




Applicable Products

Product name	Product code
IX30G-A-10S-CVL1(7.0)	CL0251-0063-0-00
IX30G-A-10S-CVL1(7.0)(01)	CL0251-0063-0-01
IX30G-B-10S-CVL1(7.0)	CL0251-0064-0-00
IX30G-B-10S-CVL1(7.0)(01)	CL0251-0064-0-01
IX30G-A-10S-CVL2(7.0)	CL0251-0065-0-00
IX30G-A-10S-CVL2(7.0)(01)	CL0251-0065-0-01
IX30G-B-10S-CVL2(7.0)	CL0251-0066-0-00
IX30G-B-10S-CVL2(7.0)(01)	CL0251-0066-0-01
IX31G-A-10S-CVL1(7.0)	CL0251-0067-0-00
IX31G-A-10S-CVL1(7.0)(01)	CL0251-0067-0-01
IX31G-B-10S-CVL1(7.0)	CL0251-0068-0-00
IX31G-B-10S-CVL1(7.0)(01)	CL0251-0068-0-01
IX31G-A-10S-CVL2(7.0)	CL0251-0069-0-00
IX31G-A-10S-CVL2(7.0)(01)	CL0251-0069-0-01
IX31G-B-10S-CVL2(7.0)	CL0251-0070-0-00
IX31G-B-10S-CVL2(7.0)(01)	CL0251-0070-0-01
IX32G-A-8S-CVL1(7.0)	CL0251-0071-0-00
IX32G-A-8S-CVL1(7.0)(01)	CL0251-0071-0-01
IX32G-B-8S-CVL1(7.0)	CL0251-0072-0-00
IX32G-B-8S-CVL1(7.0)(01)	CL0251-0072-0-01
IX32G-A-8S-CVL2(7.0)	CL0251-0073-0-00
IX32G-A-8S-CVL2(7.0)(01)	CL0251-0073-0-01
IX32G-B-8S-CVL2(7.0)	CL0251-0074-0-00
IX32G-B-8S-CVL2(7.0)(01)	CL0251-0074-0-01

	COUNT	DESCRIPTION OF REVISIONS	DESIGNED	CHECKED	DATE	
		DIS-E-00007854	MT. YASUDA	KI. KAGOTANI	20220215	
TITLE  IX30G, 31G, 32G RIGHT ANGLE PLUG ASSEMBLY INSTRUCTIONS				 HIROSE ELECTRIC CO., LTD.		
				APPROVED	MN. KENJO	20200818
				CHECKED	KI. KAGOTANI	20200818
				CHARGED	MT. YASUDA	20200818
				WRITTEN	MT. YASUDA	20200818
TECHNICAL SPECIFICATION				ETAD-E3213-00	 1 / 19	

# ix Industrial IDC Right Angle Plug Cable Assembly Instructions

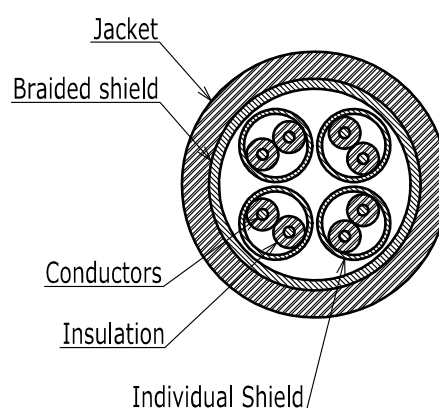
## 1. Scope of Applications

This manual specifies cable assembly procedures of the IX30G, IX31G, IX32G Series right angle plug.

## 2. Applicable cable

· IX30G-※-10S-CVL※(7.0)※

Items		Specifications
Conductors	Size	AWG26~28
	Number	7 Stranded wires
	Material	Annealed copper wire
Insulation Outer Diameter		ø0.95~1.05mm
Braided Shield		Tin Plated
Outer Jacket Diameter		ø6.3~7.2mm



· IX31G-※-10S-CVL※(7.0)※

Items		Specifications
Conductors	Size	AWG24~25
	Number	7 Stranded wires
	Material	Annealed copper wire
Insulation Outer Diameter		ø1.1~1.25mm
Braided Shield		Tin Plated
Outer Jacket Diameter		ø6.3~7.2mm

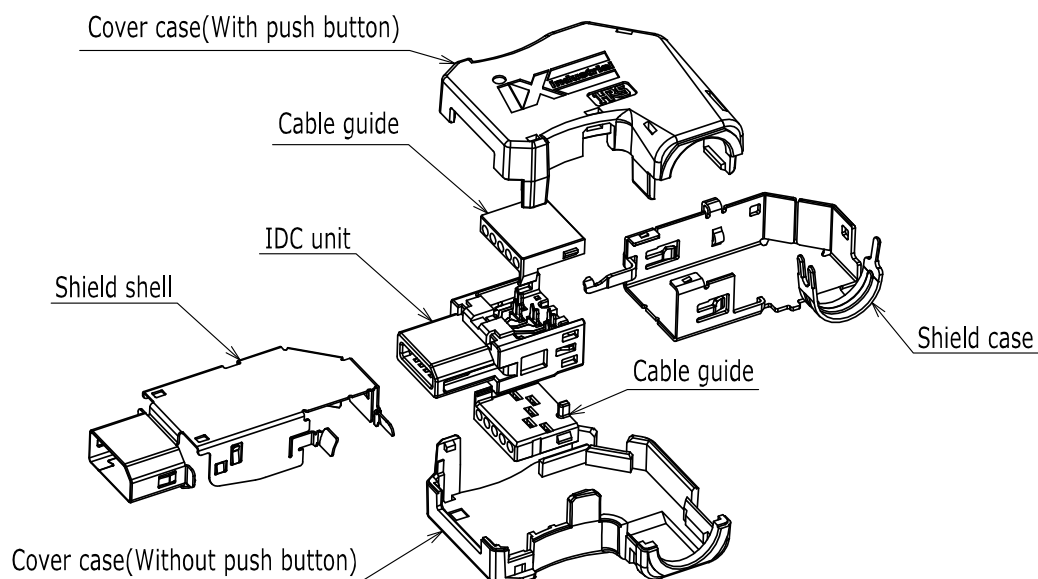
· IX32G-※-8S-CVL※(7.0)※

Items		Specifications
Conductors	Size	AWG22
	Number	7 Stranded wires
	Material	Annealed copper wire
Insulation Outer Diameter		ø1.4~1.6mm
Braided Shield		Tin Plated
Outer Jacket Diameter		ø6.3~7.2mm

## 3. Operation Procedures

Please refer to the following pages.

