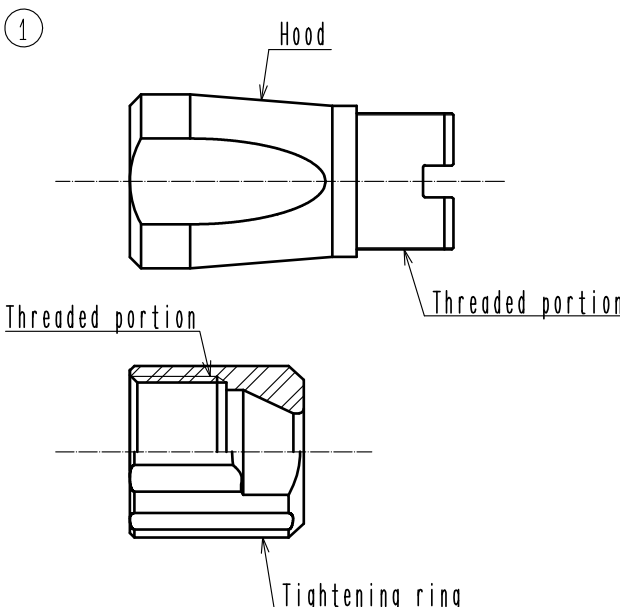
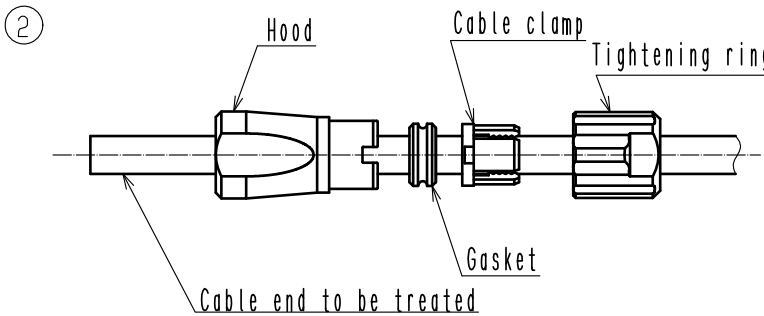
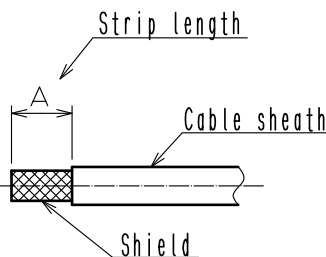


This document describes the recommended assembly procedure of LF right angled connectors.

1. Procedure

No.	Drawing	Procedure Details																						
1	<div><p>①</p><p>Plug</p><p>Insert</p><p>Cable assembly fixture</p><p>Vice</p><p>②</p><p>Right angled hood</p><p>Connection ring</p><p>Hood</p><p>Contact block</p><p>Vice</p><p>Note (1)</p><p>Contact block</p><p>Sleeve</p><p>Vice</p></div>	<p>[Plug Disassembly]</p> <p>① With the cable assembly fixture fixed in place with a vice etc., mate it with the plug.</p> <p>Table 1.</p> <table><thead><tr><th>Tool Name</th><th>Applicable Product</th></tr></thead><tbody><tr><td>LF07BP-T01</td><td>LF07WBLP-※※</td></tr><tr><td>LF10BP-T01</td><td>LF10WBLP-※※</td></tr><tr><td>LF13BP-T01</td><td>LF13WBLP-※※</td></tr></tbody></table> <p>② Loosen both the hood and connection ring and remove the hood and right angled hood from the connector.</p> <p>Note (1) When wiring, be sure to use a cable assembly fixture. Directly fixing the sleeve in place with a vice etc., could lead to damage or deformation.</p>	Tool Name	Applicable Product	LF07BP-T01	LF07WBLP-※※	LF10BP-T01	LF10WBLP-※※	LF13BP-T01	LF13WBLP-※※														
Tool Name	Applicable Product																							
LF07BP-T01	LF07WBLP-※※																							
LF10BP-T01	LF10WBLP-※※																							
LF13BP-T01	LF13WBLP-※※																							
<table><thead><tr><th>COUNT</th><th>DESCRIPTION OF REVISIONS</th><th>DESIGNED</th><th>CHECKED</th><th>DATE</th></tr></thead><tbody><tr><td>△ 1</td><td>DIS-C-00017110</td><td>HT. ZENBA</td><td>EJ. KUNII</td><td>20240219</td></tr></tbody></table> <div><div>TITLE</div><div>LF Right Angled Plug Assembly Procedure</div></div>		COUNT	DESCRIPTION OF REVISIONS	DESIGNED	CHECKED	DATE	△ 1	DIS-C-00017110	HT. ZENBA	EJ. KUNII	20240219	<div><div>HRS</div><div>HIROSE ELECTRIC CO., LTD.