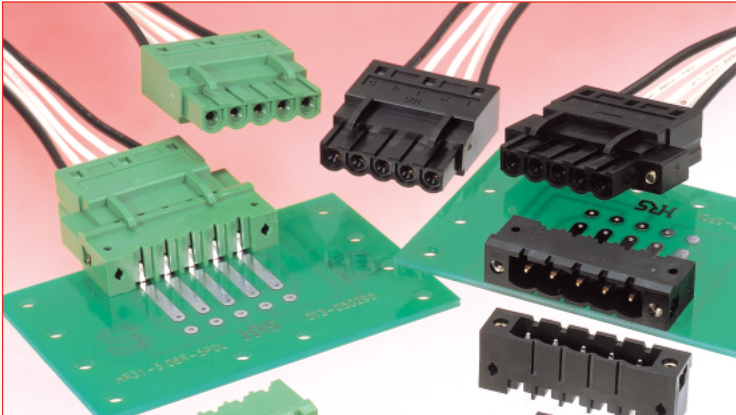


Interface Connectors for Factory Automation Network

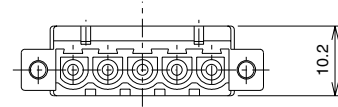
HR31 Series

Complies with Device Net requirements

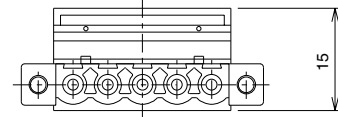


Comparison of plug heights (actual size)

● Hirose HR31



● Other manufacturer's product



■ Features

1. Device-Net Compliant

Conforms to requirements of Factory Automation Network Device-Net standards. Hirose products are distinct from products of made others, as described below.

| Feature | Made by others | Hirose HR31 |
|--|--|---|
| Reduced number of termination operations | Crimped to commercially available cap connectors, inserted into housing and fastened by screw. | Crimped and connected to terminal then fastened simply by inserting into housing. |
| High density mounting | Plug height : 15 mm | Plug height is 10.2 mm, allowing use of less space when mounting several connectors |
| Prevention of connection errors | Contact positions not identified. | Permanently identified contact positions |
| Number of required operations to secure receptacle assembly to the board | Connectors are attached by screws from the opposite side. | No need for screws, built-in locking pin secures connector to the board |

2 Locking features

The connectors can be supplied with either of the following locking features:

- Screw lock, using attached screws.
- Snap lock, using built-in feature with a definite click-sensation.

3. Commercially available tools may be used

Use crimp tools conforming to JIS C 9711 standards. Terminated contacts can be removed using 1 mm dia. steel pin. and re-inserted.

4. Prevention of deformation of the contacts

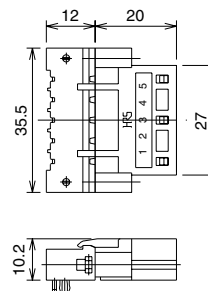
When fully inserted, the plug contacts are fully protected by the walls of the insulator body eliminating a risk of accidental damage.

■ Applications

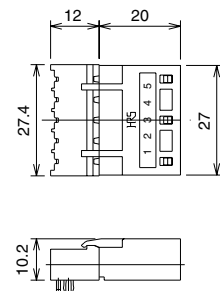
Power units and communications units of factory automation related devices

Total space occupied by mated assemblies

With screw lock



Without screw lock



■ Product Specifications

| | | | | |
|--------|----------------|--|-----------------------------|-------------------------|
| Rating | Current rating | 12A (2.5mm ² wire) 10A (1.5mm ² wire) | Operating temperature range | -40°C to +100°C |
| | Voltage rating | 250V AC, 350V DC | Storage temperature range | -40°C to +85°C (Note 2) |

| Item | Specification | Conditions |
|--------------------------------------|--|---|
| 1.Contact resistance | 5 m ohms max. | 1A DC |
| 2.Insulation resistance | 1000 M ohms min. | 500 V DC |
| 3.Withstanding voltage | No flashover or insulation breakdown | 2000V AC/one minute |
| 4.Impulse withstanding voltage | No flashover or insulation breakdown | Standard waveform of 4KV, positive/negative, 3 times each |
| 5.Vibration | No electrical discontinuity of 10 μs or more | Frequency: 10 to 55 Hz, single amplitude of 0.75 mm, 5 min. in each of the 3 directions, 10 cycles each |
| 6.Durability (insertion/ withdrawal) | Contact resistance: 10 m ohms max. | 100 cycles (1000 cycles for gold plated contacts) |
| 7.Temperature cycle | Insulation resistance: 1000 M ohms min. | Temperature: -40°C → Room temperature to +100°C → Room temperature Time: 30 → 10 to 15 → 30 → 10 to 15 (Minutes) 5 cycles |
| 8.Humidity | Insulation resistance: 10 M ohms min. (Humidity state) 100 M ohms min. (Dry state) | 96 hours at temperature of 40°C and humidity of 90% to 95% |

