



PowerFlex 750-Series Products with TotalFORCE Control Hardware Service Manual - Frames 5 and 6

Catalog Numbers 20GE, 20JE



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.



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.

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



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).

The following icon may appear in the text of this document.



Identifies information that is useful and can help to make a process easier to do or easier to understand.

Rockwell Automation recognizes that some of the terms that are currently used in our industry and in this publication are not in alignment with the movement toward inclusive language in technology. We are proactively collaborating with industry peers to find alternatives to such terms and making changes to our products and content. Please excuse the use of such terms in our content while we implement these changes.

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Preface

This manual provides recommended preventative maintenance schedules, major component tests, renewal part replacement procedures, and schematic diagrams for PowerFlex® 750-Series products with TotalFORCE® control.

This manual is intended for qualified service personnel responsible for PowerFlex 750-Series products 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 Work Place.

For product programming and troubleshooting information that can help you determine if your product requires repairs, see these publications.

For PowerFlex® TotalFORCE® control firmware revision 6.xxx and earlier:

- PowerFlex Drives with TotalFORCE Control Programming Manual, publication [750-PM100](#)
- For drive fault and alarm information, PowerFlex Drives with TotalFORCE Control Conditions Reference Data, publication [750-RD100](#).

For PowerFlex® TotalFORCE® control firmware revision 10.xxx and later:

- PowerFlex Drives with TotalFORCE Control Programming Manual, publication [750-PM101](#).
- For parameter enumerations and descriptions, PowerFlex Drives with TotalFORCE Control Parameters Reference Data, publication [750-RD101](#).
- For drive fault and alarm information, PowerFlex Drives with TotalFORCE Control Conditions Reference Data, publication [750-RD102](#).

Download Firmware, AOP, EDS, and Other Files

You can download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes from the Product Compatibility and Download Center at rok.auto/pcdc.

Summary of Changes

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes. Translated versions are not always available for each revision.

Topic	Page
The service information in this publication for PowerFlex® 755TL and 755TR frame 5 and 6 drives replaces publication 750-TG100F-EN-P.	Throughout

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation. You can view or download publications at rok.auto/literature.

Resource	Description
PowerFlex 755T Drive Resources	Find technical content to help you install, configure, use, and maintain your PowerFlex® 755T architecture-class AC drives. Includes downloads of control block diagrams and parameter and drive conditions data.
PowerFlex Drives with TotalFORCE Control Parameters Reference Data, publication 750-RD101	Provides the parameters for PowerFlex® products with TotalFORCE® control.

Resource	Description
PowerFlex Drives with TotalFORCE Control Conditions Reference Data, publication 750-RD102	Provides the fault, alarm, event, and exception codes for PowerFlex® products with TotalFORCE® control.
PowerFlex 755T Products with TotalFORCE Control Input Protection Devices Reference Data, publication 750-RD103	Provides a list of recommended fuses and circuit breakers for PowerFlex® 755TL, 755TR, and 755TM products based product voltage class, current draw, and duty rating.
PowerFlex 750-Series Products with TotalFORCE Control Technical Data, publication 750-TD100	Provides detailed information on: • Drive and bus supply specifications • Option specifications • Fuse and circuit breaker ratings
PowerFlex 755TM IP00 Open Type Kits Technical Data, publication 750-TD101	Provides detailed information on: • Kit selection • Kit ratings and specifications • Option specifications
PowerFlex 755TS Products with TotalFORCE Control Technical Data, publication 750-TD104	Provides detailed information on: • Drive specifications • Option specifications • Fuse and circuit breaker ratings
PowerFlex 750-Series Products with TotalFORCE Control Installation Instructions, publication 750-IN100	Provides the basic steps to install PowerFlex® 755TL low harmonic drives, PowerFlex® 755TR regenerative drives, and PowerFlex® 755TM drive systems.
PowerFlex 755TS Products with TotalFORCE Control Installation Instructions, publication 750-IN119	Provides the basic steps to install PowerFlex® 755TS drives.
PowerFlex 755T Flux Vector Tuning, publication 750-AT006	Provides guidance on how to tune Flux Vector position and velocity loops, filters, and other features to achieve the level of performance that is required for a given application. This publication is intended for novice drives users and users with advanced skills.
PowerFlex 20-HIM-A6 and 20HIM-C6S HIM (Human Interface Module) User Manual, publication 20HIM-UM001	Provides detailed information on HIM components, operation, and features.
PowerFlex 755TM IP00 Open Type Kits Installation Instructions, publication 750-IN101	Provides instructions to install IP00 Open Type kits in user-supplied enclosures.
PowerFlex 755TM AC Precharge Modules Unpacking and Lifting Instructions, publication 750-IN102	These publications provide detailed information on: • Component weights • Precautions and recommendations • Hardware attachment points • Lifting the component out of the packaging
PowerFlex 755TM DC Precharge Modules Unpacking and Lifting Instructions, publication 750-IN103	
PowerFlex 755TM Power and Filter Modules Unpacking and Lifting Instructions, publication 750-IN104	
PowerFlex 750-Series Service Cart and DC Precharge Module Lift Instructions, publication 750-IN105	Provides detailed setup and operating instructions for the module service cart and DC precharge module lift.

Resource	Description
PowerFlex 755TM Power and Filter Module Storage Hardware Instructions, publication 750-IN106	Provides detailed installation and usage instructions for this hardware accessory.
PowerFlex 755T Power Module Service Ramp Instructions, publication 750-IN108	Provides detailed usage instructions for the module service ramp.
Industry Installation Guidelines for Pulse Width Modulated (PWM) AC Drives, publication DRIVES-AT003	Provides basic information on enclosure systems, considerations to help protect against environmental contaminants, and power and grounding considerations for installing Pulse Width Modulated (PWM) AC drives.
Drives in Common Bus Configurations with PowerFlex 755TM Bus Supplies Application Technique, publication DRIVES-AT005	Provides basic information to properly wire and ground the following products in common bus applications: - PowerFlex® 755TM drive system for common bus solutions - PowerFlex® 750-Series AC and DC input drivexs - Kinetix® 5700 servo drives
Wiring and Grounding Guidelines for Pulse Width Modulated (PWM) AC Drives, publication DRIVES-IN001	Provides basic information to properly wire and ground PWM AC drives.
PowerFlex 750-Series I/O, Feedback, and Power Option Modules Installation, publication 750-IN111	Provides instructions to install and wire PowerFlex® 750-Series option modules.
PowerFlex Drives with TotalFORCE Control Programming Manual (firmware revision 6.xxx and earlier), publication 750-PM100	Provides detailed information on: - I/O, control, and feedback options - Parameters and programming - Faults, alarms, and troubleshooting
PowerFlex 750-Series AC Drives with TotalFORCE Control Quick Start, publication 750-QS100	Provides the basic steps that are required to start up PowerFlex® 750-Series AC Drives with TotalFORCE® Control.
CIP Security with Rockwell Automation Products Application Technique, publication SECURE-AT001	Describes how to plan and implement a Rockwell Automation system that supports the CIP Security protocol.
System Security Design Guidelines Reference Manual, publication SECURE-RM001	Provides guidance on how to conduct security assessments, implement Rockwell Automation products in a secure system, harden the control system, manage user access, and dispose of equipment.
PowerFlex 750-Series Products with TotalFORCE Control Reference Manual, publication 750-RM100	Provides detailed setup and programming instructions for common applications.
PowerFlex 750-Series Products with TotalFORCE Control Hardware Service Manual - Frames 5 and 6, publication 750-TG102	Provides detailed information on: - Preventive maintenance - Component testing - Hardware replacement procedures
PowerFlex 750-Series Products with TotalFORCE Control Hardware Service Manual - Frames 6L and 7L, publication 750-TG103	Provides detailed information on: - Preventative maintenance - Component testing - Hardware replacement procedures

Resource	Description
PowerFlex 750-Series Products with TotalFORCE Control Hardware Service Manual - Frames 7...15, publication 750-TG104	Provides detailed information on: • Preventative maintenance • Component testing • Hardware replacement procedures
System Security Design Guidelines Reference Manual, SECURE-RM001	Provides guidance on how to conduct security assessments, implement Rockwell Automation products in a secure system, harden the control system, manage user access, and dispose of equipment.
Industrial Automation Wiring and Grounding Guidelines, 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Selection and Configuration tools, rok.auto/systemtools	Helps configure complete, valid catalog numbers and build complete quotes based on detailed product information.
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.

Before You Begin

Read the information in this section before you begin tests, maintenance, or repairs on drive components.

IMPORTANT: Once the product is connected to a power supply, always verify that system power is not present before performing any work on the product. See safety-related practices that are contained in publication NFPA 70E, Standard for Electrical Safety in the Work Place.

Qualified Personnel



ATTENTION: Risk of injury or equipment damage exists.

Only qualified personnel familiar with PowerFlex drive products 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: Risk of injury or death exists.

To avoid an electric shock hazard, verify that the voltage on the bus capacitors has discharged before servicing.

Frames 5 and 6

Measure the DC bus voltage at the power terminal block by measuring between the +DC and -DC terminals. Also, measure between the +DC terminal and the chassis, and between the -DC terminal and the chassis. The voltage must be zero for all three measurements.

Frame 6L

Measure the DC bus voltage by measuring between the DC+ and DC- testpoint sockets on the bottom of the chassis. Also measure between the DC+ testpoint and PE ground bus bar (GND), and the DC- testpoint and the PE ground bus bar (GND).

Frames 7...15 and 7L

Measure the DC bus voltage by measuring between the +DC and -DC testpoint sockets on the front of the power module. Also measure between the +DC testpoint and chassis GND, and the -DC testpoint and chassis GND.



ATTENTION: Risk of injury or equipment damage exists.

Hazard of personal injury or equipment damage exists when using bipolar input sources. Noise and drift in sensitive input circuits can cause unpredictable changes in motor speed and direction. Use speed command parameters to help reduce input source sensitivity.



ATTENTION: Risk of injury or equipment damage exists.

DPI™ or SCANport™ host products must not be directly connected together via 1202 cables. Unpredictable behavior can result if two or more devices are connected in this manner.



ATTENTION: Risk of injury or death exists.

The drive start/stop/enable control circuitry includes solid state components. If hazards due to accidental contact with moving machinery or unintentional flow of liquid, gas or solids exists, an additional hardwired stop circuit may be required to remove the AC line to the drive. An auxiliary braking method may be required.



ATTENTION: Risk of injury or equipment damage exists.

Unexpected machine operation exists if the drive is configured to automatically issue a Start or Run command. Do not use these functions without considering applicable local, national and international codes, standards, regulations or industry guidelines.



ATTENTION: Risk of injury or death exists.

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 and the oscilloscope chassis is grounded to an earth ground.



ATTENTION: Risk of injury or death exists.

A possible hazard of personal injury due to prolonged exposure to high sound levels. Follow applicable local, national, and international codes, standards, regulations, or industry guidelines for hearing protection when exposed to potentially damaging noise hazards.

Class 1 LED Product



ATTENTION: Risk of injury or death exists.

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.

Product Safety



ATTENTION: Risk of equipment damage exists.

This product contains electrostatic discharge (ESD) sensitive parts and assemblies. Static control precautions are required when you install these assemblies. Component damage can result if ESD control procedures are not followed. If you are not familiar with static control procedures, reference any applicable ESD protection handbook.

Electrostatic Discharge Icon

Electrostatic Discharge (ESD) sensitive parts and assemblies are identified in this manual by this image. Take static control precautions when you install an assembly that is identified as ESD sensitive.



Remove Power from the System for Frames 5 and 6

This procedure must be completed before you attempt to service any part of the drive.



ATTENTION: Risk of injury or equipment damage exists.

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 the following 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 receiving connector. Worn contacts can create electrical resistance.

Follow these steps to remove power from the drive.

1. Turn off and lock out all input power, including any external power sources.
2. Wait 15 minutes.
3. If present, remove the conduit box cover from the drive.
4. Measure the AC input and DC bus voltage to verify that there is no voltage present:
 - a. Measure the AC input terminals R/L1, S/L2, and T/L3; L to L and L to chassis GND (PE).
 - b. Measure the DC output terminals; DC+ to DC-, DC+ to chassis GND (PE), and DC- to chassis GND (PE).

Figure 1. Frame 5 Power Terminal Identification

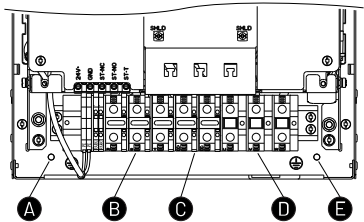
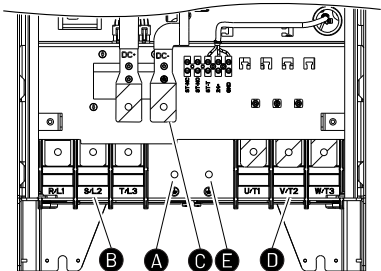


Figure 2. Frame 6 Power Terminal Identification



Item	Name	Description
A	PE grounding stud	Termination point to chassis ground for AC line shield

Item	Name	Description
B	R/L1, S/L2, T/L3	AC line input power terminals
C	DC+, DC-	DC bus terminals
D	U/T1, V/T2, W/T3	AC output motor terminals
E	PE grounding stud	Termination point to chassis ground for motor shield

Renewal Kits for PowerFlex 755T Products with Corrosive Gas Protection (XT)

All PowerFlex® 755T product renewal kits with corrosive gas protection (XT) meet the corrosive atmosphere specification as defined by Rockwell Automation. For details on the corrosive atmosphere specification, see the PowerFlex® 750-Series Products with TotalFORCE® Control Technical Data, publication [750-TD100](#).

The PowerFlex® 755T product renewal kits that are listed in this table do not meet the corrosive atmosphere specification. Do not install these renewal kits in a PowerFlex® 755T product with XT (catalog numbers 20GE and 20JE) that is installed in a corrosive environment. The renewal kit catalog number and series are contained on the kit package label and/or nameplate.

Table 1. Renewal Kits without Corrosive Gas Protection

Catalog Number	Module	Series
20-750-MCP0D1-FnM, 20-750-MCP0D2-FnM	Control pods	All
SK-RM-MCB1-PF755	Main control board	All
20-750-MI1-xnnnnnnn, 20-750-MI2-xnnnnnnn, 20-750-MI3-xnnnnnnn, 20-750-MI4-xnnnnnnn	Frames 8...15 Power modules	A
20-750-MI5-C650D650 (Corrosive atmosphere rating is Severity Level G3. Consult the factory for more information.)	Frame 7L power module	A
20-750-ML1-xnnnnnnn, 20-750-ML4-xnnnnnnn	LCL filter modules	A
20-750-MACPC1-xx or 20-750-MACPC1-xx-F7M	AC precharge control boards	A
20-750-MFTB1-F8	Fiber transceiver board	A

Protective Packaging for Renewal Kits with XT

Renewal kits with XT are shipped in packaging that is designed to protect products while stored at industrial sites that can be exposed to corrosive gas. Do not remove packaging or protective film from a renewal kit while it is in storage.

Protective Covers on Kits with XT

Some renewal kits with XT use protective covers to seal wire harness connectors, circuit board connectors, terminal blocks, and fiber-optic transceivers and ports. The covers protect against contamination and corrosion in corrosive gas environments. For the product to meet

the corrosive atmosphere rating, protective covers must remain installed in unused connectors during storage and operation. For kits with protective covers:

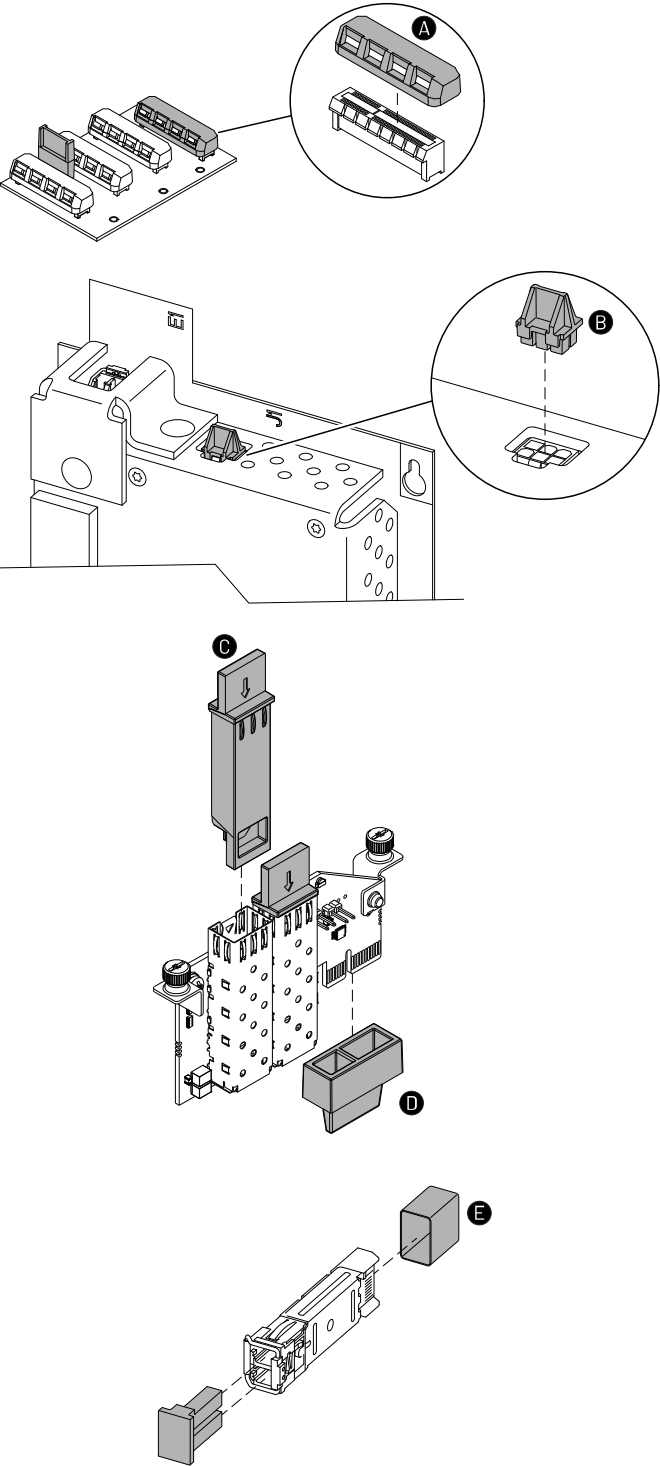
- Do not remove a protective cover from an unused connection or a kit in storage.
 - Remove a protective cover when a connection must be made at installation only.
-

IMPORTANT: Retain protective covers for power and LCL filter modules for reuse. Install protective covers on connectors when a module is removed and stored.

In each applicable chapter of this manual 'XT' appears in the description column of the Renewal Kits tables to identify a kit that contains protective covers.

This figure provides examples of protective covers for components with XT.

Figure 3. Protective Covers for Kits with XT Examples



Item	Description		Item	Description
A	Circuit board connector cover		D	Circuit board edge connector cover
B	Terminal block cover		E	Fiber-optic transceiver covers
C	Fiber-optic port cover		—	—

Dielectric Grease Application (XT)

All printed circuit board renewal kits with XT contain PolySi PST-576 dielectric grease on the edge connectors (where present). All fiber-optic transceivers in renewal kits with XT contain PolySi PST- 576 dielectric grease on the internal edge connector. The dielectric grease provides corrosion resistance for the edge connector and receiving connector.

Where applicable, '(XT)' appears in the description column of the Renewal Kits tables to identify a kit that contains dielectric grease on connectors. Greased connectors are always covered on new kits.

To be sure that edge connectors on circuit boards with XT maintain corrosion resistance, do the following:

- Do not touch or remove the dielectric grease from the circuit-board edge connectors.
- Do not allow the edge connectors to contact surfaces other than the receiving connector.
- If possible, do not pull the circuit board edge connectors out of the receiving connectors after it has been fully inserted and seated.
- Inspect and clean receiving connectors, if necessary, before you install a new or existing circuit board.
- If the grease on a circuit board edge connector becomes contaminated or the edge connector surface becomes exposed, you must clean the edge connector and reapply dielectric grease.

To be sure that edge connectors on fiber-optic transceivers with XT maintain corrosion resistance, do the following:

- Do not touch the dielectric grease on the fiber-optic transceiver edge connector.
- Inspect fiber-optic transceiver connections for contamination.
- If the grease on a fiber-optic transceiver edge connector becomes contaminated or the edge connector surface becomes exposed, you must clean the edge connector and reapply dielectric grease.

To help avoid premature failure of a circuit board or fiber-optic transceiver edge connector that contains dielectric grease, do not allow the grease on the edge connectors to become contaminated with any form of debris or particulate matter.

Inspect and Clean Circuit Board Connectors (XT)

A lint-free alcohol wipe with 90% or higher alcohol content is required to clean a receiving connector.

Before you install a new circuit board or reinstall an existing circuit board with XT, inspect and clean the receiving connector.

Follow these steps to inspect and clean a circuit board connector.

1. By using a bright light, inspect the receiving connector for debris or particulate matter.
2. If there is contamination inside the receiving connector on the circuit board, it is recommended that you replace the circuit board.
3. If the exterior surface of the receiving connector has contamination, to help prevent any debris or particulate matter from entering the connector, use a lint-free alcohol wipe to remove the contamination away from the connector opening.
4. Before you install the new circuit board or reinstall the existing circuit board, allow the receiving connector to dry thoroughly.

Clean and Apply Dielectric Grease to an Edge Connector (XT)

If either of these conditions exist for an edge connector on a circuit board with XT, do not install the circuit board:

- Debris or particulate matter is present on the greased surfaces of a circuit board edge connector.
- Any of the “gold finger” surfaces on the edge connector are not completely coated with a thin layer of grease.

If the dielectric grease on a circuit board edge connector contains debris or the gold finger surfaces are not completely coated with grease, you must thoroughly clean and reapply PolySi PST-576 non-silicone, dielectric grease to the affected connector.

