

## 3.4mm Coeur Centrality High Current Connector System and Application Tools

**SERIES:**

**SOCKETS;**

204313	PRESS FIT Option with 1.0mm of Float Tray Packaging
204365	SMT Option with 1.0mm of Float Tray Packaging
204318	SMT Standard Tray Packaging
204316	PRESS FIT Standard Tray Packaging
204608	8 AWG Crimp Option
212195	SMT Option with 1.0mm Float Tape and Reel Packaging
212194	SMT Standard with Tape and Reel Packaging

**MALE PINS;**

203263	Male SMT, Screw Mount and PRESSFIT PIN option
211922	Custom Male Terminal Options



<u>REVISION:</u> <b>B1</b>	<u>ECM INFORMATION:</u> ER No: 749681 DATE: 23/05/2023	<u>TITLE:</u> <b>APPLICATION SPECIFICATION 3.4MM COEUR CENTRALITY</b>	1 of 20
<u>DOCUMENT NUMBER:</u> <b>2043130018-AS</b>	<u>CREATED / REVISED BY:</u> SOURAJ	<u>CHECKED BY:</u> SCS02	<u>APPROVED BY:</u> HTHYAGARAJ

## 1.0 SCOPE:

This specification applies to the 3.4mm Coeur Centrality connector system for function, assembly, and use of this product.

## 2.0 PRODUCT DESCRIPTION:

The Centrality connector system is a single circuit high current power connector for busbar and PCB applications. Connectors available with or without 1.0mm of float. Also available in crimp contacts for cable applications.

## 3.0 REFERENCE DOCUMENTS:

- 3.1 2043130018-SD 3.4MM CENTRALITY PRESS FIT WITH 1.0mm FLOAT
- 3.2 2043650018-SD 3.4MM CENTRALITY SMT WITH 1.0mm FLOAT
- 3.3 2043160018-SD 3.4MM CENTRALITY STANDARD PRESS FIT
- 3.4 2043180018-SD 3.4MM CENTRALITY STANDARD SMT
- 3.5 2032630018-SD 3.4MM Press-Fit pin
- 3.6 2046081034-SD 8AWG Crimp Option
- 3.7 2032631134-SD 3.4MM SMT Pin
- 3.8 2032638034-SD 3.4MM Screw Mount Pin
- 3.9 2121950018-SD SMT Option with 1.0mm of Float, Tape and Reel
- 3.10 2121940018-SD SMT Standard, Tape and Reel
- 3.11 212950020-SD 3.4MM CENTRALITY SMT WITH 1.0mm FLOAT SHORT, Tape and Reel.
- 3.12 2043130018-PS Product Specification
- 3.13 2043130018-PK Packaging Specification
- 3.14 2043180018-PK Packaging Specification
- 3.15 2046081034-PK Packaging Specification
- 3.16 2121940018-PK Packaging Specification
- 3.17 2121950018-PK Packaging Specification
- 3.18 2043130018-AS Application Specification
- 3.19 2121950020-PK Packaging Specification

## 4.0 GENERAL REQUIREMENTS:

The Centrality male pin requires mounting to a PCB via SMT or PRESS FIT into a busbar

### 4.1 SMT (PCB)

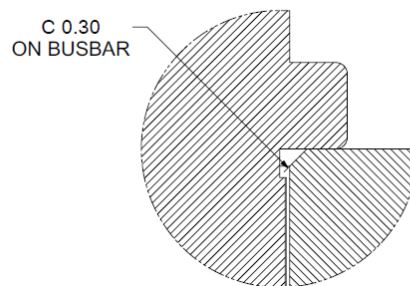
- a. Min board thickness is **1.58mm**
- b. Board layers shall be as such to handle needed current

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- c. Copper OSP plating is recommended, other plating types acceptable
- d. Allow for proper fixturing under board to allow part to protrude during reflow
- e. Soldering fixture that encapsulates pin is recommended to maintain terminal straightness and true position throughout soldering process

#### 4.2 Press-Fit (Busbar)

- a. Minimum busbar thickness is **1.5mm**
- b. Reem all holes
- c. Verify hole sizes prior to install
- d. Allow for proper fixturing under press in holes to avoid hole deformation especially in thin busbars
- e. Laser drilled holes in busbars may exhibit draft and should be tested for proper size and retention for proper use
- f. 0.3mm Chamfer Recommended on top of hole where possible for aid in assembly



#### 4.3 Screw Mount (busbar or PCB)

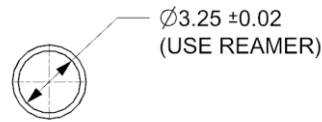
- a. Minimum Thickness 1.4mm
- b. Recommended lock washer or Belleville washer
- c. Screw torqued down to 12 in/lbs
- d. M2 thread size required

