

# Kinetix 7000 DC-DC Converter and Control Board Kits

Catalog Numbers 2099-K7KCP-1, 2099-K7KCB-1

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## About This Publication

This publication provides information for removing and replacing the dc-dc converter, dc-dc converter fuse, and the control board assembly on Kinetix 7000 drive modules.

For additional information on mounting, wiring, configuring, and troubleshooting your Kinetix 7000 drive, refer to the Kinetix 7000 High Power Servo Drive User Manual, publication [2099-UM001](#).

## Important User Information

Solid state equipment has operational characteristics differing from those of electromechanical equipment. Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls (publication SGI-1.1 available from your local Rockwell Automation sales office or online at <http://literature.rockwellautomation.com>) describes some important differences between solid state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.





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.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

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

<p><b>WARNING</b></p> 	<p>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.</p>
<p><b>IMPORTANT</b></p>	<p>Identifies information that is critical for successful application and understanding of the product.</p>
<p><b>ATTENTION</b></p> 	<p>Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you to identify a hazard, avoid a hazard, and recognize the consequences.</p>
<p><b>SHOCK HAZARD</b></p> 	<p>Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.</p>
<p><b>BURN HAZARD</b></p> 	<p>Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.</p>

## Before You Begin

Make sure you have the following spare parts, tools, and have removed power so you can safely remove the drive covers and assemblies.

### Parts List

This publication provides installation instructions for removing and replacing the following components:

- DC-DC converter cassette kit (catalog number 2099-K7KCP-1)
- Control board assembly kit (catalog number 2099-K7KCB-1)
- DC-DC converter fuse (customer supplied)

### Required Tools

- Phillips screwdriver
- Flat blade screwdriver
- 3/16 in. thin-walled socket, nut driver, or open-ended wrench
- 1/4 in. thin-walled socket, nut driver, or open-ended wrench

### Remove Power

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**ATTENTION**

Do not remove the Kinetix 7000 drive from the panel. Due to the physical size and weight of the drives, perform these procedures with the drive mounted to the panel.

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Follow these steps to remove power from your drive.

1. Verify that all control and input power has been removed from the system.

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**ATTENTION**

To avoid shock hazard or personal injury, assure that all power has been removed before proceeding. This system may have multiple sources of power. More than one disconnect switch may be required to de-energize the system.

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2. Allow five minutes for the dc bus to completely discharge before proceeding.

**ATTENTION**

This product contains stored energy devices. To avoid hazard of electrical shock, verify that all voltage on capacitors has been discharged before attempting to service, repair, or remove this unit. You should only attempt the procedures in this document if you are qualified to do so and are familiar with solid-state control equipment and the safety procedures in publication [NFPA 70E](#).

3. Label and remove the fiber-optic (Tx and Rx) cables, and I/O (IOD), motor feedback (MF), and auxiliary feedback (AF) connectors from the drive.
4. Go to [Remove the Drive Covers](#).

## Remove the Drive Covers

Depending on the catalog number of your Kinetix 7000 drive, access to the control board, dc-dc converter, and fuse varies.

