



**PRODUCT SAFETY ADVISORY**  
Notice of Potential Unsafe Condition

**PowerFlex 7000 Variable Frequency Drives  
with Active Front End Rectifier Configurations**

Reference: 2010-02-001  
Date: February 2010

This Product Safety Advisory gives you information about a potential unsafe condition with the PowerFlex 7000 Variable Frequency Drives with Active Front End Rectifier Configurations. This notice applies to the Line Filter Capacitor (LFC) used in the Active Front End Rectifier configurations.

**- Product Identification -**

PowerFlex 7000 Variable Frequency Drives (VFD) with Active Front End Rectifier Configurations.

**'A' Frame Cat. No.**  
7000A-\*-RPDTD  
7000A-\*-RPLR  
7000A-\*-RPTX  
7000A-\*-RPTXI

**'B' Frame Cat. No.**  
7000-\*-RPDTD  
7000-\*-RPLR  
7000-\*-RPTX

**'C' Frame Cat. No.**  
7000L-\*-RPDTD  
7000L-\*-RPLR  
7000L-\*-RPTX

Rockwell Automation shipped the affected product from September 2000 through February 2010.

**- Description -**

In rare instances, the Line Filter Capacitor in PowerFlex 7000 VFDs with Active Front End (AFE) Rectifiers may be damaged by significant transient-line disturbances.

The initial Failure mode of an LFC in higher power configurations using multiple LFCs (that is, Bulletin 7000 and 7000L) is not always detectable. Continued operation after the initial Failure mode results in a progressive deterioration of the LFC elements that eventually results in an internal line-to-ground or line-to-line short in the LFC. Before the damage to the LFC approaches the level of a line-to-ground or line-to-line short, the VFD detects the event and trips on multiple faults, including Master Current Unbalance.

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The annunciated faults on the PowerFlex Operator Interface Terminal generally refer to overcurrents or overvoltages, or unbalances of line (input) voltages and currents. No fault message on the display specifically indicates the failure of an LFC. The hard-copy documentation provided with the VFD order (user manual and technical data) does indicate the need to check the LFC. However, if the operators do not refer to the documentation and do not assess the cause of the fault, they may repeatedly reset the fault and try to initiate a VFD restart.

Repeatedly resetting the fault and re-energizing the PowerFlex 7000 VFD with a shorted LFC, without correcting the anomaly, can result in the rupture of the LFC and the expulsion of flammable dielectric oil, hot gases, and an arc flash from the LFC cabinet enclosure. This would result in damage to the VFD in the area of the LFC cabinet and possible property damage to the immediate area and the potential for personal injury or death.

#### **-Temporary Workarounds -**

Note that these VFDs, dependent on when they were manufactured, could be supplied with either the Classic Control platform or the ForGe Control platform.

The control platform you have affects:

- which Technical Note to download and follow.
- which firmware upgrade you will download.
- which updated documentation set you will download.
- the fault code identifier number.

To determine which control platform you have, refer to Appendix 'B-1'.

Two comprehensive Technical Notes provide guidance through all actions required at site to address this anomaly. Be sure to review these Technical Notes before taking action. Additional references to existing documentation are supplemental and for information only.

- ForGe Control Users – download Technical Note 'PF7000\_4thGen\_GEN-15'  
[http://rockwellautomation.custhelp.com/app/answers/detail/a\\_id/66655/kw/66655](http://rockwellautomation.custhelp.com/app/answers/detail/a_id/66655/kw/66655)
- Classic Control Users – download Technical Note 'PF7000\_GEN-95'  
[http://rockwellautomation.custhelp.com/app/answers/detail/a\\_id/66654/kw/66654](http://rockwellautomation.custhelp.com/app/answers/detail/a_id/66654/kw/66654)

#### **Earlier Detection of Fault Condition**

Lowering the default trip levels detects the preliminary Failure mode earlier, before it progresses to an internal line-to-ground or line-to-line short condition. This should not result in any significant increase in nuisance tripping.

