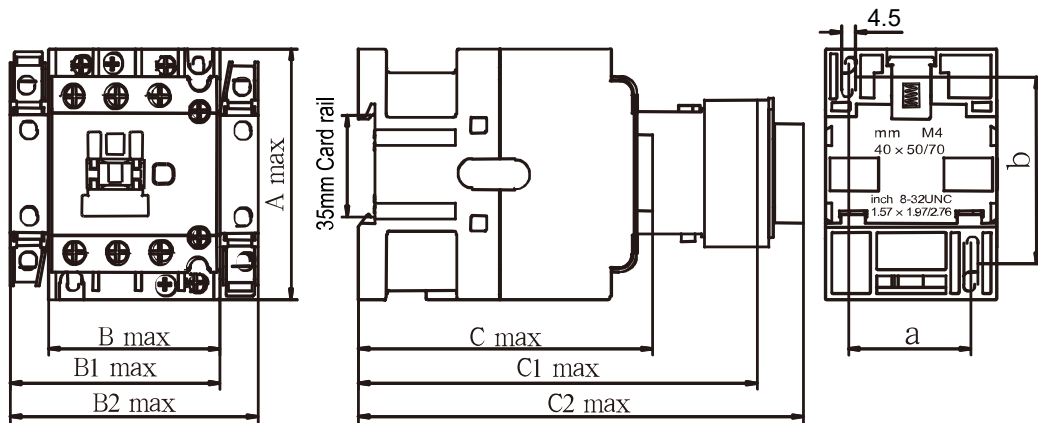


Figure 5 HDCK-09~38

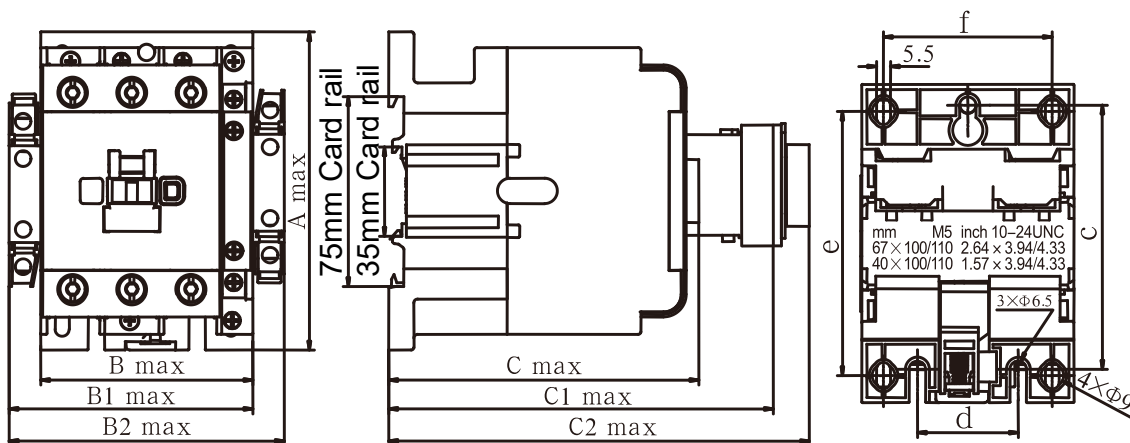


Figure 6 HDCK-40~95

Table 3 Dimensions and mounting dimensions of HDCK-09~95 AC contactors

Unit: mm

Model	Auxiliary contact	Amax	Bmax	B1max	B2max	Cmax	C1max	C2max
HDCK-09,12,18	01, 10	74.5	45.5	58	71	82.5	114.5	139.5
HDCK-25,32,38	01, 10	83	56.5	69	82	97	129	154
HDCK-40,50,65	11	127.5	74.5	88	101	117	148.5	173.5
HDCK-80,95	11	127.5	85.5	99	112	125.5	157	182
Note: B1max — Contactor + HFC4 C1max—Contactor +HF4				B2max—Contactor + two HFC4 C2max—Contactor + two HFT6				
Model	Auxiliary contact	a	b	C	d	e	f	
HDCK-09,12,18	01, 10	35	50/60	—	—	—	—	
HDCK-25,32,38	01, 10	40	50/72	—	—	—	—	
HDCK-40,50,65	11	—	—	105	40	100/110	59	
HDCK-80,95	11	—	—	105	40	100/110	67	

- Refer to Figures 7 and 8 and Table 4 for the dimensions and mounting dimensions of the directional AC contactor.

