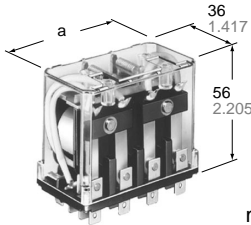




NAIS

20 AMP POWER RELAY

HG-RELAYS



mm inch

| | a |
|-----|------------|
| HG2 | 34.0 1.339 |
| HG3 | 50.0 1.969 |
| HG4 | 68.0 2.667 |

FEATURES

- Large capacity — 20 A 250 V AC resistive and 1.5 kW 3 phase 220 V AC motor loads
- High contact reliability after long use
- Usable with direct soldering, quick-connect and plug-in terminals. (.250)

SPECIFICATIONS

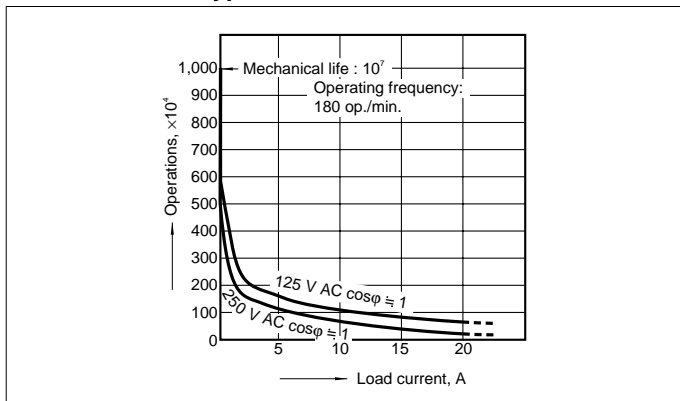
Contacts

| | |
|--------------------------------------------------------------|------------------------------|
| Arrangement | 2 Form C, 3 Form C, 4 Form C |
| Initial contact resistance, max. (By voltage drop 6 V DC 1A) | 15 mΩ |
| Contact material | Silver alloy |
| Nominal switching capacity | 20 A 250 V AC (resistive) |

Expected life (min. operations)

| | |
|-------------------------|-----------------------------------------------------|
| Mechanical (at 180 cpm) | AC type: 10 ⁷ , DC type: 10 ⁶ |
|-------------------------|-----------------------------------------------------|

Life curve for AC types



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

Characteristics (at 60 Hz, 20°C 68°F)

| | | |
|----------------------------------------------------------------------------------------------------|---------------------------|----------------------------------------------------------------------|
| Maximum operating speed | 20 cpm | |
| Initial insulation resistance*1 | Min. 100 MΩ at 500 V DC | |
| Initial breakdown voltage*2 | Between open contacts | 2,000 Vrms for 1 min. |
| | Between contacts sets | 2,000 Vrms for 1 min. |
| | Between contacts and coil | 2,000 Vrms for 1 min. |
| Operate time*3 (approx.) (at nominal voltage) | 2 Form C type | 15 ms |
| | 3 Form C & 4 Form C type | 25 ms |
| Release time (without diode)*3 (approx.) (at nominal voltage) | 2 Form C type | 15 ms |
| | 3 Form C & 4 Form C type | 25 ms |
| Shock resistance | Functional*4 | 98 m/s ² {10 G} (except for the contact moving direction) |
| | Destructive*5 | 980 m/s ² {100 G} |
| Vibration resistance | Functional*6 | 58.8 m/s ² {6 G}, 10 to 55 Hz at 1 mm double amplitude |
| | Destructive | 117.6 m/s ² {12 G}, 10 to 55 Hz at 2 mm double amplitude |
| Conditions for operation, transport and storage*7 (Not freezing and condensing at low temperature) | Ambient temp. | -50°C to +40°C -58°F to +104°F |
| | Humidity | 5 to 85% R.H. |
| Unit weight | 2 Form C type | Approx. 130 g 4.59 oz |
| | 3 Form C type | Approx. 185 g 6.53 oz |
| | 4 Form C type | Approx. 240 g 8.47 oz |

*5 Half-wave pulse of sine wave: 6ms

*6 Detection time: 10μs

*7 Refer to 5. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT (Page 61).

