

## Features

### HIGH CURRENT CARRY AND HIGH VOLTAGE

Inert gas filled arc chamber suitable for high voltage switching

### COMPACT STRUCTURE, LOW NOISE

Small, low-profile design with low noise while carrying or switching loads

### COIL ECONOMIZER

Economized coil for low power consumption

### SAFE FOR EXPLOSIVE ENVIRONMENTS

No arc leakage due to a hermetically sealed design

### HIGH RELIABILITY DESIGN

Hermetic sealing creates a stable environment for high voltage switching

### NO SPECIFIC MOUNTING ARRANGEMENT

Mountable in any orientation without reduction of performance

### VARIOUS APPLICATIONS

Battery disconnect, EV charging, energy storage systems, photovoltaics, power control, circuit protection and much more

## Sealing Type: Epoxy Resin

- ✓ Internal coil economizer option
- ✓ Bidirectional switching option
- ✓ High voltage switching options



## Certification Information

1. Meet RoHS (2011/65/EU)
2. CE Certified
3. UL Approved

## Nomenclature

AEV250

M

A

H

### Series code:

"AEV250" = AEV250

### Coil Voltage Code:

"M" = 12 - 24 VDC

"F" = 72 VDC

"G" = 48 - 72 VDC

### Options:

Blank = Std. Options (Bottom Mount, Without Aux. Contact & Polarized Load Terminals)

"A" = With Aux. Contact (SPST-NO)

"B" = With Aux. Contact (SPST-NC)

"N" = Non-Polar Load Terminals

"P" = Potted PCB

"E" = Without Coil Economizer (External Coil Economizer Required, not UL approved)

"H" = 1000 Volts Switching Voltage

\*Note: H version can only be applied in the AEV250-M and AEV250-MA



## Performance Data for 900V Switching Option

### MAIN CONTACT

|   |                           |  |
|---|---------------------------|--|
| Contact Arrangement                       | 1 Form X (SPST-NO)        |  |
| Rated Operating Voltage                   | 900VDC                    |  |
| Continuous (Carry) Current                | 500 (85°C Ambient)        |  |
| Max Short Circuit Current                 | 2,000A @320VDC, 1 cycle*1 |  |
| Dielectric Withstanding Voltage (initial) | Between Open Contacts     | 4000VAC (leakage <1mA)                                   |
|   | Between Contacts to Coil  | 2200Vrms (leakage <1mA)                                  |
| Insulation Resistance (initial)           | Terminal to Terminal      | New: Min 100 MΩ @500VDC<br>End of life: Min 50 MΩ@500VDC |
|   | Terminals to Coil         |  |
| Voltage Drop (@500A)                      | ≤50mV                     |  |

### OPERATE / RELEASE TIME

|                               |            |
|-------------------------------|------------|
| Close (includes bounce)       | 25ms, Max. |
| Release (@2000A includes arc) | 12ms, Max  |

### ENVIRONMENTAL DATA

|                            |             |   |
|----------------------------|-------------|---|
| Shock                      | Functional  | 196m/s <sup>2</sup><br>Sine half-wave pulse |
|                            | Destructive | 490m/s <sup>2</sup><br>Sine half-wave pulse |
| Vibration, Sine, Peak, 20G |             | 80 to 2,000Hz                               |
| Operating Temperature      |             | -40 to +85°C                                |
| Altitude                   |             | <4000m                                      |
| Weight                     |             | 0.95 Lb (0.43 kg)                           |

### MAKE/BREAK LIFE CAPACITIVE & RESISTIVE LOADS AT 320VDC\*1

|                                 |               |
|---------------------------------|---------------|
| @90% pre-charge (make only)     | 50,000 cycles |
| @Min 80% pre-charge (make only) | 50 cycles     |

### AUX CONTACT

|                             |                                      |
|-----------------------------|--------------------------------------|
| Aux. Contact Arrangement    | 1 Form A, 1 Form B                   |
| Aux. Contact Current Max    | 2A@30VDC/ 3A@125VAC                  |
| Aux. Contact Current Min    | 100mA@8V                             |
| Aux. Contact Resistance Max | 0.417ohms@30VDC/<br>0.150ohms@125VAC |

### COIL DATA

|                       |                              |                 |                 |
|-----------------------|------------------------------|-----------------|-----------------|
| Coil Voltage          | 12-24VDC                     | 72VDC           | 48-72VDC        |
| Voltage (Max.)        | 36VDC                        | 95VDC           | 95VDC           |
| Max. Pick-up Voltage  | 9VDC                         | 48VDC           | 32VDC           |
| Min. Drop-out Voltage | 6VDC                         | 27VDC           | 18VDC           |
| Max. Inrush Current   | 3.8A                         | 0.7A            | 1.3A            |
| Avg. Holding Current  | 0.13A@12VDC /<br>0.07A@24VDC | 0.02A@<br>72VDC | 0.03A@<br>48VDC |



