

## Terminal Plate Connections for Dual Winding Compressors

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**Revision Tracking R6**

Pg. 2 – AWD electrical code and its description added to 6 Terminals Section.

Pg. 5 – Figure of AWD electrical code connection added.

**Introduction**

4, 6, 8, and certain M, 9, and 3D compressors have motors with two separate three-phase windings to permit flexibility, within limits, of starting methods and operating voltage. Since the final jobsite requirements of these options cannot be predetermined at the factory, compressors are shipped from Emerson Climate Technologies with all jumper bars, terminal insulators, lugs, and stud extensions contained in a bag placed in the terminal box. This permits the compressor terminal connections to be correctly made at the time of installation. Diagrams shown on the following pages illustrate the proper terminal connections and voltages. The wiring diagram on the inside of the terminal box cover has complete wiring details for that specific compressor.

**9 Terminals**

**Dual Voltage (TSN, TSK)**

4, 6, and 8 cylinder compressors with nine terminals for wiring connections have two separate three phase windings for dual voltage connections. One motor winding (connected to the #7, #8, and #9 terminals) is wye connected internally, while the other winding has terminal connections on each end (#1, #2, #3, and #4, #5, #6). Basically, the windings are connected in parallel for nominal 230 volt, 60 cycle and 200 volt, 50 cycle applications, and connected in series for nominal 460 volt, 60 cycle and 380 volt, 50 cycle power supplies. The nine terminals are provided so the necessary wiring connections can be made by means of jumper bars, which must be positioned correctly to insure proper compressor operation.

**6 Terminals**

**Single Voltage (FSD, FSM, FSR, FSU, TSE, TSU AWD)**

Single voltage, 6 terminal compressors with the designation FSD, FSM, FSR, FSU, TSE or TSU have two separate windings wye connected internally. The two windings can be wired externally for either across the line or part-wind starting.

**The AWD voltage code is across the line 460 Volt only, not part winding start.**

**Single Voltage (ESM, ESY)**

ESM and ESY motors have one winding with external terminals at the ends of each phase. The winding is connected externally in the delta configuration for across the line starting. For reduced current starting, the winding is connected in wye and then delta in sequence with a time delay.

**Single Voltage (ES7)**

ES7 motors have one winding with external terminals at the ends of each phase. The winding is connected externally in the wye configuration for across the line starting.

**Dual Voltage (ESL, ESX, ES8)**

ESL, ESX and ES8 motors have one winding with external terminals at the end of each phase. They can be connected in wye (star) for across the line starting at the high voltage rating or delta for across the line starting at the low voltage rating. For reduced current starting (low voltage only), the winding is connected in wye and then delta in sequence with a time delay.

