

# HIGH VOLTAGE DC CONTACTORS ECPN800B SERIES

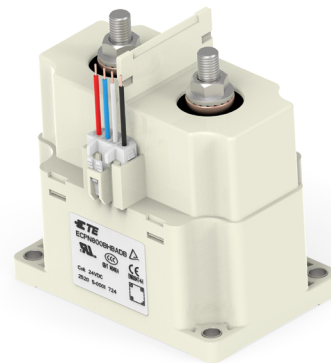
UP TO 800AMP

## INTRODUCTION

TE Connectivity (TE)'s ECPN800B series high-voltage DC contactor is designed for control in high voltage environments like battery energy storage systems, solar inverters, and EV charging applications. It can be used in 1500 VDC voltage systems, and the enhanced insulation distance meets the requirement of UL60947-4-1 & IEC60947-4-1 standards. The contacts provided in this series allow bi-directional load and are hermetically sealed with ceramic sealing technology, making them safer and more reliable.

## FEATURES

- Strong short circuit current endurance upto 20KA
- Hermetically sealed with ceramic technology
- Continuous current carrying capacity of upto 800 A
- Enhanced breaking capacity up to 1500 VDC at 2000 A
- Allows bi-directional load
- Dual coil design requiring 5W holding power
- Equipped with auxiliary contact
- Compatibility with DC-1 utilization category in IEC60947-4-1



## APPLICATIONS

ECPN800B series contactors can be used for multiple applications including some of the below highlighted

- Battery energy storage systems
- Photovoltaic inverters
- Power conversion system
- Megawatt EV DC charger

## APPROVALS

UL, TUV, CE, CCC



**Note:** Technical data of approved types on request

# High Voltage DC Contactors ECPN800B Series

## MAIN CONTACT DATA

|                                    |   |
|------------------------------------|---|
| Contact current                    | 800 A   |
| Maximum switching voltage          | 1500 VDC  |
| Maximum breaking capacity          | 1500 VDC, 2000A, 1 cycle<br>1500 VDC, 1000A, 3 cycles |
| Contact arrangement                | 1 Form X (SPST-NO-DM)                                 |
| Initial contact resistance         | $\leq 0.2$ mOhm<br>(800 A, after 1 minute)            |
| Operate time maximum<br>(at 23°C)  | 50 ms   |
| Release time,<br>maximum (at 23°C) | 20 ms   |
| Mechanical life                    | 200,000 cycles  |

## CONTACT RATINGS

| Load                                       | Cycles |
|--|--------|
| 100A, 1500 VDC, make/break, resistive      | 9,000  |
| 250A, 1500 VDC, break only, resistive      | 1,700  |
| 600A, 1500VDC, resistive, break only, 85°C | 300    |
| 600A, 1000VDC, resistive, break only, 85°C | 460    |
| 800A, 1500VDC, resistive, break only, 85°C | 80     |

### NOTE:

- Only typical rating listed, please refer to make/break curves in next page for more details at different current and voltage.
- Rating under room temperature if not specific mentioned.

## CE DECLARATION (IEC60947-4-1)

| Rated Operational Current | Rated Operational Voltage | Utilization Category | Switching Cycles |
|---------------------------|---------------------------|----------------------|------------------|
| 60 A                      | 1500 VDC                  | DC-1                 | 6,050            |

## AUXILIARY CONTACT DATA

|                       |                    |
|-----------------------|--------------------|
| Contact Form          | 1 Form A (SPST-NO) |
| Contact Current, Max. | 2A, 24 VDC         |
| Contact Current, Min. | 10mA, 12 VDC       |

## COIL VERSIONS, DC COIL

| Coil Code | Nominal Voltage | Operate Voltage | Release Voltage | Maximum Operate Voltage | Coil Power               |
|-----------|-----------------|-----------------|-----------------|-------------------------|--------------------------|
| A         | 12 VDC          | $\leq 9$ VDC    | $\geq 1.2$ VDC  | 16 VDC                  | Start: 50 W<br>Hold: 5 W |
| B         | 24 VDC          | $\leq 18$ VDC   | $\geq 2.4$ VDC  | 32 VDC                  | Start: 50 W<br>Hold: 5 W |

All figures are given for coil without pre-energization, at ambient temperature +23°C, and the coil will be automatically switched to 5W hold status after about 200ms energization with coil power 50W.

