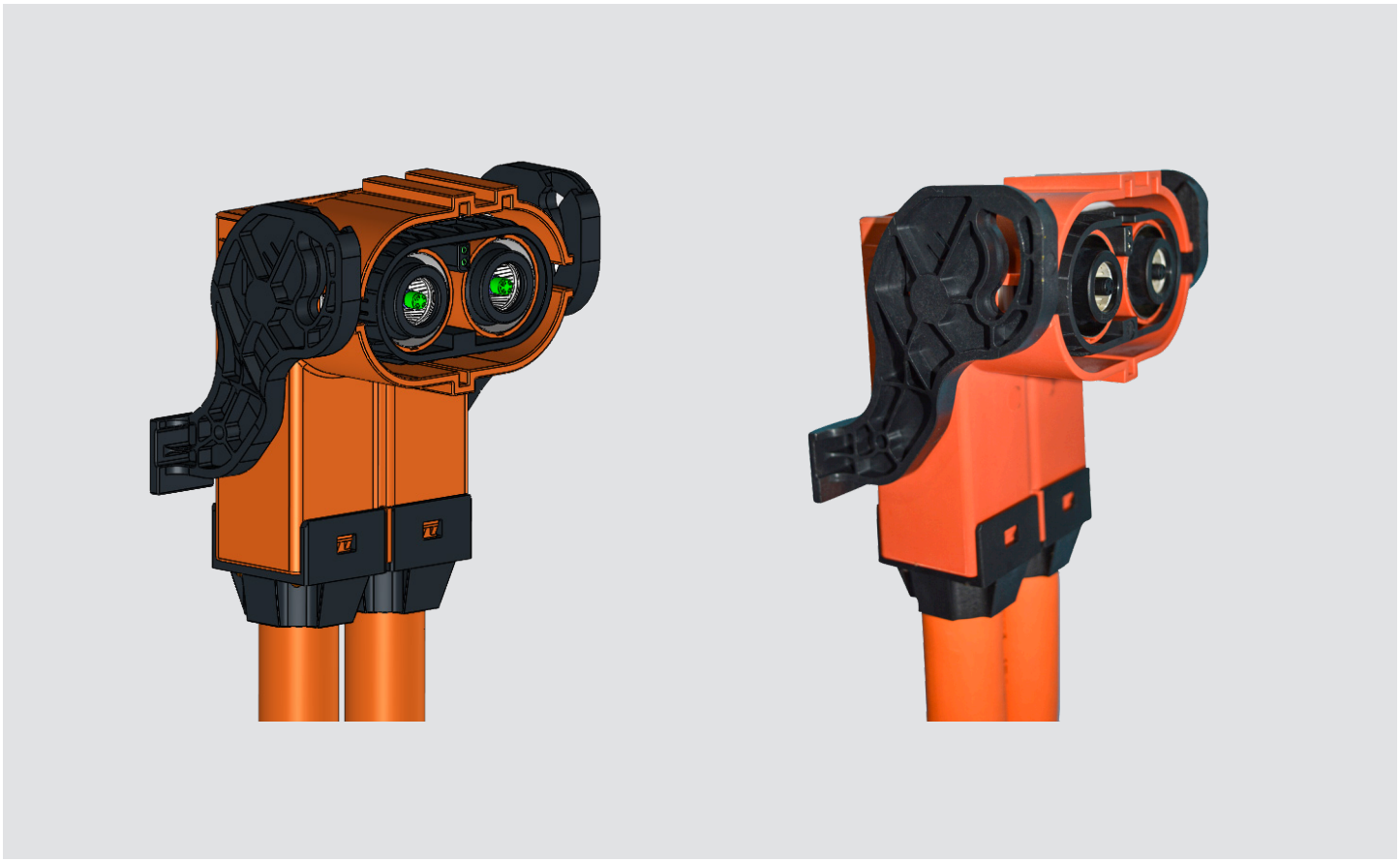
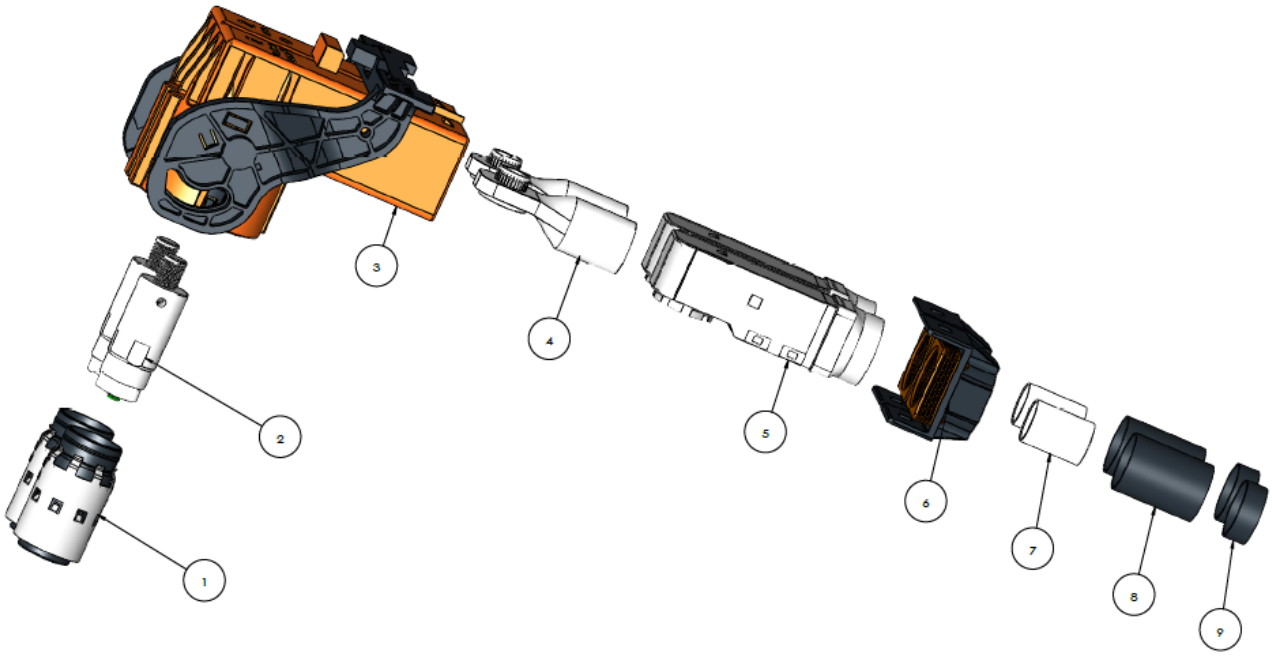
Amphenol Industrial

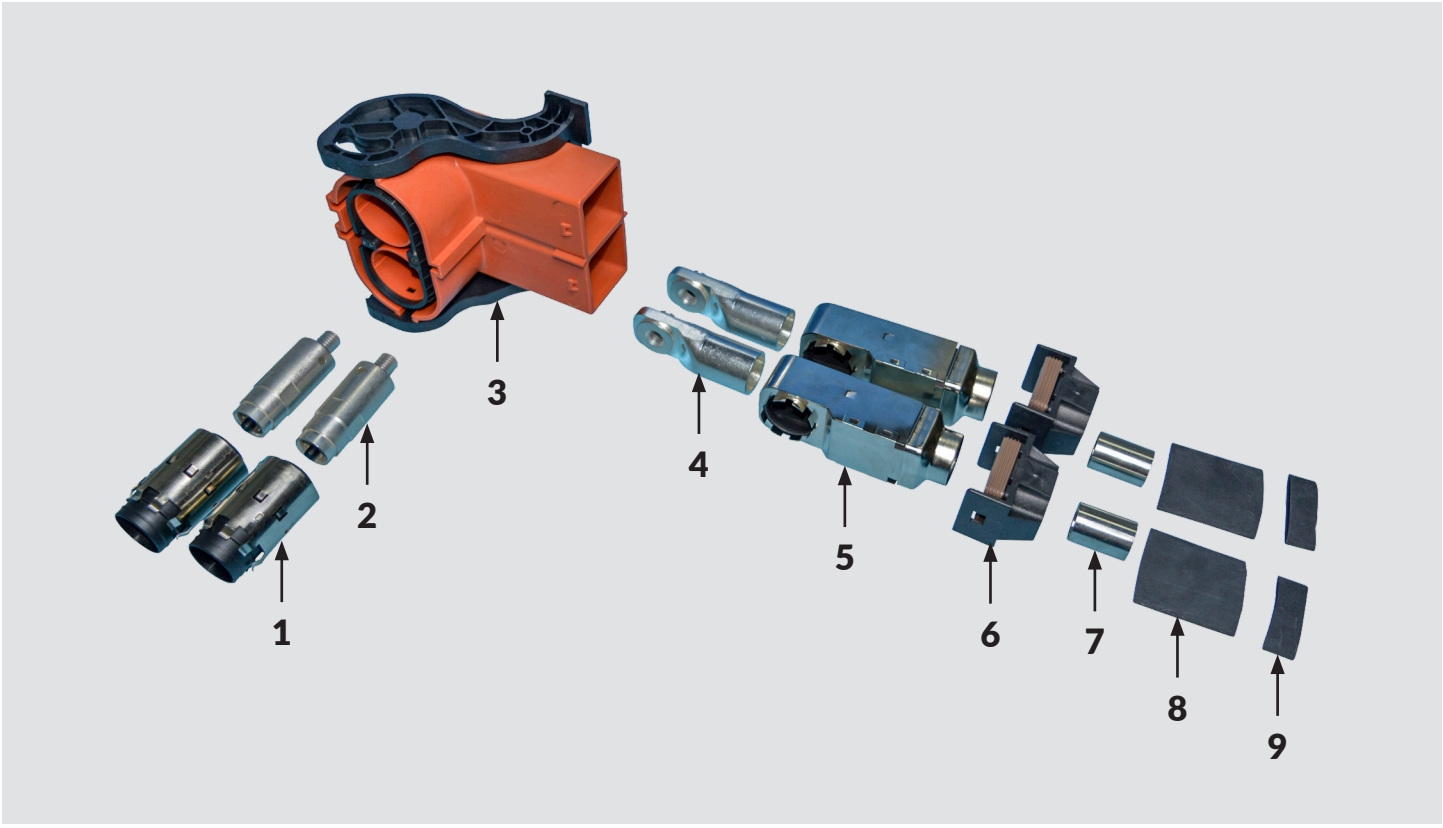
CABLE ASSEMBLY WORK INSTRUCTION

14.0mm RADSOK® for UPC Right Angle Plug Connector



Part 1: Package Contents





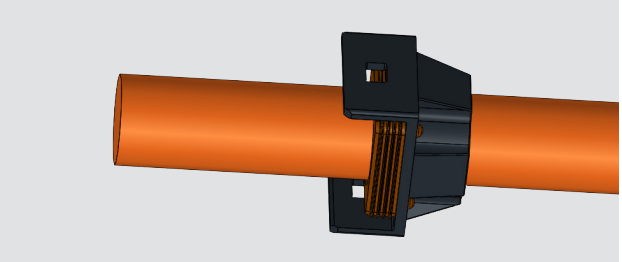
1. Connector Body

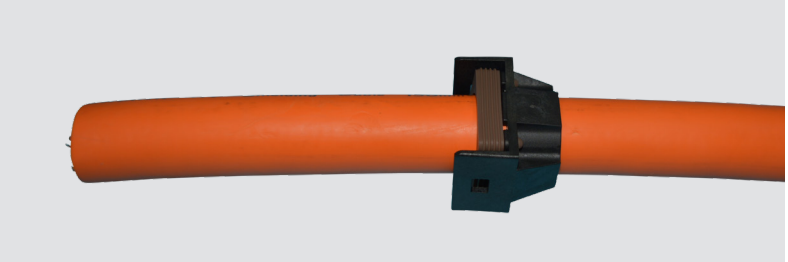
- **1:** Barrel sealing (not included when there is no sealing requirement)
- **2:** O-Ring (not included when there is no sealing requirement)
- **3:** Plug shell sub assembly
- **4:** Contact lug
- **5:** Shielding shell assembly
- **6:** Cable gland
- **7:** Crimping barrel
- **8:** Heat shrink tube
- **9:** Heat shrink tube

Note: Don't include part 7 when using 150mm² cable

Part 2: Ports Plug Assembly

Step 1: Pass the cable through the grommet and cap (Figure 1.1)

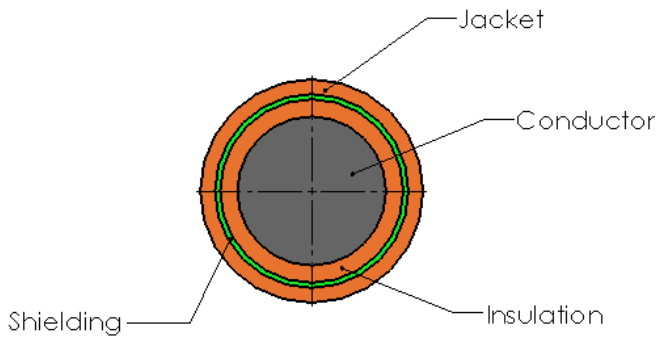




Cable	OD/mm		
	Conductor ref	Insulation	Jacket
95 mm²	14.6 max	18.2±0.5	22.6±0.6
120 mm²	16.4 max	20.2±0.5	24.6±0.7
150 mm²	18.3 max	22.5±0.5	27.1±0.8

Note: If the cable is different from recommended cable specification, it must be tested and confirmed according to the cable provided by the customer.

