

# DC Power Relays (200-A Models) G9EC-1

## DC Power Relays Capable of Interrupting High-voltage, High-current Loads

- A compact relay (98 x 44 x 86.7 mm (L x W x H)) capable of switching 400-V 200-A DC loads. (Capable of interrupting 1,000 A at 400 VDC max.)
- The switching section and driving section are gas-injected and hermetically sealed, allowing these compact relays to interrupt high-capacity loads. The sealed construction also requires no arc space, saves space, and helps ensure safe applications.
- Downsizing and optimum design allow no restrictions on the mounting direction.
- Terminal Cover is also available for industrial applications.
- UL/CSA standard UL508 approved.



**Note:** Refer to *Precautions* on page 22.

## Model Number Structure

### Model Number Legend

G9EC-□-□-□-□  
          1  2  3  4

- 1. Number of Poles**  
1: 1 pole
- 2. Contact Form**  
Blank: SPST-NO
- 3. Coil Terminals**  
B: M3.5 screw terminals (standard)  
Blank: Lead wire output
- 4. Special Functions**

## Ordering Information

### List of Models

Models	Terminals		Contact form	Coil rated voltage	Model
	Coil terminals	Contact terminals			
Switching/current conduction models	Screw terminals (See note 2.)	Screw terminals (See note 1.)	SPST-NO	12 VDC 24 VDC 48 VDC 60 VDC 100 VDC	G9EC-1-B
	Lead wire				G9EC-1

- Note:** 1. Two M8 nuts are provided for the contact terminal connection.  
2. Two M3.5 screws are provided for the coil terminal connection.

# Specifications

## ■ Ratings

### Coil

Rated voltage	Rated current	Coil resistance	Must-operate voltage	Must-release voltage	Maximum voltage (See note 3.)	Power consumption
12 VDC	938 mA	12.8 Ω	75% max. of rated voltage	8% min. of rated voltage	110% of rated voltage (at 23°C within 10 minutes)	Approx. 11 W
24 VDC	469 mA	51.2 Ω				
48 VDC	234 mA	204.8 Ω				
60 VDC	188 mA	320.0 Ω				
100 VDC	113 mA	888.9 Ω				

- Note:**
1. The figures for the rated current and coil resistance are for a coil temperature of 23°C and have a tolerance of ±10%.
  2. The figures for the operating characteristics are for a coil temperature of 23°C.
  3. The figure for the maximum voltage is the maximum voltage that can be applied to the relay coil.

### Contacts

Item	Resistive load
	G9EC-1(-B)
Rated load	200 A at 400 VDC
Rated carry current	200 A
Maximum switching voltage	400 V
Maximum switching current	200 A

## ■ Characteristics

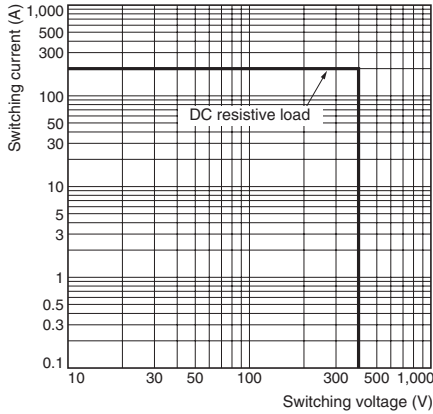
Item	G9EC-1(-B)	
Contact resistance (See note 2.)	30 mΩ max. (0.2 mΩ typical)	
Contact voltage drop	0.1 V max. (for a carry current of 200 A)	
Operate time	50 ms max.	
Release time	30 ms max.	
Insulation resistance (See note 3.)	Between coil and contacts	1,000 MΩ min.
	Between contacts of the same polarity	1,000 MΩ min.
Dielectric strength	Between coil and contacts	2,500 VAC, 1 min
	Between contacts of the same polarity	2,500 VAC, 1 min
Impulse withstand voltage (See note 4.)	4,500 V	
Vibration resistance	Destruction	10 to 55 to 10 Hz 0.75-mm single amplitude (Acceleration: 2.94 to 88.9 m/s <sup>2</sup> )
	Malfunction	10 to 55 to 10 Hz 0.75-mm single amplitude (Acceleration: 2.94 to 88.9 m/s <sup>2</sup> )
Shock resistance	Destruction	490 m/s <sup>2</sup>
	Malfunction	196 m/s <sup>2</sup>
Mechanical endurance (See note 5.)	200,000 operations min.	
Electrical endurance (resistive load) (See note 6.)	400 VDC, 200 A, 3,000 operations min.	
Short-time carry current	300 A (15 min)	
Maximum interruption current	1,000 A at 400 VDC (10 times)	
Overload interruption	700 A at 400 VDC (40 times min.)	
Reverse polarity interruption	-200 A at 200 VDC (1,000 times min.)	
Ambient operating temperature	-40 to 50°C (with no icing or condensation)	
Ambient operating humidity	5% to 85%	
Weight	Approx. 560 g	

