⚠ 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.

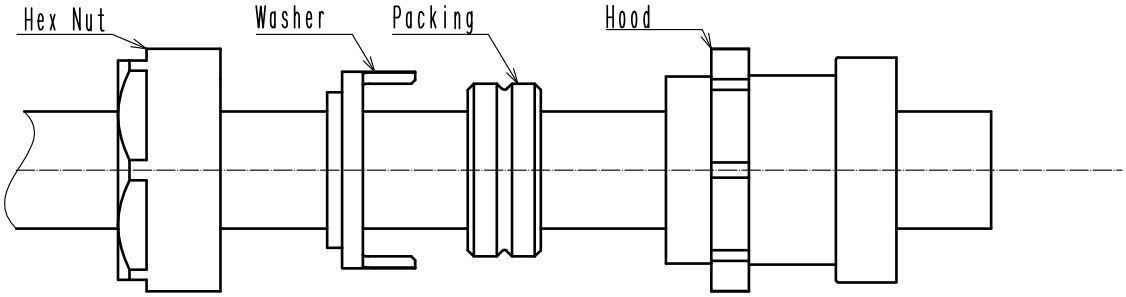


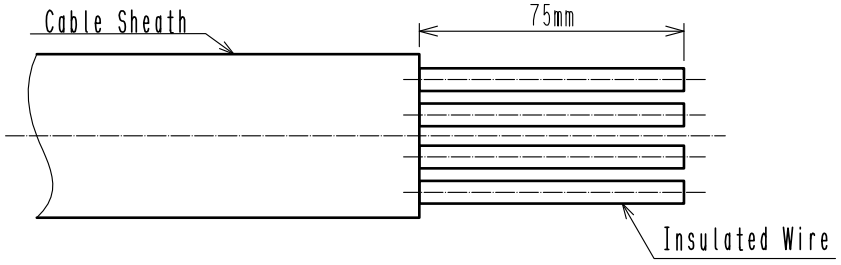
Table 1 Outer Diameter of Applicable Cable for Cable Gland

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
⚠0					

TITLE

EM52M Connector Assembly Procedure(Cabtyre Cable Specification)

HRS HIROSE ELECTRIC CO., LTD.

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 ⚠0

FORM 213-1

3 Strip the cable sheath and wire jacket of the insulated wire. The strip length is in accordance with Table 2.

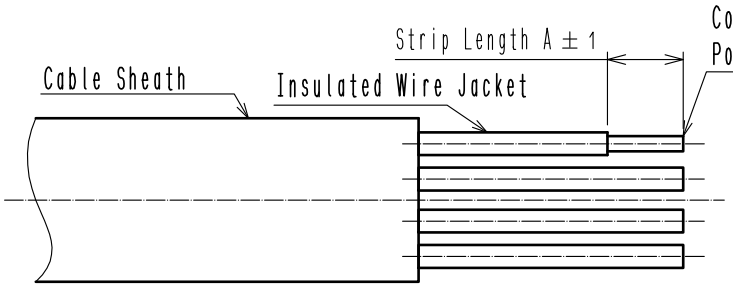
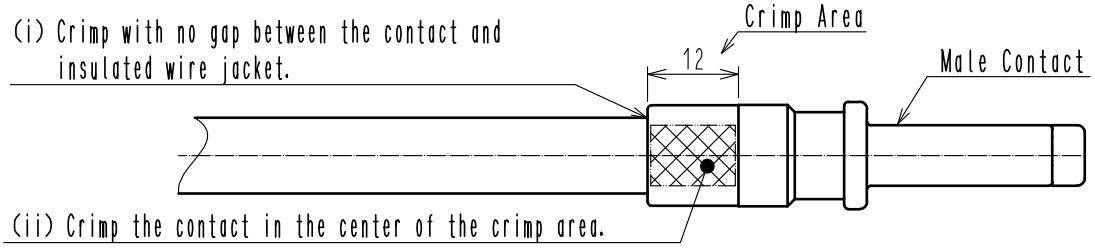


Table 2 Cable Strip Length

Applicable Cable Size	A Length
38mm²	18
22mm²	17

Attention: 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.

4 Crimp the male contact.
Adjusting for the size of the cable, use a crimping tool with a die size of 22 or 38 and crimp.
The applicable male contacts, die sizes, and connectors are in accordance with Table 3.



(iii) After crimping, check that the gap between the contact and the insulated wire jacket is $0^{+1.5}_{-0}$ 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 3 Applicable male contacts, die size, and connectors

Applicable Male Contact		Tool	Applicable Cable	Applicable Connector	
HRS No.	Connector Name	Applicable Die Size	Conducting Cross Sectional Area	HRS No.	Connector Name
CL138-0006-0	EM52M-PC2-132	38	26.66 to 42.42mm²	CL138-0035-6	EM52M-WBP-4PCA
CL138-0012-0	EM52M-PC-112	22	16.78 to 26.66mm²		

■Crimping Tool's Crimp Height (Reference)

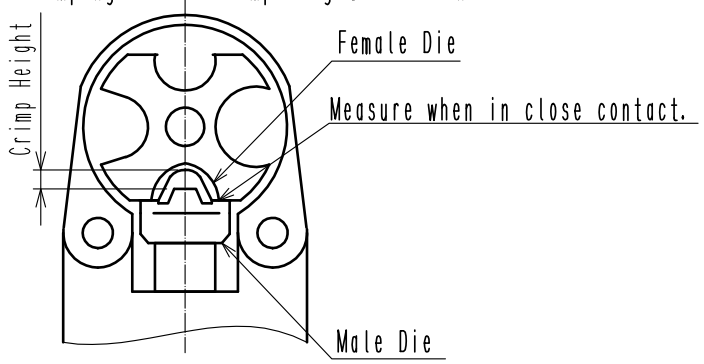


Table 4 Crimp Height (Reference)

