

**Max. 1,000 V DC, 20 A cut-off possible**  
**High capacity power relays**

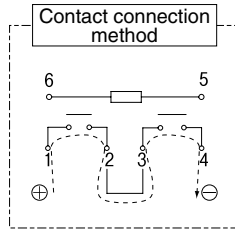
# HE-V RELAYS



**RoHS compliant**

## FEATURES

- **Compact size**  
(L: 41.0 × W: 50.0 × H: 39.4 mm  
**L: 1.614 × W: 1.969 × H: 1.551 inch**)  
Maximum 1,000 V DC, 20 A cut-off has been achieved (at each 1 Form A contact connected in series)



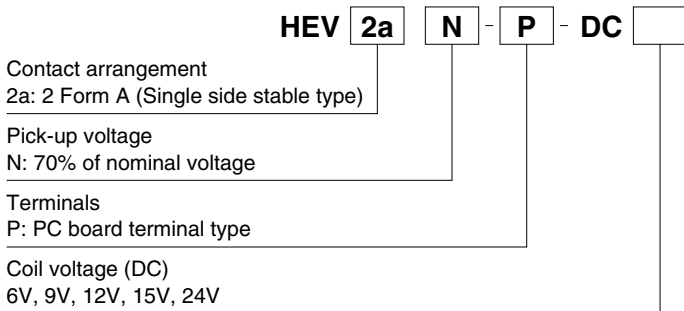
## TYPICAL APPLICATIONS

- Photovoltaic power generation systems
- Battery charge and discharge systems
- Inverter control, DC load control, etc.

- **Contact arrangement: 2 Form A**  
400 DC, 20 A per 1 Form A
- **Contributes to energy saving in devices thanks to reduced coil hold voltage**  
Coil hold voltage can be reduced down to 33% of the nominal coil voltage. This equals to operating power of approximately 210 mW.  
\*Coil hold voltage is the coil voltage after 100 ms following application of the nominal coil voltage.

• Protective construction: Flux-Resistant type

## ORDERING INFORMATION



## TYPES

Nominal coil voltage	Part No.
6V DC	HEV2aN-P-DC6V
9V DC	HEV2aN-P-DC9V
12V DC	HEV2aN-P-DC12V
15V DC	HEV2aN-P-DC15V
24V DC	HEV2aN-P-DC24V

Standard packing: Carton: 10 pcs.; Case: 50 pcs.

# HE-V

## RATING

### 1. Coil data

Nominal coil voltage	Pick-up voltage (at 20°C 68°F) (Initial)	Drop-out voltage (at 20°C 68°F) (Initial)	Nominal operating current [±10%] (at 20°C 68°F)	Coil resistance [±10%] (at 20°C 68°F)	Nominal operating power	Max. applied voltage (at 55°C 131°F)
6V DC	70%V or less of nominal voltage	5%V or more of nominal voltage	320mA	18.8Ω	1,920mW	110%V of nominal voltage
9V DC			213mA	42.2Ω		
12V DC			160mA	75.0Ω		
15V DC			128mA	117.0Ω		
24V DC			80mA	300.0Ω		

### 2. Specifications

Characteristics	Item	Specifications	
Contact	Arrangement	2 Form A	
	Contact material	AgNi type	
	Contact resistance (Initial)	Max. 100 mΩ (By voltage drop 6 V DC 1 A), Max. 3 mΩ (By voltage drop 6 V DC 20 A, Reference value)	
Rating	Contact rating (Resistive load)	20 A 800 VDC (at each 1 Form A contact connected in series), 20 A 400 VDC (at 1 Form A contact only)	
	Max. switching voltage	1,000 V DC	
	Max. switching current	20 A	
	Min. switching capacity (Reference value)*1	100 mA 5 V DC	
Electrical characteristics	Insulation resistance (Initial)	Min. 1,000MΩ (at 1,000V DC) Measurement at same location as "Breakdown voltage" section.	
	Short current (Initial)	Max. 300 A 1 ms (Reference value)	
	Breakdown voltage (Initial)	Between open contacts	2,000 Vrms for 1 min. (Detection current: 10 mA)
		Between contact sets	4,000 Vrms for 1 min. (Detection current: 10 mA)
		Between contact and coil	5,000 Vrms for 1 min. (Detection current: 10 mA)
	Surge breakdown voltage*2 (Between contact and coil) (Initial)	Min. 10,000 V	
	Coil temperature rise value	Max. 75°C 135°F (By resistive method, contact carrying current: 20A, 100%V of nominal coil voltage at 55°C 131°F), Max. 45°C 113°F (By resistive method, contact carrying current: 20A, 60%V of nominal coil voltage at 85°C 185°F)	
	Coil holding voltage*3	33 to 110%V (Contact carrying current: 20A, at 55°C 131°F), 33 to 60%V (Contact carrying current: 20A, at 85°C 185°F)	
Operate time (at 20°C 68°F)	Max. 30 ms (nominal coil voltage, without bounce)		
Release time (at 20°C 68°F)	Max. 10 ms (nominal coil voltage) (without diode)		
Mechanical characteristics	Shock resistance	Functional	Min. 98 m/s <sup>2</sup> (Half-wave pulse of sine wave: 11 ms; detection time: 10 μs)
		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 1.0 mm (Detection time: 10 μs)
		Destructive	10 to 55 Hz at double amplitude of 1.5 mm
Expected life	Mechanical life	Min. 10 <sup>6</sup> (at 180 cpm)	
Conditions	Conditions for operation, transport and storage*4	Ambient temperature: -40 to +55°C -40 to +131°F (When coil holding voltage is 33% to 110% of nominal coil voltage) -40 to +85°C -40 to +185°F (When applied coil hold voltage is 33% to 60% of nominal coil voltage) Humidity: 5 to 85% R.H. (Not freezing and condensing)	
	Max. operating speed	6 times/min. (at nominal switching capacity ON : OFF = 1s : 9s)	
Unit weight		Approx. 120 g 4.23 oz	

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. Coil holding voltage is the coil voltage after 100 ms following application of the nominal coil voltage.

\*4. The upper operation ambient temperature limit is the maximum temperature that can satisfy the coil temperature rise value. Refer to Usage, transport and storage conditions in NOTES.