DCNHE50 Series
1000V DC Max Contactor Relays


DCNHE50QF12-B


DCNHE50MF12-F


DCNHE50NF12-T

Description

Designed for use in battery electric vehicles (BEVs), hybrid electric vehicles (HEVs), and other high-voltage DC systems, the DCNHE50 Series DC Contactor Relay is rated for a continuous current of 50A and a maximum voltage of 1000V. Its compact structure minimizes operational noise and supports flexible, orientation-free installation.

A UL 94 V-0 nylon housing provides corrosion resistance in harsh environments, while sealed SPST-NO contacts prevent electrical arc leakage for enhanced safety. Optional mechanically linked auxiliary contacts enable system status monitoring.

IP67-rated, the DCNHE50 Series ensures durable, dependable performance in demanding EV and industrial applications, with a wide variety of configurations available, including those with polarized or non-polarized contacts, stud or internal-thread terminals, side- or bottom-mount options, and 12V, 24V, or 48V coil voltages to meet diverse system requirements.

Web Resources

Download 2D print, installation guide and technical resources at: **littelfuse.com/DCNHE50**

Specifications

Rating Continous Current:	50A
Contact Max. Voltage:	1000V DC
Contact Circuitry:	SPST NO
Ingress Protection:	IP67
Contacts Material:	Copper Alloy
Terminals:	M5 Silver Plated Copper
Contact Torque:	M5 Bolt or M5 Nut: 3~4N·m
Housing:	Nylon UL 94 V-0
Coil Connector:	Wire Leads for Control Circuit
Coil Type:	Single
Mounting Method:	M4 Bolt
Mounting Torque:	M4 Bolt: 1.7~2.5N·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

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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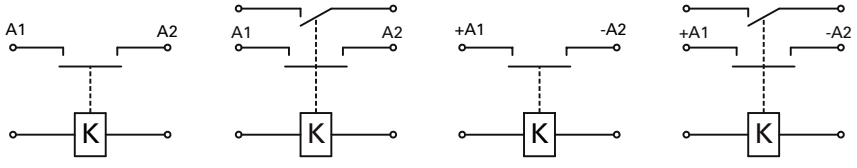
Ordering Information

PART NUMBER	RATED CURRENT(A)	POLARIZED	AUX. CONTACT	COIL VOLTAGE(V DC)	MOUNTING	POWER CONNECTION
DCNHE50MF12-F	50	No	Yes	12	Bottom	Internal Thread
DCNHE50MF24-F	50	No	Yes	24	Bottom	Internal Thread
DCNHE50MF48-F	50	No	Yes	48	Bottom	Internal Thread
DCNHE50MF12-T	50	No	Yes	12	Side	Internal Thread
DCNHE50MF24-T	50	No	Yes	24	Side	Internal Thread
DCNHE50MF48-T	50	No	Yes	48	Side	Internal Thread
DCNHE50NF12-F	50	No	No	12	Bottom	Internal Thread
DCNHE50NF24-F	50	No	No	24	Bottom	Internal Thread
DCNHE50NF48-F	50	No	No	48	Bottom	Internal Thread
DCNHE50NF12-T	50	No	No	12	Side	Internal Thread
DCNHE50NF24-T	50	No	No	24	Side	Internal Thread
DCNHE50NF48-T	50	No	No	48	Side	Internal Thread
DCNHE50QF12-B	50	Yes	Yes	12	Bottom	Stud Terminal
DCNHE50QF24-B	50	Yes	Yes	24	Bottom	Stud Terminal
DCNHE50QF48-B	50	Yes	Yes	48	Bottom	Stud Terminal
DCNHE50QF12-F	50	Yes	Yes	12	Bottom	Internal Thread
DCNHE50QF24-F	50	Yes	Yes	24	Bottom	Internal Thread
DCNHE50QF48-F	50	Yes	Yes	48	Bottom	Internal Thread
DCNHE50QF12-T	50	Yes	Yes	12	Side	Internal Thread
DCNHE50QF24-T	50	Yes	Yes	24	Side	Internal Thread
DCNHE50QF48-T	50	Yes	Yes	48	Side	Internal Thread
DCNHE50PF12-F	50	Yes	No	12	Bottom	Internal Thread
DCNHE50PF24-F	50	Yes	No	24	Bottom	Internal Thread
DCNHE50PF48-F	50	Yes	No	48	Bottom	Internal Thread
DCNHE50PF12-T	50	Yes	No	12	Side	Internal Thread
DCNHE50PF24-T	50	Yes	No	24	Side	Internal Thread
DCNHE50PF48-T	50	Yes	No	48	Side	Internal Thread

Electrical Diagrams



DCNHE50NF DCNHE50MF DCNHE50PF DCNHE50QF

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Performance Data

MAIN CONTACT	
Contact Arrangement	1 Form, SPST-NO
Operating Voltage	12~1000V DC
Continous Current	50A
Max Short Circuit	1000A, 1sec
Max Breaking Limit	1000A@320V DC, 1cycle
Dielectric Withstanding Voltage	Between open contacts: 4000V AC,≤1mA, 1min Between contact and coil and Aux. contact: 3000V AC,≤1mA, 1min
Insulation Resistance	Min. 100 MΩ@1000V DC End of Life: Min. 50 MΩ@1000V DC
Contact Voltage Drop	≤60mV@50A

COIL DATA			
Rating Voltage	12V DC	24V DC	48V DC
Voltage (Max.)	16V DC	28V DC	52V DC
Pickup Voltage(25°C)	≤9V DC	≤18V DC	≤36V DC
Release Voltage (25°C)	≥1V DC	≥2V DC	≥4V DC
Starting Current (25°C)	≤0.6A	≤0.3A	≤0.16A
Holding Power (25°C)	5.5W	6W	6W

Note: The coil of the product may operate at maximum voltage for a maximum duration of 30 minutes.

