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		AUTHORIZED BY Stalin Alosius	DATE 2019-09-12
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# 1. ASSEMBLING OF OCTIS KITS – USER INSTRUCTION

## 1.1. CRIMPED TYPE: Hybrid - Signal & Power (Combo) connector interface

Plug Kit Part Number 10135748-101LF

**PART NUMBER 10135748-101LF**

**Assembly instruction**

1

2 Stripping dimensions  
5 mm  
37 mm  
Ground wire  
18 mm  
43 mm

3 Stripping dimensions  
9 mm  
6 mm  
Signal cable housing

4 Contacts configuration  
1 2 3  
D  
C  
B  
A

5 Crimp the Power contacts  
Orientation contacts  
Crimp the Signal contacts

6 CLAC

7


8 Contacts configuration in Combo housing  
1 2 3  
D  
C  
B  
A

9 Orientation Combo housing and contacts  
CLIC(x4)

10 CLIC

11 2 Tighten the screw until the strap clamps the cable

12 CLAC

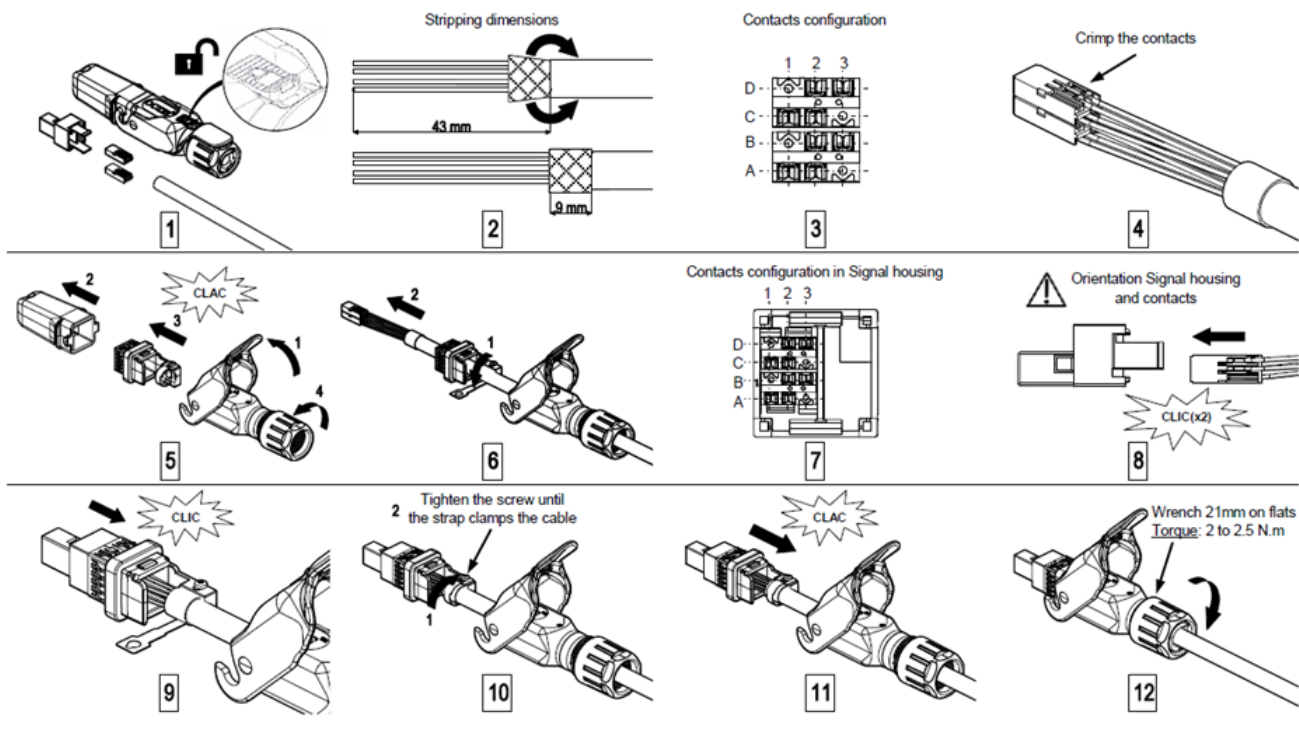
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## 1.2. CRIMPED TYPE: Signal Metral HDXS connector interface

Plug kit Part Number 10135750-101LF

PART NUMBER **10135750-101LF**

**Assembly instruction**



**Stripping dimensions**  
43 mm  
9 mm

**Contacts configuration**  
1 2 3  
D  
C  
B  
A

**Contacts configuration in Signal housing**  
1 2 3  
D  
C  
B  
A

**Orientation Signal housing and contacts**  
CLIC(x2)

**Tighten the screw until the strap clamps the cable**


**Wrench 21mm on flats  
Torque: 2 to 2.5 N.m**

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### 1.3. CRIMPED TYPE: Power - Pwr Profile connector interface

