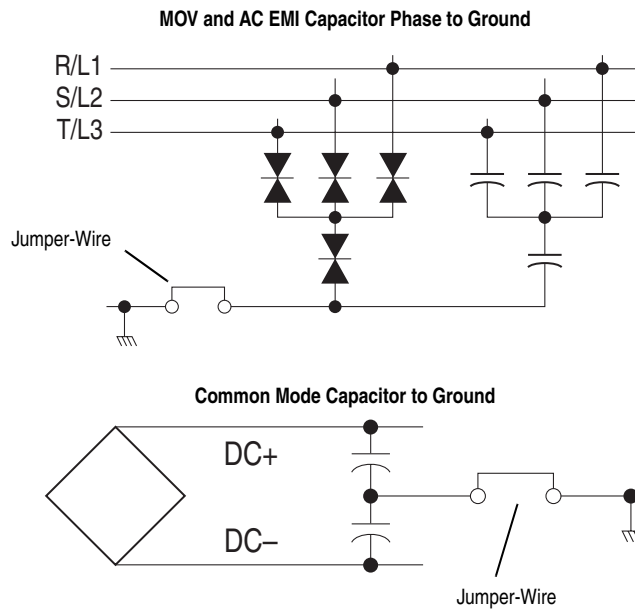


# PowerFlex 700S Power Jumpers Frames 1...6



## Installation Instructions

The PowerFlex 700S drive contains protective MOVs and Common Mode Capacitors referenced to ground (see below). To guard against unstable operation and/or damage, the drive must be properly configured as shown in [Table A on page 2](#).



**Important:** All PowerFlex 700S drives, frames 1...6, are shipped with the DC bus common mode capacitors referenced to ground.

For additional general information, refer to:

| Title   | Publication  | Available Online at ...   |
|---|--------------|---|
| PowerFlex 700S Phase II Drives, Frames 1...6<br>Installation Instructions | 20D-IN024    | <a href="http://www.rockwellautomation.com/literature">www.rockwellautomation.com/<br/>literature</a> |
| Wiring and Grounding Guidelines for PWM AC Drives                         | DRIVES-IN001 |   |
| Guarding Against Electrostatic Damage                                     | 8000-4.5.2   |   |

Before proceeding, ensure that all power to the drive has been removed.



**ATTENTION:** This drive contains ESD (Electrostatic Discharge) sensitive parts and assemblies. Static control precautions are required when installing, testing, servicing or repairing this assembly. Component damage may result if ESD control procedures are not followed. If you are not familiar with static control procedures, reference A-B publication 8000-4.5.2, *Guarding Against Electrostatic Damage* or any other applicable ESD protection guide.



**ATTENTION:** Only qualified personnel familiar with adjustable frequency AC drives and associated machinery should perform maintenance/repair of the system. Failure to comply may result in personal injury and/or equipment damage.



**ATTENTION:** To avoid an electric shock hazard, verify that the voltage on the bus capacitors has discharged before performing any work on the drive. Measure the DC bus voltage at the +DC & -DC terminals of the Power Terminal Block (refer to the User Manual for location). The voltage must be zero.



**ATTENTION:** The following information is merely a guide for proper installation. Rockwell Automation cannot assume responsibility for the compliance or the noncompliance to any code, national, local or otherwise for the proper installation of this drive or associated equipment. A hazard of personal injury and/or equipment damage exists if codes are ignored during installation.

**Table A Recommended Power Jumper Configurations**

| Power Source Type <sup>(1)</sup>  | MOV/Input Filter Caps <sup>(2)</sup> | DC Bus Common Mode Caps | Benefits Of Correct Configuration on Power Source Type  |
|---|--------------------------------------|-------------------------|---|
| <b>Solid Ground</b> <ul style="list-style-type: none"> <li>• AC fed, solidly grounded</li> <li>• DC fed from passive rectifier which has an AC source and solid ground</li> </ul>   | Connected                            | Connected               | <ul style="list-style-type: none"> <li>• UL compliance,</li> <li>• Reduced electrical noise,</li> <li>• Most stable operation,</li> <li>• EMC compliance,</li> <li>• Reduced voltage stress on components and motor bearings</li> </ul> |
| <b>Non-Solid Ground</b> <ul style="list-style-type: none"> <li>• AC fed ungrounded</li> <li>• Impedance grounded</li> <li>• High resistive ground</li> <li>• B phase ground</li> <li>• Regenerative unit such as common DC bus supply &amp; brake</li> <li>• DC fed from an active converter</li> </ul> | Disconnected                         | Disconnected            | <ul style="list-style-type: none"> <li>• Helps avoid severe equipment damage when ground fault occurs</li> </ul>  |

<sup>(1)</sup> It is highly recommended to accurately determine the power source type and then configure appropriately.

