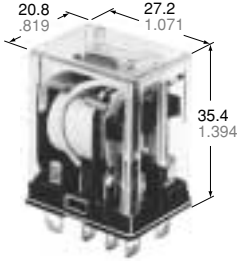


**Panasonic**  
ideas for life

**15A (1C), 10 A (2C)  
SPACE SAVING  
POWER RELAY**

**HL RELAYS**



mm inch

## FEATURES

- **High switching capacity in a compact size**  
1 Form C (15 A 125 V AC), 2 Form C (10 A 250 V AC)
- **Rugged construction for tough applications**
- **Long life**  
Mechanical: Min.  $10^8$  operations (DC),  
Min.  $5 \times 10^7$  operations (AC)  
Electrical: Min.  $5 \times 10^5$  operations

## SPECIFICATIONS

### Contacts

|  |                            |                                   |                          |
|--|----------------------------|-----------------------------------|--------------------------|
| Arrangement  |                            | 1 Form C                          | 2 Form C                 |
| Initial contact resistance, max.<br>(By voltage drop 6 V DC 1 A) |                            | 50 mΩ                             |                          |
| Contact material   |                            | Silver alloy                      |                          |
| Rating<br>(resistive)  | Nominal switching capacity | 15 A 125 V AC,<br>10 A 250 V AC   | 10 A 250 V AC            |
|  | Max. switching power       | AC: 2,500 VA<br>DC: 90 W          | AC: 2,500 VA<br>DC: 90 W |
|  | Max. switching voltage     | 250 V AC<br>30 V DC               | 250 V AC<br>30 V DC      |
|  | Max. switching current     | 15 A                              | 10 A                     |
|  | Min. switching capacity#1  | 100 mA, 5 V DC                    |                          |
| Expected life  | Mechanical (at 180 cpm)    | $5 \times 10^7$ (AC), $10^6$ (DC) |                          |
|  | Electrical<br>(resistive)  | 15 A 125 V AC                     | $5 \times 10^5$          |
|  |                            | 10 A 250 V AC                     | $5 \times 10^5$          |
|  | 3 A 30 V DC                | $5 \times 10^5$                   | $5 \times 10^5$          |

#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.

### Remarks

- \* Specifications will vary with foreign standards certification ratings.
- \*1 Measurement at same location as "Initial breakdown voltage" section
- \*2 Detection current: 10 mA
- \*3 Excluding contact bounce time
- \*4 Half-wave pulse of sine wave: 11ms; detection time: 10μs
- \*5 Half-wave pulse of sine wave: 6ms
- \*6 Detection time: 10μs
- \*7 Refer to 6. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT

### Characteristics (at 25°C 77°F, 50% Relative humidity)

|  |  |  |
|--|--|--|
| Max. operating speed   | 20 cpm                                       |  |
| Initial insulation resistance*1  | Min. 100 MΩ (at 500 V DC)                    |  |
| Initial breakdown voltage*2  | Between contact sets                         | 1,500 Vrms for 1 min.                      |
|  | Between open contacts                        | 1,000 Vrms for 1 min.                      |
|  | Between contacts and coil                    | 2,000 Vrms for 1 min.                      |
| Operate time (at nominal voltage)  | Max. 25 ms (DC type)<br>Max. 25 ms (AC type) |  |
| Release time*3 (without diode)<br>(at nominal voltage)   | Max. 25 ms (DC type)<br>Max. 25 ms (AC type) |  |
| Temperature rise, max.<br>(at nominal voltage)   | Max. 80°C                                    |  |
| Shock resistance   | Functional*4                                 | Min. 196 m/s <sup>2</sup> {20 G}           |
|  | Destructive*5                                | Min. 980 m/s <sup>2</sup> {100 G}          |
| Vibration resistance   | Functional*6                                 | 10 to 55 Hz<br>at double amplitude of 1 mm |
|  | Destructive                                  | 10 to 55 Hz<br>at double amplitude of 2 mm |
| Conditions for operation,<br>transport and storage*7<br>(Not freezing and<br>condensing at low<br>temperature) | Ambient temperature                          | -50°C to +70°C<br>-58°F to +158°F          |
|  | Humidity                                     | 5 to 85% R.H.                              |
| Unit weight  | Approx. 35 g 1.25 oz                         |  |

## TYPICAL APPLICATIONS

Power station control equipment,  
refrigerators, building control equipment,  
office machines, and medical equipment.