### 5.0 INSTALLATION OF SENTRALITY

#### 5.1 Sentrality single male terminal (2032630034-SD) Press in Steps

1. Follow recommended hole size and drill hole in busbar per sales drawing maintaining a minimum wall thickness of 2mm from any edge of board (example layout shown below)

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## HOLE REQUEST ON BUS BAR

2. Verify hole with gage pin
3. Create fixture to allow for Centrality features and other components protruding through bottom of busbar.
  - a. Hole for clearance should be 0.25mm larger in diameter maximum
  - b. Fixture and hole to be aligned within the 0.25mm difference to prevent stubbing
4. Hand place male terminal into tool (contact molex for insertion tooling information)



5. Place tool with terminal into center of above verified hole

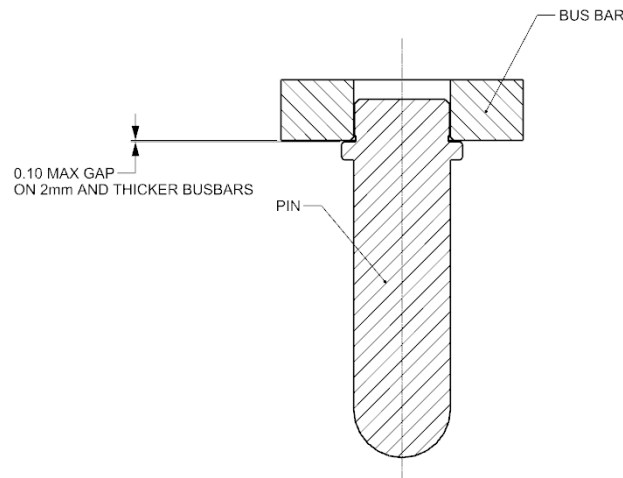


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6. Press head can be used to hold tool and terminal in place until press



7. Press on top of tool until bottom of positive stop on the part is flush with the top of busbar  
 a. Do not under press connector



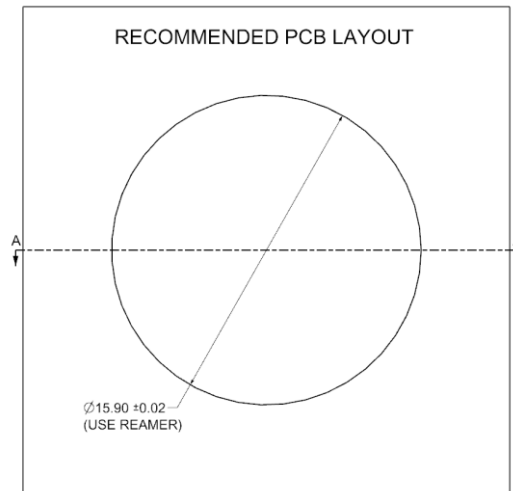
- b. Do not over press connector
  - i. Max insertion force of 3000N
  - ii. Min insertion force 5000N
  - iii. Min retention force 1000N

8. Inspect pressed in part looking for damage and straightness

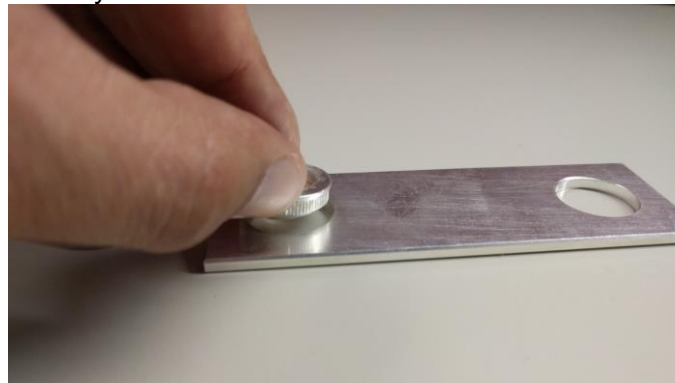
## 5.2 Sentrality Press Fit Socket with 1.0mm of float (2043130018-SD) Press in Steps

1. Follow recommended hole size and drill hole in busbar per sales drawing maintaining a minimum wall thickness of 2mm from any edge of board (example layout shown below)

