



WARNING

To Prevent Electrical Shock and Short Circuits

• For your safety, make sure the power is off before carrying out the following procedures.



Plug (Waterproof) Assembly Procedure

No.

Schematic Representation (Operation Guide)

1

Run the cabtyre cable through the component (cable gland).

The outer diameter of the applicable cable for the cable gland is in accordance with Table 1.

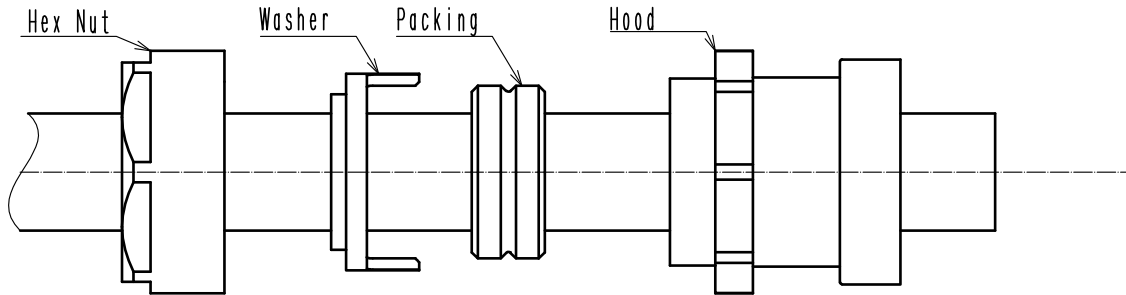


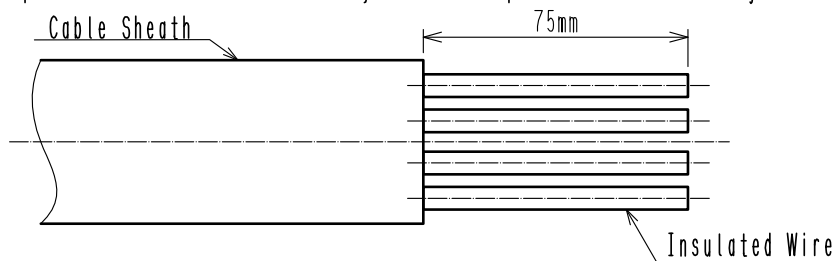
Table 1 Outer Diameter of Applicable Cable for Cable Gland

Applicable Cable Gland (Sankei Manufacturing Co., Ltd., Part Number)	Outer Diameter of Applicable Cable
E2KD 2836	24 to 28mm
E2KD 3236	28 to 32mm
E2KD 3636	32 to 36mm

Attention: After terminal processing of cable, the cable (cable gland) may not be run.
Care should be taken.

2

Strip the cable sheath and wire jacket. Strip the cable sheath by the length shown below.



Attention: If a shield cable is used, also strip the braided shield.

Make sure that the braided shield stripped does not remain in the connector.

If an offcut of the braided shield remains in the connector, it could cause an insulation failure.