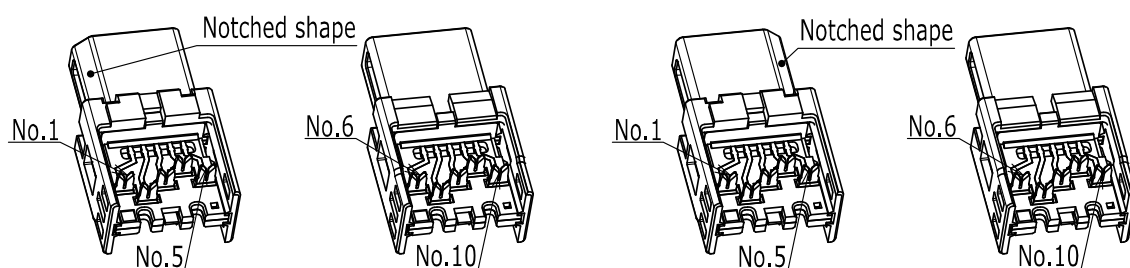
#### 4. Component Names



#### 5. IDC Unit Contact Number Assignment

[Key A]

[Key B]



#### 6. Wire arrangement for each contact

[Key A] In case of the Ethernet applications

Contact number	Signal		TIA cable wiring color	
	10/100 Mbit/s	1/10 Gbit/s	TIA/EIA-568-A	TIA/EIA-568-B
1	TX+	BI_DA+	White/Green	White/Orange
2	TX-	BI_DA-	Green	Orange
3	N.C	N.C	N.C	N.C
4	N.C	BI_DC+	Blue	Blue
5	N.C	BI_DC-	White/Blue	White/Blue
6	RX+	BI_DB+	White/Orange	White/Green
7	RX-	BI_DB-	Orange	Green
8	N.C	N.C	N.C	N.C
9	N.C	BI_DD+	White/Brown	White/Brown
10	N.C	BI_DD-	Brown	Brown

[Key B] There is no contact assignment for non-Ethernet applications.

## 7. Required components and tools

The required component and tool examples for the cable assembly are given below.

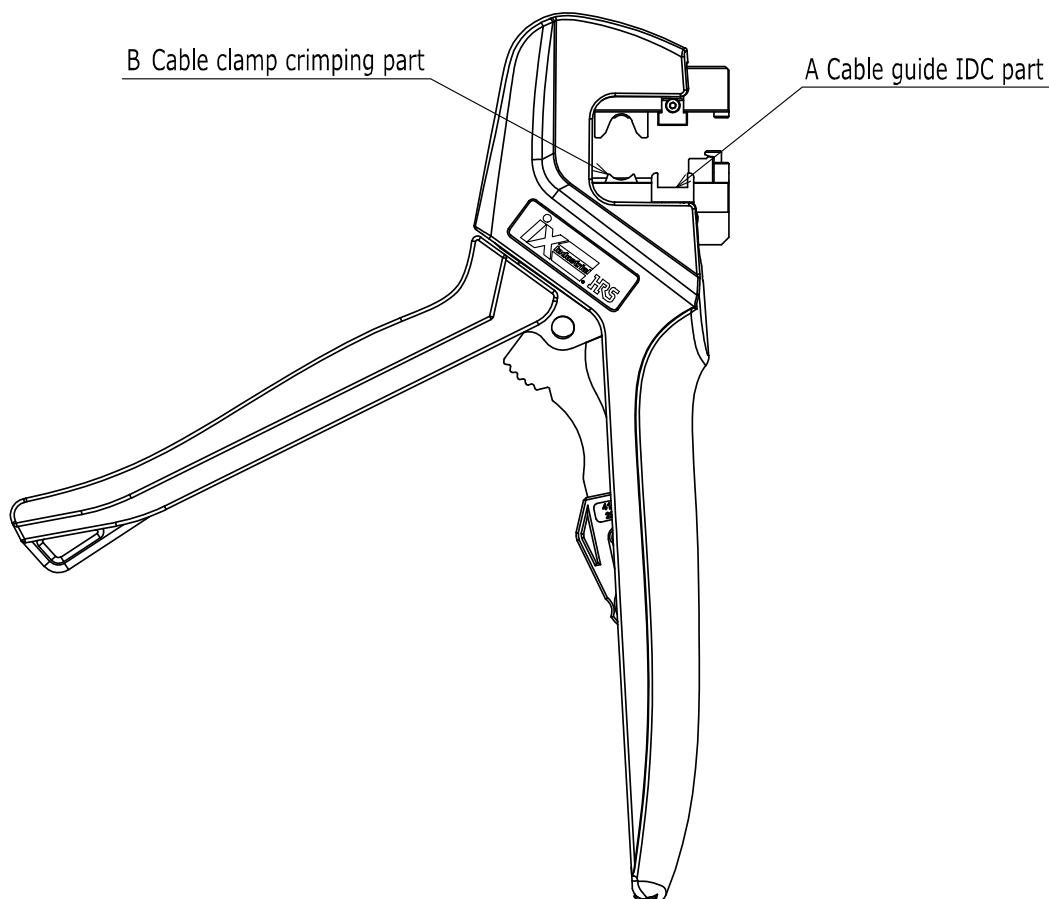
- Cable length (finished length L + 30mm length inside the plug per end)
- Copper tape (4mm to 5mm width)
- IDC/Crimp Hand tools (HT803/IXG-10S-CVL-70)
- Calipers or Rulers (For cable termination length measurement)
- Cutters (For stripping cable jacket)
- Scissors (For cutting braided shield)
- Nippers (For cutting core wires)

## 8. Hand tools

Use part A of the cable guide for IDC termination and part B for cable clamp crimping.

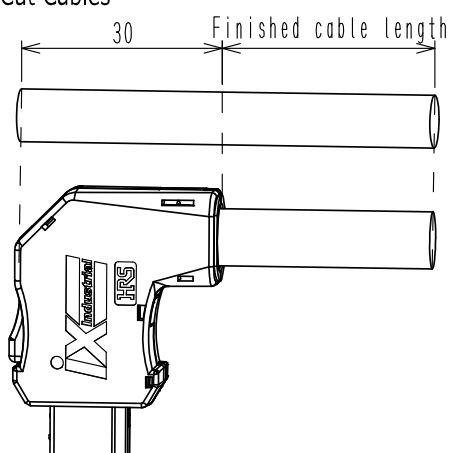
Tool Name	Tool Code
HT803/IXG-10S-CVL-70	CL0902-2223-0-00

Please refer to instruction manual (ATAD-P0358) for tool handling.



## 9. Cable termination

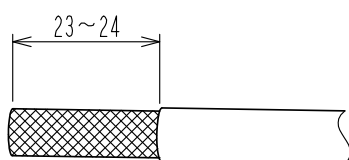
### ① Cut Cables



Cut cables.

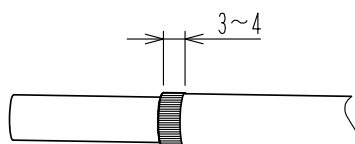
Necessary cable length =  
finished cable length + excess length  
(30mm from the cover case to the cable end)

### ② Strip Jacket



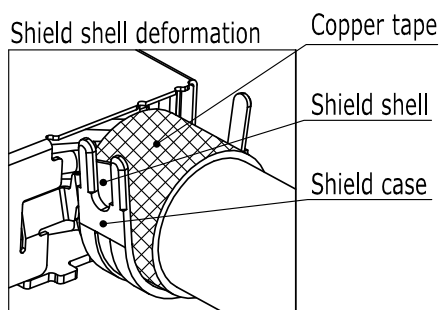
Strip cable jacket 23mm - 24mm from cable edge.

### ③ Braided Shield Processing



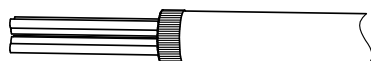
Pull the braided shield back over the Jacket,  
unravel braided shield wires and cut 3mm - 4mm long.

※3mm-4mm is recommended. In step 12 "Crimp Cable Clamp", the shield case clamp can be used to crimp the braided shield together with the cable. After completing the assembly in step 13, please ensure the braided shield does not come out from the edge of the cover case and adjust accordingly if it does.