</div></div> <table><tbody><tr><td>APPROVED</td><td>YH. YAMADA</td><td>20170525</td></tr><tr><td>CHECKED</td><td>HY. KOBAYASHI</td><td>20170524</td></tr><tr><td>CHARGED</td><td>TY. SUZUKI</td><td>20170524</td></tr><tr><td>WRITTEN</td><td>THOMAS FORAN</td><td>20170524</td></tr></tbody></table>	APPROVED	YH. YAMADA	20170525	CHECKED	HY. KOBAYASHI	20170524	CHARGED	TY. SUZUKI	20170524	WRITTEN	THOMAS FORAN	20170524
COUNT	DESCRIPTION OF REVISIONS	DESIGNED	CHECKED	DATE																				
△ 1	DIS-C-00017110	HT. ZENBA	EJ. KUNII	20240219																				
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WRITTEN	THOMAS FORAN	20170524																						
TECHNICAL SPECIFICATION		ETAD-C0404-00	△ 1	8																				

No.	Drawing	Procedure Details									
2	<p>①</p>  <p>②</p> 	<p>[Connector Assembly Preparation]</p> <p>① Spray or brush Loctite 7649 primer, manufactured by Henkel Japan LTD., on the threaded portions of both the hood and the tightening ring, and then allow the primer-applied surfaces to dry completely.</p> <p>Notes (1) Leave to dry for 30 to 70 seconds at room temperature. (2) While drying, make sure there is sufficient ventilation, as solvent components are volatilized during drying. (3) After applying primer, keep the primer-applied surfaces away from dirt or dust.</p> <p>② Thread the cable through the tightening ring, cable clamp, gasket, and hood in the order shown in the figure.</p> <p>Note (1) Threading of the components may not be possible after treating the cable.</p>									
