PowerFlex 755 AC Drives Floor Mount Frames 8 and Larger, Hardware Service Manual

Catalog Numbers 755, 20G, 21G
Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

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**WARNING**: Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.

**ATTENTION**: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.

**IMPORTANT** Identifies information that is critical for successful application and understanding of the product.

Labels may also be on or inside the equipment to provide specific precautions.

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**SHOCK HAZARD**: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.

**BURN HAZARD**: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.

**ARC FLASH HAZARD**: Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).
## Summary of Changes

This manual revision contains the following new and updated information.

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This manual provides a recommended preventive maintenance schedule, major component test and hardware replacement procedures, and schematic diagrams for floor mount frame 8 and larger PowerFlex® 750-Series AC drives. See Drive Input Power Configurations on page 28 for information on drive input power configurations and frame sizes.

It is highly recommended that you obtain a copy of the PowerFlex 750-Series AC Drives Programming Manual, publication 750-PM001. This publication contains fault, alarm, and programming information that can help you troubleshoot drive errors and determine if repairs are necessary.

Who Should Use This Manual

This manual is intended for qualified service personnel responsible for frame 8 and larger PowerFlex 750-Series AC drive repairs. You must have previous experience with, and an understanding of, electrical terminology, procedures, required equipment, equipment protection procedures and methods, and safety precautions. See safety-related practices that are contained in publication NFPA 70E, Standard for Electrical Safety in the Workplace.

Additional Resources

Additional drive services and software/firmware support information are available on the Allen-Bradley Drives Service and Support website: http://www.ab.com/support/abdrives/.

See PowerFlex Architecture Class Low Voltage Drives Spare Parts Options, publication PFLEX-SB002 for a complete list of spare parts for PowerFlex 755 floor mount frame 8 and larger drives.

The following table lists publications that provide general drive-related information.

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<td>Wiring and Grounding Guidelines for Pulse Width Modulated (PWM) AC Drives, publication DRIVES-IN001</td>
<td>Provides basic information that is required to properly wire and ground PWM AC drives.</td>
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<tr>
<td>Safety Guidelines for the Application, Installation, and Maintenance of Solid-State Control, publication SGD-1.1</td>
<td>Provides general guidelines for the application, installation, and maintenance of solid-state control.</td>
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<tr>
<td>Guarding Against Electrostatic Damage, publication 8000-4.5.2</td>
<td>Provides practices for guarding against Electrostatic damage (ESD)</td>
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<td>Product Certifications that are provided on the Allen-Bradley website: <a href="http://ab.rockwellautomation.com/">http://ab.rockwellautomation.com/</a></td>
<td>Provides declarations of conformity, certificates, and other certification details.</td>
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The following table lists publications that provide information about PowerFlex 750-Series drives.

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<tr>
<td>PowerFlex 750-Series AC Drives Programming Manual, publication 750-PM001</td>
<td>Provides information that is required to start-up, program, and troubleshoot PowerFlex 750-Series AC drives.</td>
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<tr>
<td>PowerFlex 755 Drive Embedded EtherNet/IP Adapter User Manual, publication 750COM-UM001</td>
<td>Provides information on how to install, configure, and troubleshoot the Embedded EtherNet/IP Adapter for PowerFlex 755 AC drives.</td>
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<tr>
<td>Safe Speed Monitor Option Module for PowerFlex 750-Series AC Drives Safety Reference Manual, publication 750-RM001</td>
<td>Describes how to use PowerFlex 750-Series AC drives in Safety Integrity Level (SIL) CL3, Performance Level (PL(e)), or Category (CAT) 4 applications. This manual provides information on how to install, configure, and troubleshoot the PowerFlex Safe Speed Monitor Option module.</td>
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<tr>
<td>PowerFlex 750-Series AC Drives Technical Data, publication 750-TD001</td>
<td>Provides information on product features and benefits, options, and technical specifications information.</td>
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<td>PowerFlex 750-Series AC Drives Installation Instructions, publication 750-IN001</td>
<td>Explains the basic steps for mechanical installation, and provides instructions on how to connect incoming power, the motor, and basic I/O to the PowerFlex 750-Series Adjustable Frequency AC drive.</td>
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<td>PowerFlex 755 IP00, NEMA/UL Open Type Drive Frames 8-10 Installation Instructions, publication 750-IN020</td>
<td>This document provides instructions for the installation of an IP00, Open Type PowerFlex 755 drive (Frames 8…10) in a user supplied enclosure. The information provided in this publication supplements the PowerFlex 750-Series AC Drives Installation Instructions, publication 750-IN001, and is intended for qualified drive service personnel only.</td>
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<tr>
<td>PowerFlex 750-Series AC Drives Hardware Service Manual – Frame 8 and Larger, publication 750-TG001</td>
<td>Provides a recommended preventative maintenance schedule, major component test and hardware replacement procedures, and schematic diagrams for floor mount frame 8 and larger PowerFlex 750-Series AC drives.</td>
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<tr>
<td>PowerFlex 750-Series Service Cart High-power Conversion Kit, publication 750-IN017</td>
<td>Provides instructions to convert the multi-drive 750-Series Service Cart to a high-power (frame 8…10) service cart.</td>
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<tr>
<td>PowerFlex 750-Series Spare Parts Installation Instructions, publication 750-IN013</td>
<td>Provides additional information to acquire spare parts for the PowerFlex 750-Series.</td>
</tr>
<tr>
<td>PowerFlex Architecture Class Low Voltage Drives Spare Parts Options, publication PFLEX-SB002</td>
<td>Includes spare part lists and part numbers for PowerFlex low voltage drives.</td>
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You can view or download publications at [http://www.rockwellautomation.com/literature/](http://www.rockwellautomation.com/literature/). To order paper copies of technical documentation, contact your local Rockwell Automation distributor or sales representative.
Before You Begin Tests, Maintenance, or Repairs

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<td>30</td>
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<td>Commonly Used Tools</td>
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<td>34</td>
</tr>
</tbody>
</table>

Read the information in this chapter before you begin tests, maintenance, or repairs on drive components.
Chapter 1  Before You Begin Tests, Maintenance, or Repairs

General Precautions

Read the following precautions before you begin to test components, perform maintenance, or repair the drive.

Qualified Personnel

ATTENTION: Only qualified personnel familiar with adjustable frequency AC drives and associated machinery should plan or implement the installation, startup, and subsequent maintenance of the system. Failure to comply can result in personal injury and/or equipment damage.

Personal Safety

ATTENTION: To avoid an electric shock hazard, verify that the voltage on the bus capacitors has discharged completely before servicing. Measure the DC bus voltage at the -DC and +DC TESTPOINT sockets on the front of the power module (see Remove Power from the Drive on page 25 for location).

ATTENTION: Potentially fatal voltages can result from improper usage of an oscilloscope and other test equipment. The oscilloscope chassis can be at a potentially fatal voltage if not properly grounded. If an oscilloscope is used to measure high-voltage waveforms, use only a dual channel oscilloscope in the differential mode with X 100 probes. It is recommended that the oscilloscope is used in the A minus B Quasi-differential mode with the chassis of the oscilloscope that is correctly grounded to an earth ground.

Product Safety

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 can result if ESD control procedures are not followed. If you are not familiar with static control procedures, reference Guarding Against Electrostatic Damage, publication 8000-4.5.2 or any other applicable ESD protection handbook.

Class 1 Status Indicator Products

ATTENTION: Hazard of permanent eye damage exists when using optical transmission equipment. This product emits intense light and invisible radiation. Do not look into module ports or fiber-optic cable connectors.
Remove Power from the Drive

**WARNING:** To avoid an electric shock hazard, verify that the voltage on the bus capacitors has discharged completely before servicing. Measure the DC bus voltage at the -DC and +DC TESTPOINT sockets on the front of the power module.

Remove power before you remove or make cable connections. When you remove or insert a cable connector with power applied, an electric arc can occur. An electric arc can cause personal injury or property damage in these ways:

- An electric arc can send an erroneous signal to system field devices, which can cause unintended machine motion
- An electric arc can cause an explosion in a hazardous environment

Electric arcs cause excessive wear to contacts on both the module and its mating connector. Worn contacts can create electrical resistance.

1. Turn off and lockout all input power, including any external power sources (such as a regenerative power supply or other DC power source).

2. Wait 15 minutes and verify that there is no voltage at the drive input power terminals.

3. Measure the DC bus voltage at the -DC and +DC TESTPOINT sockets on the front of the power module.
4. For common DC input drives only, follow steps a…e to turn off and lockout additional input power sources.

   a. Turn off and lock the drive circuit breaker SW5 (if used).

   b. Turn off and lock the drive disconnect switch SW2.

ATTENTION: To avoid an electric shock hazard when servicing the drive, a means for lockout/tagout of the external power supply source must be. The single-phase 120/240V power source and, if present, the external 120V uninterruptible both apply.
Common DC Input Drives

c. For common DC input drives with a circuit breaker access door (DC input with precharge units 20-750-P6-xnnxnnn and later), loosen the two hexalobular screws that secure the circuit breaker access door to the door panel and lower the door.

d. Close and lock the hasp on the molded case switch SW1.

e. If you must remove the drive from the cabinet, close and secure the circuit breaker access door before removal.
Drive Input Power Configurations

The PowerFlex 750-Series drives discussed in this manual are available as floor-mount frame 8, 9, and 10 drives with either AC or common DC input. See Figure 1 and Figure 2 on page 29 to familiarize yourself with AC versus DC input drive configurations and the main drive sections each configuration contains.

Figure 1 - AC Input Drives

Frame 8
- Exhaust Vent
- Control Wireway
- Converter Section (left)
- Control Pod and/or Control Panel (right)
- Note: Only one Control Pod per Drive (can also be remotely mounted - see 750-Series POD Remote Mounting Kit, publication 750-IN015)

Inverter Section
- DC Choke and Main Cooling Fan Intake

Frame 9
- Bay 1
- Bay 2

Frame 10
- Bay 1
- Bay 2
- Bay 3

Note: Enclosure doors shown removed.

Note: The exhaust vent is optional. A minimum top clearance of 182 mm (7.2 in.) must be maintained to help ensure proper airflow.
Before You Begin Tests, Maintenance, or Repairs

Chapter 1

Figure 2 - Common DC Input Drives

Frame 8

Exhaust Vent
Control Wireway
DC Input with Precharge Section (left)
Control Pod and/or Control Panel (right)
Note: Only one Control Pod per Drive (can also be remotely mounted - see 750-Series POD Remote Mounting Kit, publication 750-IN015)
Inverter Section
Main Cooling Fan Intake

Frame 9

Bay 1
Bay 2

Frame 10

Bay 1
Bay 2
Bay 3

Note: Enclosure doors are shown removed.
Note: Exhaust hoods are optional.
The drive frame size, date of manufacture, and firmware revision determine if series A or B components are installed. The following tables identify the drive components that are series-specific and the catalog numbers that can be used based on frame size and firmware revision. To avoid improper drive operation, verify the frame size, component series, and firmware revision before you purchase and replace any of these components.

### Drive Series Components Compatibility

**Spare Part Compatibility with Series A and Series B Drives**

Series A and series B power core components are not compatible with each other and cannot be combined.

**TIP** Safety cards are not allowed for use in Series A power core components.

- All frame 8 drives that are manufactured before August 31, 2011 contain series A components.
- All frame 8, 9, and 10 drives that are manufactured after August 31, 2011 contain series B and C components.

**IMPORTANT** Safety cards cannot be used on series A power core components.

<table>
<thead>
<tr>
<th>Series Specific Component</th>
<th>Frame 8 - Series A Drives</th>
<th>Frame 8...10 - Series B and C Drives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Converter Unit, AC Input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>770 A, 400V / 740 A, 480V</td>
<td>20-750-C1-C770D740</td>
<td>20-750-C6-C770D740</td>
</tr>
<tr>
<td>Converter Unit, AC Input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>510 A, 600V / 500 A, 690V</td>
<td>--</td>
<td>20-750-C6-E510FS00</td>
</tr>
<tr>
<td>Inverter Unit, AC Input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>460 A, 400V / 430 A, 480V</td>
<td>20-750-I1-C460D430</td>
<td>20-750-I1B-C460-D430</td>
</tr>
<tr>
<td>Inverter Unit, AC Input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>540 A, 400V / 485 A, 480V</td>
<td>20-750-I1-C540D485</td>
<td>20-750-I1B-C540D485</td>
</tr>
<tr>
<td>Inverter Unit, AC Input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>567 A, 400V / 545 A, 480V</td>
<td>20-750-I1-C567D545</td>
<td>20-750-I1B-C567D545</td>
</tr>
<tr>
<td>Inverter Unit, AC Input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>650 A, 400V / 617 A, 480V</td>
<td>20-750-I1-C650D617</td>
<td>20-750-I1B-C650D617</td>
</tr>
<tr>
<td>Inverter Unit, AC Input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>750 A, 400V / 710 A, 480V</td>
<td>20-750-I1-C750D710</td>
<td>20-750-I1B-C750D710</td>
</tr>
<tr>
<td>Inverter Unit, AC Input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>770 A, 400V / 740 A, 480V</td>
<td>20-750-I1-C770D740</td>
<td>20-750-I1B-C770D740</td>
</tr>
<tr>
<td>Converter Gate Board</td>
<td></td>
<td></td>
</tr>
<tr>
<td>400V/480V AC Input (1)</td>
<td>SK-R1-CGDB1-CD-F8</td>
<td>SK-R1-CGDB4-CD-F8</td>
</tr>
<tr>
<td>Converter Gate Board</td>
<td></td>
<td></td>
</tr>
<tr>
<td>600V/690V AC Input (1)</td>
<td>--</td>
<td>SK-R1-CGDB4-EF-F8</td>
</tr>
<tr>
<td>Inverter Power Layer, Interface Board (2)</td>
<td>SK-R1-PINT1-F8</td>
<td>SK-R1-PINT2-F8</td>
</tr>
</tbody>
</table>

(1) This board is included with a replacement converter unit.

(2) This board is included with a replacement inverter unit.
### Firmware Revision Compatibility with Series A and B Circuit Boards

<table>
<thead>
<tr>
<th>Firmware Revision</th>
<th>Drive Series</th>
<th>Frame Size</th>
<th>Converter Gate Board</th>
<th>Inverter Power Layer, Interface Board</th>
<th>Converter Gate Board</th>
<th>Inverter Power Layer, Interface Board</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>SK-R1-CGDB1-CD-F8</td>
<td>SK-R1-PINT1-F8</td>
<td>SK-R1-CGDB2-CD-F8</td>
<td>SK-R1-PINT2-F8</td>
</tr>
<tr>
<td>2.xxx</td>
<td>A</td>
<td>8</td>
<td>Compatible</td>
<td>Compatible</td>
<td>NOT Compatible</td>
<td>NOT Compatible</td>
</tr>
<tr>
<td>3.xxx...5.xxx</td>
<td>B</td>
<td>8 and 9</td>
<td>NOT Compatible</td>
<td>NOT Compatible</td>
<td>Compatible</td>
<td>Compatible</td>
</tr>
<tr>
<td>6.xxx or later</td>
<td>B</td>
<td>10</td>
<td>NOT Compatible</td>
<td>NOT Compatible</td>
<td>Compatible</td>
<td>Compatible</td>
</tr>
</tbody>
</table>

### Series A, B, and C Converter Components and Drive Input Power Compatibility

<table>
<thead>
<tr>
<th>Series Specific Component</th>
<th>Compatible with 400/480VAC Input Drives</th>
<th>Compatible with 600/690VAC Input Drives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Converter EMC Filter Board SK-R1-EMCFLT1-F8 (Series A)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Converter EMC Filter Board SK-R1-EMCFLT2-F8 (Series B and C)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Converter Current Sensor SK-R1-CNWF1B1-F8 (Series A)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Converter Current Sensor SK-R1-CNWF1B2-F8 (Series B and C)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
## Commonly Used Tools

**IMPORTANT** Care must be taken to be sure that tools and/or hardware components do not fall into open drive assemblies. Do not energize the drive unless all loose tools and/or hardware components have been removed from the drive assemblies and enclosure.

This list includes the tools that are needed for test measurements, basic maintenance, and service repairs.

<table>
<thead>
<tr>
<th>Tool Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allen socket wrench</td>
<td>4 mm, 5 mm (with long extension)</td>
</tr>
<tr>
<td>Allen socket wrench extension</td>
<td>254 mm (10 in.)</td>
</tr>
<tr>
<td>Box wrench</td>
<td>7 mm, 8 mm, 10 mm, 13 mm, 17 mm, 19 mm, 22 mm</td>
</tr>
<tr>
<td>Crimping tools</td>
<td>For cable terminals, crimp per the tool manufactures specifications.</td>
</tr>
<tr>
<td>Current clamp</td>
<td>1000 A (AC, rms), signal output</td>
</tr>
<tr>
<td>ESD-protected place of work</td>
<td>Work surface, Floor cover, seat, and ground connections</td>
</tr>
<tr>
<td>ESD-protective clothing</td>
<td>Wrist wrap, shoes, overall clothing (coat)</td>
</tr>
<tr>
<td>Flash light</td>
<td>—</td>
</tr>
<tr>
<td>Flat-nose screwdriver</td>
<td>3 mm (0.12 in.), 5 mm (0.19 in.), 6.4 mm (0.25 in.)</td>
</tr>
<tr>
<td>Fuse puller</td>
<td>—</td>
</tr>
<tr>
<td>Hexalobular screw driver/bit</td>
<td>#15, #20, #25, #30, #40, #45</td>
</tr>
<tr>
<td>Hexagonal socket wrench</td>
<td>2.5 mm, 7 mm, 8 mm, 10 mm, 12 mm, 13 mm, 17 mm, 18 mm</td>
</tr>
<tr>
<td>Insulation tester</td>
<td>1000V DC</td>
</tr>
<tr>
<td>Lifting strap</td>
<td>8 mm (5/16 in.) J-hook style, 609 mm (24 in.) long, 454 kg (1000 lb.) Minimum</td>
</tr>
<tr>
<td>Multi-meter</td>
<td>Digital multi-meter, capable of AC and DC voltage, continuity, resistance, capacitance measurements, and forward diode bias tests. Fluke model 87 III or equivalent.</td>
</tr>
<tr>
<td>Nose pliers</td>
<td>—</td>
</tr>
<tr>
<td>Oscilloscope</td>
<td>Portable, digitizing, dual channel scope, with isolation</td>
</tr>
<tr>
<td>Phillips screwdriver/bit</td>
<td>#1, #2</td>
</tr>
<tr>
<td>Roll-out cart</td>
<td>20-750-CART1-F8. Note: The roll-out cart is required to remove the drive assembly from the enclosure.</td>
</tr>
<tr>
<td>Torque wrench</td>
<td>1...12 N-m (8.8...106 lb-in)</td>
</tr>
<tr>
<td>Torque wrench</td>
<td>6...50 N-m (53...443 lb-in)</td>
</tr>
<tr>
<td>Wire cutter</td>
<td>—</td>
</tr>
</tbody>
</table>

## Service Tools

Software Tools

Connected Components Workbench™ software and DriveTools™ SP software are applications that can be used to upload and download parameter configuration and monitor and trend system parameters. Connected Components Workbench version 1.02 and DriveTools SP version 5.3 are required for use with PowerFlex® 750-Series floor mount frame 8 and larger drives and option modules.
Fastener/Tool/Torque Information

The disassembly illustrations in the following chapters identify the type of fastener, tool, and torque that is used for disassembly/assembly of components in the drive.

<table>
<thead>
<tr>
<th>Fastener Type</th>
<th>Tool Type and Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat-head screw</td>
<td>F Flat-nose screwdriver</td>
</tr>
<tr>
<td>Hexagonal bolt</td>
<td>Px Phillips screwdriver/bit and size</td>
</tr>
<tr>
<td>Hexagonal nut or standoff</td>
<td>Pzx Pozidriv screwdriver/bit and size</td>
</tr>
<tr>
<td>Hexagonal screw</td>
<td>Txx Hexalobular screwdriver/bit and size</td>
</tr>
<tr>
<td>Hexalobular screw</td>
<td>xx mm Hexagonal socket wrench</td>
</tr>
</tbody>
</table>

**Torque Requirement**

- T20 or F - 6.4 mm (0.25 in.)
- 1.8 N-m (16 lb-in)
ATTENTION: When mounting components to a drive heat sink, component fastener torque sequences and tolerances are crucial to component-to-heat sink heat dissipation.

Components can be damaged if the initial tightening procedure is not performed to specification.

The following illustrates the initial and final tightening sequences for components that are fastened to a heat sink by using two, four, and six screws. Initial torque is $1/3$ (33%) of final torque, except six-point mountings, which require $0.7 \text{ N•m (6 lb•in)}$ initial torque. The numeric illustration labels are for your assistance. Drive components do not contain these labels.

**Figure 3 - Two-point Mounting**

![Two-point Mounting Diagram](image)

**Figure 4 - Four-point Mounting**

![Four-point Mounting Diagram](image)
Figure 5 - Six-point Mounting

Do not exceed 0.7 N·m (6 lb·in) on initial torque of all six screws.
Notes:
Chapter 2

Periodic Maintenance

This chapter provides information on how to perform preventive maintenance on drive and option bay components that can affect the life and operability of the drive.

Recommended Preventive Maintenance

Rockwell Automation recognizes that following a defined maintenance schedule delivers the maximum product availability. By strictly following the maintenance schedule that is provided, you can expect the highest possible uptime.

This annual preventive maintenance program includes the following primary tasks:

- A visual inspection of all drive components visible from the front of the unit
- Resistance checks on the power components
- Power-supply voltage level checks
- General cleaning and maintenance
- Tightness checks on all accessible power connections

See Chapter 3 - Component Inspection and Test Procedures on page 47 for additional information on how to perform these procedures and tests.

The recommended maintenance tasks and schedule for a drive are contained in Maintenance of Industrial Control Equipment on page 39. The recommended maintenance tasks and schedule for an option bay are contained in Table 4 on page 45. The Schedule Codes Explanations section on page 38 contains an explanation of the codes that are contained in the recommended maintenance tasks and schedule tables.

IMPORTANT  Duty cycle, load profile, temperature, altitude, incoming line conditions, and other operating/environmental conditions greatly affect reliability of a drive.
Schedule Codes Explanations

The following codes are used to indicate the tasks that are associated with the components that are identified in the recommended tasks and maintenance schedule tables on pages 39...45.

**ATTENTION:** Servicing energized industrial control equipment can be hazardous. Severe injury or death can result from electrical shock, burn, or unintended actuation of controlled equipment. Recommended practice is to disconnect and lockout control equipment from power sources, and discharge stored energy in capacitors, if present. If it is necessary to work in the vicinity of energized equipment, only qualified personnel are permitted to perform such work. Adhere to all applicable safety practices and wear protective equipment.

**IMPORTANT** Review product manuals for detailed maintenance information relevant a particular model.

<table>
<thead>
<tr>
<th>Code</th>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Inspect</td>
<td>Inspect the component for signs of excessive accumulation of dust, dirt, or external damage. For example, inspect the filter capacitors for bulges in the case, inspect the filters/fan inlet screens for debris that can block the airflow path.</td>
</tr>
<tr>
<td>C</td>
<td>Clean</td>
<td>Clean the components that can be reused, specifically the door-mounted air filters and fan inlet screens.</td>
</tr>
<tr>
<td>M</td>
<td>Maintain</td>
<td>This type of maintenance task can include an inductance test of line reactors/DC links, or a full test of an isolation transformer, and so on.</td>
</tr>
<tr>
<td>R</td>
<td>Replace</td>
<td>This component has reached its mean operational life. Replace the component to decrease the chance of failure. It is likely that components can exceed the designed life in the drive, but component life is dependent on many factors such as usage and heat.</td>
</tr>
<tr>
<td>RFB/R</td>
<td>Refurbish/Replace</td>
<td>The parts can be refurbished, at lower cost, or replaced with new ones.</td>
</tr>
<tr>
<td>Rv</td>
<td>Review</td>
<td>A discussion with Rockwell Automation personnel is recommended to help determine whether any of the enhancements/changes made to the drive hardware and control could benefit the application.</td>
</tr>
</tbody>
</table>
Periodic Inspection — Industrial control equipment must be inspected periodically. Inspection intervals are based on environmental/operating conditions, and adjusted as indicated by experience. We recommend an initial inspection within 3...4 months after installation. We recommend an annual inspection after initial inspection on an ongoing basis.

Contamination — If inspection reveals that dust, dirt, moisture, or other contamination has reached the control equipment, the cause must be eliminated. This contamination can indicate an incorrect or ineffective enclosure, unsealed enclosure openings (conduit or other), or incorrect operating procedures. Dirty, wet, or contaminated parts must be replaced unless they can be cleaned effectively by vacuuming or wiping.

Cooling Devices — Inspect blowers and fans that are used for forced air cooling. Replace any that have bent, chipped, missing blades or if the shaft does not turn freely. Apply power momentarily to check operation. If unit does not operate, check and replace wiring, fuse, blower, or fan motor as appropriate. Clean or change air filters as recommended.

Inspect and clean the power section components (IGBTs, SCRs, and capacitors) as part of the annual clean and inspection cycle (as access allows). Do not remove the whole drive assembly to gain access to the components. The life expectancies of the power section components are designed to last for the life of the drive for wall-mounted drives. The actual life is dependent on ambient and environmental conditions, load, variation of load, power system configuration, output and carrier frequency configuration, cooling system, and other application-related factors.

The design life expectancy of the overall components normally exceeds 10 years (in some cases it can last 20 years or more) in normal operating environments.
**Bus Capacitors** — For drives that are in storage and do not have a voltage applied, maintenance of the capacitors in a drive product can also be required (see Figure 6). For drives that are stored under one year, there is no additional maintenance required. For storage greater than one year, see Table 1 for bus capacitor reforming requirements.

**Table 1 - Drive Storage Duration and Reforming Recommendations**(1)(2)

<table>
<thead>
<tr>
<th>Duration</th>
<th>Guideline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 1 year</td>
<td>No reforming required.</td>
</tr>
<tr>
<td>1…2 years</td>
<td>Apply rated voltage, per the normal method, for 60 minutes under no load.</td>
</tr>
<tr>
<td>2…3 years</td>
<td>Using a DC power supply that is connected directly to the DC terminals of the product, ramp-up voltage from 0…100% of DC bus voltage (see Table 2) in steps of 25% Dwell at 25%, 50%, and 75% steps for 30 minutes each. At 100% voltage, dwell for 60 minutes, all under no load.</td>
</tr>
<tr>
<td>Over 3 years</td>
<td>Using DC power supply connect directly to the DC terminals of the product, ramp-up voltage from 0…100% of DC bus voltage (see Table 2) in steps of 25%. Dwell at each stem for 120 minutes.</td>
</tr>
</tbody>
</table>

(1) The forming voltage must be 1.35…1.45 times the rated AC system voltage.
(2) The power supply current draw must not exceed 50 mA.

**Table 2 - DC Bus Voltage Ramp-up Values**

<table>
<thead>
<tr>
<th>AC Input Voltage</th>
<th>Voltage Across the DC Bus</th>
</tr>
</thead>
<tbody>
<tr>
<td>230V</td>
<td>325V DC</td>
</tr>
<tr>
<td>400/480V</td>
<td>680V DC</td>
</tr>
<tr>
<td>600V</td>
<td>848V DC</td>
</tr>
<tr>
<td>600/690V</td>
<td>976V DC</td>
</tr>
</tbody>
</table>

**Figure 6 - Bus Capacitor Reforming Guidelines**
**Operating Mechanisms** — Check for proper functioning and freedom from sticking or binding. Replace any broken, deformed, or badly worn parts or assemblies according to individual product renewal parts lists. Check and securely retighten (if necessary) any loose fasteners. Lubricate (if specified) per individual product instructions.

---

**Contacts** — Check contacts for excessive wear and dirt accumulations. Discoloration and slight pitting are acceptable. Do not file contacts. Do not use contact spray cleaners as residues can cause sticking or interfere with electrical continuity. Replace the contacts only after the silver has become badly worn. Always replace contacts in complete sets to avoid misalignment and uneven contact pressure.

**Terminals** — Loose connections can cause overheating that can lead to equipment malfunction or failure. Check the tightness of all terminals and bus bar connections – securely tighten any loose connections. Replace any parts or wiring that is damaged by overheating. Also check ground connection integrity.

**Coils** — If a coil exhibits evidence of overheating (cracked, melted, or burned insulation), it must be replaced. In that event, check for and correct overvoltage or undervoltage conditions, which can cause coil failure. Be sure to clean any residues of melted coil insulation from other parts of the device or replace such parts.

**Batteries** — Replace batteries periodically as specified in product manual or if a battery shows signs of electrolyte leakage. Use tools to handle batteries that have leaked electrolyte; most electrolytes are corrosive and can cause burns. Dispose of the old battery in accordance with instructions that are supplied with the new battery or as specified in the manual for the product.

**Pilot Lights** — Replace any burned out lamps or damaged lenses.
**Solid-state Devices** — Solid-state devices require little more than a periodic visual inspection. Inspect the printed circuit boards to determine whether they are properly seated in the edge connectors. Board locking tabs must be in place. Necessary replacements must be made only at the personal computer board or plug-in component level. Do not use solvents on printed circuit boards. When blowers are used, air filters must be cleaned or changed periodically depending on the specific environmental conditions encountered.

**ATTENTION:** Use of other than factory recommended test equipment for solid-state controls can result in damage to the control or test equipment or unintended actuation of the controlled equipment.

**High-Voltage Testing** — Do not perform high-voltage insulation resistance (IR) and dielectric withstanding voltage (DWV) tests to check solid-state control equipment. When measuring IR or DWV of electrical equipment such as transformers or motors, a solid-state device that is used for control or monitoring must be disconnected before performing the test. Even though no damage is readily apparent after an IR or DWV test, the solid-state devices are degraded and repeated application of high voltage can lead to failure.

**Locking and Interlocking Devices** — Check these devices for proper working condition and capability of performing their intended functions.

**Maintenance After a Fault Condition** — An open short circuit protective device (such as a fuse or circuit breaker) in a properly coordinated motor branch circuit is an indication of a fault condition in excess of operating overload. Such conditions can damage control equipment. Before restoring power, the fault condition must be corrected and any necessary repairs or replacements must be made to restore the control equipment to good working order. Make sure that the parts are properly matched to the model, series, and revision level of the equipment.

**Final Check Out** — After maintenance or repair of industrial controls, always test the control system for proper functioning under controlled conditions that avoid hazards if a control malfunction occurs.

**Keep Good Maintenance Records** — This rule is most helpful to locate possible intermittent problems by pointing to a particular area of constant trouble within the overall system. Further, good maintenance records reduce major costly shutdowns by demanding the use of proper test equipment and an appropriate inventory of spare parts.

We recommend that a complete record of parameter settings be kept close to the drive for future reference. Some drives also incorporate an operator interface that can store a copy of the parameter setting.

**IMPORTANT**  Duty cycle, load profile, temperature, altitude, incoming line conditions, and other operating/environmental conditions greatly affect reliability of a drive.
### Table 3 - Recommended Drives Maintenance Tasks and Schedule

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<td><strong>Components and Activities</strong></td>
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## Chapter 2  Periodic Maintenance

| Integral Magnetics/Power Filters | Line Reactor\(^2\) | — | I | I | I | I | M | I | I | I | I | I | I | M | I | I | I | I | M |
| DC Link Common-Mode Choke (AC Input Only) pg. 285 | — | I | I | I | I | M | I | I | I | I | I | M | I | I | I | M | I | I | I | M |
| Control Pod Components | Converter Gate Circuit Board Removal/Installation pg. 149 | — | I | I | I | I | RFB /R | I | I | I | I | I | RFB /R | I | I | I | I | I | I | I | RFB /R |
| Main Control Boards pg. 65 | — | I | I | I | I | I | I | I | I | I | I | I | I | I | I | I | I | I | I | I |
| Fiber Interface Control Boards pg. 73 | — | I | I | I | I | I | I | I | I | I | I | I | I | I | I | I | I | I | I | I |
| Batteries (DCBs and CIB)\(^3\) pg. 73 | — | I | I | R | I | I | R | I | I | R | I | I | R | I | I | R | I | I | R |
| Fiber-optic Cables\(^4\)(5)(6) pg. 57, 82, 158, 228 | — | I | I | I | I | R | I | I | I | I | R | I | I | I | R | I | I | I | R |
| Enhancements | Firmware — | — | - | - | Rv | - | - | Rv | - | - | Rv | - | - | Rv | - | - | Rv | - | - |
| Hardware pg. 32-3 | — | - | - | Rv | - | - | Rv | - | - | Rv | - | - | Rv | - | - | Rv | - | - |
| Operational Conditions | Parameters pg. 32-3 | — | I | I | Rv | I | I | Rv | I | I | Rv | I | I | Rv | I | I | Rv | I | I |
| Variables\(^5\) | — | I | I | Rv | I | I | Rv | I | I | Rv | I | I | Rv | I | I | Rv | I | I |
| Application Concerns\(^7\) | — | I | I | Rv | I | I | Rv | I | I | Rv | I | I | Rv | I | I | Rv | I | I |
| Spare Parts | Spare Parts and Inventory/Needs\(^8\) — | — | I | I | Rv | I | I | Rv | I | I | Rv | I | I | Rv | I | I | Rv | I | I |

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(1) Inspect and replace filters every 3 months or more frequently, depending on the environment.
(2) Associated devices that are integrated into drive modules cannot be replaced individually. It is recommended to replace the entire module at the specified interval.
(3) User installed CR1220 lithium coin cell battery provides power to the real-time clock (Optional, not supplied). Preserves the real-time clock setting in the event power to the drive is lost or cycled.
(4) Hazard of permanent eye damage exists when using optical transmission equipment. This product emits intense light and invisible radiation. Do not look into module ports or fiber-optic cable connectors.
(5) Evaluate, update, and verify compatibility when maintenance is performed.
(6) See the listed page numbers and reference the corresponding call out: pg. 57 (#5), 82 (#21), 158 (#28), 228 (#12).
(7) See Wiring and Grounding Guidelines for Pulse-width Modulated (PWM) AC Drives, publication DRIVES-IN001.
(8) See the associated chapter or section for the list of parts.

**IMPORTANT** Duty cycle, load profile, temperature, altitude, incoming line conditions, and other operating/environmental conditions greatly affect reliability of a drive.
### Table 4 - Recommended Option Bay Maintenance Tasks and Schedule

| Years | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|-------|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|
| **Components and Activities** | | | | | | | | | | | | | | | | | | | | | | |
| **Air-cooling System** | | | | | | | | | | | | | | | | | | | | | | |
| IPS4 Door-mounted Air Filters | | | | | | | | | | | | | | | | | | | | | | |
| **Page** | 355 | C/R | C/R | C/R | C/R | C/R | C/R | C/R | C/R | C/R | C/R | C/R | C/R | C/R | C/R | C/R | C/R | C/R | C/R | C/R | C/R | C/R | C/R | C/R |
| IPS4 Frame 8 Cabinet-mounted Cooling Fans | | | | | | | | | | | | | | | | | | | | | | |
| **Page** | 362 | | | | | | | | | | | | | | | | | | | | | |
| IPS4 Frame 9 Cabinet-mounted Cooling Fans | | | | | | | | | | | | | | | | | | | | | | |
| **Page** | 374 | | | | | | | | | | | | | | | | | | | | | |
| IP20 Door-mounted Cooling Fans | | | | | | | | | | | | | | | | | | | | | | |
| **Page** | 381 | | | | | | | | | | | | | | | | | | | | | |
| Reactor Fan Tray | | | | | | | | | | | | | | | | | | | | | | |
| **Page** | 386 | | | | | | | | | | | | | | | | | | | | | |
| **Control Components** | | | | | | | | | | | | | | | | | | | | | | |
| Frame 8 Control Transformer | | | | | | | | | | | | | | | | | | | | | | |
| **Page** | 364 | | | | | | | | | | | | | | | | | | | | | |
| Frame 9 Control Transformer | | | | | | | | | | | | | | | | | | | | | | |
| **Page** | 380 | | | | | | | | | | | | | | | | | | | | | |
| Frame 9 Fan Control Relay | | | | | | | | | | | | | | | | | | | | | | |
| **Page** | 391 | | | | | | | | | | | | | | | | | | | | | |
| **Spare Parts** | Inventory/ Needs(2) | | | | | | | | | | | | | | | | | | | | | |
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(1) Inspect and replace filters every 3 months or more frequently, depending on the environment.
(2) See the associated chapter or section for the list of parts.

**IMPORTANT** Duty cycle, load profile, temperature, altitude, incoming line conditions, and other operating/environmental conditions greatly affect reliability of a drive.
Notes:
Chapter 3

Component Inspection and Test Procedures

<table>
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<th>Topic</th>
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<tr>
<td>Converter Fuse Tests</td>
<td>53</td>
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<tr>
<td>Converter Gate-lead Resistance Measurements</td>
<td>53</td>
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<tr>
<td>DC Precharge Assembly Fuse Tests</td>
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</table>

This chapter provides details about how to inspect and test the major components of the drive and includes recommendations for repairs.
Chapter 3  Component Inspection and Test Procedures

Component Inspection and Maintenance

Visually inspect the door filters, heatsink fan inlet screen, and major components on the control pod, converter or DC input with precharge assembly, and inverter for dirt and damage. Dirt build-up on some components can lead to component damage or failure. By replacing components and/or circuit boards with burn marks, breakage, or foil delamination, you can help prevent damage to the drive. Use this procedure with the Recommended Preventive Maintenance on page 37.

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Inspect the door fans for blockage and verify free rotation. Clean or replace as necessary.
   - For AC input drives, see IP20, NEMA/UL Type 1 Enclosure Door Fan Removal/Installation on page 306.
   - For common DC input drives, see Enclosure Door Fan Removal/Installation on page 333.
   - For option bays, see IP20, NEMA/UL Type 1 Door Fan Removal/Installation (Frame 8 Only) on page 351.

4. Remove the filters from the enclosure doors and inspect for blockage. For IP54, NEMA/UL Type 12 enclosures, remove the filters from the cabinet blower, and inspect for blockage. Clean or replace all filters as necessary. See IP20, NEMA/UL Type 1 Door Filter Removal/Installation on page 313, and/or IP54, NEMA/UL Type 12 Cabinet Blower Exhaust Filters Removal/Installation on page 312 and IP54, NEMA/UL Type 12 Cabinet Door Filters Removal/Installation on page 314.