IMPORTANT: Only PolySi PST-576 dielectric grease is approved for use on edge connectors of circuit boards with XT.

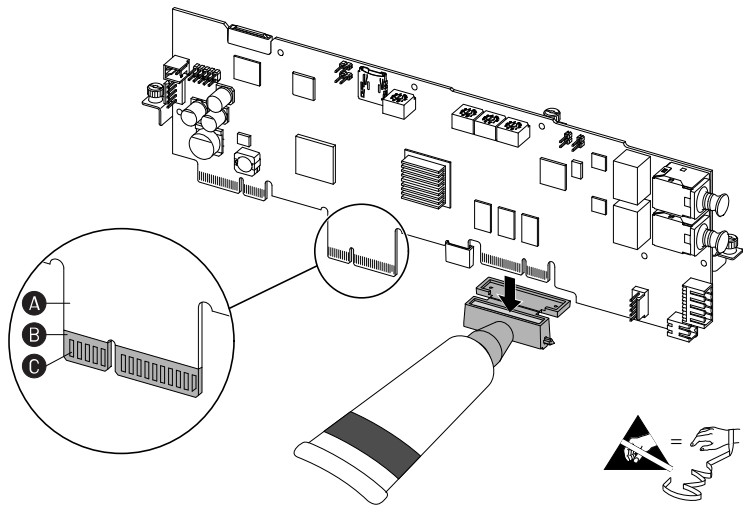
The dielectric grease applicator kit, catalog number SK-RM-GRAPP1, is available to reapply grease to edge connectors on circuit boards and fiber transceivers. See [Dielectric grease applicator kit on page 17](#).



Complete coverage of the edge connector with grease is more important than the thickness of the grease layer. A thicker application of grease does not improve corrosion resistance.

Follow these steps to use the grease applicator kit to apply dielectric grease to an edge connector on a circuit board.

1. By using a lint-free alcohol wipe with 90% or higher alcohol content, remove the contamination and grease from the connector.
2. Before you apply grease, allow the edge connector to dry thoroughly.
3. Open the grease tube and by using the pin on the side of the large applicator, puncture the seal on the end of the tube.
4. Install the large grease applicator on the threaded tip of the tube.
5. Close the applicator cover.
6. Press the tube until the applicator-tip chamber is completely filled with grease. The chamber is full when grease escapes through the small holes on the applicator cover.
7. Open the applicator cover and verify that the chamber is full of grease.
8. If the chamber is not full of grease, repeat steps 5...7.
9. To apply dielectric grease to both sides, insert the edge connector (A) into the center of the applicator tip. Be sure that the grease (B) is applied beyond the edge of the gold finger surfaces (C) on the edge connector (ideally in contact with the conformal coating on the board).



- 10. Repeat steps 5...9 for each affected edge connector.
- 11. After use, remove the grease applicator from the grease tube.
- 12. Replace the cap on the grease tube.
- 13. By using a clean cloth, wipe the remaining grease out of the applicator tip and close the cover.

Dielectric Grease Applicator Kit

The dielectric grease applicator kit, catalog number SK-RM-GRAPP1, is available to reapply grease to edge connectors on circuit boards and fiber transceivers. The grease applicator kit contains these components.

Figure 4. Dielectric Grease Applicator Kit Contents

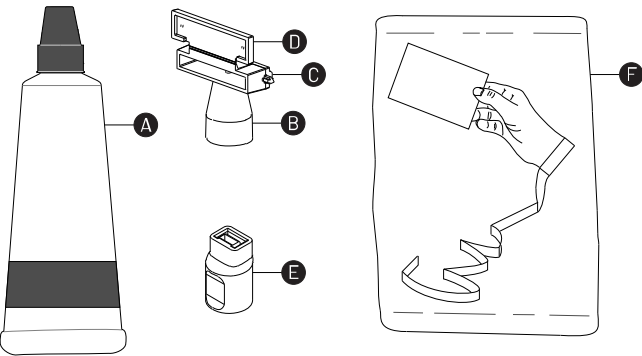


Table 2. Grease Kit Contents Description

Item	Description		Item	Description
A	PolySi PST-576 dielectric grease tube		D	Applicator cover (hinged)
B	Large grease applicator (for circuit board edge connectors)		E	Small grease applicator (for fiber transceiver edge connector)
C	Pin (to pierce grease tube)		F	Electrostatic discharge (ESD) strap

Installation Tools

This list includes the tools that are needed for installation and test measurements.

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.

Table 3. Installation Tools

Tool Description	Details
Allen socket wrench	3 mm, 4 mm, 5 mm (with long extension)
Allen socket wrench extension	254 mm (10 in.)
Box wrench	7 mm, 8 mm, 10 mm, 13 mm, 15 mm, 17 mm, 19 mm, 22 mm
Crimp tools	For cable terminals 1.5...240
Current clamp	1000 A (AC, rms), signal output
ESD-protected place of work	Work surface, floor cover, seat, and ground connections
ESD-protective clothing	Wrist wrap, shoes, overall clothing (coat)
Flash light / Task light	For inspections
Flat-nose screwdriver	3 mm (0.12 in.), 5 mm (0.19 in.), 6.4 mm (0.25 in.)
Fuse puller	—
Hexagonal socket wrench	2.5 mm, 7 mm, 8 mm, 10 mm, 12 mm, 13 mm, 17 mm, 18 mm
Insulation tester	1000V DC
Level	—
Lift strap	5/16 in. J-hook style, 24 in. long, 1000 lb min.
Module service cart	The optional module service cart (20-750-MCART1) is recommended to handle and transport power modules. Important: The service cart is required to handle and transport LCL filter modules.
DCPC module lift	Used together with the module service cart to remove DC precharge modules.
Module storage hardware	Module storage hardware (20-750-MINV-ATIP) helps to stabilize power and filter modules during temporary storage after removal.
Multi-meter	Digital multi-meter, capable of AC and DC voltage, continuity, resistance, capacitance measurements, and forward diode bias tests. Fluke model 87 III or equivalent.

Table 3. Installation Tools (continued)

Tool Description	Details
Nose pliers	—
Open end wrenches	Two 1-1/2 in. open end wrenches to tighten coolant hose connections.
Oscilloscope	Portable, digitizing, dual channel scope, with isolation
Phillips screwdriver/bit	#1, #2
Ratcheting wrench	1...12 N•m (8.8...106 lb•in)
Torque wrench	1...12 N•m (8.8...106 lb•in)
Torque wrench	6...50 N•m (53...443 lb•in)
Torx, star, or hexalobular screw driver/bit	#15, #20, #25, #30, #40, #45
Wire cutter	—

Software Tools

PowerFlex® 750-Series products with TotalFORCE® Control can be configured by using the following software products:

- Studio 5000 Logix Designer® software is an intuitive programming environment that allows you to work collaboratively to design and maintain their automation systems.
- Connected Components Workbench™ software provides controller programming and simulation, device configuration, and visualization with Human Machine Interface (HMI) editor.

For PowerFlex® 750-Series products and software compatibility, see the Product Compatibility and Download Center at rok.auto/pcdc.

Hardware Installation Diagrams

The assembly illustrations throughout this manual contain diagrams (as shown here) that identify the following: sequence number (if necessary), type of fastener, fastener size, tool type and size, and final assembly torque.

Figure 5. Fastener Diagram

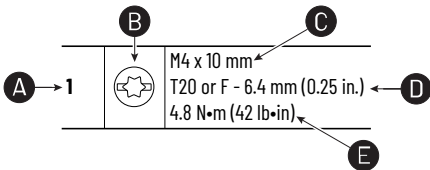


Table 4. Fastener Diagram Elements

Item	Name	Description
A	Sequence number	When used, the sequence number corresponds with a step in a procedure.
B	Fastener type	A graphic representation of the fastener drive type.
C	Fastener size	Specifies diameter x thread pitch x length as necessary.
D	Tool type and size	The recommended tool for the specified fastener drive type.
E	Torque	Specifies the final assembly torque for the fastener.

Table 5. Fastener Drive Types

Graphic	Description
	Flat-head screw
	Hexagonal bolt
	Hexagonal nut or standoff
	Hexagonal screw
	Torx screw
	Phillips screw
	Pozidriv screw
	Slotted torx screw
	Slotted Phillips

Table 6. Tool Types

F	Flat-nose screwdriver
---	-----------------------

Table 6. Tool Types (continued)

Px	Phillips screwdriver/bit and size
PZx	Pozidriv screwdriver/bit and size
Txx	Torx screwdriver/bit and size
xx mm	Hexagonal socket wrench

Fastener Torque Sequences



ATTENTION: Risk of equipment damage exists.
Components can be damaged if the tightening procedure is not performed to specification.

These figures illustrate the initial and final torque sequences for components that are fastened to a heatsink by using two, four, and six screws. The initial torque is 1/3 (33%) of the final torque, except six-point mountings, which require a 0.7 N•m (6 lb•in) initial torque. The numeric illustration labels are for your assistance. Drive components do not contain these labels.

Figure 6. Two-point Mounting

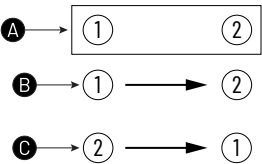


Figure 7. Four-point Mounting

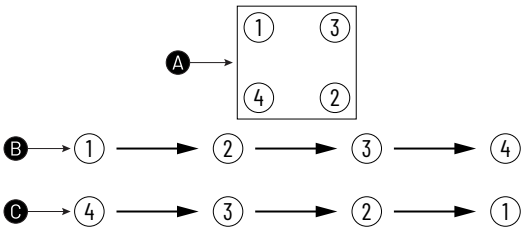


Figure 8. Six-point Mounting

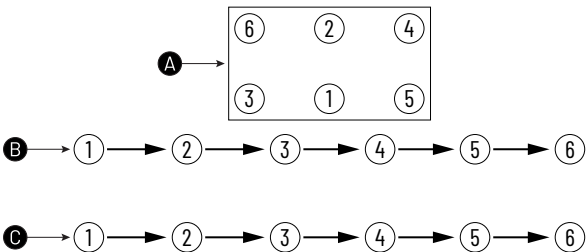


Table 7. Torque Sequences

Item	Description
A	Fastener pattern
B	Initial torque sequence
C	Final torque sequence

Preventative and Predictive Maintenance

For applications that demand the highest levels of machine availability, Rockwell Automation recommends regularly scheduled preventative maintenance for PowerFlex® product components. There are two methods for planning preventative maintenance for your product:

- Follow a recommended preventative maintenance schedule for the operating environment applicable to your drive, bus supply, or common bus inverter.
- The predicted remaining life of components appears on the Predictive Maintenance page in the Connected Components Workbench™ and Studio 5000 Logix Designer® software applications.

Recommended Preventative Maintenance

To help achieve the highest level of uptime, Rockwell Automation recommends that you follow the maintenance schedule that is provided for your operating environment. For environments with a corrosive atmosphere, use PowerFlex® 755T products with enhanced (XT) protection only.

A recommended maintenance schedule is provided for these environments:

- Operating conditions below 40 °C (104 °F)
- Operating conditions above 40 °C (104 °F)

IMPORTANT: Duty cycle and load profile can greatly affect the reliability of PowerFlex® 750-Series Products with TotalFORCE® Control.

An annual preventative maintenance program includes the following primary tasks:

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

IMPORTANT: For products that have been in storage for multiple years, see instructions on how to reform the bus capacitors, visit rok.auto/support and search on Capacitor Reforming Guidelines.

Recommended Maintenance Schedule Task Descriptions

Table 8. Maintenance Task Descriptions

Task	Description
Inspect	Inspect the component for signs of excessive accumulation of dust, dirt, or external damage. For example, inspect the filters/fan inlet screens for debris that can block the airflow path.
Clean	Clean the components that can be reused, specifically the door-mounted air filters and fan inlet screens.
Maintain	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.

Table 8. Maintenance Task Descriptions (continued)

Task	Description
Replace	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. Use the predictive maintenance parameters to determine a replacement schedule for components in shaded table rows.
Review	Self-review or a discussion with Rockwell Automation personnel is recommended to help determine whether any of the enhancements/changes made to the drive firmware or hardware could benefit the application.

Recommended Maintenance Schedule for Operating Conditions Below 40 °C (104 °F) for Frames 5 and 6

This table provides a recommended schedule of maintenance tasks for the components or activities that are associated with products that are operated in conditions below 40 °C (104 °F). The table also identifies the components that have parameters (firmware revisions 6.xxx and earlier only) or objects available to monitor the remaining life in software applications.

Table 9. Recommended Maintenance Schedule for Operating Conditions Below 40 °C (104 °F)

Components and Activities	Kit Cat. No. or Requirements	Monitor Predictive Maintenance Parameters or Objects	Inspect/Clean	Maintain	Review	Replace
Insulated Gate BiPolar Transistor (IGBT)	An IGBT failure requires a drive or bus supply replacement.	Parameters: Port 12 /14: 140 Object: 0x414	—	—	—	—
Power Feedback Circuit Board	SK-RM-PFB-F5-F6	—	—	—	—	Every 12 years
Fan Power Supply Circuit Board	SK-RM-PSB1-F5-F6	—	—	—	—	Every 12 years
Stirring Fan	SK-RM-MFAN1-F5, SK-RM-MFAN1-F6	Parameter: Port 14: 128 Object: 0x414	Every year	—	—	—
Heatsink Fan	SK-RM-HSFAN1-F5, SK-RM-HSFAN1-F6	Parameter: Port 14: 136 Object: 0x414	Every year	—	—	—
LCL Filter Capacitor	SK-RM-LCLCP4-F5, SK-RM-LCLCP6-F5, SK-RM-LCLCP4-F6, SK-RM-LCLCP6-F6	Parameter: Port 14: 1250 Object: 0x414	—	—	—	—
Control Pod Main Control Circuit Board	SK-RM-MCB2- PF755	—	—	—	—	Every 12 years
Control Pod Backplane Circuit Board	SK-RM-PODBP1	—	—	—	—	Every 12 years

Table 9. Recommended Maintenance Schedule for Operating Conditions Below 40 °C (104 °F) (continued)

Components and Activities	Kit Cat. No. or Requirements	Monitor Predictive Maintenance Parameters or Objects	Inspect/Clean	Maintain	Review	Replace
Cables and Connectors	—	—	Every year	Every year	—	—
Electrical Connections	—	—	Every year	—	—	—
PE Ground Connections	—	—	Every year	—	—	—
Firmware Enhancements	—	—	—	—	Every 3 years	—
Hardware Enhancements	—	—	—	—	Every 3 years	—
Parameters	—	—	—	—	Every 3 years	—
Operational Variables	—	—	—	—	Every 3 years	—
Application Concerns	—	—	—	—	Every 3 years	—
Spare Part Inventory	—	—	—	—	Every year	—

Recommended Maintenance Schedule for Operating Conditions Above 40 °C (104 °F) for Frames 5 and 6

This table provides a recommended schedule of maintenance tasks for the components or activities that are associated with products that are operated in conditions above 40 °C (104 °F). The table also identifies the components that have parameters (firmware revisions 6.xxx and earlier only) or objects available to monitor the remaining life in software applications.

Table 10. Recommended Maintenance Schedule for Operating Conditions Above 40°C (104 °F)

Components and Activities	Kit Cat. No. or Requirements	Monitor Predictive Maintenance Parameters or Objects	Inspect/Clean	Maintain	Review	Replace
Insulated Gate BiPolar Transistor (IGBT)	An IGBT failure requires a drive or bus supply replacement.	Parameters: Port 12 /14: 140 Object: 0x414	—	—	—	—
Power Feedback Circuit Board	SK-RM-PFB-F5-F6	—	—	—	—	Every 8 years
Fan Power Supply Circuit Board	SK-RM-PSB1-F5-F6	—	—	—	—	Every 8 years
Stirring Fan	SK-RM-MFAN1-F5, SK-RM-MFAN1-F6	Parameter: Port 14: 128 Object: 0x414	Every year	—	—	—
Heatsink Fan	SK-RM-HSFAN1-F5, SK-RM-HSFAN1-F6	Parameter: Port 14: 136 Object: 0x414	Every year	—	—	—

Table 10. Recommended Maintenance Schedule for Operating Conditions Above 40°C (104 °F) (continued)

Components and Activities	Kit Cat. No. or Requirements	Monitor Predictive Maintenance Parameters or Objects	Inspect/Clean	Maintain	Review	Replace
LCL Filter Capacitor	SK-RM-LCLCP4-F5, SK-RM-LCLCP6-F5, SK-RM-LCLCP4-F6, SK-RM-LCLCP6-F6	Parameter: Port 14: 1250 Object: 0x414	—	—	—	—
Control Pod Main Control Circuit Board	SK-RM-MCB2- PF755	—	—	—	—	Every 8 years
Control Pod Backplane Circuit Board	SK-RM-PODBP1	—	—	—	—	Every 8 years
Cables and Connectors	—	—	Every year	Every year	—	—
Electrical Connections	—	—	Every year	—	—	—
PE Ground Connections	—	—	Every year	—	—	—
Firmware Enhancements	—	—	—	—	Every 3 years	—
Hardware Enhancements	—	—	—	—	Every 3 years	—
Parameters	—	—	—	—	Every 3 years	—
Operational Variables	—	—	—	—	Every 3 years	—
Application Concerns	—	—	—	—	Every 3 years	—
Spare Part Inventory	—	—	—	—	Every year	—

Predictive Maintenance

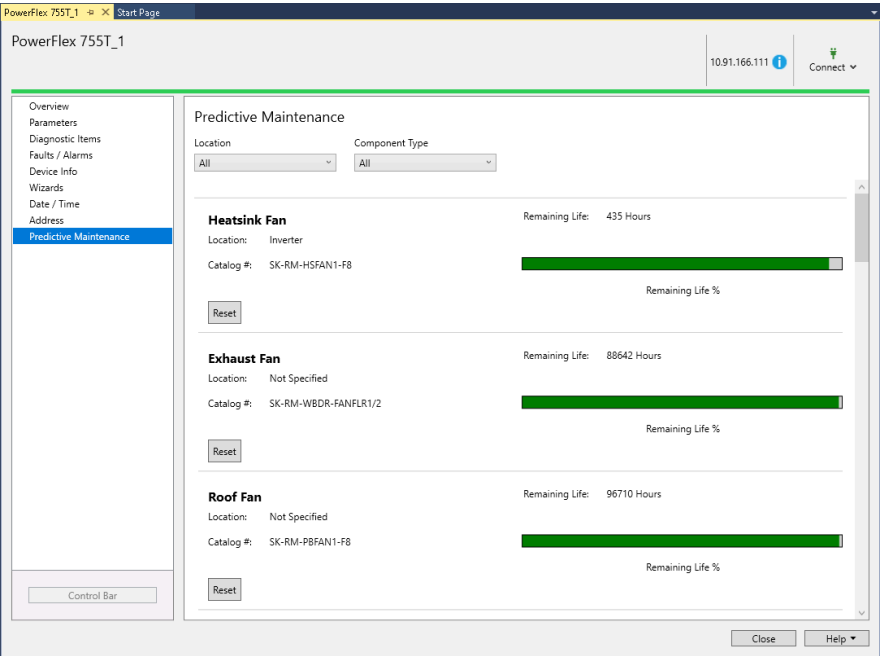
PowerFlex® 750-Series Products with TotalFORCE® Control contain algorithms for predictive maintenance that are used to improve the uptime of machines, processes, and facilities. These algorithms monitor the lifespan of certain components and display the percentage of remaining life and the number of hours or counts of remaining life in specific parameters or a software interface. These algorithms can be used to alert personnel when the components are nearing the end of their lifespan so the components can be replaced before they fail. For an overview of predictive maintenance, see the Predictive Maintenance section in the PowerFlex 750-Series Products with TotalFORCE Control Reference Manual, publication [750-RM100](#).

IMPORTANT: Failure to address predictive maintenance alarms can cause unexpected downtime or premature product failure.

For firmware revisions 6.005 and earlier, the remaining life of components with predictive maintenance appear in parameters. For firmware revisions 10.001 and later, the remaining life of components with predictive maintenance appear on the Predictive Maintenance page in the Device Details window in Connected Components Workbench™ software and the Drive Details window in Studio 5000 Logix Designer® application (as shown in this Predictive Maintenance page example).

NOTE: Firmware revisions 6.xxx and earlier cannot be used in frame 6L and 7L liquid cooled drives.

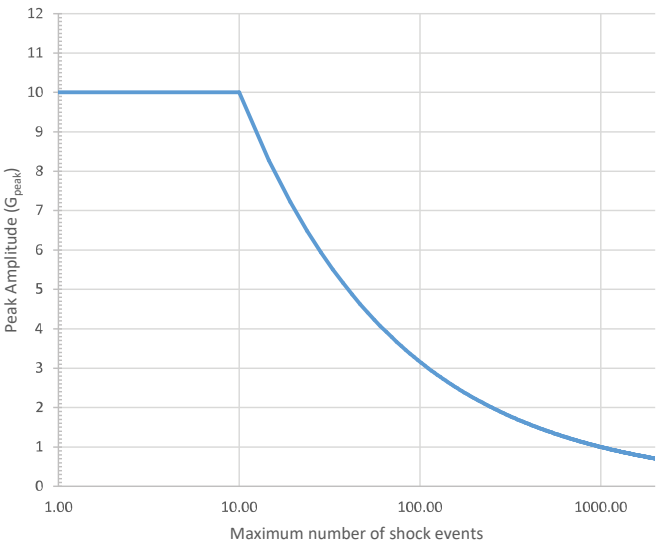
Figure 9. Connected Components Workbench - Predictive Maintenance Page



Shock Events

PowerFlex® 755T products can withstand a finite number of shock events. The maximum allowable number of shock events increases as the peak amplitude decreases. Below 0.7 g peak, the maximum total shock events should not exceed 2000 cycles.

Figure 10. Shock Events Graph



Maintenance of Industrial Control Equipment



ATTENTION: Risk of injury or death exists.

