symphony™

Instruction
Harmony Series

Modular Power System III

ABB

Preface

The Modular Power System III (MPSIII) supplies 5 VDC, ±15 VDC, 24 VDC, 48 VDC, and 125 VDC power to Harmony Rack components of the Symphony Enterprise Management and Control System. The power system is designed to operate with 2N redundancy. This power system can operate with 120 VAC, 240 VAC, or 125 VDC input power.

This instruction provides specific hardware installation, troubleshooting, maintenance, and replacement information necessary for the MPSIII system. The information in this instruction applies to MPSIII systems installed in ABB cabinets.

This instruction can be used as a guide by system engineers. It is not a tutorial and assumes the reader has a general knowledge of installing and maintaining process control systems.

Some sections of this instruction have been prepared in procedure format. There is a sequence flowchart that follows the introduction to the section and any nonprocedural information. This flowchart directs personnel to the appropriate procedure located in the back of this instruction. By treating each task as a separate entity, the procedures provide an easy method for finding the information needed to perform each task. The procedures can be removed and placed in separate folders or notebooks, or carried to the job site.

The procedures have check boxes in the margin by each step. When performing a procedure, check each box as each step is completed. Some procedures have numbered warnings and / or cautions under Safety Considerations. A triangle with a warning or caution reference number appears in the margin by the part of the procedure to which the warning or caution applies.

Do not perform any procedures related to installation, maintenance, or repair until reading and understanding this instruction.

List of Effective Pages

Total number of pages in this instruction is 82, consisting of the following:

Page No.	Change Date
Preface	13 Feb 2001
List of Effective Pages	13 Feb 2001
iii through vii	13 Feb 2001
1-1 through 1-6	Original
1-7	13 Feb 2001
1-8 through 1-9	Original
2-1 through 2-2	13 Feb 2001
2-3	Original
2-4 through 2-8	13 Feb 2001
3-1 through 3-5	Original
4-1	Original
5-1 through 5-2	Original
6-1	Original
6-2	13 Feb 2001
7-1	Original
PR1-1 through PR1-3	Original
PR2-1 through PR2-4	Original
PR3-1 through PR3-2	Original
PR4-1	Original
PR4-2	13 Feb 2001
PR4-3	Original
PR5-1	Original
PR5-2 through PR5-4	13 Feb 2001
PR6-1 through PR6-2	Original
PR7-1 through PR7-2	Original
PR8-1 through PR8-4	13 Feb 2001
PR9-1 through PR9-6	Original
PR10-1 through PR10-3	13 Feb 2001
PR11-1	Original
PR11-2	13 Feb 2001
PR12-1 through PR12-2	Original
PR13-1 through PR13-2	Original
PR14-1 through PR14-2	Original
PR15-1	13 Feb 2001
PR15-2	Original
PR16-1	13 Feb 2001
PR16-2	Original
Index-1 through Index-2	13 Feb 2001

NOTE: Changed text or tables are indicated by a vertical bar adjacent to the changed area. Changed figures are indicated by a vertical bar next to the figure caption. The date appears beside the page number.

Table of Contents

Table of Contents (continued)

List of Procedures

List of Figures

List of Figures (continued)

List of Tables

Safety Summary

Electrostatic Sensitive Device
Devices labeled with this symbol require special handling precautions as described in the installation section.

GENERAL WARNINGS

Equipment Environment
All components, whether in transportation, operation or storage, must be in a noncorrosive environment.

Electrical Shock Hazard During Maintenance
Disconnect power or take precautions to insure that contact with energized parts is avoided when servicing.

SPECIFIC WARNINGS

Disconnect power before attempting these procedures. Failure to do so could result in severe or fatal shock, or equipment damage. (p. PR2-1, PR3-1, PR4-1, PR5-2, PR6-1, PR7-1, PR8-1, PR9-1, PR10-1, PR11-1, PR12-1, PR13-1, PR14-1, PR16-1)

SPECIFIC CAUTIONS

Do not use the same power level from two power chassis. Doing so will disrupt the active power sharing scheme and damage the power system. (p. PR5-2, PR9-1)

Turn off the circuit breaker on the power entry panel (PEP) corresponding to the line (LINE 1 or LINE 2) that powers the power supply tray to be removed or installed. Process upset may occur if a power supply tray is removed or installed with power applied. (PR5-2, PR10-1)

Support Services

ABB will provide assistance in the operation and repair of its products. Requests for sales or application services should be made to your nearest sales or service office. ABB can also provide installation, repair and maintenance contract services.

When ordering parts, use nomenclature or part numbers and part descriptions from equipment manuals. Parts without a description must be ordered from the nearest sales or service office. Recommended spare parts lists, including prices are available through the nearest sales or service office.

ABB has modern training facilities available for training your personnel. On-site training is also available. Contact your nearest ABB sales office for specific information and scheduling.

Additional copies of this instruction, or other instructions, can be obtained from the nearest ABB sales office at a reasonable charge.

Preface

The Modular Power System III (MPSIII) supplies 5 VDC, ±15 VDC, 24 VDC, 48 VDC, and 125 VDC power to Harmony Rack components of the Symphony Enterprise Management and Control System. The power system is designed to operate with 2N redundancy. This power system can operate with 120 VAC, 240 VAC, or 125 VDC input power.

This instruction provides specific hardware installation, troubleshooting, maintenance, and replacement information necessary for the MPSIII system. The information in this instruction applies to MPSIII systems installed in ABB cabinets.

This instruction can be used as a guide by system engineers. It is not a tutorial and assumes the reader has a general knowledge of installing and maintaining process control systems.

Some sections of this instruction have been prepared in procedure format. There is a sequence flowchart that follows the introduction to the section and any nonprocedural information. This flowchart directs personnel to the appropriate procedure located in the back of this instruction. By treating each task as a separate entity, the procedures provide an easy method for finding the information needed to perform each task. The procedures can be removed and placed in separate folders or notebooks, or carried to the job site.

The procedures have check boxes in the margin by each step. When performing a procedure, check each box as each step is completed. Some procedures have numbered warnings and / or cautions under Safety Considerations. A triangle with a warning or caution reference number appears in the margin by the part of the procedure to which the warning or caution applies.

Do not perform any procedures related to installation, maintenance, or repair until reading and understanding this instruction.

List of Effective Pages

Total number of pages in this instruction is 82, consisting of the following:

Page No.	Change Date
Preface	13 Feb 2001
List of Effective Pages	13 Feb 2001
iii through vii	13 Feb 2001
1-1 through 1-6	Original
1-7	13 Feb 2001
1-8 through 1-9	Original
2-1 through 2-2	13 Feb 2001
2-3	Original
2-4 through 2-8	13 Feb 2001
3-1 through 3-5	Original
4-1	Original
5-1 through 5-2	Original
6-1	Original
6-2	13 Feb 2001
7-1	Original
PR1-1 through PR1-3	Original
PR2-1 through PR2-4	Original
PR3-1 through PR3-2	Original
PR4-1	Original
PR4-2	13 Feb 2001
PR4-3	Original
PR5-1	Original
PR5-2 through PR5-4	13 Feb 2001
PR6-1 through PR6-2	Original
PR7-1 through PR7-2	Original
PR8-1 through PR8-4	13 Feb 2001
PR9-1 through PR9-6	Original
PR10-1 through PR10-3	13 Feb 2001
PR11-1	Original
PR11-2	13 Feb 2001
PR12-1 through PR12-2	Original
PR13-1 through PR13-2	Original
PR14-1 through PR14-2	Original
PR15-1	13 Feb 2001
PR15-2	Original
PR16-1	13 Feb 2001
PR16-2	Original
Index-1 through Index-2	13 Feb 2001

NOTE: Changed text or tables are indicated by a vertical bar adjacent to the changed area. Changed figures are indicated by a vertical bar next to the figure caption. The date appears beside the page number.

Table of Contents

Table of Contents (continued)

List of Procedures

List of Figures

List of Figures (continued)

List of Tables

Safety Summary

Electrostatic Sensitive Device
Devices labeled with this symbol require special handling precautions as described in the installation section.

GENERAL WARNINGS

Equipment Environment
All components, whether in transportation, operation or storage, must be in a noncorrosive environment.

Electrical Shock Hazard During Maintenance
Disconnect power or take precautions to insure that contact with energized parts is avoided when servicing.

SPECIFIC WARNINGS

Disconnect power before attempting these procedures. Failure to do so could result in severe or fatal shock, or equipment damage. (p. PR2-1, PR3-1, PR4-1, PR5-2, PR6-1, PR7-1, PR8-1, PR9-1, PR10-1, PR11-1, PR12-1, PR13-1, PR14-1, PR16-1)

SPECIFIC CAUTIONS

Do not use the same power level from two power chassis. Doing so will disrupt the active power sharing scheme and damage the power system. (p. PR5-2, PR9-1)

Turn off the circuit breaker on the power entry panel (PEP) corresponding to the line (LINE 1 or LINE 2) that powers the power supply tray to be removed or installed. Process upset may occur if a power supply tray is removed or installed with power applied. (PR5-2, PR10-1)

Support Services

ABB will provide assistance in the operation and repair of its products. Requests for sales or application services should be made to your nearest sales or service office. ABB can also provide installation, repair and maintenance contract services.

When ordering parts, use nomenclature or part numbers and part descriptions from equipment manuals. Parts without a description must be ordered from the nearest sales or service office. Recommended spare parts lists, including prices are available through the nearest sales or service office.

ABB has modern training facilities available for training your personnel. On-site training is also available. Contact your nearest ABB sales office for specific information and scheduling.

Additional copies of this instruction, or other instructions, can be obtained from the nearest ABB sales office at a reasonable charge.

Preface

The Modular Power System III (MPSIII) supplies 5 VDC, ±15 VDC, 24 VDC, 48 VDC, and 125 VDC power to Harmony Rack components of the Symphony Enterprise Management and Control System. The power system is designed to operate with 2N redundancy. This power system can operate with 120 VAC, 240 VAC, or 125 VDC input power.

This instruction provides specific hardware installation, troubleshooting, maintenance, and replacement information necessary for the MPSIII system. The information in this instruction applies to MPSIII systems installed in ABB cabinets.

This instruction can be used as a guide by system engineers. It is not a tutorial and assumes the reader has a general knowledge of installing and maintaining process control systems.

Some sections of this instruction have been prepared in procedure format. There is a sequence flowchart that follows the introduction to the section and any nonprocedural information. This flowchart directs personnel to the appropriate procedure located in the back of this instruction. By treating each task as a separate entity, the procedures provide an easy method for finding the information needed to perform each task. The procedures can be removed and placed in separate folders or notebooks, or carried to the job site.

The procedures have check boxes in the margin by each step. When performing a procedure, check each box as each step is completed. Some procedures have numbered warnings and / or cautions under Safety Considerations. A triangle with a warning or caution reference number appears in the margin by the part of the procedure to which the warning or caution applies.

Do not perform any procedures related to installation, maintenance, or repair until reading and understanding this instruction.

List of Effective Pages

Total number of pages in this instruction is 82, consisting of the following:

Page No.	Change Date
Preface	13 Feb 2001
List of Effective Pages	13 Feb 2001
iii through vii	13 Feb 2001
1-1 through 1-6	Original
1-7	13 Feb 2001
1-8 through 1-9	Original
2-1 through 2-2	13 Feb 2001
2-3	Original
2-4 through 2-8	13 Feb 2001
3-1 through 3-5	Original
4-1	Original
5-1 through 5-2	Original
6-1	Original
6-2	13 Feb 2001
7-1	Original
PR1-1 through PR1-3	Original
PR2-1 through PR2-4	Original
PR3-1 through PR3-2	Original
PR4-1	Original
PR4-2	13 Feb 2001
PR4-3	Original
PR5-1	Original
PR5-2 through PR5-4	13 Feb 2001
PR6-1 through PR6-2	Original
PR7-1 through PR7-2	Original
PR8-1 through PR8-4	13 Feb 2001
PR9-1 through PR9-6	Original
PR10-1 through PR10-3	13 Feb 2001
PR11-1	Original
PR11-2	13 Feb 2001
PR12-1 through PR12-2	Original
PR13-1 through PR13-2	Original
PR14-1 through PR14-2	Original
PR15-1	13 Feb 2001
PR15-2	Original
PR16-1	13 Feb 2001
PR16-2	Original
Index-1 through Index-2	13 Feb 2001

NOTE: Changed text or tables are indicated by a vertical bar adjacent to the changed area. Changed figures are indicated by a vertical bar next to the figure caption. The date appears beside the page number.

Table of Contents

Table of Contents (continued)

List of Procedures

List of Figures

List of Figures (continued)

List of Tables

Safety Summary

Electrostatic Sensitive Device
Devices labeled with this symbol require special handling precautions as described in the installation section.

GENERAL WARNINGS

Equipment Environment
All components, whether in transportation, operation or storage, must be in a noncorrosive environment.

Electrical Shock Hazard During Maintenance
Disconnect power or take precautions to insure that contact with energized parts is avoided when servicing.

SPECIFIC WARNINGS

Disconnect power before attempting these procedures. Failure to do so could result in severe or fatal shock, or equipment damage. (p. PR2-1, PR3-1, PR4-1, PR5-2, PR6-1, PR7-1, PR8-1, PR9-1, PR10-1, PR11-1, PR12-1, PR13-1, PR14-1, PR16-1)

SPECIFIC CAUTIONS

Do not use the same power level from two power chassis. Doing so will disrupt the active power sharing scheme and damage the power system. (p. PR5-2, PR9-1)

Turn off the circuit breaker on the power entry panel (PEP) corresponding to the line (LINE 1 or LINE 2) that powers the power supply tray to be removed or installed. Process upset may occur if a power supply tray is removed or installed with power applied. (PR5-2, PR10-1)

Support Services

ABB will provide assistance in the operation and repair of its products. Requests for sales or application services should be made to your nearest sales or service office. ABB can also provide installation, repair and maintenance contract services.

When ordering parts, use nomenclature or part numbers and part descriptions from equipment manuals. Parts without a description must be ordered from the nearest sales or service office. Recommended spare parts lists, including prices are available through the nearest sales or service office.

ABB has modern training facilities available for training your personnel. On-site training is also available. Contact your nearest ABB sales office for specific information and scheduling.

Additional copies of this instruction, or other instructions, can be obtained from the nearest ABB sales office at a reasonable charge.

Preface

The Modular Power System III (MPSIII) supplies 5 VDC, ±15 VDC, 24 VDC, 48 VDC, and 125 VDC power to Harmony Rack components of the Symphony Enterprise Management and Control System. The power system is designed to operate with 2N redundancy. This power system can operate with 120 VAC, 240 VAC, or 125 VDC input power.

This instruction provides specific hardware installation, troubleshooting, maintenance, and replacement information necessary for the MPSIII system. The information in this instruction applies to MPSIII systems installed in ABB cabinets.

This instruction can be used as a guide by system engineers. It is not a tutorial and assumes the reader has a general knowledge of installing and maintaining process control systems.

Some sections of this instruction have been prepared in procedure format. There is a sequence flowchart that follows the introduction to the section and any nonprocedural information. This flowchart directs personnel to the appropriate procedure located in the back of this instruction. By treating each task as a separate entity, the procedures provide an easy method for finding the information needed to perform each task. The procedures can be removed and placed in separate folders or notebooks, or carried to the job site.

The procedures have check boxes in the margin by each step. When performing a procedure, check each box as each step is completed. Some procedures have numbered warnings and / or cautions under Safety Considerations. A triangle with a warning or caution reference number appears in the margin by the part of the procedure to which the warning or caution applies.

Do not perform any procedures related to installation, maintenance, or repair until reading and understanding this instruction.

List of Effective Pages

Total number of pages in this instruction is 82, consisting of the following:

Page No.	Change Date
Preface	13 Feb 2001
List of Effective Pages	13 Feb 2001
iii through vii	13 Feb 2001
1-1 through 1-6	Original
1-7	13 Feb 2001
1-8 through 1-9	Original
2-1 through 2-2	13 Feb 2001
2-3	Original
2-4 through 2-8	13 Feb 2001
3-1 through 3-5	Original
4-1	Original
5-1 through 5-2	Original
6-1	Original
6-2	13 Feb 2001
7-1	Original
PR1-1 through PR1-3	Original
PR2-1 through PR2-4	Original
PR3-1 through PR3-2	Original
PR4-1	Original
PR4-2	13 Feb 2001
PR4-3	Original
PR5-1	Original
PR5-2 through PR5-4	13 Feb 2001
PR6-1 through PR6-2	Original
PR7-1 through PR7-2	Original
PR8-1 through PR8-4	13 Feb 2001
PR9-1 through PR9-6	Original
PR10-1 through PR10-3	13 Feb 2001
PR11-1	Original
PR11-2	13 Feb 2001
PR12-1 through PR12-2	Original
PR13-1 through PR13-2	Original
PR14-1 through PR14-2	Original
PR15-1	13 Feb 2001
PR15-2	Original
PR16-1	13 Feb 2001
PR16-2	Original
Index-1 through Index-2	13 Feb 2001

NOTE: Changed text or tables are indicated by a vertical bar adjacent to the changed area. Changed figures are indicated by a vertical bar next to the figure caption. The date appears beside the page number.