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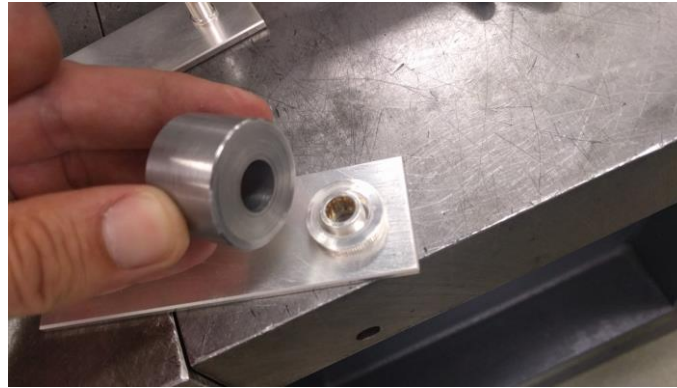


2. Verify hole with gage pin
3. Create fixture to allow for Sentrality features and other components protruding through bottom of busbar
  - a. Hole for clearance should be no larger than 0.25mm in diameter from press in hole
  - b. Fixture and hole to be aligned within the 0.25mm difference to prevent stubbing
4. Hand place Sentrality socket into center of above verified hole



5. Place tool onto top of placed socket, aligning hole over the protruding socket. DO NOT PRESS ON TOP OF CONNECTOR (contact molex for insertion tooling information)

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6. Press head can be used to hold tool and terminal in place until press

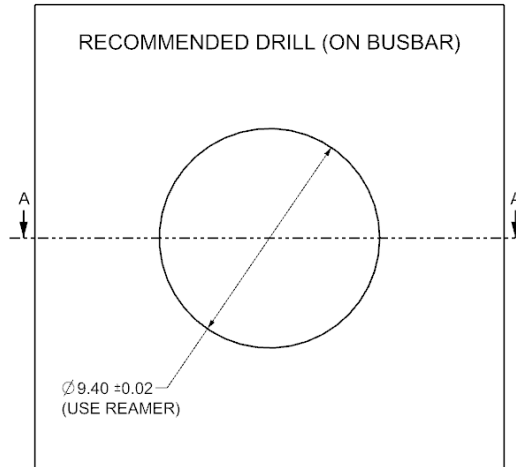


7. Press on top of tool until bottom of positive stop on the part is flush with the top of busbar
  - c. Do not under press connector
  - d. Do not over press connector
    - i. Max insertion force of 10,000N
    - ii. Min insertion force 3000N
    - iii. Min retention force 1000N
8. Inspect pressed in part looking for damage, straightness, and if socket still floats

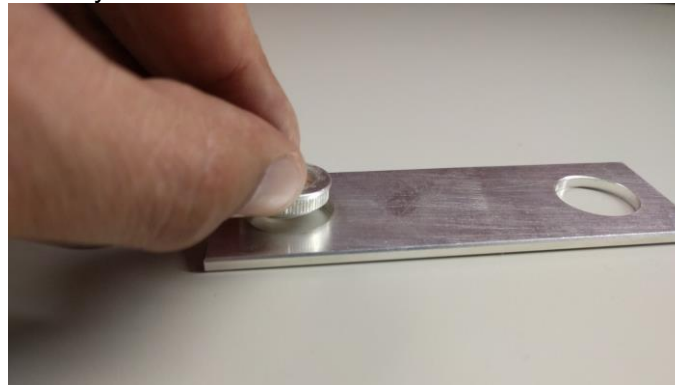
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### 5.3 Sentrality Standard PRESS FIT Socket (2043160018-SD) Press in Steps

1. Follow recommended hole size and drill hole in busbar per sales drawing maintaining a minimum wall thickness of 2mm from any edge of board (example layout shown below)



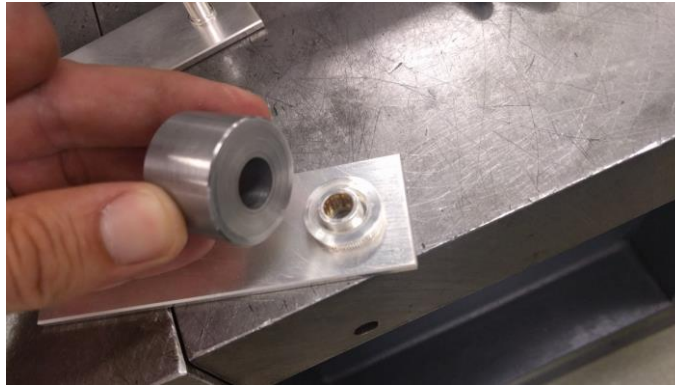
2. Verify hole with gage pin
3. Create fixture to allow for Sentrality features and other components protruding through bottom of busbar
  - a. Fixture Hole for clearance should be no larger than 0.25mm in diameter from press in hole
  - b. Fixture and hole to be aligned within the 0.25mm difference to prevent stubbing
4. Hand place Sentrality socket into center of above verified hole



