



Discontinued  
Last time buy: August 31, 2012



**Panasonic**  
ideas for life

Relay for control panel of  
20A (2c/3c/4c)

**HG RELAYS**



RoHS compliant

## FEATURES

### 1. High-capacity and long life

The electrical life of this high capacity is 20A 100,000 operations (250 V AC). It can be used for 1.5kW (3-phase 200 V) motor control.

### 2. High breakdown voltage

Both between contacts, and between contacts and coil, high breakdown voltage is 2,000 V for 1 minute.

### 3. Easy mounting and wiring

The terminal arrangement is apparent at a glance and wiring is easy. Moreover, #250 series tab terminals can be used.

### 4. Socket and terminal sockets available

Lineup includes DIN terminal sockets that enable the use of DIN rails. The pole numbers of the terminal sockets are interchangeable and different terminal sockets can be used in combination.

### 3. Machine tools

Control of positioning and directional change in turning machines, lathes, borers, etc.

### 4. Food processing packing machines

Automatic control of packing equipment for milk and seafood, bottling, canning, and packaging

### 5. Office equipment

Control of copiers, time recorders, etc.

### 6. Coin operate machines

Control of food, cigarette, and other vending machines

### 7. Measuring devices and equipment

For repeating installation of control signals and in power amplifiers

### 8. Generators, transformers and power receiving equipment.

Functional parts in protective equipment, functional assistance in automatic adjustment equipment, telemeters and other remote monitoring equipment

### 9. Control of conveyance equipment

Control panels for elevators, escalators, and other conveyance equipment, control of all kinds industrial transport equipment such as conveyors.

### 10. Amusement equipment

Control of equipment in amusement parks, etc., control of bowling alley equipment, control of fountains in public parks

## TYPICAL APPLICATIONS

1. HP relays enjoy wide use in various applications, particularly in automation controls and remote controls.

### 2. Industrial machinery

For controlling positioning, pressure, and temperature in molding equipment, boilers, pumps, charging pressure equipment, measuring and evaluation equipment, textile machines, etc.

## ORDERING INFORMATION

HG [ ] - [ ] - F

Contact arrangement

2: 2 Form C

3: 3 Form C

4: 4 Form C

Nominal coil voltage

AC 24, 48, 100, 115, 200, 220, 240 V

DC 12, 24, 48, 100, 110, 200 V

Contact material

F: AgSnO<sub>2</sub> type

Note: Certified by UL and CSA



**TYPES**

| Nominal coil voltage | 2 Form C     | 3 Form C     | 4 Form C     |
|----------------------|--------------|--------------|--------------|
|                      | Part No.     | Part No.     | Part No.     |
| 24V AC               | HG2-AC24V-F  | HG3-AC24V-F  | HG4-AC24V-F  |
| 48V AC               | HG2-AC48V-F  | HG3-AC48V-F  | HG4-AC48V-F  |
| 100V AC              | HG2-AC100V-F | HG3-AC100V-F | HG4-AC100V-F |
| 115V AC              | HG2-AC115V-F | HG3-AC115V-F | HG4-AC115V-F |
| 200V AC              | HG2-AC200V-F | HG3-AC200V-F | HG4-AC200V-F |
| 220V AC              | HG2-AC220V-F | HG3-AC220V-F | HG4-AC220V-F |
| 240V AC              | HG2-AC240V-F | HG3-AC240V-F | HG4-AC240V-F |
| 12V DC               | HG2-DC12V-F  | HG3-DC12V-F  | HG4-DC12V-F  |
| 24V DC               | HG2-DC24V-F  | HG3-DC24V-F  | HG4-DC24V-F  |
| 48V DC               | HG2-DC48V-F  | HG3-DC48V-F  | HG4-DC48V-F  |
| 100V DC              | HG2-DC100V-F | HG3-DC100V-F | HG4-DC100V-F |
| 110V DC              | HG2-DC110V-F | HG3-DC110V-F | HG4-DC110V-F |
| 200V DC              | HG2-DC200V-F | HG3-DC200V-F | HG4-DC200V-F |

Standard packing (2 Form C): Carton: 20 pcs.; Case: 100 pcs.  
 Standard packing (3 Form C, 4 Form C): Carton: 10 pcs.; Case: 50 pcs.  
 Note: Terminal sockets and sockets are not included. Please order these separately.