5. Open the enclosure door.

6. Inspect the heatsink fan inlet screen for blockage and clean it, if necessary.

7. Inspect the heatsink fan blower for dirt build-up and/or damage and verify free rotation. Clean or replace as necessary. See Heatsink Fan Assembly Removal/Installation on page 236.

8. Remove the protective covers from the control pod, converter or DC input with precharge assembly, and inverter assemblies. See Control Pod Cover Removal/Installation on page 59, Converter Left Cover Removal/Installation on page 87 or DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard Removal/Installation on page 163, and Inverter Front Cover Removal/Installation on page 239.

9. Check all visible major components on the control pod, converter or DC input with precharge assembly, and inverter assemblies. Replace any of these components without further testing if they show evidence of burn marks or breakage.
10. Check all visible circuit boards, wires, and connectors on the control pod, converter or DC input with precharge assembly, and inverter assemblies. Replace any of these circuit boards and/or wires without further testing if they show evidence of burn marks, breakage, or foil delamination.

11. If the inspections performed in steps 3–7 resulted in heavy build-up of dirt and or debris, inspect the cooling tunnels and heatsink fins on the converter and inverter assemblies. Clean the cooling tunnels and heatsink fins, if necessary. To inspect the cooling tunnels and heatsink fins, you must remove the drive from the enclosure and remove the converter. See the PowerFlex® 750-Series AC Drive Installation Instructions, publication number 750-IN001. For instructions on how to remove the converter, refer to Converter Removal/Installation on page 152.

Forward and Reverse Biased SCR/Diode Tests

This section contains procedures for performing both forward and reverse biased SCR/diode tests on the major power components of the drive. A failed test indicates damage to the components in the converter or inverter and requires replacement.

IMPORTANT The actual voltage readings can vary depending upon your equipment. If your readings are not near the indicated values in Table 5…Table 8, on pages 51…52, verify that the actual voltage that is measured is consistent for each phase of the converter and inverter.

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Open the drive enclosure door.

4. Remove the control transformer primary fuses (FU4 and FU5). See Remove the Control Transformer Primary Fuses (FU4 and FU5) on page 21.
5. Remove the connection bolts from the output power terminals (U, V, W) and set them aside.

6. Insert an appropriate insulation material between the terminals (U, V, W) on the drive power unit and the enclosure. To receive accurate readings for these tests, the terminals must not make contact.

Figure 7 - Power Terminal Connections

![Diagram of power terminal connections]

- **AC Input Terminals:** R/L1, S/L2, T/L3
- **DC Bus Terminals:** DC-, DC+
- **Output Power Terminals:** U, V, W
- **All Terminals:** M8 x 30 Machine Screws
- **Tolerant:** T45
- **22.6 N-m (200.0 lb-in)**
7. Complete the forward biased SCR/diode tests on the converter assembly as identified in Table 5.

### Table 5 - Forward Biased SCR/Diode Tests on the Converter SCR Assembly

<table>
<thead>
<tr>
<th>Meter Leads</th>
<th>Nominal Meter Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>– DC+</td>
<td>+ R/L1</td>
</tr>
<tr>
<td>DC+</td>
<td>S/L2</td>
</tr>
<tr>
<td>DC+</td>
<td>T/L3</td>
</tr>
<tr>
<td>R/L1</td>
<td>DC-</td>
</tr>
<tr>
<td>S/L2</td>
<td>DC-</td>
</tr>
<tr>
<td>T/L3</td>
<td>The value should gradually rise to between 0.20V and 0.75V. If the value is outside this range, contact Technical Support. (2)</td>
</tr>
</tbody>
</table>

(1) Residual voltage on the DC bus capacitors can affect this reading. If the capacitors are completely discharged (less than 1 volt), the meter initially shows a low voltage. This voltage reading is the residual bus voltage plus the drop through the low side diodes. The meter gradually charges the bus, and the voltage slowly increases, until eventually the meter switches to “OL”. This increase can take several minutes to occur.

(2) The actual voltage reading can vary depending upon your equipment.

8. If performing the Reverse Biased Diode Tests on the Converter SCR Assembly identified Table 6, remove the connection bolts from the DC bus terminals (DC-, DC+) between the converter and inverter assemblies, and set them aside. See Figure 7 on page 50 for terminal locations.

9. Insert an appropriate insulation material between the DC bus terminals (DC-, DC+) between the converter and inverter. To receive accurate readings for these tests, the terminals must not make contact.

10. Complete the reverse biased SCR/diode tests on the converter as identified in Table 6.

### Table 6 - Reverse Biased Diode Tests on the Converter SCR Assembly

<table>
<thead>
<tr>
<th>Meter Leads</th>
<th>Nominal Meter Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ DC-</td>
<td>– R/L1</td>
</tr>
<tr>
<td>R/L1</td>
<td>DC-</td>
</tr>
<tr>
<td>S/L2</td>
<td>DC-</td>
</tr>
<tr>
<td>T/L3</td>
<td>DC-</td>
</tr>
<tr>
<td>DC+</td>
<td>R/L1</td>
</tr>
<tr>
<td>DC+</td>
<td>S/L2</td>
</tr>
<tr>
<td>DC+</td>
<td>T/L3</td>
</tr>
</tbody>
</table>

(1) Residual voltage on the DC bus capacitors can affect this reading. If the capacitors are completely discharged (less than 1 volt), the meter initially shows a low voltage. This voltage reading is the residual bus voltage plus the drop through the low side diodes. The meter gradually charges the bus, and the voltage slowly increases, until eventually the meter switches to “OL”. This increase can take several minutes to occur.

11. Replace the converter section or converter SCR assembly if it fails these measurements. See Converter Removal/Installation on page 152, or Converter SCR Assembly Removal/Installation on page 111.

12. Install the control transformer primary fuses (FU4 and FU5). See Install the Control Transformer Primary Fuse (FU4 and FU5) on page 91.
13. Complete the forward and reverse biased diode tests on the inverter IGBT assembly as identified in Table 7 and Table 8.

**TIP** Reverse bias diode tests on the IGBT are for reference troubleshooting only and can result in readings other than 0.0V (or close to 0) or the OL. The readings can vary widely depending on the meter used, the amount of charge on the batteries in the meter, and the current temperature of the drive unit.

### Table 7 - Forward Biased Diode Tests on the Inverter IGBT Assembly

<table>
<thead>
<tr>
<th>Meter Leads</th>
<th>Nominal Meter Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC- U</td>
<td>The value should gradually rise to between 0.20V and 0.75V. If the value is outside this range, contact Technical Support. (1)</td>
</tr>
<tr>
<td>DC- V</td>
<td></td>
</tr>
<tr>
<td>DC- W</td>
<td></td>
</tr>
<tr>
<td>U DC+</td>
<td></td>
</tr>
<tr>
<td>V DC+</td>
<td></td>
</tr>
<tr>
<td>W DC+</td>
<td></td>
</tr>
</tbody>
</table>

(1) The actual voltage reading can vary depending upon your equipment.

### Table 8 - Reverse Biased Diode Tests on the Inverter IGBT Assembly

<table>
<thead>
<tr>
<th>Meter Leads</th>
<th>Nominal Meter Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>U DC-</td>
<td>“0L” (open circuit) (1)</td>
</tr>
<tr>
<td>V DC-</td>
<td></td>
</tr>
<tr>
<td>W DC-</td>
<td></td>
</tr>
<tr>
<td>DC+ U</td>
<td></td>
</tr>
<tr>
<td>DC+ V</td>
<td></td>
</tr>
<tr>
<td>DC+ W</td>
<td></td>
</tr>
</tbody>
</table>

(1) Residual voltage on the DC bus capacitors can affect this reading. If the capacitors are completely discharged (less than 1 volt), the meter initially shows a low voltage. This voltage reading is the residual bus voltage plus the drop through the low side diodes. The meter gradually charges the bus, and the voltage slowly increases, until eventually the meter switches to “OL”. This increase can take several minutes to occur.

14. Replace the inverter section if it fails these measurements. To remove the inverter, see the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001.

15. Complete the procedures in Chapter 12 Drive Startup after Repairs on page 419 before placing the drive back into service.
Converter Fuse Tests

Follow these steps to perform converter fuse tests.

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Test the control transformer secondary fuse (FU6) by removing it from the fuse holder. Replace the fuse as necessary. See Control Transformer Secondary Fuse Removal/Installation on page 92.
5. Test the control transformer primary fuses (FU4 and FU5) by removing them from the fuse holder. See Remove the Control Transformer Primary Fuses (FU4 and FU5) on page 91.
6. Continuity test the AC line fuses (FU1, FU2, and FU3) in circuit. If fuses are blown, analyze to reveal the root cause. Replace a fuse as necessary. See AC Line Fuse Removal/Installation on page 99.
7. Replace the control transformer primary fuses (FU4 and FU5) as necessary. See Install the Control Transformer Primary Fuse (FU4 and FU5) on page 91.

Converter Gate-lead Resistance Measurements

Follow these steps to perform resistance measurements on the gate leads for the converter.

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. To provide access to the converter gate board, open the control pod. See Rotate the Control Pod Forward on page 88.
5. Disconnect the SCR gate harness J11 from P11 on the converter gate board.

6. Complete the gate circuit measurements on the J11 harness as identified in Table 9.

Table 9 - Gate Circuit Measurements

<table>
<thead>
<tr>
<th>Meter Lead +</th>
<th>Meter Lead -</th>
<th>Nominal Meter Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>J11-1, SCR Gate L1</td>
<td>J11-2, SCR Cathode L1</td>
<td>12…30 ohms</td>
</tr>
<tr>
<td>J11-3, SCR Gate L2</td>
<td>J11-4, SCR Cathode L2</td>
<td>12…30 ohms</td>
</tr>
<tr>
<td>J11-5, SCR Gate L3</td>
<td>J11-6, SCR Cathode L3</td>
<td>12…30 ohms</td>
</tr>
</tbody>
</table>

- An “OL” reading can indicate an open wire harness or a disconnected intermediate connector. Verify the harness integrity by making a continuity measurement. Replace a faulty harness if indicated by these measurements.
- A “shorted” meter reading can indicate a failed SCR. Replace the converter SCR assembly if it fails these measurements. See Converter SCR Assembly Removal/Installation on page 111.

7. Connect the SCR gate harness to P11 on the converter gate board.
8. Return the control pod to the service position. See Return the Control Pod to the Service Position on page 21.

DC Precharge Assembly Fuse Tests

Follow these steps to test the fuses on the DC precharge assembly.

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Test the control transformer 240V secondary fuse (FU5) by removing it from the fuse holder. Replace the fuse as necessary. See Control Transformer Secondary Fuses Removal/Installation on page 172.
5. Test the control transformer 120V secondary fuse (FU6) by removing it from the fuse holder. Replace the fuse as necessary. See Control Transformer Secondary Fuses Removal/Installation on page 172.
6. Test the DC line fuses (FU1 and FU2) in circuit. Replace a fuse as necessary. See DC Line Fuses and Fuse Indicators Removal/Installation on page 180.
7. Test the DC precharge fuses (FU3 and FU4) in circuit. Replace a fuse as necessary. See Precharge Circuit Fuses Removal/Installation on page 182.
Notes:
Chapter 4

Control Pod Component Replacement Procedures

Table 10 contains the components that comprise the control pod and provides the following information for each component, if applicable:

- Kit catalog number or part number
- Quantity that is contained in the kit
- Illustration figure and page number and identification number

See PowerFlex Architecture Class Low Voltage Drives Spare Parts Options, publication PFLEX-SB002 for a complete list of spare parts for PowerFlex® 755 Frame 8...10 drives.

### Control Pod Components Identification

Complete the procedures in Chapter 12 Drive Startup after Repairs that begin on page 419 before placing the drive back into service.

**Table 10 - Control Pod Replacement Kits/Parts**

<table>
<thead>
<tr>
<th>Component Description</th>
<th>Replacement Kit Cat. No. or Part No.</th>
<th>Quantity</th>
<th>Figure and Page</th>
<th>ID No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Pod</td>
<td>20-750-POD1-F8</td>
<td>1</td>
<td>Figure 8 on page 58</td>
<td>–</td>
</tr>
<tr>
<td>Frame 8 Main Control Board</td>
<td>SK-R1-MCB1-F8</td>
<td>1</td>
<td>Figure 8 on page 58</td>
<td>1</td>
</tr>
<tr>
<td>Main Control Board Terminal Block</td>
<td>SK-R1-TB-PF755</td>
<td>1</td>
<td>Figure 8 on page 58</td>
<td>2</td>
</tr>
<tr>
<td>Backplane Board</td>
<td>SK-R1-BP1</td>
<td>1</td>
<td>Figure 8 on page 58</td>
<td>3</td>
</tr>
<tr>
<td>Control Pod HIM Bezel</td>
<td>SK-R1-BZ1</td>
<td>1</td>
<td>Figure 8 on page 58</td>
<td>4</td>
</tr>
<tr>
<td>Fiber Interface Board (Includes a fiber-optic transceiver)</td>
<td>SK-R1-FIB1-F8</td>
<td>1</td>
<td>Figure 8 on page 58</td>
<td>5</td>
</tr>
<tr>
<td>Control Pod Cover</td>
<td>SK-R1-CVRP1-F8</td>
<td>1</td>
<td>Figure 8 on page 58</td>
<td>6</td>
</tr>
<tr>
<td>Internal Cooling Fan</td>
<td>SK-R9-FAN2-F23</td>
<td>1</td>
<td>Figure 8 on page 58</td>
<td>7</td>
</tr>
<tr>
<td>Remote Mount Control Pod Kit</td>
<td>20-750-RPD1-F8</td>
<td>1</td>
<td>See publication 750-IN015</td>
<td>–</td>
</tr>
</tbody>
</table>

This chapter provides detailed procedures for how to remove and replace control pod components.
Figure 8 - Control Pod Components
Control Pod Cover Removal/Installation

Remove the Control Pod Cover

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Loosen, but do not remove, the bottom two M4 x 12 mm slotted hexalobular screws that secure the cover to the assembly.
5. Remove the top two M4 x 12 mm slotted hexalobular screws that secure the cover to the assembly and remove the cover.

Install the Control Pod Cover

Install the control pod cover in the reverse order of removal. See Control Pod Cover Removal/Installation on page 59.
Control Pod Cables Removal/Installation

Remove the Control Pod Cables

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Open the drive enclosure door.

4. Remove the control pod cover. See Control Pod Cover Removal/Installation on page 59.

5. Disconnect the drive internal 24V wire harness J14 connector from the fiber interface board P14 terminal.

6. If installed, disconnect the customer supplied 24V supply power wiring from the fiber interface board P13 terminal.

Install the Control Pod Cables

Install the control pod cable set in the reverse order of removal. See Remove the Control Pod Cables on page 60.
Fiber-optic Cable Removal/Installation (Frame 8)

Remove the Fiber-optic Cable (Frame 8)

Note: For instructions on how to remove the fiber-optic cables on frame 9 and larger drives, see Chapter 11 - Enclosure Cable Components Replacement Procedures (Frame 9 and Larger Drives) that begin on page 397.

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Open the drive enclosure door.

4. Remove the control pod cover. See Control Pod Cover Removal/Installation on page 59.

5. Remove the inverter circuit board connections cover from the inverter. See Inverter Circuit Board Connections Cover Removal/Installation on page 238.

**IMPORTANT** Minimum inside bend radius for fiber-optic cable is 50 mm (2 in.). Any bends with a shorter inside radius can permanently damage the fiber-optic cable. Signal attenuation increases with decreased inside bend radii.
6. Disconnect the fiber-optic cable from INV1 on the fiber interface board and INV on the power layer interface board in the inverter card cage.

**TIP**

Listed are the different circuit board locations:
Chapter 4 *Figure 8 on page 58* call-out #5
Chapter 5 *Figure 10 on page 86* call-out #21
Chapter 6 *Figure 12 on page 162* call-out #28
Chapter 7 *Figure 14 on page 232* call-out #7
7. Disconnect the fiber-optic cable from CONV on the converter gate board and CONV on the power layer interface board in the inverter card cage.
Install the Fiber-optic Cable (Frame 8)

**IMPORTANT** Minimum inside bend radius for fiber-optic cable is 50 mm (2 in.). Any bends with a shorter inside radius can permanently damage the fiber-optic cable. Signal attenuation increases with decreased inside bend radii.

Install the fiber-optic cable set in the reverse order of removal. See Remove the Fiber-optic Cable (Frame 8) on page 61.

**IMPORTANT** Frame 8 fiber-optic cables that connect the fiber interface and converter gate boards to the power layer interface board must be the same length. Cables are 560 mm (22 in.) long to meet this requirement.

- Install the new fiber-optic cables from the converter gate board to the power layer interface board by using the two center cable supports provided, as shown in this illustration.
• Install the new fiber-optic cables from the fiber interface board to the power layer interface board by using the two, outer-most cable supports provided, as shown in this illustration.

Main Control Board Removal/Installation

Remove the Main Control Board (Control Pod in Drive Enclosure)

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the control pod cover. See Control Pod Cover Removal/Installation on page 59.
5. Loosen the retention screw that secures the HIM cradle to the control pod frame and swing the cradle upward until the latch engages.
6. If installed, remove the option module in slot 7, by loosening the two captive thumb screws on the module and by pulling the board out of the control pod. The torque requirement for installation is the same as for the main control board.

7. Disconnect the plug-in terminal block (TB1) on the main control board.

8. Disconnect the HIM and stirring fan power wire connectors from the main control board.

9. Loosen the three captive thumb screws and remove the board.
**Install the Main Control Board**

Install the Main Control board in the reverse order of removal. See Remove the Main Control Board (Control Pod in Drive Enclosure) on page 65.

---

**IMPORTANT** Verify that the main control board seats properly into the connectors on the backplane and fiber interface boards when installing a new board.

---

**Control Pod Removal/Installation**

**Remove the Control Pod**

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the converter left cover. See Remove the Converter Left Cover on page 87.
5. Remove the control pod cover. See Control Pod Cover Removal/Installation on page 59.
6. Remove the inverter circuit board connections cover from the inverter. See Inverter Circuit Board Connections Cover Removal/Installation on page 238.
7. Disconnect the J14 connector from the fiber interface board P14 terminal.

8. If installed, disconnect the customer supplied 24V supply power wiring from the fiber interface board P13 terminal.
9. Disconnect the fiber-optic cable from INV on the power layer interface board in the inverter card cage. Place the cable ends on the bottom of the control pod and follow the minimum bend radius requirement.

**IMPORTANT** Minimum inside bend radius for fiber-optic cable is 50 mm (2 in.). Any bends with a shorter inside radius can permanently damage the fiber-optic cable. Signal attenuation increases with decreased inside bend radii.
10. If installed, disconnect the plug-in terminal block (TB1) on the main control board.

11. Loosen the two M4 captive panel fasteners that secure the control pod to the converter control panel and rotate the assembly forward to the right.
12. Remove the four M4 x 12 mm screws that secure the control pod to the converter control panel, right-side wall and remove the control pod.

Install the Control Pod

Install the control pod in the reverse order of removal. See Remove the Control Pod on page 68.
Fiber Interface Board
Removal/Installation

Remove the Fiber Interface Board

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the control pod cover. See Control Pod Cover Removal/Installation on page 59.
5. Disconnect the J14 connector from the fiber interface board P14 terminal.
6. If installed, disconnect the customer supplied 24V supply power wiring from the fiber interface board P13 terminal.

7. Disconnect the inverter fiber-optic cable from INV1 on the fiber interface board, carefully coil the fiber-optic cable, and place it in the bottom of the control pod. Follow the minimum bend radius requirement.
8. From fiber-optic cage INV1 on the fiber interface board, remove the transceiver by pulling its wire latch. Set the transceiver aside and save for reinstallation.

9. Loosen the retention screw that secures the HIM cradle to the control pod frame and swing the cradle upward until the latch engages.

10. Disconnect all wiring to the main control-board terminal block (TB1).

11. If installed, disconnect all wiring to all option module terminal blocks.
12. If installed, remove the option module in slot 7, by loosening the two captive thumb screws on the module and by pulling the board out of the control pod. The torque requirement for installation is the same as for the main control board.

13. Disconnect the HIM and stirring fan power wire connectors from the main control board.

14. Loosen the three captive thumb screws and remove the board.
15. Press the two tabs on the sides of the fan housing inward, and remove the stirring fan assembly from the top of the control pod chassis.
16. Remove the four M4 x 12 mm screws that secure the control pod chassis to the standoffs on the control panel, then remove control pod chassis.

**IMPORTANT** The four M4 x 12 mm screws that secure the control pod chassis to the control panel are not retentive. Take steps to be sure that the screws do not fall into the drive below.

17. Remove all routed wiring and six anchors from the left sidewall of the control panel and move the wiring to the outside of the control panel.

18. Remove the M4 hex stand from the center of the fiber interface circuit board.
19. Remove the four M4 x 10 mm long screws that secure fiber interface board to the control pod.

20. Move the fiber interface board slightly upward toward top of the control pod, so that keyholes on board clear the mounting posts and lift off the board.

21. The right side of the board must clear the mounting tab in right sidewall of the control pod. Slowly rotate the left side of fiber interface board away from the control pod. Remove the board from the control pod.

22. Inspect the fiber interface board-insulator sheet and replace it if damaged.
Install the Fiber Interface Board

IMPORTANT  Minimum inside bend radius for fiber-optic cable is 50 mm (2 in.). Any bends with a shorter inside radius can permanently damage the fiber-optic cable. Signal attenuation increases with decreased inside bend radii.

Install the fiber interface board in the reverse order of removal. See Remove the Fiber Interface Board on page 73.

IMPORTANT  The insulator sheet must be installed behind the fiber interface board. When installing the fiber-optic cable, be sure that the wire latch is down.
# Converter Component Replacement Procedures

<table>
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<tr>
<td>Converter Right Cover (No Control Pod) Removal/Installation</td>
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<td>Control Pod Rotation</td>
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<td>Control Transformer Primary Fuses Removal/Installation</td>
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<td>Control Transformer Secondary Fuse Removal/Installation</td>
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<td>Converter EMC Filter Circuit Board Removal/Installation</td>
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<td>Converter Input Fuse Stirring Fan Removal/Installation</td>
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<td>AC Line Fuse Sense Wire Harness Removal/Installation</td>
<td>97</td>
</tr>
<tr>
<td>AC Line Fuse Removal/Installation</td>
<td>99</td>
</tr>
<tr>
<td>DC Bus Sense Wire Harness Removal/Installation</td>
<td>101</td>
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<td>Converter Current Sensor Wire Harness Removal/Installation</td>
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<td>Converter Current Sensors Removal/Installation</td>
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<td>Converter SCR Gate Wire Harness Removal/Installation</td>
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<td>Converter Heat Sink Gasket Replacement</td>
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<td>AC Line Wire Harness Removal/Installation</td>
<td>123</td>
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<td>Surge-suppressor Sense Wire Harness Removal/Installation</td>
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<tr>
<td>Surge Suppressor Removal/Installation</td>
<td>126</td>
</tr>
<tr>
<td>Surge Suppressor Assembly Removal/Installation</td>
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<td>Converter Gate Board Stirring Fan Removal/Installation</td>
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<tr>
<td>24V/240V Power Wire Harness Removal/Installation</td>
<td>132</td>
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<tr>
<td>Control-transformer Primary Wire Harness Removal/Installation</td>
<td>138</td>
</tr>
<tr>
<td>Control Transformer Removal/Installation</td>
<td>140</td>
</tr>
<tr>
<td>No DC Bus Fuse Wire Harness Removal/Installation</td>
<td>143</td>
</tr>
<tr>
<td>DC Bus Fuse Wire Harness Removal/Installation</td>
<td>144</td>
</tr>
<tr>
<td>Control Power Isolator Board 24V Wire Harness Removal/Installation (600/690V AC Input Drives Only)</td>
<td>146</td>
</tr>
<tr>
<td>Control Power Isolator Board 24V Wire Harness Removal/Installation (600/690V AC Input Drives Only)</td>
<td>148</td>
</tr>
<tr>
<td>Converter Gate Circuit Board Removal/Installation</td>
<td>149</td>
</tr>
<tr>
<td>Converter Removal/Installation</td>
<td>152</td>
</tr>
<tr>
<td>Converter Duct Gasket Replacement</td>
<td>155</td>
</tr>
</tbody>
</table>
This chapter provides detailed procedures for how to remove and replace converter components.

**TIP** In some illustrations in this chapter, the converter and/or control pod are shown removed from the drive to clarify the instructions only. Only remove the converter and/or control pod from the drive if directed to do so.

**IMPORTANT** Complete the procedures in Chapter 12 Drive Startup after Repairs that begin on page 419 before placing the drive back into service.

### Converter Components Identification

Table 11 contains the components that comprise the converter assembly and provides the following information for each component, if applicable:

- Kit catalog number or part number
- Quantity that is contained in the kit
- Illustration figure and page number and identification number

See PowerFlex Architecture Class Low Voltage Drives Spare Parts Options, publication PFLEX-SB002 for a complete list of spare parts for PowerFlex® 755 Frame 8…10 and larger drives.

#### Table 11 - Converter Replacement Kits/Parts

<table>
<thead>
<tr>
<th>Component Description</th>
<th>Replacement Kit Cat. No. or Part No.</th>
<th>Quantity</th>
<th>Figure and Page</th>
<th>ID No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC Drive Converter Unit, 400V, 770 A / 480V, 740 A</td>
<td>20-750-C1-C770D740 (Series A) 20-750-C6-C770D740 (Series B)</td>
<td>1</td>
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<tr>
<td>AC Drive Converter Unit, 600V, 510 A / 690V, 500 A</td>
<td>20-750-C6-E510F500 (Series B)</td>
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<tr>
<td>Control Transformer Fuses for 400/480V AC Input Drives, with Converter Cat. No. 20-750-C1-C770D740 ... 20-750-C5-C770D740</td>
<td>SK-R1-FUSE2-CD-F8</td>
<td>–</td>
<td>–</td>
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<tr>
<td>Fuse, 8 A, 600V, IEC Class gG/gl, 14 x 51 mm (FU4 / FU5)</td>
<td>2</td>
<td>Figure 9 on page 85</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Fuse, 5 A, 600V, Class CC, Time-Delay (FU6)</td>
<td>1</td>
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</tr>
<tr>
<td>Control Transformer Fuses for 400/480V AC Input Drives, with Converter Cat. No. 20-750-C6-C770D740</td>
<td>SK-R1-FUSE4-CD-F8</td>
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</tr>
<tr>
<td>Fuse, 6 A, 600V, IEC Class gG/gl, 14 x 51 mm (FU4 / FU5)</td>
<td>2</td>
<td>Figure 9 on page 85</td>
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<tr>
<td>Fuse, 5 A, 600V, Class CC, Time-Delay (FU6)</td>
<td>1</td>
<td>Figure 10 on page 86</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Control Transformer Fuses Kit for 600/690V AC Input Drives with Converter Cat. No. 20-750-C2-E510F500 ... 20-750-C5-E510F500</td>
<td>SK-R1-FUSE2-EF-F8</td>
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<td></td>
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<tr>
<td>Fuse, 6 A, 690V, IEC Class gG/gl, 14 x 51 mm (FU4 / FU5)</td>
<td>2</td>
<td>Figure 9 on page 85</td>
<td>1</td>
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<tr>
<td>Fuse, 5 A, 600V, Class CC, Time-Delay (FU6)</td>
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<td>Figure 10 on page 86</td>
<td>2</td>
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</tr>
<tr>
<td>Control Transformer Fuses Kit for 600/690V AC Input Drives with Converter Cat. No. 20-750-C6-E510F500</td>
<td>SK-R1-FUSE4-EF-F8</td>
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<td>–</td>
<td></td>
</tr>
<tr>
<td>Fuse, 8 A, 690V, IEC Class gG/gl, 14 x 51 mm (FU4 / FU5)</td>
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<td>Figure 9 on page 85</td>
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<tr>
<td>Fuse, 5 A, 600V, Class CC, Time-Delay (FU6)</td>
<td>1</td>
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<td>2</td>
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### Table 11 - Converter Replacement Kits/Parts (continued)

<table>
<thead>
<tr>
<th>Component Description</th>
<th>Replacement Kit Cat. No. or Part No.</th>
<th>Quantity</th>
<th>Figure and Page</th>
<th>ID No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC Line Fuse Kit 1100 A, 400/480V AC Input Drives</td>
<td>SK-R1-FUSE1-CD-F8</td>
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<tr>
<td>Fuse, 690/700V, 1100 A</td>
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<tr>
<td>Fuse Indicator</td>
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<td></td>
<td></td>
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<tr>
<td>AC Line Fuse Kit 900 A, 600/690V AC Input Drives</td>
<td>SK-R1-FUSE1-EF-F8</td>
<td>1</td>
<td>Figure 9 on page 85</td>
<td>4</td>
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<tr>
<td>Fuse, 690/700V, 900 A</td>
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<tr>
<td>Fuse Indicator</td>
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<tr>
<td>Converter EMC Filter Board, 400/480V and 600/690V AC Input Drives</td>
<td>SK-R1-EMCFLT2-F8 (Series B)</td>
<td>1</td>
<td>Figure 9 on page 85</td>
<td>5</td>
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<tr>
<td>Figur 9 on page 85</td>
<td>6</td>
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<td></td>
<td></td>
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<tr>
<td>Converter SCR Gate Wire Harness</td>
<td>SK-R1-SCR1-CD-F8</td>
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<td>Figure 9 on page 85</td>
<td>17</td>
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<tr>
<td>Converter SCR Gate Wire Harness, 600/690V AC Input Drives</td>
<td>SK-R1-SCR1-EF-F8</td>
<td>1</td>
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<tr>
<td>Converter Current Sensor Wire Harness</td>
<td>SK-R1-CNVI1FB2-F8 (Series B)</td>
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<td>Control Transformer Primary Wire Harness</td>
<td>SK-R1-XFMR1-F8</td>
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<td>19</td>
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<tr>
<td>DC Bus Sense Wire Harness</td>
<td>SK-R1-MOV1-CD-F8</td>
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<tr>
<td>No DC Bus Fuse Wire Harness</td>
<td>SK-R1-MOV1-EF-F8</td>
<td>1</td>
<td>Figure 10 on page 86</td>
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<td>Surge Suppressor Sense Wire Harness</td>
<td>SK-R1-CGDB1-CD-F8 (Series A) SK-R1-CGDB4-CD-F8 (Series B)</td>
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<td>Figure 10 on page 86</td>
<td>21</td>
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<tr>
<td>Inverter Power Supply Wire Harness</td>
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<td>Assembly, External NTC</td>
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<tr>
<td>Converter SCR Assembly, 400/480V AC Input Drives</td>
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<td>Figure 9 on page 85</td>
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<tr>
<td>Converter SCR Assembly, 600/690V AC Input Drives</td>
<td>SK-R1-SCR1-EF-F8</td>
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<td>Figure 9 on page 85</td>
<td>17</td>
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<tr>
<td>Converter Current Sensor, 400/480V and 600/690V AC Input Drives</td>
<td>SK-R1-CNVI2FB2-F8 (Series B)</td>
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<td>18</td>
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<td>Control Transformer</td>
<td>SK-R1-XFMR1-F8</td>
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<tr>
<td>Converter Surge Suppressor, 400/480V AC Input Drives</td>
<td>SK-R1-MOV1-CD-F8</td>
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<tr>
<td>Converter Surge Suppressor, 600/690V AC Input Drives</td>
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<tr>
<td>Converter Gate Board, 400/480V AC Input Drives (Includes a fiber-optic transceiver)</td>
<td>SK-R1-CCVR1-F8</td>
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<td>24</td>
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<tr>
<td>Converter Gate Board, 600/690V AC Input Drives (Includes a fiber-optic transceiver)</td>
<td>SK-R1-CCVR4-CD-F8 (Series B)</td>
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<td>24</td>
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<tr>
<td>Fiber-optic Cable, 560 mm (22 in.) Long Kit (Frame 8 Drives)</td>
<td>20-750-FCBL1-F8</td>
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<td>22</td>
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<tr>
<td>Fiber-optic Cable, 560 mm (22 in.) Long</td>
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<td>Cable Labels (CONV and INV)</td>
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<tr>
<td>Fiber-optic Cable, 2.8 m (110 in.) Long Kit (1)</td>
<td>20-750-FCBL1-F10</td>
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<td>(See page 397 for more information)</td>
<td>22</td>
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<tr>
<td>Fiber-optic Cable, 2.8 m (110 in) Long</td>
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<tr>
<td>Cable Labels (INV1, INV2, INV3)</td>
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<tr>
<td>Fiber-optic Transceiver</td>
<td>SK-R1-FTR1-F8</td>
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<td>23</td>
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<tr>
<td>Converter Left Front Cover with Side Shield</td>
<td>SK-R1-CCVR1-F8</td>
<td>1</td>
<td>Figure 9 on page 85</td>
<td>24</td>
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</table>
## Chapter 5  Converter Component Replacement Procedures

### Table 11 - Converter Replacement Kits/Parts (continued)

<table>
<thead>
<tr>
<th>Component Description</th>
<th>Replacement Kit Cat. No. or Part No.</th>
<th>Quantity</th>
<th>Figure and Page</th>
<th>ID No.</th>
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<tr>
<td>Converter Right Front Cover (No Control Pod) Kit</td>
<td>SK-R1-CCVR2-F8</td>
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<tr>
<td>Right Front Cover</td>
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<td>25</td>
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<tr>
<td>Bracket Cover, 82 mm (3.2 in.) Long</td>
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<tr>
<td>One Bay 24V Wire Harness Kit (Frame 8)</td>
<td>20-750-PH1-F8</td>
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<tr>
<td>Two Bay 24V Wire Harness Kit (Frame 9)</td>
<td>20-750-PH2-F9</td>
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<td>27</td>
</tr>
<tr>
<td>Three Bay 24V Wire Harness Kit (Frame 10)</td>
<td>20-750-PH3-F10</td>
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<td>27</td>
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<td>Frame 8 Gasket Kit</td>
<td>20-750-G1-F8</td>
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<tr>
<td>Gasket, Converter, Heatsink</td>
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<td>28</td>
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<tr>
<td>Gasket, Converter/DC Input with Precharge Assembly, Duct</td>
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<td>29</td>
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<td>Gasket, Inverter, Heatsink</td>
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<td>Gasket, Inverter, Door Interface</td>
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<td>Gasket, Inverter, Exhaust Interface</td>
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<td>(1)</td>
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<td>Gasket, Inverter, Inlet Ring</td>
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<td>(1)</td>
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<tr>
<td>Gasket, Inverter, No Choke</td>
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<td>(1)</td>
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<td>Gasket, Inverter, Blower Box Bottom</td>
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<td>(1)</td>
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<tr>
<td>Gasket, Inverter, Choke</td>
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<td>(1)</td>
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<tr>
<td>DC Bus Fuse Wire Harness Kit (Frame 9 AC Input Drives Only)</td>
<td>SK-R1-DCBUSH1-F9</td>
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<td>30</td>
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<tr>
<td>Control Power Isolator Board Kit, 600/690V AC Input Drives</td>
<td>SK-R1-CPIB1-F8</td>
<td>1</td>
<td>Figure 9 on page 85</td>
<td>31</td>
</tr>
<tr>
<td>Control Power Isolator 24V Wire Harness Kit, 600/690V AC Input Drives</td>
<td>SK-R1-CPIH1-F8</td>
<td>1</td>
<td>Figure 9 on page 85</td>
<td>32</td>
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<tr>
<td>Converter Gate Board Stirring Fan</td>
<td>20-750-CFANKIT-F8</td>
<td>1</td>
<td>Figure 10 on page 86</td>
<td>33</td>
</tr>
<tr>
<td>Converter Input Fuse Stirring Fan</td>
<td>SK-R1-FUSEFAN-F8</td>
<td>1</td>
<td>Figure 9 on page 85</td>
<td>34</td>
</tr>
<tr>
<td>Chassis mounting screw (4 captive screw sets, 4 long bolts)</td>
<td>SK-R1-PCSCREWS</td>
<td>1</td>
<td>Figure 10 on page 86</td>
<td>35</td>
</tr>
</tbody>
</table>

(1) Order 2 kits for frame 9 drives. Order 3 kits for frame 10 drives.

(2) This gasket is included in the Frame 8 Gasket Kit (20-750-G1-F8), but is identified in Chapter 7 - Inverter Component Replacement Procedures on page 83.
Figure 9 - Converter Assembly Components Diagram 1

Note: Covers shown at smaller scale than other components.
Figure 10 - Converter Assembly Components Diagram 2

600/800 V AC Drives Only

Frame 8 Drives Only

600/690 V AC Drives Only

Frame 9 AC Input Drives Only

400/480 V AC Drives Only

Frame 8 AC Input Drives Only
Converter Left Cover
Removal/Installation

Remove the Converter Left Cover

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the four M5 x 14 mm screws that secure the cover to the assembly and remove the cover.

Install the Converter Left Cover

Install the converter cover in the reverse order of removal. See Remove the Converter Left Cover.

TIP
See Fastener/Tool/Torque Information on page 33 for descriptions of the fasteners, tools, and torque figures that are used in the disassembly/assembly procedures in this chapter.
Converter Right Cover (No Control Pod) Removal/Installation

Remove the Converter Right Cover (No Control Pod)

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the four M5 x 14 mm screws that secure the cover to the assembly and remove the cover.

Install the Converter Right Cover (No Control Pod)

Install the converter cover (no control pod) in the reverse order of removal. See Remove the Converter Right Cover (No Control Pod).

Control Pod Rotation

Rotate the Control Pod Forward

Use this procedure to move the control pod, when it is installed on the converter assembly, to access other components behind it.

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the converter left cover or DC input with precharge assembly left cover, top guard, and left guard. See Remove the Converter Left Cover on page 87 or Remove the DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard on page 163.

5. Remove the control pod cover. See Remove the Control Pod Cover on page 59.

6. Disconnect the drive internal 24V wire harness J14 connector from the fiber interface board (in the control pod) P14 terminal.

7. If installed, disconnect the customer supplied 24V supply power wiring from the fiber interface board P13 terminal.

8. Remove the inverter circuit board connections cover from the inverter. See Inverter Circuit Board Connections Cover Removal/Installation on page 238.
9. Disconnect the inverter fiber-optic cable from INV and the converter fiber-optic cable from CONV on the inverter power-layer interface board in the inverter card cage assembly. Place the cables on the bottom of the control pod and follow the minimum bend radius requirement. Verify that cable damage does not occur when moving the control pod.

