



1 Form A Plug-in type

### FEATURES

#### 1. Excellent resistance to contact welding

Owing to the pre-tension and kick-off mechanism, the 1 Form A passes TV-15 and the 2 Form A passes TV-10.

#### 2. High-capacity and long life

Contact arrangement	1 Form A type	2 Form A type
Contact capacity	30A	20A
Electrical life (at 20 cpm)	2×10 <sup>5</sup>	
Mechanical life (at 180 cpm)	DC type: 10 <sup>7</sup> , AC type: 5×10 <sup>6</sup>	

#### 3. Excellent surge resistance

Between contacts and coil, the surge voltage is more than 10,000 V (when surge waveform accords with JEC-212-1981).

#### 4. Compatible with all major safety standards

UL, CSA, VDE and TÜV certified

### TYPICAL APPLICATIONS

#### 1. Office equipment

Copiers, package air conditioners, automatic vending machines.

#### 2. Industrial equipment

Machine tools, molding equipment, wrapping machines, food processing equipment, etc.

#### 3. Home appliances

Air conditioners, microwave ovens, televisions, stereo systems, water heaters and air heating equipment.

**RoHS Directive compatibility information**  
<http://www.mew.co.jp/ac/e/environment/>

Type	Single side stable type	
	HE 1 Form A, 2 Form A	
Insulation gap	Min. 8 mm	
Distance between contacts*	1 Form A and 2 Form A: Min. 3 mm	PC board type: Min. 2.5 mm
Breakdown voltage	Between open contacts	2, 000 Vrms for 1 min.
	Between contact and coil	5, 000 Vrms for 1 min.

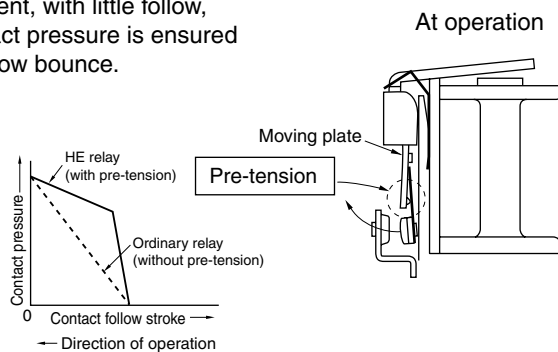
### CLASSIFICATION

Type	PC board		Plug-in		TM		Screw terminal	
Operating function	Single side stable							
Contact arrangement	1 Form A	1 Form A	2 Form A	1 Form A	2 Form A	1 Form A	2 Form A	

### PRE-TENSION AND KICK-OFF MECHANISM

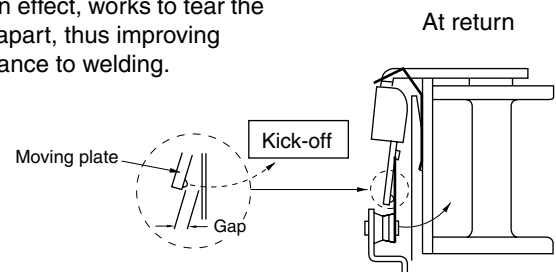
#### 1. Pre-tension mechanism

Before operation, the moving spring is pre-tensioned by being held down by a moving plate. As a result, at the ON moment, with little follow, contact pressure is ensured with low bounce.



#### 2. Kick-off mechanism

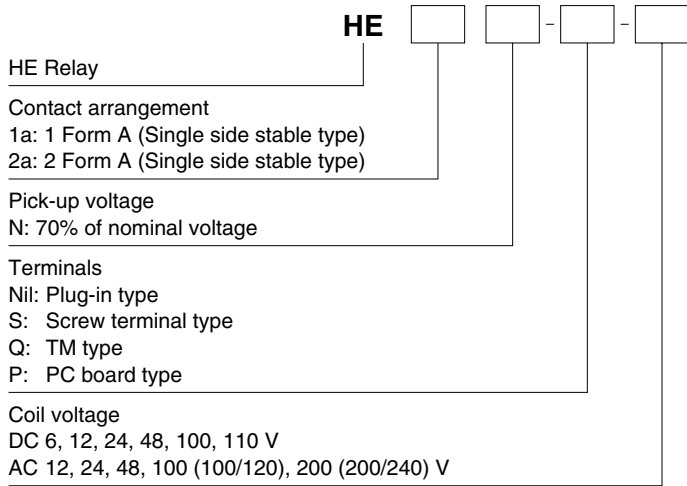
Even when contact welding has occurred, at the moment of return, the moving plate taps the moving spring (kick-off) and, in effect, works to tear the weld apart, thus improving resistance to welding.