Table of Contents

Table of Contents (continued)

List of Procedures

List of Figures

List of Figures (continued)

List of Tables

Safety Summary

Electrostatic Sensitive Device
Devices labeled with this symbol require special handling precautions as described in the installation section.

GENERAL WARNINGS

Equipment Environment
All components, whether in transportation, operation or storage, must be in a noncorrosive environment.

Electrical Shock Hazard During Maintenance
Disconnect power or take precautions to insure that contact with energized parts is avoided when servicing.

SPECIFIC WARNINGS

Disconnect power before attempting these procedures. Failure to do so could result in severe or fatal shock, or equipment damage. (p. PR2-1, PR3-1, PR4-1, PR5-2, PR6-1, PR7-1, PR8-1, PR9-1, PR10-1, PR11-1, PR12-1, PR13-1, PR14-1, PR16-1)

SPECIFIC CAUTIONS

Do not use the same power level from two power chassis. Doing so will disrupt the active power sharing scheme and damage the power system. (p. PR5-2, PR9-1)

Turn off the circuit breaker on the power entry panel (PEP) corresponding to the line (LINE 1 or LINE 2) that powers the power supply tray to be removed or installed. Process upset may occur if a power supply tray is removed or installed with power applied. (PR5-2, PR10-1)

Support Services

ABB will provide assistance in the operation and repair of its products. Requests for sales or application services should be made to your nearest sales or service office. ABB can also provide installation, repair and maintenance contract services.

When ordering parts, use nomenclature or part numbers and part descriptions from equipment manuals. Parts without a description must be ordered from the nearest sales or service office. Recommended spare parts lists, including prices are available through the nearest sales or service office.

ABB has modern training facilities available for training your personnel. On-site training is also available. Contact your nearest ABB sales office for specific information and scheduling.

Additional copies of this instruction, or other instructions, can be obtained from the nearest ABB sales office at a reasonable charge.

Introduction

Section 1

Overview

The Modular Power System III (MPSIII) supplies 5 VDC, 15 VDC, -15 VDC, 24 VDC, 48 VDC, and 125 VDC power to Harmony Rack components of Symphony Enterprise Management and Control Systems. A single power chassis system consists of a power chassis, two power supply trays, a power entry panel (PEP), a fan assembly, and a DC bus monitoring assembly. A dual power chassis system consists of two power chassis, four power supply trays, a PEP, a fan assembly, and a DC bus monitoring assembly.

NOTE: The 24 VDC supply is nominally 25.5 VDC; however, throughout this instruction it is referred to as the 24 VDC supply.

The MPSIII system is designed to operate with 2N power redundancy. It directly accepts 120 VAC, 240 VAC, and 125 VDC inputs with no switches or jumpers to set.

Intended User

This instruction is intended for engineers, technicians, and system designers as a source of technical information on the MPSIII system. It should be used by those installing, operating, troubleshooting, maintaining, and replacing the system or system components.

Personnel working with the power system should:

- Have experience working with AC and DC power.
- Know what safety precautions to take when working with AC and DC power.
- Have experience and knowledge of working with basic electronic test equipment.
- Have training in and experience working with electrical and electronic principles.

Applications

The MPSIII system is compatible with Harmony Rack systems and INFI 90® OPEN systems.

It is a direct replacement for MPSII systems, used in Harmony Rack systems, in their entireties. Components of the previous power systems are not compatible with this power system. The MPSIII system fits in the same cabinet space as the MPSII system, but may require additional mounting provisions.

NOTE: The MPSIII system incorporates an optional rear cabinet door fan for supplemental cooling. Most MPSII systems do not have this fan.

Features

Features of the MPSIII system include:

- ***Power Factor Correction.*** AC inputs have active power factor correction to greater than 0.95.
- ***Online Replaceable Components.*** Power supply trays may be replaced while system is operating.
- ***Monitoring Functions.*** Monitors supplies, fans, and cabinet temperature.
- ***Directly Accepts 120 VAC, 240 VAC, or 125 VDC Inputs.*** No switches or jumpers to set.

Instruction Content

This instruction contains information on the MPSIII system. It is organized into seven sections and a set of procedures. After becoming completely familiar with it and the equipment it describes, it may be used as a reference.

Introduction — Contains general information, nomenclature, and product specifications.

Description and Operation — Provides detailed descriptions of the components of the MPSIII system.

Installation — Provides an introduction into the procedures involved in placing the MPSIII system into operation. Provides installation

sequence flowcharts that direct installation personnel to the appropriate procedures.

Troubleshooting — Provides information on the status indicators on the power supply trays and fan assembly.

Maintenance — Provides an introduction into the routine maintenance of the power system. Includes a preventive maintenance schedule that includes references to applicable procedures.

Replacement Procedures — Provides an introduction into the procedures involved in replacing power system components. Includes a repair and replacement sequence flowchart that directs repair personnel to the appropriate procedures.

Spare Parts — Includes a spare parts list.

Procedures PR1 through PR16 — Provide procedures for each task.

How to use this Instruction

Read this entire instruction carefully before attempting to install, maintain, or repair the power system. After gaining a complete understanding of this instruction and the power system, it can be used as a reference.

Some sections of this instruction have been prepared in procedure format. There are flowcharts that follow the introduction to the section and any nonprocedural information. These flowcharts direct personnel to the appropriate procedure. By treating each task as a separate entity, the procedures provide an easy method for finding the information needed to perform each task. The procedures can be removed and placed into separate folders or notebooks, or carried to the job site.

Each procedure lists the recommended tools to perform that procedure.

Document Conventions

This document uses standard text conventions:

Revision variable — A ? indicates a value that may change depending on the version of an item. Example:

Part number: 1234567?0
Part number: 1234567??

Glossary of Terms and Abbreviations

Table 1-1 contains those terms and abbreviations that are unique to ABB or have a definition that is different from standard industry usage.

Table 1-1. Glossary of Terms and Abbreviations

Term	Definition
Installation location	The specific area within the installation site in which equipment is, or will be positioned. There may be several installation locations within an installation site.
Installation site	The facility on site that includes the area occupied, or to be occupied, by a structure or set of structures.
PEP	Power entry panel.
PFI	Power fail interrupt. A signal that causes active controllers to reset and the communication system to be bypassed, when generated in the system by an out of tolerance bus voltage.

Reference Documents

Table 1-2 lists ABB documents directly referred to in this instruction.

Table 1-2. Reference Documents

Number	Title
WBPEEUI200505??	Site Planning
WBPEEUI210503??	Symphony Enclosures

Nomenclature

Table 1-3 contains the nomenclatures used in this instruction.

Table 1-3. Nomenclature

Position 1 2 3 4 5 6 7 8 9	10	11	12	13	14	15	16	17	Modular Power System III
									Power Supply Trays[1]
P - HA - RPS -	0	0	0	1	0	0	0	0	125 VDC at 2.3 A
-	0	0	2	0	0	0	0	0	48 VDC at 8.5 A
-	0	2	0	1	0	0	0	0	24 VDC at 17 A, 125 VDC at 2.3 A
-	0	2	2	0	0	0	0	0	24 VDC at 17 A, 48 VDC at 8.5 A
-	0	3	0	0	0	0	0	0	24 VDC at 17 A (dual output, 34 A total)
-	1	1	0	0	0	0	0	0	5 VDC at 14 A, ±15 VDC at 1 A each, 24 VDC at 6 A
-	1	1	0	1	0	0	0	0	5 VDC at 14 A, ±15 VDC at 1 A each, 24 VDC at 6 A, 125 VDC at 2.3 A
-	1	1	1	0	0	0	0	0	5 VDC at 14 A, ±15 VDC at 1 A each, 24 VDC at 6A, 48 VDC at 3 A
-	2	1	0	0	0	0	0	0	5 VDC at 20 A, ±15 VDC at 3 A each, 24 VDC at 6 A
-	2	1	0	1	0	0	0	0	5 VDC at 20 A, ±15 VDC at 3 A each, 24 VDC at 6 A, 125 VDC at 2.3 A
-	2	1	2	0	0	0	0	0	5 VDC at 20 A, ±15 VDC at 3 A each, 24 VDC at 6 A, 48 VDC at 8.5 A
-	3	2	0	0	0	0	0	0	5 VDC at 60 A, ±15 VDC at 3 A each, 24 VDC at 17 A
-	3	2	0	1	0	0	0	0	5 VDC at 60 A, ±15 VDC at 3 A each, 24 VDC at 17 A, 125 VDC at 2.3 A[2]
-	3	2	2	0	0	0	0	0	5 VDC at 60 A, ±15 VDC at 3 A each, 24 VDC at 17 A, 48 VDC at 8.5 A[2]
-	4	0	0	0	0	0	0	0	5 VDC at 100 A, ±15 VDC at 8 A each
P - HA - RPS -	C	H	1	0	0	0	0	0	**Power Chassis**
P - HA - RPS -	F	A	N	0	3	0	0	0	**Fan Assembly**
									Power Entry Panel[3]
P - HA - RPS -	P	E	P	1	1	0	1	2	Single chassis, 120/240 VAC main, 120/240 VAC aux, Category II
				1	1	0	2	2	Single chassis, 120/240 VAC main, 125 VDC aux, Category II
				1	2	0	0	2	Single chassis, 125 VDC main, 125 VDC aux, Category II
				1	1	0	1	3	Single chassis, 120/240 VAC main, 120/240 VAC aux, Category III
				1	1	0	2	3	Single chassis, 120/240 VAC main, 125 VDC aux, Category III
				1	2	0	0	3	Single chassis, 125 VDC main, 125 VDC aux, Category III
				2	1	0	1	2	Dual chassis, 120/240 VAC main, 120/240 VAC aux, Category II
				2	1	0	2	2	Dual chassis, 120/240 VAC main, 125 VDC aux, Category II
				2	2	0	0	2	Dual chassis, 125 VDC main, 125 VDC aux, Category II
				2	1	0	1	3	Dual chassis, 120/240 VAC main, 120/240 VAC aux, Category III
				2	1	0	2	3	Dual chassis, 120/240 VAC main, 125 VDC aux, Category III
				2	2	0	0	3	Dual chassis, 125 VDC main, 125 VDC aux, Category III

NOTES:

1. Voltage and amperage ratings are at 50°C (122°F). At temps above 50°C (122°F), the amperage rating is reduced 2.5% per °C rise to a max. of 70°C (158°F) where only 50% of the amperage rating is available.
2. The max. output power for these power supply trays is 816 W.
3. Category III power entry panels have 2 transient suppressors; Category II panels are without transient suppressors.

Specifications

Table 1-4 lists the specifications for the MPSIII system.

Table 1-4. Specifications

Property	Characteristic/Value
General	
Power input Voltage	 102 to 265 VAC, 102 to 144 VDC
Current	12.5 A per power supply max.
Peak inrush current	40 A peak
Frequency	47 to 63 Hz
Total harmonic distortion	Less than 5%
Efficiency	70% at full load
Power factor	Actively corrected to 0.95 min at input currents greater than 5 A
Power module chassis Output bus capacity	 100 A at 5.1 VDC max. 8 A at ±15.1 VDC max. 35 A at 25.5 VDC max. 9 A at 49.1 VDC max. 5 A at 125.6 VDC max.
Power entry disconnect device	Separate disconnect switch/circuit breaker provided for each power supply
Circuit Breaker Rating	25 A
System fans Input power	 Fan assembly: 0.75 A nominal at 24 VDC Door fan (optional): 0.70 A nominal at 24 VDC
Weight and dimensions	**P-HA-RPS-CH100000:** 431.8-mm wide x 431.8-mm deep x 88.9-mm high (17.00 x 17.00 x 3.50 in.), 16.1 kg (35.5 lbs) with 2 power supplies installed **P-HA-RPS-PEP?????:** 431.8-mm wide x 152.4-mm deep x 222.3-mm high (17.00 x 6.00 x 8.75 in.), 4.5 kg (10.0 lbs) **P-HA-RPS-FAN03000:** 439.4-mm wide x 330.2-mm deep x 44.5-mm high (17.30 x 13.00 x 1.75 in.), 6.8 kg (15.0 lbs)
Electromagnetic/radio frequency interference	Meets IEC 1000-4-3, level 3, 80 MHz to 1 GHz and IEC 1000-4-8, level 4, 30 A/m, 50 Hz with no loss of function or false status information.

Table 1-4. Specifications *(continued)*

Property	Characteristic/Value
Fast transient/burst susceptibility	Meets IEC 1000-4-4, level 3, mains 2 kV at 5 kHz, outputs 1 kV at 5.0 kHz with no degradation or loss of function.
Transient surge	Meets IEC 1000-4-5, level 3, 2 kV with no degradation or loss of function.
Electrostatic discharge	Meets IEC 1000-4-2, level 3 with no degradation or loss of function.
Environmental	
Temperature	
Operating enclosure (int)	0° to 70°C (32° to 158°F) with derating from 50°C (-2.5% per °C)
Operating enclosure (ext)	0° to 55°C (32° to 131°F) with derating from 50°C (-2.5% per °C)
Storage and transport	-40° to 85°C (-40° to 185°F)
Relative humidity	
Operating	20% to 90% up to 55°C (131°F) noncondensing 20% to 45% at 55° to 70°C (131° to 158°F) noncondensing
Altitude	
Operating	Sea level to 3,048 m (10,000 ft)
Storage and transport	Up to 9,144 m (30,000 ft)
Air quality	Noncorrosive per ISA S71.04 class LA, LB, LC Severity Level 1
Overvoltage category	IEC 1010-1, Category II or III, for mains
Vibration	13.2 to 100 Hz, 0.7 G 2 to 13.2 Hz, 12 mm (0.47 in.) peak-to-peak displacement
Certifications	
Canadian Standards Association (CSA)	Certified for use as process control equipment in an ordinary (nonhazardous) location.
Factory Mutual (FM)	Approval pending for the following categories: Nonincendive for Class I; Division 2; Groups A,B,C,D T4
	CE mark, low voltage directive, EMC Directive when used in appropriate cabinet

Table 1-4. Specifications *(continued)*

<table>
<tr><th>Property</th><th>Characteristic/Value</th></tr>
<tr><td>Power output
Voltage/current</td><td>
<table>
<tr><th rowspan="2">Module Outputs</th><th colspan="6">Rated Voltages (VDC)</th></tr>
<tr><th>5</th><th>+15</th><th>-15</th><th>24</th><th>48</th><th>125</th></tr>
<tr><td>Nominal VDC</td><td>5.09</td><td>15.10</td><td>-15.10</td><td>25.50</td><td>49.1</td><td>125.6</td></tr>
<tr><td>Minimum VDC</td><td>5.04</td><td>14.95</td><td>-14.95</td><td>24.35</td><td>48.5</td><td>123.1</td></tr>
<tr><td>Maximum VDC</td><td>5.25</td><td>15.75</td><td>-15.75</td><td>26.80</td><td>49.6</td><td>128.1</td></tr>
<tr><td>Maximum ripple and noise (mV_{pp})</td><td>100</td><td>150</td><td>150</td><td>300</td><td>600</td><td>1,000</td></tr>
</table>
</td></tr>
<tr><td>Load sharing</td><td>Current shared equally between modules within 10% (highest current load to lowest current load) at full load for +5 VDC and +24 VDC outputs</td></tr>
<tr><td>Line regulation</td><td>±0.5% of nominal output voltage over input voltage range</td></tr>
<tr><td>Load regulation</td><td>Within specified min and max. outputs from 0% to 100% load</td></tr>
<tr><td>Hold up time</td><td>20 msecs following loss of power</td></tr>
<tr><td>Power Consumption and Heat Dissipation (max. values)</td><td>
<table>
<tr><th>Power Supply</th><th>Power Consumption (Watts)</th><th>Heat Dissipation (BTU/Hr[1])</th></tr>
<tr><td>P-HA-RPS-00010000</td><td>411</td><td>421</td></tr>
<tr><td>P-HA-RPS-00200000</td><td>583</td><td>597</td></tr>
<tr><td>P-HA-RPS-02010000</td><td>994</td><td>1,018</td></tr>
<tr><td>P-HA-RPS-02200000</td><td>1,166</td><td>1,194</td></tr>
<tr><td>P-HA-RPS-03000000</td><td>1,166</td><td>1,194</td></tr>
<tr><td>P-HA-RPS-11000000</td><td>349</td><td>357</td></tr>
<tr><td>P-HA-RPS-11010000</td><td>760</td><td>778</td></tr>
<tr><td>P-HA-RPS-11100000</td><td>554</td><td>568</td></tr>
<tr><td>P-HA-RPS-21000000</td><td>477</td><td>489</td></tr>
<tr><td>P-HA-RPS-21010000</td><td>888</td><td>909</td></tr>
<tr><td>P-HA-RPS-21200000</td><td>1,060</td><td>1,086</td></tr>
<tr><td>P-HA-RPS-32000000</td><td>1,140</td><td>1,168</td></tr>
<tr><td>P-HA-RPS-32010000[2]</td><td>1,166</td><td>1,194</td></tr>
<tr><td>P-HA-RPS-32200000[2]</td><td>1,166</td><td>1,194</td></tr>
<tr><td>P-HA-RPS-40000000</td><td>1,057</td><td>2,251</td></tr>
</table>
NOTES:
1. 70% of input power converted to output power. 30% of input power converted to heat dissipated into cabinet.
2. The max. output power for these power supply trays is 816 W.
</td></tr>
</table>

Table 1-4. Specifications *(continued)*

Property	Characteristic/Value
Monitoring functions	
System bus voltage monitor trip points	4.75 VDC for 5 VDC bus 14.75 VDC for ±15 VDC busses
Power fail interrupt (PFI)	1 output, open collector driven (nonisolated), logic 0 = power failure Logic 0 ≤0.8 VDC at 10 mA sink current Logic 1 ≥ 4.75 to 5.25 VDC at 80 µA source current
Status out	1 output, open collector driven (nonisolated), logic 0 = fault Logic 0: 0.8 VDC at 10 mA sink current Logic 1: 4.75 to Vcc at 80 µA source current

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Description and Operation

Section 2

Introduction

The MPSIII system supplies 5 VDC, 15 VDC, -15VDC, 24VDC, 48 VDC, and 125 VDC power to Harmony rack components of the Symphony control system. The MPSIII system can also be used to power INFI 90 OPEN system components.

