## **Product Datasheet**

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# **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.

## Web Resources

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

## **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>B:</b> 3.3A	
Max con mush current.	<b>C:</b> 1.7A	
Size:		
	<b>C:</b> 1.7A	
Size:	<b>C:</b> 1.7A 74mm x 54mm x 120mm	
Size: Mounting:	<b>C:</b> 1.7A 74mm x 54mm x 120mm M5	
Size: Mounting: Mounting Bolt Torque:	<b>C:</b> 1.7A 74mm x 54mm x 120mm M5 3-4 Nm (26-35 in-lb)	
Size: Mounting: Mounting Bolt Torque: Contact Torque:	<b>C:</b> 1.7A 74mm x 54mm x 120mm M5 3-4 Nm (26-35 in-lb) 13 - 15 Nm (115- 130 in-lb)	
Size: Mounting: Mounting Bolt Torque: Contact Torque: Terminals:	<b>C:</b> 1.7A 74mm x 54mm x 120mm M5 3-4 Nm (26-35 in-lb) 13 - 15 Nm (115- 130 in-lb) M10 Silver Plated Copper	

## **Features and Benefits**

- High current (500A) and high voltage (1800V) contactor for EV applications
- Dual Coil Enonomizer 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 ٠ certification for Automotive Quality Systems.
- Designed specifically for automotive applications.

## **Applications**

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

PART NUMBER	DESCRIPTION	COIL VOLTAGE 12V DC	COIL VOLTAGE 24V DC	BOTTOM MOUNT	AUXILIARY CONTACT SPST-NO
DCNEVT500-C	High Voltage DC Contactor Relay Bottom Mount with Polar Load Terminals		•	•	
DCNEVT500-CA	High Voltage DC Contactor Relay Bottom Mount with Auxiliary Circuit with Polar Load Terminals		•	•	•
DCNEVT500-BA	High Voltage DC Contactor Relay Bottom Mount with Auxiliary Circuit with Polar Load Terminals	•		•	•
DCNEVT500-B	High Voltage DC Contactor Relay Bottom Mount with Polar Load Terminals	•		•	

\* Box Packaging Available

**Ordering Information** 



**Product Datasheet** 

# DCNEVT500 Series High Current High Voltage DC Contactor Relay

## **Dimensions in MM**



# <figure>

**Estimated Make Break Chart** 



## **Electrical Diagram**





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## **Product Datasheet**

# DCNEVT500 Series High Current High Voltage DC Contactor Relay

## **Performance Data**

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

COIL DATA			
Voltage rating	12Vdc	24Vdc	
Pickup voltage (25°C)	9.9Vdc	19.7Vdc	
Dropout voltage (25°C)	2Vdc	4Vdc	
Inrush current @ nominal voltage*2	3.3A	1.7A	
Holding current @ nominal voltage*2	0.74A	0.37A	

MAX. BREAKING LIMIT	MAX. SHORT CIRCUIT
3,300A @ 800VDC, 1 cycle	4.000A, 1 sec

# **Current vs Time Curve**



LIFE		
Electrical life	See estimated make break chart	
Mechanical life	200,000 cycles	

OPERATE / RELEASE TIME		
Close (includes bounce)	40ms, Max.	
Release	20ms, Max.	

ENVIRONMENTAL DATA		
Shock, 11ms ½ sine, operating	20G Peak	
Vibration, Sine, Peak, 20G	10—1,000Hz	
Operating Ambient Temperature	-40 to +85°C	
Weight	3.38 lb (1.53 kg)	

AUX. CONTACT			
Aux. Contact Arrangement	SPST-NO (1 Form A)		
Aux. Contact Rating (Max Wattage)	10W		
Aux. Contact Rating (Max Voltage)	100 VDC		
Aux. Contact Resistance (Max)	500mΩ		

1: Current is relevant to cross-sectional area of conductor.

2: Two coil design

## **Application Note:**

- 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.
- 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.