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Complete both of these steps.

1. Change and save the default Line Current Unbalance Trip (Parameter #108) setting from 5% (shown as 0.05 pu) to 3% (shown as 0.03 pu).
2. Change and save the default Line Current Unbalance Delay (Parameter #109) setting from 1.0 second to 0.1 second.

**THESE TWO PARAMETERS CAN BE CHANGED WHILE THE VFD IS RUNNING.**

Refer to the applicable user manual (refer to the Affected Documentation section for specific catalog numbers) for instructions and 'how to' information to change and save parameters.

ForGe and Classic Control Users – refer to Chapter 3 (Operator Interface), subsection – Modify Parameters.

### **More Comprehensive Troubleshooting**

If the VFD trips on a Master Current Unbalance fault, inspection of the LFC is required.

- ForGe Control Users – Master Current Unbalance fault code is 123.
- Classic Control Users – Master Current Unbalance fault code is 163.

**DO NOT RESET THE FAULT AND RESTART THE VFD UNTIL THE ROOT CAUSE IS DETERMINED AND THE LFC IS EXCLUDED AS THE CAUSE OF THE FAULT.**

Details to assess the condition of the LFC are included in the Technical Notes and will be included in the next revisions of the user manuals that you will be able to download shortly. Note that the revised user manuals will be available only in English at this time. We will begin the translation of the user manuals, for the current language set we support, and these will be available at a later date.

### **Affected Documentation**

#### **ForGe Control**

'A' Frame User Manual, publication 7000A-UM151A-EN-P  
'B' Frame User Manual, publication 7000-UM151A-EN-P  
'C' Frame User Manual, publication 7000L-UM301A-EN-P  
Technical Data, publication 7000A-TD002A-EN-P

#### **Classic Control**

'A' Frame User Manual, publication 7000A-UM150D-EN-P  
'B' Frame User Manual, publication 7000-UM150G-EN-P  
'C' Frame User Manual, publication 7000L-UM300G-EN-P

The revised documentation will have the revision letter incremented to indicate it is the updated publication. For example, the existing ForGe 'A' Frame User Manual is publication 7000A-UM151A-EN-P. The updated revision will become 7000A-UM151B-EN-P.

Links to the updated user manuals can be found here (they will be available no later than end of Feb, 2010).

- ForGe Control – User manual [http://rockwellautomation.custhelp.com/app/answers/detail/a\\_id/66682](http://rockwellautomation.custhelp.com/app/answers/detail/a_id/66682)
- Classic Control – User manual [http://rockwellautomation.custhelp.com/app/answers/detail/a\\_id/66681](http://rockwellautomation.custhelp.com/app/answers/detail/a_id/66681)

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**- Correction -**

This anomaly will be corrected with a firmware upgrade.

Download and install the firmware upgrade.

- ForGe Control – firmware revision 7.003 <http://www.ab.com/support/abdrives/webupdate/powerflex7000.html>
- Classic Control – firmware revision 5.006 <http://www.ab.com/support/abdrives/webupdate/powerflex7000.html>

Ensure these changes required in the 'Temporary Workaround' section are complete:

- Confirm the default Line Current Unbalance Trip (Parameter # 108) setting is 3% (shown as 0.03 pu).
- Confirm the default Line Current Unbalance Delay (Parameter # 109) setting is 0.1 second.

After the firmware upgrade is installed, if the VFD trips on a Master Current Unbalance fault, the VFD will:

- announce 'CheckLineCap' and 'DoNotApplyMV' alternating flashing messages on the Top Level menu screen and Alarm Summary screen of the PowerFlex Operator Interface Terminal.
- will not allow a reset of the fault unless a specific code is entered (refer to applicable Technical Note).