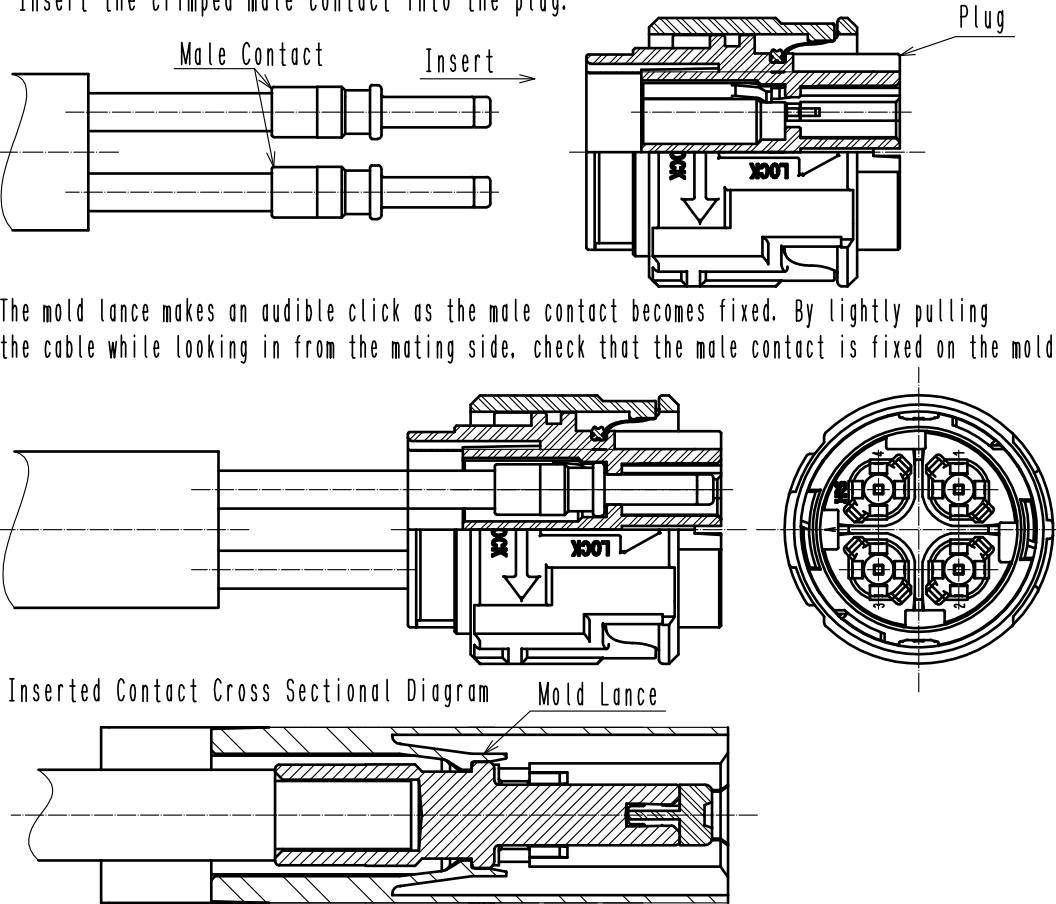
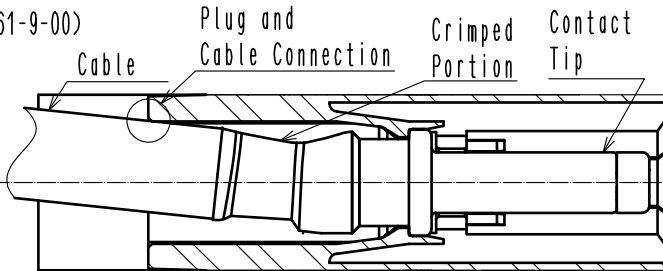
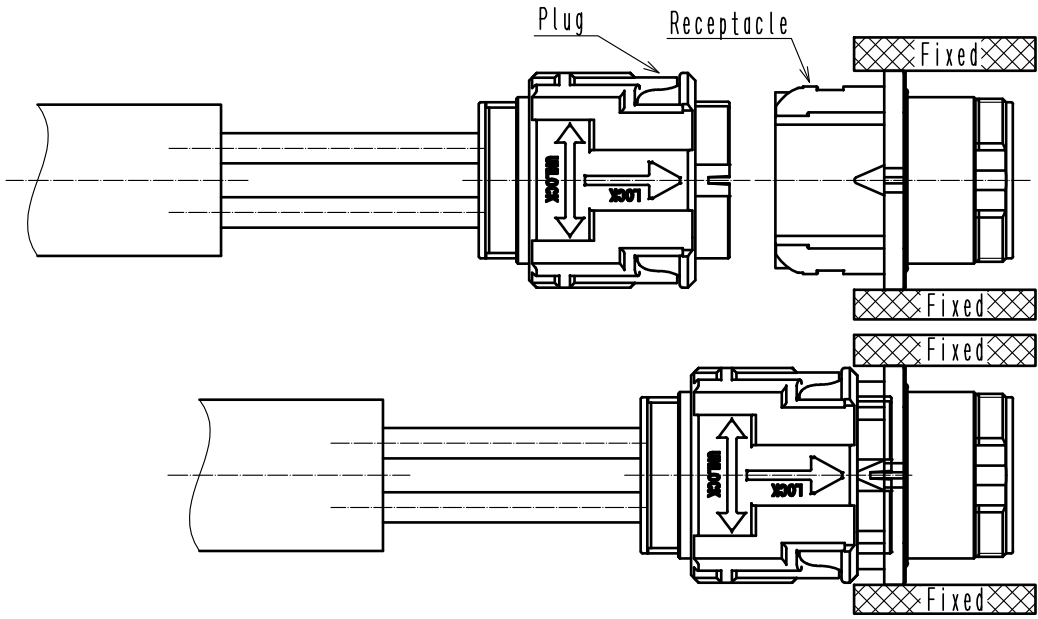
Note that this connector does not have a structure that connects the cable shield to the connector.

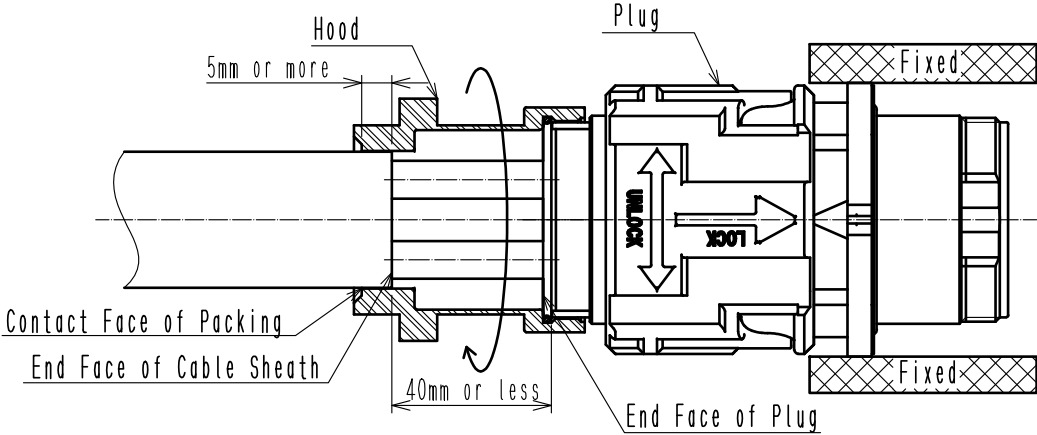
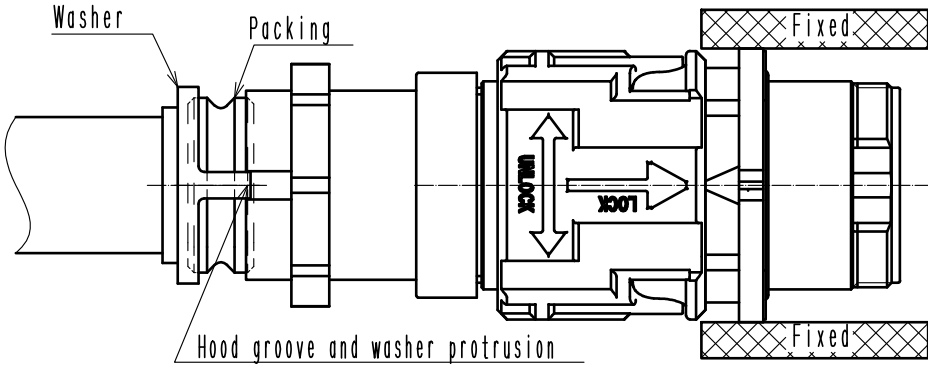
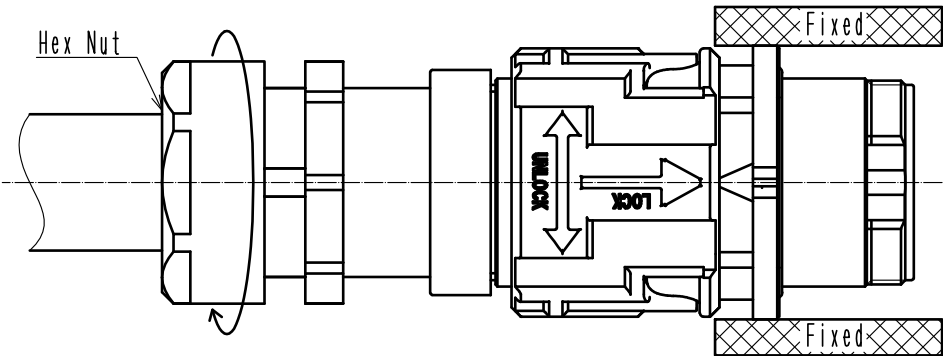