## Performance Data for AEV250-XX-H /1000V Switching Option

### MAIN CONTACT

|   |                          |                              |
|---|--------------------------|------------------------------|
| Contact Arrangement                       | 1 Form X (SPST-NO)       |                              |
| Max. Switching Voltage                    | 1000 VDC                 |                              |
| Rated Current                             | 500A                     |                              |
| Max. Short Circuit Current                | 3000A @450VDC (1s)       |                              |
| Dielectric Withstanding Voltage (initial) | Between Open Contacts    | 4000VDC 1mA 1min             |
|   | Between Contacts to Coil | 2200VAC 1mA 1min             |
| Insulation Resistance (initial)           | Terminal to Terminal     | Min 1000 M $\Omega$ @1000VDC |
|   | Terminals to Coil        |                              |
| Contact Resistance                        | Max 10m $\Omega$ (1A 6V) |                              |
| Limit breaking                            | 2000A@450VDC, 1 Cycle    |                              |

### OPERATE / RELEASE TIME

|                         |                   |
|-------------------------|-------------------|
| Close (includes bounce) | 25ms, Max.@20 °C  |
| Release Time            | 12ms, Max.@ 20 °C |

### ENVIRONMENTAL DATA

|                            |             |   |
|----------------------------|-------------|---|
| Shock                      | Functional  | 196m/s <sup>2</sup><br>Sine half-wave pulse |
|                            | Destructive | 490m/s <sup>2</sup><br>Sine half-wave pulse |
| Vibration, Sine, Peak, 20G |             | 80 to 2,000Hz                               |
| Operating Temperature      |             | -40 to +85 °C                               |
| Altitude                   |             | <4000m                                      |
| Weight                     |             | 0.43kg                                      |
| Humidity                   |             | 5% to 85%RH                                 |

### EXPECTED LIFE

|                      |                                |
|----------------------|--------------------------------|
| Electrical Endurance | See below Make and Break Graph |
| Mechanical Life      | 200,000 Cycle                  |

### AUX CONTACT

|                              |                                      |
|------------------------------|--------------------------------------|
| Aux. Contact Arrangement     | 1 Form A                             |
| Aux. Contact Current Max     | 2A@30VDC/3A@125VAC                   |
| Aux. Contact Current Min     | 100mA@8V                             |
| Aux. Contact Resistance Max. | 0.417ohms@30VDC/<br>0.150ohms@125VAC |

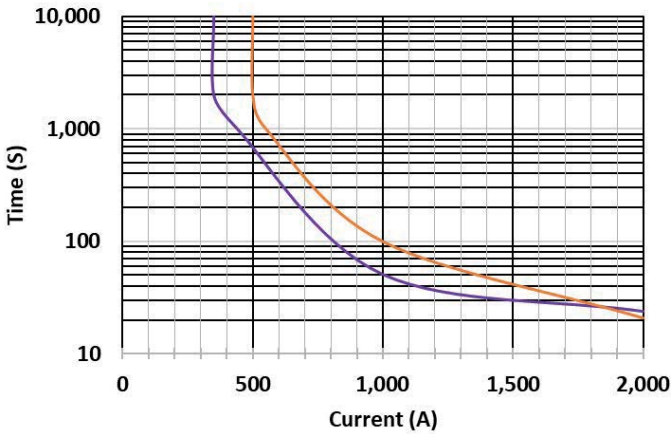
### COIL DATA

|                              |            |
|------------------------------|------------|
| Nominal Voltage              | 12/24 VDC  |
| Max. Pick-up Voltage 20°C    | 9VDC       |
| Min. Drop-out Voltage 20°C   | 6VDC       |
| Max. Inrush Current 20°C     | 3.8A       |
| Average Holding Current 20°C | 0.15@12VDC |

