




Applicable Products

Product name	Product code
IX40G-A-10S-CVL1(7.0)	CL0251-0075-0-00
IX40G-A-10S-CVL1(7.0)(01)	CL0251-0075-0-01
IX40G-B-10S-CVL1(7.0)	CL0251-0076-0-00
IX40G-B-10S-CVL1(7.0)(01)	CL0251-0076-0-01
IX40G-A-10S-CVL2(7.0)	CL0251-0077-0-00
IX40G-A-10S-CVL2(7.0)(01)	CL0251-0077-0-01
IX40G-B-10S-CVL2(7.0)	CL0251-0078-0-00
IX40G-B-10S-CVL2(7.0)(01)	CL0251-0078-0-01

	COUNT	DESCRIPTION OF REVISIONS	DESIGNED	CHECKED	DATE	
		DIS-E-00007854	MT. YASUDA	KI. KAGOTANI	20220215	
T I T L E  IX40G 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-E3222-00	 1 / 17	

# ix Industrial Soldering Right Angle Plug Cable Assembly Instructions

## 1. Scope of Applications

This manual specifies cable assembly procedures of the IX40G Series right angle plug.

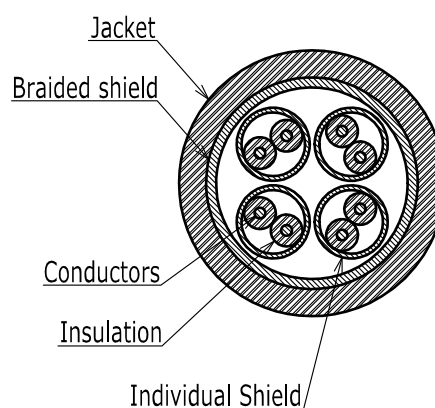
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IX40G-A-10S-CVL2(7.0)	CL0251-0077-0-00
IX40G-A-10S-CVL2(7.0)(01)	CL0251-0077-0-01
IX40G-B-10S-CVL2(7.0)	CL0251-0078-0-00
IX40G-B-10S-CVL2(7.0)(01)	CL0251-0078-0-01

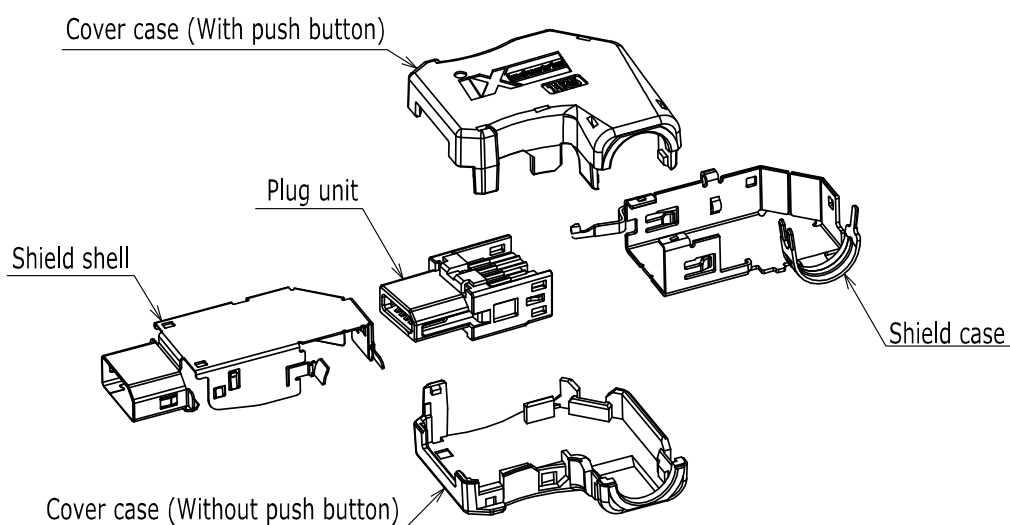
## 3. Applicable Cable

・IX40G-※-10S-CVL※(7.0)※

Items	Specifications
Conductors Size	AWG 28-22
Insulation Outer Diameter	ø 1.55 mm Max
Braided Shield	Tin Plated
Outer Jacket Diameter	ø 6.3 -7.2 mm



