

1. Scope

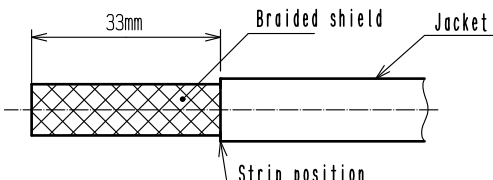
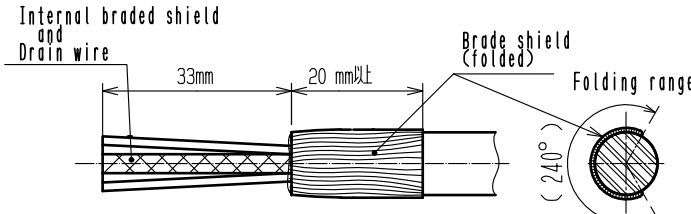
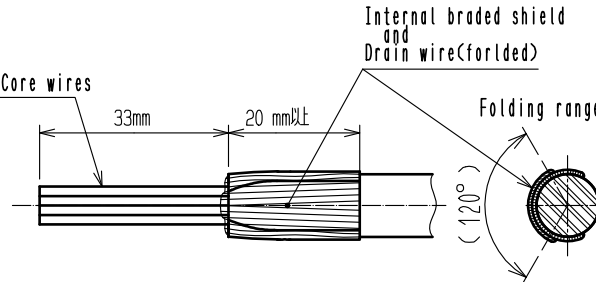
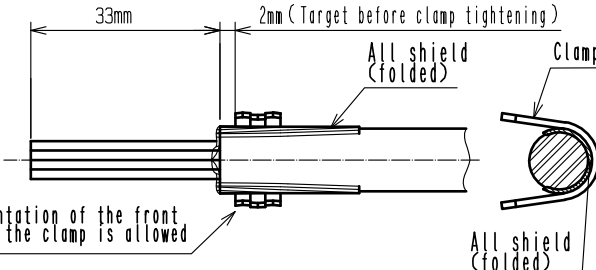
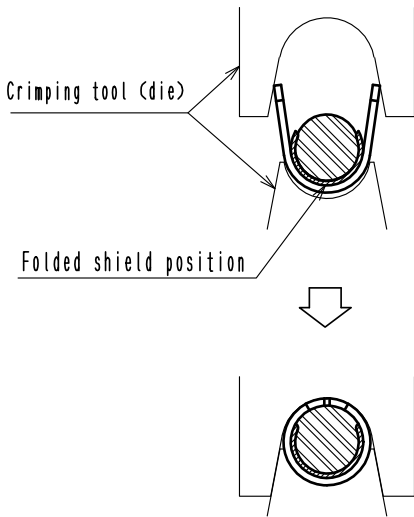
This specification defines the cable assembly procedure for HR22K-12WBP-20SC.

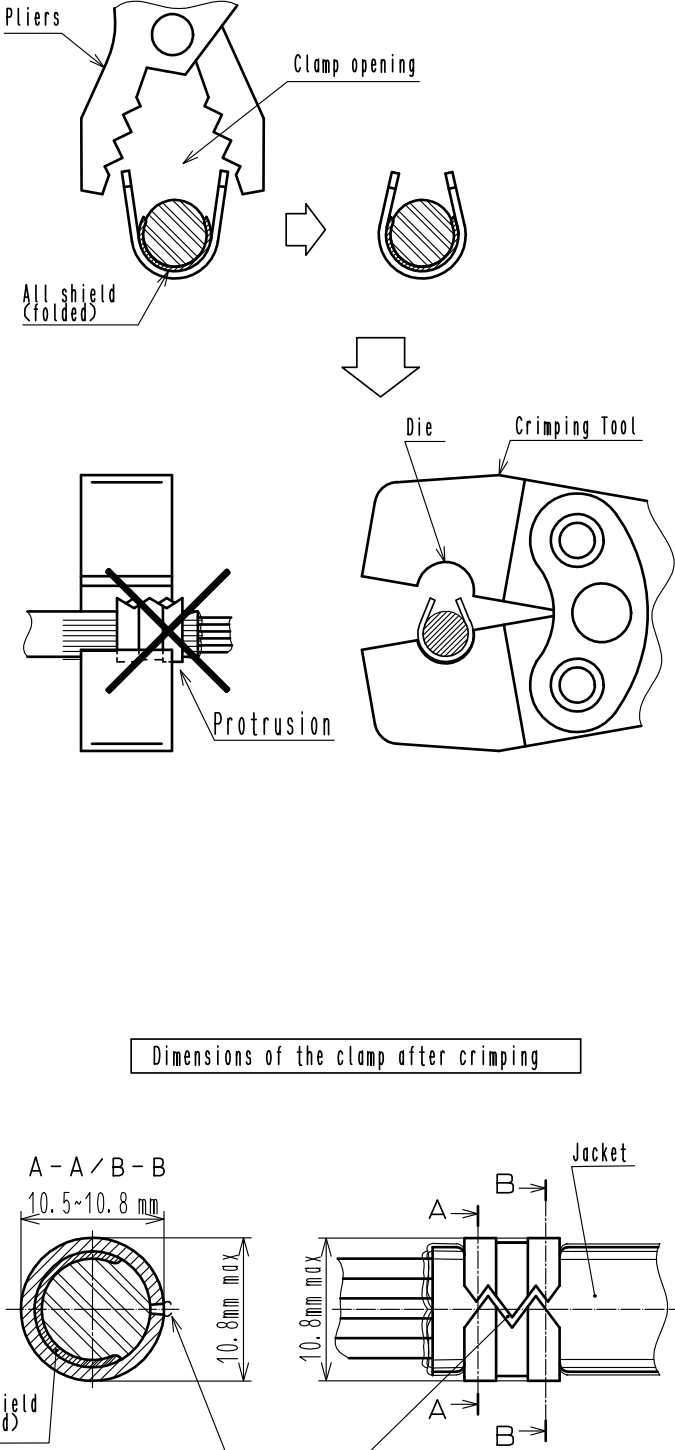
This specification shows an example using a cable with an outer braided shield and internal braided shields.

2. Work Procedure

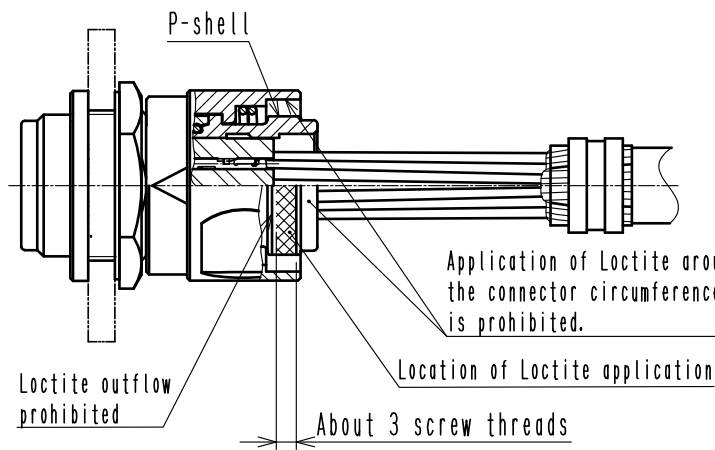
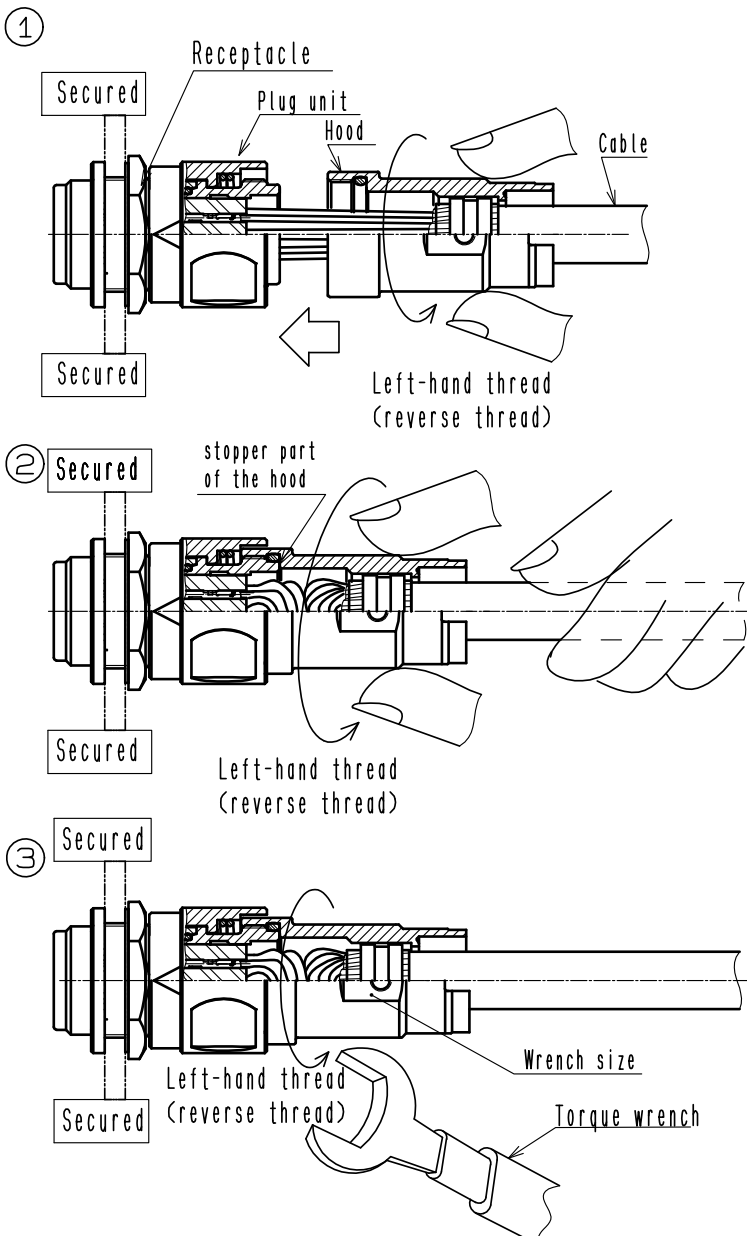
No.	Sketch	Work Procedure
1		<p>• Connector disassembly</p> <p>① Mate the plug with the receptacle.</p> <p>(Notice)</p> <p>Any panel can be attached to the receptacle and secured in place. See connector drawings for panel mounting hole dimensions.</p> <p>② Secure the receptacle, unscrew and remove the cord tube screwed into the plug body.</p> <p>(Notice)</p> <ul style="list-style-type: none"> <li>The mounting screw on the cord tube is a left-hand thread (reverse thread), so be careful of the loosening direction.</li> <li>Attaching or detaching the plug unit to or from the receptacle with the cord tube removed may result plug unit disassembly. If disassembled, reassemble the plug unit in accordance with the assembly instructions for the plug unit.</li> </ul>
2		<p>• Connector Assembly</p> <p>Pass each component through the cable in the orientation and order shown on the left.</p> <p>(Notice)</p> <p>Parts may not be able to pass through after the cable ends are processed.</p>

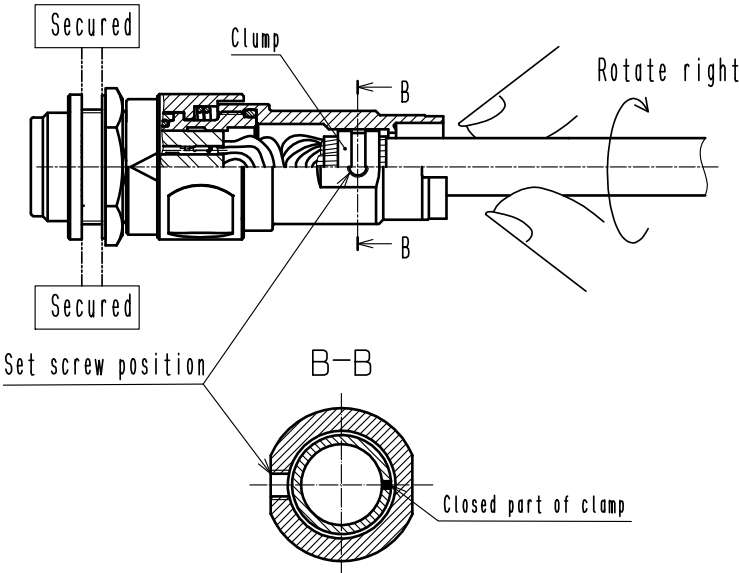
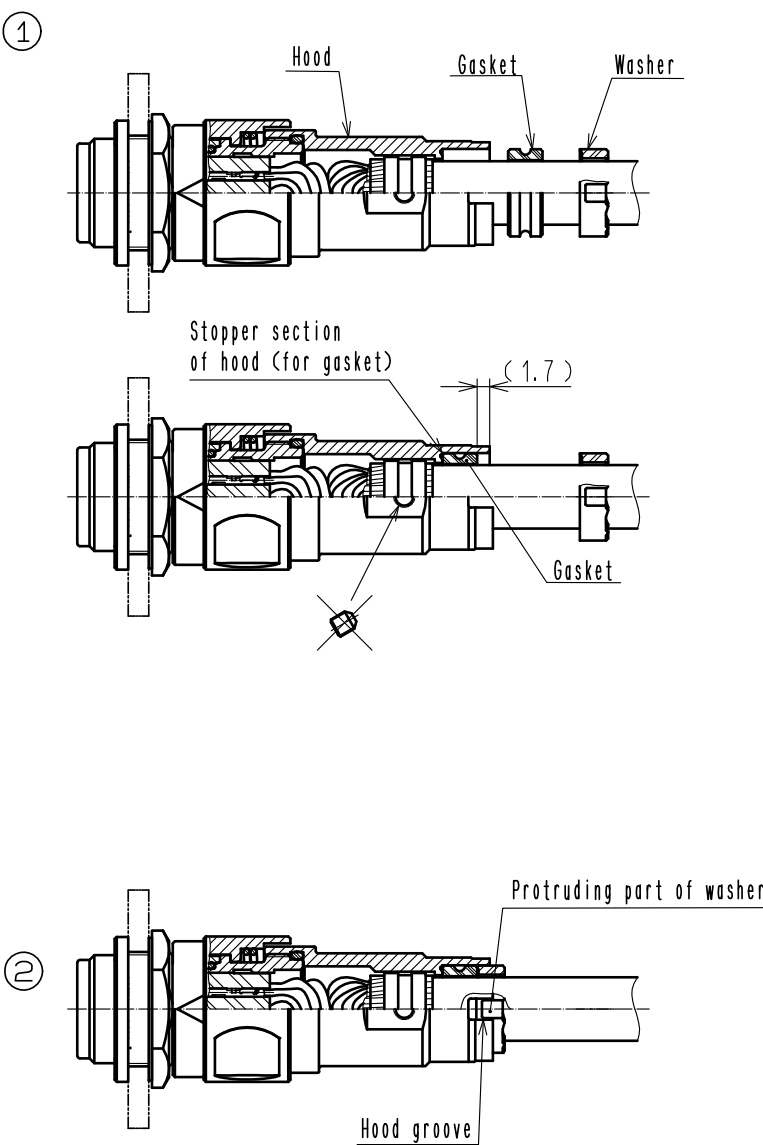
COUNT	DESCRIPTION OF REVISIONS	DESIGNED	CHECKED	DATE												
△																
<p>TITLE</p> <p>HR22K Assembly Procedure</p>			<p><b>HRS</b> HIROSE ELECTRIC CO., LTD.</p> <table border="1"> <tr> <td>APPROVED</td> <td>TP. KOMATSU</td> <td>20220913</td> </tr> <tr> <td>CHECKED</td> <td>HY. KOBAYASHI</td> <td>20220913</td> </tr> <tr> <td>CHARGED</td> <td>HY. KISHI</td> <td>20220912</td> </tr> <tr> <td>WRITTEN</td> <td>HY. KISHI</td> <td>20220912</td> </tr> </table>		APPROVED	TP. KOMATSU	20220913	CHECKED	HY. KOBAYASHI	20220913	CHARGED	HY. KISHI	20220912	WRITTEN	HY. KISHI	20220912