## ORDERING INFORMATION

Ex. HL 2 — H — AC240V

| Contact arrangement        | Terminal arrangement  | Coil voltage  |
|----------------------------|---|---|
| 1: 1 Form C<br>2: 2 Form C | H: Plug-in<br>HP: PC board<br>HTM: Top mounting<br>L: Light emitting diode wired, plug-in<br>PL: Light emitting diode wired, PC board | AC 6, 12, 24, 48,<br>120, 240 V<br>DC 6, 12, 24, 48,<br>110 V |

Note: Standard packing Carton: 20 pcs., Case: 200 pcs.  
UL/CSA approved type is standard.

# COIL DATA (at 20 °C 68°F)

## DC coils

| Coil voltage, V DC | Pick-up voltage, V DC (max.) | Drop-out voltage, V DC (min.) | Max. allowable voltage, V DC | Coil resistance, Ω (±10%) | Nominal coil current, mA | Operating power, W |         |
|--------------------|------------------------------|-------------------------------|------------------------------|---------------------------|--------------------------|--------------------|---------|
|                    |                              |                               |                              |                           |                          | Nominal            | Minimum |
| 6                  | 4.8                          | 0.6                           | 6.6                          | 40                        | 150                      | 0.90               | 0.58    |
| 12                 | 9.6                          | 1.2                           | 13.2                         | 160                       | 75                       |                    |         |
| 24                 | 19.2                         | 2.4                           | 26.4                         | 650                       | 37                       |                    |         |
| 48                 | 38.4                         | 4.8                           | 52.8                         | 2,600                     | 18.5                     |                    |         |
| 110                | 88.0                         | 11.0                          | 121.0                        | 10,000                    | 10                       | 1.0                | 0.64    |

## AC coils at 60 Hz

| Coil voltage, V DC | Pick-up voltage, V AC (max.) | Drop-out voltage, V AC (min.) | Max. allowable voltage, V AC | Nominal coil current, mA | Operating power, VA |         |
|--------------------|------------------------------|-------------------------------|------------------------------|--------------------------|---------------------|---------|
|                    |                              |                               |                              |                          | Nominal             | Minimum |
| 6                  | 4.8                          | 1.8                           | 6.6                          | 200                      | 1.20                | 0.77    |
| 12                 | 9.6                          | 3.6                           | 13.2                         | 100                      |                     |         |
| 24                 | 19.2                         | 7.2                           | 26.4                         | 50                       |                     |         |
| 48                 | 38.4                         | 14.4                          | 52.8                         | 25                       |                     |         |
| 110/120            | 88                           | 36                            | 132                          | 10.9/11.9                |                     |         |
| 220/240            | 176                          | 72                            | 264                          | 6.0/6.5                  |                     |         |