**9 Lead Compressors TSK, TSN**

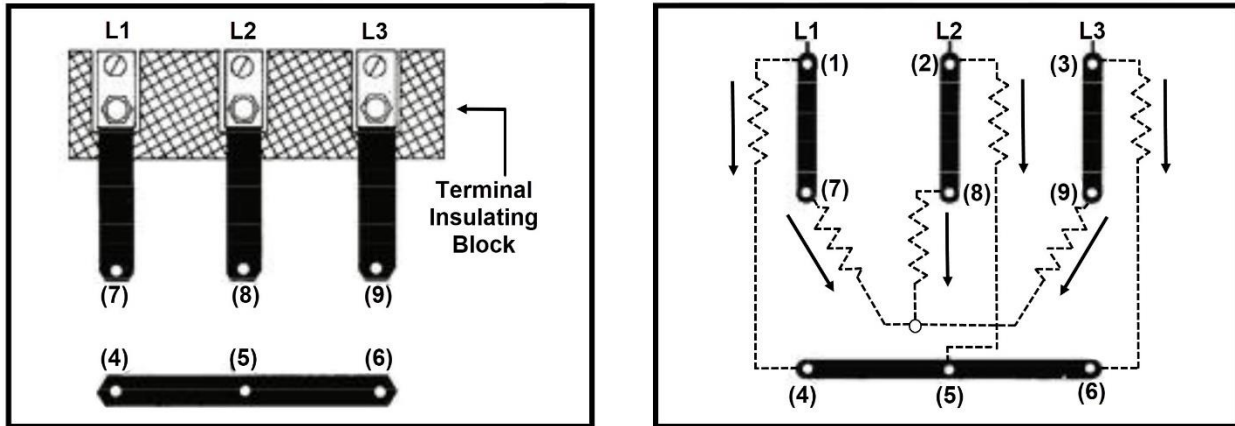


Figure 1 - Connections on nominal 208/230 volt, 60 cycle or 200 volt, 50 cycle power for across the line start with single contactor and 3 line leads. Install terminal block, lugs, and jumpers as shown. Connect line leads to terminals 1, 2, and 3.

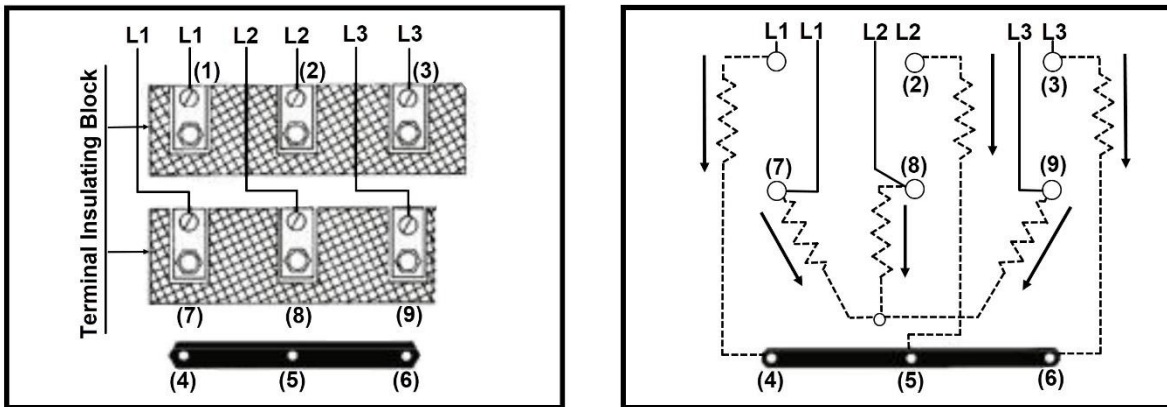


Figure 2 - Connections on nominal 208/230 volt, 60 cycle or 200 volt, 50 cycle power for two contactor, part winding, or single contactor circuit with six line leads.

