CMC HYBRID CONNECTORS
CIRCUIT SIZES: 24/32, 36/48

CMC Connectors 32 and 48-circuits

CP Terminals 0.6mm and 1.5mm
### Table of Revisions

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<td>B</td>
<td>Revised shelf life</td>
<td>38</td>
<td>2015/06/10</td>
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<td>B1</td>
<td>Template update                  Updated recommendations, add bundle curvature recommendation and update of traceability</td>
<td>All 10, 29, 41</td>
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Pictures in this document are for reference. Component details may change since this document has been written.
# Table of Contents

1. **PRESENTATION** .................................................................................................................. 5  
   1.1. Product Introduction .......................................................................................................... 5  
   1.2. CMC Connector interfaces in Standard Version ................................................................. 5  
   1.3. Overview ............................................................................................................................... 5  
   1.4. CMC Application examples ................................................................................................. 6  
   1.5. CMC Connector and Part Number Information ................................................................. 7  
   1.6. Components for 24, 32, 36, 48 Circuits .......................................................................... 8  
   1.7. CMC Connector Exploded View ......................................................................................... 8  

2. **Connector Assembly Process** ............................................................................................. 9  
   2.1. Terminal Crimping .............................................................................................................. 9  
   2.2. Recommendation for Harness Maker Plant ...................................................................... 10  
   2.3. Recommendation for Final Assembly Plant .................................................................... 10  
   2.4. Connector Loading ............................................................................................................ 11  
      2.4.1 Cavity number for terminal insertion ........................................................................... 11  
      2.4.2 Wire Length .................................................................................................................. 11  
   2.5. Step 1: Seal Plug Assembly ............................................................................................... 12  
   2.6. Step 2: Opening the TPA .................................................................................................. 14  
      2.6.1 Dimensions with opened TPA, for assembly onto a Fixture Board ......................... 15  
   2.7. Step 3: Terminal Insertion ............................................................................................... 16  
      2.7.1 Twisted wires .............................................................................................................. 18  
      2.7.2 Splicing Cables ............................................................................................................ 19  
   2.8. Step 4: Closing the TPA (Secondary lock) ..................................................................... 20  
      2.8.1 Troubleshooting .......................................................................................................... 21  
   2.9. Step 5: Installing the Wire Cap (or Wire Dress Cover) ..................................................... 22  
   2.10. Tie-Wrap Consideration .................................................................................................. 23  
      2.10.1 Tie-Wrap Matrix, example ......................................................................................... 23  
   2.11. Step 6: Tie-Wrap Installation ......................................................................................... 25  
   2.12. Step 7: Wire Dressing ...................................................................................................... 25  
   2.13. Step 8: Closing the Tie-Wrap ......................................................................................... 26  
   2.15. Step 10: Wire Harness Testing ....................................................................................... 30  
      2.15.1 Harness Test Layout Definition .................................................................................. 30  
      2.15.2 Dimensions with closed TPA, for Electrical and Seal Counter Part ..................... 30  
      2.15.3 PoGo Pins For Test Fixing ......................................................................................... 31  
      2.15.4 Electrical Continuity Checking ................................................................................. 31  
      2.15.5 Connector Sealing Test ............................................................................................... 31  
      2.15.6 Manual Testing Electrical Continuity .......................................................................... 32  

3. **Connector Rework Operations** .......................................................................................... 33  
   3.1. Step 1: Removal of the Wire Dress Cover ....................................................................... 33  
   3.2. Step 2: Opening the TPA (Secondary Lock) ................................................................... 33  
   3.3. Step 3: Removal of the Terminals ................................................................................... 34  
      3.3.1 Terminal Removal Tools .............................................................................................. 34  
      3.3.2 Locate Cavity Number for Terminal Removal ............................................................. 34  
      3.3.3 Terminal Removal Process ......................................................................................... 35  

4. **Assembly Operations to the Header** ................................................................................. 37
4.1. Mating Operations ........................................................................................................... 38
  4.1.1 Step 1: Insert the Connector Till It Stops In the Header ........................................... 38
  4.1.2 Step 2: Rotate the Lever .......................................................................................... 38
  4.1.3 Step 3: Lock the Lever on the Wire Dress Cover Until it Clicks ................................. 39