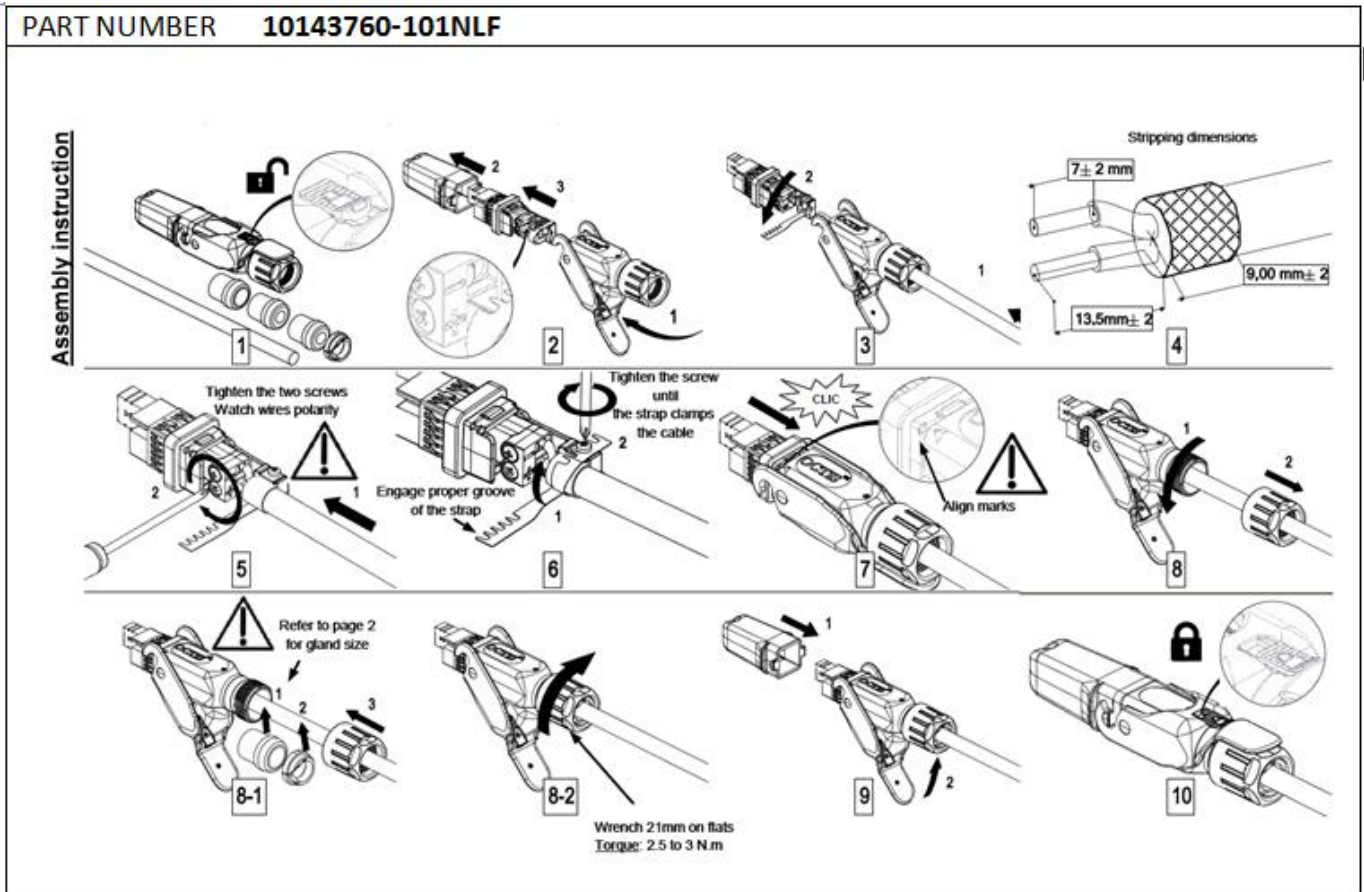
Plug Kit Part Number 10135752-101LF


<b>PART NUMBER</b>	<b>10135752-101LF</b>			
<b>Assembly instruction</b>	<p>1</p>	<p>Stripping dimensions</p> <p>5 mm, 37 mm, 9 mm</p> <p>2</p>	<p>Crimp the contacts</p> <p>Orientation contacts</p> <p>3</p>	<p>CLAC</p> <p>2, 3, 4</p> <p>4</p>
	<p>2</p> <p>1</p> <p>5</p>	<p>Orientation Power housing and contacts</p> <p>CLIC(x2)</p> <p>6</p>	<p>CLIC</p> <p>7</p>	<p>Tighten the screw until the strap clamps the cable</p> <p>2</p> <p>1</p> <p>8</p>
	<p>CLAC</p> <p>9</p>	<p>Wrench 21mm on flats</p> <p>Torque: 2 to 2.5 N.m</p> <p>10</p>	<p>1</p> <p>2</p> <p>11</p>	<p>12</p>

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### 1.4. SCREW TYPE: 2 position Power - Pwr Profile connector interface

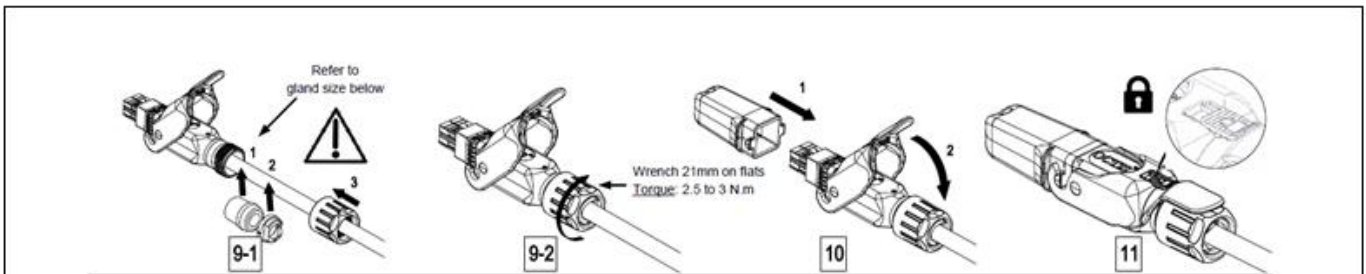
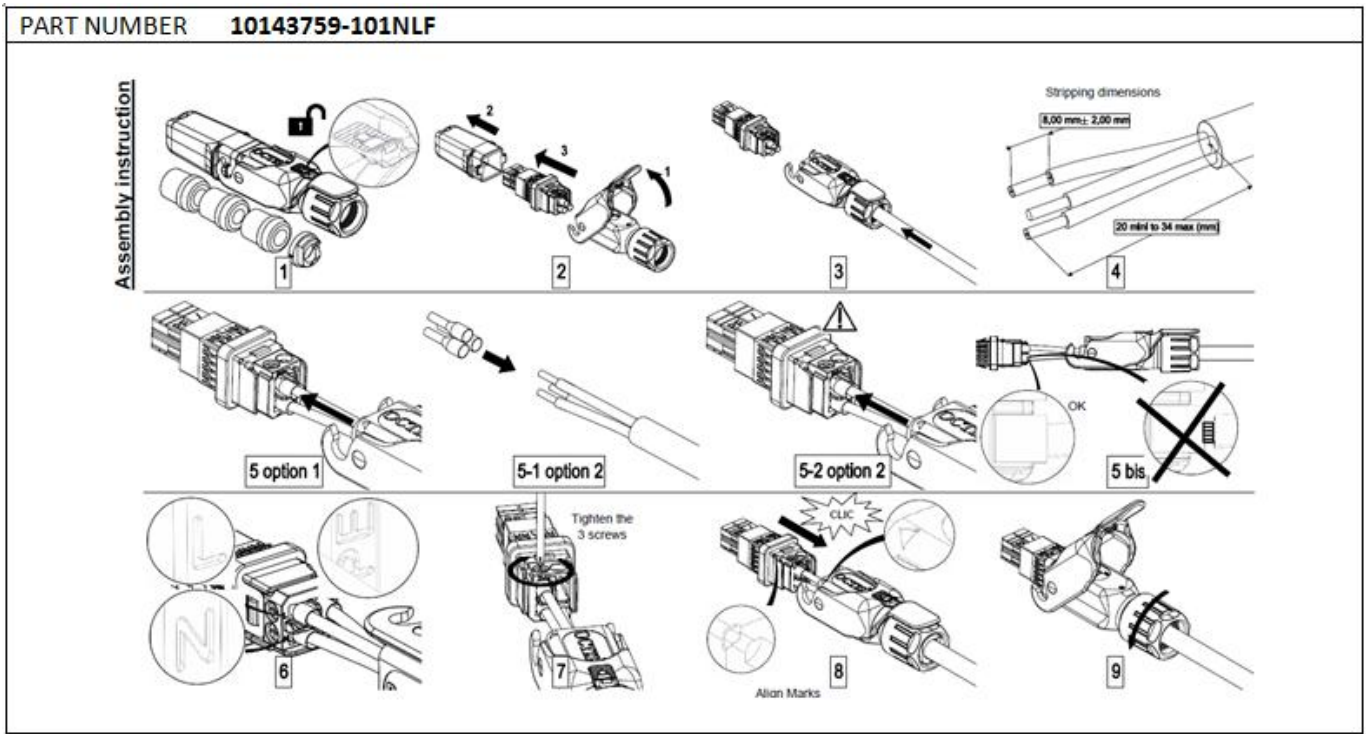
Plug Kit Part Number 10143760-101NLF




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## 1.5. SCREW TYPE: 3 position Power - Pwr Profile connector interface

Plug Kit Part Number 10143759-101NLF



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## 2. OBJECTIVE

This specification provides information and requirements for customer application of the OCTIS Metral HDXS OCTIS Cable Connector & cable assembly. It is intended to provide general guidance for application process development. It should be recognized that no single process will work under all customer applications and that customers should develop processes to meet individual needs. However, if the process varies greatly from the recommended one, FCI cannot guarantee acceptable results.

