

# Handling Connector Precautions

## 1. Applicable scope

This document shows precautions for handling of the Product made in Minebea Connect connector and in each operation process.

Incidentally, the contents described in this manual are representative examples, and each product's individual specifications and work control standards shall take precedence.

- Product Type

Product Category	Mating configuration
Wire-to-Wire Connector	Mating type
Wire-to-Board Connector	Mating, board-in type
Waterproof Connector	Mating type

## 2. General precautions

2-1. Protect and handle the connector and terminal appropriately and install them in the equipment while avoiding the following.

- Environment in which excessive continuous external force, shocks, etc. are applied
- Environment in which there is exposure to corrosive substance and atmosphere, high temperature, high humidity and direct sunlight or ultraviolet light
- Environment in which there is exposure to high-pressure or high-temperature air, water, vapor, etc.
- Wear protective gloves to prevent direct contact with the male and female terminals.

**Contact performance may not be satisfied due to foreign matter, corrosion, deformation, etc. at the terminal contacts.**

In addition, black spots, slight scratches, and colors may differ in the connector resin part, but this does not affect the connector performance.

2-2. The product has not been manufactured so that a mating operation can be performed while being energized. Be sure to energize the circuit only after mating the connector.

2-3. Waterproof type connectors provide waterproof performance after fully mating the housing on the male (M) And female (F) sides. Since the product is not waterproof before mating, take appropriate measures to prevent condensation and water from getting wet.

2-4. The product shall be stored in the packing style at the time of delivery. Avoid storage in a place where direct sunlight strikes or there is much dust because the packing materials may be deformed or the product may be deteriorated.

Storage under the following conditions is recommended.

- Storage temperature: 5 to 35°C
- Storage humidity: 85%R.H. or less
- Storage period: 1 year or less after delivery

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### 3. Precautions for crimping operation and crimped terminal

- 3-1. Electric wire to be used  
Use one within the applicable scope written in the crimping specification.
- 3-2. Applicator to be used  
Please check the crimping specification and use the specified applicator because the blade type parts of the applicator differ depending on the terminal part number.  
**A product crimped not by the applicator designated by us shall not be assured.**
- 3-3. Electric wire strip length  
Control it within the scope of the crimping specification.  
Check the following before use.
- There shall be no scratch, breakage and disconnection of a core wire.
  - There shall be no scratch and excessive deformation of the insulation.
- 3-4. Crimp height  
Control the wire crimp height and insulation crimp height within the scope of the crimping specification.
- 3-5. Position of crimping of core wire  
Crimp it so that it will protrude from the wire barrel part to the tip mating side by approximately 0.5 mm. If it protrudes to the tip side excessively, terminal insertion into the housing will be difficult, which will cause incomplete insertion. If the protrusion is excessively short and hidden by the wire barrel, the tensile strength of the crimped part will decrease significantly.  
Be careful so that there is no breakage of a core wire.
- 3-6. Position of insulation  
The tip position of the insulation shall be the middle position between the wire barrel and insulation barrel desirably. Be careful so that the insulation will not be caught by the wire barrel. If the insulation is caught by the wire barrel, electric continuity may be lost.

### 4. Control of crimped terminal

- 4-1. Check after crimping  
Check a crimped terminal based on the crimping specification for the following.
- Crimp height
  - Condition of electric wire (core wire and insulation)
  - Condition of terminal (deformation such as bending and twisting)
- 4-2. Precautions for storage  
When storing crimped terminals, note the following.  
Otherwise, terminal deformation or a contact defect may be caused.
- Bundling of crimped terminals  
If many crimped terminals are bundled, terminals and electric wires will be tangled with each other easily  
Do not apply shock to the terminals as it may cause deformation or scratching of the terminals.  
When unbundling crimped terminals, remove tangles of the terminals and then hold the terminals.  
When separating bundles, take care of the tangled terminals and electric wires before holding the terminals.  
Pulling the wires when they are entangled may cause deformation of the terminals or damage to the wires.  
Avoid using vulcanized rubber in the bundling rubber, as this may cause discoloration of the terminals.  
Protect them to prevent attachment of dust etc. and terminal deformation.
  - Stacking of crimped terminals  
Terminal deformation, a scratch on electric wires, etc. may be caused due to the weight of the terminals and electric wires, so if they are stacked, the weight shall not be applied directly.