The MPSIII system is designed to entirely replace the MPSII system used in Harmony Rack systems. Components of the MPSII and the MPSIII system are not interchangeable. The MPSIII system fits in the same cabinet space as the MPSII system, but some cabinet arrangements and types may require that additional mounting provisions be used.

NOTE: The MPSIII system has provisions for a supplemental rear door mounted fan for proper cooling. Cabinets using the MPSII system may not have had this fan.

Description

The MPSIII system consists of a power chassis, PEP, fan assembly, DC bus monitoring assembly, and power supply trays. Figure 2-1 shows the system architecture of the MPSIII system.

At the right side of the Figure 2-1, the 5 VDC, 15 VDC, and -15 VDC lines shown entering the system power bus bar are the operating voltages for the rack devices. MCOM (module common) is the return line for these voltages. The 25.5 VDC line shown entering the system power bus bar is I/O power for field devices and I/O COM is its return line.

The physical arrangement of the MPSIII system components is shown in Figure 2-2.

Power Chassis

The power chassis provides mounting slots for two redundant power supply trays, cooling fans, power output terminals, a DIN rail for the DC bus monitoring assembly, and a status

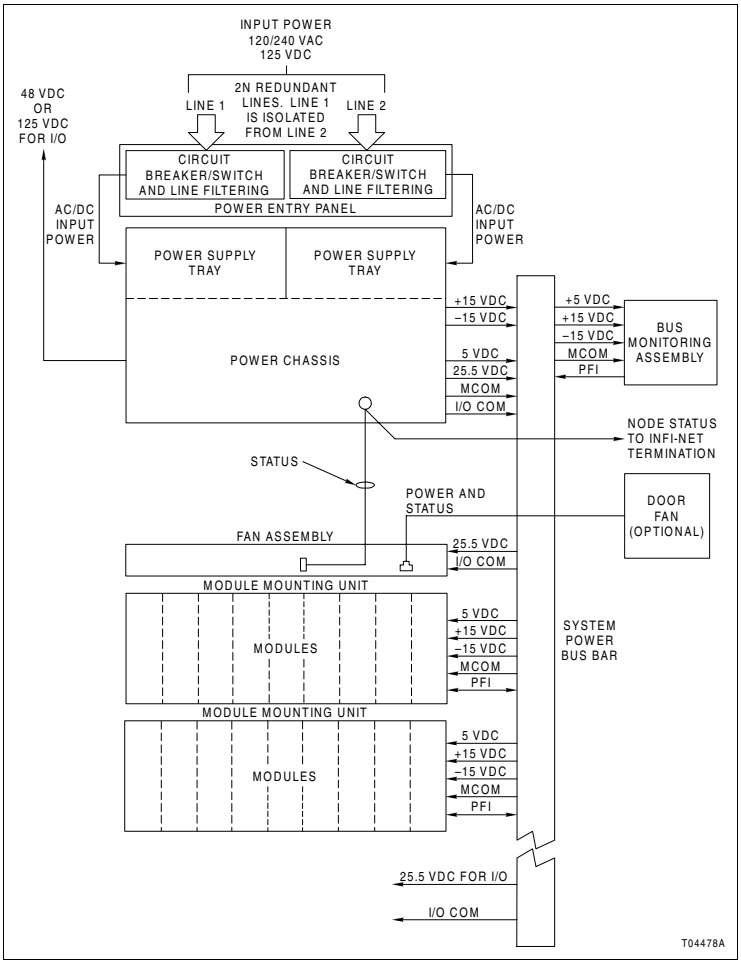

Figure 2-1. MPSIII System Architecture

output terminal connection. Cables connect the power terminals for 5 VDC, ±15 VDC, and 24 VDC to the power bus bar for distribution to the cabinet. The 48 VDC and 125 VDC terminals are for field I/O devices. Power supply trays can be removed from the power chassis and replaced while the system

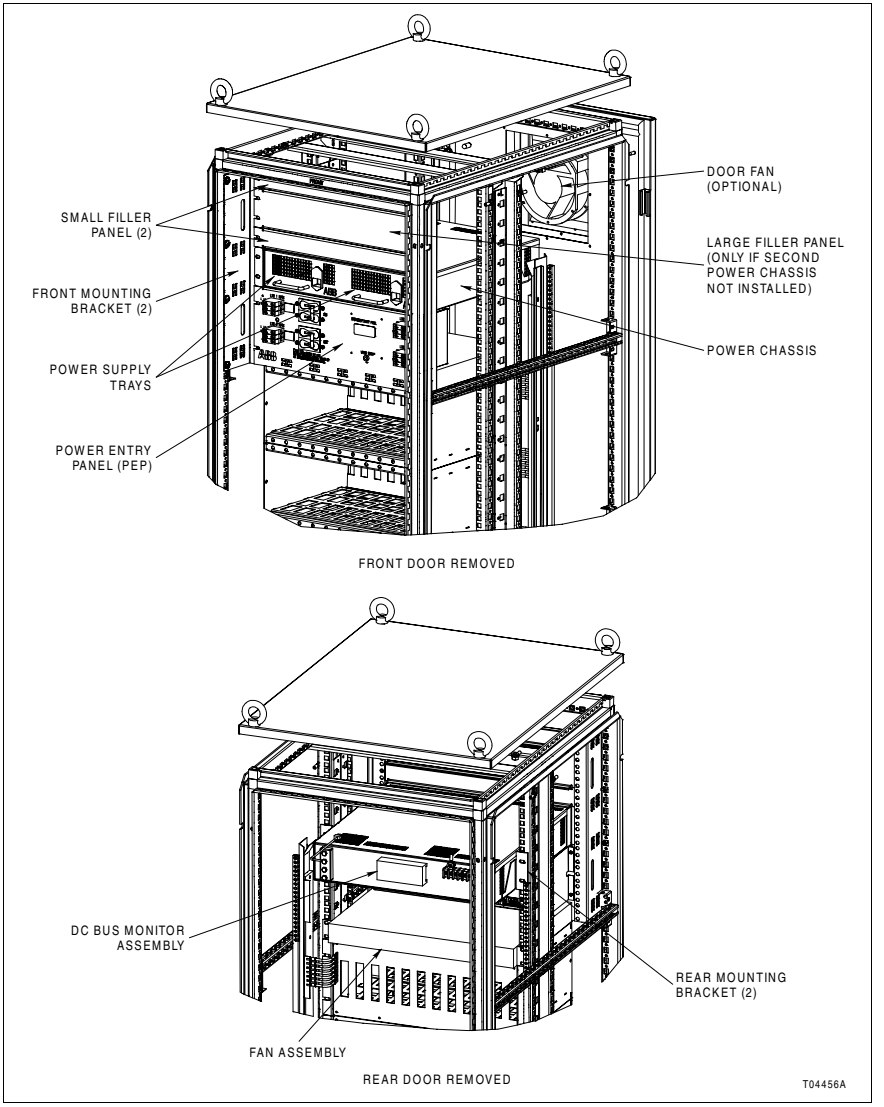

Figure 2-2. MPSIII System (Single Power Chassis)

is online. Prior to removing a power supply tray, power to that power supply tray must be switched off at the PEP. Failure to do so may generate a PFI signal and cause a process upset.

In some cases, one redundant pair of power supply trays may not provide all the power needs of the cabinet, thus requiring the installation of two power chassis; however, each voltage must be provided by only one power chassis. ***Do not attempt to connect like voltages from two power chassis, as it will result in equipment damage.*** A typical use for two power chassis has the lower power chassis providing system voltages (5 VDC, ±15 VDC) and the upper power chassis providing power for field I/O (24 VDC, 48 VDC, or 125 VDC). Figure 2-3 shows the power chassis with redundant power supply trays installed.

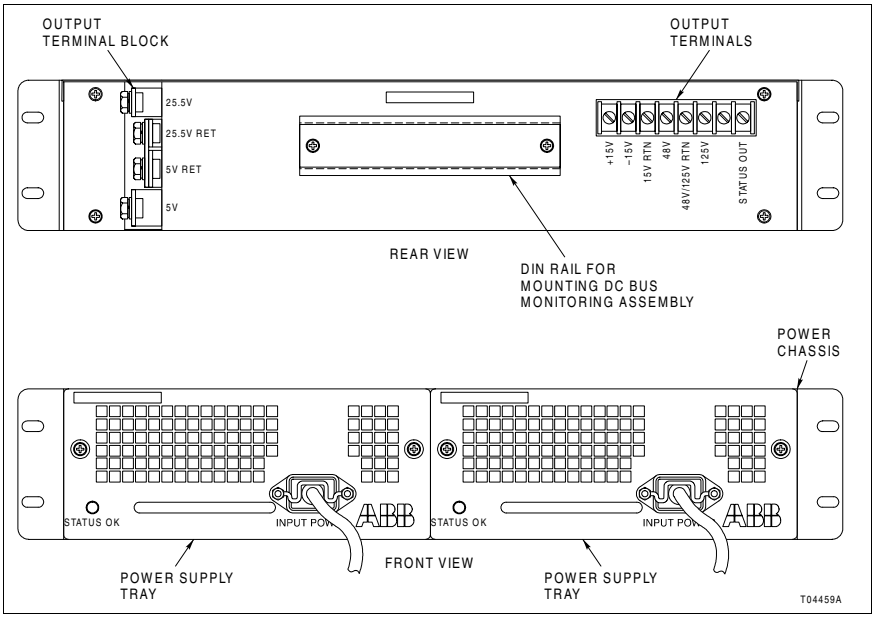

Figure 2-3. Power Chassis (Power Supply Trays Installed)

Power Supply Trays

Power supply trays slide into the power chassis and are secured with thumb screws. There are 15 different power supply trays available. Refer to ***Nomenclature*** in Section 1 for the full listing. Power supply trays installed in a power chassis must be of the same type. Power supply trays can provide combinations of 5 VDC, 15 VDC, or -15 VDC system operating voltages, and 24 VDC, 48 VDC, or 125 VDC field power. Each power supply tray can accept 120 VAC, 240 VAC, or 125 VDC input power. Input voltages to a redundant pair of power supply trays may be from different sources and of different voltages. AC inputs have active power factor correction to greater than 0.95. Sharing circuitry allows the power supply trays to equally share output current. The power supply tray monitors its output and internal temperature and displays the status with an LED. Input power to each power supply tray is provided by a cord that connects to the PEP. Figure 2-4 shows the layout of the power supply tray.

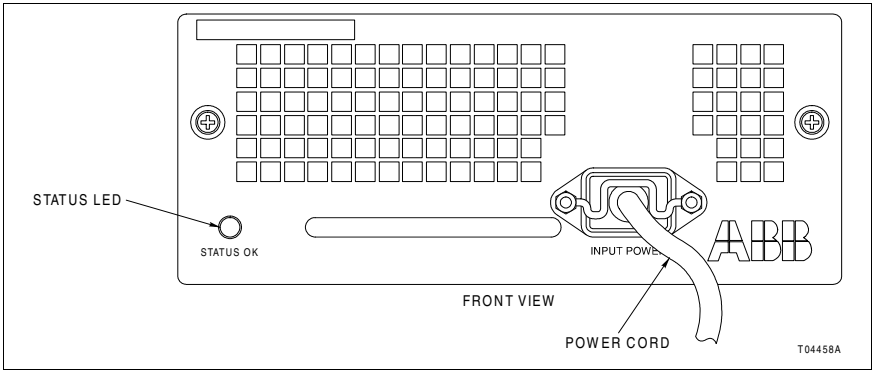

Figure 2-4. Power Supply Tray

Power Entry Panel (PEP)

There are twelve available power entry panel parts kits. They are essentially the same, differing in the number of chassis that can connect to them, the presence of transient surge suppressors (required for Overvoltage Category III), and the circuit breakers installed depending on input voltages. Refer to

Nomenclature in Section 1 for a detailed listing of the power entry panels available.

When ordered by nomenclature, each PEP comes with the components listed in Table 2-1.

Table 2-1. Power Entry Panel Kit

Part No.	Qty	Description
6644403?1	1 or 2	Mounting bracket, right rear (1 for single power chassis, 2 for dual power chassis)
6644403?2	1 or 2	Mounting bracket, left rear (1 for single power chassis, 2 for dual power chassis)
6644417?1	2	Mounting bracket, front
6644418?1	2	Filler panel, 1.7 in.
6644418?2	0 or 1	Filler panel, 3.5 in. (included for single power chassis only)
6644423?1	2	Cable, 5 VDC
6644423?2	2	Cable, 12 in., 24 VDC
6644423?3	0 or 1	Cable, 21 in., 24 VDC (included for dual power chassis only)
6644424?1	1	DC bus monitoring assembly
6644463??	1	PEP

Power entry panels include connection points for two input power sources, two 25-Ampere disconnect switch/circuit breakers, two optional surge suppressors, connection points for four power tray cords, chassis ground studs, and a wrist strap ground jack. The input terminals accept 16-square millimeter (six-AWG) to four-square millimeter (12-AWG) wires for customer input power. Figure 2-5 shows a typical PEP layout. Figure 2-5 shows only the PEP itself and not all of the components listed in Table 2-1.

Fan Assembly

The fan assembly provides cooling for rack modules mounted in the cabinet. The fan assembly includes three fans, selectable cabinet temperature monitoring, status output connection, status LEDs, a door fan power connection, and status connection terminals. 24 VDC power for the fan assembly is derived from the DC power bus bar via a cable connection. An optional 24 VDC door fan mounted on the upper portion of the

rear door is used to draw air out of the top of the cabinet. Power must be removed from the fans before attempting to service them. Figure 2-6 shows the module cooling fan assembly layout.

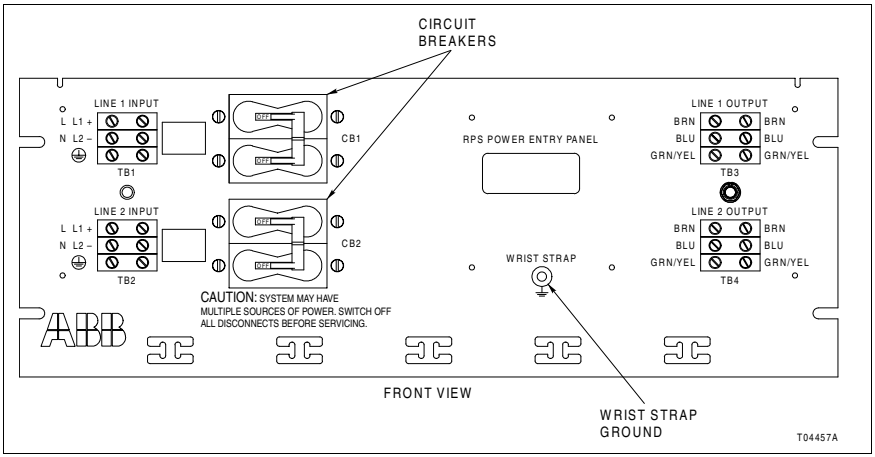

Figure 2-5. Power Entry Panel

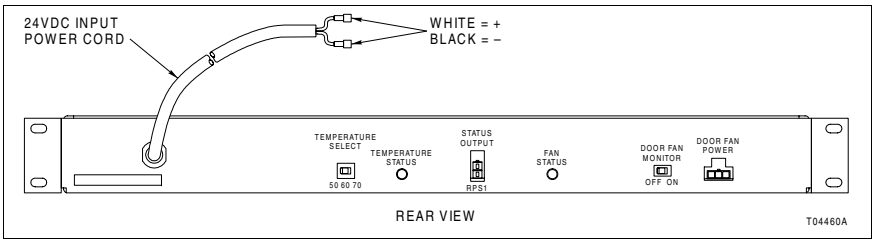

Figure 2-6. Fan Assembly

DC Bus Monitoring Assembly

The DC bus monitoring assembly is used to generate a PFI signal to shut down control modules in the event of a loss of power. The assembly mounts to the DIN rails on the rear of the power chassis. The DC bus monitoring assembly cable connects to the 5 VDC, +15 VDC, -15 VDC, MCOM, and PFI

connectors on the DC power bus bar. It monitors each of these voltages and generates a PFI on failure of any of them. Monitoring of +15 VDC and -15 VDC may be disabled by a jumper. Figure 2-7 shows a view of the DC bus monitoring assembly.