Performing service on energized Industrial Control Equipment can be hazardous. Severe injury or death can result from electrical shock, bump, or unintended actuation of controlled equipment. Recommended practice is to disconnect and lockout control equipment from power sources, and release stored energy, if present. See National Fire Protection Association Standard No. NFPA 70E, Part II and (as applicable) OSHA rules for Control of Hazardous Energy Sources (lockout/tagout) and OSHA Electrical Safety Related Work Practices for safety-related work practices. These publications include procedural requirements for lockout/tagout, and appropriate work practices, personnel qualifications, and required training where it is not feasible to de-energize and lock out or tag out electric circuits and equipment before working on or near exposed circuit parts.

Periodic Inspection

Periodically inspect industrial control equipment. Base inspection intervals on the environmental and operating conditions and adjust the intervals as necessary. An initial inspection within 3 to 4 months after installation is suggested. See National Electrical Manufacturers Association (NEMA) Standard No. ICS 1.3, Preventive Maintenance of Industrial Control and Systems Equipment, for general guidelines for defining a periodic maintenance program. Some specific guidelines for Rockwell Automation products are listed here.

Contamination

If inspection reveals that dust, dirt, moisture, or other contamination has reached the control equipment, the cause must be removed. Contamination can indicate an incorrectly selected or ineffective enclosure, unsealed enclosure openings (conduit or other), or incorrect operating procedures. Replace any improperly selected enclosure with one that is suitable for the environmental conditions. See the Industry Installation Guidelines for Pulse Width Modulated (PWM) AC Drives, publication [DRIVES-AT003](#), for guidance on environmental considerations. See NEMA Standard No. 250, Enclosures for Electrical Equipment, or UL 50E Electrical Equipment Enclosures, for enclosure type descriptions and test criteria.

Replace any damaged or cracked elastomer seals and repair or replace any other damaged or malfunctioning parts (for example, hinges and fasteners). Dirty, wet, or contaminated control devices must be replaced. Compressed air is not recommended for cleaning because it can displace dirt, dust, or debris into other parts or equipment, or damage delicate parts.

PowerFlex® 755T products with XT use dielectric grease to protect critical connections from the effects of corrosive gases. When you disconnect or reconnect a greased connection, always inspect for dust, dirt, conductive debris, or other contaminants. If contamination is found, thoroughly clean receiving surfaces and reapply dielectric grease as described in the dielectric grease section.

Blowers and Fans

Inspect blowers and fans that are used for forced air cooling. Replace any that have bent, chipped, or missing blades, or if the shaft does not turn freely. Apply power momentarily to check operation. If the unit does not operate, check and replace wiring, fuse, or blower or fan motor as appropriate. Clean or change air filters as recommended in the product manual. Also, clean the fins of heat exchangers so convection cooling is not impaired.

Operating Mechanisms

Check for proper function and freedom from sticking or binding. Replace any broken, deformed, or badly worn parts or assemblies according to individual product renewal-parts lists. Check

for and retighten any loose fasteners. Lubricate if specified in individual product instructions. Note: Allen-Bradley® magnetic starters, contactors, and relays are designed to operate without lubrication. Do not lubricate these Allen-Bradley devices because oil or grease on the pole faces (mated surfaces) of the operating magnet can cause the device to stick in the “ON” mode. Some parts of other devices are factory lubricated – if lubrication during use or maintenance of these devices is needed, it is specified in their individual instructions. If in doubt, consult your nearest Rockwell Automation sales office for information.

Contacts

Check contacts for excessive wear and dirt accumulation. Wipe contacts with a soft cloth, if necessary, to remove dirt. Discoloration and slight pitting does not harm contacts. Do not file contacts – this action shortens the life of the contact. Do not use contact spray cleaners because residue on magnet pole faces or in operating mechanisms can cause sticking, and on contacts can interfere with electrical continuity. Replace 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 in power circuits can cause overheating that can lead to equipment malfunction or failure. Loose connections in control circuits can cause control malfunctions. Loose bond or ground connections can increase the hazards of electrical shock and contribute to electromagnetic interference (EMI). Check the tightness of all terminals and bus bar connections and torque any loose connections properly. Infrared technology can be used to check for hot (high resistance/loose) connections during periodic maintenance. Replace any parts or wiring that is damaged by overheating, and any broken wires or bond straps.

Coils

If a coil is overheated (contains 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.

Pilot Lights

Replace any burned-out lamps or damaged lenses.

Photoelectric Switches

The lenses of photoelectric switches require periodic cleaning with a soft dry cloth. Reflective devices that are used with photoelectric switches also require periodic cleaning. Do not use solvents or detergents on the lenses or reflectors. Replace any damaged lenses and reflectors

Maintenance of Solid-state Devices



ATTENTION: Risk of equipment damage exists.

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. Solid-state devices require little more than a periodic visual inspection. Discolored, charred, or burned components can indicate the need to replace the component or circuit board. Make necessary replacements only at the circuit board or plug-in component level. Inspect printed circuit boards to determine whether they are properly seated in the edge board connectors. Board locking tabs must also be in place. Solid-state devices must also be protected from contamination, and temperature control provisions must be maintained. Do not use solvents on printed circuit boards.

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 locking and interlocking devices for proper working condition and capability of performing their intended functions. Make any necessary replacements only with Allen-Bradley renewal parts or kits. Adjust or repair only in accordance with Allen-Bradley instructions.

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 power is restored, the fault condition must be corrected and any necessary repairs or replacements must be made to restore the control equipment to good working order. See NEMA Standards Publication No. ICS-2, Part ICS2-302 for procedures. For replacements, use only parts and devices that Rockwell Automation recommends maintaining the integrity of the equipment. 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 function under controlled conditions to avoid a control malfunction hazard. For additional information, see NEMA ICS 1.3, PREVENTIVE MAINTENANCE OF INDUSTRIAL CONTROL AND SYSTEMS EQUIPMENT, published by the National Electrical Manufacturers Association, and NFPA 70B, ELECTRICAL EQUIPMENT MAINTENANCE, published by the National Fire Protection Association.

Component Inspection and Tests

Preventative maintenance includes inspections and tests of the major components in the drive and includes recommendations for repairs. For information on conditions that can cause a fault or alarm and how to troubleshoot these conditions, review the Troubleshooting section in one of these manuals:

- PowerFlex Drives with TotalFORCE Control programming manual, publication [750-PM100](#) (firmware revisions 6.xxx and earlier)
- PowerFlex Drives with TotalFORCE Control programming manual, publication [750-PM101](#) (firmware revision 10.xxx and later)

Inspect Fan Assemblies for Maintenance of Wall-mount Drives

Inspect the fan assemblies for dirt and damage. Dirt build-up or blockage on fans can lead to component damage or failure. Follow these inspection and maintenance instructions along with the Recommended Preventative Maintenance information.

1. Review the product advisories in [Before You Begin on page 9](#).
2. Remove power from the system.
3. Remove the cover from the drive.
4. Inspect these fan assemblies for blockage and verify free rotation:
 - Heatsink fans
 - Stirring fans
5. Clean or replace the fan assemblies as necessary.

Inspect Circuit Boards, Wire Harnesses, and Fiber-optic Cables for Maintenance

Visually inspect the primary circuit boards, wire harnesses and connectors, and fiber-optic cables for burn marks, breakage, foil delamination, dirt, or damage. Dirt build-up and other visible damage on some components can lead to component failure. Follow these inspection and maintenance instructions along with the Recommended Preventative Maintenance information.

1. Review the product advisories in [Before You Begin on page 9](#).
2. Remove power from the system.
3. Read the Protective Covers on Kits with XT topic.

IMPORTANT: Do not remove protective covers from wire harnesses, circuit board connectors, terminal blocks, and fiber-optic transceivers (if present) and ports unless used at the time of installation. For the product to meet the corrosive atmosphere rating, protective covers must remain installed in unused connectors during storage and operation.

4. Remove the cover from the control pod and inspect all major visible components, including: circuit boards, wire harnesses, fiber-optic cables (if present), and connectors.
5. If any control pod components show evidence of burn marks or breakage, replace the damaged components without further testing.
6. For frames 5 and 6L, inspect the power feedback circuit board.
7. If any power feedback board components, particularly the resistors, show evidence of burn marks or breakage, replace the circuit board without further testing.
8. If an AC precharge module or system is installed, inspect all major visible components.

9. If any AC precharge components show evidence of burn marks or breakage, replace the damaged components without further testing.
10. If a DC precharge module is installed, inspect all major visible components.
11. If any DC precharge components show evidence of burn marks or breakage, replace the damaged components without further testing.
12. Visibly inspect all visible circuit boards, wire harnesses and connectors, and fiber-optic cables (if present) throughout the system.
13. Replace any of these circuit boards, wire harnesses and connectors, or fiber-optic cables without further testing if they show evidence of burn marks, breakage, or foil delamination.

Perform Forward and Reverse Biased IGBT/Diode Tests for Frames 5 and 6

Follow these steps to perform forward and reverse biased IGBT/diode tests on the power module.

1. Review the product advisories in [Before You Begin on page 9](#).
2. Remove power from the system.

IMPORTANT: The actual voltage readings can vary depending upon your equipment. If your readings are not near the values that are indicated in these tables, verify that the actual voltage that is measured is consistent for each phase of the power module.

IMPORTANT: Residual voltage on the DC bus capacitors can affect a ".OL" (open circuit) reading. If the capacitors are 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". The voltage increase and eventual display of ".OL" can take several minutes to occur.

3. On the digital multi-meter, select the "Diode Test" mode and complete the forward-biased diode tests on the power module by using the test points in this table

IMPORTANT: Use the DC+ and DC- bus bar terminals for testing.

Table 11. Forward-biased Diode Test Points and Meter Readings

+ Meter Lead to Test Point	- Meter Lead to Test Point	Nominal Meter Reading	+ Meter Lead to Test Point	- Meter Lead to Test Point	Nominal Meter Reading
DC-	U/T1	0.36	U/T1	DC+	0.36
DC-	V/T2	0.36	V/T2	DC+	0.36
DC-	W/T3	0.36	W/T3	DC+	0.36
DC-	R/L1	0.36	R/L1	DC+	0.36
DC-	S/L2	0.80	S/L2	DC+	".OL" (open circuit)

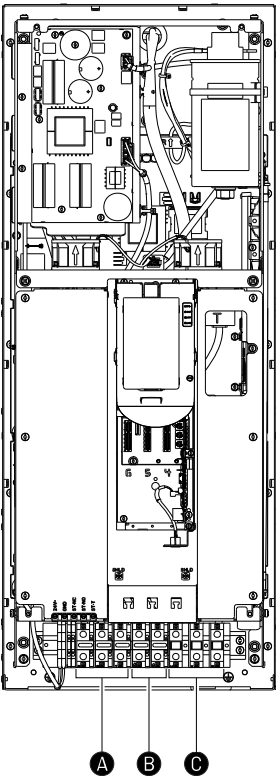
+ Meter Lead to Test Point	- Meter Lead to Test Point	Nominal Meter Reading	+ Meter Lead to Test Point	- Meter Lead to Test Point	Nominal Meter Reading
DC-	T/L3	0.80	T/L3	DC+	".0L" (open circuit)

4. On the digital multi-meter, select the "Diode Test" mode and complete the reverse-biased diode tests on the power module by using the test points in this table.

Table 12. Reverse-biased Diode Test Points and Meter Readings

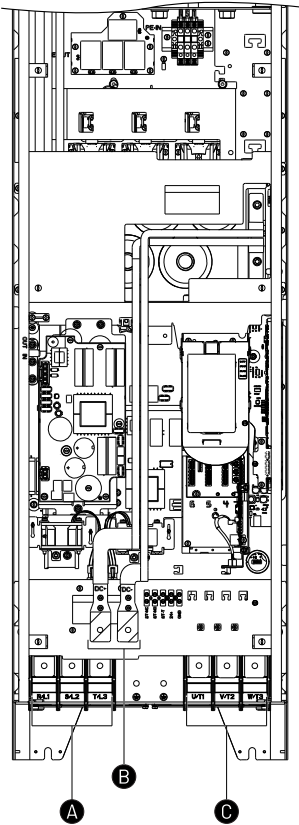
+ Meter Lead to Test Point	- Meter Lead to Test Point	Nominal Meter Reading
U/T1	DC-	".0L" (open circuit)
V/T2	DC-	".0L" (open circuit)
W/T3	DC-	".0L" (open circuit)
DC+	U/T1	".0L" (open circuit)
DC+	V/T2	".0L" (open circuit)
DC+	W/T3	".0L" (open circuit)

Figure 11. Frame 5 Power Terminal Locations



Item	Name	Item	Name	Item	Name
A	R/L1, S/L2, T/L3 (left to right)	B	DC+, DC-	C	U/T1, V/T2, W/T3 (left to right)

Figure 12. Frame 6 Power Terminal Locations



Item	Name	Item	Name	Item	Name
A	R/L1, S/L2, T/L3 (left to right)	B	DC+, DC-	C	U/T1, V/T2, W/T3 (left to right)

- 5. If the product fails the meter readings, replace the drive or bus supply.
- 6. Before you place the drive or bus supply back into service, complete the Start Up After Repairs procedure.

Frame 5 Kits

This table lists the renewal kits available for PowerFlex® 755T frame 5 products. (XT) appears in the description column in the table to identify a kit that contains protective covers and/or dielectric grease on connectors.

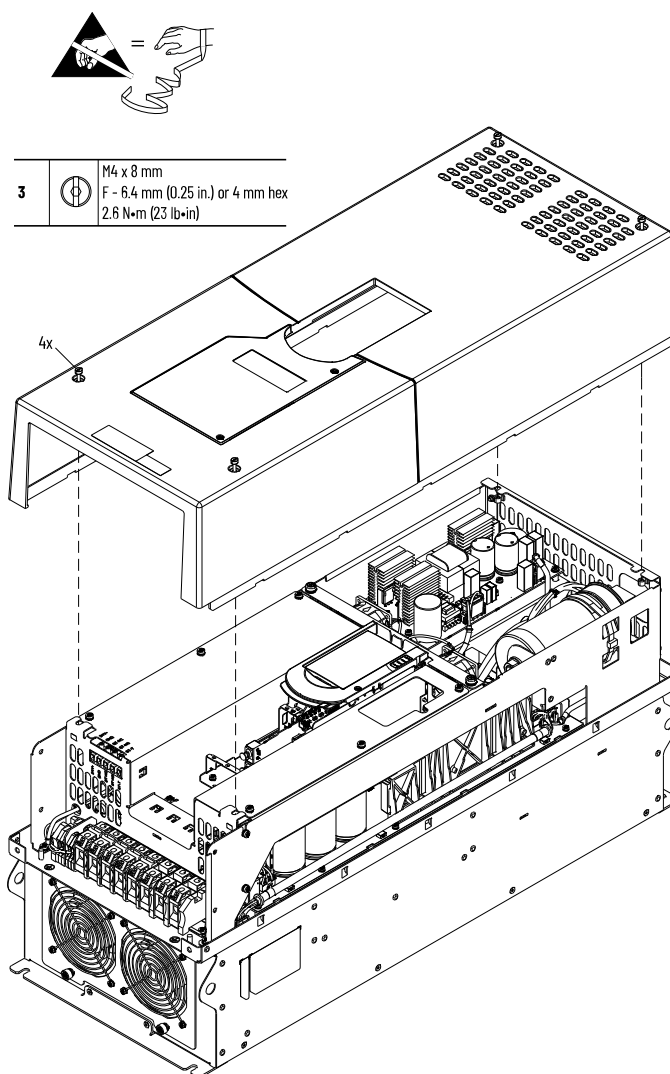
Table 13. Frame 5 Renewal Kits

Cat. No.	Description	Notes
SK-RM-CR1	Control Pod HIM Cradle with DPI™ Connector (XT)	—
SK-RM-MCB2-PF755	Main Control Circuit Board (XT)	—
SK-RM-MFAN1-F5	Stirring Fan Assembly	—
SK-RM-HSFAN1-F5	Heatsink Fan Assembly	—
SK-RM-PSB1-F5-F6	Fan Power Supply Circuit Board	—
SK-RM-JMPR1-F5	Potential Earth (PE) Jumper	—
SK-RM-PFB-F5-F6	Power Feedback Circuit Board and Bracket (XT)	—
SK-RM-LCLCP4-F5	LCL Filter Capacitor for 400V/480V, 30 kW/40 Hp and higher drives	—
SK-RM-LCLCP6-F5	LCL Filter Capacitor for 400V/480V, 22 kW/30 Hp and lower and all 600V/690V drives	—

Remove and Install the Frame 5 Cover

Remove the cover from the chassis to access components within the drive or bus supply. Follow these steps to remove and install the cover from the chassis.

1. Review the product advisories in [Before You Begin on page 9](#).
2. Remove power from the system.
3. Loosen the four M4 x 8 mm captive screws that secure the cover to the assembly, and remove the cover.



4. Install the cover in the reverse order of removal.

Remove and Install the Control Pod HIM Cradle with DPI Connector (XT) for Frame 5

Replace the control pod human interface module (HIM) cradle with DPI™ connector (XT) with kit catalog number SK-RM-CR1.

Follow these steps to remove and install the control pod HIM cradle with DPI™ connector.

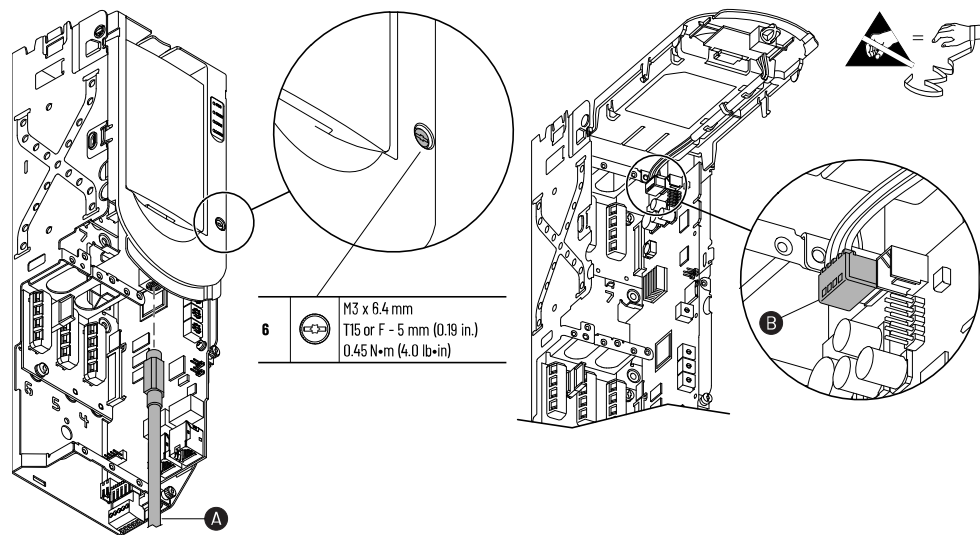
1. Review the product advisories in [Before You Begin on page 9](#).
2. Remove power from the system.
3. Remove the cover from the chassis.
4. If a HIM is installed in the control pod cradle, remove the HIM.
5. If used, disconnect the DPI™ cable (A) from the connector on the bottom of the HIM cradle.



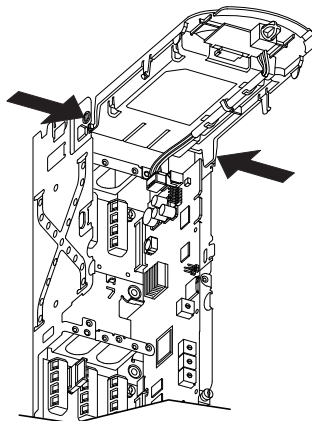
If a cable is not connected to the DPI™ port on the human interface module (HIM) cradle, be sure to leave the protective cover installed.

6. Loosen the screw that secures the HIM cradle to the pod chassis, and rotate the cradle up to a 90° horizontal position.

7. Disconnect the terminal block (B) for the HIM wire harness from the connector on the main control board.

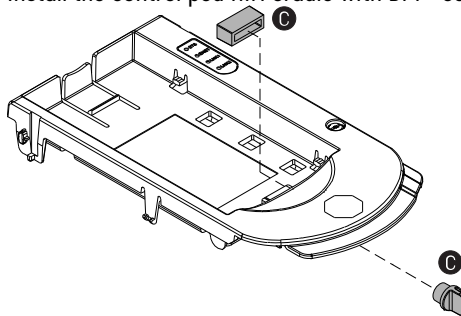


8. Press in on the tabs at the top of the HIM cradle where it connects to the control pod chassis to release the cradle from the chassis.



IMPORTANT: Do not remove protective covers (C) from wire harnesses, circuit board connectors, terminal blocks, and fiber-optic transceivers and ports unless used at the time of installation. For the product to meet the corrosive atmosphere rating, protective covers must remain installed in unused connectors during storage and operation.

9. Install the control pod HIM cradle with DPI™ connector in the reverse order of removal.

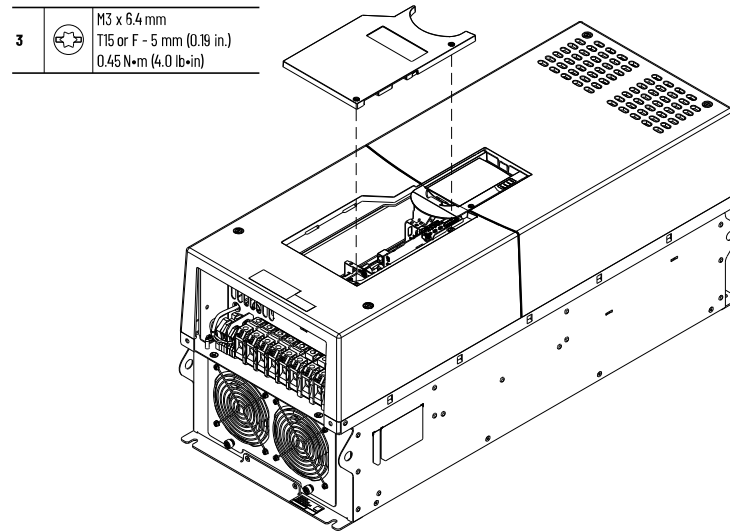


Remove and Install the Main Control Circuit Board (XT) for Frame 5

Replace a main control circuit board with kit catalog number SK-RM-MCB2-PF755. Follow these steps to remove and install the main control circuit board.