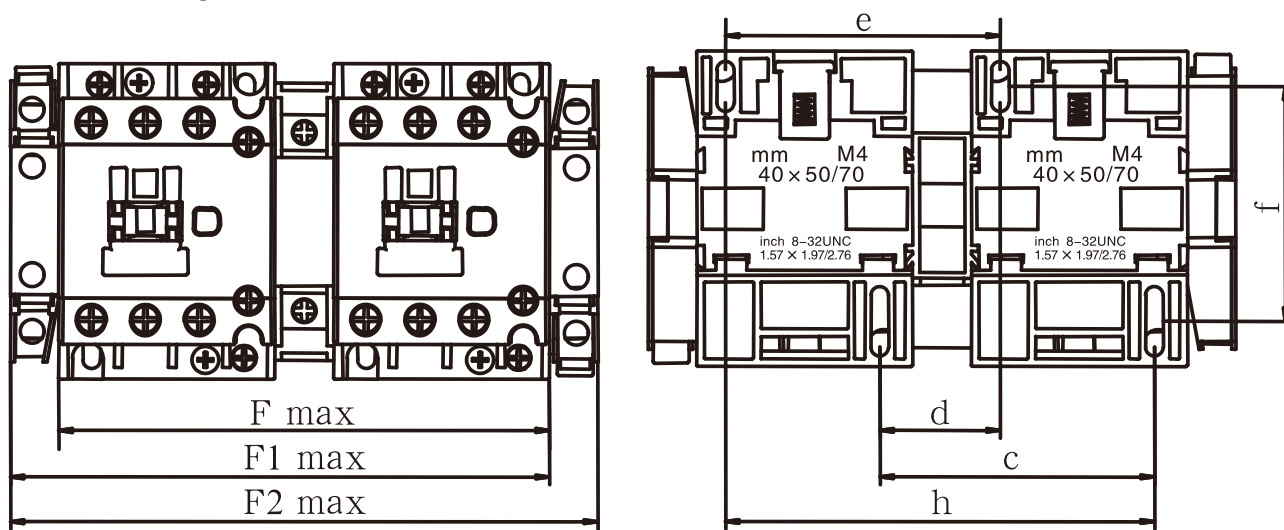


Figure 7 HDCK-09N~38N

Table 4 Dimensions and mounting dimensions of HDCK-09N~95N directional AC contactor

Unit: mm

Model	Fmax	F1max	F2max	C	d	e	f	h
HDCK-09N,12N,18N	107	120	131	60	25	60	50/60	95
HDCK-25N,32N,38N	129	142	153	71	31.5	71	50/72	111.5
HDCK-40N,50N,65N	163	180	193	—	50	90	100/110	130
HDCK-80N,95N	186	202	215	—	60	100	100/110	140

