Migration Guide

Original Instructions

Allen-Bradley

PowerFlex 700AFE to PowerFlex 755TM Regenerative Bus Supply

Catalog Numbers 20Y, 20J

Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

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

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

	**WARNING:** Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
	**ATTENTION:** Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.

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

	**SHOCK HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.
	**BURN HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.
	**ARC FLASH HAZARD:** Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

Preface

Chapter 1

Selection Considerations

Chapter 2

Bus Supply Hardware and Parameter Conversion

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Appendix A

Enclosure Information

The purpose of this migration guide is to assist you in migrating a PowerFlex® 700AFE active front end to a PowerFlex 755TM regenerative bus supply. Use this migration guide to help you understand some basic migration requirements.

This document provides basic guidelines for migrating to the PowerFlex 755TM bus supply. To help you determine the proper migration solution, review the associated product literature to understand the technical similarities and differences between the PowerFlex 700AFE and the PowerFlex 755TM bus supplies.

Download the installation instructions, technical data, programming, and wiring manuals listed in Additional Resources on page 10.

Many sections of this migration guide direct you to additional details and information available in these publications.

IMPORTANT Throughout this publication, the term PowerFlex 755T is used to describe the entire family of PowerFlex 755T TotalFORCE® AC drives including 755TM bus supplies. Where there is a notable difference, the specific suffix letters are indicated.

The terms 'bus supply' and 'line side converter' are both used to describe the active front end converter in the PowerFlex 755TM bus supplies.

Overview

This publication contains these three chapters:

Chapter 1: Selection Considerations on page 13.

This chapter compares the specifications, features, dimensions, and power and control terminals of the PowerFlex 700AFE with the PowerFlex 755TM bus supply.

Chapter 2: Bus Supply Hardware and Parameter Conversion on page 67.

This chapter provides comparisons of the electrical configuration, control wiring, and parameters of the PowerFlex 700AFE with the PowerFlex 755TM bus supply.

Chapter 3: Communication Configuration on page 79.

This chapter identifies the network options that can be migrated to the PowerFlex 755TM bus supply. This section also provides overview information for reference/feedback scaling, and using I/O adapters and 16-bit processors (PLC-5®).

Parameter References

PowerFlex 700AFE parameters are referenced in the format P*xxx* [*name*], B*y*, where:

- *xxx* is the parameter number
- [*name*] is the parameter display name
- *y* is the bit number (if applicable)

In this document, PowerFlex 755T ports, parameters, and bits are referenced in the format #:x.y [name], where:

- # is the port number
- x is the parameter number
- [name] is the parameter display name
- y is the bit number (if applicable).

EXAMPLE For example; referencing an I/O module that is installed in port 4, parameter 6 [Dig Out Invert], bit 1 (TransOut0) can be shown as 04:0006.01 [Dig Out Invert].

The leading zeroes and [name] can be omitted unless required to clarify the context.

This parameter can also be shown as 4:6.1, 4:6.01 [Dig Out Invert] or any other combination that shows the minimum port:parameter information.

General Precautions

Be aware of the following general precautions when working with this type of equipment. See the installation instructions for each bus supply for additional product-specific precautions. Applicable publication information can be found in Additional Resources on page 10.

ATTENTION: Only qualified personnel familiar with adjustable frequency AC drives and associated machinery should plan or implement the installation, startup, and subsequent maintenance of the system. Failure to comply can result in personal injury and/or equipment change.

ATTENTION: This drive contains ESD (Electrostatic Discharge) sensitive parts and assemblies. Static control precautions are required when installing, testing, servicing or repairing this assembly. Component damage may result if ESD control procedures are not followed. If you are not familiar with static control procedures, reference Guarding Against Electrostatic Damage, publication 8000-4.5.2 or any other applicable ESD protection handbook.

Compatibility Quick Check

Use the following comparison table to confirm that there are compatible PowerFlex 755TM bus supplies available to migrate from your existing PowerFlex 700AFE bus supply. If the existing PowerFlex 700AFE installation configuration does not have any of these exceptions, proceed to use the guidelines in this document.

Table 1 - Comparison Quick Check Considerations

Consideration	If you have these existing PowerFlex 700AFE Configuration Exceptions	Then follow these recommendations for the PowerFlex 755TM Bus Supply migration
Maximum DC bus current and power output	More than 2 x frame 13 AFE bus supplies in parallel.	When this migration guide was published there were no compatible units available. Future product enhancements may expand the range of migration solutions.
Mixed Frame Sizes	Any combination of frame 10 and frame 13 AFE converters in parallel.	Mixed frame parallel migration solutions are not covered in this migration guide. A custom migration solution may be required.
Custom Packaging	IP00 open type units that are installed in non-standard enclosures.	Open type IP00 PowerFlex 755TM Bus Supplies are available. IP00 conversions are not covered in this migration guide. A custom migration solution may be required.
Parallel non-regenerative bus supply	Any system with an AFE in parallel with a non-regenerative converter (diode or SCR rectifier). The most common configuration was an AFE in parallel with PowerFlex SCR converter(s).	The PowerFlex 755TM Bus Supply cannot be combined in parallel with any other bus supply converters.
Integration with common DC bus drive system lineup	DC bus bars, control bus bars integrated between the AFE and common bus inverter drive enclosures.	This configuration can be migrated to PowerFlex 755TM bus supply, however, this solution is not covered in this migration guide. The IP21/IP54 enclosed PowerFlex 755TM bus supply converter bus bar configuration is not mechanically compatible with any existing PowerFlex 700AFE configurations and may require a custom migration solution with transition cell enclosure(s).
Communication Protocol	ControlNet Fiber BACnetIP HVAC Modbus RTU CANopen Interbus LonWorks Modbus/TCP Remote I/O RS485 DF1	These communication protocols are not supported by the PowerFlex 755T product. A custom migration solution and/or an external communication protocol converter may be required.

If the existing PowerFlex 700AFE bus supply has any of the above configuration exceptions, contact an Authorized Rockwell Automation Distributor specialist, Solution Partner, Recognized System Integrator, or Rockwell Automation account manager to discuss engineered solutions for custom migrations.

Follow this link for a list of Solution Partners and Recognized System Integrators: http://www.software.rockwell.com/corporate/sp/RASISearchResults.cfm?Programlevel=SP.

Before Migration

Follow these best practices to be sure that your migration is successful.

- Upload and save the PowerFlex 700AFE parameters via Connected Components Workbench™, Studio 5000 Logix Designer®, or DriveExecutive™ software. If you cannot connect to the drive online, manually record the parameter values.
- Record and label all power, digital, and analog I/O control wiring.
- Upload and save any network files and programmable logic controller (PLC) programs.

General Information

See the Wiring and Grounding Guidelines for Pulse-width Modulated (PWM) AC Drives Installation Instructions, publication DRIVES-IN001, for information regarding the topics listed below.

Wire/cable type

- General
- Input power
- Discrete drive I/O
- Analog signal and encoder
- Communication

Power distribution

- System configurations
- AC line voltage
- Surge protection MOVs and common mode capacitors
- AC line impedance
- PowerFlex drives used with regenerative units
- DC bus wiring guidelines

Grounding

- Safety grounds
- Noise-related grounds

Installation practices

- Mounting
- Conduit entry
- Ground connections
- Wire routing
- Conduit
- Cable trays
- Shield termination
- Conductor termination
- Moisture

Electromagnetic interference

- Causes and containing common mode noise
- Causes and preventing/mitigating transient interference
- Enclosure lighting

Abbreviations

This table contains abbreviations that are used throughout this document.

Abbreviation	Description
(o)	Optional equipment
(s)	Standard, or included in base catalog number
AFE	Active Front End
AIC	Ampere Interrupting Current
AOP	Add On Profile
CBI	Common Bus Inverter
EMI	Electromagnetic Interference Filter
HD	Heavy Duty Overload Rating
HIM	Human Interface Module
I/O	Input/Output
LD	Light Duty Overload Rating
LSC	Line Side Converter
MCC	Motor Control Center
MOV	Metal Oxide Varistor
ND	Normal Duty Overload Rating
PLC	Programmable Logic Controller
PWM	Pulse-width Modulated
SCCR	Short Circuit Current Rating
TVSS	Transient Voltage Surge Suppressor
VFD	Variable Frequency Drive
XLPE	Cross-linked Polyethylene

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
PowerFlex Active Front End User Manual, publication 20Y-UM001	Provides basic information that is needed to install, start-up, and troubleshooting of IP20/IP21 enclosed PowerFlex 700AFE bus supplies. Provides detailed technical data, specifications, ratings, and option information. Provides detailed parameter descriptions, configuration settings, and fault/alarm troubleshooting.
Lifting and Mounting PowerFlex Active Front End (AFE) – Frames 10 and 13 Installation Instructions, publication 20Y-IN001	Provides detailed installation instructions for handling IP20/IP21 enclosed PowerFlex 700AFE bus supplies.
PowerFlex 700AFE Firmware v1.003 Release Notes, publication 20Y-RN001	Firmware Release Notes for PowerFlex 700AFE bus supply.
PowerFlex Active Front End Solutions Product Profile, publication 20Y-PP001	Provides an overview of product benefits and features.
PowerFlex Active Front End – Frame 10 Hardware Service Manual, publication 20Y-TG001	This manual contains hardware service information for the frame 10 PowerFlex Active Front End.
PowerFlex Active Front End – Frame 13 Hardware Service Manual, publication 20Y-TG002	This manual contains hardware service information for the frame 13 PowerFlex Active Front End.
PowerFlex Active Front End in IP20 2500 MCC Style Encl. Fr. 10 Bus Splice Kit Installation Instructions, publication 20Y-IN003	Provides detailed installation instructions for MCC bus splice kit.
PowerFlex Active Front End in IP20 2500 MCC Style Encl. Fr. 13 Right-Side Bus Splice Kit Installation Instructions, publication 20Y-IN004	Provides detailed installation instructions for MCC bus splice kit.
PowerFlex Active Front End in IP20 2500 MCC Style Encl. Fr. 13 Left-Side Bus Splice Kit Installation Instructions, publication 20Y-IN005	Provides detailed installation instructions for MCC bus splice kit.
PowerFlex 700AFE Spare Parts Installation Instructions, publication 20Y-IN002	Provides detailed installation instructions for PowerFlex 700AFE spare parts.
PowerFlex 700H, 700S, and 700AFE Drive Fan Systems, Frames 9…14 Installation Instructions, publication PFLEX-IN029	Provides detailed installation instructions for cooling fan replacement and installation.
Balancing Resistor Kit for 600/690V Frame 13 PowerFlex 700AFE and 600/690V Frame 13 and 14 PowerFlex 700H/700S AC Drives Installation Instructions, publication PFLEX-IN028	Provides detailed installation instructions for balancing resistor replacement.
PowerFlex 750-Series Products with TotalFORCE Control Technical Data, publication 750-TD100	Provides detailed technical data, specifications, ratings, fuse/circuit breaker sizing and option information for IP20/IP54 enclosed PowerFlex 755T products.
PowerFlex 750-Series Products with TotalFORCE Control Installation Instructions, publication 750-IN100	Provides procedures for the handling, installation, and electrical wiring of IP20/IP54 enclosed PowerFlex 755T products.
PowerFlex 755TM IP00 Open Type Kits Technical Data, publication 750-TD101	Provides detailed technical data, specifications, ratings, fuse/circuit breaker sizing and option information for IP00 open type PowerFlex 755T drive system products.
PowerFlex 755TM IP00 Open Type Kits Installation Instructions, publication 750-IN101	Provides procedures for the handling, installation, and electrical wiring of IP00 open type PowerFlex 755T drive system products.
PowerFlex Drives with TotalFORCE Control Programming Manual, publication 750-PM100	Provides detailed parameter descriptions, configuration settings, and fault/alarm troubleshooting.