10. Loosen the two M4 captive panel fasteners that secure the control pod to the converter control panel and rotate the control pod forward.

**IMPORTANT** Minimum inside bend radius for fiber-optic cable is 50 mm (2 in.). Any bends with a shorter inside radius can permanently damage the fiber-optic cable. Signal attenuation increases with decreased inside bend radii.
Return the Control Pod to the Service Position

Return the control pod to the service position in the reverse order. See Rotate the Control Pod Forward on page 88.

Control Transformer Primary Fuses Removal/Installation

Remove the Control Transformer Primary Fuses (FU4 and FU5)

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the converter left cover. See Remove the Converter Left Cover.
5. Remove the fuse from the two-position fuse holder by using a fuse puller.

Install the Control Transformer Primary Fuse (FU4 and FU5)

Install the control transformer primary fuse (FU4 and FU5) in the reverse order of removal. See Remove the Control Transformer Primary Fuses (FU4 and FU5).
Control Transformer Secondary Fuse Removal/Installation

Remove the Control Transformer Secondary Fuse (FU6)

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. If the control pod is installed, then rotate the control pod to gain access to the converter control panel. See Rotate the Control Pod Forward on page 88.
   
   If the control pod is not installed, then remove the converter right cover. See Remove the Converter Right Cover (No Control Pod) on page 88.
5. Remove the fuse from the one-position fuse holder by using a fuse puller.

Install the Control Transformer Secondary Fuse (FU6)

Install the control transformer secondary fuse (FU6) in the reverse order of removal. See Remove the Control Transformer Secondary Fuse (FU6) on page 92.
Converter EMC Filter Circuit Board Removal/Installation

Remove the Converter EMC Filter Circuit Board

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the left converter cover. See Remove the Converter Left Cover on page 87.

**IMPORTANT** Before you disconnect the J2/J3 connector from the EMC filter board, note the J2/J3 location. The P3 (PE-A2) terminal is grounded. The P2 terminal is not grounded.

The jumper settings are provided in the PowerFlex 750-Series Power Jumpers Installation Instructions, publication 750-IN011, available at http://www.rockwellautomation.com/literature/.

5. Remove the J2/J3 connector from the P2 or P3 connector on the EMC filter board.
6. Remove the AC line wire harness J1 connector from the P1 connector on the EMC filter board P1 terminal.

Note: Board shown rotated 90° from actual installation position.
7. Remove the three M4 x 8 mm screws that secure the EMC filter board to the AC line bus bar.

8. Release the three board mounting clips along the right edge of the EMC filter board and remove the board.

---

**Install the Converter EMC Filter Circuit Board**

Install the EMC filter board in the reverse order of removal. See Remove the Converter EMC Filter Circuit Board on page 93.

**IMPORTANT** Be sure that the J2/J3 connector is reassembled in the correct location (P2 or P3) on the EMC filter board.
Remove the Converter Input Fuse Stirring Fan

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Open the enclosure door.

4. Remove the left converter cover. See Remove the Converter Left Cover on page 87.

5. For frame 8 drives, continue with step 6 on page 96. For frame 9 and larger drives only, complete these steps.
   a. Disconnect the cabinet-side, three-position DC bus fuse wire harness connector from terminal block TB6 on the lower left side of the converter.
   b. Remove the two M3 x 12 mm screws that secure the harness terminal block TB6 to the cover support bracket.
   c. Disengage the three cable tie push mounts that secure the harness to the cover support bracket, and remove the harness.

Note: Support bracket shown removed and from rear side only to clarify instructions.

<table>
<thead>
<tr>
<th>T15 or F - 4.8 mm (0.19 in.)</th>
<th>0.61 N·m (5.5 lb·in)</th>
</tr>
</thead>
</table>

Converter Input Fuse Stirring Fan Removal/Installation
6. Disengage the two cable tie push mounts that secure the fan harness to the bracket.

7. Disconnect the Fan (+) and Fan (-) power wires from the fan terminals and pull the terminal wires through the hole in the bracket.

8. Remove the three M6 x 14 mm screws that secure the label bracket and stirring fan to the rail support and remove the bracket.
9. Remove the four M4 x 12 mm hexalobular screws that secure the stirring fan to the support bracket and remove the stirring fan.

![Converter Component Replacement Procedures](image)

**Install the Converter Input Fuse Stirring Fan**

Install the stirring fan in the reverse order of removal. See Remove the Converter Input Fuse Stirring Fan on page 95.

**AC Line Fuse Sense Wire Harness Removal/Installation**

**Remove the AC Line Fuse Sense Wire Harness**

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the left converter cover. See Remove the Converter Left Cover on page 87.
5. If the control pod is installed, then rotate the control pod to gain access to the converter control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the converter right cover. See Remove the Converter Right Cover (No Control Pod) on page 88.
6. Disconnect the AC line fuse sense wire harness J7 connector from the converter gate board P7 terminal.

7. Release the AC line fuse sense wire harness from the cable support on the left side of the bus bar support rail.

8. Disconnect the AC line fuse sense wire harness from the six AC line fuse indicator terminals and remove the AC line fuse sense wire harness.

Note: The label bracket and fan are not shown, for instructional clarity.

Install the AC Line Fuse Sense Wire Harness

Install the AC line fuse sense harness in the reverse order of removal. See Remove the AC Line Fuse Sense Wire Harness on page 97.
Remove the AC Line Fuses (FU1, FU2, and FU3)

**IMPORTANT** It is recommended that you replace all three AC line fuses.

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the left converter cover. See Remove the Converter Left Cover on page 87.
5. If replacing FU3, remove the three M6 x 14 mm screws that secure the label bracket and input fuse stirring fan to the rail support and remove the bracket.

---

**T30 or F - 6.4 mm (0.25 in.)**
5.1 N·m (45 lb-in)
6. Remove the AC line fuse sense wire harness leads from the fuse indicator terminals for the fuse being replaced. See Remove the AC Line Fuse Sense Wire Harness on page 97.

**IMPORTANT** Note the orientation of the fuse indicator terminals before removal. Replace each fuse with the terminals in same orientation.

7. Remove the two M10 x 35 mm screws and two flat washers for the fuse being replaced and remove the AC line fuse. Remove the fuse indicator from the AC line fuse, if necessary.

Important: Note the orientation of the fuse indicator terminals before removal. Replace each fuse with the terminals in same orientation.

6 FU1 and FU2 indicator terminals point downward.
FU3 indicator terminals point upward.
Install AC Line Fuse (FU1, FU2, and FU3)

Install the AC line fuse in the reverse order of removal. See Install AC Line Fuse (FU1, FU2, and FU3) on page 101.

DC Bus Sense Wire Harness Removal/Installation

Remove the DC Bus Sense Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the left converter cover. See Remove the Converter Left Cover on page 87.
5. If the control pod is installed, then rotate the control pod to gain access to the converter control panel. See Rotate the Control Pod Forward on page 88.

   If the control pod is not installed, then remove the converter right cover. See Remove the Converter Right Cover (No Control Pod) on page 88.

6. To gain access to the DC bus sense wire harness connections at the top of the –DC and +DC bus bars, remove the AC line fuse FU1 (from Phase R/L1). See Remove the AC Line Fuses (FU1, FU2, and FU3) on page 99.
7. Loosen, but do not remove, the two M4 hex nuts that secure the wire harness to the top of the –DC and +DC bus bars. Slide the wire harness fork terminals off the bus bars.

8. Release the cable supports that secure the DC bus sense wire harness to the converter SCR assembly and support bracket.

9. Disconnect the DC bus sense wire harness J10 connector from the converter gate board P10 terminal and remove the wire harness.

Note: Some components are not shown only to clarify instructions.
Install the DC Bus Sense Wire Harness

Install the DC bus sense wire harness in the reverse order of removal. See Remove the DC Bus Sense Wire Harness on page 101.

Converter Current Sensor Wire Harness Removal/Installation

Remove the Converter Current Sensor Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. If the control pod is installed, then rotate the control pod to gain access to the converter control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the converter right cover. See Remove the Converter Right Cover (No Control Pod) on page 88.
5. Disconnect the converter current-sensor wire harness CT1, CT2, and CT3 connectors from the three converter current sensor connectors.

6. Release the cable supports from the right side of the bus bar support rail.

7. Disconnect the converter current-sensor wire harness J6 connector from the converter gate board P6 terminal and remove the converter current-sensor wire harness.

Install the Converter Current Sensor Wire Harness

Install the converter current-sensor wire harness in the reverse order of removal. See Remove the Converter Current Sensor Wire Harness on page 103.
Converter Current Sensors

Removal/Installation

Remove the Converter Current Sensors

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the left converter cover. See Remove the Converter Left Cover on page 87.
5. If the control pod is installed, then rotate the control pod to gain access to the converter control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the converter right cover. See Remove the Converter Right Cover (No Control Pod) on page 88.

IMPORTANT Before you disconnect the control-transformer primary wire harness, note the terminal connections. The control transformer has multiple input phase terminals. See the AC Input Drive Control Transformer Schematic Diagram on page 442 for more information.

6. Disconnect the control-transformer primary wire harness lead wires H1 and Hx from the control transformer input terminals. Release the cable support securing the harness to the EMC filter plastic support.

Rear Side of Rotated Control Pod

P2
1.8 N-m (16.0 lb-in)
7. Remove the AC line fuse sense wire harness. See Remove the AC Line Fuse Sense Wire Harness on page 97.

8. Remove the three AC line fuses with fuse indicators. See Remove the AC Line Fuses (FU1, FU2, and FU3) on page 99.

9. Disconnect the converter current-sensor wire harness J6 connector from the converter gate board P6 terminal.

10. Remove the EMC filter board. See Remove the Converter EMC Filter Circuit Board on page 93.
11. Remove the right (DC+) bus bar rail:
   a. Remove the three M10 x 30 mm screws that secure the AC input bus bars to the SCR.
   b. Remove the two M6 x 14 mm screws that secure the right bus bar rail to the rail support. Remove the right bus bar rail with three AC input bus bars, three current sensors, current sensor wire harness, and EMC filter board plastic support attached.
12. For the phase being replaced, remove the two M6 x 25 mm screws that connect the AC bus bar to the right bus bar rail.

13. Cut the three cable ties that connect the current sensor to the plastic support and remove the current sensor.

Note: The EMC filter board plastic mounting support is not shown only to clarify the instructions.
Install the Converter Current Sensors

Install the current sensors in the reverse order of removal. See Remove the Converter Current Sensors on page 105.

**IMPORTANT** Verify that the control-transformer primary wire harness lead wires H1 and Hx are connected to the correct input terminals. The control transformer has multiple input phase terminals. See the AC Input Drive Control Transformer Schematic Diagram on page 442 for more information. If the wires are connected to the wrong terminals, drive damage can occur.

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Converter SCR Gate Wire Harness Removal/Installation

**Remove the Converter SCR Gate Wire Harness**

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the left converter cover. See Remove the Converter Left Cover on page 87.
5. If the control pod is installed, then rotate the control pod to gain access to the converter control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the converter right cover. See Remove the Converter Right Cover (No Control Pod) on page 88.
6. Remove the three M4 x 12 mm screws that secure the shield to the converter heatsink and remove the shield.

7. Disconnect the SCR gate wire harness J11 connector from the converter gate board P11 terminal.

8. Disengage the cable tie from the cable tie mount on the wire harness ladder.

9. Release the wire harness from the two cable supports securing the harness to the converter heatsink.

10. Remove the three SCR gate connectors from the SCR modules and remove the SCR gate wire harness from the drive.

**Install the Converter SCR Gate Wire Harness**

Install the converter SCR gate wire harness in the reverse order of removal. See Remove the Converter SCR Gate Wire Harness on page 109.
Remove the Converter SCR Assembly

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the left converter cover. See Remove the Converter Left Cover on page 87.
5. If the control pod is installed, then rotate the control pod to gain access to the converter control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the converter right cover. See Remove the Converter Right Cover (No Control Pod) on page 88.

**IMPORTANT** Before you disconnect the control-transformer primary wire harness, note the terminal connections. The control transformer has multiple input phase terminals. See the AC Input Drive Control Transformer Schematic Diagram on page 442 for more information.

6. Disconnect the control-transformer primary wire harness lead wires H1 and Hx from the control transformer input terminals. Release the cable support securing the harness to the EMC filter plastic support.
7. Remove the J2/J3 connector from connector P2 or P3 on the EMC filter board.

**IMPORTANT** Before you disconnect the control-transformer primary wire harness J2/J3 connector from the EMC filter board, note the J2/J3 location. The P3 (PE-A2) terminal is grounded. The P2 terminal is not grounded.


Note: Board shown rotated 90° from actual installation position.
8. Remove the three M6 x 14 mm screws that secure the fuse bracket to the left and right rail supports. Remove the fuse bracket with the control-transformer primary wire harness attached.

9. Remove the three M6 x 14 mm screws that secure the label bracket to the rail support and remove the label bracket.

10. Remove the AC line fuse sense wire harness. See Remove the AC Line Fuse Sense Wire Harness on page 97.

11. Remove the three AC line fuses with fuse indicators. See Remove the AC Line Fuses (FU1, FU2, and FU3) on page 99.
12. Remove the two M6 x 14 mm screws that secure the left bus bar rail to the left rail supports. Remove the left rail with the three AC input bus bars attached.

13. Remove the EMC filter board. See Remove the Converter EMC Filter Circuit Board on page 93.
14. For the right bus bar rail:
   a. Disconnect the current sensor wire harness J6 connector from the converter gate board P6 terminal.
b. Remove the three M10 x 30 mm screws and flat washers that secure the AC input bus bars to the SCRs.

c. Remove the two M6 x 14 mm screws that secure the right bus bar rail to the right rail supports. Remove the right bus bar rail with three AC input bus bars, three current sensors, current sensor wire harness, and EMC filter board plastic support attached.

15. Remove the DC bus wire harness. See Remove the DC Bus Sense Wire Harness on page 101.
16. Remove the three M10 x 30 mm screws that secure the -DC bus bars (A) to the SCRs and remove the -DC bus bars.

17. Remove the three M10 x 30 mm screws that secure the +DC bus bars with insulation sheet attached (B) to the SCRs and remove the +DC bus bars and insulation sheet.
18. Disconnect the SCR wire harness J11 connector from the converter gate board P11 terminal.

19. Disconnect the NTC wire harness connector from the converter gate board P2 terminal.
20. Secure equipment and hardware capable of lifting 17 kg (37 lb) to the lifting holes identified on the SCR assembly.

21. Remove the 12 M5 x 20 mm screws that secure the assembly to the converter duct.

22. Remove the converter SCR assembly.

**IMPORTANT** Do NOT remove the SCRs from the assembly.
Install the Converter SCR Assembly

1. Inspect the converter heat sink gasket on the converter duct for damage and replace it if necessary. See Converter Heat Sink Gasket Replacement on page 120.

2. Install the converter SCR assembly in the reverse order of removal.

**IMPORTANT** Verify that the J2/J3 connector is reassembled in the appropriate location (P2 or P3) on the EMC filter board.

**IMPORTANT** Verify that the control-transformer primary wire harness lead wires H1 and Hx are connected to the correct input terminals. The control transformer has multiple input phase terminals. See the AC Input Drive Control Transformer Schematic Diagram on page 442 for more information. If the wires are connected to the wrong terminals, drive damage can occur.

**IMPORTANT** If you replace the external NTC, you must apply thermal grease to the bottom of the NTC before securing it to the SCR assembly heatsink.

Converter Heat Sink Gasket Replacement

Remove the Converter Heat Sink Gasket

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Open the enclosure door.

4. Remove the converter SCR assembly. Remove the Converter SCR Assembly on page 111.

5. Carefully remove the gasket and any gasket material that can be stuck to the sealing surface.

6. Clean the converter duct surface with a 50% isopropyl alcohol / 50% water mixture.
Install the Converter Heat Sink Gasket

Note: One side of the heat sink gasket is coated with an adhesive. Take care to align the gasket properly before fully removing the paper liner and exposing the adhesive.

1. Begin removing the paper liner as you align the replacement gasket with the duct edges and cutouts as shown here and press the gasket into place on the duct.

2. Install the converter SCR assembly in the reverse order of removal. See Install the Converter SCR Assembly on page 120.

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Inverter Power-supply Wire Harness Removal/Installation

Remove the Inverter Power-supply Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. If the control pod is installed, then rotate the control pod to gain access to the converter control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the converter right cover. See Remove the Converter Right Cover (No Control Pod) on page 88.

5. Remove the inverter circuit board connections cover from the inverter. See Inverter Circuit Board Connections Cover Removal/Installation on page 238.

6. Disconnect the inverter power-supply wire harness from the inverter power supply board P6 terminal and converter terminal block TB1.

7. Remove the inverter power supply harness.

**Install the Inverter Power-supply Wire Harness**

Install the inverter power-supply wire harness in the reverse order of removal. See Remove the Inverter Power-supply Wire Harness.
AC Line Wire Harness
Removal/Installation

Remove the AC Line Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. If the control pod is installed, then rotate the control pod to gain access to the converter control panel. See Rotate the Control Pod Forward on page 88.
   If the control pod is not installed, then remove the converter right cover. See Remove the Converter Right Cover (No Control Pod) on page 88.
5. Disconnect the J9 connector from P9 on the converter gate board.
6. Disconnect the J1 connector from P1 on the EMC filter board.
7. Loosen the Phillips head screws that secure the wires to the surge suppressor L1, L2, L3, and G terminals and remove the wires.
Chapter 5  Converter Component Replacement Procedures

8. Loosen the screw that secures the jumper wire to the PE-A1 or GND terminal and remove the wire.

9. Remove the AC line wire harness.

**IMPORTANT** Before you disconnect the jumper wire of the AC line wire harness, note the wire location (PE-A1 or GND terminal) on the surge suppressor mounting plate.

---

**Install the AC Line Wire Harness**

Install the AC line wire harness in the reverse order of removal. See Remove the AC Line Wire Harness on page 123.

**IMPORTANT** Be sure that the jumper wire is reassembled in the appropriate location (PE-A1 or GND terminal) on the surge suppressor mounting plate.
**Surge-suppressor Sense Wire Harness Removal/Installation**

**Remove the Surge-suppressor Sense Wire Harness**

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. If the control pod is installed, then rotate the control pod to gain access to the converter control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the converter right cover. See Remove the Converter Right Cover (No Control Pod) on page 88.

5. Disconnect the J13 connector from P13 on the converter gate board.
6. Remove the four three-position surge suppressor sense wire terminal blocks from the surge suppressor.
7. Disconnect the connector from the shunt trip ST terminal.
8. Release the cable support on the surge suppressor mounting plate and remove the surge-suppressor sense wire harness.

**Install the Surge-suppressor Sense Wire Harness**

1. Remove the four three-position plug terminals from the original wire harness and install them on the replacement wire harness.
2. Install the surge-suppressor sense wire harness in the reverse order of removal. See Remove the Surge-suppressor Sense Wire Harness on page 125.
Surge Suppressor Removal/Installation

Remove the Surge Suppressor

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Open the enclosure door.

4. If the control pod is installed, then rotate the control pod to gain access to the converter control panel. See Rotate the Control Pod Forward on page 88.

   If the control pod is not installed, then remove the converter right cover. See Remove the Converter Right Cover (No Control Pod) on page 88.

5. Loosen the Phillips head screws that secure the wires to the surge suppressor L1, L2, L3, and G terminals and remove the wires.
6. Remove the four, three-position surge suppressor sense wire terminal blocks from the surge suppressor.

7. Release the surge suppressor from the DIN rail and remove the surge suppressor.

Install the Surge Suppressor

Install the surge suppressor in the reverse order of removal. See Remove the Surge Suppressor on page 126.

Surge Suppressor Assembly
Removal/Installation

Remove the Surge Suppressor Assembly

Note: This procedure is used only to gain access to the converter gate board.

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Open the enclosure door.

4. If the control pod is installed, then rotate the control pod to gain access to the converter control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the converter right cover. See Remove the Converter Right Cover (No Control Pod) on page 88.
5. For 600/690V AC input drives only, disconnect the 24V wire harness two-position connector from the bottom of the control power isolator board.

6. For 600/690V AC input drives only, disconnect the upper 24V wire harness two-position connector from the top of the control power isolator board. Disengage the harness from the two side entry cable supports.
7. Disconnect the J1 connector from the P1 terminal on the EMC filter board.

8. Disconnect the J9 connector from the P9 terminal on the converter gate board.

9. Disconnect the J13 connector from the P13 terminal on the converter gate board.

10. Disconnect the connector from the ST connector on the 24V/240V wire harness.
11. Loosen the four, captive M4 panel fasteners on the surge suppressor mounting plate and remove the surge suppressor assembly.

**Install the Surge Suppressor Assembly**

Install the surge suppressor assembly in the reverse order of removal. See Remove the Surge Suppressor Assembly on page 127.
Converter Gate Board Stirring Fan Removal/Installation

Remove the Converter Gate Board Stirring Fan

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. If the control pod is installed, then rotate the control pod to gain access to the converter control panel. See Rotate the Control Pod Forward on page 88.
   If the control pod is not installed, then remove the converter right cover. See Remove the Converter Right Cover (No Control Pod) on page 88.
5. Remove the surge suppressor assembly. See Remove the Surge Suppressor Assembly on page 127.
6. Disconnect the two-position fan connector from the stirring fan to the 24V/240V wire harness.
7. Remove two M4 x 35 mm long screws that secure the stirring fan to the control panel and remove the stirring fan.
Install the Converter Gate Board Stirring Fan

Install the stirring fan in the reverse order of removal. See Remove the Converter Gate Board Stirring Fan on page 131.

24V/240V Power Wire Harness Removal/Installation

Remove the 24V/240V Power Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Disconnect the enclosure fan harness and enclosure shunt trip harness from TB2.
5. Remove the two M3 screws from TB2.
6. If the control pod is installed, then rotate the control pod to gain access to the converter control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the converter right cover. See Remove the Converter Right Cover (No Control Pod) on page 88.

7. Disconnect the connector from the shunt trip ST terminal.
8. Remove the M4 screw that secures the ground wire lug to the converter control panel and remove the ground wire lug.

9. Loosen the M4 screws that secure the four X1 and X2 lead wires to the control transformer and remove the leads.

10. Loosen the captive screws that secure the two X2 lead wires from the FU6 fuse block and remove the leads.

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<tr>
<td>T20 or F - 6.4 mm (0.25 in)</td>
<td>1.8 N·m (16.0 lb-in)</td>
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<tr>
<td>P2</td>
<td>1.8 N·m (16.0 lb-in)</td>
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<tr>
<td>P2</td>
<td>2.3 N·m (20.0 lb-in)</td>
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11. Disconnect the five-position inverter power supply wire harness connector from TB1.

12. Disconnect the three-position 24V wire harness connector from TB1.
13. Disconnect the enclosure fan six-position connector from converter gate board P1.

14. Disconnect the system 24V three-position connector from converter gate board P12.
15. Disconnect the two-position connector from the stirring fan.

16. Loosen the four cable tie mounts along the outside right surface of the converter control panel by using the pliers.

17. Release terminal block TB1 from the DIN rail and remove the 24V/240V power wire harness from the converter control panel.

Install the 24V/240V Power Wire Harness

Install the 24V/240V power wire harness in reverse order of removal. See Remove the 24V/240V Power Wire Harness on page 132.
Control-transformer Primary Wire Harness Removal/Installation

Remove the Control-transformer Primary Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. If the control pod is installed, then rotate the control pod to gain access to the converter control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the converter right cover. See Remove the Converter Right Cover (No Control Pod) on page 88.

5. Disconnect the wire harness FU4-1, FU4-2, FU5-1, and FU5-2 connectors from the FU4/FU5 fuse block.
6. Disconnect the ground wire from the fuse bracket by loosening the screw.
7. Release the two cable tie supports from the fuse bracket.

**IMPORTANT** Before you disconnect the control-transformer primary wire harness J2/J3 connector from the EMC filter board, note the J2/J3 location. The P3 (PE-A2) terminal is grounded. The P2 terminal is not grounded.

The jumper settings are provided in the PowerFlex 750-Series Power Jumper Installation Instructions, publication 750-IN011, available at http://www.rockwellautomation.com/literature/.

8. Remove the J2/J3 connector from the P2 or P3 connector on the EMC filter board.
9. Disconnect the control-transformer primary wire harness lead wires H1 and Hx from the control transformer input terminals. Release the cable support securing the harness to the EMC filter plastic support.

**IMPORTANT** Before you disconnect the control-transformer primary wire harness, note the terminal connections. The control transformer has multiple input phase terminals. See the AC Input Drive Control Transformer Schematic Diagram on page 442 for more information.

10. Slide one end of the wire harness through the fuse bracket and remove the control-transformer primary wire harness.
Install the Control-transformer Primary Wire Harness

Install the control-transformer primary wire harness in the reverse order of removal. See Remove the Control-transformer Primary Wire Harness on page 138.

**IMPORTANT** Verify that the PE-A2 connector is reassembled in the appropriate location (P2 or P3) on the EMC filter board.

**IMPORTANT** Verify that the control-transformer primary wire harness lead wires H1 and Hx are connected to the correct input terminals. The control transformer has multiple input phase terminals. See the AC Input Drive Control Transformer Schematic Diagram on page 442 for more information. If the wire are connected to the wrong terminals, drive damage can occur.

Control Transformer Removal/Installation

Remove the Control Transformer

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. If the control pod is installed, then rotate the control pod to gain access to the converter control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the converter right cover. See Remove the Converter Right Cover (No Control Pod) on page 88.
5. Loosen the M4 screws that secure the four X1 and X2 lead wires to the control transformer and remove the leads.

**IMPORTANT** Before you disconnect the control-transformer primary wire harness, note the terminal connections. The control transformer has multiple input phase terminals. See the AC Input Drive Control Transformer Schematic Diagram on page 442 for more information.

6. Disconnect the control-transformer primary wire harness lead wires H1 and Hx from the control transformer input terminals. Release the cable support securing the harness to the EMC filter plastic support.
7. Remove four M6 hex nuts that secure the control transformer to the chassis and slide the control transformer forward off the control panel mounting studs.

**Install the Control Transformer**

Install the control transformer in the reverse order of removal. See Remove the Control Transformer. See AC Input Drive Control Transformer Schematic Diagram on page 442 for more information.

**IMPORTANT** Verify that the control-transformer primary wire harness lead wires H1 and Hx are connected to the correct input terminals. The control transformer has multiple input phase terminals. See the AC Input Drive Control Transformer Schematic Diagram on page 442 for more information. If the wires are connected to the wrong terminals, drive damage can occur.
No DC Bus Fuse Wire Harness Removal/Installation (Frame 8 Drives Only)

Remove the No DC Bus Fuse Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. If the control pod is installed, then rotate the control pod to gain access to the converter control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the converter right cover. See Remove the Converter Right Cover (No Control Pod) on page 88.
5. Remove the no DC bus fuse wire harness from the converter gate board P8 terminal.

Install the No DC Bus Fuse Wire Harness

Install the No DC bus fuse wire harness in the reverse order of removal. See Remove the No DC Bus Fuse Wire Harness on page 143.
DC Bus Fuse Wire Harness Removal/Installation (Frame 9 and Larger Drives Only)

Remove the DC Bus Fuse Wire Harness

Note: This procedure is applicable to frame 9 and larger drives only.

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. If the control pod is installed, then rotate the control pod to gain access to the converter control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the converter right cover. See Remove the Converter Right Cover (No Control Pod) on page 88.
5. Disconnect the four-position DC bus fuse wire harness connector J8 from P8 on the converter gate board.
6. Unlatch the two twist-lock cable supports on the AC line filter board support.
7. Disconnect the cabinet-side, three-position DC bus fuse wire harness connector from terminal block TB6 on the lower left side of the converter.

8. Remove the two M3 x 12 mm screws that secure the harness terminal block TB6 to the cover support bracket.

9. Disengage the three cable tie push mounts that secure the harness to the cover support bracket, and remove the harness.

**Install the DC Bus Fuse Wire Harness**

Install the DC bus fuse wire harness in the reverse order of removal. See Remove the DC Bus Fuse Wire Harness on page 144.
Control Power Isolator Board 24V Wire Harness Removal/Installation (600/690V AC Input Drives Only)

Remove the Control Power Isolator Board 24V Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the door of the enclosure that contains the control pod.
4. To gain access to the converter control panel, rotate the control pod. See Rotate the Control Pod Forward on page 88.
5. If necessary, disconnect the 24V wire harness two-position connector from P14 on the fiber interface board in the control pod.
6. Disconnect the 24V wire harness two-position connector from the terminal block on the bottom of the control power isolator board.

7. Open the twist-lock cable support that secures the wire harness to the bottom of the control frame and remove the wire harness.

Install the Control Power Isolator Board 24V Wire Harness

Install the control power isolator board 24V wire harness in the reverse order of removal. See Remove the Control Power Isolator Board 24V Wire Harness on page 146.
Control Power Isolator Board
Removal/Installation (600/690V AC Input Drives Only)

Remove the Control Power Isolator Board

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Open the door of the enclosure that contains the control pod.

4. To gain access to the converter control panel, rotate the control pod. See Rotate the Control Pod Forward on page 88.

5. Disconnect the 24V wire harness two-position connector from the bottom of the control power isolator board.

6. Disconnect the upper one, two, or three bay 24V wire harness two-position connector from the top of the control power isolator board. Disengage the harness from the two side-entry cable supports.
7. Loosen the two M4 captive screws that secure the control-power isolator board mounting bracket to the MOV mounting plate and remove the bracket with the board attached.

8. Remove the two M4 x 12 mm screws that secure the control power isolator board to the mounting bracket. Pull the board out to disengage it from two non-threaded standoffs and remove the board.

Install the Control Power Isolator Board

Install the control power isolator board in the reverse order of removal. See Remove the Control Power Isolator Board on page 148.

Converter Gate Circuit Board Removal/Installation

Remove the Converter Gate Circuit Board

**IMPORTANT** Determine if the existing converter gate board is series A or series B, and verify that you have ordered/received a compatible board before replacement. See Drive Series Components Compatibility on page 30 for details.

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Open the enclosure door.
4. If the control pod is installed, then rotate the control pod to gain access to the converter control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the converter right cover. See Remove the Converter Right Cover (No Control Pod) on page 88.

5. Remove the surge suppressor assembly. See Remove the Surge Suppressor Assembly on page 127.

6. Disconnect all wire harnesses from the converter gate board.

**IMPORTANT** Minimum inside bend radius for fiber-optic cable is 50 mm (2 in.). Any bends with a shorter inside radius can permanently damage the fiber-optic cable. Signal attenuation increases with decreased inside bend radii.

7. Disconnect the fiber-optic cable from the port in the lower left corner of the gate board.

8. From the fiber-optic cage in the lower left corner of the converter gate board, remove the fiber-optic transceiver by pulling its wire latch. Set the transceiver aside and save for reinstallation.

**IMPORTANT** When installing the fiber-optic cable, be sure that the wire latch is down.
9. Remove the two M4 x 40 mm hex standoffs.

10. Remove the four M4 x 6 mm screws that secure the converter gate board to the converter control panel. Slide the converter gate board up to disengage its four keyhole slots and remove the board.

**IMPORTANT** Do not remove the insulation sheet that is attached to the converter duct.

---

### Install the Converter Gate Circuit Board

1. Verify that the insulation sheet is attached to the converter duct.

2. Install the converter gate board in the reverse order of removal. See Remove the Converter Gate Circuit Board on page 149.
Converter Removal/Installation

ATTENTION: Only perform a field replacement of the converter section of the power core (the converter is attached to the inverter) as part of the drive assembly removal procedure. Otherwise, equipment damage can result.

Remove the Converter from the Inverter Assembly

IMPORTANT Determine if the existing converter is series A or series B, and verify that you have ordered/received a compatible unit before replacement. See Drive Series Components Compatibility on page 30 for details.

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Remove the drive assembly from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.
4. Remove the inverter circuit board connections cover from the inverter. See Inverter Circuit Board Connections Cover Removal/Installation on page 238.
5. Disconnect the inverter power-supply wire harness connector from terminal P6 on the inverter power control board.

**IMPORTANT** Minimum inside bend radius for fiber-optic cable is 50 mm (2 in.). Any bends with a shorter inside radius can permanently damage the fiber-optic cable. Signal attenuation increases with decreased inside bend radii.

6. Disconnect the converter fiber-optic cable from CONV on the inverter power-layer interface board and secure it to the converter. Do not remove the fiber-optic transceiver.

7. If the control pod is assembled on the converter, disconnect the inverter fiber-optic cable from INV on the inverter power-layer interface board and secure it to the control pod. Do not remove the fiber-optic transceiver.

8. Remove the four M8 x 30 mm machine screws that secure the inverter DC bus bars to the converter DC bus bars.

**IMPORTANT** A load capacity of 80 kg (175 lb) minimum is required for all lifting equipment and hardware that is used for this procedure. Verify that the angle of attachment of the lifting hardware is no more than 45° from vertical.

9. Connect the lifting hardware to the two lifting holes on the lifting bar at the top of the converter section.

10. Loosen the two M8 screws that secure the converter duct to the inverter duct.
11. Lift and slide the converter away from the inverter assembly.
Install the Converter on the Inverter Assembly

1. Inspect the gasket at the top of the converter duct for damage and replace it if necessary. See Converter Duct Gasket Replacement on page 155.

2. Inspect the gasket at the top of the inverter duct for damage and replace it if necessary.

3. Install the converter on the inverter assembly in the reverse order of removal. See Remove the Converter from the Inverter Assembly on page 152.

Remove the Converter Duct Gasket

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Remove the drive assembly from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.

4. Remove the converter. Remove the Converter from the Inverter Assembly on page 152.

5. Carefully remove the gasket and any gasket material that can be stuck to the sealing surface.

6. Clean the duct surface with a 50% isopropyl alcohol/50% water mixture.

Converter Duct Gasket Replacement
**Install the Converter Duct Gasket**

Note: One side of the duct gasket is coated with an adhesive. Take care to align the gasket properly before fully removing the paper liner and exposing the adhesive.

1. Begin removing the paper liner as you align the replacement gasket with the duct edges as shown here and press the gasket into place on the duct.

2. Install the converter on the inverter assembly in the reverse order of removal. See Remove the Converter from the Inverter Assembly on page 152.
Chapter 6

DC Input with Precharge Assembly Component Replacement Procedures

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This chapter provides detailed procedures for how to remove and replace DC input with precharge assembly components.

Note: In some illustrations in this chapter, the DC input with precharge assembly and/or control pod is shown removed from the drive for clarity only. Only remove the DC input with precharge assembly and/or control pod from the drive if directed to do so.

**IMPORTANT** Complete the procedures in Chapter 12 Drive Startup after Repairs that begin on page 419 before placing the drive back into service.

### DC Input with Precharge Assembly Components Identification

Table 12 contains the components that comprise the DC input with precharge assembly and provides the following information for each component, if applicable:

- Kit catalog number or part number
- Quantity that is contained in the kit
- Illustration figure and page number and identification number

See PowerFlex Architecture Class Low Voltage Drives Spare Parts Options, publication PFLEX-SB002 for a complete list of spare parts for PowerFlex® 755 Frame 8...10 and larger drives.

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<th>Figure and Page</th>
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<tr>
<td>DC Input with Precharge Unit for 810V, 510 A / 932V, 500 A DC Input Drives</td>
<td>20-750-P6-E510F500</td>
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<tr>
<td>DC Line Fuse Kit, 1600 A, 540/650V DC Input Drives</td>
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<tr>
<td>Fuse, 690/700V, 1600 A (FU1 and FU2)</td>
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<tr>
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<tr>
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<tr>
<td>Fuse, 1250/1300V, 1000 A (FU1 and FU2)</td>
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<td>Fuse Indicator</td>
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<td>Precharge and Control Transformer Fuse Kit, 540/932V DC Input Drives</td>
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<td>DC Precharge Control Board, 540/650V</td>
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<tr>
<td>DC Input Control Board Kit, 810/932V DC Input Drives</td>
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<td>DC Precharge Control Board, 810/932V</td>
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<tr>
<td>One-Bay fiber-optic Cable Kit</td>
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<td>CONV Fiber-optic Cable, 560 mm Long</td>
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<td>INV Fiber-optic Cable, 560 mm Long</td>
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<td>Fiber-optic Transceiver</td>
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<td>One Bay 24V Wire Harness Kit (Frame 8)</td>
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<td>Two Bay 24V Wire Harness Kit (Frame 9)</td>
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<td>Three Bay 24V Wire Harness Kit (Frame 10)</td>
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<td>Left Front Cover with Shields Kit</td>
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<td>Top Guard</td>
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<tr>
<td>Left Guard</td>
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<tr>
<td>Left Front Cover and Interlock Assembly Retrofit Kit</td>
<td>20-750-CBPPANEL</td>
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<tr>
<td>DC Bus Guard</td>
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<tr>
<td>Interlock Assembly</td>
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<tr>
<td>L-bracket and Screws</td>
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<tr>
<td>Right Front Cover (No Control POD) Kit</td>
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<tr>
<td>Right Front Cover</td>
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<tr>
<td>Bracket, Cover, 59 mm (2.3 in.) Long</td>
<td></td>
<td>2</td>
<td>Figure 12 on page 162</td>
<td>38</td>
</tr>
<tr>
<td>Control Power Isolator Board Kit, 600/690V AC and 810/932V DC Input Drives</td>
<td>SK-R1-CPIB1-F8</td>
<td>1</td>
<td>Figure 11 on page 161</td>
<td>39</td>
</tr>
<tr>
<td>Control Power Isolator 24V Wire Harness Kit, 600/690V AC and 810/932V DC Input Drives</td>
<td>SK-R1-CPHI1-F8</td>
<td>1</td>
<td>Figure 11 on page 161</td>
<td>40</td>
</tr>
<tr>
<td>DC Precharge Control Board Stirring Fan</td>
<td>20-750-CFANIKIT-F8</td>
<td>1</td>
<td>Figure 12 on page 162</td>
<td>41</td>
</tr>
</tbody>
</table>

(1) This gasket is included in the Frame 8 Gasket Kit (20-750-G1-F8), but is identified in the table in Converter Components Identification on page 82.
(2) This gasket is included in the Frame 8 Gasket Kit (20-750-G1-F8), but is identified in the table in Inverter Components Identification on page 228.
Figure 11 - DC Input with Precharge Assembly Components Diagram 1
Figure 12 - DC Input with Precharge Assembly Components Diagram 2

540/650V DC Drives Only

810/932V DC Drives Only
DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard Removal/Installation

Remove the DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove only the four M5 x 14 mm screws that secure the cover to the assembly and remove the cover with the top and left guards attached.
5. If necessary, remove the four M5 x 14 mm screws that secure the top and left guards to the cover; and remove the guards.