**ATTENTION**

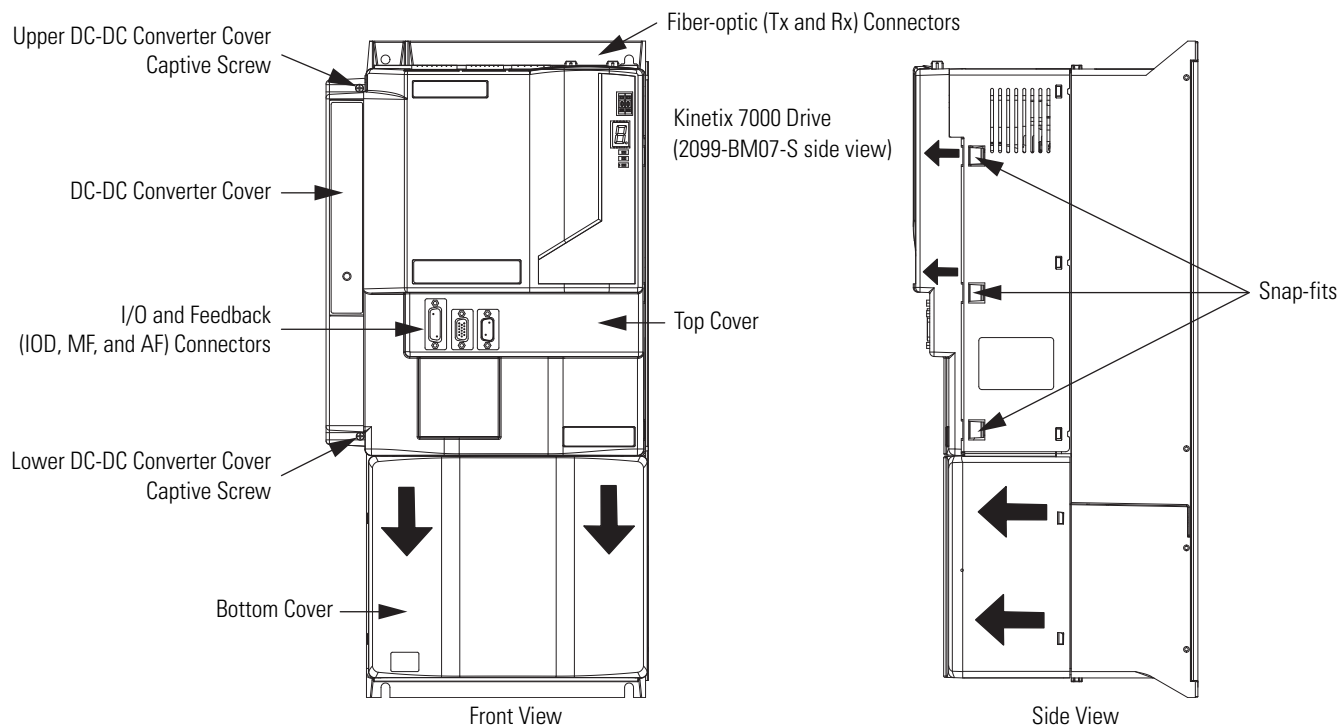
This drive contains ESD (electrostatic discharge) sensitive parts and assemblies. You are required to follow static control precautions when you install, test, service, or repair this assembly. If you do not follow ESD control procedures, components can be damaged. If you are not familiar with static control procedures, refer to Guarding Against Electrostatic Damage Service Bulletin, publication [8000-4.5.2](#), or any other applicable ESD protection handbook.

Cat. No.	Topic	Page
2099-BM06-S, 2099-BM07-S, or 2099-BM08-S	Remove 2099-BM06-S, 2099-BM07-S, and 2099-BM08-S Covers	5
2099-BM09 -S or 2099-BM10-S	Remove 2099-BM09-S and 2099-BM10-S Covers	6
2099-BM11-S, or 2099-BM12-S	Remove 2099-BM11-S and 2099-BM12-S Covers	7

## Remove 2099-BM06-S, 2099-BM07-S, and 2099-BM08-S Covers

Follow these steps to remove the drive covers.

1. Remove the bottom cover.
  - a. Pull the cover downward approximately 12 mm (0.5 in.).
  - b. Pull the cover straight out and away from the drive.
2. Remove the two dc-dc converter cover screws.
3. Pull the dc-dc converter cover outward and away from the drive.
4. Depress the three top cover snap-fits on the right-hand side of the top cover and pull the cover slightly outward and away from the drive.
5. Pivot the top cover to the left and maneuver the cover out from under the slots on the left-hand side of the top cover.