Step 2: Wire cutting and stripping.



Step 2.1: Jacket stripping.
Stripping jacket: 40+0/-1mm (Figure 2.1)

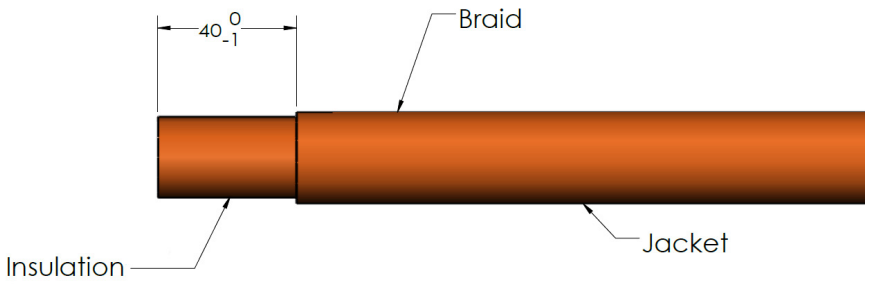


Figure 2.1

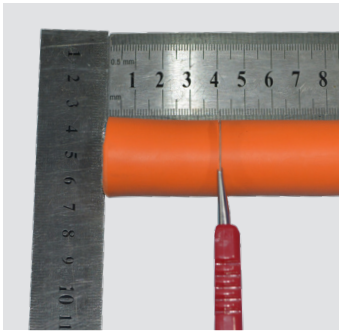


Figure 2.1a

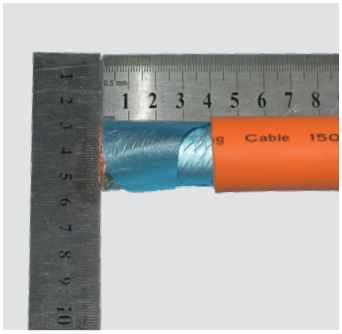


Figure 2.1b

Figure 2.1c

Figure 2.1d

Step 2.2: Inner insulation.
Stripping conductor: 28+0/-1mm (Figure 2.2)

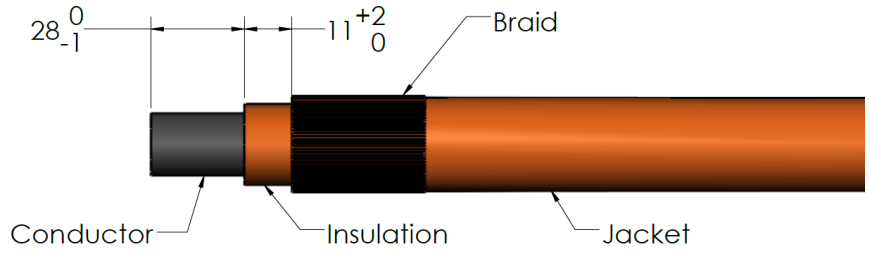


Figure 2.2

Figure 2.2a

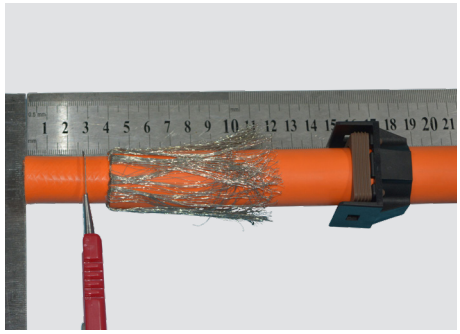


Figure 2.2b

Figure 2.2c

Step 3: Preassemble crimping barrel. Insert the wire conductor into the crimping barrel (Figure 3.1)
Notes: Do not include step 3 when using 150mm² cable

Figure 3.1

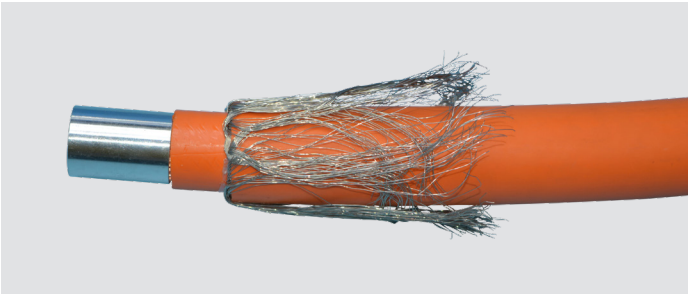
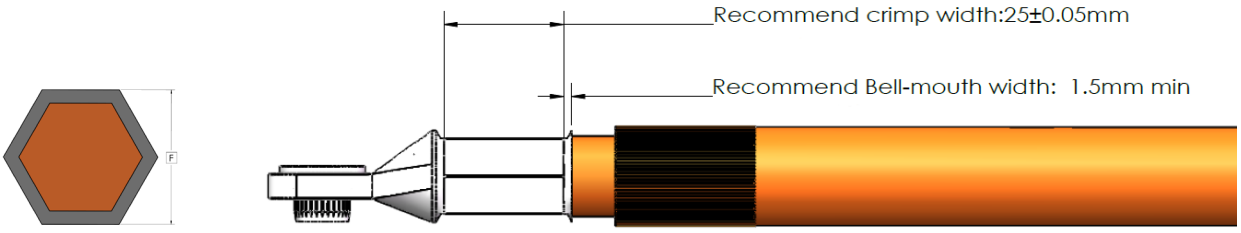


Figure 3.1a

Step 4: Crimping the contact lug to the wire (Figure 4.1)



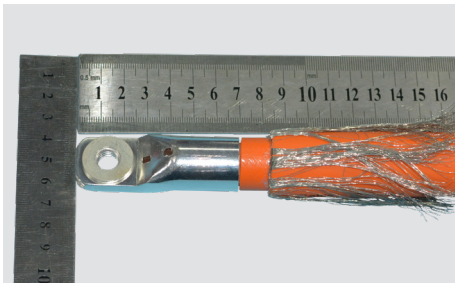


Figure 4.1a

Figure 4.1b

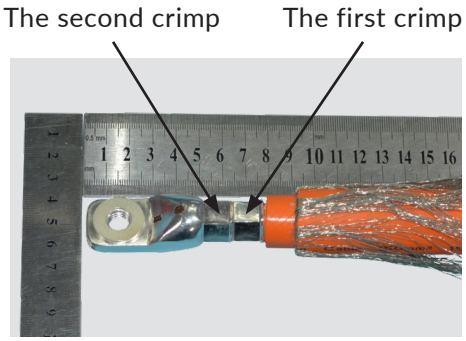


Figure 4.1c

Cable	Recommended connect crimp height (CCH) "F"	Cable pullout force
150 mm²	16.2 0.1	3000 N Min.
120 mm²	16.3±0.1	2700 N Min.
95 mm²	16.35±0.1	2700 N Min.

Note: No sharp burrs after crimping, and single copper wire cannot be exposed, if it has, it must be cut out.

Step 5: Assemble the shrink tube (Figure 5.1&5.2)

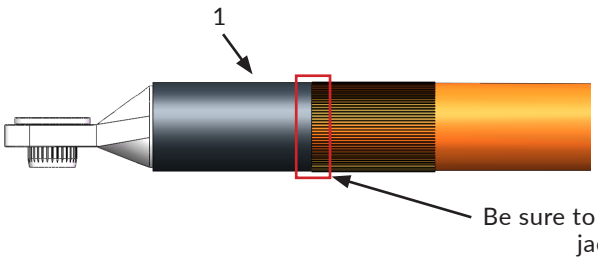


Figure 5.1

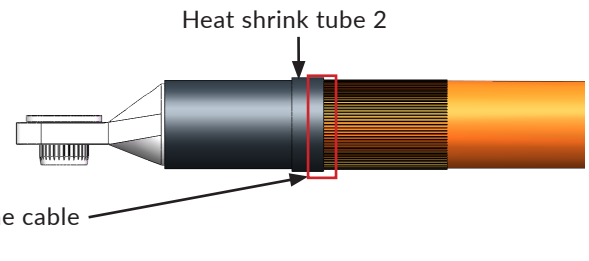


Figure 5.2

Step 5.1: Assemble heat shrink tube 1

Figure 5.1a

Figure 5.1b

Figure 5.1c

Step 5.2: Assemble heat shrink tube 2

Figure 5.2a

Figure 5.2b

Figure 5.2c

Note: Don't let the shrink tubing cover the braid

Step 6: Install the shielding ring and the plug shielding shell assembly to wire (Figure 6.1.1&6.1.2)

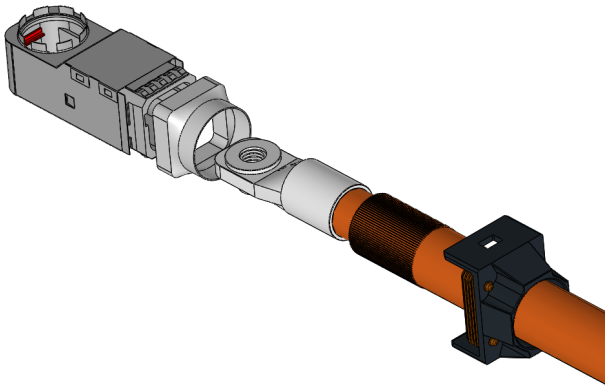


Figure 6.1.1

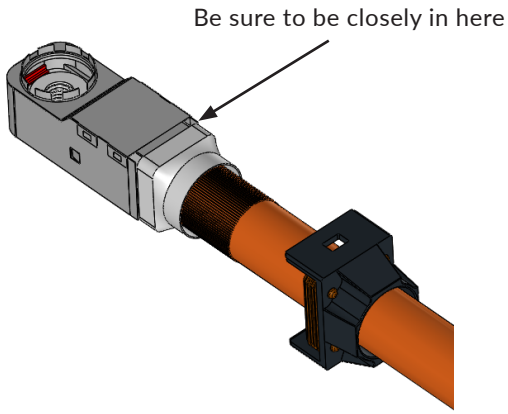


Figure 6.1.2

Figure 6.1a

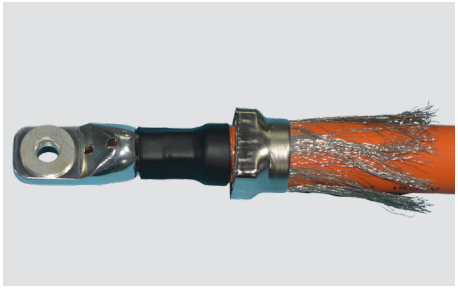


Figure 6.1b

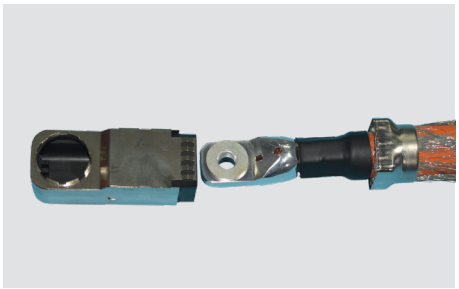


Figure 6.1c

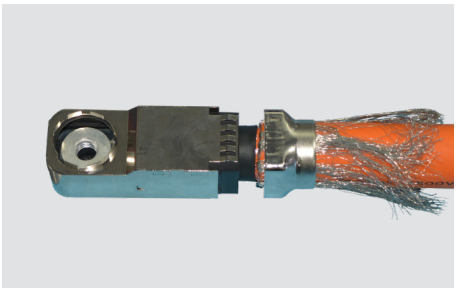


Figure 6.1d

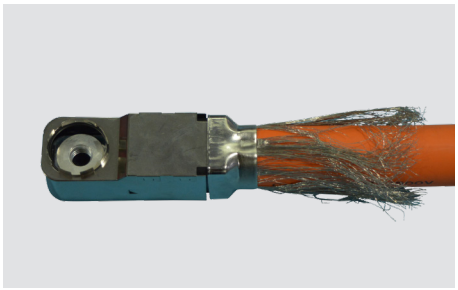


Figure 6.1e

Note: the plug must be pushed the bottom of the shielding shell assembly.