※Please evenly unravel the braided shield wires.  
There will be variance in the cable thickness after wrapping the copper tape if the braided shield is gathered together. This may result in shield shell deformation from interference with the copper tape during the assembly process of the shield case and shield shell as described below.

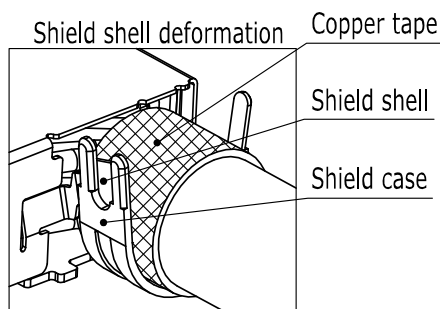
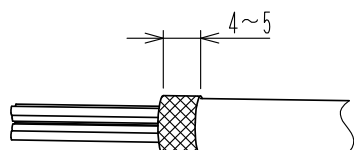
### ④ Cut Tape/Other materials/Individual Shield



If there is tape, other materials inside or an individual shield, use nippers, etc. to cut off and to expose the insulation.

※Be careful not to damage the insulation while cutting.

# ⑤ Wrap copper tape



Pull the braided shield back over the jacket and wrap the copper tape free from folds on it.  
Use copper tape with 4mm - 5mm width to prevent the braided shield sticking out.

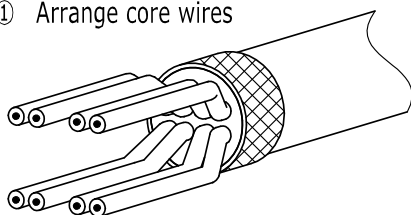
※4mm-5mm is recommended. In step 12 "Crimp Cable Clamp", the shield case clamp can be used to crimp the braided shield together with the cable. After completing the assembly in step 13, please ensure the braided shield does not come out from the edge of the cover case and adjust accordingly if it does.

※Please wrap the copper tape between 1 and 2 turns. The wrapped part of the cable's diameter should be between  $\phi 6.4\text{mm}$  to  $7.4\text{mm}$ .

※Wrap the tape tightly otherwise shield shell deformation from interference with the copper tape during the assembly process of the shield case and shield shell as described below.

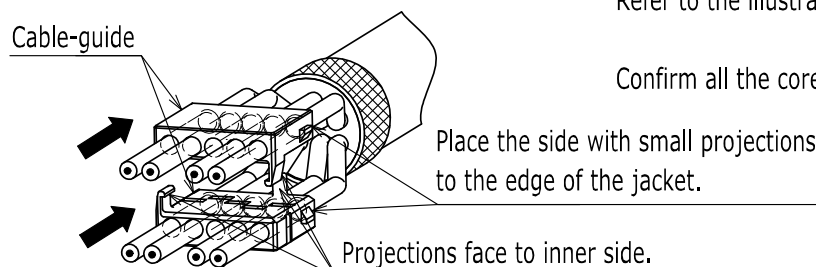
## 10. IDC termination to the IDC unit.

### ① Arrange core wires



Arrange the wires in two rows with four wires in each row for easy insertion to cable guide.

### ② Insert core wire into cable-guide

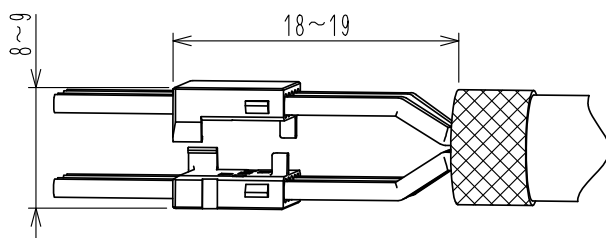


Insert core wire into cable guide.

Refer to the illustration for the cable guide directions.

Confirm all the core wires passed through the cable guide.

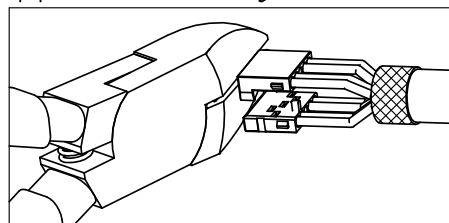
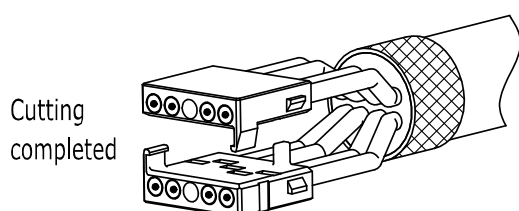
### ③ Cut excess length



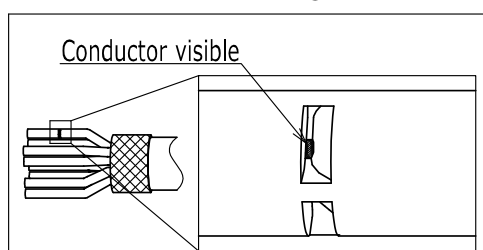
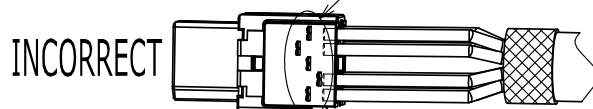
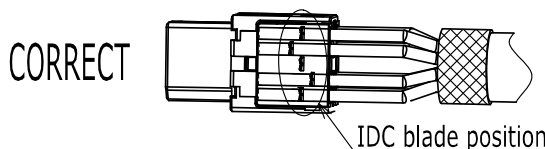
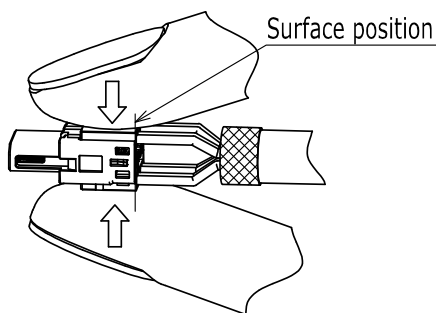
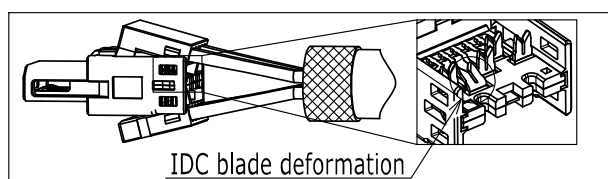
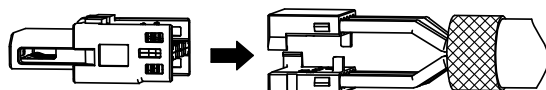
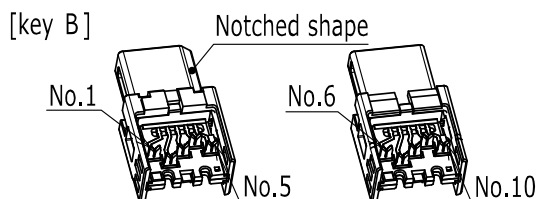
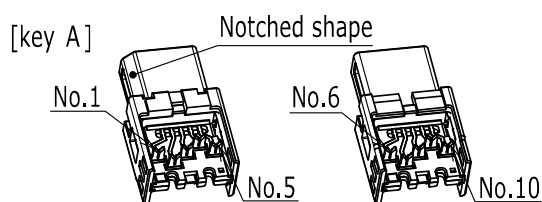
Set the distance between cable guide to 8mm - 9mm.

