

## User Manual

### HDCX-09~38 DC Coil 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.



#### HDCX-09-38 DC User manual

##### Safety notification

Please read this manual carefully before installation, operation, maintenance, inspection, install and use the product accurately according to the contents of the manual.

##### ⚠ Danger:

- Do not operate the contactor with water on your hands.
- Do not touch the conductive part while in use.
- During maintenance and care, ensure that the product is electrically neutral.

##### ⚠ Attention:

- Installation and maintenance should be operated by professionally qualified personnel.
- Please confirm whether the product operating voltage, rated current, frequency and use category meet the requirements before use.
- Firstly, please connect the control circuit for no-load test, if there is no abnormality, then connect the load.
- Regularly tighten the terminal wiring and remove the deposited dust.
- Do not allow anything else to fall into the product.
- If you need to buy accessories, please choose the matching accessories provided by our company.
- If the product is damaged or has abnormal sound when unpacking, please refuse to use and contact our company.
- Please dispose of end-of-life products in the correct way.
- The main contacts of the contactor are not recommended to be used when the AC load capacity is less than 72VA or the DC load power is less than 72W (e.g., DC control of PLC output), and the HFD6 auxiliary contact set can be used to achieve better results.

##### Learn about HDCX-09-38 DC products

- Panel introduction

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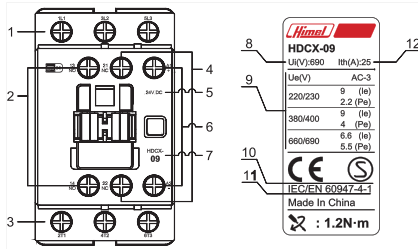


Fig. 1 Product diagram

- Instructions:
    - 1—Main circuit inlet terminal 1/L1, 3/L2, 5/L3
    - 2—Normally open auxiliary terminal
    - 3—Main circuit outlet terminal 2/T1, 4/T2, 6/T3
    - 4—Normally close auxiliary terminal
    - 5—Rated control circuit voltage
    - 6—Coil inlet terminal A1, outlet terminal A2
    - 7—Product specification
    - 8—Rated insulation voltage Ui
    - 9—Rated operational current, voltage, power
    - 10—Certification mark
    - 11—Compliant with standard number: IEC/EN 60947-4-1
    - 12—Conventional free air thermal current
- The specific product parameters are shown in Table 1.

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Table. 1						
Model	HDCX-09	HDCX-12	HDCX-18	HDCX-25	HDCX-32	HDCX-38
Conventional free air thermal current I <sub>th</sub> (A)	25	32	40	50	50	50
Rated operational current I <sub>e</sub> (A)	AC-3 220/230 9 (W) 2.2 (Pa) 9 (W) 4 (Pa) 380/400 6.6 (W) 6.6 (Pa) 660/690 11 (W) 11 (Pa)	12 18 25 32 38	18 25 32 38	25 32 38	32 38	38
Rated operational power P <sub>e</sub> (kW)	AC-3 220/230 4 5.5 7.5 10 15 18.5 18.5	4 5.5 7.5 10 15 18.5 18.5	4 5.5 7.5 10 15 18.5 18.5	4 5.5 7.5 10 15 18.5 18.5	4 5.5 7.5 10 15 18.5 18.5	4 5.5 7.5 10 15 18.5 18.5
Rated insulation voltage U <sub>i</sub> (V)	690	690	690	690	690	690
Rated impulse withstand voltage U <sub>imp</sub> (V)	6	6	6	6	6	6
Electrical endurance	1 million times	1 million times	1 million times	1 million times	1 million times	1 million times
Intermittent operation	1200 times/h	1200 times/h	1200 times/h	1200 times/h	1200 times/h	1200 times/h
Load factor of the rated operational frequency	300 times/h	300 times/h	300 times/h	300 times/h	300 times/h	300 times/h
Arching distance(mm)	3	3	3	3	3	3
Rated control circuit voltage U <sub>c</sub>	DC 24V/DC 48V/DC 110V/DC 220V	DC 24V/DC 48V/DC 110V/DC 220V	DC 24V/DC 48V/DC 110V/DC 220V	DC 24V/DC 48V/DC 110V/DC 220V	DC 24V/DC 48V/DC 110V/DC 220V	DC 24V/DC 48V/DC 110V/DC 220V
Mechanical endurance	15 million times	15 million times	15 million times	15 million times	15 million times	15 million times
Switching frequency	3600 times/h	3600 times/h	3600 times/h	3600 times/h	3600 times/h	3600 times/h
Power consumption of the magnetic coils	Pick-up Sealing 6.5W	Pick-up Sealing 6.5W	Pick-up Sealing 6.5W	Pick-up Sealing 6.5W	Pick-up Sealing 6.5W	Pick-up Sealing 6.5W
Magnetic coil operating range	Pick-up Sealing 0.8U <sub>c</sub> ~1.1U <sub>c</sub> 0.1U <sub>c</sub> ~0.7U <sub>c</sub>	Pick-up Sealing 0.8U <sub>c</sub> ~1.1U <sub>c</sub> 0.1U <sub>c</sub> ~0.7U <sub>c</sub>	Pick-up Sealing 0.8U <sub>c</sub> ~1.1U <sub>c</sub> 0.1U <sub>c</sub> ~0.7U <sub>c</sub>	Pick-up Sealing 0.8U <sub>c</sub> ~1.1U <sub>c</sub> 0.1U <sub>c</sub> ~0.7U <sub>c</sub>	Pick-up Sealing 0.8U <sub>c</sub> ~1.1U <sub>c</sub> 0.1U <sub>c</sub> ~0.7U <sub>c</sub>	Pick-up Sealing 0.8U <sub>c</sub> ~1.1U <sub>c</sub> 0.1U <sub>c</sub> ~0.7U <sub>c</sub>
Average operating time	20ms	20ms	20ms	20ms	20ms	20ms