Install the DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard

Install the left cover, top guard, and left guard in the reverse order of removal. See Remove the DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard.

TIP
See Fastener/Tool/Torque Information on page 33 for descriptions of the fasteners, tools, and torque figures that are used in the disassembly/assembly procedures in this chapter.
This retrofit kit (cat. no. 20-750-CBPPANEL) can be used to improve the access to the molded case switch (SW1) on common DC input drives for lockout/tagout procedures. Install this kit only on DC input with precharge modules with catalog numbers 20-750-P5-C770D740 and 20-750-P5-E510F500.

Remove the DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard and Disconnect Handle

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove only the four M5 x 14 mm screws that secure the cover to the assembly and remove the cover with the top and left guards attached.
5. Remove the four M5 x 14 mm screws that secure the top and left guards to the cover, and remove the guards. Retain the guards and screws for reuse.
6. Remove the two M4 x 12 mm hexalobular screws and washers that secure the rotary disconnect on/off handle to the front cover and remove the handle. Retain the handle, screws, and washers for reuse.

7. Loosen the hexagonal screw that secures the disconnect handle shaft to the disconnect switch and remove the handle.
Install the New Disconnect Switch Interlock and Front Cover Assemblies

1. Complete steps a….d to install the interlock assembly on the disconnect handle shaft.
   a. Position the interlock rod (A) under the clamp assembly (as shown in the illustration).
   b. Position the set screw (B) to the right of the clamp assembly.
   c. Position the pins (C) on the disconnect handle shaft vertically and slide the base of the shaft through the square opening in the clamp assembly.
d. Position the back of the interlock clamp assembly 34 mm (1.33 in.) from the base of the shaft and tighten the M3 x 1.5 mm set screw.

2. With the interlock rod (D) positioned below the handle shaft, fully insert the handle shaft (E) into the receptacle on the disconnect switch.

3. Secure the handle shaft in place by using the set screw on the disconnect switch. Torque requirement is 0.6 N·m (5.4 lb·in).
4. By using the pliers, remove the four cable tie mounts, which secure the resistor wires, from the back of the existing DC bus guard.

5. Loosen the two M4 x 12 mm hexalobular screws that secure the clear, plastic shield to the front of the DC bus guard and remove the plastic panel. Retain this panel for reuse.

6. Loosen the two M4 x 12 mm hexalobular screws that secure the sheet metal DC bus guard to the resistor assembly and remove and discard the guard.
Chapter 6

7. Place the new sheet metal DC bus guard on the resistor assembly and secure the guard by tightening the two existing screws.

8. Place the clear, plastic shield on the new DC bus guard and secure the shield by tightening the existing screws.

9. Fully insert the four cable tie mounts, which secure the resistor wires, into the holes on the new DC bus guard.

10. Secure the existing rotary on/off disconnect handle to the new DC precharge assembly left front cover by using the two M4 x 8 mm long screws and washers. Torque requirement is 1.8 N•m (16 lb•in).

11. Secure the two clear plastic guards to the new DC precharge assembly left front cover by using the four existing M5 x 14 mm screws. Torque requirement is 2.8 N•m (25 lb•in).
12. Set the rotary on/off handle and the disconnect handle shaft to the “off” position.

The disconnect handle shaft is in the “off” position when the pins on the end of the shaft are oriented horizontally.

13. Align the rotary disconnect handle and shaft and place the new front cover on the DC precharge unit.

14. Secure the front cover by using the existing screws. Torque requirement is 2.8 N•m (25 lb•in).

15. Loosen the two hexalobular screws that secure the circuit-breaker access door to the left front cover and lower the door.
16. Position the L-bracket with the square opening on top and the screw holes to the front and flush with the back of the cover.

**IMPORTANT** The interlock rod behind the cover must fit into the square opening on the top of the L-bracket (as shown in the illustration).

17. Secure the L-bracket by using the two M5 x 14 mm hexalobular screws that are provided in the kit.

18. Close and secure the circuit-breaker access door.

19. Move the disconnect handle to the “ON” position.

20. Verify that the circuit-breaker access door cannot be opened.

21. Secure the circuit-breaker access door by tightening the two hexalobular screws.
DC Input with Precharge Assembly Right Cover (No Control Pod) Removal/Installation

Remove the DC Input with Precharge Assembly Right Cover (No Control Pod)

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the four M5 x 14 mm screws that secure the cover to the assembly and remove the cover.

Install the DC Input with Precharge Assembly Right Cover (No Control Pod)

Install the right cover in the reverse order of removal. See Remove the DC Input with Precharge Assembly Right Cover (No Control Pod).

Control Transformer Secondary Fuses Removal/Installation

Remove the Control Transformer Secondary Fuses (FU5 and FU6)

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the left cover, top guard, and left guard assembly. See Remove the DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard on page 163.

5. If the control pod is installed, then rotate the control pod to gain access to the DC input with precharge assembly control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the right cover. See Remove the DC Input with Precharge Assembly Right Cover (No Control Pod) on page 172.

6. Remove the fuse from the one-position fuse holder by using a fuse puller. The fuses are on the right wall of the control panel next to the control transformer.

Install the Control Transformer Secondary Fuses (FU5 and FU6)

Install the control transformer secondary fuses (FU5 and FU6) in the reverse order of removal. See Remove the Control Transformer Secondary Fuses (FU5 and FU6) on page 172.
**DC Bus Output/Sense Wire Harness Removal/Installation**

**Remove the DC Bus Output/Sense Wire Harness**

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the left cover, top guard, and left guard assembly. See Remove the DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard on page 163.
5. If the control pod is installed, then rotate the control pod to gain access to the DC input with precharge assembly control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the right cover. See Remove the DC Input with Precharge Assembly Right Cover (No Control Pod) on page 172.
6. Remove the two cable ties that secure the wire harness to the center wall.
7. Disconnect the connector from P1 on the DC input control board.

Note: The cooling fan, undervoltage delay, and control transformer are not shown only to clarify the instructions.
8. Remove the two cable ties that secure the wire harness to the disconnect bracket and the 24/120/240V wire harness.

9. Loosen the screws that secure the +DC and -DC wires to the fuseholder terminals and remove the wires.

10. Remove the M4 hex nuts that secure the +DC and -DC wires to the +DC and -DC output bus bars and remove the wires.
11. Disconnect the connectors from the R1, R2, R3 and, R4 precharge resistor terminals.

12. Loosen, but do not remove, the two M4 x 12 mm hexalobular screws that secure the wire harness support to the bottom of the precharge resistor assembly and remove the harness.

Install the DC Bus Output/Sense Wire Harness

Install the DC bus output/sense wire harness in the reverse order of removal. See Remove the DC Bus Output/Sense Wire Harness on page 174.
Precharge Resistor Assembly Removal/Installation

Remove the Precharge Resistor Assembly

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the left cover, top guard, and left guard assembly. See Remove the DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard on page 163.
5. Loosen but do not remove the two M4 x 12 mm long hexalobular screws that secure the DC bus output/sense harness wire support to the resistor assembly.
6. Remove the four wire connectors of the DC bus output/sense harness from the R1, R2, R3, and R4 precharge resistor terminals.
7. Loosen but do not remove the two M5 nuts that secure the resistor assembly to the mounting bracket.
8. Remove the resistor assembly by completing the following steps.
   a. Disengage the bottom bracket slot by rotating the bottom of the assembly to the right.
   b. Slide the assembly down to disengage the top bracket slot.
9. Remove the resistor jumper harness from the top four terminals.

**Install the Precharge Resistor Assembly**

Install the precharge resistor assembly in the reverse order of removal. See Remove the Precharge Resistor Assembly on page 178.

**Precharge Resistor Jumper Wires Removal/Installation**

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the left cover, top guard, and left guard assembly. See Remove the DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard on page 163.
5. Remove the precharge resistor assembly. See Remove the Precharge Resistor Assembly on page 178.

**Install the Precharge Resistor Jumper Wires**

Install the precharge resistor jumper wires in the reverse order of removal. See Remove the Precharge Resistor Jumper Wires.
DC Line Fuses and Fuse Indicators Removal/Installation

Remove the DC Line Fuses (FU1 and FU2) and Fuse Indicators (SW3 and SW4)

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the left cover, top guard, and left guard assembly. See Remove the DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard on page 163.
5. Remove the 24V control wire harness leads from the fuse indicator (SW3 or SW4) terminals for the fuse being replaced (FU1 or FU2).

**IMPORTANT** Note the orientation of the fuse indicator terminals before removal. Replace each fuse with the terminals in the same orientation as shown here.

Note: Fuses shown removed in this illustration only to clarify the instructions.
6. Remove the M10 x 35 mm hexalobular screw and flat washer for the fuse being replaced and remove the DC line fuse. Remove the fuse indicator from the DC line fuse for reuse, if necessary.

Install the DC Line Fuses (FU1 and FU2) and Fuse Indicators (SW3 and SW4)

Install the DC line fuses and fuse indicators in the reverse order of removal. See Remove the DC Line Fuses (FU1 and FU2) and Fuse Indicators (SW3 and SW4) on page 180.
Precharge Circuit Fuses
Removal/Installation

Remove the Precharge Circuit Fuses (FU3 and FU4)

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the left cover, top guard, and left guard assembly. See Remove the DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard on page 163.
5. Pull-down on the tabs at the top of the fuse holder and remove the fuse.

Install the Precharge Circuit Fuses (FU3 and FU4)

Install the precharge circuit fuses in the reverse order of removal. See Remove the Precharge Circuit Fuses (FU3 and FU4) on page 182.
DC Bus Input Wire Harness
Removal/Installation

Remove the DC Bus Input Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the left cover, top guard, and left guard assembly. See Remove the DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard on page 163.
5. Disconnect the +DC and -DC wires from the +DC and -DC bus bars, respectively.
6. Loosen the screw that secures the +DC wire to terminal SW2-5 on the disconnect switch, and remove the wire.
7. Loosen the screw that secures the -DC wire to terminal SW2-1 on the disconnect switch and remove the wire.
8. Remove the -DC wire from the two supports on the disconnect bracket and remove the wire harness.

\[ P1 \quad 0.8 \text{ N-m (7 lb-in)} \]
Install the DC Bus Input Wire Harness

Install the DC bus input wire harness in the reverse order of removal. See Remove the DC Bus Input Wire Harness on page 183.

Left Wall Removal/Installation

Remove the Left Wall

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the drive assembly from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.
5. Remove the DC line fuses and fuse indicators. See Remove the DC Line Fuses (FU1 and FU2) and Fuse Indicators (SW3 and SW4) on page 180.
6. Disconnect the +DC wire (of the DC bus input wire harness) from the +DC bus bar.
7. Disconnect the -DC wire (of the DC bus input wire harness) from the -DC bus bar.
8. Loosen the two captive M4 panel fasteners that secure the disconnect bracket to the left wall.
9. Remove the six M6 x 12 mm flat head screws that secure the left wall to the drive.
10. Slide the left wall (with input bus bar assembly) off the two mounting pins and remove the left wall.

**Install the Left Wall**

Install the left wall in the reverse order of removal. See Remove the Left Wall on page 184.
Remove the Molded Case Switch Wire Terminal Support

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the left wall. See Remove the Left Wall on page 184.
5. Remove the two M3 x 45 mm Phillips head screws that secure the wire terminal support to the molded case switch and remove the support.

Install the Molded Case Switch Wire Terminal Support

Install the molded-case switch wire terminal support in the reverse order of removal. See Remove the Molded Case Switch Wire Terminal Support.
24V Control Wire Harness Removal/Installation

Remove the 24V Control Wire Harness

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Open the enclosure door.

4. Remove the left cover, top guard, and left guard assembly. See Remove the DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard on page 163.

5. If the control pod is installed, then rotate the control pod to gain access to the DC input with precharge assembly control panel. See Rotate the Control Pod Forward on page 88.

   If the control pod is not installed, then remove the right cover. See Remove the DC Input with Precharge Assembly Right Cover (No Control Pod) on page 172.

6. Remove the 24V control wire harness leads from the fuse indicators SW3 (on FU1) and SW4 (on FU2).

   **IMPORTANT** Note the orientation of the fuse indicator terminals before removal. Replace each fuse with the terminals in the same orientation as shown here.

   FU1 Indicator Terminals Point Upward to Right

   FU2 Indicator Terminals Point Downward to Left

   Note: Fuses shown removed in this illustration only to clarify the instructions.

7. Remove the molded-case switch wire terminal support. See Remove the Molded Case Switch Wire Terminal Support on page 186.
8. Disconnect the 24V wire harness connector from terminals 31/21 and 32/34 on the molded case switch by using a flat nose screwdriver (as shown in the illustration).

9. Loosen the Phillips head screws that secure the 24V wire harness wires to terminals 13 and 14 on the disconnect switch auxiliary contact and remove the wires.

10. Release the 24V wire harness from the cable support on the top, front of the disconnect switch.
11. Release, but do not remove, the two releasable cable ties from the top rungs of two cable support ladders on the control panel.

12. Disconnect the 24V control wire harness connector from terminal P3 on the DC precharge control board. Pull the 24V wire harness to the right through the gap in the center wall and remove the wire harness.

---

**Install 24V Control Wire Harness**

Install the 24V control wire harness in the reverse order of removal. See Install 24V Control Wire Harness on page 189.
Molded-case Switch Control Wire Harness Removal/Installation

Remove the Molded-case Switch Control Wire Harness

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Open the enclosure door.

4. Remove the left cover, top guard, and left guard assembly. See Remove the DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard on page 163.

5. If the control pod is installed, then rotate the control pod to gain access to the DC input with precharge assembly control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the right cover. See Remove the DC Input with Precharge Assembly Right Cover (No Control Pod) on page 172.

6. Remove the 24V control wire harness leads from the fuse indicators SW3 (on FU1) and SW4 (on FU2).

**IMPORTANT**

Note the orientation of the fuse indicator terminals before removal. Replace each fuse with the terminals in the same orientation as shown here.

Note: Fuses shown removed in this illustration only to clarify the instructions.

7. Remove the molded-case switch wire terminal support. See Remove the Molded Case Switch Wire Terminal Support on page 186.
8. Disconnect the molded-case switch (MCS) control wire harness connector from terminals U1/U2, D1/D2, C1/C2, and C12/C11 on the molded case switch by using a flat nose screwdriver (as shown in the illustration).

9. Release the harness from two supports on the top, rear of the disconnect switch.
10. Release, but do not remove, the cable tie from the second rung of the left cable support ladder on the control panel.

11. Disconnect the MCS control wire harness from the UV connector for the undervoltage delay.

12. Disconnect the MCS control wire harness connector from terminal P2 on the DC precharge control board.

13. Pull the MCS control wire harness to the right and remove the wire harness.

---

**Install the Molded-case Switch Control Wire Harness**

Install the molded-case switch control wire harness in the reverse order of removal. See Remove the Molded-case Switch Control Wire Harness on page 190.
Remove the Transformer Primary Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the left cover, top guard, and left guard assembly. See Remove the DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard on page 163.
5. If the control pod is installed, then rotate the control pod to gain access to the DC input with precharge assembly control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the right cover. See Remove the DC Input with Precharge Assembly Right Cover (No Control Pod) on page 172.

6. Loosen, but do not remove, the captive screws that secure the control-transformer primary lead wires to terminals H1 and HX and remove the wires.

Note: Transformer wiring for 120V AC input shown.

Note: Center wall shown removed only to clarify the instructions.
7. Loosen the screws that secure the three wires to terminals SW2-6, SW2-7, and SW2-8 on the disconnect switch and remove the wires.

8. Loosen the captive screw that secures the wire to TB5-1 on right side of control panel, and remove the wire.

9. Loosen the two cable tie mounts on the center wall and the cable tie mount on the top of the control panel and remove the harness by using the pliers.

Installing the Transformer Primary Wire Harness

Install the transformer primary wire harness in the reverse order of removal. See Remove the Transformer Primary Wire Harness on page 193.
Remove the 24V/120V/240V Wire Harness

**Removal/Installation**

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the left cover, top guard, and left guard assembly. See Remove the DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard on page 163.
5. If the control pod is installed, then rotate the control pod to gain access to the DC input with precharge assembly control panel. See Rotate the Control Pod Forward on page 88.
   
   If the control pod is not installed, then remove the right cover. See Remove the DC Input with Precharge Assembly Right Cover (No Control Pod) on page 172.

6. Loosen the screw that secures the transformer primary wire harness to terminal 1 on terminal block TB5, and remove the wire.
7. Remove the M4 x 12 mm screw and grounding washer that secure the ground wire lug to the control panel; and remove the ground wire lug.
8. Loosen, but do not remove, the M4 screws that secure the secondary lead wires to terminals X1, X2, and X3 on the control transformer; and remove the leads.
9. Loosen, but do not remove, the captive screws that secure the four leads wires to FU5 and FU6 fuse blocks; and remove the leads.
10. Loosen the screws that secure the 120V control power output wiring (if used) to terminals 7 and 8 on terminal block TB5, and remove the wires.

11. Remove the two M3 x 12 mm screws that secure terminal block TB5 to the control panel and remove the terminal block.

12. Remove the plug-in terminal block for the enclosure fan harness, 120/240V control power input harness, and 120V UPS harness from terminal block TB2.

13. Remove the two M3 x 12 mm screws that secure terminal block TB2 to the control panel and remove the terminal block.

14. Disconnect the five-position inverter power supply harness connector from terminal block TB1 (see following illustration).

15. Disconnect the three-position 24V wire harness connector from terminal block TB1 (see following illustration).

16. Disconnect the enclosure fan six-position connector from P9 on the DC precharge control board (see following illustration).
17. Disconnect the system 24V three-position connector from P10 on the DC precharge control board.

18. Disconnect the two-position connector from the stirring fan.

19. Loosen and remove the seven cable tie mounts along the right surface of the control panel by using the pliers.

Note: The undervoltage delay is not shown only to clarify the instructions.
20. Loosen the screws that secure the input wires to terminals SW2-6, SW2-7, and SW2-8 on the disconnect switch and remove the wires.
21. Cut four cable ties between the disconnect switch and terminal block TB1. Pull the three disconnect switch wires SW2-6, SW2-7, and SW2-8 through the opening in the bottom, center wall of the control panel.

22. Release terminal block TB1 from the DIN rail and remove the 24V/120V/240V wire harness from the control panel.

Install the 24V/120V/240V Wire Harness

Install the 24V/120V/240V wire harness in the reverse order of removal. See Remove the 24V/120V/240V Wire Harness on page 195.
Disconnect Switch Jumper Wires Removal/Installation

Remove the Disconnect Switch Jumper Wires

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the left cover, top guard, and left guard assembly. See Remove the DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard on page 163.
5. Disconnect the +DC jumper wire from terminals SW2-5 and SW2-4 on the bottom of the disconnect switch.
6. Disconnect the +DC jumper wire from terminals SW2-4 and SW2-3 on the top of the disconnect switch.
7. Disconnect the +DC jumper wire from terminal SW2-3 on the bottom of the disconnect switch and the top of fuse block FU3.
8. Disconnect the -DC jumper wire from terminals SW2-1 and SW2-2 on the top of the disconnect switch.
9. Disconnect the -DC jumper wire from terminal SW2-2 on the bottom of the disconnect switch and the top of fuse block FU4.
Install the Disconnect Switch Jumper Wires

Install the disconnect switch jumper wires in the reverse order of removal. See Remove the Disconnect Switch Jumper Wires on page 201.

Remove the Disconnect Switch, Auxiliary Contact and Handle Shaft Removal/Installation

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the left cover, top guard, and left guard assembly. See Remove the DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard on page 163.
5. Remove the DC bus input harness +DC wire from the disconnect switch terminal SW2-5 and the DC bus input harness -DC wire from the disconnect switch terminal SW2-1. See Remove the DC Bus Input Wire Harness on page 183.
6. Remove the 24V control harness wires from terminals 13 and 14 on the disconnect switch auxiliary contact. See Remove the 24V Control Wire Harness on page 187.
7. Remove the transformer primary wire harness from the disconnect switch terminals SW2-6, SW2-7, and SW2-8. See Remove the Transformer Primary Wire Harness on page 193.
8. Remove the 24V/120V/240V wire harness from the disconnect switch terminals SW2-6, SW2-7, and SW2-8. See Remove the 24V/120V/240V Wire Harness on page 195.
9. Remove the five disconnect switch jumper wires from the disconnect switch SW2. See Remove the Disconnect Switch Jumper Wires on page 201.
10. Extend the two release tabs near poles 4 and 7 on the bottom of the disconnect switch. Remove the disconnect switch, auxiliary contact, and handle shaft from the mounting rail.

Note: The auxiliary contact snaps fits onto the disconnect switch.

Note: If removed, fully insert the handle shaft to the bottom of the disconnect switch before set screw tightening. A 2.5 mm hex key and torque requirement of 0.6 N•m (5.4 lb•in) is recommended for the set screw.
Install the Disconnect Switch, Auxiliary Contact and Handle Shaft

Install the disconnect switch, auxiliary contact, and handle shaft in the reverse order of removal. See Remove the Disconnect Switch, Auxiliary Contact and Handle Shaft on page 202.

Wiring must be installed as shown in the DC Input with Precharge Assembly Schematic Diagram (540V DC, 650V DC, 810V DC, and 932V DC Classes Common DC Input Drives) on page 442.

Disconnect Switch Handle Removal/Installation

Remove the Disconnect Switch Handle

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the left cover, top guard, and left guard assembly. See Remove the DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard on page 163.
5. Remove the two M4 x 12 mm long screws and washers that secure the handle to the front cover and remove the handle.

Install the Disconnect Switch Handle

Install the disconnect switch handle in the reverse order of removal. See Remove the Disconnect Switch Handle on page 203.
Control Transformer
Removal/Installation

Remove the Control Transformer

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Open the enclosure door.

4. Remove the left cover, top guard, and left guard assembly. See Remove the DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard on page 163.

5. If the control pod is installed, then rotate the control pod to gain access to the DC input with precharge assembly control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the right cover. See Remove the DC Input with Precharge Assembly Right Cover (No Control Pod) on page 172.

IMPORTANT The disconnect switch handle must be installed in the orientation that is shown in the illustration.
6. Loosen, but do not remove, the M4 screws that secure the X1, X2, X3, and X4 secondary lead wires to the control transformer and remove the wires.

**IMPORTANT** Before you disconnect the control-transformer primary wire leads, note the terminal locations. The control transformer has both 120V and 240V input phase terminals. See the DC Input with Precharge Assembly Control Transformer Schematic Diagram on page 442 for more information.

7. Loosen, but do not remove, the M4 screws that secure the H1 and HX primary lead wires to the control transformer and remove the wires.
8. Remove the four M6 hex nuts that secure the control transformer to the control panel and slide the control transformer forward off the control panel studs.

Note: The undervoltage delay is not shown only to clarify the instructions.
Install the Control Transformer

Install the control transformer in the reverse order of removal. See Remove the Control Transformer on page 204.

**IMPORTANT**  Be sure that the control-transformer primary wire harness lead wires H1 and HX are connected to the proper input terminals. The control transformer has both 120V and 240V input phase terminals. See the DC Input with Precharge Assembly Control Transformer Schematic Diagram on page 442 for more information. If the wires are connected to the wrong terminals, drive damage can occur.

Control Power Isolator Board 24V Wire Harness Removal/Installation (810/932V DC Input Drives Only)

Remove the Control Power Isolator Board 24V Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the door of the enclosure that contains the control pod.
4. To gain access to the DC input with precharge assembly control panel, rotate the control pod. See Rotate the Control Pod Forward on page 88.
5. If necessary, disconnect the 24V wire harness two-position connector from P14 on the fiber interface board in the control pod.

6. Disconnect the 24V wire harness two-position connector from the bottom of the control power isolator board.

7. Untwist one twist-lock cable support and remove the harness.

---

**Install the Control Power Isolator Board 24V Wire Harness**

Install the control power isolator board 24V wire harness in the reverse order of removal. See Remove the Control Power Isolator Board 24V Wire Harness on page 207.

**Control Power Isolator Board Removal/Installation (810/932V DC Input Drives Only)**

**Remove the Control Power Isolator Board**

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Open the door of the enclosure that contains the control pod.

4. To gain access to the DC input with precharge assembly control panel, rotate the control pod. See Rotate the Control Pod Forward on page 88.
5. Disconnect the 24V wire harness two-position connector from the bottom of the control power isolator board.

6. Disconnect the one, two, or three bay 24V wire harness two-position connector from the top of the control power isolator board. Disengage the harness from the two side-entry cable supports.

7. Remove the two M4 x 12 mm screws that secure the control power isolator board to the mounting bracket, slide the board to the right to disengage it from the two keyhole standoffs, and remove the board.

---

**Install the Control Power Isolator Board**

Install the control power isolator board in the reverse order of removal. See Remove the Control Power Isolator Board on page 208.
Remove the Undervoltage Delay Bracket

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. If the control pod is installed, then rotate the control pod to gain access to the DC input with precharge assembly control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the right cover. See Remove the DC Input with Precharge Assembly Right Cover (No Control Pod) on page 172.
5. For 810/932V DC input drives only, disconnect the 24V wire harness two-position connector from the bottom of the control power isolator board.
6. For 810/932V DC input drives only, disconnect the upper 24V wire harness two-position connector from the top of the control power isolator board. Disengage the harness from the two side entry cable supports.
7. Disconnect the undervoltage wire harness connector from terminal P5 on the DC precharge control board.
8. Disconnect the undervoltage wire harness connector from connector UV on the molded-case switch control wire harness.

9. Loosen the four M4 captive panel fasteners on the undervoltage delay bracket and remove bracket.

**Install the Undervoltage Delay Bracket**

Install the undervoltage delay bracket in the reverse order of removal. See Remove the Undervoltage Delay Bracket on page 210.
Remove the Undervoltage Delay Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. If the control pod is installed, then rotate the control pod to gain access to the DC input with precharge assembly control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the right cover. See Remove the DC Input with Precharge Assembly Right Cover (No Control Pod) on page 172.
5. Remove the undervoltage delay bracket from the control panel. See Remove the Undervoltage Delay Bracket on page 210.
6. Loosen the captive screws that secure the five harness wires to the undervoltage delay terminals and remove the wire harness.

Install the Undervoltage Delay Wire Harness

Install the undervoltage delay wire harness in reverse order of removal. See Remove the Undervoltage Delay Wire Harness on page 213.
Undervoltage Delay Removal/Installation

Remove the Undervoltage Delay

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. If the control pod is installed, then rotate the control pod to gain access to the DC input with precharge assembly control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the right cover. See Remove the DC Input with Precharge Assembly Right Cover (No Control Pod) on page 172.
5. Remove the undervoltage delay bracket from the control panel. See Remove the Undervoltage Delay Bracket on page 210.
6. Remove the undervoltage delay wire harness. See Remove the Undervoltage Delay Wire Harness on page 213.
7. Remove two M4 x 16 mm screws that secure the undervoltage delay to its mounting bracket, and remove the undervoltage delay.
Install the Undervoltage Delay

Install the undervoltage delay in the reverse order of removal. See Remove the Undervoltage Delay on page 214.

Remove the DC Precharge Control Board Stirring Fan

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. If the control pod is installed, then rotate the control pod to gain access to the DC input with precharge assembly control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the right cover. See Remove the DC Input with Precharge Assembly Right Cover (No Control Pod) on page 172.
5. Remove the undervoltage delay bracket. See Remove the Undervoltage Delay Bracket on page 210.
6. Disconnect the two-position fan connector from the stirring fan to the 24V/120V/240V wire harness.

7. Remove two M4 x 35 mm long screws that secure the stirring fan to the control panel and remove the stirring fan.

Install the DC Precharge Control Board Stirring Fan

Install the stirring fan in the reverse order of removal. See Remove the DC Precharge Control Board Stirring Fan on page 215.

Door-interlock Wire Harness Removal/Installation

Removing the Door Interlock Wire Harness

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Open the enclosure door.
4. If the control pod is installed, then rotate the control pod to gain access to the DC input with precharge assembly control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the right cover. See Remove the DC Input with Precharge Assembly Right Cover (No Control Pod) on page 172.

5. Disconnect the door-interlock wire harness connector J6 from the connector P6 on the DC precharge control board.

6. Remove the two M3 x 12 mm hexalobular screws that secure the terminal block TB4 to the control panel and remove the wire harness from the control panel.

Note: The control pod and undervoltage delay are shown removed only to clarify the instructions.
Install the Door Interlock Wire Harness

Install the door interlock wire harness in the reverse order of removal. See Removing the Door Interlock Wire Harness on page 216.

Digital I/O Wire Harness Removal/Installation

Remove the Digital I/O Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the left cover, top guard, and left guard assembly. See Remove the DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard on page 163.
5. If the control pod is installed, then rotate the control pod to gain access to the DC input with precharge assembly control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the right cover. See Remove the DC Input with Precharge Assembly Right Cover (No Control Pod) on page 172.
6. Disconnect the digital I/O wire harness connector from connector P7 on the DC precharge control board.

7. Disconnect the digital I/O wire harness connector from connector P8 on the DC precharge control board.

8. Remove the two M3 x 12 mm hexalobular screws that secure the terminal block TB3 to the control panel and remove the wire harness from the control panel.

**Install the Digital I/O Wire Harness**

Install the digital I/O wire harness in the reverse order of removal. See Remove the Digital I/O Wire Harness on page 218.
Remove the DC Precharge Control Circuit Board

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the left cover, top guard, and left guard assembly. See Remove the DC Input with Precharge Assembly Left Cover, Top Guard, and Left Guard on page 163.
5. If the control pod is installed, then rotate the control pod to gain access to the DC input with precharge assembly control panel. See Rotate the Control Pod Forward on page 88.

If the control pod is not installed, then remove the right cover. See Remove the DC Input with Precharge Assembly Right Cover (No Control Pod) on page 172.

6. Remove the undervoltage delay bracket. See Remove the Undervoltage Delay Bracket on page 210.
7. Disconnect the wire harnesses from the DC precharge control board.
8. From the fiber-optic cage in the lower left corner of the DC precharge control board, remove the fiber-optic transceiver by pulling its wire latch. Set the transceiver aside and save for reinstallation.
9. Remove the two M4 x 40 mm hex standoffs.

10. Remove the three M4 x 8 mm screws that secure the DC precharge control board to the DC input control panel, slide the DC precharge control board up to disengage its four keyhole slots, and remove the board.

**Install the DC Precharge Control Circuit Board**

Install the DC precharge control board in the reverse order of removal. See Remove the DC Precharge Control Circuit Board on page 220.
DC Input with Precharge Assembly Removal/Installation

ATTENTION: Only perform a field replacement of the DC input with precharge assembly of the power core as part of the drive assembly removal procedure. Otherwise, equipment damage can result.

Remove the DC Input with Precharge Assembly

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Remove the drive assembly from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.

4. Remove the inverter circuit board connections cover from the inverter. See Inverter Circuit Board Connections Cover Removal/Installation on page 238.

5. Disconnect the inverter power-supply wire harness connector from terminal P6 on the inverter power control board.

IMPORTANT  Minimum inside bend radius for fiber-optic cable is 50 mm (2 in.). Any bends with a shorter inside radius can permanently damage the fiber-optic cable. Signal attenuation increases with decreased inside bend radii.

6. Disconnect the fiber-optic cable from CONV on the inverter power-layer interface board and secure it to the DC input with precharge assembly. Do not remove the fiber-optic transceiver.

7. If the control pod is assembled on the DC input with precharge assembly, disconnect the fiber-optic cable from INV on the inverter power-layer interface board and secure it to the control pod. Do not remove the fiber-optic transceiver.
8. Remove the four M8 x 30 mm machine screws that secure the inverter DC bus bars to the DC input with precharge assembly bus bars.

**IMPORTANT**
A load capacity of 80 kg (175 lb) minimum is required for all lifting equipment and hardware that is used for this procedure. Verify that the angle of attachment of the lifting hardware is no more than 45° from vertical.

9. Connect the lifting hardware to the two lifting holes on the lifting bar at the top of the DC input with precharge assembly.

10. Loosen the two M8 screws that secure the DC input with precharge assembly duct to the inverter duct.

11. Lift and slide the DC input with precharge assembly away from the inverter assembly.
Install the DC Input with Precharge Assembly

1. Inspect the gasket at the top of the DC input with precharge assembly duct for damage and replace if necessary. See Remove the DC Input with Precharge Assembly Duct Gasket on page 225.

2. Inspect the gasket at the top of the inverter duct for damage and replace if necessary.

3. Install the DC input with precharge assembly on the inverter assembly in the reverse order of removal. See Remove the DC Input with Precharge Assembly on page 222.

Remove the DC Input with Precharge Assembly Duct Gasket

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Remove the drive assembly from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.

4. Remove the DC input with precharge assembly. Remove the DC Input with Precharge Assembly on page 222.

5. Carefully remove the gasket and any gasket material that can be stuck to the sealing surface.

6. Clean the duct surface with a 50% isopropyl alcohol/50% water mixture.

Install the DC Input with Precharge Assembly Duct Gasket

Note: One side of the duct gasket is coated with an adhesive. Take care to align the gasket properly before fully removing the paper liner and exposing the adhesive.

1. Begin removing the paper liner as you align the replacement gasket with the duct edges as shown and press the gasket into place on the duct.
2. Install the DC input with precharge assembly on the inverter assembly in the reverse order of removal. See Remove the DC Input with Precharge Assembly on page 222.
# Inverter Component Replacement Procedures

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This chapter provides detailed procedures for how to remove and replace inverter components.

**Important** Complete the procedures in Chapter 12 Drive Startup after Repairs that begin on page 419 before placing the drive back into service.

### Inverter Components Identification

Table 13 contains the components that comprise the inverter assembly and provides the following information for each component, if applicable:

- Kit catalog number or part number
- Quantity that is contained in the kit
- Illustration figure and page number and identification number

See PowerFlex Architecture Class Low Voltage Drives Spare Parts Options, publication PFELEX-SB002 for a complete list of spare parts for PowerFlex® 755 Frame 8...10 drives.

**Important** A replacement IGBT assembly is not available. If IGBT replacement is required, the recommendation is to replace the entire inverter unit.

### Table 13 - Inverter Replacement Kits/Parts

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<th>Component Description</th>
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<td>Inverter Unit for 400V, 540 A / 480V, 485 A AC Input Drives</td>
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<td>DC Choke, 69 mH, 600V 510 A, 690V 500 A</td>
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<td>1</td>
<td>Figure 13 on page 231</td>
<td>8</td>
</tr>
<tr>
<td>Inverter Power Control Board</td>
<td>SK-R1-PC1-F8</td>
<td>1</td>
<td>Figure 14 on page 232</td>
<td>10</td>
</tr>
<tr>
<td>Inverter Heatsink Power Supply Board, 400/480V</td>
<td>SK-R1-PWRS1-CD-F8</td>
<td>1</td>
<td>Figure 14 on page 232</td>
<td>11</td>
</tr>
<tr>
<td>Inverter Heatsink Power Supply Board, 600/690V</td>
<td>SK-R1-PWRS1-EF-F8</td>
<td>1</td>
<td>Figure 14 on page 232</td>
<td>11</td>
</tr>
<tr>
<td>Inverter Gate Board, 400V 770 A, 480V 740 A</td>
<td>SK-R1-IG1-C770D740</td>
<td>1</td>
<td>Figure 13 on page 231</td>
<td>14</td>
</tr>
<tr>
<td>Inverter Gate Board, 400V 567 A, 480V 545 A</td>
<td>SK-R1-IG1-C567D545</td>
<td>1</td>
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<td>14</td>
</tr>
<tr>
<td>Inverter Gate Board, 600V 510 A, 690V 500 A</td>
<td>SK-R1-IG1-E510F500</td>
<td>1</td>
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<td>14</td>
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<tr>
<td>Inverter Gate Board, 600V 395 A, 690V 370 A</td>
<td>SK-R1-IG1-E395F370</td>
<td>1</td>
<td>Figure 13 on page 231</td>
<td>14</td>
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<tr>
<td>Inverter Ribbon Cable</td>
<td>SK-R1-ICBL1-F8</td>
<td>1</td>
<td>Figure 13 on page 231</td>
<td>15</td>
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<tr>
<td>Inverter Front Cover with Side Shield</td>
<td>SK-R1-IFCVR1-F8</td>
<td>1</td>
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<td>16(2)</td>
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<tr>
<td>Inverter Heatsink Fan Inlet Screen</td>
<td>SK-R1-IFCVR2-F8</td>
<td>1</td>
<td>Figure 13 on page 231</td>
<td>17</td>
</tr>
<tr>
<td>Inverter Heatsink Fan Inlet Bottom Cover</td>
<td>SK-R1-IFCVR1-F8</td>
<td>1</td>
<td>Figure 13 on page 231</td>
<td>18</td>
</tr>
<tr>
<td>Inverter Wire Harness Kit</td>
<td>SK-R1-INVH1-F8</td>
<td>1</td>
<td>Figure 13 on page 231</td>
<td>19</td>
</tr>
<tr>
<td>EMC Capacitors</td>
<td>SK-R1-EMCCAP1-F8</td>
<td>3</td>
<td>Figure 13 on page 231</td>
<td>21</td>
</tr>
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</table>
### Table 13 - Inverter Replacement Kits/Parts (continued)

<table>
<thead>
<tr>
<th>Component Description</th>
<th>Replacement Kit Cat. No. or Part No.</th>
<th>Quantity</th>
<th>Figure and Page</th>
<th>ID No.</th>
</tr>
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<tr>
<td>Frame 8 Gasket Kit</td>
<td>20-750-G1-F8</td>
<td>1</td>
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<td></td>
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<tr>
<td>Gasket, Converter, Heatsink</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Gasket, Converter/DC Input with Precharge Assembly, Duct</td>
<td></td>
<td>1</td>
<td>Figure 13 on page 231</td>
<td>22</td>
</tr>
<tr>
<td>Gasket, Inverter, IGBT Assembly Heatsink</td>
<td></td>
<td>1</td>
<td>Figure 13 on page 231</td>
<td>23</td>
</tr>
<tr>
<td>Gasket, Inverter, Door Interface</td>
<td></td>
<td>1</td>
<td>Figure 13 on page 231</td>
<td>24</td>
</tr>
<tr>
<td>Gasket, Inverter, Exhaust Interface</td>
<td></td>
<td>1</td>
<td>Figure 13 on page 231</td>
<td>25</td>
</tr>
<tr>
<td>Gasket, Inverter, Inlet Ring</td>
<td></td>
<td>1</td>
<td>Figure 13 on page 231</td>
<td>26</td>
</tr>
<tr>
<td>Gasket, Inverter, No Choke</td>
<td></td>
<td>1</td>
<td>Figure 13 on page 231</td>
<td>27</td>
</tr>
<tr>
<td>Gasket, Inverter, Fan Inlet Bottom Cover</td>
<td></td>
<td>1</td>
<td>Figure 13 on page 231</td>
<td>28</td>
</tr>
<tr>
<td>Gasket, Inverter, Choke</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
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</table>

1. This gasket is included in the Frame 8 Gasket Kit (20-750-G1-F8), but is identified in the table in Converter Components Identification on page 82.