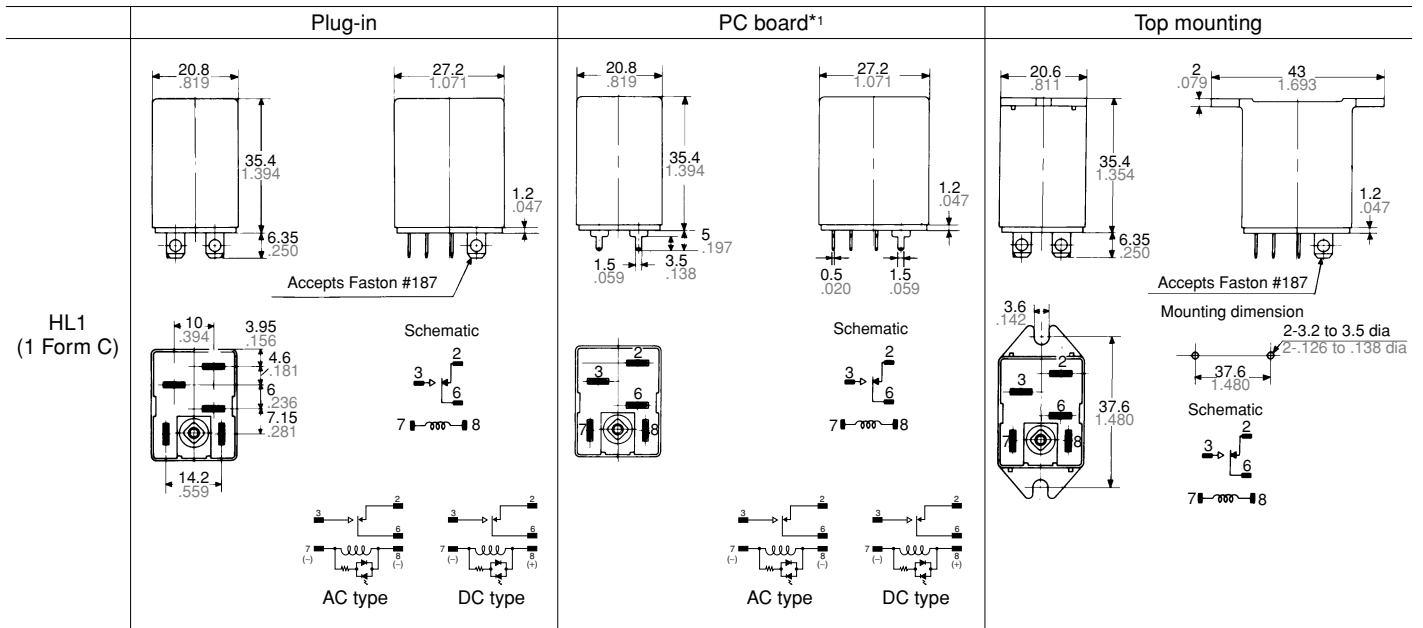
**Notes:**

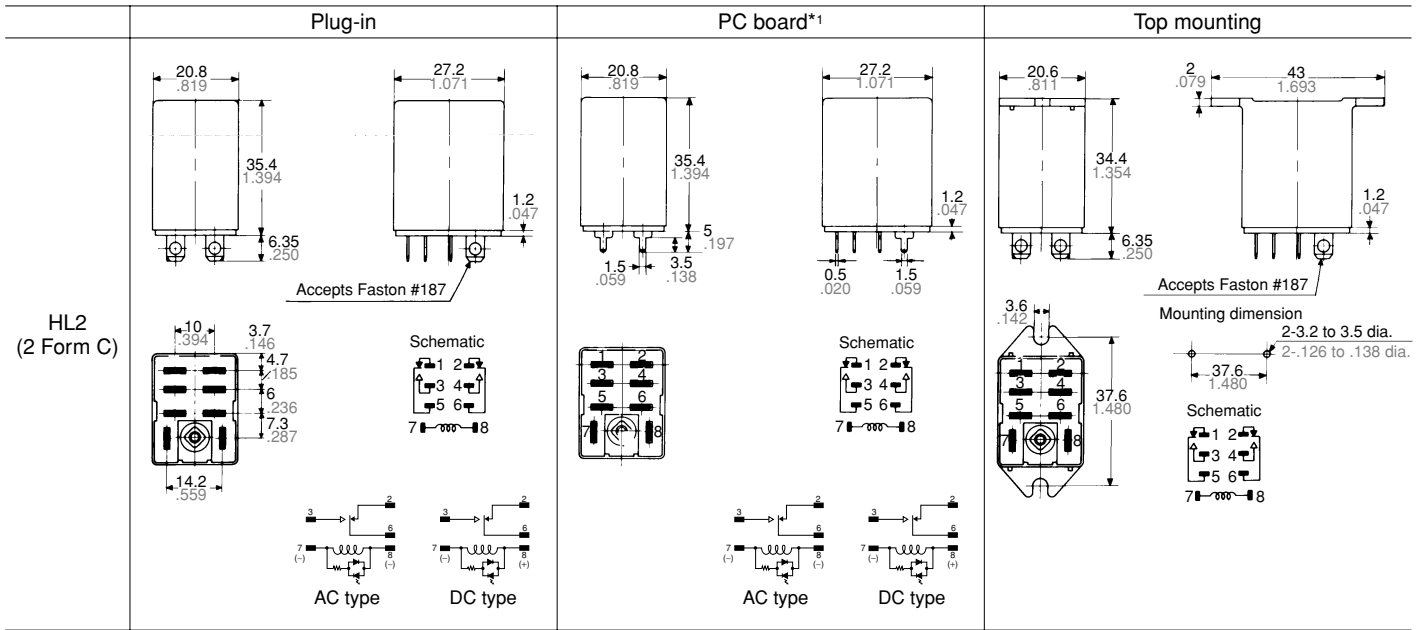
- The range of coil current is ±15% for AC (60 Hz), ±10% for DC, at 20°C.
- The relay may be used in the range of 80% to 110% of the nominal coil voltage. However, it is recommended that the relay be used at 85% to 110% nominal voltage to take temporary voltage variations into consideration.
- Each coil resistance of DC types is the measured value at a coil temperature of 20°C. Please allow a compensation of ±0.4% resistance for each coil temperature change of ±1°C.
- All AC 240 V types are rated for double coil voltages, both AC 220 V and AC 240 V.
- For use with 220 or 240 V DC, connect a resistor, as suggested below, in series with the 110 V DC relay.