	1 Form A	2 Form A
Electrical life	30 A 277 V AC, 10 <sup>5</sup> 30 A 250 V AC, 20 <sup>5</sup>	25 A 277 V AC, 10 <sup>5</sup> 20 A 250 V AC, 20 <sup>5</sup>
TV rating	TV-15	TV-10

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## ORDERING INFORMATION



## TYPES

### 1. PC board type (1 Form A, DC coil) (Single side stable)

Coil voltage	1 Form A		Packing quantity	
	Part No.		Carton	Case
6V DC	HE1aN-P-DC6V		25 pcs.	100 pcs.
12V DC	HE1aN-P-DC12V			
24V DC	HE1aN-P-DC24V			
48V DC	HE1aN-P-DC48V			
100V DC	HE1aN-P-DC100V			
110V DC	HE1aN-P-DC110V			

### 2. Plug-in type (Single side stable)

Type	Coil voltage	1 Form A		2 Form A		Packing quantity	
		Part No.		Part No.		Carton	Case
DC type	6V DC	HE1aN-DC6V	HE2aN-DC6V	20 pcs.	100 pcs.		
	12V DC	HE1aN-DC12V	HE2aN-DC12V				
	24V DC	HE1aN-DC24V	HE2aN-DC24V				
	48V DC	HE1aN-DC48V	HE2aN-DC48V				
	100V DC	HE1aN-DC100V	HE2aN-DC100V				
	110V DC	HE1aN-DC110V	HE2aN-DC110V				
AC type	12V AC	HE1aN-AC12V	HE2aN-AC12V	20 pcs.	100 pcs.		
	24V AC	HE1aN-AC24V	HE2aN-AC24V				
	48V AC	HE1aN-AC48V	HE2aN-AC48V				
	100/120V AC	HE1aN-AC100V	HE2aN-AC100V				
	200/240V AC	HE1aN-AC200V	HE2aN-AC200V				

### 3. TM type (Single side stable)

Type	Coil voltage	1 Form A		2 Form A		Packing quantity	
		Part No.		Part No.		Carton	Case
DC type	6V DC	HE1aN-Q-DC6V	HE2aN-Q-DC6V	20 pcs.	100 pcs.		
	12V DC	HE1aN-Q-DC12V	HE2aN-Q-DC12V				
	24V DC	HE1aN-Q-DC24V	HE2aN-Q-DC24V				
	48V DC	HE1aN-Q-DC48V	HE2aN-Q-DC48V				
	100V DC	HE1aN-Q-DC100V	HE2aN-Q-DC100V				
	110V DC	HE1aN-Q-DC110V	HE2aN-Q-DC110V				
AC type	12V AC	HE1aN-Q-AC12V	HE2aN-Q-AC12V	20 pcs.	100 pcs.		
	24V AC	HE1aN-Q-AC24V	HE2aN-Q-AC24V				
	48V AC	HE1aN-Q-AC48V	HE2aN-Q-AC48V				
	100/120V AC	HE1aN-Q-AC100V	HE2aN-Q-AC100V				
	200/240V AC	HE1aN-Q-AC200V	HE2aN-Q-AC200V				

