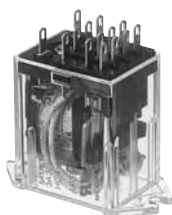


Plug-in type

PC board type



TM type

FEATURES

1. Long track record means reliable quality.
2. Can provide switching across the range from low to high level power loads (100 μ A to 10 A).
3. Full range of types
Standard types include 1 Form C, 2 Form C, 3 Form C, 4 Form C, 4-pole bifurcated (twin), plug-in type, PC board type, and TM type.
4. HC relay with LED indication type also available
5. UL, CSA approval is standard
Compliance also with Japanese Electrical Appliance and Material Control Law.

2. Office equipment, automatic vending machines, telecommunications equipment, disaster prevention equipment, copiers, measuring devices, medical equipment, amusement devices, etc.
3. All types of household appliance

About Cd-free contacts

We have introduced Cadmium free type products to reduce Environmental Hazardous Substances. (The suffix "F" should be added to the part number. The Suffix "F" is required only for 1 Form C, 2 Form C, 3 Form C contact type. The 4 Form C and 4 Form C bifurcated (twin) contact type is originally cadmium-free, the suffix "F" is not required.) Please replace parts containing Cadmium with Cadmium-free products and evaluate them with your actual application before use because the life of a relay depends on the contact material and load.

TYPICAL APPLICATIONS

Suitable for factory automation equipment and automotive devices

1. Control panels, power supply equipment, molding equipment, machine tools, welding equipment, agricultural equipment, etc.

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

ORDERING INFORMATION

HC - - -

Contact arrangement

- 1: 1 Form C
- 2: 2 Form C
- 3: 3 Form C
- 4: 4 Form C
- 4D: Bifurcated contact (twin)

Terminal arrangement

- H: Plug-in type
 HL: Plug-in with LED indication
 HP: PC board type
 HPL: PC board with LED indication
 HTM: TM type

Coil voltage

AC 6, 12, 24, 48, 100 (100/110), 120 (110/120), 200 (200/220), 240 (220/240) V
 DC 6, 12, 24, 48, 100 (100/110) V

Contact material

Contact arrangement	Contact material	Ag alloy (cadmium-free)	AgNi type
1 Form C		F	
2 Form C		F	
3 Form C		F	
4 Form C			Nil
Bifurcated contact (twin)			Nil

Notes: UL/CSA approved type is standard.

Please inquire about VDE (1 Form C, 2 Form C, and 4 Form C only) and TV-3 (1 Form C and 2 Form C only) approved products.

HC

TYPES

1) Plug-in type

Coil voltage	1 Form C	2 Form C	3 Form C	4 Form C	4 Form C (twin)
	Part No.	Part No.	Part No.	Part No.	Part No.
6V AC	HC1-H-AC6V-F	HC2-H-AC6V-F	HC3-H-AC6V-F	HC4-H-AC6V	HC4D-H-AC6V
12V AC	HC1-H-AC12V-F	HC2-H-AC12V-F	HC3-H-AC12V-F	HC4-H-AC12V	HC4D-H-AC12V
24V AC	HC1-H-AC24V-F	HC2-H-AC24V-F	HC3-H-AC24V-F	HC4-H-AC24V	HC4D-H-AC24V
48V AC	HC1-H-AC48V-F	HC2-H-AC48V-F	HC3-H-AC48V-F	HC4-H-AC48V	HC4D-H-AC48V
100/110V AC	HC1-H-AC100V-F	HC2-H-AC100V-F	HC3-H-AC100V-F	HC4-H-AC100V	HC4D-H-AC100V
110/120V AC	HC1-H-AC120V-F	HC2-H-AC120V-F	HC3-H-AC120V-F	HC4-H-AC120V	HC4D-H-AC120V
200/220V AC	HC1-H-AC200V-F	HC2-H-AC200V-F	HC3-H-AC200V-F	HC4-H-AC200V	HC4D-H-AC200V
220/240V AC	HC1-H-AC240V-F	HC2-H-AC240V-F	HC3-H-AC240V-F	HC4-H-AC240V	HC4D-H-AC240V
6V DC	HC1-H-DC6V-F	HC2-H-DC6V-F	HC3-H-DC6V-F	HC4-H-DC6V	HC4D-H-DC6V
12V DC	HC1-H-DC12V-F	HC2-H-DC12V-F	HC3-H-DC12V-F	HC4-H-DC12V	HC4D-H-DC12V
24V DC	HC1-H-DC24V-F	HC2-H-DC24V-F	HC3-H-DC24V-F	HC4-H-DC24V	HC4D-H-DC24V
48V DC	HC1-H-DC48V-F	HC2-H-DC48V-F	HC3-H-DC48V-F	HC4-H-DC48V	HC4D-H-DC48V
100/110V DC	HC1-H-DC100V-F	HC2-H-DC100V-F	HC3-H-DC100V-F	HC4-H-DC100V	HC4D-H-DC100V