Resource	Description
PowerFlex 750-Series Products with TotalFORCE Control Hardware Service Manual, publication 750-TG100	Provides detailed troubleshooting, maintenance, component testing, and hardware service instructions for PowerFlex 750T drives and bus supplies.
Drives in Common Bus Configurations with PowerFlex 755TM Bus Supplies Application Techniques, publication DRIVES-AT005	Provides basic information to properly wire and ground the following products in common bus applications: • PowerFlex 755TM drive system products for common bus solutions • PowerFlex 750-Series AC and DC input drives • Kinetix 5700 servo drives
PowerFlex 755 Drive Embedded EtherNet/IP Adapter User Manual, publication 750COM-UM001	These publications provide detailed information on to configure, use, and troubleshoot PowerFlex 750-Series communication option modules and adapters.
PowerFlex 20-750-DNET DeviceNet Option Module User Manual, publication 750COM-UM002	
PowerFlex 20-750-CNETC Coaxial ControlNet Option Module, publication 750COM-UM003	
PowerFlex 20-750-PBUS Profibus DPV1 Option Module, publication 750COM-UM004	
PowerFlex 20-750-BNETIP BACnet/IP Option Module, publication 750COM-UM005	
PowerFlex 20-750-PNET Profinet Single-port Option Module User Manual, publication 750COM-UM006	
PowerFlex 20-750-PNET2P Profinet Dual-port Option Module, publication 750COM-UM007	
PowerFlex 20-750-ENETR Dual-port EtherNet/IP Option Module User Manual, publication 750COM-UM008	
PowerFlex 750-Series Drives with TotalFORCE Control Built-in EtherNet/IP Adapter User Manual, publication 750COM-UM009	
PowerFlex 20-HIM-A6 and 20-HIM-C6S HIM (Human Interface Module) User Manual, publication 20HIM-UM001	Provides detailed information on the Human Interface Module (HIM).
PowerFlex 755TM DC Precharge Modules Unpacking and Lifting Installation Instructions, publication 750-IN103	Provides detailed set-up and operating instructions for the DC precharge module lift.
PowerFlex 750-Series Service Cart and DCPC Module Lift Installation Instructions, publication750-IN105	Provides detailed set-up and operating instructions for the module service cart and lift extension option.
PowerFlex 755TM Power and Filter Module Storage Hardware Installation Instructions, publication 750-IN106	Provides detailed installation and usage instructions for this hardware accessory.
PowerFlex 755T Module Service Ramp Installation Instructions, publication 750-IN108	Provides detailed usage instructions for the module service ramp.
PowerFlex 750-Series ATEX Option Module user manual, publication 750-UM003	Provides information on using the 20-750-ATEX option module.
Wiring and Grounding Guidelines for Pulse-width Modulated (PWM) AC Drives Installation Instructions, publication DRIVES-IN001	Provides detailed installation guidelines and recommendations for PWM AC drive equipment.
Industry Installation Guidelines for Pulse Width Modulated (PWM) AC Drives, publication DRIVES-AT003	Provides basic information on enclosure systems, considerations to help protect against environmental contaminants, and power and grounding considerations for installing Pulse Width Modulated (PWM) AC drives.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.

Resource	Description
Safety Guidelines for the Application, Installation, and Maintenance of Solid-State Control, publication SGI-1.1	Provides general guidelines for the application, installation, and maintenance of solid-state control.
Guarding Against Electrostatic Damage, publication 8000-4.5.2	Provides practices for guarding against Electrostatic damage (ESD)
Product Certifications website, http://www.rockwellautomation.com/global/certification/overview.page	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at http://www.rockwellautomation.com/global/literature-library/overview.page. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Selection Considerations

Before proceeding with detailed migration guidelines, see Table 1 on page 7 to verify that you can migrate your PowerFlex 700AFE bus supply.

You must consider the hardware and control differences between the PowerFlex 700AFE and PowerFlex 755TM bus supplies. This chapter describes some of the primary differences. Additional chapters will provide in-depth comparisons.

A common DC bus drive system is a complex electrical and mechanical system that can be composed of many different power devices, such as DC input common bus inverter, capacitor banks, bus conditioners, and common mode filters. Because these drive systems are custom designed, it is important to review the existing inverter and other equipment that will be connected to the DC bus to confirm whether the equipment is compatible with the new PowerFlex 755TM bus supply. Some devices are not compatible and must be substituted, removed completely, or circuits modified for use with the PowerFlex 755TM bus supply.

IMPORTANT Review Drives in Common Bus Configurations with PowerFlex 755TM Bus Supplies application technique, publication DRIVES-AT005, to confirm that the existing DC bus system and connected DC bus equipment is compatible with the PowerFlex 755TM bus supply converter.

About the PowerFlex 700AFE Bus Supply

The PowerFlex 700AFE, catalog code 20Y..., is available in two different power rating frame sizes (frames 10 and 13) and three different packaging methods:

- IP00 open
- IP21 Rittal
- IP20 2500 Motor Control Centers (MCCs)

Custom enclosures and hardware configurations using Bulletin 2100 MCC enclosures were created by Rockwell Automation drive systems and many system integrators. Because of the many variations that are possible with IP00 open type equipment, this document does not cover custom engineered AFE migrations. Contact an Authorized Rockwell Automation Distributor specialist, Solution Partner, Recognized System Integrator, or a Rockwell Automation account manager to discuss engineered solutions for these AFE migrations.

A list of Solution Partners and Recognized System Integrators is located at: http://www.software.rockwell.com/corporate/sp/RASISearchResults.cfm?Programlevel=SP.

It was possible to parallel individual converters to increase the total available DC bus power rating.

- The IP21 Rittal enclosed AFE can have up to six units of either frame size paralleled.
- The IP20 2500 MCC could have two units of the same frame size paralleled. Paralleling rules are in place, due to the ampere rating of the DC bus bars available for the enclosures indicated.

When paralleled, the individual converters operate independently with 5% droop, so a master/slave architecture was not required. Paralleling required derating the AFE DC current and power output to 95% of published ratings.

PowerFlex 700AFE Catalog Number Explanation

The catalog current 'Code' numbers are related to the PowerFlex 700AFE AC input current, NOT the DC output current. The 'kW' and 'Hp' columns in the catalog structure tables are the DC output ratings.

Position

1…3	*4*	*5…7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
20Y	**D**	**460**	**A**	**0**	**A**	**N**	**N**	**A**	**N**	**A**	**0**
a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*j*	*k*	*l*

a

Drive

Code	Type
20Y	PowerFlex 700AFE

b

Voltage Rating

Code	Input Voltage	Phase
D	400/480V AC	3
F	600/690V AC	3

c1

400/480V Input

Code	Input Amps ND (HD)	kW at 400V ND (HD)	Hp at 480V ND (HD)	Frame Size
460	460 (385)	309 (258)	497 (416)	10
1K3	1300 (1150)	873 (772)	1404 (1242)	13

c2

600/690V Input

Code	Input Amps ND (HD)	Hp at 600V ND (HD)	kW at 690V ND (HD)	Frame Size
325	325 (240)	439 (324)	376 (278)	10
1K0	1030(1)	1390(1)	1193(1)	13

(1) There is no heavy-duty rating for frame 13, 600/690V.

d

Enclosure

Code	Type	Conformal Coating
A(1)	IP21 Rittal Enclosure, NEMA/UL Type 1	Yes
N(2)	IP00, open-chassis	Yes
P(3)	IP20, NEMA/UL Type 1 2500 MCC Style enclosure with power bus, 800 mm (31.5 in.) deep, standard cabinet color (RAL7032)	Yes
W(3)	IP20, NEMA/UL Type 1 2500 MCC Style enclosure with power bus, 800 mm (31.5 in.) deep, CenterLine 2100 gray (ASA49)	Yes

(1) Includes AFE power module, LCL filter, control assembly, motor-controlled circuit breaker, and precharge circuit in a Rittal enclosure.

(2) Restricted to SSB. Includes AFE power module, LCL filter, and control assembly. Excludes circuit breaker or precharge circuit.

(3) Includes AFE power module, LCL filter, control assembly, Incoming circuit breaker, and precharge circuit in 2500 MCC Style enclosure. Frame 10 has 1250 A DC bus and frame 13 has 3000 A DC bus.

e

HIM

Code	Operator Interface	Mount
0	No HIM	AFE

f

Documentation

Code	Documents	Ship Carton
A	User Manual	Yes

g

Brake

Code	With Brake IGBT
N	No

h

Brake Resistor

Code	With Resistor
N	No

i

Equipment Type

Code	Description
A	AFE with power line filter

j

Comm Slot

Code	Communication Option
N	None

k

I/O Option

Code	Type	I/O Volts
A(1)	Standard, with outputs	24V DC

(1) A 120V AC I/O option is not available.

l

Feedback

Code	Type	Installed On
0	None	—

About the PowerFlex 755TM Bus Supply

The PowerFlex 755TM bus supply, catalog code 20J..., is available in five different power rating frame sizes (frames 8, 9, 10, 11, and 12) and three different packaging methods:

- IP00 open
- IP21 Rittal
- IP54 Rittal

Paralleling of PowerFlex 755TM bus supplies is not supported. The PowerFlex 755TM bus supply is a fully regenerative, low harmonic active front end converter that can easily be integrated with PowerFlex 750-Series and PowerFlex 755TM IP20/IP54 enclosed common bus inverters. The enclosure design and power/control bus bar systems in the PowerFlex 755TM bus supply are mechanically and electrically compatible with similarly enclosed PowerFlex 750-Series and PowerFlex 755TM DC input common bus inverters.

IMPORTANT PowerFlex 755TM enclosures and bus systems are not directly compatible with any existing PowerFlex 700AFE enclosures and connected inverter enclosures. In almost all cases, it is necessary to employ a transition cabinet between the existing drive enclosures and the new PowerFlex 755TM bus supply enclosure. Transition cells are expected to be available from Rockwell Automation at a later date.

PowerFlex 755T Product Catalog Number Explanation

1…3	4	5	6	7	8…10	11	12	13	14	15	16	17	18	
20G	1	G	3	D	740	L	N	A	N	N	N	N	N	-C0-P15…
a	*b*	*c*	*d*	*e*	*f1…f4*	*g*	*h*	*i*	*Positions 14…18 are not used.*					*Control and Power Options*

a

Drive		
Code	Type	Frames
20G	PowerFlex 755TL Drives	8…10
	PowerFlex 755TR Drives PowerFlex 755TM Common Bus Inverters	8…12
20J	PowerFlex 755TM Bus Supplies	8…12

b

Cooling Type		
Code	Description	Frames
1	Forced Air	8…12

c

Input Type		
Code	Description	Frames
D	Common Bus with DC Precharge	8…12
E	Common Bus without DC Precharge	8…12
F	Regenerative and Low Harmonic AFE (1)	8…12
G	Low Harmonic AFE (2)	8…10

(1) Applies to PowerFlex 755TR drives and 755TM bus supplies.
(2) Applies to PowerFlex 755TL drives.