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<p>TECHNICAL SPECIFICATION</p>			<p>ETAD-C0489-00</p>	<p>△ 1 / 8</p>												

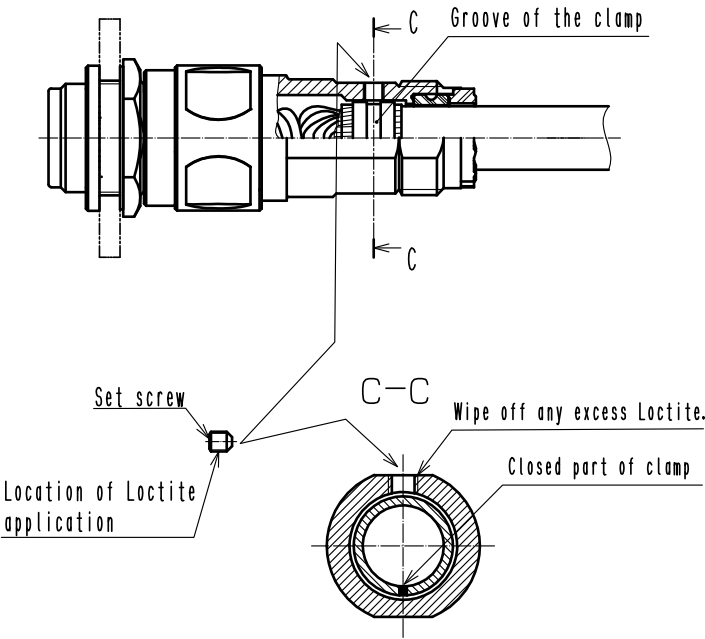
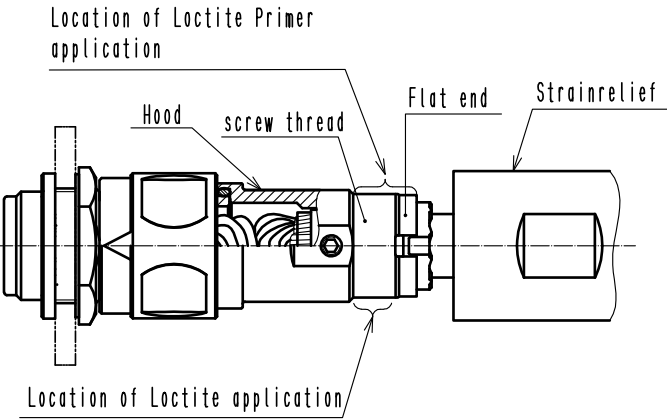
No.	Sketch	Work Procedure				
3	<p>①</p>  <p>②</p>  <p>③</p> 	<p>- Cable end treatment</p> <p>① Strip the cable jacket.</p> <p>(Notice) If the braided shield or core wire sheath is damaged during stripping, insulation or conduction failure may occur.</p> <p>② Unravel the braided shield and fold it back at the strip position.</p> <p>③ Unravel the internal braided shield and fold with drain wire it back at the strip position.</p> <p>(Notice) Make sure that the configuration of the braided shield does not collapse within the cable sheath when treating the braided shield. If the configuration of the braided shield is not correct, the clamping force after tightening the clamp metal may be low.</p>				
4	<p>①</p>  <p>② - 1 [For tabletop press tool]</p> 	<p>- Crimp the cable clamp</p> <p>① Set the folded all shield on the bottom side of the inner U-shape of the clamp, push it in and secure it temporarily.</p> <p>② - 1 Use the clamping tool to crimp the clamp. Adjust the height of the tool so that the dimension of the tool after crimping is the same as the dimension after crimping as shown in the figure in section-3.</p> <table border="1" data-bbox="1109 1657 1468 1724"> <tr> <td>Applicable tools</td> <td>crimping tool</td> </tr> <tr> <td>Part No.</td> <td>HR22/CK-MP</td> </tr> </table> <p>(Notice) - Refer to the separate instruction manual for handling the crimping tool.</p>	Applicable tools	crimping tool	Part No.	HR22/CK-MP
Applicable tools	crimping tool					
Part No.	HR22/CK-MP					

No.	Sketch	Work Procedure				