4.2. Un-mating Operations .................................................................................................. 39
  4.2.1 Step 1: Press on the Latch on Top of the Wire Dress Cover, and Rotate the Lever .......................................................................................... 39
  4.2.2 Step 2: Rotate the Lever .......................................................................................... 40
  4.2.3 Step 3: Final Un-Mate Connector Position ............................................................... 40

5. Storage Conditions .......................................................................................................... 41
  5.1. Applicable to all components without seal plug and single wire seal ....................... 41
1. PRESENTATION

1.1. Product Introduction

CMC Connectors are wire-to-board connection systems.
Key features of CMC connectors are:
- Sealed: High performing matte seal and single wire seal
- High-density: Fine pitch size for compact PCB design
- Hybrid: 2 different terminal sizes used CP 0.6 and CP 1.5mm
- Modular: Different numbers of circuit sizes, color coding and 2 wire output orientations are available

CMC Connectors are to be used with Molex CP Terminals CP 0.6mm and CP 1.5mm.

1.2. CMC Connector interfaces in Standard Version

<table>
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<tr>
<th>Connectors</th>
<th>24 ckt</th>
<th>32 ckt</th>
<th>36 ckt</th>
<th>48 ckt</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.6 mm CP (pcs)</td>
<td>18</td>
<td>24</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>1.5 mm CP (pcs)</td>
<td>6</td>
<td>8</td>
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<td>8</td>
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<td>Existing colors coding</td>
<td>Blk, Gry</td>
<td>Blk, Gry, Brn Blu, Grn</td>
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<td>Product Series</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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</table>

1.3. Overview

Figure 1-1: 48 circuits CMC Connector, brown color coding, wire cap and seal plug for 0.60 and 1.50mm cavity
1.4. CMC Application examples

- Engine control unit
- Automatic gear box
- Suspension controller
- Parking brake
- Fuse box
- Electric doors

Figure 1-2: Examples of applications
1.5. CMC Connector and Part Number Information

“G” and “D” are providing indication of the wire output direction

Note: with letter “D”, lever and wire output are in the opposite direction
1.6. Components for 24, 32, 36, 48 Circuits

1.7. CMC Connector Exploded View

Note: Do not disassemble CMC connector – For Reference Only
### 2. CONNECTOR ASSEMBLY PROCESS

#### 2.1. Terminal Crimping

Hand Crimp Tool parts numbers:

<table>
<thead>
<tr>
<th>CP 0.6</th>
<th>ISO</th>
<th>TXL</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.35 mm²</td>
<td>63811-9100</td>
<td>AWG 22</td>
</tr>
<tr>
<td>0.5 to 0.75 mm²</td>
<td>63811-9200</td>
<td>AWG 20/18*</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>CP 1.5</th>
<th>ISO</th>
<th>TXL</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 to 0.75 mm²</td>
<td>63811-8900</td>
<td>AWG 18</td>
</tr>
<tr>
<td>1 to 2 mm²</td>
<td>63811-9000</td>
<td>AWG 16/14</td>
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</tbody>
</table>

- *The CP 0.6 terminal, with 18 TXL wire is limited to a maximum diameter of 2.06mm, meeting the requirement of Ford specification FSB-M1L123-A.

Applicator part number:

<table>
<thead>
<tr>
<th>CP 0.6</th>
<th>ISO</th>
<th>TXL</th>
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<td>0.35 mm²</td>
<td>63902-1900</td>
<td>AWG 22</td>
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<tr>
<td>0.5 to 0.75 mm²</td>
<td>63902-2000</td>
<td>AWG 20/18*</td>
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</table>

<table>
<thead>
<tr>
<th>CP 1.5</th>
<th>ISO</th>
<th>TXL</th>
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<tbody>
<tr>
<td>0.5 to 0.75 mm²</td>
<td>63868-8000</td>
<td>AWG 18</td>
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<tr>
<td>1 to 2 mm²</td>
<td>63868-8100</td>
<td>AWG 16/14</td>
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</table>

- *The CP 0.6 terminal, with 18 TXL wire is limited to a maximum diameter of 2.06mm, meeting the requirement of Ford specification FSB-M1L123-A.

