DCNEVT500 SERIES HIGH CURRENT HIGH VOLTAGE DC CONTACTOR RELAY

Description
High current and high voltage DC contactor relays for electric vehicle, hybrid electric vehicle, circuit protection, battery switch disconnect, and main transfer switch. The Coil Economizer greatly reduces coil power and heating after the contactor is energized. Once the contactor is energized, it takes minimal coil power to keep the contacts closed due to Pulse Width Modulation (PWM) reducing the average power delivered by pulsing the electrical signal. Utilizes polarized contacts for optimum performance amidst polarized electrical loads.

Features and Benefits
- High current (500A) and high voltage (1800V) contactor for EV applications
- Dual Coil Economizer greatly reduces coil power and heating
- Hermetically sealed contact chamber to protect all moving parts
- Optional auxiliary contacts available
- 360KW power switch capable
- Designed and manufactured under the IATF16949 certification for Automotive Quality Systems.
- Designed specifically for automotive applications.

Specifications Overview
- Amperage: 500A Continuous Carry
- Housing: Nylon UL 94-V0
- Voltage Rating: 1800V
- Output Connectors: M10
- Ingress Protections: IP54
- Operating Temperature: -40 to 85°C
- Circuitry: SPST NO
- Coil Voltage: B: 12V DC Nominal, 9.9 - 14V DC Working
  C: 24V DC Nominal, 19.7 - 28V DC Working
- Max Coil Inrush Current: B: 3.3A
  C: 1.7A
- Size: 74mm x 54mm x 120mm
- Mounting: M5
- Mounting Bolt Torque: 3-4 Nm (26-35 in-lb)
- Terminal Torque: 13 - 15 Nm (115-130 in-lb)
- Terminal Material: M10 Silver Plated Copper
- Approvals: UL File No. E510407 Recognized

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

Web Resources
Download 2D print and technical resources at: littelfuse.com/DCNEVT500

Ordering Information

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
<th>COIL VOLTAGE 12V DC</th>
<th>COIL VOLTAGE 24V DC</th>
<th>BOTTOM MOUNT</th>
<th>AUXILIARY CONTACT SPST-NO</th>
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</thead>
<tbody>
<tr>
<td>DCNEVT500-C</td>
<td>High Voltage DC Contactor Relay Bottom Mount with Polar Load Terminals</td>
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<tr>
<td>DCNEVT500-CA</td>
<td>High Voltage DC Contactor Relay Bottom Mount with Auxiliary Circuit with Polar Load Terminals</td>
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<tr>
<td>DCNEVT500-BA</td>
<td>High Voltage DC Contactor Relay Bottom Mount with Auxiliary Circuit with Polar Load Terminals</td>
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<tr>
<td>DCNEVT500-B</td>
<td>High Voltage DC Contactor Relay Bottom Mount with Polar Load Terminals</td>
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</table>

* Box Packaging Available
DCNEVT500 SERIES HIGH CURRENT HIGH VOLTAGE DC CONTACTOR RELAY

Dimensions in MM

Estimated Make Break Chart

Electrical Diagram

- Positive Coil Terminal
- Negative Coil Terminal
- Optional AUX Contact
- (4) M5 Captive Screws
- POSITIVE COIL TERMINAL
- NEGATIVE COIL TERMINAL
- Optional AUX Contact
- POSITIVE COIL TERMINAL
- NEGATIVE COIL TERMINAL

Estimated Life (Cycles) vs. Preferred Purity

- 100,000
- 10,000
- 1,000
- 100
- 10
- 1

Current (Amps) (resistive load, make and break)

- 100,000
- 10,000
- 1,000
- 100
- 10
- 1

- +A1
- -A2
- POS. TERM.
- NEG. TERM.
- AUX. CONTACT
- COIL

- Optional AUX. Contact
- Optional AUX. Contact

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Performance Data

<table>
<thead>
<tr>
<th>MAIN CONTACT</th>
<th>LIFE</th>
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<tbody>
<tr>
<td>Contact arrangement</td>
<td>1 Form X (SPST-NO, DM)</td>
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<tr>
<td>Rated Operating Voltage</td>
<td>12-1,800VDC</td>
</tr>
<tr>
<td>Continuous (Carry) Current</td>
<td>500A*</td>
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<tr>
<td>Max short circuit current</td>
<td>3,300A @ 320VDC (1 cycle)</td>
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<tr>
<td>Dielectric Withstanding Voltage</td>
<td>Between open contacts: 4,000VDC (leakage ≤1mA)</td>
</tr>
<tr>
<td></td>
<td>Between contact and coil: 2,200Vrms (leakage ≤1mA)</td>
</tr>
<tr>
<td>Insulation Resistance</td>
<td>Terminal to Terminal/Terminal to coil</td>
</tr>
<tr>
<td></td>
<td>New: Min 100 MΩ @500Vdc</td>
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<tr>
<td>Voltage Drop (@350A)</td>
<td>≤70mV</td>
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</table>

<table>
<thead>
<tr>
<th>LIFE</th>
<th>OPERATE / RELEASE TIME</th>
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<tbody>
<tr>
<td></td>
<td>Close (includes bounce)</td>
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<tr>
<td></td>
<td>Release</td>
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<tr>
<th>ENVIRONMENTAL DATA</th>
<th>AUX. CONTACT</th>
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<tbody>
<tr>
<td>Shock, 11ms ½ sine, operating</td>
<td>SPST-NO (1 Form A)</td>
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<tr>
<td>Vibration, Sine, Peak, 20G</td>
<td>10—1,000Hz</td>
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<tr>
<td>Operating Ambient Temperature</td>
<td>-40 to +85˚C</td>
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<tr>
<td>Weight</td>
<td>3.38 lb (1.53 kg)</td>
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<table>
<thead>
<tr>
<th>COIL DATA</th>
<th>AUX. CONTACT</th>
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<tbody>
<tr>
<td>Voltage rating</td>
<td>12Vdc</td>
</tr>
<tr>
<td>Pickup voltage (25˚C)</td>
<td>9.9Vdc</td>
</tr>
<tr>
<td>Dropout voltage (25˚C)</td>
<td>2Vdc</td>
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<tr>
<td>Inrush current @ nominal voltage*</td>
<td>3.3A</td>
</tr>
<tr>
<td>Holding current @ nominal voltage*</td>
<td>0.74A</td>
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Current vs Time Curve

Application Note:
1. 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.
   - Contact Terminal Torque: 115 – 130 lb.in (13 - 15 N.m)
   - Mounting Torque: 26 - 35 lb.in (3 - 4 N.m)
2. Contact terminals are polarized so refer to drawing during connecting. There is a reverse surge absorption circuit so that it is not necessary to use a surge protective device.
3. Do not use if dropped.
4. Avoid installing in a strong magnetic field (close to a transformer or magnet), or near a heat source.
5. 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 considerations into account and to make sure power shall be cut off within 1 second.
6. Avoid debris or oil contamination of the main terminals to optimize contact and avoid excess heat generation.

1: Current is relevant to cross-sectional area of conductor.
2: Two coil design