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#### 4-3. Precaution for conveyance

When conveying crimped terminals, protect them so that the shock of a drop etc. will be absorbed.

### 5. Precautions for insertion of terminal into housing

#### 5-1. Check of products to be used

Be sure to check the housing and terminal to be used (part No.).

#### 5-2. Check of terminal

Before using the terminal, check the following.

- The terminal shall be crimped based on the crimping specification.
- There shall be no terminal deformation, crack and dust attachment due to conveyance etc.
- The crimped electric wires shall be within the applicable electric wire scope for the connector to be used.

#### 5-3. Insertion direction and method of terminals

Insert the terminals straight (horizontally) into the housing, paying attention to the orientation of the terminals.

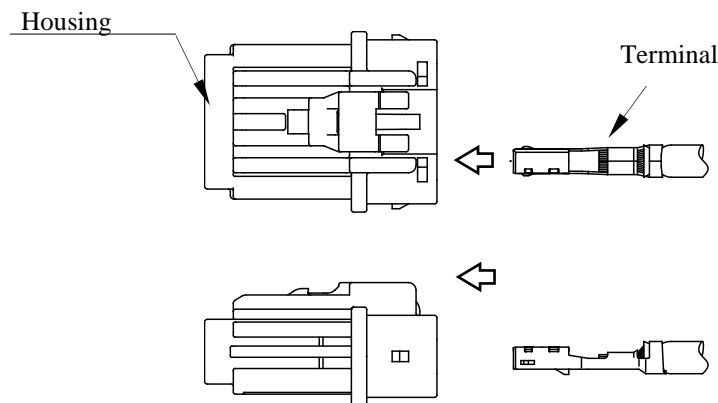


Fig.1: Example of Terminal Insertion

In addition, for the waterproof connector, check that there is no dust, dirt, or other foreign matter in the terminal insertion part (hole) of the wire seal built in the housing, and insert straight so that the hole position of the wire seal matches the terminal. If the wires are inserted at an angle or if they are shifted greatly in the vertical and horizontal directions, the wire seal may be damaged, and the waterproof property cannot be guaranteed.

#### 5-4. Method to insert terminal

There is a feeling of click when the terminal is fully inserted. After insertion, pull the wire horizontally (about 5N) to confirm that the terminal is securely locked.

#### 5-5. Storage

Since the housing must prevent dust from adhering to it, and the wire seal and housing seal oil from decreasing in the waterproof connector, store the remaining housing in a vinyl bag or the like after the terminal insertion work, and keep it away from high temperature.

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## 6. Precautions for removing the terminal due to incorrect insertion

### 6-1. Precautions for removal of terminal from housing

Insert the removal jig into the convex hole(Fig.2) when seen from the mating side of the housing, pull the electric wire with the lance (terminal locking part) of the housing raised and remove the terminal. (Fig.3)

However, do not pull the electric wire to the extent that the lance is removed from the terminal. At this time, note the following.

- When the jig is inserted into the housing, the jig shall not interfere with the terminal. If the terminal is scratched or deformed due to interference, the product performance may be impaired.
- An electric wire shall not be pulled forcibly.  
If it is pulled forcibly, the terminal may be scratched or deformed and the product performance may be impaired.