d

Enclosure		
Code	Description	Frames
3	IP21, UL Type 1; Floor Mount	8…12
4	IP54, UL Type 12; Floor Mount	8…12

e

Voltage Rating	
Code	Voltage
C	400V AC; 3 PH
D	480V AC; 3 PH
E	600V AC; 3 PH
F	690V AC; 3 PH

f1

PowerFlex 755 ND Rating			
400V, 50 Hz Input			
Code	Amps	kW	Frame
302	302	160	8
367	367	200	
460	460	250	
540	540	315	
585	585	315	
650	650	355	
750	750	400	
770	770	400	
920	920	500	9
1K0	1040	560	
1K1	1112	630	
1K2	1175	710	
1K4	1465	800	
1K6	1590	850	10
1K7	1715	1000	
2K1	2156	1250	
2K8	2849	1650	11
3K5	3542	2000	12

f2

PowerFlex 755 ND Rating			
480V, 60 Hz Input			
Code	Amps	Hp	Frame
302	302	250	8
361	361	300	
430	430	350	
505	505	400	
545	545	450	
617	617	500	
710	710	600	
740	740	650	
800	800	700	9
960	960	800	
1K0	1045	900	
1K1	1135	1000	
1K3	1365	1100	
1K4	1420	1250	10
1K6	1655	1500	
2K0	2072	1800	
2K6	2738	2400	11
3K4	3404	3000	12

f3

PowerFlex 755 ND Rating			
600V, 60 Hz Input			
Code	Amps	Hp	Frame
242	242	250	8
295	295	300	
355	355	350	
395	395	400	
435	435	450	
545	545	550	
595	580	600	9
690	690	700	
760	760	800	
825	825	900	
980	980	1000	
1K1	1045	1100	10
1K2	1220	1250	
1K5	1430	1500	
2K0	1946	2000	11
2K4	2420	2500	12

f4

PowerFlex 755 ND Rating			
690V, 50 Hz Input			
Code	Amps	kW	Frame
215	215	200	8
265	265	250	
330	330	315	
370	370	355	
415	415	400	
505	505	500	
565	565	560	9
650	650	630	
735	735	710	
820	820	800	
920	920	900	
1K0	1030	1000	10
1K1	1150	1100	
1K4	1419	1400	
1K8	1865	1800	11
2K3	2318	2300	12

1…3	4	5	6	7	8…10	11	12	13	14	15	16	17	18	
20J	1	F	3	C	1K6	L	N	A	N	N	N	N	N	-C1-P16…
a	*b*	*c*	*d*	*e*	*f5…f8*	*g*	*h*	*i*	*Positions 14…18 are not used.*					*Control and Power Options*

f5

PowerFlex 755TM Bus Supplies ND Rating			
400V, 50 Hz Input			
Code	Amps	kW	Frame
302	324	188	8
367	394	228	
460	494	286	
540	579	336	
585	628	364	
650	698	405	
750	805	467	
770	826	479	
920	987	572	9
1K0	1116	647	
1K1	1193	692	
1K2	1261	731	
1K4	1570	910	
1K6	1697	984	10
1K7	1840	1067	
2K1	2314	1342	
2K8	3057	1772	11
3K5	3801	2204	12

f6

PowerFlex 755TM Bus Supplies ND Rating			
480V, 60 Hz Input			
Code	Amps	kW	Frame
302	311	216	8
361	371	258	
430	442	307	
505	519	361	
545	560	390	
617	635	442	
710	730	508	
740	761	529	
800	823	573	9
960	987	687	
1K0	1075	748	
1K1	1167	812	
1K3	1404	977	
1K4	1460	1016	10
1K6	1702	1184	
2K0	2131	1483	
2K6	2816	1959	11
3K4	3501	2436	12

f7

PowerFlex 755TM Bus Supplies ND Rating			
600V, 60 Hz Input			
Code	Amps	kW	Frame
242	249	217	8
295	303	263	
355	365	317	
395	406	353	
435	447	389	
545	560	487	
595	596	518	9
690	710	617	
760	782	680	
825	848	737	
980	1008	877	
1K1	1075	935	10
1K2	1255	1091	
1K5	1471	1279	
2K0	2001	1740	11
2K4	2489	2164	12

f8

PowerFlex 755TM Bus Supplies ND Rating			
690V, 50 Hz Input			
Code	Amps	kW	Frame
215	221	221	8
265	272	272	
330	339	339	
370	380	380	
415	426	426	
505	518	518	
565	580	580	9
650	667	667	
735	754	754	
820	842	842	
920	944	944	
1K0	1057	1057	10
1K1	1180	1180	
1K4	1456	1456	
1K8	1914	1914	11
2K3	2379	2379	12

1…3	4	5	6	7	8…10	11	12	13	14	15	16	17	18	
20G	1	D	3	F	2K3	M	N	D	N	N	N	N	N	-C0-C11-P15…
a	*b*	*c*	*d*	*e*	*f9…f12*	*g*	*h*	*i*	*Positions 14…18 are not used.*					*Control and Power Options*

f9

PowerFlex 755TM Common Bus Inverter ND Rating			
400V, 50 Hz Input			
Code	Amps	kW	Frame
302	302	160	8
367	367	200	
460	460	250	
540	540	315	
585	585	315	
650	650	355	
750	750	400	
770	770	400	
920	920	500	9
1K0	1040	560	
1K1	1112	630	
1K2	1175	710	
1K4	1465	800	
1K6	1590	850	10
1K7	1715	1000	
2K1	2156	1250	
2K8	2849	1650	11
3K5	3542	2000	12

f10

PowerFlex 755TM Common Bus Inverter ND Rating			
480V, 60 Hz Input			
Code	Amps	Hp	Frame
302	302	250	8
361	361	300	
430	430	350	
505	505	400	
545	545	450	
617	617	500	
710	710	600	
740	740	650	
800	800	700	9
960	960	800	
1K0	1045	900	
1K1	1135	1000	
1K3	1365	1100	
1K4	1420	1250	10
1K6	1655	1500	
2K0	2072	1800	
2K6	2738	2400	11
3K4	3404	3000	12

f11

PowerFlex 755TM Common Bus Inverter ND Rating			
600V, 60 Hz Input			
Code	Amps	Hp	Frame
242	242	250	8
295	295	300	
355	355	350	
395	395	400	
435	435	450	
545	545	550	
595	580	600	9
690	690	700	
760	760	800	
825	825	900	
980	980	1000	
1K1	1045	1100	10
1K2	1220	1250	
1K5	1430	1500	
2K0	1946	2000	11
2K4	2420	2500	12

f12

PowerFlex 755TM Common Bus Inverter ND Rating			
690V, 50 Hz Input			
Code	Amps	kW	Frame
215	215	200	8
265	265	250	
330	330	315	
370	370	355	
415	415	400	
505	505	500	
565	565	560	9
650	650	630	
735	735	710	
820	820	800	
920	920	900	
1K0	1030	1000	10
1K1	1150	1100	
1K4	1419	1400	
1K8	1865	1800	11
2K3	2318	2300	12

g

Filtering and CM Cap Configuration				
Code	EMC Filtering	PE-A (1)	PE-B	Reflected Wave Filtering
J	Yes	Installed	Removed	No
K	Yes	Installed	Removed	Yes
L	No	Installed	Removed	No
M	No	Installed	Removed	Yes

(1) Setting does not apply to product type 20G with input types D and E. PE-A jumpers are removed when bus conditioner for marine applications (-P51) is selected.

h

Dynamic Braking (1)		
Code	Internal Resistor	Internal Transistor
N	No	No

(1) Not available on Frames 8…12, specify Code 'N'.

i

Door-mounted HIM (Frames 8…10)	
Code	Operator Interface and Control
A	No Door-mounted HIM with TotalFORCE Control
D	Enhanced LCD, Full Numeric, IP66, NEMA Type 4X/12 with TotalFORCE Control

20G Control Options Selection

Code	Option	Frames	Input Type
C0	Torque Accuracy Module	8…12	D, E, F, G
C11	Single Pod (with Control Bay) (1)	8…12	D, E
C12	Dual Pod (with Control Bay) (1)	8…12	D, E

(1) When code 'D' is selected in position 13, code C11 includes one door-mounted HIM and code C12 includes two door-mounted HIMs.

20J Control Options Selection

Code	Option	Frames	Input Type
C1	Control Transformer (Internal 240V) (1)	8…12	F

(1) This option only applies to 755TM regenerative and low harmonic bus supplies. If this option is not selected, a 240V AC, single-phase, neutral grounded external power source must be supplied by the customer.

20G Power Options Selection

Code	Option	Frames	Input Type
P15	Top Cable Exit w/wiring bay	8…12	D, E, F, G
P16	Top Cable Entry w/wiring bay	10…12	F, G
P17	Top Cable Entry no wiring bay	8… 9	F, G
P46	System DC Bus (4700 Amp)	8…10	D, E
P50	DC Bus Conditioner	8…12	F, G
P51	DC Bus Conditioner – Marine Applications	8…12	F, G

20J Power Options Selection

Code	Option	Frames	Input Type
P16	Top Cable Entry w/wiring bay	10…12	F
P17	Top Cable Entry no wiring bay	8… 9	F
P46	System DC Bus (4700 Amp)	8…10	F
P50	DC Bus Conditioner	8…12	F
P51	DC Bus Conditioner – Marine Applications	8…12	F

Power and Control Bus Bar Ratings

DC power and control circuit bus bars may not be available, standard, or optional for the PowerFlex 700AFE or PowerFlex 755TM bus supply. See Table 2 to identify the existence and rating of bus bars.

Table 2 - Power and Control Bus Bar Rating Comparison

Description	PowerFlex 700AFE Bus Supply	PowerFlex 755TM Bus Supply
DC Power Bus Bars	• IP21 Rittal, enclosure code (A); not applicable • IP20 2500 MCC, enclosure code (W); standard CENTERLINE™ DC bus, frame 10, 1250 A DC frame 13, 3000 A DC	(s) frames 8…10; 3000 A DC (s) frames 11…12; 4700 A DC (o) frames 8…10; 4700 A DC, specify power option code (-P46)
Control Power Bus Bars	—	(s) Primary control 240V AC, 1 PH, 100 A (s) Auxiliary 24V DC, 100 A (s) User 120/240V AC, 1 PH, 100 A

The DC power bus bars and control power bus bars within the IP21/IP54 enclosed PowerFlex 755TM bus supplies are not mechanically or electrically compatible with the bus bars in the IP21 Rittal or IP20 2500 MCC enclosed PowerFlex 700AFE bus supplies. A transition enclosure may be required if the new bus supply must interface electrically and mechanically with existing common bus inverter power and control bus bars. Contact an authorized Rockwell Automation Distributor specialist, Solution Partner, Recognized System Integrator, or Rockwell Automation account manager to discuss engineered solutions for these AFE migrations.

IMPORTANT PowerFlex 755TM common bus inverters that are used with the PowerFlex 755TM bus supply must have the same DC bus bar rating as the bus supply. PowerFlex 755TM 3000 A and 4700 A bus bars are not compatible with each other. If any 4700 A bus bars are used, then frames 8…10 drives and bus supplies must have the 4700 A DC bus option (-P46) installed. See the Drives in Common Bus Configurations with PowerFlex 755TM Bus Supplies application techniques, publication DRIVES-AT005, for detailed information regarding PowerFlex 755TM DC bus bar compatibility.

Power Source Considerations

The PowerFlex 700AFE bus supply is typically powered from a dedicated isolation transformer with a solid ground X0 connection. This is the recommended power source and grounding method. See the existing power source wiring diagrams to confirm the following power source electrical information:

- kVA
- primary voltage
- secondary voltage
- % impedance
- secondary winding configuration
- grounding method, solid ground X0, resistance grounded, ungrounded
- other electrical equipment powered from the secondary of the transformer

To verify that the PowerFlex 755TM bus supply operates reliably with the existing power source, consider the following factors.

Sizing

The PowerFlex 755TM bus supply is suitable for use on a power source that is capable of delivering 100,000 A rms symmetrical amperes at 400/480/600V and 65,000 A rms symmetrical amperes at 690V.

The PowerFlex 755TM bus supply must not be used on undersized or high-impedance supply systems. The supply system kVA must be equal to or greater than the drive-related kW. The system impedance must be less than 10%. Operation outside of these limits can cause instability, which results in shutdown.

$$\text{System Impedance} = \left(\frac{\text{Bus Supply kVA}}{\text{Transformer kVA}}\right) \times \text{Transformer \% Impedance}$$

You must take into account the kVA of all PowerFlex 755TM bus supplies on the distribution system and the system impedance of upstream transformers.

