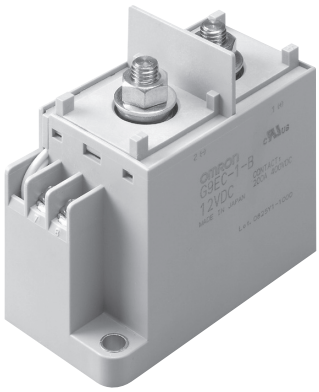
G9EC-1

DC Power Relays (200-A Models)

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.)
  1,000 VDC 100 A type are also added.
  (Capable of interrupting 500 A at 1,000 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.

⚠ Refer to "**DC Power Relays Common Precautions**".

■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
X1 : High Voltage type (1,000 V)

■List of Models

Models	Terminals		Contact form	Coil rated voltage	Model
	Coil terminals	Contact terminals			
Switching/current conduction models	Screw terminals	Screw terminals	SPST-NO	12 VDC 24 VDC 48 VDC 60 VDC 100 VDC	G9EC-1-B
	Lead wire				G9EC-1
	Screw terminals			12 VDC 24 VDC	G9EC-1-B-X1

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

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■Ratings

●Coil

Model	Item / Rated voltage	Rated current (mA)	Coil resistance (Ω)	Must-operate voltage (V)	Must-release voltage (V)	Maximum voltage (V)	Power consumption (W)
				Percentage of rated voltage			
G9EC-1-B G9EC-1	12 VDC	938	12.8	75% max.	8% min.	110% (at 23°C within 10 minutes)	Approx. 11
	24 VDC	469	51.2				
	48 VDC	234	204.8				
	60 VDC	188	320.0				
	100 VDC	113	888.9				
G9EC-1-B-X1	12 VDC	583	20.6			130%	Approx. 7
	24 VDC	292	82.3				

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%.
Note 2. The figures for the operating characteristics are for a coil temperature of 23°C.
Note 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)	G9EC-1-B-X1
Rated load	200 A at 400 VDC	100 A at 1,000 VDC
Rated carry current	200 A	200 A
Maximum switching voltage	400 V	1,000 V
Maximum switching current	200 A	200 A

■Characteristics

Item / Model		G9EC-1(-B)	G9EC-1-B-X1
Contact resistance *1		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 *2	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.)	4,000 VAC (1 min.)
	Between contacts of the same polarity	2,500 VAC (1 min.)	4,000 VAC (1 min.)
Impulse withstand voltage *3		4,500 V	
Vibration resistance	Destruction	10 to 55 to 10 Hz 0.75-mm single amplitude (Acceleration: 2.94 to 88.9 m/s²)	5 to 200 to 5 Hz (Acceleration: 44.1 m/s²)
	Malfunction	10 to 55 to 10 Hz 0.75-mm single amplitude (Acceleration: 2.94 to 88.9 m/s²)	5 to 200 to 5 Hz (Acceleration: 44.1 m/s²)
Shock resistance	Destruction	490 m/s²	
	Malfunction	196 m/s²	
Mechanical endurance *4		200,000 operations min.	
Electrical endurance (resistive load) *5		400 VDC, 200 A (3,000 operations min.)	1,000 VDC, 100 A (6,000 operations min.) 1,000 VDC, 150 A (1,000 operations min.)
Short-time carry current		300 A (15 min.)	
Maximum interruption current		1,000 A at 400 VDC (10 operations min.)	1,000 VDC, 500 A (5 operations min.)
Overload interruption		700 A at 400 VDC (40 operations min.)	850 VDC, 900 A (3 operations min.)
Reverse polarity interruption		-200 A at 200 VDC (1,000 operations min.)	850 VDC, -600 A (1 operations min.) 1,000 VDC, -300 A (1 operations min.)
Ambient operating temperature		-40 to 50°C (with no icing or condensation)	-40 to 85°C (with no icing or condensation)
Ambient operating humidity		5% to 85%	
Weight (Including accessories)		Approx. 560 g	Approx. 650 g

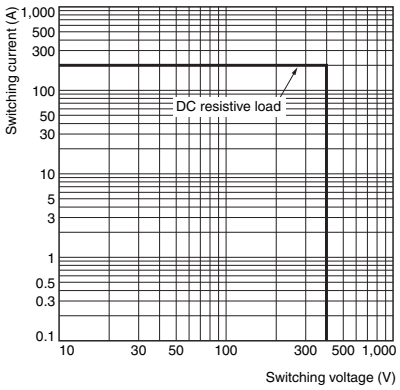
Note. The above values are initial values at an ambient temperature of 23°C unless otherwise specified.
*1. The contact resistance was measured with 1 A at 5 VDC using the voltage drop method.
*2. The insulation resistance was measured with a 500-VDC megohmmeter.
*3. The impulse withstand voltage was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

