DCNHE400 Series
1000V DC Max Contactor Relays

DCNHE400MF12-B

DCNHE400NF12-F

Description

The DCNHE400 Series high-voltage DC contactor, rated for 400A continuous current (500A with 400MCM cable) and 1000V maximum contact voltage, is designed for industrial and electric vehicle (EV) applications such as battery power supply, charging pile, motor control, circuit insulation, circuit protection, and safety devices for industrial machinery.

Featuring non-polarized, sealed contacts and a double-coil design, the DCNHE400 Series industrial and EV contactor supports reliable operation in electrical systems regardless of polarity and can be mounted in any orientation.

With internal-thread and stud terminal types, 12V and 24V coil voltage ratings, and the availability of mechanically linked auxiliary contacts, the DCNHE400 Series contactor relay offers versatile installation and operation, accommodating a wide range of system requirements.

Web Resources

Download 2D print, installation guide and technical resources at: **littelfuse.com/DCNHE400**

Specifications

Rating Continous Current	400A or 500A (400MCM)
Contact Max. Voltage	1000V DC
Contact Circuitry	SPST NO
Ingress Protection	Main Contact IP67, PCBA IP54
Contacts Material	Copper Alloy
Terminals	M6 or M8 Stud Silver Plated Copper
Contact Torque	M6 Bolt:6~8N·m or M8 Stud: 8~10N·m
Housing	Nylon UL 94-V0
Coil Connector	Wire Leads for Control Circuit
Coil Type	Double
Mounting Method	M5 Bolt
Mounting Torque	M5 Bolt: 2.5~3.5N·m
Normal Position	Any Mounting Position
Approvals:	
CE:	EN 60947-4-1,2018

Applications

- Battery Electric Vehicles
- Hybrid Electric Vehicles
- Material Handling
- Electric Maintenance and Transport Vehicles
- Industrial Applications

Features and Benefits

- High voltage (1000V) contactor for EV applications
- Compact structure, helping reduce noise when turned on
- Resin housing provides corrosion resistance in harsh automotive environments
- Sealed contacts with no leakage of electrical arc for maximum safety
- No mounting orientation restrictions
- RoHS and REACH compliant
- Available with mechanically linked auxiliary contacts

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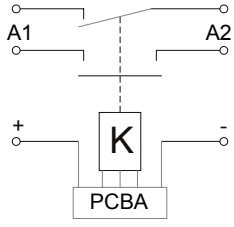
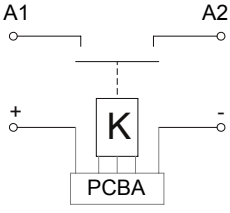
Ordering Information

PART NUMBER	RATED CURRENT(A)	POLARIZED	AUX. CONTACT	COIL VOLTAGE(VDC)	MOUNTING	POWER CONNECTION
DCNHE400MF12-B	400	No	Yes	12	Bottom	Stud Terminal
DCNHE400MF24-B	400	No	Yes	24	Bottom	Stud Terminal
DCNHE400MF12-F	400	No	Yes	12	Bottom	Internal Thread
DCNHE400MF24-F	400	No	Yes	24	Bottom	Internal Thread
DCNHE400NF12-B	400	No	No	12	Bottom	Stud Terminal
DCNHE400NF24-B	400	No	No	24	Bottom	Stud Terminal
DCNHE400NF12-F	400	No	No	12	Bottom	Internal Thread
DCNHE400NF24-F	400	No	No	24	Bottom	Internal Thread

Electrical Diagrams



DCNHE400MF



DCNHE400NF

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Performance Data

MAIN CONTACT	
Contact Arrangement	1 Form, SPST-NO
Operating Voltage	12~1000VDC
Continous Current	400A OR 500A(400MCM)
Max short circuit	2000A, 1sec
Max Breaking Limit	2500A@320VDC, 1cycle
Dielectric Withstanding Voltage	Between open contacts: 4000VAC, ≤1mA,1min Between Contact and Coil and Aux. contact: 2200VAC, ≤1mA,1min
Insulation Resistance	100 MΩ@1000VDC End of Life: Min. 50 MΩ@1000VDC
Contact Voltage Drop	≤160mV@400A

COIL DATA		
Rating Voltage	12VDC	24VDC
Voltage(Max.)	16VDC	28VDC
Pickup Voltage(25°C)	≤9VDC	≤18VDC
Release Voltage(25°C)	≥1.2VDC	≥2VDC
Starting Current(25°C)	≤3.8A	≤2.2A
Holding Power(25°C)	6W	6W

Note: This product is a double-coil, and the coil control voltage must be a step voltage. A slowly rising voltage cannot make the contactor work.