Electrical life with AC load

| AC load | Voltage, V AC | Current, A | Expected life (min. operations) |
|-------------------------|---------------|------------|---------------------------------|
| Resistive (cos φ ≈ 1) | 125 | 20 | 5×10 ⁵ |
| | | 15 | 7.5×10 ⁵ |
| | 250 | 20 | 2×10 ⁵ |
| | | 10 | 7.5×10 ⁵ |
| Inductive (cos φ ≈ 0.4) | 125 | 15 | 2×10 ⁵ |
| | | 10 | 5×10 ⁵ |
| | 250 | 10 | 2×10 ⁵ |
| | | 7.5 | 5×10 ⁵ |

Note: In case of an electromagnet or exiting coil load (solenoid, etc.), the value of the motor or lamp load is applicable.

| AC load | Voltage, V AC | Capacity, kW | Expected life (min. operations) | |
|---------|---------------|--------------|---------------------------------|-------------------|
| Lamp | 125 | 0.5 | 2×10 ⁵ | |
| | | 0.3 | 5×10 ⁵ | |
| Motor | Single phase | 125 | 0.75 | 2×10 ⁵ |
| | | | 0.4 | 5×10 ⁵ |
| | Three phase | 250 | 0.75 | 2×10 ⁵ |
| | | | 0.4 | 5×10 ⁵ |
| | | 1.5 | 2×10 ⁵ | |
| | | 0.75 | 5×10 ⁵ | |

Electrical life with DC load

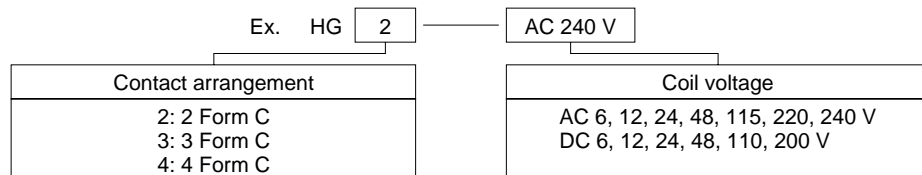
| DC load | Voltage, V DC | Current, A | Expected life (min. operations) |
|------------------------|---------------|------------|---------------------------------|
| Resistive | 24 | 15 | 5×10 ⁵ |
| | 125 | 0.8 | 5×10 ⁵ |
| Inductive (L/R ≈ 7 ms) | 24 | 10 | 5×10 ⁵ |
| | 125 | 0.4 | 5×10 ⁵ |

Note: For DC inductive load, use of an arc extinguishing circuit is recommended.

TYPICAL APPLICATIONS

Industrial machinery, machine tools, food processing and packing machines, office machines, transportation equipment and amusement devices.

ORDERING INFORMATION



(Note) Standard packing Carton: HG2 20 pcs.

HG3, HG4 10 pcs.

Case: HG2 100 pcs.

HG3, HG4 50 pcs.

UL/CSA approved type is standard.