- Note:**
1. The above values are initial values at an ambient temperature of 23°C unless otherwise specified.
  2. The contact resistance was measured with 1 A at 5 VDC using the voltage drop method.
  3. The insulation resistance was measured with a 500-VDC megohmmeter.
  4. The impulse withstand voltage was measured with a JEC-212 (1981) standard impulse voltage waveform (1.2 × 50 μs).
  5. The mechanical endurance was measured at a switching frequency of 3,600 operations/hr.
  6. The electrical endurance was measured at a switching frequency of 60 operations/hr.

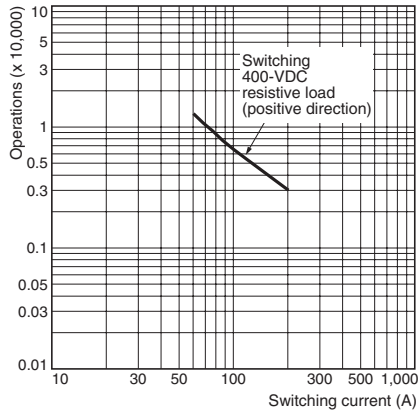
# Engineering Data

## ■ G9EC-1(-B) Switching/Current Conduction Models

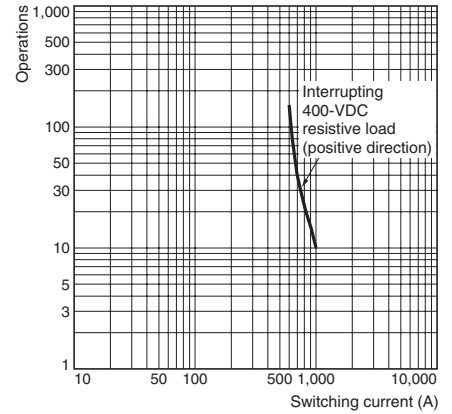
**Maximum Switching Capacity**



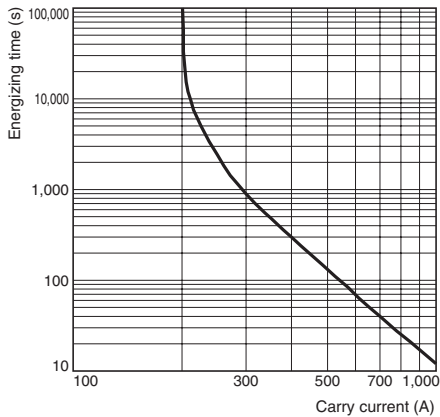
**Electrical Endurance (Switching Performance)**



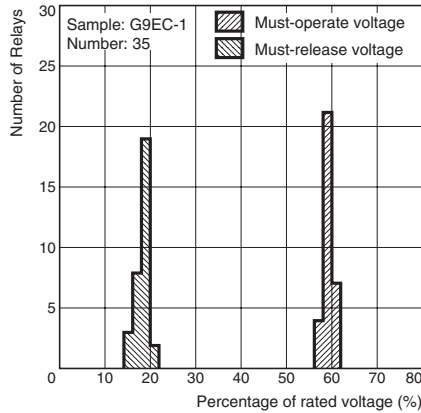
**Electrical Endurance (Interruption Performance)**



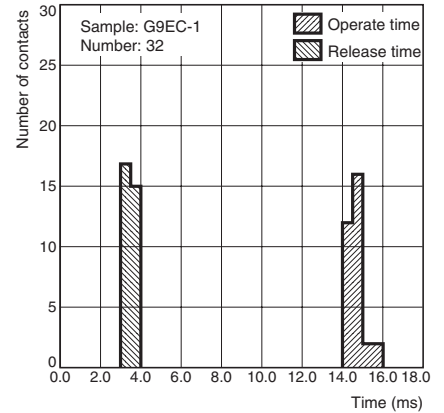
**Carry Current vs Energizing Time**



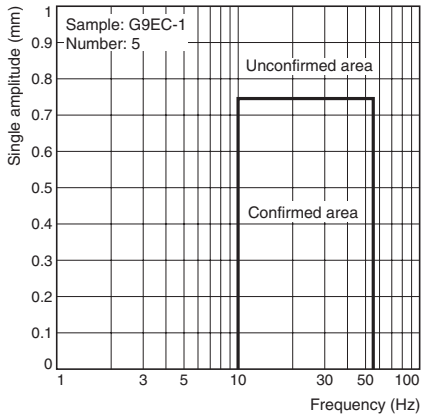
**Must-operate Voltage and Must-release Voltage Distributions**