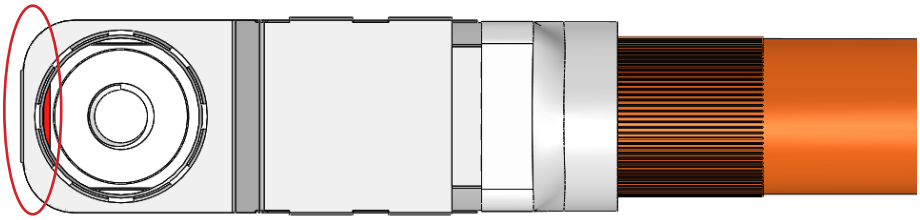
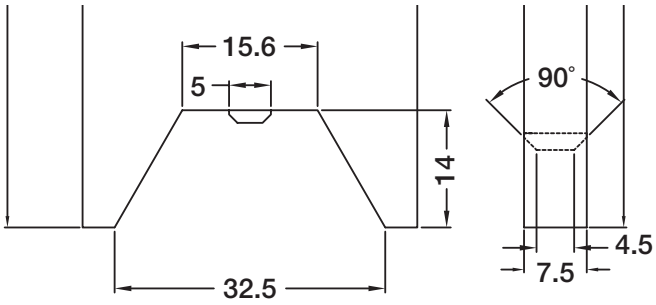


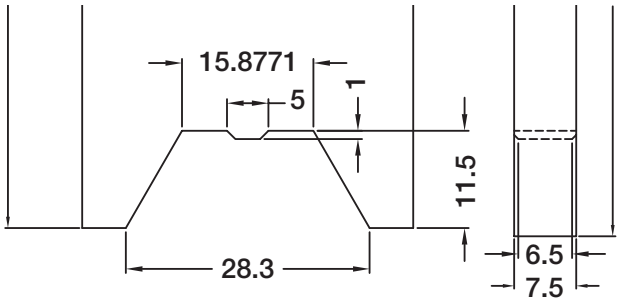
Figure 6.2

Step 7: Fix and crimping the shielding ring

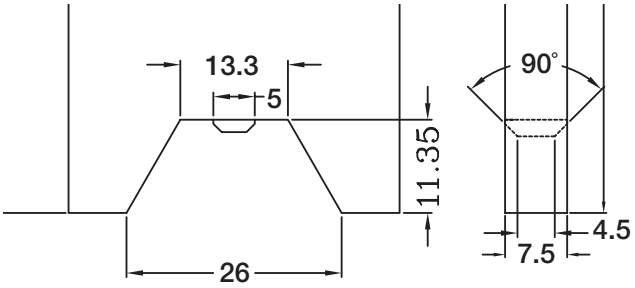
Recommended crimping tool: Hydraulic press (Tonnage: 30 T)



150mm² shielding ring



150mm² shielding ring



95mm² shielding ring

The down crimping die is the same size as the up crimping die.

Note: The die need to be closed and crimp the shielding ring near the shell edge as shown below.

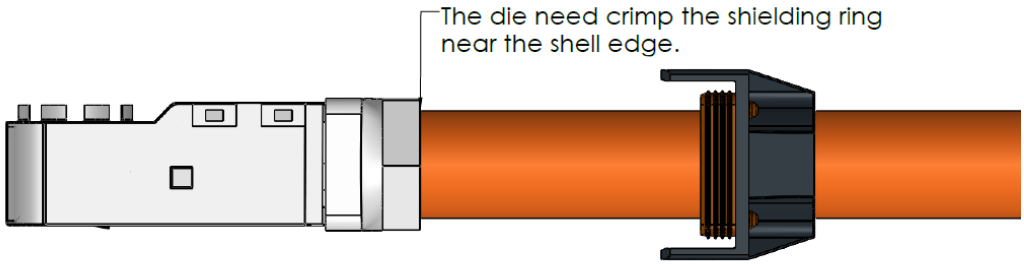


Figure 7.1

Fix and crimping the shielding ring (Figure 7.2.1 & 7.2.2)

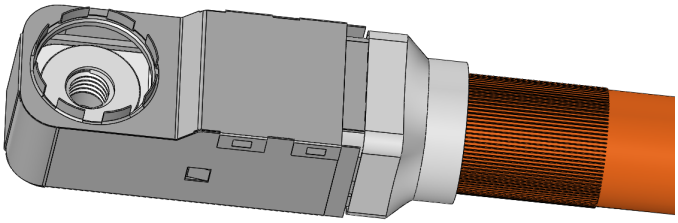


Figure 7.2.1

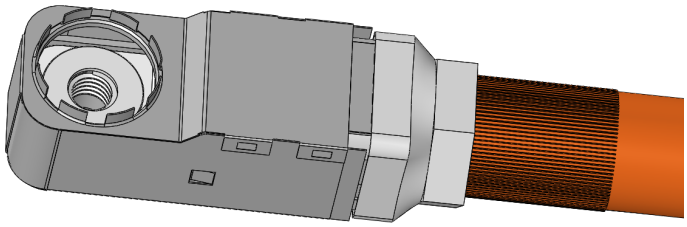


Figure 7.2.2

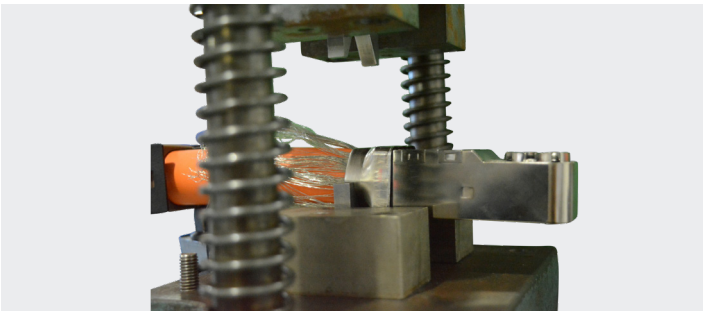


Figure 7.2a

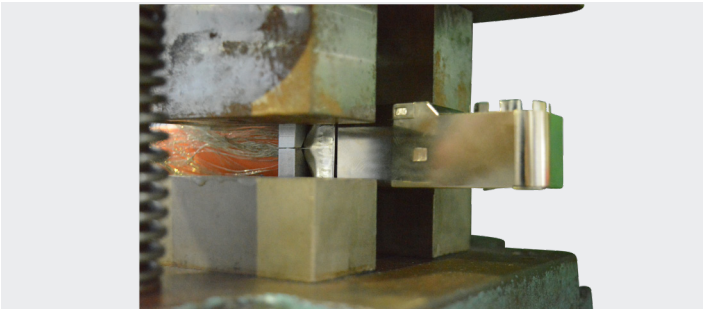


Figure 7.2b

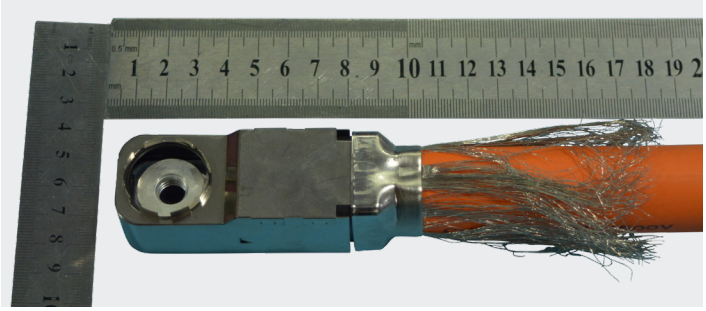


Figure 7.2c

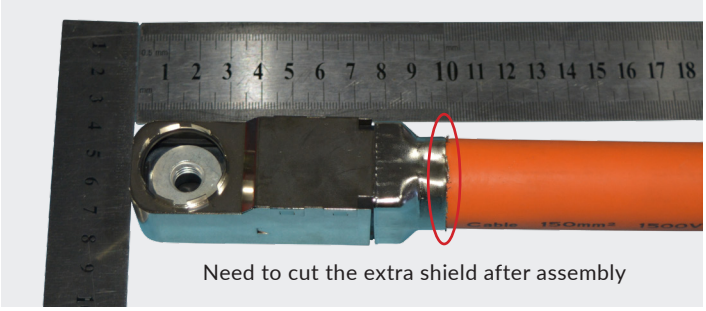


Figure 7.2d

Suggestion: Once finished crimping, insulation resistance and DWV test are needed
Insulation Resistance test: 1000V/DV, 60s, 500Ω Min
DWV: 3000V/AC, 60s, leakage current <5mA

Step 8: Repeat step 1 to step 7 for another port (Figure 8.1)

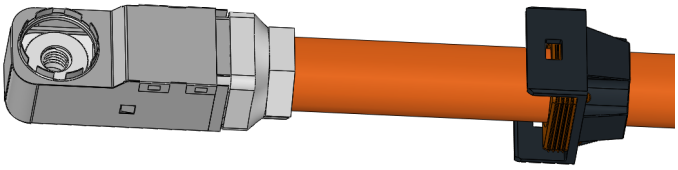


Figure 8.1

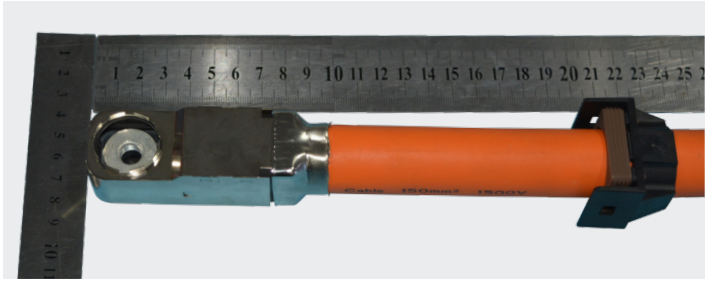


Figure 8.1a

Step 9: Insert the cable assembly into the plug shell assembly (Figure 9.1.1 & 9.1.2)