TYPES AND COIL DATA

DC TYPES at 20°C 68°F

| Type | Part No. | Nominal coil voltage, V DC | Pick-up voltage, V DC (max.) | Drop-out voltage, V DC (min.) | Max. allowable, V DC voltage | Coil resistance, Ω (±10%) | Nominal coil current, mA | Operating power, W |
|-------------------|------------|----------------------------|------------------------------|-------------------------------|------------------------------|---------------------------|--------------------------|--------------------|
| HG2 (2 Form C) | HG2-DC6V | 6 | 4.8 | 0.9 | 6.6 | 26.4 | 230 | (approx.) 1.4 |
| | HG2-DC12V | 12 | 9.6 | 1.8 | 13.2 | 100 | 119.6 | (approx.) 1.4 |
| | HG2-DC24V | 24 | 19.2 | 3.6 | 26.4 | 416 | 57.6 | (approx.) 1.4 |
| | HG2-DC48V | 48 | 38.4 | 7.2 | 52.8 | 1585 | 30.3 | (approx.) 1.4 |
| | HG2-DC110V | 110 | 88 | 16.5 | 121 | 7650 | 14.4 | (approx.) 1.4 |
| | HG2-DC200V | 200 | 160 | 20 | 220 | 27,800 | 7.2 | (approx.) 1.4 |
| HG3 (3 Form C) | HG3-DC6V | 6 | 4.8 | 0.9 | 6.6 | 22.7 | 264 | (approx.) 1.6 |
| | HG3-DC12V | 12 | 9.6 | 1.8 | 13.2 | 89.5 | 134 | (approx.) 1.6 |
| | HG3-DC24V | 24 | 19.2 | 3.6 | 26.4 | 364 | 66 | (approx.) 1.6 |
| | HG3-DC48V | 48 | 38.4 | 7.2 | 52.8 | 1450 | 33.1 | (approx.) 1.6 |
| | HG3-DC110V | 110 | 88 | 16.5 | 121 | 6670 | 16.5 | (approx.) 1.6 |
| | HG3-DC200V | 200 | 160 | 20 | 220 | 23,800 | 8.4 | (approx.) 1.6 |
| HG4 (4 Form C) | HG4-DC6V | 6 | 4.8 | 0.9 | 6.6 | 18.5 | 325 | (approx.) 2.1 |
| | HG4-DC12V | 12 | 9.6 | 1.8 | 13.2 | 71.4 | 168 | (approx.) 2.1 |
| | HG4-DC24V | 24 | 19.2 | 3.6 | 26.4 | 296 | 81.2 | (approx.) 2.1 |
| | HG4-DC48V | 48 | 38.4 | 7.2 | 52.8 | 1050 | 45.7 | (approx.) 2.1 |
| | HG4-DC110V | 110 | 88 | 16.5 | 121 | 5420 | 20.3 | (approx.) 2.1 |
| | HG4-DC200V | 200 | 160 | 20 | 220 | 15,500 | 12.9 | (approx.) 2.1 |