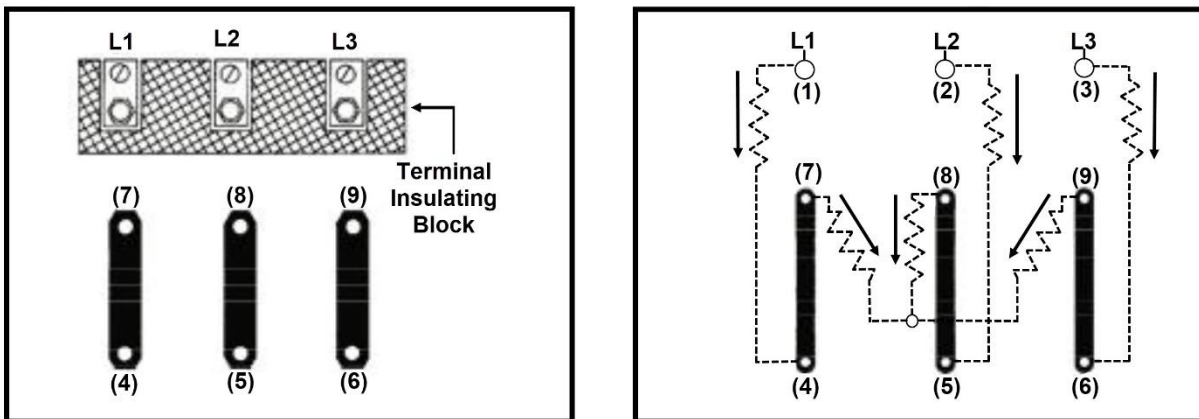
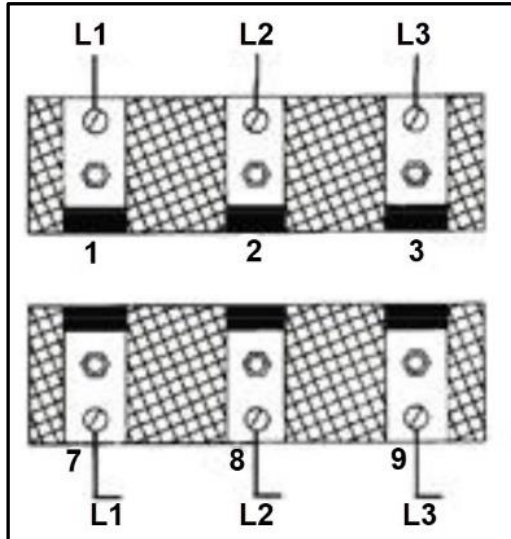
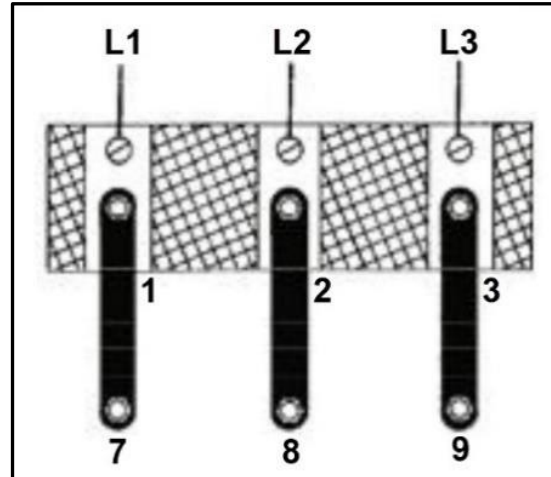


Figure 3 - Connections on nominal 460 volt, 60 cycle or 380 volt, 50 cycle power for across the line start. Install terminal insulation block and jumpers as shown. Connect line leads to terminals 1, 2, and 3.

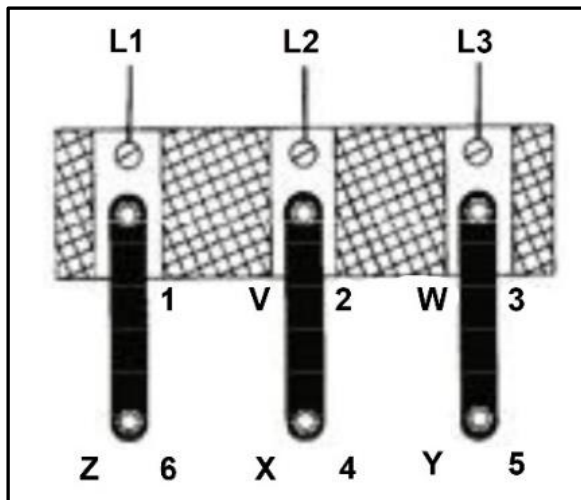
**6 Lead Compressors**



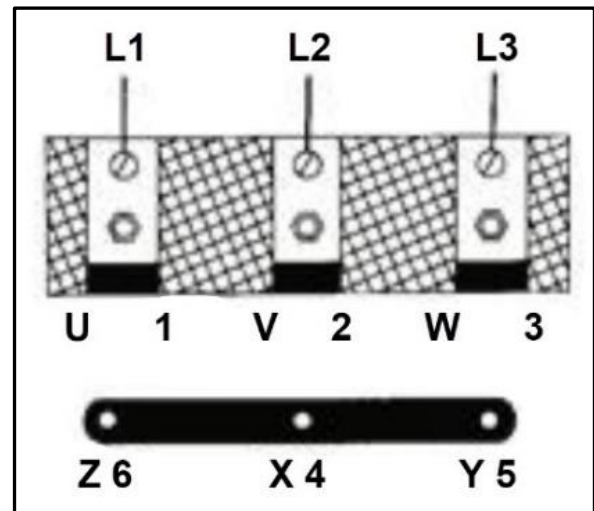
**Figure 4 - Reduced Current Part winding start (two contactor with time delay relay) FSD, FSM, FSR, FSU, TSE and TSU.**