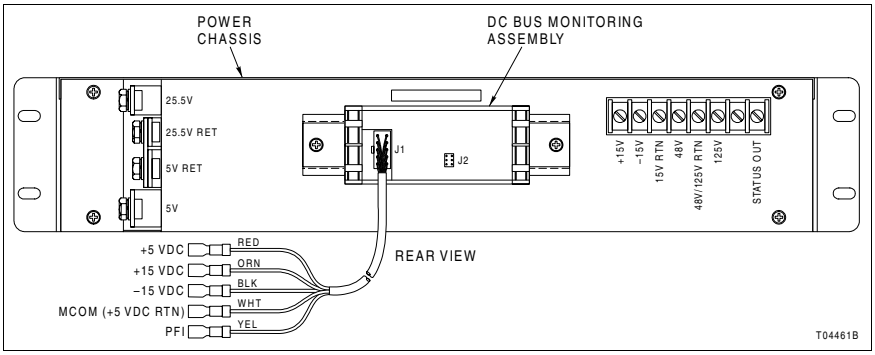

Figure 2-7. DC Bus Monitoring Assembly

Installation

Section 3

Introduction

This section contains information needed when installing the MPSIII system. It includes information on special handling, unpacking and inspection, safety considerations, and wiring considerations.

Following these topics is an installation sequence flowchart that guides personnel, seeking to perform a specific installation task, to the proper procedure needed to perform that task.

Special Handling

The MPSIII system contains sensitive electronic circuitry. This circuitry contains semiconductor devices that are subject to damage by static electricity.

A static field kit is available for personnel working on components containing semiconductor devices. It contains two wrist straps, a ground cord assembly, an alligator clip, and a static dissipating work surface. The intention is to connect the technician and the static dissipating work surface to the same ground point to prevent electrostatic discharge damage to the static sensitive devices.

When handling static sensitive devices:

1. Most assemblies with semiconductor devices come in a special antistatic bag. Keep the assembly in the bag as much as possible whenever the assembly is not installed.

2. Remove assemblies containing semiconductor devices from their antistatic container only under certain conditions:

    a. When at a static-free workstation or when the bag is grounded at a field test sight.

    b. Only after neutralizing the conductive area of the container.

c. Only after firm contact with an antistatic mat and/or firmly gripped by grounded personnel.

3. Personnel handling assemblies with semiconductor devices should be neutralized to a static-free workstation by a grounding wrist strap connected to the station or to a good ground point at the field sight.

4. Do not allow clothing to contact semiconductor devices. Most clothing generates static electricity.

5. Avoid touching connectors or components.

6. Avoid partial connection of semiconductor devices. Most devices can be damaged by floating leads, especially the power supply connector. If an assembly must be placed in a live system, it should be done quickly. Do not cut leads or lift circuit paths when troubleshooting.

7. Be sure to ground any test equipment.

8. Avoid static charges during removal and replacement. Make sure the assembly is fully clean around its leads, but do not rub or clean with an insulating cloth.

9. Remove dust from components using an antistatic field service vacuum.

Unpacking and Inspection

When the MPSIII system is received it should be unpacked and inspected.

1. Check for any obvious damage to the crate or its contents. If damage is evident, notify the carrier and an ABB Automation sales representative.

2. Remove any loose packing from the crate.

3. Inspect the nameplate and verify the unit received matches the desired function.

4. If storing the MPSIII system prior to installation, leave it in the original crate, if possible. Store in an area free from corrosive vapors and extremes in temperature and humidity.

5. Do not store the MPSIII system in an area that would take it out of the specifications listed in Table 1-4.

Safety Considerations

It is critical to read, understand, and heed all instructions, warnings, and cautions located throughout this instruction and on the equipment itself. Only qualified personnel must be allowed to install, operate, maintain, and repair this equipment.

Do not remove or install printed circuit boards, or modules or components containing them, unless otherwise indicated in this instruction, with power applied. This could damage the equipment. Remove power to all AC wiring when removing or connecting AC wires to prevent injury to personnel and equipment damage. To prevent equipment damage, remove DC power to all DC wiring when removing or connecting DC wires, circuit boards, or modules or components connected to them.

Wiring Considerations

This section discusses AC power wiring and grounding for the MPSIII system. For the procedures to accomplish these tasks, refer to the installation sequence flowcharts at the end of this section for the path to the proper procedure.

For detailed information on AC power distribution and system grounding, refer to:

- ***Site Planning.***
- ***Recommended Practice for Powering and Grounding Sensitive Electronic Equipment (IEEE Emerald Book)***, ANSI/IEEE 1100.
- ***Recommended Practice for Grounding of Industrial and Commercial Power Systems (IEEE Green Book)***, ANSI/IEEE 142.

Do not attempt to install any system or related equipment before consulting and understanding these documents as well as any other applicable international standards.

Grounding

The PEP provides grounding of the AC input to the MPSIII system chassis.

This instruction does not discuss the details of grounding systems. Good grounding practices prevent problems and reduce system downtime. A complete and properly grounded electrical system is vital for personnel safety, equipment protections, and normal process system operation. Digital process control systems require a single-point grounding system that has two paths: one path for an alternating current ground (safety ground) and one path for a direct current ground (system common).

For detailed information on system grounding, refer to the ***Site Planning*** instruction.

Installation Sequence

Refer to Figure 3-1 for the installation sequence for the main components of the MPSIII system. Each block of the flow represents a single task that must be completed before continuing with the sequence.

Some blocks contain alphanumeric codes. These codes identify the procedure that describes the steps to complete an indicated task. Complete all of the steps given in a procedure before continuing to the next procedure.

The procedures have check boxes in the margin by each procedural step. When performing a procedure, check each box as each step is completed. Some procedures have numbered warnings and /or cautions under Safety Considerations. A triangle with a warning or caution reference number appears in the margin by the part of the procedure to which the warning or caution applies.

By treating each task as a separate entity, the procedures provide an easy method for finding the information needed to perform each task in the installation sequence.

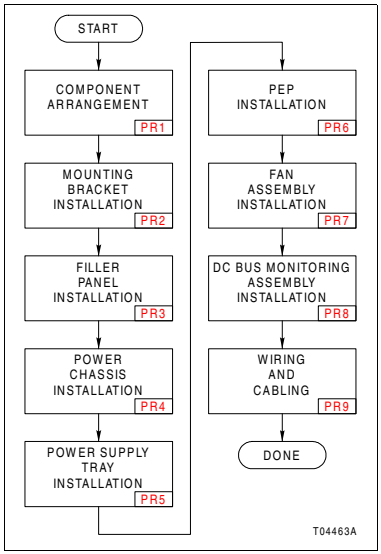

Figure 3-1. Installation Sequence

Troubleshooting

Section 4

Introduction

This section provides troubleshooting tables containing troubleshooting procedures to help locate and correct MPSIII system problems. These are general troubleshooting guidelines and are not exhaustive of all possible causes.

Troubleshooting Procedures

Tables 4-1 and 4-2 contain troubleshooting procedures that are listed by LED state, cause, and corrective action. Use these tables to correct power system problems that are revealed by LEDs on the power supply tray (Table 4-1) and the fan assembly (Table 4-2).

Table 4-1. Power Supply Tray LED

LED	LED State	Cause	Corrective Action
Status	Green	Normal Operation.	None.
	Off	Output voltage under threshold or temperature over threshold.	1. If the cabinet temperature is over 70°C (144°F), reduce cabinet temperature. 2. If cabinet temperature is OK, replace power supply tray (refer to Section 6).

Table 4-2. Fan Assembly Status LEDs

LED	LED State	Problem	Corrective Action
Temperature	Off	Normal operation.	None.
	Red	Fan assembly over selected temperature	Reduce cabinet temperature.
Fan status	Off	Normal operation.	None.
	Red	One or more fan assembly fans are under speed.	Disable door fan monitor. If fan status LED is still red, replace fan assembly (refer to Section 6). If fan status LED turns off, replace optional door fan.

Maintenance

Section 5

Introduction

This section contains a preventive maintenance schedule for the power system (Table 5-1). This table has a procedure reference next to the task when applicable. The reference indicates the procedure number where the procedure for that task can be found.

Be sure to follow all warnings, cautions, and notes. Put boards containing semiconductors into antistatic bags when stored or shipped back to the factory. Do not repair printed circuit boards in the field. All repairs and adjustments should be performed by qualified personnel.

The maintenance of any stand-alone product or control system affects the reliability of that product. All equipment users should practice a preventive maintenance program that will keep the equipment operating at an optimum level.

The procedures referred to in this section contain instructions that the customer should be able to perform on site. These preventive maintenance procedures should be used as a guideline to assist in establishing good preventive maintenance practices. Select the minimum steps required to meet the needs of the system.

Personnel performing preventive maintenance should meet the following qualifications:

- Maintenance personnel should be qualified electrical technicians or engineers that know the proper use of test equipment.
- Maintenance personnel should be familiar with the equipment, have experience working with process control systems, and know what precautions to take when working with live AC power.

Preventive Maintenance Schedule

Table 5-1 is the preventive maintenance schedule for the MPSIII system. The table lists the preventive maintenance tasks in groups according to their specified maintenance interval. Some tasks in Table 5-1 are self-explanatory. Instructions for tasks that require further explanation are found in the procedures.

NOTE: The preventive maintenance schedule is for general purposes only. Each application may require special attention.

Table 5-1. Preventive Maintenance Schedule

Task	Procedure	Frequency
Check cabinet air filters. Clean or replace them as necessary. Check the air filter more frequently in excessively dirty environments.	PR15	3 months
Check cabinet for dust. Clean as necessary using an antistatic vacuum.	—	
Check all signal, power, and ground connections within the cabinet and verify that they are secure.	PR16	
Do a visual inspection of the fan assembly. Verify that all fans are rotating. Refer to Section 6 for replacement sequence if fans need replaced.	—	6 months
Check the quality of the plant power and grounding system. Follow the power and grounding system verification procedures in the ***Site Planning*** instruction.	—	12 months
Inspect all control, I/O, and power modules, giving particular attention to power supply contacts and heat sinks. Clean as necessary.	—	
Replace power supply. Call ABB sales and service for exchange information. (Components such as electrolytic capacitors deteriorate over time and need to be replaced.)	Section 6	5 years
Complete all checks and inspections in this table. Replacement tasks should be done at the scheduled frequency.	—	Shutdown

Replacement Procedures

Section 6

Introduction

This section provides replacement procedures for the power system. The power system components are not field replaceable. If a component fails, it must be returned to the factory for repair.

NOTE: Follow the procedures for working with static sensitive devices when performing the replacement procedures.

Replacement Sequence

Refer to Figure 6-1 for the replacement sequence.

Each block of the flow represents a single task that must be completed before continuing with the sequence. In some cases, more than one path can be taken during replacement procedures. For paths that are in parallel, either complete all of the tasks in all of the paths before continuing or complete all of the tasks in only those paths that apply before continuing. At least one path must be completed.

Some blocks contain alphanumeric codes. These codes identify the procedure that describes the steps to complete an indicated task. Complete all of the steps given in a procedure before continuing to the next procedure. By treating each task as a separate entity, the procedures provide an easy method for finding the information needed for each task in the replacement sequence.

The procedures have check boxes in the margin by each procedural step. When performing a procedure, check each box as each step is completed. Some procedures have numbered warnings and /or cautions under Safety Considerations. A triangle with a warning or caution reference number appears in the margin by the part of the procedure to which the warning or caution applies.

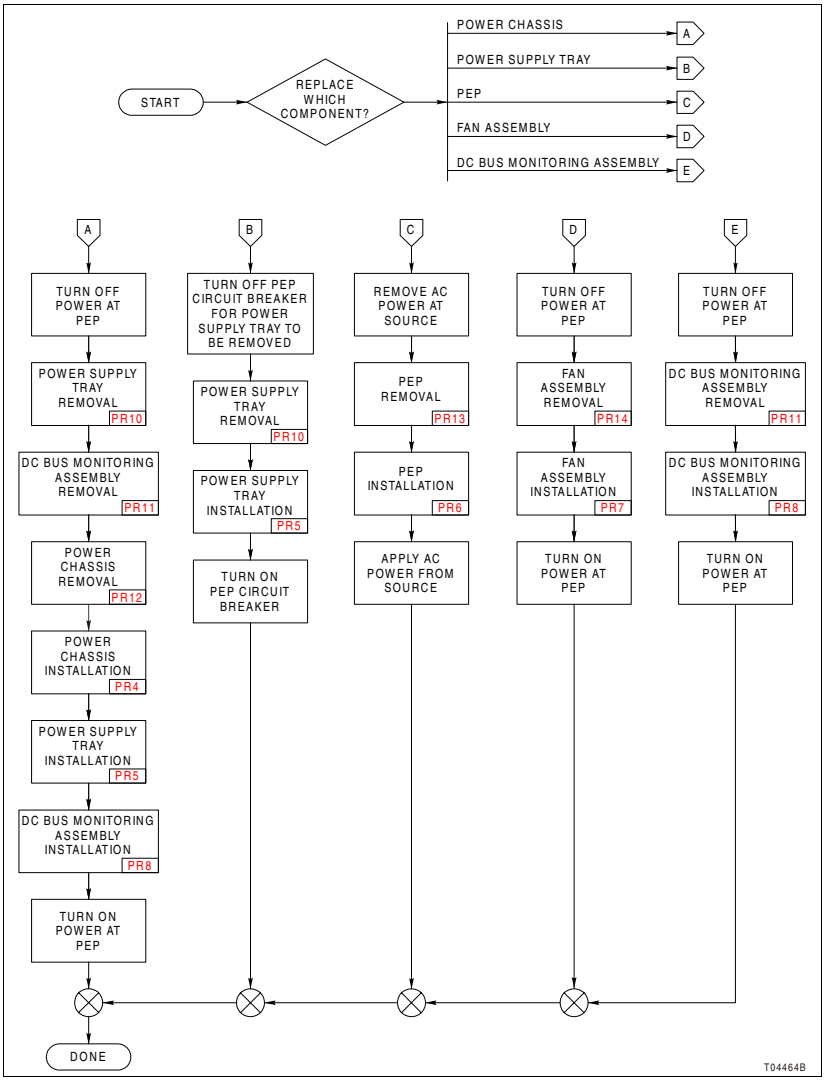

Figure 6-1. Replacement Sequence

Spare Parts

Table 7-1 lists the spare parts. The quantities listed are those recommended by ABB for each installation site.

Table 7-1. Spare Parts

Part Number	Qty	Description
6644424?1	1	DC bus monitoring assembly
Power Entry Panels		
6644463?1	1 of each type used	120/240 VAC, 25 A, without line filter
6644463?2		120/240 VAC, 25 A, with line filter
6644463?3		120/240 VAC, 25 A; 125 VDC, 25 A, without line filter
6644463?4		120/240 VAC, 25 A; 125 VDC, 25 A, with line filter
6644463?5		125 VDC, 25 A, without line filter
6644463?6		125 VDC, 25 A, with line filter
Power Supply Trays		
P-HA-RPS-00010000	1 of each type used	125 VDC at 2.3 A
P-HA-RPS-00200000		48 VDC at 8.5 A
P-HA-RPS-02010000		24 VDC at 17 A, 125 VDC at 2.3 A
P-HA-RPS-02200000		24 VDC at 17 A, 48 VDC at 8.5 A
P-HA-RPS-03000000		24 VDC at 17 A (dual output, 34 A total)
P-HA-RPS-11000000		5 VDC at 14 A, ±15 VDC at 1 A each, 24 VDC at 6 A
P-HA-RPS-11010000		5 VDC at 14 A, ±15 VDC at 1 A each, 24 VDC at 6 A, 125 VDC at 2.3 A
P-HA-RPS-11100000		5 VDC at 14 A, ±15 VDC at 1 A each, 24 VDC at 6A, 48 VDC at 3 A
P-HA-RPS-21000000		5 VDC at 20 A, ±15 VDC at 3 A each, 24 VDC at 6 A
P-HA-RPS-21010000		5 VDC at 20 A, ±15 VDC at 3 A each, 24 VDC at 6 A, 125 VDC at 2.3 A
P-HA-RPS-21200000		5 VDC at 20 A, ±15 VDC at 3 A each, 24 VDC at 6 A, 48 VDC at 8.5 A
P-HA-RPS-32000000		5 VDC at 60 A, ±15 VDC at 3 A each, 24 VDC at 17 A
P-HA-RPS-32010000		5 VDC at 60 A, ±15 VDC at 3 A each, 24 VDC at 17 A, 125 VDC at 2.3 A
P-HA-RPS-32200000		5 VDC at 60 A, ±15 VDC at 3 A each, 24 VDC at 17 A, 48 VDC at 8.5 A
P-HA-RPS-40000000		5 VDC at 100 A, ±15 VDC at 8 A each
P-HA-RPS-CH100000	1	Power chassis
P-HA-RPS-FAN03000	1	Fan assembly

Component Arrangement

PR1

Purpose/Scope

This procedure explains the arrangement options available for power system components.