\* For sockets and terminal sockets, see page 126.

**RATING**

**1. Coil data**

1) AC coils

| Contact arrangement | Nominal coil voltage | Pick-up voltage (at 20°C 68°F)            | Drop-out voltage (at 20°C 68°F)           | Nominal operating current [±20%] (at 20°C 68°F) |        | Coil inductance |        | Nominal operating power |       | Max. applied voltage (at 40°C 104°F) |
|---------------------|----------------------|---|---|---|--------|-----------------|--------|-------------------------|-------|--------------------------------------|
|                     |                      |   |   | 50Hz  | 60Hz   | 50Hz            | 60Hz   | 50Hz                    | 60Hz  |                                      |
| 2 Form C            | 24V AC               | 80%V or less of nominal voltage (Initial) | 30%V or more of nominal voltage (Initial) | 167mA   | 150mA  | 0.441H          | 0.416H | 4.2VA                   | 3.6VA | 110%V of nominal voltage             |
|                     | 48V AC               |   |   | 86mA  | 75mA   | 1.717H          | 1.660H |                         |       |                                      |
|                     | 100V AC              |   |   | 42mA  | 36mA   | 7.457H          | 7.216H |                         |       |                                      |
|                     | 115V AC              |   |   | 36mA  | 31.3mA | 9.868H          | 9.531H |                         |       |                                      |
|                     | 200V AC              |   |   | 21mA  | 18mA   | 30.39H          | 29.00H |                         |       |                                      |
|                     | 220V AC              |   |   | 19mA  | 16.4mA | 35.99H          | 34.82H |                         |       |                                      |
| 3 Form C            | 24V AC               | 80%V or less of nominal voltage (Initial) | 30%V or more of nominal voltage (Initial) | 250mA   | 216mA  | 0.299H          | 0.290H | 6.0VA                   | 5.2VA | 110%V of nominal voltage             |
|                     | 48V AC               |   |   | 125mA   | 108mA  | 1.195H          | 1.163H |                         |       |                                      |
|                     | 100V AC              |   |   | 61mA  | 52mA   | 5.174H          | 5.039H |                         |       |                                      |
|                     | 115V AC              |   |   | 52.4mA  | 45.2mA | 6.844H          | 6.648H |                         |       |                                      |
|                     | 200V AC              |   |   | 30mA  | 26mA   | 20.71H          | 20.14H |                         |       |                                      |
|                     | 220V AC              |   |   | 27.3mA  | 23.6mA | 25.00H          | 24.27H |                         |       |                                      |
| 4 Form C            | 24V AC               | 80%V or less of nominal voltage (Initial) | 30%V or more of nominal voltage (Initial) | 367mA   | 316mA  | 0.204H          | 0.199H | 8.8VA                   | 7.6VA | 110%V of nominal voltage             |
|                     | 48V AC               |   |   | 184mA   | 158mA  | 0.817H          | 0.795H |                         |       |                                      |
|                     | 100V AC              |   |   | 88mA  | 76mA   | 3.540H          | 3.444H |                         |       |                                      |
|                     | 115V AC              |   |   | 76.8mA  | 66.1mA | 4.685H          | 4.557H |                         |       |                                      |
|                     | 200V AC              |   |   | 44mA  | 38mA   | 14.16H          | 13.79H |                         |       |                                      |
|                     | 220V AC              |   |   | 39mA  | 34mA   | 17.48H          | 16.89H |                         |       |                                      |
| 240V AC             | 36.6mA               | 31.6mA                                    | 20.48H                                    | 19.87H  |        |                 |        |                         |       |                                      |