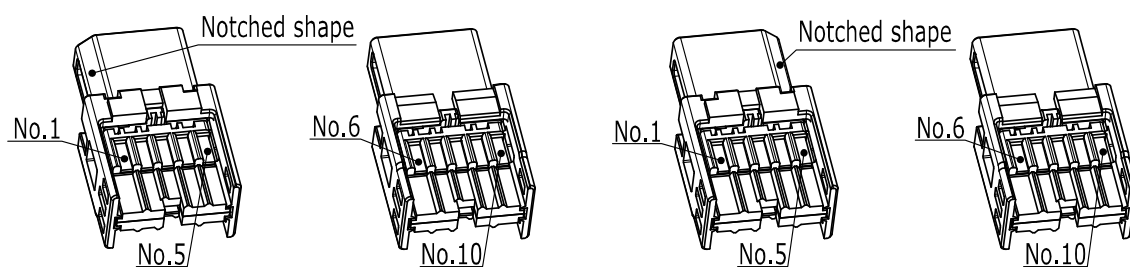
#### 4. Component Names



#### 5. Plug 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.

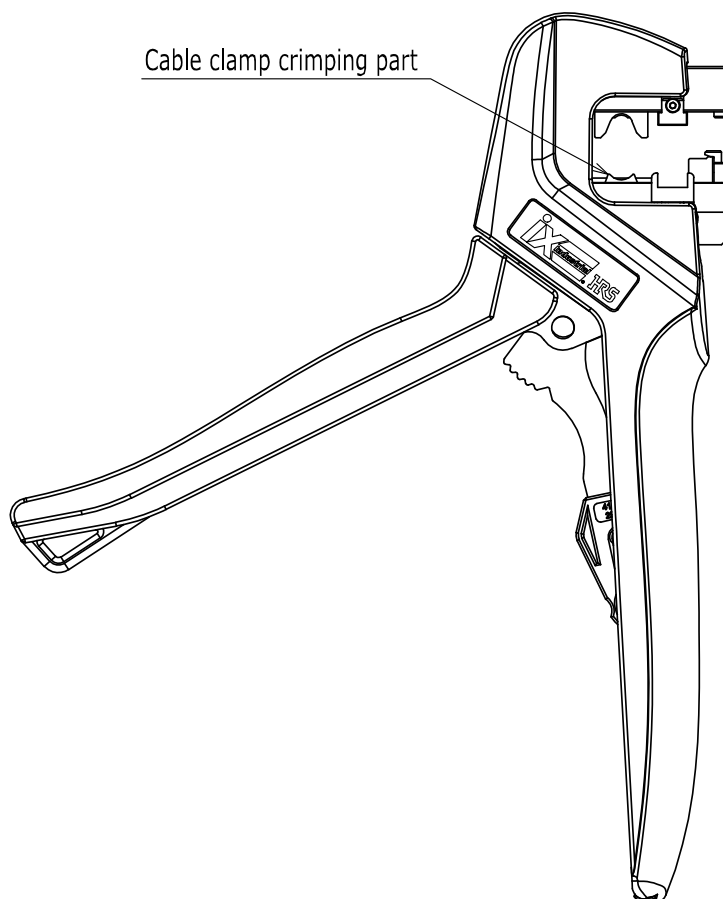
- Cable length (finished length L + 25mm length inside the plug per end)
- Copper tape (4mm to 5mm width)
- Hand tool for crimping cable clamp (HT803/IXG-10S-CVL-70)
- Calipers or Rulers (For cable termination length measurement)
- Cutters (For stripping cable jacket)
- Scissors (For cutting braided shield)
- Nippers (For cutting core wires)

## 8. Hand tools

Crimp cable clamp by using the hand tool as illustrated below.

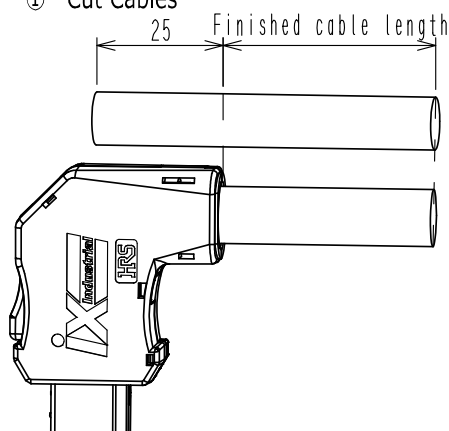
Tool Name	Tool Code
HT803/IXG-10S-CVL-70	CL0902-2223-0-00

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



## 9. Cable termination

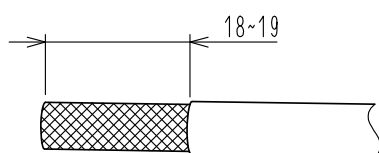
### ① Cut Cables



Cut cables.

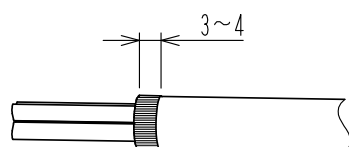
Necessary cable length =  
finished cable length + excess length  
(25mm from the cover case to the cable end)

### ② Strip Jacket



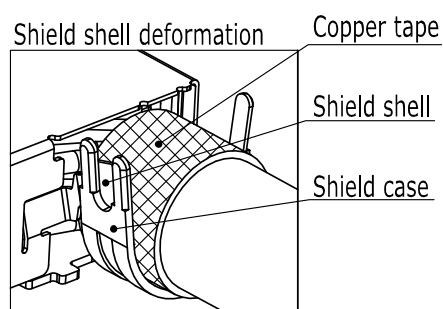
Strip cable jacket 18mm - 19mm from cable edge.

### ③ Braided Shield Processing



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

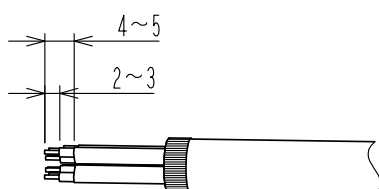
※3mm-4mm is recommended. In step 12 "Crimp Cable Clamp", the shield case clamp can be used to crimp the braided shield together with the cable. After completing the assembly in step 13, please ensure the braided shield does not come out from the edge of the cover case and adjust accordingly if it does.



※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.

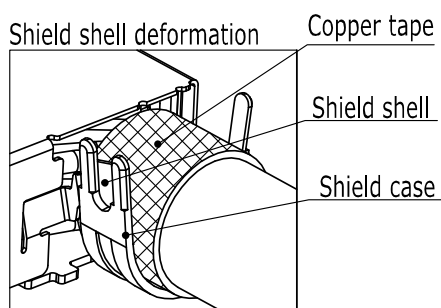
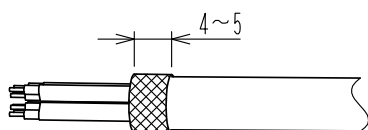
### ④ Cut Tape/Other materials/Individual Shield



If there is tape, other materials inside or an individual shield, use nippers, etc. to cut them to 4mm-5mm long from the top of the conductor, use a wire stripper to strip insulation to 2mm-3mm long from the top of conductor.