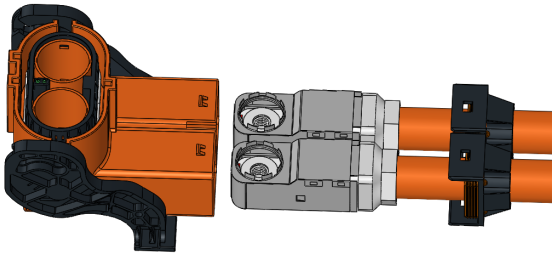


Figure 9.1.1

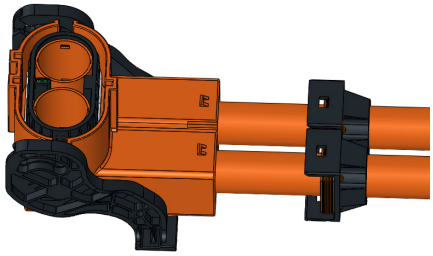


Figure 9.1.2

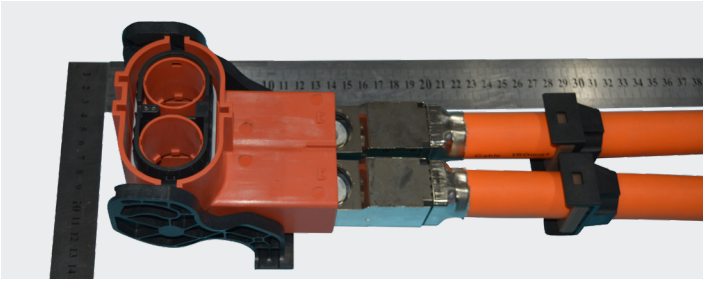


Figure 9.2.1

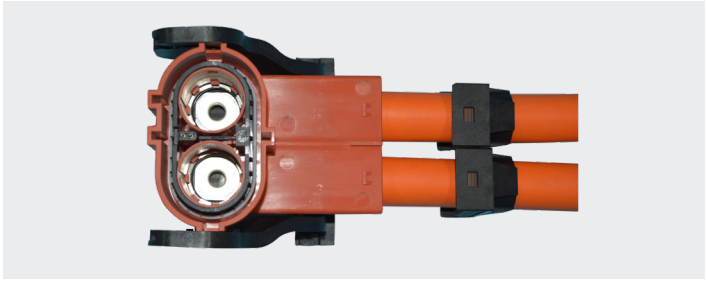


Figure 9.2.2

Note: When hearing a click and handing gently pull, then it isn't quit, so it shows that assembly is OK.

Step 10: Socket contact sub assembly

Insert the socket contact sub into the plug shell sub and use the special hex wrench lockthe socket (Figure 10.1.1 & 10.1.2)

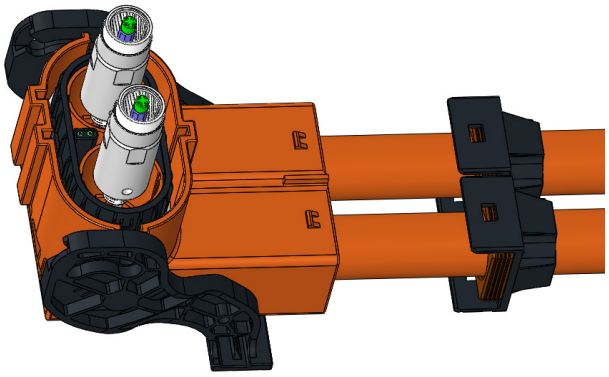


Figure 10.1.1

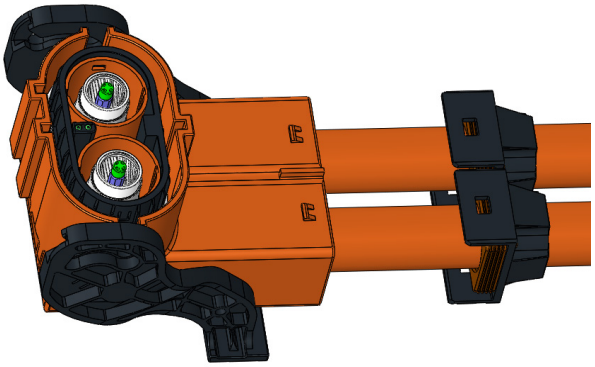


Figure 10.1.2

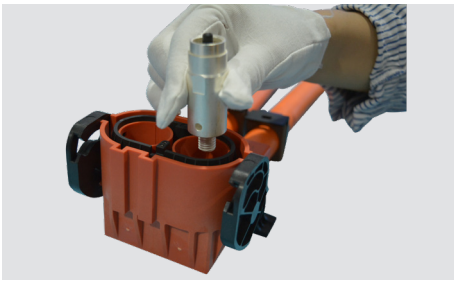


Figure 10.1a

Figure 10.1b

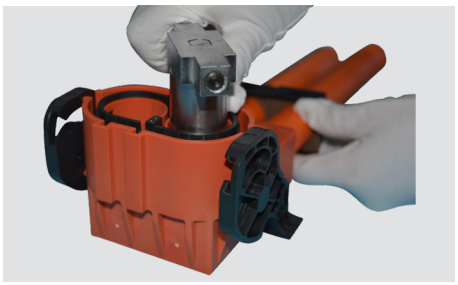


Figure 10.1c

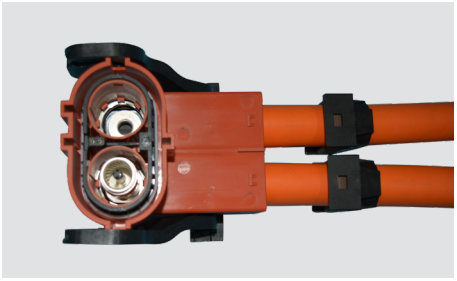


Figure 10.1d

Figure 10.1e

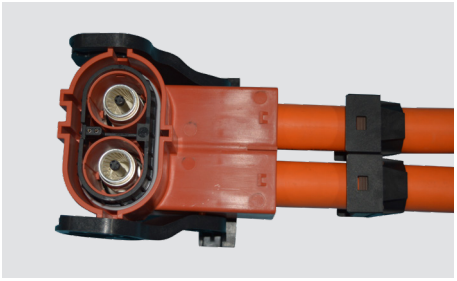


Figure 10.1f

Note: Recommended torque of the special hex wrench: 19.5-21.5 N·m

Tool assembly diagram: FX3-0037-001

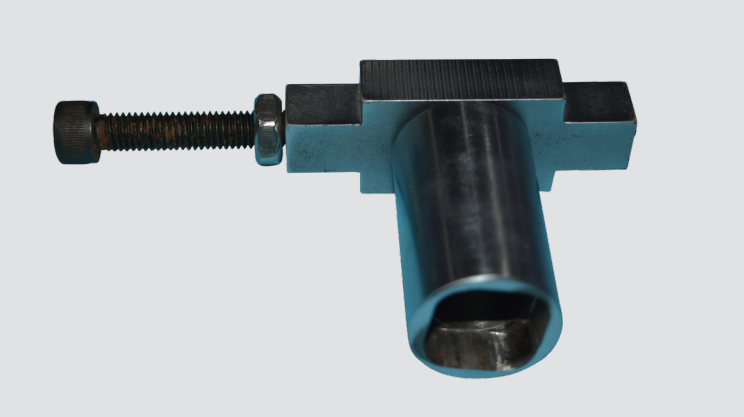
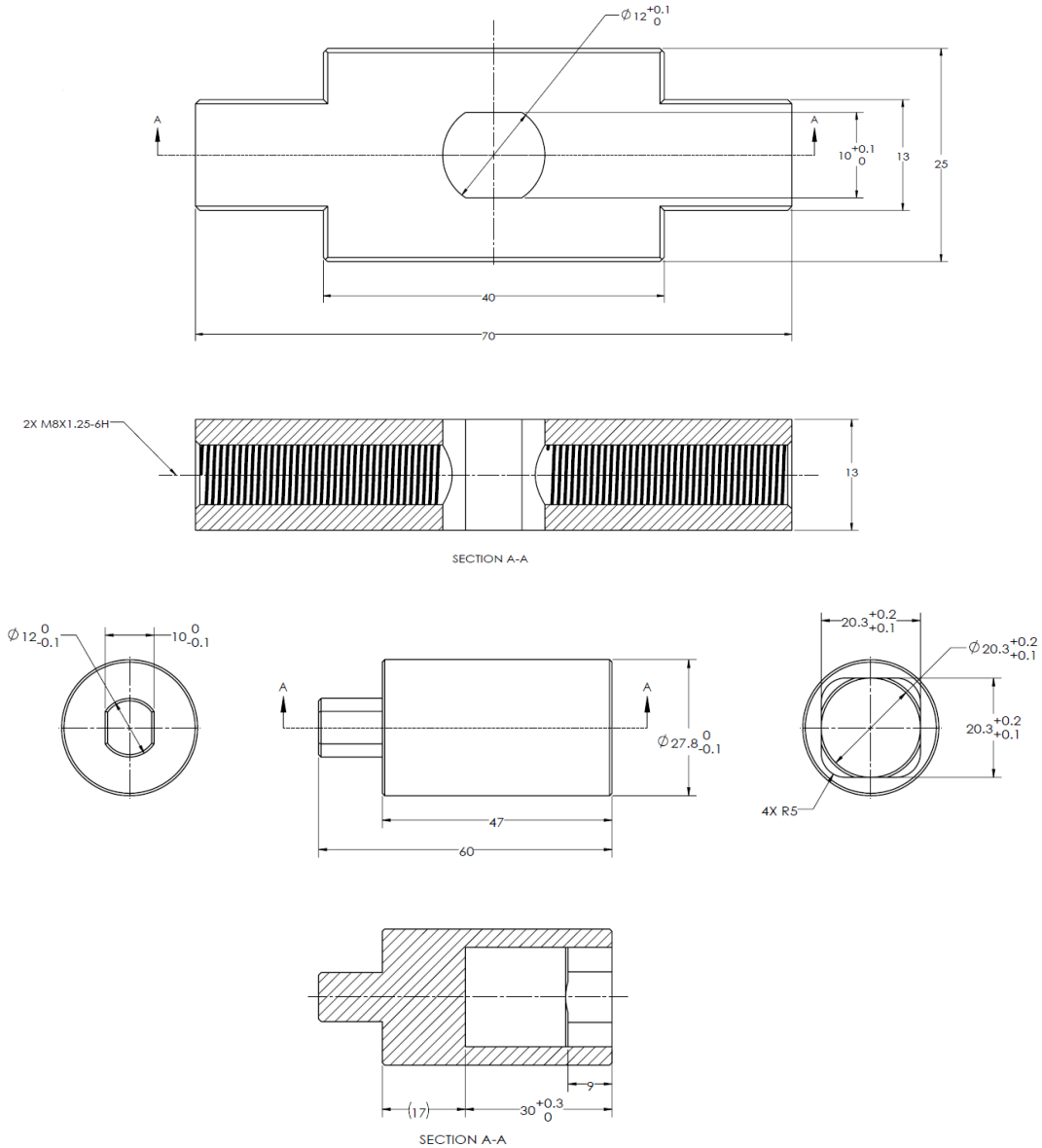


Figure 10.2

Tool processing figure as below:



Step 11: Insert sleeve and the front shielding shell into the plug assembly by the manual press with the right position (one convex of insulation plastic sleeve should be toward the groove of shell). (Figure 11.1.1 & 11.1.2)

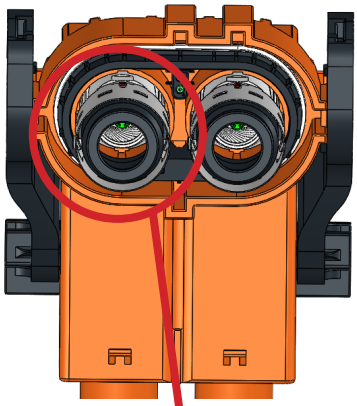


Figure 11.1.1

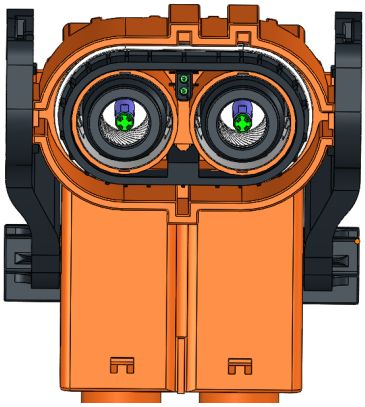


Figure 11.1.2

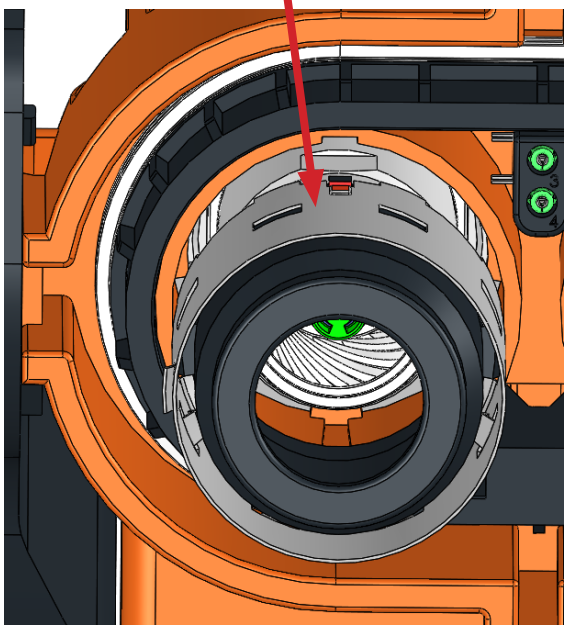


Figure 11.1.3

The red sign of the shielding shell should assemble in the direction of the plug shell grooves.