6. Install your kit.

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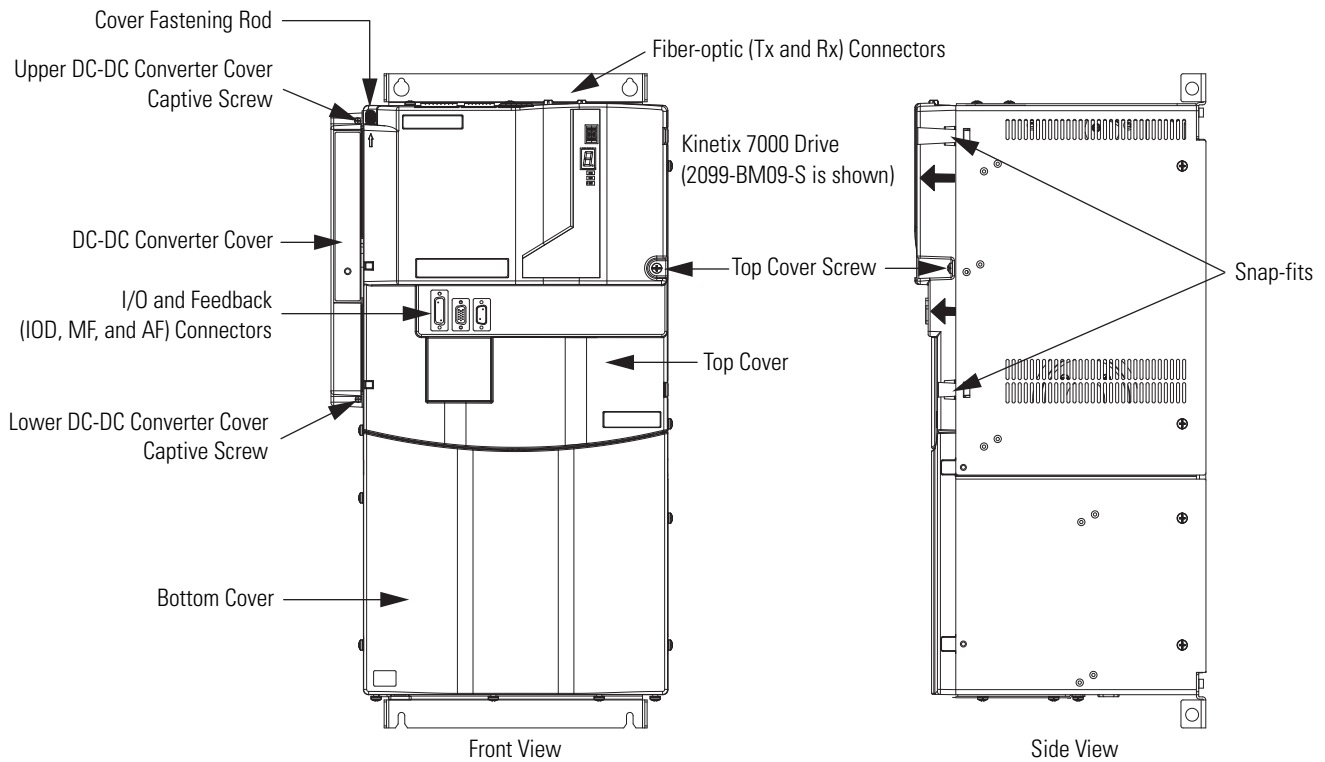
## Remove 2099-BM09-S and 2099-BM10-S Covers

Follow these steps to remove the drive covers.

1. Remove the two dc-dc converter cover screws.
2. Pull the dc-dc converter cover outward and away from the drive.
3. Pull the top cover fastener rod upward approximately 12 mm (0.5 in.).

If the rod is pulled far enough, the three latch points on the rod will disengage with the chassis.

4. Remove the top cover screw.
5. Depress the two snap-fits on the right-hand side of the top cover and pull the cover outward and away from the drive.



6. Install your kit.

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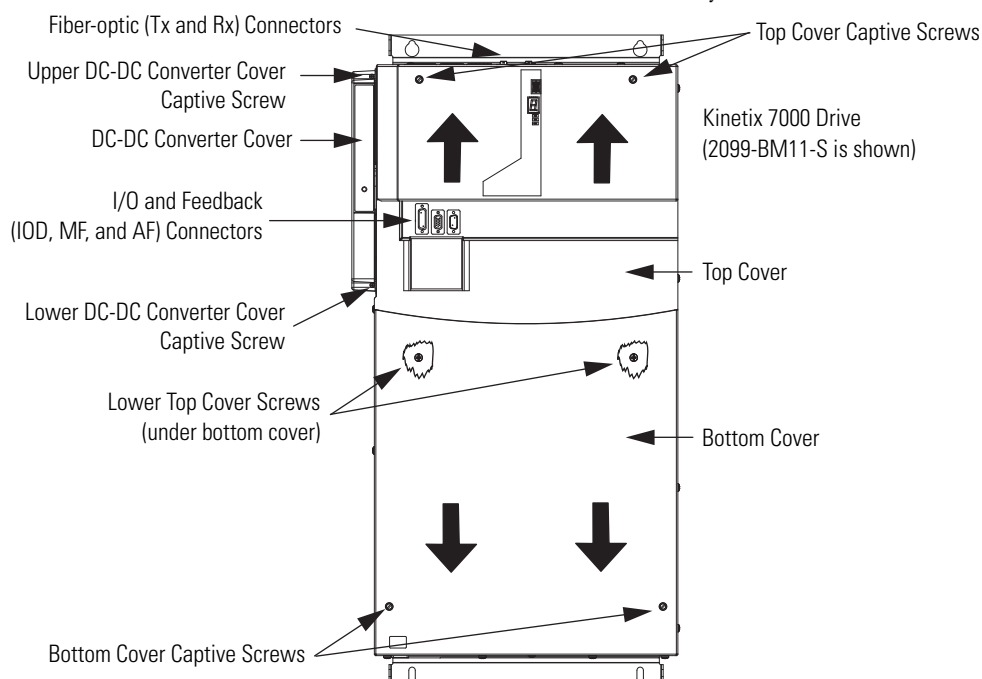
## Remove 2099-BM11-S and 2099-BM12-S Covers