**Figure 5 - Across the line (single contactor) FSD, FSM, FSR, FSU, TSE and TSU.**



**Figure 6 - Star Delta - Delta connection Across the line (single contactor)**  
 ESL 210/240 V – 50 Hz      ES8 200 V – 50 Hz  
 ESX 210 V – 50 Hz      200/220 V – 60 Hz  
 ESM 380/420 V – 50 Hz  
 ESY 500 V – 50 Hz



**Figure 7 - Star Delta - Star Connection Across the line (single contactor)**  
 ESL 380/420 – 50 Hz  
 ESX 380 – 60 Hz  
 ES7 380 V – 60 Hz  
 ES8 380 V – 60Hz

**6 Lead Compressors Continued**

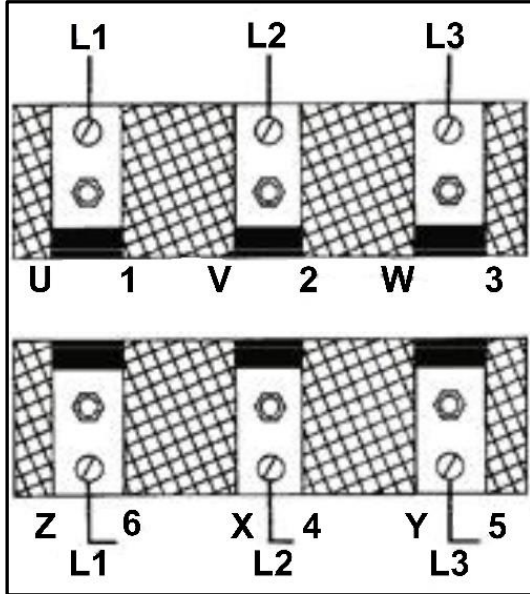


Figure 8 - Star Delta\*  
 Star (WYE) connected for start  
 Delta connected for running  
 ESL 210/420 V – 50 Hz  
 ESX 200/220 V – 60 Hz  
 ESM 380/420 V – 50 Hz  
 ESY 500 V – 50 Hz  
 ES8 200/220 V – 60 Hz, 200 – 50 Hz  
 \* See electrical handbook for proper connections.

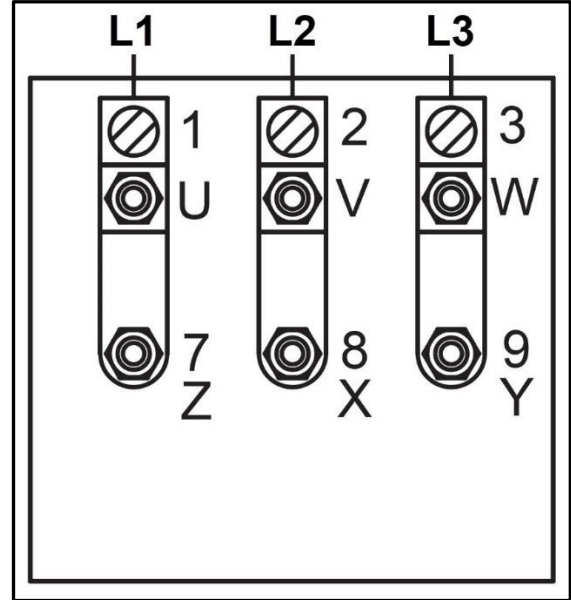


Figure 9 - AWD Connection  
 Across the Line Connected  
 AWD 460 V – 60 Hz.