When stripping the cable sheath and wire jacket,

prevent damage to the jacket or conductor part of the insulated wire.

Damage to it could cause an insulation failure or a continuity failure.

COUNT	DESCRIPTION OF REVISIONS	DESIGNED	CHECKED	DATE
TITLE			HRS HIROSE ELECTRIC CO., LTD.	
EM52M Connector Assembly Procedure(Cabtyre Cable Specification)			APPROVED	YH. YAMADA 18.05.30
			CHECKED	YH. YAMADA 18.05.30
			CHARGED	TP. KOMATSU 18.05.30
			WRITTEN	EK. KIDO 18.05.30
TECHNICAL SPECIFICATION			ETAD-C0417-00	1 / 10

No.	Schematic Representation (Operation Guide)
5	<p data-bbox="260 147 815 185">Insert the crimped male contact into the plug.</p>  <p data-bbox="240 456 1374 528">The mold lance makes an audible click as the male contact becomes fixed. By lightly pulling the cable while looking in from the mating side, check that the male contact is fixed on the mold lance.</p> <p data-bbox="248 835 906 871">Inserted Contact Cross Sectional Diagram</p> <p data-bbox="248 1077 1158 1149">After installation, check the wiring. If there is a wiring mistake, use the contact removal tool to pull out the contact to fix the problem. Applicable Contact Removal Tool: EM52M-PC-TP(CCL150-0261-9-00)</p> <p data-bbox="245 1223 812 1402">Warning: When the contact is inserted. If the contact is bent up and touching the wall of the contact hole, inspect or reconsider the tool that was used. If the plug and cable are in contact, it could cause a loss of water tightness.</p> 
6	<p data-bbox="260 1447 1070 1485">(i) Mate the plug to the receptacle using a vice for stabilization.</p> 

No.	Schematic Representation (Operation Guide)
6	<p data-bbox="240 143 1268 215">(ii) Attach the hood to the plug. Make sure that the hood is not against to the plug. Tighten the hood using a tightening torque of 5 to 7 N.m.</p> <div data-bbox="448 230 1489 663"></div> <p data-bbox="252 685 1350 853">Attention: Make sure that the end face of the cable sheath is located 5 mm or more away from the contact face of the hood to the packing. Otherwise, the cable is not compressed sufficiently by the packing, which may affect the waterproof property. A distance between the end face of the plug and that of the cable sheath is approximately 40 mm or less.</p> <p data-bbox="252 904 1334 1014">(iii) Attach the packing to the cable. Once the packing is attached, insert it and the washer into the hood in that order. Align the groove at the hood with the protrusion of the washer and insert.</p> <div data-bbox="557 1039 1489 1402"></div> <p data-bbox="252 1464 1497 1597">(iv) Tighten the hex nut with a tightening torque of 5 to 7 N.m. Make sure the hex nut is not aslant to the hood. Furthermore, water tightness, cable retention force, rotational performance, and other characteristics may differ depending on the cable specifications and structure. Please evaluate before use.</p> <div data-bbox="542 1612 1489 1966"></div>
7	<p data-bbox="240 2022 1422 2092">Assembly process complete. We recommend testing waterproof and electrical performance using any method under the individual conditions.</p>
<div data-bbox="263 2107 351 2154"></div> <div data-bbox="406 2114 896 2148">HIROSE ELECTRIC CO., LTD.</div> <div data-bbox="1031 2114 1311 2148">ETAD-C0417-00</div> <div data-bbox="1358 2114 1401 2148"></div> <div data-bbox="1430 2114 1453 2148">4</div> <div data-bbox="1469 2125 1497 2154">10</div>	

◆ Receptacle (Waterproof Panel Jack) Assembly Procedure

No. Schematic Representation (Operation Guide)

- 1 Run the cable through the component (cable gland).
The outer diameter of the applicable cable for the cable gland is in accordance with Table 5.