<sup>(2)</sup> When MOVs are disconnected, the power system must have its own transient protection to ensure known and controlled voltages.

To connect or disconnect these devices, refer to pages [4](#) through [7](#).

**Important:** Common mode capacitors are required to conform with the EMC directive. Removing these devices will withdraw the associated directive.

In addition, on an ungrounded distribution system where the line-to-ground voltages on any phase could exceed 125% of the nominal line-to-line voltage, an isolation transformer should be installed. See *Wiring and Grounding Guidelines for PWM AC Drives*, publication DRIVES-IN001 for more information on impedance grounded and ungrounded systems.

### Jumper Installation, Removal and Storage

PowerFlex 700S drives utilize plug-in style jumpers and jumper wires. Most drives will have a jumper storage area inside the front cover. Extra jumpers or jumpers that have been removed should be stored in this location for use at a later time.

### Insulating Jumper Wires

Some drives utilize nylon screws and spacers to insulate jumper wires from ground and secure them to the chassis. The components must be installed as shown.

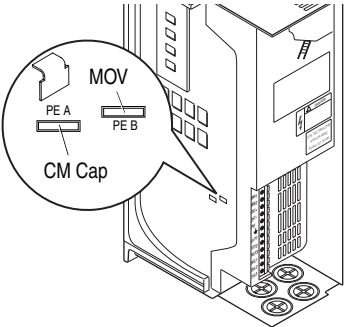
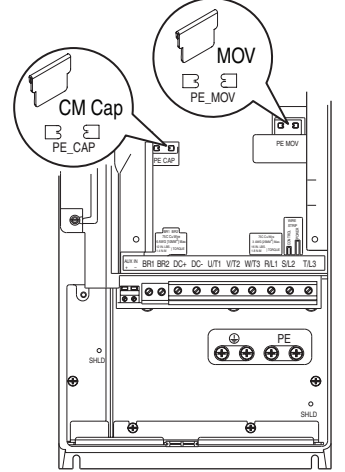


### Drive Identification

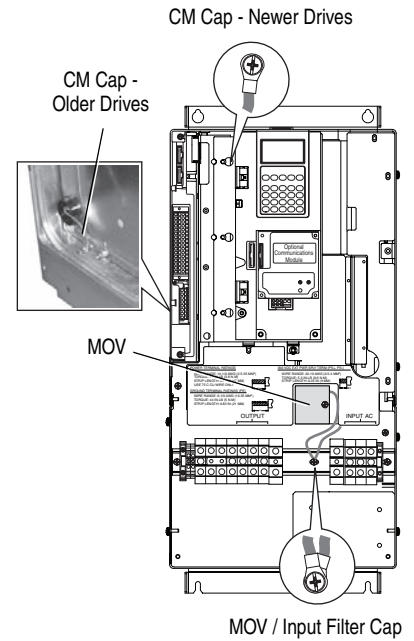
Refer to the drive nameplate and locate the “Voltage Code,” “Current Rating,” “Frame,” and “Series”. Use this information to locate the proper procedure in the following tables.

|   |                 |   |
|---|-----------------|---|
| Cat No. 20D <b>D xxx</b> x x xxxxxxxx   |                 | Series: <b>B</b>                                |
| UL TYPE 1/IP20  | 400V 480V       | Original Firmware V. x.xxx                      |
| Normal Duty Power   | xxx kW          | xxx kW  |
| Heavy Duty Power  | xxx kW          | xxx kW  |
| <i>Input: 3 Phase, 47-63Hz</i>  |                 |   |
| AC Voltage Range  | 342-440         | 432-528   |
| Amps  | xxx             | xxx   |
| <i>Output: 3 Phase, 0-400 Hz</i>  |                 |   |
| AC Voltage Range  | 0-400           | 0-460   |
| Base Hz (default)   | 50 Hz           | 60 Hz   |
| Continuous Amps   | xxx             | xxx   |
| 1 Min Overload Amps   | xxx             | xxx   |
| 3 Sec Overload Amps   | xxx             | xxx   |
| Mfd. in 2007 on Aug 1   | Frame: <b>3</b> | Serial Number: xxxxxxxx                         |
| <b>Allen-Bradley</b><br>Made in the USA (TAC 1J)<br>Rockwell Automation, Mequon WI 53092-4400 |                 | Listed<br>Ind. Cont<br>Eq. 966X<br><br><br><br> |