3	<p>①</p>  <p>Table 2. Strip lengths (Unit: mm)</p> <table><tr><th>Number of Contacts</th><th>A Length</th></tr><tr><td>6</td><td>35 to 37</td></tr><tr><td>12</td><td>46 to 48</td></tr><tr><td>11</td><td rowspan="2">57 to 59</td></tr><tr><td>20</td></tr></table>	Number of Contacts	A Length	6	35 to 37	12	46 to 48	11	57 to 59	20	<p>[Cable-end stripping]</p> <p>① Strip the cable at the appropriate length shown in the table.</p> <p>Notes (1) When stripping the cable sheath, be careful not to damage the shield. (2) Be careful not to damage the cable sheath, as it could affect waterproof performance.</p>
Number of Contacts	A Length										
6	35 to 37										
12	46 to 48										
11	57 to 59										
20											

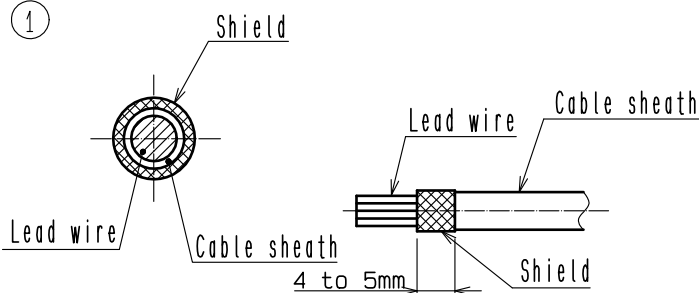
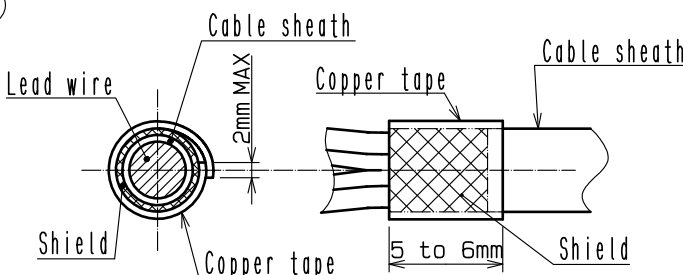
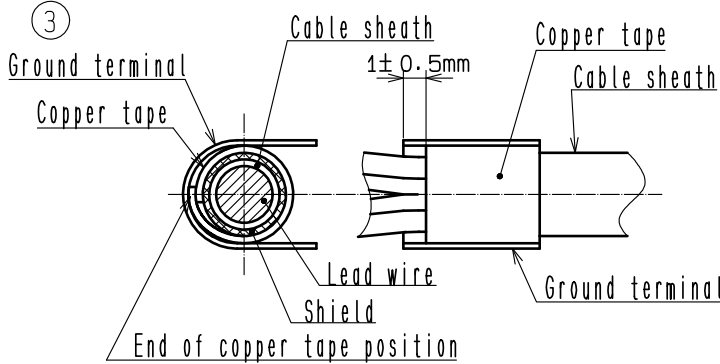
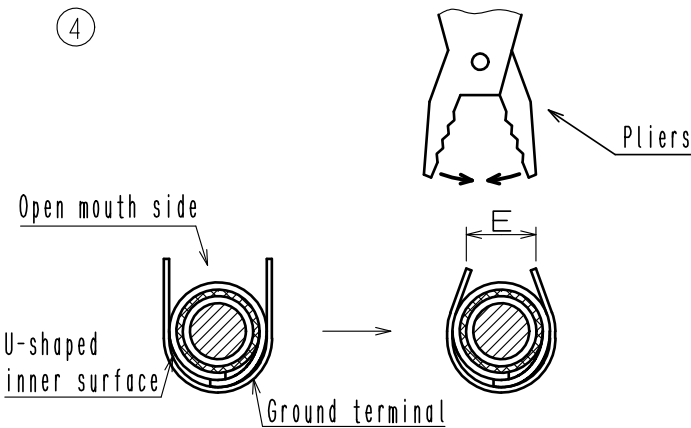
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No.	Drawing	Procedure Details						
4	<div>①</div> 	<div>(Crimping of ground terminal)</div> <div>① Fold the shield over the cable sheath uniformly.</div>						
	<div>②</div> 	<div>② Wrap copper tape, of width 5 to 6mm, around the shield to prevent it from loosening. Make sure that the shield does not extend out of the copper tape.</div> <div>Note (1) Make sure that the overlapping portion of the tape is under 2mm.</div>						
	<div>③</div> 	<div>③ The ground terminal should be placed over the copper tape as shown in the diagram. The end of the copper tape should be at the bottom face of the U-shape.</div> <div>Note (1) If the end of the copper tape faces the mouth, the ground terminal will not cover the tape ends after crimping.</div>						