Note: Please refer to Molex Crimp Specifications for Crimp Heights.

To order please contact your Molex Sales Representative or check [www.molex.com](http://www.molex.com)
2.2. Recommendation for Harness Maker Plant

- Place arrows of cardboard box oriented to the top:
- Open packaging with a sharp less tool.
- Do unpack the products only when you use them for assembly (dust...).
- Do not change the position lever during assembly (delivery position).
- Cabling process must not damage the interfacial seal.
- The connector should not receive shock during the whole process.
- Do not contaminate the peripheral seal during the whole process.
- Avoid contact of the housing with lubricants, solvents or other product which might deteriorate the seals. In case of pollution with such material, the connector must be changed.
- TPA must be closed when handing the harness.
- Use only Molex recommended tool.

2.3. Recommendation for Final Assembly Plant

- Do not change the position lever during the assembly process.
- The connector should not receive shock during the whole process.
- Modify the lever position only on the header.
- Do not touch nor damage the perimeter seal during any process.
- Do not contaminate the peripheral seal during the whole process.
- Avoid contact of the housing with lubricants, solvents or other product which might deteriorate the seals. In case of pollution with such material, the connector must be changed.
2.4. Connector Loading

2.4.1 Cavity number for terminal insertion

32 circuits

48 circuits

Number

Letter

Number

Letter

2.4.2 Wire Length

Wire length (+/- 0.5 mm) inside the connector:
- CP 0.6 crimped on 0.5mm² wire
- CP 1.5 crimped on 1.5mm² wire

For letter “D”:

<table>
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<tr>
<th>Row</th>
<th>A</th>
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<th>C</th>
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<th>E</th>
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2.5. Step 1: Seal Plug Assembly

Plugs should be inserted before terminals

Note: Plugs have a specific insertion direction:

- Orange Seal Plug 1.5 cavity
- White Seal Plug 0.6 cavity

Insert completely the seal plugs

Do not insert the white seal plug on any 1.5 cavity
Insert the 0.6 and 1.5 seal plugs in the rear cover until it stops

0.6 & 1.5 seal plugs position
0.5 ± 0.5 mm

To order please contact your Molex Sales Representative or check [www.molex.com](http://www.molex.com)

Note:
- Do not use connectors with empty cavities.
- All cavities need to have either a CP Terminal or a seal plug inserted.
- If seal plugs are not used, the connector is NOT SEALED.

Note: Seal plug is mandatory on each assembled connector.
2.6. Step 2: Opening the TPA

Pull the TPA to “Open” position by hand or by using a 3x0.6mm screw-driver:

3x0.6 mm Screw-driver

TPA (Secondary Lock)
2.6.1 Dimensions with opened TPA, for assembly onto a Fixture Board

24/32 circuits (in mm)  

36/48 circuits (in mm)
2.7. Step 3: Terminal Insertion

Terminal loading sequence recommendation, TXL wires only:

### 32 way

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### 48 way

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<td>11</td>
<td>12</td>
<td>13</td>
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</tr>
</tbody>
</table>
Check terminal locking by “push-click-pull” on the wire.

Good crimp orientation
CP 1.5 & CP 0.6

CP 1.5

CP 0.6

Latch

Coding

Latch

Orientation
(Only 2 orientations are possible)

NO

TPA (Secondary Lock) must be closed when handling the harness

Do not rotate the terminal at any point during insertion, otherwise damaging the terminal or the matt seal is possible.

Bad crimp orientation of CP 1.5 & CP 0.6
Note for CP0.6 and 1.5: In case of rotation, do not remove the wire! Check the position of the insulation between the insulation crimp and the conductor crimp. If the insulation is perpendicular to the letter, insertion is possible; if not, turn over slowly.

2.7.1 Twisted wires

Insert completely one wire:

Choose the better orientation considering the second wire

Push – Clic - Pull
Insert completely the second wire:

Push – Clic - Pull

Do not rotate the terminal at any point during insertion, otherwise damaging the terminal or the matt seal is possible.