## Jumper Settings and Locations

| Frame | Voltage Code     | Current Rating | Factory Default Jumper Settings |                         | Power Source Type  |   |
|-------|------------------|----------------|---------------------------------|-------------------------|--|---|
|       |                  |                | MOV/ Input Filter Caps          | DC Bus Common Mode Caps |  |   |
| 1     | B<br>C<br>D<br>E | All            | PE_B<br>Installed               | PE_A<br>Installed       | <b>Solid Ground</b> <ul style="list-style-type: none"> <li>Remove the I/O Cassette (refer to the Installation Instructions for details). Verify that jumpers are installed at the "PE_A" and "PE_B" locations on the Power Board.</li> </ul> <b>Non-Solid Ground</b> <ul style="list-style-type: none"> <li>Remove the I/O Cassette (refer to the Installation Instructions for details). Remove jumpers at the "PE_A" and "PE_B" locations on the Power Board.</li> </ul> |    |
|       |                  |                | PE_MOV<br>Installed             | PE_CAP<br>Installed     |  |   |
| 3...4 | B<br>C<br>D<br>E | All            | PE_MOV<br>Installed             | PE-CAP<br>Installed     | <b>Solid Ground</b> <ul style="list-style-type: none"> <li>Verify that jumpers are installed at the "PE_CAP" and "PE_MOV" locations.</li> </ul> <b>Non-Solid Ground</b> <ul style="list-style-type: none"> <li>Remove jumpers at the "PE_CAP" and "PE_MOV" locations.</li> </ul>   |  |

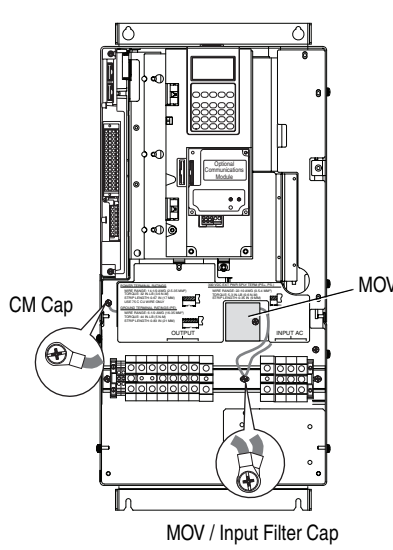
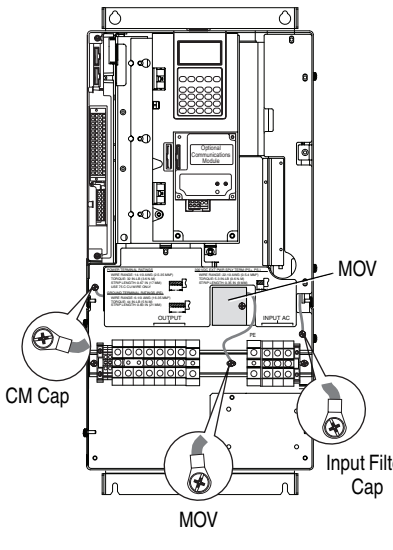
| Frame | Voltage Code                         | Current Rating                   | Factory Default Jumper Settings  |   | Power Source Type   |
|-------|--------------------------------------|----------------------------------|--|---|---|
|       |                                      |                                  | MOV/Input Filter Caps <sup>(1)(2)</sup>                                  | DC Bus Common Mode Caps                         |   |
| 5     | B<br>C<br>D<br>H<br>J<br>N<br>P<br>R | All, except C140 (see next page) | Two green/yellow wires <u>connected</u> to the Power Terminal Block rail | Green/yellow wire is <u>connected</u> to ground | <p><b>Solid Ground</b></p> <ol style="list-style-type: none"> <li>CM Cap jumper wire should be connected to ground with a metal screw. Verify. <ul style="list-style-type: none"> <li>Newer Drives - If necessary, remove the nylon screw/spacer and insert a metal M5 x 8 screw. Torque to 3.2 N•m (28 lb•in).</li> <li>Older Drives - Remove the I/O Cassette (see Installation Instructions for details). The green/yellow CM Cap jumper wire is located on the back of chassis and should be connected to ground with a metal screw. If necessary, remove the insulation from the wire terminal and connect to chassis with a metal M5 x 12 screw. Torque screw to 3.2 N•m (28 lb•in).</li> </ul> </li> <li>MOV/Input Filter Cap jumper wires should be connected to ground with a metal screw. Verify. If necessary, remove the nylon screw/spacer and insert a metal M5 x 12 screw.</li> </ol> <p><b>Non-Solid Ground</b></p> <ol style="list-style-type: none"> <li>CM Cap jumper wire should be insulated from ground. Verify. <ul style="list-style-type: none"> <li>Newer Drives - If necessary, remove the metal screw and insert a M5 x 15 nylon screw/spacer.</li> <li>Older Drives - Remove the I/O Cassette (see Installation Instructions for details). If necessary, insulate/secure jumper wire to guard against unintentional contact with chassis or components.</li> </ul> </li> <li>MOV/Input Filter Cap jumper wires should be insulated from ground with a nylon screw/spacer. Verify. If necessary, remove the metal screw and insert a M5 x 20 nylon screw/spacer.</li> </ol> |



