DCNHF400 Series
1800V DC Max Contactor Relays

Description

The DCNHF400 Series high-voltage DC contactor is designed for electric vehicle and industrial applications, including battery power supply, charging pile, motor control, circuit insulation, circuit protection, and safety devices. Rated for 400A continuous current and up to 1800V DC, the contactor delivers dependable high voltage switching performance for demanding systems. Its compact, corrosion-resistant resin housing minimizes operational noise and ensures dependable performance in harsh environments.

Sealed, non-polarized contacts prevent electrical arc leakage and support a variety of electrical system configurations. Its double-coil economizer minimizes power consumption once the contactor is engaged, reducing heat generation and improving overall efficiency and reliability.

With bottom-mount installation with no orientation restrictions, internal thread terminals, and 12V or 24V coil voltage options, the DCNHF400 Series contactor relay provides robust, flexible performance across a wide range of EV and industrial applications.

Web Resources

Download 2D print, installation guide and technical resources at: **littelfuse.com/DCNHF400**

Specifications

Rating Continous Current:	400A
Contact Max. Voltage:	1800V DC
Contact Circuitry:	SPST NO
Ingress Protection:	Contact IP67
Contacts Material:	Copper Alloy
Terminals:	M8 Copper
Contact Torque:	M8 Bolt: 9~11N·m
Housing:	Nylon UL 94 V-0
Coil Connector:	Yazaki 7283-1044 (compatible option)
Coil Type:	Double
Mounting Method:	M5 Bolt
Mounting Torque:	M5 Bolt: 3~4N·m
Normal Position:	Any Mounting Position
Approvals:	
UL File Number:	E47258 Recognized
CE:	EN 60947-4-1,2018

Applications

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

Features and Benefits

- High voltage (1800V) contactor for EV applications
- Resin housing provides corrosion resistance in harsh automotive environments
- Sealed contacts with no leakage of electrical arc for maximum safety
- Auxiliary contact enables circuit monitoring
- No mounting orientation restrictions
- Ceramic arc chamber enables higher contact voltage capability
- RoHS and REACH compliant

Ordering Information

PART NUMBER	RATED CURRENT(A)	POLARIZED	AUX CONTACT	COIL VOLTAGE(V DC)	MOUNTING	POWER CONNECTION
DCNHF400MH12-F	400	No	Yes	12	Bottom	Internal Thread
DCNHF400MH24-F	400	No	Yes	24	Bottom	Internal Thread

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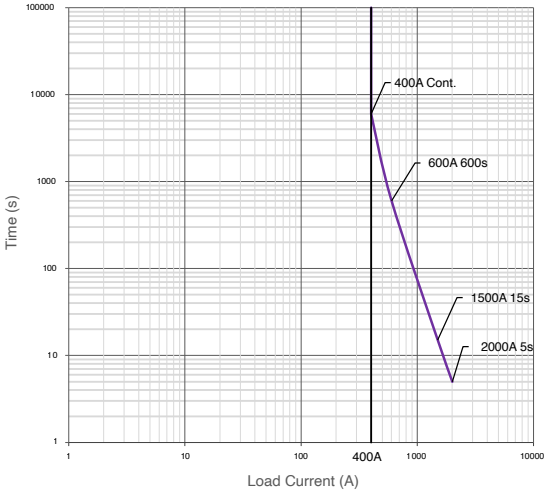
Performance Data

MAIN CONTACT	
Contact Arrangement	1 Form, SPST-NO
Operating Voltage	12~1800V DC
Continous Current	400A
Max Short Circuit	2000A, 5s
Max Breaking Limit	2000A@1000V DC, 1cycle,
Dielectric Withstanding Voltage	Between open contacts: 3000V AC, ≤1mA,1min Between contact and coil: 3000V AC, ≤1mA,1min
Insulation Resistance	Min. 1000 MΩ@1000V DC
Contact Voltage Drop	≤80mV@400A

COIL DATA		
Rating Voltage	12V DC	24V DC
Voltage (Max.)	16V DC	32V DC
Pickup Voltage (25°C)	≤9V DC	≤18V DC
Release Voltage (25°C)	≥1.2V DC	≥2V DC
Starting Current (25°C)	≤4.2A	≤2.1A
Starting Power (25°C)	50W	50W
Holding Current (25°C)	≤0.42A	≤0.21A
Holding Power (25°C)	5W	5W

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

Carry Current vs Time at 65°C Chart



LIFE	
Electrical Life	1000cycles, 400A@1000V DC 6000cycles, 100A@1800V DC
Mechanical Life	200,000 cycles

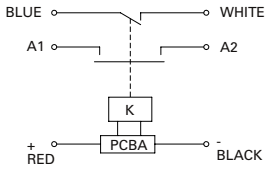
Note: Electrical life rating is based on resistive load with 27μH maximum inductance in circuit. Because your application may be different, we suggest you test the contactor in your circuit to verify life is as required.

OPERATE / RELEASE TIME	
Pickup Time (includes bounce)	≤50ms
Release Time	≤30ms

ENVIRONMENTAL DATA	
Shock, 11ms ½ Sine, Operating	20g, Peak
Vibration, Sine	10~500Hz, 5g, Peak
Operating Temperature	-40°C~+85°C
Humidity	5%~85%RH
Weight	800g

AUX. CONTACT	
Aux.Contact Arrangement	1 Form A
Aux.Contact Current Max.	2A@24V DC
Aux.Contact Current Min.	5mA@12V DC
Max. Contact Resistance	300mΩ

Electrical Diagram



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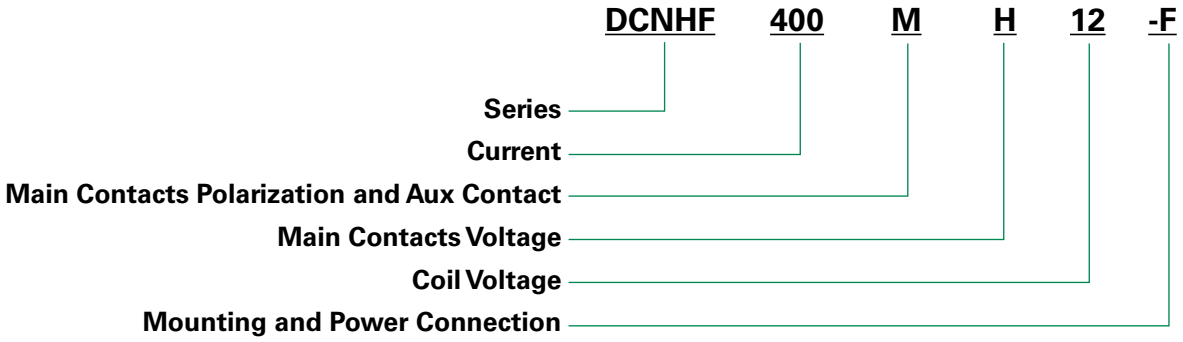
Part Number System



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

MAIN CONTACT TEST VOLTAGE		
H:	1000	V DC

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

	MOUNTING	POWER CONNECTION
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: in (9 ~11) N.m.
  - Mounting torque: in (3~4) N.m.
- Contact terminals are non-polarized, Coil terminals are polarized, so refer to drawing during connecting. We suggest 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.