Parts None.

Tools None

Procedure

This instruction covers installation of the power system into standard ABB cabinets. Nonstandard cabinets require rack mount rails positioned at the front of the cabinet to provide secure mounting points for the power chassis, PEP, and filler plates. Nonstandard cabinets and rack mount rails must comply with ***Racks, Panels, and Associated Equipment***, EIA RS-310-B. Figure PR1-1 shows the height and physical arrangement of each individual component, and Figure PR1-2 shows the location of the mounting rails.

This procedure describes the physical arrangement in which to install the power system components. The arrangement is slightly different for one or two power chassis systems. It is for reference only and does not contain any installation or replacement procedures.

Figure PR1-1 shows the two standard mounting schemes. The front mounting brackets accommodate two power chassis. When two power chassis are mounted in the same cabinet, mount the I/O field power chassis in the upper position and the module power chassis in the lower position. When only one power chassis is used, mount it in the lower position. Each power chassis requires its own set of rear mounting brackets.

When using one power chassis, three filler plates are required to direct cabinet air flow for cooling. When using two power chassis, two filler plates are required to direct cabinet air flow for cooling.

Follow the order shown in Figure PR1-1 when mounting the various power system components.

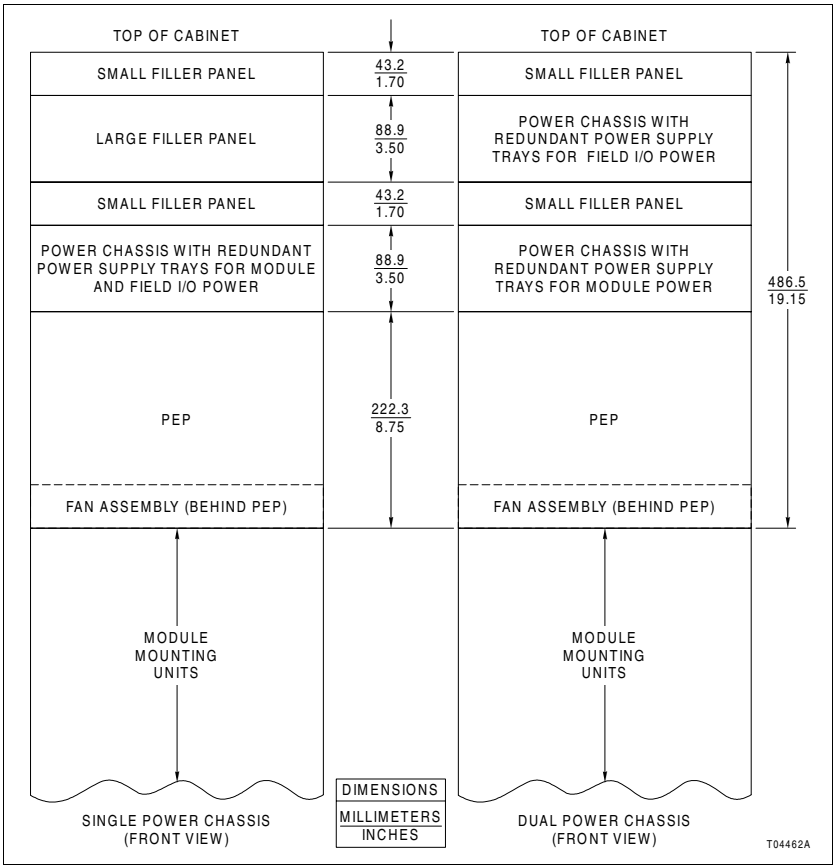

Figure PR1-1. Component Arrangements and Dimensions

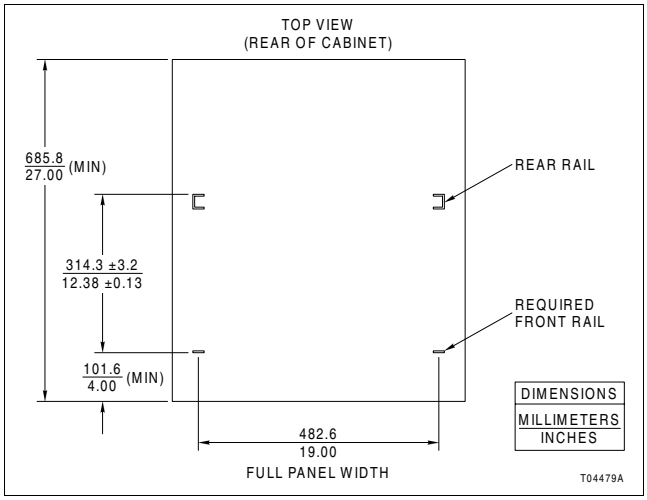

Figure PR1-2. Rack Mount Rail Locations for Nonstandard Cabinets

Mounting Bracket Installation

PR2

Purpose/Scope

60 min.

This procedure explains how to install the front and rear mounting brackets into the cabinets.

Parts

Number	Qty	Description
6644403?1	1 or 2[1]	Mounting bracket, left rear (when viewed from rear of cabinet)
6644403?2	1 or 2[1]	Mounting bracket, right rear (when viewed from rear of cabinet)
6644417?1	2	Mounting bracket, front
NFWAB19008	8	Screw, Phillips, thread forming, pan head, No. 12 x 0.500 long
NIDHA16008	4 or 8[1]	Screw, sems ext pan head slot, 0.190-32
NMPCC16002	4 or 8[1]	Nut, cage, 10-32
NTLAC25000	8	Lockwasher, ext, No. 25

NOTE:

1. Use lesser quantity for cabinets with 1 power chassis and greater quantity for cabinets with 2 power chassis.

Tools

- Bladed screwdriver.
- Phillips screwdriver.

Safety Considerations

WARNING	**1. Disconnect power before attempting these procedures. Failure to do so could result in severe or fatal shock, or equipment damage.**

Procedure

☐ 

1. Be sure power is removed at the source before starting this procedure.

☐ 2. Open the front and rear doors of the cabinet.

Front Mounting Brackets

☐ 1. Align the top hole in one of the front mounting brackets with the first round mounting hole from the top of the cabinet on the frame as shown in Figure PR2-1.

☐ 2. Use the Phillips screwdriver, and four thread forming screws and lockwashers to secure the front mounting bracket to the cabinet.

☐ 3. Repeat Steps 1 and 2 for the other front mounting bracket.

Rear Mounting Brackets

Each cabinet can have two or four rear mounting brackets. Two rear mounting brackets are used for single power chassis installations and four rear mounting brackets are used for dual power chassis installations.

NOTE: Figure PR2-1 shows a single power chassis installation.

Single Power Chassis

☐ 1. Install two cage nuts on the 13th and 18th holes on the left (when viewed from the rear of the cabinet) vertical mounting rail inside the cabinet as shown in Figure PR2-1.

☐ 2. Align the top hole of the left rear mounting bracket with the top cage nut.

☐ 3. Use the bladed screwdriver, and two pan head screws and lockwashers to secure the left rear mounting bracket to the vertical mounting rail.

☐ 4. Repeat Steps 1 through 3 to install the right rear mounting bracket, installing it on the right vertical mounting rail.

Dual Power Chassis

☐ 1. For dual power chassis installations, perform the steps under ***Single Power Chassis*** to install the bottom rear mounting brackets.

☐ 2. Install two cage nuts on the 4th and 9th holes on the left (when viewed from the rear of the cabinet) vertical mounting rail inside the cabinet.

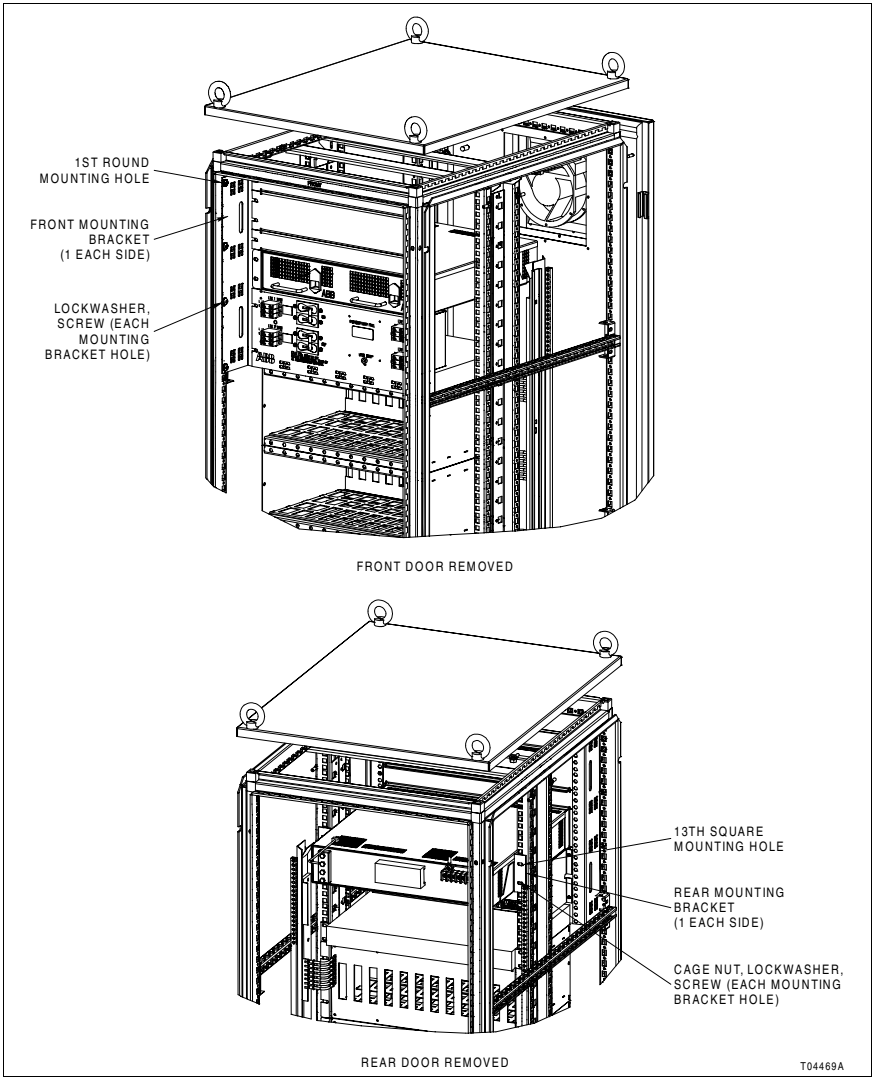

Figure PR2-1. Mounting Bracket Installation

☐ 3. Align the top hole of the left rear mounting bracket with the top cage nut.

☐ 4. Use the bladed screwdriver, and two pan head screws and lockwashers to secure the left rear mounting bracket to the vertical mounting rail.

☐ 5. Repeat Steps 2 through 4 to install the right rear mounting bracket, installing it on the right vertical mounting rail.

Filler Panel Installation

PR3

Purpose/Scope

20 min.

This procedure explains how to install the filler panels into the cabinets.

Parts

Number	Qty	Description
200037A080A1020	4 or 8[1]	Lockwasher, helical spring, M8
6644403?1	2	Filler panel, small
6644403?2	0 or 1[1]	Filler panel, large
NIDHA16008	4 or 8[1]	Screw, sems ext pan head slot, 0.190-32
NMPCC16002	4 or 8[1]	Nut, cage, 10-32

NOTE:

1. Use lesser quantity for cabinets with 1 power chassis and greater quantity for cabinets with 2 power chassis.

Tools

Bladed screwdriver.

Safety Considerations

WARNING	**1. Disconnect power before attempting these procedures. Failure to do so could result in severe or fatal shock, or equipment damage.**

Procedure

☐ 

1. Be sure power is removed at the source before starting this procedure.

☐ 2. Open the front door of the cabinet.

☐ 3. Keeping in mind the component arrangement discussed at the beginning of this installation sequence, install cage nuts

on the proper locations on the front mounting brackets (Fig. PR3-1).

NOTE: Figure PR3-1 shows a single power chassis configuration. In dual power chassis configurations the top power chassis takes the place of the large filler panel.

a. For single power chassis installations, install the cage nuts on the 1st, 3rd, 4th, 9th, 10th, and 12th holes from the top of the cabinet.

b. For dual power chassis installations, install the cage nuts on the 1st, 3rd, 10th, and 12th holes from the top of the cabinet.

☐ 4. Use the bladed screwdriver, and appropriate number of pan head screws and lockwashers to secure the filler plates to the front mounting brackets.

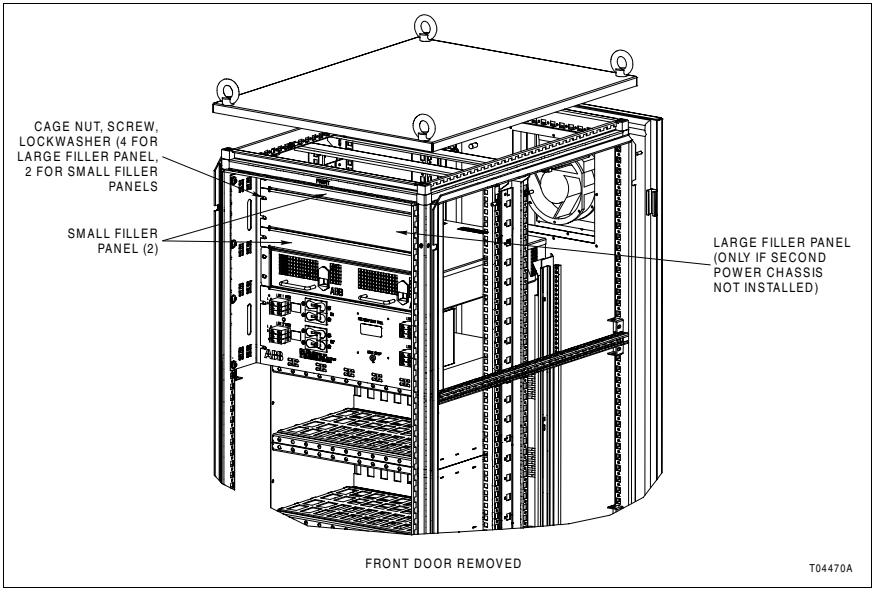

Figure PR3-1. Filler Panel Installation

Power Chassis Installation

PR4

Purpose/Scope

20 min.

This procedure explains how to install the power chassis into the cabinets.

Parts

Number	Qty	Description
200021A040S100	4 or 8[1]	Screw, pan head phil, M4 x 10
200036A040A1008	4 or 8[1]	Washer, flat, M4
200037A040A1009	4 or 8[1]	Washer, lock, M4
200037A080A1020	4 or 8[1]	Lockwasher, helical spring, M8
NIDHA16008	4 or 8[1]	Screw, sems ext pan head slot, 0.190-32
NMPCC16002	4 or 8[1]	Nut, cage, 10-32
P-HA-RPS-CH100000	1 or 2[1]	Power chassis

NOTE:

1. Use lesser quantity for cabinets with 1 power chassis and greater quantity for cabinets with 2 power chassis.

Tools

- Bladed screwdriver.
- Phillips screwdriver.

Safety Considerations

WARNING	**1. Disconnect power before attempting these procedures. Failure to do so could result in severe or fatal shock, or equipment damage.**

Procedure

☐ 

1. Be sure power is removed at the source before starting this procedure.

☐ 2. Open the front and rear doors of the cabinet.

☐ 3. Keeping in mind the component arrangement discussed at the beginning of this installation sequence, install cage nuts

on the proper locations on the front mounting brackets (Fig. PR4-1).

NOTES:

1. This step does not apply if this procedure is part of the replacement sequence.

2. Figure PR4-1 shows a single power chassis configuration. In dual power chassis configurations the top power chassis takes the place of the large filler panel.

a. For single power chassis installations, install the cage nuts on the 14th and 17th holes from the top of the cabinet.

b. For dual power chassis installations, install the cage nuts on the 5th, 8th, 14th, and 17th holes from the top of the cabinet.

☐ 4. Install the power chassis from the front of the cabinet until the rear of the power chassis rests on the rear mounting brackets while still manually supporting the front of the power chassis.

☐ 5. Use the bladed screwdriver, and appropriate number of pan head slotted screws and M8 lockwashers to secure the power chassis to the front mounting brackets.

☐ 6. Use the Phillips screwdriver, and appropriate number of pan head Phillips screws, M4 lockwashers, and M4 flat washers to secure to power chassis to the rear mounting brackets.

☐ 7. If this procedure is part of power chassis replacement rather than an initial installation, duplicate the wiring and cabling from the replaced power chassis to the new power chassis. If this procedure is part of initial power chassis installation, continue with the next procedure in the installation sequence.