1. Review the product advisories in [Before You Begin on page 9](#).
2. Remove power from the system.
3. Loosen the two captive thumb screws on the control pod access cover and remove the cover.

Figure 13. Frame 5 Control Pod Access Cover Removal



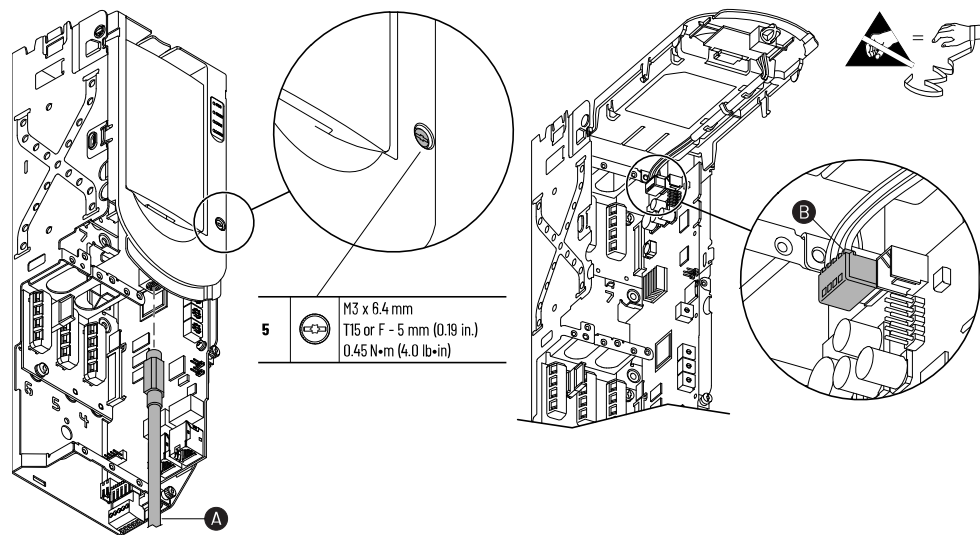
4. If used, disconnect the DPI™ cable (A) from the connector (Port 2) on the bottom of the human interface module (HIM) cradle.



If a cable is not connected to the DPI™ port on the HIM cradle, be sure to leave the protective cover installed.

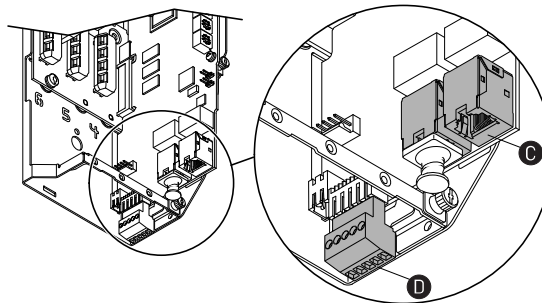
5. Loosen the screw that secures the HIM cradle to the pod chassis, and rotate the cradle up to a 90° horizontal position.
6. If necessary, to provide access to the main control circuit board, disconnect and remove any option modules.

7. Disconnect the terminal block (B) for the HIM wire harness from the connector on the main control board.



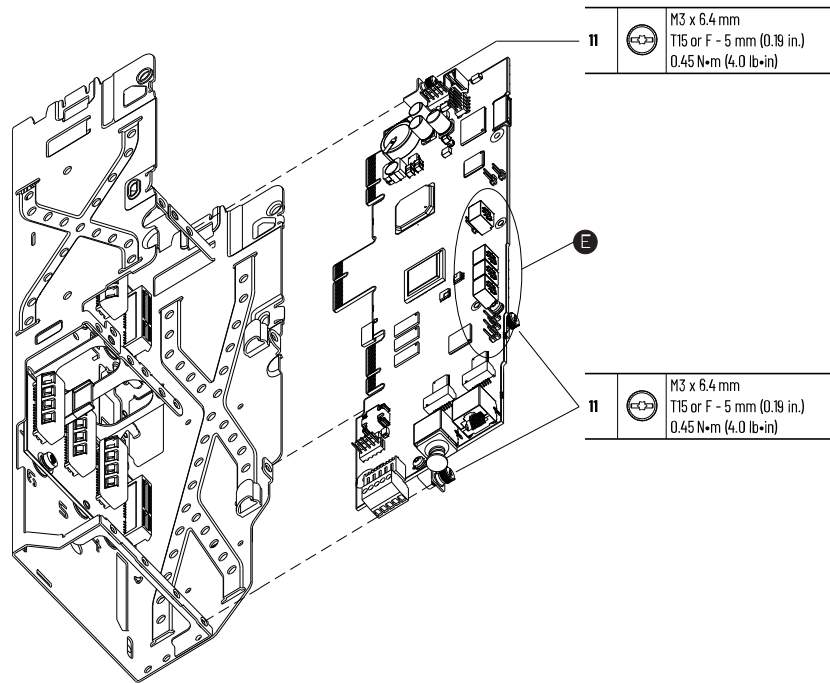
The inner control pod chassis is shown removed from the drive chassis for clarity only.

8. Disconnect any Ethernet cables from the Ethernet ports (C) on the bottom of the main control board.
9. Disconnect the plug-in terminal block (D) from the TB1 connector on the bottom of the main control board.



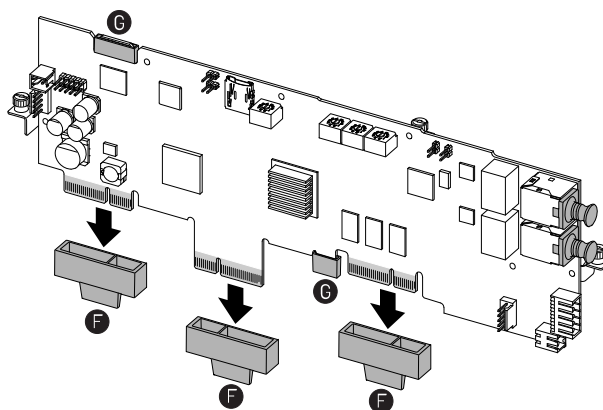
10. Record any settings that are made on these main control board selectors or jumpers (E):
 - Control selector
 - Embedded EtherNet/IP™ address selectors
 - Safety enable jumper
 - Hardware enable jumper

11. Loosen the three captive thumbscrews that secure the main control board to the pod chassis and remove the board.



IMPORTANT: Circuit boards that are contained in renewal kits with XT contain dielectric grease on the edge connectors, where present. Do not touch or remove the grease from circuit board edge connectors. A non-greased connector can lead to corrosion. If before you install the new board, grease is removed from an edge connector or is contaminated, do not install the circuit board. You must clean and reapply grease to the affected edge connector or connectors.

12. On the new main control circuit board, for each protective cover, hold the tab (F) on the cover and carefully remove the cover from the edge connector on the circuit board. Do not touch the edge connector.



IMPORTANT: Do not remove protective covers (G); for factory use only.

13. Install the main control circuit board in the reverse order of removal.
14. Make any necessary changes to the settings on these main control board selectors or jumpers:
 - Control selector
 - Embedded EtherNet/IP™ address selectors
 - Safety enable jumper
 - Hardware enable jumper
15. Install any option modules in the reverse order of removal.
16. Install the control pod access cover in the reverse order of removal. Tightening torque for the cover screws is 0.4 N•m (3.5 lb•in).

Remove and Install the Main Control Circuit Board (Standard) for Frame 5

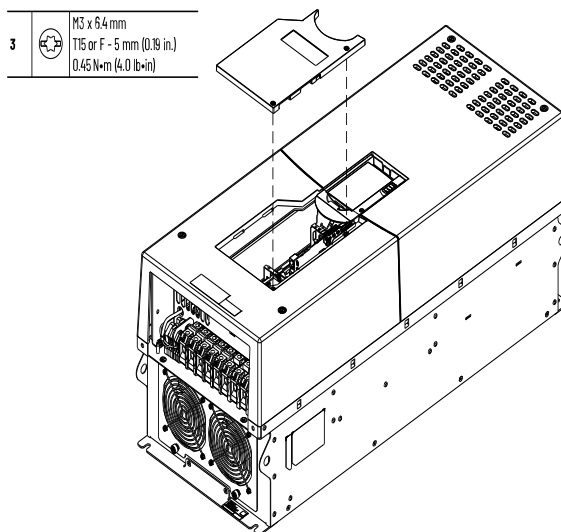
Replace a main control circuit board with kit catalog number SK-RM-MCB1-PF755.

NOTE: This kit has been discontinued and is no longer available for sale.

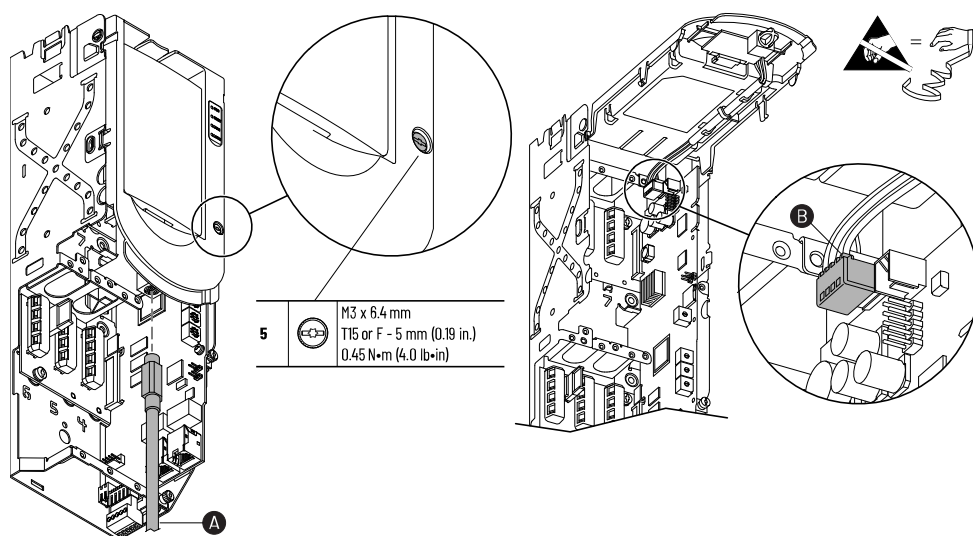
Follow these steps to remove and install the main control circuit board.

1. Review the product advisories in [Before You Begin on page 9](#).
2. Remove power from the system.
3. Loosen the two captive thumb screws on the control pod access cover and remove the cover.

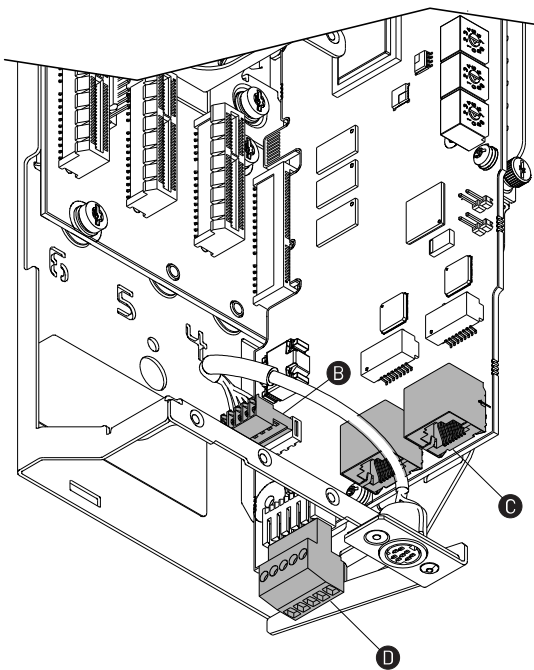
Figure 14. Frame 5 Control Pod Access Cover Removal



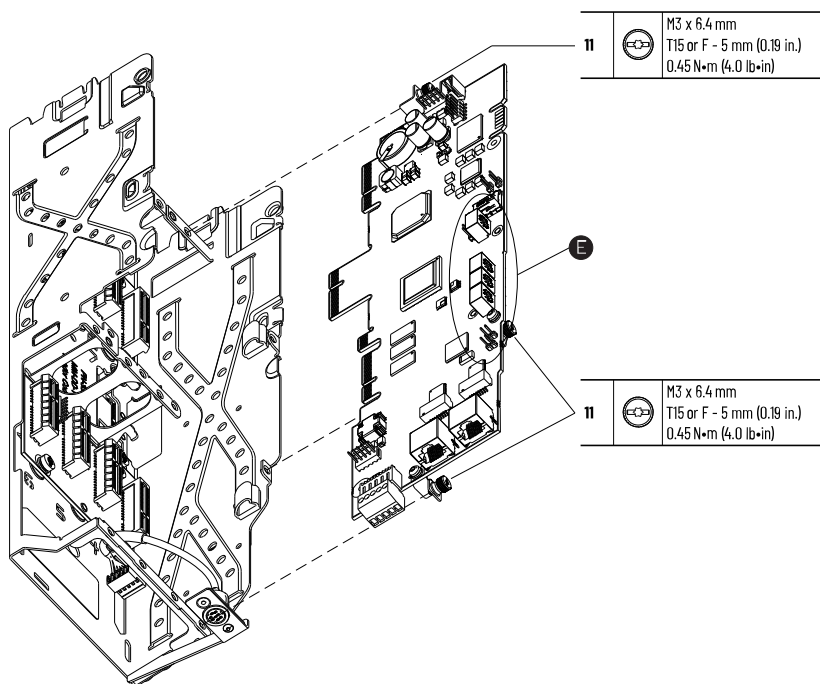
4. Loosen the screw that secures the HIM cradle to the pod chassis, and rotate the cradle up to a 90° horizontal position.
5. If necessary, disconnect and remove any option modules, to provide access to the main control circuit board. Re-installation of option modules is the same as the main control circuit board.
6. Disconnect the terminal block (A) for the HIM wire harness from the connector on the main control board.



7. Disconnect the HIM plug-in terminal block (B) for the mini-DIN connector on the control board.
8. Disconnect any Ethernet cables from the Ethernet ports (C) on the bottom of the main control board.
9. Disconnect the plug-in terminal block (D) from the TB1 connector on the bottom of the main control board.



10. Record any settings that are made on these main control board selectors or jumpers (E):
 - Control selector
 - Embedded EtherNet/IP™ address selectors
 - Safety enable jumper
 - Hardware enable jumper
11. Loosen the three captive thumbscrews that secure the main control board to the pod chassis and remove the board.

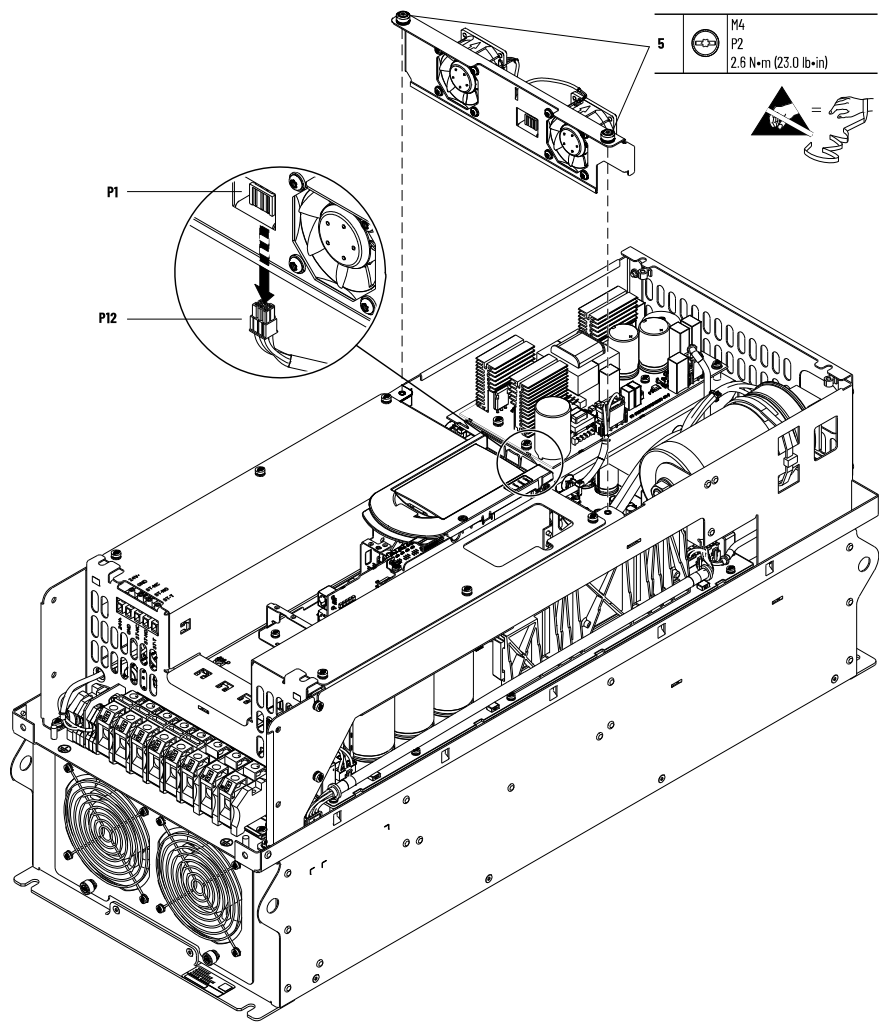


12. Install the main control circuit board in the reverse order of removal.
13. Make any necessary changes to the settings on these main control board selectors or jumpers:
 - Control selector
 - Embedded EtherNet/IP™ address selectors
 - Safety enable jumper
 - Hardware enable jumper

Remove and Install the Stirring Fan Assembly for Frame 5

Replace a stirring fan assembly with kit catalog number SK-RM-MFAN1-F5. Follow these steps to remove and install the stirring fan assembly.

1. Review the product advisories in [Before You Begin on page 9](#).
2. Remove power from the system.
3. Remove the cover from the chassis. See [Remove and Install the Frame 5 Cover on page 35](#).
4. Disconnect the wire harness connector P12 from connector P1 on the fan assembly bracket.
5. Loosen the two captive screws that secure the fan assembly to the chassis and remove the fan assembly.

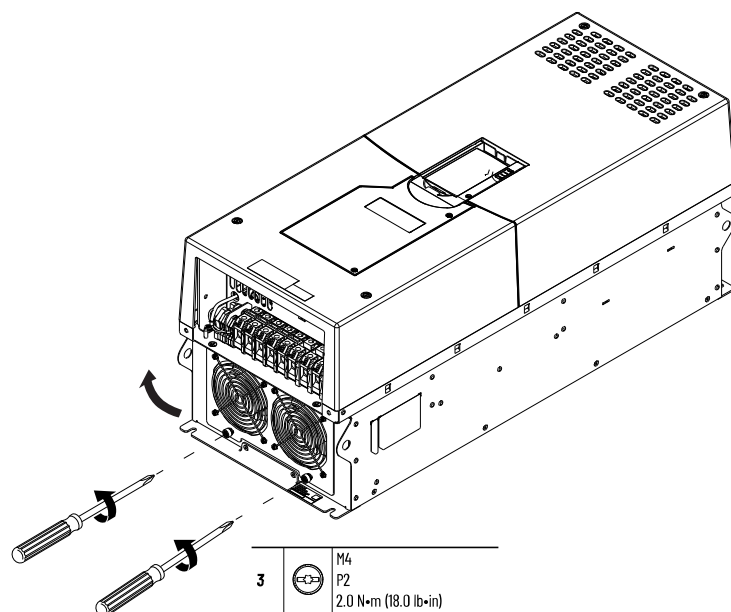


6. Install the stirring fan assembly in the reverse order of removal.

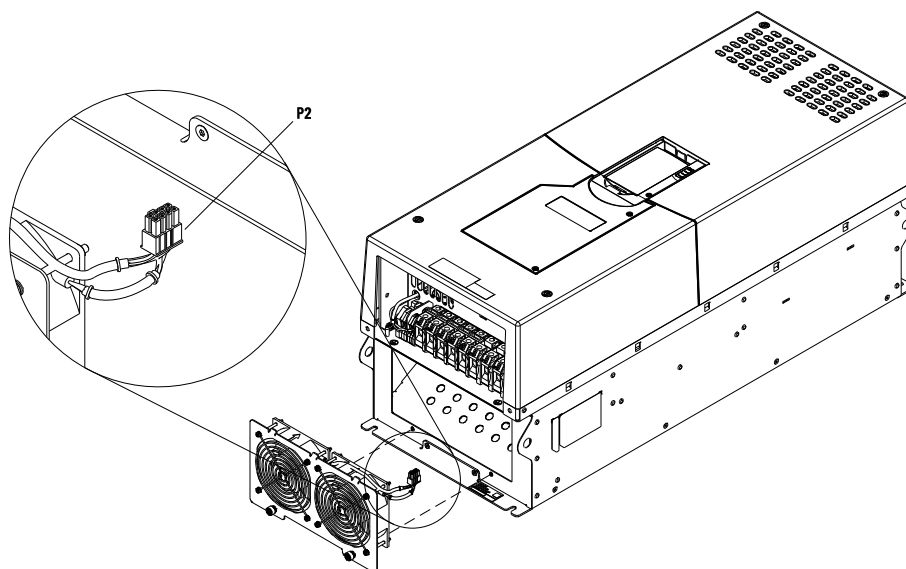
Remove and Install the Heatsink Fan Assembly for Frame 5

Replace a heatsink fan assembly with kit catalog number SK-RM-HSFAN1-F5. Follow these steps to remove and install the heatsink fan assembly.

1. Review the product advisories in [Before You Begin on page 9](#).
2. Remove power from the system.
3. Loosen the two captive screws that secure the fan assembly to the chassis.
4. Carefully pull the bottom of the fan assembly away from the chassis and release the three tabs from the chassis. The power wire harness is connected inside the chassis.