#### 4. Screw terminal type (Single side stable)

Type	Coil voltage	1 Form A	2 Form A	Packing quantity	
		Part No.	Part No.	Carton	Case
DC type	6V DC	HE1aN-S-DC6V	HE2aN-S-DC6V	10 pcs.	50 pcs.
	12V DC	HE1aN-S-DC12V	HE2aN-S-DC12V		
	24V DC	HE1aN-S-DC24V	HE2aN-S-DC24V		
	48V DC	HE1aN-S-DC48V	HE2aN-S-DC48V		
	100V DC	HE1aN-S-DC100V	HE2aN-S-DC100V		
AC type	110V DC	HE1aN-S-DC110V	HE2aN-S-DC110V	10 pcs.	50 pcs.
	12V AC	HE1aN-S-AC12V	HE2aN-S-AC12V		
	24V AC	HE1aN-S-AC24V	HE2aN-S-AC24V		
	48V AC	HE1aN-S-AC48V	HE2aN-S-AC48V		
	100/120V AC	HE1aN-S-AC100V	HE2aN-S-AC100V		
	200/240V AC	HE1aN-S-AC200V	HE2aN-S-AC200V		

Note: The TM type of the screw terminals are also available.

## RATING

### 1. Coil data

#### 1) AC coils

Coil voltage	Pick-up voltage (at 20°C 68°F)	Drop-out voltage (at 20°C 68°F)	Nominal operating current [±10%] (at 20°C 68°F)	Nominal operating power	Max. allowable voltage (at 20°C 68°F)
12V AC	70%V or less of nominal voltage (Initial)	15%V or more of nominal voltage (Initial)	138mA	1.7VA	110%V of nominal voltage
24V AC			74mA	1.8VA	
48V AC			39mA	1.9VA	
100/120V AC			18.7 to 2.1mA	1.9 to 2.7VA	
200/240V AC			9.1 to 10.8mA	1.8 to 2.6VA	

#### 2) DC coils

Coil voltage	Pick-up voltage (at 20°C 68°F)	Drop-out voltage (at 20°C 68°F)	Nominal operating current [±10%] (at 20°C 68°F)	Coil resistance [±10%] (at 20°C 68°F)	Nominal operating power	Max. allowable voltage (at 55°C 131°F)
6V DC	70%V or less of nominal voltage (Initial)	10%V or more of nominal voltage (Initial)	320mA	18.8Ω	1.92W	110%V of nominal voltage
12V DC			160mA	75Ω	1.92W	
24V DC			80mA	300Ω	1.92W	
48V DC			40mA	1,200Ω	1.92W	
100V DC			19mA	5,200Ω	1.92W	
110V DC			18mA	6,300Ω	1.92W	