Figure 11.1a

Figure 11.1b

Figure 11.1c

Figure 11.1d

Figure 11.1e

Figure 11.1f

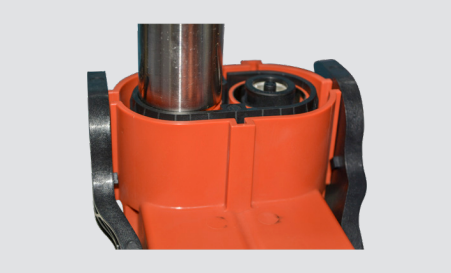


Figure 11.1g

Figure 11.1h

Note: Recommended torque of the special hex wrench: 19.5-21.5 N·m

When assembling OK, the dimension refer to the below picture:

Basic dimension:

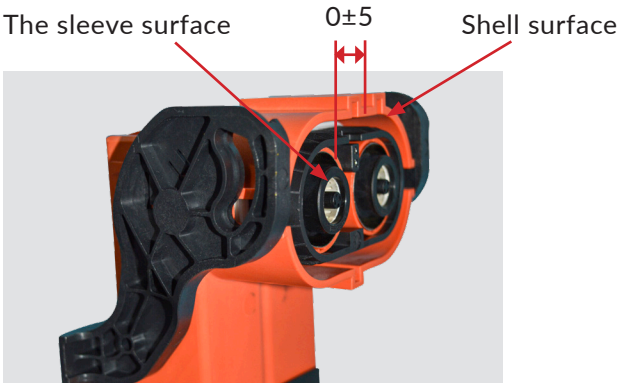


Figure 11.2.1

Confirm the assembled dimension:

When assembling OK, the dimension refer to the below picture.

Figure 11.2a

Figure 11.2b

Figure 11.2c

Step 12: Assemble the cable gland (Figure 12.1.1 & 12.1.2)

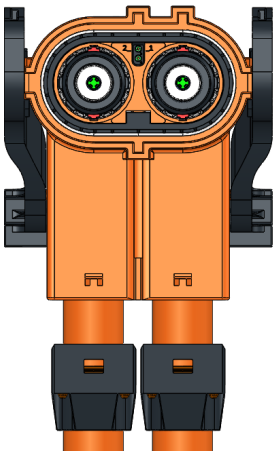


Figure 12.1.1

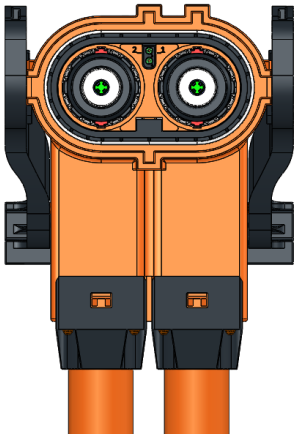


Figure 12.1.2

Figure 12.2a

Figure 12.2b

Figure 12.2c

Notes: When hearing a click, so it shows that cable cap assembly is OK.

Part 3: Plug and Receptacle Mating and Un-mating

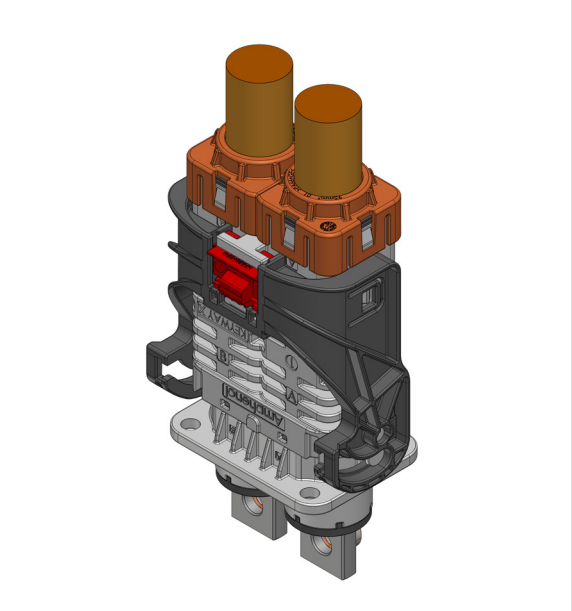
Mating:

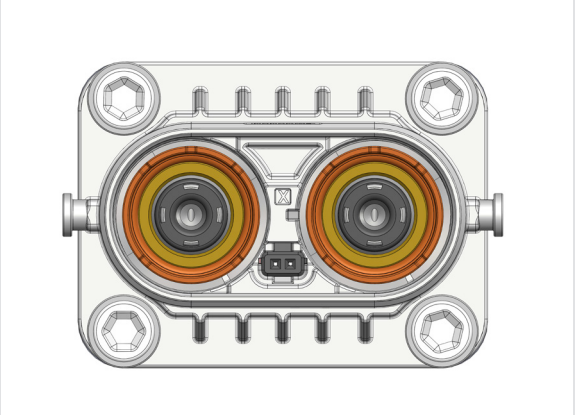
Unmating:

Amphenol Industrial

CABLE ASSEMBLY WORK INSTRUCTION

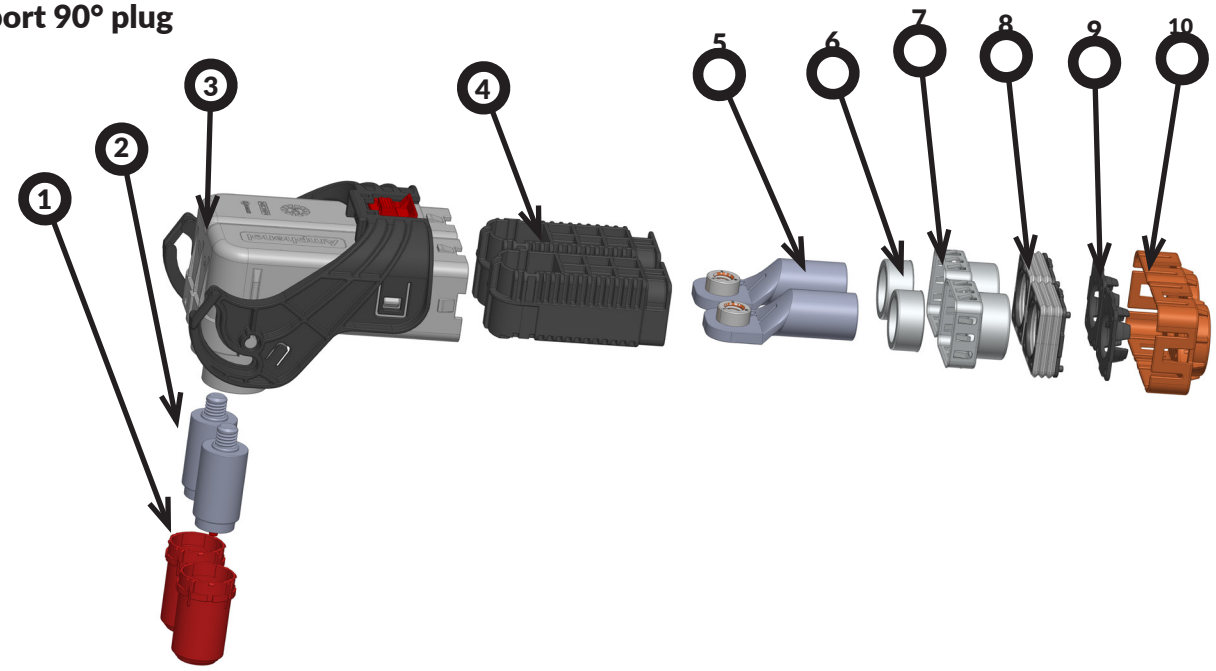
12.0mm RADSOK® for UPC Right Angle Plug Connector





Part 1: Package Contents and Specifications

2 port 90° plug

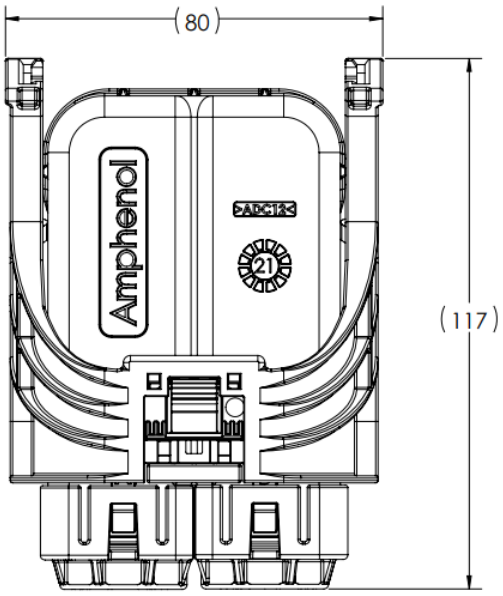


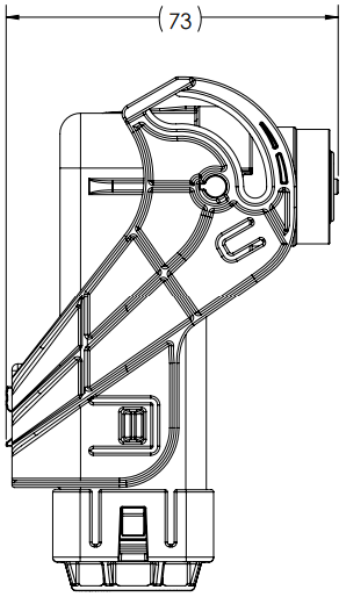
1. Connector Body

- **1:** Socket Insulator (2x)
- **2:** RADSOK® Socket (2x)
- **3:** 90° Plug Kit
- **4:** Insulator (2x)
- **5:** Crimp Lug (2x)
- **6:** Inner Shield Ring (2x)
- **7:** Outer Shield Ring (2x)
- **8:** Grommet (2x)
- **9:** Cable Clip (2x)
- **10:** Cable Cover (2x)

Specifications

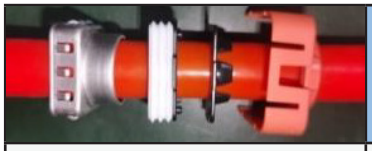
- Current: 350A Max (detail see derating curve)
- Operating voltage: 1000v DC or 1000v AC (50~60Hz)
- Operating temperature: -40~+140 140°C
- Durability: 100 cycles MIN
- Water proof: IPX7, IP6K9K (when connector is mated)
- Touch proof: IPXXB unmated and IPXXXD mated
- HVIL: yes
- Shield: yes
- Salt spray: 96H MIN (5% NaCl NSS)
- CPA: yes
- Keyway: 3 (X/Y/Z)