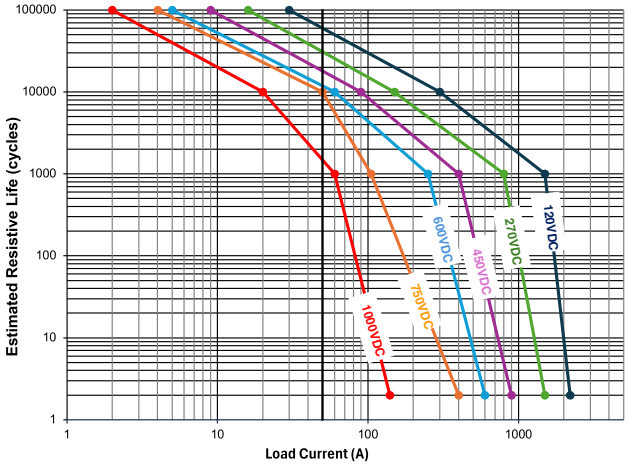
LIFE	
Electrical Life	Please See Make Break Chart
Mechanical Life	300,000 cycles

OPERATE / RELEASE TIME	
Pickup Time (includes bounce)	≤30ms
Release Time	≤10ms

ENVIRONMENTAL DATA	
Shock, 11ms ½ Sine, Operating	20g, Peak
Vibration, Sine	80~2000Hz, 20g, Peak
Operating Temperature	-40°C~+85°C
Humidity	5%~85%RH
Weight	200g

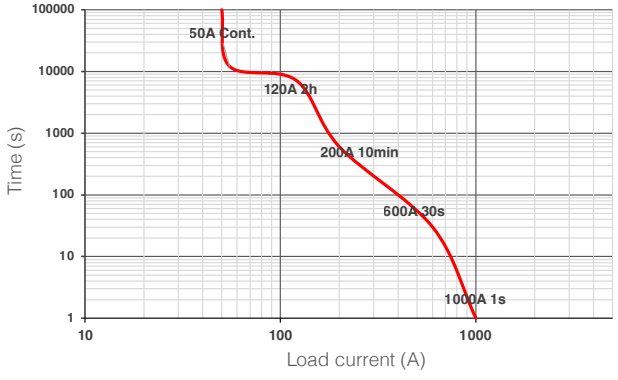
AUX. CONTACT	
Aux.Contact Arrangement	1 Form A
Aux.Contact Current Max.	2A@30V DC/3A@125V AC
Aux.Contact Current Min.	100mA@8V DC
Max. Contact Resistance	300mΩ

Estimated Make Break Chart



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.

Carry Current vs Time at 65°C Chart



Note: The above data was tested at 65°C cross-sectional area of the wire≥ 16mm^2.

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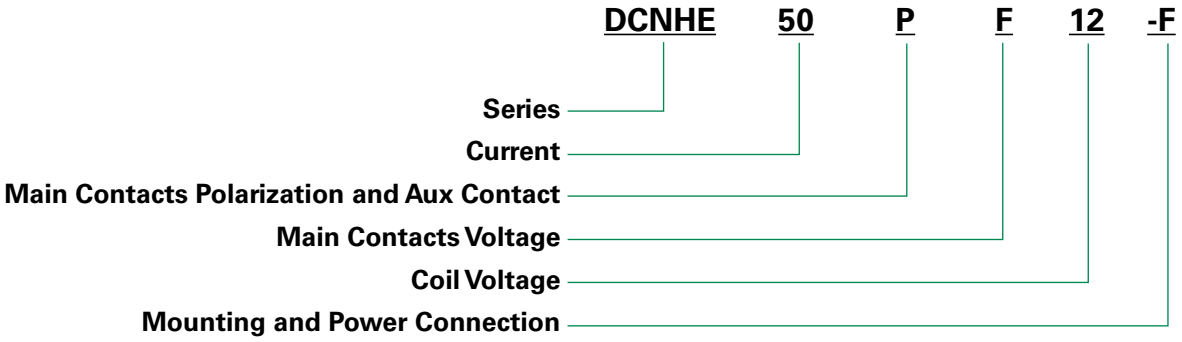
Part Number System



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

MAIN CONTACT TEST VOLTAGE		
F:	450	V DC

COIL VOLTAGE		
12:	12	V DC
24:	24	V DC
48:	48	V DC

	MOUNTING	POWER CONNECTION
B:	Bottom	Stud Terminal
F:	Bottom	Internal Thread
T:	Side	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 (3 ~4) N.m.
  - Mounting torque: in (1.7~2.5) N.m.
- The contact terminals are available in polarized and non-polarized variants. For correct wiring, please refer to the provided schematic diagram.
- 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.
- Not all configuration models (part numbers) are UL recognized. Please refer to the UL information of each PN as shown on the drawing before use.