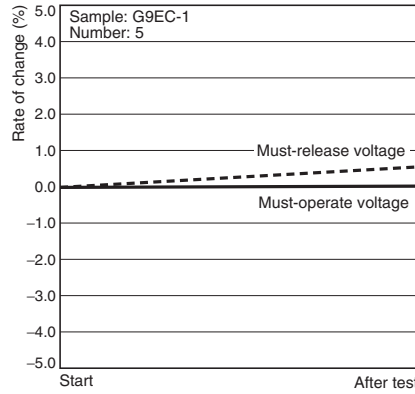
**Time Characteristic Distributions**



### Vibration Malfunction

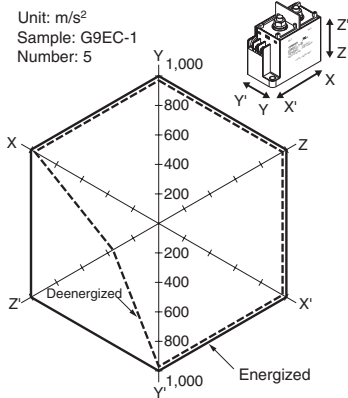


### Vibration Resistance



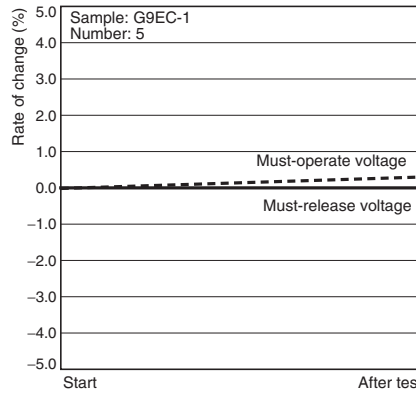
Characteristics were measured after applying vibration at a frequency of 10 to 55 Hz (single amplitude of 0.75 mm) to the test piece (not energized) for 2 hours each in 3 directions. The percentage rate of change is the average value for all of the samples

### Shock Malfunction



The value at which malfunction occurred was measured after applying shock to the test piece 3 times each in 6 directions along 3 axes.

### Shock Resistance



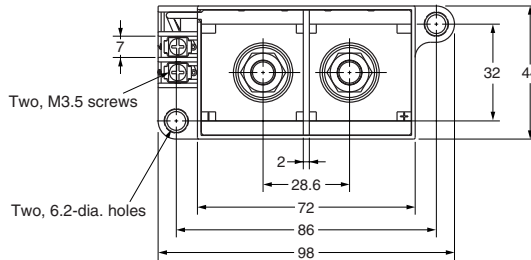
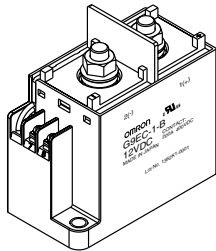
Characteristics were measured after applying a shock of  $490 m^2/s$  to the test piece 3 times each in 6 directions along 3 axes. The percentage rate of change is the average value for all of the samples.

# Dimensions

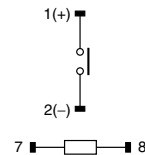
Note: All units are in millimeters unless otherwise indicated.

## Models with Screw Terminals

### G9EC-1-B

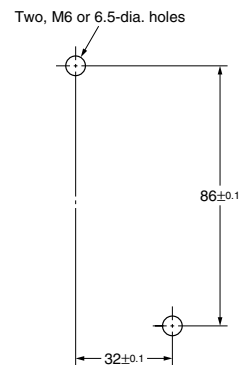


Terminal Arrangement/  
Internal Connections  
(TOP VIEW)

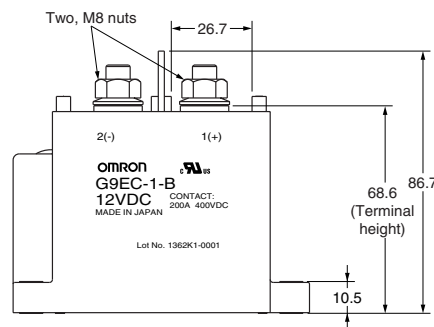
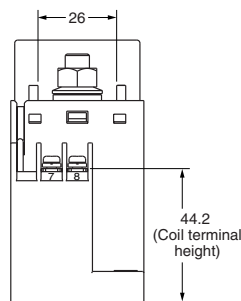


Note: Be sure to connect terminals with the correct polarity. Coils do not have polarity.