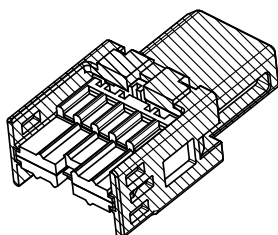
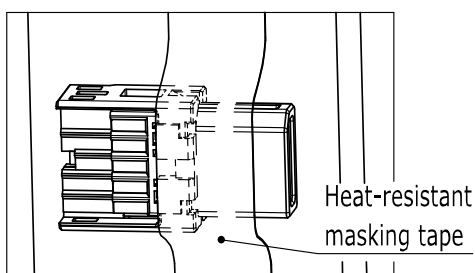
※Be careful not to damage the insulation while cutting.

# ⑤ Wrap copper tape



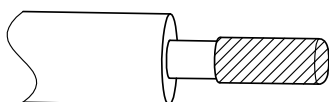
## 10. Solder wire to plug unit

### ① Protect connector while soldering

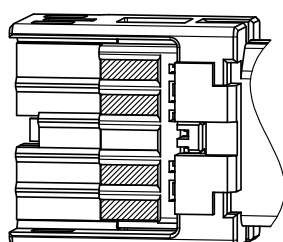
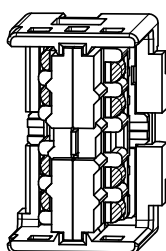
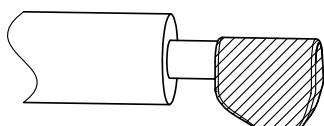


### ② Pre-tin

CORRECT



INCORRECT



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 may occur during the assembly process

Attach heat-resistant masking tape on plug unit where it can be easily touched, to protect plug unit.

It is recommended to perform soldering with the soldering iron in the right hand, and the tape in left hand (for right-handed people).

Work in the direction illustrated on the left.

※Especially for the molding area with hatched lines, be sure it is not deformed by heat, because it will interfere with other components if deformed. Make sure that the soldering iron tip does not touch other areas of the mold resulting in deformation.

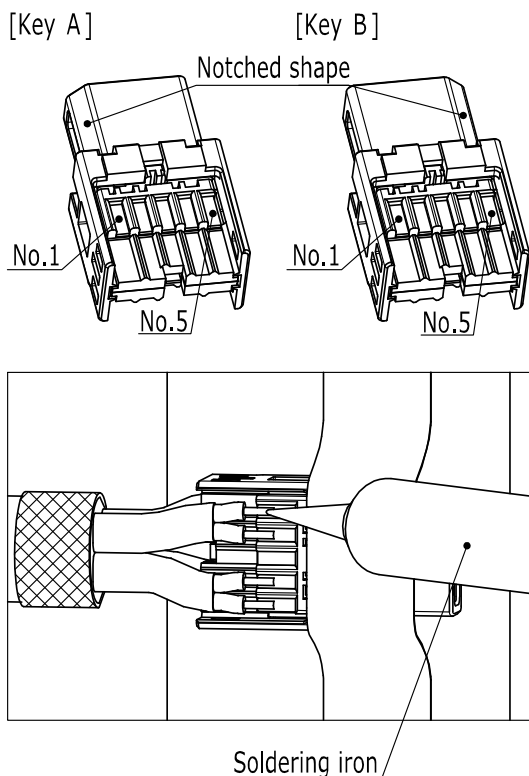
Pre-tin wire conductor and plug unit with following conditions.

Soldering iron tip temperature :  $360^{\circ}\text{C}$  Max

Heating time : 5 seconds Max

※Lightly tin the tip of the wire, do not apply excessive solder on it. Only pre-tin the plug unit for required number of conductors.

### ③ Soldering



Terminate pre-tinned wire to plug unit.

※Double check the wire assignment before soldering.

Be sure the soldering tip of iron does not touch the molded parts.

Solder with following conditions.

Soldering iron tip temperature : 360°C Max

Heating time : 5 seconds Max

Bridges between the contacts may occur if the soldering amount is in excess. Consider adjusting the soldering amount to enable termination with pre-tinned soldering amount only.

You may lightly tin the tip of the soldering iron before soldering pre-tinned parts, this will make the termination easier.

※Please perform the soldering in the shortest possible time, because wire insulation melts easily with heat.

※When finished, check that there is no bridge between adjacent contacts because reassembly is not possible after the metal shells have been attached.

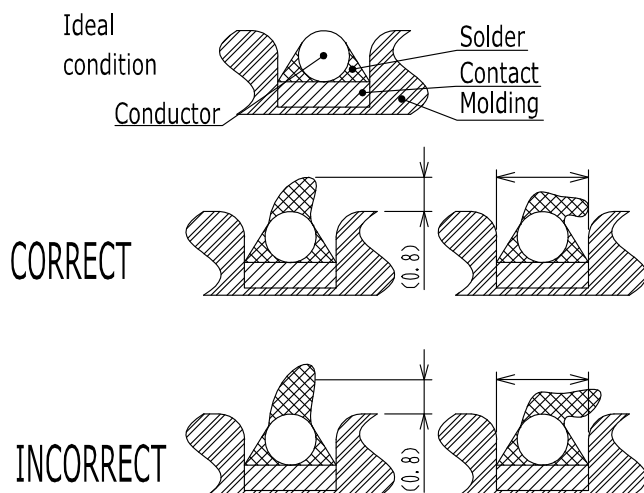
When finished check that no more solder than necessary has been applied.

Height: 0.8mm max from molding.

Width : within the range between the inner sidewall of the molding.