Refer to the applicable user manual for instructions to download firmware:

- ForGe Control Users – refer to Chapter 5 (Component Definition and Maintenance), subsection - Downloading Firmware
- Classic Control Users – refer to Chapter 6 (Component Definition and Maintenance), subsection - Downloading Firmware

Download firmware and Technical Notes at <http://www.ab.com/support/abdrives/webupdate/powerflex7000.html>

**Requested Customer Action -**

We ask that you take the following actions:

- Check that you have product affected by this Product Safety Advisory.  
Refer to the Product Identification section of this document for identification help. The catalog number of your specific VFD is included in the Dimensional Drawing set supplied with your original order. See Appendix 'B-2' for the generic PowerFlex 7000 catalog number explanation.
- Determine whether your VFD was supplied with the Classic Control platform or the ForGe Control platform.  
See Appendix 'B-1' for instructions on how to determine which control platform you have.
- Download and read the appropriate Technical Note.
- Immediately change and save the default settings for Line Current Unbalance Trip and Line Current Unbalance Delay, as stated previously in this letter.
- Immediately communicate this anomaly and recommended Temporary Workarounds, as stated previously in this letter, to all personnel involved in the operation of affected PowerFlex 7000 VFDs.
- Download and install the firmware upgrade.
- Download the updated user manual and technical data, when available. Recycle previous hard-copy revisions.

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- Contact your local technical support center if you need additional technical help. Refer to Appendix A of this document.

This Product Safety Advisory is posted on the Rockwell Automation Knowledgebase, <http://www.rockwellautomation.com/knowledgebase>, as ID number 66609.

If this Product Safety Advisory does not affect you because you do not have the products any longer, Rockwell Automation asks that you forward a copy of this notice, with any identifying documentation, immediately to the person or company that now has the product. We also ask that you contact Rockwell Automation Technical Support and provide the location of the affected units.

We appreciate your immediate cooperation. If you have any questions, please contact us.

Sincerely,

ROCKWELL AUTOMATION

**You can register for Automatic Product Notifications from Rockwell Automation by email. Go to the Support web page at <http://support.rockwellautomation.com>. Under 'Self-Service Support Knowledgebase — Technical questions? Start here!', you can subscribe to important product updates, including Product Safety Advisories and Product Notices.**

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**Appendix A**  
**Regional Technical Support Information**

The following list can help you to contact the correct technical support center for your location. If your country is not listed, you can find a customer support number for your location on <http://www.rockwellautomation.com/support/> under Phone Support/Email Support (located on the left edge of your screen).

Region / Country	Phone Number ( ) International Code
<b>Asia/Pacific</b>	
Australia	1 800 809 929
China	(86 21) 6128 8888
Hong Kong	800 96 5575
India	1 800 3000 7635
Japan	00 44 2261 2142
Korea	0030 833 0004
Malaysia	1 800 80 4851
New Zealand	0800 27 27 25
Taiwan	0080 333 332
Thailand	001 800 611 2757
<b>Caribbean</b>	
All Countries	(1) 440 646 3650
<b>Central America</b>	
Argentina	800.666.0320
Belize	(1) 440 646 3650
Bolivia	(54) 800 10 0632
Brazil	(55) 11 5189 9500
Chile	800.53.0012
Colombia	01.800.700.2107
Costa Rica	0800.013.1215
Ecuador	58.212.949.0611
El Salvador	(52) 55 5246 2010
Guatemala	(52) 55 5246 2010
Honduras	(52) 55 5246 2010
Mexico	001.888.365.8677
Nicaragua	(52) 55 5246 2010
Panama	001.800.203.3475
Paraguay	(54) 11 5554 4000
Peru	0800.535.36
Suriname	(1) 440 646 3650
Uruguay	(54) 11 5554 4000
Venezuela	800.1.00.3062