## INSULATION DATA

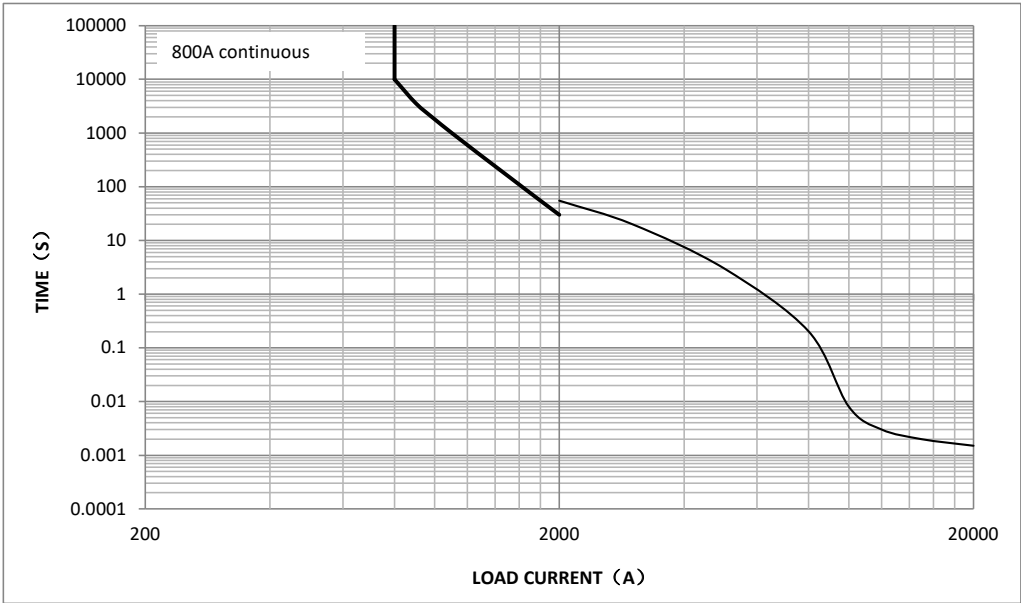
|   |                        |
|---|------------------------|
| Dielectric Withstand Voltage (leakage current <1mA) |                        |
| Between open main contacts                          | 5,400 V <sub>rms</sub> |
| Between main contact and coil                       | 5,400 V <sub>rms</sub> |
| Between main contacts and aux contacts              | 5,400 V <sub>rms</sub> |
| Between open aux contacts                           | 750 V <sub>rms</sub>   |
| Initial Insulation Resistance @ 1000 VDC            |                        |
| Between insulated elements                          | > 1x10 <sup>9</sup> Ω  |

## OTHER DATA



|                                   |  |
|-----------------------------------|--|
| Material compliance               | EU RoHS/ELV, China RoHS, REACH, Halogen content refer to the Product Compliance Support Center at <a href="http://www.te.com/customer-support/rohssupportcenter">www.te.com/customer-support/rohssupportcenter</a> |
| Ambient temperature               | -40 °C to 85 °C  |
| Vibration resistance (functional) | Sine, 10-2000Hz, 5G  |
| Shock resistance (functional)     | 11ms 1/2 Sine, Peak 20G  |
| Terminal type                     | Screw for contact, wire for coil   |
| Weight                            | ~ 1155g  |
| Packaging/unit                    | box/9 pcs.   |