## 3. SCOPE

This specification provides information and requirements regarding application of Metral HDXS OCTIS Cable Connector (FCI product number: 10135748-101LF, 10135750-101LF, 10135752-101LF, 10143759-101NLF, 10143760-101NLF) into OCTIS cable assemblies.

## 4. GENERAL

This document is a general application guide. If there is a conflict between the product drawings and this specification, the drawings take precedence.

## 5. DRAWINGS AND APPLICABLE DOCUMENTS

FCI product drawings and specifications are available by accessing the FCI website or contacting the FCI Technical Service. In the event of a conflict between this specification and the product drawing, the drawing takes precedence. Customers should refer to the latest revision level of FCI product drawings for appropriate product details.

- Product Specification **GS-12-1334 (Combo), GS-12-1338 (Signal) , GS-12-1339 (Power)**
- Plug Kit Part Number, Hybrid - **Signal & Power (Combo)** connector for Octis **10135748-101LF(Crimped type)**
- Plug Kit Part Number, **Signal** Metral HDXS connector for Octis **10135750-101LF(Crimped type)**
- Plug Kit Part Number, **Power** - Pwr Profile connector for Octis **10135752-101LF(Crimped type)**
- Plug Kit Part Number, **2 position Power** - Pwr Profile connector for Octis **10135760-101LF (Screw type)**
- Plug Kit Part Number, **3 position Power** - Pwr Profile connector for Octis **10135759-101LF (Screw type)**

## 6. APPLICATION REQUIREMENTS


Materials, as cable and shrink sleeves must comply with the specifications mentioned in the product specification

## 7. RECOMMENDED WIRE SIZES AND INSULATIONS

### *7.1 Wire Insulation Materials*

Semi-rigid PVC, PVC, PE, PP is used.



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## 7.2 Maximum Insulation Diameters and Wire Sizes


### 7.2.1 Signal Contact

Conductor Size	Insulation Diameter	
	mm	inch
26 gauge solid	0.74	0.0291
0.4mm solid	0.74	0.0291
24 gauge	1.00	0.0394
0.5mm solid	1.00	0.0394

Certain wire sizes other than those recommended above can be inserted in the contact IDC but must be qualified individually. The specification of the cable using the stranded wire must have the wire insulation type, wire insulation thickness, number of strands, size of strands and twist of strands controlled.

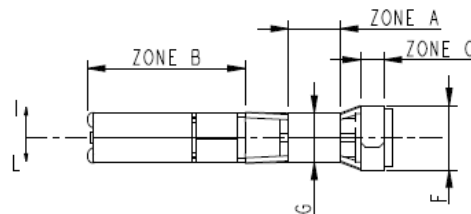
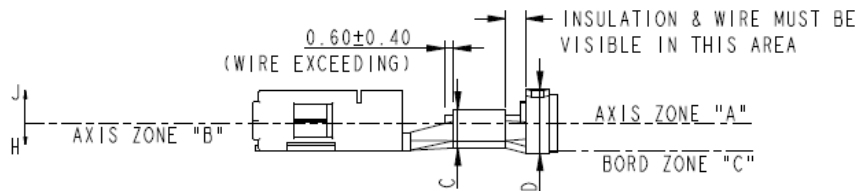
### 7.2.2 Power Contact

Wire Size Range (mm <sup>2</sup> )		Insulation Diameter (mm)	
Min	Max	Min	Max
1.00	2.50	2.00	3.00


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### 7.2.3 CRIMP ON WIRE (POWER CONTACT)

AUTHORIZED DEFORMATION MAXIMUM AFTER CRIMPING :  
 $\pm 4^\circ$  BETWEEN ZONE A AXIS & ZONE C EDGE.  
 $\pm 2^\circ$  BETWEEN ZONE A AXIS & ZONE B AXIS.



RECEPTACLE TERMINAL	WIRE BARREL			INSULATION BARREL	
	SECTION mm <sup>2</sup>	WIDTH	HEIGHT	(WIDTH)	(HEIGHT)
GAUGE	THEORETIC	$G \pm 0.04$	$C \pm 0.04$	$(F \pm 0.08)$	$(D \pm 0.08)$
	1	2.89	1.50	(3.80)	(2.90)
1 to 2.5	1.5	2.91	1.62	(3.84)	(2.81)
	2	2.93	1.68	(3.86)	(2.98)
	2.50	2.96	1.83	(3.89)	(3.22)
				(3.89)	(3.31)

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## 8 ACCEPTABLE WIRE TERMINATION

Caution: The wire strain relief of each contact must be closed by the wire insertion punch even if no wire is inserted into the contact. If the strain relieves are not closed, a short can occur between contacts on both shielded and unshielded connectors or between the contact and metal shields on shielded connectors.

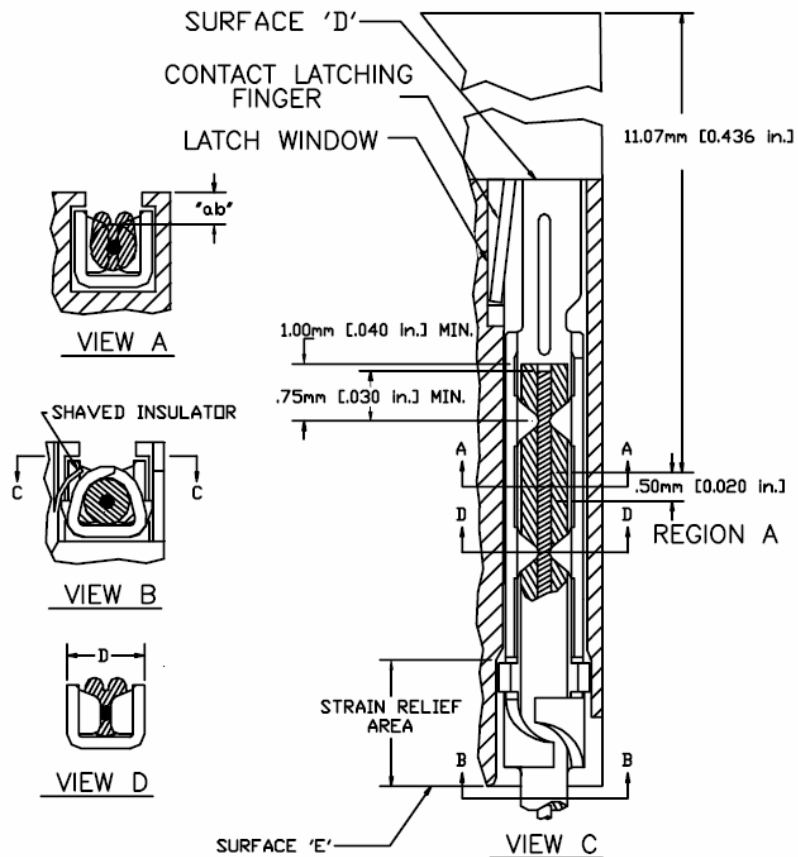
The automatic wire terminators will set all the unused contacts unless the machine cycle is interrupted. When using hand tools, the operator must index the connector subassembly to all unused positions and activate the hand tool.