4	<p>②-2 [Hand tools (manual one-handed tools)]</p>  <p>③</p> <p style="border: 1px solid black; padding: 2px; display: inline-block;">Dimensions of the clamp after crimping</p> <p>A - A / B - B 10.5~10.8 mm 10.8mm max</p> <p>All shield (folded)</p> <p>Jacket</p> <p>Closed part of clamp</p> <p>If there is a jacket that protrudes and gets caught when it is assembled into the connector, remove the protruding part.</p>	<p>②-2</p> <p>Use pliers or similar tools to crush the clamp so that the opening of it can fit into the crimping tool die.</p> <p>Use a crimping tool to crimp the clamp.</p> <table border="1" data-bbox="1082 627 1492 694"> <tr> <td>Applicable tools</td> <td>crimping tool</td> </tr> <tr> <td>Part No.</td> <td>HT303/HR22K-10.2</td> </tr> </table> <p>(Notice)</p> <ul style="list-style-type: none"> <li>Refer to the separate instruction manual for crimping tool handling.</li> <li>Be careful that the clamp do not protrude from the die of the crimping tool.</li> </ul> <p>It is crimping with protrude from die may prevent it from being assembled into the connector or otherwise impair its performance.</p> <p>③ Check the tightness of the clamp. If there is a cable jacket that protrudes and gets caught when it is assembled into the connector, remove the protruding part.</p> <p>(Notice)</p> <ul style="list-style-type: none"> <li>If the clamping dimension is too large, it may not be possible to assemble into the connector. The cable securing force may also be too low, resulting in cable movement that causes stress on the contacts resulting in conduction failure.</li> </ul>	Applicable tools	crimping tool	Part No.	HT303/HR22K-10.2
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No.	Sketch	Work Procedure			
5	<p>Excess length of shielded wire (spread out)</p> <p>33 mm</p> <p>2 ~ 4mm (After crimping the clamp)</p> <p>2 ~ 2.5mm</p> <p>1.5 mm max</p>	<ul style="list-style-type: none"> <li>• Cut shield and strip insulation</li> </ul> <p>Cut shield and strip insulation of core wire according to the dimensions shown in the figure.</p> <p>(Notice)</p> <ul style="list-style-type: none"> <li>• When cutting the shield, use wire cutters with a round blade to make it easier to cut at the root of the shield.</li> <li>• When stripping insulation of core wires, scratching the conductor may cause poor conduction.</li> </ul>			