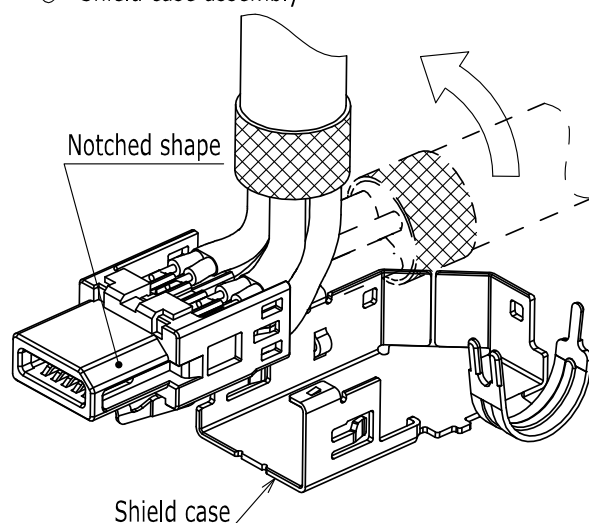
※The above confirmation items are for reference when soldering. Depending on the solder conditions, there is a possibility of short circuit to the shield or adjacent terminals. Please cover the soldered area with insulating tape or conduct a withstanding voltage test as necessary.

### ④ Soldering range



## 1 1. Shield case and shield shell assembly

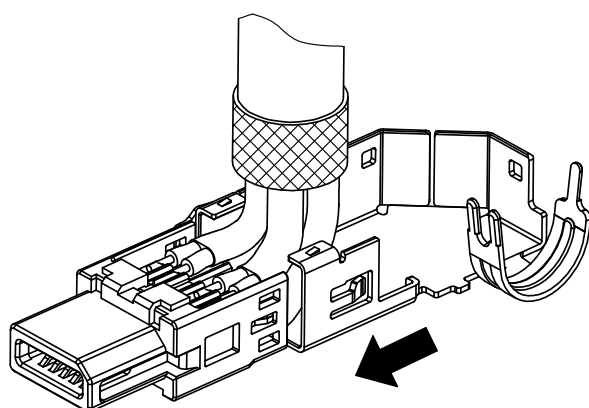
### ① Shield case assembly



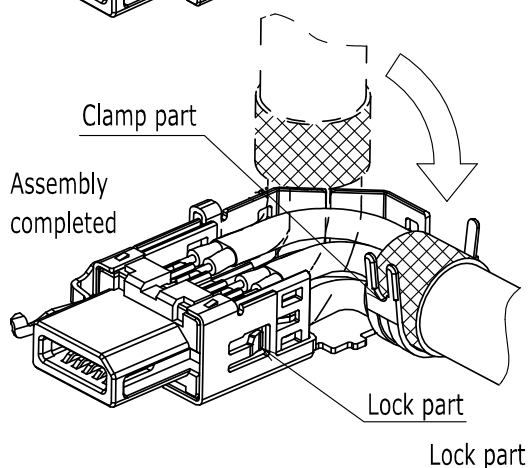
Assemble shield case onto plug unit with cable passed through.

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

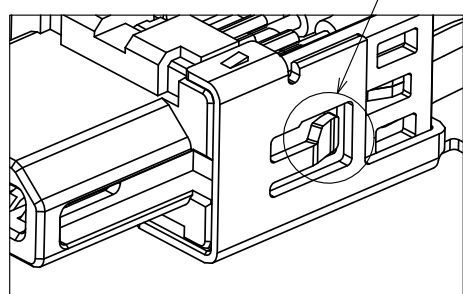
※The notched shape of the plug unit faces upward in respect to the shield case as shown in the figure.



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



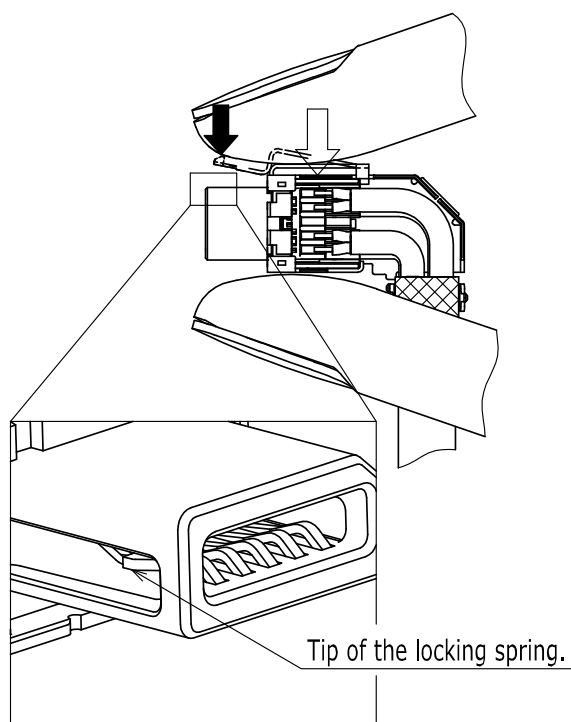
Pull the cable to the clamp part of the shield case.



Check to ensure both sides are locked after assembly completion.