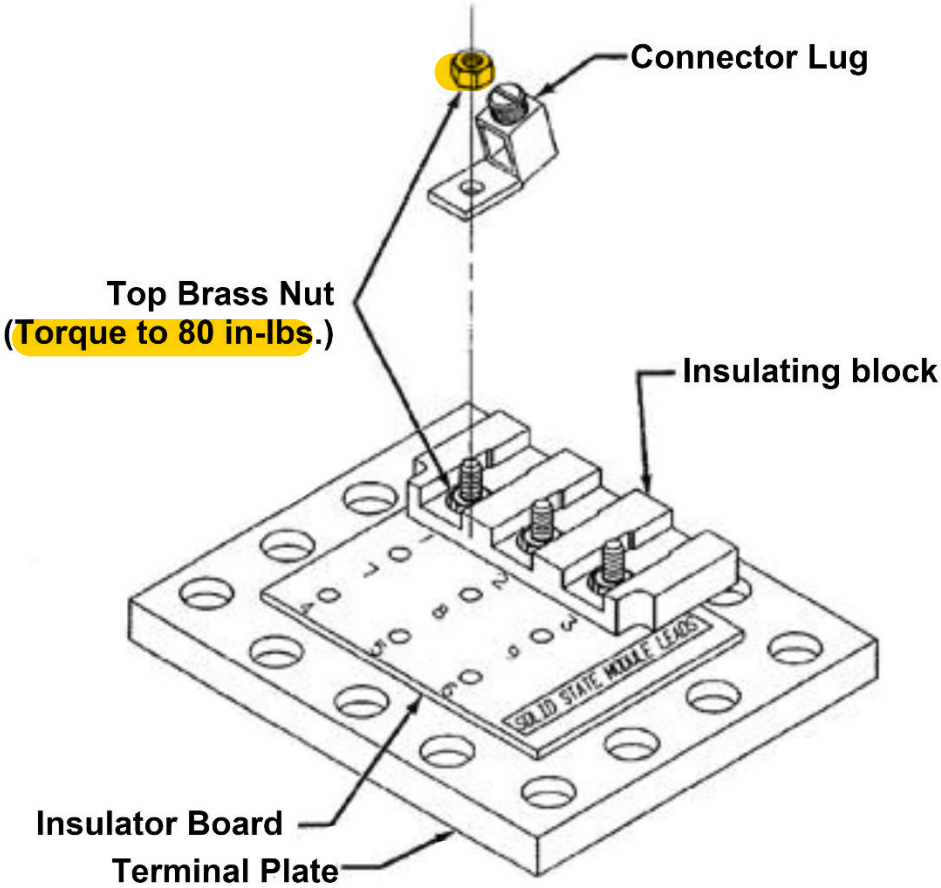


Figure 10 - 4, 6, & 8 Series Assembly Shown (9 Leads)

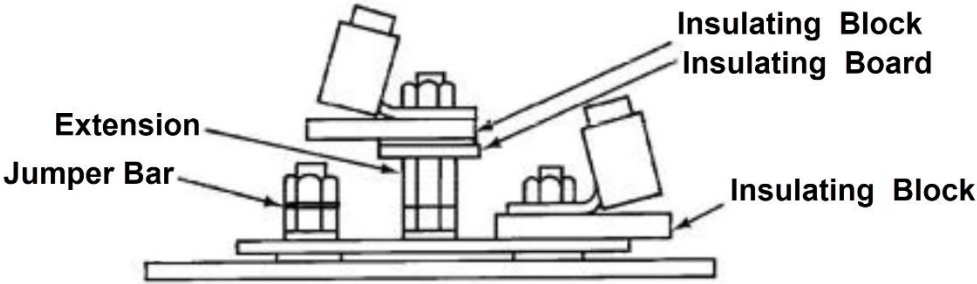


Figure 11 - Terminal Block Assembly with Extension Studs for 6 Lead Connections

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