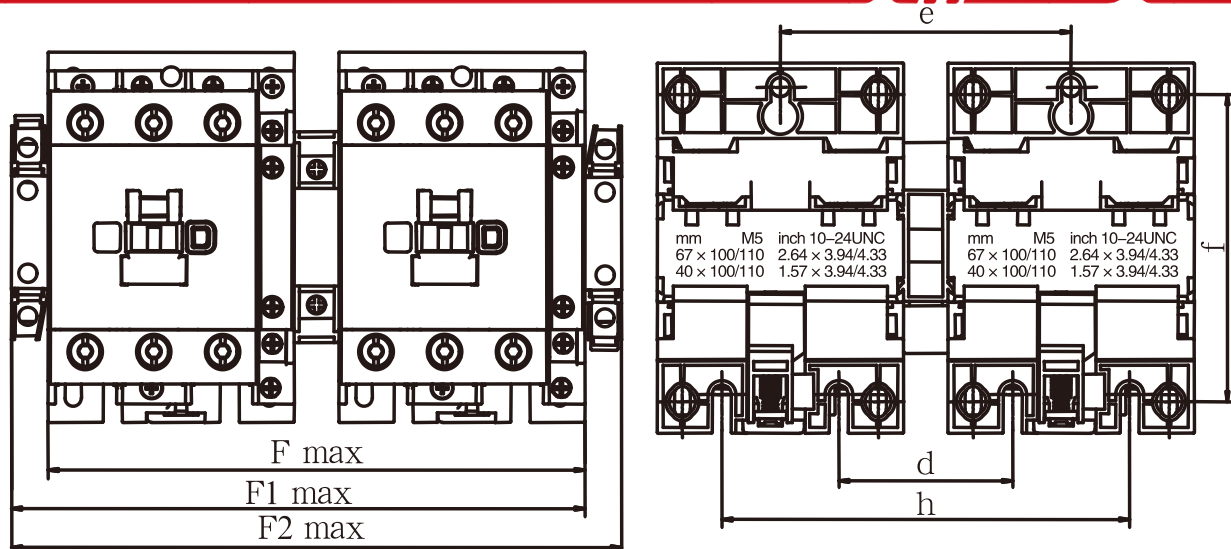


Figure 8 HDCK-40N~95N

● Accessory installation

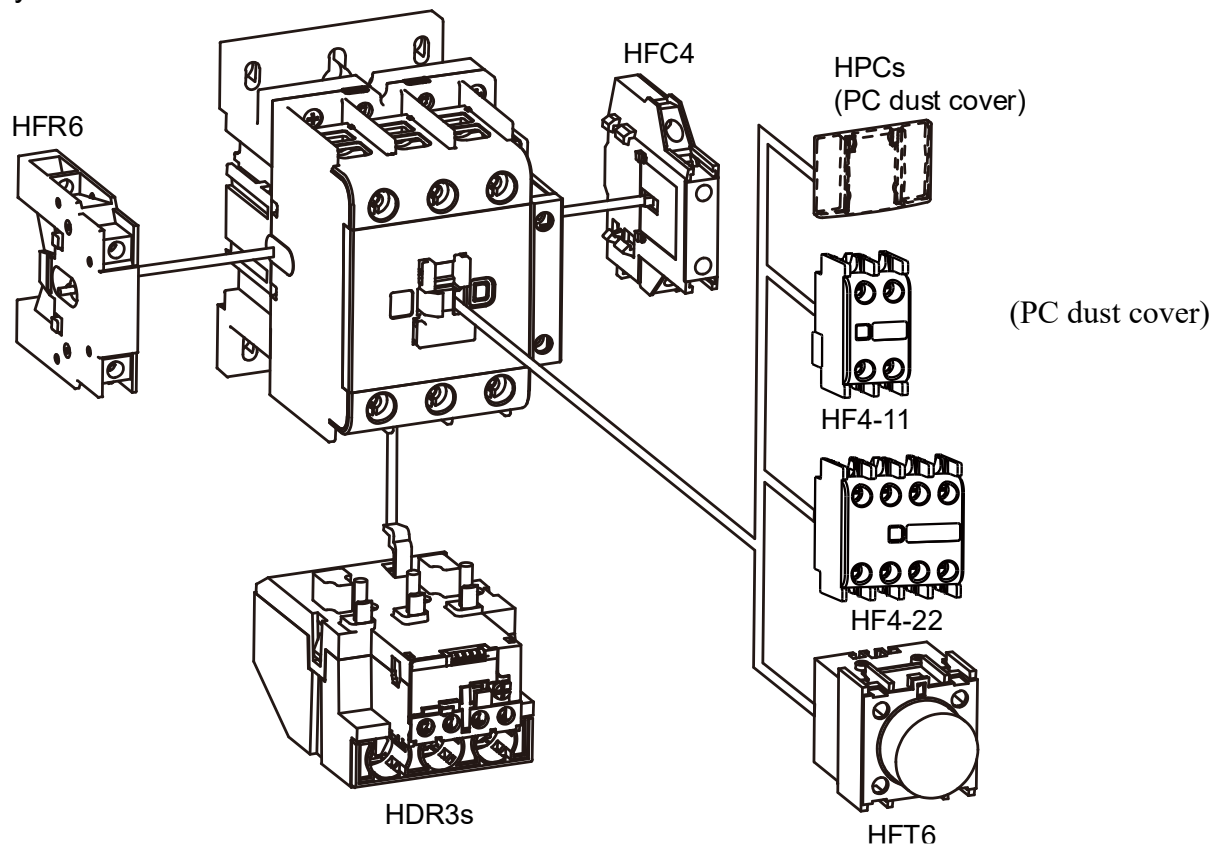


Figure 9 Installation Diagram for Accessories

(1) Auxiliary contact

HDCK-09~38 contactor body has a pair of normally open or normally closed auxiliary contact blocks, while HDCK-40~95 contactor body has a pair of normally open auxiliary contact blocks and a pair of normally closed auxiliary contact blocks. Refer to Table 5 for their main parameters.