Standard packing: Carton: 20 pcs.; Case: 200 pcs.

2) Plug-in type (with LED indication)

Coil voltage	1 Form C	2 Form C	3 Form C	4 Form C	4 Form C (twin)
	Part No.	Part No.	Part No.	Part No.	Part No.
6V AC	HC1-HL-AC6V-F	HC2-HL-AC6V-F	HC3-HL-AC6V-F	HC4-HL-AC6V	HC4D-HL-AC6V
12V AC	HC1-HL-AC12V-F	HC2-HL-AC12V-F	HC3-HL-AC12V-F	HC4-HL-AC12V	HC4D-HL-AC12V
24V AC	HC1-HL-AC24V-F	HC2-HL-AC24V-F	HC3-HL-AC24V-F	HC4-HL-AC24V	HC4D-HL-AC24V
100/110V AC	HC1-HL-AC100V-F	HC2-HL-AC100V-F	HC3-HL-AC100V-F	HC4-HL-AC100V	HC4D-HL-AC100V
110/120V AC	HC1-HL-AC120V-F	HC2-HL-AC120V-F	HC3-HL-AC120V-F	HC4-HL-AC120V	HC4D-HL-AC120V
200/220V AC	HC1-HL-AC200V-F	HC2-HL-AC200V-F	HC3-HL-AC200V-F	HC4-HL-AC200V	HC4D-HL-AC200V
220/240V AC	HC1-HL-AC240V-F	HC2-HL-AC240V-F	HC3-HL-AC240V-F	HC4-HL-AC240V	HC4D-HL-AC240V
6V DC	HC1-HL-DC6V-F	HC2-HL-DC6V-F	HC3-HL-DC6V-F	HC4-HL-DC6V	HC4D-HL-DC6V
12V DC	HC1-HL-DC12V-F	HC2-HL-DC12V-F	HC3-HL-DC12V-F	HC4-HL-DC12V	HC4D-HL-DC12V
24V DC	HC1-HL-DC24V-F	HC2-HL-DC24V-F	HC3-HL-DC24V-F	HC4-HL-DC24V	HC4D-HL-DC24V
48V DC	HC1-HL-DC48V-F	HC2-HL-DC48V-F	HC3-HL-DC48V-F	HC4-HL-DC48V	HC4D-HL-DC48V
100/110V DC	HC1-HL-DC100V-F	HC2-HL-DC100V-F	HC3-HL-DC100V-F	HC4-HL-DC100V	HC4D-HL-DC100V

Standard packing: Carton: 20 pcs.; Case: 200 pcs.