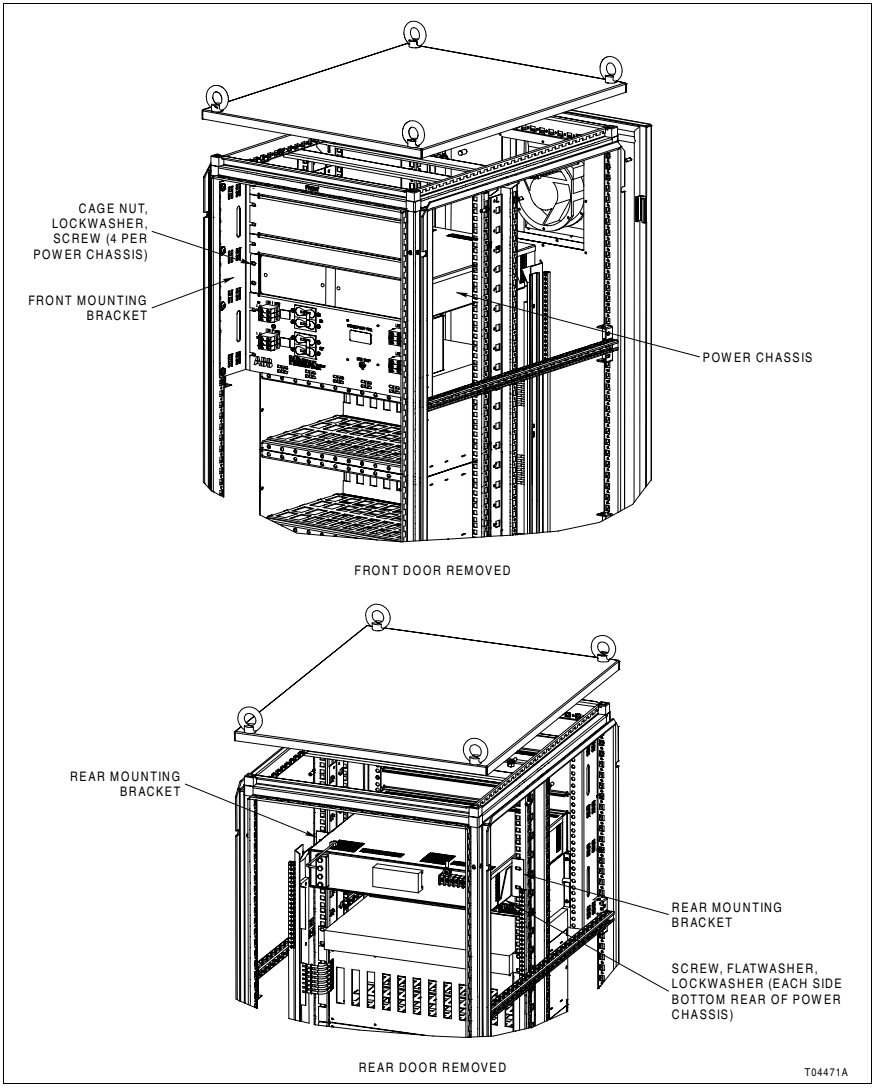

Figure PR4-1. Power Chassis Installation

Power Supply Tray Installation

PR5

Purpose/Scope

5 min.

This procedure explains how to install the power supply trays into the power chassis.

Parts

Number	Description
P-HA-RPS-00010000	Power supply tray, 125 VDC at 2.3 A
P-HA-RPS-00200000	Power supply tray, 48 VDC at 8.5 A
P-HA-RPS-02010000	Power supply tray, 24 VDC at 17 A, 125 VDC at 2.3 A
P-HA-RPS-02200000	Power supply tray, 24 VDC at 17 A, 48 VDC at 8.5 A
P-HA-RPS-03000000	Power supply tray, 24 VDC at 17 A (dual output, 34 A total)
P-HA-RPS-11000000	Power supply tray, 5 VDC at 14 A, ±15 VDC at 1 A each, 24 VDC at 6 A
P-HA-RPS-11010000	Power supply tray, 5 VDC at 14 A, ±15 VDC at 1 A each, 24 VDC at 6 A, 125 VDC at 2.3 A
P-HA-RPS-11100000	Power supply tray, 5 VDC at 14 A, ±15 VDC at 1 A each, 24 VDC at 6A, 48 VDC at 3 A
P-HA-RPS-21000000	Power supply tray, 5 VDC at 20 A, ±15 VDC at 3 A each, 24 VDC at 6 A
P-HA-RPS-21010000	Power supply tray, 5 VDC at 20 A, ±15 VDC at 3 A each, 24 VDC at 6 A, 125 VDC at 2.3 A
P-HA-RPS-21200000	Power supply tray, 5 VDC at 20 A, ±15 VDC at 3 A each, 24 VDC at 6 A, 48 VDC at 8.5 A
P-HA-RPS-32000000	Power supply tray, 5 VDC at 60 A, ±15 VDC at 3 A each, 24 VDC at 17 A
P-HA-RPS-32010000	Power supply tray, 5 VDC at 60 A, ±15 VDC at 3 A each, 24 VDC at 17 A, 125 VDC at 2.3 A
P-HA-RPS-32200000	Power supply tray, 5 VDC at 60 A, ±15 VDC at 3 A each, 24 VDC at 17 A, 48 VDC at 8.5 A
P-HA-RPS-40000000	Power supply tray, 5 VDC at 100 A, ±15 VDC at 8 A each

Tools

None.

Safety Considerations

WARNING	**1. Disconnect power before attempting these procedures. Failure to do so could result in severe or fatal shock, or equipment damage.**

CAUTION	**1. Do not use the same power level from two power chassis. Doing so will disrupt the active power sharing scheme and damage the power system.** **2. Turn off the circuit breaker on the power entry panel (PEP) corresponding to the line (LINE 1 or LINE 2) that powers the power supply tray to be removed or installed. Process upset may occur if a power supply tray is removed or installed with power applied.**

Procedure

This procedure can be used for an initial installation or as part of power chassis replacement with no power applied to the cabinet (refer to ***Initial Installation***), or as part of the power supply tray replacement procedures with power applied to the cabinet (refer to ***Field Installation***).

Initial Installation

☐ 

1. Be sure power is removed at the source before starting this procedure.

☐ 2. Open the front door of the cabinet.

☐ 3. Keeping in mind the component arrangement discussed at the beginning of this installation sequence, slide the appropriate power supply tray into the appropriate power chassis and push until it firmly connects with the power chassis.

☐ 4. Turn the two thumbscrews (Figure PR5-1) clockwise to secure the power supply tray to the power chassis.

NOTE: Figure PR5-1 shows a single power chassis configuration. In dual power chassis configurations the top power chassis takes the place of the large filler panel.

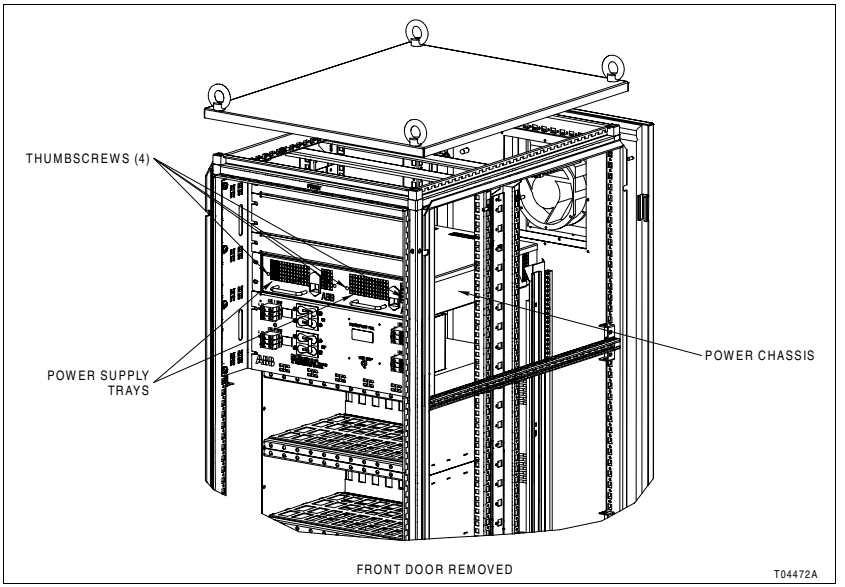

Figure PR5-1. Power Supply Tray Installation

☐ 5. Slide another power supply tray of the same type into the other side of the power chassis and push until it firmly connects with the power chassis.

☐ 6. Turn the two thumbscrews clockwise to secure the power supply tray to the power chassis.

☐ C1 7. Repeat Steps 3 through 6 if for the second power chassis if this is a dual power chassis installation. Output voltages from each power chassis must be kept isolated from each other to avoid damage to the power system. This typically means that one power chassis supplies module power (±15 VDC and 5 VDC) and the other supplies field I/O power (24 VDC, 48 VDC, and 125 VDC).

Field Installation

The power supply trays can be installed into an operational control system. This procedure assumes that the remaining

installed power supply tray is operational and that its status light is on.

☐ 1. Open the front door to the cabinet.

☐ 

2. Verify that the circuit breaker on the PEP to the line (LINE 1 or LINE 2) that will power the power supply tray to be installed is off.

☐ 3. Slide the new power supply tray into the power chassis and push until it firmly connects with the power chassis.

☐ 4. Turn the two thumbscrews (Figure PR5-1) clockwise to secure the power supply tray to the power chassis.

☐ 5. Plug the power cord into the front of the power supply tray and secure it with the wire retaining clip.

☐ 6. Check the circulation vents on the power supply trays and power chassis and make sure they are free of air flow obstructions.

☐ 7. Turn the proper circuit breaker on the PEP to the on position.

☐ 8. Verify that the status LED is lit.

PEP Installation

PR6

Purpose/Scope

20 min.

This procedure explains how to install the PEP into the cabinets.

Parts

Number	Qty	Description
200037A080A1020	4	Lockwasher, helical spring, M8
NIDHA16008	4	Screw, sems ext pan head slot, 0.190-32
NMPCC16002	4	Nut, cage, 10-32
6644463?1	1	PEP, 120/240 VAC, 25 A, without line filter
6644463?2		PEP, 120/240 VAC, 25 A, with line filter
6644463?3		PEP, 120/240 VAC, 25 A; 125 VDC, 25 A, without line filter
6644463?4		PEP, 120/240 VAC, 25 A; 125 VDC, 25 A, with line filter
6644463?5		PEP, 125 VDC, 25 A, without line filter
6644463?6		PEP, 125 VDC, 25 A, with line filter

Tools

Bladed screwdriver.

Safety Considerations

WARNING

1. Disconnect power before attempting these procedures. Failure to do so could result in severe or fatal shock, or equipment damage.

Procedure

☐ 

1. Be sure power is removed at the source before starting this procedure.

☐ 2. Open the front door of the cabinet.

☐ 3. Install cage nuts on the 21st and 28th holes from the top of the cabinet on the front mounting brackets (Fig. PR6-1).

☐ 4. Use the bladed screwdriver, and four screws and lockwashers to secure the PEP to the front mounting brackets.

☐ 5. If this procedure is part of PEP replacement rather than an initial installation, duplicate the wiring and cabling from the replaced PEP to the new PEP. If this procedure is part of initial PEP installation, continue with the next procedure in the installation sequence.

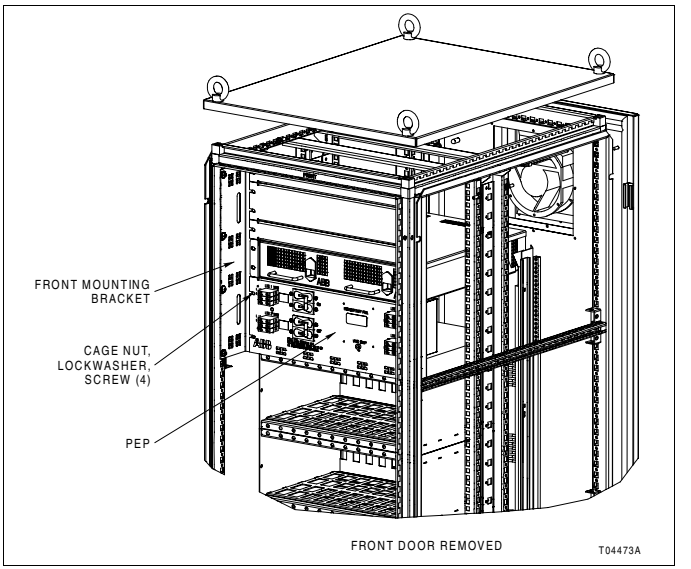

Figure PR6-1. PEP Installation

Fan Assembly Installation

PR7

Purpose/Scope

20 min.

This procedure explains how to install the fan assembly into the cabinets.

Parts

Number	Qty	Description
200037A080A1020	4	Lockwasher, helical spring, M8
NIDHA16008	4	Screw, sems ext pan head slot, 0.190-32
NMPCC16002	4	Nut, cage, 10-32
P-HA-RPS-FAN03000	1	Fan assembly

Tools Bladed screwdriver.

Safety Considerations

WARNING **1. Disconnect power before attempting these procedures. Failure to do so could result in severe or fatal shock, or equipment damage.**

Procedure

☐ 

1. Be sure power is removed at the source before starting this procedure.

☐ 2. Open the rear door of the cabinet.

☐ 3. Install cage nuts on the 28th and 30th holes from the top of the cabinet on vertical mounting rail inside the cabinet (Fig. PR7-1).

☐ 4. Slide the fan assembly into the cabinet from the rear until the holes in the mounting bracket on the rear of the fan assembly align with the cage nuts.

☐ 5. Use the bladed screwdriver, and four screws and lockwashers to secure the fan assembly to the vertical mounting rail.

☐ 6. If this procedure is part of fan assembly replacement rather than an initial installation, duplicate the wiring and cabling from the replaced fan assembly to the new fan assembly. If this procedure is part of initial fan assembly installation, continue with the next procedure in the installation sequence.

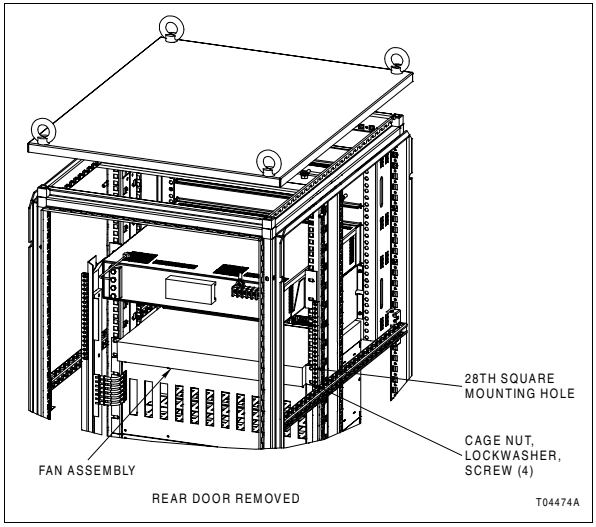

Figure PR7-1. Fan Assembly Installation

DC Bus Monitoring Assembly Installation

PR8

Purpose/Scope

5 min.

This procedure explains how to install the DC bus monitoring assembly onto the rear of the power chassis.

Parts

Number	Qty	Description
6644424?1	1	DC bus monitoring assembly

Tools

- Phillips screwdriver.

Safety Considerations

WARNING **1. Disconnect power before attempting these procedures. Failure to do so could result in severe or fatal shock, or equipment damage.**

Procedure

☐ 

1. Be sure power is removed at the source before starting this procedure.

☐ 2. Open the rear door of the cabinet.

☐ 3. Refer to Figure PR8-1 and use the Phillips screwdriver to remove the two screws that secure the right DIN rail mounting bracket to the DC bus monitoring assembly and remove the right DIN mounting bracket.

☐ 4. Slide the protective cover off of the DC bus monitoring assembly.

☐ 5. Set the jumper on the DC bus monitoring assembly as desired as shown in Figure PR8-2.

☐ 6. Slide the protective cover onto the DC bus monitoring assembly.

☐ 7. Install the right DIN mounting bracket and use the Phillips screwdriver to install the two screws that secure the right DIN rail mounting bracket to the DC bus monitoring assembly.

☐ 8. Attach the DC bus monitoring assembly to the DIN rail on the rear of the power chassis and press the locking devices into place as shown in Figure PR8-3.

☐ 9. Refer to Figure PR8-3 and connect the wires to the DC bus bar and the cable connector to J1.

NOTE: Do not disconnect or connect the cable from the DC bus monitoring assembly to the DC bus bar while the system is operating. Doing so could cause a PFI to occur.

☐ 10. If this procedure is part of DC bus monitoring replacement rather than an initial installation, duplicate the wiring and cabling from the replaced bus monitoring assembly to the new DC bus monitoring assembly. If this procedure is part of initial DC bus monitoring assembly installation, continue with the next procedure in the installation sequence.