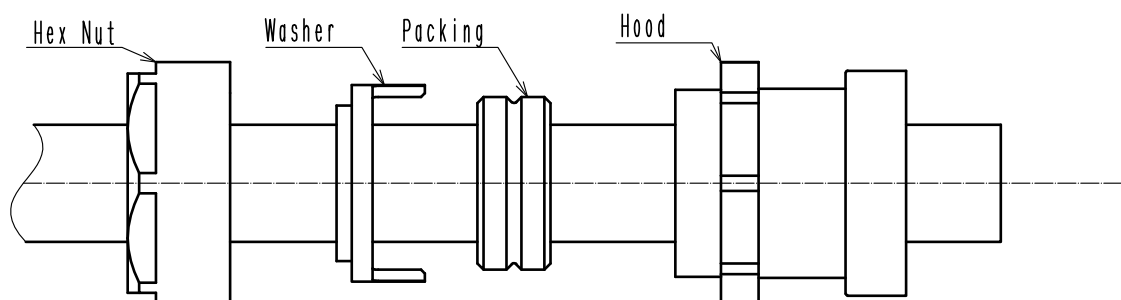
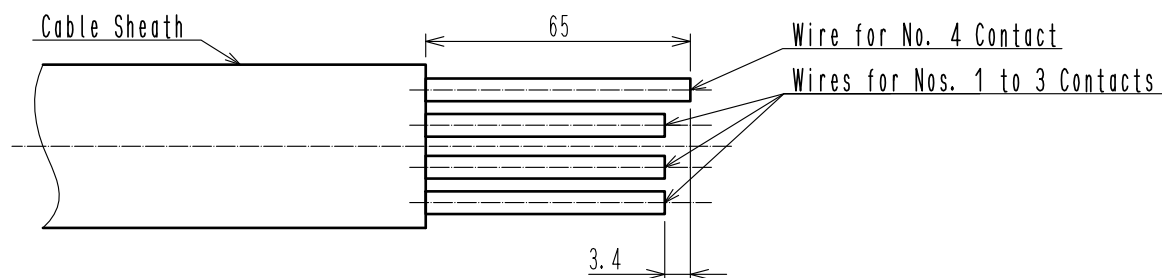


Table 5 Outer Diameter of Applicable Cable for Cable Gland

Applicable Cable Gland (Sankei Manufacturing Co., Ltd. Part Number)	Outer Diameter of Applicable Cable
E2KD 2836	24 to 28mm
E2KD 3236	28 to 32mm
E2KD 3636	32 to 36mm

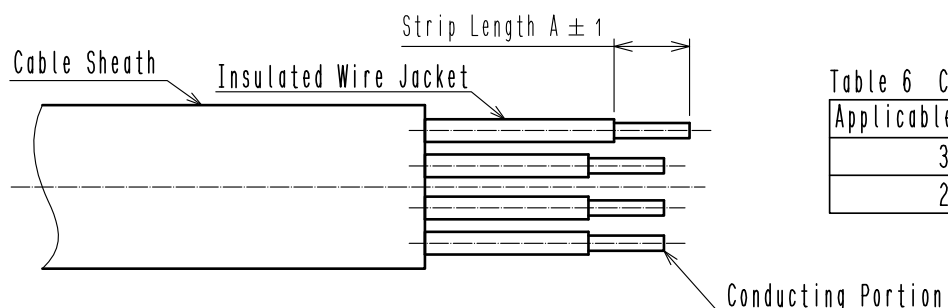
Attention: After terminal processing of the cable, care should be taken because the cable may not be run into the component.

- 2 Strip the cable sheath and wire jacket. Strip the cable sheath by the length shown below.



Attention: The strip length of the No. 4 contact differs from those of other contacts because of its sequence structure.
If a shield cable is used, also strip the braided shield.
Make sure that the braided shield stripped does not remain in the connector.
If an offcut of braided shield remains in the connector, it could cause an insulation failure.
Note that this connector does not have a structure that connects the cable shield to the connector.

- 3 Strip the cable sheath and wire jacket.
The strip length of the insulated wire is in accordance with Table 6.



Applicable Cable Size	A Length
38mm ²	18
22mm ²	17

Attention: Make sure that the conductor part of the wire is not damaged.
The strip lengths of Nos. 1 to 4 contacts of the insulated wire are the same.

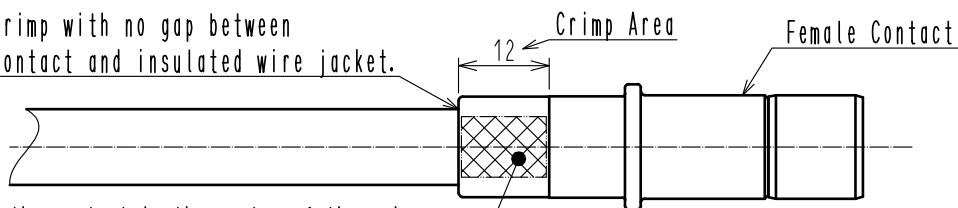
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◆Receptacle (Waterproof Panel Jack) Assembly Procedure

No. Schematic Representation (Operation Guide)

- 4 Crimp the female contact in the same procedures as Plug (Waterproof) Assembly Procedures 1 and 2. The applicable contacts, die sizes, and connectors are in accordance with Table 7.

(i) Crimp with no gap between the contact and insulated wire jacket.



(ii) Crimp the contact in the center of the crimp area.

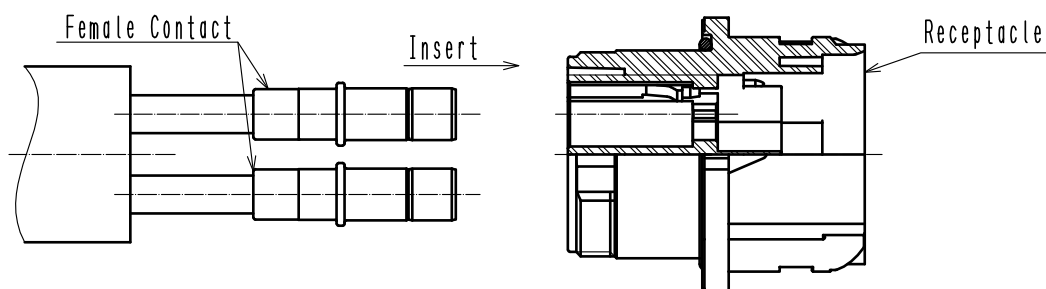
(iii) After crimping, check that the gap between the contact and the insulated wire jacket is 0.15 before use.