### 8.1 Termination Requirements, Visual

Requirements for an acceptable termination as well as non-destructive visual inspection methods to ensure satisfactory terminations without removing wires.

#### 8.1.1 Wire location

The copper conductor shall extend at least 0.75mm beyond the IDC dimples. This requirement shall be considered to meet if the wire insulation extends at least 1.00mm beyond the IDC dimples. At a maximum the insulation may extend to surface "D" (See fig 4).



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**Figure 4: Wire Insertion Visual Requirements**

### 8.1.2 Wire Depth

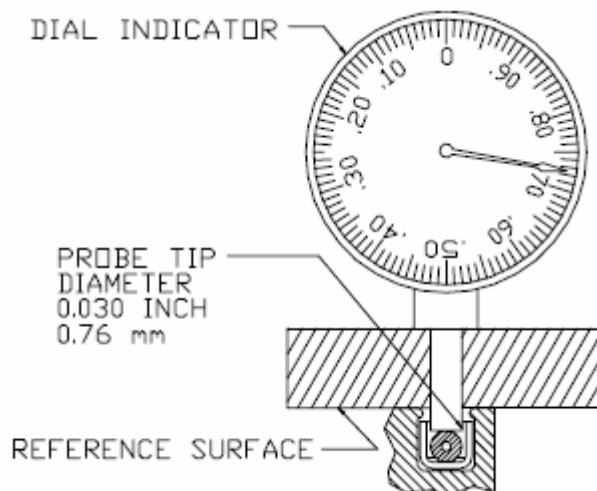
The wire shall be inserted into the IDC dimples so that the wire depth is greater than or equal to dimension “ab” as measured from the connector insulator to the top of the wire insulation in region “A” (views A and C of fig 4). A dial indicator (as depicted on fig 5) can be used to measure the depth required. The dimension “ab” is based on the diameter of the wire being used.

Conductor Size	Insulation Diameter (mm)	Dimension “ab” (mm)
26 gauge wire	0.74	0.42+/-0.12
24 gauge wire	1.00	0.36+/-0.12


The measurement should be done when the insertion equipment is set up. If the measurement is less than specified, reduce the depth of insertion until it meet. Contact your FCI representative if the wire you selected cannot meet all requirements.

A standard depth gage is available for the measurement of “ab” as listed below. We have observed that with some wire insulation types, the insulation gradually lifts off the wire after insertion. For this reason, the measurement of wire depth “ab” should be made as soon after insertion as possible to avoid incorrect low readings.

Dial Indicator Insertion Depth Gage			
FCI Part No.	Scale	Travel per Revolution	Graduations
413395-001	Millimeters	1.00	0.01



**Figure 5: Wire Depth Gage**

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### 8.1.3 Strain Relief

For 26 gage wire, all strain relief tabs must be crimped firmly against the wire such that retention of the wire will not be dislodged with a 9.8N (2.2LB.) minimum pull.  
For 24 gage wire, all strain relief tabs must be crimped firmly against the wire such that the wire will not be dislodged with a 19.6N (4.4LB.) minimum pull.

The wire shall be pulled at 90 degrees to the axis of the terminated wire, in a direction opposite to the insertion direction. It should be considered a major defect if either of the contact strain relief tabs have not been crimped over the wire.

### 8.1.4 IDC Terminal Damage

There should be no distortion of the metal terminal other than the intended forming of the strain relief except that the insertion punch may cut into the ace of the IDC dimple a maximum of 0.1 millimeter (0.004 inched) during wire insertion.

### 8.1.5 Wire Damage

There shall be no breaks in the wire insulation to expose the center conductor below surface "E" In fig 4, view C. Marks and dents in the insulation caused by the insertion equipment that do not expose the conductor in this area are permitted.

## 8.2 Tool Set up and Destructive Inspection Techniques

Techniques to verify proper tool set-up and for further inspection of suspected visual failures require wire removal. Wire removal shall be done in accordance with the following instructions.

### 8.2.1 Wire Removal


Open the wire strain relieves of the contact and peel the wire away from the strain relief and out of the IDC dimples, being careful not to damage the contact.

### 8.2.2 IDC Terminal Damage

Examine the IDC dimples. There shall be no visible damage other than that caused by the intended forming of the strain relief and the normal widening of the IDC gap by the wire except that the insertion punch must cut into the face of the IDC dimple a maximum of 0.10 millimeters (0.004 inches) during wire insertion.

### 8.2.3 Acceptable Metallic Contact

The removed wire shall show evidence of metallic contact with all four IDC dimples.

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## 9 APPLICATION TOOLING

Product number	Tool description
10137182-001	Semi automatic IDC Cable Terminator (Fig 6)
10135856-001	IDC table top pistol for Metral HDXS Octis Cable Connector (Fig 7)
10135701-001	Octis Power Profile Crimping Tool (Fig 8)
10141086-001	Octis Signal Crimping Tool (Fig 9)
Cable stripper	General available cable stripper



Figure 6: 10137182-001



Figure 7: 10135856-001



Figure 8: 10135701-001



Figure 9: 10141086-001

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## 10 APPLICATION PROCEDURE

### 10.1 *Cable Preparation for Power Profile Contact*

#### Step 1

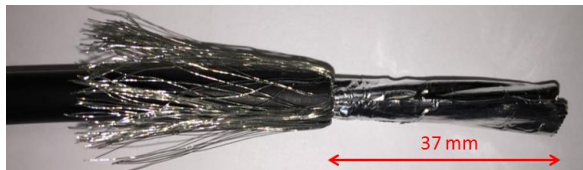
- Strip the outer jacket. (Fig 9)
- Do not cut any wire on braid



**Figure 9**

#### Step 2

- Unweave and fold back the braid (Fig 10)
- The braid should be equally distributed
- No Bundles




**Figure 10**

#### Step 3

- Cut the braid to 9mm (Fig 11)



**Figure 11**

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#### Step 4

- Attach copper tape (1.5 turn) (Fig 12)

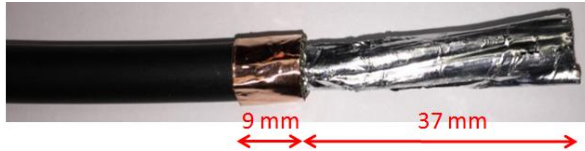


Figure 12

#### Step 5

- Remove the foil (Fig 13)
- When cutting away the foil, make sure that no wires of the braid are being damaged