3) PC board type

Coil voltage	1 Form C	2 Form C	3 Form C	4 Form C	4 Form C (twin)
	Part No.	Part No.	Part No.	Part No.	Part No.
6V AC	HC1-HP-AC6V-F	HC2-HP-AC6V-F	HC3-HP-AC6V-F	HC4-HP-AC6V	HC4D-HP-AC6V
12V AC	HC1-HP-AC12V-F	HC2-HP-AC12V-F	HC3-HP-AC12V-F	HC4-HP-AC12V	HC4D-HP-AC12V
24V AC	HC1-HP-AC24V-F	HC2-HP-AC24V-F	HC3-HP-AC24V-F	HC4-HP-AC24V	HC4D-HP-AC24V
48V AC	HC1-HP-AC48V-F	HC2-HP-AC48V-F	HC3-HP-AC48V-F	HC4-HP-AC48V	HC4D-HP-AC48V
100/110V AC	HC1-HP-AC100V-F	HC2-HP-AC100V-F	HC3-HP-AC100V-F	HC4-HP-AC100V	HC4D-HP-AC100V
110/120V AC	HC1-HP-AC120V-F	HC2-HP-AC120V-F	HC3-HP-AC120V-F	HC4-HP-AC120V	HC4D-HP-AC120V
200/220V AC	HC1-HP-AC200V-F	HC2-HP-AC200V-F	HC3-HP-AC200V-F	HC4-HP-AC200V	HC4D-HP-AC200V
220/240V AC	HC1-HP-AC240V-F	HC2-HP-AC240V-F	HC3-HP-AC240V-F	HC4-HP-AC240V	HC4D-HP-AC240V
6V DC	HC1-HP-DC6V-F	HC2-HP-DC6V-F	HC3-HP-DC6V-F	HC4-HP-DC6V	HC4D-HP-DC6V
12V DC	HC1-HP-DC12V-F	HC2-HP-DC12V-F	HC3-HP-DC12V-F	HC4-HP-DC12V	HC4D-HP-DC12V
24V DC	HC1-HP-DC24V-F	HC2-HP-DC24V-F	HC3-HP-DC24V-F	HC4-HP-DC24V	HC4D-HP-DC24V
48V DC	HC1-HP-DC48				

4) PC board type (with LED indication)

Coil voltage	1 Form C	2 Form C	3 Form C	4 Form C	4 Form C (twin)
	Part No.	Part No.	Part No.	Part No.	Part No.
6V AC	HC1-HPL-AC6V-F	HC2-HPL-AC6V-F	HC3-HPL-AC6V-F	HC4-HPL-AC6V	HC4D-HPL-AC6V
12V AC	HC1-HPL-AC12V-F	HC2-HPL-AC12V-F	HC3-HPL-AC12V-F	HC4-HPL-AC12V	HC4D-HPL-AC12V
24V AC	HC1-HPL-AC24V-F	HC2-HPL-AC24V-F	HC3-HPL-AC24V-F	HC4-HPL-AC24V	HC4D-HPL-AC24V
100/110V AC	HC1-HPL-AC100V-F	HC2-HPL-AC100V-F	HC3-HPL-AC100V-F	HC4-HPL-AC100V	HC4D-HPL-AC100V
110/120V AC	HC1-HPL-AC120V-F	HC2-HPL-AC120V-F	HC3-HPL-AC120V-F	HC4-HPL-AC120V	HC4D-HPL-AC120V
200/220V AC	HC1-HPL-AC200V-F	HC2-HPL-AC200V-F	HC3-HPL-AC200V-F	HC4-HPL-AC200V	HC4D-HPL-AC200V
6V DC	HC1-HPL-DC6V-F	HC2-HPL-DC6V-F	HC3-HPL-DC6V-F	HC4-HPL-DC6V	HC4D-HPL-DC6V
12V DC	HC1-HPL-DC12V-F	HC2-HPL-DC12V-F	HC3-HPL-DC12V-F	HC4-HPL-DC12V	HC4D-HPL-DC12V
24V DC	HC1-HPL-DC24V-F	HC2-HPL-DC24V-F	HC3-HPL-DC24V-F	HC4-HPL-DC24V	HC4D-HPL-DC24V
48V DC	HC1-HPL-DC48V-F	HC2-HPL-DC48V-F	HC3-HPL-DC48V-F	HC4-HPL-DC48V	HC4D-HPL-DC48V
100/110V DC	HC1-HPL-DC100V-F	HC2-HPL-DC100V-F	HC3-HPL-DC100V-F	HC4-HPL-DC100V	HC4D-HPL-DC100V

Standard packing: Carton: 20 pcs.; Case: 200 pcs.