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2) DC coils

| Contact arrangement | Nominal coil voltage | Pick-up voltage (at 20°C 68°F)            | Drop-out voltage (at 20°C 68°F)           | Nominal operating current [ $\pm 10\%$ ] (at 20°C 68°F) | Coil resistance [ $\pm 10\%$ ] (at 20°C 68°F) | Nominal operating power | Max. applied voltage (at 40°C 104°F) |
|---------------------|----------------------|---|---|---|---|-------------------------|--------------------------------------|
| 2 Form C            | 12V DC               | 80%V or less of nominal voltage (Initial) | 10%V or more of nominal voltage (Initial) | 119.6mA   | 100 $\Omega$                                  | 1.4W                    | 110%V of nominal voltage             |
|                     | 24V DC               |   |   | 57.6mA  | 416 $\Omega$                                  | 1.4W                    |                                      |
|                     | 48V DC               |   |   | 30.3mA  | 1,585 $\Omega$                                | 1.5W                    |                                      |
|                     | 100V DC              |   |   | 14.4mA  | 6,950 $\Omega$                                | 1.4W                    |                                      |
|                     | 110V DC              |   |   | 14.4mA  | 7,650 $\Omega$                                | 1.6W                    |                                      |
|                     | 200V DC              |   |   | 7.2mA   | 27,800 $\Omega$                               | 1.4W                    |                                      |
| 3 Form C            | 12V DC               | 80%V or less of nominal voltage (Initial) | 10%V or more of nominal voltage (Initial) | 134mA   | 89.5 $\Omega$                                 | 1.6W                    | 110%V of nominal voltage             |
|                     | 24V DC               |   |   | 66mA  | 364 $\Omega$                                  | 1.6W                    |                                      |
|                     | 48V DC               |   |   | 33.1mA  | 1,450 $\Omega$                                | 1.6W                    |                                      |
|                     | 100V DC              |   |   | 16.5mA  | 6,060 $\Omega$                                | 1.7W                    |                                      |
|                     | 110V DC              |   |   | 16.5mA  | 6,670 $\Omega$                                | 1.8W                    |                                      |
|                     | 200V DC              |   |   | 8.4mA   | 23,800 $\Omega$                               | 1.7W                    |                                      |
| 4 Form C            | 12V DC               | 80%V or less of nominal voltage (Initial) | 10%V or more of nominal voltage (Initial) | 168mA   | 71.4 $\Omega$                                 | 2.0W                    | 110%V of nominal voltage             |
|                     | 24V DC               |   |   | 81.2mA  | 296 $\Omega$                                  | 1.9W                    |                                      |
|                     | 48V DC               |   |   | 45.7mA  | 1,050 $\Omega$                                | 2.2W                    |                                      |
|                     | 100V DC              |   |   | 20.3mA  | 4,930 $\Omega$                                | 2.0W                    |                                      |
|                     | 110V DC              |   |   | 20.3mA  | 5,420 $\Omega$                                | 2.2W                    |                                      |
|                     | 200V DC              |   |   | 12.9mA  | 15,500 $\Omega$                               | 2.6W                    |                                      |

- Notes: 1. The nominal current area is  $\pm 15\%$  (60Hz) [AC coils],  $\pm 10\%$  (20°C) [DC coils]  
2. The coil resistance for DC operation is the value measured when the coil temperature is 20°C 68°F. Compensate  $\pm 0.4\%$  for every  $\pm 1^\circ\text{C}$  change in temperature.  
3. The relay operates in a range of 80% to 110% V of the nominal voltage, but ideally, in consideration of temporary voltage fluctuations, it should be operated at the nominal voltage. In particular, for AC operation, if the impressed voltage drops to 80% V or more below the nominal voltage, humming will occur and a large current will flow leading possibly to coil burnout.  
4. As a general rule, only a pure DC voltage should be used for the coil drive. However, a DC power supply that contains ripples has characteristics that differ from pure DC. Therefore, please verify characteristics (operate voltage, release voltage, humming) using the actual circuit that will be used.