6	<p>Core wire</p> <p>Crimp contact</p>	<ul style="list-style-type: none"> <li>• Crimp contact</li> </ul> <p>Crimp the crimp contacts to the core wires.</p> <table border="1" data-bbox="1098 775 1481 887"> <tr> <td>Applicable crimping tool</td> </tr> <tr> <td>Crimp machine main unit: CM-105</td> </tr> <tr> <td>Crimp applicator: AP105-HR22-2</td> </tr> </table> <p>(Notice)</p> <p>For C/H and other crimp quality standards (ATAD-C0331), please make a request to our sales.</p>	Applicable crimping tool	Crimp machine main unit: CM-105	Crimp applicator: AP105-HR22-2
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7	<p>Housing</p> <p>Plug unit</p> <p>Protrusions on housing</p> <p>Crimp contact lance</p>	<ul style="list-style-type: none"> <li>• Contact insertion</li> </ul> <p>Insert the crimped contacts into the housing of the plug unit. When inserting, align the direction of the protrusion on the housing with the contact lance as shown in the figure, and insert until you hear a snap. After insertion, gently pull the wire to confirm that the contact is secured.</p> <p>(Notice)</p> <ul style="list-style-type: none"> <li>• When inserting the contacts, be careful not to deform them. The crimp contact will be deformed if the retainer position of the housing is not aligned with the orientation of the contact during insertion. If the part of the contact that is secured is pulled strongly after insertion, the contact will be damaged, fall out and cannot be secured even if it is reinserted.</li> <li>• The contacts may be difficult to insert if the core wires are soft. In this case, insert the core wire by holding the part of closest to the contact.</li> </ul>			

No.	Sketch	Work Contents								