Region / Country	Phone Number ( ) International Code
<b>Europe</b>	
Austria	(49) 02104 960 664
Belgium	(32) 2 716 8411
Czech Republic	(420) 28401 5911
Denmark	(45) 43 466 006
Finland	(358) 958 447 419
France	(33) 825303132
Germany	(49) 02104 960 664
Hungary	(420) 28401 5911
Ireland	(44) 01908 635245
Italy (Brescia, Milano e Padova)	(39) 199 11 99 00
Italy (Napoli, Roma e Torino)	(39) 199 11 99 22
Morocco	(33) 825303132
Netherlands	(31) 297 543543
Poland	(48) 22 32 60 707
Portugal	(1) 440 646 3223
Slovakia	(420) 284015911
Spain	(34) 902 30 93 30
Sweden	(46) 46 19 93 91
Switzerland (German)	(41) 0844 84 84 11
Switzerland (French)	(41) 0844 84 84 12
Switzerland (Italian)	(41) 0844 84 84 13
United Kingdom	(44) 01908 635245
<b>North America</b>	
Canada	(1) 440-646-3223
United States	(1) 440-646-3223

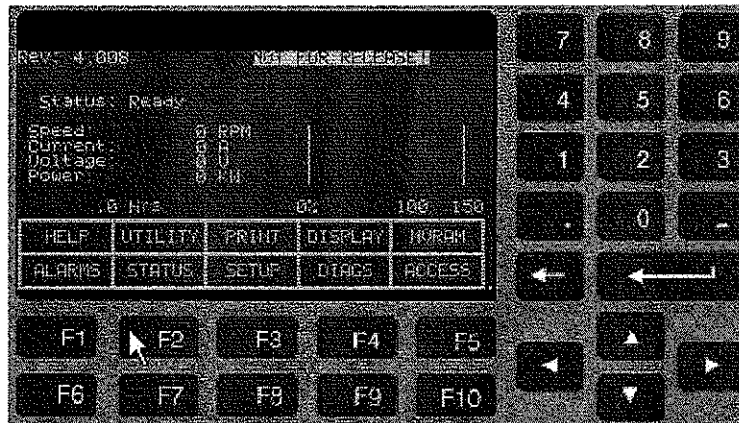
If you have a TechConnect contract, please use the telephone number supplied to you with the contract.

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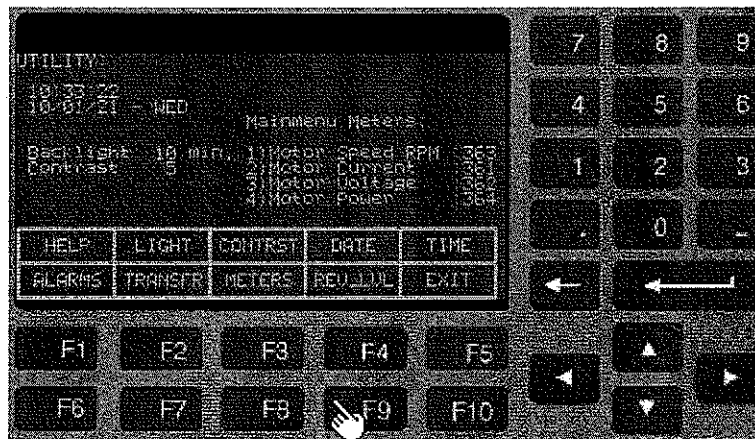
## Appendix B-1 Determine Whether You Have a ForGe or Classic Control Platform

To view the drive firmware from the drive terminal, press the function keys in the following order.

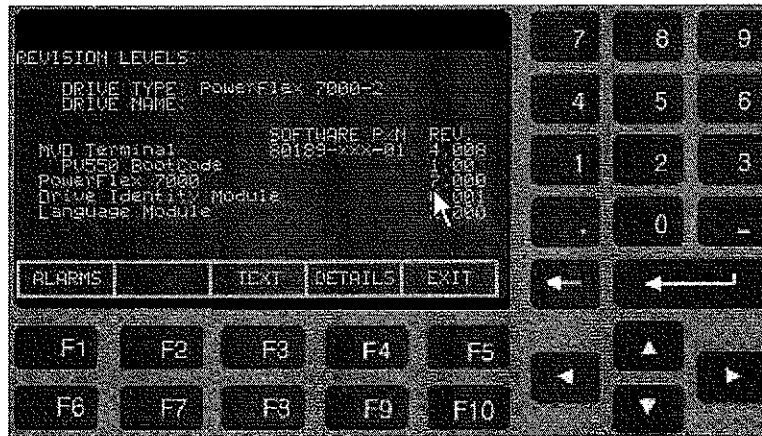
From the main screen, press **F2** (Utility) then press **→ F9** (REV\_LVL). At the Rev Level screen (bottom screenshot) the cursor arrow points to the PowerFlex 7000 firmware revision level. The firmware level shown will be 7.xxx or later for the ForGe Control platform, and 6.xxx or earlier for the Classic Control platform.