Note: Please add "31" before "F" in the part number when ordering the PC board type 0.9 mm width terminal (ex) HC1-HPL-AC6V-31-F.

5) TM type

Coil voltage	1 Form C	2 Form C	3 Form C	4 Form C	4 Form C (twin)
	Part No.	Part No.	Part No.	Part No.	Part No.
6V AC	HC1-HTM-AC6V-F	HC2-HTM-AC6V-F	HC3-HTM-AC6V-F	HC4-HTM-AC6V	HC4D-HTM-AC6V
12V AC	HC1-HTM-AC12V-F	HC2-HTM-AC12V-F	HC3-HTM-AC12V-F	HC4-HTM-AC12V	HC4D-HTM-AC12V
24V AC	HC1-HTM-AC24V-F	HC2-HTM-AC24V-F	HC3-HTM-AC24V-F	HC4-HTM-AC24V	HC4D-HTM-AC24V
48V AC	HC1-HTM-AC48V-F	HC2-HTM-AC48V-F	HC3-HTM-AC48V-F	HC4-HTM-AC48V	HC4D-HTM-AC48V
100/110V AC	HC1-HTM-AC100V-F	HC2-HTM-AC100V-F	HC3-HTM-AC100V-F	HC4-HTM-AC100V	HC4D-HTM-AC100V
110/120V AC	HC1-HTM-AC120V-F	HC2-HTM-AC120V-F	HC3-HTM-AC120V-F	HC4-HTM-AC120V	HC4D-HTM-AC120V
200/220V AC	HC1-HTM-AC200V-F	HC2-HTM-AC200V-F	HC3-HTM-AC200V-F	HC4-HTM-AC200V	HC4D-HTM-AC200V
6V DC	HC1-HTM-DC6V-F	HC2-HTM-DC6V-F	HC3-HTM-DC6V-F	HC4-HTM-DC6V	HC4D-HTM-DC6V
12V DC	HC1-HTM-DC12V-F	HC2-HTM-DC12V-F	HC3-HTM-DC12V-F	HC4-HTM-DC12V	HC4D-HTM-DC12V
24V DC	HC1-HTM-DC24V-F	HC2-HTM-DC24V-F	HC3-HTM-DC24V-F	HC4-HTM-DC24V	HC4D-HTM-DC24V
48V DC	HC1-HTM-DC48V-F	HC2-HTM-DC48V-F	HC3-HTM-DC48V-F	HC4-HTM-DC48V	HC4D-HTM-DC48V
100/110V DC	HC1-HTM-DC100V-F	HC2-HTM-DC100V-F	HC3-HTM-DC100V-F	HC4-HTM-DC100V	HC4D-HTM-DC100V

Standard packing: Carton: 20 pcs.; Case: 200 pcs.

RATING**1. Coil data****1) AC coils (50/60Hz)**

Type	Nominal coil voltage	Pick-up voltage (at 20°C 68°F)	Drop-out voltage (at 20°C 68°F)	Nominal coil current [±20%] (at 20°C 68°F)		Coil inductance		Nominal operating power		Max. allowable voltage (at 70°C 158°F)
				50Hz	60Hz	N.C. condition	N.O. condition	50Hz	60Hz	
Standard	6V AC	80%V or less of nominal voltage (Initial)	30%V or more of nominal voltage (Initial)	224mA	200mA	0.078H	0.074H	1.3VA	1.2VA	110%V of nominal voltage
	12V AC			111mA	100mA	0.312H	0.295H	1.3VA	1.2VA	
	24V AC			56mA	50mA	1.243H	1.181H	1.3VA	1.2VA	
	48V AC			28mA	25mA	4.974H	4.145H	1.3VA	1.2VA	
	100/110V AC			13.4/14.7mA	12/13.2mA	23.75H	20.63H	1.3VA	1.2VA	
	110/120V AC			12.2/13.5mA	10.9/11.9mA	27				