AC TYPES (50/60 Hz) at 60 HZ, 20°C 68°F

| Type | Part No. | Nominal coil voltage, V AC | Pick-up voltage, V AC (max.) | Drop-out voltage, V AC (min.) | Max. allowable, V AC voltage | Inductance, H | Nominal coil current, mA | Operating power, VA |
|-------------------|------------|----------------------------|------------------------------|-------------------------------|------------------------------|---------------|--------------------------|---------------------|
| HG2 (2 Form C) | HG2-AC6V | 6 | 4.8 | 1.8 | 6.6 | 0.026 | 600 | (approx.) 3.6 |
| | HG2-AC12V | 12 | 9.6 | 3.6 | 13.2 | 0.104 | 300 | (approx.) 3.6 |
| | HG2-AC24V | 24 | 19.2 | 7.2 | 26.4 | 0.416 | 150 | (approx.) 3.6 |
| | HG2-AC48V | 48 | 38.4 | 14.4 | 52.8 | 1.660 | 75 | (approx.) 3.6 |
| | HG2-AC115V | 115 | 92 | 34.5 | 126.5 | 9.531 | 31.3 | (approx.) 3.6 |
| | HG2-AC220V | 220 | 176 | 66 | 242 | 34.96 | 16.4 | (approx.) 3.6 |
| | HG2-AC240V | 240 | 192 | 72 | 264 | 41.68 | 15 | (approx.) 3.6 |
| HG3 (3 Form C) | HG3-AC6V | 6 | 4.8 | 1.8 | 6.6 | 0.018 | 864 | (approx.) 5.2 |
| | HG3-AC12V | 12 | 9.6 | 3.6 | 13.2 | 0.073 | 432 | (approx.) 5.2 |
| | HG3-AC24V | 24 | 19.2 | 7.2 | 26.4 | 0.290 | 216 | (approx.) 5.2 |
| | HG3-AC48V | 48 | 38.4 | 14.4 | 52.8 | 1.163 | 108 | (approx.) 5.2 |
| | HG3-AC115V | 115 | 92 | 34.5 | 126.5 | 6.648 | 45.2 | (approx.) 5.2 |
| | HG3-AC220V | 220 | 176 | 66 | 242 | 24.26 | 23.6 | (approx.) 5.2 |
| | HG3-AC240V | 240 | 192 | 72 | 264 | 29.06 | 21.6 | (approx.) 5.2 |
| HG4 (4 Form C) | HG4-AC6V | 6 | 4.8 | 1.8 | 6.6 | 0.012 | 1264 | (approx.) 7.6 |
| | HG4-AC12V | 12 | 9.6 | 3.6 | 13.2 | 0.050 | 632 | (approx.) 7.6 |
| | HG4-AC24V | 24 | 19.2 | 7.2 | 26.4 | 0.199 | 316 | (approx.) 7.6 |
| | HG4-AC48V | 48 | 38.4 | 14.4 | 52.8 | 0.795 | 158 | (approx.) 7.6 |
| | HG4-AC115V | 115 | 92 | 34.5 | 126.5 | 4.557 | 66.1 | (approx.) 7.6 |
| | HG4-AC220V | 220 | 176 | 66 | 242 | 16.89 | 34 | (approx.) 7.6 |
| | HG4-AC240V | 240 | 192 | 72 | 264 | 19.87 | 31.6 | (approx.) 7.6 |

Notes:

1. The coil current ranges is ±15% for AC (60 Hz), ±10% for DC (20°C 68°F).
 2. These relays are applicable to a range of 80% to 110% of the nominal coil voltage. However, it is recommended that the relay be used in a range of 85% to 110% of the nominal coil voltage, taking the temporary voltage variation into consideration. For AC types, when operating voltage is 70% of nominal coil voltage, "buzzing" will occur, and a large amount of current will flow, burning the coil.

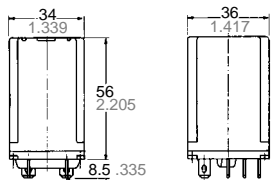
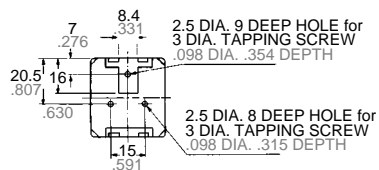
3. Each coil resistance of DC types is the measured value at coil temperature of 20°C 68°F. Please compensate the coil resistance by ±0.4%, each time the coil temperature changes by ±1°C.

HG

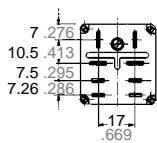
DIMENSIONS

mm inch

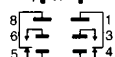
HG2 (2 Form C)



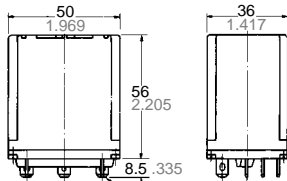
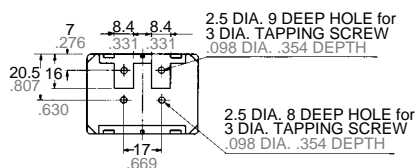
AMP SERIES FASTON 250 CONNECTORS CAN BE USED



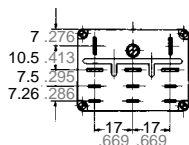
Schematic (Bottom view)



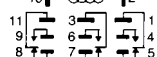
HG3 (3 Form C)