2. Updated panel excludes access to the P6 connector on the inverter power control board. Access to this connector, is now gained by removing the entire side shield.

**TIP**

See Fastener/Tool/Torque Information on page 33 for descriptions of the fasteners, tools, and torque figures that are used in the disassembly/assembly procedures in this chapter.
Figure 13 - Inverter Main Assembly Components Diagram
Figure 14 - Inverter Card Cage Assembly Components Diagram
Common-mode Core Assembly Removal/Installation

Remove the Common Mode Core Assembly

Note: This assembly is installed in the field only.

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the inverter assembly from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.
5. Remove the two M6 x 25 mm screws that secure the common mode core assembly to the drive frame and slide the assembly off the AC output bus terminals.

Install the Common Mode Core Assembly

Install the common mode core assembly in the reverse order of removal. See Remove the Common Mode Core Assembly.

**IMPORTANT** Grounding and Power Jumper configuration must be appropriate for EMC applications. See “Drive Power Jumper Configuration” in the Powerflex 750-Series Installation Instructions (Publication 750-IN001) for detailed information.
Internal Stirring Fan Tray
Removal/Installation

Remove the Internal Stirring Fan Tray

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Loosen the two captive screws on the face of the fan tray and pull the tray straight out from the inverter frame.

Install in the internal stirring fan tray in the reverse order of removal. See Remove the Internal Stirring Fan Tray.

IMPORTANT The power wire connector for the fans is at the right, rear of the fan mounting tray. Verify that the connector mates with the socket at the back of the enclosure when sliding the tray into the inverter frame.
Heatsink Fan Inlet Screen
Removal/Installation

Remove the Heatsink Fan Inlet Screen

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the four M5 x 14 mm screws that secure the screen to the drive frame pull down and out on the bottom screen.

Install the Heatsink Fan Inlet Screen

Install the heatsink fan inlet screen in the reverse order of removal. See Remove the Heatsink Fan Assembly.
Heatsink Fan Assembly
Removal/Installation

Remove the Heatsink Fan Assembly

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the heatsink fan inlet screen. See Remove the Heatsink Fan Inlet Screen on page 235.
5. Disconnect the control and power wire connectors P4 and P5 from the front, right side of the fan assembly.
6. Remove the eight M6 x 20 mm screws that secure the inlet seal mounting plate to the chassis and remove the plate.

Note: The inverter is shown removed from the drive enclosure only to clarify the instructions.
7. Remove the two M6 x 20 mm screws from the fan assembly. The assembly rests on two guide pins on the back wall.

8. Remove the fan assembly:
   a. By using both hands, pull the assembly slightly forward until it comes off the guide pins.
   b. Pull the bottom of the assembly toward the front of the inverter chassis and tilt the top backward so it clears the DC choke assembly (if installed). Remove the assembly.

---

**Install the Heatsink Fan Assembly**

Install the heatsink fan assembly in the reverse order of removal. See Install the Heatsink Fan Assembly on page 237.
Inverter Circuit Board Connections Cover Removal/Installation

Remove the Inverter Circuit Board Connections Cover

This section only applies when the inverter cover has the inverter circuit board connections cover present.

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Loosen the two M5 x 14 mm screws that secure the clear cover to the inverter front cover and remove the cover.

Install the Inverter Circuit Board Connections Cover

Install the inverter circuit board connections cover in the reverse order of removal. See Remove the Inverter Circuit Board Connections Cover.
Inverter Front Cover
Removal/Installation

Remove the Inverter Front Cover

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Loosen the six M5 x 14 mm screws, raise the front cover vertically, and lift it off the screws.

Note: The inverter is shown removed from the drive enclosure only to clarify the instructions.

7.25 or 0.25 in.
2.8 N·m (25.0 lb·in)
Install the Inverter Front Cover

Install the inverter front cover in the reverse order of removal. See Remove the Inverter Front Cover on page 239.

Inverter Current Sensors
Removal/Installation

Remove the Inverter Current Sensors

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the inverter assembly from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.
5. Remove the inverter front cover. See Remove the Inverter Front Cover on page 239.
6. Disengage the locking tabs and disconnect the wire connector from P1 on the power control board.
7. Remove the eight M5 x 12 mm screws and the two M5 x 10 mm screws from the current sensor mounting panel on the left side of the inverter.
8. Disengage the locking tabs and disconnect the connector that is labeled U, V, or W attached to the current sensor and remove the current sensor.

9. Remove the four M6 x 14 mm screws that secure each of the current sensors to the mounting panel.

Install the Inverter Current Sensors

Install the inverter current sensor in the reverse order of removal. See Remove the Inverter Current Sensors on page 240.
Inverter Current Sensor Wire Harness Removal/Installation

Remove the Inverter Current Sensor Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the inverter assembly from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.
5. Remove the inverter front cover. See Remove the Inverter Front Cover on page 239.
6. Disengage the locking tabs and disconnect the wire connector from P1 on the power control board.
7. Remove the eight M5 x 12 mm screws and the two M5 x 10 mm screws from the current sensor mounting panel on the left side of the inverter.
8. Disengage the locking tabs and disconnect the connector that is labeled U, V, or W attached to the current sensor and remove the current sensor.

9. Cut all wire ties from the tie locations and remove the harness.

**Install the Inverter Current Sensor Wire Harness**

Install the inverter current-sensor wire harness in the reverse order of removal. See Remove the Inverter Current Sensor Wire Harness on page Remove the Inverter Current Sensor Wire Harness.
Inverter Capacitor Bank Assembly Removal/Installation

Remove the Inverter Capacitor Bank Assembly

**IMPORTANT** A load capacity of 80 kg (175 lb) minimum is required for all lifting equipment and hardware that is used for this procedure.

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the internal stirring fan tray. See Remove the Internal Stirring Fan Tray on page 234.
5. Remove the inverter front cover. See Remove the Inverter Front Cover on page 239.
6. Remove the lower tray in the card cage that contains the power control and power supply circuit boards and store it in a dry, electrically protected, static-free location. See Remove the Power Control Circuit Board on page 262. Note, it is not necessary to remove the power control board from the tray for this procedure.

Note: The inverter is shown removed from the drive enclosure only to clarify the instructions.

**IMPORTANT** Verify that the angle of attachment of the lifting hardware is no more than 45° from vertical.
7. Connect the lifting hardware to the two lifting holes on the front of the capacitor bank assembly.

8. Remove the 12 M6 hex nuts and washers from the bus connection tabs at the top and bottom of the capacitor bank assembly.

9. Remove the six or 12 M8 x 20 mm IGBT connection screws from the capacitor bank assembly. Use lifting equipment to pull the assembly forward and out of the inverter.

10. Remove the six M6 x 50 mm screws (three at the top, three at the bottom), from the capacitor bank assembly.

<table>
<thead>
<tr>
<th>Screw Size</th>
<th>Torque Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>M6</td>
<td>10 mm 5.1 N·m (45.0 lb·in)</td>
</tr>
<tr>
<td>M6</td>
<td>T30 or F - 6.4 mm (0.25 in.) 5.1 N·m (45.0 lb·in)</td>
</tr>
<tr>
<td>M8</td>
<td>T40 or F - 6.4 mm (0.25 in.) 9.0 N·m (80.0 lb·in)</td>
</tr>
</tbody>
</table>
Install the Inverter Capacitor Bank

Install in the reverse order of removal. See Remove the Inverter Capacitor Bank Assembly on page 246.

Capacitor Balance Resistor Assembly Removal/Installation

Remove the Capacitor Balance Resistor Assembly

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the internal stirring fan tray. See Remove the Internal Stirring Fan Tray on page 234.
5. Remove the inverter front cover. See Remove the Inverter Front Cover on page 239.
6. Remove the capacitor bank. See Remove the Inverter Capacitor Bank Assembly on page 246.
7. Remove the six M5 x 16 mm screws from the sides of the capacitor balance resistor mounting tray.

8. Disconnect the POS, NEG, and MIDP wire connections from the three faston terminals on the capacitor bank assembly.

9. Slide the capacitor balance resistor mounting tray up and out of the capacitor bank assembly.

---

**Install the Capacitor Balance Resistors**

Install the capacitor balance resistors (on mounting tray) in the reverse order of removal. See Remove the Capacitor Balance Resistor Assembly on page 248.
IGBT Flexbus Bars Removal/Installation

Remove the IGBT Flexbus Bars

Note: This assembly is installed in the field only.

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the inverter assembly from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.
5. Remove the internal stirring fan tray. See Remove the Internal Stirring Fan Tray on page 234.
6. Remove the inverter front cover. See Remove the Inverter Front Cover on page 239.
7. Remove the current sensor mounting panel. See Remove the Inverter Current Sensors on page 240.
8. Remove the capacitor bank. See Remove the Inverter Capacitor Bank Assembly on page 246.
9. Remove the M10 hex nut that secures each IGBT Flexbus bar to the AC output bus bar assembly.
10. Remove the two M8 x 30 mm screws that secure each IGBT Flexbus bar to the IGBT connections.

11. Slide each of the IGBT Flexbus bars out of the front of the inverter.

**IMPORTANT** Remove the IGBT Flexbus bars carefully, so as not to damage the inverter gate boards.

---

**Inverter Gate Board Connection Ribbon Cables Removal/Installation**

**Remove the Inverter Gate Board Connection Ribbon Cables**

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the internal stirring fan tray. See Remove the Internal Stirring Fan Tray on page 234.
5. Remove the inverter front cover. See Remove the Inverter Front Cover on page 239.

**Install the IGBT Flexbus Bars**

Install the IGBT Flexbus bars in the reverse order of removal. See Remove the IGBT Flexbus Bars on page 250.
6. Remove the capacitor bank. See Remove the Inverter Capacitor Bank Assembly on page 246.

7. Disengage the locking tabs and disconnect each end of the jumper ribbon cable from the inverter gate board and remove the ribbon cable.

8. Disengage the locking tabs and disconnect one end of the upper ribbon cable from the gate board and disconnect the opposite end of the ribbon cable from the backplane in the card cage. Remove the upper ribbon cable by pulling it vertically out of the top of the inverter.

Note: The inverter is shown removed from the drive enclosure only to clarify the instructions.
Install the Inverter Gate Board Connection Ribbon Cables

Install the inverter gate board connection ribbon cables in the reverse order of removal. See Remove the Inverter Gate Board Connection Ribbon Cables on page 251.

- The gate board connection ribbon cables kit contains one each of the straight (type A) and folded (type B) upper ribbon cables. Only use the cable in the kit that matches that cable type that you have removed from the drive. Use the following drive sizing information for verification of the appropriate cable type to use with your drive.

<table>
<thead>
<tr>
<th>Table 14 - Gate Board Upper Ribbon Cable Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Ribbon Cable Type</td>
</tr>
<tr>
<td>A (straight)</td>
</tr>
<tr>
<td>B (folded)</td>
</tr>
</tbody>
</table>

Inverter Gate Circuit Board Removal/Installation

Remove the Inverter Gate Circuit Board

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the inverter assembly from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.
5. Remove the internal stirring fan tray. See Remove the Internal Stirring Fan Tray on page 234.
6. Remove the inverter front cover. See Remove the Inverter Front Cover on page 239.
7. Remove the current sensor mounting panel. See Remove the Inverter Current Sensors on page 240.
8. Remove the capacitor bank. See Remove the Inverter Capacitor Bank Assembly on page 246.
9. Remove the IGBT Flexbus bars. See Remove the IGBT Flexbus Bars on page 250.
10. Remove the inverter ribbon cables. See Remove the Inverter Gate Board Connection Ribbon Cables on page 251.
11. Remove the seven M4 x 10 mm screws that secure the gate board to the IGBT (E1, E2, G1, G2, C1, NTC1, NTC2 connections).
12. Remove the four M4 x 10 mm screws that secure the gate board to the standoffs and remove the board.

Install the Inverter Gate Circuit Board

Install the inverter gate board in the reverse order of removal. See Remove the Inverter Gate Circuit Board on page 253.
Remove the Rating Plug

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Open the drive enclosure door.

4. Remove the inverter front cover. See Remove the Inverter Front Cover on page 239.

5. Remove the lower tray in the card cage that contains the power control and power supply circuit boards and store it in a dry, electrically protected, static-free location. See Remove the Power Control Circuit Board on page 262. Note, it is not necessary to remove the power control board from the tray for this procedure.

**IMPORTANT** The program that is embedded in the backplane board determines the inverter rating; the rating plug must be compatible with the programmed value.

Note: The inverter is shown removed from the drive enclosure only to clarify the instructions.
6. Unlatch the two metal clips that secure the rating plug in the slot, tilt slightly upward, and gently pull forward to remove the plug.

**Install the Rating Plug**

Install the rating plug in the reverse order of removal. See Remove the Rating Plug on page 255.

**Power Layer Interface Circuit Board Removal/Installation**

**IMPORTANT** Determine if the existing inverter power-layer interface board is series A or series B, and verify that you have ordered/received a compatible board before replacement. See Drive Series Components Compatibility on page 30 for details.

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the inverter front cover. See Remove the Inverter Front Cover on page 239.
5. Disconnect the terminal block from P6 on the power control board.

6. Disconnect the fiber-optic cables from CONV and INV on the power layer interface board.

**IMPORTANT** Minimum inside bend radius for fiber-optic cable is 50 mm (2 in.). Any bends with a shorter inside radius can permanently damage the fiber-optic cable. Signal attenuation increases with decreased inside bend radii.
7. From the INV and CONV fiber-optic cages on the power layer interface board, remove each fiber-optic transceiver by pulling its wire latch. Set the transceivers aside and save for reinstallation.

8. Fully loosen the two captive screws on the face of the top tray in the card cage, pull forward, and remove the tray. Note, the right front corner of the power layer interface board may not clear the card cage frame. Lift the tray up to clear the card cage.

9. Remove the three M4 x 8 mm screws that secure the power layer interface board to the tray, push the board slightly back and then up to remove it from the two keyhole standoffs on the tray.

---

**Install the Power-layer Interface Circuit Board**

Install the power layer interface board in the reverse order of removal. See Remove the Power-layer Interface Circuit Board on page 256.

---

**Power Supply Circuit Board Removal/Installation**

**Remove the Power Supply Circuit Board**

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Open the drive enclosure door.
4. Remove the inverter front cover. See Remove the Inverter Front Cover on page 239.

5. Disengage the locking tabs and disconnect the wire connector from P1 on the power control board.

6. Disconnect the terminal block from P6 on the power control board.
7. Disengage the locking tabs and disconnect the wire connector from J1 on the power supply board.
8. Fully loosen the two captive screws on the face of the bottom tray in the card cage and pull the tray out of the cage.

9. Remove the five M4 x 8 mm screws that secure the power supply board to the tray, pull the board slightly forward and then down to remove it from the two keyhole standoffs on the tray.

---

Note: The inverter is shown removed from the drive enclosure only to clarify the instructions.

---

**Install the Power Supply Circuit Board**

Install the power supply board in the reverse order of removal. See Remove the Power Supply Circuit Board on page 258.
Power Control Circuit Board
Removal/Installation

Remove the Power Control Circuit Board

**TIP** During removal, keep the rating plug. It is needed for proper installation of the replacement board.

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the inverter front cover. See Remove the Inverter Front Cover on page 239.
5. Disengage the locking tabs and disconnect the wire connector from P1 on the power control board.
   **TIP** During installation mate P1 to J1.
6. Disconnect the terminal block from P6 on the power control board.
7. Disengage the locking tabs and disconnect the wire connector from J1 on the power supply board.
8. Fully loosen the two captive screws on the face of the bottom tray in the card cage and pull the tray out of the cage.

9. Remove the five M4 x 8 mm screws that secure the power control board to the tray, pull the board slightly back and then up to remove it from the two keyhole standoffs on the tray.

**Install the Power Control Circuit Board**

Install the power control board in the reverse order of removal. See Remove the Power Control Circuit Board on page 262.
Remove the Inverter Backplane Circuit Board

**IMPORTANT** Firmware must be factory programmed into the inverter backplane board by qualified Rockwell Automation personnel. Field programming is not supported.

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the inverter front cover. See Remove the Inverter Front Cover on page 239.
5. Disengage the locking tabs and disconnect the wire connector from P1 on the power control board.
6. Disconnect the terminal block from P6 on the power control board.
7. Disengage the locking tabs and disconnect the wire connector from J1 on the power supply board.

8. Disconnect the fiber-optic cables from CONV and INV on the power layer interface board.
9. Fully loosen the two captive screws on the face of the top tray in the card cage, pull forward, and remove the tray.

10. Fully loosen the two captive screws on the face of the bottom tray in the card cage and pull the tray out of the cage.

11. Disconnect the ribbon cable that is connected to the top edge of the backplane board.

12. Remove the three M4 x 8 mm screws that secure the backplane board to the tray and pull the backplane gently forward to release it from the four snap-top standoffs.

---

**Install the Inverter Backplane Circuit Board**

Install the inverter backplane board in the reverse order of removal. See Remove the Inverter Backplane Circuit Board on page 265.
Inverter EMC Capacitor
Removal/Installation (AC
Input Drive Only)

Remove the Inverter EMC Capacitors (AC Input Drive Only)

Note: There are three sets of EMC capacitors on the inverter. One set is to the left of the card cage, a second set is behind the card cage, and a third set is below the capacitor bank.

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the inverter assembly from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.
5. Remove the internal stirring fan tray. See Remove the Internal Stirring Fan Tray on page 234.
6. Remove the inverter front cover. See Remove the Inverter Front Cover on page 239.
7. Remove the current sensor mounting panel. See Remove the Inverter Current Sensors on page 240.
8. Remove the capacitor bank. See Remove the Inverter Capacitor Bank Assembly on page 246.
9. Remove the two M4 hex nuts that secure the connections from the EMC capacitors to DC choke/converter bus bar assembly.

![Diagram of Inverter EMC Capacitor](image-url)
10. Remove the two M3 x 12 mm screws that secure the inverter wire harness to the backplane in the card cage.

11. Disconnect the ribbon cable that is connected to the top edge of the backplane board.

12. Remove the two M4 x 10 mm screws that secure the card cage to the inverter frame and slide the card cage out and up to remove it.

13. Remove the two M4 x 8 mm screws that secure the EMC capacitor assembly to the card cage and remove the capacitor assembly.
14. Remove the two M4 hex nuts that secure the connections from the EMC capacitors to DC choke/converter bus bar assembly.

15. Remove the two M4 x 8 mm screws that secure the EMC capacitor assembly to the standoffs on the capacitor bank support and remove the EMC capacitor assembly.
16. Remove the five M4 hex nuts that secure the connections from the EMC capacitors to the DC choke input positive and negative bus bars and the EMC capacitor assembly to the drive chassis and remove the EMC capacitor assembly.

**Install the Inverter EMC Capacitors (AC Input Drive Only)**

Install the Inverter EMC Capacitors in the reverse order of removal. See Remove the Inverter EMC Capacitors (AC Input Drive Only) on page 268.
Remove the Inverter Side DC Bus Bars (AC Input Drive Only)

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the inverter assembly from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.
5. Remove the internal stirring fan tray. See Remove the Internal Stirring Fan Tray on page 234.
6. Remove the inverter front cover. See Remove the Inverter Front Cover on page 239.
7. Remove the current sensor mounting panel. See Remove the Inverter Current Sensors on page 240.
8. Remove the capacitor bank. See Remove the Inverter Capacitor Bank Assembly on page 246.
9. Remove the IGBT Flexbus bars. See Remove the IGBT Flexbus Bars on page 250.
10. Remove the two M4 hex nuts that secure the connections from the EMC capacitors to DC choke/converter bus bar assembly.
11. Remove the two M3 x 12 mm screws that secure the inverter wire harness to the backplane in the card cage.

12. Disconnect the ribbon cable that is connected to the top edge of the backplane board.

13. Remove the two M4 x 10 mm screws that secure the card cage to the inverter frame and slide the card cage out and up to remove it.
14. Fully loosen, but do not remove, the two M6 hex nuts at the back edge of the AC output bus bar assembly.

15. Remove the three M6 hex nuts and washers that secure the front of the AC output assembly to the capacitor bank support.

16. Lift the assembly off the front three bolts and pull forward to remove the AC output assembly.
17. Remove the two M6 hex nuts and two M5 x 10 mm screws that secure the capacitor bank gusset to the capacitor bank support and drive chassis and remove the gusset.

<table>
<thead>
<tr>
<th>Nut/Socket Head Screw</th>
<th>Torque Specification</th>
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<tr>
<td>M6 hex nuts</td>
<td>10 mm (0.4 in.)</td>
</tr>
<tr>
<td></td>
<td>5.1 N·m (45.0 lb·in)</td>
</tr>
<tr>
<td>M5 x 10 mm screws</td>
<td>T25</td>
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<tr>
<td></td>
<td>2.8 N·m (25.0 lb·in)</td>
</tr>
</tbody>
</table>
18. Remove the two M4 hex nuts that secure the connections from the EMC capacitors to the DC choke input positive and negative bus bars.

19. Remove the four M8 x 30 mm screws and four M8 flat washers that secure the bottom of the DC choke/converter bus bar assembly to the DC choke input positive and negative bus bars.

20. Remove the four M8 x 30 mm screws and M8 flat washers from the DC input and output positive and negative bus bars where they connect to the top of the DC choke and remove the bus bars.
21. Remove the three M6 x 16 mm screws that secure the DC choke/converter bus bar assembly to the chassis and remove the DC choke/converter bus bar assembly.
22. Remove the two M4 hex nuts that secure the connections from the EMC capacitors to side DC bus bars.

23. Remove the two M4 x 8 mm screws that secure the EMC capacitor assembly to the standoffs on the capacitor bank support and remove the EMC capacitor assembly.

24. Remove the two M4 x 40 mm standoffs that are secured to the capacitor bank support.

25. Remove the two M6 hex nuts that secure the two discharge resistor wires to the inverter side DC bus bars. Move the wires out of the way to allow for removal of the side DC bus bars.

26. Remove the four M6 x 20 mm screws that secure the side DC bus bars to the chassis and remove the bus bars.
Install the Inverter Side DC Bus Bars (AC Input Drive Only)

Install the inverter side DC bus bars in the reverse order of removal. See Remove the Inverter Side DC Bus Bars (AC Input Drive Only) on page 272.

**IMPORTANT** The new side DC bus bar assembly is shipped with a stabilizer bar secured to the upper connection bolts. This stabilizer bar must be removed before installing the new assembly.

Remove the four nuts and washers and stabilizer bar from the side DC bus bar assembly before installation.
Inverter Top DC Bus Bar Removal/Installation (Common DC Input Drive Only)

Remove the Inverter Top DC Bus Bars (Common DC Input Drive Only)

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the inverter assembly from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.
5. Remove the internal stirring fan tray. See Remove the Internal Stirring Fan Tray on page 234.
6. Remove the inverter front cover. See Remove the Inverter Front Cover on page 239.
7. Remove the current sensor mounting panel. See Remove the Inverter Current Sensors on page 240.
8. Remove the capacitor bank. See Remove the Inverter Capacitor Bank Assembly on page 246.
9. Remove the IGBT Flexbus bars. See Remove the IGBT Flexbus Bars on page 250.
10. Remove the two M3 x 12 mm screws that secure the inverter wire harness to the backplane in the card cage.

11. Disconnect the ribbon cable that is connected to the top edge of the backplane board.

12. Remove the two M4 x 10 mm screws that secure the card cage to the inverter frame and slide the card cage out and up to remove it.
13. Fully loosen, but do not remove, the two M6 hex nuts at the back edge of the AC output bus bar assembly.

14. Remove the three M6 hex nuts and washers that secure the front of the AC output assembly to the capacitor bank support.

15. Lift the assembly off the front three bolts and pull forward to remove the AC output assembly.
16. Remove the two M6 hex nuts and two M5 x 10 mm hexalobular screws that secure the capacitor bank gusset to the capacitor bank support and drive chassis and remove the gusset.
17. Remove the two M4 hex nuts that secure the connections from the EMC capacitors to top DC bus bars.

18. Remove the two M4 x 8 mm screws that secure the EMC capacitor assembly to the standoffs on the capacitor bank support and remove the EMC capacitor assembly.

19. Remove the two M4 x 40 mm standoffs that are secured to the capacitor bank support.

20. Remove the two M6 hex nuts that secure the two discharge resistor wires to the inverter top DC bus bars. Move the wires out of the way to allow for removal of the top DC bus bars.

21. Remove the four M6 x 20 mm screws that secure the top DC bus bars to the chassis and remove the bus bars.

---

**Install the Inverter Top DC Bus Bars (Common DC Input Drive Only)**

Install the inverter top DC bus bars in the reverse order of removal. See Remove the Inverter Top DC Bus Bars (Common DC Input Drive Only) on page 280.
DC Choke Removal/ Installation (AC Input Drives Only)

**Remove the DC Choke (AC Input Drives Only)**

**ATTENTION:** The DC choke weighs 42 kg (93 lb). To guard against possible personal injury, do not place any part of your person below the DC choke when removing it from the drive.

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the inverter assembly from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.
5. Remove the internal stirring fan tray. See Remove the Internal Stirring Fan Tray on page 234.
6. Remove the heatsink fan inlet screen. See Remove the Heatsink Fan Inlet Screen on page 235.
7. Remove the inverter front cover. See Remove the Inverter Front Cover on page 239.
8. Remove the current sensor mounting panel. See Remove the Inverter Current Sensors on page 240.
9. Remove the capacitor bank. See Remove the Inverter Capacitor Bank Assembly on page 246.
10. Remove the eight M8 x 30 mm screws and eight M8 flat washers from the DC input and output positive and negative bus bars where they connect to the top of the DC choke.

11. Remove the five M4 hex nuts that secure the connections from the EMC capacitors to the DC choke input positive and negative bus bars and the EMC capacitor assembly to the drive chassis and remove the EMC capacitor assembly.

12. Loosen only, the six M6 x 70 mm screws that secure the DC choke to the inverter.

13. Remove the four corner screws that were loosened in the previous step and then slowly loosen the remaining two screws to lower the DC choke onto the two angle brackets on either side of the fan inlet. Once the DC choke is resting on the two angle brackets, the remaining two screws can be removed.

14. Pull the DC choke forward through the fan inlet opening and remove the choke.
Install the DC Choke (AC Input Drives Only)

Install the DC choke in the reverse order of removal. See Remove the DC Choke (AC Input Drives Only) on page 285.

Inverter Wire Harness Removal/Installation

Remove the Inverter Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the inverter assembly from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.
5. Remove the internal stirring fan tray. See Remove the Internal Stirring Fan Tray on page 234.
6. Remove the heatsink fan inlet screen. See Remove the Heatsink Fan Inlet Screen on page 235.
7. Remove the inverter front cover. See Remove the Inverter Front Cover on page 239.
8. Remove the inverter current-sensor mounting panel only. Do not remove the current sensors from the mounting panel. See Remove the Inverter Current Sensors on page 240.
9. Remove the capacitor bank. See Remove the Inverter Capacitor Bank Assembly on page 246.
10. For AC input drives, remove the side DC bus bar assembly. See Remove the Inverter Side DC Bus Bars (AC Input Drive Only) on page 272. For common DC input drives, remove the top DC bus bar assembly. See Remove the Inverter Top DC Bus Bars (Common DC Input Drive Only) on page 280.
11. Remove the three M6 x 20 mm screws that secure the top bus bar support to the capacitor bank support and remove the bus bar support.
12. Cut the wire ties from the group of blue control wires on the inside, right-rear corner of the capacitor bank support.

13. Depress the tabs on the stirring fan connector and disconnect it from the mounting bracket.

14. Cut the two final cables ties where the blue fan control wires are routed through the right side of the heatsink fan inlet.

15. Remove the bushing and blue wires from the heatsink fan-inlet side plate.

16. On the inside of the heatsink fan inlet, depress the tabs on the blue control wire connector to remove it from the heatsink fan connection.

17. Remove the two M4 hex nuts that secure the black power wires at the top of the inverter.

18. Cut the remaining wire ties where the wires are routed down the outside of the inverter.

19. Remove the bushing and black wires from the heatsink fan-inlet side plate.
20. On the inside of the heatsink fan inlet, depress the tabs on the black power wire connector to remove it from the heatsink fan connection.

Install the Inverter Wire Harness

Install the inverter wire harness in the reverse order of removal. See Remove the Inverter Wire Harness on page 287.
Discharge Resistor Assembly Removal/Installation

Remove the Discharge Resistor Assembly

Note: The discharge resistor assembly includes the resistors, harness, and screws.

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the inverter assembly from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.
5. Remove the inverter front cover. See Remove the Inverter Front Cover on page 239.
6. Remove the current sensor mounting panel. See Remove the Inverter Current Sensors on page 240.
7. Remove the capacitor bank. See Remove the Inverter Capacitor Bank Assembly on page 246.
8. Remove the IGBT Flexbus bars. See Remove the IGBT Flexbus Bars on page 250.
9. Remove the two M4 hex nuts that secure the connections from the EMC capacitors to DC choke/converter bus bar assembly.
10. Remove the two M3 x 12 mm screws that secure the inverter wire harness connector to the backplane in the card cage.

11. Remove the two M4 x 10 mm screws that secure the card cage to the inverter frame and slide the card cage out and up to remove it.
12. Fully loosen, but do not remove, the two M6 hex nuts at the back edge of the AC output bus bar assembly.

13. Remove the three M6 screws that secure the front of the AC output assembly to the capacitor bank support.

14. Lift the assembly off the front three bolts and pull forward to remove the AC output assembly.
15. Remove the two M6 hex nuts and two M5 x 10 mm screws that secure the capacitor bank gusset to the capacitor bank support and drive chassis and remove the gusset.
16. Remove the two M4 hex nuts that secure the connections from the EMC capacitors to the DC choke input positive and negative bus bars.

17. Remove the four M8 x 30 mm screws and four M8 flat washers that secure the bottom of the DC choke/converter bus bar assembly to the DC choke input positive and negative bus bars.

18. Remove the four M8 x 30 mm screws and M8 flat washers from the DC input and output positive and negative bus bars where they connect to the top of the DC choke and remove the bus bars.
19. Remove the three M6 x 16 mm screws that secure the DC choke/converter bus bar assembly to the chassis and remove the DC choke/converter bus bar assembly.
20. Remove the two M4 hex nuts that are used to secure the connections from the EMC capacitors to the side DC bus bar assembly.

21. Remove the two M4 x 8 mm screws that secure the EMC capacitor assembly to the standoffs on the capacitor bank support.

22. Remove the four M4 x 8 mm screws from the discharge resistors.

23. Remove the two M6 hex nuts from the wire connections on the side DC bus bars and remove the discharge resistor assembly.

Install the Discharge Resistor Assembly

Install the discharge resistor assembly in the reverse order of removal. See Remove the Discharge Resistor Assembly on page 291.
Inverter Heatsink Fan Inlet Bottom Cover Removal/Installation

Remove the Inverter Heatsink Fan Inlet Bottom Cover

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the inverter assembly from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.
5. Lay the inverter on the back panel. See the Lifting instructions that are contained in the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001.
6. Remove the 12 M6 x 12 mm screws that secure the bottom cover and gasket to the inverter frame and remove the cover and gasket.

Install the Inverter Heatsink Fan Inlet Bottom Cover

1. Inspect the inlet bottom cover gasket for damage and replace it if necessary. See Inlet Bottom Cover Gasket Replacement on page 299.
2. Install the inverter heatsink fan-inlet bottom cover in the reverse order of removal. See Remove the Inverter Heatsink Fan Inlet Bottom Cover on page 298.

Inlet Bottom Cover Gasket Replacement

Remove the Inlet Bottom Cover Gasket

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the drive enclosure door.
4. Remove the inverter heatsink fan-inlet bottom cover. See Remove the Inverter Heatsink Fan Inlet Bottom Cover on page 298.
5. Carefully remove the gasket and any gasket material that may be stuck to the sealing surface.
6. Clean the chassis surface on which the gasket is installed with a 50% isopropyl alcohol / 50% water mixture.

Install the Inlet Bottom Cover Gasket

Note: One side of the duct gasket is coated with an adhesive. Take care to align the gasket properly before fully removing the paper liner and exposing the adhesive.

1. Begin removing the paper liner as you align the replacement gasket with the cover edges and press the gasket into place on the duct.
2. Install the inverter heatsink fan-inlet bottom cover. See Install the Inverter Heatsink Fan Inlet Bottom Cover on page 298.
Notes:
Chapter 8

AC Input Drive Enclosure Component Replacement Procedures

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This chapter provides detailed procedures for how to remove and replace AC input drive and common drive enclosure components.

Note: For detailed removal and installation instructions for the IP54, NEMA/UL Type 12 cabinet blower assembly, see the PowerFlex® 755 AC Drives Cabinet Blower Assembly Kit - Frames 8...10 Installation Instructions, publication 750-IN026.
AC Input Drive Enclosure Components Identification

This table contains the components that comprise the AC input drive and provides the following information for each component, if applicable:

- Kit catalog number or part number
- Quantity that is contained in the kit

See PowerFlex Architecture Class Low Voltage Drives Spare Parts Options, publication PFLEX-SB002 for a complete list of spare parts for PowerFlex 755 Frame 8…10 drives.

**IMPORTANT** Use only Rockwell Automation provided filters, gaskets, and components. Use of third-party components is not supported.

<table>
<thead>
<tr>
<th>Component Description</th>
<th>Replacement Kit Cat. No. or Part No.</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP20, NEMA/UL Type 1 Door Filter</td>
<td>20-750-FLTR1-F8</td>
<td>1</td>
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<tr>
<td>IP54, NEMA/UL Type 12 Cabinet Blower Exhaust Filter, Fiber (Single Pair)</td>
<td>SK-R1-FLTR2-F8</td>
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<tr>
<td>IP54, NEMA/UL Type 12 Cabinet Blower Exhaust Filter, Fiber (12 Pairs)</td>
<td>SK-R1-FLTR2M-F8</td>
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<td>IP54, NEMA/UL Type 12 Cabinet Door Filter Cassette</td>
<td>SK-R1-FLTRFRM-F8</td>
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<tr>
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<td>SK-R1-FLTR3-F8</td>
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<td>IP54, NEMA/UL Type 12 Cabinet Door Inlet Filter, Pleated (12 Pieces)</td>
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<td>IP54, NEMA/UL Type 12 Cabinet Door Gasket</td>
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<td>IP20, NEMA/UL Type 1 Debris Screen</td>
<td>SK-R1-GRILL1-F8</td>
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<td>(1) Exhaust Hood</td>
<td>20-750-HOOD1-F8</td>
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<td>Top Conduit Plate 600 mm</td>
<td>SK-R1-CPLT1-F8</td>
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<td>Top Conduit Plate 800 mm</td>
<td>SK-R1-CPLT2-F8</td>
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<td>IP20, NEMA/UL Type 1 Door Fan with Finger Guard</td>
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<td>DC Bus Fuse, 1400 A</td>
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<td>Cabinet Door Shield Kit (Frame 10)</td>
<td>20-750-EMCDK1-F10</td>
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(1) Included with IP54 enclosure, optional for IP20 enclosure.

**TIP** See Fastener/Tool/Torque Information on page 33 for descriptions of the fasteners, tools, and torque figures that are used in the disassembly/assembly procedures in this chapter.
IP20, NEMA/UL Type 1 Debris Screen Removal/Installation

Remove the Debris Screen

Note: This procedure applies to both AC input and Common DC input drive enclosures.

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Remove the four M5 x 16 screws that secure the debris screen to the top of the enclosure and remove the screen.

**Install the Debris Screen**

Install the debris screen in the reverse order of removal. See Remove the Debris Screen.
Exhaust Hood Removal/Installation

Remove the Exhaust Hood

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Remove the four M5 x 16 screws that secure the exhaust hood to the top of the enclosure and remove the hood.

![Diagram of exhaust hood](image)

Install the Exhaust Hood

Install the exhaust hood in the reverse order of removal. See Remove the Exhaust Hood.
Remove the Top Conduit Plate

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Remove the eight (for 600 mm deep enclosures) or ten (for 800 mm deep enclosures) M5 x 16 screws that secure the conduit plate to the top of the enclosure and remove the plate.

Install the Top Conduit Plate

Install the top conduit plate in the reverse order of removal. See Remove the Top Conduit Plate.
Remove the Enclosure Door Fan

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the M5 x 8 mm screw that secures the fan-power harness ground wire to the fan and remove the ground wire. Retain the screw for reuse.
5. Disconnect the Fan (+) and Fan (-) power wires from the fan terminals.
6. Remove the four M5 x 20 screws that secure the inner guard to the fan housing and remove the guard.

7. Remove the four M5 x 20 screws that secure the outer fan guard and fan to the enclosure door and remove the outer fan guard and fan.

---

### IP54, NEMA 12 Cabinet Blower Assembly and Exhaust Hood Removal/Installation

**Remove the Enclosure Door Fan**

IP54, NEMA 12 drives are equipped with a top mounted blower assembly and exhaust hood.