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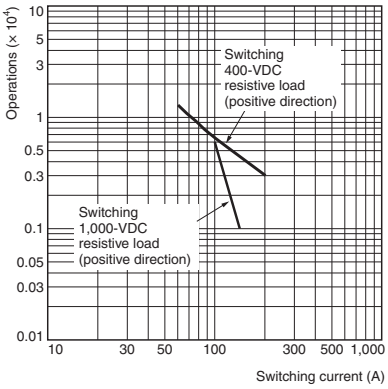
■Engineering Data

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

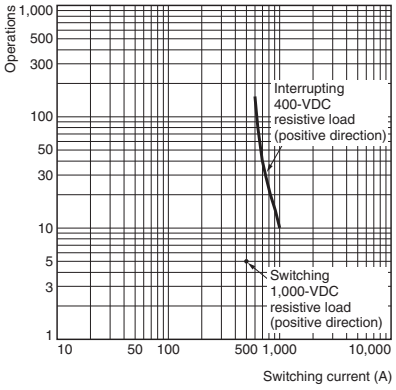
●Maximum Switching Capacity



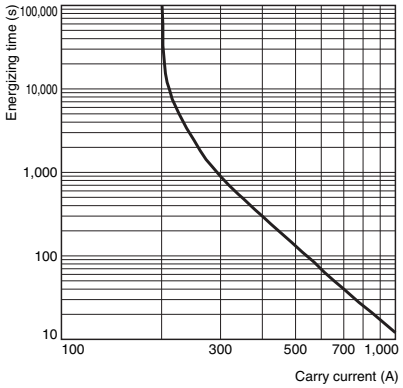
●Electrical Endurance (Switching Performance)



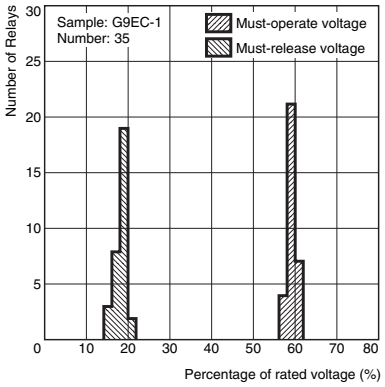
●Electrical Endurance (Interruption Performance)



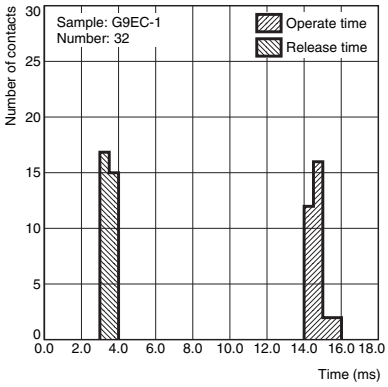
●Carry Current vs Energizing Time



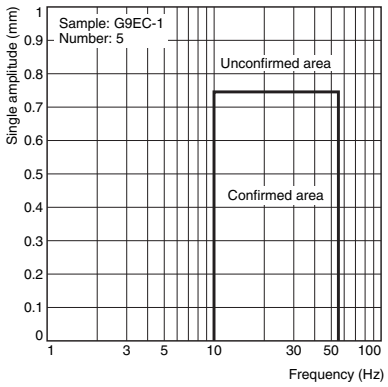
●Must-operate Voltage and Must-release Voltage Distributions