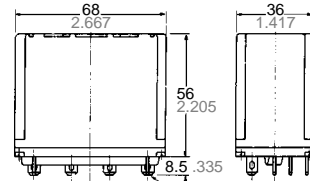
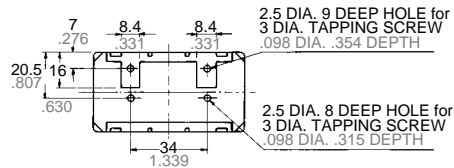
AMP SERIES FASTON 250 CONNECTORS CAN BE USED



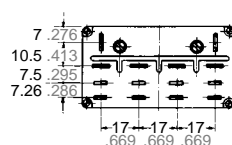
Schematic (Bottom view)



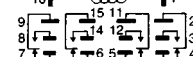
HG4 (4 Form C)



AMP SERIES FASTON 250 CONNECTORS CAN BE USED





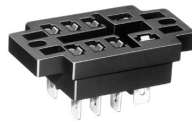





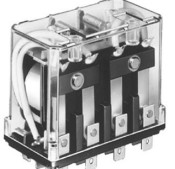
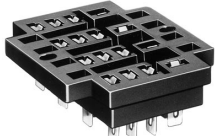

Schematic (Bottom view)



General tolerance: $\pm 0.5 \pm 0.20$

ACCESSORIES

Please refer to "MOUNTING METHOD" for further information.

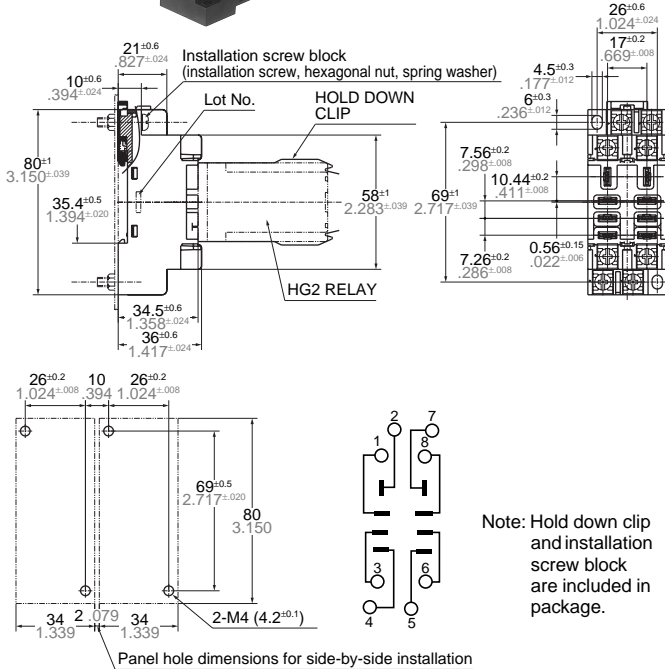
| HG | Relay | Screw terminal socket for DIN rail assembly (with hold-down clip) | Solder terminal socket for rectangular hole (with hold-down clip) | Bracket for direct mounting |
|----------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| HG2 (2 Form C) |  | HG2-SFD  | HG2-SS  | HP-BRACKET  1 pc. |
| HG3 (3 Form C) |  | HG3-SFD  | HG3-SS  | HP-BRACKET  2 pcs. |
| HG4 (4 Form C) |  | No screw terminal socket for HG4 use 2 screw terminal sockets (HG2-SFD) | HG4-SS  | HP-BRACKET  2 pcs. |

Note: Tapping-screw holes are provided on the cover top for direct mounting.