Mounting Hole Dimensions  
(TOP VIEW)

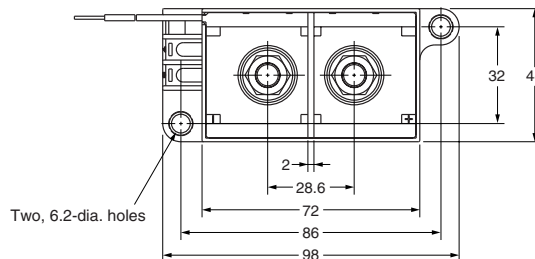
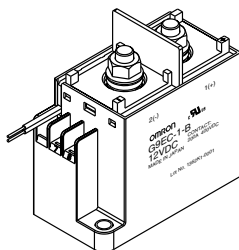


Dimension (mm)	Tolerance (mm)
10 or lower	±0.3
10 to 50	±0.5
50 or higher	±1

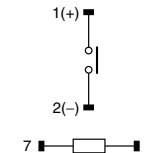


## Models with Lead Wires

### G9EC-1

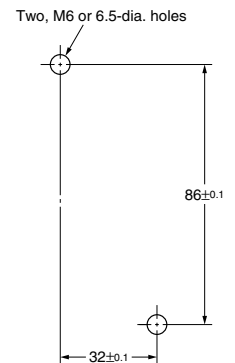


Terminal Arrangement/  
Internal Connections  
(TOP VIEW)

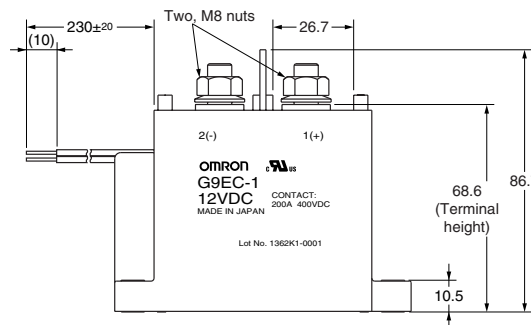
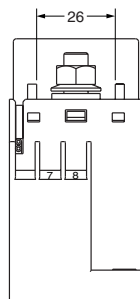


Note: Be sure to connect terminals with the correct polarity. Coils do not have polarity.

Mounting Hole Dimensions  
(TOP VIEW)



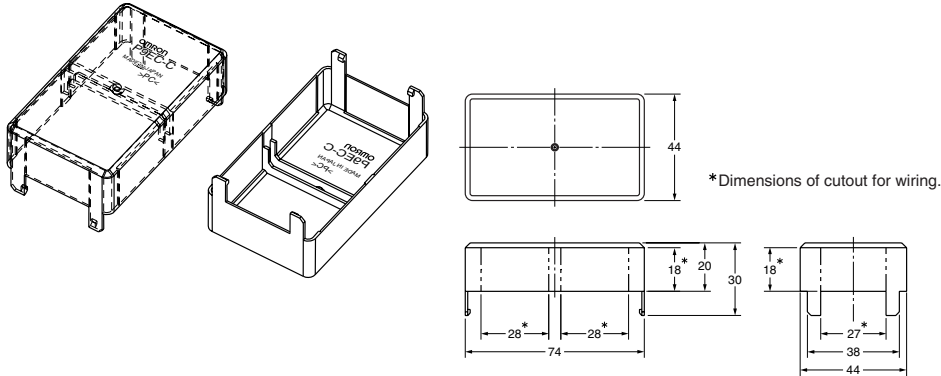
Dimension (mm)	Tolerance (mm)
10 or lower	±0.3
10 to 50	±0.5
50 or higher	±1



## Options

### Terminal Cover

P9EC-C



**Note:** Be sure to remove the cutouts for wiring that are located in the wiring outlet direction before installing the Terminal Cover.

Dimension (mm)	Tolerance (mm)
10 or lower	±0.3
10 to 50	±0.5
50 or higher	±1