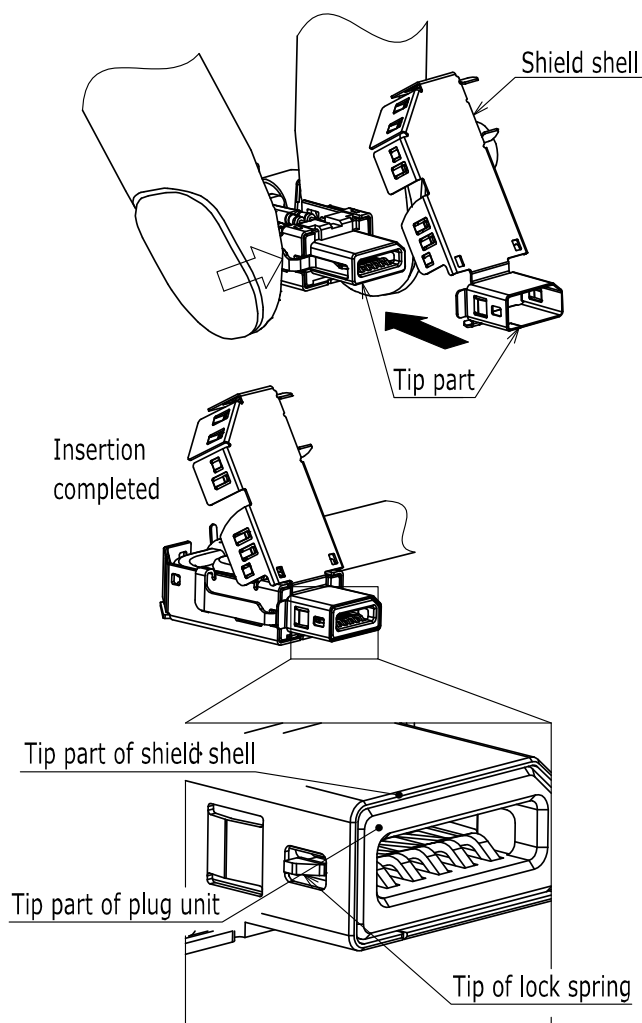


## ② Shield shell assembly



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

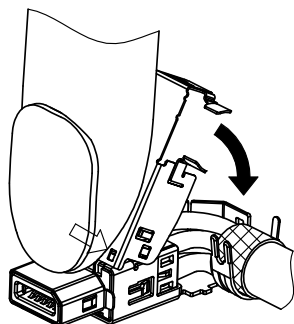
While assembling the shield shell,  
push on the spring on the shield case to keep  
the locking spring inside of the plug unit as shown  
in the figure.



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

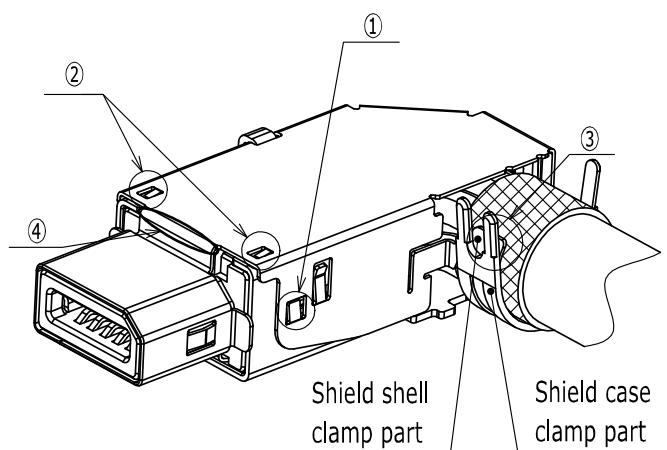
Stop pushing the locking spring after the tip parts  
of the plug unit and the shield shell are aligned.

※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.



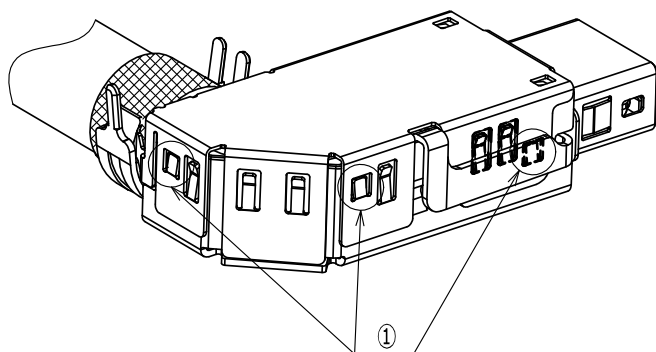
Push down shield shell in the direction shown in the figure and align the shield case and shield shell clamp.

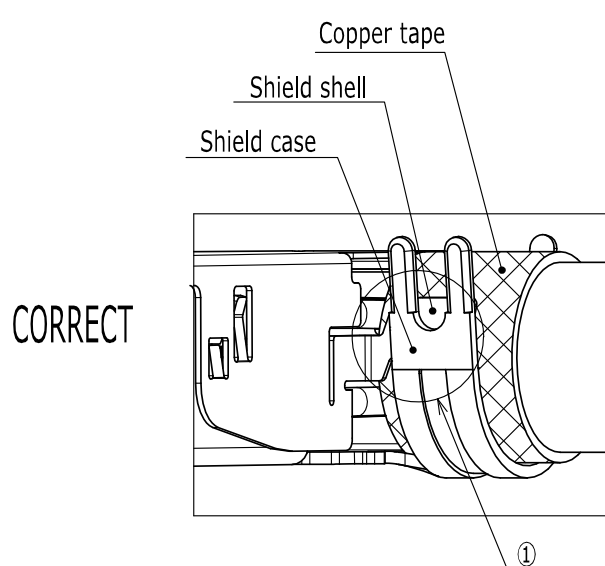
※When assembling the shield shell, please press the spot close to the bending area. If you press down the top of the shield shell (crimping part area) the shield shell may deform.



Please check the 4 points below after assembly completion.