<sup>(1)</sup> AC input drives only. MOV's and input filter caps do not exist on DC input drives.

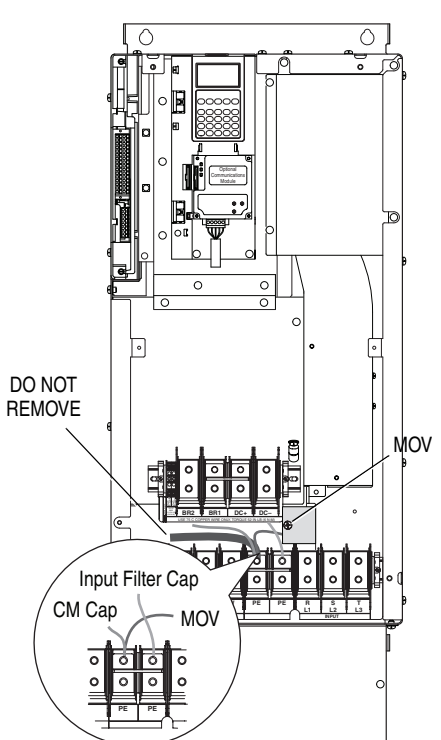
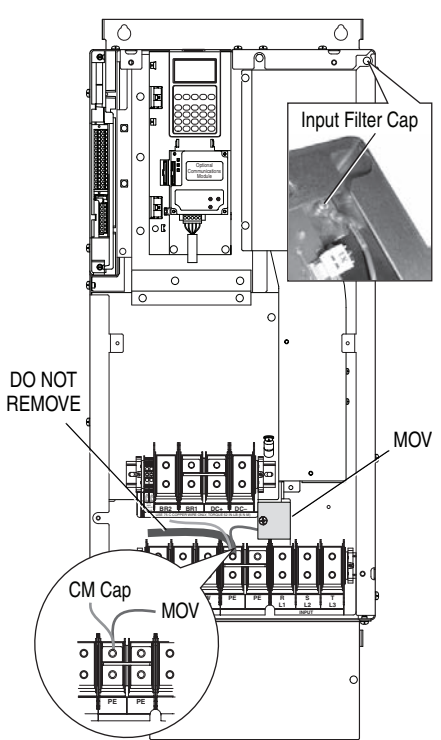
<sup>(2)</sup> When removing MOV's, the input filter capacitor must also be removed.

Frame 5 continued on next page

| Frame | Voltage Code | Current Rating | Factory Default Jumper Settings  |   | Power Source Type   |   |
|-------|--------------|----------------|--|---|---|---|
|       |              |                | MOV/Input Filter Caps <sup>(1)(2)</sup>                                  | DC Bus Common Mode Caps   |   |   |
| 5     | C            | 140            | Two green/yellow wires <u>connected</u> to the Power Terminal Block rail | Green/yellow wire to CM Cap Board is <u>connected</u> to ground | <p><b>Solid Ground</b></p> <ol style="list-style-type: none"> <li>CM Cap jumper wire should be connected to ground with a metal screw. Verify. If necessary, remove the nylon screw/spacer and insert a metal M5 x 8 screw. Torque to 3.2 N•m (28 lb•in).</li> <li>MOV/Input Filter Cap jumper wires should be connected to ground with a metal screw. Verify. If necessary, remove the nylon screw/spacer and insert a metal M5 x 12 screw.</li> </ol> <p><b>Non-Solid Ground</b></p> <ol style="list-style-type: none"> <li>CM Cap jumper wire should be insulated from ground with a nylon screw/spacer. Verify. If necessary, remove the metal screw and insert a M5 x 15 nylon screw/spacer.</li> <li>MOV/Input Filter Cap jumper wires should be insulated from ground with a nylon screw/spacer. Verify. If necessary, remove the metal screw and insert a M5 x 20 nylon screw/spacer.</li> </ol>  |    |
|       | F            | 052            |  |   |   |   |
|       | W            | 060            |  |   |   |   |
| E     | F            | 077            | Two green/yellow wires <u>connected</u> to chassis ground                | Green/yellow wire to CM Cap Board is <u>connected</u> to ground | <p><b>Solid Ground</b></p> <ol style="list-style-type: none"> <li>CM Cap jumper wire should be connected to ground with a metal screw. Verify. If necessary, remove the nylon screw/spacer and insert a metal M5 x 8 screw. Torque to 3.2 N•m (28 lb•in).</li> <li>MOV jumper wire should be connected to ground with metal screws. Verify. If necessary, remove the nylon screw/spacers and insert metal M5 x 12 screws.</li> <li>Input Filter Cap jumper wire should be connected to ground with a metal screw. Verify. If necessary, remove the nylon screw/spacer and insert metal M5 x 8 screw.</li> </ol> <p><b>Non-Solid Ground</b></p> <ol style="list-style-type: none"> <li>CM Cap jumper wire should be insulated from ground with a nylon screw/spacer. Verify. If necessary, remove the metal screw and insert a M5 x 15 nylon screw/spacer.</li> <li>MOV jumper wire should be insulated from ground with a nylon screw/spacer. Verify. If necessary, remove the metal screws and insert a M5 x 20 nylon screw/spacer.</li> <li>Input Filter Cap jumper wire should be insulated from ground with a nylon screw/spacer. Verify. If necessary, remove the metal screws and insert a M5 x 15 nylon screw/spacer.</li> </ol> |  |
|       |              | 082            |  |   |   |   |
|       |              | 099            |  |   |   |   |
|       |              | 098            |  |   |   |   |

