

**Board SMT  
to Cable**

**.050"**  
9 thru 51 Contacts

Rugged Metal

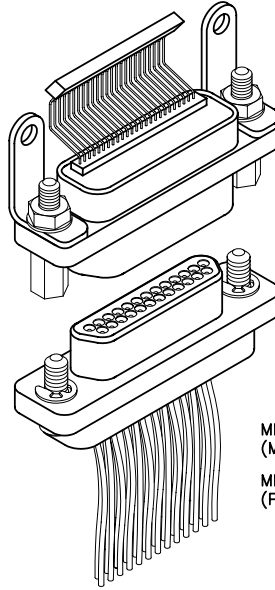
**MM**

Rugged Plastic

**MN**

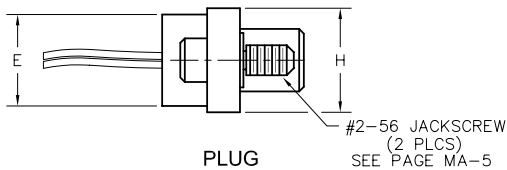
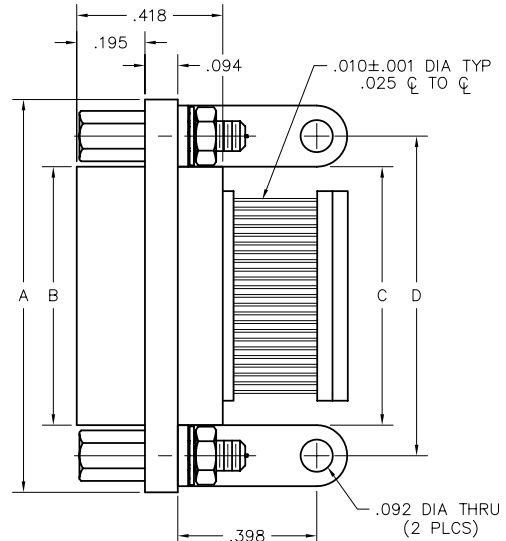
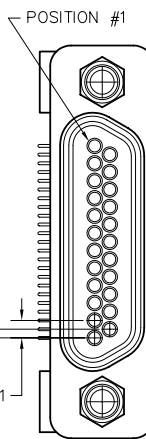
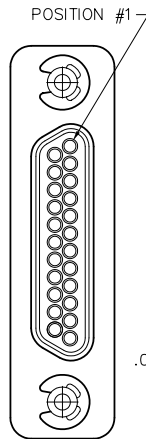
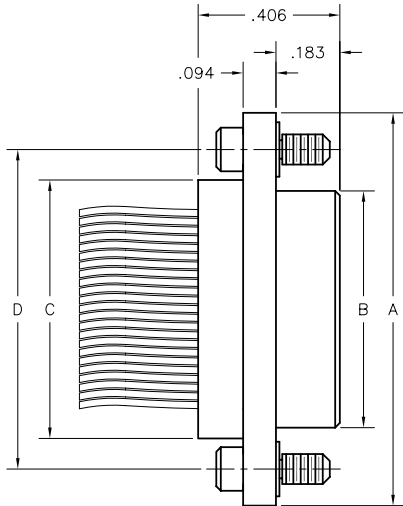
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(METAL)

MN-221-025-275-320S  
(PLASTIC)



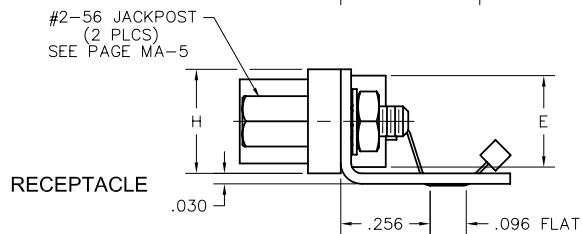
MM-213-025-161-41WQ  
(METAL)

MN-211-025-161-41WQ  
(PLASTIC)