2. Specifications

Characteristics		Item		Specifications		
Contact	Arrangement	1 Form C	2 Form C	3 Form C	4 Form C	4 Form C (twin)
	Contact pressure	Approx. 0.294N{30gf}	Approx. 0.147N{15gf}	Approx. 0.147N{15gf}	Approx. 0.098N{10gf}	Approx. 0.127N{13gf}
	Initial contact resistance, max	Max. 30 mΩ (By voltage drop 6 V DC 1A)				
	Contact material	Ag alloy (cd free) + Au flash			AgNi type + Au clad	
Rating	Nominal switching capacity (resistive load)	10A 250V AC	7A 250V AC	7A 250V AC	5A 250V AC	3A 250V AC
	Max. switching power (resistive load)	2,500VA	1,750VA	1,750VA	1,250VA	750VA
	Max. switching voltage	250VAC				
	Max. switching current	10A	7A	7A	5A	3A
	Nominal operating power	AC (50Hz): 1.3VA, AC (60Hz): 1.2VA, DC: 0.9 to 1.1W				
	Min. switching capacity (Reference value)*1	1mA 1V DC				100μA 1V 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	700 Vrms for 1min. (Detection current: 10mA.)			
		Between contact sets	700 Vrms for 1min. (Detection current: 10mA.)			
		Between contact and coil	2,000 Vrms for 1min. (Detection current: 10mA.)			
	Temperature rise (at 70°C 158°F)		Max. 80°C (By resistive method, nominal voltage)			
	Operate time (at 20°C 68°F)*2		Max. 20ms (Nominal voltage applied to the coil, excluding contact bounce time.)			
	Release time (at 20°C 68°F)*2		Max. 20ms (Nominal voltage applied to the coil, excluding contact bounce time.) (without diode)			
Mechanical characteristics	Shock resistance	Functional	Min. 196 m/s ² (Half-wave pulse of sine wave: 11 ms; detection time: 10μs.)			
		Destructive	Min. 980 m/s ² (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 2 mm			
Expected life	Mechanical		Min. 5×10 ⁷ : AC coil type (at 180 cpm); Min. 10 ⁸ : DC coil type (at 180 cpm)			
	Electrical (resistive load)		Min. 2×10 ⁵ (at 20 cpm)	Min. 2×10 ⁵ (at 20 cpm)	Min. 10 ⁵ (at 20 cpm)	Min. 2×10 ⁵ (at 20 cpm)
Conditions	Conditions for operation, transport and storage*3		Ambient temperature: -50°C to +70°C -58°F to +158°F (without LED); -50°C to +60°C -58°F to +140°F (with LED) Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)			
	Max. Operating speed		20 cpm (at max. rating)			
Unit weight			Approx. 30g 1.06 oz			

Notes: In accordance with the Electrical Appliance and Material Safety Law, you cannot exceed a voltage of 150V AC when using the 4 Form C type. For more information, please inquire.

*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 For the AC coil types, the operate/release time will differ depending on the phase.

*3 The upper operation ambient temperature limit is the maximum temperature that can satisfy the coil temperature rise value.
Refer to 6. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT.