	<div>④</div> 	<div>④ Next, to prevent the ground terminal from falling, use a pliers, etc. to close the mouth of the ground terminal to the appropriate size as shown in table 3. This process will make it easier to crimp the ground terminal.</div> <div>Table 3.</div> <table><tr><th>Shell Size</th><th>E</th></tr><tr><td>LF07</td><td>5mm MAX</td></tr><tr><td>LF10</td><td rowspan="2">7mm MAX</td></tr><tr><td>LF13</td></tr></table>	Shell Size	E	LF07	5mm MAX	LF10	7mm MAX
Shell Size	E							
LF07	5mm MAX							
LF10	7mm MAX							
LF13								

HRS

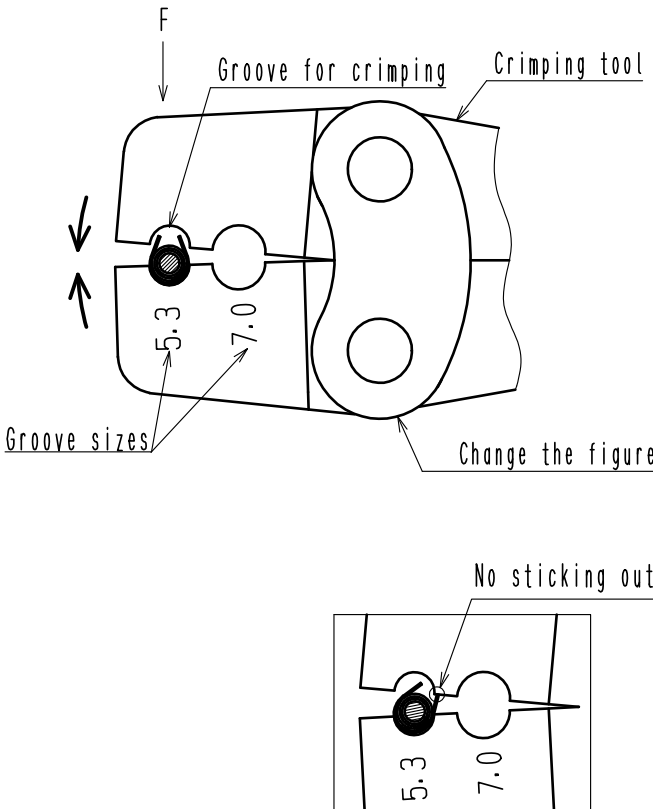
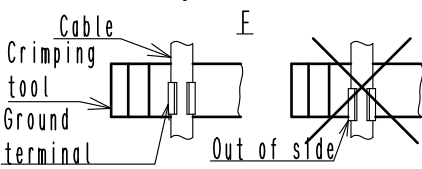
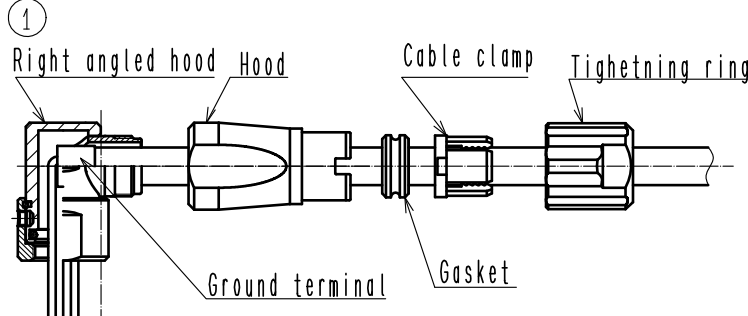
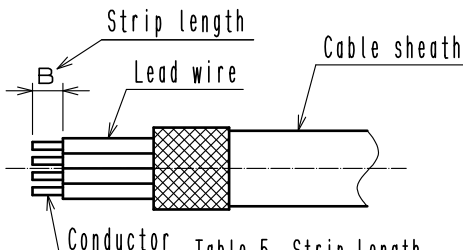
HIROSE ELECTRIC CO., LTD.

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No.	Drawing	Procedure Details																				
4	<div><p>⑤</p></div> <p>Table 4. Crimp Tools</p> <table><tr><th>Shell Size</th><th>Crimp Tool Name</th><th>Groove Size</th><th>Applicable Cable</th><th>Ground Terminal Outer Diameter After Crimping</th></tr><tr><td>LF07</td><td>HR10A-TC-02</td><td>5.3</td><td>φ5</td><td>φ5.3mm to φ5.5mm</td></tr><tr><td>LF10</td><td>LF-TC-01</td><td>7.9</td><td>φ7.3</td><td>φ7.9mm to φ8.1mm</td></tr><tr><td>LF13</td><td>LF-TC-01</td><td>9.1</td><td>φ8.7</td><td>φ9.1mm to φ9.3mm</td></tr></table> <div><p>⑤ Place the ground terminal into the 5.3 groove of the crimp tool as shown in the figure, and then crimp.</p><p>Note The appropriate cable size for each groove is shown in table 4.</p><p>⚠ Caution</p><p>(1) Be careful not to stick out the ground terminal from the tool. ※Refer to figure F.</p><p>(2) Ensure that both ground terminal plates are inserted into the crimping die set before starting to crimp. ※Refer to figure on the left.