00	 <p>P-shell</p> <p>Loctite outflow prohibited</p> <p>Application of Loctite around the connector circumference is prohibited.</p> <p>Location of Loctite application</p> <p>About 3 screw threads</p>	<p>• Loctite applied to P-shell</p> <p>Apply Loctite 263 to the threaded portion of the P-shell to prevent the cord tube from loosening.</p> <table border="1" data-bbox="1077 324 1508 526"> <tr> <td>Type</td> <td>Loctite</td> </tr> <tr> <td>Part No.</td> <td>263</td> </tr> <tr> <td>Location of Loctite application</td> <td>About 3 screw threads</td> </tr> <tr> <td>Coating amount</td> <td>Until the thread screw is covered</td> </tr> </table> <p>(Notice)</p> <p>• If Loctite adheres to the Loctite prohibited areas and hardens as it is, it may cause waterproof leakage or operation failure. Please wipe it off before it hardens.</p> <p>• If too much Loctite is applied, it may flow inside the plug unit and solidify, causing malfunction.</p>	Type	Loctite	Part No.	263	Location of Loctite application	About 3 screw threads	Coating amount	Until the thread screw is covered
Type	Loctite									
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00	 <p>①</p> <p>Receptacle</p> <p>Secured</p> <p>Plug unit</p> <p>Hood</p> <p>Cable</p> <p>Secured</p> <p>Left-hand thread (reverse thread)</p> <p>②</p> <p>Secured</p> <p>stopper part of the hood</p> <p>Left-hand thread (reverse thread)</p> <p>③</p> <p>Secured</p> <p>Left-hand thread (reverse thread)</p> <p>Wrench size</p> <p>Torque wrench</p>	<p>• Hood assembly</p> <p>Tighten the hood to the wired plug unit.</p> <p>① Push in and engage the threads while turning the hood to the left. Do not rotate the hood more than one rotation.</p> <p>(Notice)</p> <p>• Receptacles should be fastened firmly so that they will not move even when using torque to assemble the plug. If the receptacle is not sufficiently secured, it may tilt during assembly, resulting in connector damage or failure to tighten with the specified torque.</p> <p>• The hood mounting screw is a left-hand thread (reverse thread), so be careful about the tightening direction.