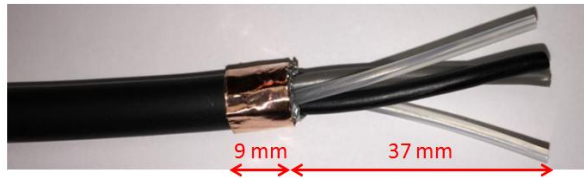


Figure 13

#### Step 6

- Remove the two fillers (Fig 14)
- When cutting away the fillers, make sure that no wires of the braid or the individual wire insulation are being damaged
- 

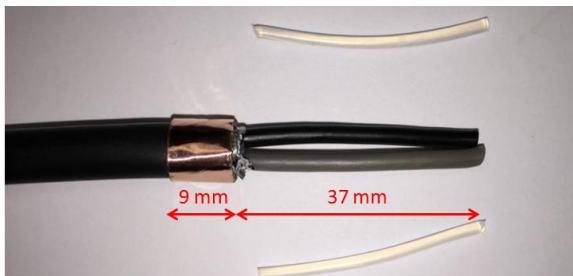



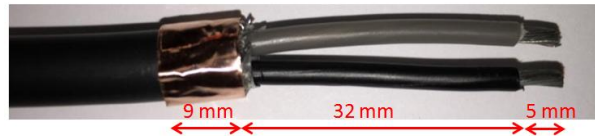
Figure 14



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### Step 7

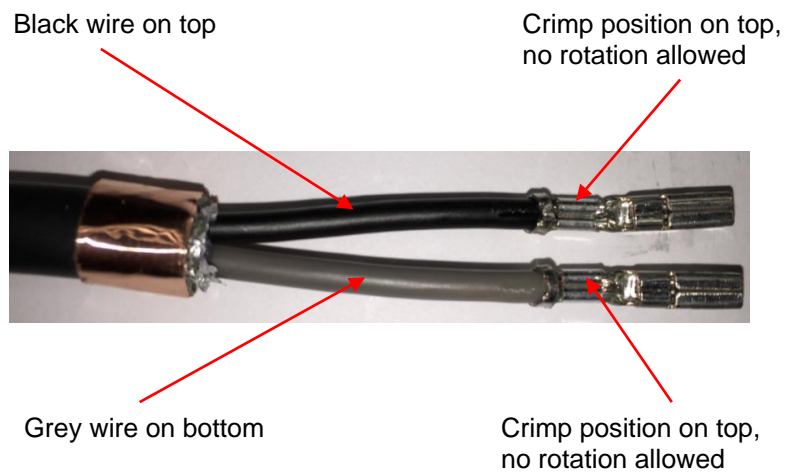
- Remove the individual wire insulation (Fig 15)
- Make sure that the wires are not damaged
- 




**Figure 15**

### Step 8

- Crimp the contacts (Fig 16) (By using 10135701-001, Octis Power Profile Crimping Tool)
- Make sure the cables are positioned side by side, as flat as possible (no twisting allowed)



**Figure 16**

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## 10.2 Cable Preparation for Signal Contact

### Step 1

- Strip the outer jacket. (Fig 17)
- Do not cut any wire of the braid

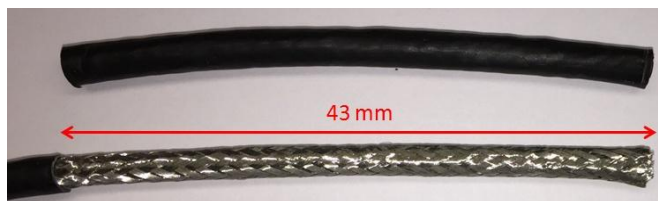


Figure 17

### Step 2

- Unweave the braid

### Step 3


- Fold back the braid
- The braid should be equally distributed
- No Bundles

### Step 4

- Cut the braid to 9mm (Fig 18)



Figure 18

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#### Step 5

- Attach the copper tape (1.5 turn) (Fig 19)



**Figure 19**

#### Step 6

- Remove the foil (Fig 20)
- When cutting away the foil, make sure that no wires of the braid are being damaged



**Figure 20**

#### Step 7

- Remove the plastic foil
- When cutting away the foil, make sure that no wires of the braid are being damaged

### 10.3 Cable IDC


#### General Tooling Setup:

- For application tooling see Chapter 9.
- Read the manual before setting up.

#### 10.3.1 Crimping Process – Method 1 (by using 10135856-001, IDC table top pistol for Metral HDXS Octis Cable Connector)

##### Step 1

First place the connector housing into the nest or positioning body. (Fig 22)

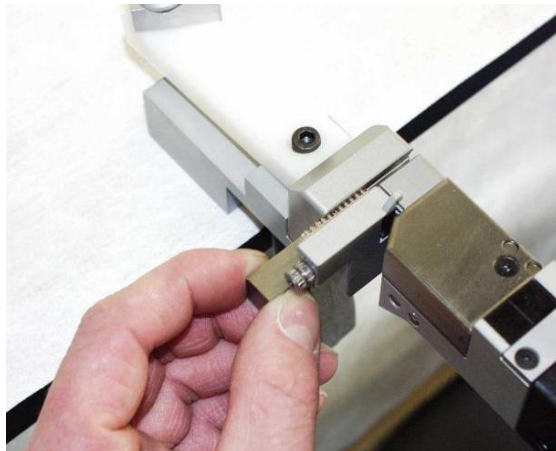
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**Figure 22**

**Step 2**


Place the nest or positioning body into the insertion head. Move the nest by hand until the first insertion position is reached. (Fig 23)

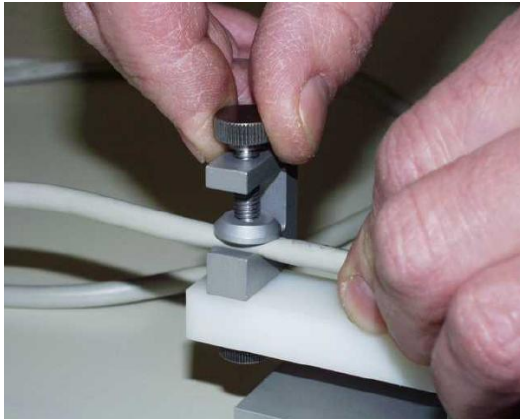


**Figure 23**

**Step 3**

Fix the cable by means of a cable clamp. This will ensure a correct positioning of the cable and guarantees a correct length of the individual wires for easy cover mounting. (Fig 24)

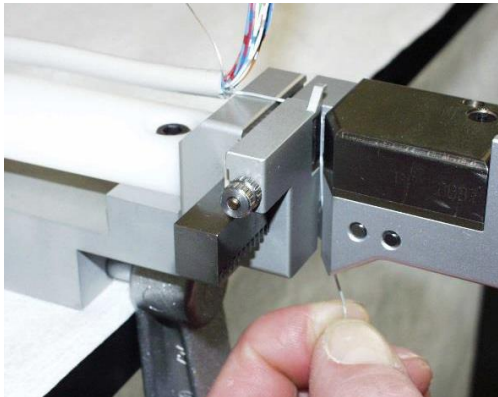
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**Figure 24**