Other Loads Powered from the AFE AC Power Source

Full-wave 3 phase or 6-pulse rectifiers are used by most standard AC drives that are powered from AC power sources. If 6-pulse rectifiers are sharing the same AC input source as the PowerFlex 755TM bus supply, follow these recommendations:

- Apply an appropriately-sized isolation transformer to the AC input side of the PowerFlex 755TM bus supply to help isolate unwanted harmonics that are commonly associated with 6-pulse loads.
- If an isolation transformer cannot be used with the PowerFlex 755TM bus supply, consider the following:
  - If the 6-pulse rectifiers are equipped with 3% AC line reactors, the combined 6-pulse rectifier load cannot exceed 150% of the bus supply rating.
  - If the 6-pulse rectifiers are equipped with integral DC link chokes, the combined 6-pulse rectifier load cannot exceed 40% of the bus supply rating.

If the bus supply is connected to an AC source with other drives, or devices with AFE-type input converters that share that same AC input line source, install an appropriately-sized isolation transformer between the power source and the AC input of PowerFlex 755TM bus supply.

Power Source Grounding

The Safety Ground-PE must be connected to system ground. Ground impedance must conform to the requirements of national and local industrial safety regulations and/or electrical codes. Check the integrity of all ground connections periodically.

The PowerFlex 700AFE bus supply can be used with various grounding methods. The PowerFlex 755TM bus supply can be used with similar grounding methods. There are special considerations that may require external bus conditioning equipment, depending on the power source grounding method. A single point (PE only) grounding scheme should be used. Some applications with long distances between the drives or drive line-ups that could cause large potential differences between the drive or line-up grounds may require alternate grounding schemes. See Wiring and Grounding Guidelines for Pulse-width Modulated (PWM) AC Drives, publication DRIVES-IN001, for more information. In addition, see the Drives in Common Bus Configurations with PowerFlex 755TM bus supplies application technical guide, publication DRIVES-AT005, for information about how to configure the PowerFlex 755TM bus supply depending on the power source grounding method.

See Table 3 to assist with modifying the existing installation and as a guide to required power conditioning options for the PowerFlex 755TM bus supply. This table only refers to power conditioning. There are also considerations for the types of common bus inverters that are compatible. For more information, refer to Drives in Common Bus Configuration with PowerFlex 755TM Bus Supplies application techniques, publication DRIVES-AT005 for common bus inverter drive compatibility.

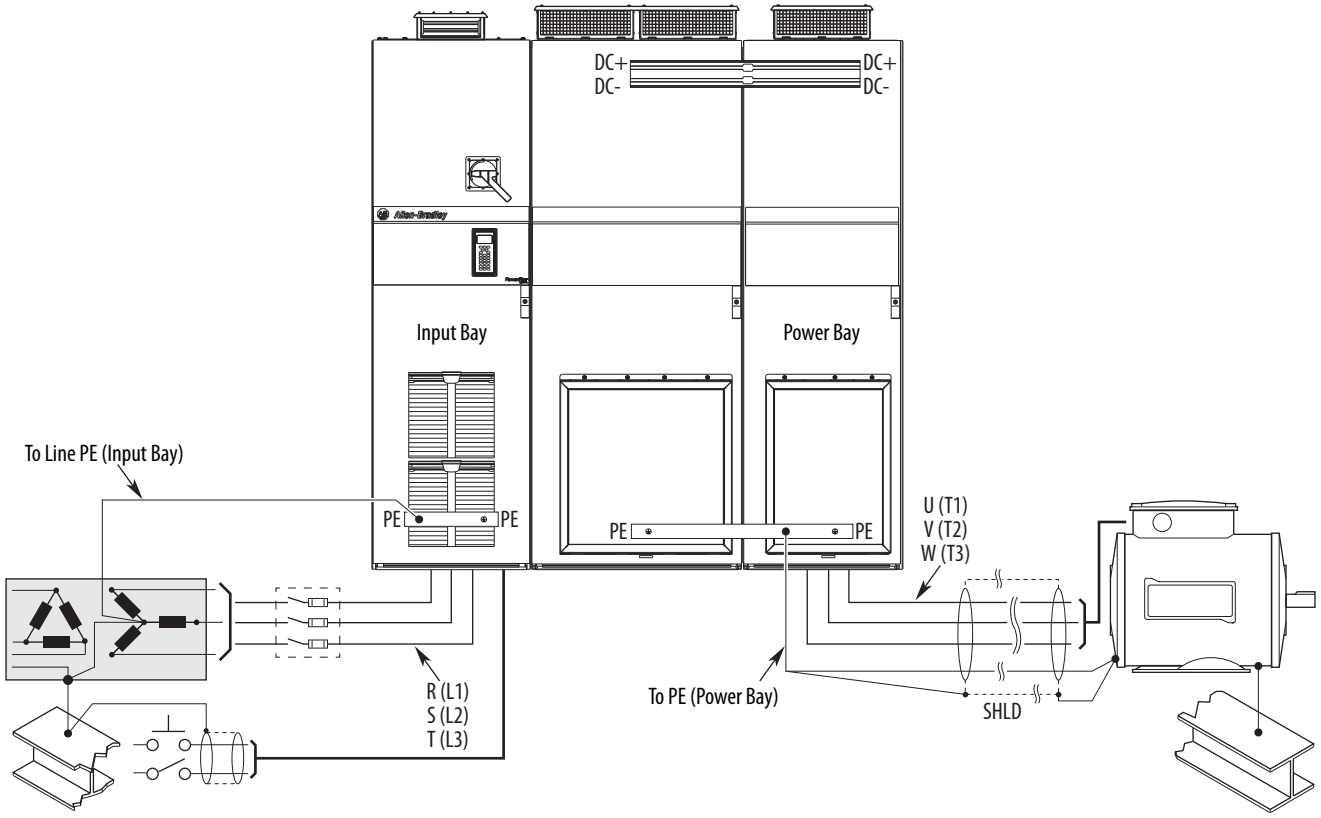
Table 3 - Power Source Grounding Comparison

Power Source Grounding Method	Existing PowerFlex 700AFE External Circuit Modifications that may be required	PowerFlex 755TM Bus Supply Considerations
Wye secondary, X0 solid ground	• Remove external DC Bus Conditioner unit(s). • Remove Common Mode Choke at the DC output of the AFE. • Remove Common Mode Chokes at the DC input to common bus inverter drives. • Retain Common Mode Chokes at the AC output of the common bus inverter drives.	• DC Bus Conditioner included as required. • Confirm if external DC bus capacitor banks are required and of the correct value. Remove/add/modify per publication DRIVES-AT005. • Retain or install Common Mode Chokes at the AC output of PowerFlex 750-series common bus inverter as recommended in publication DRIVES-AT005. • Power Filter Jumpers; PE-A/PE-A1/PE-A2, and PE-B1 jumpers installed per publication 750-IN100.
Wye secondary, X0 resistance grounded with ground fault indicator	• Remove the external DC Bus Conditioner unit(s). • Remove the Common Mode Choke at the DC output of the AFE. • Remove Common Mode Chokes at the DC input to common bus inverter drives. • Retain Common Mode Chokes at the AC output of the common bus inverter drives.	• Specify power option code (–P50) DC Bus Conditioner. The bus supply is factory-shipped with the DC Bus Conditioner(s) installed within the enclosure. • Confirm if external DC bus capacitor banks are required and of the correct value. Remove/add/modify per publication DRIVES-AT005. • Retain or install Common Mode Chokes at the AC output of PowerFlex 750-series common bus inverter as recommended in publication DRIVES-AT005. • Power filter jumpers; PE-A/PE-A1/PE-A2, and PE-B1 jumpers must be set per publication 750-IN100.
Delta secondary, ungrounded with artificial ground (zig-zag) transformer and ground fault indicator	• Remove the external DC Bus Conditioner unit(s). • Remove the Common Mode Choke at the DC output of the AFE. • Remove Common Mode Chokes at the DC input to common bus inverter drives. • Retain Common Mode Chokes at the AC output of the common bus inverter drives.	• Specify power option code (–P50) DC Bus Conditioner. The bus supply is factory shipped with the DC Bus Conditioner(s) installed within the enclosure. • Confirm if external DC bus capacitor banks are required and of the correct value. Remove/add/modify per publication DRIVES-AT005. • Retain or install Common Mode Chokes at the AC output of PowerFlex 750-series common bus inverter as recommended in publication DRIVES-AT005. • Power filter jumpers; PE-A/PE-A1/PE-A2, and PE-B1 jumpers must be set per publication 750-IN100.

Recommended Grounding Scheme

If the bus supply is installed within an enclosure, use a single safety ground point or ground bus bar connected directly to building steel. All circuits (including the AC input ground conductor) must be grounded independently and directly to this point or ground bus bar. A suitable jumper conductor should be installed between the bus supply and common bus inverter PE ground bus bars. We recommend a wye secondary isolation transformer with solid grounded X0 connection (Figure 1).

Figure 1 - Recommended Grounding Method



Bus Capacitance and Precharging Consideration

The PowerFlex 700AFE bus supply had limitations on the maximum DC bus capacitance that could be connected.

The PowerFlex 755TM bus supply has similar requirements for maximum connected DC bus capacitance. The precharge circuits are not designed to charge DC bus capacitance greater than the maximum indicated. If the existing external DC bus capacitance is greater than the maximum for the selected bus supply, it may be necessary to select a larger rating for the PowerFlex 755TM bus supply.

Information about internal DC bus capacitance for most PowerFlex and Kinetix DC input common bus inverters can be found in publication DRIVES-AT005, and publication DRIVES-AT002. Also consider additional capacitor banks that can connect to the DC bus when calculating the external DC bus capacitance.

Table 4 - Maximum External DC Bus Capacitance

PowerFlex 700AFE, Maximum External Capacitance		PowerFlex 755TM Bus Supply, Maximum External Capacitance	
Frame 10	60,100 µF	Frames 8…12	See Appendix A of publication DRIVES-AT005.
Frame 13	98,300 µF		

ATTENTION: Do not exceed the maximum DC bus capacitance as it can cause damage to the bus supply precharge circuits.

See the applicable sections of the Drives in Common Bus Configurations with PowerFlex 755TM Bus Supplies application technique, publication DRIVES-AT005, to verify the PowerFlex 755TM bus supply and connected DC input common bus inverter precharge and interlocking is properly configured for use with the PowerFlex 755TM bus supply. The following items require attention and are covered in the General Considerations section of publication DRIVES-AT005.

1. If drives without internal precharge are used and a disconnect switch is installed between the DC input of the drive and the DC bus, you must use an external precharge circuit between the disconnect switch and the DC input of the drive.

   ATTENTION: Kinetix servo drives and some PowerFlex drives do not have built in precharging circuits. Exercise extreme care to confirm proper precharging and interlocking is implemented for safe and reliable operation of the DC bus system.

2. If drives with internal precharge are used with a disconnect switch installed between the DC input of the drive and the DC bus, you must connect an auxiliary contact on the disconnect switch to a digital input of the drive. The corresponding input must be set to the 'Precharge Enable' option. This provides the proper precharge interlock, guarding against possible damage to the drive when connected to a common DC bus, especially for drives with auxiliary 24V DC control power.
3. The precharge status of the PowerFlex 755TM bus supply must be interlocked with the connected drives, such that the drives are disabled (not running) when the PowerFlex 755TM bus supply is in a precharge state.

