DCNHF20 Series
1500V DC Max Contactor Relays

Description

The DCNHF20 Series high-voltage DC contactor relay is engineered for electric vehicle and industrial high-voltage DC applications that require flexible system integration and reliable low-current switching. Rated for 20A continuous current and up to 1500V DC, it is ideal for use in battery power supply systems, charging piles, motor control, circuit isolation, circuit protection, and industrial safety devices.

Featuring SPST normally open (NO) circuitry with non-polarized contacts, the DCNHF20 Series supports bidirectional current flow, making it well suited for a wide range of electrical systems. Its compact design helps minimize operational noise during switching, while a robust housing delivers dependable performance in demanding automotive and industrial environments.

The bottom-mounting DCNHF20 Series contactor is equipped with quick-connect (QC) terminals for efficient installation and secure electrical connections and is available with 12V DC or 24V DC coil voltage options to support common EV and industrial control systems.

Web Resources

Download 2D print, installation guide and technical resources at: **littelfuse.com/DCNHF20**

Specifications

Rating Continous Current	20A
Contact Max. Voltage	1500V DC
Contact Circuitry	SPST NO
Ingress Protection	Contact IP67
Contacts Material	Copper Alloy
Terminals	QC Terminal
Contact Torque	Pull/Push Force MAX 49N
Housing	Nylon UL 94-V0
Coil Connector	QC Terminal
Coil Type	Single
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

Features and Benefits

- High voltage (1500V) 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

Ordering Information

PART NUMBER	RATED CURRENT(A)	POLARIZED	AUX. CONTACT	COIL VOLTAGE(V DC)	MOUNTING	POWER CONNECTION
DCNHF20NH12-Q	20	No	No	12	Bottom	QC Terminal
DCNHF20NH24-Q	20	No	No	24	Bottom	QC Terminal

DCNHF20 Series
1500V DC Max Contactor Relays

Performance Data

MAIN CONTACT	
Contact Arrangement	1 Form, SPST-NO
Operating Voltage	6~1500V DC
Continous Current	20A
Max Short Circuit	200A, 0.6sec
Max Breaking Limit	≤80mV@20A
Dielectric Withstanding Voltage	Between open contacts: 4000V AC, ≤1mA,1min Between contact and coil: 4000V AC, ≤1mA,1min
Insulation Resistance	Min. 1000 MΩ@1000V DC

LIFE	
Electrical Life	6000cycles, 15A@1500V DC 10000cycles, Only Make 40A@1500V 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.

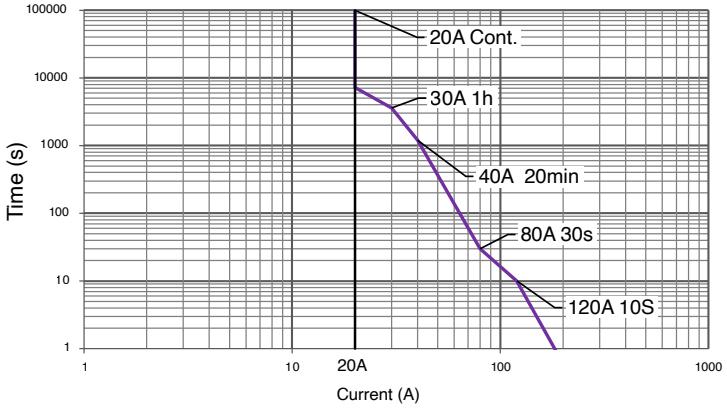
OPERATE / RELEASE TIME	
Pickup Time (includes bounce)	≤30ms
Release Time	≤10ms

COIL DATA		
Rating Voltage	12V DC	24V DC
Voltage (Max.)	16V DC	32V DC
Pickup Voltage (25°)	≤9V DC	≤18V DC
Release Voltage (25°)	≥1V DC	≥2V DC
Holding Current (25°)	≤0.275A	≤0.1375A
Wattage (25°)	3W	3W

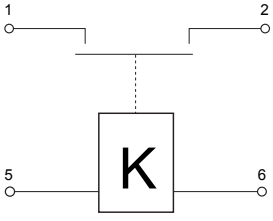
Note: The coil of the product may operate at maximum voltage for a maximum duration of 30 minutes.

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	160g

Carry Current vs Time at 65°C Chart

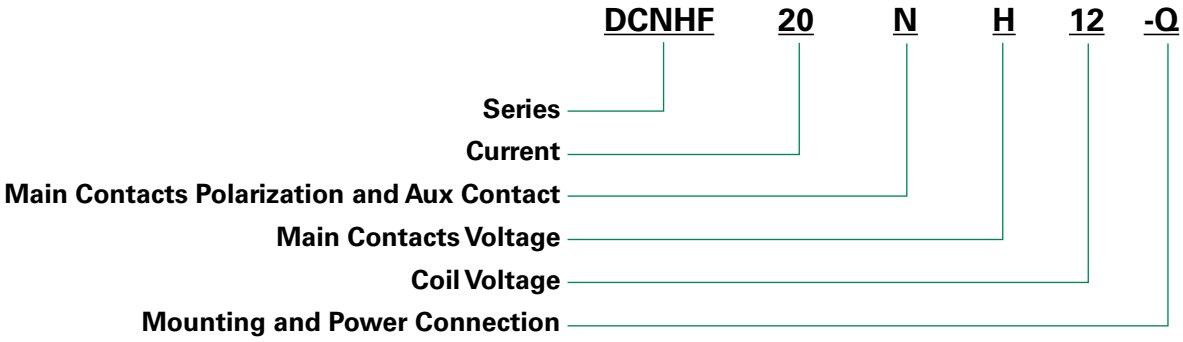


Electrical Diagram



DCNHF20 Series
1500V DC Max Contactor Relays

Part Number System



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

MAIN CONTACT TEST VOLTAGE		
H:	1000	V DC

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

	MOUNTING	POWER CONNECTION
Q:	Bottom	QC Terminal

- 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: Pull/Push Force MAX 49N
  - Mounting torque: in (3~4) N.m.
- Contact terminals are polarized, Coil terminals are non-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.