# High Voltage DC Contactors ECPN800B Series

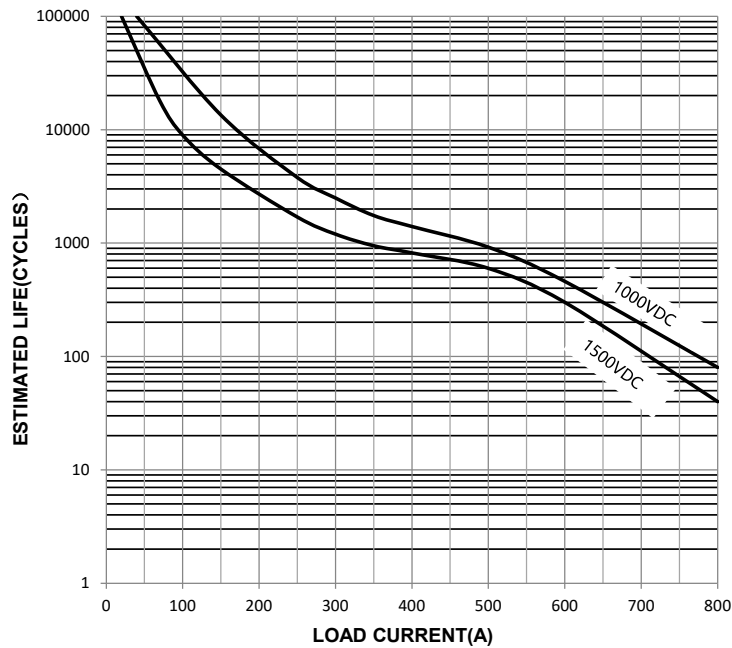
## CURRENT CARRY CAPABILITY CURVE



**NOTE**

1.  Overload current carry endurance. The data is measured at the environment temperature 85 °C with cross section area of wire 2\*240mm<sup>2</sup> min
2.  Short circuit current endurance. The data is measured at the environment temperature 23 °C with cross section area of wire 2\*240mm<sup>2</sup> min. Over 2000A load, the judgement criteria of the above reference data is no burning and no explosion.