The permitted utilization categories for contactor main circuit and auxiliary circuit are shown in Table 2.

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Table. 2 The permitted utilization categories of contactor main circuit and auxiliary circuit

Circuit categories	Category	Typical applications
Main circuit	AC-1	Non-inductive or slightly inductive loads, resistance furnaces
	AC-2	Slip-ring motors; starting, switching off
	AC-3	Squirrel-cage motors; starting, switching off motors during running
	AC-4	Squirrel-cage motors; starting, plugging, inching
Auxiliary circuit	AC-15	Control AC electromagnet load
	DC-13	Control DC electromagnet load

##### Conditions of use, installation, and transport

- Conditions of use and installation
  - The ambient air temperature ranges between -5°C and +40°C with average value in 24h not exceeding +35°C.
  - Altitude: ≤2000m
  - The atmosphere relative humidity shall not exceed 50% at the maximum temperature of +40°C. Higher relative humidity is possible at lower temperatures, e.g., 90% humidity at 20°C. Protective measures should be taken against occasional condensation due to temperature changes.
  - The installation position should be vertical, and the inclination of each direction should not exceed ±25°.
  - Installed in a place without shock vibration and without rain and snow attack.
  - Pollution degree: 3
  - Overvoltage category: III
  - Rated frequency: 50Hz
  - IP degree of protection: IP20 (except terminal)
  - Suitable for 8h working system, intermittent cycle working system, uninterrupted working system and short time working system.
- Conditions of storage and transport
  - Temperature: -25°C ~ +55°C, up to +70°C within a short time (24h).
  - Relative humidity: ≤95%
  - The product should be transported gently, without inversion and strong impact.
  - The product must not be exposed to rain or snow during transport and storage.

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##### Product installation

- The contactors are available in both screw and DIN rail mounting. HDCX-09-38 DC can be installed with 35mm DIN rail. Before installation, check whether the rated voltage and frequency of the coil are consistent with the control power supply. Do not use when the contactor is damaged or not securely assembled. Installation and disassembly methods are shown in Figure 2.

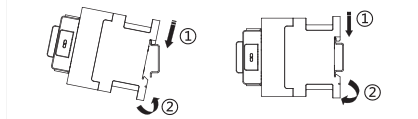


Fig. 2 HDCX-09-38 DC Installation and disassembly methods

- Product installation requirements are shown in Figure 3.