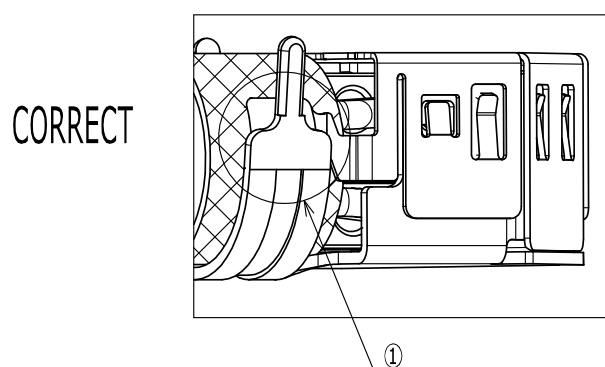
- ① Whether the parts of the shield shell and shield case that should be engaged are or not.
- ② The projection of the shield case is caught in the opening of the shield shell.
- ③ The clamp of the shield shell is placed behind the clamp of the shield case.
- ④ Shield shell close to the bending area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



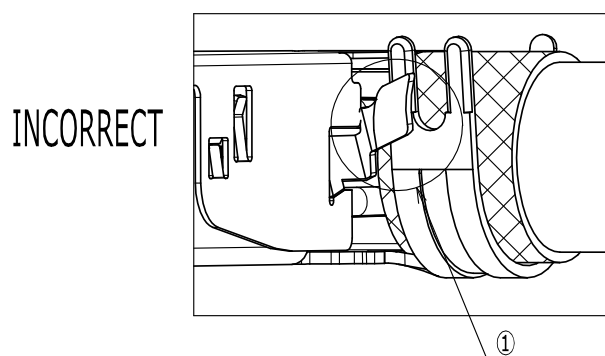


The shield shell may deform during insertion if the cable and copper tape hit the shell.

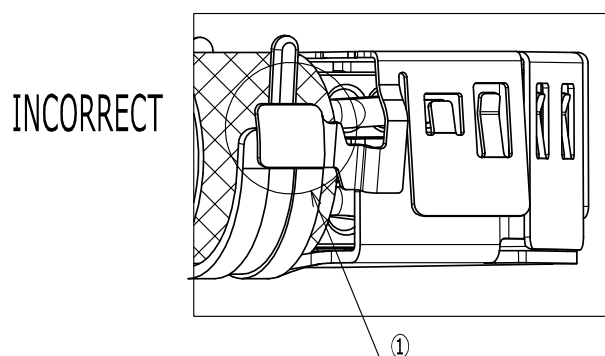
① Shield shell does not protrude from the shield case.



① Shield shell does not protrude from the shield case.

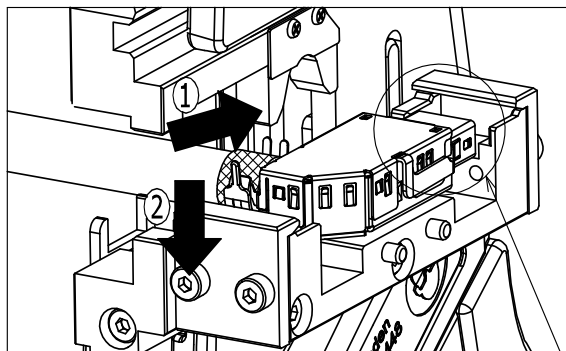


① Shield shell protrudes from the shield case.



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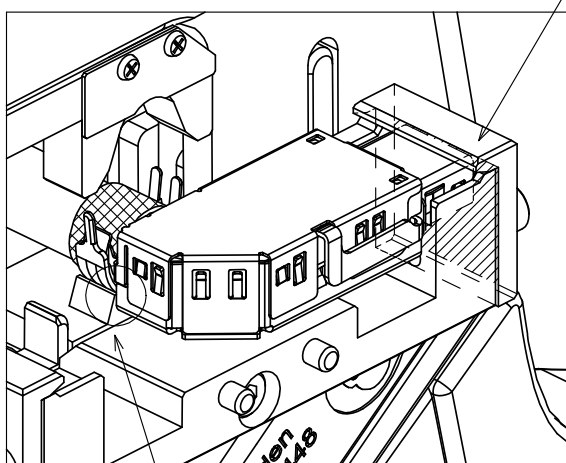
## 1 2. Crimp Cable Clamp



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.

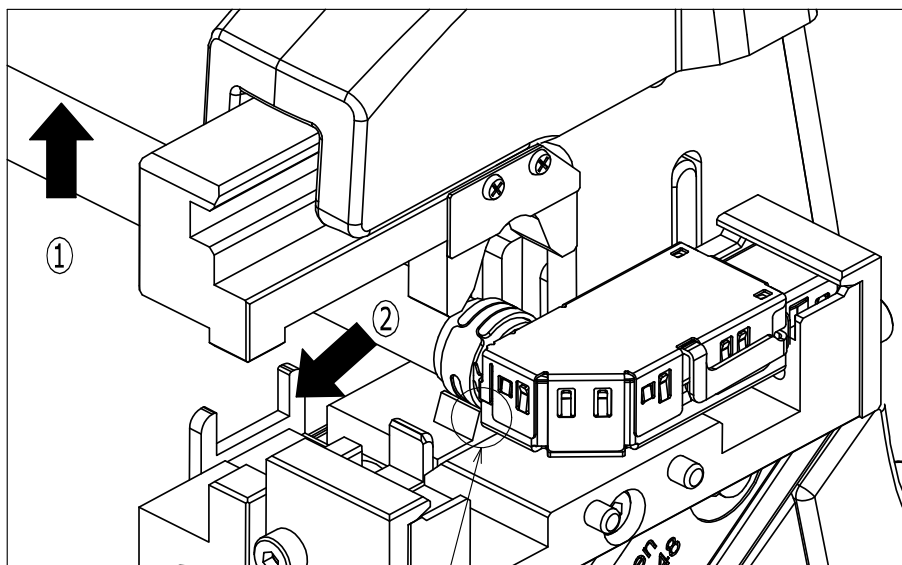


Shield case is caught in the hand tool when the cable is pulled.