5. Disconnect the fan wire harness connector P2 from connector J2 inside the chassis and remove the fan assembly.



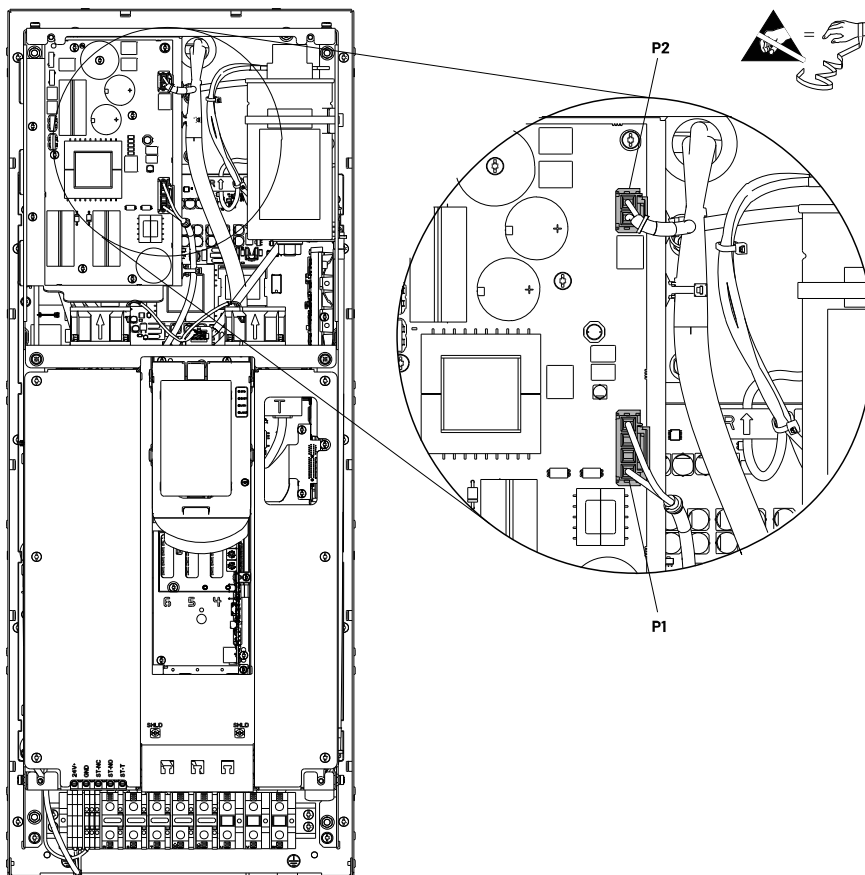
6. Install the heatsink fan assembly in the reverse order of removal.

Remove and Install the Fan Power Supply Circuit Board for Frame 5

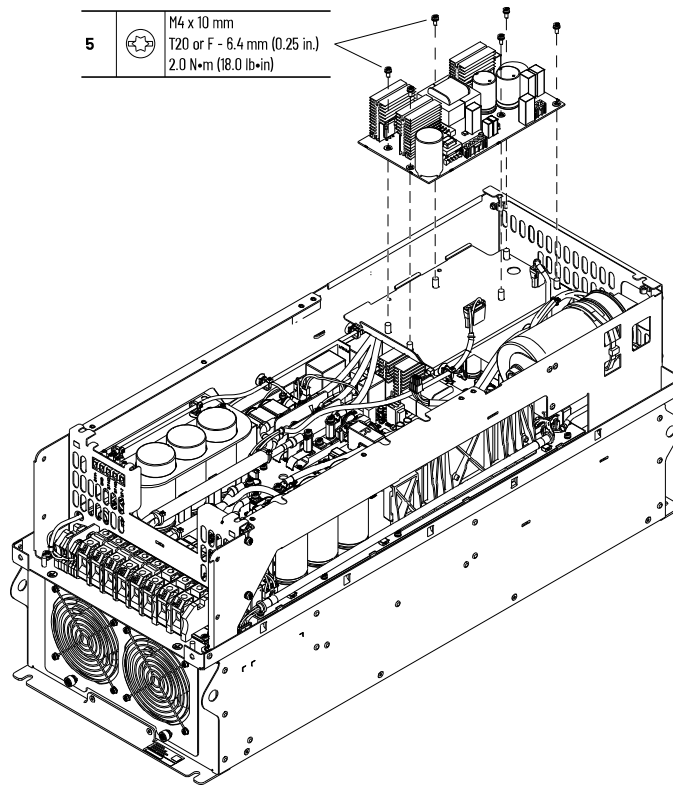
Replace a fan power supply circuit board with kit catalog number SK-RM-PSB1-F5-F6. Follow these steps to remove and install the fan power supply circuit board.

1. Review the product advisories in [Before You Begin on page 9](#).
2. Remove power from the system.
3. Remove the cover from the chassis. See [Remove and Install the Frame 5 Cover on page 35](#).

4. Disconnect these cable connectors from the fan power supply circuit board:
 - P1 from J1
 - P2 from J2



5. Remove the six M4 x 10 mm Torx screws that secure the fan power supply circuit board to the bracket and remove the board.

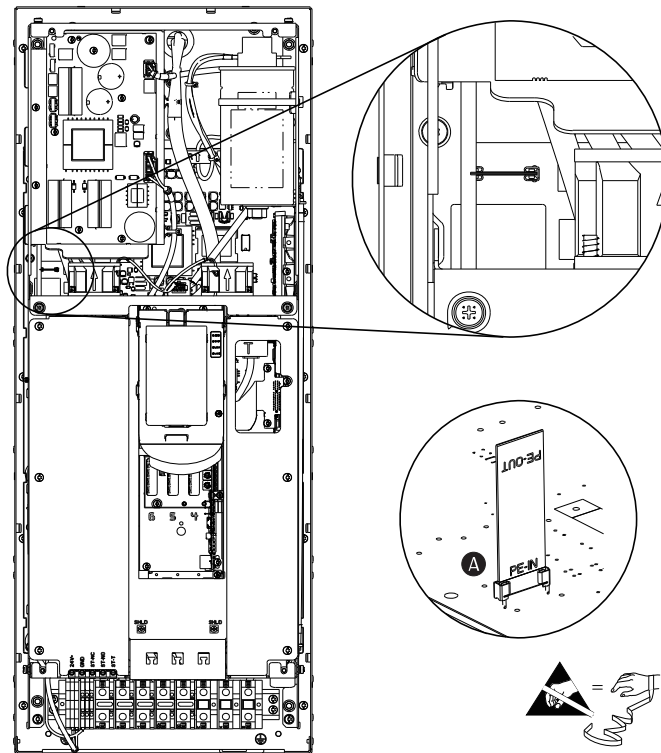


6. Install the fan power supply circuit board in the reverse order of removal.

Remove and Install the PE Jumper for Frame 5

Replace a PE jumper with kit catalog number SK-RM-JMPRI-F5. Follow these steps to remove and install the PE jumper.

1. Review the product advisories in [Before You Begin on page 9](#).
2. Remove power from the system.
3. Remove the cover from the chassis. See [Remove and Install the Frame 5 Cover on page 35](#).
4. If present, record the jumper position (A) on the power circuit board; PE-IN or PE-OUT.
5. If present, remove the PE jumper from the power circuit board.



6. Install the PE jumper in the reverse order of removal. Verify that the PE jumper (A) is installed in the same position as it was before it was removed. See the PowerFlex 750-Series Products with TotalFORCE Control Installation Instructions, publication [750-IN100](#), for power jumper configuration.

Remove and Install the Power Feedback Circuit Board and Bracket for Frame 5

Replace a power feedback circuit board and bracket with kit catalog number SK-RM-PFB-F5-F6. Follow these steps to remove and install the power feedback circuit board and bracket.

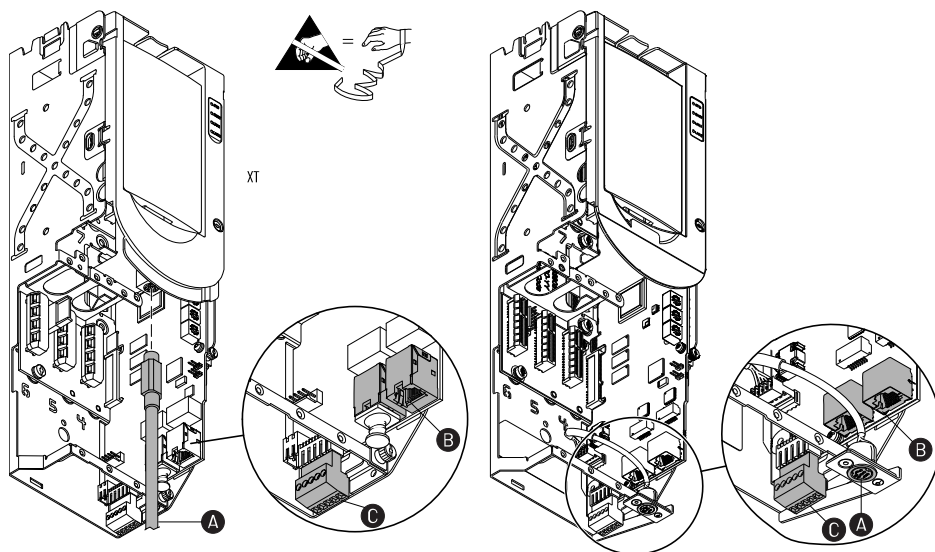
1. Review the product advisories in [Before You Begin on page 9](#).
2. Remove power from the system.
3. Remove the cover from the chassis. See [Remove and Install the Frame 5 Cover on page 35](#).
4. Remove the stirring fan from the drive. See [Remove and Install the Stirring Fan Assembly for Frame 5 on page 43](#).
5. If used, disconnect the DPI™ cable (A) from the connector (port 2) on the human interface module (HIM) cradle (XT), or disconnect the mini-DIN (port 2) connector on the main control board (standard).



If a cable is not connected to the DPI™ port on the HIM cradle (XT), be sure to leave the protective cover installed.

6. Disconnect any Ethernet cables from the Ethernet ports (B) on the bottom of the main control board in the control pod.
7. If used, disconnect the plug-in terminal block (C) from the connector on the bottom of the main control board.

8. If used, disconnect any I/O wiring terminal blocks from an installed option module.

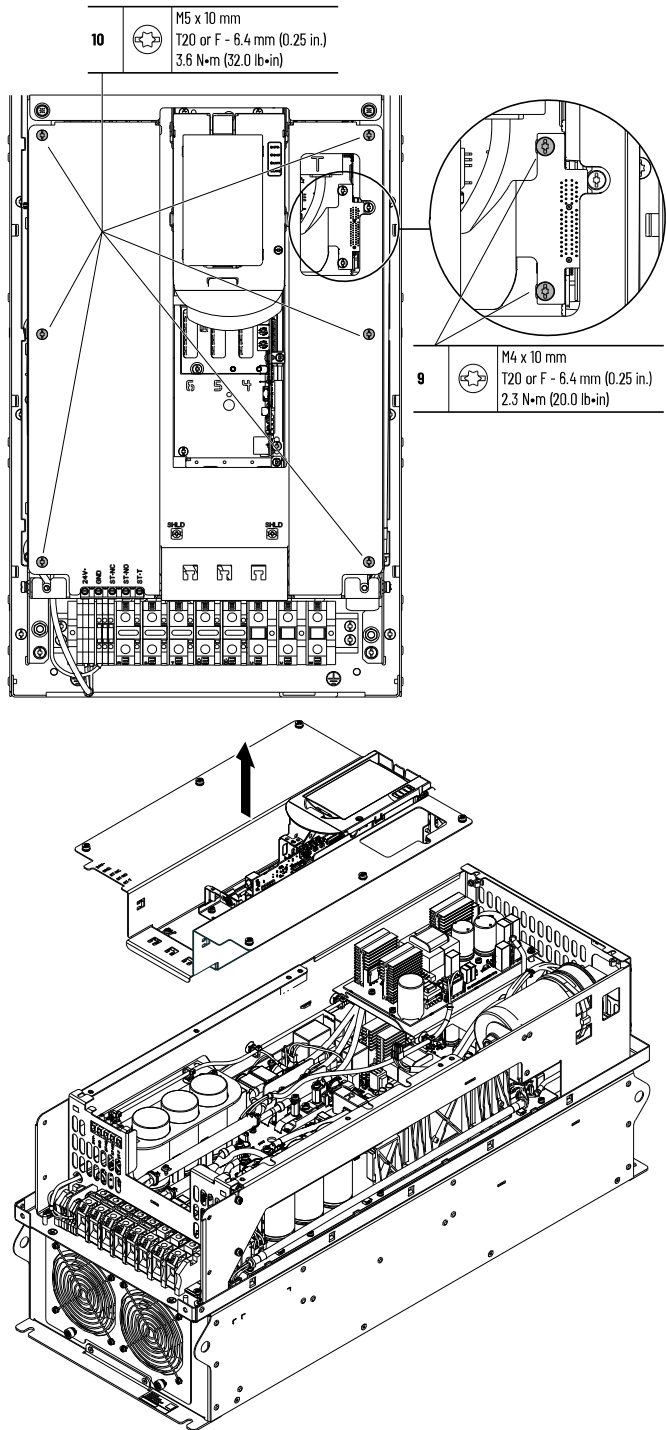


The inner control pod chassis is shown removed from the drive chassis for clarity only.

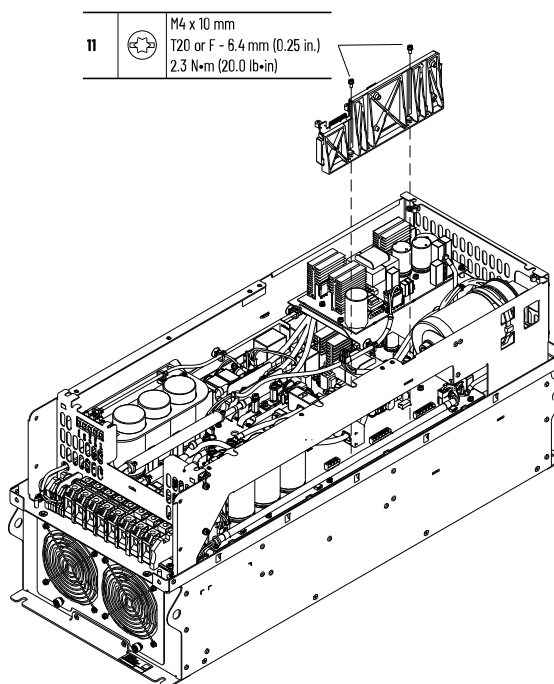
9. Remove the two M4 x 10 mm slotted-Torx screws that secure the human machine interface (HMI) flex circuit connector to the power interface circuit board.

IMPORTANT: The HMI flex circuit connector connects the main control circuit board to an edge connector on the power feedback circuit board below it. Take care when lifting the control pod and support bracket off the drive chassis so that circuit board damage does not occur.

10. Remove the six M5 x 10 mm Torx screws that secure the control pod support bracket and control pod to the chassis and carefully lift and remove the control pod and bracket from the chassis.

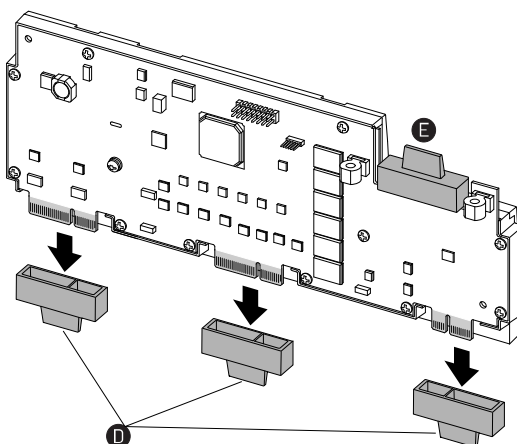


11. Remove the two M4 x 10 mm Torx screws that secure the power feedback circuit board and support bracket to the chassis and carefully lift the bracket and board edge connectors off the connectors on the power circuit board.



IMPORTANT: Circuit boards that are contained in renewal kits with XT contain dielectric grease on the edge connectors, where present. Do not touch or remove the grease from circuit board edge connectors. A non-greased connector can lead to corrosion. If before you install the new board, grease is removed from an edge connector or is contaminated, do not install the circuit board. You must clean and reapply grease to the affected edge connector or connectors.

12. On the new power feedback circuit board, for each protective cover, hold the tab (D) on the cover and carefully remove the cover from the edge connector on the circuit board. Do not touch the edge connector.



13. Complete the remaining steps to install the power feedback board and bracket in the reverse order of removal.
 - Before reinstallation of the control pod and support bracket, remove the protective cover (E) from the upper edge connector on the power feedback circuit board.
 - Verify that the HMI flex-circuit connector on the lower, right side of the control pod seats properly on the edge connector on the top of the power feedback board when you re-install the control pod.

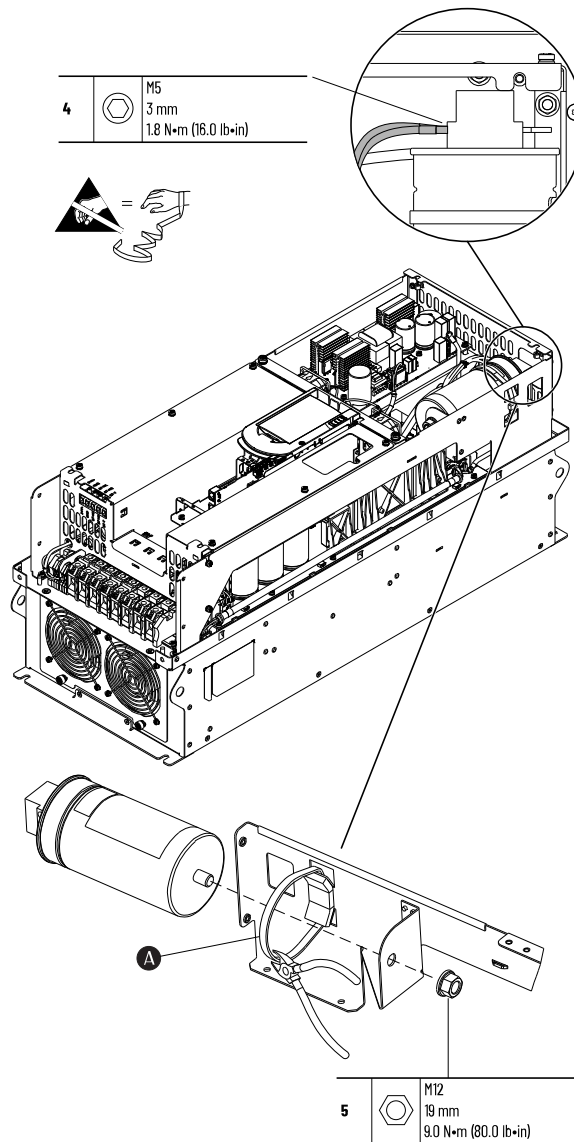
Remove and Install the LCL Filter Capacitor for Frame 5

Replace an LCL filter capacitor with one of the following kit catalog numbers:

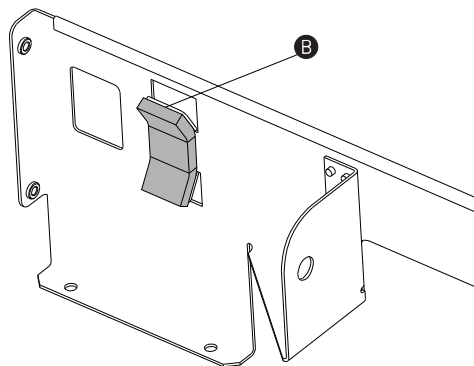
- SK-RM-LCLCP4-F5 (400V/480V, 30 kW/40 Hp and higher)
- SK-RM-LCLCP6-F5 (400V/480V, 22 kW/30 Hp and lower, and all 600V/690V)

Follow these steps to remove and install the LCL filter capacitor.

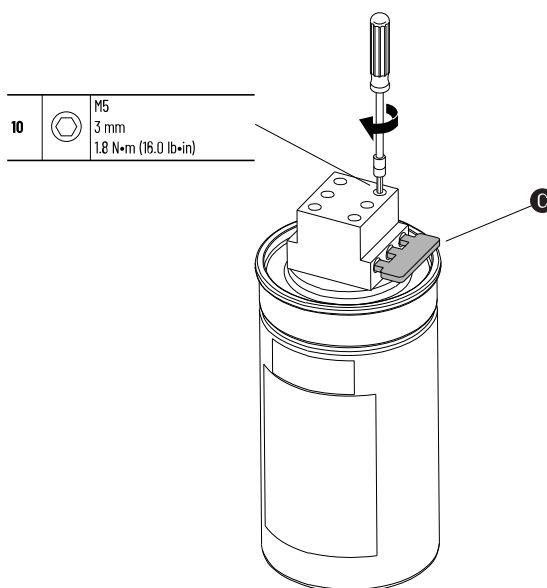
1. Review the product advisories in [Before You Begin on page 9](#).
2. Remove power from the system.
3. Remove the cover from the chassis. See [Remove and Install the Frame 5 Cover on page 35](#).
4. Loosen the M5 hexagonal screws that secure the capacitor wires to terminals R, S and T on the capacitor terminal block at the top of the cap, and remove the wires.
5. Remove the M12 hex nut that secures the capacitor to the mounting bracket.
6. Cut the cable tie (A) that secures the capacitor to the bracket, and remove the capacitor.



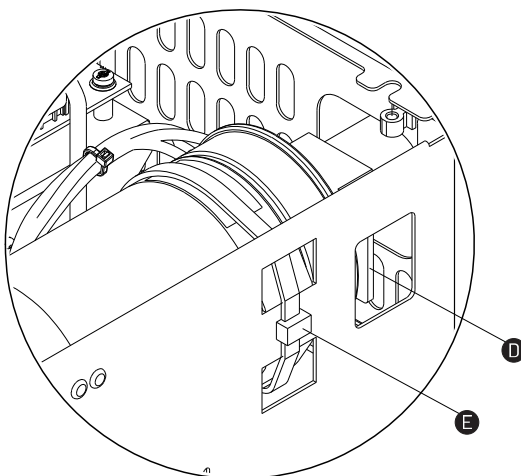
7. Inspect the foam pad (B) on the side wall of the chassis for damage.