Attention: Make sure that the wiring does not protrude from the gap between the contact and the insulated wire. A protrusion of the wire could cause an insulation failure.

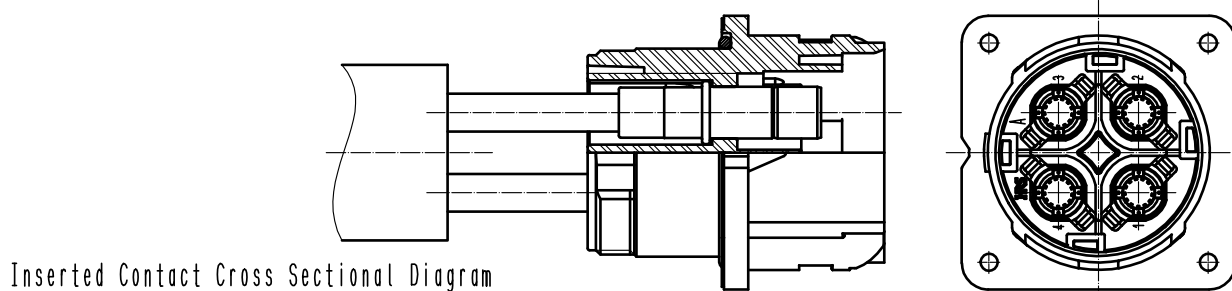
Table 7 Applicable female contact, die size, and connector

Applicable Female Contact		Tool	Applicable Cable	Applicable Connector	
HRS No.	Connector Name	Applicable Die Size	Conducting Cross Sectional Area	HRS No.	Connector Name
CL139-0012-7-03	EV1-SC2-132(03)	38	26.66 to 42.42mm ²	CL138-0046-2	EM52M-WBR-4SCA
CL139-0013-0-03	EV1-SC2-112(03)	22	16.78 to 26.66mm ²		

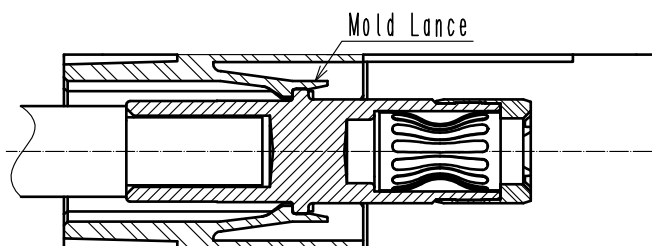
- 5 Insert the crimped female contact into the receptacle.



The mold lance makes an audible click as the female contact becomes fixed. By lightly pulling the cable while looking in from the mating side, check that the female contact is fixed on the mold lance of the receptacle.



Inserted Contact Cross Sectional Diagram



After installation, check the wiring.

If there is a wiring mistake, use the contact removal tool to pull out the contact to fix the problem.

Applicable Contact Removal Tool: EM52M-SC-TP(CL150-0262-1-00)

HRS

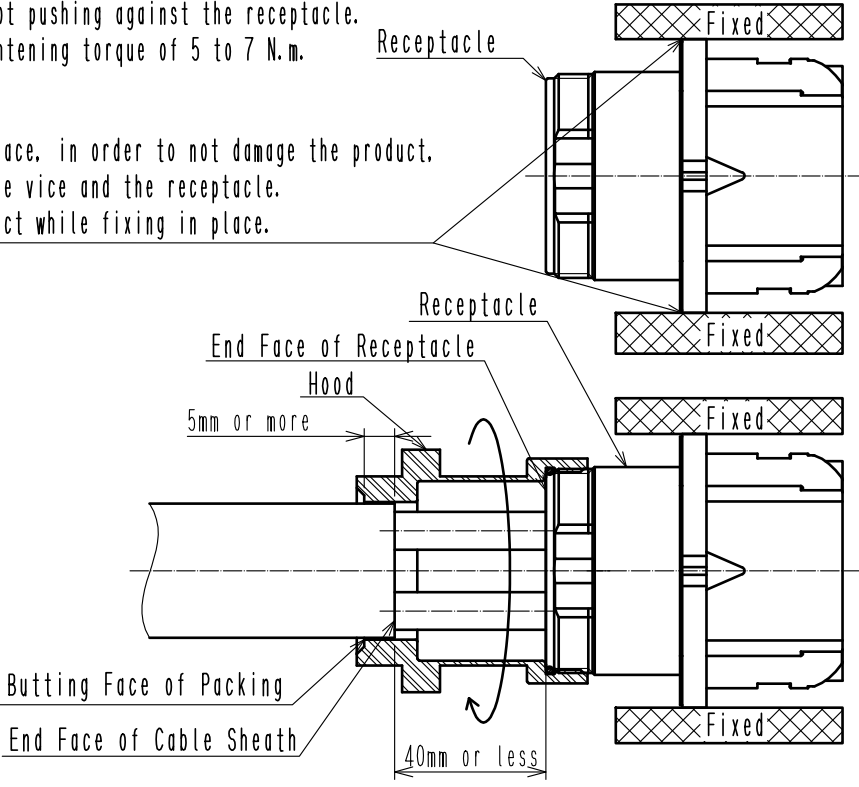
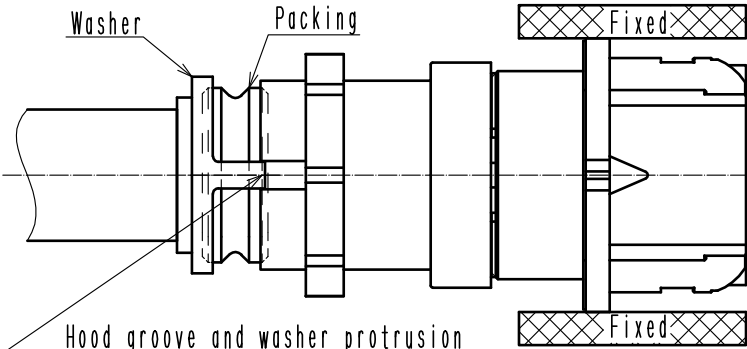
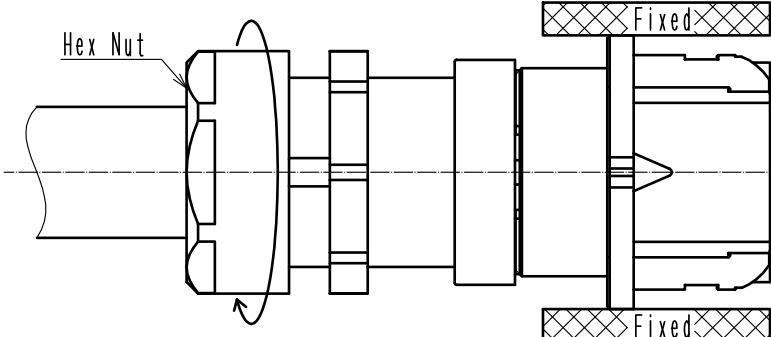
HIROSE ELECTRIC CO., LTD.