5. Place flat rock tooling on top of product, this SENTRALITY version can be pressed directly on the top of the part

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6. Press head can be used to hold tool and terminal in place until press



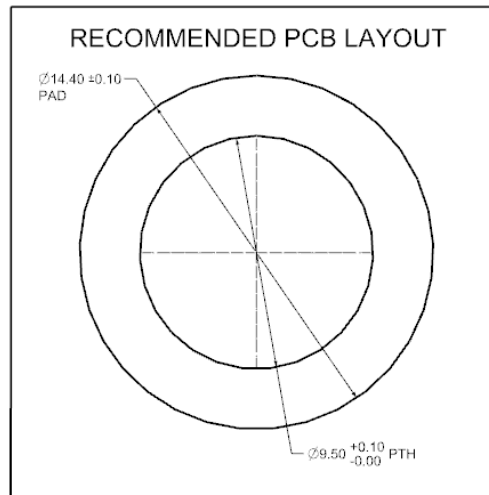
- 7. Press on top of tool until bottom of positive stop on the part is flush with the top of busbar
  - a. Do not under press connector
  - b. Do not over press connector
    - i. Max insertion force of 7500N
    - ii. Min insertion force 1500N
    - iii. Min retention force 1000N

8. Inspect pressed in part looking for damage, straightness

### 5.4 Centrality Standard SMT Floating Socket (2043650018-SD/2121950018-SD) solder Steps

- 1. Hole pattern in 1.58mm min board per the sales drawing (example shown below)

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2. Verify hole with gage pin, as shown above in male terminal steps
3. Apply solder paste for above hole pattern using a 6 mil stencil thickness
  - a. Standard SAC 305 lead free paste was used in testing
4. Create fixture to allow for protruding features of Sentrality and other components during installation if needed.
  - a. Fixture Hole for clearance should be a minimum of 0.25mm in diameter from solder hole
  - b. Fixture and hole to be aligned within the 0.25mm difference to prevent stubbing
5. Lightly hand or pick and place the Sentrality socket into center of above verified hole making sure to not press the solder out of the way

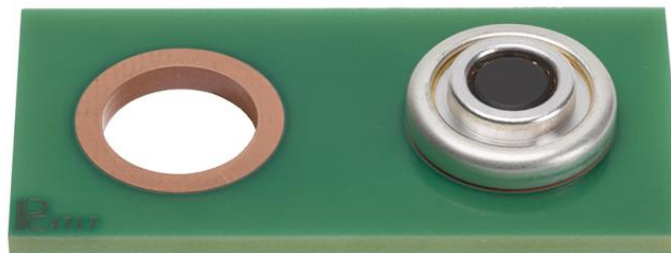


Figure 1

6. Verify part is centered properly on hole pattern
7. Solder part (s) using a recommended standard convection oven reflow technique
  - a. Parts tested with zone temperatures below and a conveyor speed of 12 in/min

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### Zone Heater Temperatures

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Top	160 deg. C	168 deg. C	200 deg. C	230 deg. C	270 deg. C
Bottom	160 deg. C	168 deg. C	200 deg. C	230 deg. C	270 deg. C

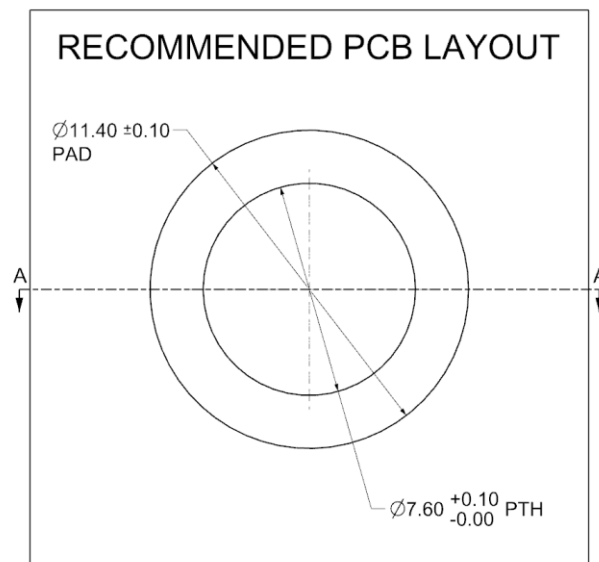
### Zone Airflow

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Top	50 L/min	30 L/min	30 L/min	70 L/min	20 L/min
Bottom	50 L/min	30 L/min	30 L/min	70 L/min	20 L/min

8. Inspect soldered in part looking for a good solder joint, damage, and straightness
  - Solder process is highly dependent on customer application and set up. processing should be adjusted appropriately for each application