| Voltage  | 1 Form C, 2 Form C |
|----------|--------------------|
| 220 V DC | 11 kW (5 W)        |
| 240 V DC | 13 kW (5 W)        |

# DIMENSIONS

mm inch

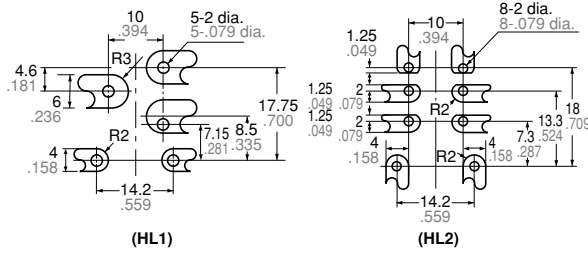
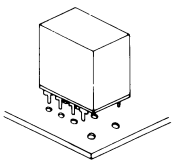




Tolerance:  $\pm 0.5 \pm .020$

\*1 PC board pattern

Copper-side view



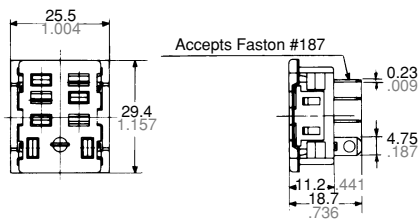
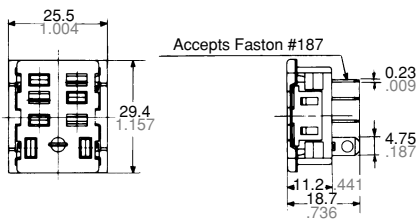
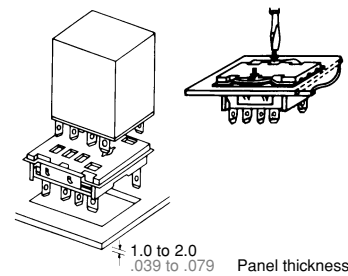
Tolerance:  $\pm 0.1 \pm .004$

## ACCESSORIES

HL1-SS-K (with hold-down clip)

HL2-SS-K (with hold-down clip)

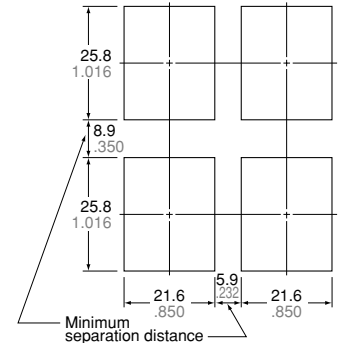
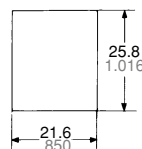
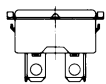
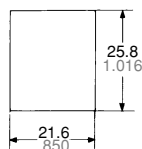
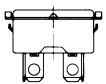
Plug-in terminal socket mount  
Simply insert socket into panel hole and push down as indicated to lock socket in place.