Step 1 – press Function Key 'F2'.



Step 2 – press Function Key 'F9'.



Step 3 – record firmware revision level as shown on 'PowerFlex 7000' row.

Appendix B-2

Catalog Number Explanation for PowerFlex 7000 VFDs

Position						
First	Second	Third	Fourth	Fifth	Sixth	Seventh
7000	A	40	D	A	RPDTD	1 - ... etc.
Bulletin Number	Service Duty / Altitude Code	Current Rating	Enclosure Type	Line and Control Voltages	Rectifier Configuration / Line Impedance Type	Options: refer to PowerFlex 7000 Medium Voltage Drives Global Price List

Code	Description	Code	Description	Code	Description
7000A	"A" Frame (Air Cooled)	D	Type 1 w/gasket (IP21)	RPDTD	AFE Rectifier with Integral Line Reactor and Direct-to-Drive DC Link
7000	"B" Frame (Air Cooled)	T	Type 1 w/gasket (IP21) - Seismic rated	RPTX	AFE Rectifier with provision for connection to separate Isolation Transformer (standard DC Link)
7000L	"C" Frame (Liquid Cooled)	K	Type 12 w/vents and filters (IP42)	RPTXI	AFE Rectifier with integral Isolation Transformer (standard DC Link)
		U	Type 12 w/vents and filters (IP42) - Seismic rated	RPLR	AFE Rectifier with Integral Line Reactor and Standard DC Link
				R6TX	6 Pulse Rectifier with provision for connection to separate Isolation Transformer (standard DC Link)
				R18TX	18 Pulse Rectifier with provision for connection to separate Isolation Transformer (standard DC Link)

Code	Description
A	Normal Duty, 0-1000 m Altitude (Maximum 40°C Ambient)
B	Normal Duty, 1001-5000 m Altitude (Reduced Ambient)
	1001 - 2000 m = 37.5°C
	2001 - 3000 m = 35°C
	3001 - 4000 m = 32.5°C
4001 - 5000 m = 30°C	
C	Heavy Duty, 0-1000 m Altitude (Maximum 40°C Ambient)
D	Heavy Duty, 1001-5000 m Altitude (Reduced Ambient - Same as 'B' above)
E	Normal Duty, 0-1000 m Altitude (35°C Ambient)
F	Normal Duty, 1001-5000 m Altitude (Reduced Ambient)
	1001 - 2000 m = 32.5°C
	2001 - 3000 m = 30°C
	3001 - 4000 m = 27.5°C
4001 - 5000 m = 25°C	
J	Normal Duty, 0-1000 m Altitude (Maximum 50°C Ambient)
L	Heavy Duty, 0-1000 m Altitude (Maximum 50°C Ambient)
Z	Custom Configuration (Contact Factory)

Code	Description
40	40 Amp
46	46 Amp
53	53 Amp
61	61 Amp
70	70 Amp
81	81 Amp
93	93 Amp
105	105 Amp
120	120 Amp
140	140 Amp
160	160 Amp
185	185 Amp
215	215 Amp
250	250 Amp
285	285 Amp
325	325 Amp
375	375 Amp
430	430 Amp
495	495 Amp
575	575 Amp
625	625 Amp
657	657 Amp

See Table "A" and "B" in Appendix "C" of publication 7000-PL040K-EN-E (PowerFlex 7000 Medium Voltage Drives Global Price List)