## 2. Specifications

Characteristics	Item	Specifications		
		1 Form A	2 Form A	
Contact	Arrangement	1 Form A	2 Form A	
	Initial contact resistance, max	Max. 100 mΩ (By voltage drop 6 V DC 1A)		
	Contact material	AgSnO <sub>2</sub> type		
Rating	Nominal switching capacity (resistive load)	30A 277V AC	25A 277V AC	
	Max. switching power	8,310VA	6,925VA	
	Max. switching voltage	277V AC, 30V DC		
	Max. switching current	30A	25A	
	Nominal operating power	DC: 1.92W, AC: 1.7 to 2.7VA		
	Min. switching capacity (Reference value)*1	100mA 5V DC		
Electrical characteristics	Insulation resistance (Initial)	Min. 1,000MΩ (at 500V DC) Measurement at same location as "Initial breakdown voltage" section.		
	Breakdown voltage (Initial)	Between open contacts	2,000 Vrms for 1min (Detection current: 10mA.)	
		Between contact sets	—	4,000 Vrms for 1min (Detection current: 10mA.)
		Between contact and coil	5,000 Vrms for 1min (Detection current: 10mA.)	
	Surge breakdown voltage*2 (between contact and coil)	Min. 10,000V (initial)		
	Temperature rise	DC: Max. 60°C (at 55°C) (By resistive method), AC: Max. 65°C (at 55°C) (By resistive method)		
	Operate time (at nominal voltage)	Max. 30ms (excluding contact bounce time)		
Release time (at nominal voltage)	DC: Max. 10ms (excluding contact bounce time, without diode), AC: Max. 30ms (excluding contact bounce time)			
Mechanical characteristics	Shock resistance	Functional	Min. 98 m/s <sup>2</sup> (Half-wave pulse of sine wave: 11 ms; detection time: 10μs.)	
		Destructive	Min. 980 m/s <sup>2</sup> (Half-wave pulse of sine wave: 6 ms.)	
	Vibration resistance	Functional	10 to 55 Hz at double amplitude of 1 mm (Detection time: 10μs.)	
		Destructive	10 to 55 Hz at double amplitude of 1.5 mm	
Expected life	Mechanical	DC: Min. 10 <sup>7</sup> (at 180 cpm), AC: Min. 5×10 <sup>6</sup> (at 180 cpm)		
	Electrical (resistive load) (at 20 cpm)	Min. 10 <sup>5</sup> (30A 277V AC) Min. 2×10 <sup>5</sup> (30A 250V AC)	Min. 10 <sup>5</sup> (25A 277V AC) Min. 2×10 <sup>5</sup> (20A 250V AC)	
Conditions	Conditions for operation, transport and storage*3	Ambient temperature: -50°C to +55°C -58°F to +131°F Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature), Air pressure: 86 to 106kPa		
	Conditions for operation, transport and storage*3	20 cpm (at max. rating)		
Unit weight		PC board type: approx. 80g 2.82oz, Plug-in type/TM type: approx. 90g 3.17oz, Screw terminal type: approx. 120g 4.23oz		

Notes: \*1 This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.

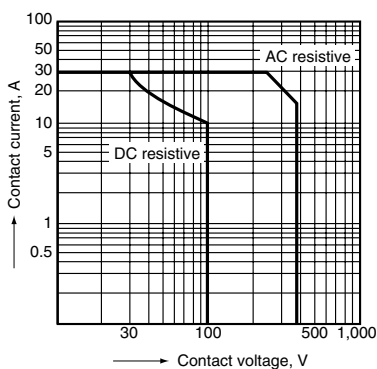
\*2 Wave is standard shock voltage of ±1.2×50μs according to JEC-212-1981

\*3 Refer to 6. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT.

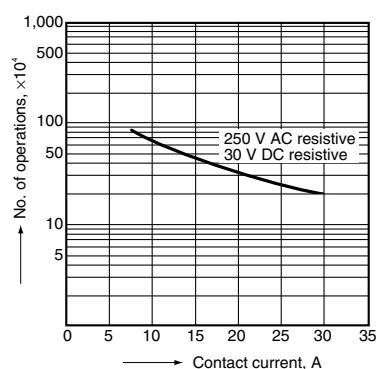
## REFERENCE DATA

### 1 Form A Type

#### 1. Maximum switching power

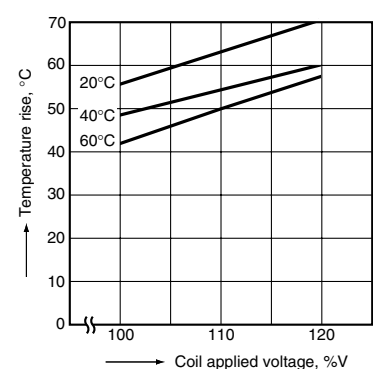


#### 2. Life curve



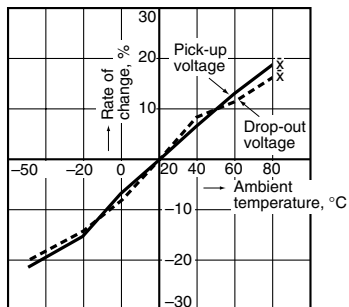
#### 3. Coil temperature rise (DC type)

Measured portion: Inside the coil  
Contact current: 30 A



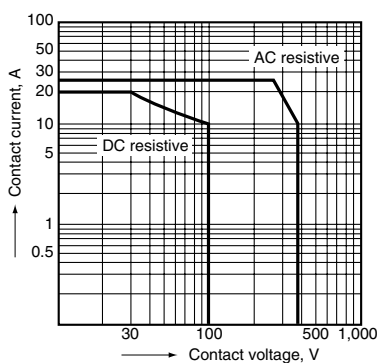
4. Ambient temperature characteristics

Tested sample: HE1aN-AC120V, 6 pcs.