Panel cutout

Panel cutout

Panel cutout for tandem mounting

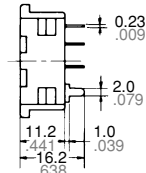
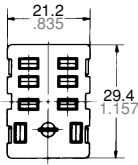


Tolerance:  $\pm 0.1 \pm .004$

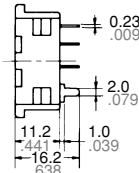
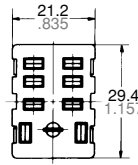
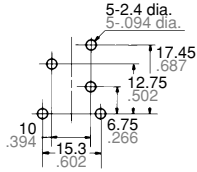
2. PC board terminal socket

HL1-PS-K

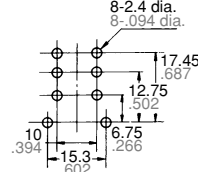
HL2-PS-K



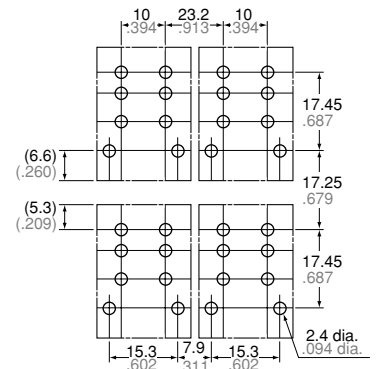
PC board pattern



PC board pattern



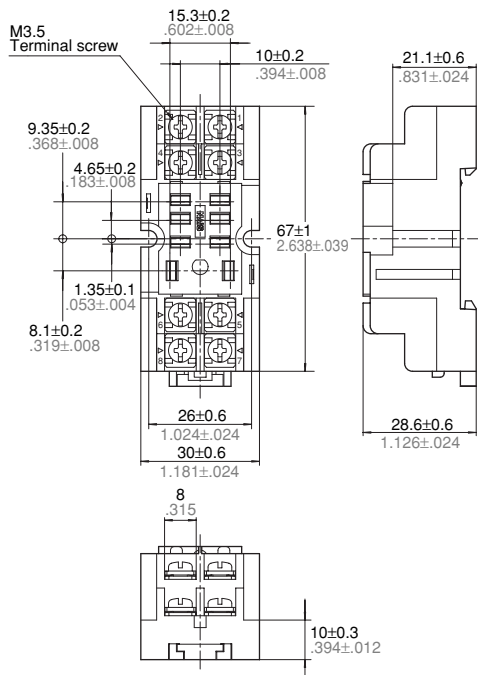
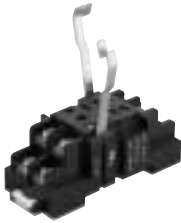
Layout for tandem mounting  
(2 Form C)



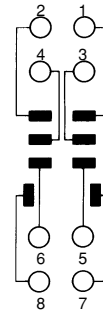
Tolerance: ±0.1 ±0.04

3. Screw terminal socket for DIN rail assembly

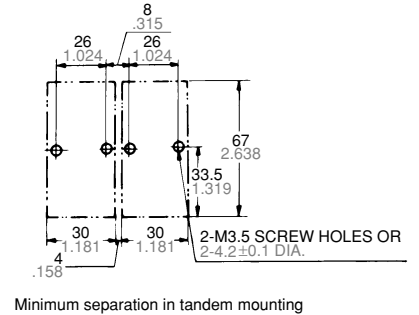
HL2-SFD-K (with hold-down clip)



Schematic



Layout for tandem mounting



Minimum separation in tandem mounting

Tolerance: ±0.1 ±0.04

(Remark) Max. continuous current of all HL sockets is 10 A.

For Cautions for Use, see Relay Technical Information