PLUG

#2-56 JACKSCREW  
(2 PLCS)  
SEE PAGE MA-5



RECEPTACLE

#2-56 JACKPOST  
(2 PLCS)  
SEE PAGE MA-5

| SIZE | CONTACT ROWS | DIMENSIONS |             |             |       |       | E<br>POTTING WELL<br>MAX | H    | HARDWARE                         |
|------|--------------|------------|-------------|-------------|-------|-------|--------------------------|------|----------------------------------|
|      |              | A          | B           |             | C     | D     |                          |      |                                  |
|      |              |            | PLUG<br>MAX | RCPT<br>MAX |       |       |                          |      |                                  |
| 9    | 2            | .775       | .334        | .400        | .390  | .565  | .270                     | .298 | #2-56 UNC THD<br>(.092 DIA THRU) |
| 15   |              | .925       | .484        | .550        | .540  | .715  |                          |      |                                  |
| 21   |              | 1.075      | .634        | .700        | .690  | .865  |                          |      |                                  |
| 25   |              | 1.175      | .734        | .800        | .790  | .965  |                          |      |                                  |
| 31   |              | 1.325      | .884        | .950        | .940  | 1.115 |                          |      |                                  |
| 37   |              | 1.475      | 1.034       | 1.100       | 1.090 | 1.265 |                          |      |                                  |
| 43   |              | 1.625      | 1.184       | 1.250       | 1.240 | 1.415 |                          |      |                                  |
| 51*  |              | 1.825      | 1.384       | 1.450       | 1.440 | 1.615 |                          |      |                                  |

\* = 51 POSITION CONNECTORS ARE AVAILABLE IN METAL ONLY.

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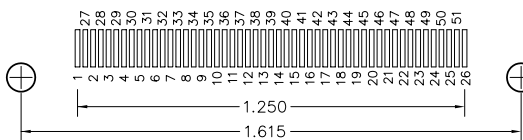
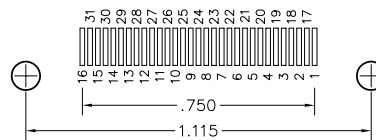
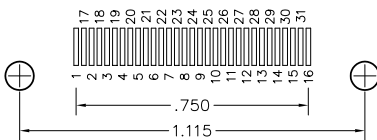
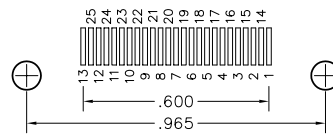
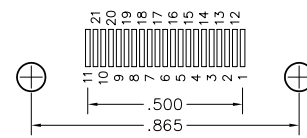
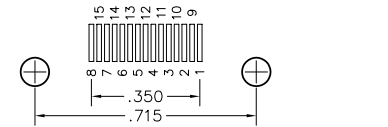
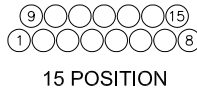
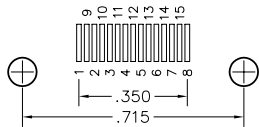
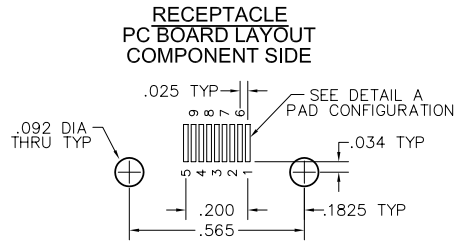
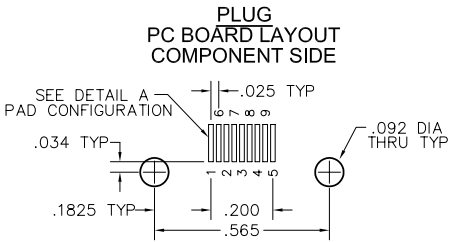
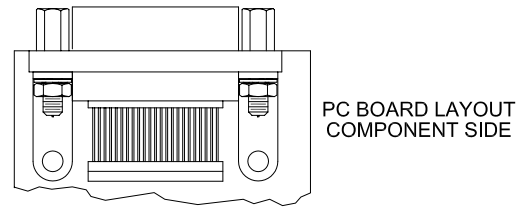
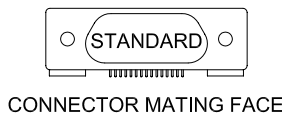
**PLUG:** MM- 213- 025- 161- 41WQ  
**RECEPTACLE:** MM- 223- 025- 275- 320S  
**PLUG:** MN- 211- 025- 161- 41WQ  
**RECEPTACLE:** MN- 221- 025- 275- 320S  
 XX-XXX-XXX-XXX-XXXX-XXX