2.7.2 Splicing Cables

Minimum distance between splice and terminal: 250mm
2.8. Step 4: Closing the TPA (Secondary lock)

TPA detects badly seated terminals.
If the force is high, please check all terminals are well seated.
TPA seating is stopped by badly seated terminal.

Push on to the TPA to close

TPA must be in-line with the connector

Note: Secondary lock must be closed when handling the harness during the final assembly.

Closed TPA

Force to close: 40 N MAX
2.8.1 Troubleshooting

When the TPA closing force is high and/or the TPA is stopped before its final position:

Process:
- Identify the area where terminal is badly seated,
- Open the TPA,
- Check in the identified area any badly seated terminal,
- Re-check by “Push – Clic – Pull” – Do not rotate the terminal,
- Close the TPA.
2.9. Step 5: Installing the Wire Cap (or Wire Dress Cover)

Dress the wires to fit the wire cap (opposite the lever)
- #1: Install wire dress cover on the lever side
- #2: Slide the wire dress cover until it locks position

Wire Dress Cover in its final locked position

Note: Wire Dress Cover is mandatory on each assembled connector.
2.10. Tie-Wrap Consideration

Tie-wrap to use have to comply with the following dimensions:

Note: Tie-wrap is mandatory on each assembled connector.

2.10.1 Tie-Wrap Matrix, example

Select the Tie-Wrap position according the quantity of wires:
### Application Specification

**Title:** AS CMC 24/32 AND 36/48 CKT MATTE SEAL VERSION

<table>
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Quantity of CP 0.6 (0.5mm² wire gauge)
2.11. Step 6: Tie-Wrap Installation

Position 1

Position 2 and 3

2.12. Step 7: Wire Dressing
2.13. Step 8: Closing the Tie-Wrap

Final Tie-Wrap position:

Note:

- Check that the Wire Dress Cover (Wire Cap) as the Wires are not damaged by the Tie-Wrap.
- Check that the head of the Tie-Wrap is in the correct position and allow the Cam Lever to lock on the Wire Dress Cover (Wire Cap).
Tie-Wrap not in a correct position
2.14. Step 9: Taping and Fixing

30mm Min Before Taping

120mm Min Before Fixing
Minimal curvature radius should be minimum 5x the bundle diameter. The considered radius to be measured at the inner edge of the bundle.
2.15. Step 10: Wire Harness Testing

2.15.1 Harness Test Layout Definition

Please see Interface drawing.

2.15.2 Dimensions with closed TPA, for Electrical and Seal Counter Part

- 24, 32 circuits (in mm)
- 36, 48 circuits (in mm)
2.15.3 PoGo Pins For Test Fixing

<table>
<thead>
<tr>
<th>POGO PIN CP 0.6</th>
<th>POGO PIN CP 1.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>POGO PIN EFFORT: 2.0 N MAX.</td>
<td>POGO PIN EFFORT: 3.0 N MAX.</td>
</tr>
<tr>
<td>Pogo pin diameter: 0.6 mm, spherical end</td>
<td>Pogo pin diameter: 0.74 mm, spherical end</td>
</tr>
</tbody>
</table>

A= 1.90 min / 2.70 max
A= 2.60 min / 3.55 max

2.15.4 Electrical Continuity Checking

Fixtures used for continuity testing must meet the row and the pitch dimensions, according the Interface drawing.

Fixtures outside these requirements could result in damage to the connector and/or terminals.

Probe pin recommendations:
- When testing the connector for continuity it is mandatory to not damage the terminals.
- Pogo pins should be checked for damage or sticking several times a shift. This should assure containment, if an issue is found.
- At first a visual inspection of all the pins for damage should be performed.
- Then a testing block should be used to depress all the pogo pins up into the barrel. If there is a bent or sticking pin, it should remain stuck in the barrel of the pogo pin. A damaged or stucked pin should be replaced before any additional testing is performed.