Follow these steps to remove the drive covers.

1. Loosen the two bottom-cover captive screws and pull the cover slightly away from the drive module.
2. Slide the bottom cover downward until the upper tabs clear the top cover slots.
3. Loosen the two lower-top cover screws.

These screws were covered by the bottom cover.

4. Loosen the two top-cover captive screws and pull the cover slightly away from the drive module.
5. Slide the top cover upward until the cover clears the lower screws.
6. Remove the two dc-dc converter cover screws.
7. Pull the dc-dc converter cover outward and away from the drive.



8. Install your kit.

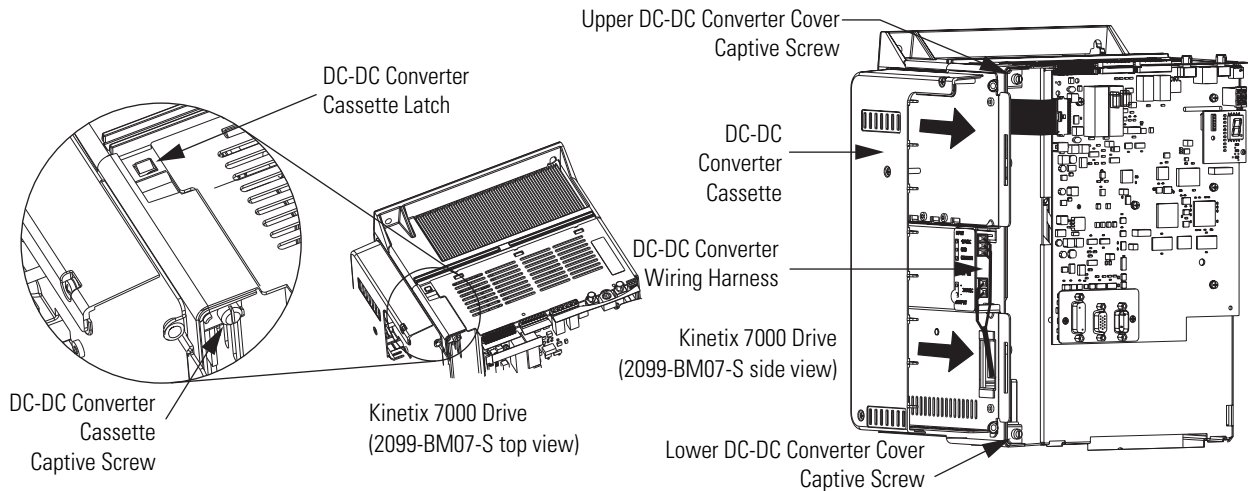
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## Install the DC-DC Converter Kit

Follow these steps to remove and replace the dc-dc converter cassette.

1. Loosen the upper and lower dc-dc converter screws.

Turn the screws until the latch disengages from the cassette. The upper screw and latch are shown, the lower screw latches the same way.



2. Remove the dc-dc converter wiring harness.

Unplug the two connectors and route through slot in cassette.

3. Pull the dc-dc converter cassette straight out and away from the drive.
4. Replace the dc-dc converter cassette.
5. Replace the wiring harness.

Route the two connectors back through the slot in the cassette and reseat the two-position and three-position connectors.

6. Tighten the upper and lower dc-dc converter screws.

Turn the screws until the latch engages with the cassette. The upper screw and latch are shown, the lower screw latches the same way. Torque screws to 0.45 N•m (4.0 in•lb).