| PLUG   | RECEPTACLE   |
|--|--|
| <b>SERIES</b>  |  |
| MM .050" Rugged Metal I/O Connector<br>MN .050" Rugged Plastic I/O Connector<br>(MM & MN mate with MK, ML, MM, MN receptacles)   | MM .050" Rugged Metal PC Board Mount, SMT Connector<br>MN .050" Rugged Plastic PC Board Mount, SMT Connector<br>(MM & MN mate with MK, ML, MM, MN plugs)   |
| <b>BODY</b>  |  |
| 2 2-Row (Sizes 9 thru 51***)<br><br><b>BODY STYLE:</b><br>1 Plug, straight, with ears<br><br><b>BODY MATERIAL:</b><br>1 Polyphenylene Sulfide (MN only)<br>2 Polyphenylene Sulfide with electroless nickel shell<br>3 Polyphenylene Sulfide with electrodeposited cadmium shell <input type="checkbox"/><br>4 Polyphenylene Sulfide with hard anodized black shell<br>5 Polyphenylene Sulfide with stainless steel shell   | 2 2-Row (Sizes 9 thru 51***)<br><br><b>BODY STYLE:</b><br>2 Receptacle, straight, with ears<br><br><b>BODY MATERIAL:</b><br>1 Polyphenylene Sulfide (MN only)<br>2 Polyphenylene Sulfide with electroless nickel shell<br>3 Polyphenylene Sulfide with electrodeposited cadmium shell <input type="checkbox"/><br>4 Polyphenylene Sulfide with hard anodized black shell<br>5 Polyphenylene Sulfide with stainless steel shell |
| <b>SIZE</b>  |  |
| XXX 009, 015, 021, 025, 031, 037, 051***   | XXX 009, 015, 021, 025, 031, 037, 051***   |
| <b>CONTACTS</b>  |  |
| <b>TYPE CONTACTS/TERMINATIONS:</b><br>11 Pin, straight, solder cup<br>14 Pin, straight, .500" pigtails (.018 dia)<br>15 Pin, straight, 1.000" pigtails (.018 dia)<br>16 Pin, straight, crimped wire<br><br><b>PLATING OPTIONS:</b><br>1 50 μ" Au contacts (crimp wire)<br>3 50 μ" Au contacts: 10 μ" Au terminations (solder cup, pigtail)<br>5 50 μ" Au contacts; Sn/Pb alloy terminations (pigtail) <input type="checkbox"/><br>7 50 μ" Au contacts; SAC305 terminations (pigtail) | <b>TYPE CONTACTS/TERMINATIONS:</b><br>27 Socket, Surface Mount<br><br><b>PLATING OPTIONS:</b><br>5 50 μ" Au contacts; Sn/Pb alloy terminations <input checked="" type="checkbox"/><br>8 50 μ" Au contacts; Sn plated terminations  |
| <b>HARDWARE</b>  |  |
| <b>STYLE OF HARDWARE:</b><br>00 None<br>22 Two fixed jacknut assemblies<br>41 Two turning jackscrews, allen head, retaining ring<br>42 Two long turning jackscrews, allen head, retaining ring<br>43 Two turning jackscrews, slot head, retaining ring<br>44 Two long turning jackscrews, slot head, retaining ring<br>45 Two turning jackscrews, allen head, captivated**   | <b>STYLE OF HARDWARE:</b><br>00 None<br>32 Two fixed jacknut assemblies with mounting bracket<br>46 Two turning jackscrews, allen head, captivated** with mounting bracket   |
| <b>POLARIZATION / WIRING:</b><br>00 None<br>XX For wiring codes, see page MA-3 & MA-4  | <b>POLARIZATION / WIRING</b><br>0R Reverse Body Polarization<br>0S Standard Body Polarization  |
| <b>OPTIONS</b>   |  |
| 900 Interfacial sealing gasket   |  |