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Remove the ten screws that secure the blower to the drive.
4. Remove the four screws that anchor the exhaust hood to the blower unit.
5. Remove the exhaust hood.
Install the Enclosure Door Fan

Install the enclosure door fan in the reverse order of removal. See Remove the Enclosure Door Fan on page 306.

**IMPORTANT** When installing a new fan, verify that the airflow direction arrow on the fan points toward the exterior of the drive enclosure.
IP20, NEMA/UL Type 1
Enclosure Door Fan Harness
Removal/Installation

Remove the Enclosure Door Fan Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Disconnect the two-position, fan power connector from terminal TB2-3 and TB2-4 on the outside, right wall of the drive control panel.
5. Remove the M6 grounding nut from the enclosure wireway ceiling.
6. Cut the cable ties on the enclosure wireway.

![Diagram of enclosure door fan harness removal/installation](image)
7. Remove the M5 x 8 mm screw that secures the fan-power harness ground wires to each of the fans and remove the ground wires.

8. Disconnect the Fan (+) and Fan (-) power wires from the terminals on both fans and remove the fan harness.

**Install the Enclosure Door Fan Wire Harness**

Install the enclosure door fan harness in the reverse order of removal. See Remove the Enclosure Door Fan Wire Harness on page 309.

**IP54, NEMA/UL Type 12 Cabinet Blower Wire Harness Removal/Installation**

**Remove the Cabinet Blower Wire Harness**

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Remove the drive assembly from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.
4. Remove the blower assembly from the drive. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.

5. Remove the M6 x 12 mm screw that secures the wire harness ground wire to the cabinet.

6. Cut all cable ties that secure the blower wire harness to the cabinet and remove the wire harness.

---

**Install the Cabinet Blower Wire Harness**

Install the cabinet blower wire harness in the reverse order of removal. See Remove the Cabinet Blower Wire Harness on page 310.
IP54, NEMA/UL Type 12
Cabinet Blower Exhaust Filters Removal/Installation

Remove the Cabinet Blower Exhaust Filters

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Loosen the two hexalobular screws that secure each of the outer metal mesh filters to the blower assembly and remove the outer metal and inner fiber filters from the blower.

Install the Cabinet Blower Exhaust Filters

Install the cabinet blower exhaust filters in the reverse order of removal. See Remove the Cabinet Blower Exhaust Filters on page 312.

For more information on the removal and installation of the cabinet blower, see PowerFlex 755 AC Drives Cabinet Blower Assembly, publication 750-IN026.
IP20, NEMA/UL Type 1 Door Filter Removal/Installation

Remove the IP20 Door Filter

Note: This procedure applies to both AC input and Common DC input drive enclosures.

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Remove the two M6 x 16 mm screws that secure the filter bracket to the enclosure door and remove the bracket.

4. Remove the filter from the holder.

Install the Door Filter

Install the door filter in the reverse order of removal. See Remove the IP20 Door Filter.
Remove the Cabinet Door Filters

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Remove the four hexalobular screws that secure the filter cassette cover and metal mesh filter to the filter cassette chassis and remove the cover.
4. Remove the pleated fiber filter from the cassette on the cabinet door.
5. Loosen the four hexalobular screws on the outside walls of the cassette chassis that secure the metal mesh filter to the chassis.

6. Rotate the four metal latches on the inside wall of the cassette chassis and remove the filter.

---

**T25 or F - 6.4 mm (0.25 in.)**

**2.8 N·m (25 lb·in)**

---

**Install the Cabinet Door Filters**

Install the cabinet door filters in the reverse order of removal. See Remove the Cabinet Door Filter Cassette on page 316.
IP54, NEMA/UL Type 12 Cabinet-door Filter Cassette Removal/Installation

Remove the Cabinet Door Filter Cassette

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Remove the cabinet door filters. See IP54, NEMA/UL Type 12 Cabinet Door Filters Removal/Installation on page 314.
4. Remove the 16-hex nuts that secure the filter cassette chassis to the cabinet door and remove the chassis.

Install the Cabinet Door Filter Cassette

Install the cabinet door filter cassette in the reverse order of removal. See Remove the Cabinet Door Filter Cassette on page 316.
Remove the Cabinet Door Gasket

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Carefully remove the gasket and any gasket material that may be stuck to the sealing surface.
5. Clean the surface on which the gasket is installed with a 50% isopropyl alcohol / 50% water mixture.

Install the Cabinet Door Gasket

Note: One side of the door gasket is coated with an adhesive. Take care to align the gasket properly before fully removing the paper liner and exposing the adhesive.

- Begin removing the paper liner as you align the replacement gasket with the cabinet edges and press the gasket into place.
DC Bus Fuse Wire Harness
Removal/Installation (Frame 9 and Larger Drives Only)

Remove the DC Bus Fuse Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. The DC bus fuses and fuse indicators, to which the wire harness is connected, are at the back of the drive enclosure. Therefore, the drive assemblies must be removed from the enclosure. Remove the drive assemblies from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.

**IMPORTANT** You must first remove the wiring as detailed in the PowerFlex 750-Series AC Drive Installation Instructions. Then, you must disconnect the three-position, DC bus fuse wire harness connector from terminal block TB6 on the lower left side of the converter (as shown here).

Note: The converter is shown removed from the drive enclosure for clarity only.
5. Unlock the cable support on the left wall of the drive enclosure and release the DC bus wire harness from the support.

6. Remove the DC bus wire harness leads from the fuse indicators and remove the wire harness.

**Install the DC Bus Fuse Wire Harness**

Install the DC Bus Fuse Wire Harness in the reverse order of removal. See Remove the DC Bus Fuse Wire Harness on page 318.
**DC Bus Fuses and Fuse Indicators Removal/Installation (Frame 9 and Larger Drives Only)**

**Remove the DC Bus Fuses and Fuse Indicators**

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. The DC bus fuses and fuse indicators are at the back of the drive enclosure. Therefore, the drive assemblies must be removed from the enclosure. Remove the drive assemblies from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.

**IMPORTANT** You must first remove the wiring as detailed in the PowerFlex 750-Series AC Drive Installation Instructions. Then, you must disconnect the three-position, DC bus fuse wire harness connector from terminal block TB6 on the lower left side of the converter (as shown here).

Note: The converter is shown removed from the drive enclosure for clarity only.
5. Remove the two M10 hex nuts that secure each of the L-brackets to the drive backplane DC bus (extruded bars) at the back of the drive enclosure.

6. Remove the two M10 hex nuts that secure each of the brackets to the DC+ and DC- forward bus bar terminals.

**IMPORTANT**
Note the orientation of the fuse indicator terminals before removal. Replace each fuse with the terminals in same orientation.

7. Remove the DC bus wire harness leads from the fuse indicators and slide the fuse assemblies off the bolts.

*Important:* Note the orientation of the fuse indicator terminals before removal. Replace each fuse with the terminals in same orientation.

- DC+ (FU7) - terminals point downward.
- DC- (FU8) - terminals point upward.
8. Remove the two M12 x 18 mm hex bolts and washers that secure the L-bracket and connector plate to the fuse and remove the fuse.

**Install the DC Bus Fuses and Fuse Indicators**

Install the DC bus fuses and fuse indicators in the reverse order of removal. See Remove the DC Bus Fuses and Fuse Indicators on page 320.
Remove the Input Common Mode Core

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. The input common mode core is at the back of the drive enclosure. Therefore, the drive assemblies must be removed from the enclosure. Remove the drive assemblies from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.

**IMPORTANT** You must first remove the wiring as detailed in the PowerFlex 750-Series AC Drive Installation Instructions. Then, you must disconnect the three-position, DC bus fuse wire harness connector from terminal block TB6 on the lower left side of the converter (as shown here).

Note: The converter is shown removed from the drive enclosure for clarity only.
5. Remove the two M10 nuts that secure the center (S/L2) AC input terminal to the input common-mode core assembly.

6. Remove the M8 nut and washer that secures the center (S/L2) AC input terminal and isolation sheet to the insulator material on the side of the drive enclosure. Remove the terminal and isolation sheet.

7. Remove front plate and aluminum core for the center terminal from the bolts.
8. Remove the four M10 nuts that secure the remaining (R/L1, T/L3) AC input terminals to the input common-mode core assembly.

9. Remove the two M8 nuts that secure each of the remaining (R/L1, T/L3) AC input terminals to the insulator material on the side of the drive enclosure. Remove the terminals.

10. While supporting the input common mode core, remove the two front plates from the bolts connected to the drive backplane DC bus (extruded bars) at the back of the enclosure.

11. Remove the input common mode core.

12. Remove the two aluminum cores from the bolts.

13. Remove the three back plates from the bolts.

---

**Install the Input Common Mode Core**

Install the input common-mode core assembly in the reverse order of removal. See Remove the Input Common Mode Core on page 323.

---

**IMPORTANT**  The isolation sheet that separates the S/L2 terminal from the other two terminals must be installed in the same location as it was before removal.
Cabinet L Bus Bars Removal/Installation

Remove the Cabinet L Bus Bars

Note: The cabinet L bus bars are used on both AC input and common DC input frame 10 drives.

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Open the enclosure door.

4. The cabinet L bus bar is at the back of the drive enclosure. Therefore, the drive assemblies must be removed from the enclosure. Remove the drive assemblies from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.

5. Disconnect the AC line input power, output to motor, or DC power cables from the L bus bars.

6. Loosen the two M10 x 1.5 nuts that secure each L bus bar to the extruded bus bar at the back of the cabinet. Slide the L bus bars and hardware to the notch in the extruded bus bar and pull the bus bar, clamp, and bolt off the bus bar.

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Review the General Precautions on page 24.</td>
</tr>
<tr>
<td>2</td>
<td>Remove power from the drive. See Remove Power from the Drive on page 25.</td>
</tr>
<tr>
<td>3</td>
<td>Open the enclosure door.</td>
</tr>
<tr>
<td>4</td>
<td>The cabinet L bus bar is at the back of the drive enclosure. Therefore, the drive assemblies must be removed from the enclosure. Remove the drive assemblies from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.</td>
</tr>
<tr>
<td>5</td>
<td>Disconnect the AC line input power, output to motor, or DC power cables from the L bus bars.</td>
</tr>
<tr>
<td>6</td>
<td>Loosen the two M10 x 1.5 nuts that secure each L bus bar to the extruded bus bar at the back of the cabinet. Slide the L bus bars and hardware to the notch in the extruded bus bar and pull the bus bar, clamp, and bolt off the bus bar.</td>
</tr>
</tbody>
</table>
Install the Cabinet L Bus Bars

Install the cabinet L bus bars in the reverse order of removal. See Remove the Cabinet L Bus Bars on page 326.

**IMPORTANT** Verify that the clamp fits squarely in the extruded bus bar slot.

Cabinet Door EMC Shield

**Removal/Installation (Frame 10 Drives Only)**

**Remove the Cabinet Door EMC Shield**

Note: The cabinet door EMC shield assembly is used on both AC input and common DC input frame 10 drives.

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the two hex-head screws that secure the EMC assembly (five per cabinet) to the cabinet frame and remove the assembly.
5. Remove the M5 hex nut that secures the EMC assembly (five per door) to the cabinet door and remove the assembly.

Install the Cabinet Door EMC Shield

Install the cabinet door shield in the reverse order of removal. Verify that the new EMC shield kit is installed as described in the illustration that is shown here. Also, see Remove the Cabinet Door EMC Shield on page 327.
Notes:
Chapter 9

Common DC Input Drive Enclosure Component Replacement Procedures

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<th>Page</th>
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<td>342</td>
</tr>
<tr>
<td>Input Common-mode Core Removal/Installation (Common DC Input Drives)</td>
<td>343</td>
</tr>
</tbody>
</table>

This chapter provides detailed procedures for how to remove and replace common DC input drive enclosure components.
Common DC Input Drive
Enclosure Components
Identification

This table contains the components that comprise the common DC input drive
enclosure and provides the following information for each component, if
applicable:
- Kit catalog number or part number
- Quantity that is contained in the kit

See PowerFlex Architecture Class Low Voltage Drives Spare Parts Options,
publication PFLEX-SB002 for a complete list of spare parts for PowerFlex® 755
Frame 8...10 drives.

Table 16 - Common DC Input Drive Enclosure Replacement Kits/Parts

<table>
<thead>
<tr>
<th>Component Description</th>
<th>Replacement Kit Cat. No. or Part No.</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP20, NEMA/UL Type 1 Door Filter</td>
<td>20-750-FLTR1-F8</td>
<td>1</td>
</tr>
<tr>
<td>DC Input Cabinet Wire Harness Kit</td>
<td>SK-R1-CBPBRKH1-F8</td>
<td></td>
</tr>
<tr>
<td>Wire Harness, 120/240V Control Power</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Wire Harness, Transformer Primary</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Wire Harness, 120V UPS Input</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>DC Input Cabinet Back Bus Guard Kit</td>
<td>SK-R1-CBPGRD1-F8</td>
<td></td>
</tr>
<tr>
<td>Guard, Control Rail</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Guard, DC Bus</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Door Fan with Finger Guard</td>
<td>20-750-FAN3-F8</td>
<td>1</td>
</tr>
<tr>
<td>Door Fan Harness</td>
<td>SK-R1-FANH1-F8</td>
<td>1</td>
</tr>
<tr>
<td>Input Common Mode Core</td>
<td>20-750-CBPEMCCM1-F8</td>
<td>1</td>
</tr>
<tr>
<td>Cabinet L Bus Bar (see Cabinet L Bus Bars Removal/Installation on page 326 for instructions)</td>
<td>20-750-LBRKT1</td>
<td>1</td>
</tr>
<tr>
<td>Circuit Breaker, 2-Pole, 13 A</td>
<td>1489-A2D130</td>
<td>1</td>
</tr>
<tr>
<td>Lockout Attachment</td>
<td>1489-AALOA</td>
<td>1</td>
</tr>
<tr>
<td>Cabinet Door Shield Kit (Frame 10) (see Cabinet Door EMC Shield Removal/Installation (Frame 10 Drives Only) on page 327 for instructions)</td>
<td>20-750-EMCDK1-F10</td>
<td>1</td>
</tr>
</tbody>
</table>

**TIP**
See Fastener/Tool/Torque Information on page 33 for descriptions of the
fasteners, tools, and torque figures that are used in the disassembly/assembly
procedures in this chapter.
Enclosure Door Fan Removal/Installation

Remove the Enclosure Door Fan

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the M5 x 8 mm screw that secures the fan power-harness ground wire to the fan and remove the ground wire. Retain the screw for reuse.
5. Disconnect the Fan (+) and Fan (-) power wires from the fan terminals.
6. Remove the four M5 x 20 screws that secure the inner guard to the fan housing and remove the guard.

7. Remove the four M5 x 20 screws that secure the outer fan guard and fan to the enclosure door and remove the outer fan guard and fan.

## Install the Enclosure Door Fan

Install the enclosure door fan in the reverse order of removal. See Remove the Enclosure Door Fan on page 333.

**IMPORTANT** When installing a new fan, verify that the airflow direction arrow on the fan points toward the exterior of the drive enclosure.

## Enclosure Door Fan Wire Harness Removal/Installation

## Remove the Enclosure Door Fan Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Disconnect the two-position, fan power connector from terminal TB2-5 and TB2-6 on the outside, right wall of the drive control panel.

5. Remove the M6 grounding nut from the enclosure wireway ceiling.

6. Cut the cable ties that secure the wire harness to the enclosure wireway.
7. Remove the M5 x 8 mm screw that secures the fan power-harness ground wires to each of the fans and remove the ground wires.

8. Disconnect the Fan (+) and Fan (-) power wires from the terminals on both fans and remove the fan harness.

Install the Enclosure Door Fan Wire Harness

Install the enclosure door fan harness in the reverse order of removal. See Remove the Enclosure Door Fan Wire Harness on page 334.

DC Back Bus Guards Removal/Installation

Remove the DC Back Bus Guards

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Remove the drive assembly from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.
4. Remove the two ¼-20 x 1 in. hex head screws that secure the top guard (that covers the 120V control bus) to the enclosure and remove the guard.

5. Remove the four M10 x 16 mm screws that secure the middle guard (that covers the +DC and -DC bus) to the enclosure and remove the guard.

6. Remove the two ¼-20 x 1 in. hex head screws that secure the bottom guard (that covers the 120V UPS bus) to the enclosure and remove the guard.

Install the DC Back Bus Guards

Install the DC back bus guards in the reverse order of removal. Guards must be replaced before returning the drive to service. See Remove the DC Back Bus Guards on page 336.
120/240V Control Power Input Wire Harness Removal/Installation

Remove the 120/240V Control Power Input Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Remove the drive assembly from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.
4. Remove the top DC bus back guard to access the 120V control bus. See Remove the DC Back Bus Guards on page 336.
5. Loosen the two ¼-20 x ½ in. hex head screws that secure the harness to the 120V control bus and remove the wires.
6. Loosen the screws that secure the input wires to terminals SW5-2 and SW5-4 on the bottom of the circuit breaker and remove the wires.
7. Cut the cable ties that secure the wire harness to the enclosure wireways and remove the harness.
Install the 120/240V Control Power Input Wire Harness

Install the 120/240V control power-input wire harness in the reverse order of removal. See Remove the 120/240V Control Power Input Wire Harness on page 338.

Remove the 120/240V Control Power Output Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Loosen the screws that secure the output wires from terminals SW5-1 and SW5-3 on the top of the circuit breaker and remove the wires.
5. Disconnect the two-position connector from terminal block TB2-3 and TB2-4 on the outside right wall of the drive control panel.
6. Cut the cable ties from enclosure wireways and remove the harness.
Install the 120/240V Control Power Output Wire Harness

Install the 120/240V control-power output wire harness in the reverse order of removal. See 120/240V Control Power Output Wire Harness Removal/Installation on page 339.

120/240V Circuit Breaker Removal/Installation

Remove the 120/240V Circuit Breaker

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Open the enclosure door.

4. Loosen the screws that secure the output wires to terminals SW5-1 and SW5-3 on the top of the circuit breaker and the input wires to terminals SW5-2 and SW5-4 on the bottom of the circuit breaker. Remove the wires.
5. Release the spring-loaded latches at the bottom of the circuit breaker and lift the circuit breaker off the DIN rail.

Install the 120/240V Circuit Breaker

Install the 120/240V circuit breaker in the reverse order of removal. See Remove the 120/240V Circuit Breaker on page 340.
120V UPS Power Input Wire Harness Removal/Installation

Remove the 120V UPS Power Input Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Remove the drive assembly from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.
4. Remove the bottom DC bus back guard to access the 120V UPS bus. See Remove the DC Back Bus Guards on page 336.
5. Loosen the two ¼-20 x ½ in. hex head screws that secure the harness to the 120V UPS bus and remove the wires.
6. Disconnect the two-position connector from terminal block TB2-1 and TB2-2 on the outside, right wall of the drive control panel.
7. Cut the cable ties that secure the wire harness to the enclosure wireways and remove the harness.
Install the 120V UPS Power Input Wire Harness

Install the 120V UPS power input wire harness in the reverse order of removal. See Remove the 120V UPS Power Input Wire Harness on page 342.

Remove the Input Common Mode Core

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. The input common-mode core is at the back of the drive enclosure. Therefore, the drive assembly must be removed from the enclosure. Remove the drive assembly from the enclosure. See the PowerFlex 750-Series AC Drive Installation Instructions, publication number 750-IN001, for details.
5. Remove the two M10 nuts and washers that secure each of the DC+ and DC- input terminals to the input common-mode core assembly.

6. Remove the M8 nut and washer that secures each of the DC+ and DC- input terminals to the insulator material on the side of the drive enclosure. Remove the terminals.

7. While supporting the input common-mode core, remove the two front plates from the bolts connected to the drive backplane DC bus (extruded bars) at the back of the enclosure.

8. Remove the input common-mode core from the back plates.

9. Remove the two aluminum cores from the bolts.

10. Remove the two back plates from the bolts.

---

**Install the Input Common Mode Core**

Install the input common-mode core assembly in the reverse order of removal. See Remove the Input Common Mode Core on page 343.
Chapter 10

Option-bay Enclosure Component Replacement Procedures

This chapter provides detailed procedures for how to remove and replace option bay enclosure components.
## Option-bay Enclosure Components Identification

*Table 17* and *Table 18* (on page 347) contain the components that comprise the frame 8 and 9 option bay enclosures and provides the following information for each component, if applicable:

- Kit catalog number or part number
- Quantity that is contained in the kit

See PowerFlex Architecture Class Low Voltage Drives Spare Parts Options, publication [PFLX-SB002](#) for a complete list of spare parts for PowerFlex® 755 Frame 8...10 drives.

### Table 17 - Frame 8 Option Bay Replacement Kits/Parts

<table>
<thead>
<tr>
<th>Component Description</th>
<th>Replacement Kit Cat. No. or Part No. (Series A &amp; B)</th>
<th>Replacement Kit Cat. No. or Part No. (Series C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circuit Breaker Disconnect Handle Panel</td>
<td>SK-R1-ODISCP1-F8</td>
<td>SK-R1-ODISCP1-F8C</td>
</tr>
<tr>
<td>Circuit Breaker Disconnect Handle (includes handle, cable, operating, and bail mechanism)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Mechanism for 600 A, L-Frame Circuit Breaker</td>
<td>1494V-M72</td>
<td>--</td>
</tr>
<tr>
<td>Operating Mechanism for 800 A, M-Frame Circuit Breaker</td>
<td>1494V-M72</td>
<td>--</td>
</tr>
<tr>
<td>Operating Mechanism for 1200 A, N-Frame Circuit Breaker</td>
<td>1494V-M72</td>
<td>--</td>
</tr>
<tr>
<td>Disconnect Switch Handle</td>
<td>--</td>
<td>1494F-M2</td>
</tr>
<tr>
<td>IP20, NEMA/UL Type 1 Door Fan with Finger Guard</td>
<td>20-750-FAN3-F8</td>
<td></td>
</tr>
<tr>
<td>IP20, NEMA/UL Type 1 Door Fan Harness</td>
<td>SK-R1-OFANH1-F8</td>
<td></td>
</tr>
<tr>
<td>IP54, NEMA/UL Type 12 Cabinet Exhaust Blower Assembly</td>
<td>SK-R1-OFAN12-F8</td>
<td></td>
</tr>
<tr>
<td>IP54, NEMA/UL Type 12 Cabinet Exhaust Blower Harness</td>
<td>SK-R1-OFAN12H1-F8</td>
<td></td>
</tr>
<tr>
<td>IP54, NEMA/UL Type 12 Cabinet Exhaust Blower Filter, Fiber (Single)</td>
<td>SK-R1-FLTR2-F8</td>
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</tr>
<tr>
<td>IP54, NEMA/UL Type 12 Cabinet Exhaust Blower Filter, Fiber (Multi)</td>
<td>SK-R1-FLTR2M-F8</td>
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<tr>
<td>Thermostat</td>
<td>SK-R1-OTH1-F8</td>
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<tr>
<td>Thermostat Wire Harness</td>
<td>SK-R1-OTH1H1-F8</td>
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<tr>
<td>Control Transformer</td>
<td>SK-R1-OFAUXFMR</td>
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<tr>
<td>Control Transformer Fuses (includes both 400V and 600V class)</td>
<td>SK-R1-OXFMRFUSES</td>
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</tr>
<tr>
<td>IP20, NEMA/UL Type 1 Control Transformer Panel Harness</td>
<td>SK-R1-OXFMRH1-F8</td>
<td>SK-R1-OXFMRH1-F8C</td>
</tr>
<tr>
<td>IP54, NEMA/UL Type 12 Control Transformer Panel Harness</td>
<td>SK-R1-OXFMRH2-F8</td>
<td>SK-R1-OXFMRH2-F8C</td>
</tr>
<tr>
<td>Contactor Wire Harnesses</td>
<td>SK-R1-OCONTH1-F8</td>
<td>SK-R1-OCONTH1-F8C</td>
</tr>
<tr>
<td>IP54, NEMA/UL Type 12 Cabinet Door Inlet Filter, Pleated (Single Piece)</td>
<td>SK-R1-FLTR3-F8</td>
<td></td>
</tr>
<tr>
<td>IP54, NEMA/UL Type 12 Cabinet Door Inlet Filter, Pleated (12 Pieces)</td>
<td>SK-R1-FLTR3M-F8</td>
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<tr>
<td>IP54, NEMA/UL Type 12 Cabinet Door Inlet Filter, Metal Mesh</td>
<td>SK-R1-FLTR4-F8</td>
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</tbody>
</table>
### Table 18 - Frame 9 Option Bay Replacement Kits/Parts

<table>
<thead>
<tr>
<th>Component Description</th>
<th>Replacement Kit Cat. No. or Part No. (Series B)</th>
<th>Replacement Kit Cat. No. or Part No. (Series C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option Bay Guards</td>
<td>SK-R1-OGRD2-F9</td>
<td>SK-R1-OGRD2-F9C</td>
</tr>
<tr>
<td>Door Interlock with Wire Harness</td>
<td>SK-R1-ODISCP1-F9</td>
<td>SK-R1-ODRL1-F9C</td>
</tr>
<tr>
<td>Circuit Breaker Disconnect Handle Panel</td>
<td>SK-R1-ODISCP1-F9</td>
<td>SK-R1-ODISCP1-F9C</td>
</tr>
<tr>
<td>Circuit Breaker Disconnect Handle (includes handle, cable, operating, and bail mechanism)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flex-Cable Operating Mechanism for 1200 A, N-Frame Circuit Breaker</td>
<td>140U-N-FCX04</td>
<td>SK-R1-OFAN12-F8</td>
</tr>
<tr>
<td>Flex-Cable Operating Mechanism for 2500 A, R-Frame Circuit Breaker</td>
<td>140U-R-FCX04</td>
<td>SK-R1-OFAN12-F9</td>
</tr>
<tr>
<td>IP54, NEMA/UL Type 12 Cabinet Exhaust Blower Assembly</td>
<td>SK-R1-OFAN12-F8</td>
<td>SK-R1-OFAN12-F8</td>
</tr>
<tr>
<td>IP20, NEMA/UL Type 1 Cabinet Exhaust Blower Assembly</td>
<td>SK-R1-OFAN12-F9</td>
<td>SK-R1-OFAN12-F9</td>
</tr>
<tr>
<td>IP54, NEMA/UL Type 12 Cabinet Exhaust Blower Filter, Fiber (Single)</td>
<td>SK-R1-FLTR2-F8</td>
<td>SK-R1-FLTR2-F8</td>
</tr>
<tr>
<td>IP54, NEMA/UL Type 12 Cabinet Exhaust Blower Filter, Fiber (Multi)</td>
<td>SK-R1-FLTR2M-F8</td>
<td>SK-R1-FLTR2M-F8</td>
</tr>
<tr>
<td>Option-bay Wire Harness Kit</td>
<td>SK-R1-OBAH1-F9</td>
<td>SK-R1-OBAH1-F9</td>
</tr>
<tr>
<td>600V and below Control-transformer Panel Wire Harness</td>
<td>SK-R1-OBAH1-F9</td>
<td>SK-R1-OBAH1-F9</td>
</tr>
<tr>
<td>690V Control Transformer Panel Wire Harness</td>
<td>SK-R1-OBAH1-F9</td>
<td>SK-R1-OBAH1-F9</td>
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<tr>
<td>Output Reactor Wire Harness</td>
<td>SK-R1-OTH1-F8</td>
<td>SK-R1-OTH1-F8</td>
</tr>
<tr>
<td>With input/output Reactor Jumper Wire</td>
<td>SK-R1-OTH1-F8</td>
<td>SK-R1-OTH1-F8</td>
</tr>
<tr>
<td>No Reactor Jumper Wire</td>
<td>SK-R1-OTH1-F8</td>
<td>SK-R1-OTH1-F8</td>
</tr>
<tr>
<td>Reactor Fan Tray Wire Harness</td>
<td>SK-R1-OTH1-F8</td>
<td>SK-R1-OTH1-F8</td>
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<tr>
<td>Exhaust Blower Wire Harness</td>
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<td>SK-R1-OTH1-F8</td>
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<tr>
<td>Exhaust Blower Jumper Wire</td>
<td>SK-R1-OTH1-F8</td>
<td>SK-R1-OTH1-F8</td>
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<tr>
<td>24V Supply Wire Harness</td>
<td>SK-R1-OTH1-F8</td>
<td>SK-R1-OTH1-F8</td>
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<tr>
<td>Thermostat</td>
<td>SK-R1-OTH1-F8</td>
<td>SK-R1-OTH1-F8</td>
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<tr>
<td>Thermostat Wire Harness</td>
<td>SK-R1-OTH1-F8</td>
<td>SK-R1-OTH1-F8</td>
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<tr>
<td>Control Transformer</td>
<td>SK-R1-OTH1-F8</td>
<td>SK-R1-OTH1-F8</td>
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### Table 18 - Frame 9 Option Bay Replacement Kits/Parts (continued)

<table>
<thead>
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<th>Component Description</th>
<th>Replacement Kit Cat. No. or Part No. (Series B)</th>
<th>Replacement Kit Cat. No. or Part No. (Series C)</th>
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<tbody>
<tr>
<td>Control Transformer Fuses (includes both 400V and 600V class)</td>
<td>SK-R1-OXFMRFUSES</td>
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<tr>
<td>Reactor Fan Tray</td>
<td>SK-R1-OCAARTFAN-F9</td>
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<tr>
<td>Reactor Fan Relay</td>
<td>700-HLT12U2X</td>
<td></td>
</tr>
<tr>
<td>IP54, NEMA/UL Type 12 Cabinet Door Inlet Filter, Pleated (Single Piece)</td>
<td>SK-R1-FLTR3-F8</td>
<td></td>
</tr>
<tr>
<td>IP54, NEMA/UL Type 12 Cabinet Door Inlet Filter, Pleated (12 Pieces)</td>
<td>SK-R1-FLTR3M-F8</td>
<td></td>
</tr>
<tr>
<td>IP54, NEMA/UL Type 12 Cabinet Door Inlet Filter, Metal Mesh</td>
<td>SK-R1-FLTR4-F8</td>
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<tr>
<td>IP54, NEMA/UL Type 12 Cabinet Door Filter Cassette</td>
<td>SK-R1-FLTRFRM-F8</td>
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</tr>
<tr>
<td>IP54, NEMA/UL Type 12 Cabinet Door Gasket</td>
<td>SK-R1-G2-F8</td>
<td></td>
</tr>
<tr>
<td>Upper and Lower Conduit Plates (600 mm deep cabinet)</td>
<td>SK-R1-OCPLT1-F8</td>
<td></td>
</tr>
<tr>
<td>Upper and Lower Conduit Plates (800 mm deep cabinet)</td>
<td>SK-R1-OCPLT2-F8</td>
<td></td>
</tr>
</tbody>
</table>

**TIP** See Fastener/Tool/Torque Information on page 33 for descriptions of the fasteners, tools, and torque figures that are used in the disassembly/assembly procedures in this chapter.

### Remove the Frame 8 Circuit Breaker Disconnect Handle Panel

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the option bay door.
4. Remove the circuit breaker disconnect handle per the manufacturer’s instructions.
5. Remove the three M8 x 20 mm hexalobular screws that secure the disconnect handle panel to the support bracket and remove the handle panel.

T40
6.7 N·m (60 lb·in)
6. Remove the four M5 x 12 mm hex head screws that secure the disconnect support bracket to the enclosure frame and remove the support bracket.

Install the Frame 8 Circuit Breaker Disconnect Handle Panel

Install the disconnect support bracket and handle panel in the reverse order of removal. See Remove the Frame 8 Circuit Breaker Disconnect Handle Panel on page 348.
Remove the IP20, NEMA/UL Type 1 Door Fan (Frame 8 Only)

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the M5 x 8 mm screw that secures the fan-power harness ground wire to the fan and remove the ground wire. Retain the screw for reuse.
5. Disconnect the Fan (+) and Fan (-) power wires from the fan terminals.
6. Remove the four M5 x 20 mm screws that secure the inner guard to the fan housing and remove the guard.

7. Remove the four M5 x 20 mm screws that secure the outer fan guard and fan to the enclosure door and remove the outer fan guard and fan.

---

**Install the IP20, NEMA/UL Type 1 Door Fan (Frame 8 Only)**

Install the door fan in the reverse order of removal. See Remove the IP20, NEMA/UL Type 1 Door Fan (Frame 8 Only) on page 351.

**IMPORTANT** When installing a new fan, verify that the airflow direction arrow on the fan points to the exterior of the drive enclosure.
Remove the IP20, NEMA/UL Type 1 Door Fan Harness (Frame 8)

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the M5 screw that secures the fan-power harness ground wire to the fan and remove the ground wire. Retain the screw for reuse.
5. Disconnect the Fan (+) and Fan (-) power wires from the fan terminals.
6. Remove the M6 grounding nut from the cabinet ceiling.

7. Disconnect the fan harness from the connector in the upper left corner of the cabinet, and remove the fan harness.

Install the IP20, NEMA/UL Type 1 Door Fan Harness (Frame 8 Only)

Install the door fan harness in the reverse order of removal. See Remove the IP20, NEMA/UL Type 1 Door Fan Harness (Frame 8) on page 353.
Remove the IP54, NEMA/UL Type 12 Cabinet Exhaust Blower Filter

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Remove the four hexalobular screws that secure the filter cover to the door and remove the filter and cover from the drive.

Install the IP54, NEMA/UL Type 12 Cabinet Exhaust Blower Filter

Install the IP54, NEMA/UL Type 12 cabinet exhaust blower in the reverse order of removal. See Remove the IP54, NEMA/UL Type 12 Cabinet Exhaust Blower Filter.

IP54, NEMA/UL Type 12 Cabinet Door-inlet Filters Removal/Installation

The steps to remove and install the IP54, NEMA/UL Type 12 cabinet door inlet filters is the same as the IP54, NEMA/UL Type 12 Cabinet Door Filters Removal/Installation procedures on page 314.

IP54, NEMA/UL Type 12 Cabinet Door-inlet Filter Cassette Removal/Installation

The steps to remove and install the IP54, NEMA/UL Type 12 cabinet door-inlet filter cassette is the same as the IP54, NEMA/UL Type 12 Cabinet-door Filter Cassette Removal/Installation procedures on page 316.
IP54, NEMA/UL Type 12 Cabinet Door Gasket Removal/Installation

The steps to remove and install the IP54, NEMA/UL Type 12 cabinet door gasket is the same as the IP54, NEMA/UL Type 12 Cabinet Door Gasket Removal/Installation procedures on page 317.

Frame 8 Option Bay Guard Removal/Installation

Remove the Frame 8 Option Bay Guard

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the option bay door.
4. Loosen, but do not remove, the 11 M5 x 12 mm hex head screws that secure the guard to the cabinet frame and remove the guard.

Install the Frame 8 Option Bay Guard

Install the frame 8 option bay guard in the reverse order of removal. See Remove the Frame 8 Option Bay Guard on page 356.
Frame 9 Series B Option Bay Guards Removal/Installation

Remove the Frame 9 Series B Option Bay Guards

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the option bay door.
4. Remove the six nylon M5 hex nuts that secure the upper guard to the chassis, and remove the guard.

![Diagram showing the removal process](image-url)
5. Remove the six nylon M5 hex nuts that secure the lower guard to the chassis, and remove the guard.

Install the Frame 9 Series B Option Bay Guards

Install the frame 9 series B option bay guards in the reverse order of removal. See Remove the Frame 9 Series B Option Bay Guards on page 357.

**IMPORTANT** The circuit breaker disconnect handle cable must be positioned in front of the lower guard and behind the upper guard.
Frame 9 Series C Option Bay Guards Removal/Installation

Remove the Frame 9 Series C Option Bay Guards

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the option bay door.
4. Remove the six nylon M5 hex nuts that secure the upper guard to the chassis, and remove the guard.
5. Remove the six nylon M5 hex nuts that secure the lower guard to the chassis, and remove the guard.

---

**Install the Frame 9 Series C Option Bay Guards**

Install the frame 9 series C option bay guards in the reverse order of removal. See Remove the Frame 9 Series C Option Bay Guards on page 359.
Control Transformer Fuses

Removal/Installation

Remove the Control Transformer Fuses

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the option bay door.
4. Remove the guards. See Remove the Frame 8 Option Bay Guard on page 356, or Remove the Frame 9 Series B Option Bay Guards on page 357.
5. To remove the fuses from the two-position fuse holders, use a fuse puller.

Install the Control Transformer Fuses

Install the control transformer fuses in the reverse order of removal. See Remove the Control Transformer Fuses on page 361. Also, see the frame 8 and frame 9 option bay schematics in Appendix A on page 423 for fuse designations.
Frame 8 IP54, NEMA/UL Type 12 Cabinet Blower Assembly

Remove the Frame 8 IP54, NEMA/UL Type 12 Cabinet Blower Assembly

Note: The blower assembly weights approximately 12.4 kg (27.3 lb).

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the option bay door.
4. Disconnect the four-position blower power harness connector from the connector on the bottom of the blower assembly.
5. Loosen the four captive 5 mm hex screws that secure the blower assembly to the cabinet frame and remove the assembly from the drive.

Install the Frame 8 IP54, NEMA/UL Type 12 Cabinet Blower Assembly

Install the frame 8 IP54, NEMA/UL Type 12 cabinet blower assembly in the reverse order of removal. See Remove the Frame 8 IP54, NEMA/UL Type 12 Cabinet Blower Assembly on page 362.
Frame 8 IP54, NEMA/UL Type 12 Cabinet Blower Wire Harness Removal/Installation

Remove the Frame 8 IP54, NEMA/UL Type 12 Cabinet Blower Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the option bay door.
4. Remove the guard. See Remove the Frame 8 Option Bay Guard on page 356.
5. Disconnect the power connector from terminal block TB5 on the control transformer panel on the right side of the cabinet.
6. Open the releasable cable tie that secures the harness to the control transformer panel and pull the harness up from behind the panel.
7. Disconnect the cable connector from the blower assembly.

8. Disconnect the two-position blower harness connector from the drive bay connector.

9. Open the releasable cable ties that secure the blower harness to the enclosure wireway and remove the harness.

Install the Frame 8 IP54, NEMA/UL Type 12 Cabinet Blower Wire Harness

Install the IP54, NEMA/UL Type 12 cabinet blower wire harness in the reverse order of removal. See Remove the Frame 8 IP54, NEMA/UL Type 12 Cabinet Blower Wire Harness on page 363.