### 5.5 Sentrality Standard SMT Socket (2043180018-SD/2121940018-SD) solder Steps

1. Hole pattern in 1.58mm minimum board per the sales drawing (example shown below)



2. Verify hole with gage pin, as shown above in male terminal steps
3. Apply solder paste for above hole pattern using a 6 mil stencil thickness
  - a. Standard SAC 305 lead free paste was used in testing

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4. Create fixture to allow for protruding features of Sentrality and other components during installation if needed.
  - a. Fixture Hole for clearance should be a minimum of 0.25mm in diameter from solder hole
  - b. Fixture and hole to be aligned within the 0.25mm difference to prevent stubbing
5. Lightly hand or pick and place the Sentrality socket into center of above verified hole making sure to not press the solder out of the way (see Figure 1 for reference)
6. Verify part is centered properly on hole pattern
7. Solder part (s) using a recommended standard convection oven reflow technique
  - a. Parts tested with zone temperatures below and a conveyor speed of 12 in/min

**Zone Heater Temperatures**

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
<b>Top</b>	160 deg. C	168 deg. C	200 deg. C	230 deg. C	270 deg. C
<b>Bottom</b>	160 deg. C	168 deg. C	200 deg. C	230 deg. C	270 deg. C

**Zone Airflow**

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
<b>Top</b>	50 L/min	30 L/min	30 L/min	70 L/min	20 L/min
<b>Bottom</b>	50 L/min	30 L/min	30 L/min	70 L/min	20 L/min

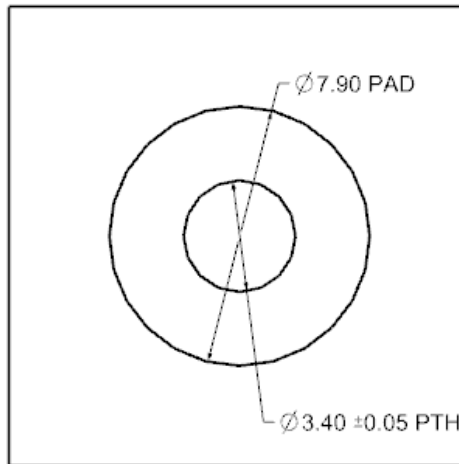
8. Inspect soldered in part looking for a good solder joint, damage, and straightness
  - Solder process is highly dependent on customer application and set up. processing should be adjusted appropriately for each application
9. Pick and place cap can now be removed by gripping from the bottom if board permits. Else cap must be pushed through top to exit the rear of connector without damaging the terminals. This can be achieved by using a tool mimicking the male terminal

**5.6 Sentrality Standard SMT (2032631134-SD) male terminal solder Steps**

1. Hole pattern in **1.58mm** min board per the sales drawing (example shown below)

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## RECOMMENDED PCB LAYOUT



2. Verify hole with gage pin, as shown above in male terminal press in steps
3. Apply solder paste for above hole pattern using a 6 mil stencil thickness
  - a. Standard SAC 305 lead free paste was used in testing
4. Create fixture to allow for protruding features of SENTRALITY and other components during installation if needed
  - a. Fixture Hole for clearance should be a minimum of 0.25mm in diameter from solder hole
  - b. Fixture and hole to be aligned within the 0.25mm difference to prevent stubbing
5. Lightly hand or pick and place the Sentrality pin into center of above verified hole making sure to not press the solder out of the way
  - a. A SOLDER FIXTURE MAY BE NEEDED FOR STRAIGHTNESS OF LONGER SOLDERED PINS



6. Verify part is straight and centered properly on hole pattern
7. Solder part (s) using a recommended standard convection oven reflow technique

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a. Parts tested with zone temperatures below and a conveyor speed of 12 in/min

**Zone Heater Temperatures**

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Top	160 deg. C	168 deg. C	200 deg. C	230 deg. C	270 deg. C
Bottom	160 deg. C	168 deg. C	200 deg. C	230 deg. C	270 deg. C

**Zone Airflow**

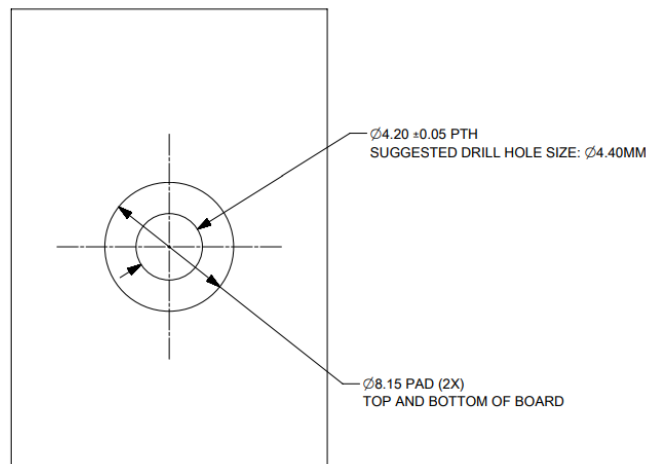
	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Top	50 L/min	30 L/min	30 L/min	70 L/min	20 L/min
Bottom	50 L/min	30 L/min	30 L/min	70 L/min	20 L/min