※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



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

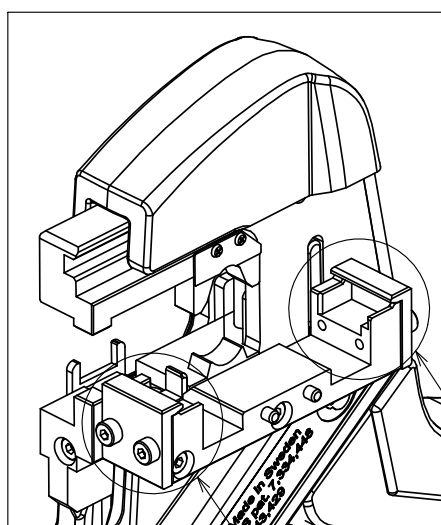
※The cable cannot be pulled out in a straight direction if it is caught in the hand tool after crimping, please lift the cable up before taking it out.

Be careful not to damage the connector during cable removal.

※After removing the connector, please confirm the correct status described in page 10 is maintained.

If the connector does not appear as described in page 10, there is a risk that the cover case cannot be assembled in "13. Cover case assembly."

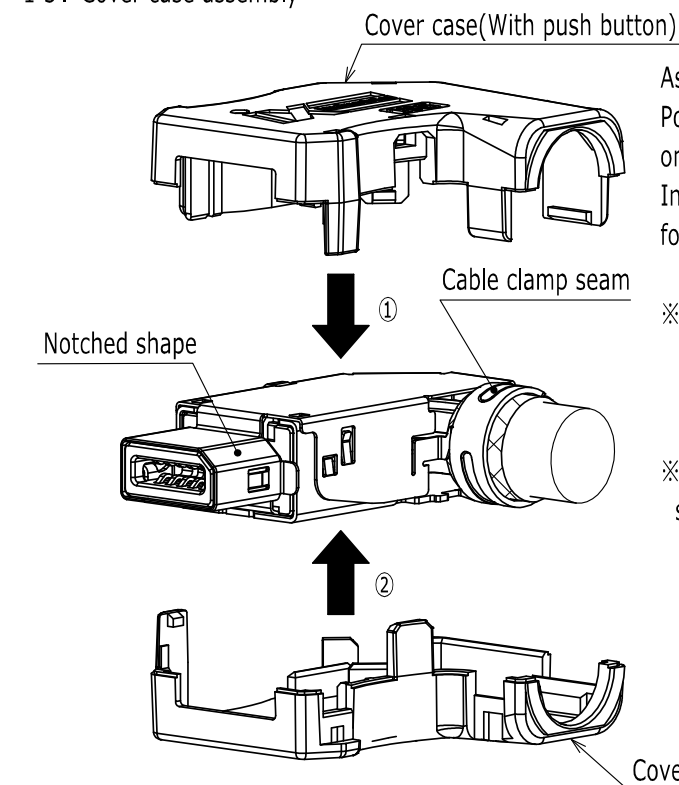
※The clamping guides are different for CVL1 and CVL2. When clamping CVL2, use the clamping guide for CVL2 in the same way as described in this document.



Clamp guide for CVL1

Clamp guide for CVL2

### 1 3. Cover case assembly

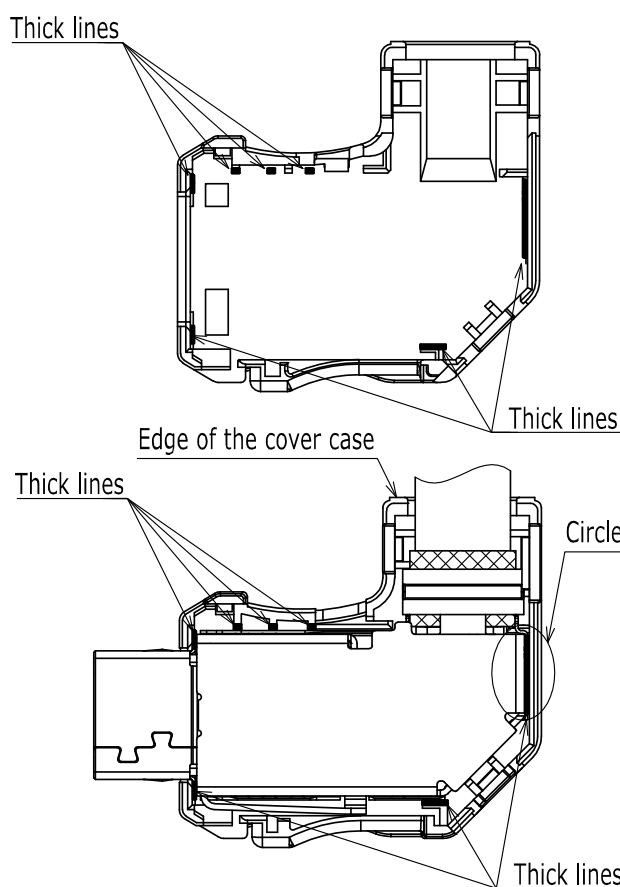


Assemble the cover case.

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.