2. Specifications

| Characteristics            | Item  | Specifications  |  |
|----------------------------|---|---|--|
| Contact                    | Contact resistance (Initial)  | Max. 15 m $\Omega$ (By voltage drop 6 V DC 1A)  |  |
|                            | Contact material  | AgSnO <sub>2</sub> type   |  |
| Rating                     | Nominal switching capacity  | 20A 250V AC (resistive load)  |  |
|                            | Min. switching capacity (Reference value)*1   | 100mA 5V DC   |  |
| Electrical characteristics | Insulation resistance (Initial)   | Min. 100M $\Omega$ (at 500V DC) Measurement at same location as "Breakdown voltage" section.                                      |  |
|                            | Breakdown voltage (Initial)   | Between open contacts   | 2,000 Vrms for 1min (Detection current: 10mA)  |
|                            |   | Between contact sets  | 2,000 Vrms for 1min (Detection current: 10mA)  |
|                            |   | Between contact and coil  | 2,000 Vrms for 1min (Detection current: 10mA)  |
|                            | Operate time*2  | Max. 30ms (2 Form C), Max.40ms (3 Form C, 4 Form C)<br>(Nominal coil voltage applied to the coil, excluding contact bounce time.) |  |
| Release time*2             | Max. 30ms (2 Form C), Max.40ms (3 Form C, 4 Form C)<br>(Nominal coil voltage applied to the coil, excluding contact bounce time.) (without diode) |   |  |
| Mechanical characteristics | Shock resistance  | Functional  | Min. 98 m/s <sup>2</sup> (Except for contact operating direction)<br>(Half-wave pulse of sine wave: 11 ms; detection time: 10 $\mu$ s) |
|                            |   | 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: 10 $\mu$ s)   |
|                            |   | Destructive   | 10 to 55 Hz at double amplitude of 2 mm  |
| Expected life              | Mechanical  | AC coil<br>Min. 10 <sup>7</sup> (at 180 times/min.)<br>DC coil<br>Min. 10 <sup>6</sup> (at 180 times/min.)                        |  |
|                            | Electrical  | 20A 250V AC resistive load (cos $\phi$ =1), Min. 10 <sup>5</sup>  |  |
| Conditions                 | Conditions for operation, transport and storage*3   | Ambient temperature: -50°C to +40°C -58°F to +104°F<br>Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)   |  |
|                            | Max. Operating speed  | 20 times/min. (at max. rating)  |  |
| Unit weight                |   | 2 Form C: approx. 130g 4.59oz, 3 Form C: approx. 185g 6.53oz, 4 Form C: approx. 240g 8.47oz                                       |  |

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.

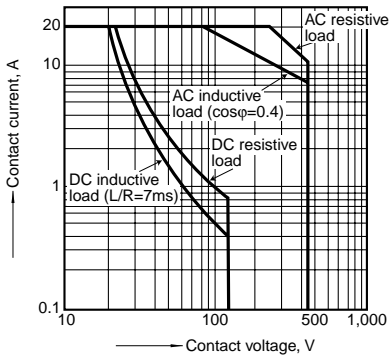
\*2. For the AC coil types, the operate/release time will differ depending on the phase.

\*3. The upper limit of the ambient temperature is the maximum temperature that can satisfy the coil temperature rise value. Refer to Usage, transport and storage conditions in NOTES.