■ Materials

| Part | | Material | Finish | Remarks |
|---------------|---------------------|---|--|---|
| Plug | Insulator | PBT | Color: Black or Green | UL94V-0 |
| | Screw | Steel | Nickel plating | |
| Crimp contact | Socket contact | Contact area: phosphor bronze Termination area: copper | Contact area: tin plating Termination area: tin plating | Available with gold plating on contact area |
| Receptacle | Insulator | PBT | Color: Black or Green | UL94V-0 |
| | Male contact | Brass | Contact area: tin plating Termination are: tin plating | Available with gold plating on contact area |
| | Nut | Steel | Nickel plating | |
| | Board retention pin | Phosphor bronze | Tin plating | |

■ Ordering information

●Connector

HR31 - 5.08 P A - 5 S C (01)

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

| | | |
|-------------------|---------------------------------------|--|
| ① Series name | HR31 | ⑥ Contact type S: Female contact P: Male contact |
| ② Contact pitch | 5.08mm | |
| ③ Connector type | P: Plug R: Receptacle | ⑦ Terminal type C: Crimping DL: Right angle through hole type D: Straight through hole type |
| ④ Screw lock type | Blank: With screw A: Without screw | |
| ⑤ No. of contacts | 5 | ⑧ Color, plating, board retention pin type |

●Crimp contact

HR31 - SC - 1 1 3 (01)

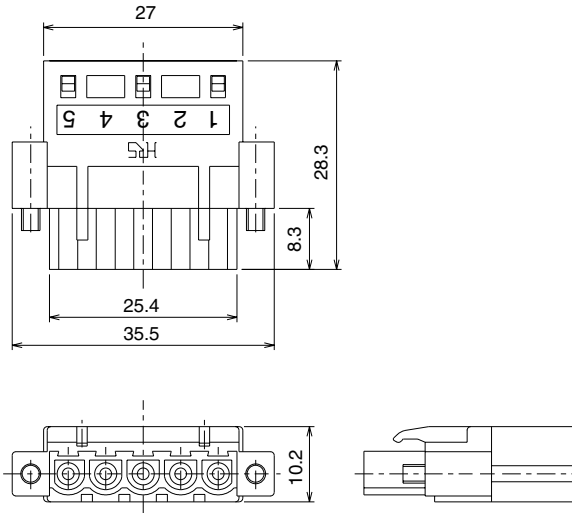
⑨ ⑩ ⑪ ⑫ ⑬ ⑭

| | | |
|--|--------------------|---|
| ⑨ Series name | HR31 | ⑬ Plating type 3: Tin plating 1: Gold plating |
| ⑩ Contact type | SC: female contact | |
| ⑪ Contact packaging type 1: loose contact | | ⑭ Suffix |
| ⑫ Conductor cross area 1: 1.04 to 2.63mm ² 2: 0.25 to 1.65mm ² | | |

■ Plug (with screw lock)



HR31-5.08P-5SC

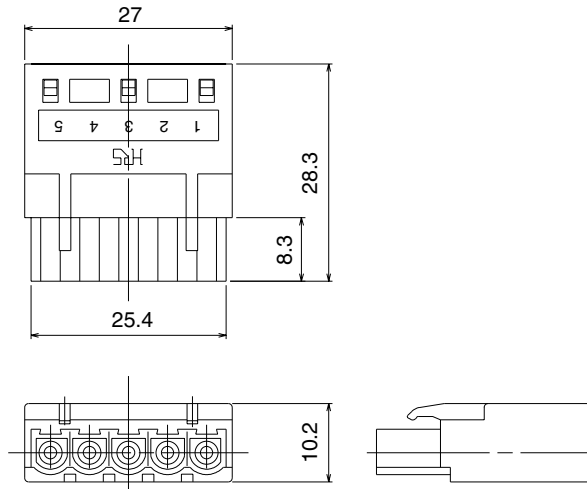


| Part No. | CL No. | Weight | Color |
|--------------------|---------------|--------|-------|
| HR31-5.08P-5SC(71) | 131-0002-2-71 | 8g | Black |
| HR31-5.08P-5SC(72) | 131-0002-2-72 | | Green |