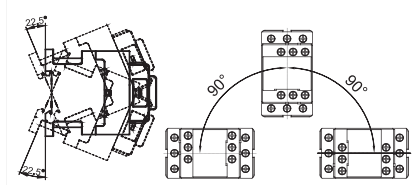


Fig. 3 HDCX-09-38 DC Installation requirements

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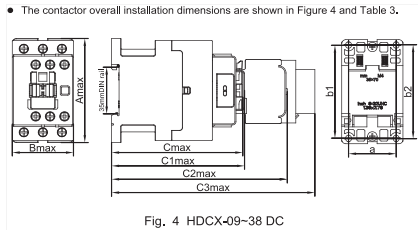


Table. 3 HDCX-09-38 DC overall installation dimensions

Unit: mm						
Model	Amax	Bmax	Cmax	C1max	C2max	C3max
HDCX-09, 12, 18 DC	79	45.5	97	98.5	130	155
HDCX-25, 32, 38 DC	86.5	45.5	103	104.5	136	161
Note: C1max—Contactor+Transparent cover C2max—Contactor+HFD6 C3max—Contactor+HFD6						
Model	a	b1	b2	-	-	-
HDCX-09, 12, 18 DC	35	69.6	70.4	-	-	-
HDCX-25, 32, 38 DC	35	69.6	70.4	-	-	-

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##### Accessory installation

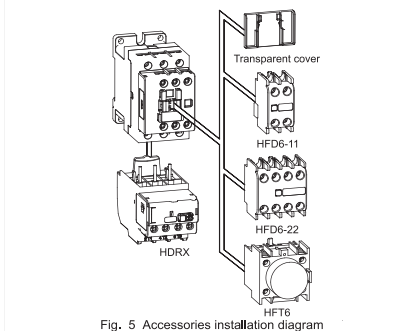


Fig. 5 Accessories installation diagram

(1) Auxiliary contact  
HDCX-09-38 DC coil contactor has a pair of normally open and a pair of normally close auxiliary contact group, the main parameters are shown in Table 4.

Table. 4 Auxiliary contacts main parameters

Category	Rated insulation voltage U <sub>i</sub>	Conventional free air thermal current I <sub>th</sub>	Rated making-breaking capacity	Rated operational current I <sub>e</sub>
AC-15	690V	10A	3600VA making 360VA breaking	220V 380V 1.6A 0.95A
DC-13	690V	10A	33W	0.15A

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Each contactor can be equipped with an independent auxiliary contact module, its references of the normal open and close combination are shown in Table 5. The HFD6 installation method consist with the HFT6 air delayed head.

Table. 5 Auxiliary contact group

Model	HFD6-20	HFD6-11	HFD6-02	HFD6-40	HFD6-3	HFD6-22	HFD6-13	HFD6-04
Number of NO	2	1	0	4	3	2	1	0
Number of NC	0	1	2	0	1	2	3	4

(2) Air delayed head

The contactor can be equipped with HFT6 air delayed head to combine into a delay contactor, and its delay range is shown in Table 6

Table. 6 Air delayed head

Model	Delay range	Number of delay contacts	Delay category
HFT6-20	0.1~3s	1NO+1NC	Power-on delay
HFT6-22	0.1~30s		
HFT6-24	10~180s		
HFT6-30	0.1~3s		
HFT6-32	0.1~30s	1NO+1NC	Power-off delay
HFT6-34	10~180s		
HFT6-36	10~180s		

Note: The air delayed head is adjusted to the minimum value when leaving the factory.

The air delayed head installation and disassembly are shown in Figure 6 and Figure 7.

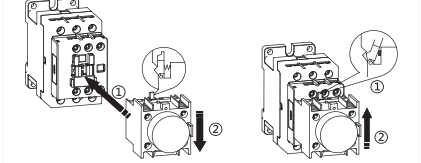


Fig. 6 Air delayed head installation

Fig. 7 Air delayed head disassembly

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##### Test and operation

- During installation:
    - Slide groove aligned with contactor rail.
    - Push down until the dip self-locks.
  - During disassembly:
    - Clip lifts up.
    - Push up along the slide groove to remove.
  - Electromagnetic starter
- The contactor can be combined with the HDRX series thermal overload relay to form an electromagnetic starter.