8. If the pad is damaged, remove the existing pad material and clean the surface of the chassis with a 50% isopropyl alcohol and 50% water solution.
9. Install the new foam pad that is provided with the kit.
10. Insert the three legs of the resistor (C) that is supplied with the kit into the terminal block at the top of the capacitor and secure the resistor.



11. Install the filter capacitor in the reverse order of removal with the resistor (D) and new cable tie (E) positioned as shown here.



Frame 6 Kits

This table lists the renewal kits available for PowerFlex® 755T frame 6 products. (XT) appears in the description column in the table to identify a kit that contains protective covers and/or dielectric grease on connectors.

Table 14. Frame 6 Renewal Kits

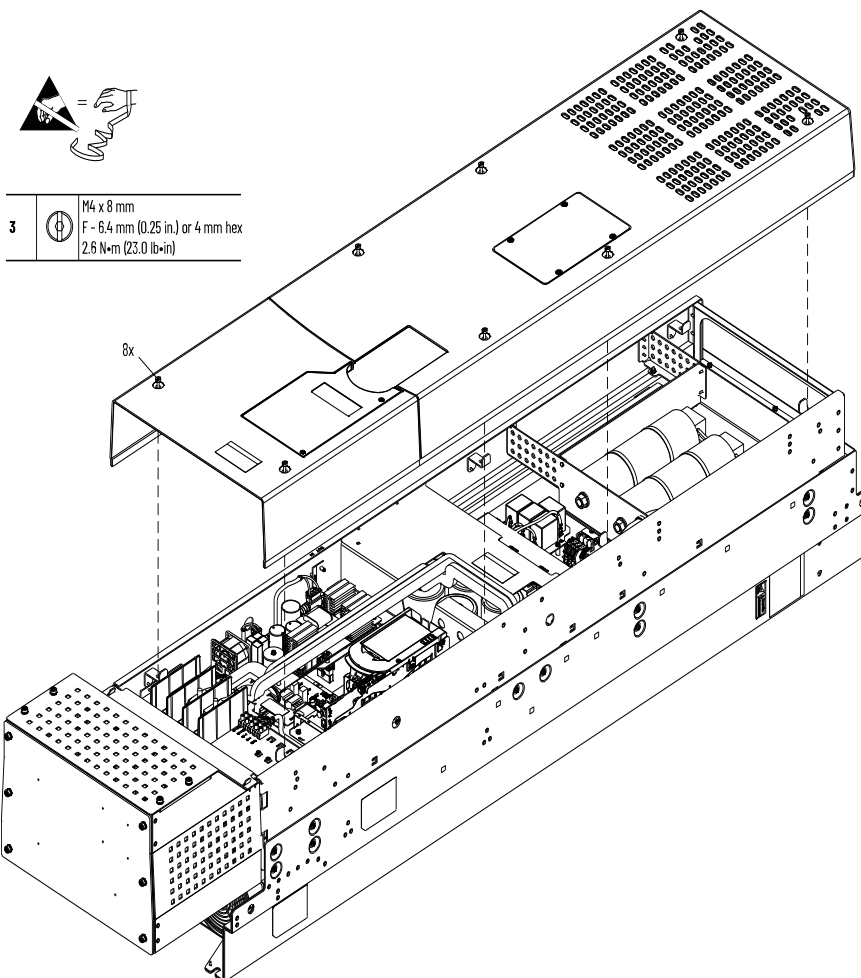
Cat. No.	Description	Notes
SK-RM-CR1	Control Pod HIM Cradle with DPI™ Connector (XT)	—
SK-RM-MCB2-PF755	Main Control Circuit Board (XT)	—
SK-RM-MFAN1-F6	Stirring Fan Assembly	—
SK-RM-HSFAN1-F6	Heatsink Fan Assembly	—
SK-RM-PSB1-F5-F6	Fan Power Supply Circuit Board	—
SK-RM-JMPR1-F6	DR and PE-A (EMC and MOV) Jumper	—
SK-RM-LCLCP4-F6	LCL Filter Capacitor for 400V/480V drives and bus supplies	This kit contains one capacitor. 400V/480V, 90 kW/125 Hp drives and bus supplies require one kit (capacitor). 400V/480V, 110 kW/150 Hp and higher drives and bus supplies require two kits (capacitors).
SK-RM-LCLCP6-F6	LCL Filter Capacitor for 600V/690V drives and bus supplies	This kit contains one capacitor. 400V/480V, 90 kW/125 Hp drives and bus supplies require one kit (capacitor). 400V/480V, 110 kW/150 Hp and higher drives and bus supplies require two kits (capacitors).

Remove and Install the Frame 6 Cover

Remove the cover from the chassis to access components within the drive or bus supply. Follow these steps to remove and install the cover from the chassis.

1. Review the product advisories in [Before You Begin on page 9](#).
2. Remove power from the system.

- Loosen the eight M4 x 8 mm captive screws that secure the cover to the assembly, and remove the cover.



Shown with optional conduit box installed.

- Install the cover in the reverse order of removal.

Remove and Install the Control Pod HIM Cradle with DPI Connector (XT) for Frame 6

Replace the control pod human interface module (HIM) cradle with DPI™ connector (XT) with kit catalog number SK-RM-CR1.

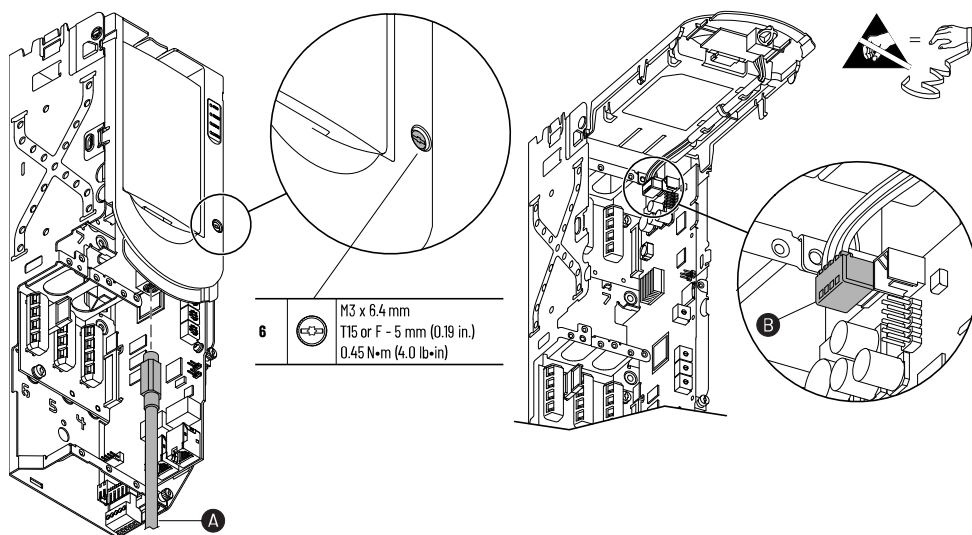
Follow these steps to remove and install the control pod HIM cradle with DPI™ connector.

- Review the product advisories in [Before You Begin on page 9](#).
- Remove power from the system.
- Remove the cover from the chassis.
- If a HIM is installed in the control pod cradle, remove the HIM.
- If used, disconnect the DPI™ cable (A) from the connector on the bottom of the HIM cradle.

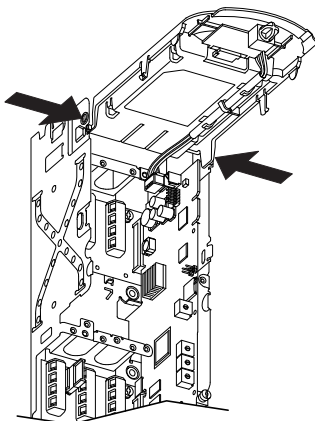


If a cable is not connected to the DPI™ port on the human interface module (HIM) cradle, be sure to leave the protective cover installed.

6. Loosen the screw that secures the HIM cradle to the pod chassis, and rotate the cradle up to a 90° horizontal position.
7. Disconnect the terminal block (B) for the HIM wire harness from the connector on the main control board.

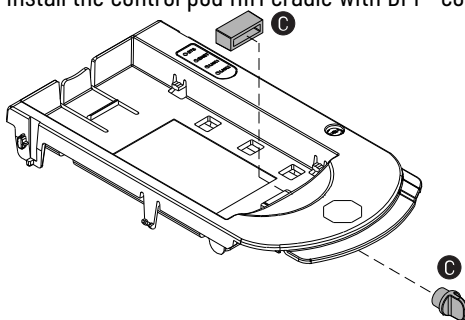


8. Press in on the tabs at the top of the HIM cradle where it connects to the control pod chassis to release the cradle from the chassis.



IMPORTANT: Do not remove protective covers (C) from wire harnesses, circuit board connectors, terminal blocks, and fiber-optic transceivers and ports unless used at the time of installation. For the product to meet the corrosive atmosphere rating, protective covers must remain installed in unused connectors during storage and operation.

9. Install the control pod HIM cradle with DPI™ connector in the reverse order of removal.

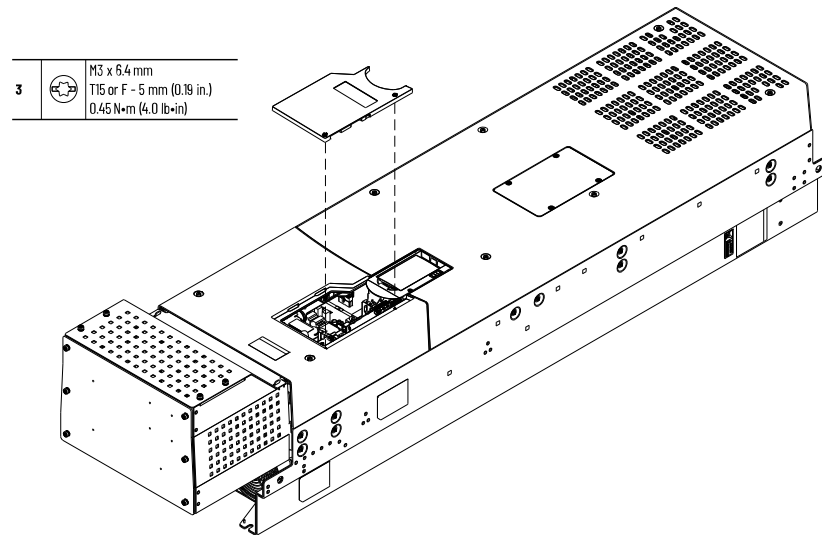


Remove and Install the Main Control Circuit Board (XT) for Frame 6

Replace a main control circuit board with kit catalog number SK-RM-MCB2-PF755. Follow these steps to remove and install the main control circuit board.

1. Review the product advisories in [Before You Begin on page 9](#).
2. Remove power from the system.
3. Loosen the two captive thumb screws on the control pod access cover and remove the cover.

Figure 15. Frame 6 Control Pod Access Cover Removal



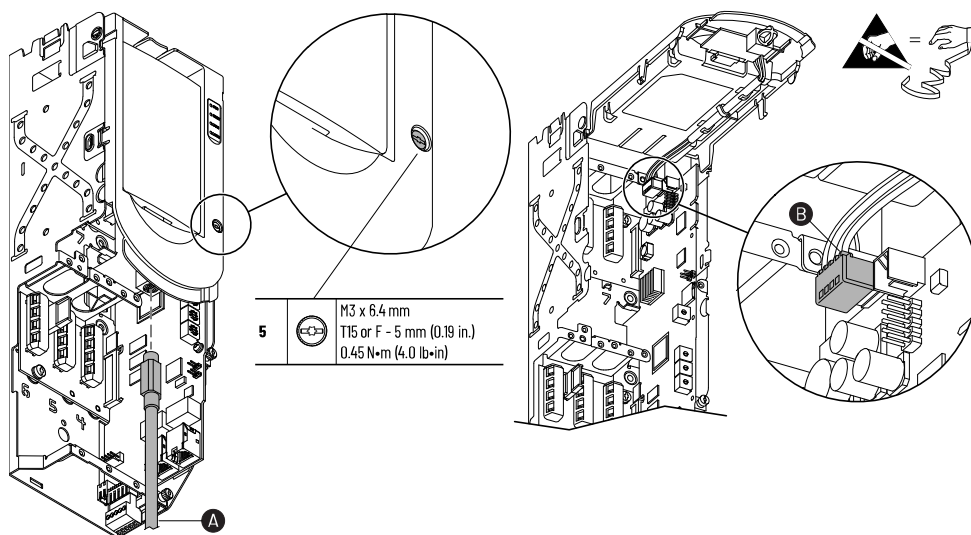
4. If used, disconnect the DPI™ cable (A) from the connector (Port 2) on the bottom of the human interface module (HIM) cradle.



If a cable is not connected to the DPI™ port on the HIM cradle, be sure to leave the protective cover installed.

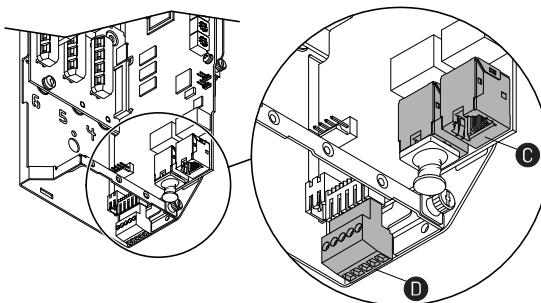
5. Loosen the screw that secures the HIM cradle to the pod chassis, and rotate the cradle up to a 90° horizontal position.
6. If necessary, to provide access to the main control circuit board, disconnect and remove any option modules.

7. Disconnect the terminal block (B) for the HIM wire harness from the connector on the main control board.



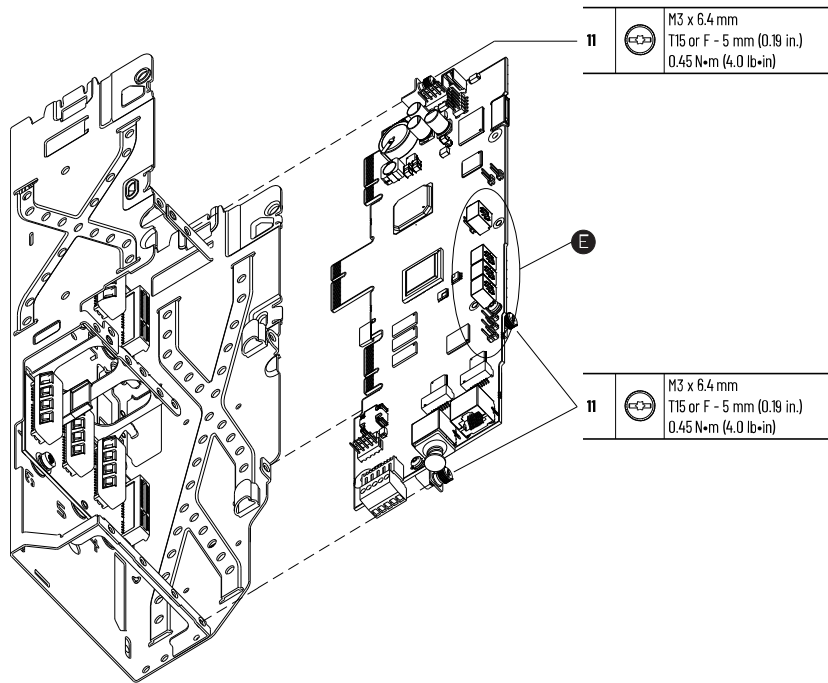
The inner control pod chassis is shown removed from the drive chassis for clarity only.

8. Disconnect any Ethernet cables from the Ethernet ports (C) on the bottom of the main control board.
9. Disconnect the plug-in terminal block (D) from the TB1 connector on the bottom of the main control board.



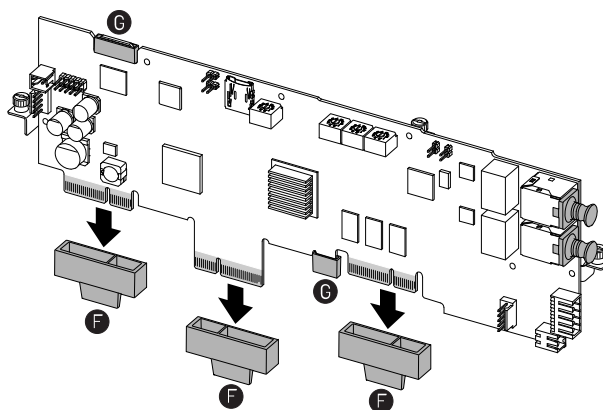
10. Record any settings that are made on these main control board selectors or jumpers (E):
 - Control selector
 - Embedded EtherNet/IP™ address selectors
 - Safety enable jumper
 - Hardware enable jumper

11. Loosen the three captive thumbscrews that secure the main control board to the pod chassis and remove the board.



IMPORTANT: Circuit boards that are contained in renewal kits with XT contain dielectric grease on the edge connectors, where present. Do not touch or remove the grease from circuit board edge connectors. A non-greased connector can lead to corrosion. If before you install the new board, grease is removed from an edge connector or is contaminated, do not install the circuit board. You must clean and reapply grease to the affected edge connector or connectors.

12. On the new main control circuit board, for each protective cover, hold the tab (F) on the cover and carefully remove the cover from the edge connector on the circuit board. Do not touch the edge connector.



IMPORTANT: Do not remove protective covers (G); for factory use only.

13. Install the main control circuit board in the reverse order of removal.
14. Make any necessary changes to the settings on these main control board selectors or jumpers:
 - Control selector
 - Embedded EtherNet/IP™ address selectors
 - Safety enable jumper
 - Hardware enable jumper
15. Install any option modules in the reverse order of removal.
16. Install the control pod access cover in the reverse order of removal. Tightening torque for the cover screws is 0.4 N•m (3.5 lb•in).

Remove and Install the Main Control Circuit Board (Standard) for Frame 6

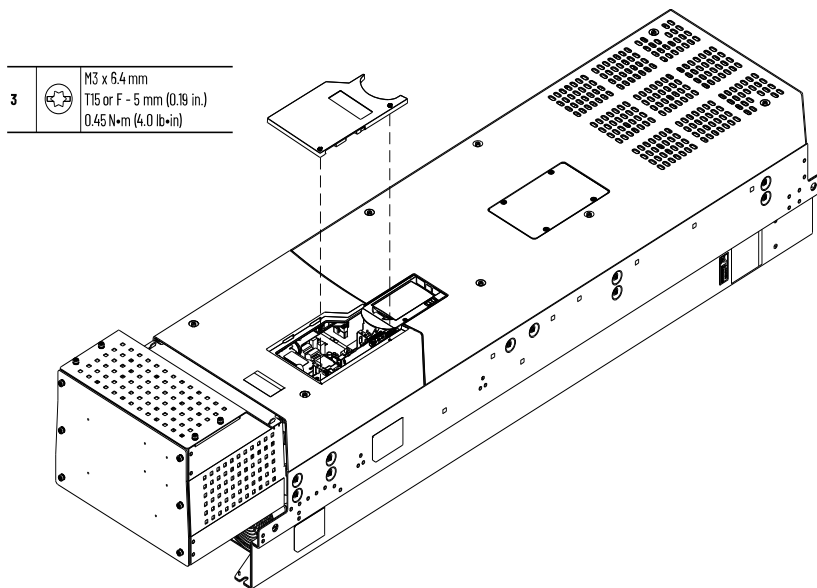
Replace a main control circuit board with kit catalog number SK-RM-MCB1-PF755.

NOTE: This kit has been discontinued and is no longer available for sale.

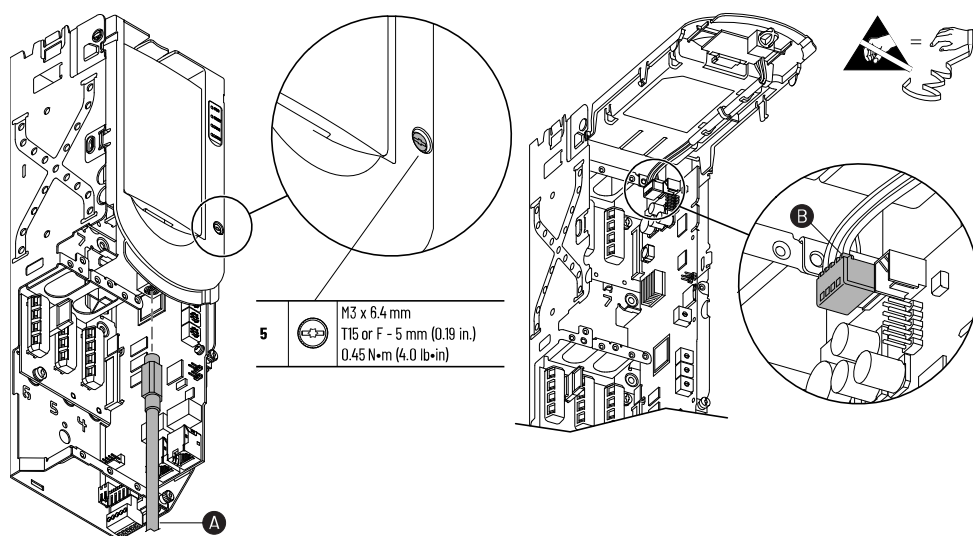
Follow these steps to remove and install the main control circuit board.

1. Review the product advisories in [Before You Begin on page 9](#).
2. Remove power from the system.
3. Loosen the two captive thumb screws on the control pod access cover and remove the cover.