■ Plug (without screw lock)

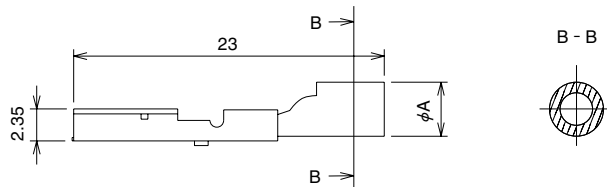


HR31-5.08PA-5SC



| Part No. | CL No. | Weight | Color |
|---------------------|---------------|--------|-------|
| HR31-5.08PA-5SC | 131-0009-1 | 6g | Black |
| HR31-5.08PA-5SC(01) | 131-0009-1-01 | | Green |

■ Crimp contact

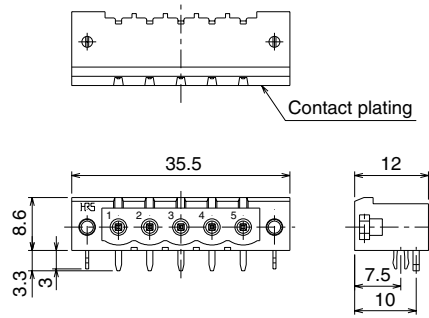


| Part No. | CL No. | φA | Weight | Contact plating | Applicable conductor cross area (Note 2) |
|-----------------|---------------|-----|--------|-----------------|--|
| HR31-SC-113(71) | 131-0006-3-71 | 4 | 1g | Tin | 1.04 to 2.63mm ² |
| HR31-SC-123(72) | 131-0007-6-72 | 3.3 | | | 0.2 to 1.65mm ² |
| HR31-SC-111(71) | 131-0004-8-71 | 4 | | Gold | 1.04 to 2.63mm ² |
| HR31-SC-121(72) | 131-0005-0-72 | 3.3 | | | 0.2 to 1.65mm ² |

Note 1: Bag packaging (100 pieces/bag)

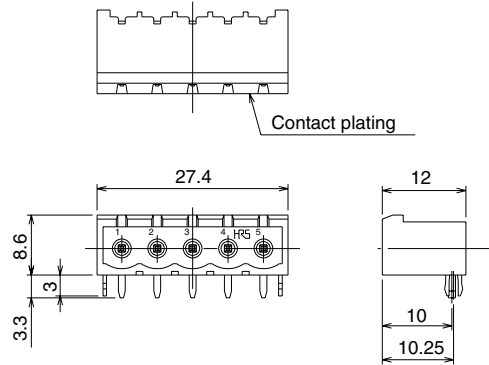
Note 2: For a multi-strand conductors

■ Receptacle (Right angle through hole type with screw lock)



| Part No. | CL No. | Weight | Color | Contact plating | Board retention pin |
|---------------------|---------------|--------|-------|-----------------|---------------------|
| HR31-5.08R-5PDL(71) | 131-0001-0-71 | 4g | Black | Tin | With |
| HR31-5.08R-5PDL(72) | 131-0001-0-72 | | | Gold | |
| HR31-5.08R-5PDL(73) | 131-0001-0-73 | | | Tin | Without |
| HR31-5.08R-5PDL(74) | 131-0001-0-74 | | Gold | With | |
| HR31-5.08R-5PDL(75) | 131-0001-0-75 | | | Without | |
| HR31-5.08R-5PDL(76) | 131-0001-0-76 | | Green | Gold | Without |

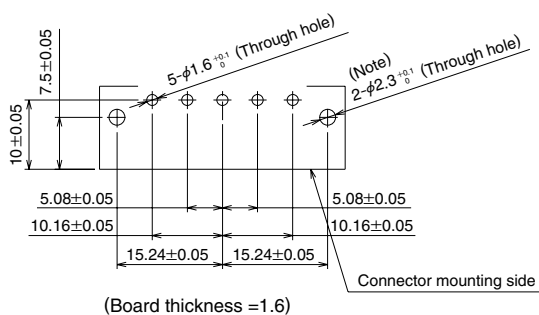
Receptacle (Right angle through hole type without screw lock)