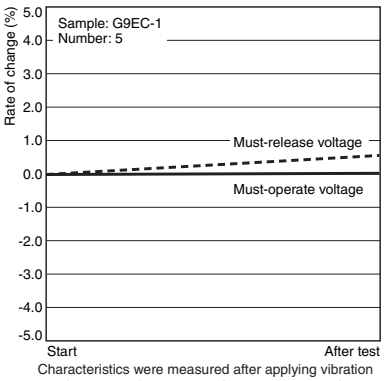
●Time Characteristic Distributions



●Vibration Malfunction

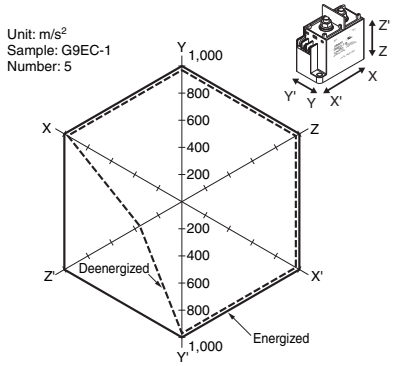


●Vibration Resistance



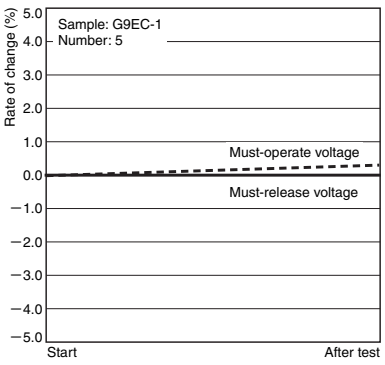
Characteristics were measured after applying vibration at a frequency of 10 to 55 Hz (single amplitude of 0.75 mm) to the test piece (not energized) for 2 hours each in 3 directions. The percentage rate of change is the average value for all of the samples.

●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



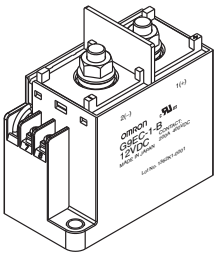
Characteristics were measured after applying a shock of 490 m^2/s to the test piece 3 times each in 6 directions along 3 axes. The percentage rate of change is the average value for all of the samples.

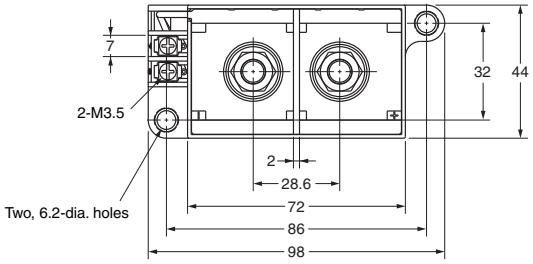
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■Dimensions (Unit: mm)

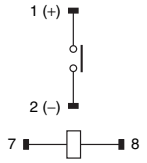
●Models with Screw Terminals

G9EC-1-B

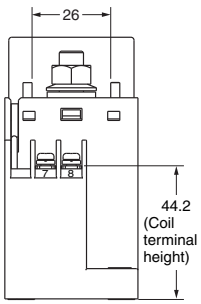


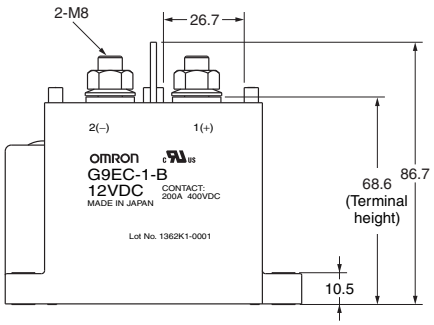


Terminal Arrangement/ Internal Connections (TOP VIEW)

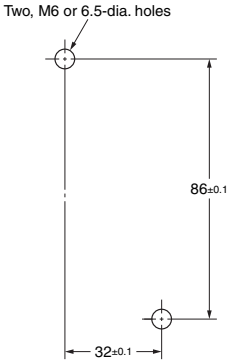


Note: Be sure to connect terminals with the correct polarity. Coils do not have polarity.



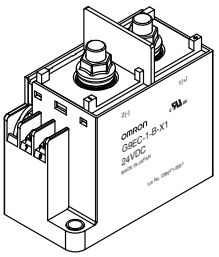


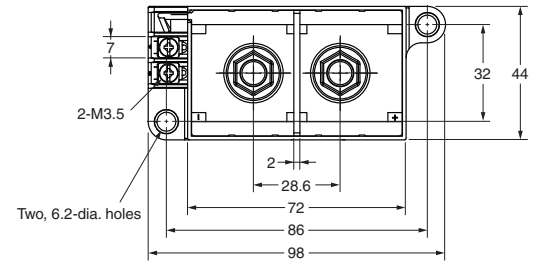
Mounting Hole Dimensions (TOP VIEW)



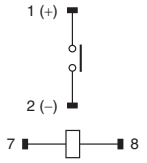
Dimension (mm)	Tolerance (mm)
10 or lower	±0.3
10 to 50	±0.5
50 or higher	±1

G9EC-1-B-X1

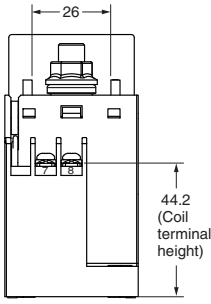


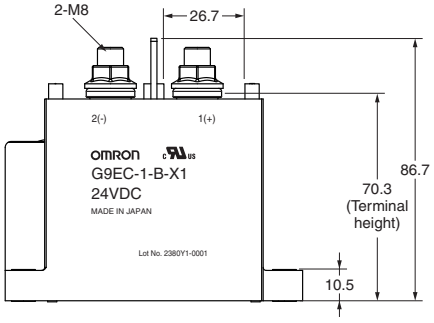


Terminal Arrangement/ Internal Connections (TOP VIEW)