**An F housing into which a terminal has been inserted cannot be used again, so after removing the terminal from the F housing, use a new housing to insert a terminal.**

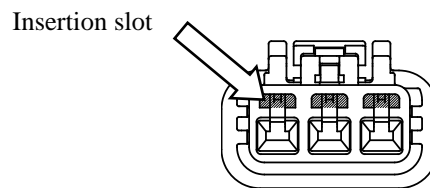


Fig.2: Example of hole for inserting/removing jig

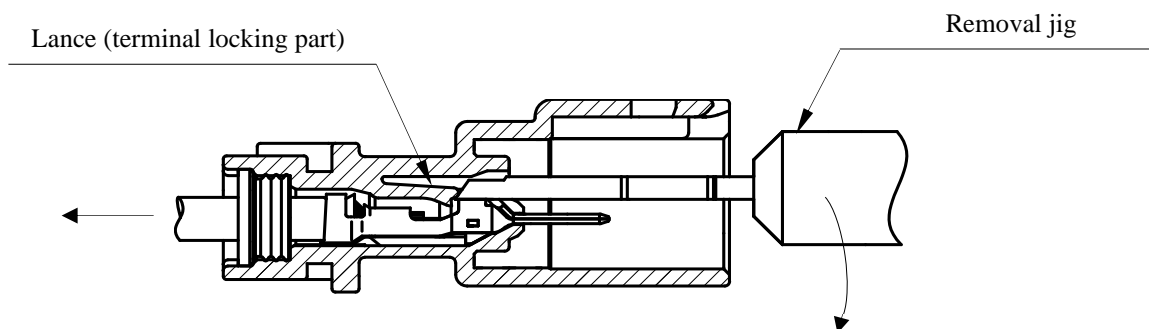


Fig.3: Example of inserting/removing jig

6-2. For connectors with a lance at the terminal

Pull the wire out of the lance window of the housing while pressing the lance with a pulling jig (or a flat object with a thin tip like a flat screwdriver) to remove the terminal.

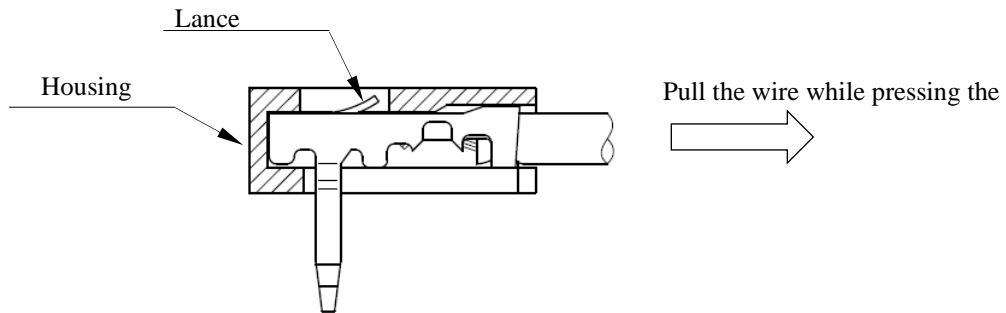


Fig. 4. Example of how to repair the connector with a lance at the terminal

6-3. Check of terminal after removal

If a terminal is deformed or scratched, it shall not be used and shall be replaced with a new one

7. Precautions for retainer insertion (In the case of a connector with retainer)

7-1. Check before retainer insertion

Check the following sufficiently.

- There shall be no incomplete terminal insertion.
- There shall be no wrong terminal insertion. (Wiring mistake)

7-2. Retainer insertion

Push in the retainer to the extent that there is a click feeling and change the temporary locking status to a final locking status.