3. Switching capacity and expected life

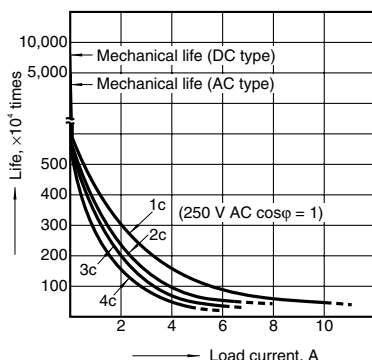
1) Electrical (at 20 cpm)

Load	AC				DC		Expected life
	Resistive (cos φ = 1)		Inductive (cos φ ≒ 0.4)		Resistive	Inductive	
Voltage	125V AC	250V AC	125V AC	250V AC	30V DC	30V DC	
1 Form C	10A	10A	5A	3A	—	—	Min. 2×10 ⁵
	7A	7A	3A	2.5A	3A	1A	Min. 5×10 ⁵
	5A	5A	2A	1.5A	—		

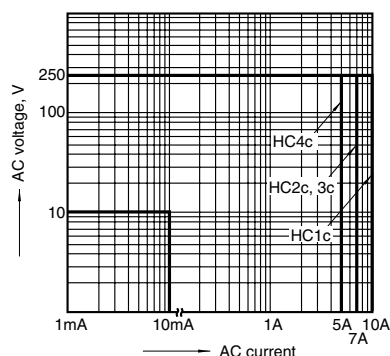
REFERENCE DATA

1. Life curve

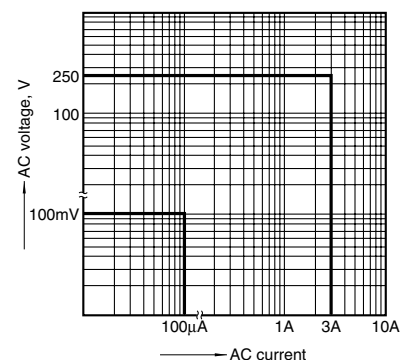
Load: 250 V AC resistive load



2.-(1) Switching capacity range (single contact type)



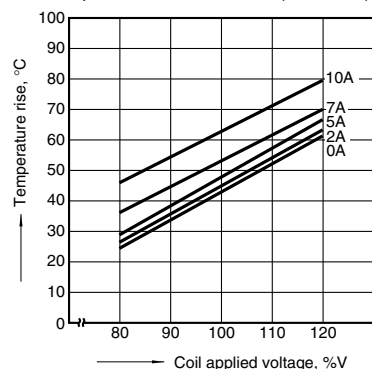
2.-(2) Switching capacity range (4-pole bifurcated (twin))



3.-(1) Coil temperature rise (1 Form C, AC type)

Measured portion: Inside the coil

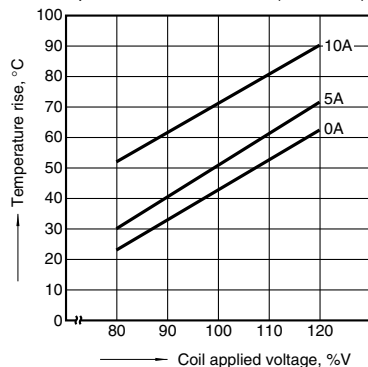
Ambient temperature: 25°C 77°F (See note.)



3.-(2) Coil temperature rise (2 Form C, AC type)

Measured portion: Inside the coil

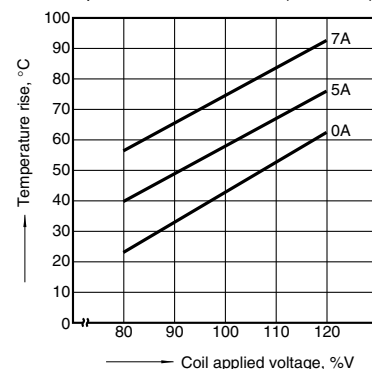
Ambient temperature: 30°C 86°F (See note.)