EMI Filters

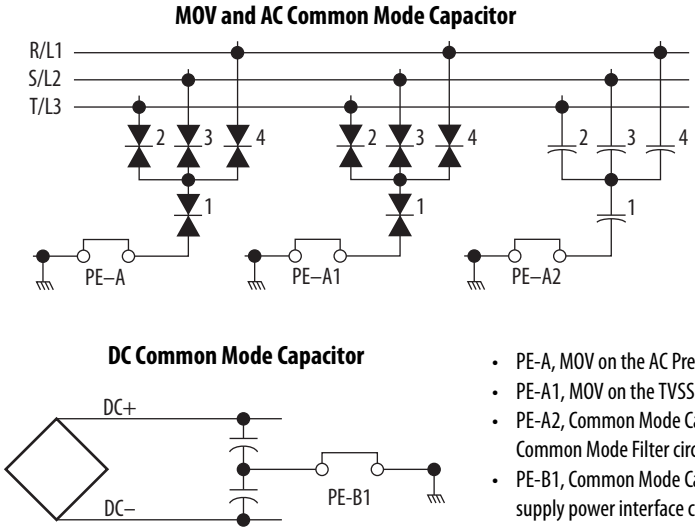
The PowerFlex 755TM bus supply standard filtering is obtained by selecting catalog code (-L) in catalog position 'g' (see PowerFlex 755T Product Catalog Number Explanation on page 17). Additional EMI filtering can be ordered with auxiliary AC line EMI filtering by selecting catalog code (-J) in catalog position 'g'. The (-J) option code adds ferrite cores to AC lines after the precharge circuits. See Power Filter Jumpers on page 26 for more information about power filter jumper settings.

Power Filter Jumpers

The power filter jumper configuration of the PowerFlex 755TM bus supply is an important part of your migration.

See PowerFlex 750-Series Products with TotalFORCE Control Installation Instructions, publication 750-IN100 for detailed information about the use and location of the power filter jumpers.

Figure 2 - PowerFlex 755T Power Jumpers



- PE-A, MOV on the AC Precharge circuit board
- PE-A1, MOV on the TVSS module
- PE-A2, Common Mode Capacitors on the AC Common Mode Filter circuit board
- PE-B1, Common Mode Capacitors on the bus supply power interface circuit boards

IMPORTANT The default factory settings for the power filter jumpers is; PE-A, PE-A1, PE-A2 jumpers in the connected (IN) position and the PE-B1 jumper in the disconnected (OUT) position. If necessary, reconfigure the power filter jumpers as required by the power source grounding method and EMC requirements. When the -P51 option is selected, the factory jumper settings change.

IMPORTANT There could be multiple PE-A2 jumpers, depending on the frame size of the PowerFlex 755TM bus supply. Each LCL Filter roll-in assembly has a separate PE-A2 jumper. All PE-A2 jumpers MUST be in the same position.

IMPORTANT There could be multiple PE-B1 jumpers, depending on the frame size of the PowerFlex 755TM bus supply. Each IGBT power supply roll-in assembly has a separate PE-B1 jumper. All PE-B1 jumpers MUST be in the same position.

IMPORTANT It is important to consider the EMC requirements and grounding configuration of the power source. Certain power source grounding configurations may require removal of the PE-B1 power jumpers. Contact an Authorized Rockwell Automation Distributor specialist, Solution Partner, Recognized System Integrator, or Rockwell Automation account manager to discuss EMC, grounding, and power jumper settings if your system does not match Rockwell Automation recommendations.

The general recommendation is that all connected DC input common bus inverters have their respective DC common mode (PE-B1) jumpers in the disconnected (OUT) position when powered by a PowerFlex 755TM bus supply. See the applicable sections of publication DRIVES-AT005.

Circuit Protection

Branch circuit protection must be provided in accordance with all applicable electrical codes (CEC/CSA/NEC) and any additional or equivalent local electrical installations codes.

User-supplied protective device (fuse and circuit breaker) sizing may be different between equivalent PowerFlex 700AFE and PowerFlex 755TM bus supplies. Verify that the existing protective devices are suitable for use with the selected PowerFlex 755TM bus supply. It may be necessary to change the types and ratings of the existing user-supplied protective devices to be compatible with the PowerFlex 755TM bus supply.

See the fuse and circuit breaker ratings selection tables in publications 20Y-UM001 and 750-TD100, to compare requirements for PowerFlex 700AFE and PowerFlex 755TM external protective devices

External Circuit Protection Device Compatibility Check Example

Figure 3 and Figure 4 show the external circuit protection fuses that are required for a PowerFlex 700AFE frame 10, IP21 Rittal, 480V AC, and the equivalent PowerFlex 755TM bus supply frame 8, normal duty, 480V AC, 519 A DC, catalog current code 'D505'.

According to the tables, the PowerFlex 700AFE should have had either 800 A time delay or 1000 A non-time delay branch circuit fuses installed external to the PowerFlex 700AFE enclosure.

The PowerFlex 755TM bus supply has integral 900 A high-speed semiconductor fuses and may not require external branch circuit protection devices. If external branch circuit fuses are required, the recommended fuse rating per the table should be 650...800 A time delay or 650...1500 A non-time delay fuses.

The existing external branch circuit protection fuses can be reused.

IMPORTANT Figure 3 and Figure 4 are for illustrative purposes only. Do not use these for fuse selection.

Figure 3 - PowerFlex 700AFE, IP21 Rittal Frame 10, Required External AC Input Fuses

400/480 Volt AC Fusing and MCCB Ratings

Frame Size	Fuse Ratings			MCCB Ratings	
	Amps	Bussman Type (1)	Ferraz Shawmut Type	Amps	ABB Type
10	800	—	NH3UD69V800PV	630	T5H630FF3LS
	1000	170M6277	—		
13	2200	—	PC44UD75V22CTQ	1600	T7516FF3PR231LS
	1000 (3 per phase)	170M6277	—		

(1) Suitable for replacement fuse.

Figure 4 - PowerFlex 755TM Bus Supply, Frame 8, 519A DC, Normal Duty, Catalog Code D505

480 Volt AC Input																	
Applied Rating (1)		Cont. Output Amps	Duty	Catalog Number	Output Overload Amps		Continuous AC Input	AC Input Integral Semiconductor Fuse Size (170M Type) (2)			AC Input Protection Devices						
											Dual Element Time Delay Fuse		Non-Time Delay Fuse		Circuit Breaker (5)		Motor Circuit Protector (6)
Hp	Frame			(x = G or J)	1 min	3 s	Amps	2xLCLA mps	2xLCLA mps	1xLCLA mps	1/Phase Min (3)	Max (4)	1/Phase Min (3)	Max (4)	Min	Max	
300	8	361	Light	20x...D302	397	–	332	–	–	900	500	650	500	1000	500	900	500
250		302	Normal		332	453	278	–	–	900	400	500	400	900	400	750	400
200		248	Heavy		372	446	228	–	–	900	350	400	350	750	350	600	350
350	8	430	Light	20x...D361	473	–	396	–	–	900	600	750	600	1200	600	1000	600
300		361	Normal		397	542	332	–	–	900	500	650	500	1000	500	900	500
250		302	Heavy		453	544	278	–	–	900	400	500	400	900	400	750	400
400	8	485	Light	20x...D430	534	–	446	–	–	900	650	800	650	1500	650	1200	650
350		430	Normal		473	645	396	–	–	900	600	750	600	1200	600	1000	600
300		361	Heavy		542	650	332	–	–	900	500	650	500	1000	500	900	500
450	8	545	Light	20x...D505	600	–	501	–	–	900	700	900	700	1600	700	1350	700
400		505	Normal		556	758	465	–	–	900	650	800	650	1500	650	1200	650
350		430	Heavy		645	774	396	–	–	900	600	750	600	1200	600	1000	600

AC Power Cables

The PowerFlex 700AFE IP20/IP21 enclosed DC bus supply used various AC power connection methods. If you intend to reuse any of the existing AC power cables, review the installation and verify that the cables, lugs, and cable ratings meet the requirements of the new PowerFlex 755TM bus supply.

The PowerFlex 755TM IP21/IP54 enclosed bus supplies are connected to the required AC power source with two-hole, UL-listed, crimp barrel lugs that are bolted to the internal AC bus bars or bus stubs.

We recommend this cable construction:

- Three tinned copper conductors with XLPE insulation and three bare copper ground conductors.
- Minimum insulation rating 600V, 75 °C (167 °F)
- Maximum 500 MCM copper conductors, multiple parallel conductors may be required per phase.
- Shielded cable with continuous aluminum armor, copper braid/ aluminum foil combination shield, and tinned copper drain wire, three drain wires per cable assembly, although not necessary, is recommended and may be required to meet some EMC standards for CE, C-Tick, or FCC.
- Armored cable with PVC jacket.

ATTENTION: National Codes and standards (NEC, VDE, CSA, BSI, and so forth) and local codes outline provisions for safely installing electrical equipment. Installation must comply with specifications regarding wire types, conductor sizes, branch circuit protection, and disconnect devices. Failure to do so may result in personal injury and/or equipment damage.

IMPORTANT Refer to Wiring and Grounding Guidelines for Pulse-width Modulated (PWM) AC Drives, publication DRIVES-IN001, for detailed installation planning guidelines.

Other Power Circuit Considerations

If your application requires the use of AC input contactors or other power circuit devices, see the appropriate sections of the PowerFlex 750-Series Products with TotalFORCE Control installation manual, publication 750-IN100. Confirm that interrupting the AC input circuits of the new bus supply is handled correctly to prevent malfunctions, damage, or operational issues with the equipment.

Control Power

The PowerFlex 700AFE IP20/IP21 enclosed DC bus supplies have a standard internal control transformer. The control transformer is sized to supply 240V AC and 120V AC for the PowerFlex 700AFE only. The PowerFlex 700AFE does not support control circuit bus bars.

The PowerFlex 755TM bus supplies do not come with a standard internal 240V AC control transformer. The PowerFlex 755TM control bus system includes as standard; primary control 240V AC bus bars, Auxiliary 24V DC bus bars, and User 120/240V AC bus bars.

- 240V AC primary control power is required. 240V AC control power can be supplied from an external source or from the optional control transformer (option code –C1). If an external 240V AC power supply is used, refer to Table 6 on page 31. We recommend that the optional internal control transformer is ordered with the PowerFlex 755TM bus supply. If the control transformer option (-C1) is specified, the 240V AC primary control power bus bars will be energized from the control transformer.
- 24V DC auxiliary control power is not required for basic operation of the PowerFlex 755TM bus supply. The 24V DC auxiliary control power is used to maintain logic and communication power if the 240V AC primary control power is shut down. If 24V DC auxiliary power is used, you must provide an external properly-sized 24V DC power supply to energize the auxiliary 24V DC bus bars. You must calculate auxiliary 24V DC power supply requirements. See Specification and Feature Comparison on page 33 for PowerFlex 755TM auxiliary 24VDC power supply requirements.
- User 120/240V AC control power is not required for operation of the PowerFlex 755TM bus supply. The User 120/240V AC bus bars are not used by the PowerFlex 755T product and if energized by a user-supplied power supply is available for user-installed control devices.

Connections are made to the control bus bars using a 20-750-CTRLBUS-CONN1 control bus connector. Taps from the control bus connector are rated for 10 A.

External 240V AC control power requirements greater than 10 A total can be made using the control bus connector, 0-750-MCTRLBUS-CONN2. This connector is rated for 100 A to match the control bus rating.