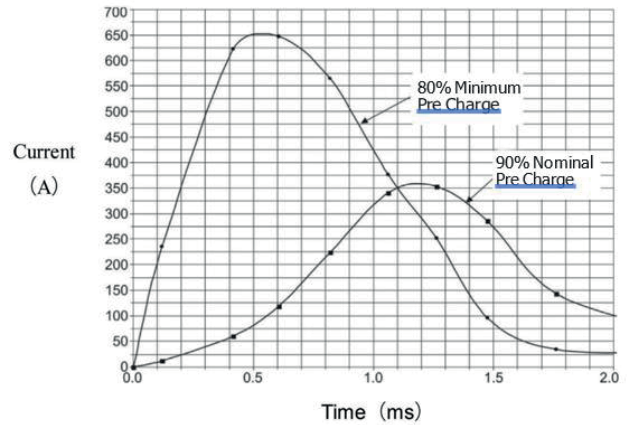
**Performance Data**

**Current Carry vs Time (85°C Ambient)**

**500A Max (400 MCM) / 350A Max (2/0)**

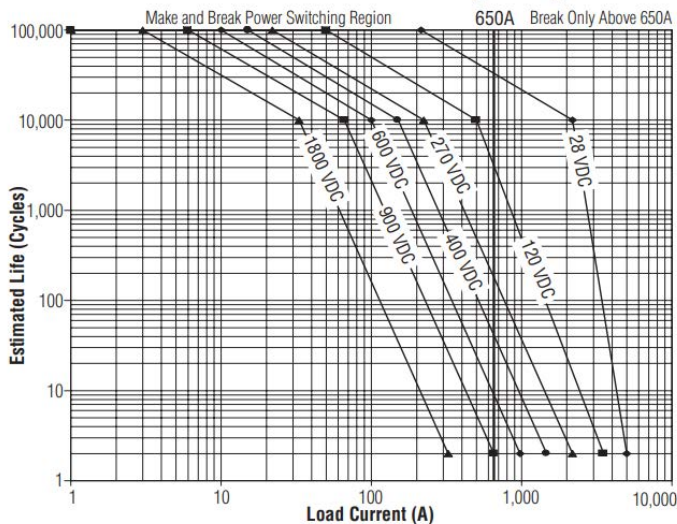


**Capacitive Make Test Curves for Pre-Charged Motor Controller**



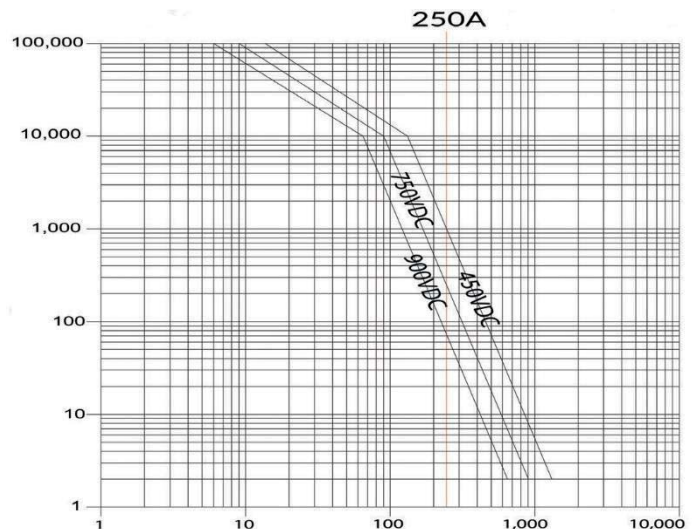
**Estimated Make & Break Resistive Load Ratings for Polarized Type**

**1000V Option**



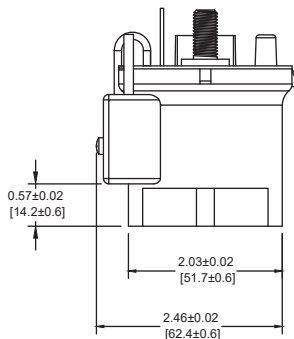
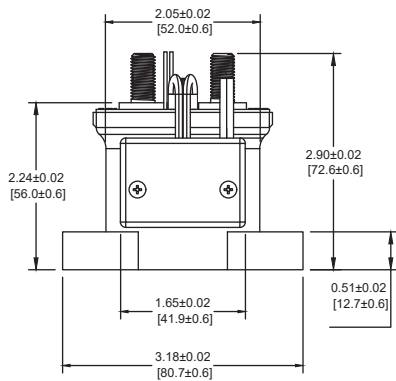
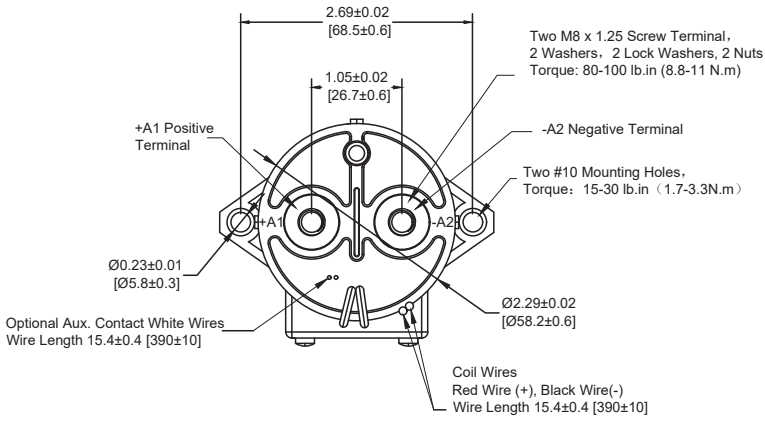
\* Note:  
 This graph was generated using test results from a specific lab condition. It should be used as reference and the customer is encouraged to verify the endurance of the device meets their application requirements