Crimping Tool	9H-60		REC-Li150	
Die Designation	Crimp Height Values			
	Min.	Max.	Min.	Max.
22	4.83	5.13	4.95	5.35
38	5.33	5.63	6.45	6.90

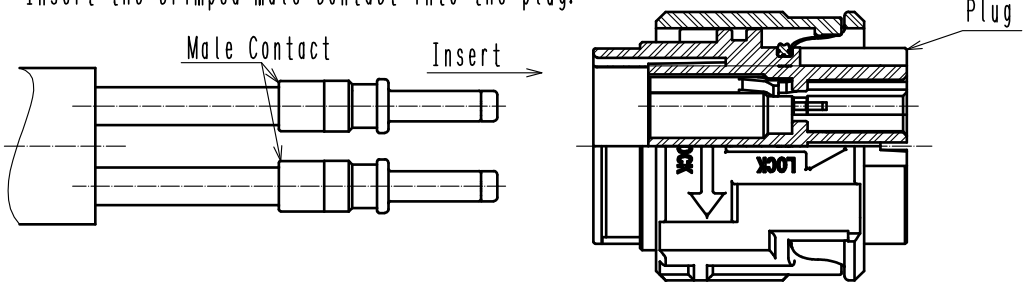
*The shown shape is just one example.

For detailed information concerning the maintenance of the crimping tool, please inquire with Izumi Seiki Co., Ltd.

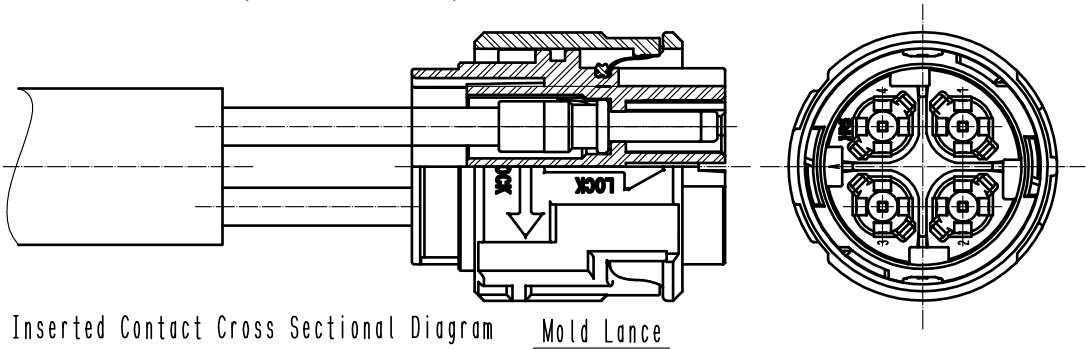
FORM 213-2

Schematic Representation (Operation Guide)

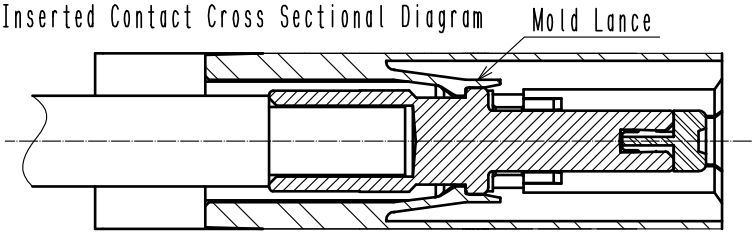
5 Insert the crimped male contact into the plug.



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.