Frame 8 Control Transformer Removal/Installation

Remove the Frame 8 Control Transformer

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Open the option bay door.
4. Remove the guard. See Remove the Frame 8 Option Bay Guard on page 356.

**IMPORTANT** Before you disconnect the control-transformer primary wires leads, note the terminal connections. The control transformer has multiple input phase terminals. See Frame 8 AC Input IP20 Option Bay with a Control Transformer Schematic Diagram on page 431 or Frame 8 AC Input IP54 Option Bay Schematic Diagram on page 432 for more information.

5. Loosen the M4 screws that secure the primary wire leads to the Hx terminals at the top of the transformer and remove the wires.

6. Loosen the M4 screws that secure the secondary wire leads to the X1...X3 terminals at the bottom of the transformer and remove the wires.

**IMPORTANT** The control transformer is heavy. Be sure to support it as you remove the screws, so it does not fall and damage other components.

7. Remove the four M6 nuts and washers that secure the transformer to the control panel and remove the control transformer.
Install the Frame 8 Control Transformer

Install the frame 8 control transformer in the reverse order of removal. See Remove the Frame 8 Control Transformer on page 364.

**IMPORTANT** The control transformer has multiple input phase terminals. See Frame 8 AC Input IP20 Option Bay with a Control Transformer Schematic Diagram on page 431 or Frame 8 AC Input IP54 Option Bay Schematic Diagram on page 432 for more information.

Frame 8 Control Transformer Wire Harness Removal/Installation

Remove the Frame 8 Control Transformer Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the option bay door.
4. Remove the guard. See Remove the Frame 8 Option Bay Guard on page 356.

**IMPORTANT** Before you disconnect the control-transformer primary wires leads, note the terminal connections. The control transformer has multiple input phase terminals. See Frame 8 AC Input IP20 Option Bay with a Control Transformer Schematic Diagram on page 431 or Frame 8 AC Input IP54 Option Bay Schematic Diagram on page 432 for more information.
5. Loosen the M4 screws that secure the primary wire leads to the Hx terminals at the top of the transformer and remove the wires.

6. Loosen the M4 screws that secure the secondary wire leads to the X1...X3 terminals at the bottom of the transformer and remove the wires.

7. Remove the M6 nut and washer that secures the ground wire (GND) to the control panel. Retain the screw and washer for reuse.
8. Loosen the screws that secure each of the wire leads to the fuse holders (FU9, FU10, FU11, FU12, FU13) and remove the wires.

9. For IP54 drives only, loosen the screws that secure the wires to the relay terminal block (RELAY1) and remove the wires.
10. Loosen the screws that secure the wires to terminal blocks TB4 and GND.

11. If present, disconnect the four-position contactor status connector from terminal block TB3.

12. If present, disconnect the three-position control power connector from terminal block TB3.

13. For IP54 drives, disconnect the five-position blower power connector from terminal blocks TB5.
14. For IP54 drives, remove the two screws that secure terminal block TB5 to the control panel and remove the terminal block. Retain the screws for reuse. Torque requirement for reassembly is 1.6 N•m (15 lb•in).

15. Use a flat nose screwdriver to remove the push-mount terminal block TB3 from the DIN rail.

16. Remove the removable cable tie mounts that secure the wire harness to the control panel and remove the wire harness.

---

**Install the Frame 8 Control Transformer Wire Harness**

Install the frame 8 control transformer wire harness in the reverse order of removal. See Remove the Frame 8 Control Transformer Wire Harness on page 366.
Frame 8 Contactor Wire Harness Removal/Installation

Remove the Frame 8 Contactor Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the option bay door.
4. Remove the guard. See Remove the Frame 8 Option Bay Guard on page 356.
5. Loosen the screws that secure the wire leads to terminals A1 and A2 on the top of the contactor and remove the wires.
6. Loosen the screws that secure the wire leads to terminals 13, 14, 21, and 22 on the side of the contactor and remove the wires.
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7. Loosen the screws that secure the four wires to the top of terminal block TB3 on the control panel and remove the wires.

8. Loosen the screws that secure the two wires to the bottom of terminal block TB4 on the control panel and remove the wire harness.

Install the Frame 8 Contactor Wire Harness

Install the frame 8 contactor wire harness in the reverse order of removal. See Remove the Frame 8 Contactor Wire Harness on page 371.

Frame 8 Thermostat and Wire Harness Removal/Installation

Remove the Frame 8 Thermostat and Wire Harness

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Open the option bay enclosure door.

4. Remove the guard. See Remove the Frame 8 Option Bay Guard on page 356.
5. Remove the two nylon screws that secure the thermostat to the mounting standoffs and remove the thermostat and wire harness.

6. Disconnect the thermostat wire harness from the connector on the side of the cabinet frame.

7. Remove the cable tie mounts from the cabinet frame and remove the wire harness.

Install the Frame 8 Thermostat and Wire Harness

Install the thermostat and wire harness in the reverse order of removal. See Remove the Frame 8 Thermostat and Wire Harness on page 372.
Frame 9 Cabinet Blower Assembly Removal/Installation

Remove the Frame 9 Cabinet Blower Assembly

Note: The blower assembly weights approximately 12.4 kg (27.3 lb).

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the option bay door.
4. Disconnect the blower power connector from the connector on the bottom of the blower assembly.
5. Loosen the four captive 5 mm hex screws that secure the blower assembly to the cabinet frame and remove the assembly from the drive.

Install the Frame 9 Cabinet Blower Assembly

Install the frame 9 cabinet blower assembly in the reverse order of removal. See Remove the Frame 9 Cabinet Blower Assembly on page 374.
Frame 9 Cabinet Blower Wire Harness Removal/Installation

Remove the Frame 9 Cabinet Blower Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the option bay door.
4. Remove the upper guard. See Remove the Frame 9 Series B Option Bay Guards on page 357.
5. Disconnect the blower wire harness from the terminal block on the left side of the control panel.
6. Open the releasable cable ties that secure the harness to the side of the cabinet.
7. Disconnect the blower power connector from the connector on the bottom of the blower assembly.

8. Disconnect the connector from the drive bay connector and remove the harness.

---

Install the Frame 9 Cabinet Blower Wire Harness

Install the frame 9 cabinet blower wire harness in the reverse order of removal. See Remove the Frame 9 Cabinet Blower Wire Harness on page 375.
Frame 9 Circuit Breaker Disconnect Handle Panel (Series A) Removal/Installation

Remove the Frame 9 Circuit Breaker Disconnect Handle Panel (Series A)

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the option bay door.
4. Remove the power option assembly from the cabinet. See the PowerFlex 750-Series AC Drives Installation Instructions, publication 750-IN001 for details.
5. Remove the circuit breaker disconnect handle per the manufacturer’s instructions.
6. Push the thermostat harness connector through the cutout in the top of the panel.
7. Remove the two cable tie mounts from the panel and remove the thermostat wire harness.
8. Remove the eight M5 x 12 mm hexalobular screws that secure the disconnect handle panel to the power option assembly and remove the panel.

6 7 8

2.8 N•m (25 lb•in)
**Install the Frame 9 Circuit Breaker Disconnect Handle Panel (Series A)**

Install the frame 9 circuit breaker disconnect handle panel (series A) in the reverse order of removal. See Remove the Frame 9 Circuit Breaker Disconnect Handle Panel (Series A) on page 377.

---

**Frame 9 Thermostat and Wire Harness Removal/Installation**

**Remove the Frame 9 Thermostat and Wire Harness**

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the option bay door.
4. Remove the power option assembly from the cabinet. See the PowerFlex 750-Series AC Drives Installation Instructions, publication 750-IN001 for details.
5. Remove the two nylon screws that secure the thermostat to the mounting standoffs and remove the thermostat.
6. Open the releasable cable ties that secure the harness to the chassis.
7. Push the thermostat harness connector through the cutout in the top of the panel and remove the thermostat and wire harness.

Install the Frame 9 Thermostat and Wire Harness

Install the frame 9 thermostat and wire harness in the reverse order of removal. See Remove the Frame 9 Thermostat and Wire Harness on page 378.
Frame 9 Control Transformer Removal/Installation

Remove the Frame 9 Control Transformer

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Open the option bay door.

4. Remove the upper guard. See Remove the Frame 9 Series B Option Bay Guards on page 357.

**IMPORTANT** Before you disconnect the control-transformer primary wires leads, note the terminal connections. The control transformer has multiple input phase terminals. See Frame 9 AC Input Option Bay Schematic Diagram on page 433 for more information.

5. Loosen the M4 screws that secure the primary wire leads to the Hx terminals on the left side of the transformer and remove the wires.

6. Loosen the M4 screws that secure the secondary wire leads to the X1...X3 terminals on the right side of the transformer and remove the wires.

**IMPORTANT** The control transformer is heavy. Be sure to support it as you remove the screws, so it does not fall and damage other components.

7. Remove the four M6 nuts and washers that secure the transformer to the control panel and remove the control transformer.
**Install the Frame 9 Control Transformer**

Install the frame 9 control transformer in the reverse order of removal. See Remove the Frame 9 Control Transformer on page 380.

---

**IMPORTANT**
The control transformer has multiple input phase terminals. See Frame 9 AC Input Option Bay Schematic Diagram on page 433 for more information.

---

**Frame 9 Main Control-panel Wire Harness Removal/Installation**

**Remove the Frame 9 Main Control-panel Wire Harness**

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the option bay door.
4. Remove the guards. See Remove the Frame 9 Series B Option Bay Guards on page 357.
5. Loosen the two screws that secure the wires from the control panel to the door interlock and remove the wires.
6. Disconnect the blower wire harness from terminal block TB5 on the left side of the control panel.
7. Remove the two M3 x 12 mm hexalobular screws and washers that secure the terminal block to the left side of the control panel. Retain the screws and washers for reuse.
8. Loosen the M4 screws that secure the primary wire leads to the Hx terminals on the left side of the transformer and remove the wires.

9. Loosen the M4 screws that secure the secondary wire leads to the X1...X3 terminals on the right side of the transformer and remove the wires.

**IMPORTANT** Before you disconnect the control-transformer primary wires leads, note the terminal connections. The control transformer has multiple input phase terminals. See Frame 9 AC Input Option Bay Schematic Diagram on page 433 for more information.
10. Remove the two screws and washers that secure the fuse wire leads to the AC input bus bars and remove the wires. Retain the screws and washers for reuse.

11. Loosen the screws that secure each of the eight wire leads to the fuse holders (FU9, FU10, FU11, FU12) and remove the wires.

12. Loosen the screws that secure the wires to the relay terminal block (RELAY1) and remove the wires.

13. Loosen the screws that secure the wires to the top and bottom of the grounding terminal block (GND) and remove the wires.
14. Remove the screw and washer that secures the ground wire to the control panel (GND) and remove the ground wire. Retain the screw and washer for reuse.

15. If present, disconnect the three-position control output power connector from terminal block TB3.

16. If present, disconnect the three-position reactor fans power connector from terminal block TB3.
17. To remove the push-mount terminal block TB3 from the DIN rail, use a flat nose screwdriver.

18. Remove the removable cable tie mounts that secure the wire harness to the control panel and remove the wire harness.

Install the Frame 9 Main Control-panel Wire Harness

Install the frame 9 main control-panel wire harness in the reverse order of removal. See Remove the Frame 9 Main Control-panel Wire Harness on page 381.

**IMPORTANT** The control transformer has multiple input phase terminals. See Frame 9 AC Input Option Bay Schematic Diagram on page 433 for more information.
Frame 9 Reactor Fan Tray
Removal/Installation

Remove the Frame 9 Reactor Fan Tray

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the option bay door.
4. Remove the guards. See Remove the Frame 9 Series B Option Bay Guards on page 357.
5. Disconnect the three-position fan power connector from the terminal block at the bottom, right side of the option bay chassis.

6. Remove the two M4 x 12 mm hexalobular screws that secure the fan tray to the chassis and slide the fan tray out of the chassis.

120°F - 6.4 mm (0.25 in.)
3.3 N·m (30 lb·in.)
Install the Frame 9 Reactor Fan Tray

Install the frame 9 reactor fan tray in the reverse order of removal. See Remove the Frame 9 Reactor Fan Tray on page 386.

Frame 9 Reactor Fan Tray Wire Harness Removal/Installation

Remove the Frame 9 Reactor Fan Tray Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the option bay door.
4. Remove the Reactor Fan Tray from the drive. See Remove the Frame 9 Reactor Fan Tray on page 386.
5. Disconnect the Fan (+) and Fan (-) power wires from the fan terminals.
6. Remove the M4 x 8 mm hexalobular screw that secures the ground wire to the side of the fan and remove the ground wire.

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**T20 or F - 6.4 mm (0.25 in.)**
**2.2 N-m (20 lb-in)**
7. On the underside of the tray, remove the two M4 x 12 mm hexalobular screws that secure the fan harness ground wires to the fan tray.

8. On the underside of the tray, remove the two M4 x 16 mm hexalobular screws that secure the fan harness terminal block to the fan tray.

9. On the underside of the tray, disengage the two cable tie push mounts that secure the fan harness to the fan tray and remove the harness.

**Install the Frame 9 Reactor Fan Tray Wire Harness**

Install the frame 9 reactor fan tray harness in the reverse order of removal. See Remove the Frame 9 Reactor Fan Tray Wire Harness on page 387.

**TIP** The positions of the cable tie push mounts and ground wire connection points determine the proper orientation of the wire harness.
Frame 9 Reactor Fans Wire Harness Removal/Installation

Remove the Frame 9 Reactor Fans Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the option bay door.
4. Remove the power option assembly from the cabinet. See the PowerFlex 750-Series AC Drives Installation Instructions, publication 750-IN001 for details.
5. Disconnect the three-position fan power connector from terminal block TB3 on the control panel.
6. Disconnect the three-position fan power connector from the terminal block at the bottom, right side of the option bay chassis.

7. Remove the cable tie mounts from the side of the power option assembly.

8. Remove the grommets from the holes in the power option assembly and remove the wire harness.
Install the Frame 9 Reactor Fans Wire Harness

Install the frame 9 reactor fans wire harness in the reverse order of removal. See Remove the Frame 9 Reactor Fans Wire Harness on page 389.

Frame 9 Cabinet Blower Relay Removal/Installation

Remove the Frame 9 Cabinet Blower Relay

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the option bay door.
4. Remove the guards. See Remove the Frame 9 Series B Option Bay Guards on page 357.
5. Loosen the four screws that secure the wire leads to the top of the fan relay terminal block (RELAY1) and remove the wires.
6. Loosen the two screws that secure the wire leads to the bottom of the fan relay and remove the wires.
7. To remove the relay from the DIN rail, use a flat nose screwdriver.

Install the Frame 9 Cabinet Blower Relay

Install the frame 9 cabinet blower relay in the reverse order of removal. See Remove the Frame 9 Cabinet Blower Relay.
Frame 9 Control Panel Thermostat Harness Removal/Installation

Remove the Frame 9 Control-panel Thermostat Wire Harness

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the option bay door.
4. Remove the guards. See Remove the Frame 9 Series B Option Bay Guards on page 357.
5. Disconnect the thermostat connector from terminal block TB6 on the right side of the control panel.
6. Remove the two M3 x 12 mm hexalobular screws that secure the terminal block to the support bracket.

T15
2.8 N·m (25 lb·in)
7. Loosen the screws that secure the wire leads to the top and bottom of terminal block TB4, remove the wire harness from the supports, and remove the wire harness.

**Install the Frame 9 Control-panel Thermostat Wire Harness**

Install the frame 9 control-panel thermostat wire harness in the reverse order of removal. See Remove the Frame 9 Control-panel Thermostat Wire Harness on page 392.
Top Conduit Plate Removal/Installation

Remove the Top Conduit Plate

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Remove the ten M5 x 16 mm screws that secure the conduit plate to the top of the enclosure and remove the plate.

Install the Top Conduit Plate

Install the top conduit plate in the reverse order of removal. See Remove the Top Conduit Plate.
Bottom Conduit Plate Removal/Installation

Remove the Bottom Conduit Plate

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Remove the chassis from the option bay.
4. Remove the eight M5 x 16 screws that secure the plate to the bottom of the enclosure and remove the plate.

Install the Bottom Conduit Plate

Install the bottom conduit plate in the reverse order of removal. See Remove the Bottom Conduit Plate.
Notes:
Enclosure Cable Components Replacement Procedures (Frame 9 and Larger Drives)

This chapter provides detailed procedures for how to remove and replace enclosure cable components that are used on frame 9 and larger drives.

Enclosure Cable Components and Part Numbers

This table contains the components that comprise the frame 9 and larger drive enclosure cables and provides the following information for each component, if applicable:

- Kit catalog number or part number
- Quantity that is contained in the kit

See PowerFlex Architecture Class Low Voltage Drives Spare Parts Options, publication **PFLEx-SB002** for a complete list of spare parts for PowerFlex® 755 Frame 8...10 drives.

**IMPORTANT** Use only Rockwell Automation provided fiber-optic cables and transceivers. Use of third-party components is not supported.

<table>
<thead>
<tr>
<th>Component Description</th>
<th>Replacement Kit Cat. No. or Part No.</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Bay 24V Wire Harness Kit</td>
<td>20-750-PH2-F9</td>
<td>1</td>
</tr>
<tr>
<td>3-Bay 24V Wire Harness Kit</td>
<td>20-750-PH3-F10</td>
<td>1</td>
</tr>
<tr>
<td>Fiber-optic Cable, 560 mm (22 in.) Long, Kit</td>
<td>20-750-FCBL1-F8</td>
<td>–</td>
</tr>
<tr>
<td>Fiber-optic Cable, 560 mm (22 in.) Long</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Cable Labels (CONV and INV)</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>
Table 19 - Enclosure Cable Replacement Kits/Parts (continued)

<table>
<thead>
<tr>
<th>Component Description</th>
<th>Replacement Kit Cat. No. or Part No.</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber-optic Cable, 2.8 m (110 in.) Long, Kit</td>
<td>20-750-FCL1-F10</td>
<td></td>
</tr>
<tr>
<td>Fiber-optic Cable, 2.8 m (110 in.) Long</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Cable Labels (INV1, INV2, and INV3)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Fiber-optic Cable Spool Kit</td>
<td>20-750-SPL1-F10</td>
<td>1</td>
</tr>
<tr>
<td>Fiber-optic Transceiver</td>
<td>SK-R1-FTR1-F8</td>
<td>1</td>
</tr>
</tbody>
</table>

**TIP**  
See Fastener/Tool/Torque Information on page 33 for descriptions of the fasteners, tools, and torque figures that are used in the disassembly/assembly procedures in this chapter.

24V Wire Harness Removal/Installation (Frame 9 and Larger Drives)

Removing the 24V Wire Harness (Frame 9 and Larger Drives)

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure doors.
4. Complete the following steps in the drive bay that holds the control pod.
   a. Remove the control pod cover. See Remove the Control Pod Cover on page 59.
b. Disconnect the J14 connector from P14 on the fiber interface board in the control pod.
c. Disconnect the three-position 24V wire harness connector from terminal block TB1 on the control panel (behind the control pod). Remove the cable from the cable support on the bottom of the control panel.
d. Unlock the three cable supports along the inside left wall of the control pod.

e. Open the two releasable cable ties; one at the top left of the control pod, and one on the horizontal wireway at the top of the enclosure.
5. Complete the following steps in each additional enclosure.
   a. Remove the converter or common-bus precharge right cover. See Remove the Converter Right Cover (No Control Pod) on page 88 or Remove the DC Input with Precharge Assembly Right Cover (No Control Pod) on page 172.
   b. Disconnect the three-position 24V wire harness connector from terminal block TB1 on the control panel and remove the cable from the cable support on the bottom of the control panel.
   c. Open the three releasable cable ties along the inside right wall of the control panel.

6. On the horizontal wireway, open all releasable cable ties.

7. Remove the 24V wire harness from the enclosures.

---

**Installing the 24V Wire Harness (Frame 9 and Larger Drives)**

Install the 24V wire harness in the reverse order of removal. See Removing the 24V Wire Harness (Frame 9 and Larger Drives) on page 398.
First Inverter (INV1) Fiber-optic Cable Removal/Installation

Removing the First Inverter (INV1) Fiber-optic Cable

**IMPORTANT**  Minimum inside bend radius for fiber-optic cable is 50 mm (2 in.). Any bends with a shorter inside radius can permanently damage the fiber-optic cable. Signal attenuation increases with decreased inside bend radii.

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Remove the control pod cover. See Remove the Control Pod Cover on page 59.
5. Disconnect the fiber-optic cable from INV1 on the fiber interface board in the control pod.

6. Disconnect the fiber-optic cable from INV on the power layer interface board in the inverter card cage (below the control pod).
7. Unlock the three cable supports along the inside left wall of the control pod.

8. Open the releasable cable tie at the top left of the control pod.

9. On the cable spool at the top of the horizontal enclosure wireway, open the two releasable cable ties and unspool the fiber-optic cable from the cable supports and remove the fiber-optic cable.
Installing the First Inverter (INV1) Fiber-optic Cable

**IMPORTANT** Frame 9 and larger drives fiber-optic cables that are connected between the fiber interface circuit board and the power-layer interface circuit board on each inverter must be the same length. Cables kits are provided with a length of 2.8 m (110 in.) to meet this requirement.

**IMPORTANT** Follow these guidelines when installing the new fiber-optic cable on the inverters for frame 9 and 10 drives:
- The cable must be looped through the cable supports on the fiber-optic cable spool as directed in the following table.
- The cable must be routed through all existing cable ties as previously installed.

<table>
<thead>
<tr>
<th>Drive Enclosure</th>
<th>Number of Fiber-optic Cable Loops on Spool</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Inverter</td>
<td>2</td>
</tr>
<tr>
<td>Second Inverter</td>
<td>1</td>
</tr>
<tr>
<td>Third Inverter</td>
<td>0</td>
</tr>
</tbody>
</table>

**IMPORTANT** Minimum inside bend radius for fiber-optic cable is 50 mm (2 in.). Any bends with a shorter inside radius can permanently damage the fiber-optic cable. Signal attenuation increases with decreased inside bend radii.

Install the first inverter (INV1) fiber-optic cable in the reverse order of removal. See Removing the First Inverter (INV1) Fiber-optic Cable on page 403.
Second Inverter (INV2) Fiber-optic Cable Removal/Installation

Removing the Second Inverter (INV2) Fiber-optic Cable

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Open the enclosure door.

4. Complete the following steps in the drive bay that holds the control pod.
   a. Remove the control pod cover. See Remove the Control Pod Cover on page 59.
   b. Disconnect the fiber-optic cable from INV2 on the fiber interface board in the control pod.

![Diagram of Fiber Interface Board with labels: INV1, INV2, INV3, Fiber Interface Board, 4b, P12, P11, P15, P13, P14, P15, P13, P14]
c. Unlock three cable supports along the inside left wall of the control pod.

d. Open the two releasable cable ties; one at the top left of the control pod, and one on the horizontal wireway at the top of the enclosure.
5. Complete the following steps in the second bay.
   a. Remove the converter or common-bus precharge right cover. See Remove the Converter Right Cover (No Control Pod) on page 88 or Remove the DC Input with Precharge Assembly Right Cover (No Control Pod) on page 172.
   b. Disconnect the fiber-optic cable from INV on the power layer interface board in the inverter card cage (below the control panel).
c. Open the three releasable cable ties along the inside right wall of the control panel.

d. Open the two releasable cable ties on the horizontal enclosure wireway.

e. On the cable spool at the top of the horizontal enclosure wireway, open the two releasable cable ties and unspool the fiber-optic cable from the cable supports and remove the fiber-optic cable.
Installing the Second Inverter (INV2) Fiber-optic Cable

**IMPORTANT** Frame 9 and larger drives fiber-optic cables that are connected between the fiber interface circuit board and the power-layer interface circuit board on each inverter must be the same length. Cables kits are provided with a length of 2.8 m (110 in.) to meet this requirement.

**IMPORTANT** Follow these guidelines when installing the new fiber-optic cable on the inverters for frame 9 and 10 drives:
- The cable must be looped through the cable supports on the fiber-optic cable spool as directed in the following table.
- The cable must be routed through all existing cable ties as previously installed.

<table>
<thead>
<tr>
<th>Drive Enclosure</th>
<th>Number of Fiber-optic Cable Loops on Spool</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Inverter</td>
<td>2</td>
</tr>
<tr>
<td>Second Inverter</td>
<td>1</td>
</tr>
<tr>
<td>Third Inverter</td>
<td>0</td>
</tr>
</tbody>
</table>

**IMPORTANT** Minimum inside bend radius for fiber-optic cable is 50 mm (2 in.). Any bends with a shorter inside radius can permanently damage the fiber-optic cable. Signal attenuation increases with decreased inside bend radii.

Install the second inverter (INV2) fiber-optic cable in the reverse order of removal. See Removing the Second Inverter (INV2) Fiber-optic Cable on page 407.
Chapter 11  Enclosure Cable Components Replacement Procedures (Frame 9 and Larger Drives)

Third Inverter (INV3) Fiber-optic Cable Removal/Installation

Removing the Third Inverter (INV3) Fiber-optic Cable

1. Review the General Precautions on page 24.

2. Remove power from the drive. See Remove Power from the Drive on page 25.

3. Open the enclosure door.

4. Complete the following steps in the drive bay that holds the control pod.
   a. Remove the control pod cover. See Remove the Control Pod Cover on page 59.
   b. Disconnect the fiber-optic cable from INV3 on the fiber interface board in the control pod.
c. Unlock three cable supports along the inside left wall of the control pod.

d. Open the two releasable cable ties; one at the top left of the control pod, and one on the horizontal wireway at the top of the enclosure.
5. Complete the following steps in the third bay.
   a. Remove the converter or common-bus precharge right cover. See
      Remove the Converter Right Cover (No Control Pod) on page 88 or
      Remove the DC Input with Precharge Assembly Right Cover (No
      Control Pod) on page 172.
   b. Disconnect the fiber-optic cable from INV on the power layer interface
      board in the inverter card cage (below the control panel).
c. Open the three releasable cable ties along the inside right wall of the control panel.

d. Open the four releasable cable ties on the horizontal enclosure wireway and remove the fiber-optic cable.
Installing the Third Inverter (INV3) Fiber-optic Cable

**IMPORTANT** Frame 9 and larger drives fiber-optic cables that are connected between the fiber interface circuit board and the power-layer interface circuit board on each inverter must be the same length. Cables kits are provided with a length of 2.8 m (110 in.) to meet this requirement.

**IMPORTANT** Follow these guidelines when installing the new fiber-optic cable on the inverters for frame 9 and 10 drives:

- The cable must be looped through the cable supports on the fiber-optic cable spool as directed in the following table.
- The cable must be routed through all existing cable ties as previously installed.

<table>
<thead>
<tr>
<th>Drive Enclosure</th>
<th>Number of Fiber-optic Cable Loops on Spool</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Inverter</td>
<td>2</td>
</tr>
<tr>
<td>Second Inverter</td>
<td>1</td>
</tr>
<tr>
<td>Third Inverter</td>
<td>0</td>
</tr>
</tbody>
</table>

**IMPORTANT** Minimum inside bend radius for fiber-optic cable is 50 mm (2 in.). Any bends with a shorter inside radius can permanently damage the fiber-optic cable. Signal attenuation increases with decreased inside bend radii.

Install the third inverter (INV3) fiber-optic cable in the reverse order of removal. See Removing the Third Inverter (INV3) Fiber-optic Cable on page 412.

**Fiber-optic Spool Removal/Installation**

**Removing the Fiber-optic Spool**

1. Review the General Precautions on page 24.
2. Remove power from the drive. See Remove Power from the Drive on page 25.
3. Open the enclosure door.
4. Open the releasable cable ties on the fiber-optic spool.

5. Carefully unspool the fiber-optic cable from the cable supports on the spool.

6. Remove the M6 x 14 mm hex screw that secures the spool to the enclosure wireway.

7. To remove the spool, lift it off the tabs on the wireway.

| 14.0 mm |
| 5.1 N·m (45.0 lb-in) |
Installing the Fiber-optic Spool

Install the fiber-optic spool in the reverse order of removal. See Removing the Fiber-optic Spool on page 416.

**IMPORTANT** Follow these guidelines when installing the new fiber-optic cable on the inverters for frame 9 and 10 drives:

- The cable must be looped through the cable supports on the fiber-optic cable spool as directed in the following table.
- The cable must be routed through all existing cable ties as previously installed.

<table>
<thead>
<tr>
<th>Drive Enclosure</th>
<th>Number of Fiber-optic Cable Loops on Spool</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Inverter</td>
<td>2</td>
</tr>
<tr>
<td>Second Inverter</td>
<td>1</td>
</tr>
<tr>
<td>Third Inverter</td>
<td>0</td>
</tr>
</tbody>
</table>

**IMPORTANT** Minimum inside bend radius for fiber-optic cable is 50 mm (2 in.). Any bends with a shorter inside radius can permanently damage the fiber-optic cable. Signal attenuation increases with decreased inside bend radii.
Chapter 12

Drive Startup after Repairs

This chapter provides detailed instructions for starting a drive after you have completed repairs.

Before You Apply Power to the Drive

1. Check the DC bus voltage at the -DC and +DC testpoints sockets on the front of the power module.
2. Perform forward and reverse biased diode tests, by using a digital multimeter. See Forward and Reverse Biased SCR/Diode Tests on page 49.

3. Inspect the drive for loose bolts, disconnected cables, and so forth.

4. Verify the following connections.
   - All fiber-optic cables are connected at both ends and properly supported by cable ties along their entire length when connected between enclosures.
   - If any work was performed on the converter, inspect all converter wire harnesses to be sure that they are all connected at both ends.
   - If any work was performed on the converter, inspect the control transformer primary connections to verify that the taps are appropriate for the applied voltage:

<table>
<thead>
<tr>
<th>Primary Terminal Connections</th>
<th>Input Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1 &amp; H2</td>
<td>380/415</td>
</tr>
<tr>
<td>H1 &amp; H3</td>
<td>440/480</td>
</tr>
<tr>
<td>H1 &amp; H4</td>
<td>575/600</td>
</tr>
<tr>
<td>H1 &amp; H5</td>
<td>690</td>
</tr>
</tbody>
</table>

   - If any work was performed on the DC input with precharge assembly, inspect all DC input wire harnesses to be sure that they are all connected at both ends.
   - If any work was performed on the DC input with precharge assembly, inspect the control transformer primary connections to verify that the taps are appropriate for the applied voltage:

<table>
<thead>
<tr>
<th>Primary Terminal Connections</th>
<th>Input Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1 &amp; H2</td>
<td>120</td>
</tr>
<tr>
<td>H1 &amp; H3</td>
<td>240</td>
</tr>
</tbody>
</table>

   - If any work was performed on a frame 9 or larger drive, inspect the 24V wire harnesses to be sure that they are properly connected at the ends and properly supported by cables ties along their entire length.
   - If any work was performed to or around the inverter card cage, verify that the current feedback cable is connected to the inverter power board, and to all three current sensors. Also verify that the P6 cable is connected to the inverter power board, and that the J1 cable is connected to the main power supply board.
   - The two heatsink fan cables are connected to the fan terminal block.
Testing with the Motor without a Mechanical Load

This test lets you measure the DC bus voltage and output current and diagnose problems without connecting the motor to its mechanical load.

1. Verify that the input power and ground wires are connected.
2. Verify that the motor cables are connected.
3. Verify that the motor load is disconnected.
4. Energize the drive.
5. Measure the DC bus voltage and verify that the value is reflected in parameter 11 [DC Bus Volts].
6. Start the drive and increase the speed from zero to base speed.
7. Measure drive output current and verify that the value is reflected in the parameter 7 [Output Current].
8. Stop the drive.
Notes:
# Schematics

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<th>Page</th>
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<tr>
<td>Frame 9 Common DC Input Drive Schematic Diagram (540V DC, 650V DC, 810V DC, and 932V DC Classes)</td>
<td>428</td>
</tr>
<tr>
<td>Frame 10 Common DC Input Drive Schematic Diagram (540V DC, 650V DC, 810V DC, and 932V DC Classes)</td>
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<tr>
<td>Frame 10 Control Power Isolator Board Wiring Diagrams (600V AC Class AC Input Drive, and 810V DC and 932V DC Classes Common DC Input Drive)</td>
<td>437</td>
</tr>
<tr>
<td>DC Input with Precharge Assembly Schematic Diagram (540V DC, 650V DC, 810V DC, and 932V DC Classes Common DC Input Drives)</td>
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</tr>
<tr>
<td>DC Input with Precharge Devices Schematic Diagrams</td>
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<tr>
<td>Inverter Circuit Board Schematic Diagram (All Drive Configurations)</td>
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<td>Inverter Power Layer Schematic Diagram (All Drive Configurations)</td>
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<td>AC Input Drive Control Transformer Schematic Diagram</td>
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<td>DC Input with Precharge Assembly Control Transformer Schematic Diagram</td>
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<td>Inverter Main Blower and Capacitor Bank Cooling Fan Wire Harness Diagram</td>
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</tr>
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<td>Cabinet Cooling Wiring Diagrams</td>
<td>443</td>
</tr>
</tbody>
</table>
Frame 8 AC Input Drive Schematic Diagram (400VAC and 600VAC Classes)

Converter Spare Part Cat. No. = (See Table 11 on page 82 for a list of replacement converter units)

Three Phase AC Input

Chassis PE

Source Ground

Converter Gate Board

Converter with Control Pod

1 2 3 4 5

FIB

P3

INV

Chopper

Field-Installed Option)

Inverter-Mounted Output Common Mode Core (Field-Installed Option)

Spare Part Cat. No. = 20-750-POD1-F8

Spare Part Cat. No. = 20-750-FCBL1-F8

INV Fiber-Optic Cable 560 mm Long

Spare Part Cat. No. = 20-750-FCBL1-F8

CONV Fiber-Optic Cable 560 mm Long

Spare Part Cat. No. = 20-750-FCBL1-F8

To use a chopper on a frame 8 AC input drive a 20-750-BUS1A-F8 kit is required to connect to the DC bus.

Chopper (AC Input Version) with DC Link Choke

Spare Part Cat. No. = 20-750-11-BcoxDoor (Series B)
20-750-11B-coxDoor (Series B)
20-750-11B-exoDoor (Series B)

Inverter (AC Input Version) with DC Link Choke

Spare Part Cat. No. = 20-750-P0D1-F8 (Series A)

Frame 8 No DC Bus Fuse Wire Harness. See Converter Schematic.

Three Phase AC Output

Motor Ground

1-Bay 24V Wire Harness (400V Class Only)

Spare Part Cat. No. = 20-750-PH1-F8

(F for 600V Class; see Control Power Isolator Board Wiring Diagram on page 436.)

Fiber-Optic Transceiver (4 Per Drive, 1 Per Kit)

Spare Part Cat. No. = SK-R1-FTR-F8

INV Fiber-Optic Cable 560 mm Long

Spare Part Cat. No. = 20-750-POD1-F8 (Series A)

Converter Gate Board

Control Pod Spare Part Cat. No. = 20-750-POD1-F8 (Series A)

Fiber Interface Board

P1

INV1

1-Bay 240V AC Neutral 24V Com

1-Bay 240V AC Hot

24V/240V Wire Harness. See Converter and Inverter Schematics.

Three Phase AC Input

Three Phase AC Output

Motor Ground

Chassis PE

To use a chopper on a frame 8 AC input drive a 20-750-BUS1A-F8 kit is required to connect to the DC bus.

Inverter-Mounted Output Common Mode Core (Field-Installed Option)

Spare Part Cat. No. = 20-750-POD1-F8

Spare Part Cat. No. = 20-750-FCBL1-F8

INV Fiber-Optic Cable 560 mm Long

Spare Part Cat. No. = 20-750-FCBL1-F8

CONV Fiber-Optic Cable 560 mm Long

Spare Part Cat. No. = 20-750-FCBL1-F8

To use a chopper on a frame 8 AC input drive a 20-750-BUS1A-F8 kit is required to connect to the DC bus.

Inverter-Mounted Output Common Mode Core (Field-Installed Option)

Spare Part Cat. No. = 20-750-POD1-F8

Spare Part Cat. No. = 20-750-FCBL1-F8

INV Fiber-Optic Cable 560 mm Long

Spare Part Cat. No. = 20-750-FCBL1-F8

CONV Fiber-Optic Cable 560 mm Long

Spare Part Cat. No. = 20-750-FCBL1-F8

To use a chopper on a frame 8 AC input drive a 20-750-BUS1A-F8 kit is required to connect to the DC bus.

Inverter-Mounted Output Common Mode Core (Field-Installed Option)

Spare Part Cat. No. = 20-750-POD1-F8

Spare Part Cat. No. = 20-750-FCBL1-F8

INV Fiber-Optic Cable 560 mm Long
Frame 10 AC Input Drive Schematic Diagram (400VAC and 600VAC Classes)

Note: See the “Frame 9 AC Input Drive Schematic Diagram (400VAC and 600VAC Classes)” for all spare part kit catalog numbers not shown.

Converter Spare Part Cat. No. = (See Table 11 on page 82 for a list of replacement converter units)

Cabinet-Mounted Input Common Mode Core (3) (Field-Installed Option)
Spare Part Cat. No. = 20-750-EMCCM1-F8

3-Bay 24V Wire Harness (400V Class Only)
Spare Part Cat. No. = 20-750-FH1-10

Inverter-Mounted Output Common Mode Core (Field-Installed Option)
(3 per Drive, 1 per Kit)
Spare Part Cat. No. = 20-750-EMCCM1-F8

Field-Installed Option
Spare Part Cat. No. = SK-R1-FTR-F8

Cabinet-Mounted Input Common Mode Core (3) (Field-Installed Option)
Spare Part Cat. No. = 20-750-EMCCM1-F8

Spare Part Cat. No. = 20-750-FCBL1-F10

Spare Part Cat. No. = 20-750-PH3-F10

(For 600V Class, see Control Power Isolator Board Wiring on page 436.)