Table 5 Main parameters of auxiliary contacts

Utilization category	Rated Insulation Voltage U_i	Conventionally rated free air thermal current I_{th}	Control capacity		Rated operating current I_e	
			Power-On	Breaking	220 V	380V
AC-15	690V	10A	3600VA	360VA	1.6A	0.95A
DC-13			33W		0.15A	—

The contactor can be equipped with an independent auxiliary contact module. The models, specifications, and combinations of normally open and normally closed contacts are shown in Table 6. The installation method for HF4 is the same as that for the air delay contact. The installation and removal methods for HFC4 are shown in Figures 10 and 11.

Table 6 Auxiliary contact blocks

Model/Specification	HF4-20	HF4-11	HF4-02	HF4-40	HF4-31	HF4-22	HF4-13	HF4-04
Number of normally open (NO) contacts	2	1	0	4	3	2	1	0
Number of normally closed (NC) contacts	0	1	2	0	1	2	3	4

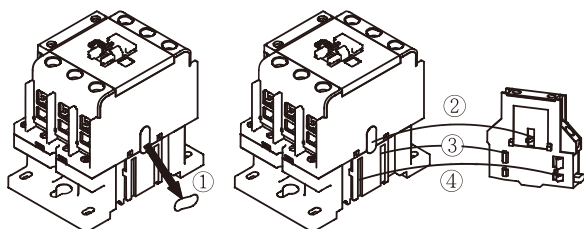


Figure 10 Installation method for HFC4

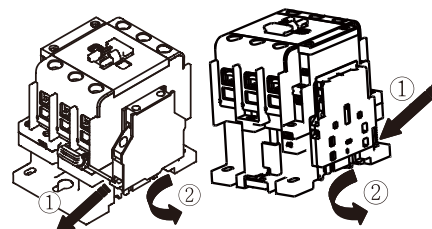


Figure 11 Removal method for HFC4

(2) Air delay contact

The contactor can be equipped with HFT6 air delay contact to form a timing contactor. Its delay ranges are shown in Table 7.

Table 7 Air delay contact

Model/Specification	Delay range	Number of air delay contacts	Delay type
HFT6-20	0.1~3s	1NO+1NC	Power-on delay
HFT6-22	0.1~30s		
HFT6-24	10~180s		
HFT6-30	0.1~3s		Power off delay
HFT6-32	0.1~30s		
HFT6-34	10~180s		
Note: The air delay contact is adjusted to the minimum value at the factory.			

The installation and removal of the air delay contact are shown in Figures 12 and 13.

For installation: ① Align the chute with the guide rail of the contactor.

② Push downward until the buckle is clamped automatically;

For removal: ① Lift the buckle upward; ② Push upward along the chute to disassemble it.