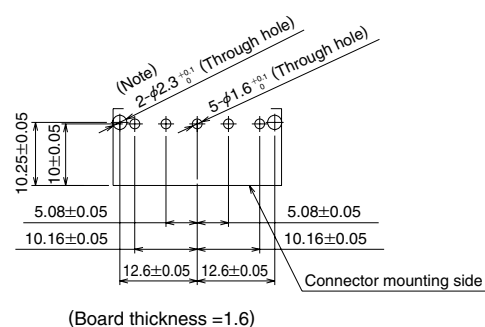
| Part No. | CL No. | Weight | Color | Contact plating | Board retention pin |
|----------------------|---------------|--------|-------|-----------------|---------------------|
| HR31-5.08RA-5PDL(71) | 131-0008-9-71 | 2g | Black | Tin | With |
| HR31-5.08RA-5PDL(72) | 131-0008-9-72 | | | Gold | |
| HR31-5.08RA-5PDL(73) | 131-0008-9-73 | | | Tin | Without |
| HR31-5.08RA-5PDL(74) | 131-0008-9-74 | | Gold | With | |
| HR31-5.08RA-5PDL(75) | 131-0008-9-75 | | | Without | |
| HR31-5.08RA-5PDL(76) | 131-0008-9-76 | | Green | Gold | Without |

◆ PCB mounting pattern

● With screw lock

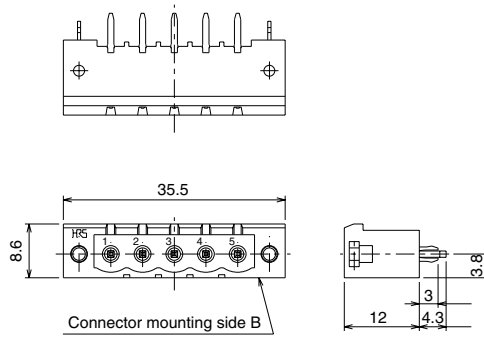


● Without screw lock



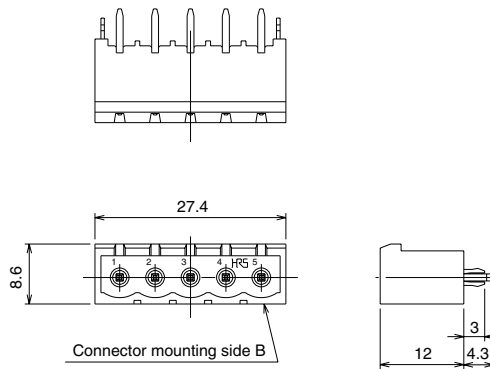
Note: Dia. 2.3 through hole is not required on the board when using connectors without the retention pin.

■ Receptacle (Straight through hole type with screw lock)



| Part No. | CL No. | Weight | Color | Contact plating | Board retention pin |
|--------------------|---------------|--------|-------|-----------------|---------------------|
| HR31-5.08R-5PD(71) | 131-0003-5-71 | 4g | Black | Tin | With |
| HR31-5.08R-5PD(72) | 131-0003-5-72 | | | Gold | |
| HR31-5.08R-5PD(73) | 131-0003-5-73 | | | Tin | Without |
| HR31-5.08R-5PD(74) | 131-0003-5-74 | | Gold | With | |
| HR31-5.08R-5PD(75) | 131-0003-5-75 | | | Without | |
| HR31-5.08R-5PD(76) | 131-0003-5-76 | | Green | Without | |

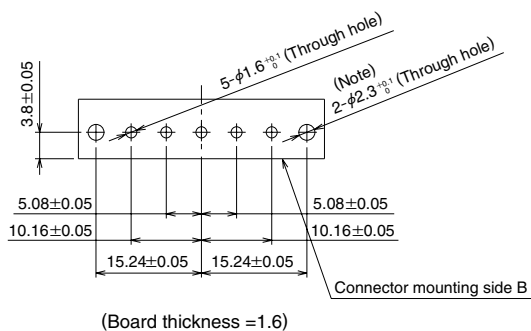
Receptacle (Straight through hole type without screw lock)