Adjust the cable guide position so that the length from the edge of the jacket to the edge of the cable guide is 18mm-19mm.

Cut excess wires along cable guide edge to ensure the tip position of the cable guide and the wire are aligned.



④ Temporary cable-guide insertion to the IDC unit.



Assemble the cable guide with the core wire passed through to the IDC unit.

※The cable-guide can be inserted to the IDC unit in either direction. Recheck the contact assignment sequence and temporarily insert to IDC unit.

Open the cable guide for easy insertion to the IDC unit.

※When opening the cable guide, make sure the core wire does not slip off from the cable guide.

※If the cable guide pushes the IDC unit with insufficient opening space, the cable guide may hit the tip of the IDC blade, resulting in IDC blade deformation. Assemble with caution.

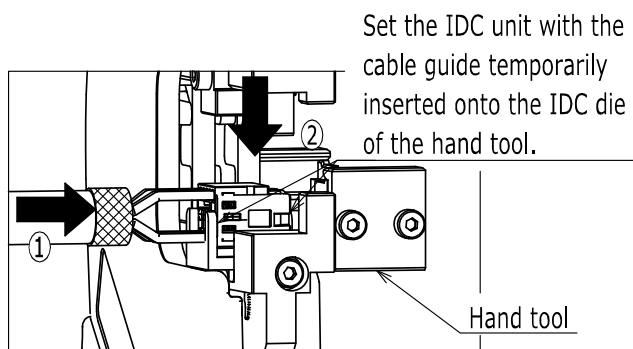
Insert the IDC unit into the cable guide. Align the position of the edge of the cable guide and IDC unit while pushing with fingers for temporary insertion to confirm that the core wires do not slip off. Push down with fingers until the wire hits the IDC blade.

※After temporary insertion, check that the cable guide does not come off even when the finger is removed.

※Check that the wire does not slip off from the IDC blade during temporary insertion.

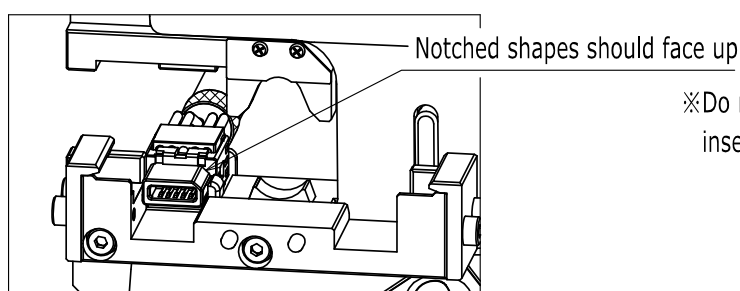
※Confirm the core wire appearance if the cable guide slips off from the IDC unit. If scratches on the IDC blade do not reach the conductor, it can be used after re-inserting the cable guide.

## ⑤ Insulation displacement with hand tools

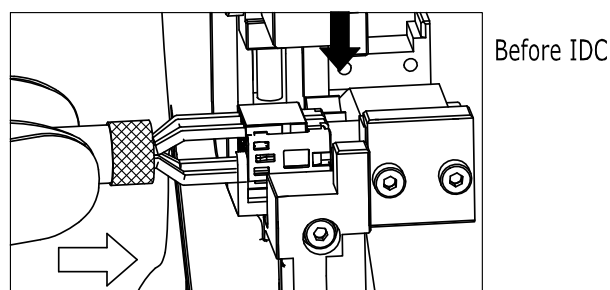


Perform the insulation displacement by using part A of the hand tool. Set the IDC unit with the cable guide temporarily inserted into the hand tool with the notched shape facing up. Align with the hand tool IDC guide and set the IDC unit onto the IDC die of the hand tool vertically from above.

※Recheck whether the core wire has slipped off before insulation displacement.

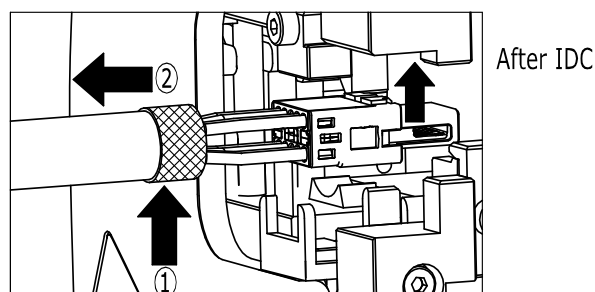


※Do not set the IDC unit with temporary cable-guide inserted at a diagonal.



After successfully setting up the hand tool, hold the hand tool while forcing the cable towards the IDC unit in order to avoid the wire slipping off from the cable guide, and perform IDC termination.

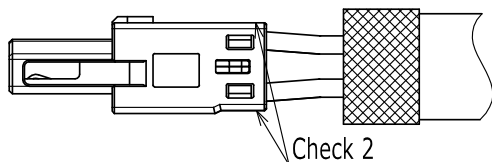
The ratchet of the hand tool can be released and the plug unit removed by pressing down on the hand tool after it is fully closed.



Lift the plug unit upward to ensure it is completely withdrawn from the hand tool and then remove.

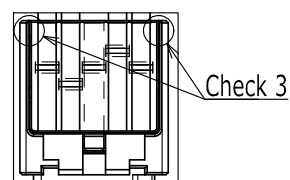
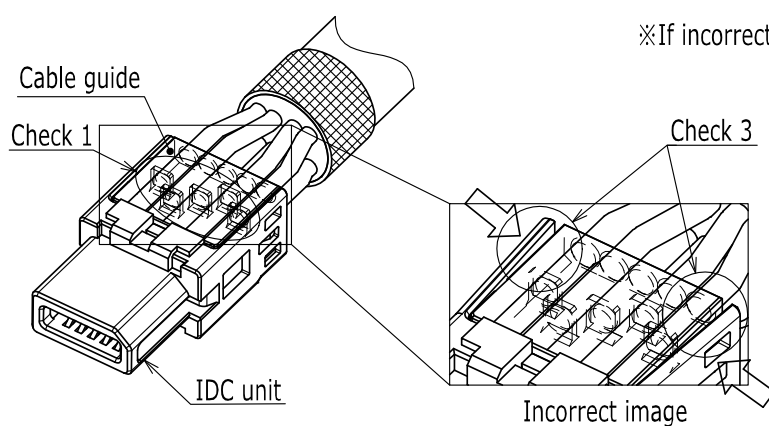


Please check the 3 points below after IDC completion.



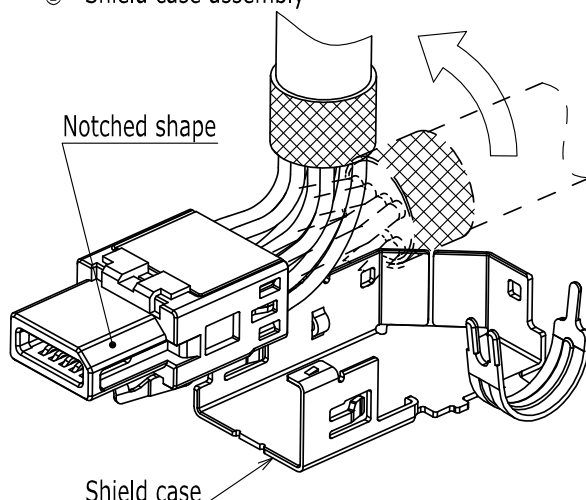
1. The core wire does not come off from the IDC blade.
2. The height of the IDC unit and cable guide after IDC termination are the same.
3. There is no gap between the IDC unit and the cable guide. If the gap can be closed by pressing the areas indicated by arrows by hand, then it can be used without problem.