**Step 4**


Bring the individual wire to be crimped via the wire slot into to the insertion head. Make sure the wire is positioned after the little hook on top of the insertion head. (Fig 25)

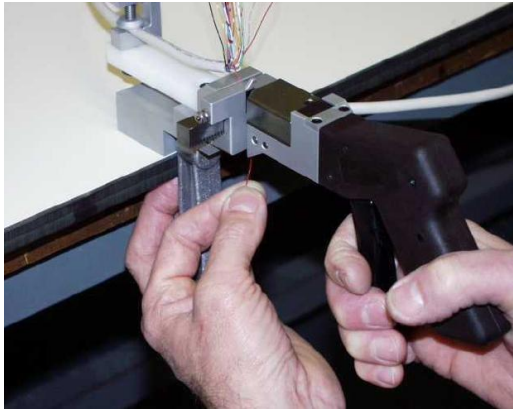


**Figure 25**

**Step 5**

Straighten the wire by a slight pulling force and activate simultaneously the tool by pulling down the hand lever till the end position. The wire is now crimped and excess wire is cut off. (Fig 26)

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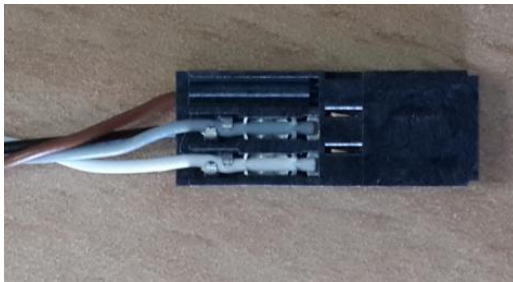


**Figure 26**


**Step 6**

Repeat step 4 and 5 until the whole contact row is inserted. Afterwards, the inserted process can always be restarted by placing the nest again in the correct start position. After the first contact row is installed, pull out the positioning body and turn it over 180°. The empty contact row is now facing the wire guiding gap. Repeat all different steps as described above.

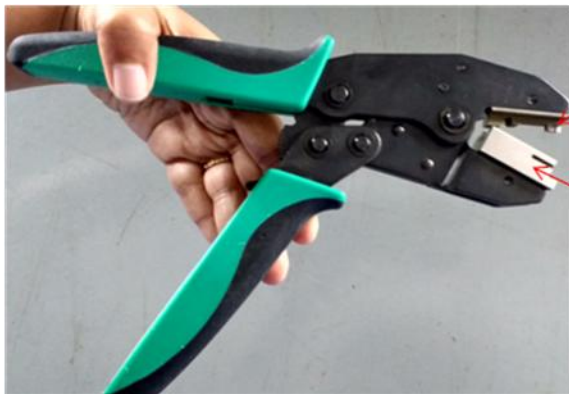
After crimping all the contacts, the required terminal block assembly is completed. (Fig 27)



**Figure 27**

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### 10.3.2 Crimping Process – Method 2 (by using 10141086-001, Octis Signal Crimping Tool)



■ Upper jaw holds the crimping punch

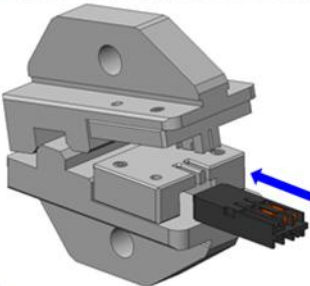
■ Lower jaw where the terminal block with preloaded contacts is placed & wires are positioned

#### Cable preparation

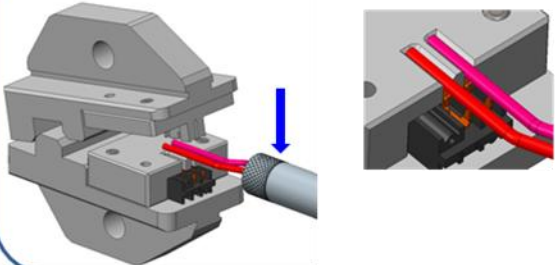
See 10.2

#### IDC termination process

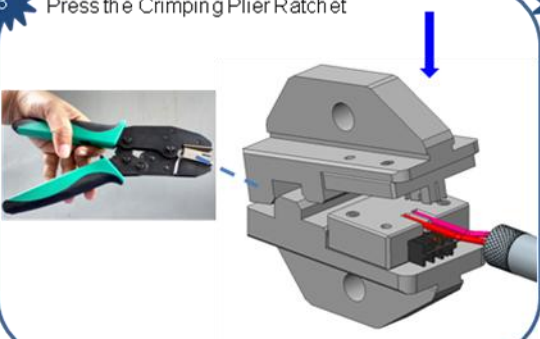
**1** Insert 1 Terminal block into the lower jaw



**2** Place 2 individual wires from the top side, position the wires in the slot

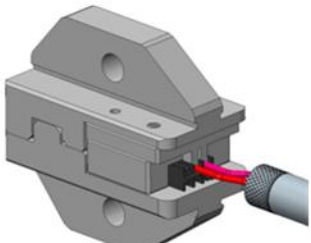



**3** Press the Crimping Plier Ratchet



**4**

- Close the handle completely until the ratchet is released.
- Remove the crimped terminal block from lower jaw.
- Repeat steps 1 to 4 on the opposite side of terminal block
- Repeat the steps 1-4 for the second terminal block

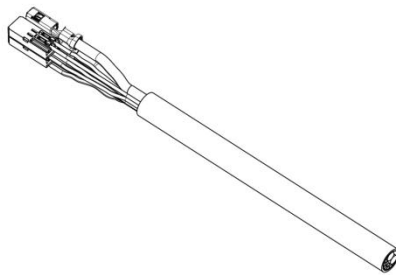


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## 10.4 OCTIS ASSEMBLY

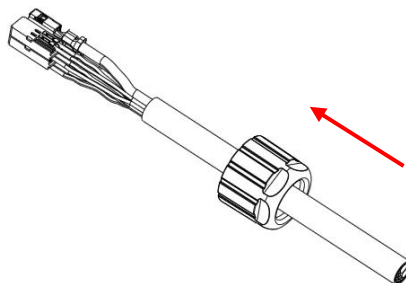
### 10.4.1 Assembling Hybrid - Signal & Power (Combo) connector