Figure 5 - PowerFlex 755T Control Bus Configuration (External 240V AC Control Power Connector)

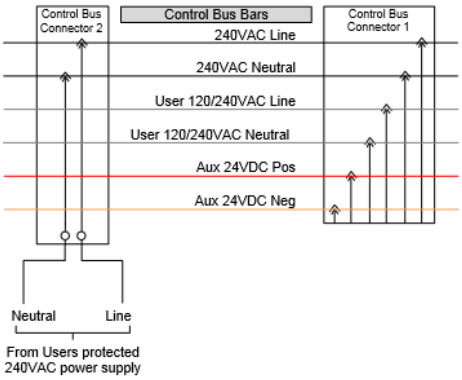


Table 5 - Standard and Optional Control Power Comparison

Description	PowerFlex 700AFE	PowerFlex 755TM Bus Supply
240V AC Primary Control Power	(s) Control transformer, 240V AC,1 PH	(s) Primary 240V AC control bus bars, 100 A, powered from user supplied 240V AC, 50/60Hz, 1 PH, neutral grounded protected primary control power. See Table 6 on page 31 for PowerFlex 755TM bus supply 240V AC power requirements. (o) Control transformer, specify control option code (-C1), 240V AC, 1 PH will supply power to primary control bus bars. see Specification and Feature Comparison on page 33 for PowerFlex 755TM bus supply for additional 240V AC power available with the (–C1) option installed. • The PowerFlex 755T packaged product uses the primary 240V AC control bus bars to supply 240V AC 1 PH control power to various circuits. Primary control power is required and must be supplied by the user or from the optional control transformer.
24V DC Auxiliary Control Power	—	(s) Auxiliary 24V DC bus bars, 100 A. • User supplied 24V DC control power. see Specification and Feature Comparison on page 33 for PowerFlex 755TM bus supply 24V DC power requirements. • The PowerFlex 755T packaged product uses these bus bars to supply 24V DC auxiliary power to various circuits when the 240V AC primary control power is shut off.
120/240V AC User Control Power	—	(s) User 120/240V AC control bus bars, 100 A. • User supplied 120V AC or 240V AC 1 PH control power. • The User 120/240V AC control power and bus bars are not used by PowerFlex 755T product.

Table 6 - PowerFlex 755TM Bus Supply External 240V AC Control Power Requirements

Bus Supply Frame	Required (A rms)		Required for Optional Wiring Bays (A rms)	
	IP21 Enclosure	IP54 Enclosure	Entry (Power Opt Code -P16)	Exit (Power Opt Code -P15)
8	8.4	10.4	0.39	—
9	11.2	15.2	0.39	—
10	17.5	23.5	0.39	—
11	20.3	28.3	0.39	—
12	26.0	36.0	0.39	—

Note the following regarding user-supplied 240V AC primary control power:

- If an external user-supplied 240V AC primary control power source is used, it should be 240V AC, 50/60 Hz, 1 PH, and must have the neutral conductor grounded.
- User-supplied branch circuit protection is required to protect the 240V AC control circuit connectors and bus bars.
- If the primary control bus must also supply 240V AC control power to existing common bus inverter drives then the external supply must be sized for these additional loads.
- If the total 240V AC control power current exceeds 100 A, you must split the control bus and apply separate 240V AC control power to groups of drives.
- Calculate the required external control 240V AC control circuit current from the loading data that is shown in Table 6 on page 31.
  a. Add the current required for applicable Entry and Exit wiring bays.
  b. When selecting an external control transformer power or VA rating, multiply the total current requirement by 240V AC. Multiply this value by 1.25 to ensure the transformer can supply inrush currents.

EXAMPLE Quantity 1 x frame 11 PowerFlex 755TM bus supply, IP54 enclosure with optional entry wiring bay.
- External 240V AC control current required = (34.6 + 0.39) = 35.0 A
- Is the total 240V AC control bus current less than 100 A? Yes.
- Calculate the VA rating of the external transformer = 35 A x 240V x 1.25 = 10,500 VA

A standard size control transformer rated 12…15 kVA is an acceptable solution for this example. The control power option (-C1) control transformer for this example is rated 15,000VA.

ATTENTION: DO NOT connect external 240V AC control power if an internal control transformer is installed. Severe damage to the PowerFlex 755T and external power supplies could occur.

IMPORTANT The PowerFlex 755T product control bus bars and splice kits are not compatible with other enclosure bus bar systems that may have been used with PowerFlex common bus inverters. If it is necessary to connect to existing control bus bars, the migration solution designer is responsible for the proper design and installation of any bus bar transition equipment. Transition cells are expected to be available from Rockwell Automation at a later date.

If the optional 240V AC control transformer control option code (-C1) is specified, the PowerFlex 755TM bus supply is factory-equipped with a 240V AC control transformer rated (as shown in Table 7). Note the additional available 240V AC current that can be used to supply 240V AC control power to common bus inverters that are powered by the bus supply.

Table 7 - Optional Control Transformer Ratings

Bus Supply Frame	Optional Control Transformer (Control Opt Code –C1) (VA)		Additional Available With Optional (-C1) Control Transformer (A rms)	
	IP21 Enclosure	IP54 Enclosure	IP21 Enclosure	IP54 Enclosure
8	3000	4000	1.6	2.9
9	5000	8000	5.4	11.4
10	8000	12,000	9.2	16.6
11	10,000	15,000	13.0	21.7
12	12,000	20,000	14.0	30.6

Specification and Feature Comparison

Table 8 through Table 15 compare the ratings, specifications, certifications, and features between the bus supplies. In the following tables, (s) means included as standard and (o) means available as an option.

Table 8 - Input Power and Features

Description	PowerFlex 700AFE Bus Supply	PowerFlex 755TM Bus Supply
	Cat No. 20Y…	Cat. No. 20J…
Voltage Class	400/480V AC 600/690V AC	400V AC 480V AC 600V AC 690V AC
Input Phases	3 PH only	3 PH only
Voltage Tolerance, for rated DC output power	+/- 10% of nominal	See Voltage Tolerance derating in publication 750-TD100
Input Frequency Range	48…63 Hz	47…63 Hz
Displacement Power Factor	1.0 default, adjustable	0.98 default, adjustable
Power Factor Control	(s)	(s)
Efficiency at rated amps, nominal AC line voltage	97.5%	97.0%
Maximum Short Circuit Current Capacity, SCCR (Actual short circuit current rating may be further limited by AIC rating of customer supplied branch circuit protection devices)	IP20 2500 MCC • 100 kA, frame 10,400/480V AC • 65 kA, frame 10, 600/690V AC • 100 kA, frame 13, all voltage IP21 Rittal • Depends on AIC of external branch circuit protective device	• 100 kA, 400…600V AC • 65 kA, 690V AC
Input Filter	LCL	LCL
Transient Protection	• Power, up to 6000V peak per IEEE C62.41-1991 • Control Circuit, showering arc transients up to 1500V peak	Up to 2000V line-to-line and 4000V line-to-ground per IEC 61800-3
PWM Carrier Frequency	3.6 kHz	4.0 kHz

Table 8 - Input Power and Features (Continued)

Description	PowerFlex 700AFE Bus Supply	PowerFlex 755TM Bus Supply
	Cat No. 20Y…	**Cat. No. 20J…**
Current Limit	20…150% of rated input current	20…160% of rated input current
AC input disconnect	• IP20 2500 MCC; circuit breaker, high-speed AC line fuses, contactor • IP21 Rittal; disconnect switch, motor control breaker. External user supplied AC line fuses are required.	Motor Operated Circuit Breaker with shunt trip, high-speed AC line fuses
DC Bus precharger	(s) Contactor, rectifier and resistors	(s) Contactor and resistors
Harmonic Compliance	IEEE 519	IEEE 519
Control Power	(s) Internal 240/120V AC, 1 PH, 50/60 Hz	(s) User supplied 240V AC, 1 PH, 50/60Hz, neutral grounded, +/-10% of nominal. See Table 6 on page 31. (o) Internal 240V AC, 1 PH, 50/60 Hz, specify control option (–C1) when ordering. See Table 6 on page 31.
Auxiliary 24V DC Control Power	—	(o) External 24V DC +/-5% of nominal; • Frame 8, 182 W max • Frame 9, 213 W max • Frame 10, 245 W max • Frame 11, 276 W max • Frame 12, 308 W max
400V AC input, DC Bus Normal Duty Output Ratings	• 520…1469 A DC, ND • 309…873 kW, ND • Up to 4976 kW, ND, with 6 x parallel units (IP21 Rittal enclosures only). Max practical power limited by DC bus bar ampacity. See publication 20Y-UM001 for paralleling information.	• 324…3801 A DC, ND • 188…2204 kW, ND • Parallel operation, not applicable

Table 9 - Output Power and Features

Description	PowerFlex 700AFE Bus Supply	PowerFlex 755TM Bus Supply
	Cat No. 20Y…	**Cat. No. 20J…**
480V AC input, DC Bus Normal Duty Output Ratings	• 520…1469 A DC, ND • 370…1046 kW, ND • Up to 5962 kW, ND, with 6 x parallel units (IP21 Rittal enclosures only). Max practical power limited by DC bus bar ampacity. See publication 20Y-UM001 for paralleling information.	• 311…3501 A DC, ND • 216…2436 kW, ND • Parallel operation, not applicable
600V AC input, DC Bus Normal Duty Output Ratings	• 367…1164 A DC, ND • 327…1036 kW, ND • Up to 5905 kW, ND, with 6 x parallel units (IP21 Rittal enclosures only). Max practical power limited by DC bus bar ampacity. See publication 20Y-UM001 for paralleling information.	• 249…2489 A DC, ND • 217…2164 kW, ND • Parallel operation, not applicable

Table 9 - Output Power and Features (Continued)

Description	PowerFlex 700AFE Bus Supply	PowerFlex 755TM Bus Supply
	Cat No. 20Y…	**Cat. No. 20J…**
690V AC input, DC Bus Normal Duty Output Ratings	• 367…1164 ADC, ND • 376…1193 kW, ND • Up to 6800 kW, ND, with 6 x parallel units (IP21 Rittal enclosures only). Max practical power limited by DC bus bar ampacity. See publication 20Y-UM001 for paralleling information.	• 221…2379 A DC, ND • 221…2379 kW, ND • Parallel operation, not applicable
Nominal DC Bus Output Voltage, AFE	• 400V Class; 594V DC • 480V Class; 712V DC • 600V Class; 890V DC • 690V Class; 1025V DC	• 400V Class; 580V DC • 480V Class; 696V DC • 600V Class; 870V DC • 690V Class; 1000V DC
60 s Overload	• ND = 110% • HD = 150%, except Frame 13, 600/690V AC	• LD = 110% • ND = 110% • HD = 150%
3 s Overload	—	• LD = not applicable • ND = 150% • HD = 180%
DC Bus Voltage Boost	(s) • +30% for 400/480V AC Class • +15% for 600/690V AC Class	(s) • +25% for 400/600V AC Class • +16% for 480/690V AC Class Manual reference mode. De-rating of DC output current may be required. Contact Rockwell Automation for more information.
DC Output Fuses	(s)	(s)
DC Bus Conditioner or Filter	(o) May be required, refer to publication DRIVES-AT002. Installed external to the AFE enclosure.	(s) Installed within the bus supply enclosure. (o) Additional units may be required depending on system grounding method. Specify power option code (-P50) for resistance or ungrounded power systems. Optional units are factory installed within bus supply enclosure. See publication DRIVES-AT005.

Table 10 - Enclosure Features

Description	PowerFlex 700AFE Bus Supply	PowerFlex 755TM Bus Supply
	Cat No. 20Y…	**Cat. No. 20J…**
IP00, Open Chassis	Yes, see publication 20Y-UM001.	Yes, see publication 750-TD101 and publication 750-IN101 for detailed dimensional data.
IP20, NEMA/UL Type 1 Dimensions (H x D), approx. (width varies) Dimensions exclude fan housings, handles and so on.	2500 MCC 2266 x 800 mm (89.2 x 31.5 in.) See publication 20Y-UM001 for detailed dimensional data.	—
IP21, NEMA/UL Type 1 Dimensions (H x D), approx. (width varies) Dimensions exclude fan housings, handles and so on.	Rittal 2200 x 800 mm (86.6 x 31.5 in.) See publication 20Y-UM001 for detailed dimensional data.	Rittal 2000 x 600 mm (78.7 x 23.6 in.) See publication 750-TD101 and publication 750-IN101 for detailed dimensional data.