Spare Part Cat. No. = 20-750-FCBL1-F8

Spare Part Cat. No. = 20-750-EMCCM1-F8

Note: See the “Frame 9 AC Input Drive Schematic Diagram (400VAC and 600VAC Classes)” for all spare part kit catalog numbers not shown.
Frame 8 Common DC Input Drive Schematic Diagram (540V DC, 650V DC, 810V DC, and 932V DC Classes)

Drive Backplane DC Bus

Cabinet-Mounted Input Common Mode Core (Factory-Installed)
Spare Part Cat. No. = 20-750-CBPEMCCM1-F8

DC Input Cabinet Wire Harness Kit
Spare Part Cat. No. = SK-R1-CBP-BRKHI-F8
(3 Harnesses Per Kit)
Transformer Primary Harness
120V AC UPS Harness

User-Provided Drive Control 120/240V AC Bus In
User-Provided Drive UPS Control 120V AC Bus In (Optional)

SWS - Drive Circuit Breaker, 2-Pole, 13 A, 120/240V AC Input
(1 per Drive, 1 per Kit)
Spare Part Cat. No. = 1489-A2D130A
Circuit Breaker Lock Attachment
(1 per Drive, 1 per Kit)
Spare Part Cat. No. = 1489-AALOA

DC Input with Precharge Assembly
with Control

DC Inverters

INV Fiber-Optic Cable 560 mm Long
Spare Part Cat. No. = 20-750-FCBL1-F8

CONV Fiber-Optic Cable 560 mm Long
Spare Part Cat. No. = 20-750-FCBL1-F8

User-Provided Drive Control 120/240V AC Bus In
User-Provided Drive UPS Control 120V AC Bus In (Optional)

Inverter (DC Input Version)
Without DC Link Choke
Spare Part Cat. No. = 20-750-12B-CoxDxx (Series B)
20-750-12B-Eoxxx (Series B)

Inverter-Mounted Output Common Mode Core
(Factory-Installed Option)
Spare Part Cat. No. = 20-750-EMCCM1-F8

Motor Ground

Three Phase AC Output

DC Input with Precharge Assembly
with Control

Control Pod
Spare Part Cat. No. = 20-750-P001-F8 (Series A)

Fiber Interface Board

INV Fiber-Optic Cable
560 mm Long
Spare Part Cat. No. = 20-750-FCBL1-F8

CONV Fiber-Optic Cable
560 mm Long
Spare Part Cat. No. = 20-750-FCBL1-F8

21G cabinet option code P30 provides bus and wire harness. See the PowerFlex® 750-Series AC Drives Installation Instructions, publication 750-IN001, for DC Input TB5 jumper settings for use with Drive UPS Control 120V AC Bus.

24V/240V Wire Harness. See DC Input with Precharge Assembly and Inverter Schematics.

1-Bay 24V Wire Harness
(400V Class Only)
Spare Part Cat. No. = 20-750-PH1-F8
(For 600V Class, see Control Power Isolator Board Wiring Diagram on page 436.)

Circuit Breaker Lock Attachment
(1 per Drive, 1 per Kit)
Spare Part Cat. No. = 1489-AALOA

24V Com
TB1-7
24V
TB1-8

DC Bus
DC- DC+
DC- DC+
DC- DC+

U V W
INV Fiber-Optic Cable 560 mm Long
Spare Part Cat. No. = 20-750-FCBL1-F8

CONV Fiber-Optic Cable 560 mm Long
Spare Part Cat. No. = 20-750-FCBL1-F8

Fiber-Optic Transceiver
(4 Per Drive, 1 Per Kit)
Spare Part Cat. No. = SK-R1-FTR-F8
Frame 9 Common DC Input Drive Schematic Diagram (540V DC, 650V DC, 810V DC, and 932V DC Classes)

Drive Backplane
DC Bus

Cabinet-Mounted Input Common Mode Core (Factory-Installed)
Spare Part Cat. No. = 20-750-CBPEMCCM1-F8

Frame 9 Common DC Input Drive Schematic Diagram (540V DC, 650V DC, 810V DC, and 932V DC Classes)

User-Provided Drive Control 120/240V AC Bus In
User-Provided Drive UPS Control 120V AC Bus In (Optional)

Inverter
(DC Input Version)
without DC Link Choke
Spare Part Cat. No. = 20-750-I2B-CxxxDxxx (Series B)
20-750-I2B-ExxxFxxx (Series B)

Inverter-Mounted Output Common Mode Core (Field-Installed Option)
Spare Part Cat. No. = 20-750-EMCCM1-F8

Three Phase AC Output

Motor Ground

Chassis PE
Appendix A  Schematics

Frame 8 AC Input IP20 Option Bay without a Control Transformer Schematic Diagram

Input Reactor LR1 or LR3 (Factory-installed Option)
Input Contactor M4 (Factory-installed Option)

Main Control Board
(ENABLE jumper removed)

Converter with Control Pod

Option Bay Contactor Harness
Spare Part Cat. No. = SK-R1-OCONTH1-F8

Input Circuit Breaker CB1 or Molded Case Switch MCS1
See Notes 1 and 2

Converter (AC Input Version) With DC Link Choke

Digital Input 0 (120V AC)
Digital Input Common
Connections for AC power supply

Input Circuit Breaker CB1 or Molded Case Switch MCS1
See Notes 1 and 2

Notable Components:
- Drive Bay
- Door Fan 1
- Door Fan 2
- Option Bay
- Option Bay Contactor Harness
- User-provided Contactor Status Wiring
- User-provided Contactor Input Voltage 50 Hz 230VAC 60 Hz 115V AC

Notes:
1. For 21G Required Selections — Either P3 or P5 option is required and is installed at the factory.
2. See Appendix C, on page 451 for default circuit breaker or molded case switch settings.
Frame 8 AC Input IP20 Option Bay with a Control Transformer Schematic Diagram

Notes:
1. For 21G Required Selections – Either P3 or P5 option is required and is installed at the factory.
2. See Appendix C, on page 452 for default circuit breaker or molded case switch settings.
Frame 8 AC Input IP54 Option Bay Schematic Diagram

Main Control Board TB1 I/O Terminal Designations

1. 24V common
2. 24V Power
3. Digital Input 0 (24V DC)
4. Digital Input Common
5. Digital Input 0 (120V AC)

Connections for drive supplied 24V power. 150 mA max.
Connections for DC power supply
Connections for AC power supply

Input Circuit Breaker CB1 or Molded Case Switch MCS1 (Factory-installed Option) See Notes 1 and 2

Input Reactor LR1 or LR3 (Factory-installed Option)

Option Bay Contactor Harness Spare Part Cat. No. = SK-R1-0CNTH1-F8

Control Panel Fuse Specifications:
- FU9, FU10 (690VAC) 690V AC, 6 A, IEC gl-gG
- FU9, FU10 (400, 480, 600VAC) 600V AC, 6 A, Class CC
- FU11 600V AC, 5 A, Class CC
- FU12 (120V AC) 600V AC, 5 A, Class CC
- FU12 (230VAC) 600V AC, 3 A, Class CC
- FU13 600V AC, 5 A, Class CC

Three-Phase AC Output Bus

Relay 1 Circuit Breaker CB1

Relay 3 (Wired to the Drive Enable Terminals at the Factory)

Input Bus to Frame 8 Drive Bay

Drive Bay Fan / Blower Harness Spare Part Cat. No. = SK-R1-OFAN12-F8

TB4

Option Bay Exhaust Blower Spare Part Cat. No. = SK-R1-0FAN12H-F8

M2/M4 Contactor Coil 230V Coil for 400V & 600V Drives 120V Coil for 480V & 600V Drives (Factory-installed Option)

TB3

Control Power Output For Customer Use 500VAC 50 Hz 230VAC 2.2 A 60 Hz 120V AC 4.2 A

FU9, FU10, FU11, FU12, FU13 Control Transformer Fuses Spare Part Cat. No. = SK-R1-OXFMRFUSES (See Control Panel Fuse Specifications Below)

Jumper Option Bay Thermostat / Relay Harness Spare Part Cat. No. = SK-R1-OXFMRFH2-F8

FU9, FU10, FU11, FU12, FU13 (Factory-installed Option)

Output Reactor LR2 or LR4 (Factory-installed Option)

Motor Ground Chassis PE

Chassis PE

Three-Phase AC Input Bus

Notes:
1. For 21G Required Selections – Either P3 or P5 option is required and is installed at the factory.
2. See Appendix C, on page 451 for default circuit breaker or molded case switch settings.
Frame 9 AC Input Option Bay Schematic Diagram

Notes:
1. For 21G Required Selections – PS Input Non-Fused Molded Case Disconnect Switch is not offered.
2. For 21G Additional Selections – P11 & P12 contactors are not offered; and L3 & L4 5% reactors are not offered.
3. See Appendix C, on page 451 for default circuit breaker settings.
Control Pod Schematic Diagram

Fiber Interface Board
Spare Part Cat. No. = SK-R1-FIB1-F8
(Includes one board and one fiber-optic transceiver)

Pod Bucket - Main Control

Main Control Board
Spare Part Cat. No. = SK-R1-MCB1-F8 (Series A)

External HIM

Pod Bucket - Main Control Board

See Drive Schematic Diagrams for frame-specific INV fiber-optic cable connections.

Fiber-Optic Transceiver (1 Per Kit)
1 per Frame 8 Drive
2 per Frame 9 Drive
3 per Frame 10 Drive
Spare Part Cat. No. = SK-R1-FTR-F8

See Drive Schematic Diagrams for frame-specific 24V wire harness connections.

User-Provided 24V DC Auxiliary Power Supply

To Converter or DC Input with Precharge

See Drive Schematic Diagrams for frame-specific 24V wire harness connections.
Converter Schematic Diagram (400VAC and 600VAC Classes AC Input Drive)

- Chassis PE
- Transformer Primary Harness
- Disconnected
- Connected
- Removable at User Accessible Location
- FU1, FU2, FU3 - AC Line Fuse
- 690V, 900 A (600V Class)
- 600V, 1100 A (600V Class)
- SW1, SW2, SW3 - Fuse Indicator
- Converter Wire Harness Kit Cat. No. = SK-R1-FUSEFAN-F8 (One board and one Fiber-optic transceiver per kit)

- Primary Harness, AC Bus Harness
- Current Transformer Sense Harness
- SCR Gate Harness
- DC Bus Harness
- Harness, Power 24V/240V Harness

- EMC Filter Board
- Spare Part Cat. No. = SK-R1-EMCFLT-F8
- (Series B - 400V and 600V Classes)
- CT1, CT2, CT3 - Current Transformer
- One transformer and cable ties per kit

- Converter Gate Board
- (Spare Part Cat. No. Listed Below)*
- DC Bus Switch Senser
- Direct Screw Connection (3 Places)

- Converter Wire Harness Kit Cat. No. = SK-R1-CNVH1-F8 (11 Harnesses Per Kit)
- No DC Bus Fuse Harness, Misc., I/O Harness, Power 24V/240V Harness
- Inverter Power Supply Harness, ITC, Current Transformer Sense Harness, AC Line Fuse Harness, Transformer Primary Harness, AC Bus Harness

- FU1, FU2, FU3 - AC Line Fuse
- 690V, 900 A (600V Class)
- 600V, 1100 A (600V Class)
- SW1, SW2, SW3 - Fuse Indicator

- Converter Gate Board Spare Part Cat. No. = SK-R1-GGDB1-CD-F8 (Series A - 400V Class)
- SK-R1-GGDB3-CD-F8 (Series B - 400V Class)
- SK-R1-GGDB3-CD-F8 (Series B - 600V Class)

Notes:
1. If you have a 600V or 690V drive, a control power isolator board is installed. See pages 436-437 for corresponding frame sizes.
2. Fiber-Optic Transceiver (1 Per Converter, 1 Per Kit) Spare Part Cat. No. = SK-R1-FTR-F8.
Frame 8 Control Power Isolator Board Wiring Diagrams (600V AC Class AC Input Drive, and 810V DC and 932V DC Classes Common DC Input Drive)

Frame 9 Control Power Isolator Board Wiring Diagrams (600V AC Class AC Input Drive, and 810V DC and 932V DC Classes Common DC Input Drive)

Notes:
1. If you have a 600V or 690V drive, a control power isolator board is installed. See pages 436 – 437 for corresponding frame sizes.
2. Based on the system configuration, the use of the optional control power isolator board may or may not be necessary.
Frame 10 Control Power Isolator Board Wiring Diagrams (600V AC Class AC Input Drive, and 810V DC and 932V DC Classes Common DC Input Drive)

Notes:
1. If you have a 600V or 690V drive, a control power isolator board is installed. See pages 436...437 for corresponding frame sizes.
2. Based on the system configuration, the use of the optional control power isolator board may or may not be necessary.
DC Input with Precharge Assembly Schematic Diagram (540V DC, 650V DC, 810V DC, and 932V DC Classes Common DC Input Drives)
DC Input with Precharge Devices Schematic Diagrams

DC Input Circuit Breaker (SW5)
User-Provided Drive Control 120/240V AC Bus In

1. Hot
2. Neutral
3. 4

To Disconnect Switch SW2 Via TB2

DC Input Disconnect Switch (SW2)
Drive Backplane DC Bus In

1. Hot
2. Neutral
3. 4

To Precharge Fuses FU3 and FU4
To Control Transformer (T1)

To DC Precharge Control Board P3

24V I/O

13

24V Aux. In N.O.

To SW2 Aux. In N.O.

User-Provided Drive Control 120/240V AC Bus In Via TB2

User-Provided UPS 120V AC Bus In Via TB2

DC Input Molded Case Switch (SW1) Control
To DC Precharge Control Board P2
To UV Connector

To UV Connector

To DC Precharge Control Board P3

DC Input Molded Case Switch (SW1) Power

To SW1 Undervoltage Trip

To DC Precharge Control Board P3

DC Input Undervoltage Delay Module (PS1)

240V AC Hot

Delay Setting:
• No Jumper Connection
• Time Delay = 3 seconds (Factory Default)
Inverter Circuit Board Schematic Diagram (All Drive Configurations)

Inverter Gate Driver Board Ribbon Cables
Spare Part Cat. No. = SK-R1-IB1-F8
Includes one upper ribbon cable (folded),
one upper ribbon cable (straight),
and two jumper ribbon cables.
Usage based on Inverter section replacement or equivalent
component Cat. No. 20-750-ICEE-7F74.

For Cat. No. Position 9 = C; and Position 10...12 = 460, 540, or 567 and
For Cat. No. Position 13 = D; and Position 14...16 = 265, 330, or 370:
For Cat. No. Position 13 = F; and Position 14...16 = 415, 460, or 500:
For Cat. No. Position 9 = E; and Position 10...12 = 435, 460, or 510 and
For Cat. No. Position 13 = F; and Position 14...16 = 265, 330, or 370:
For Cat. No. Position 13 = D; and Position 14...16 = 430, 485, or 545; or
For Cat. No. Position 9 = C; and Position 10...12 = 460, 540, or 567 and
For Cat. No. Position 13 = D; and Position 14...16 = 430, 485, or 545; or
For Cat. No. Position 9 = C; and Position 10...12 = 460, 540, or 567 and
For Cat. No. Position 13 = D; and Position 14...16 = 430, 485, or 545; or

Ribbon Cable
Jumper Ribbon Cable
Gate Driver Board “U”
Gate Driver Board “V”
Gate Driver Board “W”

Spare Part Cat. Nos. Based on Inverter Equivalent Component Voltage and
current Ratings (1 Per Kit):

For 400V 770 A, 480V 740 A = SK-R1-IG1-C770D740
For 400V 567 A, 480V 545 A = SK-R1-IG1-C540D545
For 600V 510 A, 690V 500 A = SK-R1-IG1-E510F500
For 600V 395 A, 690V 370 A = SK-R1-IG1-E395F370

Direct Screw Connection (5 Places)

See Inverter Main Blower and Capacitor Bank Cooling Fan Wire Harness Diagram
on page 443 for details.

Ratings Plug Board -
Spare Part Cat. Nos. Based on Inverter Equivalent Component Voltage and
current Ratings:

For 400V 770 A, 480V 740 A = SK-R1-IR1-E540D430
For 600V 510 A, 690V 500 A = SK-R1-IR1-E510F500
For 600V 460 A, 480V 430 A = SK-R1-IR1-E460D430
For 600V 395 A, 690V 370 A = SK-R1-IR1-E395F370
For 600V 355 A, 480V 330 A = SK-R1-IR1-E355F330
For 600V 295 A, 480V 265 A = SK-R1-IR1-E295F265
For 400V 460 A, 480V 430 A = SK-R1-IR1-E460D430
For 400V 355 A, 480V 330 A = SK-R1-IR1-E355F330
For 400V 295 A, 480V 265 A = SK-R1-IR1-E295F265

(1) Inverter Switch Mode Power Supply - Spare Part Cat. Nos.
For 400V Class AC Input and 540V and 650V Classes Common DC Input = SK-R1-PWR51-CD-F8
For 600V Class AC Input and 810V and 932V Classes Common DC Input = SK-R1-PWR51-EF-F8

Direct Screw Connection (3 Places)
Chassis PE

Motor Shield

L1 - DC Link Choke: Spare Part Cat. No. based on Inverter Section Replacement or Equivalent Component Cat. No. 20-750-xx-xxxx-yyyy.

For Cat. No. Position 9 = C and Position 10...12 = 460, 540, or 567, and
For Cat. No. Position 13 = D and Position 14...16 = 430, 485, or 545, and
For Cat. No. Position 9 = E and Position 10...12 = 435, 460, 510, and
For Cat. No. Position 13 = F and Position 14...16 = 415, 460, or 500.
Inductance = 50 uH
Spare Part Cat. No. = SK-R1-DCHK2-F8

For Cat. No. Position 9 = C and Position 10...12 = 650, 750, or 770, and
For Cat. No. Position 13 = D and Position 14...16 = 617, 710, or 740.
Inductance = 33 uH
Spare Part Cat. No. = SK-R1-DCHK1-F8

For Cat. No. Position 9 = E and Position 10...12 = 295, 355, or 395, and
For Cat. No. Position 13 = F and Position 14...16 = 265, 330, or 370.
Inductance = 69 uH
Spare Part Cat. No. = SK-R1-DCHK3-F8

AC Input Drives Only

Discharge Bleeder Resistors
Balance Resistors
Capacitor Bank

R3, R4 - Discharge Bleeder Resistors
Spare Part Cat. No.:
For 400V Class AC Input and
540V and 650V Classes DC Input = SK-R1-RD1-F8
(2600 Ohms each)
For 600V Class AC Input and
810V and 932V Classes DC Input = SK-R1-RD2-F8
(5000 Ohms each)
Includes two resistors and
wire harness

R1, R2 - Balance Resistors
Spare Part Cat. No.:
For 400V Class AC Input and
540V and 650V Classes DC Input = SK-R1-RB1-F8
(2600 Ohms each)
For 600V Class AC Input and
810V and 932V Classes DC Input = SK-R1-RB2-F8
(5000 Ohms each)
Includes two resistors,
mounting plate, and
wire harness

Capacitor Bank
Spare Part Cat. No.:
For 400V 770A, 480V 740A = SK-R1-CP1-C770D740
For 400V 567A, 480V 545A = SK-R1-CP1-C567D545
For 600V 510A, 690V 500A = SK-R1-CP1-E510F500
For 600V 395A, 690V 370A = SK-R1-CP1-E395F370

EMC Caps
(Inverter Input)

EMC Capacitor Kit
Spare Part Cat. No. = SK-R1-EMCCAP1-F8
Includes one inverter input part
one choke input part and one
Capacitor Bank output parts

Inverter Wire Harness Kit
Spare Part Cat. No. = SK-R1-INWH1-F8
(Includes 4 Harnesses Per Kit)
Bleeder Resistor Harness, Cap Bank Stirring Fans/
Main Blower Harness, Current Sensor Harness,
and DC Test Point/Balance Resistor Cables

DC Link Choke

18 Caps for:
400V 650...770A, 480V 617...740A
600V 435...510A, 690V 415...500A
12 Caps for:
400V 460...567A, 480V 430...544A
600V 295...395A, 690V 265...370A

Screw Connections to
Gate Driver Board

Screw Connections to
Gate Driver Board

Screw Connections to
Gate Driver Board

To P1 on Inverter Power
Board

EMC Caps
(Cap Bank Output)

CT1, CT2, CT3
Current Sensor
(3 Per Unit, 1 Per Kit)
Spare Part Cat. No = SK-R1-INVIFS-F8

Bleeder Resistor Harness, Cap Bank Stirring Fans/
Main Blower Harness, Current Sensor Harness,
and DC Test Point/Balance Resistor Cables
AC Input Drive Control Transformer Schematic Diagram

DC Input with Precharge Assembly Control Transformer Schematic Diagram
Inverter Main Blower and Capacitor Bank Cooling Fan Wire Harness Diagram

Cabinet Cooling Wiring Diagrams

**IP20, NEMA/UL Type 1 Drive Bay**
- Door Fan 1
  - G + -
  - Direct Screw Connection
  - Door Bay Door Fan Harness (1 per Bay, 1 per Kit)
  - Spare Part Cat. No. = SK-R1-FANH1-F8
- Door Fan 2
  - G + -
  - Door Fan with Finger Guard (2 per Bay, 1 per Kit)
  - Spare Part Cat. No. = 20-750-FAN3-F8
- 240V AC Neutral
- 240V AC Hot
- See Note: TB2 terminal numbers for AC Input and Common DC Input drives, see Drive Schematic Diagrams on previous pages.

**IP54, NEMA/UL Type 12 Drive Bay**
- Cabinet Blower
  - G + -
  - Direct Screw Connection
- Cabinet Blower Harness (1 per Bay, 1 per Kit)
  - Spare Part Cat. No. = SK-R1-FANH3-F8
- Cabinet Blower Fan (1 per Bay, 1 per Kit)
  - Spare Part Cat. No. = SK-R1-FAN4-F8
- 240V AC Neutral
- 240V AC Hot
- See Note

**IP20, NEMA/UL Type 1 Option Bay (Frame 8)**
- Door Fan 1
  - G + -
  - Direct Screw Connection
  - Option Bay Door Fan Harness (1 per Bay, 1 per Kit)
  - Spare Part Cat. No. = SK-R1-OFANH1-F8
- Door Fan 2
  - G + -
  - Door Fan with Finger Guard (2 per Bay, 1 per Kit)
  - Spare Part Cat. No. = 20-750-FAN3-F8
- 240V AC Neutral
- 240V AC Hot
- Option Bay
Notes:
Circuit Board Interconnections

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This chapter provides the interconnection signals between drive circuit boards.
Appendix B  Circuit Board Interconnections

Inverter Board Interconnections Diagram 1

Power Layer Interface Board

Power Control Board

Power Supply Board
Inverter Board Interconnections Diagram 2

Power Layer Interface Board

A2  VBUS GND  A2
B2  VBUS PB  B2
A3  VMID GND  A3
B3  VMID PB  B3
A4  DGND  A4
B4  PH NTC  B4
A5  PH V NTC  A5
B5  PH W NTC  B5
A6  DGND  A6
B6  AIR TEMP  B6
A7  FLOW SBNR  A7
B7  GATE D U  B7
A8  GATE D V  A8
B8  GATE D W  B8
A9  DGND  A9
B9  SP ADV  B9
A10  PWK JUP NTC  A10
B10  I SCALE ID  B10
A12  IGC U POS  A12
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A17  IGC W NEG  A17
A18  BLWR PS LV  A18
B18  BUUK PS LV  B18
A19  LOC PS LV  A19
B19  BSY PS LV  B19
A20  BSY PS CG  A20
B20  DGND  B20
A21  BLWI SBD  A21
B21  FAN1 SBD  B21
A22  FAN2 SBD  A22
B22  DGND  B22
A23  LEM P08  A23
B23  LEM P01  B23
A24  480/690V  A24
B24  RP IO6  B24
A25  RP IO1  A25
B25  RP IO7  B25
A26  RP IO3  A26
B26  DGND  B26
A27  SP IO0 1 A27
B27.B28  DGND  B27.B28
A28  SP IO2  A28
A29  SP IO3  A29
A30  SP IO4  A30
A31  SP IO5  A31
A32  SP IO6  A32

Power Control Board

A25  GATE W-  A25
B25  GATE W+  B25
A26  GATE V-  A26
B26  GATE V+  B26
A27  GATE U-  A27
B27  GATE U+  B27
A28  GATE U-  A28
B28  GATE U+  B28
A29  GATE V+  A29
B29  GATE V-  B29
A30  PWK CAM  A30
B30  PWK CAM  B30
A31  PWK CAM  A31
B31  PWK CAM  B31

Gate Board Cable

A32  PWK CAM  A32
B32  PWK CAM  B32
### Circuit Board Interconnections

#### Control Board Interconnections Diagram 1

**Main Control Board**

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### Verify that all faceplate plug/ header interfaces have Tlx reference designators

1. Verify that all faceplate plug/ header interfaces have Tlx reference designators.

#### Internal Stirring

- Fan

---

**Backplane Board**

- Option Modules

---

**Appendix B**

- Circuit Board Interconnections

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448 Rockwell Automation Publication 750-TG001G-EN-P - August 2018
Control Board Interconnections Diagram 2

Verify that all faceplate plug/header interfaces have TBx reference designators.
Notes:
Appendix C

Drive-compatible Circuit Breakers, Molded Case Switches, Contactors, and Line Reactors

Replacement Part Catalog Numbers, Ratings, and Settings

This appendix contains catalog numbers, ratings, and corresponding settings for the following:

- Drive-compatible circuit breakers
- Molded case switches
- Contactors
- 3% and 5% line reactors
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### Table 24 - 400V AC Input Drive, Normal Duty Ratings

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## Table 28 - 400V AC Input Drive, Heavy-Duty Ratings

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(1) Contact the factory.
## Table 30 - 600V AC Input Drive, Heavy-Duty Ratings

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(1) Contact the factory.
### Table 31 - 690V AC Input Drive, Heavy-Duty Ratings

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(1) Contact the factory.
Notes:
**History of Changes**

This appendix summarizes the revisions to this manual. Reference this appendix if you need information to determine what changes have been made across multiple revisions. This may be especially useful if you are deciding to upgrade your hardware based on information added with previous revisions of this manual.

### 750-TG001F-EN-P, December 2017

**Table 32 - 750-TG001F-EN-P, November 2017**

<table>
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<td>Added cross-reference pages (hot links) to the preventive maintenance table for maintenance items.</td>
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<tr>
<td>Updated maintenance topic names to correlate with maintenance section names.</td>
</tr>
<tr>
<td>Removed Power Switching Components, Control Pod Components Enhancements, and Operational Conditions from the maintenance table.</td>
</tr>
<tr>
<td>Updated section Maintenance of Industrial Control Equipment to have the most current descriptions.</td>
</tr>
<tr>
<td>Added publication reference for Cabinet Blower Exhaust Removal/Installation.</td>
</tr>
<tr>
<td>Separated IP54 and IP20 maintenance tasks.</td>
</tr>
<tr>
<td>Updated CH.3 to include notes for result readings from the reverse base diode tests.</td>
</tr>
<tr>
<td>Updated images of the inverter front cover. Access panel has been removed; P6 connector no longer accessible.</td>
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### 750-TG001E-EN-P, July 2012

**Table 33 - 750-TG001E-EN-P, July 2012**

<table>
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<td>Updated the Spare Part Compatibility with Series A and Series B Drives table to include a new Series B Converter Unit part number.</td>
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<tr>
<td>Updated the Converter Components Identification table to reflect the addition of the stirring fan kit.</td>
</tr>
<tr>
<td>Updated the Converter Assembly Components Diagram 2 to reflect the addition of the stirring fan kit.</td>
</tr>
<tr>
<td>Added the new Converter Gate Board Stirring Fan Removal/Installation procedure.</td>
</tr>
<tr>
<td>Updated the 24V/240V Power Wire Harness Removal/Installation procedure to include disconnecting the stirring fan.</td>
</tr>
<tr>
<td>Updated the DC Input with Precharge Assembly Components Identification table to reflect the addition of the stirring fan kit.</td>
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<tr>
<td>Updated the DC Input with Precharge Assembly Components Diagram 2 to reflect the addition of the stirring fan kit.</td>
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<tr>
<td>Updated the 24V/120V/240V Wire Harness Removal/Installation procedure to include disconnecting the stirring fan.</td>
</tr>
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</table>
Appendix D  History of Changes

Table 33  750-TG001E-EN-P, July 2012

| Topic |  
|-------|---|
| Added the new DC Precharge Control Board Stirring Fan Removal/Installation procedure. |  
| Updated the Converter Schematic Diagram (400VAC and 600VAC Classes AC Input Drive) to reflect the addition of the stirring fan. |  
| Updated the DC Input with Precharge Assembly Schematic Diagram (540V DC, 650V DC, 810V DC, and 932V DC Classes Common DC Input Drives) to reflect the addition of the stirring fan. |  

750-TG001D-EN-P, April 2012

Table 34  750-TG001D-EN-P, April 2012

| Topic |  
|-------|---|
| Added illustrations of Frame 10 drives to the “Drive Input Power Configurations” section. |  
| Updated the “Drive Series Components Compatibility” section to include frame 10 drives. |  
| Updated the “Maintenance of Industrial Control Equipment” table to include filters for the IP54 cabinet blower assembly. |  
| Removed the Series A Converter EMC Filter Board from the “Converter Components Identification” table. |  
| Removed the Series A Converter Current Sensor kit from the “Converter Components Identification” table. |  
| Added the Three Bay 24V Wire Harness kit for frame 10 drives to the “Converter Components Identification” table. |  
| Updated the “Control Power Isolator Board Removal/Installation (600/690V AC Input Drives Only)” procedures to include steps for frame 10 drives. |  
| Added the Three Bay 24V Wire Harness kit for frame 10 drives to the “DC Input with Precharge Assembly Components Identification” table. |  
| Updated the “Control Power Isolator Board Removal/Installation (810/932V DC Input Drives Only)” procedures to include steps for frame 10 drives. |  
| Added the Cabinet L Bus Bar kit to the “AC Input Drive Enclosure Components Identification” table. |  
| Added the Cabinet Door Shield Kit (Frame 10) to the “AC Input Drive Enclosure Components Identification” table. |  
| Added the “Cabinet L Bus Bars Removal/Installation” AC input enclosure procedures. |  
| Added the “Cabinet Door EMC Shield Removal/Installation (Frame 10 Drives Only)” AC input enclosure procedures. |  
| Added the Circuit Breaker kit to the “Common DC Input Drive Enclosure Components Identification” table. |  
| Added the Lockout Attachment kit to the “Common DC Input Drive Enclosure Components Identification” table. |  
| Updated the “Enclosure Cable Components and Part Numbers” table to include the 3-Bay 24V Wire Harness Kit. |  
| Added the new Third Inverter (INV3) Fiber-optic Cable Removal/Installation procedure. |  
| Added the “Frame 10 AC Input Drive Schematic Diagram (400VAC and 600VAC Classes)”. |  
| Added the “Frame 10 Common DC Input Drive Schematic Diagram (540V DC, 650V DC, 810V DC, and 932V DC Classes)”. |  
| Updated the “Frame 8 Control Power Isolator Board Wiring Diagrams (600V AC Class AC Input Drive, and 810V DC and 932V DC Classes Common DC Input Drive)” for frame 10 drives. |  
| Corrected the terminal labels on “Inverter Main Blower and Capacitor Bank Cooling Fan Wire Harness Diagram”. |  
| Added the “Cabinet Cooling Wiring Diagrams”. |
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<table>
<thead>
<tr>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Updated the Converter Components Identification table to include the new kits for 600/690V AC input drives.</td>
</tr>
<tr>
<td>Updated the Converter Assembly Components Diagram 2 to include the new Control Power Isolation board.</td>
</tr>
<tr>
<td>Updated the Surge-suppressor Sense Wire Harness Removal/Installation procedure to reflect the addition of the new Control Power Isolation board and 24V wire harness for 600/690V AC input drives.</td>
</tr>
<tr>
<td>Updated the Surge Suppressor Removal/Installation procedure to reflect the addition of the new Control Power Isolation board and 24V wire harness for 600/690V AC input drives.</td>
</tr>
<tr>
<td>Updated the Surge Suppressor Assembly Removal/Installation procedure to reflect the addition of the new Control Power Isolation board and 24V wire harness for 600/690V AC input drives.</td>
</tr>
<tr>
<td>Added the new Control Power Isolator Board 24V Wire Harness Removal/Installation (600/690V AC Input Drives Only) procedure.</td>
</tr>
<tr>
<td>Added the new Control Power Isolator Board Removal/Installation (600/690V AC Input Drives Only) procedure.</td>
</tr>
<tr>
<td>Added the new Control Power Isolator Board 24V Wire Harness Removal/Installation (810/932V DC Input Drives Only) procedure.</td>
</tr>
<tr>
<td>Added the new Control Power Isolator Board Removal/Installation (810/932V DC Input Drives Only) procedure.</td>
</tr>
<tr>
<td>Updated the Undervoltage Delay Bracket Removal/Installation procedure to reflect the addition of the new Control Power Isolation board.</td>
</tr>
<tr>
<td>Updated the Inverter Components Identification table to include the new kits for 600/690V AC input drives.</td>
</tr>
<tr>
<td>Updated the following schematic diagrams in Appendix A Schematics to reflect the addition of 600/690V AC input and 810/932V DC input drives:</td>
</tr>
<tr>
<td>- Frame 8 AC Input Drive Schematic Diagram (400VAC and 600VAC Classes)</td>
</tr>
<tr>
<td>- Frame 9 AC Input Drive Schematic Diagram (400VAC and 600VAC Classes)</td>
</tr>
<tr>
<td>- Frame 8 Common DC Input Drive Schematic Diagram (540V DC, 650V DC, 810V DC, and 932V DC Classes)</td>
</tr>
<tr>
<td>- Frame 9 Common DC Input Drive Schematic Diagram (540V DC, 650V DC, 810V DC, and 932V DC Classes)</td>
</tr>
<tr>
<td>- Converter Schematic Diagram (400VAC and 600VAC Classes AC Input Drive)</td>
</tr>
<tr>
<td>- DC Input with Precharge Assembly Schematic Diagram (540V DC, 650V DC, 810V DC, and 932V DC Classes Common DC Input Drives)</td>
</tr>
<tr>
<td>- Inverter Circuit Board Schematic Diagram (All Drive Configurations)</td>
</tr>
<tr>
<td>- Inverter Power Layer Schematic Diagram (All Drive Configurations)</td>
</tr>
</tbody>
</table>
| Added the following new schematic diagram to Appendix A Schematics:
|   - Frame 8 Control Power Isolator Board Wiring Diagrams (600V AC Class AC Input Drive, and 810V DC and 932V DC Classes Common DC Input Drive) |
| Added the new History of Changes appendix. |

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Table 36 - 750-TG001B-EN-P, October 2011

<table>
<thead>
<tr>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Updated the lockout/tagout procedure to include steps for common DC input drives.</td>
</tr>
<tr>
<td>Added the new “Drive Input Power Configurations” section to provide general information on identifying the main drive components for each available configuration.</td>
</tr>
<tr>
<td>Added the new “Drive Series Components Compatibility” section to provide important information about drive component compatibility based on the drive series designator.</td>
</tr>
<tr>
<td>Updated the list of “Commonly Used Tools” to include additional required tool sizes.</td>
</tr>
</tbody>
</table>
### Table 36 - 750-TG001B-EN-P, October 2011 (continued)

<table>
<thead>
<tr>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Updated the “Fastener/Tool/Torque Information” table to include the Pozidriv fastener and tool types.</td>
</tr>
<tr>
<td>Updated the “Component Inspection and Maintenance” procedure to include common DC input drives.</td>
</tr>
<tr>
<td>Added the “DC Precharge Assembly Fuse Tests” procedure.</td>
</tr>
<tr>
<td>Added the “Fiber-optic Cable Removal/Installation (Frame 8)” procedures to Chapter 4.</td>
</tr>
<tr>
<td>Added the new “DC Input with Precharge Assembly Component Replacement Procedures” chapter.</td>
</tr>
<tr>
<td>Added the new “Inverter Top DC Bus Bar Removal/Installation (Common DC Input Drive Only)” to Chapter 7.</td>
</tr>
<tr>
<td>Updated the “IP20, NEMA/UL Type 1 Enclosure Door Fan Removal/Installation” procedure to include an additional required step.</td>
</tr>
<tr>
<td>Added the “DC Bus Fuse Wire Harness Removal/Installation (Frame 9 and Larger Drives Only)” procedure.</td>
</tr>
<tr>
<td>Added the “DC Bus Fuses and Fuse Indicators Removal/Installation (Frame 9 and Larger Drives Only)” procedure.</td>
</tr>
<tr>
<td>Added the “Input Common-mode Core Removal/Installation (Frame 9 and Larger, Common DC Input Drives Only)” procedure.</td>
</tr>
<tr>
<td>Added the new “Common DC Input Drive Enclosure Component Replacement Procedures” chapter.</td>
</tr>
<tr>
<td>Added the new “Enclosure Cable Components Replacement Procedures (Frame 9 and Larger Drives)” chapter.</td>
</tr>
<tr>
<td>Updated the “Before Applying Power to the Drive” procedure to include steps for common DC input drives.</td>
</tr>
<tr>
<td>Added the following new schematic diagrams to Appendix A Schematics:</td>
</tr>
<tr>
<td>- Frame 8 AC Input Drive Schematic Diagram (400VAC and 600VAC Classes)</td>
</tr>
<tr>
<td>- Frame 9 AC Input Drive Schematic Diagram (400VAC and 600VAC Classes)</td>
</tr>
<tr>
<td>- Frame 8 Common DC Input Drive Schematic Diagram (540V DC, 650V DC, 810V DC, and 932V DC Classes)</td>
</tr>
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<td>- Frame 9 Common DC Input Drive Schematic Diagram (540V DC, 650V DC, 810V DC, and 932V DC Classes)</td>
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<tr>
<td>- DC Input with Precharge Assembly Schematic Diagram (540V DC, 650V DC, 810V DC, and 932V DC Classes Common DC Input Drives)</td>
</tr>
<tr>
<td>- DC Input with Precharge Devices Schematic Diagrams</td>
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<tr>
<td>- DC Input with Precharge Assembly Control Transformer Schematic Diagram</td>
</tr>
<tr>
<td>Updated the following schematic diagrams in Appendix A Schematics:</td>
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<td>- Control Pod Schematic Diagram</td>
</tr>
<tr>
<td>- Converter Schematic Diagram (400VAC and 600VAC Classes AC Input Drive)</td>
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<tr>
<td>- Inverter Circuit Board Schematic Diagram (All Drive Configurations)</td>
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<tr>
<td>- Inverter Power Layer Schematic Diagram (All Drive Configurations)</td>
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