※If incorrectly wired, reassemble using a new IDC unit.



## 1 1. Shield case and shield shell assembly

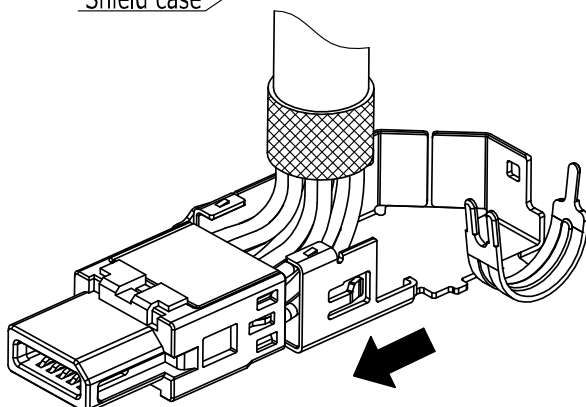
### ① Shield case assembly



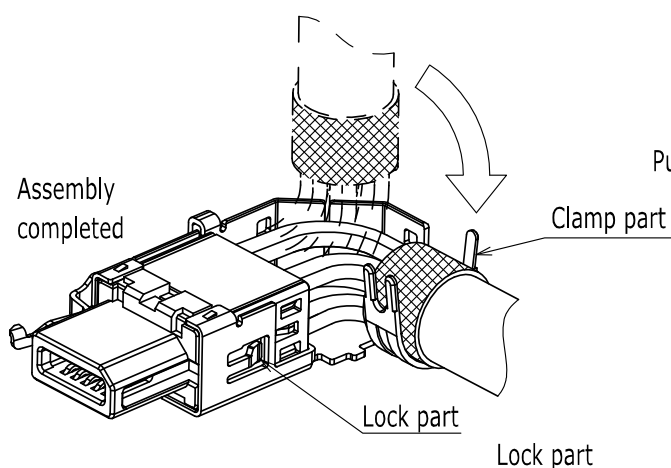
Assemble the shield case to the plug unit to which the IDC termination with the cable has been performed.

Pull the cable upward and fit the shield case onto the lower side of the cable.

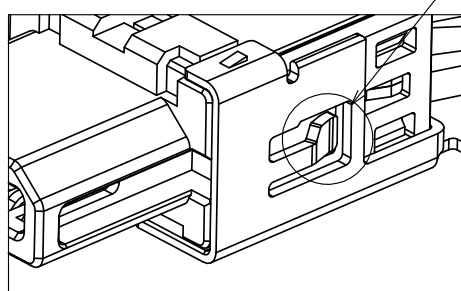
※The notches shape of the plug unit faces upward in respect to the shield case as shown in the figure.



Slide the shield case in place until you hear the plug unit making a click sound.

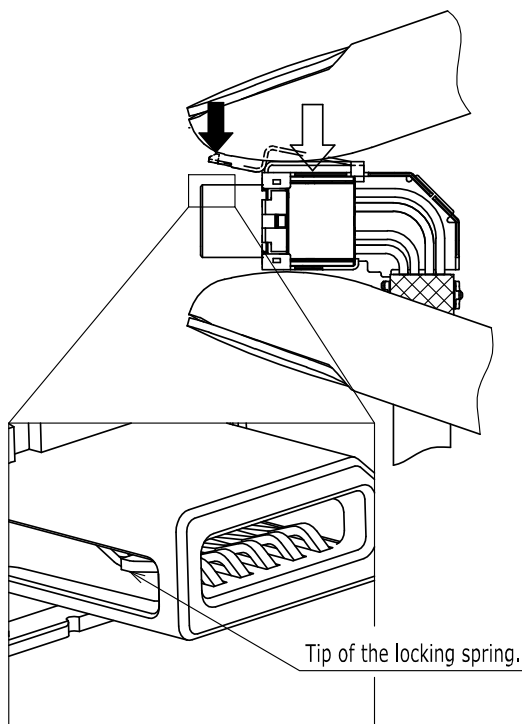


Pull the cable to the clamp part of the shield case.



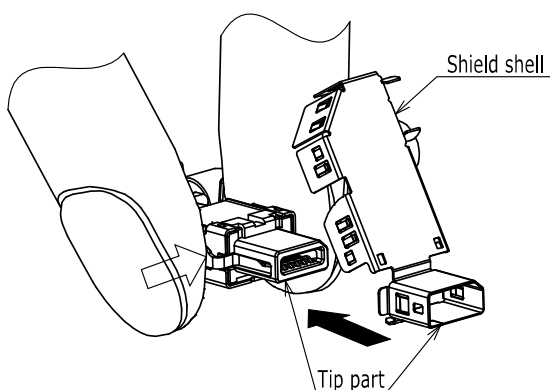
Check to ensure both sides are locked after assembly completion.

## ② Shield shell assembly



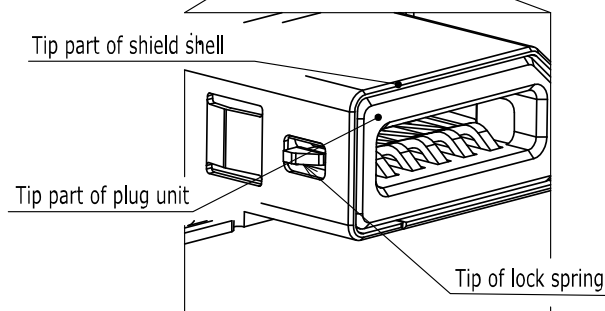
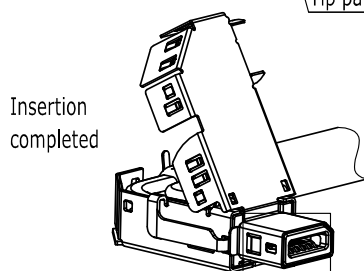
Assemble shield shell onto the plug unit with shield case attached.

While assembling the shield shell, push on the spring on the shield case to keep the locking spring inside of the plug unit as shown in the figure.

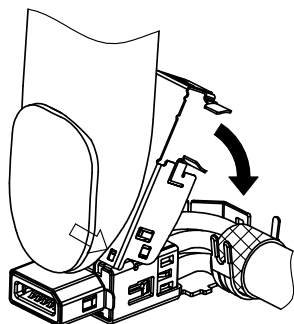


Insert the shield shell in the direction of the arrow while pushing in the spring.

Stop pushing the locking spring after the tip parts of the plug unit and the shield shell are aligned.