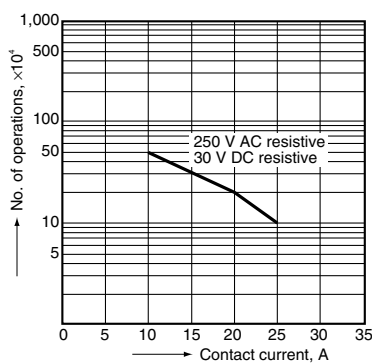


2 Form A Type

1. Maximum switching power

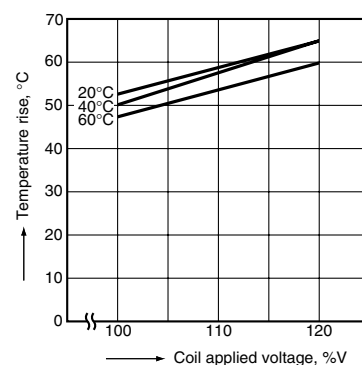


2. Life curve



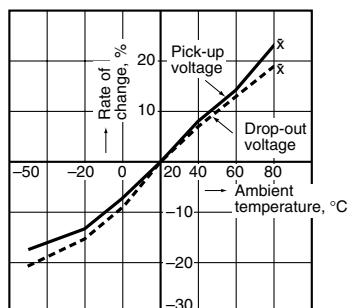
3. Coil temperature rise (DC type)

Measured portion: Inside the coil  
Contact current: 30 A



4. Ambient temperature characteristics

Tested sample: HE2aN-AC120V, 6 pcs.

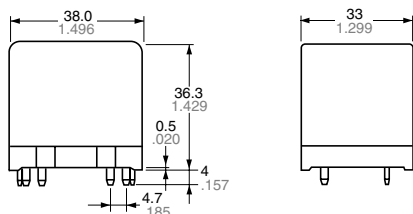


**DIMENSIONS** (Unit: mm inch)

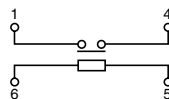
1. PC board type

1 Form A

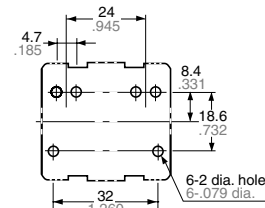
External dimensions  
Single side stable type



Schematic (Bottom view)  
Single side stable type



PC board pattern (Bottom view)



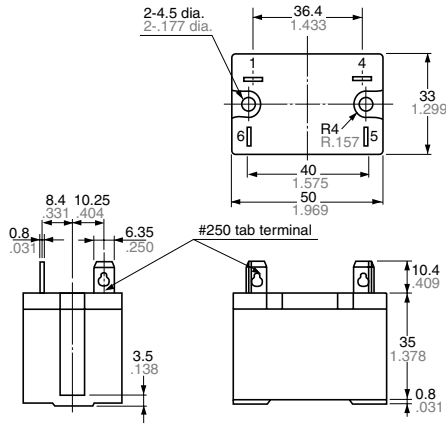
General tolerance:  $\pm 0.3 \pm 0.012$

Tolerance:  $\pm 0.1 \pm 0.004$

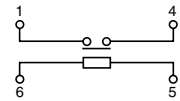
## 2. Plug-in type

1 Form A

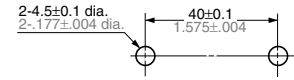
External dimensions  
Single side stable type