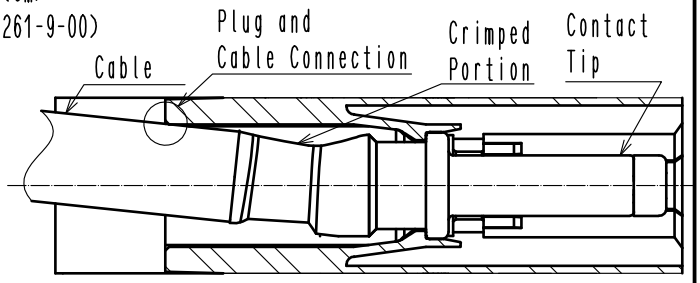


Inserted Contact Cross Sectional Diagram

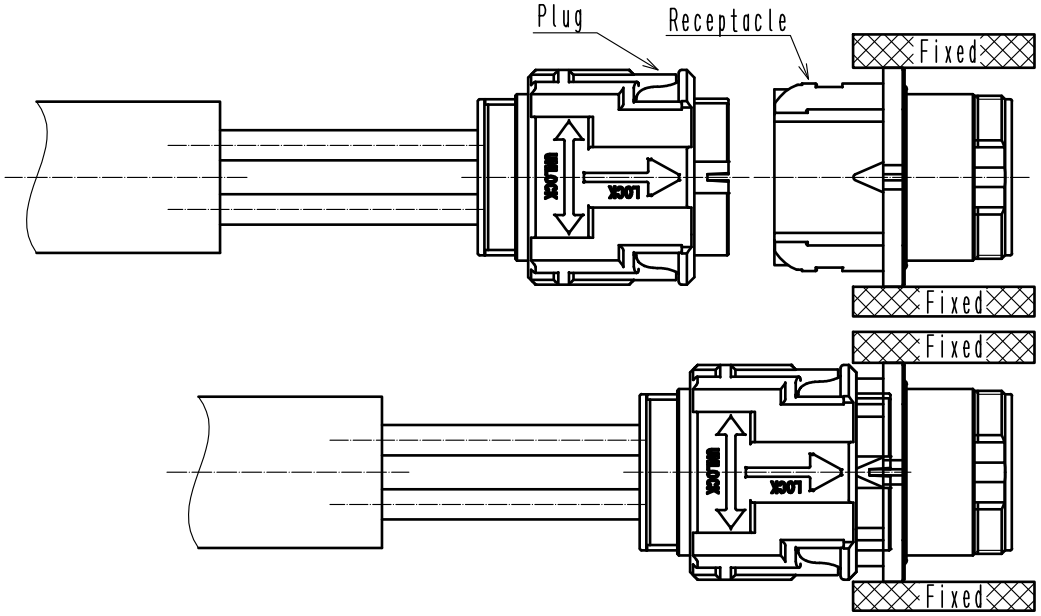


After installation, check the wiring. If there is a wiring mistake, use the contact removal tool to pull out the contact to fix the problem.
Applicable Contact Removal Tool: EM52M-PC-TP(CL150-0261-9-00)

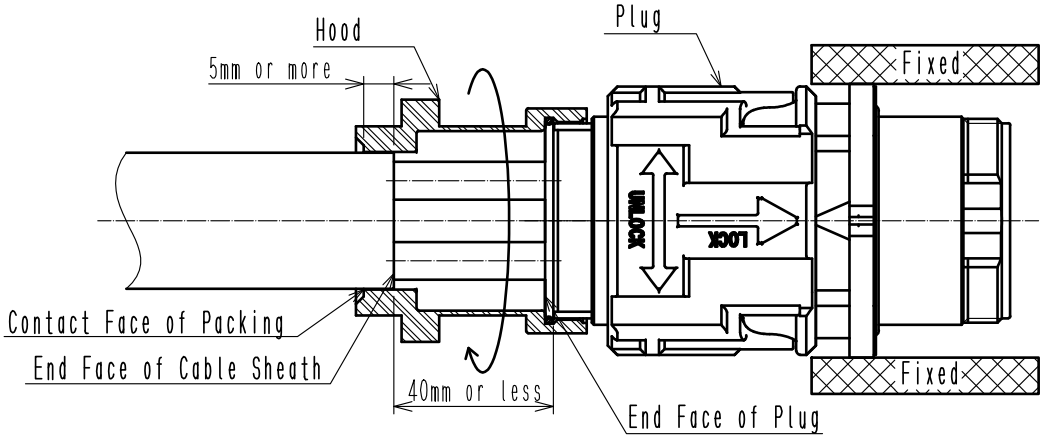
⚠Warning: When the contact is inserted, If the contact is bent up and touching the wall of the contact hole, inspect or reconsider the tool that was used. If the plug and cable are in contact, it could cause a loss of water tightness.



6 (i) Mate the plug to the receptacle using a vice for stabilization.

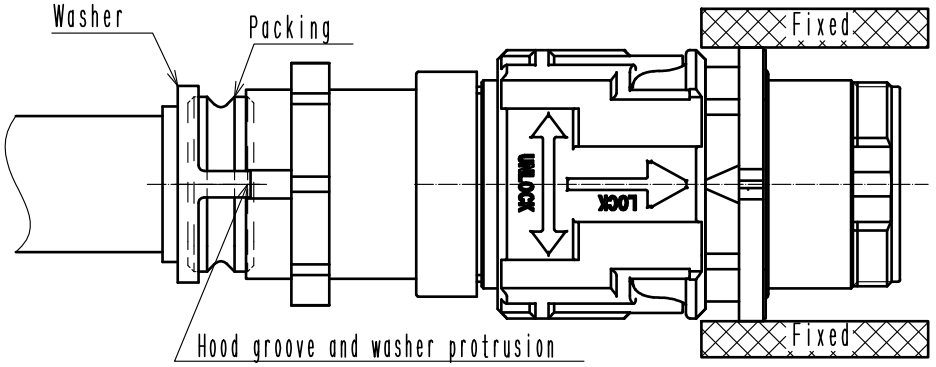


6 (ii) Attach the hood to the plug. Make sure that the hood is not against to the plug.
Tighten the hood using a tightening torque of 5 to 7 N.m.

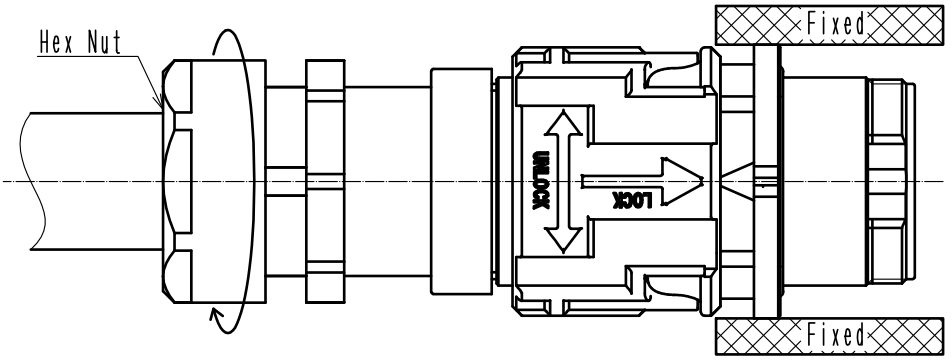


Attention: Make sure that the end face of the cable sheath is located 5 mm or more away from the contact face ofthe hood to the packing. Otherwise, the cable is not compressed sufficiently by the packing, which may affect the waterproof property. A distance between the end face of the plug and that of the cable sheath is approximately 40 mm or less.

(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.



(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.



7 Assembly process complete.
We recommend testing waterproof and electrical performance using any method under the individual conditions.

◈Receptacle (Waterproof Panel Jack) 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 5.