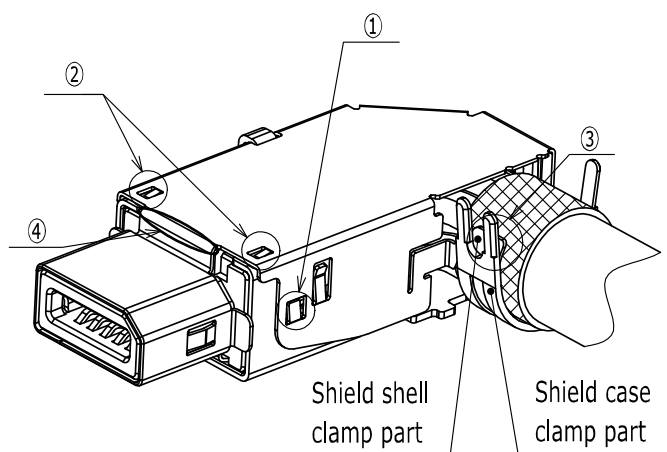


※After insertion completion, confirm the tip of locking spring is projecting from the shield shell opening, and tip parts of the plug unit and shield shell are aligned.



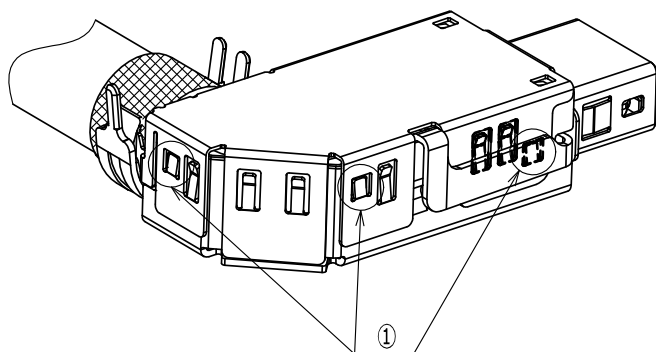
Push down shield shell in the direction shown in the figure and align the shield case and shield shell clamp.

※When assembling the shield shell, please press the spot close to the bending area. If you press down the top of the shield shell (crimping part area) the shield shell may deform.

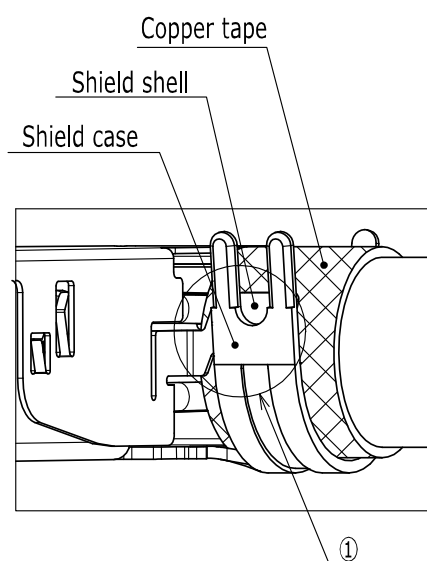


Please check the 4 points below after assembly completion.

- ① Whether the parts of the shield shell and shield case that should be engaged are or not.
- ② The projection of the shield case is caught in the opening of the shield shell.
- ③ The clamp of the shield shell is placed behind the clamp of the shield case.
- ④ Shield shell close to the bending area is not deformed.



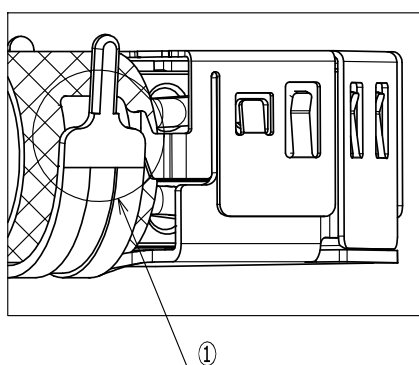
CORRECT



The shield shell may deform during insertion if the cable and copper tape hit the shell.

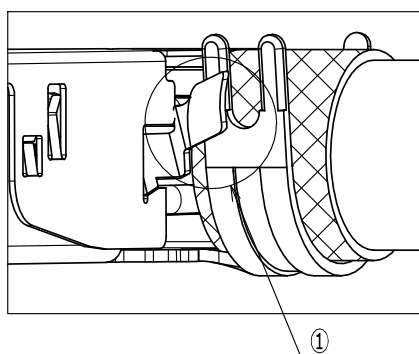
① Shield shell does not protrude from the shield case.

CORRECT



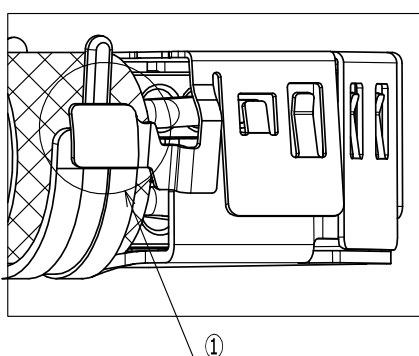
① Shield shell does not protrude from the shield case.

INCORRECT



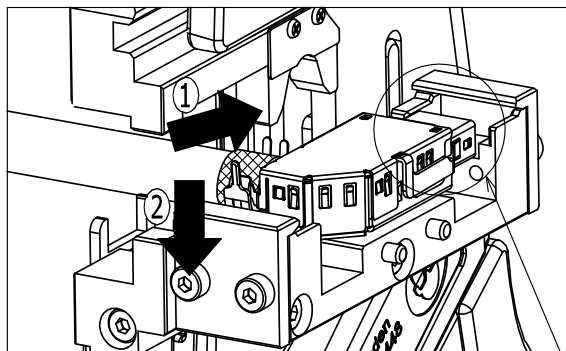
① Shield shell protrudes from the shield case.

INCORRECT



① Shield shell protrudes from the shield case.

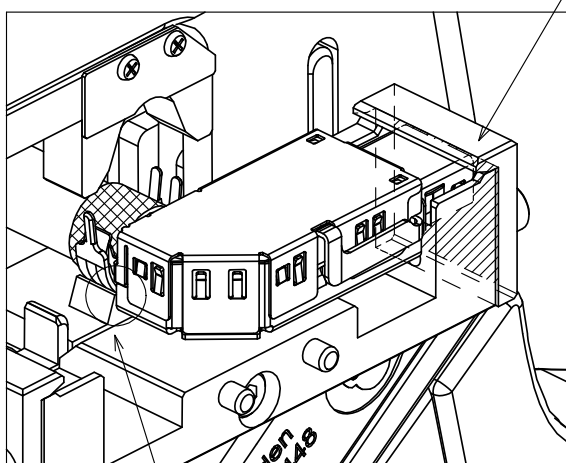
## 1 2. Crimp Cable Clamp



Place inner unit head onto crimping die of the hand tool.

Crimp the cable with shield case clamp.  
Insert inner unit (the plug unit assembled with shield case and shield shell) at a slight diagonal to avoid interference. Slightly lower the inner unit when the tip touches the crimping guide of the tool.

Inner unit touches the crimping die of the tool.