HG

**REFERENCE DATA**

1. Switching capacity range



**DIMENSIONS (mm inch)**

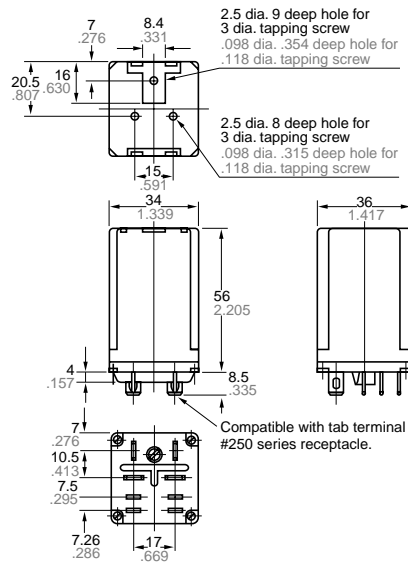
The CAD data of the products with a **CAD Data** mark can be downloaded from: <http://industrial.panasonic.com/ac/e>

2 Form C

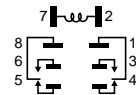
**CAD Data**



External dimensions



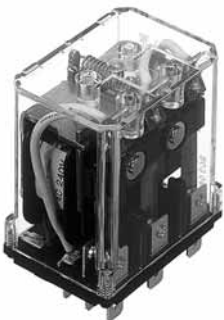
Schematic (Bottom view)



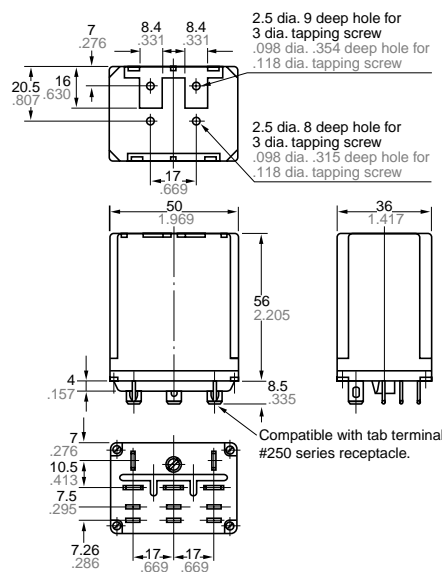
General tolerance:  $\pm 0.5 \pm .020$

3 Form C

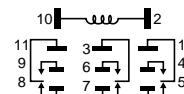
**CAD Data**



External dimensions



Schematic (Bottom view)



General tolerance:  $\pm 0.5 \pm .020$



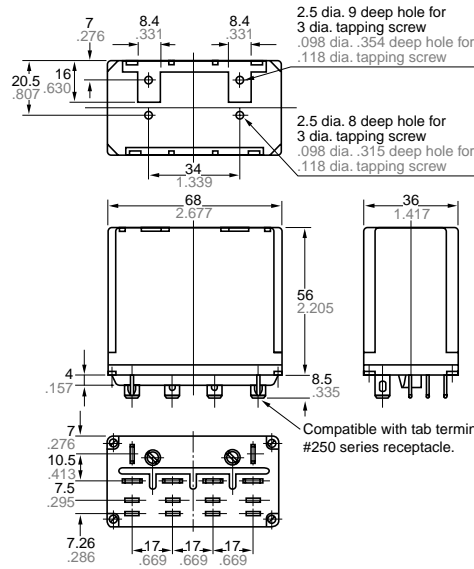
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**4 Form C**

**CAD Data**

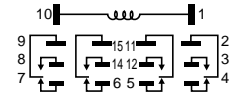


**External dimensions**



General tolerance:  $\pm 0.5 \pm .020$

**Schematic (Bottom view)**



**SAFETY STANDARDS**

|              | UL/C-UL (Recognized) |   | CSA (Certified) |  |
|--------------|----------------------|---|-----------------|--|
|              | File No.             | Contact rating                                      | File No.        | Contact rating   |
| Single phase | E43028               | 3/4HP 125V AC, 2HP 250V AC                          | LR26550 etc.    | 3/4HP 125V AC, 1HP 250V AC   |
| Three phase  | E43028               | 2HP 125V AC, 3HP 250V AC<br>20A 250V AC (cosφ=0.75) | LR26550 etc.    | 2HP 125V AC, 1HP 250V AC<br>15A 125V AC (cosφ=0.75), 10A 250V AC (cosφ=0.75) |

**For Cautions for Use.**

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