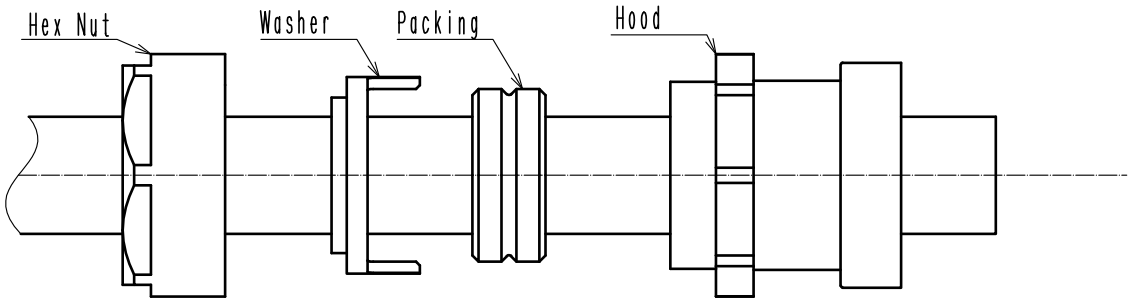
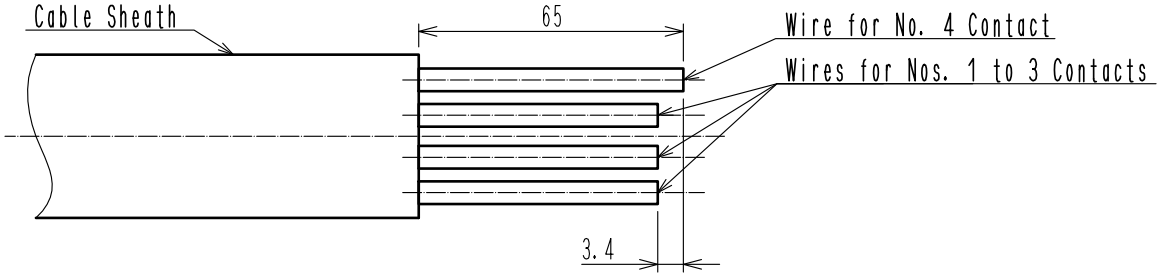


Table 5 Outer Diameter of Applicable Cable for Cable Gland

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.

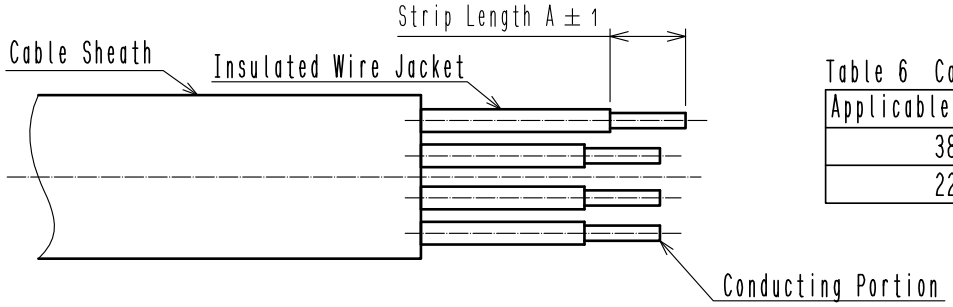


Table 6 Cable Strip Length

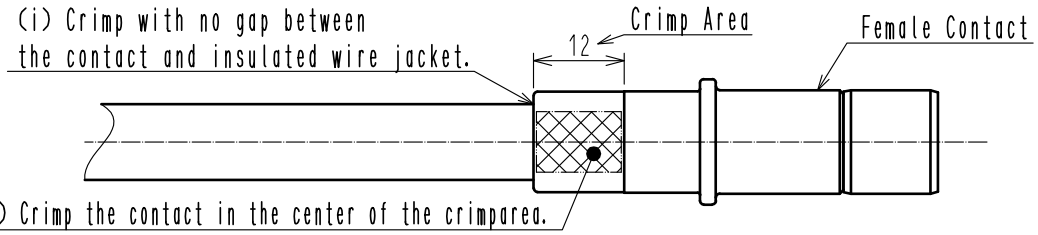
Applicable Cable Size	A Length
38mm²	18
22mm²	17

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.

◈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.



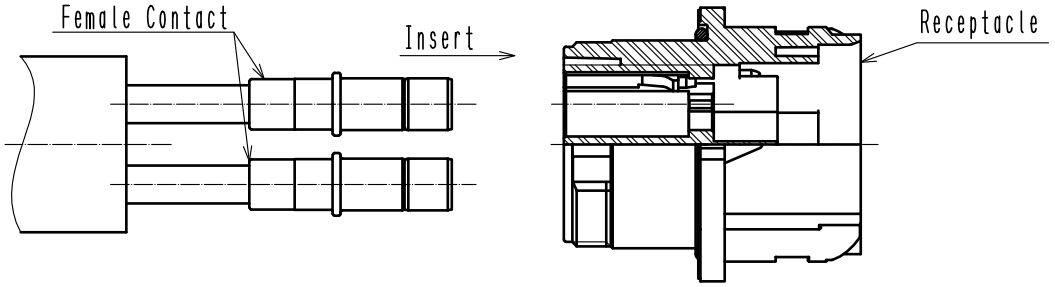
(iii) After crimping, check that the gap between the contact and the insulated wire jacket is $0^{+1.5}_{-0}$ before use.

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.