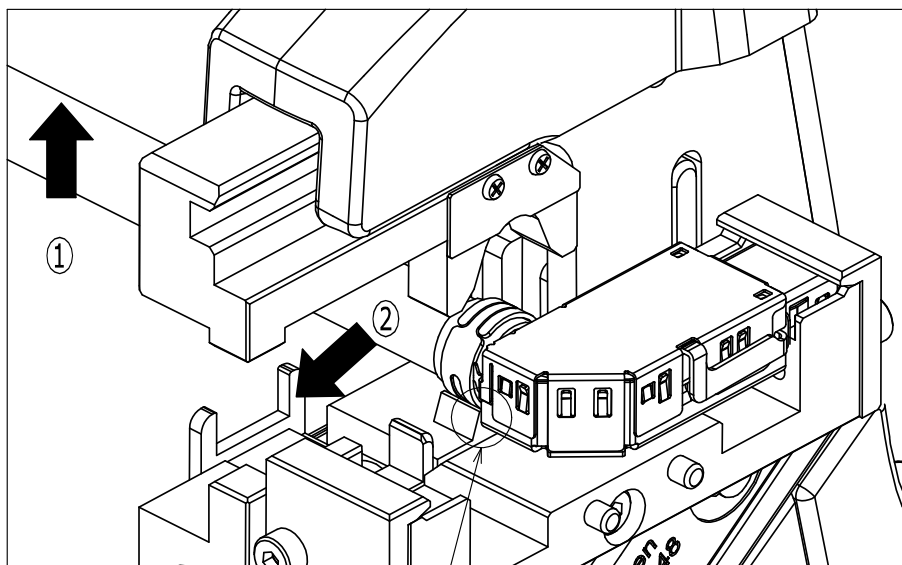


※After setting is completed, check that the inner unit touches the crimping die of the tool, and the shield case is caught in the hand tool when the cable is pulled.

After correct setting is confirmed, squeeze handles while pushing the cable in insertion direction.

Recommended crimp strength in cable axial direction : 60N or above

Shield case is caught in the hand tool when the cable is pulled.



Remove the cable by lifting upward to avoid the shield case getting caught in the hand tool.

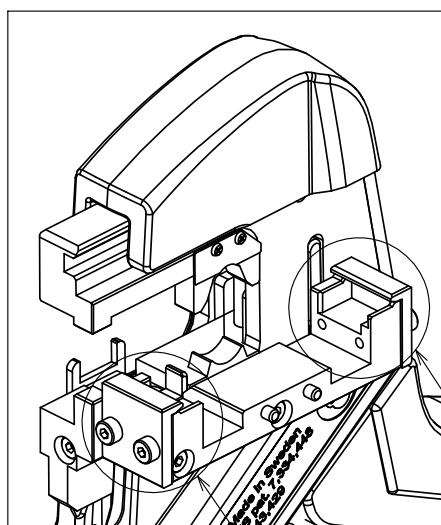
※The cable cannot be pulled out in a straight direction if it is caught in the hand tool after crimping, please lift the cable up before taking it out.

Be careful not to damage the connector during cable removal.

※After removing the connector, please confirm the correct status described in page 12 is maintained.

If the connector does not appear as described in page 12, there is a risk that the cover case cannot be assembled in "13. Cover case assembly."

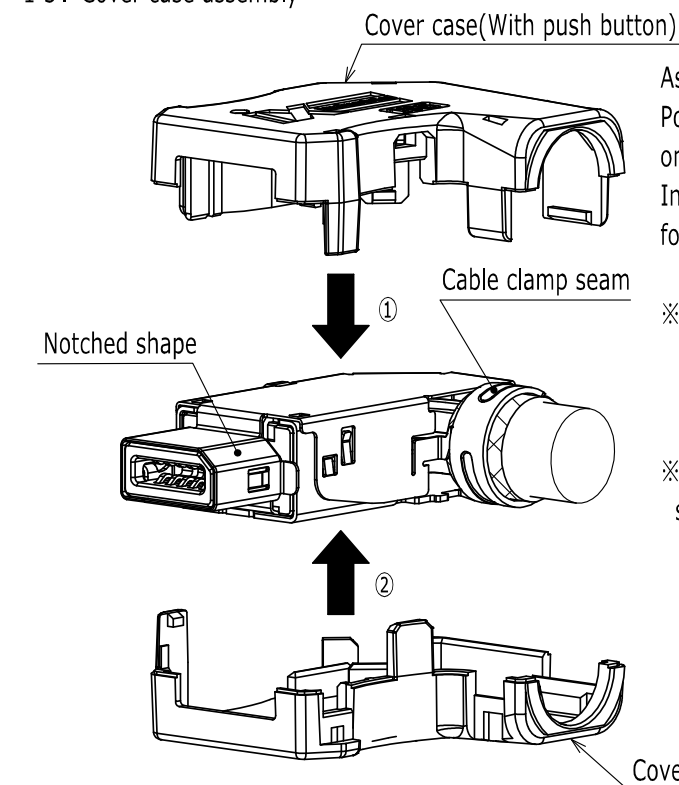
※The clamping guides are different for CVL1 and CVL2. When clamping CVL2, use the clamping guide for CVL2 in the same way as described in this document.



Clamp guide for CVL1

Clamp guide for CVL2

### 1 3. Cover case assembly

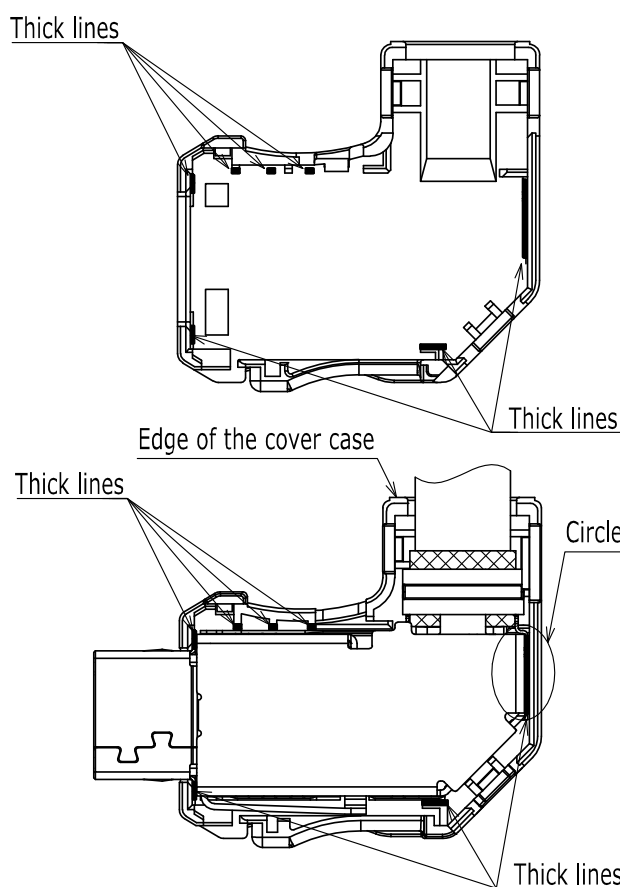


Assemble the cover case.

Position so that the cable clamp seam and the notched shape on the plug are facing upward as shown in the left diagram. Install the top cover case (with push button) first followed by the bottom cover case (without push button).

※We do not recommend installing from the lower side (without push button) because the connector may be deformed.

※The figure features the A key, but the notched shape should be facing upward for all key types.

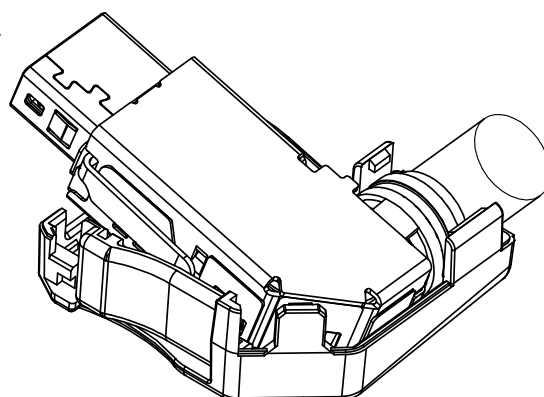


Fit the case by aligning the thick lines as shown in the left figure.