1. Make the “cable assembly” by crimping the two terminal block assemblies & power contacts (Fig 28).



**Figure 28**

2. Insert the gland nut through the other end of the cable (Fig 29).

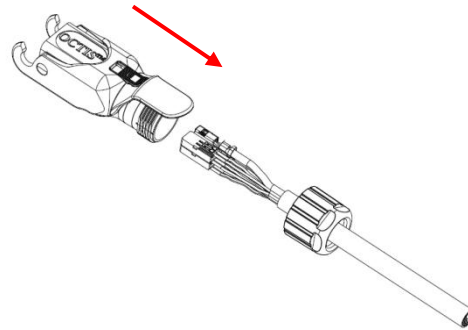


**Figure 29**

3. Insert the “housing sub set kit combo power/signal” through the front end of the cable (Fig 30)

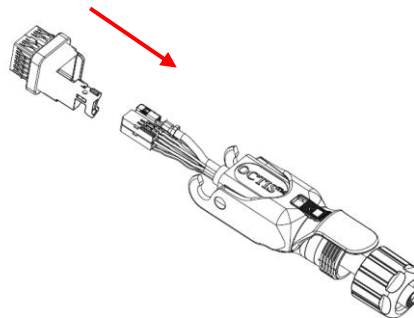


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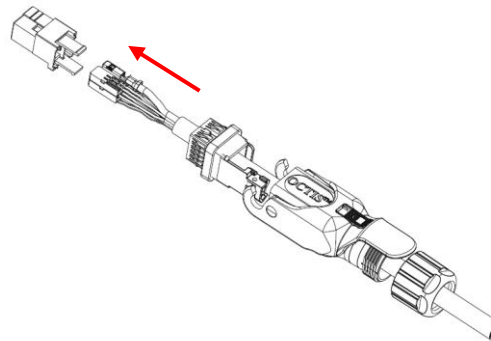
**Figure 30**

4. Insert the holder kit combo power/signal, as shown in fig 31




**Figure 31**

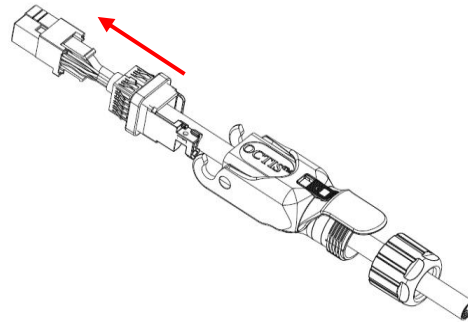
5. Insert the crimped cable assembly into the cable connector housing as shown in Fig 32



**Figure 32**

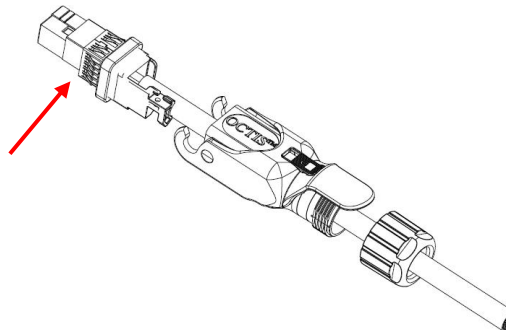
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6. Push the cable assembly into the cable connector housing till it gets fixed inside the housing. (Fig 33)



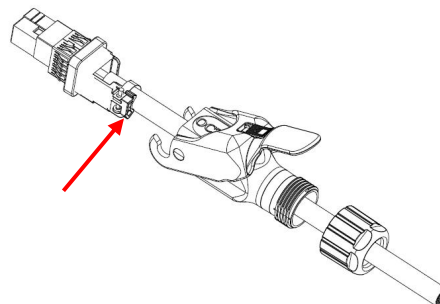
**Figure 33**

7. Push the cable connector into “holder kit combo power/signal” till the latch of the housing gets locked inside the respective slot of holder kit. (Fig 34)




**Figure 34**

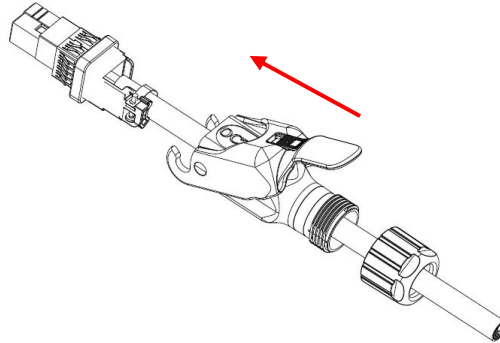
8. Tighten the “holder kit combo power/signal” against the cable using clamp, screw and nut. (Fig 35)



**Figure 35**

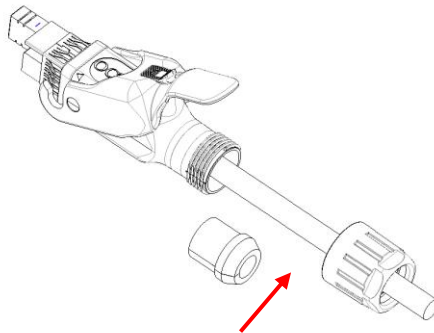
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9. Open the lever of “housing sub set kit combo power/signal” and push it against the cable assembly so that it gets fixed as a unit. (Fig 36) .

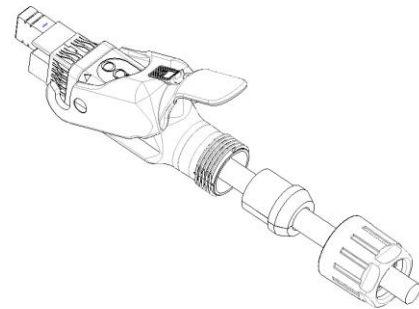


**Figure 36**


10. Place the split rubber gland onto the cable .( Fig 37 & Fig 38)



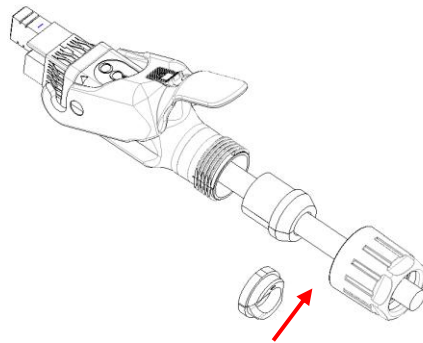
**Figure 37**



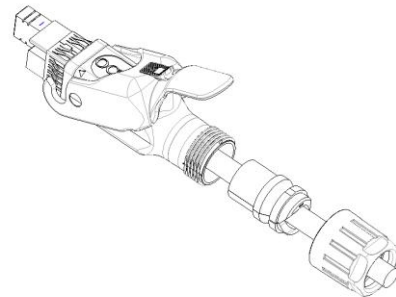
**Figure 38**

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11. Place the tightening cone onto the split rubber gland .( Fig 39 & Fig 40)

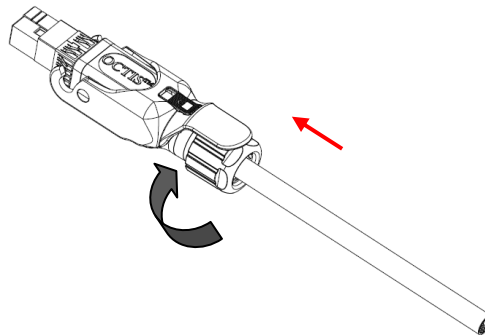


**Figure 39**




**Figure 40**

12. Tighten the gland nut, close the lever and close the secondary lock/button; Kit assembly is ready now.( Fig 41)

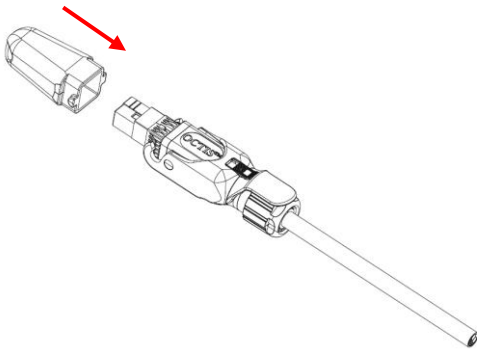


(Tighten the nut using  
Wrench 21mm flat  
Torque – 2 to 2.5N)