##### Test and operation

- Check whether the technical parameters of the product meet the use requirements.
- Firstly, connect the control circuit for no-load test, if there is no abnormality, then connect the load.
- Do not allow anything else to fall into the product.
- Recommended to select SCPD according to category one coordinated protection, rated limiting short-circuit current I<sub>q</sub>: 20kA (corresponding test voltage 400V), and the fuse references are shown in Table 7.

Table. 7 Mating fuse category

Model	HDCX-09	HDCX-12	HDCX-18	HDCX-25	HDCX-32	HDCX-38
Main circuit	HRT16-00 20A	HRT16-00 20A	HRT16-00 32A	HRT16-00 40A	HRT16-00 50A	HRT16-00 63A
Auxiliary circuit	HRT16-00 10A					

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##### Wire cross section and tightening torque are shown in Table 8.

Table.8 Wire cross section and tightening

Current specification	09/12/18	25/32/38
Main circuit wiring		
Flexible wire without terminals	1 wire mm <sup>2</sup> 2 wires mm <sup>2</sup>	1...4 1...6
Flexible wire with terminals	1 wire mm <sup>2</sup> 2 wires mm <sup>2</sup>	1...4 1...6
Rigid wire without terminals	1 wire mm <sup>2</sup> 2 wires mm <sup>2</sup>	1...4 1...6
Tightening torque	N·m	1.2 1.8
Wiring of control and auxiliary circuits		
Flexible wire without terminals	1 wire mm <sup>2</sup> 2 wires mm <sup>2</sup>	1...4 1...4
Flexible wire with terminals	1 wire mm <sup>2</sup> 2 wires mm <sup>2</sup>	1...4 1...2.5
Rigid wire without terminals	1 wire mm <sup>2</sup> 2 wires mm <sup>2</sup>	1...4 1...4
Tightening torque	N·m	1.2

##### Maintenance and care

- Regularly tighten the terminal wiring and remove the deposited dust, otherwise it will cause the danger of fire and short circuit.
- Remove small particles of spattered metal from contactor contacts or arc shields and discontinue use when contact surfaces are burned to the point of exposing base material.

##### Fault analysis and treatment

- The common faults analysis and solution are listed in Table 9.

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Table. 9 Common fault analysis and solution

Fault	Cause	Solution
The iron core does not close or has insufficient suction (contacts are closed but the core is not fully drawn).	1.The power supply voltage is too low or has too large fluctuation;	1.Increase the power supply voltage;
	2.The operating circuit has an insufficient power supply capacity or the wiring is disconnected, there is a wiring error, and the control contact is poorly connected;	2.Increase the power capacity, replace the circuit, and repair the control contact;
	3.The technical parameters of the coil are inconsistent with the working conditions;	3.Replace the contactor;
	4.The product itself is damaged (Such as, coil disconnected or burned, and mechanical movable part blocked);	4.Eliminate blocking faults and repair damage parts;
No release or slow release	5.The positive and negative terminals of the control circuit are reversed.	5.Check whether the positive terminal is connected to A+, whether the negative terminal is connected to A-, if the reverse connection needs to be corrected.
	1. Contact fusion welding.	1.Eliminate fusion welding faults, repair or replace contactors;
	2. The mechanical movable part is stuck.	2.Eliminate blocking faults;
The core is overheated or burned	3. Iron core pole surface has oil or dust.	3.Clean the pole face of the iron core.
	1.The power supply voltage is too low;	1.Adjust the power supply voltage to 0.8U <sub>c</sub> to 1.1 U <sub>c</sub> ;
	2.The technical parameters (such as rated voltage, frequency, power-on duration rate and applicable working system) of the coil are inconsistent with the actual use conditions;	2.Replace the contactor;
Contact fusion welding	3.The pole surface of the iron core is uneven or is attached with dust.	3.Clean the pole face of the iron core.
	1.The operating frequency is too high or the product is overloaded;	1.Replaces by the appropriate contactor;
Short circuit on the load side.	2. Short circuit on the load side.	2.Eliminate short circuit fault.

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