Schematic (Bottom view)  
Single side stable type



Panel cutout

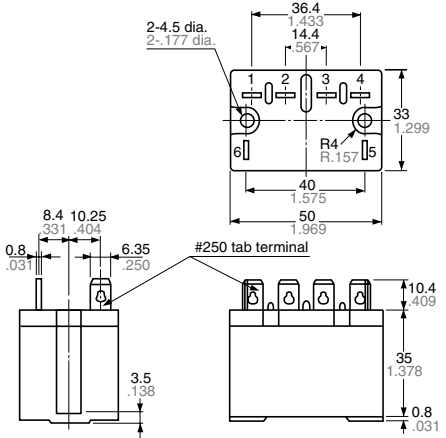


Tolerance:  $\pm 0.1 \pm .004$

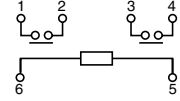
General tolerance:  $\pm 0.3 \pm .012$

2 Form A

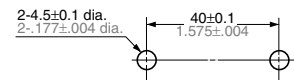
External dimensions  
Single side stable type



Schematic (Bottom view)  
Single side stable type



Panel cutout



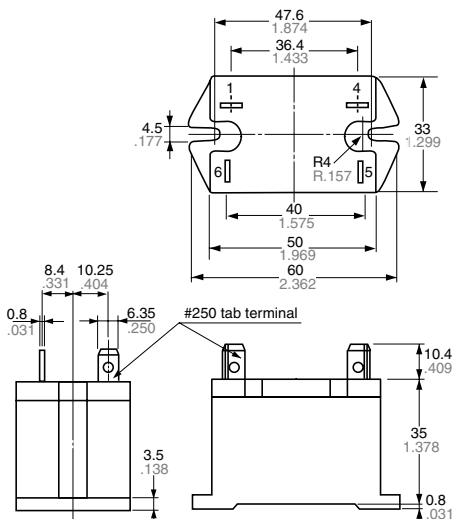
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General tolerance:  $\pm 0.3 \pm .012$

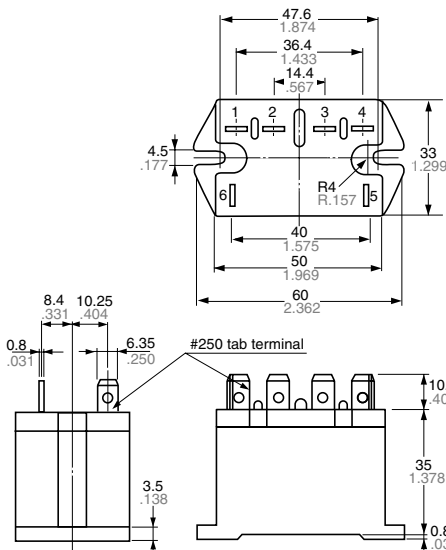
## 3. TM type

1 Form A

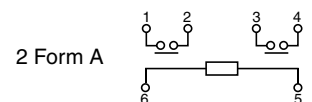
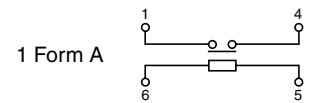
External dimensions  
Single side stable type