After the retainer insertion, check that it does not protrude from the F housing end surface. (Fig. 5)

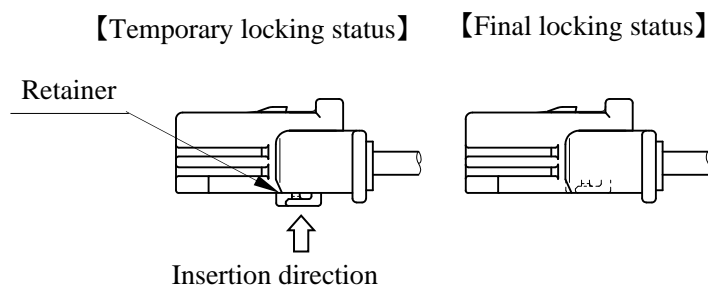


Fig.5: Example of retainer insertion method

8-3. Precautions for retainer insertion

If the terminal is in a midway insertion status, the retainer cannot be inserted. Insert all the terminals completely and then push in the retainers.

If the retainer is forcibly pushed in and damaged or deformed, do not reuse it and replace the new housing and retainer.

## 8. Control after terminal insertion

### 8-1. Bundling of electric wires

Bundling wires in a pulled state when bundling them may cause connector performance failure or Malfunction.

Avoid the following methods.

- Banding near electric wire outlet  
(Band them at a point 30 mm or more away from the housing end surface.)
- Bundling of too many electric wires

### 8-2. Stacking

A defect such as deformation of the housing may be caused due to the weight of the housing and electric wires, so if they are stacked, the weight shall not be applied directly.

### 8-3. Protection of housing

To prevent dust etc. from attaching to the F housing, protect it with vinyl etc.

Protect the housing with vinyl, etc. to prevent dust from adhering to it.

Especially, the waterproof connector is equipped with a housing seal. Be sure to protect it with a vinyl etc. (The housing seal contains oil. If the content decreases remarkably, it may mate and impair the waterproof property.)

### 8-4. Precaution for conveyance

When conveying the F housing, protect it so that the shock of a drop etc. will be absorbed.

### 8-5. Other handling

- When routing the wires, bend them at a distance so that no excessive force is applied to the connectors. Excessive force applied to the connector may cause connector performance failure or malfunction (Fig. 6). (Bend the housing at least 30mm away from the housing end face in each direction.)
- Avoid actions in which shocks are applied such as throwing a harness.