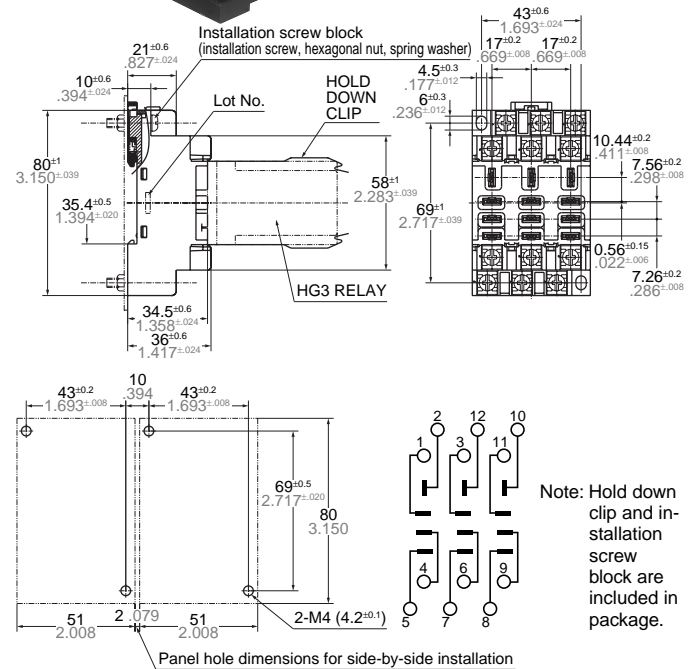
MOUNTING METHOD AND DIMENSIONS

Screw terminal socket (Hold-down clips included)

HG2-SFD

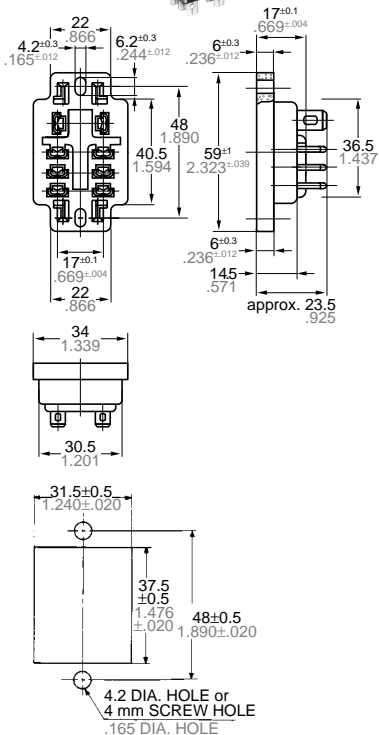


HG3-SFD

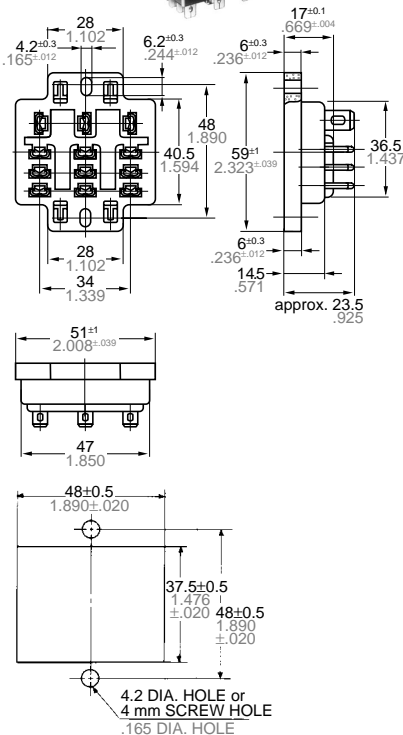


Solder terminal socket (Hold-down clips included)

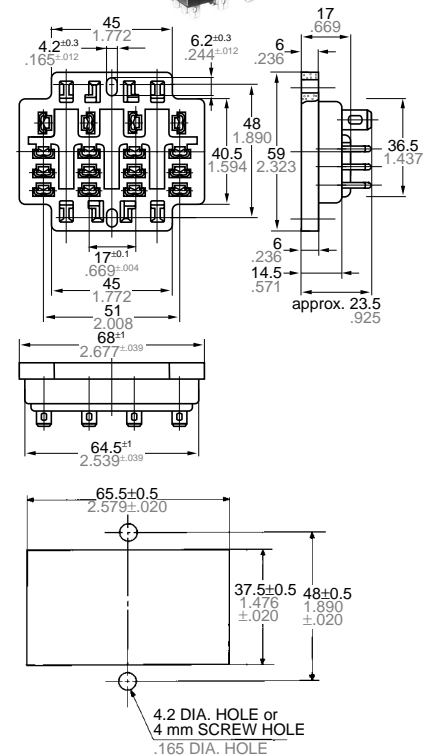
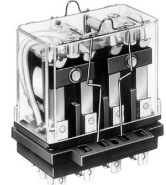
HG2-SS