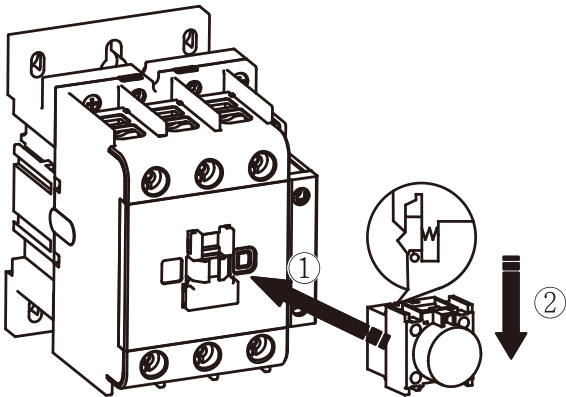


Figure 12 Installation of air delay contact

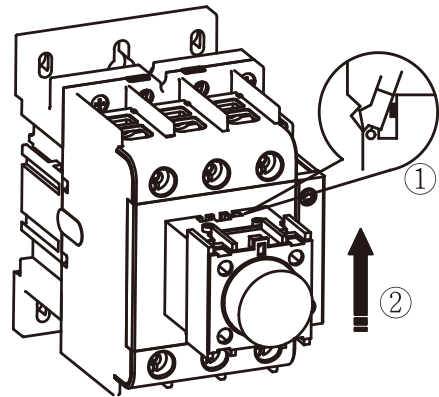


Figure 13 Removal of air delay contact

(3) The installation method of HFR6 mechanical interlock is shown in Figure 14. For HDCK-09~38A, only steps ① to ④ need to be completed. For HDCK-40~95A, the fixing connecting plate also needs to be installed.

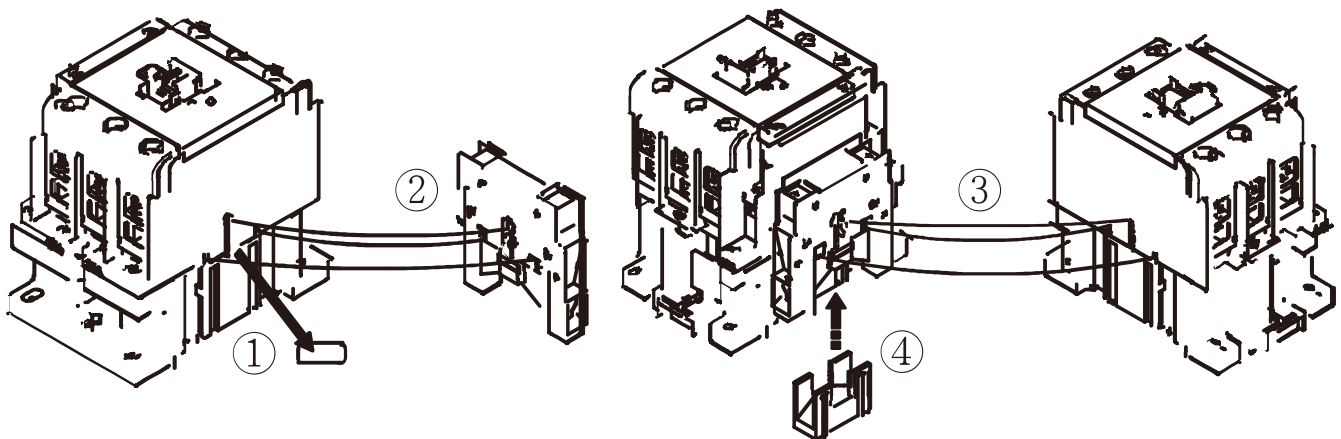
① Remove the dust absorber.

② Install HFR6

③ Install the other contactor as shown in the figure.

④ Install the fixing module as shown in the figure.

⑤ Secure the two contactors using the fixing screws, nuts, and connecting plate as shown in the figure.



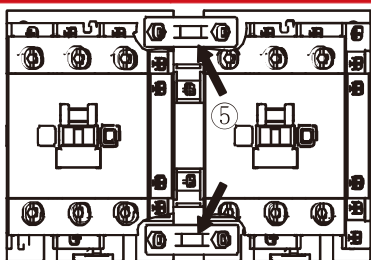


Figure 14
Installation method of mechanical interlock
HFR6

(4) Electromagnetic starter

The contactor can be combined with HDR3s series thermal overload relay to form an electromagnetic starter.

Debugging and Operation

- Check if the parameters on nameplate conform to the operation requirements;
- First connect the control circuit and perform a no-load operation test; only after confirming no abnormality, connect the load;
- Prevent any foreign matters from entering the product;
- It is recommended to select SCPD according to Type 1 coordination protection. The rated limited short-circuit current I_q is 20 kA (corresponding to a test voltage of 400V). Refer to Table 8 for the fuse models.