**900V Option**

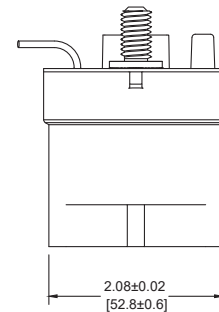
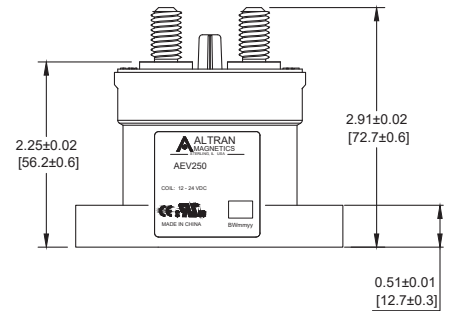
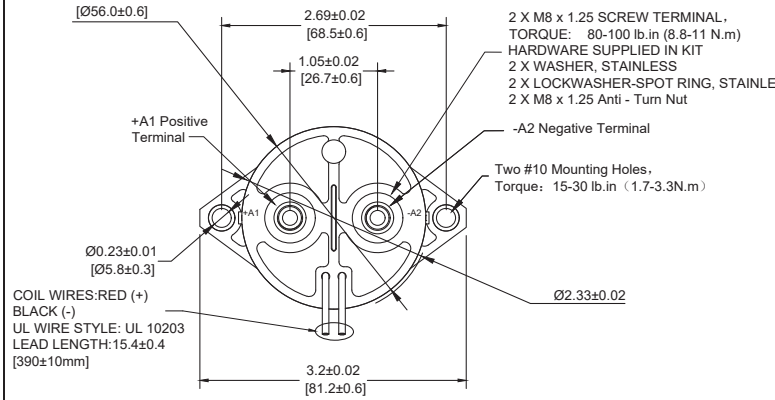


\* Note:  
 Estimates based on extrapolated data. User is encouraged to confirm performance in application.

**Outline Dimensions (mm):**



**Potted PCB/Without Coil Economizer**



\*Note: The wire size is 22 AWG.

## Application Notes

- FÈ To prevent loosening, split washers should be used whenever the contactor is installed. All terminals or conductors must be in direct contact with the contactor's main terminals. Please control the tightening torque of each part within the specified range in the table below. If the torque exceeds the recommended range, it may cause damage to the sealed cavity and thread damage.
  - Contact torque: (M8) 80-100 lb. in. (8.8 - 11 N.m)
  - Mounting torque: 1.5-2.0 lb. in. (1.7-2.3 N.m) Max.
- GÈ Products with a coil economizer are already equipped with back EMF circuits, so there is no need to use surge protectors.
- HÈ Avoid installing the contactor in a strong magnetic field environment (near transformers or magnets) and avoid placing the contactor near objects with heat radiation.
- IÈ When continuous current is applied to the contacts of the relay, and the coil is turned on immediately after the power is cut off. At this time, as the temperature of the coil increases, the resistance of the coil will also increase, which will increase the pull-in voltage of the product, which may result in exceeding the rated pull-in voltage. In this case, the following measures should be taken to reduce the load current; limit the continuous power-on time or use a coil voltage higher than the rated pull-in voltage.
- JÈ When the voltage is applied to the contactor, the contactor will generate heat. Please ensure that the contactor is installed in a well-ventilated area and that the ambient temperature is within the specified range. If the ambient temperature is too high, the contactor's performance will be affected.
- KÈ The rated values in the contact parameters are values for resistive load. When using an inductive load with a high inductance, please connect a surge current protection device to the inductive load in parallel. If no measures are taken, the electrical life may be reduced and the continuity may be poor. Please consider sufficient margin space in the design.
- LÈ Coil drive power must be greater than coil power or it will reduce performance capability.
- MÈ Please do not allow debris and oil to adhere to the main terminals; make sure that the main terminals are in reliable contact with the load conductor, otherwise the temperature rise of the terminal / conductor connection may be too high due to the excessive contact resistance.
- NÈ The load conductor must have the corresponding current load capacity and heat dissipation capacity (it is recommended to use a copper bar with min 50mm<sup>2</sup>), to prevent overheating and affecting the life of the contactor.
- OÈ It is impossible to determine the performance parameters of contactors in each specific application, therefore, customers should choose the products according to their own conditions of use. If in doubt, contact Altran. The customer will be responsible for validating that the products meet their application.
- PÈ Do not use if dropped.
- QÈ Altran reserves the right to make product changes as needed. Customers should reconfirm the contents of the specification or ask for us to supply a new specification if necessary.