</p><p>If the ground terminal is stuck out and crimped, without following the above precautions it may not be assembled into the connector or the performance may be impaired.</p></div>	Shell Size	Crimp Tool Name	Groove Size	Applicable Cable	Ground Terminal Outer Diameter After Crimping	LF07	HR10A-TC-02	5.3	φ5	φ5.3mm to φ5.5mm	LF10	LF-TC-01	7.9	φ7.3	φ7.9mm to φ8.1mm	LF13	LF-TC-01	9.1	φ8.7	φ9.1mm to φ9.3mm	
Shell Size	Crimp Tool Name	Groove Size	Applicable Cable	Ground Terminal Outer Diameter After Crimping																		
LF07	HR10A-TC-02	5.3	φ5	φ5.3mm to φ5.5mm																		
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LF13	LF-TC-01	9.1	φ8.7	φ9.1mm to φ9.3mm																		
5	<p>①</p>  <div><p>① Pass the cable through until the ground terminal stops in the right angled hood.</p></div>																					
6	<p>①</p>  <p>Table 5. Strip Length [Unit: mm]</p> <table><tr><th>Number of Contacts</th><th>B Length</th></tr><tr><td>6</td><td rowspan="3">2±0.5</td></tr><tr><td>12</td></tr><tr><td>20</td></tr><tr><td>11</td><td>3±0.5(A to D) 2±0.5(1 to 7)</td></tr></table> <div><p>[Lead Wire Strip]</p><p>① When stripping the cable, be careful not to damage the lead wire, the conductor, or the shield as it could lead to faulty insulation, faulty conduction or a loss of waterproof performance.</p></div>	Number of Contacts	B Length	6	2±0.5	12	20	11	3±0.5(A to D) 2±0.5(1 to 7)													
Number of Contacts	B Length																					
6	2±0.5																					
12																						
20																						
11	3±0.5(A to D) 2±0.5(1 to 7)																					

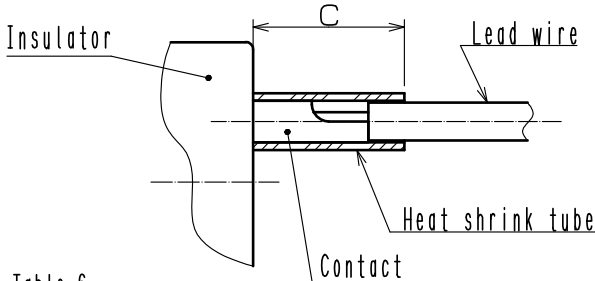
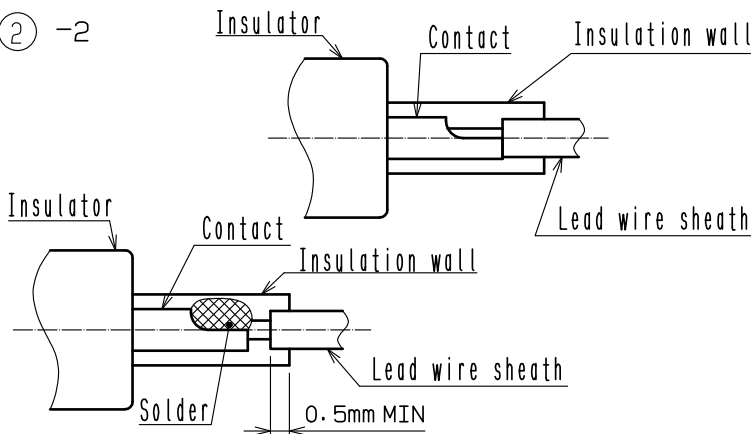
HR5

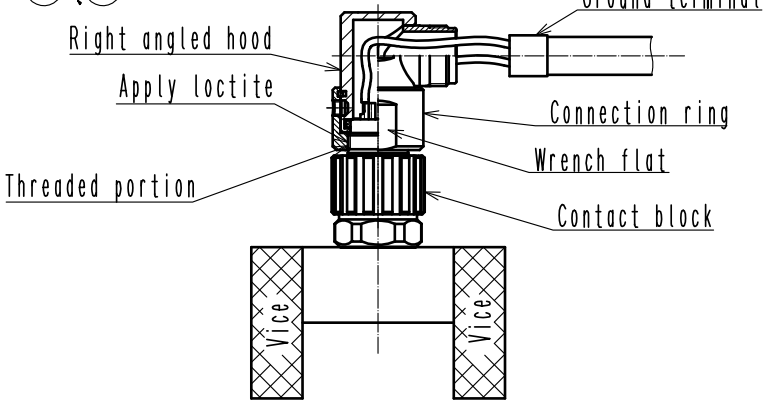
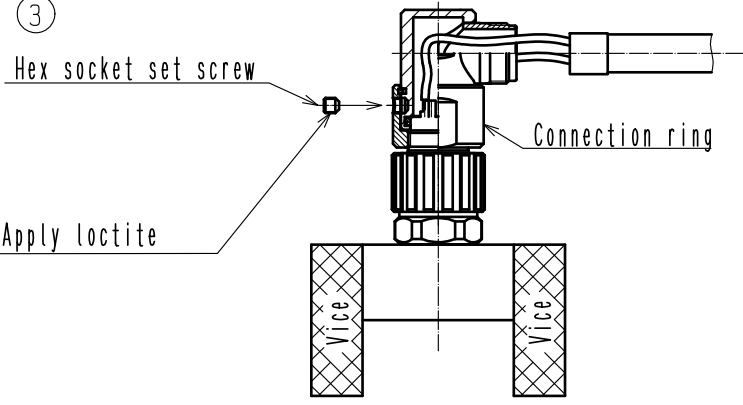
HIROSE ELECTRIC CO., LTD.