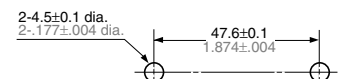
2 Form A



Schematic (Bottom view)  
Single side stable type



Panel cutout



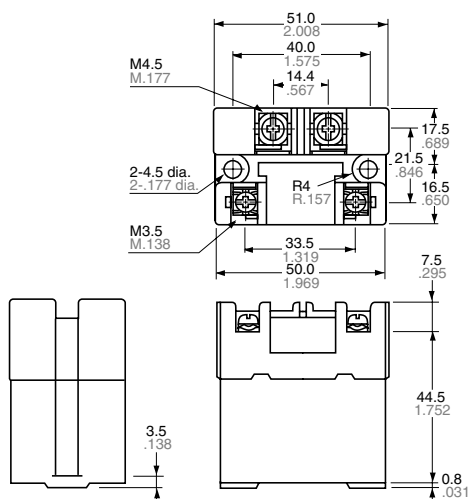
Tolerance:  $\pm 0.1 \pm .004$

General tolerance:  $\pm 0.3 \pm .012$

### 4. Screw terminal type

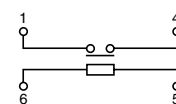
#### 1 Form A

External dimensions  
Single side stable type

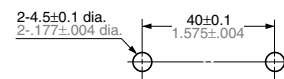


General tolerance:  $\pm 0.3 \pm .012$

Schematic (Bottom view)  
Single side stable type



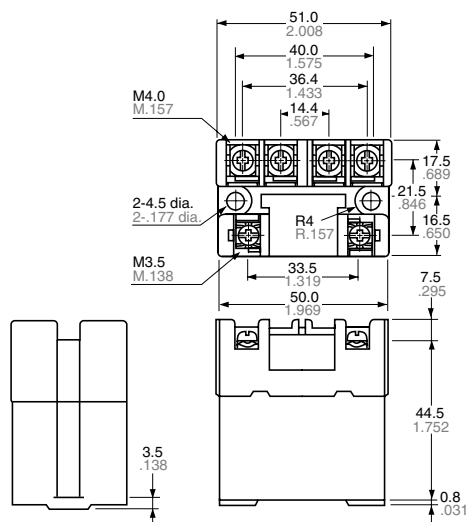
Panel cutout



Tolerance:  $\pm 0.1 \pm .004$

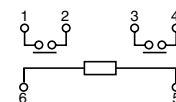
#### 2 Form A

External dimensions  
Single side stable type

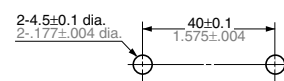


General tolerance:  $\pm 0.3 \pm .012$

Schematic (Bottom view)  
Single side stable type



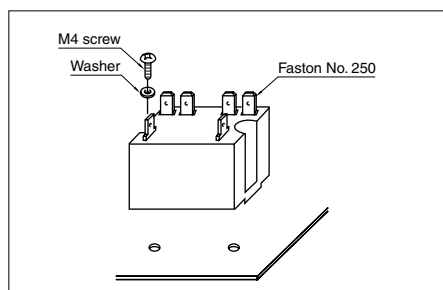
Panel cutout



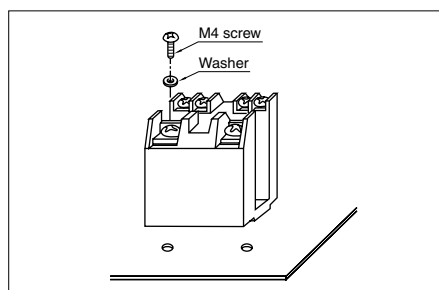
Tolerance:  $\pm 0.1 \pm .004$

## MOUNTING METHOD

### 1. Plug-in type



### 2. Screw terminal type



### 3. Allowable installation wiring size for screw terminal types and terminal sockets

Due to the UP terminals, it is possible to either directly connect the wires or use crimped terminal.

## NOTES

1. The dust cover should not be removed since doing so may alter the characteristics.

2. Avoid use under severe environmental conditions, such as high humidity, organic gas or in dust, oily locations and locations subjected to extremely frequent shock or vibrations.

3. When mounting, use spring washers. Optimum fastening torque ranges from 49 to 68.6 N·m (5 to 7 kgf·cm).

4. Firmly insert the receptacles so that there is no slack or looseness. To remove a receptacle, 19.6 to 39.2 N (2 to 4 kg) of pulling strength is required. Do not remove more than one receptacle at one time. Always remove one receptacle at a time and pull it straight outwards.

5. When using the AC type, the operate time due to the in-rush phase is 20 ms or more. Therefore, it is necessary for you to verify the characteristics for your actual circuit.

6. When using the push-on blocks for the screw terminal type, use crimped terminals and tighten the screw-down terminals to the torque below.

M4.5 screw:  
147 to 166.6 N·cm (15 to 17 kgf·cm)

M4 screw:  
117.6 to 137 N·cm (12 to 14 kgf·cm)

M3.5 screw:  
78.4 to 98 N·cm (8 to 10 kgf·cm)

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**For Cautions for Use, see Relay Technical Information.**