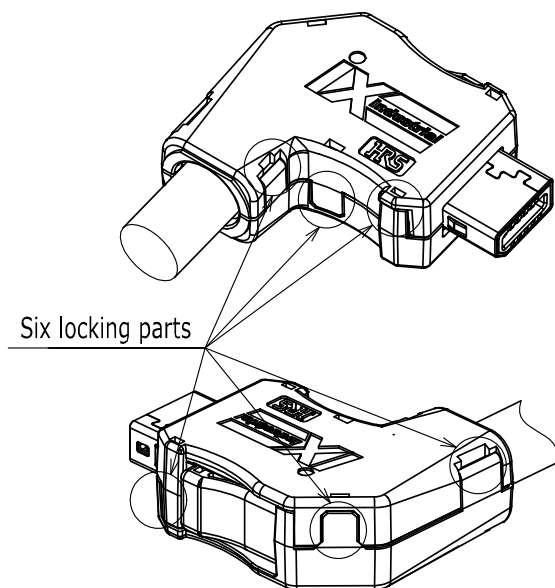
※Confirm to ensure the copper tape and the braided shield do not come out from the edge of the cover case.

※The shield shell may get caught on the cover case in the circled portion.

In that case, tilt the inner unit diagonally, insert the circled portion of the shield shell and then push in the tip as shown in the below figure.



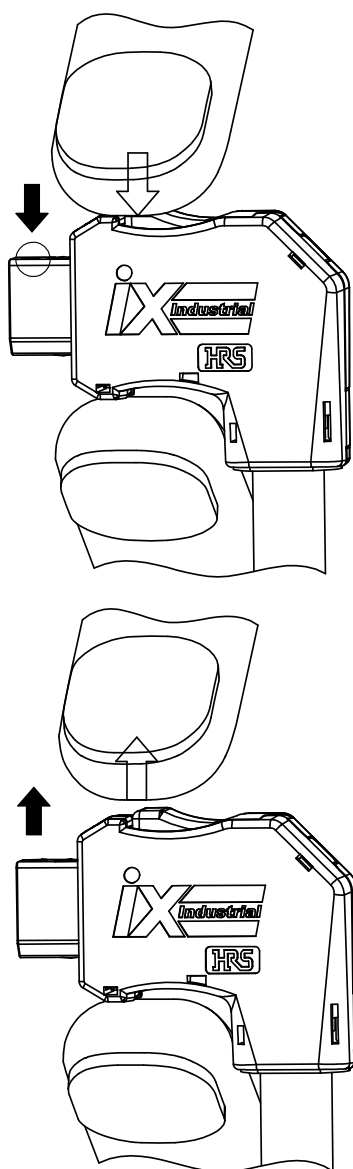




There are six locking parts on the cover case. Ensure all the locking parts are completely engaged. Push the sides of the locking parts if cover case assembly is not completed even after pushing on the top and bottom.

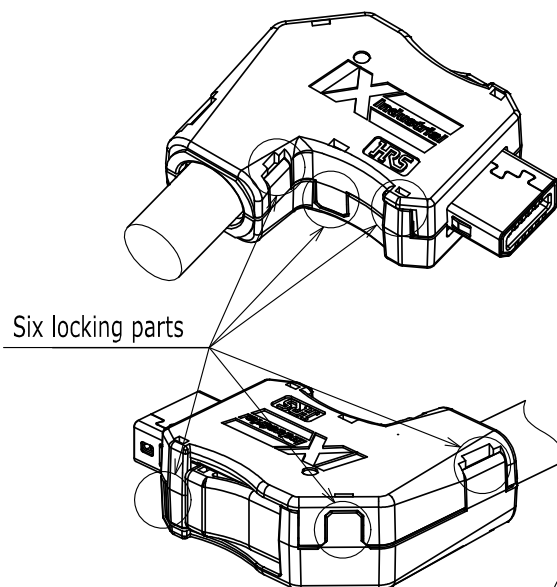
※Confirm to ensure outlines of cover case are aligned in place.

※The shield shell may be visible from the seam of the cover case, but this does indicate an issue.



After cover case assembly confirm that the top of the lock can no longer be seen when pushed down into the locking spring and that the lock returns when the finger is removed.

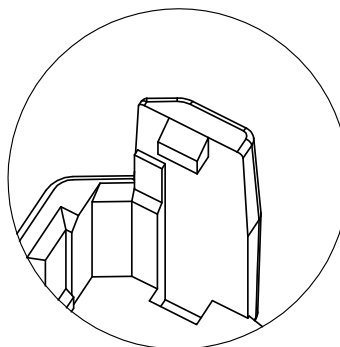
#### 1 4. Cover Case Reusage



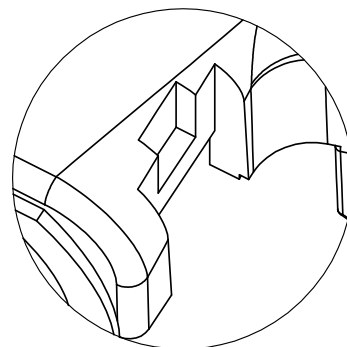
When reusing the cover case check that there are no scratches, chips or deformation on the latches and recesses of the six locking parts of the cover case. Afterwards assemble in accordance with "13. Cover case assembly".

- ※The cover case cannot be reused if the latches or recesses are scratched, chipped or have turned white.
- ※If one of the engaging parts has been deformed it cannot be reused even if returned to the original position because it loses the springiness.

Latch



Recess



#### 1 5. Wiring Precautions

- Depending on sheath thickness, it may not be possible to crimp the braided shield together with the cable at the shield case clamp.

##### Handling Method

When processing the braided shield, the braided shield and cable can be crimped together by setting the folded amount of the braided shield to be longer than the recommended 3-4mm. (See page 4, ③.)

- ※Adjust the length so that braided shield and copper tape do not project from the cover case.

- The IDC blade may deform during temporarily cable guide insertion to the IDC unit.

##### Handling Method

By opening the cable guide beforehand for easy insertion to the IDC unit, the cable guide will not hit the tip of the IDC blade, preventing IDC blade deformation. (See page 6.)

- ※When opening the cable guide, make sure that the core wire does not slip off from the cable guide.

This document is subject to change without notice.

Please check and download the latest version from the Hirose website.

Concluded

## 1 6. Revision history

Rev No.	Content of revision	Prepared by	Checked by	Approved by	Date
0	The first edition	MT.YASUDA	KI.KAGOTANI	MN.KENJO	2020/08/17
1	Wording correction Added about cover case reusage	CT.YAMAMOTO	KI.KAGOTANI	MN.KENJO	2020/11/16
2	Precautions for cover case installation added.	SN.TOYOSHIMA	KI.KAGOTANI	MN.KENJO	2020/12/21
3	Added note on repairing after IDC Added wiring precautions	MY.KOMUKAI	KI.KAGOTANI	MN.KENJO	2021/07/27
4	Changed the folded amount of the braided shield. Remoted note on crimp height confirmation. Added that the information is subject to change without notice.	MY.KOMUKAI	KI.KAGOTANI	MN.KENJO	2022/02/03