8. Inspect soldered in part looking for a good solder joint, damage, and straightness

- Solder process is highly dependent on customer application and set up. processing should be adjusted appropriately for each application

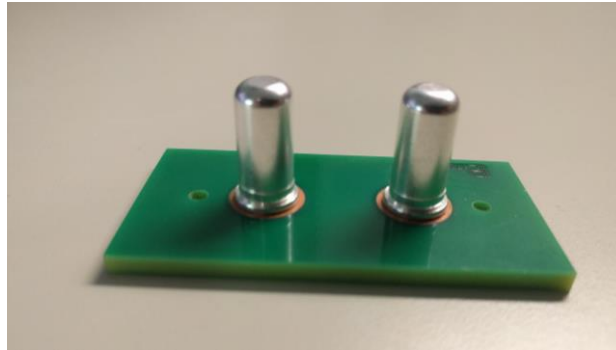
**5.7 SENTRALITY Standard Screw Mount (2032638034-SD) Male Terminal Mounting Steps to Busbar or PCB**

1. Hole pattern in 1.58mm min board thickness for PCB or 1.5mm minimum busbars thickness per the sales drawing (example shown below)



2. Verify hole with gage pin, as shown above in male terminal press in steps
3. Hand place Sentrality terminal into center of above verified hole

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4. Screw in M2 screw with washer into threaded portion of terminal
  - a. A bellville washer is recommended to maintain constant contact force
  - b. It is recommended to use a locking washer in high temp and vibrating systems
  - c. Conductive screw and washer can be used if needed
  - d. Flats on terminal base are to be used to assist in torquing down screw
5. Torque down the screw and washer to 10 in-lbs.
6. Verify part is straight and centered properly on hole pattern
7. For tight tolerance non floating applications, a fixture is recommended to center screw mount pins in hole during assembly

## 6.0 SENTRALITY CRIMPED CABLE ASSEMBLY:

### 6.1 Cable requirements:

8 AWG cable

### 6.2 Cut cable to desired length

### 6.3 Strip cable per below schematic

- a. Recommended cable processing machine is a Schleuniger EcoStrip 9600
- b. The cable stripping aid (tool 62203-0623) is used to pull the insulation slug off the cable

20.00+/-0.80 Strip Length



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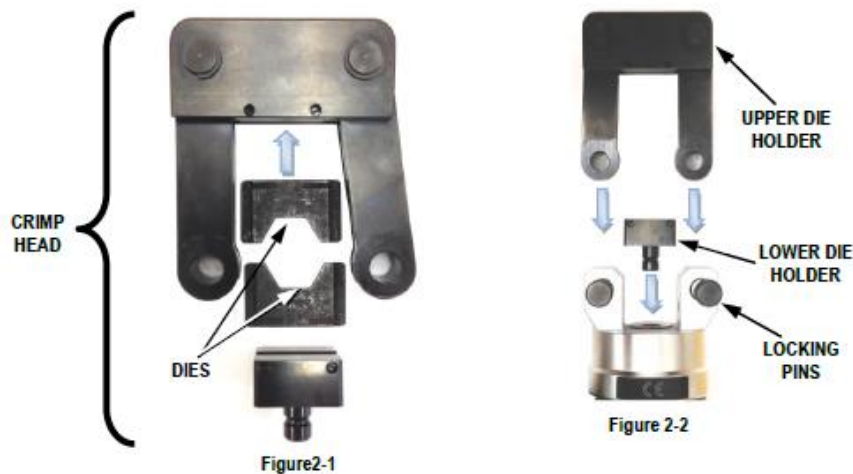
6.4 Fully insert terminal onto stripped wire (wire ties may be used on exposed strands to prevent loose strands)

- a. When handling the terminals, wear protective gloves to prevent cross-contamination of oils. Avoid handling terminals in the contact area and use the crimp barrel if needed

6.5 Verify there are no loose ends of wire protruding from terminal

6.6 Place terminal with cable into the crimping tool

- a. Recommend MOLEX crimp tool 192890800
- b. Portable crimping tool 638161000 and crimp head 638161100 also needed



Battery Powered Crimping Tool



Figure 5-1

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6.7 Crimp the terminal in the press. See document TM-192862000 for tool operating instructions

