Connector Installation Guide
Compression and Mechanical Connectors
Before compression, a typical cross section of cable consists of 75% metal and 25% air.
Typical Cross Section of a Compression Connector After Installation

After compression, little air is left.
Compression Connector Types

- Single & Dual Mounting holes
- Flared-End
- Narrow Tongue
- C-Taps

- Splices
- H-Taps
- Grid Grounding
1. Determine Proper Connector For Cable
   • Conductor size and CU = Copper conductors only
   • Conductor size and “AL9” = Aluminum conductors only
   • Conductor size and “AL9CU” = Aluminum or Copper conductors
   • Match size and type of conductor to proper lug

Note: Consult manufacturers instructions on whether fine stranded conductors or welding cable conductor types may be used.
Marking Information on Connectors:

- Manufacturer
- Wire Size
- Wire material- CU, AL, or AL9CU (indicates Dual Rating and 90° C)
- Optional Crimp Indicator Bands
- Listing Information
2. Strip and Properly Prepare Cable
   • Strip insulation carefully to avoid nicking strands.
   • Strip to proper length so conductor can be fully inserted.
   • Refer to manufacturer’s instructions for strip length.
   • Most connectors are suitable for one conductor. Never install more than one conductor unless specifically allowed by the manufacturer’s instructions.

Aluminum Conductor –
   • Brush the stripped portion of the conductor to remove oxide film using a stainless steel wire brush.
   • Apply oxide inhibitor compound and wire brush into the stranding. Do not remove pre-filled inhibitor from the barrel.
Installation Guide for Compression

- Nicks in strands
- Strands cut
- Strip length too long
- Strip length too short
3. Select proper installing die tool
   • Always refer to the connector manufacturer’s instructions for the proper compression die that is intended for the connector.
   • Manufacturer’s may use colored bands or dots that correspond to color markings on dies.
   • Manufacturer’s may use die code number marked or stamped on the connector.
   • Knurls may be used in place of colored bands.
4. Locate tool with correct die in proper position on connector and activate tool

- Connectors that are banded with colored stripes to indicate number and location of each crimp.
- Connectors may also be marked with the die code number at each compression location.
- Follow manufacturers instructions whether to crimp on the colored bands or between the colored bands.
4. Continued….

When crimped, the die code number or other marking will be embossed on connector for easy inspection to determine if correct die and connector combination were used.
Select proper installing dieless tool

- Crimp as directed by the manufacturer’s instructions.
5. Connector Securement

Use a 2-hole connector if there is a concern for twisting the connection.
Installation Guide for Mechanical
Mechanical Connector Types

- Double Conductor Lug
- Single Conductor Lug
- Overhead Transformer
- Double Conductor Lug, NEMA Pad
- Copper Single Conductor Lug
- Stud Type Transformer
Marking Information on Connectors:

- Manufacturer’s name or Symbol
- Wire Size or range
- Wire material- CU, AL, or Both
- Temperature Rating if applicable
- AL9CU Shows Dual Rating (Al & Cu) and 90°C
- UL and/or CSA if it is a listed connector
1. Unlike Compression connectors, mechanical connectors typically take a range of conductors. It is important to check that the cable falls within the cable range listed on the connector.

2. If the connector is intended to be used on a bus, pad or equipment, mount the connector and tighten the mounting hardware per the manufacturer’s specifications.
3. Strip and Properly Prepare Cable

- Strip insulation carefully to avoid nicking strands
- Strip to proper length so conductors can be fully inserted
- Refer to manufacturers instructions for strip length
- Aluminum Conductor –
  - Brush the stripped portion of the conductor to remove oxide film with a stainless steel wire brush. Apply oxide inhibitor compound and wire brush into the stranding
4. Insert the conductor(s) and tighten all set screws per the manufacturer’s recommendations.
   • Do not retighten after properly torqued.
   • Most connectors are suitable for one conductor. Never install more than one conductor unless specifically allowed by the manufacturers instructions.
   • Use the mounting bolt size as recommended by the manufacturer.
• Generally used as taps.
• If conductors are different materials, a spacer bar is included. Aluminum conductor should always be positioned on top.
• Voltage Rating (Insulated Only)
• 300 volts
• 600 volts
• 1000 volts signs/luminaires
• Note: NOT MARKED
• Non-insulated listed connectors are suitable for 2,000 volts. They may be used over 2,000 volts up to 35,000 volts where the effects of corona have been investigated.
• Non-insulated Temperature Rating
  • 75°C - Use the connector at 75°C ampacity
  • 90°C - Use the connector at 90°C ampacity
• Higher temp rated conductors at higher ambient temperatures may be used as long as the ampacity levels are used per the connector rating.
• Use the NEC® to obtain the conductor ampacity ratings.
• Insulated Temperature Rating
  – Never exceed the temperature rating of an insulated connector. See Packaging or Product for the marking.
Conductor Material

- AL 9  Aluminum  90°C
- AL9CU CU9AL  Aluminum/Copper  90°C
- AL7  Aluminum  75°C
- AL7CU CU7AL  Aluminum/Copper  75°C
• Grounding
• DB Direct Burial
• The connector is suitable for direct burial in the soil or embedded in concrete.
Look for the product markings for suitability for attachment to rods, pipe, and concrete encased reinforcement steel.
Rod size

Conductor size
Suggested Ways to Load or Balance

Parallel Feed – 4 smaller load wires in between

Parallel Feeds, 4 Load Wires on outer two holes

Three Parallel Feeds, Three parallel Loads

Two Parallel Feeds, 4 Load Wires - Load wires on outer edges and in the center two holes
Incorrect application

Parallel Feeds one end, 4 Load Wires opposite end
Typical Failure Modes in Sealed Connectors

1. Wire plug cut at angle
2. Wire plug or screw plug not fully inserted
3. Angled cut on end of wire
4. Missing wire plugs or screw plugs
5. Short/long insulation strip length
Safety Standards

Wire Connectors
• UL 486A-486B
• CSA C22.2 No. 65
• ANCE NMX-J-543
• ANSI C119.1, C119.4, C119.5, C119.6

Splicing Wire Connectors
• UL 486C
• CSA C22.2 No. 188
• ANCE NMX-J-548

Grounding and Bonding Equipment
• UL 467
• CSA C22.2 No. 41
• ANCE NMX-J-567