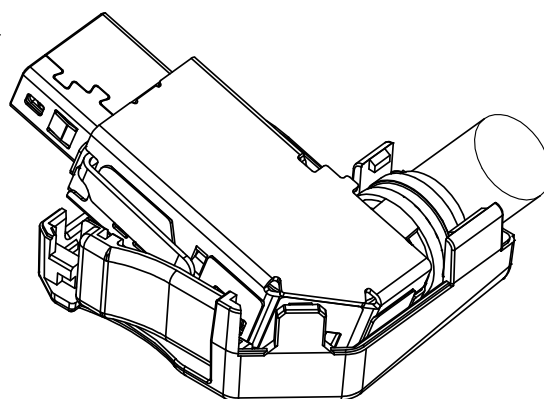


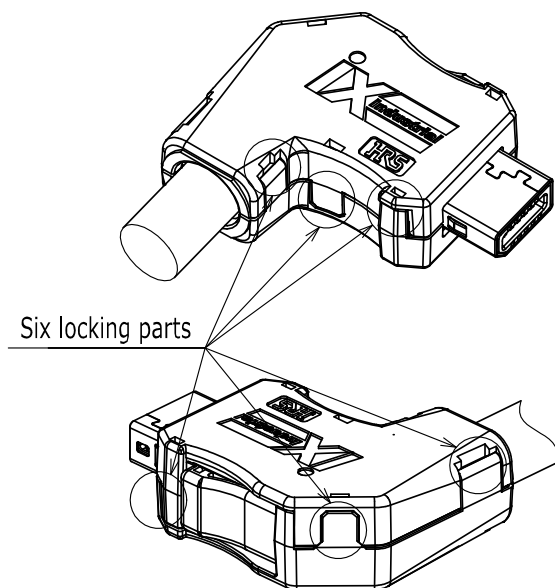
Fit the case by aligning the thick lines as shown in the left figure.

※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.

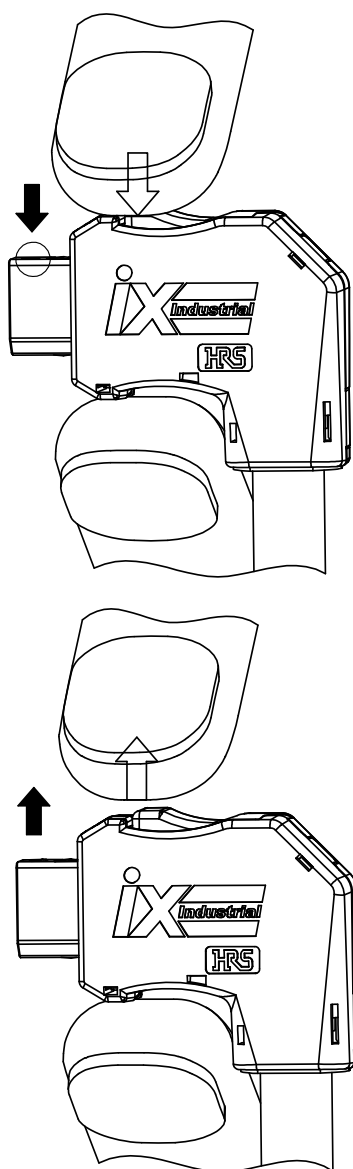




There are six locking parts on the cover case.  
Ensure all the locking parts are completely engaged.  
Push the sides of the locking parts if cover case assembly is not completed even after pushing on the top and bottom.

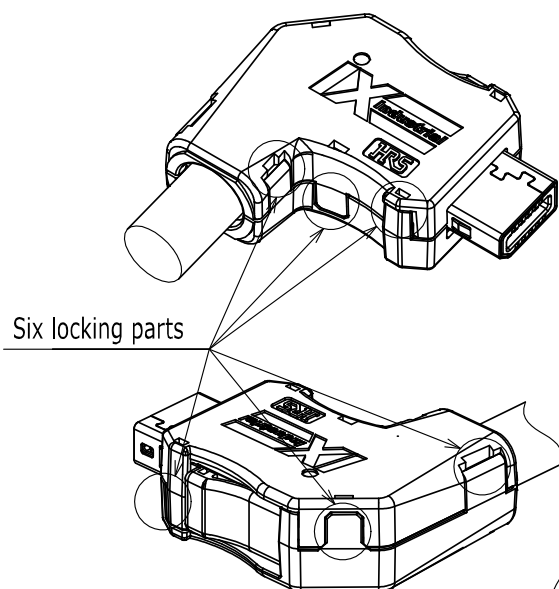
※Confirm to ensure outlines of cover case are aligned in place.

※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.

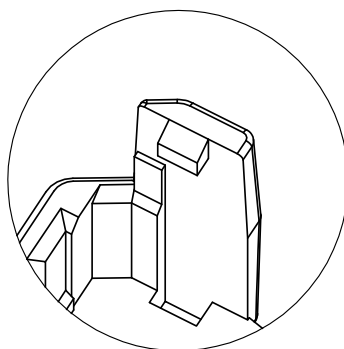
#### 1 4. Cover Case Reusage



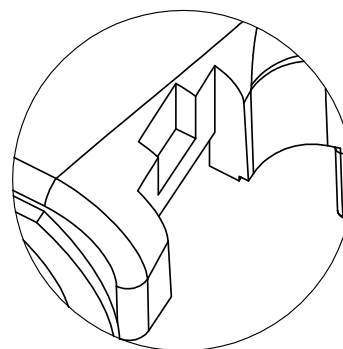
When reusing the cover case check that there are no scratches, chips or deformation on the latches and recesses of the six locking parts of the cover case. Afterwards assemble in accordance with "13. Cover case assembly".

- ※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.

- This product is not washable.

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 wiring precautions.	MY.KOMUKAI	KI.KAGOTANI	MN.KENJO	2021/07/27
4	Changed the folded amount of the braided shield. Added note on solder range. 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