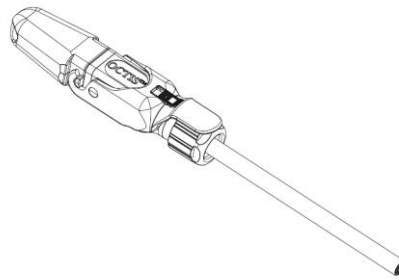
**Figure 41**

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13. If necessary, use the protection cap (optional) ( Fig 42 & Fig 43)



**Figure 42**




**Figure 43**

#### **10.4.2 Assembling Signal Metral HDXS connector**

All the procedure is same as that of the assembly of combo connector. There is change only in the cable connector

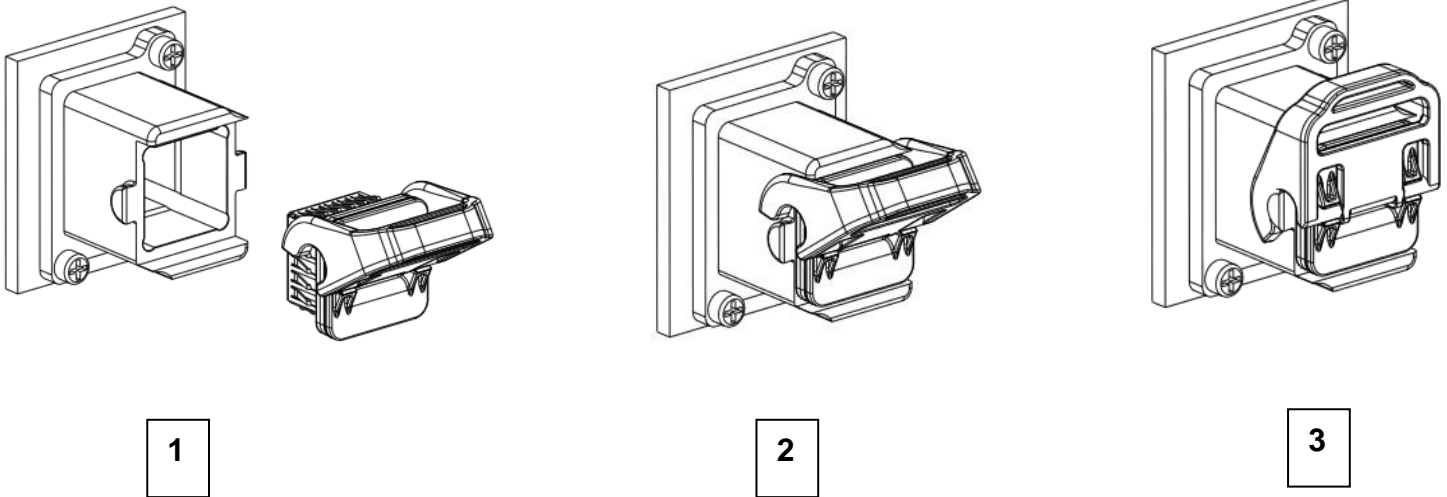
#### **10.4.3 Assembling Power - Pwr Profile connector (2 and 3 position power connector)**

All the procedure is same as that of the assembly of combo connector. Only change in the cable connector

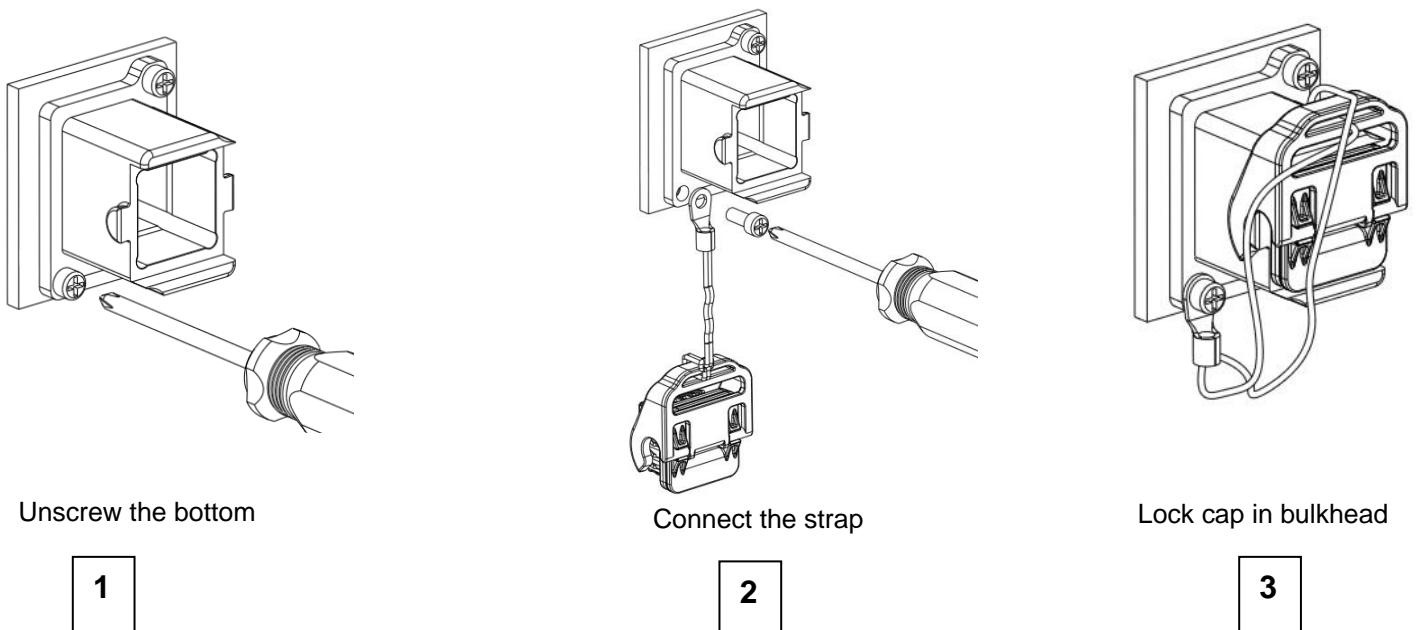
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## 10.5 OCTIS EMI CAP

### 10.5.1 OCTIS EMI cap-Assembly




### 10.5.2 OCTIS EMI cap with strap-Assembly



Unscrew the bottom

Connect the strap

Lock cap in bulkhead

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## 11 REVISION RECORD

REV	PAGE	DESCRIPTION	EC #	DATE
A	All	Pre release	xxx	2015-10-19
B	All	Modified	ELX-I-27924	2017-08-22
C	9	Texts moved to close 7.2.1	ELX-I-32440	2019-01-11
D	30	Adding EMI cap user manual	ELX-I-348331	2019-09-12