Part 2: Cable Assembly for Plug

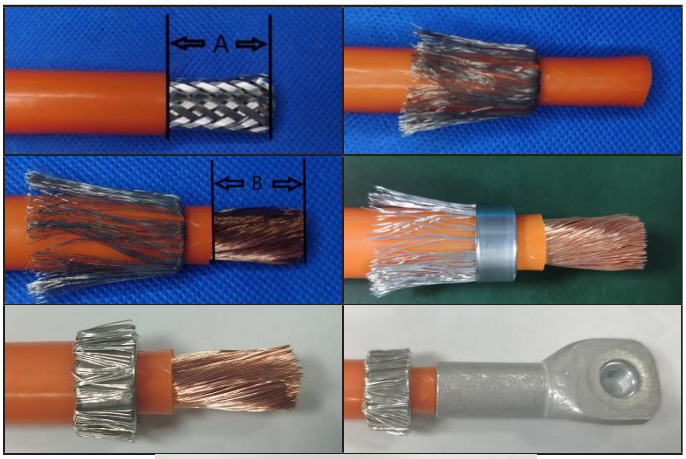
Step 1: Pre-assemble
- Go through the cable cover/ Cable clip/ grommet /Outer shield
- Cable spec:

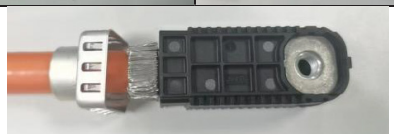
	HUBER +SUHNER Radox 155 FHLR91XC13X			Leoni FHLR2GCB2G		
Cable Size	50mm²	70 mm²	95 mm²	50 mm²	70 mm²	95 mm²
Conductor	9.4 ref	11.6 ref	13.5 ref	10.5	12.5	12.6
Insulation	11.5	13.7	16.2	12.2	14.4	16.9
Jacket	14.9	17	19.9	15.8	18.2	20.6

Attention: If using a different cable specification, please contact Amphenol to confirm

Step 2: Wire cutting stripping and assembly

- Cut the cable jacket
  "A"=30+/-1mm
- Fold the shield braid back and carding shielding wire.
- Cut the cable insulator.
  "B"=24+/1mm
- Assembly the inner shield ring on the cable.
- Fold the shield braid to cover surface of inner shield ring and cut the extra wire.
  Attention: Shield braid will never over the top of the inner shield braid.
- Assemble the crimp lug and outer shield ring on the cable.



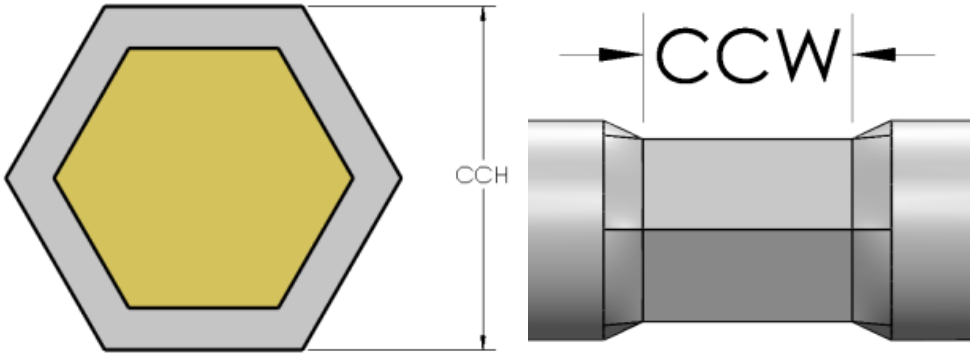


Note: the insulator can support the outer shield ring assembly.

Step 3: Crimp lug and shield ring

• Crimp the lug

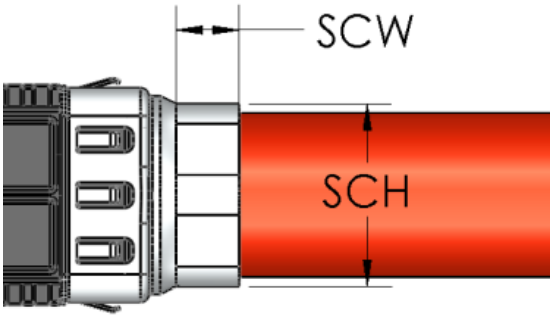
Key process parameters



Crimp Data	CCH (conductor crimp height)	CCW (conductor crimp width)
Crimp Type	**Regular hexagon crimping**	
95 mm ²	(3x) 14 ±0.1mm	16 ±0.1mm
70 mm ²	(3x) 12.712.7±0.1mm	16 ±0.1mm
50 mm ²	(3x) 11.411.4±0.1mm	16 ±0.1mm

Key process parameters

• Crimp the shield ring



Crimp Data	SCH (shield crimp height)	SCW (shield crimp width)
Crimp Type	**Regular hexagon crimping**	
95 mm ²	23 ± 0.2mm	8 ± 0.1mm
70 mm ²	21.2 ± 0.2mm	8 ± 0.1mm
50 mm ²	19.1 ± 0.2mm	8 ± 0.1mm

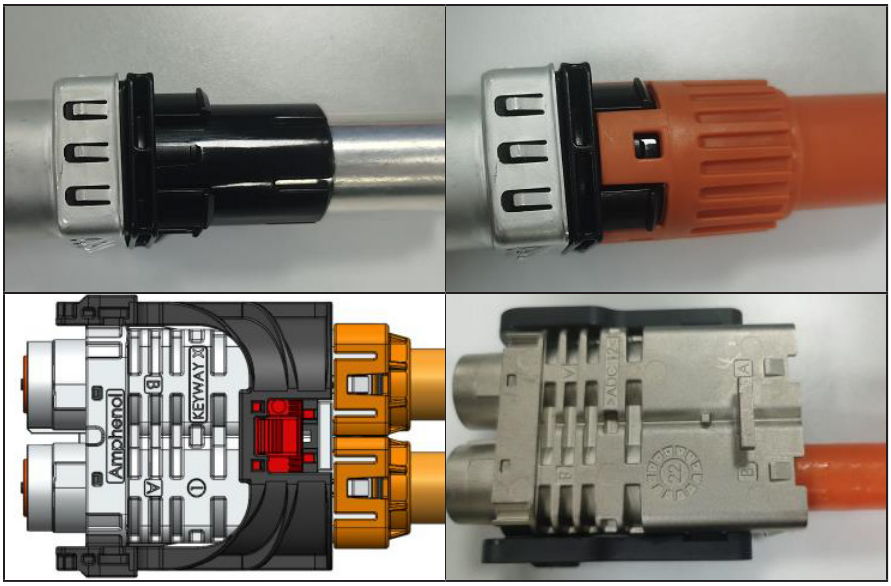
Different crimp type and dimension can be used after test(USCAR 21) with the test result is acceptable . But please note the crimp will cause the lug become longer,please adjust the strip length when the crimp type a and dimension changed.

It is better to test IR and DWV at this step to avoid assembly problems. See below for recommended test requirements:

- ◊ IR: 1000V DC, 60S 100MΩ min.
- ◊ DWV test: 3000V AC(50~60Hz), 60second, leak age current≤5mA,

Step 4: Plug assembly

- Insert the cable after crimp into the back insulator insulator.
- Assemble the front insulator.
- Insert the cable after assembly into housing.
- Assemble the grommet cable clip cable cover.
- Finished assemble the other cavities.



Step 5: Test for plug

It is better to test IR and DWV at this step to avoid assembly problems. See below for recommended test requirements:

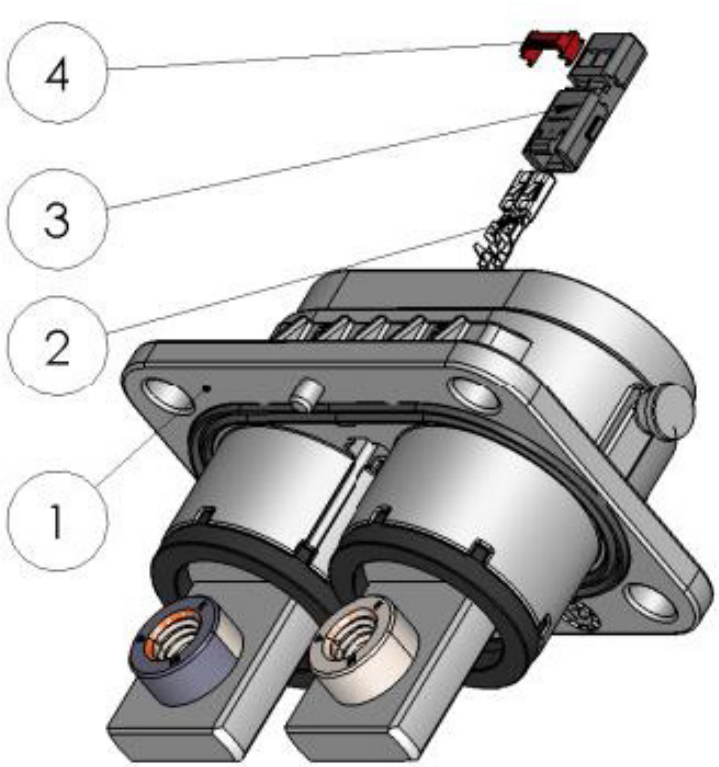
- IR: 1000V DC, 60S 100MΩ min.
- DWV : 3000V AC (50~60Hz), 60S, There shall be no dielectric breakdown or flash over.
- Air leakage: 50Kpa 60s it should be no more than 100pa leakage after test.

» Support fixture:

- Socket crimp tooling:
  - ◊ 50MM ²: TBD
  - ◊ 70MM ²: TBD
  - ◊ 95MM ²: TBD
- Crimp tooling for shield:
  - ◊ 50MM ²: TBD
  - ◊ 70MM ²: TBD
  - ◊ 95MM ²: TBD