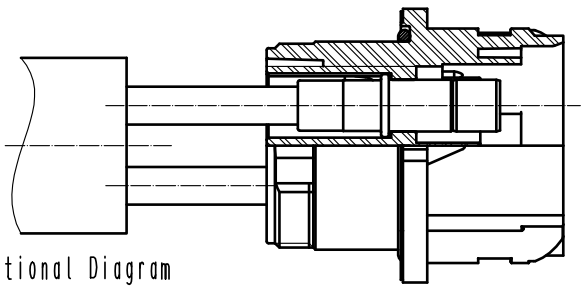
Table 7 Applicable female contact, die size, and connector

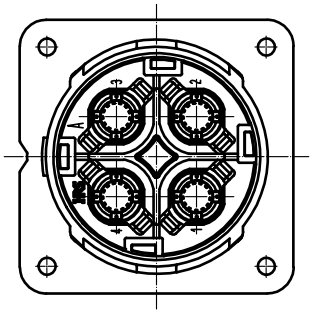
Applicable Female Contact		Tool	Applicable Cable	Applicable Connector	
HRS No.	Connector Name	Applicable Die Size	Conducting Cross Sectional Area	HRS No.	Connector Name
CL139-0012-7-03	EV1-SC2-132(03)	38	26.66 to 42.42mm^2	CL138-0046-2	EM52M-WBR-4SCA
CL139-0013-0-03	EV1-SC2-112(03)	22	16.78 to 26.66mm^2		

5 Insert the crimped female contact into the receptacle.

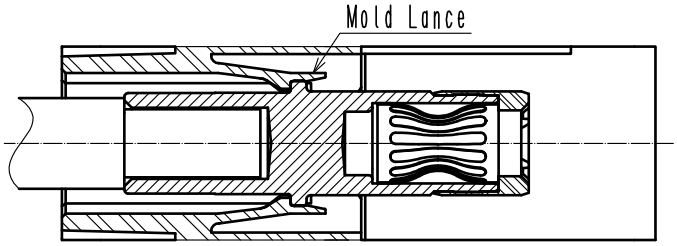


The mold lance makes an audible click as the female contact becomes fixed. By lightly pulling the cable while looking in from the mating side, check that the female contact is fixed on the mold lance of the receptacle.





Inserted Contact Cross Sectional Diagram

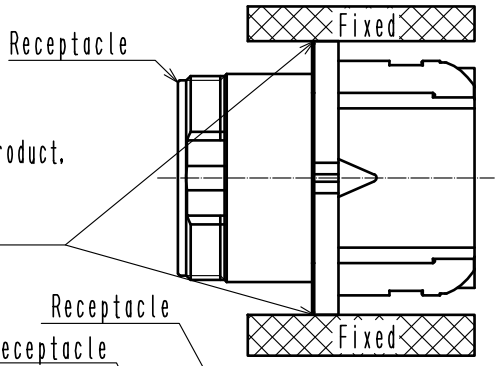


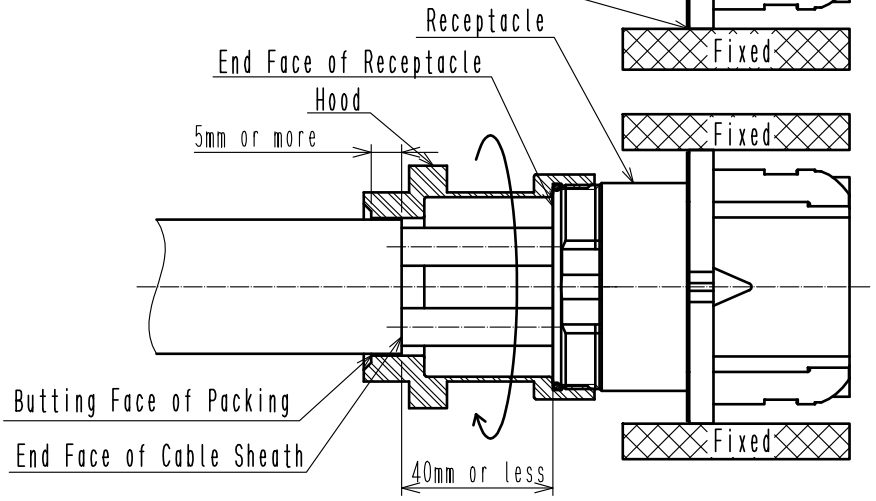
After installation, check the wiring.
If there is a wiring mistake, use the contact removal tool to pull out the contact to fix the problem.
Applicable Contact Removal Tool: EM52M-SC-TP(CL150-0262-1-00)

FORM 213-2

6 (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.

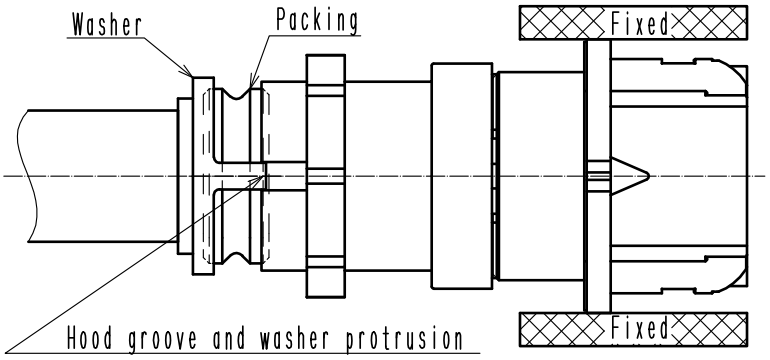
When fixing the receptacle in place, in order to not damage the product, use rubber or leather between the vice and the receptacle.
Also, try not to crack the product while fixing in place.