</p> <p>② With the cable secured by hand to prevent it from turning, screw it in until the stopper part of the hood up against it.</p> <p>(Notice)</p> <p>If the cable turns with the hood when it is screwed in, the lead wires may be twisted and break.</p> <p>③ Use a torque wrench to tighten to the specified torque.</p> <table border="1" data-bbox="1077 1948 1508 2027"> <tr> <td>Wrench size[mm]</td> <td>Tightening torque[N·m]</td> </tr> <tr> <td>16</td> <td>2~2.5</td> </tr> </table>	Wrench size[mm]	Tightening torque[N·m]	16	2~2.5				
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16	2~2.5									

No.	Sketch	Work Contents
10		<ul style="list-style-type: none"> <li>Adjusting the clamp position</li> </ul> <p>Adjust the position by rotating the cable to the right so that closed part of clamp is on the opposite side of the set screw.</p> <p>(Notice)</p> <p>Cable rotation to the right is limited to one rotation. Excessive rotation may twist the core wires and break them.</p>
11		<ul style="list-style-type: none"> <li>Installation of gaskets and washers</li> </ul> <p>① Push the gasket into position against the stopper at the back of the hood as shown on the left.</p> <p>(Notice)</p> <p>Do not install the set screw before the gasket is installed, as this will pull the cable to one side and make it difficult to install the gasket.</p> <p>② Align the protruding part of the washer with the hood groove, push the washer in, and temporarily assemble it.</p>

No.	Sketch	Work Contents																
12		<p>- Tightening set screws</p> <p>Apply Loctite to set screws to prevent loosening and to seal. Rotate and adjust the cable so that the closed part of clamp is on the opposite side of the set screw.</p> <p>Tighten the set screw with the specified torque to the point where the tip of the set screw falls into the groove of the clamp.</p> <table border="1" data-bbox="1072 622 1503 721"> <tr> <td>Hexagon Wrench size[mm]</td> <td>Tightening torque[N·m]</td> </tr> <tr> <td>1.5</td> <td>0.5~0.55</td> </tr> </table> <table border="1" data-bbox="1072 725 1503 918"> <tr> <td>Type</td> <td>Loctite</td> </tr> <tr> <td>Part No.