Part 1: Package Contents and Specifications

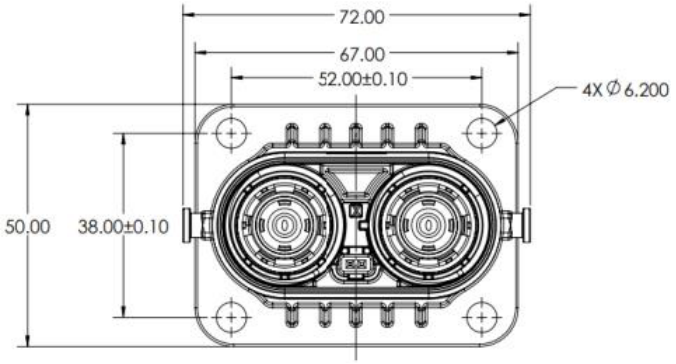
2 port receptacle

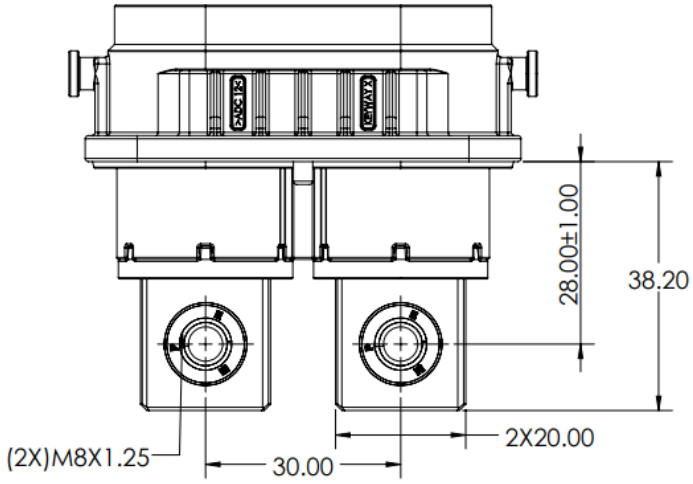


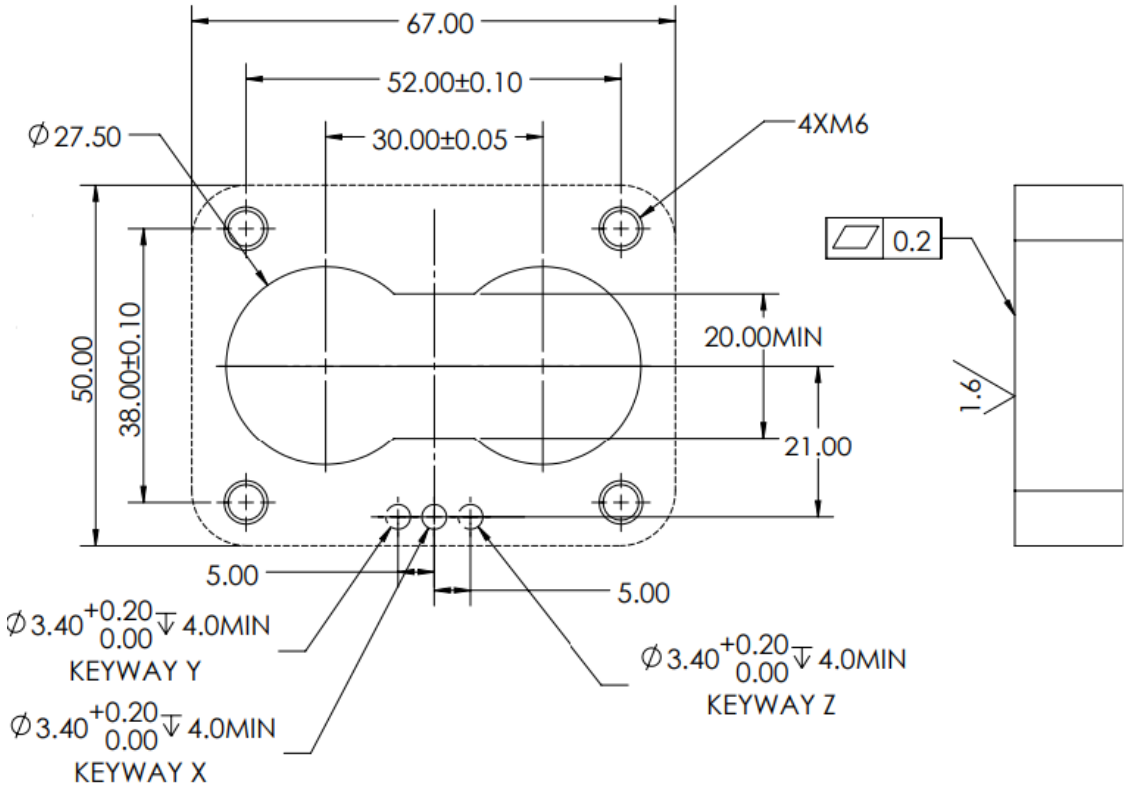
1. Connector Body
- **1:** Receptacle Body (1x)
- **2:** HVIL Housing (2x)
- **3:** HVIL Socket (2x)
- **4:** TPA of HVIL contact (1x)

Specifications:

- Current: 350 A MAX (detail see derating curve).
- Operating voltage: 1 0 00V DC or 1000V AC (50~60Hz).
- Operating temperature: 40~+140
- Durability: 100 cycles MIN.
- Water proof: IPX7, IP6K9K (when connector mated).
- Touch proof: IPXXB unmated and IPXXD mated.
- HVIL: yes
- Shield: yes
- Salt spay: 96H MIN(5% NaCl NSS)
- CPA: yes
- Keyway : 3 (X/Y/Z)







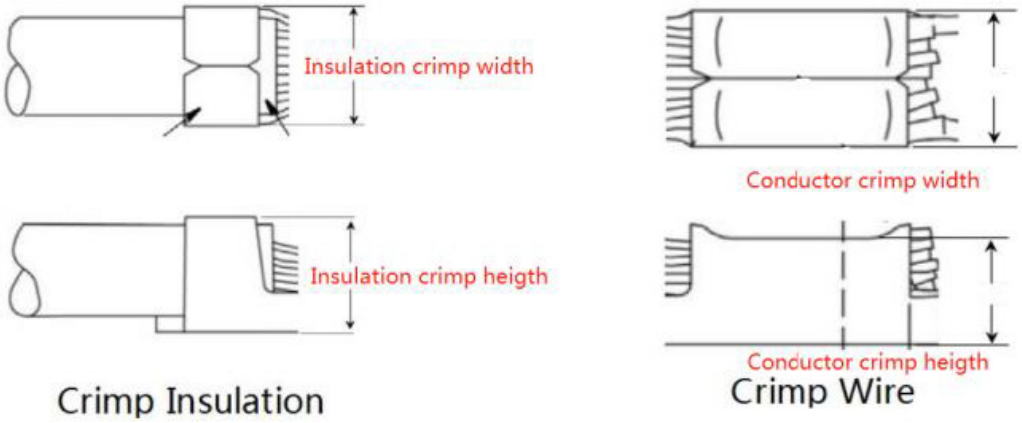
RECOMMEND PANEL SIZE

Part 2: Cable Assembly and HVIL

Step 1: Pre-Assemble

Cable Spec:

0.25 mm ² (23AWG)	Cable insulation OD: 1.1 1.6mm.
0.35 mm ² (22AWG)	
0.5mm ² (20AWG)	

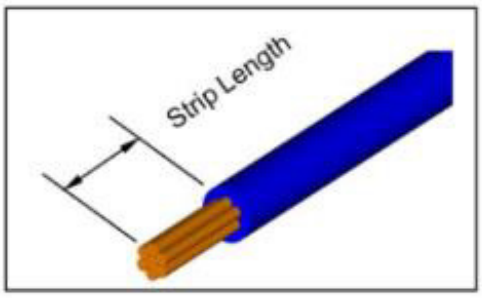


Step 2: Wire Cutting Stripping and Assembly

Cut the cable insulator:

Strip length=3.6±0.15 mm

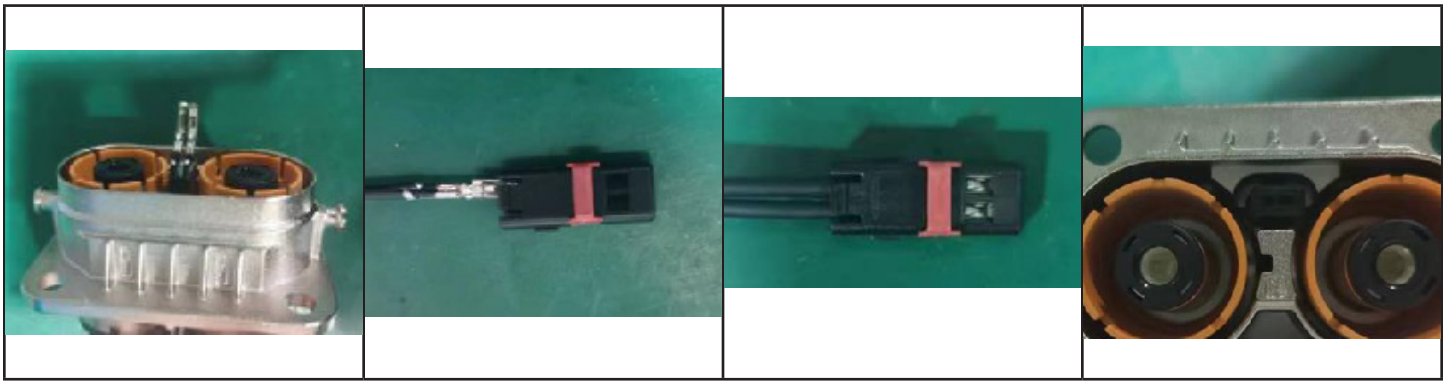
Crimp the socket contact.



Key process parameters

Cable Size	CCH(Conductor crimp height)	CCW (Conductor crimp width)	ICH (Insulation crimp height)	ICW (Insulation crimp width)
0.25 mm² (23AWG)	0.72±0.02	1.4 +0.15	1.4±0.1	1.83±0.2
0.35 mm² (22AWG)	0.76±0.02	1.4 +0.15	1.5±0.1	1.83±0.2
0.5 mm² (20AWG)	0.86±0.02	1.4 +0.15	1.8±0.1	1.83±0.2

- Go through the socket after crimp into receptacle body.
- Insert the socket into housing.
- Close the TPA on housing
- Assembly the HVIL housing on receptacle body.



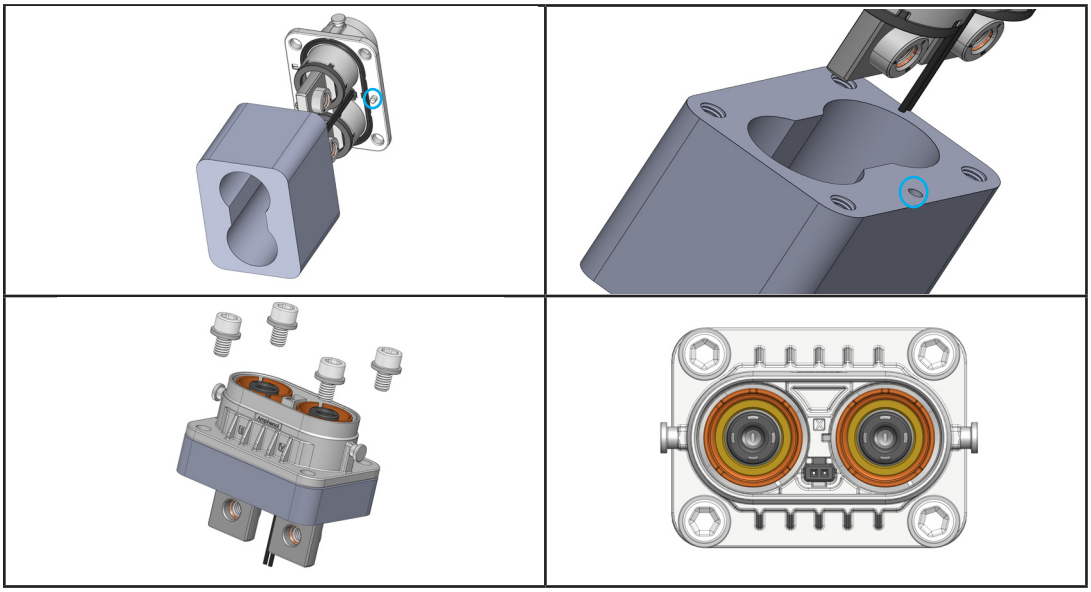
Electrical test should base on the customer requirement.(if not, please refer to the data from customer drawing)

Recommend test data:

- DWV: 80 0V AC 50~60Hz. Without any breakdown.(HVIL pin to shell)
- Insulation:1 00 0V DC i nsulation resistance should be 1 00MΩat least.(HVIL pin to)

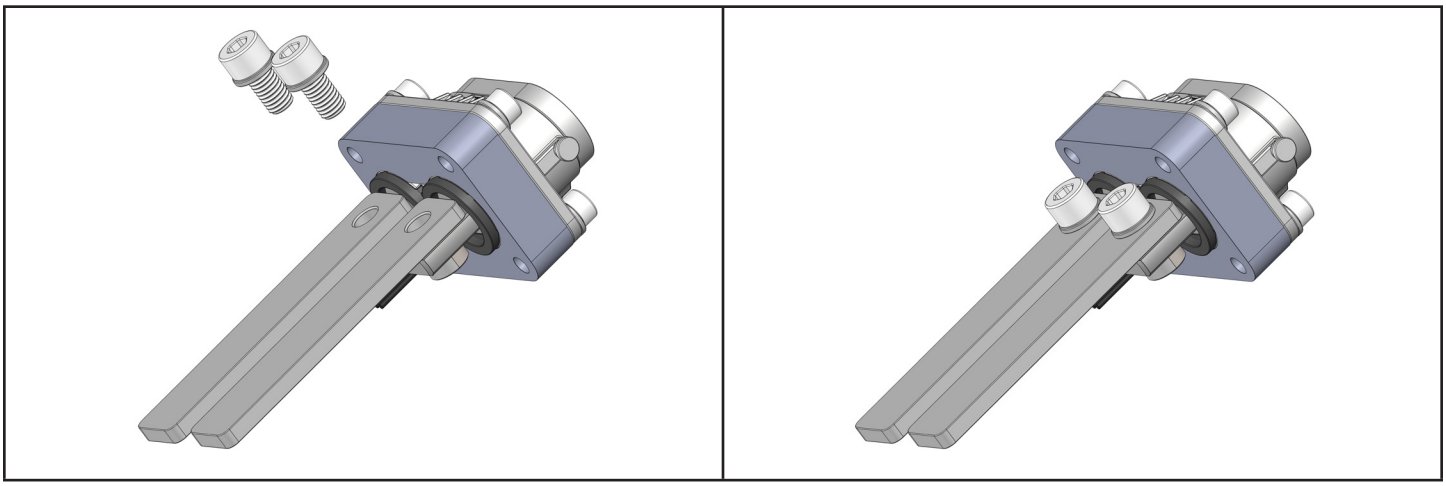
Connector Install, mating and un-mating.
Receptacle installed to panel.