6.8 Inspect the terminal crimp dimensions specified in documents ATS-192900080 (1/0 crimps)

**Note:** Coeur Centrality crimp contacts are also compatible with other industry standard crimp tooling cable (e.g., “4-point” crimp tooling), which are not sold by MOLEX

- Performance of industry standard crimps should be tested per application

## 7.0 SENTRALITY MATING REQUIREMENTS AND RECOMMENDATIONS

### 7.1 Angle of mate

7.1.1 Rigid and non rigid systems must be able to maintain a maximum 1.5 degree mating angle. Rigid systems degree of mate may be less due to pin length. Fig 7.1.1 shows longer pins with the same angle misalignment creating larger True Position offsets at the tip.

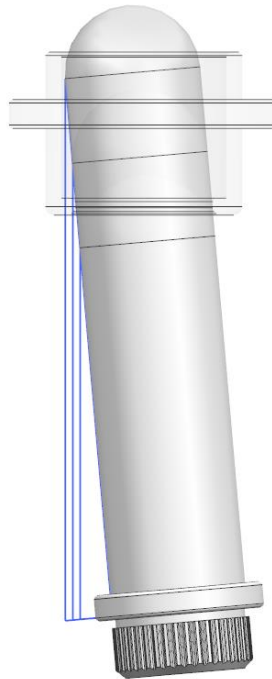
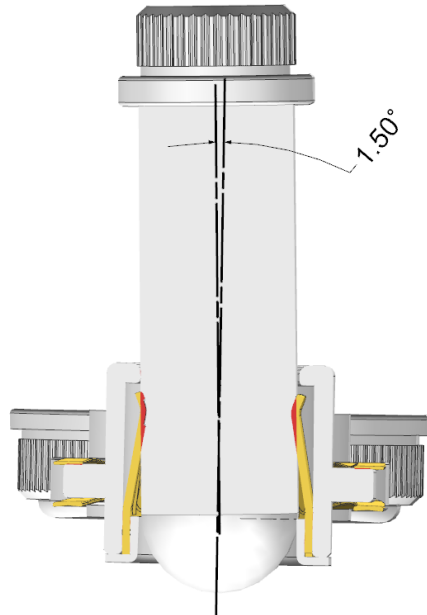


Fig 7.1.1

7.1.2 Sentrality floating connectors do not compensate for excessive mating angle

7.1.2 Systems using multiple Sentrality's must maintain a mating angle of 1.5 degrees throughout the entire mate and must be mated simultaneously to prohibit rocking or zippering during mating. This rocking or zippering with large busbars creates a moment that exerts high stress on the connector. Proper alignment and training will alleviate any mating concerns.

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## 7.2 Floating connectors

7.2.1 Molex recommends floating connectors for applications using multiple sockets. If multiple non floating sockets are to be used, applications tolerance should be reviewed against allowable misalignment. Allowing one side of the mating interface to float amongst themselves will help with potential tolerance issues. Fixturing during assembly of both mating halves will assist in any stack up of tolerances in the system.

### 7.2.2 Factors effecting misalignment;

1. Rigid mating, whether one side, or both
2. Hole TP of multiple circuits
3. Distance between any two holes in multiple circuit applications increases the tolerances of the system
4. Hole “slop” of SMT and screw mounted components
5. Length of the male terminal must also be taken into account for misaligned or out of spec forms on busbars. The longer a terminal gets the tighter the form tolerance will need to be controlled to assure proper mating

Most if not all of these misalignment concerns can be alleviated using the floating option of the Centrality connector system and or allowing float within the PCB or busbar application.

## 7.3 Multiple independent Busbar Mating

7.3.1 When mating multiple busbars in a given system, the busbars should float independently from each other to allow for tolerance stack up. Shoulder bolts or rivets are recommended to hold busbar location within the required float range.

## 7.4 Pin Length Guide and Sequence Steps

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7.4.1 To determine proper pin length Molex recommends adding below lengths to the applications stack height as shown in figure 7.4.1. This pin length will allow for increased angular misalignment while maintaining acceptable wipe. Stack height tolerances should be taken into account.