</td> <td>263</td> </tr> <tr> <td>Location of Loctite application</td> <td>Thread circumference</td> </tr> <tr> <td>Coating amount</td> <td>Until the thread screw is covered</td> </tr> </table> <p>(Notice)</p> <ul style="list-style-type: none"> <li>- If Loctite263 is not applied or not enough is applied, the gap between the threads will not be filled and waterproofing cannot be guaranteed.</li> <li>- Wipe off any excess Loctite263.</li> </ul>	Hexagon Wrench size[mm]	Tightening torque[N·m]	1.5	0.5~0.55	Type	Loctite	Part No.	263	Location of Loctite application	Thread circumference	Coating amount	Until the thread screw is covered				
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13		<p>- Apply Loctite primer and Loctite to the hood.</p> <p>Apply Loctite Primer 7649 to the male threads of the hood and allow to dry.</p> <p>After drying, apply Loctite263.</p> <table border="1" data-bbox="1072 1456 1503 1671"> <tr> <td>Type</td> <td>Loctite primer</td> </tr> <tr> <td>Part No.</td> <td>7643</td> </tr> <tr> <td>Location of Loctite application</td> <td>Flat surface on all threads and ends</td> </tr> <tr> <td>Coating amount</td> <td>To the extent that the whole surface is saturated</td> </tr> </table> <table border="1" data-bbox="1072 1675 1503 1868"> <tr> <td>Type</td> <td>Loctite</td> </tr> <tr> <td>Part No.</td> <td>263</td> </tr> <tr> <td>Location of Loctite application</td> <td>About 3 screw threads</td> </tr> <tr> <td>Coating amount</td> <td>Until the thread screw is covered</td> </tr> </table> <p>(Notice)</p> <p>Loctite begins to harden quickly due to the Loctite primer. Immediately after applying Loctite, tighten the strain relief as described in the next section.</p>	Type	Loctite primer	Part No.	7643	Location of Loctite application	Flat surface on all threads and ends	Coating amount	To the extent that the whole surface is saturated	Type	Loctite	Part No.	263	Location of Loctite application	About 3 screw threads	Coating amount	Until the thread screw is covered