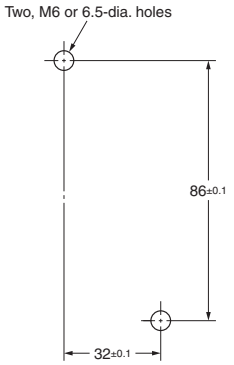


Note: Be sure to connect terminals with the correct polarity. Coils do not have polarity.





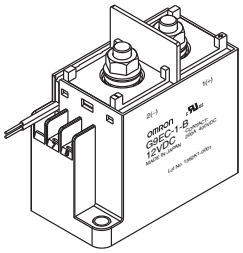
Mounting Hole Dimensions (TOP VIEW)

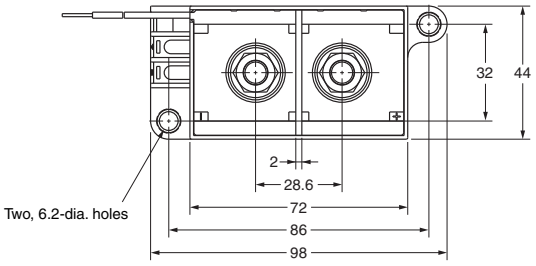


Dimension (mm)	Tolerance (mm)
10 or lower	±0.3
10 to 50	±0.5
50 or higher	±1

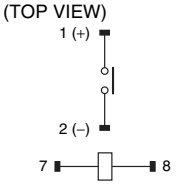
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●Models with Lead Wires
G9EC-1



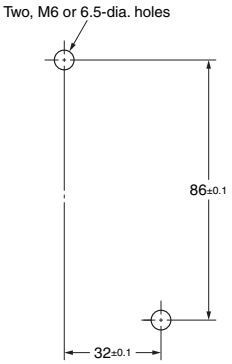


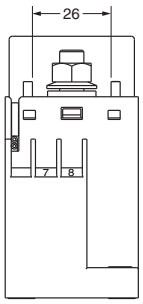
Terminal Arrangement/ Internal Connections
(TOP VIEW)

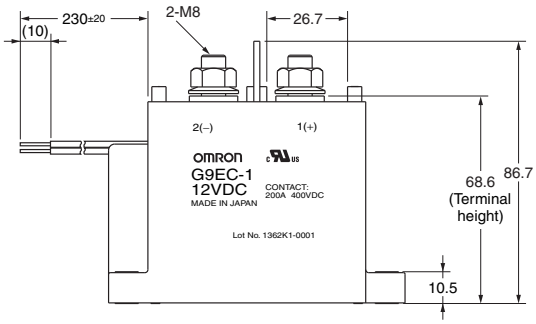


Note: Be sure to connect terminals with the correct polarity. Coils do not have polarity.

Mounting Hole Dimensions
(TOP VIEW)



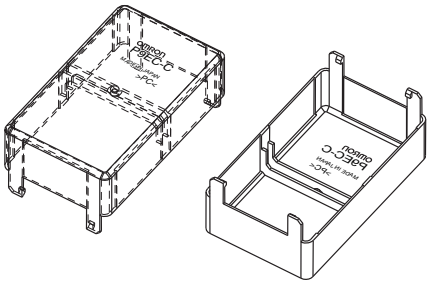


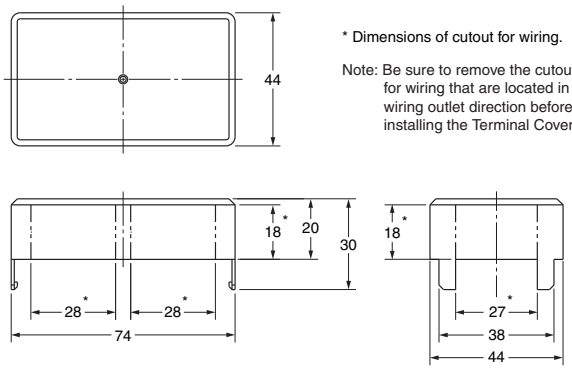


Dimension (mm)	Tolerance (mm)
10 or lower	±0.3
10 to 50	±0.5
50 or higher	±1

■Options (Unit: mm)

●Terminal Cover
P9EC-C





* Dimensions of cutout for wiring.

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

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