## ESTIMATED MAKE & BREAK POWER SWITCHING RATINGS

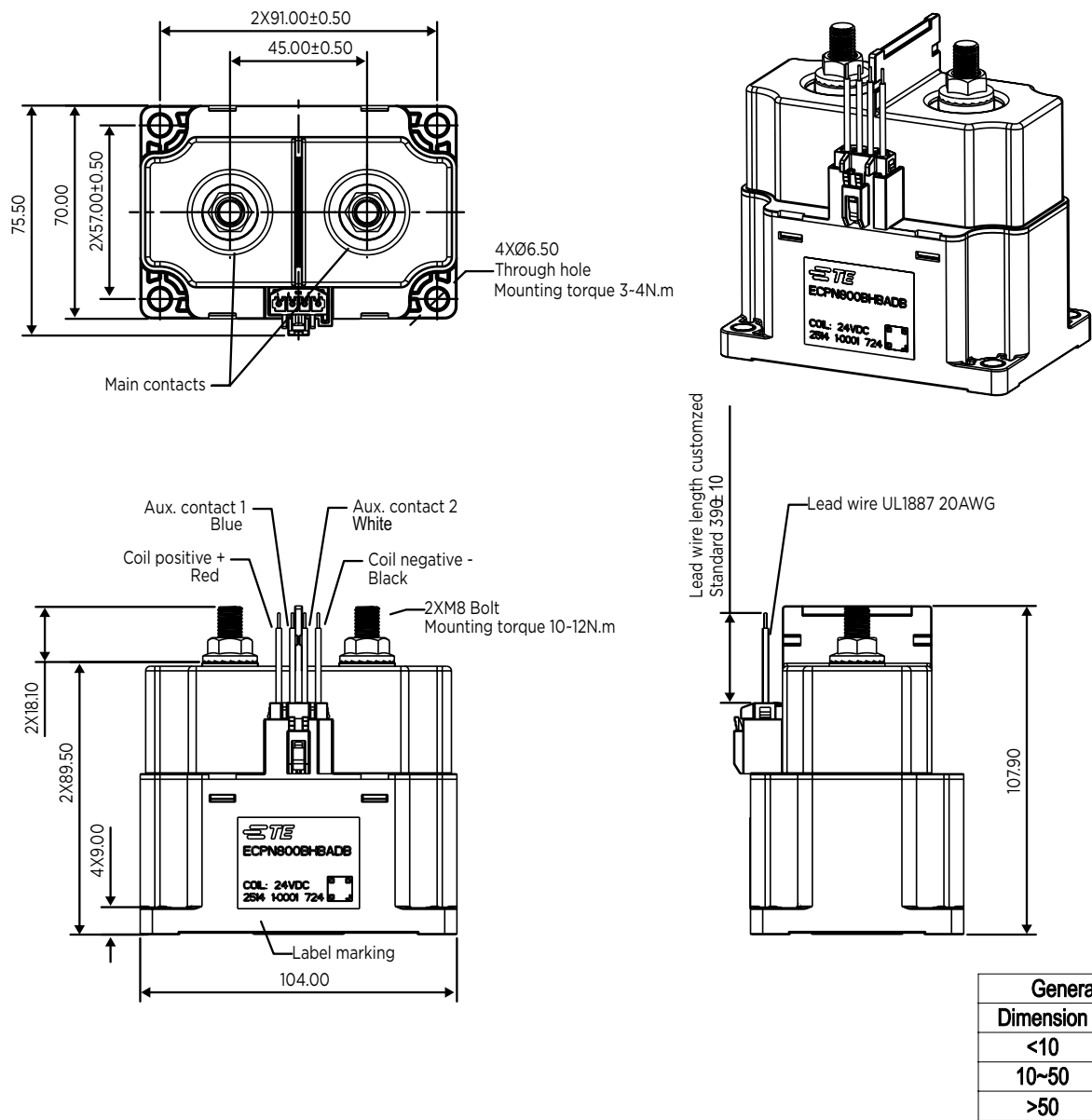


**Notes:**

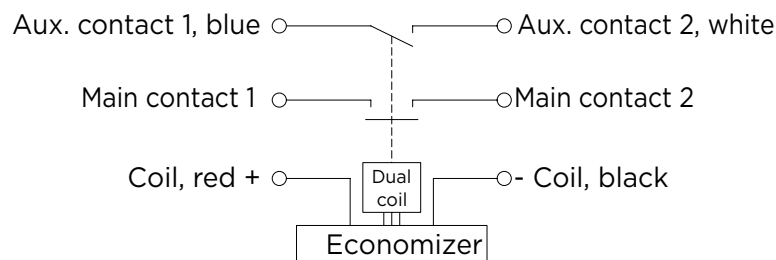
1. The curve was created based on extrapolated data with few typical points, users are recommended to confirm performance in actual application.
2. The typical data were estimated with resistive load, less than 250A were estimated under make and break, 1s on/9s off, over 250A were estimated under break only, 1s on/30-80s off based on IEC60947-4-1 recommendation according to related current level.