3.-(3) Coil temperature rise (3 Form C, AC type)

Measured portion: Inside the coil

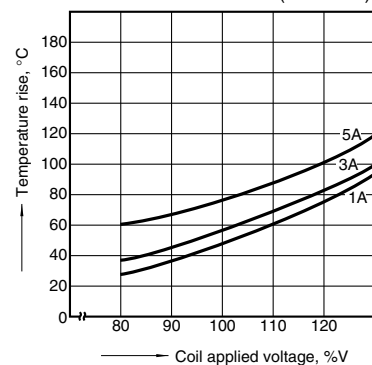
Ambient temperature: 18°C 64°F (See note.)



3.-(4) Coil temperature rise (4 Form C, AC type)

Measured portion: Inside the coil

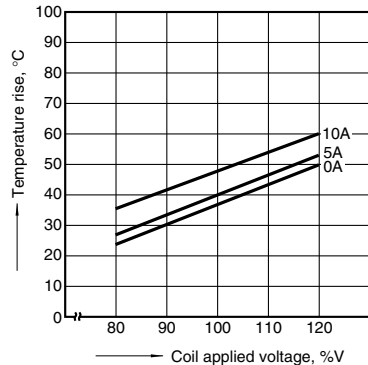
Ambient temperature: 15 to 21°C 59 to 70°F (See note.)



3.-(5) Coil temperature rise (1 Form C, DC type)

Measured portion: Inside the coil

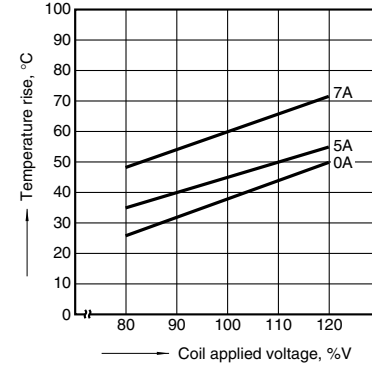
Ambient temperature: 29°C 84°F



3.-(6) Coil temperature rise (2 Form C, DC type)

Measured portion: Inside the coil

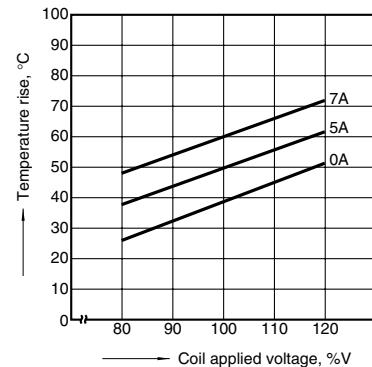
Ambient temperature: 29°C 84°F



3.-(7) Coil temperature rise (3 Form C, DC type)

Measured portion: Inside the coil

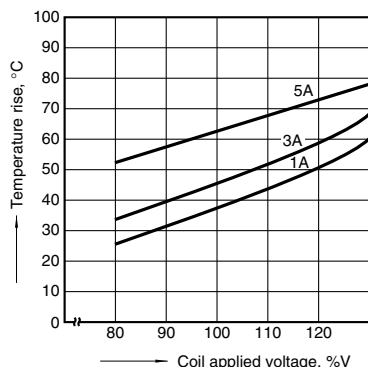
Ambient temperature: 29°C 84°F



3.-(8) Coil temperature rise (4 Form C, DC type)

Measured portion: Inside the coil

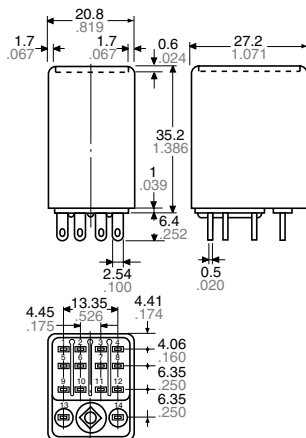
Ambient temperature: 17 to 18°C 62 to 64°F



Note: Coil temperature rise

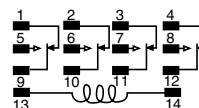
When the nominal voltage is applied to AC 120 or 240 V coil types respectively, the figures of coil temperature rise increase by approx. 10 degrees to the ones shown on each graph.