(1) AC input drives only. MOV's and input filter caps do not exist on DC input drives.

(2) When removing MOV's, the input filter capacitor must also be removed.

| Frame            | Voltage Code                         | Current Rating | Factory Default Jumper Settings  |  | Power Source Type  |
|------------------|--------------------------------------|----------------|--|--|--|
|                  |                                      |                | MOV/Input Filter Caps <sup>(1)(2)</sup>  | DC Bus Common Mode Caps  |  |
| 6                | B<br>C<br>D<br>H<br>J<br>N<br>P<br>R | All            | Two green/yellow wires <u>connected</u> to Power Terminal Block "PE"             | Green/yellow wire to CM Cap Board is <u>connected</u> to Power Terminal Block "PE" | <p><b>Solid Ground</b></p> <ol style="list-style-type: none"> <li>The green/yellow CM Cap jumper wire should be connected to "PE."</li> <li>The MOV/Input Filter Cap jumper wires should be connected to "PE."</li> </ol> <p><b>Non-Solid Ground</b></p> <ol style="list-style-type: none"> <li>The green/yellow CM Cap jumper wire should be insulated from ground. If necessary, remove the jumper wire from "PE" and insulate/secure it to guard against unintentional contact with chassis or components. <b>Important: Do Not Remove/ Disconnect the larger green/yellow wire.</b></li> <li>MOV/Input Filter Cap jumper wires should be insulated from ground. If necessary, remove the jumper wires from "PE" and individually insulate/secure each jumper wire to guard against unintentional contact with chassis or components.</li> </ol>  |
|                  |                                      |                |  |  |    |
| E<br>F<br>T<br>W |                                      | All            | Two green/yellow wires <u>connected</u> to Power Terminal Block "PE" and chassis | Green/yellow wire to CM Cap Board is <u>connected</u> to Power Terminal Block "PE" | <p><b>Solid Ground</b></p> <ol style="list-style-type: none"> <li>The green/yellow CM Cap and MOV jumper wires should be connected to "PE."</li> <li>The Input Filter Cap jumper wire (top right) should be connected to chassis ground with a metal screw. Verify. If necessary, remove the nylon screw/spacer and insert a metal M5 x 10 screw. Torque to 3.2 N•m (28 lb•in).</li> </ol> <p><b>Non-Solid Ground</b></p> <ol style="list-style-type: none"> <li>The green/yellow CM Cap and MOV jumper wires should be insulated from ground. If necessary, remove them from "PE" and individually insulate/secure each jumper wire to guard against unintentional contact with chassis or components. <b>Important: Do Not Remove/Disconnect the larger green/yellow wire.</b></li> <li>The Input Filter Cap jumper wire (top right) should be insulated from ground with a nylon screw/spacer. Verify. If necessary, remove the metal screw and insert a M5 x 15 nylon screw/spacer.</li> </ol> |
|                  |                                      |                |  |  |   |

(1) AC input drives only. MOV's and input filter caps do not exist on DC input drives.

(2) When removing MOV's, the input filter capacitor must also be removed.



PN-48718

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