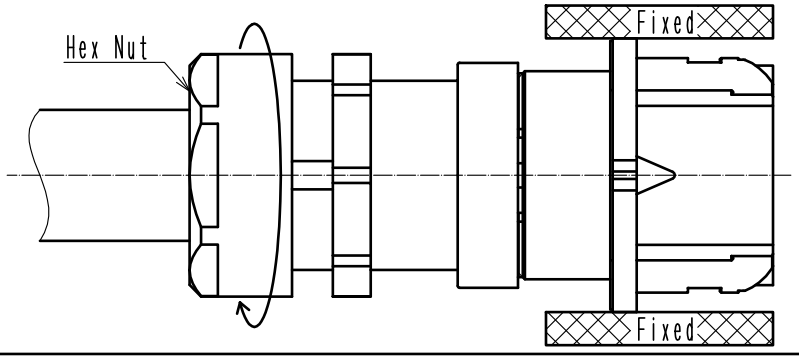


Attention: Make sure that the end face of the cable sheath is located 5 mm or more away from the contact face of the hood to the packing. Otherwise, the cable is not compressed sufficiently by the packing, which may affect the waterproof property.
A distance between the end face of the receptacle and that of the cable sheath is approximately 40 mm or less.

(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.



(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.



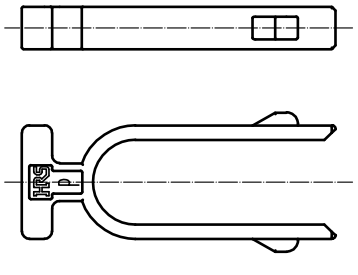
7 Assembly process complete.
We recommend testing waterproof and electrical performance using any method under the individual conditions.

◈Contact Removal Tool Usage (Male and Female Contacts)

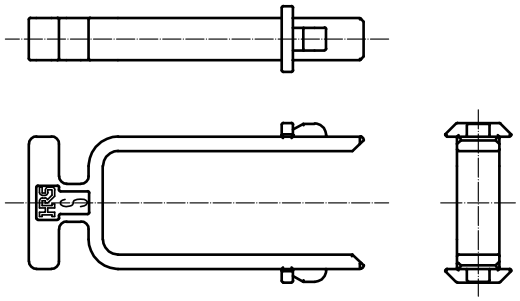
No. | Schematic Representation (Operation Guide)

(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.

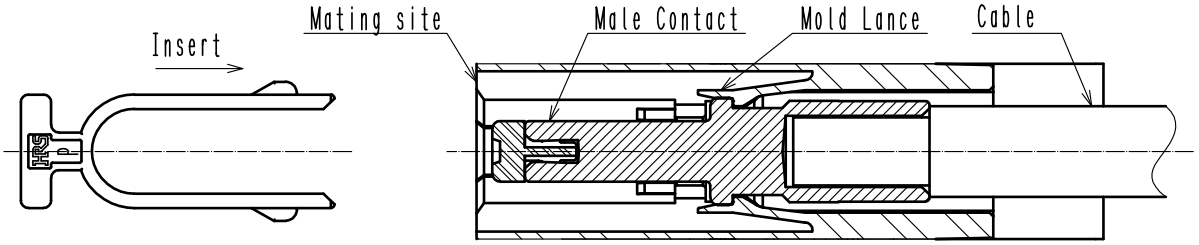
Male Contact Drawing Tool [EM52M-PC-TP(CL150-0261-9-00)]



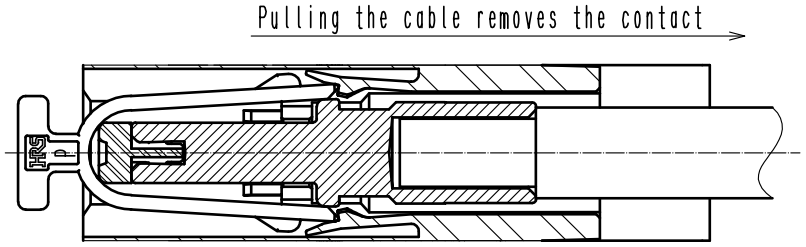
Female Contact Drawing Tool [EM52M-SC-TP(CL150-0262-1-00)]



Male Contact Removal (Same procedure for the female contact)



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

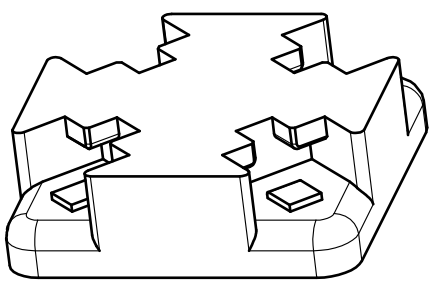


Attention: When removing the contact, make sure the lance is properly spread before pulling.
Trying to force it out could lead to a disconnection or damage to the mold lance.

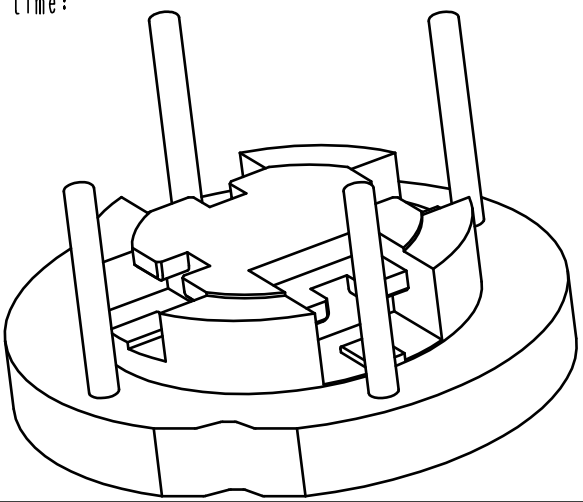
Attention: When removing the contact, do so while there is no strain on the cable.
Trying to carry out this procedure while there is strain on the cable could cause the mold lance to be damaged.