- Insert the receptacle to the panel.(picture only show the 2port vision 3 port should be same with 2 port.)
  Please note aim the colum on receptacle to the hole on panel.
- Tighten the screw of 4x M6.
  Recommend torque should be 6.5±1N.m.
  Diagonal mounting screws



Install BUSBAR to connector

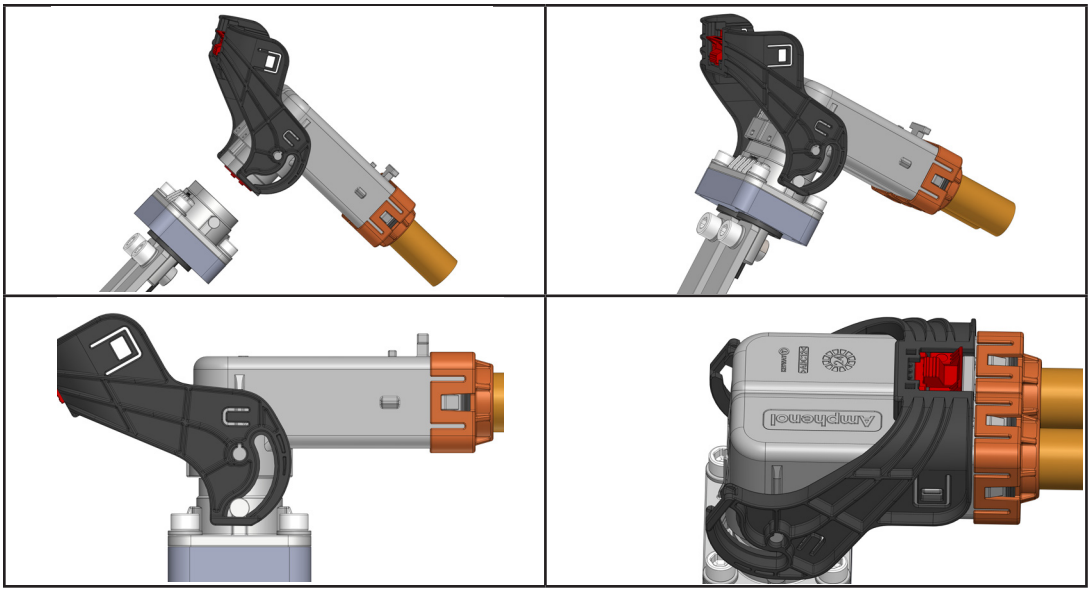
- Aim the BUSBAR hold to connector.
- Tighten the screw (M8X1.25). Recommended torque should be 6±0.5N.m



Mating and un-mating.

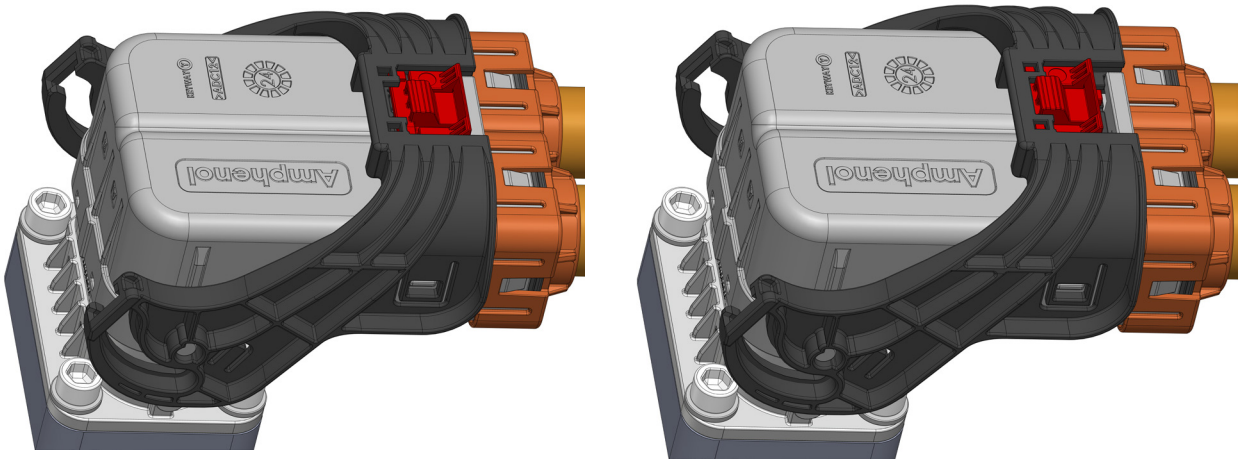
90° plug mating:

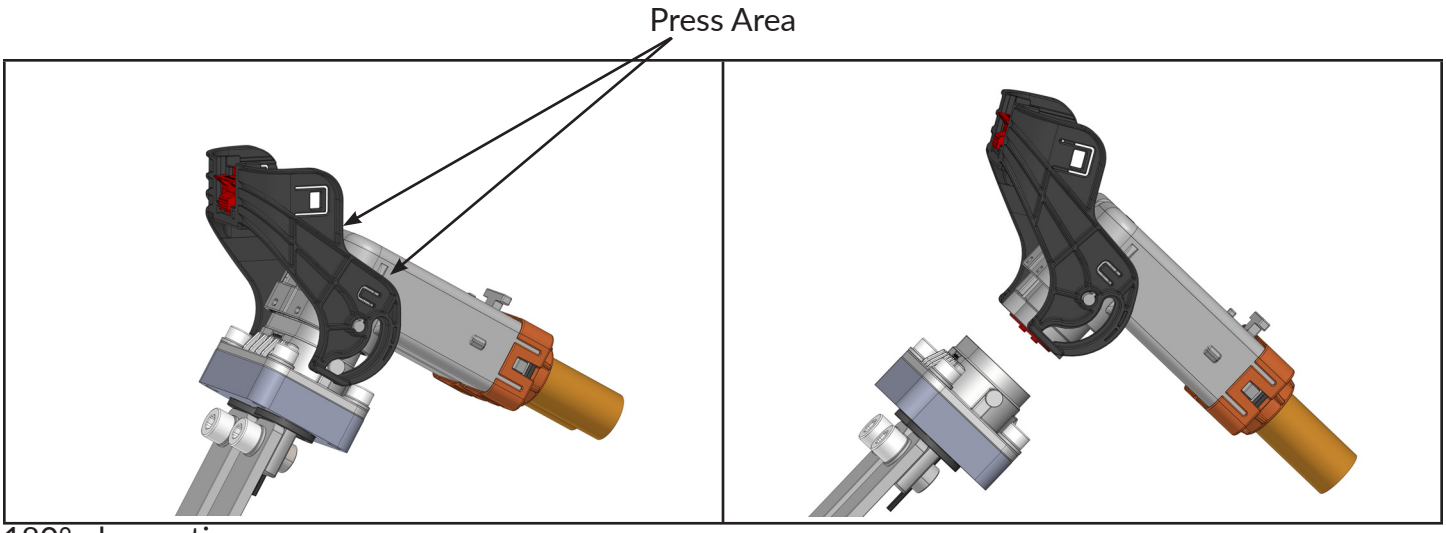
- Confirm that the keyway and installation direction are correct
- Mating plug with the receptacle to the pre-locking position.
- Press the lever and make the lever closed.(please use double hand to press the lever)
- Press the push the CPA on the lever. Make sure the CPA is in correct place and locked.



90° plug mating:

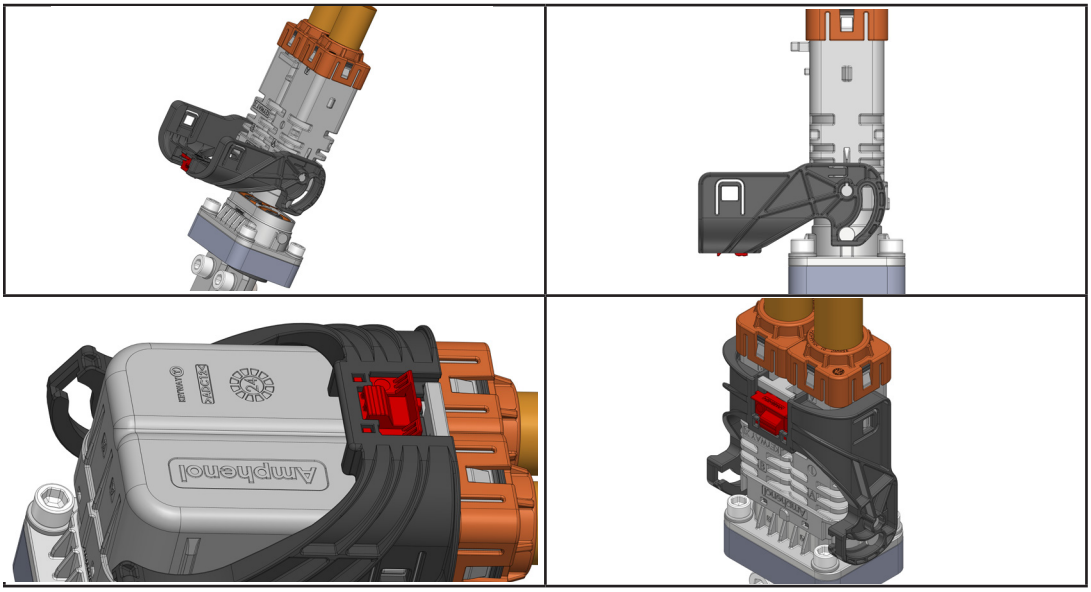
- Press and push to unlock the CPA
- Open the lever to pre-locking position(use double hand to open the lever)
- Un-mating the plug with receptacle(press the lever to pull out)





180° plug mating:

- Confirm that the keyway and installation direction are correct
- Mating plug with the receptacle to the pre-locking position
- Press the lever and make the lever closed.(please use double hand to press the lever)
- Press the push the CPA on the lever. Make sure the CPA is in correct place and locked.



180° plug un-mating:

- Press and push to unlock the CPA.
- Open the lever to pre-locking position(use double hand to open the lever)
- Un-mating the plug with receptacle.

180° plug un-mating:

- Press and push to unlock the CPA.
- Open the lever to pre-locking position(use double hand to open the lever)
- Un-mating the plug with receptacle.