7. Replace the dc-dc converter cassette and drive covers.



Refer to [Remove the Drive Covers](#) on page 4 and reverse the order of steps for your drive module.

### IMPORTANT

When replacing the top cover, temporarily remove the fiber-optic cables from the drive Tx and Rx connectors. This allows the top cover to seat properly with the chassis.

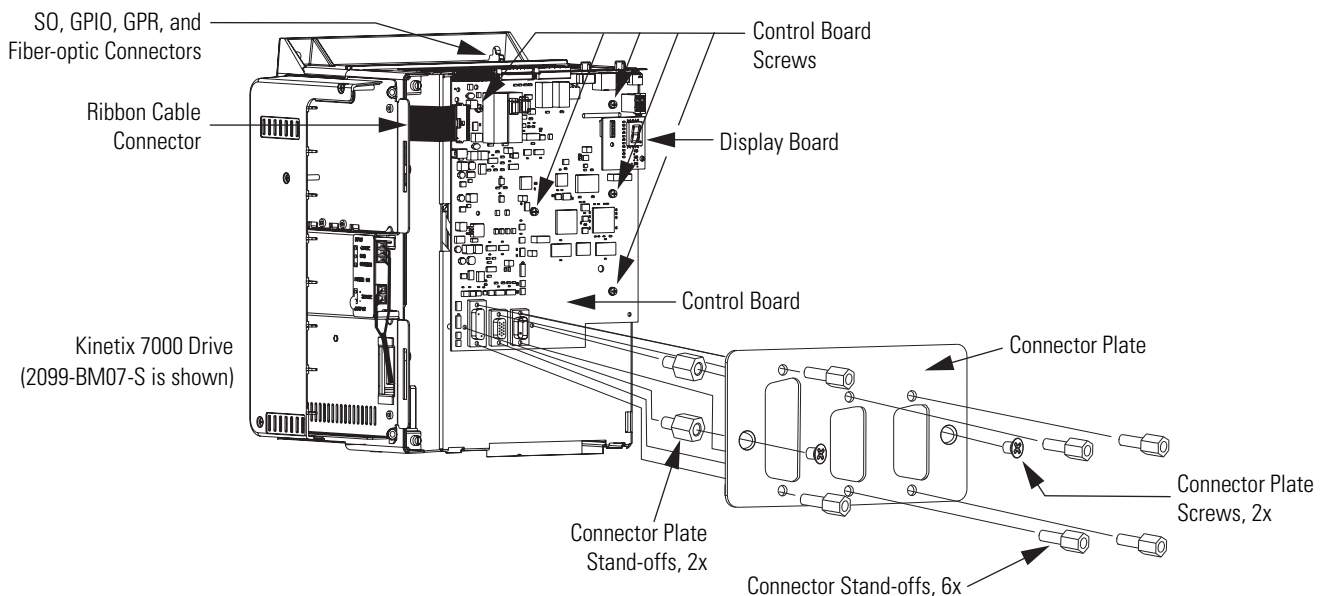
8. Return the drive to operation.

## Install the Control Board Kit

Follow these steps to remove and replace the control board.

1. Label and remove the safe-off (SO), general purpose I/O (GPIO), general purpose relay (GPR), and ribbon cable connectors from the control board.

Also, label and remove the fiber-optic (Tx and Rx) connectors, if not removed earlier.



2. Remove the six connector stand-offs by using a 3/16 in. thin-walled socket or nut driver.

### IMPORTANT

Thin-walled socket or open-ended wrench is required to remove the screws due to the clearance between screw and connector.

3. Remove the two connector plate screws by using a small Phillips screwdriver.

4. Remove the connector plate.
5. Remove the two connector plate stand-offs by using a 1/4 in. thin-walled socket, nut driver, or open-ended wrench.

**ATTENTION**

To avoid damage to small components adjacent to the stand-offs, use a thin-walled socket or open-ended wrench to remove the stand-offs.

6. Remove the five control board screws.
7. Remove and replace the control board.

Verify the control board pins are fully inserted into display board.

8. Replace the screws, stand-offs, connector plate, and ribbon cable as described in steps 1...6 above.

Screw	Torque Value
Connector plate stand-offs (2x)	0.68 N•m (6.0 in•lb)
Connector plate screws (2x)	
Connector stand-offs (6x)	
Control board screws (5x)	

9. Replace the dc-dc converter cassette cover and drive covers.

Refer to [Remove the Drive Covers](#) on page 4 and reverse the order of steps for your drive module.