Table 8 Matched fuse models

Model	HDCK-09	HDCK-12	HDCK-18	HDCK-25	HDCK-32	HDCK-38	HDCK-40
Main circuit	RT16-0020A	RT16-0020A	RT16-0032A	RT16-0040A	RT16-0050A	RT16-0063A	RT16-0063A
Model	HDCK-50	HDCK-65	HDCK-80	HDCK-95			
Main circuit	RT16-0080A	RT16-0080A	RT16-00100A	RT16-00125A			
Auxiliary circuit	RT16-0010A						

- Refer to Table 9 for wiring capacity and tightening torque.

Table 9 Wiring capacity and tightening torque

Current Specification			09/12/18	25/32/38	40/50/65	75/80/95/100
Main circuit wiring						
Flexible wire Without wiring terminal	1 conductor	mm ²	1...4	1.5...10	4...25	6...50
	2 conductors	mm ²	1...4	1.5...6	4...16	6...25
Flexible wire With wiring terminal	1 conductor	mm ²	1...4	1...6	4...25	6...50
	2 conductors	mm ²	1...2.5	1...4	4...10	6...16
Hard wire Without wiring terminal	1 conductor	mm ²	1...4	1.5...6	4...25	6...50
	2 conductors	mm ²	1...4	1.5...6	4...10	6...25
Tightening Torque		N·m	1.2	1.8	5	9
Control and auxiliary circuit wiring						
Flexible wire Without wiring terminal	1 conductor	mm ²	1...4			
	2 conductors	mm ²				
Flexible wire With wiring terminal	1 conductor	mm ²	1...2.5			
	2 conductors	mm ²				

Table 9 (Continued)

Current Specification			09/12/18	25/32/38	40/50/65	75/80/95/100
Control and auxiliary circuit wiring						
Hard wire Without wiring terminal	1 conductor	mm ²	1...4			
	2 conductors	mm ²				
Tightening Torque		N·m	1.2			

Maintenance and Servicing

- The contactor shall undergo regular maintenance such as tightening the wiring terminals and removing accumulated dust; otherwise, there is a risk of fire and short circuit.
- Small metal particles splashed around the contacts or on the arc cover of the contactor shall be removed. If the contact surface is burned to the extent that the base material is exposed, the contactor shall be taken out of service.

Fault analysis and troubleshooting

Refer to Table 10 for common fault analysis and troubleshooting.

Table 10 Common Fault Analysis and Troubleshooting

Symptom	Cause Analysis	Handling measures
The core fails to attract or has insufficient attraction (i.e., the contacts have closed, but the core has not yet fully attracted).	1. Too low supply voltage or excessive fluctuation; 2. Insufficient power supply capacity of the control circuit, or broken wires, wiring errors, or poor contact of the control contacts; 3. The technical parameters of the coil do not match the operating conditions; 4. The product itself is damaged (e.g., the coil is broken or burned, moving mechanical parts are stuck, etc.)	1. Increase the supply voltage; 2. Increase the power supply capacity, replace the wires, and repair the control contacts; 3. Replace the contactor; 4. Remove the jamming fault and repair the damaged parts.
Failure to release or slow release	1. Fusion welding of contacts; 2. Moving mechanical parts are stuck; 3. The pole faces of the core are contaminated with oil or dust.	1. Eliminate the welding fault, repair or replace the contactor; 2. Remove the jamming fault; 3. Clean the pole faces of the core.
Coil overheating or burnout	1. The supply voltage is too high or too low; 2. The technical parameters of the coil (such as rated voltage, frequency, duty cycle, and applicable duty type) do not match the actual operating conditions; 3. Moving parts are stuck; 4. The pole faces of the core are uneven or contaminated with dust.	1. Adjust the supply voltage; 2. Replace the contactor; 3. Remove the mechanical jamming fault; 4. Clean the pole faces.
Excessive noise from the electromagnet (AC)	1. The supply voltage is too low; 2. The magnetic system is skewed or mechanically stuck, preventing the core from closing properly; 3. The pole faces of the core are rusted, or foreign matter has entered the pole faces; 4. The short-circuit ring is broken, or the pole faces of the core are excessively worn and uneven.	1. Increase the operating circuit voltage; 2. Adjust the magnetic system or remove the mechanical jamming fault; 3. Clean the pole faces; 4. Replace the contactor.
Fusion welding of contacts	1. The operating frequency is too high, or the product is used under overload; 2. Short circuit on the load side;	1. Replace with a suitable contactor; 2. Remove the short circuit fault.

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