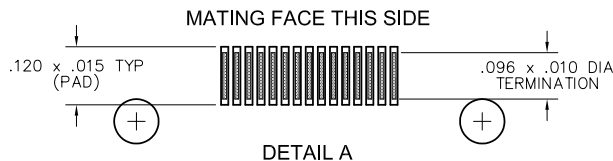
\*\* = Captive hardware is factory installed and non-removable.  
 \*\*\* = 51 position connectors are available in metal only (non Mil-Spec interface).  
 = Option not RoHS compliant  
[- CLICK HERE -](#)

# Recommended PC Board Layout

Surface Mount  
Standard Polarization



\* For pin (plug) connectors, the contact numbers are reversed left to right.



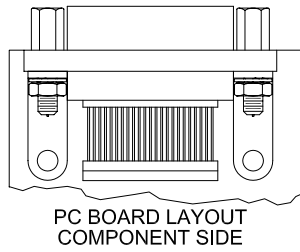
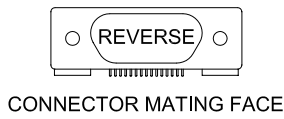
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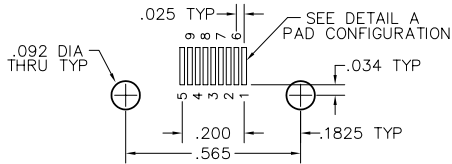
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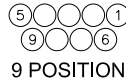
## Recommended PC Board Layout

Surface Mount  
Reverse Polarization

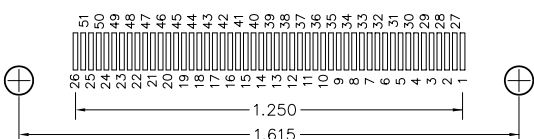
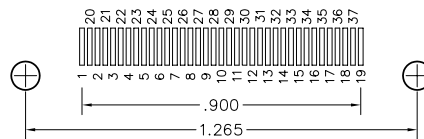
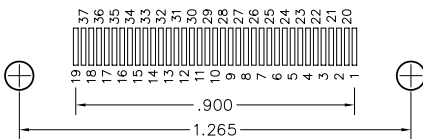
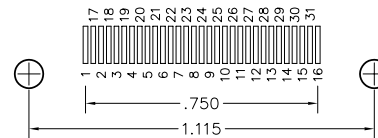
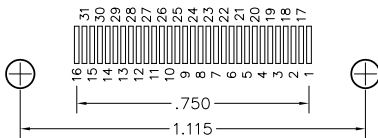
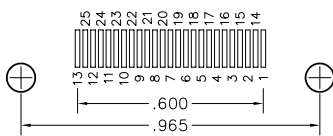
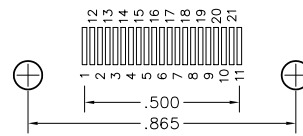
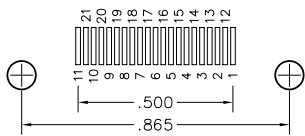
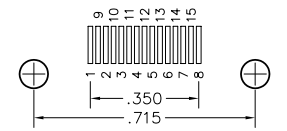
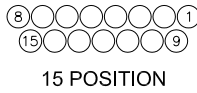
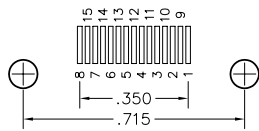
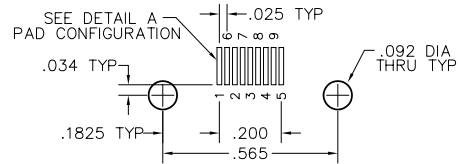
**PLUG**  
PC BOARD LAYOUT  
COMPONENT SIDE