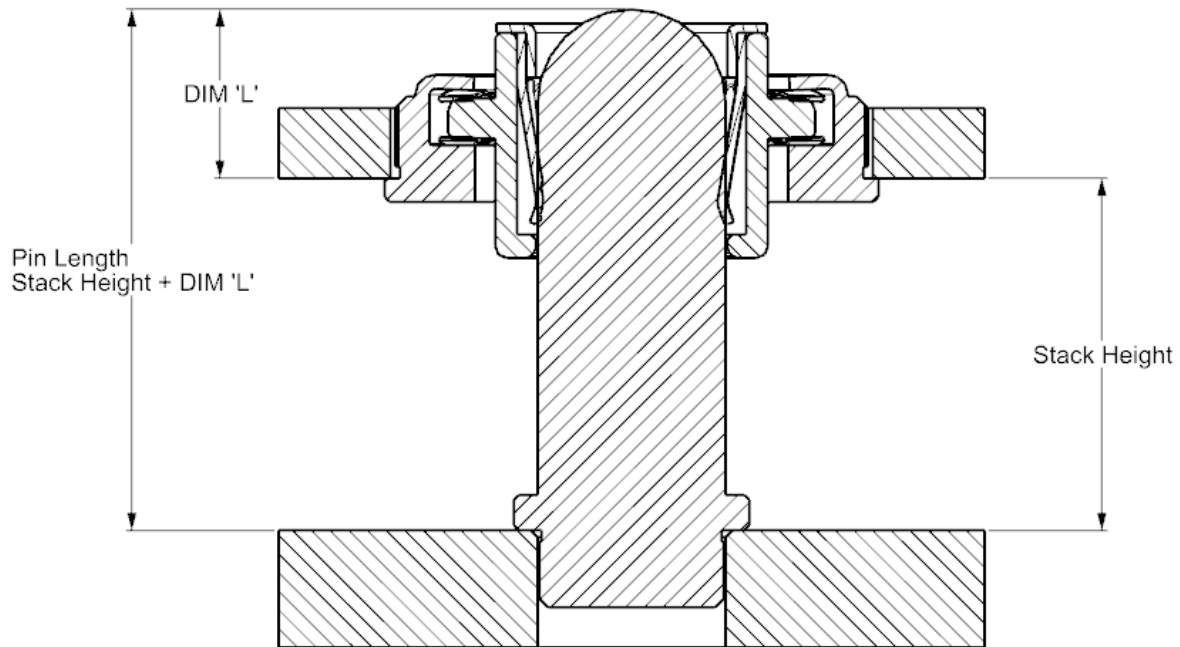


Fig 7.4.1  
Pressfit floater shown in view

SERIES	DESCRIPTION	DIM 'L' IN mm
2043130018	PRESSFIT WITH FLOAT	7.2
2043650018	SMT WITH FLOAT	5.43
2043180018	SMT WITHOUT FLOAT	6
2043160018	PRESSFIT WITHOUT FLOAT	6.4

\*Dimensions listed are for standard Sentrality and should not be used with modified flange or top mount product

Please contact Molex for help in selecting the proper pin length

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## 7.4.2 Sequence steps for above recommended pin lengths

Sequence Step	Description	distance in mm
1	Male terminal lead in enters receptacle housing plane (optional float begins) offcenter alignment may represent first electrical contact	0
2	Male terminal is fully engaged with housing and first electrical contact with terminals is made (optional floating complete)	4.5
3	Receptacle contacts at full deflection with male terminal (wipe begins)	6.5
4	Full mate, wipe complete (4mm of wipe)	10.5

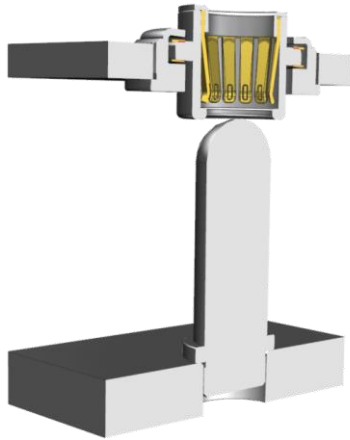


Fig 7.4.2  
Sequence step 1

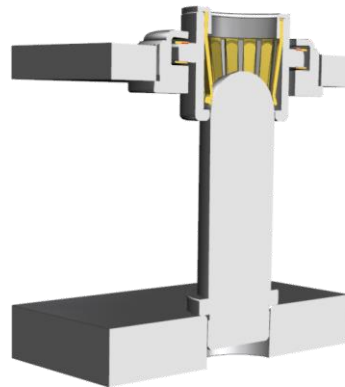


Fig 7.4.3  
Sequence step 2

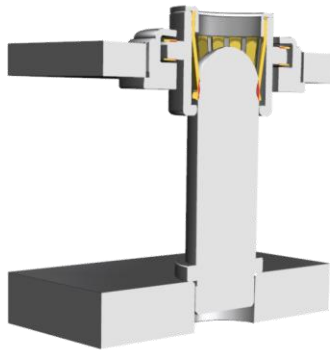


Fig 7.4.4  
Sequence step 3



Fig 7.4.5  
Sequence step 4

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