HG3-SS



HG4-SS



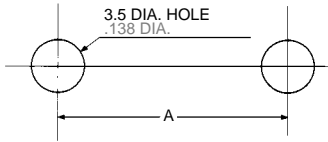
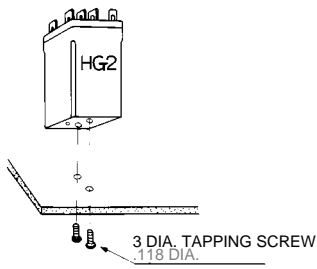
Note: HG sockets accept Faston 250.

General tolerance: ±0.6 ±0.024

HG

Direct mounting

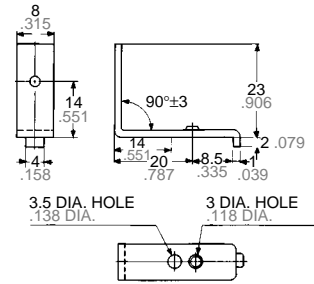
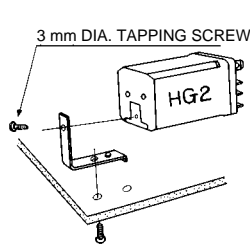
Faston 250 series quick-connectors can be used.



A: HG 2: 15mm .591
 HG 3: 17mm .669
 HG 4: 34mm 1.339

Direct mounting with HP-BRACKET

Faston 250 series quick-connectors can be used.

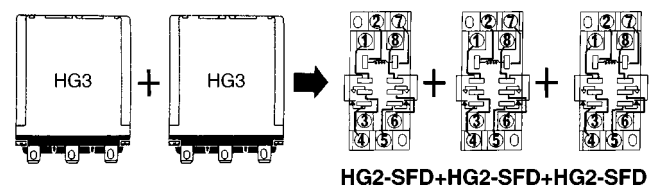
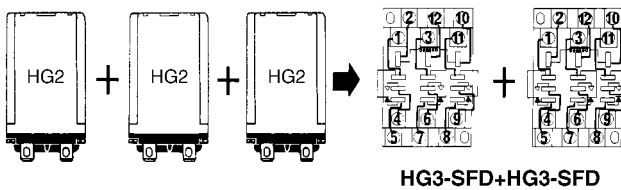
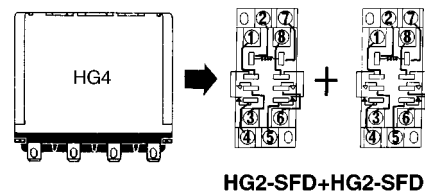
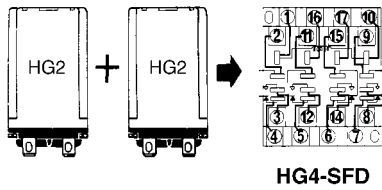


Use two brackets for HG3 and HG4

Notes:

1. This bracket is unavailable for UL, CSA and VDE applications.
2. When using any other non-standard bracket mounting-screw length should not exceed bracket thickness plus 7 mm .276 inch to avoid damage to relay coils.

Socket Combinations



NOTES

Please use the hold-down clip whenever HG relays will be used in applications where strong vibrating or shock force occurs. When used in such applications,

mount the relay so that this force does not parallel the direction of contact movement.

For Cautions for Use, see Relay Technical Information (Page 48 to 76).