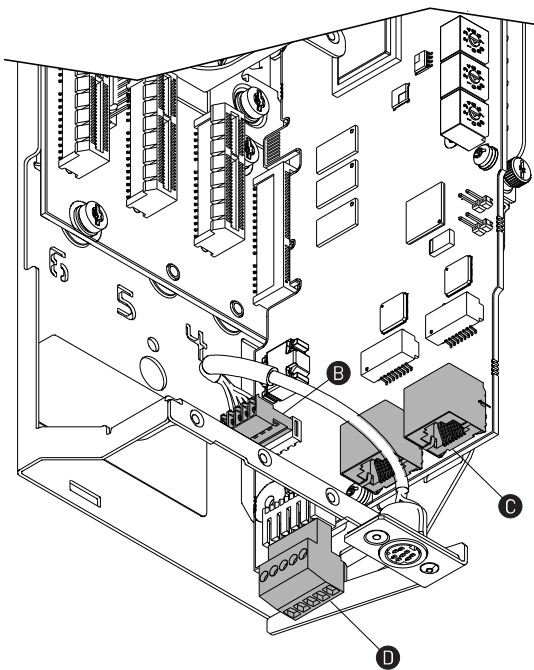
Figure 16. Frame 6 Control Pod Access Cover Removal



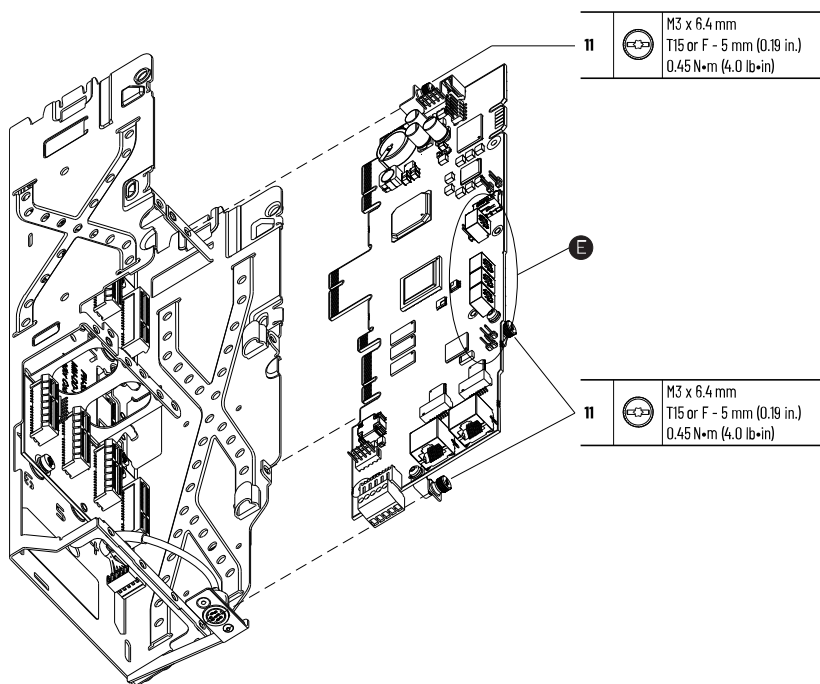
4. Loosen the screw that secures the HIM cradle to the pod chassis, and rotate the cradle up to a 90° horizontal position.
5. If necessary, disconnect and remove any option modules, to provide access to the main control circuit board. Re-installation of option modules is the same as the main control circuit board.
6. Disconnect the terminal block (A) for the HIM wire harness from the connector on the main control board.



7. Disconnect the HIM plug-in terminal block (B) for the mini-DIN connector on the control board.
8. Disconnect any Ethernet cables from the Ethernet ports (C) on the bottom of the main control board.
9. Disconnect the plug-in terminal block (D) from the TB1 connector on the bottom of the main control board.



10. Record any settings that are made on these main control board selectors or jumpers (E):
 - Control selector
 - Embedded EtherNet/IP™ address selectors
 - Safety enable jumper
 - Hardware enable jumper
11. Loosen the three captive thumbscrews that secure the main control board to the pod chassis and remove the board.

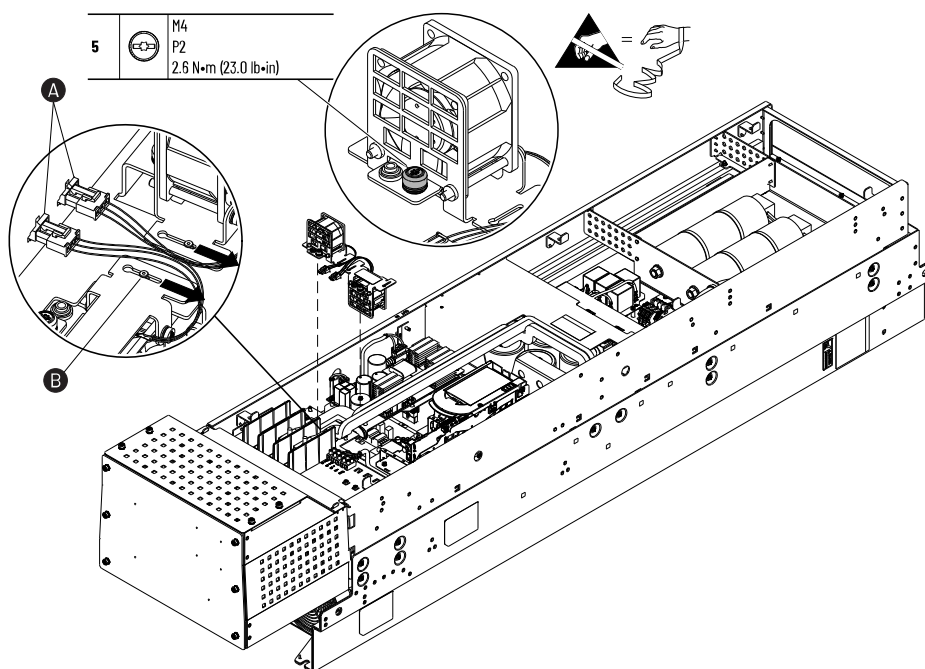


12. Install the main control circuit board in the reverse order of removal.
13. Make any necessary changes to the settings on these main control board selectors or jumpers:
 - Control selector
 - Embedded EtherNet/IP™ address selectors
 - Safety enable jumper
 - Hardware enable jumper

Remove and Install the Stirring Fan Assembly for Frame 6

Replace a stirring fan assembly with kit catalog number SK-RM-MFAN1-F6. Follow these steps to remove and install the stirring fan assembly.

1. Review the product advisories in [Before You Begin on page 9](#).
2. Remove power from the system.
3. Remove the cover from the chassis. See [Remove and Install the Frame 6 Cover on page 55](#).
4. Disconnect the fan power wire harness connectors (A) from the connectors on the chassis.
5. Loosen the M4 captive screw that secures each of the fan assemblies to the chassis.
6. Slide the fan assembly away from the chassis until the mounting tabs (B) align with the holes in the fan mounting plate, and remove the fan assembly.



7. Install the stirring fan assembly in the reverse order of removal.

Remove and Install the Heatsink Fan Assembly for Frame 6

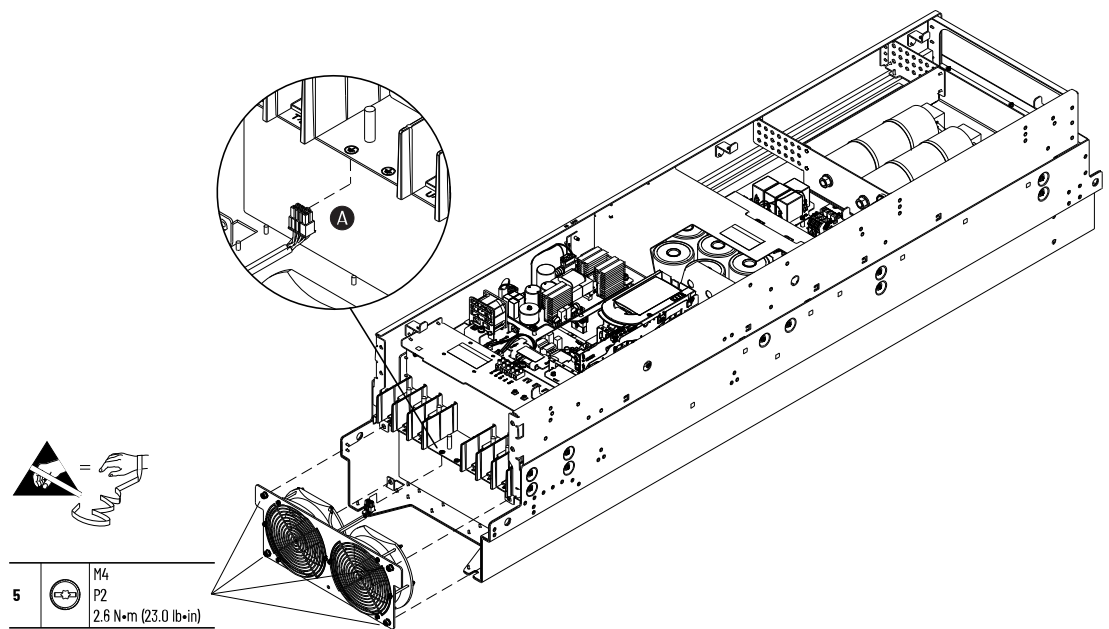
Replace a heatsink fan assembly with kit catalog number SK-RM-HSFAN1-F6. Follow these steps to remove and install the heatsink fan assembly.

1. Review the product advisories in [Before You Begin on page 9](#).
2. Remove power from the system.
3. Remove the cover from the chassis. See [Remove and Install the Frame 6 Cover on page 55](#).
4. If installed, remove the conduit box. See PowerFlex® 755T Frames 5 and 6 Conduit Box and Ground Plate Kits, Installation Instructions, publication [750-IN112](#).



The heatsink fan power wire harness is connected inside the chassis. You cannot remove the fan assembly until you disconnect the fan power wire harness.

5. Loosen the four M4 captive screws that secure the fan assembly to the chassis and carefully pull the fan assembly away from the chassis, partially.
6. Disconnect the fan power wire harness connector (A) from the connector inside the chassis and remove the fan assembly.



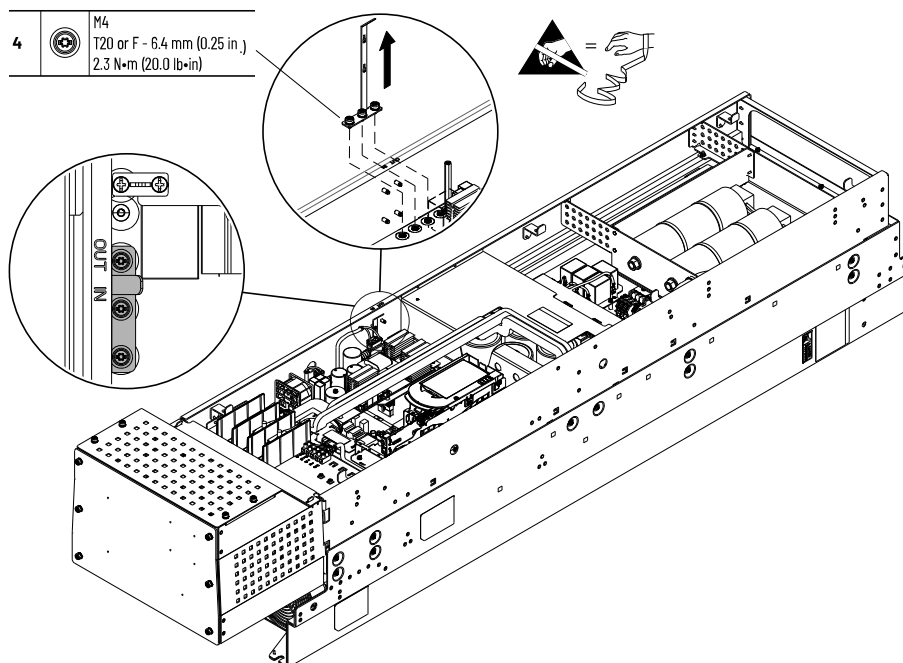
7. Install the heatsink fan assembly in the reverse order of removal.

Remove and Install the DR and PE-A (EMC and MOV) Jumper for Frame 6

Replace the DR and PE-A (EMC and MOV) jumper with kit catalog number SK-RM-JMPR1-F6. Follow these steps to remove the DR and PE-A (EMC and MOV) jumper.

1. Review the product advisories in [Before You Begin on page 9](#).
2. Remove power from the system.
3. Remove the cover from the chassis. See [Remove and Install the Frame 6 Cover on page 55](#).
4. Loosen the three captive, slotted-Torx head screws that secure the jumper to the power interface circuit board.

5. Lift the jumper away from the power interface board until the keyholes in the jumper align with the pins on the sidewall and remove the jumper.



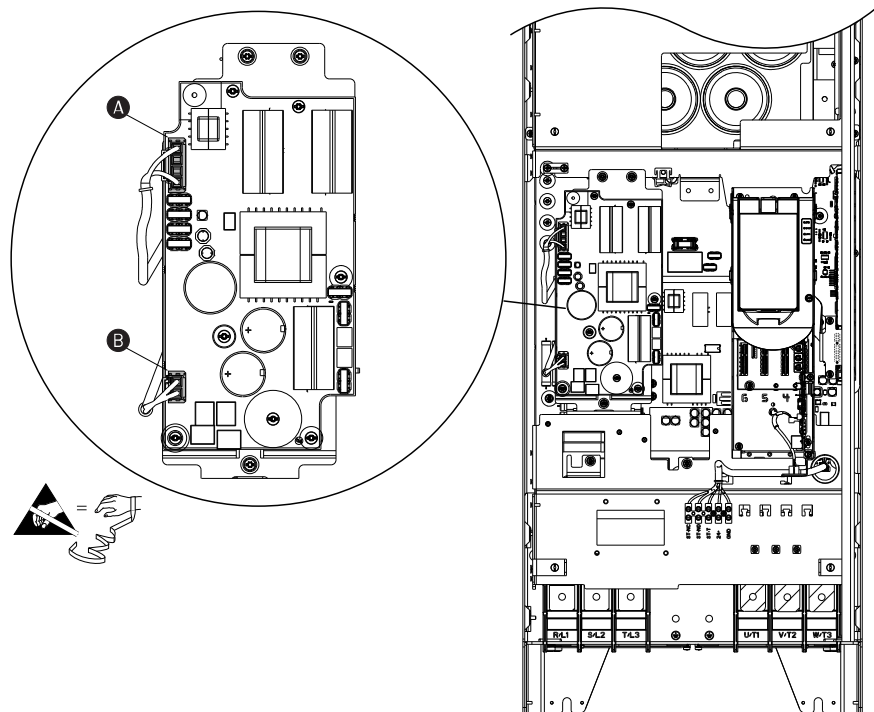
The PE-A jumper is shown in the default (IN) position.

6. Install the DR and PE-A (EMC and MOV) jumper in the reverse order of removal.
7. Verify that the jumper is installed in the correct position as required for your grounding scheme and application. See the PowerFlex 750-Series Products with TotalFORCE Control, Installation Instructions, publication [750-IN100](#), for power jumper configuration.

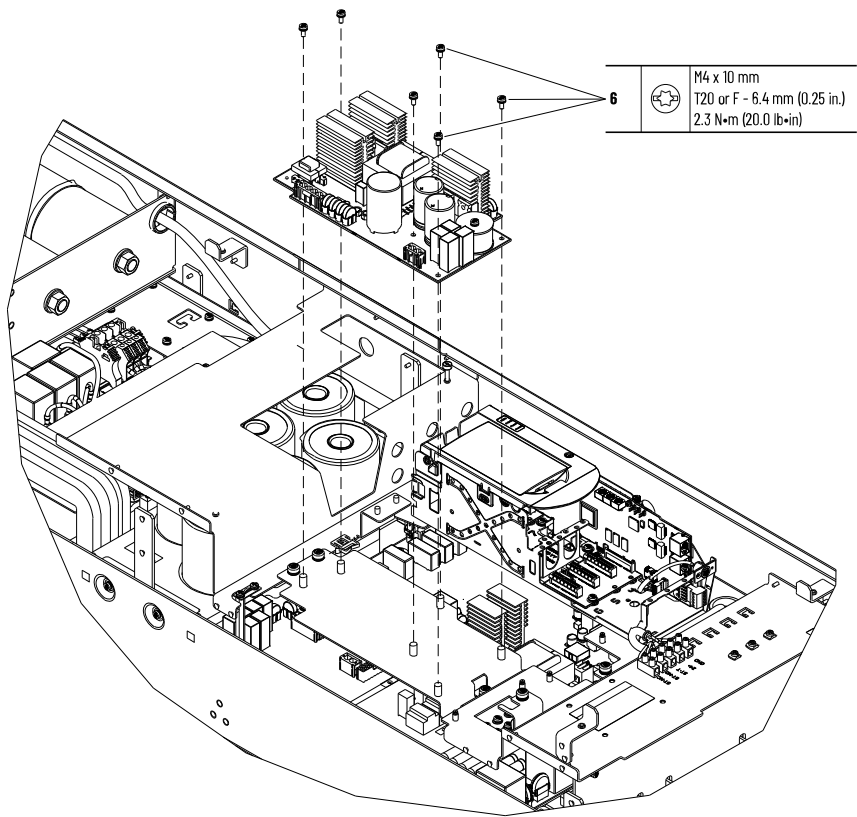
Remove and Install the Fan Power Supply Circuit Board for Frame 6

Replace a fan power supply circuit board with kit catalog number SK-RM-PSB1-F5-F6. Follow these steps to remove and install the fan power supply circuit board.

1. Review the product advisories in [Before You Begin on page 9](#).
2. Remove power from the system.
3. Remove the cover from the chassis. See [Remove and Install the Frame 6 Cover on page 55](#).
4. Disconnect the cable connector P1 (A) from connector J1 on the fan power supply circuit board.
5. Disconnect the cable connector P2 (B) from connector J2 on the fan power supply circuit board.



6. Remove the six M4 x 10 mm slotted-Torx screws that secure the fan power supply circuit board to the mounting plate and remove the circuit board.



7. Install the fan power supply circuit board in the reverse order of removal.

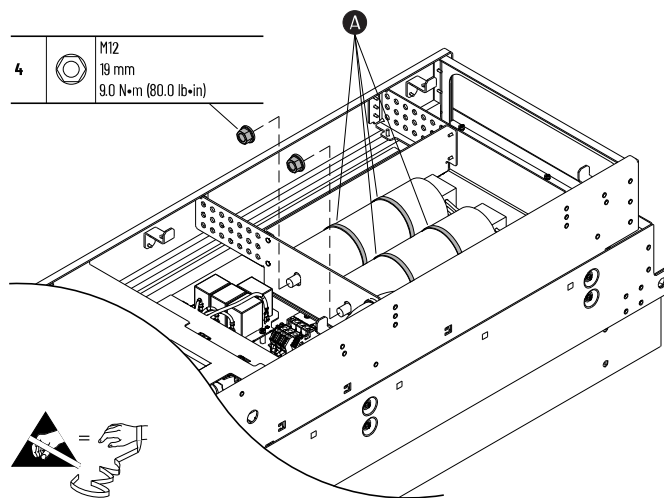
Remove and Install the LCL Filter Capacitor for Frame 6

Replace an LCL filter capacitor with one of the following kit catalog numbers:

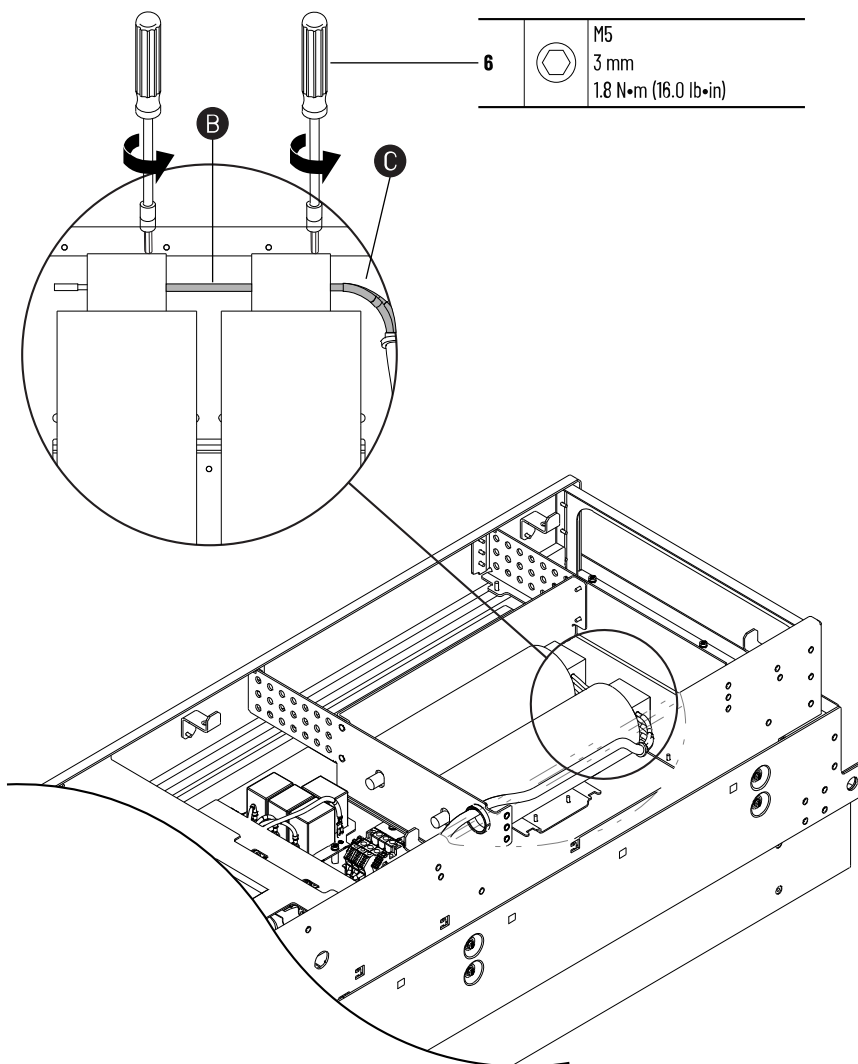
- SK-RM-LCLCP4-F6 (400V/480V, 90 kW/125 Hp)
- SK-RM-LCLCP4-F6 (400V/480V, 110 kW/150 Hp and higher)
- SK-RM-LCLCP6-F6 (all 600V/600V)

Follow these steps to remove and install the LCL filter capacitor.