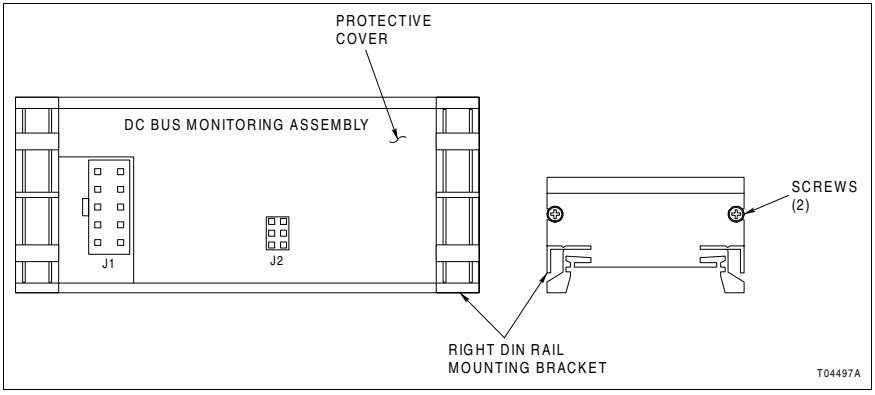

Figure PR8-1. DC Bus Monitoring Assembly Jumper Access

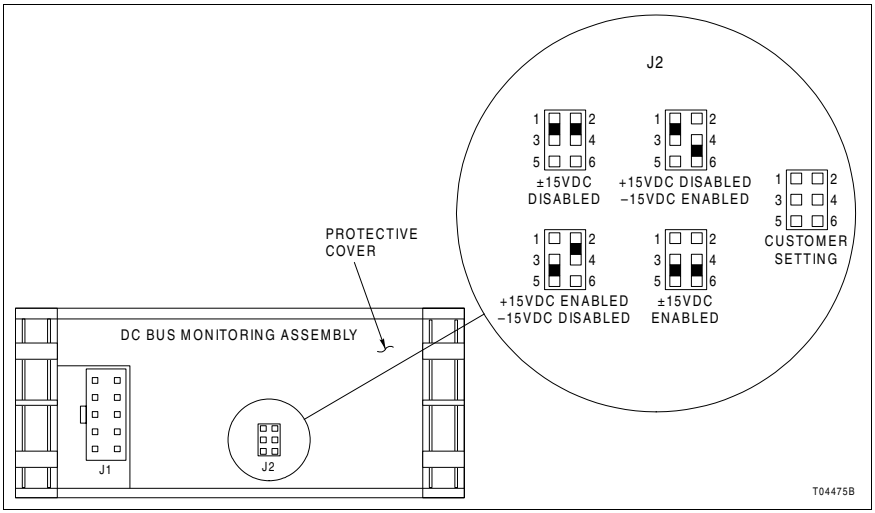

Figure PR8-2. DC Bus Monitoring Assembly Jumper Settings

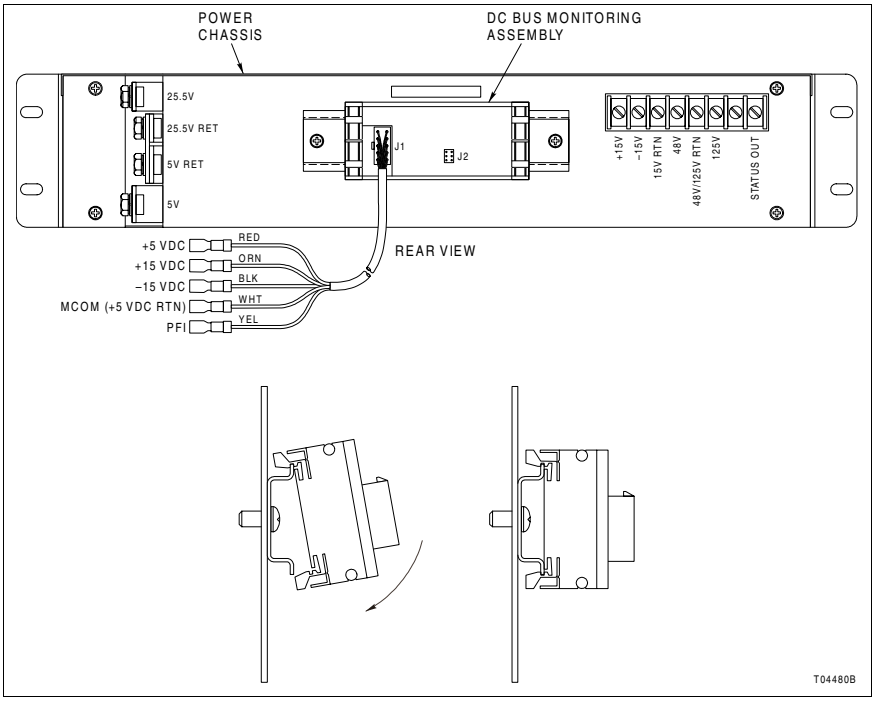

Figure PR8-3. DC Bus Monitoring Assembly Installation

Wiring and Cabling

PR9

Purpose/Scope

4 hr

This procedure contains wiring diagrams and guidelines.

Parts None.

Tools Individual tools are not listed due to the many types of connections involved.

Safety Considerations

WARNING	**1. Disconnect power before attempting these procedures. Failure to do so could result in severe or fatal shock, or equipment damage.**

CAUTION	**1. Do not use the same power level from two power chassis. Doing so will disrupt the active power sharing scheme and damage the power system.**

Procedure

☐ 

1. Be sure power is removed at the source before starting this procedure.

Wiring and Cabling Diagrams

Figures PR9-1 and PR9-2 are the wiring and cabling diagrams for single power chassis installations. Figures PR9-3 and PR9-4 are the wiring and cabling diagrams for dual power chassis installations. Wiring and cabling guidelines follow those figures.

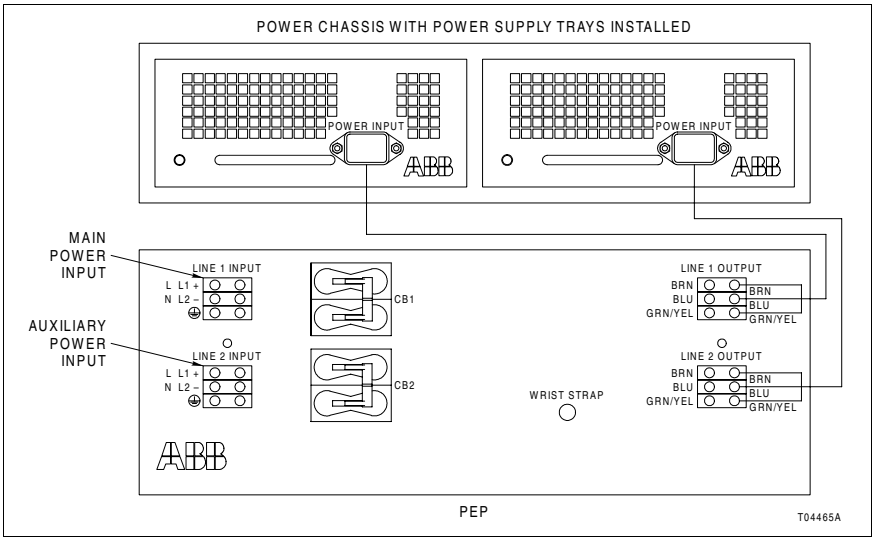

Figure PR9-1. Single Chassis Wiring and Cabling Diagram - Front of Cabinet

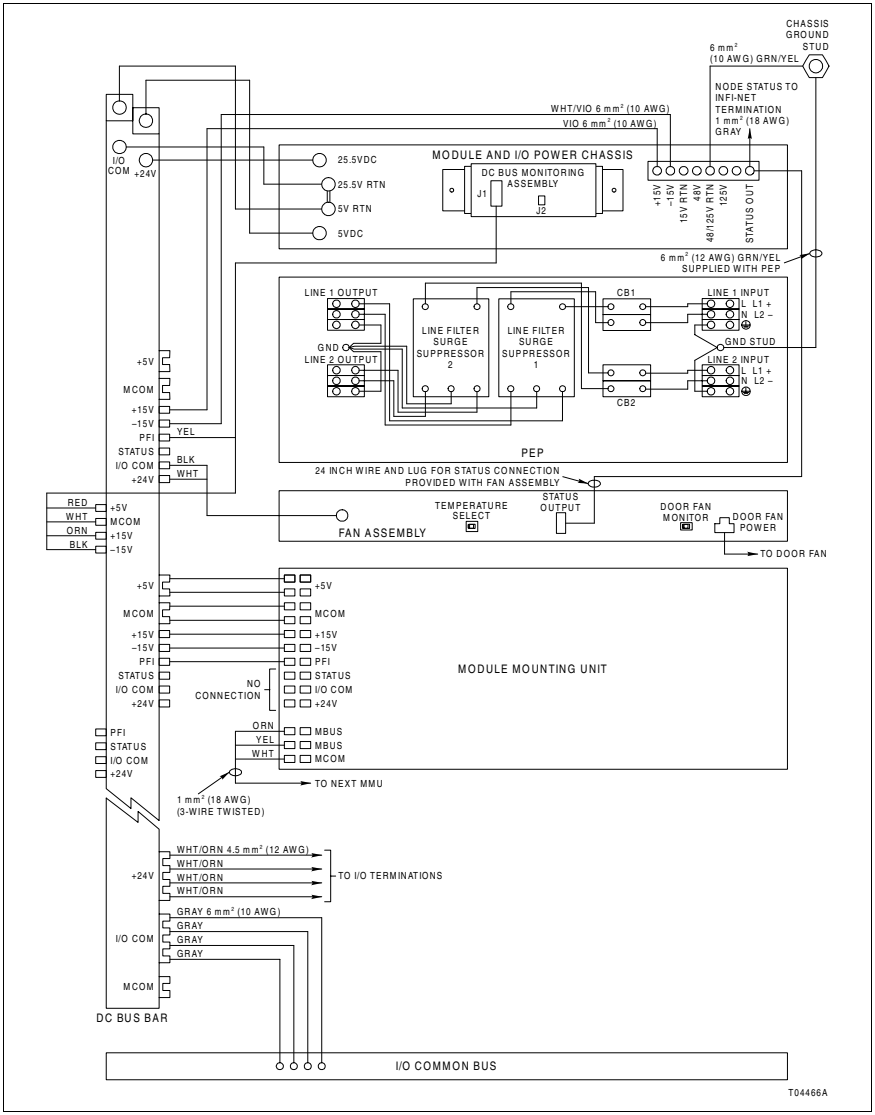

Figure PR9-2. Single Chassis Wiring and Cabling Diagram - Rear of Cabinet

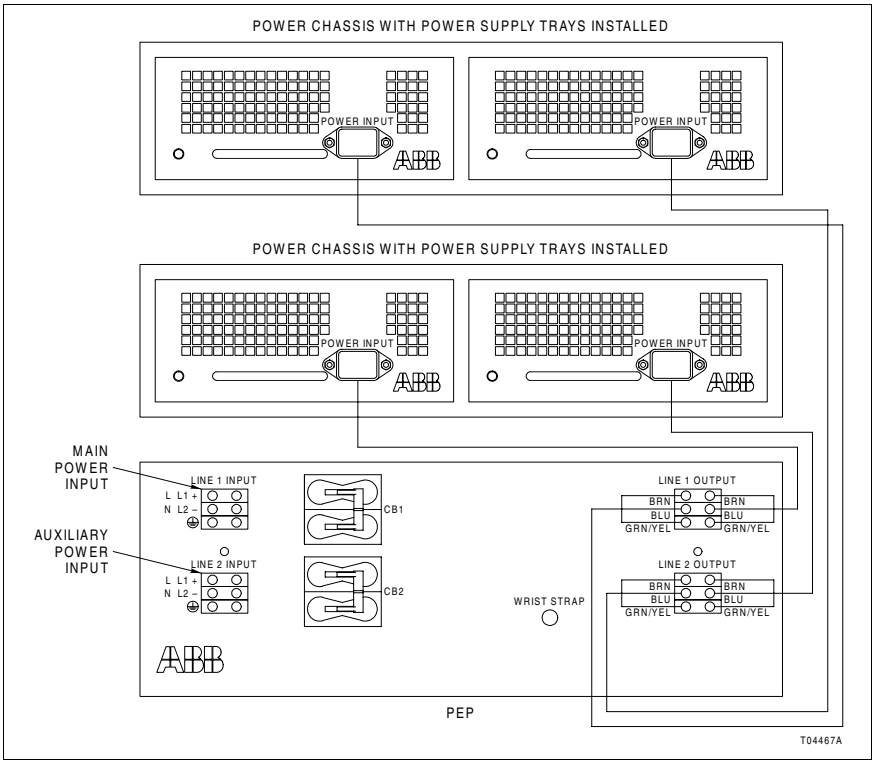

Figure PR9-3. Dual Chassis Wiring and Cabling Diagram - Front of Cabinet

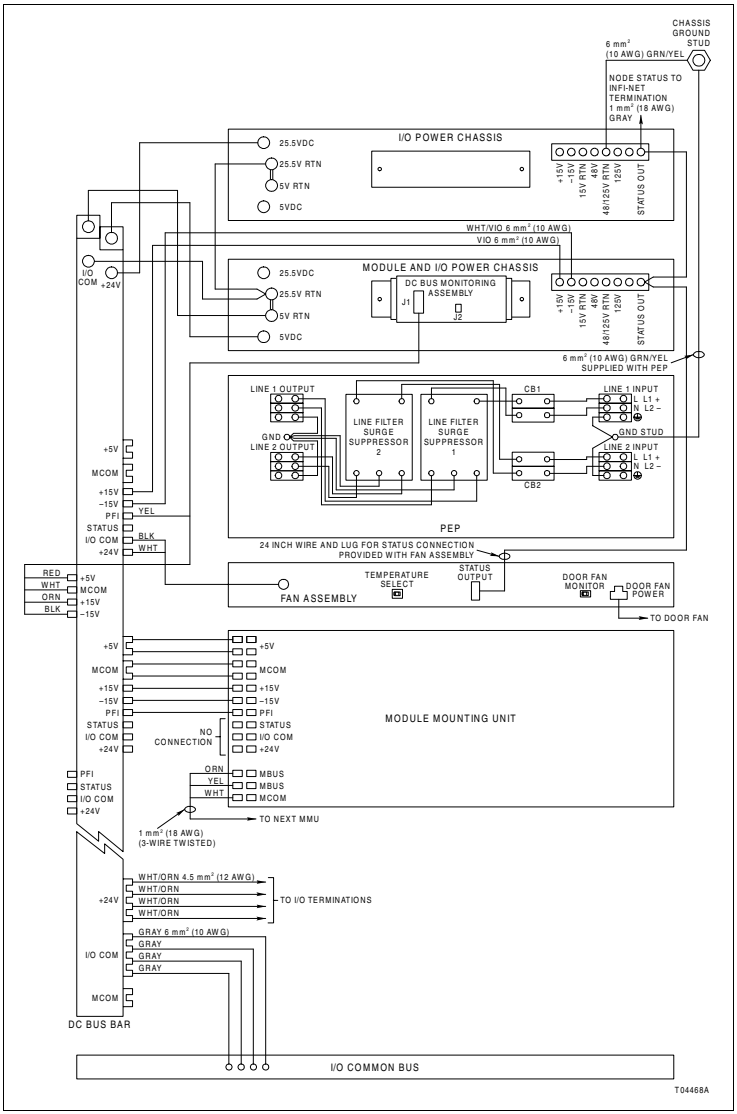

Figure PR9-4. Dual Chassis Wiring and Cabling Diagram - Rear of Cabinet

Wiring and Cabling Guidelines

1. Mixing different input voltages is permitted; however, when using one AC feed and one DC feed, the AC feed must be the LINE 1 input.

2. When Overvoltage Category III rating is required, use a PEP with the optional transient surge suppressor/line filters. When not using suppressors the circuit breakers on the PEP wire directly to the output terminals. When Overvoltage Category III is required, take care to keep input wiring separated from the cables to the power supply trays.

3. No loads other than system components shown in the figures are to be connected to the input source. Supplemental loads (lights, convenience outlets, I/O, etc.) must be powered from a separate power source.

4. Due to the limitations of the faston connectors on the DC bus bar, allow no more than 15 Amperes per 24 VDC wire connection. Add terminal blocks or IEPDP01 for more connections.

5. All modules within a cabinet must source their 5 VDC power from only one power chassis. Only one power chassis may supply 24 VDC power to the DC bus bar. If using more than one power chassis to supply 24 VDC power, care must be taken not to connect the 24 VDC power provided from different power chassis or damage to the power system may result.

6. Status connections may be daisy chained with the last power chassis connected to the INFI-NET termination.

Power Supply Tray Removal

PR10

Purpose/Scope

2 min.

This procedure explains how to remove the power supply trays from the power chassis.

Parts None.

Tools None.

Safety Considerations

WARNING	**1. Disconnect power before attempting these procedures. Failure to do so could result in severe or fatal shock, or equipment damage.**

CAUTION	**1. Turn off the circuit breaker on the power entry panel (PEP) corresponding to the line (LINE 1 or LINE 2) that powers the power supply tray to be removed or installed. Process upset may occur if a power supply tray is removed or installed with power applied.**

Procedure

There are two scenarios in which a power supply tray would be removed from the MPSIII system. One is if power supply tray removal is part of power chassis replacement. In this case, all power supply trays are removed from the power chassis to be replaced with power disconnected at the source (refer to ***Power Disconnected at Source***). The other scenario is if removal is necessary to replace the power supply tray itself. In this case, power is only removed from the power supply tray to be replaced (refer to ***Power Disconnected from Single Power Supply Tray***).

Power Disconnected at Source

All power supply trays can be removed from a power chassis as long as power is disconnected at the source. Perform this procedure as part of power chassis replacement.

☐ W1 1. Be sure power is removed at the source before starting this procedure.

