



CENTERLINE[®] Motor Control Centers

Power Factor Correction Capacitors for Bulletin 2100 MCC Starter Units

General Information

Power Factor Correction Capacitors (PFCCs) are typically mounted in a separate unit with a separate door. This unit is located below the specified starter. Door interlock and three phase power fuses are included. Capacitors are factory wired to the load side of the starter at the line side of the overload relay.

- Do not install capacitors in any vertical section that contains a variable frequency drive
- Capacitors should not be used on motors subject to plugging or jogging. Disconnect capacitors when bumping motor.
- 2 kVAR through 25kVAR in 0.5 space factor.
- 27.5 kVAR through 50 kVAR in 1.0 space factor.

ATTENTION

Failure to follow application notes can result in misapplications that subject the Power Factor Correction Capacitor to excessive voltage and/or current that can damage the PFCC and/or blow PFCC fuses.

Application Conditions

Power Factor Correction Capacitors (PFCCs) must **not** be subjected to:

1. **HIGH AMBIENT TEMPERATURES IN EXCESS OF 45°C (113°F).** Be cautious of NEMA Type 3R outdoor applications that can be exposed to direct sunlight.
2. **OPERATING VOLTAGE IN EXCESS OF 110% OF THE PFCC NAMEPLATE VOLTAGE.** PFCCs that are not switched with load, but float on the distribution system, can cause excessive voltage during periods when load is light. Floating PFCC kVAR must not exceed 25% of the distribution system transformer kVA rating.

- 3. VOLTAGE AND CURRENT WAVEFORMS OTHER THAN 60 HZ SINE WAVES.** Non-linear devices that employ solid state switching technology (AC & DC drives, AC reduced voltage controllers, arc-type lighting, programmable controllers, computers, induction furnaces, etc.) produce distorted non-sinusoidal wave forms and harmonics that can blow PFCC fuses and/or damage PFCCs due to high current because of reduced capacitive reactance and/or capacitive-inductive resonance. Do not connect a PFCC to the load side of a Bulletin 150 SMC controller or any AC Drive.
- 4. VARIABLE FREQUENCY VOLTAGE THAT CAN BE PRODUCED BY A MOTOR THAT ACTS AS A GENERATOR** when disconnected from power source, supplied with magnetizing current from PFCCs connected to the motor stator windings, and driven by the load at a sufficient and decreasing speed. Be cautious of fan application in particular. Also be cautious of high inertia loads such as bandsaws, centrifuges, chippers, hammer mills, etc.
- 5. REPETITIVE SWITCHING DUE TO JOGGING, INCHING, RESTARTING,** etc. which can occur via two or three wire, automatic or manual control. Be cautious in the use of protective relays (B813S-V_) that reset automatically. Be cautious of how HAND-OFF-AUTO selector switches are utilized and how auto control devices function. PFCC voltage must discharge to a minimum level before the PFCC is reenergized.
- 6. PLUGGING.** NOTE: A standard reversing starter could inadvertently be used to plug a motor by an operator or via a control scheme by others.
- 7. OPEN-TRANSITION SWITCHING** via reversing and multi-speed starters and via open-transition type Wye-Delta and autotransformer starters.
- 8. INDUCED VOLTAGES AND CURRENTS** produced via transformer action in isolated motor windings connected to a PFCC while other windings in the same motor are energized, when multispeed or part-winding motors are utilized. These conditions could be harmful to the motor and/or cause it to malfunction.

NOTE: As PFCCs might be inadvertently subjected to these detrimental application conditions during startup, it is recommended that PFCCs be isolated until the end of the start up process by removing PFCC fuses.

Alternatives

Instead of energizing and de-energizing a PFCC along with a motor, a lighting contactor can be utilized to connect and disconnect a PFCC to the power circuit at a point upstream of the controller or starter at the appropriate time by an appropriate contact or contacts.

If there is no space in the starter for a lighting contactor, a separate Bulletin 2102L or 2103L lighting contactor unit could be utilized.

Each PFCC connected to the power system will add to the capacity of that power system to increase inrush current to PFCCs subsequently connected to the power system. Measures may have to be taken to reduce PFCC inrush current. PFCCs may have to be located further upstream and controlled by special PFCC switching equipment that might control PFCC inrush current and/or harmonics in the power system.

For further information, contact the Motor Control Center Business Technical Support. Contact Technical Support by calling 1-440-646-5800 or by e-mailing RAMCCSupport@ra.rockwell.com.

www.rockwellautomation.com

Corporate Headquarters

Rockwell Automation, 777 East Wisconsin Avenue, Suite 1400, Milwaukee, WI, 53202-5302 USA, Tel: (1) 414.212.5200, Fax: (1) 414.212.5201

Headquarters for Allen-Bradley Products, Rockwell Software Products and Global Manufacturing Solutions

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444

Europe/Middle East/Africa: Rockwell Automation SA/NV, Vorstlaan/Boulevard du Souverain 36, 1170 Brussels, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640

Asia Pacific: Rockwell Automation, 27/F Citicorp Centre, 18 Whitfield Road, Causeway Bay, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

Headquarters for Dodge and Reliance Electric Products

Americas: Rockwell Automation, 6040 Ponders Court, Greenville, SC 29615-4617 USA, Tel: (1) 864.297.4800, Fax: (1) 864.281.2433

Europe/Middle East/Africa: Rockwell Automation, Brühlstraße 22, D-74834 Elztal-Dallau, Germany, Tel: (49) 6261 9410, Fax: (49) 6261 17741

Asia Pacific: Rockwell Automation, 55 Newton Road, #11-01/02 Revenue House, Singapore 307987, Tel: (65) 6356-9077, Fax: (65) 6356-9011

Publication 2100-AT001A-EN-P - March 2003

Supersedes Publication 2100-4.3 - May 1997

© 2003 Rockwell International, Inc. All rights reserved. Printed in the U.S.A.