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)

EM52M-PC-TP2



EM52M-SC-TP2

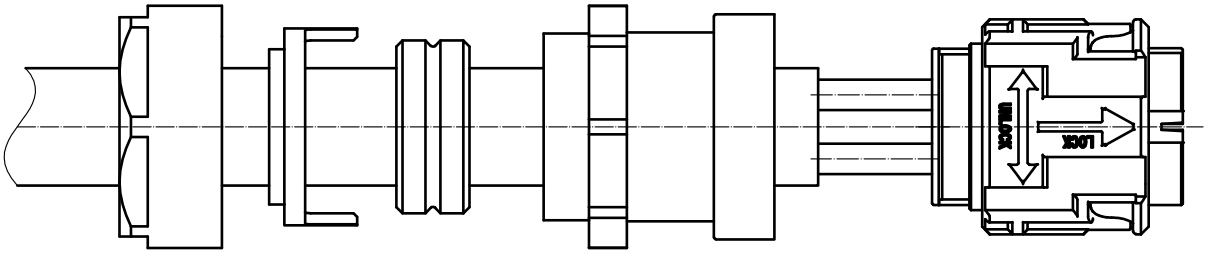


FORM 213-2

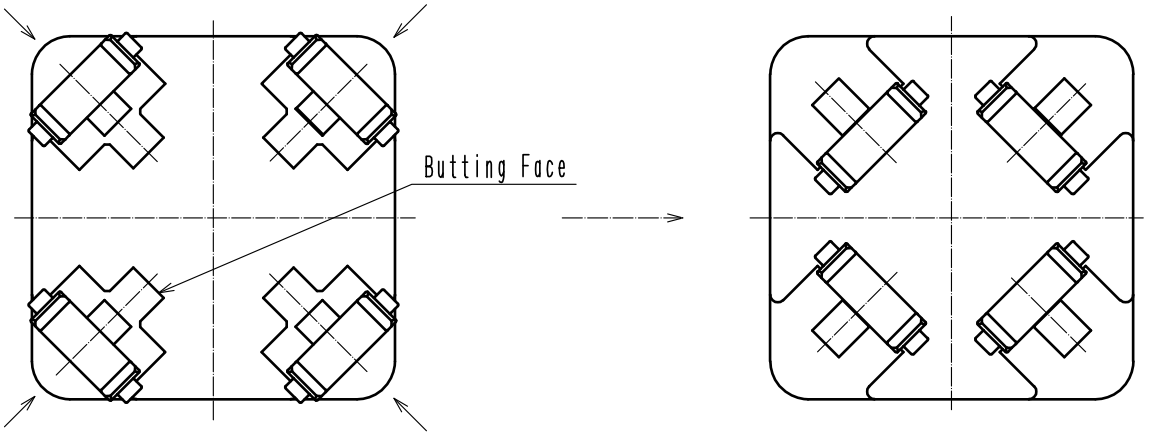
◈Contact Removal Tool Usage (One-Time Removal of Four Male Contacts)

No.	Schematic Representation (Operation Guide)

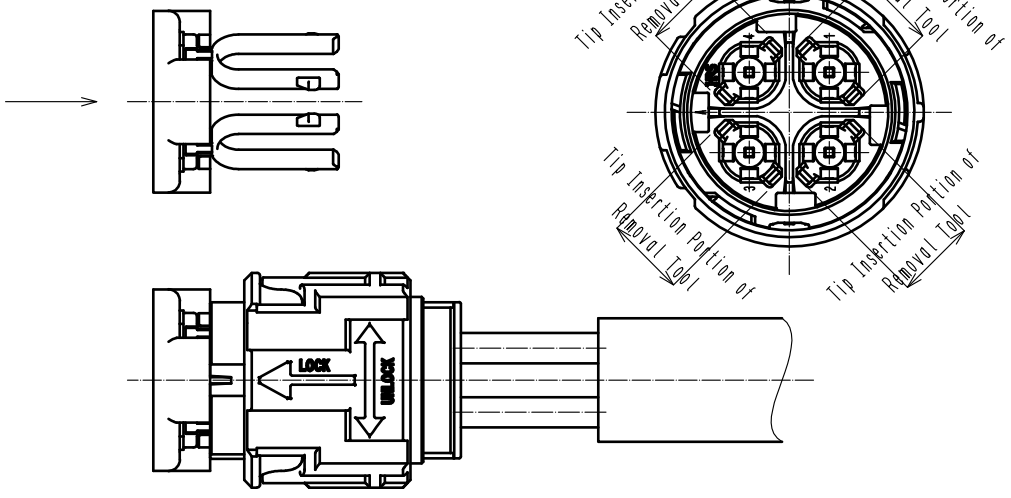
(i) Remove the Keigland from the connector.



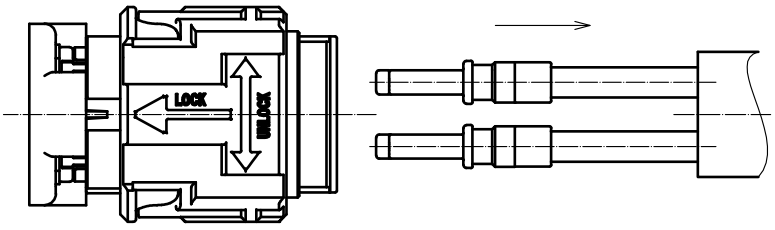
(ii) Push EM52M-PC-TP to EM52M-PC-TP2 in the four directions until it hits the butting face.



(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.