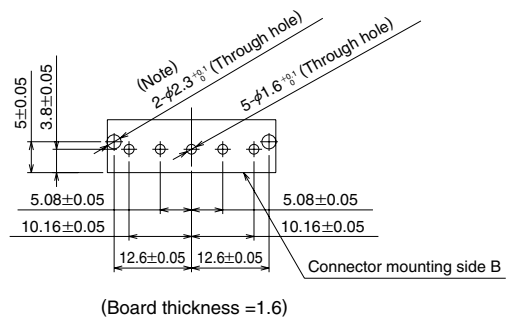
| Part No. | CL No. | Weight | Color | Contact plating | Board retention pin |
|---------------------|---------------|--------|-------|-----------------|---------------------|
| HR31-5.08RA-5PD(71) | 131-0016-7-71 | 2g | Black | Tin | With |
| HR31-5.08RA-5PD(72) | 131-0016-7-72 | | | Gold | |
| HR31-5.08RA-5PD(73) | 131-0016-7-73 | | | Tin | Without |
| HR31-5.08RA-5PD(74) | 131-0016-7-74 | | Gold | With | |
| HR31-5.08RA-5PD(75) | 131-0016-7-75 | | | Without | |
| HR31-5.08RA-5PD(76) | 131-0016-7-76 | | Green | Without | |

◆ PCB mounting pattern

● With screw lock



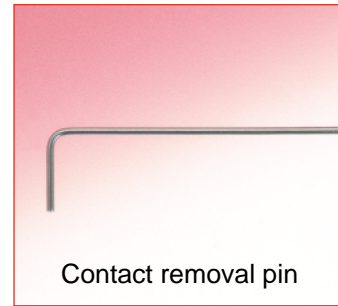
● Without screw lock



Note: Dia. 2.3 through hole is not required on the board when using connectors without the retention pin.

■ Tools

| Type | Part No. | CL No. |
|---------------------|------------|------------|
| Manual crimp tool | HR31-TC-01 | 150-0217-7 |
| Contact removal pin | HR31-SC-TP | 150-0215-1 |

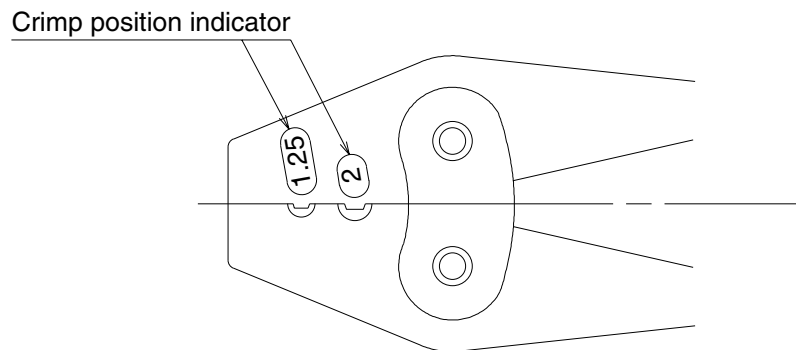


● Tools application procedures

1. Manual contact crimp tool

The tool will terminate all specified crimp contacts. Placement of correct contact in corresponding crimp position on the tool is critical. The positions are clearly indicated on the tool as (2) and (1.25). The exposed conductor strip length is 5mm.

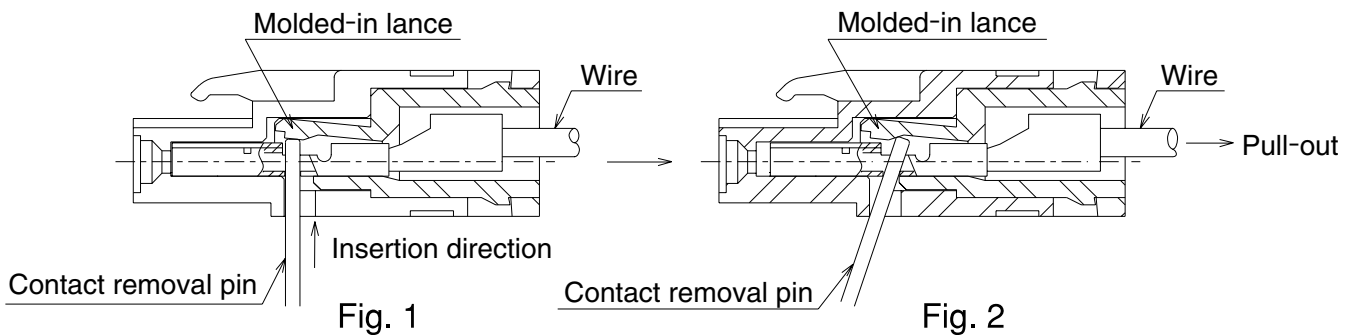
| Crimp position indicator | Applicable crimp contact |
|--------------------------|----------------------------|
| 2 | HR31-SC-113 or HR31-SC-111 |
| 1.25 | HR31-SC-123 or HR31-SC-121 |



2. Contact removal pin

Contact removal pin provides easy method of contact removal from plug assembly.