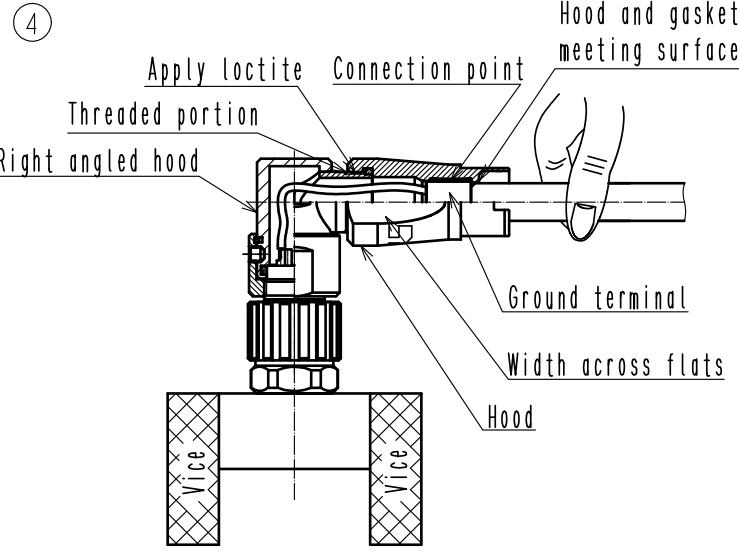
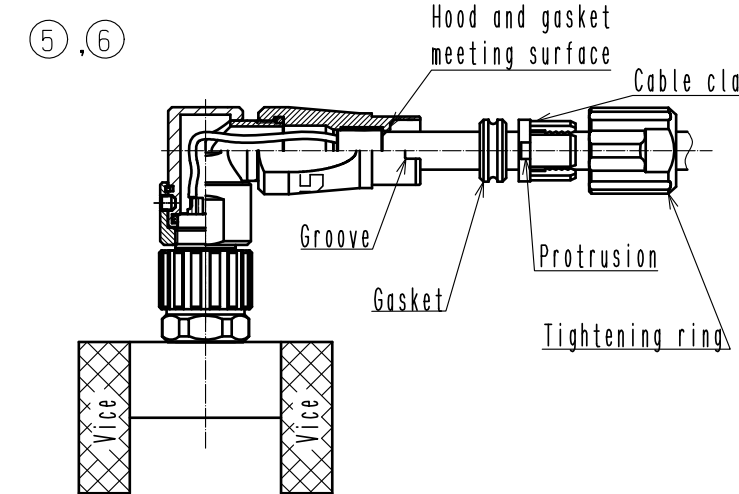
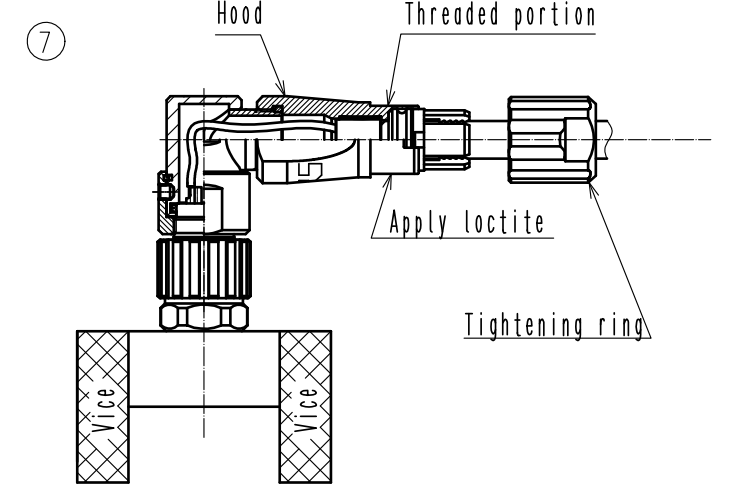
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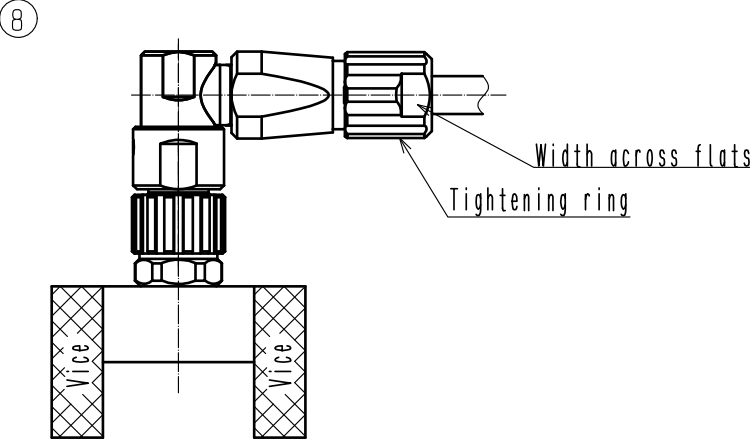
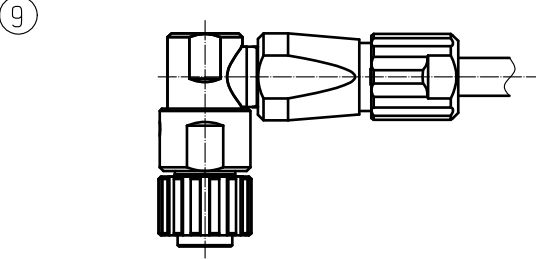
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No.	Drawing	Procedure Details																								
7	<p>② -1</p>  <p>Table 6.</p> <table border="1"> <thead> <tr> <th>Number of Contacts</th><th>Contact Number</th><th>C Length</th></tr> </thead> <tbody> <tr> <td>6</td><td>1 to 6</td><td>6</td></tr> <tr> <td>12</td><td>1 to 9</td><td>6</td></tr> <tr> <td></td><td>10 to 12</td><td>8</td></tr> <tr> <td>20</td><td>1 to 5, 16 to 20</td><td>6</td></tr> <tr> <td></td><td>6 to 15</td><td>8</td></tr> <tr> <td>11</td><td>1 to 4</td><td>8</td></tr> <tr> <td></td><td>5 to 7</td><td>6</td></tr> </tbody> </table>	Number of Contacts	Contact Number	C Length	6	1 to 6	6	12	1 to 9	6		10 to 12	8	20	1 to 5, 16 to 20	6		6 to 15	8	11	1 to 4	8		5 to 7	6	<p>[Soldering]</p> <p>① Soldering conditions Soldering tip temperature: $350 \pm 10^{\circ}\text{C}$ Soldering time: 5 seconds MAX</p> <p>Notes (1) When soldering, be careful to avoid a cold joint, an overheated joint, or any other defects. (2) Check that the the solder is fused sufficiently where the lead wire and the contact are soldered.</p> <p>② Soldering</p> <p>②-1 For 6, 12, 20 and 11 (Contacts 1 to 7 only) Contact Types</p> <p>(1) Thread a heat shrink tube (with an inner diameter of $\phi 1.1$ MIN) over every second lead wire. The length of the tube should be in accordance with table 6. (2) Place the lead wire sheath to the contact and then solder. (3) With the heat shrink tube in contact with the insulator as shown in the diagram, apply heat to shrink the tube.</p>
Number of Contacts	Contact Number	C Length																								
6	1 to 6	6																								
12	1 to 9	6																								
	10 to 12	8																								
20	1 to 5, 16 to 20	6																								
	6 to 15	8																								
11	1 to 4	8																								
	5 to 7	6																								
	<p>② -2</p> 	<p>② -2 For 11 (Contacts A to D only) Contact Types</p> <p>(1) Place the lead wire sheath to the contact and then solder. (2) When soldering, the insulation wall should overlap the lead wire by more than 0.5mm, as shown in the diagram, in order to maintain insulation between the contacts.</p>																								

No.	Drawing	Procedure Details												
