DCNHE20 Series
1000V DC Max Contactor Relays

DCNHE20PF12-Q

DCNHE20PF12-P

Specifications

Rating Continous Current	20A
Contact Max. Voltage	1000V DC
Contact Circuitry	SPST NO
Ingress Protection	Contact IP67
Contacts Material	Copper Alloy
Terminals	QC Terminal or Thru-hole PCB
Contact Torque	Pull/Push Force MAX 49N
Housing	Nylon UL 94-V0
Coil Connector	QC Terminal or Thru-hole PCB
Coil Type	Single
Mounting Method	M3 Bolt or Thru-hole PCB
Mounting Torque	M3 Bolt: 0.8~1.3N·m
Normal Position	Any Mounting Position
Approvals:	
UL File Number:	E47258 Recognized
CE:	EN 60947-4-1,2018

Description

The DCNHE20 Series high-voltage DC contactor relay is designed for electric vehicle and industrial high-voltage DC applications requiring safe, reliable switching in a compact form factor. Rated for up to 1000V DC, it is well suited 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, the DCNHE20 Series contactor delivers dependable performance with a compact structure that helps reduce operational noise. A durable resin housing provides excellent corrosion resistance for harsh automotive and industrial environments, while sealed contacts prevent electrical arc leakage to enhance safety and long-term reliability.

The DCNHE20 Series contactor is available in a bottom-mounting polarized load quick-connect (QC) terminal version or polarized load thru-hole PCB version, offering design flexibility. Multiple coil voltage options (12V, 24V, 48V, and 60V) support a wide range of EV and industrial control requirements.

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

Web Resources

Download 2D print, installation guide and technical resources at: **littelfuse.com/DCNHE20**

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Ordering Information

PART NUMBER	RATED CURRENT(A)	POLARIZED	AUX. CONTACT	COIL VOLTAGE(V DC)	MOUNTING	POWER CONNECTION
DCNHE20PF12-Q	20	Yes	No	12	Bottom	QC Terminal
DCNHE20PF24-Q	20	Yes	No	24	Bottom	QC Terminal
DCNHE20PF48-Q	20	Yes	No	48	Bottom	QC Terminal
DCNHE20PF60-Q	20	Yes	No	60	Bottom	QC Terminal
DCNHE20PF12-P	20	Yes	No	12	Thru-Hole PCB	
DCNHE20PF24-P	20	Yes	No	24	Thru-Hole PCB	
DCNHE20PF48-P	20	Yes	No	48	Thru-Hole PCB	
DCNHE20PF60-P	20	Yes	No	60	Thru-Hole PCB	

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Performance Data

MAIN CONTACT	
Contact Arrangement	1 Form, SPST-NO
Operating Voltage	MAX 1000V DC
Continous Current	20A
Max Short Circuit	200A, 0.6s
Max Breaking Limit	10A@1000V DC, 1cycle,
Dielectric Withstanding Voltage	Between open contacts: 2000V AC, ≤1mA,1min Between contact and coil: 3000V AC, ≤1mA,1min
Insulation Resistance	Min. 1000 MΩ@500V DC
Contact Voltage Drop	≤10mΩ@20A

COIL DATA				
Rating Voltage	12V DC	24V DC	48V DC	60V DC
Voltage (Max.)	16V DC	32V DC	64V DC	72V DC
Pickup Voltage (25°C)	≤9V DC	≤18V DC	≤36V DC	≤45V DC
Release Voltage (25°C)	≥1V DC	≥2V DC	≥4V DC	≥6V DC
Rating Power (25°C)	3W			

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

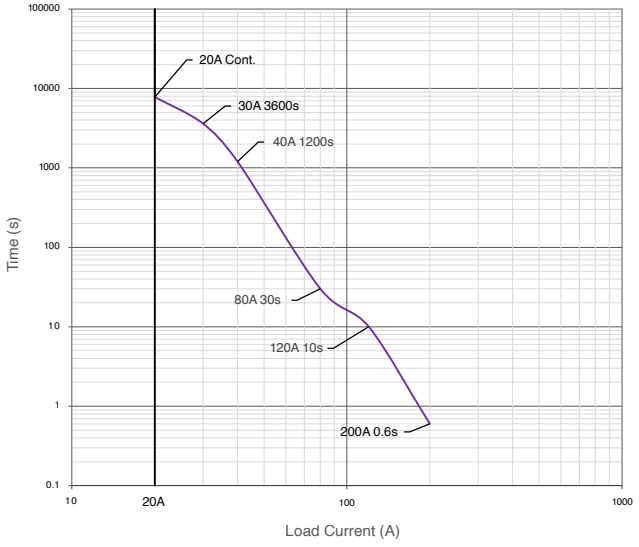
LIFE	
Electrical Life	6000cycles, 20A@450V DC 1000cycles, 10A@750V DC 500cycles, 5A@1000V DC
Mechanical Life	200,000 cycles

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.

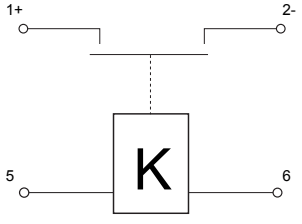
OPERATE / RELEASE TIME	
Pickup Time (includes bounce)	≤30ms
Release Time	≤10ms

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	50g

Carry Current vs Time at 65°C Chart



Electrical Diagram



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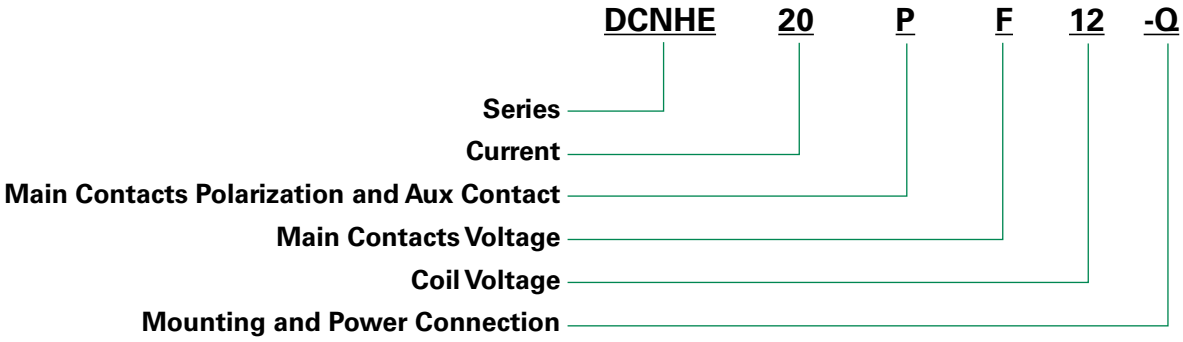
Part Number System



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

MAIN CONTACT TEST VOLTAGE		
F:	450	V DC

COIL VOLTAGE		
12:	12	V DC
24:	24	V DC
48:	48	V DC
60:	60	V DC

	MOUNTING	POWER CONNECTION
Q:	Bottom	QC Terminal
P:	Thru-Hole PCB	

- 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 (0.8~1.3) 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.