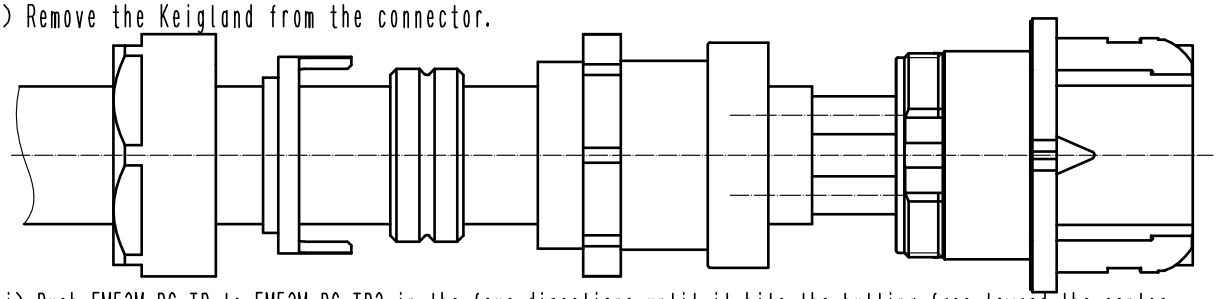
Attention: When removing the contact, make sure the lance is properly spread before pulling.
Trying to force it out could lead to a disconnection or damage to the mold lance.

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.

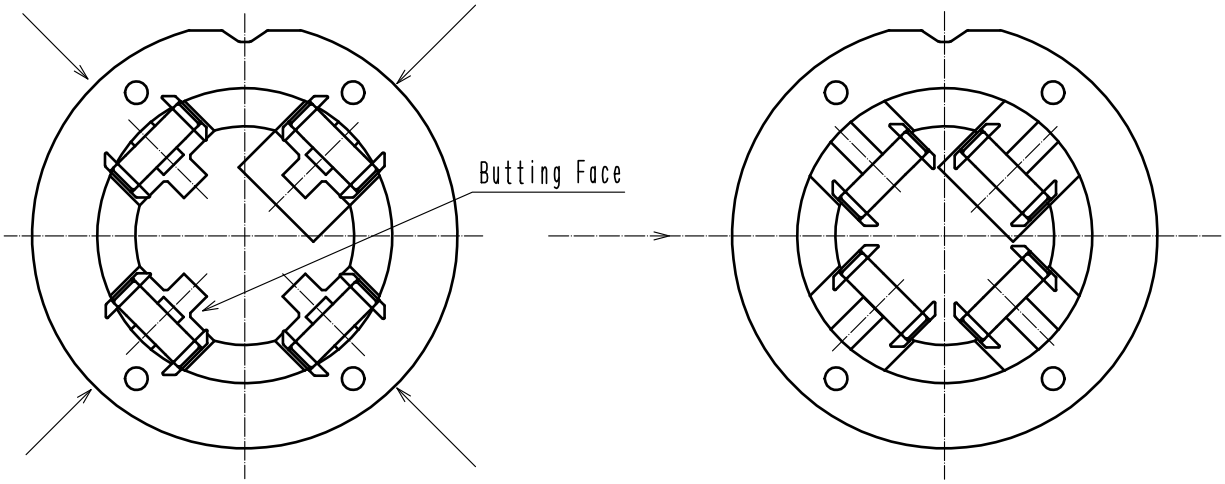
◈Contact Removal Tool Usage (One-Time Removal of Four Female Contacts)

No.	Schematic Representation (Operation Guide)

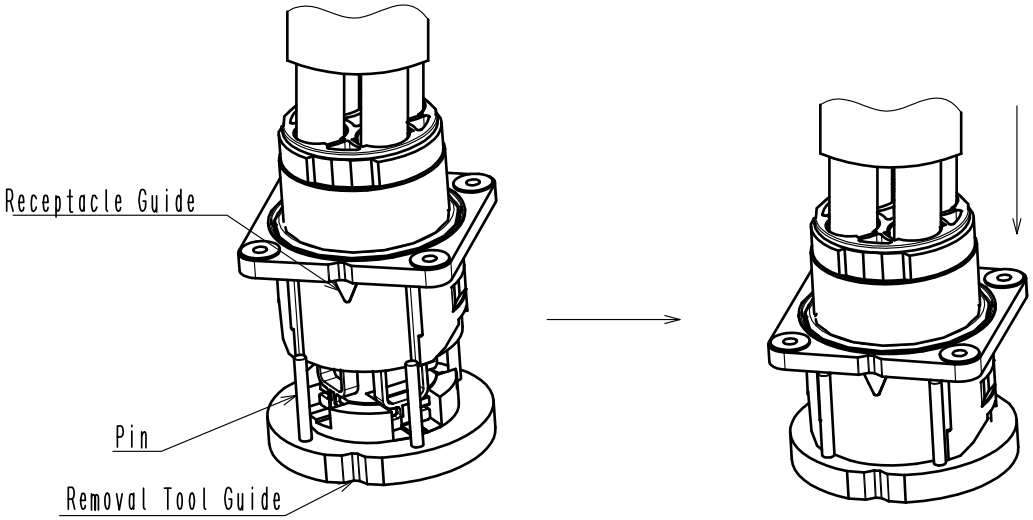
(i) Remove the Keigland from the connector.



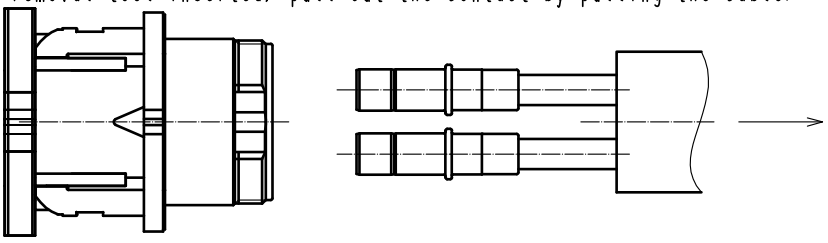
(ii) Push EM52M-PC-TP to EM52M-PC-TP2 in the four directions until it hits the butting face toward the center.



(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.