8	<p data-bbox="247 163 347 203">①, ②</p>  <p data-bbox="225 611 999 645">(The orientation of the connection ring is shown as an example.)</p> <p data-bbox="296 801 708 835">Table 7. Recommended Tightening Torque</p> <table border="1" data-bbox="266 837 940 976"><thead><tr><th>Shell Size</th><th>Tightening Torque</th><th>Width Across Flats</th></tr></thead><tbody><tr><td>LF07</td><td>1N·m to 1.5N·m</td><td>11mm</td></tr><tr><td>LF10</td><td>1.5N·m to 2N·m</td><td>14mm</td></tr><tr><td>LF13</td><td>1.5N·m to 2N·m</td><td>17mm</td></tr></tbody></table>	Shell Size	Tightening Torque	Width Across Flats	LF07	1N·m to 1.5N·m	11mm	LF10	1.5N·m to 2N·m	14mm	LF13	1.5N·m to 2N·m	17mm	<p data-bbox="1043 129 1414 163">[Right Angled Hood Assembly] ②</p> <p data-bbox="1015 170 1426 237">① Attach the right angled hood to the contact block.</p> <p data-bbox="1015 315 1398 383">② Tighten the tightening ring to the contact block.</p> <p data-bbox="1054 389 1434 584">At this time Loctite 263 of Henkel Japan LTD., should be applied to the full circumference of the threaded portion of the contact block. (Refer to ETAD-C0522-00)</p> <p data-bbox="1054 591 1434 658">The recommended tightening torque is shown in Table. 7.</p> <p data-bbox="1054 665 1453 754">Furthermore, the orientation of the right angled hood should be set before tightening.</p> <p data-bbox="1011 761 1453 1122">Notes (1) If loctite is not applied, the strength of the connector will not satisfy the specification strength value. (2) The applied loctite should not protrude out further than the threaded portion. If it does, It may affect waterproof performance. Please remove any protruding loctite with a cloth or cotton swab, etc.</p>
Shell Size	Tightening Torque	Width Across Flats												
LF07	1N·m to 1.5N·m	11mm												
LF10	1.5N·m to 2N·m	14mm												
LF13	1.5N·m to 2N·m	17mm												
	<p data-bbox="240 1312 277 1352">③</p>  <p data-bbox="225 1720 999 1753">(The orientation of the connection ring is shown as an example.)</p>	<p data-bbox="1023 1339 1437 1509">③ Tighten the hex socket set screw to the tightening ring. Loctite 263 of Henkel Japan Ltd., should be applied to the full circumference of the screw thread.</p> <ul data-bbox="1075 1547 1430 1682" style="list-style-type: none">• Hex nut hole width: 0.889mm• Recommended tightening torque: 0.12 to 0.15 N·m												

No.	Drawing	Procedure Details												
8	<p>④</p>  <p>(The orientation of the hood is shown as an example.)</p> <p>Table 8. Recommended Tightening Torque</p> <table border="1"> <thead> <tr> <th>Shell Size</th><th>Tightening Torque</th><th>Width across flats</th></tr> </thead> <tbody> <tr> <td>LF07</td><td>1N·m to 1.5N·m</td><td>10mm</td></tr> <tr> <td>LF10</td><td>1.5N·m to 2N·m</td><td>13mm</td></tr> <tr> <td>LF13</td><td>1.5N·m to 2N·m</td><td>16mm</td></tr> </tbody> </table>	Shell Size	Tightening Torque	Width across flats	LF07	1N·m to 1.5N·m	10mm	LF10	1.5N·m to 2N·m	13mm	LF13	1.5N·m to 2N·m	16mm	<p>(Connector assembly)</p> <p>④ After reconnecting the connector to the assembly tool, tighten the hood to the right angled hood. Furthermore, Loctite 263 of Henkel Japan Ltd., should be applied to the full circumference of the screw thread. The recommended tightening torque is shown in Table. 