Probing damage can occur:
- If a sharp ended probe is inserted into the contact of the terminal, it may damage the plating and increase contact resistance.
- If an oversized diameter probe is inserted into the terminal, this will overstress the beam in the terminal. This will create an environment for intermittent connections, and increased contact resistance.
- If a probe is inserted into the connector on an angle or off center it may damage the terminal, and or the connector.

2.15.5 Connector Sealing Test

<table>
<thead>
<tr>
<th>Test Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure</td>
</tr>
<tr>
<td>Time</td>
</tr>
</tbody>
</table>
2.15.6 Manual Testing Electrical Continuity

Note:
- If it’s necessary to check the continuity after final electrical test or on the application, use ONLY a tool with PoGo pin (see above specification).

Part #63812-1100 (same hand tool for CP 0.6, CP 1.5 and CP 2.8)

PoGo pin

To order please contact your Molex Sales Representative or check [www.molex.com](http://www.molex.com)
3. CONNECTOR REWORK OPERATIONS

3.1. Step 1: Removal of the Wire Dress Cover

- Cut the Tie Wrap on the Wire Dress Cover’ side
- Note: do not damage the wires!

1. Bend the locking latch with a screw-driver
2. Push on the Wire Dress Cover
3. Repeat the above operations on the other side

3.2. Step 2: Opening the TPA (Secondary Lock)

- With a small screw-driver, lift the TPA to move it until its pre-lock position
- Then pull the TPA until it stops and clicks
3.3. Step 3: Removal of the Terminals

3.3.1 Terminal Removal Tools

<table>
<thead>
<tr>
<th>Molex P/N</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>For CP 0.6</td>
<td>63813-2400</td>
</tr>
<tr>
<td>For CP 1.5</td>
<td>63813-2300</td>
</tr>
</tbody>
</table>

To order please contact your Molex Sales Representative or check www.molex.com

3.3.2 Locate Cavity Number for Terminal Removal

24, 32 circuits

36, 48 circuits
3.3.3 Terminal Removal Process

Terminal removal holes

Terminal removal process

Step 1: Push the wire

Step 2: Insert the tool

Step 3: Remove the wire without rotating the terminal nor the wire

Rework tool cavities
(If needed, turn 90° to match with above picture)

Note:
- Do not rotate the terminal at any point during terminal servicing, otherwise damage to the matte seal or to the terminal is possible.
Note:

- Insert the tool finger as mentioned above until the tool stops.
- The handle is not in contact with the plastic. DO NOT OVER PUSH.
- Keep it perfectly in the axis of the terminal.

After rework, see chapter 2, to correctly insert the terminal and finish the harness.
4. ASSEMBLY OPERATIONS TO THE HEADER

No Specific Sequence
Note:

- For the same header, 2 orientations are possible, DEPENDING ON CONNECTOR CHOICE: “G” or “D” wire output direction:

4.1. Mating Operations

4.1.1 Step 1: Insert the Connector Till It Stops In the Header

4.1.2 Step 2: Rotate the Lever
4.1.3 Step 3: Lock the Lever on the Wire Dress Cover Until it Clicks

4.2. Un-mating Operations

4.2.1 Step 1: Press on the Latch on Top of the Wire Dress Cover, and Rotate the Lever
4.2.2 Step 2: Rotate the Lever

4.2.3 Step 3: Final Un-Mate Connector Position
5. STORAGE CONDITIONS

5.1. Applicable to all components without seal plug and single wire seal

- Temperature range: -40°C up to +85°C
- Duration: 18 months maximum

Production date traceability:

Production date
- 2 first digit: year
- 3 last digit: day of the year

Note: Do not use cutting tool to open the original package!

The connectors must be stored in their original package.

Store reels in a dry and clean area.
Do not store reels in a damp or dusty area.
The reels should be protected from direct sunlight.

During storage and handling, no charge must damage original package.

In the event of repacking at the wiring station, use only clean plastic box (metal box prohibited),
this repacking must be carried out by batch where the number of connectors is less than or equal
to that mentioned on the delivery boxes.

The connectors and terminals are to be stored so that no shock can deteriorate their mechanical
and electrical functions.

After harness assembly, connector does not need specific protection. The harness maker must
guarantee an appropriate protection regarding storage, transport and/or using conditions.