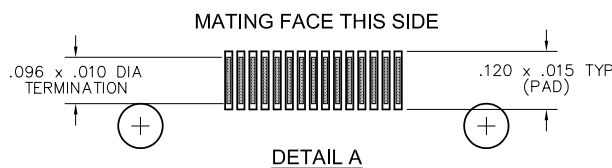
**CONNECTOR MATING FACE\* (RECEPTACLE)**



**RECEPTACLE**  
PC BOARD LAYOUT  
COMPONENT SIDE



\* For pin (plug) connectors, the contact numbers are reversed left to right.



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# Mating Matrix for AirBorn "M" Series Connectors

## RECEPTACLES

**P  
L  
U  
G  
S**

|                             | MA<br>(Strip) | MC<br>(Circular) | MM<br>(Hybrid) | MK<br>(Metal)<br>PC Board | ML<br>(Plastic)<br>PC Board | MM<br>(Metal)<br>I/O | MN<br>(Plastic)<br>I/O | MP<br>(Plastic)<br>I/O | MQ<br>(Metal)<br>I/O | MR<br>(Plastic)<br>PC Board | MS<br>(Metal)<br>PC Board |
|-----------------------------|---------------|------------------|----------------|---------------------------|-----------------------------|----------------------|------------------------|------------------------|----------------------|-----------------------------|---------------------------|
| MA<br>(Strip)               | XX            |                  |                |                           |                             |                      |                        |                        |                      |                             |                           |
| MC<br>(Circular)            |               | XX               |                |                           |                             |                      |                        |                        |                      |                             |                           |
| MM<br>(Hybrid)              |               |                  | XX             |                           |                             |                      |                        |                        |                      |                             |                           |
| MK<br>(Metal)<br>PC Board   |               |                  |                | BB                        | BB                          | BI                   | BI                     |                        |                      |                             |                           |
| ML<br>(Plastic)<br>PC Board |               |                  |                | BB                        | BB                          | BI                   | BI                     |                        |                      |                             |                           |
| MM<br>(Metal)<br>I/O        |               |                  |                | IB                        | IB                          | II                   | II                     |                        |                      |                             |                           |
| MN<br>(Plastic)<br>I/O      |               |                  |                | IB                        | IB                          | II                   | II                     |                        |                      |                             |                           |
| MP<br>(Plastic)<br>I/O      |               |                  |                |                           |                             |                      |                        | II                     | II                   | IB                          | IB                        |
| MQ<br>(Metal)<br>I/O        |               |                  |                |                           |                             |                      |                        | II                     | II                   | IB                          | IB                        |
| MR<br>(Plastic)<br>PC Board |               |                  |                |                           |                             |                      |                        | BI                     | BI                   | BB                          | BB                        |
| MS<br>(Metal)<br>PC Board   |               |                  |                |                           |                             |                      |                        | BI                     | BI                   | BB                          | BB                        |

**KEY:**

BB = PC Board Mounted Plug with PC Board Mounted Receptacle

BI = PC Board Mounted Plug with I/O Receptacle

IB = I/O Plug with PC Board Mounted Receptacle

II = I/O Plug with I/O Receptacle

For Military Configurations, See pages MIL-1 thru MIL-22

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## Specifications - Surface Mount Connectors Materials and Finishes \*