☐ 2. Open the front door of the cabinet.

☐ 3. Remove the power cord from the front of each power supply tray to be removed.

☐ 4. Turn the two thumbscrews (Figure PR10-1) on each power supply tray counterclockwise to release the power supply trays from the power chassis.

☐ 5. Slide the power supply trays out of the power chassis.

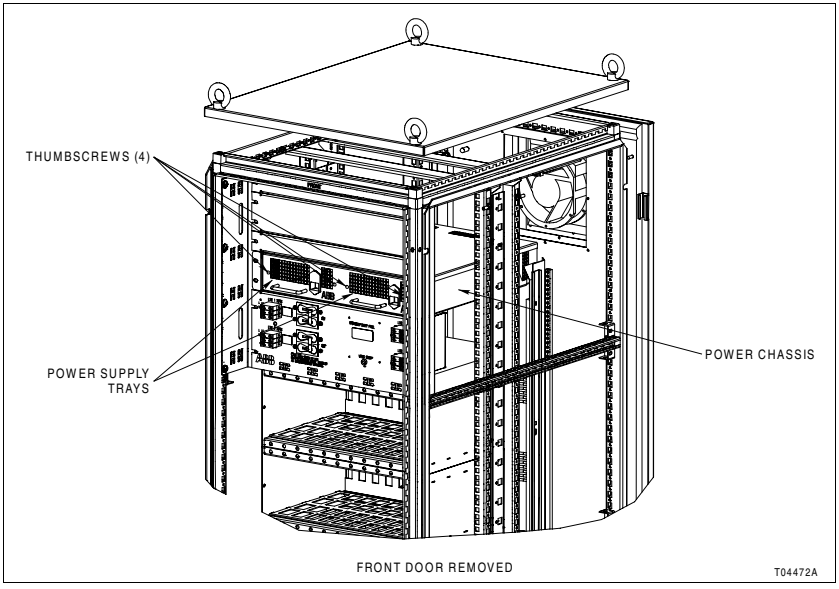

Figure PR10-1. Power Supply Tray Removal

Power Disconnected from Single Power Supply Tray

The power supply trays can be removed from an operational control system. This procedure assumes that the remaining installed power supply tray is operational and that its status light is on.

☐ 1. Open the front door to the cabinet.

☐ 

2. Turn off the circuit breaker on the PEP to the line (LINE 1 or LINE 2) that powers the power supply tray to be removed.

☐ 3. Remove the power cord from the front of the power supply tray.

☐ 4. Turn the two thumbscrews (Figure PR10-1) counterclockwise to release the power supply tray from the power chassis.

☐ 5. Slide the power supply tray out of the power chassis.

DC Bus Monitoring Assembly Removal

PR11

Purpose/Scope

5 min.

This procedure explains how to remove the DC bus monitoring assembly from the rear of the power chassis.

Parts None.

Tools Bladed screwdriver.

Safety Considerations

WARNING	**1. Disconnect power before attempting these procedures. Failure to do so could result in severe or fatal shock, or equipment damage.**

Procedure

☐ 

1. Be sure power is removed at the source before starting this procedure.

☐ 2. Open the rear door of the cabinet.

☐ 3. Disconnect and label the cable from J1 (Fig. PR11-1) on the DC bus monitoring assembly.

NOTE: Do not disconnect or connect the cable from the DC bus monitoring assembly to the DC bus bar while the system is operating. Doing so could cause a PFI to occur.

☐ 4. Refer to Figure PR11-1 and use the bladed screwdriver to disengage the locking device on the DC bus monitoring assembly.

☐ 5. Remove the DC bus monitoring assembly from the DIN rail.

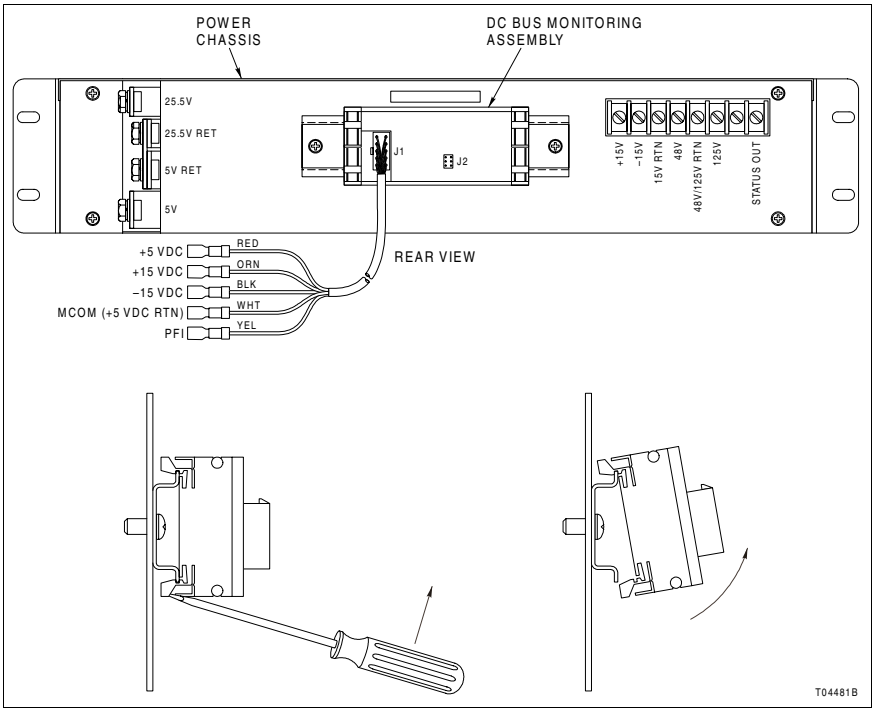

Figure PR11-1. DC Bus Monitoring Assembly Removal

Power Chassis Removal

PR12

Purpose/Scope

10 min.

This procedure explains how to remove the power chassis from the cabinet.

Parts None.

Tools
- Bladed screwdriver.
- Phillips screwdriver.

Safety Considerations

WARNING	**1. Disconnect power before attempting these procedures. Failure to do so could result in severe or fatal shock, or equipment damage.**

Procedure

☐ 

1. Be sure power is removed at the source before starting this procedure.

☐ 2. Open the front and rear doors of the cabinet.

☐ 3. Disconnect and label all wires connected to the power chassis.

☐ 4. Use the Phillips screwdriver to remove the pan head Phillips screws, M4 lockwashers, and M4 flat washers that secure the power chassis to the rear mounting brackets (Fig. PR12-1).

☐ 5. While supporting the front of the power chassis, use the bladed screwdriver to remove the pan head slotted screws and M8 lockwashers that secure the power chassis to the front mounting brackets (Fig. PR12-1).

☐ 6. Remove the power chassis from the cabinet.

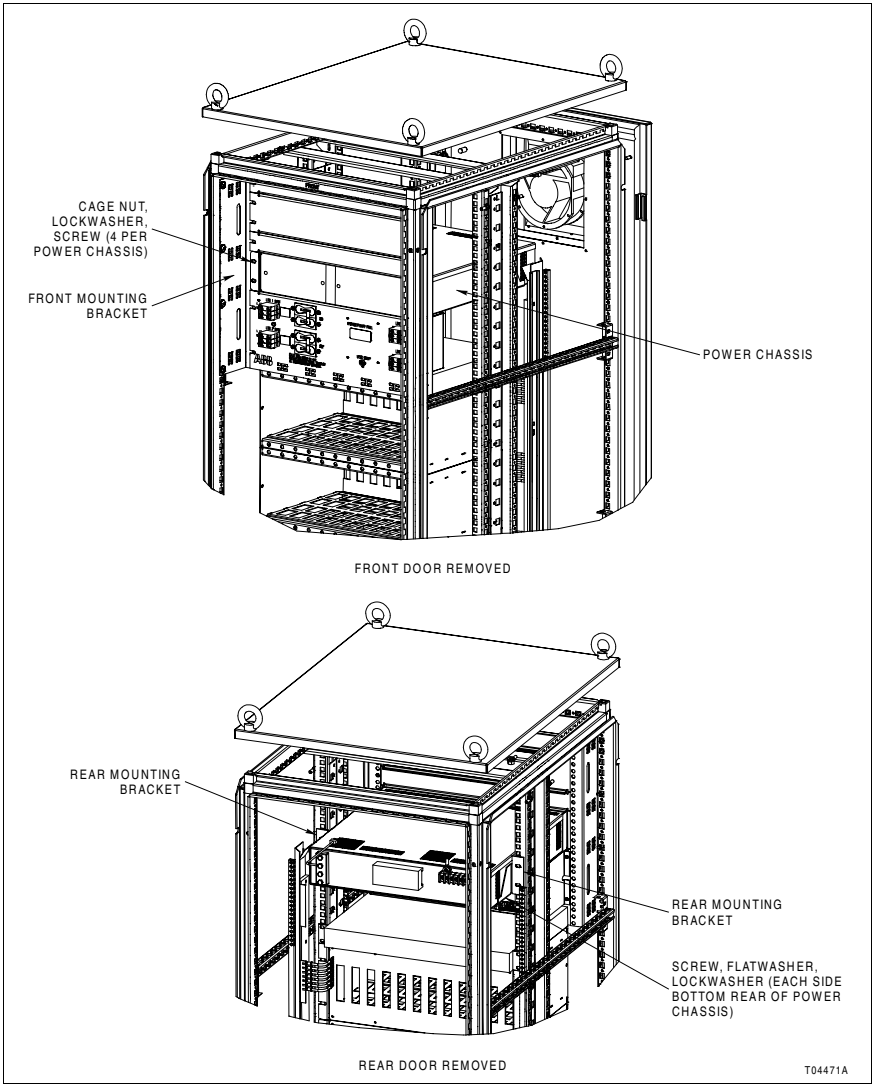

Figure PR12-1. Power Chassis Removal

PEP Removal

PR13

Purpose/Scope

10 min.

This procedure explains how to remove the PEP from the cabinet.

Parts None.

Tools Bladed screwdriver.

Safety Considerations

WARNING	**1. Disconnect power before attempting these procedures. Failure to do so could result in severe or fatal shock, or equipment damage.**

Procedure

☐ 

1. Be sure power is removed at the source before starting this procedure.

☐ 2. Open the front door of the cabinet.

☐ 3. Label and remove all wires connected to the PEP.

☐ 4. Use the bladed screwdriver to remove the four screws and lockwashers that secure the PEP to the front mounting brackets.

☐ 5. Remove the PEP from the cabinet.

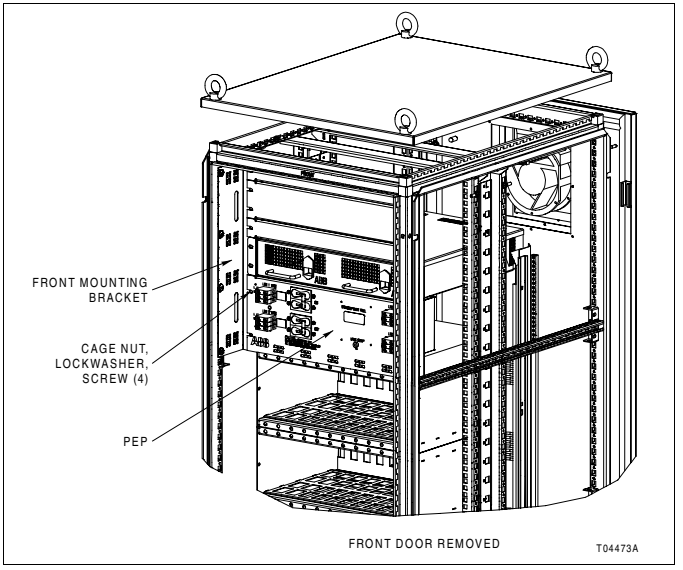

Figure PR13-1. PEP Removal

Fan Assembly Removal

PR14

Purpose/Scope

5 min.

This procedure explains how to remove the fan assembly from the cabinet.

Parts None.

Tools Bladed screwdriver.

Safety Considerations

WARNING	**1. Disconnect power before attempting these procedures. Failure to do so could result in severe or fatal shock, or equipment damage.**

Procedure

☐ 

1. Be sure power is removed at the source before starting this procedure.

☐ 2. Open the rear door of the cabinet.

☐ 3. Label and remove all cables from the fan assembly.

☐ 4. Use the bladed screwdriver to remove the four screws and lockwashers that secure the fan assembly to the vertical mounting rail. (Fig. PR14-1).

☐ 5. Slide the fan assembly out of the cabinet from the rear.

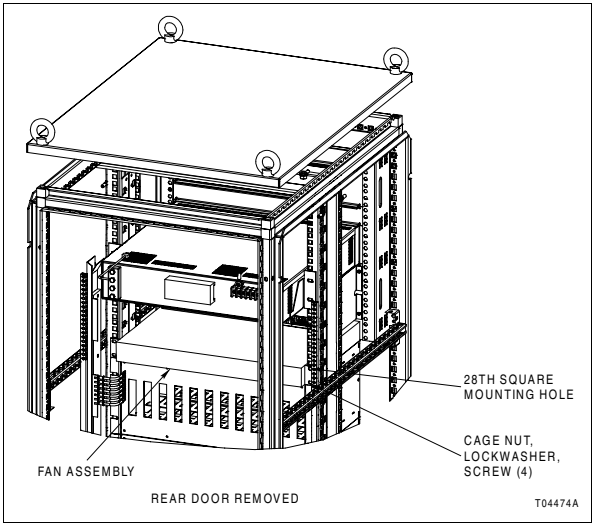

Figure PR14-1. Fan Assembly Removal

Cabinet Air Filter Cleaning

PR15

Purpose/Scope

10 min.

This procedure explains how to clean the cabinet air filter.

Parts None.

Tools
- Bladed screwdriver.
- Clean, dry, filtered compressed air.
- Distilled water.
- Mild detergent (i.e., dishwashing soap).

Procedure

The cabinet air filter mounts over the lower air vent, inside the cabinet front door.

> **NOTE:** This procedure addresses air filter cleaning. If the air filter does not come clean or is in any way damaged, refer to the ***Symphony Enclosures*** instruction and replace it with a new one.

☐ 1. Use the bladed screwdriver to remove one screw securing the mounting plate at the top of the air filter mounting bracket.

☐ 2. Pull the mounting bracket and air filter off the cabinet door.

☐ 3. Remove the air filter from its mounting bracket.

☐ 4. If the air filter is dry and relatively clean, use compressed air to blow dust and dirt free from the filter.

☐ 5. Clean a dirty filter in distilled water and mild detergent. Agitate the filter or squeeze the soapy water through the filter to remove built-up dirt.

☐ 6. When the filter is clean, rinse the filter thoroughly with distilled water.

☐ 7. Air dry the filter before replacing it.

☐ 8. Wipe any dust or dirt from the mounting bracket.

☐ 9. Return the dry filter to its mounting bracket.

☐ 10. Place the mounting bracket into position on the cabinet door and tighten the screw that holds the mounting plate over the air filter mounting bracket.

Checking Connections

PR16

Purpose/Scope

1 hr

This procedure explains how to check connections.

Parts None.

Tools Individual tools cannot be listed due to the numerous connections involved.

Safety Considerations

WARNING	**1. Disconnect power before attempting these procedures. Failure to do so could result in severe or fatal shock, or equipment damage.**

Procedure

Check all signal wiring, power, and ground connections within the cabinet to verify their integrity. When checking connections, always turn a screw, nut or other fastening device in the direction to tighten only. If the connection is loose, it will be tightened. If the connection is tight, the tightening action will verify that it is secure. There must not be any motion to loosen the connection.

☐ 

1. Be sure power is removed at the source before starting this procedure.

☐ 2. Check and verify that all line, neutral, and grounding conductor connections on the PEP are secure and within the torque values listed in Table PR16-1.

☐ 3. Check and verify that all other power connections within the cabinet, including connections to the power chassis are secure and within the torque values listed in Table PR16-1.

☐ 4. Check and verify that all field wiring connections to the modules are secure.

Table PR16-1. Torque Values

Connection	Torque Value	
	Nm	in.-lbs
PEP terminal blocks	1.58, ±0.11	14, ±1
5 VDC and 24 VDC connections on DC bus bar and power chassis	6.77, ±0.23	60, ±2
Terminal block on power chassis	1.36, ±0.11	12, ±1

Index

Index (continued)

For the latest information on ABB and Year 2000 Product Compatibility
Visit us on the World Wide Web at http://www.abb.com

Our worldwide staff of professionals is ready to meet *your* needs for process automation.
For the location nearest you, please contact the appropriate regional office.

Americas
29801 Euclid Avenue
Wickliffe, Ohio USA 44092
Telephone 1-440-585-8500
Telefax 1-440-585-8756

Asia/Pacific
539 Yishun Industrial Park A
Singapore 768740
Telephone 65-756-7655
Telefax 65-756-7309

Germany
Industriestrasse 28
D-65760 Eschborn
Germany
Telephone 49-6196-800-0
Telefax 49-6196-800-1119

Europe, Africa, Middle East
Via Puccini 2
16154 Genoa, Italy
Telephone 39-010-6584-943
Telefax 39-010-6584-941

Form WBPEEUI210509A1 Litho in U.S.A. Feb2001