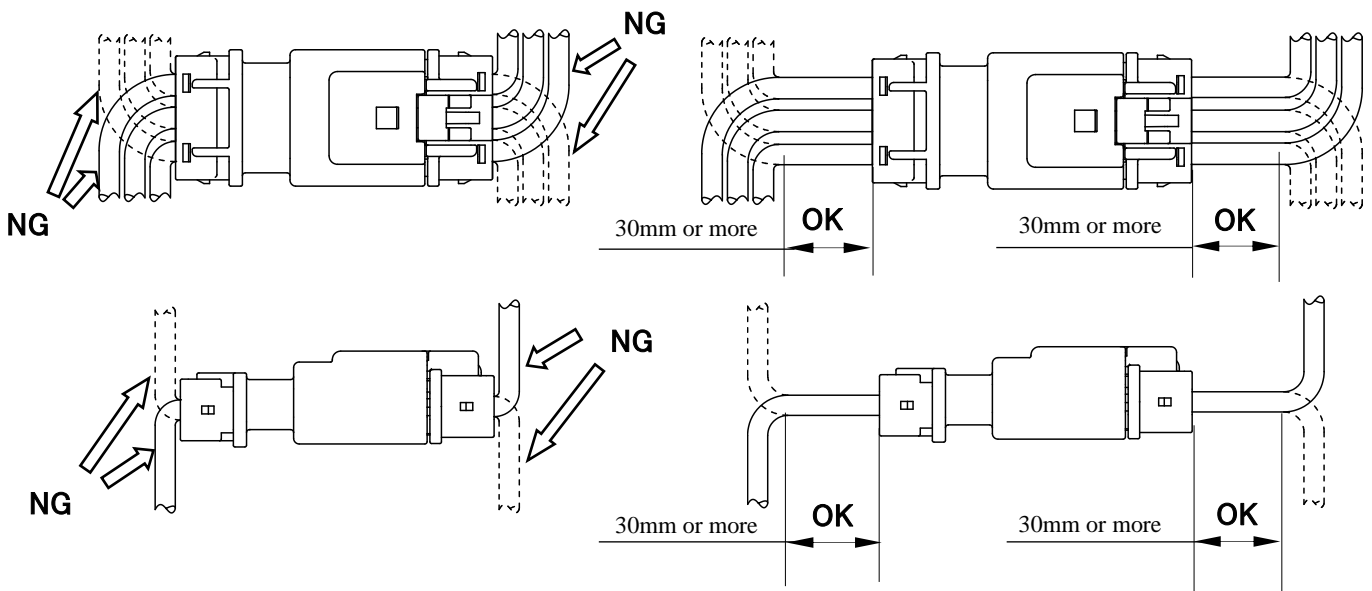


Fig.5: Wiring (Example)

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- As for the lock part of the F housing, do not apply force in the arrow direction in Fig. 7.

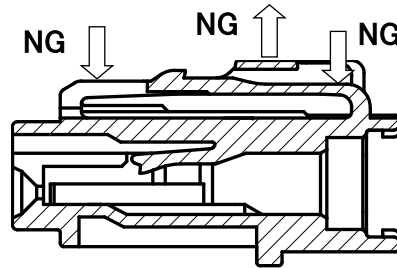


Fig.7: Lock Part of Housing, Direction in Which External Force Shall Not be Applied

## 9. Precautions for connector mating

### 9-1. Check of connector

- There shall be no attachment and foreign matter such as dust and dirt on the mated part.
- There shall be no deformation, crack, etc. of a connector or terminal.
- There shall be an allowance for an electric wire (routing), and with a connector mated, force such as tension shall not be applied to the connector.

### 9-2. Connector mating method

- Hold and mate a connector.  
(Do not mate it while holding the vicinity of the outlet of an electric wire.)
- Arrange the directions of the lock parts of the M Housing and F housing and mate them straightly (horizontally). If the housing is twisted and mated obliquely, a contact defect may be caused due to deformation or damage of the terminal and housing. (Fig. 8)
- When the connector has been mated completely, a click sound is heard at the time of locking, so check it. If it is mated incompletely and left for a long time, the lock of the F housing may not be returned while being lowered.

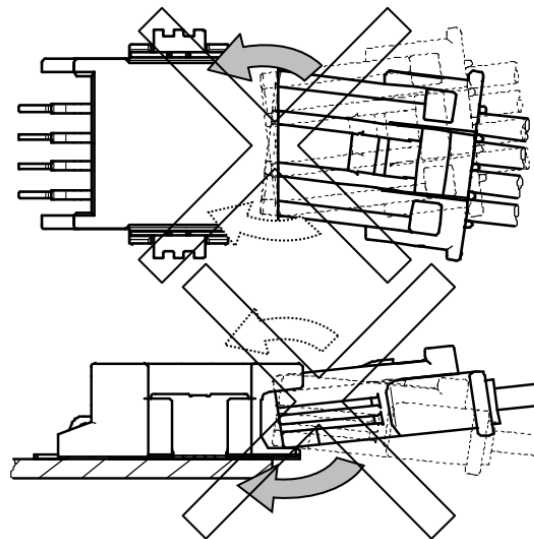


Fig.8: Mating Method of Pin Block and F Housing

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9-3. Board insertion of the board-in connector

- Hold the board insertion lead perpendicular to the board, and insert the board insertion lead into the board hole.

10. Precautions when pulling out the connector

When pulling out the connector, pull it straight (horizontally) while holding the connector to unlock the housing.

Do not pull the wires.

Also, pulling it out while twisting it at an angle may cause damage to the terminals and housing.

11. Precautions for solder mounting on the board

The solder mounting quality is greatly influenced by the mounting conditions such as temperature profile, solder paste, the atmosphere, N2 reflow, and board, so please be sure to evaluate the mounting.

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