ETAD-C0417-00



6

10

No.	Schematic Representation (Operation Guide)
6	<p data-bbox="244 152 970 257">(i) Mate the hood to the receptacle using a vice for stabilization. Make sure that the hood is not pushing against the receptacle. Tighten the hood using a tightening torque of 5 to 7 N.m.</p> <p data-bbox="244 324 1034 430">When fixing the receptacle in place, in order to not damage the product, use rubber or leather between the vice and the receptacle. Also, try not to crack the product while fixing in place.</p>  <p data-bbox="244 981 1497 1086">Attention: Make sure that the end face of the cable sheath is located 5 mm or more away from the contact face of the hood to the packing. Otherwise, the cable is not compressed sufficiently by the packing, which may affect the waterproof property. A distance between the end face of the receptacle and that of the cable sheath is approximately 40 mm or less.</p> <p data-bbox="244 1097 1109 1202">(iii) Attach the packing to the cable. Once the packing is attached, insert it and the washer into the hood in that order. Align the groove at the hood with the protrusion of the washer and insert.</p>  <p data-bbox="244 1579 1501 1684">(iv) Tighten the hex nut with a tightening torque of 5 to 7 N.m. Make sure the hex nut is not aslant to the hood. Furthermore, water tightness, cable retention force, rotational performance, and other characteristics may differ depending on the cable specifications and structure. Please evaluate before use.</p> 
7	<p data-bbox="244 2033 1476 2101">Assembly process complete. We recommend testing waterproof and electrical performance using any method under the individual conditions.</p>

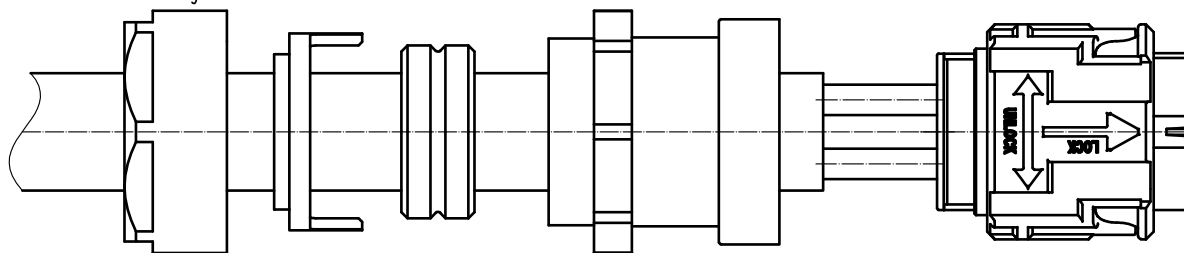
◆Contact Removal Tool Usage (Male and Female Contacts)

No.	Schematic Representation (Operation Guide)
	<p>(i) Insert the contact removal tool into the contact hole on the installation side until it hits the mold lance. By inserting the tool in as far as it will go, the lance will be extended outward, and the contact will become dislodged.</p> <div data-bbox="252 344 798 380" data-label="Caption"> Male Contact Drawing Tool [EM52M-PC-TP<CL150-0261-9-00>] </div> <div data-bbox="893 344 1460 380" data-label="Caption"> Female Contact Drawing Tool [EM52M-SC-TP<CL150-0262-1-00>] </div> <div data-bbox="252 392 1396 672" data-label="Image"> </div> <p>Male Contact Removal (Same procedure for the female contact)</p> <div data-bbox="287 739 1468 985" data-label="Image"> </div> <p>(ii) With the contact removal tool inserted, pull out the contact by pulling the cable.</p> <div data-bbox="686 1052 1468 1299" data-label="Image"> </div> <p>Attention: When removing the contact, make sure the lance is properly spread before pulling. Trying to force it out could lead to a disconnection or damage to the mold lance.</p> <p>Attention: When removing the contact, do so while there is no strain on the cable. Trying to carry out this procedure while there is strain on the cable could cause the mold lance to be damaged.</p> <p>If it is difficult to remove contacts one by one, use the support table to remove four contacts at one time: Plug: EM52M-PC-TP2<CL150-0264-0-00> Receptacle: EM52M-SC-TP2<CL150-0265-0-00></p> <div data-bbox="319 1724 750 2049" data-label="Image"> </div> <div data-bbox="909 1568 1492 2094" data-label="Image"> </div>