8.</p> <p>Notes (1) If the cable is rotated it could cause a disconnection. The cable should be kept in place by hand, etc.</p> <p>(2) After tightening the hood, please check that the ground terminal and the hood are connected. Furthermore, when the cable is pulled to the hood and gasket meeting surface, the ground terminal moves to the position shown.</p>
Shell Size	Tightening Torque	Width across flats												
LF07	1N·m to 1.5N·m	10mm												
LF10	1.5N·m to 2N·m	13mm												
LF13	1.5N·m to 2N·m	16mm												
	<p>⑤, ⑥</p>  <p>(The orientation of the hood is shown as an example.)</p>	<p>⑤ Insert the gasket until it hits the hood and gasket meeting surface.</p> <p>⑥ Align the protrusions of the cable clamp with the grooves of the hood and insert.</p> <p>Note (1) If the groove of the hood and the protrusion of the clamp are not properly aligned, the cable could be twisted when the tightening ring is being tightened, which could lead to a disconnection or a loss of waterproof performance.</p>												
	<p>⑦</p>  <p>(The orientation of the hood is shown as an example.)</p>	<p>⑦ Apply Loctite 7649 of Henkel Japan Ltd., to the thread of the hood. After checking that it has dried, apply Loctite 263 around the full circumference.</p>												

No.	Drawing	Procedure Details												
8	<div>⑧</div>  <p>(The orientations of the hood and the tightening ring are shown as examples.)</p> <p>Table 9. Recommended tightening torque</p> <table><tr><th>Shell Size</th><th>Tightening Torque</th><th>Wrench Width</th></tr><tr><td>LF07</td><td>0.8N·m to 1N·m</td><td>10mm</td></tr><tr><td>LF10</td><td>0.8N·m to 1N·m</td><td>14mm</td></tr><tr><td>LF13</td><td>1N·m to 1.5N·m</td><td>16mm</td></tr></table>	Shell Size	Tightening Torque	Wrench Width	LF07	0.8N·m to 1N·m	10mm	LF10	0.8N·m to 1N·m	14mm	LF13	1N·m to 1.5N·m	16mm	<div>⑧</div> Tighten the tightening ring to the hood. The recommended torque is shown in Table. 9
Shell Size	Tightening Torque	Wrench Width												
LF07	0.8N·m to 1N·m	10mm												
LF10	0.8N·m to 1N·m	14mm												
LF13	1N·m to 1.5N·m	16mm												
	<div>⑨</div> 	<div>⑨</div> Disconnect the connector from the assembly tool. With this, assembly is completed.												
9		[Waterproof Performance Test] When assembly is completed, apply 17.6kPa of air pressure to the connector from the mating side for 30 seconds, and check that no air bubbles appear from the inside of the connector.												