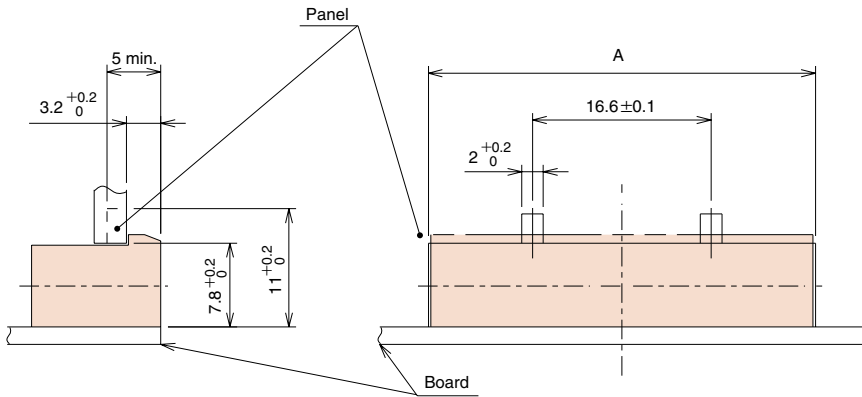
- 1) Fully insert the long end of the contact removal pin into the opening in the insulator.
- 2) Move the pin forward, in the direction of the mating face.
This will cause the terminated contact to move in opposite direction.
- 3) Pull out the wire with the attached crimped contact.



◆ Usage Precautions

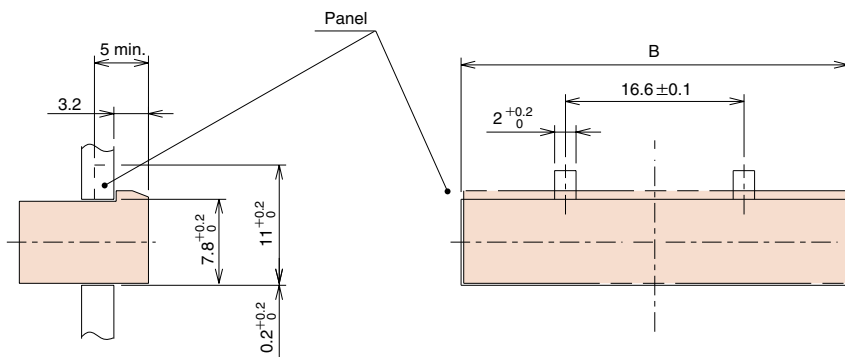
1. To prevent damage, align receptacle with the panel and board in such a way that it is not subject to excess loads.

1.1 Recommended mounting panel dimensions (right angle through hole type)



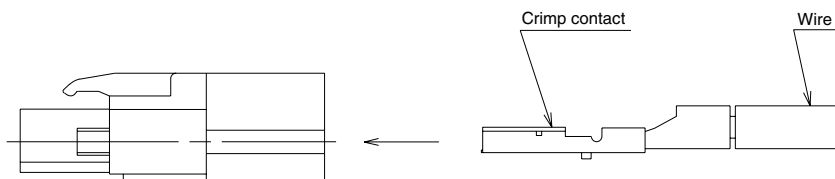
| Part No. | A |
|------------------|-----------------------------------|
| HR31-5.08R-5PDL | 36 ^{+0.2} ₀ |
| HR31-5.08RA-5PDL | 27.9 ^{+0.2} ₀ |

1.2 Recommended mounting panel dimensions (straight through hole type)



| Part No. | B |
|-----------------|-----------------------------------|
| HR31-5.08R-5PD | 36 ^{+0.2} ₀ |
| HR31-5.08RA-5PD | 27.9 ^{+0.2} ₀ |

2. Insert the crimp contact into the plug in the direction shown below.



3. Use a number 0 cross drive bit to tighten the screw lock's screw.

4. Assure that the circuit's power is off when mating and un-mating connectors.

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