# High Voltage DC Contactors ECPN800B Series

## DIMENSIONS (Unit:mm)

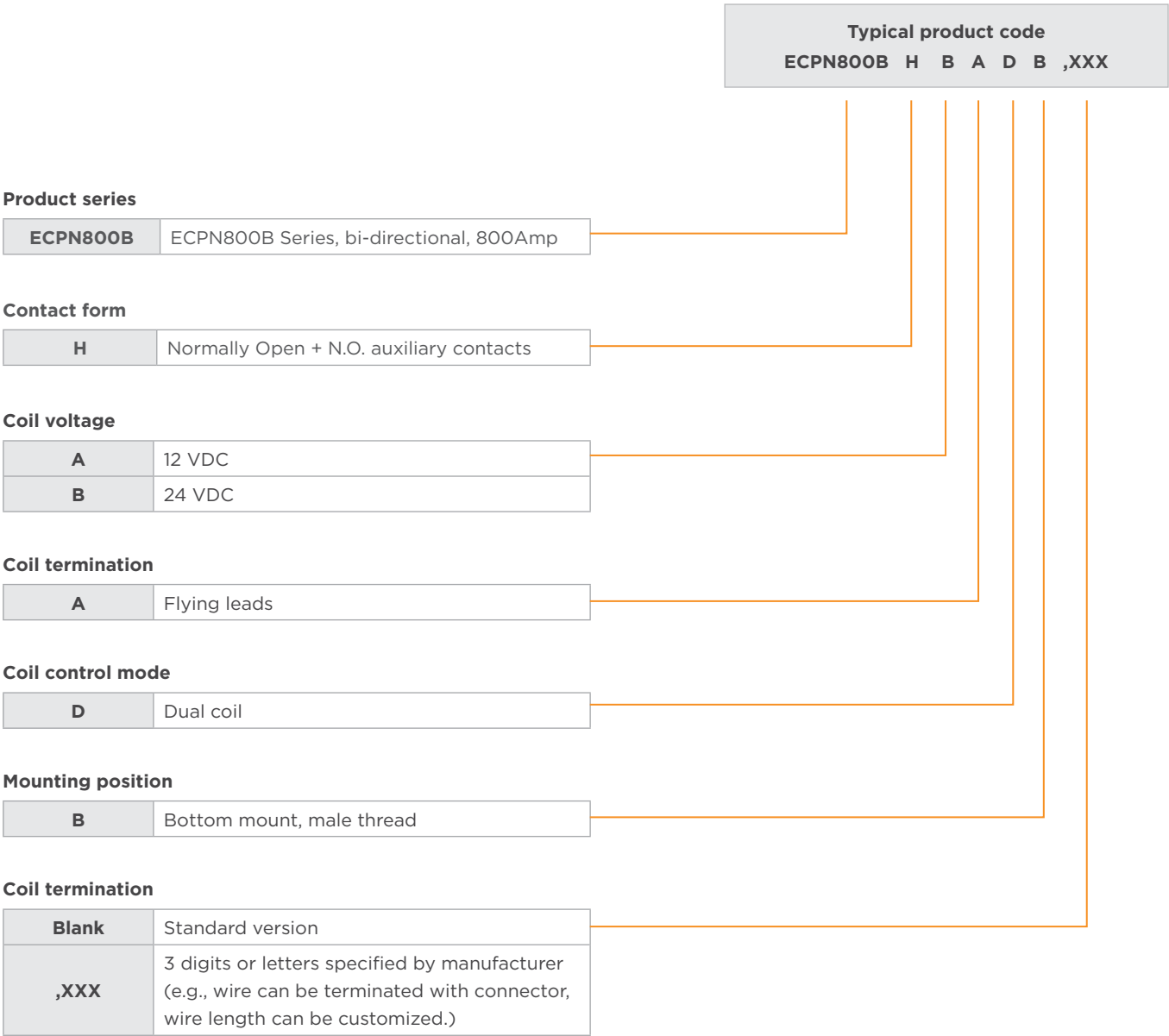


## CIRCUIT DIAGRAM



# High Voltage DC Contactors ECPN800B Series

## PRODUCT CODE STRUCTURE



## PRODUCT INFORMATION

| Product code  | Contact Form                                  | Mounting Position | Coil   | Coil Control Mode | Part Number |
|---------------|---|-------------------|--------|-------------------|-------------|
| ECPN800BHAADB | Normally open, with auxiliary contacts (N.O.) | Bottom            | 12 VDC | Dual coil         | 3-2071630-1 |
| ECPN800BHBADB |   |                   | 24 VDC |                   | 3-2071630-2 |

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## CAUTIONS

1. Do not use the contactor when contactor is dropped or broken.
2. Avoid mounting the contactor main contact terminals in downward direction, otherwise the contactor performance will not be achieved.
3. There is no polarity difference at the load connection end of this contactor, and no polarity difference at the auxiliary contact connection end. There is a polarity difference at the coil connection end: the red wire is connected to the positive pole of the control power supply, and the black wire is connected to the negative terminal of the control power supply. Please pay attention to the correct installation and use.
4. The nominal value of the contact is the value when the resistive load is applied. In the case of an inductive load (L-load) of  $L/R \geq 1$  ms, take surge absorption measures in parallel with the inductive load. Otherwise the electrical performance cannot be achieved.
5. This contactor has built-in coil suppression reverse electromotive force circuit, so it does not require surge suppression device. When performing this action voltage test, the voltage cannot rise slowly. Please drive the contactor coil through the fast rising (step type power supply mode), otherwise the contactors will not operate.
6. The coil type of this contactor is dual coil, and the coil will be automatically switched to "hold" status after about 0.2 seconds of energization, and the contactor may not operate if energization is less than 0.2 s.
7. It is strictly forbidden to place the contactor in an environment that exceeds the temperature range of the product ( $-40^{\circ}\text{C}$  ~  $+85^{\circ}\text{C}$ ) for a long time.
8. Please avoid installing near strong magnetic boundaries (around transformers and magnets) and heating objects.
9. In order to prevent loosening, please use the washer correctly when installing the contactor. Screw locking torque of main contact terminals should be 10 N.m-12 N.m for M8 screw. Screw locking torque of contactor bottom mounting should be 3-4 N.m for M5 screw.
10. Please avoid adhering to foreign matter such as grease on the lead end. To maintain the maximum long-term performance, user should select the appropriate connection cable cross section or active cooling to control the temperature.

### Notes:

1. Datasheets and product specification according to IEC 61810-1, EN/IEC60947-4-1, UL60947-4-1 and to be used only together with the 'Definitions' section.
2. Datasheets and product data is subject to the terms of the disclaimer and all chapters of the 'Definitions' section, available at <http://relays.te.com/definitions>.
3. Datasheets, product data, 'Definitions' section, application notes and all specifications are subject to change.

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