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14		<p>- Strainrelief Installation</p> <p>Check that the protruding part of the washer fits into the hood groove. Gently hand-tighten the strain relief, making sure that the protruding part of the washer does not come off the hood groove. If it cannot be tightened by hand, use a torque wrench to tighten it to the specified torque.</p> <table border="1" data-bbox="1075 589 1505 656"> <thead> <tr> <th>Wrench size[mm]</th> <th>Tightening torque[N·m]</th> </tr> </thead> <tbody> <tr> <td>19</td> <td>1.5~2</td> </tr> </tbody> </table> <p>(Notice)</p> <ul style="list-style-type: none"> <li>- Receptacles should be fastened firmly so that they will not move even when using torque to assemble the plug. If the receptacle is not sufficiently secured, it may tilt during assembly, resulting in connector damage or failure to tighten with the specified torque.</li> <li>- The screw is a left-hand thread (reverse thread), so be careful about the tightening direction.</li> <li>- When the strainrelief is properly tightened, the end of the strainrelief will be in contact with the stepped portion of the hood.</li> <li>- The strainrelief is tightened to the end of the cord tube. In this case wipe off the Loctite on the hood threads and start over from section 13. The strainrelief can only be re-installed once.</li> </ul>	Wrench size[mm]	Tightening torque[N·m]	19	1.5~2
Wrench size[mm]	Tightening torque[N·m]					
19	1.5~2					

14	<p>【 Finished 】</p> <p>[Confirmation of waterproof performance] After assembling the connector, apply air pressure of 40KPa for 30 seconds from the connector joint side. Confirm that no air bubbles are generated from inside the connector.</p>	<p>(Notice)</p> <p>The positional relationship of the plug unit and strainrelief in the rotational direction is shown as an example.</p>
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