Table 10 - Enclosure Features (Continued)

Description	PowerFlex 700AFE Bus Supply	PowerFlex 755TM Bus Supply
	Cat No. 20Y…	**Cat. No. 20J…**
IP54, NEMA/UL Type 12 Dimensions (H x D), approx. (width varies) Dimensions exclude fan housings, handles and so on.	—	Rittal 2000 x 600 mm (78.7 x 23.6 in.) See publication 750-TD101 and publication 750-IN101 for detailed dimensional data.
AC Input Cable Entry	• (s), IP21 Rittal, bottom only • (s), IP20 2500 MCC, top only	• (s) Bottom all frames • (s) Top frames 8…9, specify power option (-P17) w/o wiring bay • (o) Top, frames 10…12, specify power option (-P16) w/ wiring bay
DC Power Bus	• Not applicable, IP21 Rittal, connection terminals, near top/ front, side exit • (s), IP20 2500 MCC, Centerline horizontal bus bars, side exit, frame 10 1250 A DC, frame 13 3000 A DC	• (s) frames 8…10, 3000 A DC • (s) frames 11…12, 4700 A DC • (o) frames 8…10, 4700 A DC specify power option code (-P46) • Near top/back, horizontal bus bars, side exit
Control Power Bus	—	• (s) 240V AC, 1 PH, 100 A rms • (s) 24V DC, Auxiliary Control Bus, 100 ADC • (s) 120/240V AC, 1 PH, User Control Bus, 100A rms • Control Bus Connector taps are rated 10 A per pole.

Table 11 - Environmental Features

Description	PowerFlex 700AFE Bus Supply	PowerFlex 755TM Bus Supply
	Cat No. 20Y…	**Cat. No. 20J…**
Environmental Compliance	Refer to Rockwell Automation website: http://www.rockwellautomation.com/global/about-us/sustainability-ethics/product-environmental-compliance.page?	
Altitude (without derate)	1000 m (3000 ft) See publication 20Y-UM001 for detailed derating information.	1000 m (3000 ft) See publication 750-TD100 for detailed derating information.
Ambient Temperature Range (without derate)	• 0…40 °C (32…104 °F) • 0…35 °C (32…95 °F) Frame 13 600/690V AC See publication 20Y-UM001 for detailed derating information.	• -20…+40 °C (-4…+104 °F), all frame ratings and enclosure types See publication 750-TD100 for detailed derating information.
Storage Temperature	-40…+60 °C (-40…+140 °F)	-40…+70 °C (-40…+158 °F)
Relative Humidity (noncondensing)	5…95%	5…95%
Mechanical Shock	Non-operational; • 15G peak for 11 ms duration, EN50178/EN60068-2-27 Operating; not applicable	Packed for shipment; • Meets ATSM International standards Operating (packaged products); • 10G peak for 11 ms duration (+/-1 ms), three shocks in each direction in each axis. See the Shock Events information in the Technical Data, publication 750-TD100 for detailed information about the maximum number of shock events.

Table 11 - Environmental Features (Continued)

Description	PowerFlex 700AFE Bus Supply	PowerFlex 755TM Bus Supply
	Cat No. 20Y…	**Cat. No. 20J…**
Mechanical Vibration	Non-operational; not applicable Operating; • 1 mm (0.039 in.) displacement, 1G peak, EN50178/EN60068-2-6	Packed for shipment; • Meets ASTM International standards Operating; • 1 mm (0.040 in.) displacement, 1G peak
Sound	At 1 m (3.28 ft): • frame 10, 71 dB • frame 13, 80 dB	At 2 m (6.6 ft), IP21/IP54: • frame 8, 77/76 dBA • frame 9, 80/79 dBA • frame 10, 84/83 dBA • frame 11, 83/82 dBA • frame 12, 84/83 dBA

Table 12 - Certifications

Description	PowerFlex 700AFE Bus Supply	PowerFlex 755TM Bus Supply
	Cat No. 20Y…	**Cat. No. 20J…**
UL	• UL508C (c-UL-us). UL Listing only applicable up to 600V AC Designed to meet; • NFPA 70 – US NEC • NFPA 79 – Electrical Standard for Industrial Machinery 2002 Edition • NEMA ICS 7.0 – Safety standards for Construction and Guide for Selection, Installation and Operation of Adjustable Speed Drive Systems	UL61800-5-1 (c-UL-us) only applicable up to 600V AC
CAN/CSA	CSA 22.2 No. 14-05	CSA 22.2 No. 274, Adjustable Speed Drives
CE	Marked for following European Directives; • EMC Directive (2004/108/EC) EN 61800-3 Adjustable speed electrical power drive systems – Part 3: EMC requirements and specific test methods. Low Voltage Directive (2006/95/EC) EN 61800-5-1 Adjustable speed electrical power drive systems-Part 5-1: Safety requirements – electrical, thermal and energy.	In conformity with the following European Directives: • EMC Directive (2014/30/EU) • Low Voltage Directive (2014/35/EU) • RoHS Directive (2011/65/EU) Standards applied: • EN 61800-3 • EN 61800-5-1 (o) Additional EMI filter available, choose catalog code (-J) for EMC filter selection.
IEC	—	Atmospheric Protection: • Conformity with IEC 60721-3-3, 3C2 and 3S2, for components manufactured by Rockwell Automation. • IP54, UL Type 12 Cabinet is required to meet the 3S2 requirement
ISA	—	Atmospheric Protection; • Conformity Standard 71.04, for components manufactured by Rockwell Automation. Class SA, SB, and SC, Severity X environmental concentrations (airborne particulates) with Class SD particles at Severity 2.

Table 12 - Certifications (Continued)

Description	PowerFlex 700AFE Bus Supply	PowerFlex 755TM Bus Supply
	Cat No. 20Y…	**Cat. No. 20J…**
Functional Safety	—	Not applicable to PowerFlex 755TM Bus Supplies. PowerFlex 755TL/TR drives and PowerFlex 755TM common bus inverters; TÜV and Rheinland - Certification applies to 20-750-S, 20-750-S1, and 20-750-S3 safety options when they are installed in the drive and are configured according to the appropriate safety manual.
RCM, C-Tick	—	Australian Communications and Media Authority In conformity with the following: • Radio communications Act: 1992 • Radio communications Standard: 2008 • Radio communications Labeling Notice: 2008 Standards applied: • EN 61800-3:2012
China RoHS2	—	Compliant with China Restriction of Hazardous Substances Directive.
KCC	—	Korean KC registration
ODVA	— (option modules may be compliant)	EtherNet/IP
IEEE 519	(s)	(s)
REACH	—	Regulation (EC) No. 1907/2006 concerning the Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH)
Packaging Directive	—	In conformity with the Packaging Directive (94/62/EC and amendments 2004/12/EC and 2005/20/EC)

Table 13 - Protection Features

Description	PowerFlex 700AFE Bus Supply	PowerFlex 755TM Bus Supply
	Cat No. 20Y…	**Cat. No. 20J…**
AC Input Overvoltage Trip	— (see DC Bus Overvoltage Trip)	400/480V Class; 542V AC 600/690V Class; 780V AC
AC Input Under voltage Trip Nominal value, adjustable and configurable action	— (see DC Bus Under voltage Shutdown/Fault)	400V Class; 348V AC 480V Class; 418V AC 600V Class; 522V AC 690V Class; 600V AC
DC Bus Overvoltage Trip	400/480V Class; 911V DC 600/690V Class; 1200V DC	400/480V Class; 815V DC 600/690V Class; 1172V DC
DC Bus Under voltage Shutdown/Fault Nominal value, adjustable and configurable action	400/480V Class; 333V DC 600/690V Class; 461V DC	400V Class; 453V DC 480V Class; 543V DC 600V Class; 678V DC 690V Class; 781V DC
Heat Sink Temperature Fault	(s)	(s) over and under temperature
Ground Fault	(s)	(s)

Table 13 - Protection Features (Continued)

Description	PowerFlex 700AFE Bus Supply	PowerFlex 755TM Bus Supply
	Cat No. 20Y…	**Cat. No. 20J…**
Single Phase/ Phase Loss Fault	(s)	(s)
Line Sync Fault	(s)	(s)
Input Overcurrent Fault	(s)	(s)
Overload Fault	(s)	(s)
IGBT Over temp Fault	(s)	(s)
LCL Filter Over temp Fault	(s)	(s)
DC Bus Over Voltage Fault	(s)	(s)
DC Bus Under Voltage	(s)	(s)
AC Line Fuse Blown Fault	—	(s)
DC Bus Fuse Blown Fault	—	(s)
Precharge Fault	—	(s)
AC Input Over Voltage Fault	—	(s)
Cooling Fan Fault/Alarm	(s)	(s)
Transient Voltage Suppressor (TVSS) Fail Alarm	—	(s)
DC Bus Conditioner Fault	(o) external device	(s)

Table 14 - User Interface

Description	PowerFlex 700AFE Bus Supply	PowerFlex 755TM Bus Supply
	Cat No. 20Y…	**Cat. No. 20J…**
Local HIM	(o) 20-HIM-A3, 20-HIM-A6	(o) 20-HIM-A6
Remote HIM	(o) 20-HIM-C3S, 20-HIM-C6S	(o) 20-HIM-C6S
DriveExplorer/DriveExecutive	(s)	—
Connected Components Workbench (CCW)	(s)	(s)
Studio5000/RSLogix 5000	(s) with communication option	(s)
Digital Inputs	(s) 6, 24V DC • inputs 1…5 used for door controls • input 6 used for Hardware Enable	(o) 20-750 series 24V DC and 115V AC I/O modules; 3…6, depending on option module chosen
Digital Outputs	(s) 2, form C relay, outputs 1, 2 used for door-mounted operator devices. • Relay 240V AC/30V DC 1200VA, 150 W resistive or, 240V AC/ 30V DC, 840VA, 105 W inductive.	(o) 20-750 series 24V DC and 115V AC I/O modules; 2...3, relay or transistor depending on option module chosen. • Relay NO, 240V AC/24V DC, 2 A resistive/general purpose inductive. • Relay NC, 240V AC/24V DC, 2 A resistive. • Transistor, 24V DC, 1 A max resistive.

Table 14 - User Interface (Continued)

Description	PowerFlex 700AFE Bus Supply	PowerFlex 755TM Bus Supply
	Cat No. 20Y…	**Cat. No. 20J…**
Analog Inputs	(s) 2, isolated bipolar, differential, 9-bits + sign, 0…10V DC, +/-10V DC, or 4-20 mA.	(o) 20-750 series 24V DC and 115V AC I/O modules; 1…2, depending on option module chosen. • Bipolar, differential, 11-bits + sign, ±10V or 4-20 mA, isolated or non-isolated depending on option module chosen.
Analog Outputs	(s) 2, non-isolated, 9-bits + sign, 0…10V DC, +/-10V DC, or 4-20 mA.	(o) 20-750 series 24V DC and 115V AC I/O modules; 1…2, depending on option module chose. • Bipolar, non-isolated, 11-bits + sign, ±10V or 0-20 mA.
Internal DC Power Supply	• +24V DC digital I/O, 150 mA max • +/-10V DC analog I/O, 10 mA max	• +24V DC digital I/O, 200 mA max per I/O module, 600 mA max total. • +/-10V DC analog I/O, 5 mA max

Table 15 - Communication Features

Description	PowerFlex 700AFE Bus Supply	PowerFlex 755TM Bus Supply
	Cat No. 20Y…	**Cat. No. 20J…**
EtherNet I/P	(o) single (o) dual-port	(s) Embedded dual-port (o) dual port
RS-485 HVAC	(o)	—
RS-485 DF1	(o)	—
ControlNet	(o) coax or fiber optic	(o) coax only
DeviceNet	(o)	(o)
LonWorks	(o)	—
Modbus RTU	(o)	—
Profinet	—	(o) single or dual port
Profibus	(o)	(o) DPV1
CANopen	(o)	—
USB	(o) 1203-USB	(o) 1203-USB
Interbus	(o)	—

Cross Reference Guides

Use Table 16 through Table 19 to compare power, current, and overload capacity to migrate your bus supply. Because of the numerous migration options, we provide these tables as an example of how to cross-reference your converter rating to an equivalent PowerFlex 755TM bus supply converter. Shaded rows in the tables indicate that, unless noted otherwise, a suitable PowerFlex 755TM bus supply migration product may be available.