|  |   |
|--|---|
| <b>Contacts:</b>                       | Pins: BeCu alloy strip per ASTM B194<br>Sockets: Brass per ASTM B121 / B121M or ASTM B16 / B16M or ASTM B453  |
| <b>Contact Finish:</b>                 | Gold plate per ASTM B488  |
| <b>Shells:</b>                         | Aluminum Alloy 6061-T6 per SAE AMS-QQ-A-250/11 or 6061-T6511 per SAE AMS-QQ-A-200/8<br>or<br>Stainless Steel 300 series per ASTM A484 / A484M and ASTM A582 / A582M<br>Passivated per SAE AMS2700   |
| <b>Aluminum Shell Finishes:</b>        | Electroless Nickel per SAE AMS2404<br>Electrodeposited Cadmium per SAE AMS-QQ-P-416<br>Black Anodized per MIL-A-8625  |
| <b>Molded Insulators:</b>              | Glass filled polyphenylene sulfide per MIL-M-24519  |
| <b>Embedment:</b>                      | Insulating compound per MIL-I-16923   |
| <b>Jackscrows, Jackposts and Nuts:</b> | Corrosion resistant steel per ASTM A320 or ASTM A484 / A484M and ASTM A582 / A582M<br>Passivated per SAE AMS2700  |
| <b>Clips and Washers:</b>              | Corrosion resistant steel per ASME 18.24 or NASM35333<br>Passivated per ASME 18.24 or NASM35333   |
| <b>Brackets:</b>                       | Card Edge Mount:<br>Aluminum Alloy 7075-T6 per SAE AMS-QQ-A-250/12 or SAE AMS-QQ-A-200/11<br>Plating consistent with Aluminum Shell<br><br>Horizontal Surface Mount:<br>Corrosion resistant steel per ASTM A240<br>Passivated per SAE AMS2700 |
| <b>Interfacial Seal Gaskets:</b>       | Fluorosilicone per SAE AMS-R-25988  |
| <b>Tolerances:</b>                     | Unless otherwise specified: Fractions = $\pm 1/64$ "<br>Decimals = $\pm 0.010$ "<br>Angles = $\pm 5^\circ$<br>Wire lengths: uninsulated/solid = $+0.2"/-0.0$ "  |

Note: AirBorn can manufacture special configurations for your exact specifications.

\* = Reference the above listed specifications or an equivalent industry standard when applicable

## Performance - Surface Mount Connectors

|                                  |  |
|----------------------------------|--|
| <b>Contact Rating:</b>           | 3-amperes maximum  |
| <b>Solderability:</b>            | Terminals (except crimp) tested in accordance with MIL-STD-202, Method 208   |
| <b>Wire Size:</b>                | Solid #30 AWG standard (consult factory for other sizes and types)   |
| <b>Test Voltage:</b>             | 600 V, RMS, 60 Hz  |
| <b>Operating Temperature:</b>    | -55° C to +125° C  |
| <b>Insulation Resistance:</b>    | 5,000 megohms minimum @ 500 VDC  |
| <b>Durability:</b>               | 500 connector mating cycles  |
| <b>Vibration:</b>                | Tested in accordance with MIL-STD-1344, Method 2005, Condition IV, according to MIL-83513                                      |
| <b>Shock:</b>                    | Tested in accordance with MIL-STD-1344, Method 2004, Condition E, according to MIL-83513                                       |
| <b>Salt Spray:</b>               | Mated connectors tested in accordance with MIL-STD-1344, Method 1001, Test Condition B   |
| <b>Humidity:</b>                 | Mated connectors tested in accordance with MIL-STD-1344, Method 1002, Type II (except steps 7a and 7b)                         |
| <b>Thermal Shock:</b>            | Tested to the temperature extremes of MIL-STD-1344, Method 1003, Test Condition A (except step 3, temperature shall be 125° C) |
| <b>Contact Resistance:</b>       | 0.065 volt maximum drop @ 2.5 amps (.026 ohms)   |
| <b>Contact Engaging Force:</b>   | 6.0 ounce maximum, with .0221 diameter test sleeve   |
| <b>Contact Separating Force:</b> | 0.5 ounce minimum, with .0230 diameter test sleeve   |
| <b>Crimp Strength:</b>           | 5 pound minimum tensile strength   |