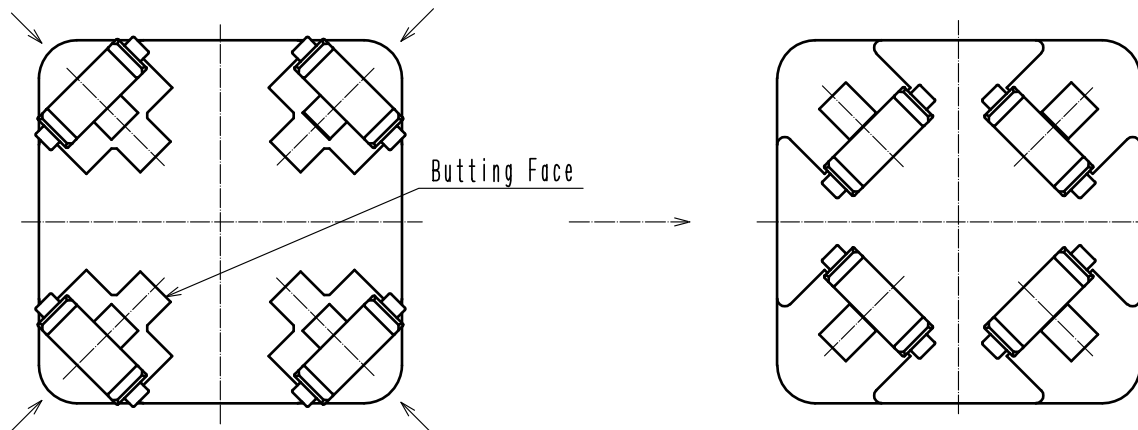
◆Contact Removal Tool Usage (One-Time Removal of Four Male Contacts)

No. Schematic Representation (Operation Guide)

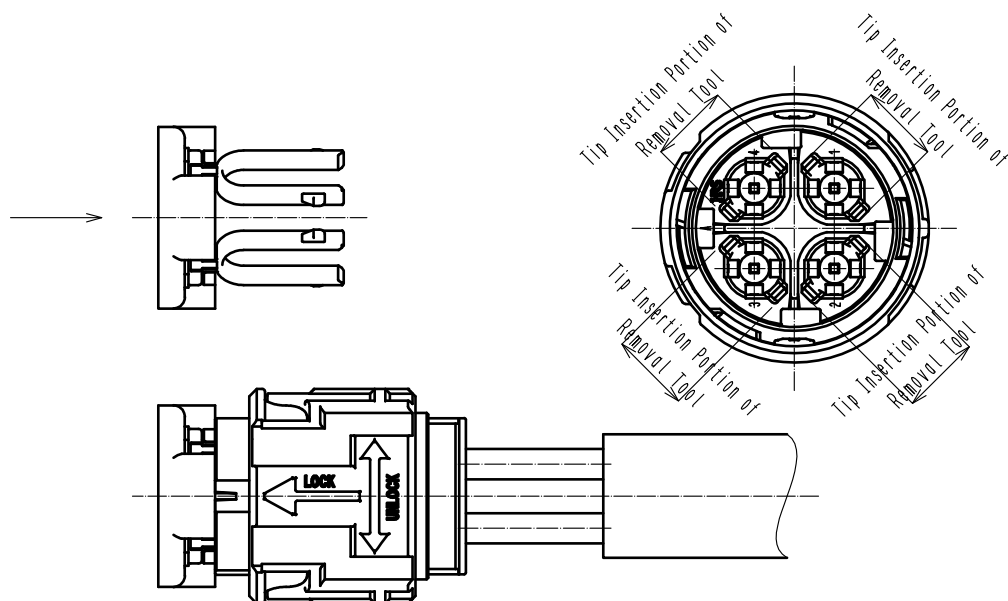
(i) Remove the Keigland from the connector.



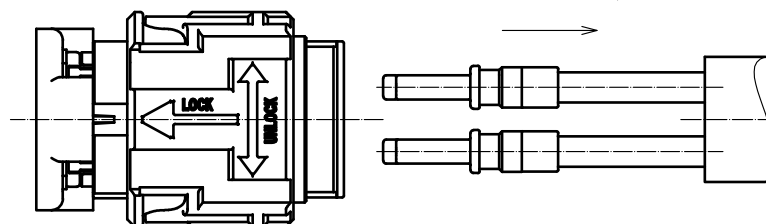
(ii) Push EM52M-PC-TP to EM52M-PC-TP2 in the four directions until it hits the butting face.



(iii) Insert the contact removal tool into the contact hole on the installation side as far as it will go.



(iv) With the contact removal tool inserted, pull out the contact by pulling the cable.



Attention: When removing the contact, make sure the lance is properly spread before pulling.

Trying to force it out could lead to a disconnection or damage to the mold lance.

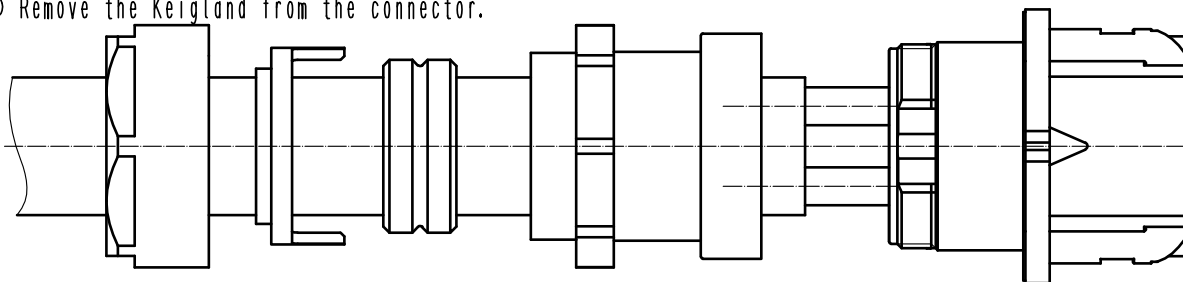
Attention: When removing the contact, do so while there is no strain on the cable.