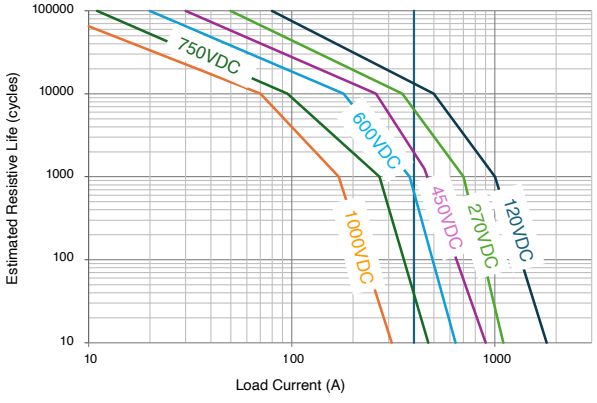
LIFE	
Electrical Life	400 cycles, 400A@450VDC 6000 cycles, 300A@450VDC 1000 cycles, 100A@1000VDC
Mechanical Life	300,000 cycles

OPERATE / RELEASE TIME	
Pickup Time(includes bounce)	≤35ms
Release Time	≤10ms

ENVIRONMENTAL DATA	
Shock, 11ms ½ sine, operating	20g, Peak
Vibration, Sine	10~500Hz, 5g, Peak
Operating Temperature	-40°C~+85°C
Humidity	5%~95%RH
Weight	650g

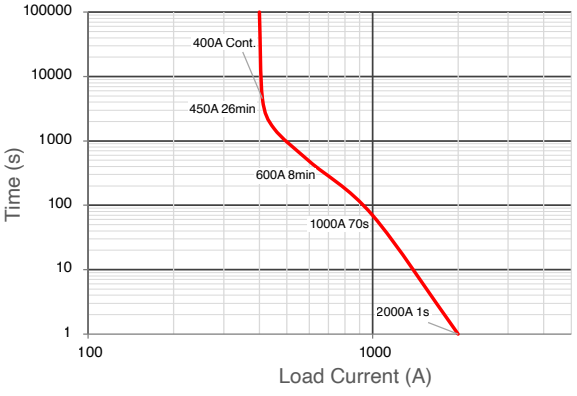
AUX. CONTACT	
Aux. Contact Arrangement	1 Form ,SPST-NO
Aux. Contact Current Max.	2A@30VDC/3A@125VAC
Aux. Contact Current Min.	100mA@8VDC
Max. Contact Resistance	300mΩ

Estimated Make Break Chart



Note: Electrical life rating is based on resistive load with 27μH maximumind-uctance in circuit. Because your application may be different, we suggest you test the contactor in your circuit to verify life is as required.

Carry Current & Time Chart



The above data was tested at 65°C, cross-sectional area of the wire≥240mm²

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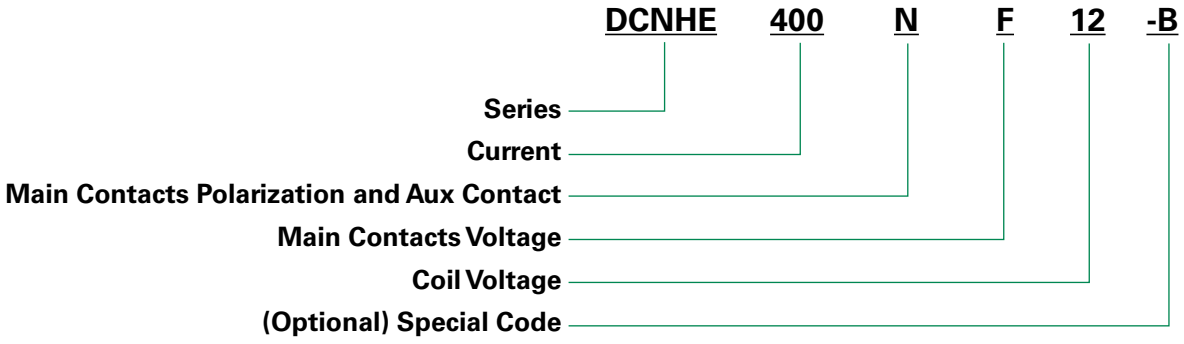
Part Number System



MAIN CONTACTS POLARIZATION AND AUX CONTACT		
	POLARIZED?	INCLUDE AUX CONTACT?
N:	No	No
M:	No	Yes

MAIN CONTACT TEST VOLTAGE		
F:	450	V DC

COIL VOLTAGE		
12:	12	V DC
24:	24	V DC

	MOUNTING	POWER CONNECTION
B:	Bottom	Stud Terminal
F:	Bottom	Internal Thread

- Be sure to use washer to prevent screws from loosening, all the terminals or copper bar must be in direct contact with the contactor's terminals. Screw tightening torque is specified below. Exceeding the maximum torque can lead to product failure.
  - Contact torque: M6 Bolt (6 ~8) N.m or M8 Stud(8 ~10) N.m.
  - Mounting torque: M5 Bolt (2.5~3.5) N.m.
- Contact terminals with polarized or non-polarized so refer to drawing during connecting. Wesuggest using a varistor rather than diode as a surge protector.
- Do not use if dropped.
- Avoid installing in a strong magnetic field (close to a transformer or magnet), or near a heat source.
- Electrical life

  Use per load capability and life cycle limits so as not to cause a function failure (treat the contactor as a product with specified life and replace it when necessary). It is possible to make parts burn around the contactor once operating failure occurs. It is necessary to take layout into account and to make sure power shall be cut off within 1 second.
- Lifetime of internal gas diffusion

  The contactor is sealed and filled with gas, lifetime of gas diffusion is determined by temperature in contact chamber (ambient temperature + temperature generated by contact operation). Operate only in an ambient temperature from -40°C to +85°C.
- Drive power must be greater than coil power or it will reduce performance capability.
- Avoid debris or oil contamination on the main terminals to optimize contact and avoid excess heat generation.
- Applications with capacitors will require a pre-charge circuit.