1. Review the product advisories in [Before You Begin on page 9](#).
2. Remove power from the system.
3. Remove the cover from the chassis. See [Remove and Install the Frame 6 Cover on page 55](#).
4. Remove the M12 hex nut that secures the capacitor to the bracket.
5. Cut the cable ties (A) that secures the capacitor to the bracket and discard the cable ties.

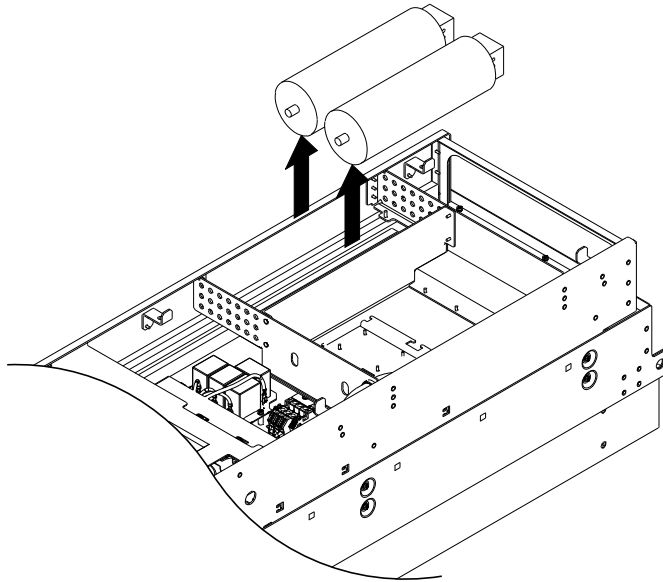


6. Loosen the M5 hexagonal screws that secure the interconnection (B) wires and wire harness (C) from the power circuit board to terminals R, S and T on the capacitor terminal blocks at the top of the capacitors, and remove the wires.

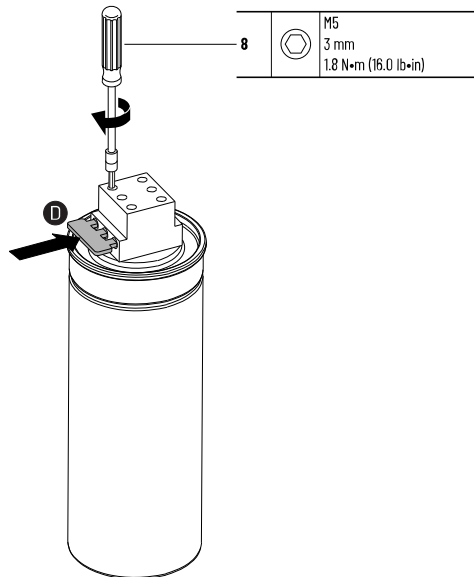


IMPORTANT: Retain all wires for reuse.

7. Remove the capacitor from the drive.



8. Insert all three legs of the resistor (D) supplied with the kit into the terminal block at the top of the capacitor and secure the resistor.



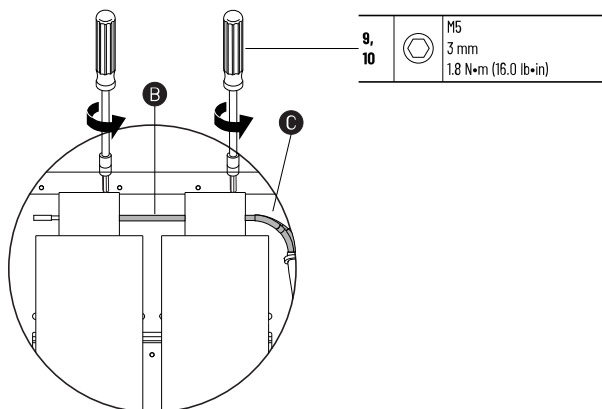
IMPORTANT: When two capacitors are installed, the resistor must be installed on the left side of the leftmost capacitor.

9. If two capacitors are used, secure the interconnection (B) wires to terminals R, S, and T on the capacitor terminal block at the top of both capacitors.



The capacitor terminal screws are not accessible when installed in the chassis. Therefore, you must install the wire harnesses before securing the capacitors to the chassis with the cable ties.

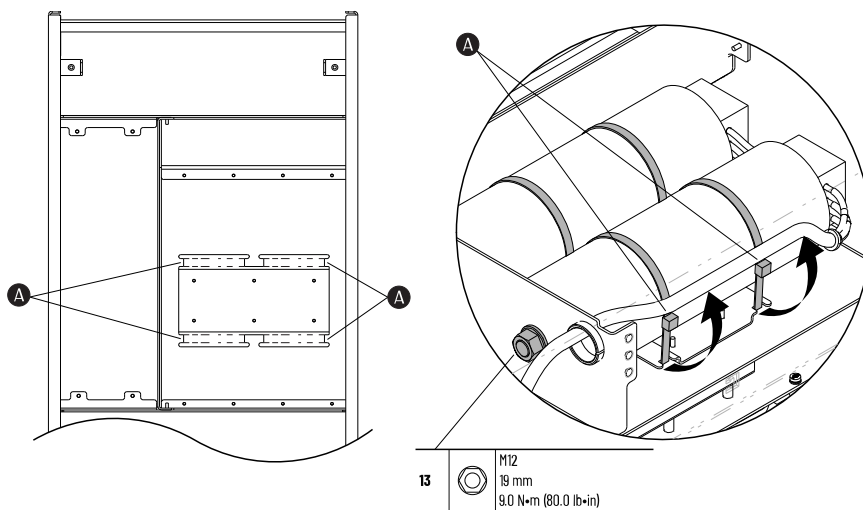
10. Secure the wire harness (C) from the power circuit board to terminals R, S, and T on the right side of the capacitor terminal block.



11. With the cable tie head on the right side of the capacitors, insert the cable ties (A) into the notches in the chassis mounting plate.
12. By inserting the threaded screw on the bottom of the capacitors through the holes on the mounting plate in the chassis, place the capacitors onto the mounting plate.
13. Secure the M12 hex nut to the threaded screw on the bottom of the capacitor.

IMPORTANT: Verify that the cable tie is aligned as it was before removal, with the head of the tie to the side of the capacitor so it does not interfere with the cover when it is replaced.

14. Secure the capacitor to the mounting plate by tightening the cable ties (A).



Start Up After Repairs

After you have completed repairs and before power has been applied, complete the detailed instructions for starting up a regenerative drive, regenerative bus supply, and common bus inverter.

Before You Apply Power to Frames 5 and 6

Before you place a drive or bus supply into operation after a repair, follow these steps.



- ATTENTION:** Risk of injury or death exists.
- To avoid an electric shock hazard, verify that there is no AC input and DC bus voltage by taking these measurements:
- Verify that there is no AC input voltage present on the R/L1, S/L2, and T/L3 terminals.
 - Verify that there is no DC bus voltage present by using the +DC to -DC terminals and measuring +DC to -DC, +DC to GND, and -DC to GND.

1. Measure the AC input and DC bus voltage to verify that there is no voltage present:
 - a. Measure the AC input terminals R/L1, S/L2, and T/L3; L to L and L to chassis GND (PE).
 - b. Measure the DC output terminals; DC+ to DC-, DC+ to chassis GND (PE), and DC- to chassis GND (PE).

Figure 17. Frame 5 Power Terminal Identification

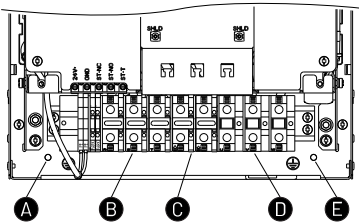
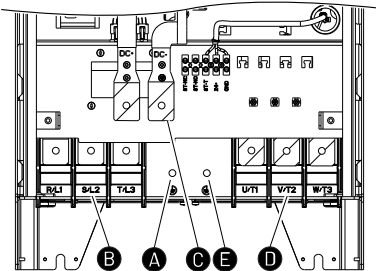


Figure 18. Frame 6 Power Terminal Identification



Item	Name	Description
A	PE grounding stud	Termination point to chassis ground for AC line shield

Item	Name	Description
B	R/L1, S/L2, T/L3	AC line input power terminals
C	DC+, DC-	DC bus terminals
D	U/T1, V/T2, W/T3	AC output motor terminals
E	PE grounding stud	Termination point to chassis ground for motor shield

- Perform phase to ground resistance tests to verify that there are no shorts on the following locations:
 - Use terminals R/L1, S/L2, and T/L3 to measure L to chassis GND (PE).
 - Use terminals +DC and -DC to measure +DC to chassis GND (PE), and -DC to chassis GND (PE).
- If the measured value of any resistance test is less than 1 kΩ, troubleshoot to find the short, correct the problem, and repeat step 2.
- For any module or component that has been removed and reinstalled, complete the following:
 - Verify that all hardware connections have been replaced and are properly torqued.
 - Verify that all interconnection wire harnesses are connected at both ends and properly supported by cable ties along their entire length where applicable.
- When service has been completed on the control pod, verify that all control power and I/O wires are connected and properly secured and supported by cable ties along their entire length when routed between enclosures.
- Continue with [Measure No-load DC Bus Voltage and Output Current on page 73](#).

Measure No-load DC Bus Voltage and Output Current

Follow these steps to measure the DC bus voltage and output current and diagnose problems without connecting the motor to its mechanical load.

- Verify that the input power and ground wires are connected.
- Verify that the AC line power at the disconnect device is within the rated value for the drive or bus supply.
- Verify that the control power voltage is correct.
- Verify that the motor cables are connected.
- Verify that the motor load is disconnected.
- Energize the system.
- Measure the DC bus voltage and verify that the measured value is displayed in port 0, parameter 3 [DC Bus Volts].
- Start the system and increase the speed from zero to base speed.
- Measure the system output current and verify that the measured value is displayed in port 10, parameter 3 [Output Current].
- Stop the system.
- Reconnect the load to the motor before proceeding with drive startup.

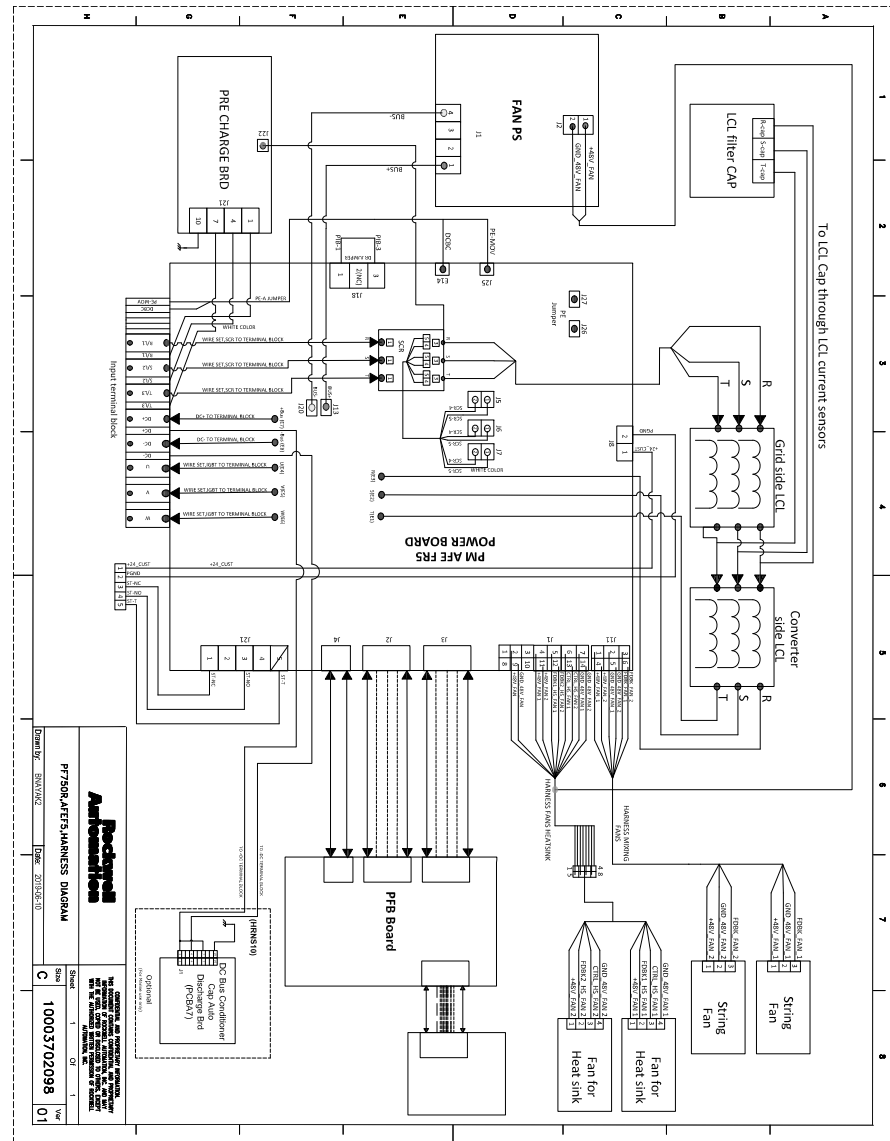
For startup information see the PowerFlex® Drives with TotalFORCE® Control Programming Manual, publication [750-PM100](#) (firmware revision 6.001 and earlier), or [750-PM101](#) (firmware revision 10.001 and later).

System Schematics

This chapter provides schematics for PowerFlex® 755T modules and products.

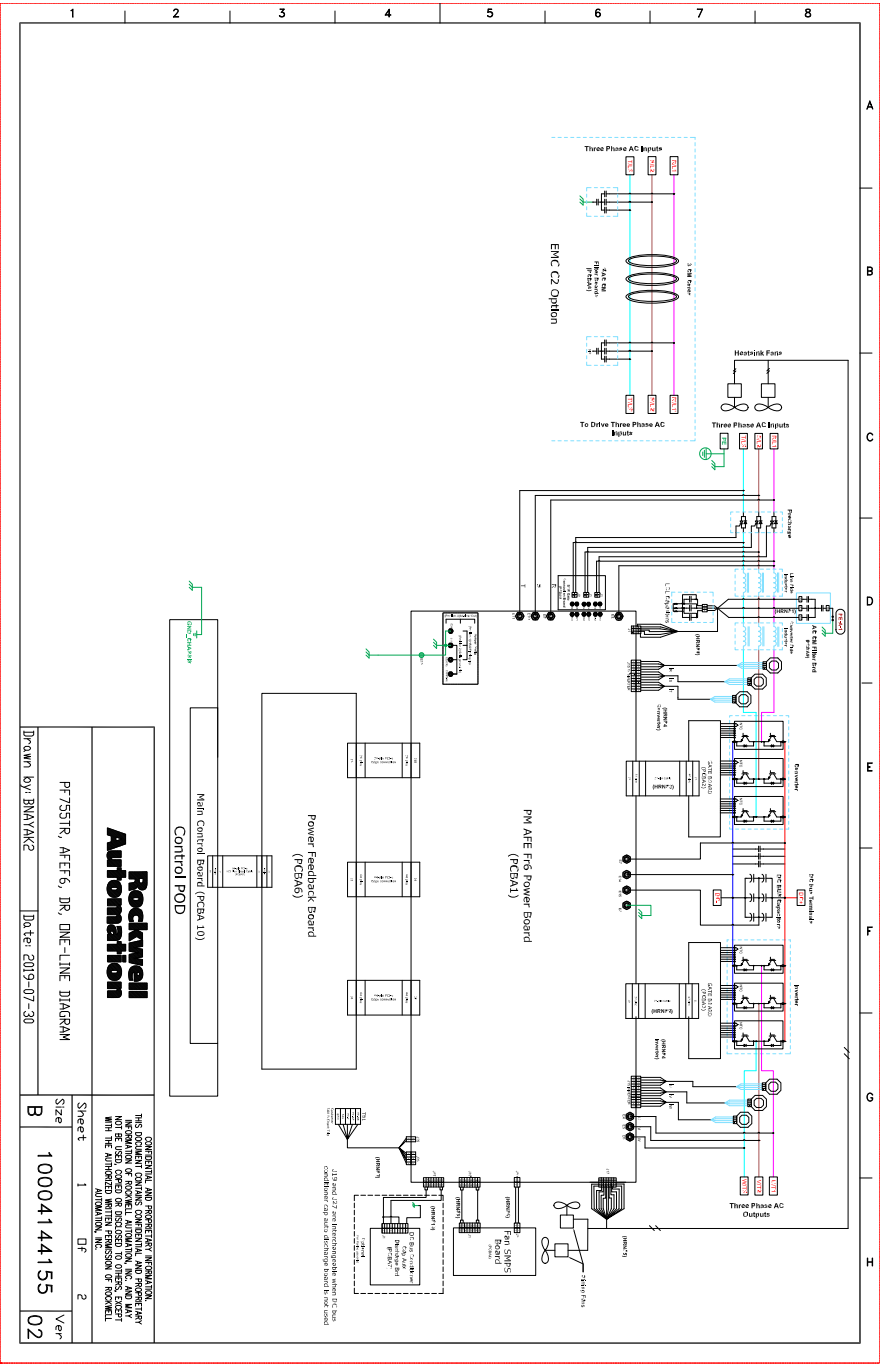
Frame 5 PowerFlex 755TL/TR Drive Schematic Diagram

Figure 19. PowerFlex® 755TL/TR Frame 5 Drive



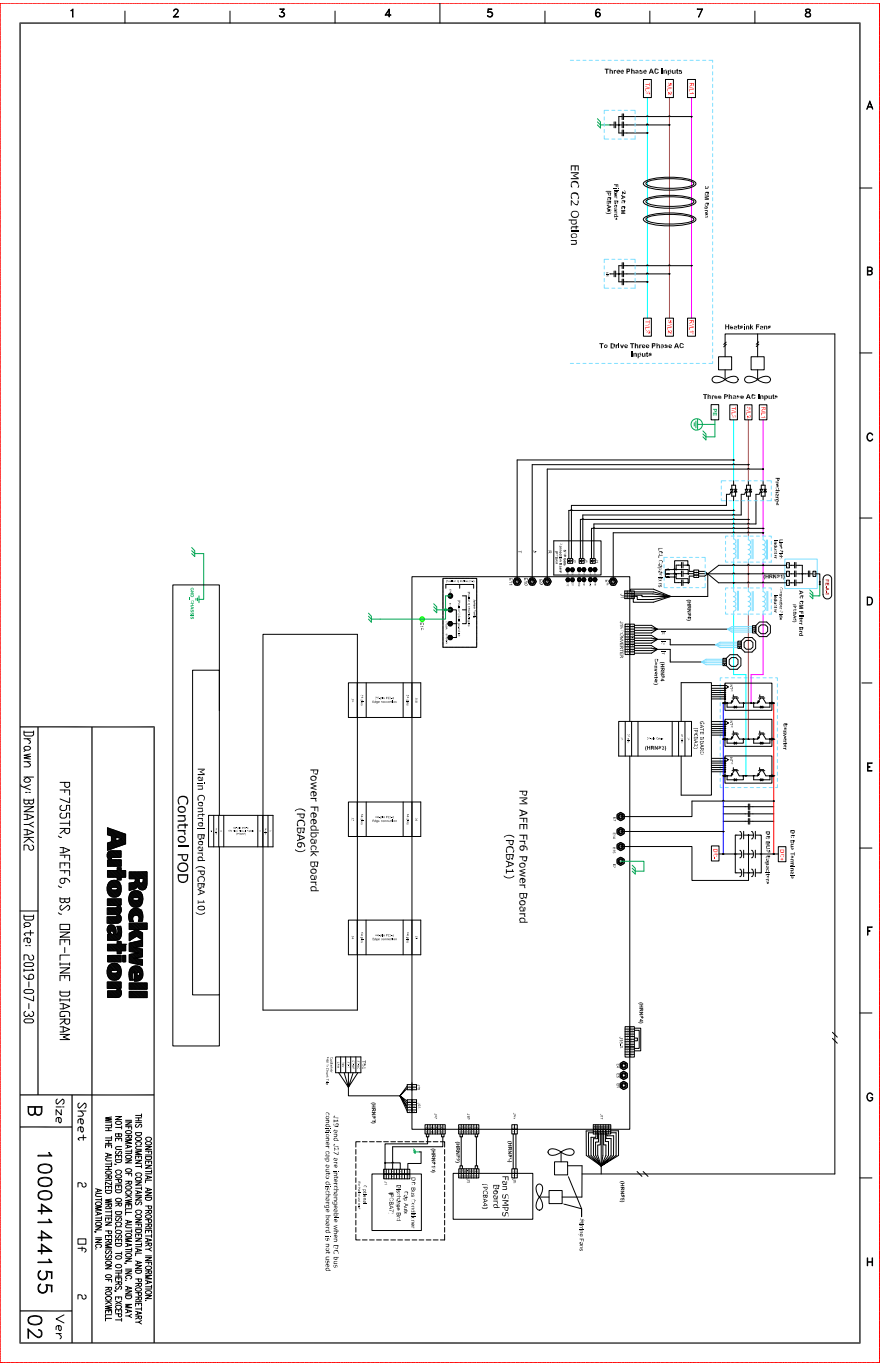
Frame 6 PowerFlex 755TL/TR Drive Schematic Diagram

Figure 20. PowerFlex® 755TL/TR Frame 6 Drive



Frame 6 PowerFlex 755TM Regenerative Bus Supply Schematic Diagram

Figure 21. PowerFlex® 755TM Frame 6 Bus Supply



Rockwell Automation Support

Use these resources to access support information.

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Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	rok.auto/pcdc

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Waste Electrical and Electronic Equipment (WEEE)



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Rockwell Automation maintains current product environmental information on its website at rok.auto/pec.

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