4 Form C and 4-pole bifurcated (twin) types
External dimensions

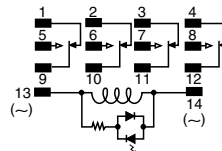


General tolerance: $\pm 0.3 \pm .012$

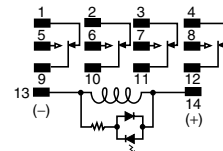
Schematic (Bottom view)
Standard type



LED AC type

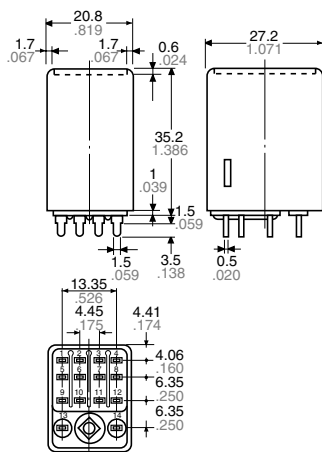


LED DC type



2. PC board type

4 Form C type External dimensions

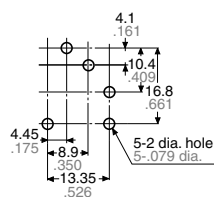


General tolerance: $\pm 0.3 \pm .012$

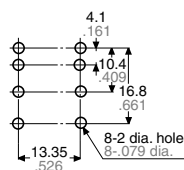
The diagrams show the external dimensions of the 4 Form C and 4-pole bifurcated (twin) types. For 1 Form C, 2 Form C, and 3 Form C, see diagrams at plug-in types (only the terminals are different). Types with 0.9 mm terminal width are also available.

PC board pattern

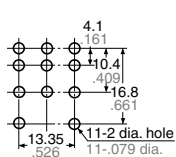
1 Form C



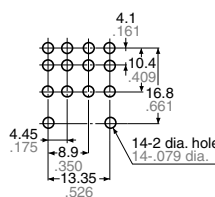
2 Form C



3 Form C



4 Form C

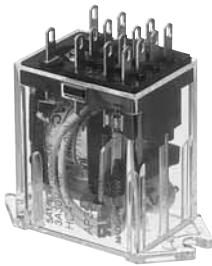


Tolerance: $\pm 0.1 \pm .004$

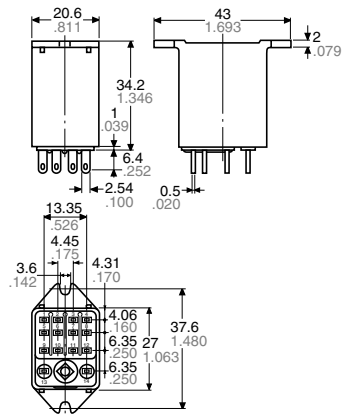
Schematic

Same schematic as plug-in type HC relay

3. TM type



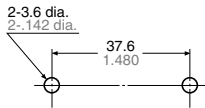
4 Form C type External dimensions



The diagrams show the external dimensions of the 4 Form C and 4-pole bifurcated (twin) types. For 1 Form C, 2 Form C, and 3 Form C, see diagrams at plug-in types (only the terminals are different).

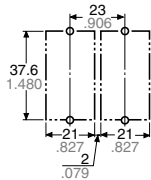
General tolerance: $\pm 0.3 \pm .012$

Chassis (Panel) cutout



Tolerance: $\pm 0.1 \pm .004$

Chassis (Panel) cutout in tandem mounting



Schematic

Same schematic as plug-in type HC relay
Be aware that there is no LED indicator with CR circuit and built-in diode types.

- Notes: 1. In mounting, use M3 screws and M3 washers.
2. When mounting TM types, use washers to prevent damage or distortion to the polycarbonate cover.
3. When tightening fixing screws, the optimum torque range should be 0.294 to 0.49 N·m, (3 to 5 kgf·cm).
Moreover, use washers to prevent loosening.

For Cautions for Use, see Relay Technical Information.