Trying to carry out this procedure while there is strain on the cable could cause the mold lance to be damaged.

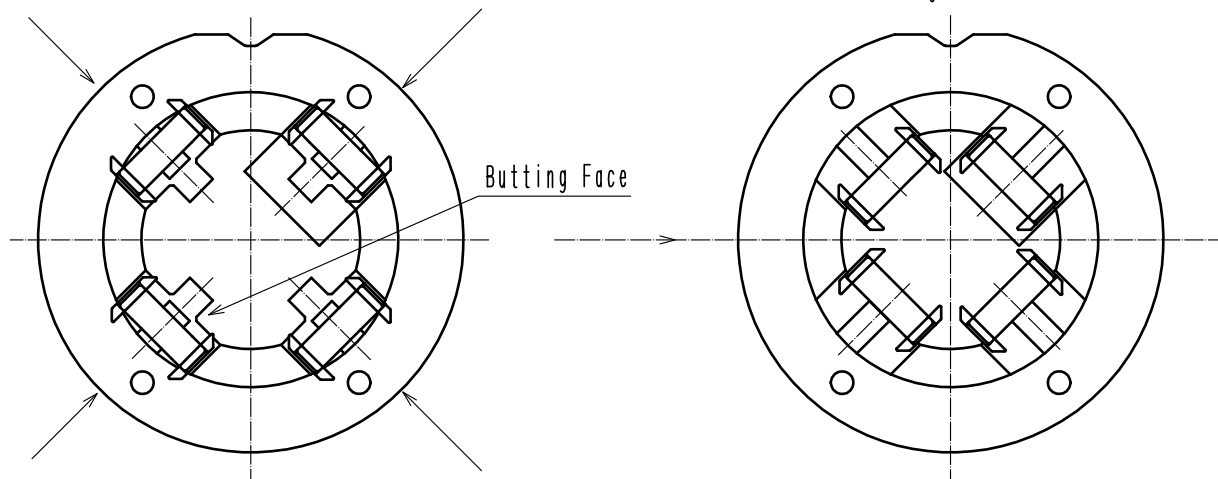
◆ Contact Removal Tool Usage (One-Time Removal of Four Female Contacts)

No. Schematic Representation (Operation Guide)

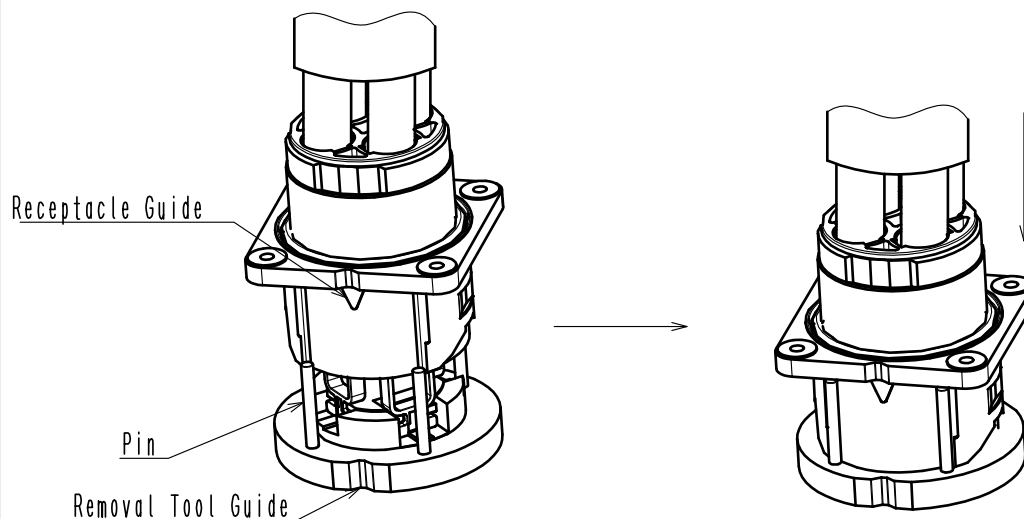
(i) Remove the Keigland from the connector.



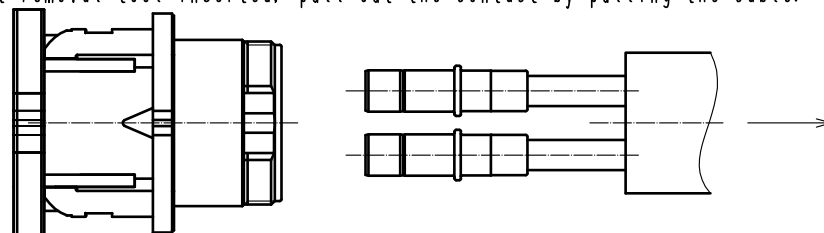
(ii) Push EM52M-PC-TP to EM52M-PC-TP2 in the four directions until it hits the butting face toward the center.



(iii) With the mating mark of the removal tool aligned with that of the connector, insert the connector between tool pins as far as it will go.



(iv) With the contact removal tool inserted, pull out the contact by pulling the cable.



Attention: When removing the contact, make sure the lance is properly spread before pulling.

Trying to force it out could lead to a disconnection or damage to the mold lance.

Attention: When removing the contact, do so while there is no strain on the cable.

Trying to carry out this procedure while there is strain on the cable could cause the mold lance to be damaged.