**IMPORTANT**

When replacing the top cover, temporarily remove the fiber-optic cables from the drive Tx and Rx connectors. This allows the top cover to seat properly with the chassis.

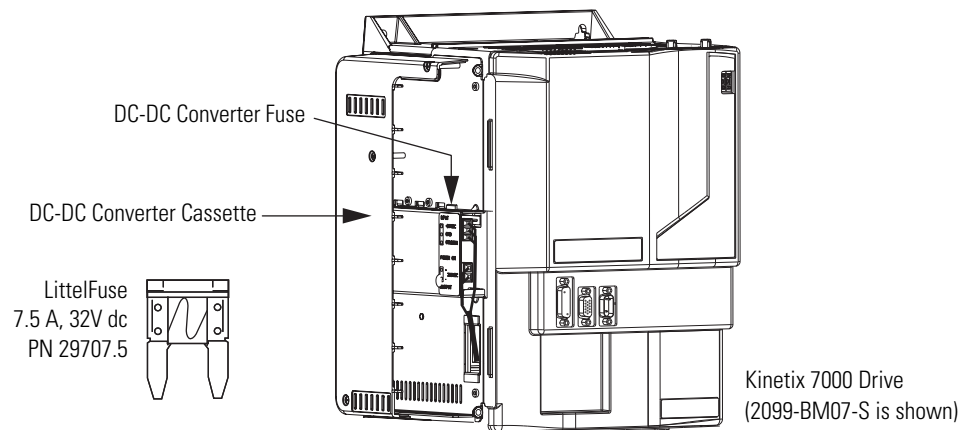
10. Return the drive to operation.

## Replace the DC-DC Converter Fuse

To access the dc-dc converter fuse, the dc-dc converter cassette cover must be removed.

1. Remove the dc-dc converter cassette cover.

Refer to [Remove the Drive Covers](#) on page 4 and follow the procedure for your drive.



2. Replace the fuse.

Refer to [Additional Resources](#) on page 12 for manufacturers datasheet information.

3. Replace the dc-dc converter cassette cover.

Refer to [Remove the Drive Covers](#) on page 4 and reverse the order of steps for your drive module.

### IMPORTANT

When replacing the top cover, temporarily remove the fiber-optic cables from the drive Tx and Rx connectors. This allows the top cover to seat properly with the chassis.

4. Return the drive to operation.

## Additional Resources

The following documents contain additional information for this Rockwell Automation product and related products.

Resource	Description
Kinetix 7000 High Power Servo Drives User Manual, publication <a href="#">2099-UM001</a>	Information on installing, configuring, startup, troubleshooting, and applications for your Kinetix 7000 servo drive system.
Littelfuse, Inc. website <a href="http://littelfuse.com">http://littelfuse.com</a>	Replacement fuse datasheet for dc-dc converter.
Guarding Against Electrostatic Damage Service Bulletin, publication <a href="#">8000-4.5.2</a>	Industry best practices for preventing damage due to electrostatic discharge (ESD).
Rockwell Automation Industrial Automation Glossary, publication <a href="#">AG-7.1</a>	A glossary of industrial automation terms and abbreviations.

You can view or download publications at <http://literature.rockwellautomation.com>. To order paper copies of technical documentation, contact your local Rockwell Automation distributor or sales representative.

**Notes:**

## Notes:

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## Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products. At <http://support.rockwellautomation.com>, you can find technical manuals, a knowledge base of FAQs, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools.

For an additional level of technical phone support for installation, configuration, and troubleshooting, we offer TechConnect support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit <http://support.rockwellautomation.com>.

## Installation Assistance

If you experience a problem within the first 24 hours of installation, please review the information that's contained in this manual. You can also contact a special Customer Support number for initial help in getting your product up and running.

United States	1.440.646.3434 Monday – Friday, 8 a.m. – 5 p.m. EST
Outside United States	Please contact your local Rockwell Automation representative for any technical support issues.

## New Product Satisfaction Return

Rockwell Automation tests all of its products to ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned, follow these procedures.

United States	Contact your distributor. You must provide a Customer Support case number (see phone number above to obtain one) to your distributor in order to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for the return procedure.

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Publication 2099-IN002B-EN-P — October 2008

PN 351781-P02

Supersedes Publication 2099-IN002A-EN-P — February 2007

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