Follow these steps when using the tables.

1. Find your existing voltage class, overload rating (ND or HD), catalog number, and number of units in parallel.
2. Use the row in the Electrical Rating Cross-reference table with your PowerFlex 700AFE bus supply to see the catalog number and ratings of a suitable migration solution.
3. Note the catalog number of the PowerFlex 755TM bus supply.
4. See the Dimensional Cross Reference Tables (Table 20 through Table 23) to see if the PowerFlex 755TM bus supply is dimensionally compatible.

ATTENTION: There may be cases where the external DC bus capacitance of DC input common bus inverters and external capacitor banks may exceed the maximum external capacitance specification of the PowerFlex 755TM bus supply converter. The maximum external DC bus capacitance of the PowerFlex 755TM bus supply could be less than an equivalent rated PowerFlex 700AFE bus supply. Exceeding the maximum external DC bus capacitance can damage the bus supply circuits. See the applicable sections of publication DRIVES-AT005.
Where the PowerFlex 755TM bus supply maximum external DC bus capacitance specification is less than the equivalent PowerFlex 700AFE bus supply, the following Electrical Rating tables will indicate the possibility with footnotes in the Electrical Ratings cross reference tables.

ATTENTION: Review the types of DC input drives applied to the PowerFlex 755TM bus supply to ensure proper precharging and interlocking is implemented. Kinetix servo drives and some PowerFlex drives do not have built in precharging circuits, so extreme care must be exercised to maintain safe and reliable operation of the DC bus system. See all applicable sections of the Drives in Common Bus Configurations with PowerFlex 755TM Bus Supplies application technique, publication DRIVES-AT005.

Table 16 - 400V AC Electrical Rating Cross Reference

PowerFlex 700AFE Bus Supply (20Y…)						PowerFlex 755TM Bus Supply (20J…)					
Frame Size x Number of Units[1]	Catalog Number[1]	ND DC Bus kW	ND DC Amps	HD DC Bus kW	HD DC Amps	Frame Size	Catalog Number[2]	ND DC Bus kW	ND DC Amps	HD DC Bus kW	HD DC Amps
						F8[3]	20J1F*n*C302…	188	324	162	279
						F8[3]	20J1F*n*C367…	229	394	188	324
						F8	20J1F*n*C460…	287	494	229	394
F10 x 1	20YD460…	309	520	258	435	F8	20J1F*n*C540…	336	579	287	494
						F8	20J1F*n*C585…	364	628	287	494
						F8	20J1F*n*C650…	405	698	336	579
						F8	20J1F*n*C750…	467	805	364	628
						F8	20J1F*n*C770…	479	826	405	698
						F9	20J1F*n*C920…	572	987	479	826
F10 x 2	2x 20YD460…	587	988	490	826	F9	20J1F*n*C1K0…	647	1116	572	987
						F9	20J1F*n*C1K1…	692	1193	647	1116
						F9	20J1F*n*C1K2…	731	1261	679	1170
F13 x 1 F10 x 3	20YD1K3… 3x 20YD460A…	873 881	1469 1482	— —	— —	F9	20J1F*n*C1K4…	911	1570	731	1261
F13 x 1 F10 x 3	20YD1K3… 3x 20YD460A…	— —	— —	772 735	1299 1214	F10	20J1F*n*C1K6…	984	1697	912	1572
						F10	20J1F*n*C1K7…	1067	1840	921	1588
F10 x 4	4x 20YD460A…	1174	1976	980	1653	F10	20J1F*n*C2K1…	1342	2314	1067	1840
F13 x 2 F10 x 5 F10 x 6	2x 20YD1K3… 5x 20YD460A… 6x 20YD460A…	1659 1468 1761	2791 2470 2964	1467 1226 —	2468 2066 —A	F11	20J1F*n*C2K8…	1773	3057	1450	2500
F10 x 6	6x 20YD460A…	—	—	1471	2379	F12	20J1F*n*C3K5…	2205	3801	1887	3254

(1) Single and two in parallel available with IP21 Rittal (catalog code A) and IP20 2500 MCC (catalog code P or W) enclosures. More than two units in parallel are only available with IP21 Rittal (catalog code A) enclosures.

(2) <*n*> In catalog number is enclosure type; catalog code 3= IP21, catalog code 4= IP54.

(3) These ratings have lower maximum external DC bus capacitance specifications than the equivalent PowerFlex 700AFE. Review and determine the external DC bus capacitance (sum of all DC input common bus inverter bus capacitance and connected capacitor banks) on the existing DC bus. If the existing total external DC bus capacitance is greater than the maximum for the selected PowerFlex 755TM bus supply, it may be necessary to select a larger rating for the PowerFlex 755TM bus supply. Maximum external DC bus capacitance specifications for the PowerFlex 755TM bus supply can be found in Appendix A of the Drives in Common Bus Configurations with PowerFlex 755TM Bus Supplies application technique, publication DRIVES-AT005.

Table 17 - 480V AC Electrical Rating Cross Reference

PowerFlex 700AFE Bus Supply (20Y…)						PowerFlex 755TM Bus Supply (20J…)					
Frame Size x Number of Units[1]	Catalog Number[1]	ND DC Bus kW	ND DC Amps	HD DC Bus kW	HD DC Amps	Frame Size	Catalog Number[2]	ND DC Bus kW	ND DC Amps	HD DC Bus kW	HD DC Amps
						F8[3]	20J1F*n*D302…	216	311	177	255
						F8[3]	20J1F*n*D361…	258	371	216	311
						F8	20J1F*n*D430…	308	442	258	371
F10 x 1	20YD460…	370	520	310	435	F8	20J1F*n*D505…	361	519	308	442
						F8	20J1F*n*D545…	390	560	308	442
						F8	20J1F*n*D617…	442	635	347	499
						F8	20J1F*n*D710…	508	730	390	560
						F8	20J1F*n*D740…	530	761	442	635
						F9	20J1F*n*D800…	573	823	530	761
						F9	20J1F*n*D960…	687	987	573	823
F10 x 2	2x 20YD460…	703	988	589	826	F9	20J1F*n*D1K0…	748	1075	687	987
						F 9	20J1F*n*D1K1…	812	1167	748	1075
						F9	20J1F*n*D1K3…	977	1404	812	1167
F10 x 3	3x 20YD460A…	—	—	884	1240	F10	20J1F*n*D1K4…	1016	1460	977	1404
F13 x 1 F10 x 3	20YD1K3… 3x 20YD460A…	1046 1055	1469 1482	925 884	1299 1240	F10	20J1F*n*D1K6…	1185	1702	1016	1460
F10 x 4	4x 20YD460A…	1406	1976	1178	1653	F10	20J1F*n*D2K0…	1483	2131	1185	1702
F10 x 5	5x 20YD460A…	1758	2470	1473	2066	F11	20J1F*n*D2K6…	1960	2816	1604	2304
F13 X 2 F10 x 6	2x 20YD1K3… 6x 20YD460A…	1987 2109	2791 2964	1758 1767	2468 2480	F12	20J1F*n*D3K4…	2437	3501	2133	3065

(1) Single and two in parallel available with IP21 Rittal (catalog code A) and IP20 2500 MCC (catalog code P or W) enclosures. More than two units in parallel are only available with IP21 Rittal (catalog code A) enclosures.

(2) *<n>* In catalog number is enclosure type; catalog code 3= IP21, catalog code 4= IP54.

(3) These ratings have lower maximum external DC bus capacitance specifications than the equivalent PowerFlex 700AFE. Review and determine the external DC bus capacitance (sum of all DC input common bus inverter bus capacitance and connected capacitor banks) on the existing DC bus. If the existing total external DC bus capacitance is greater than the maximum for the selected PowerFlex 755TM bus supply, it may be necessary to select a larger rating for the PowerFlex 755TM bus supply. Maximum external DC bus capacitance specifications for the PowerFlex 755TM bus supply can be found in Appendix A of the Drives in Common Bus Configurations with PowerFlex 755TM Bus Supplies application technique, publication DRIVES-AT005.

Table 18 - 600V AC Electrical Rating Cross Reference

PowerFlex 700AFE Bus Supply (20Y…)						PowerFlex 755TM Bus Supply (20J…)					
Frame Size x Number of Units[1]	Catalog Number[1]	ND DC Bus kW	ND DC Amps	HD DC Bus kW	HD DC Amps	Frame Size	Catalog Number[2]	ND DC Bus kW	ND DC Amps	HD DC Bus KW	HD DC Amps
						F8[3]	20J1F*n*E242…	217	249	171	197
						F8[3]	20J1F*n*E295…	264	303	217	249
						F8[3]	20J1F*n*E355…	318	365	264	303
F10 x 1	20YF325…	327	367	241	272	F8[3]	20J1F*n*E395…	353	406	318	365
						F8[3]	20J1F*n*E435…	389	447	353	406
						F8[3]	20J1F*n*E545…	487	560	403	463
F10 X 2	2x 20YF325…	—	—	458	517	F9[3]	20J1F*n*E595…	519	596	487	560
F10 X 2	2x 20YF325…	621	697	458	517	F9	20J1F*n*E690…	618	710	532	612
						F9	20J1F*n*E760…	680	782	618	710
						F9	20J1F*n*E825…	738	848	680	782
F10 x 3	3x 20YF325A…	—	—	687	775	F9	20J1F*n*E980…	877	1008	738	848
F10 x 3	3x 20YF325A…	932	1046	687	775	F10	20J1F*n*E1K1…	935	1075	877	1008
F13 x 1 F10 x 4	20YF1K0… 4x 20YF325A…	1036 —	1164 —	— 916	— 1034	F10	20J1F*n*E1K2…	1092	1255	935	1075
F10 x 4	4x 20YF325A…	1243	1395	916	1034	F10	20J1F*n*E1K5…	1280	1471	1092	1255
F10 x 5	5x 20YF325A…	1553	1743	1145	1292	F11	20J1F*n*E2K0…	1741	2001	1521	1748
F13 x 2 F10 x 6	2x 20YF1K0… 6x 20YF325A…	1968 1864	2212 2092	— 1374	— 1550	F12	20J1F*n*E2K4…	2165	2489	1852	2129

(1) Single and two in parallel available with IP21 Rittal (catalog code A) and IP20 2500 MCC (catalog code P or W) enclosures. More than two units in parallel are only available with IP21 Rittal (catalog code A) enclosures.

(2) *<n>* In catalog number is enclosure type; catalog code 3= IP21, catalog code 4= IP54.

(3) These ratings have lower maximum external DC bus capacitance specifications than the equivalent PowerFlex 700AFE. Review and determine the external DC bus capacitance (sum of all DC input common bus inverter bus capacitance and connected capacitor banks) on the existing DC bus. If the existing total external DC bus capacitance is greater than the maximum for the selected PowerFlex 755TM bus supply, it may be necessary to select a larger rating for the PowerFlex 755TM bus supply. Maximum external DC bus capacitance specifications for the PowerFlex 755TM bus supply can be found in Appendix A of the Drives in Common Bus Configurations with PowerFlex 755TM Bus Supplies application technique, publication DRIVES-AT005.

Table 19 - 690V AC Electrical Rating Cross Reference

PowerFlex 700AFE Bus Supply (20Y…)						PowerFlex 755TM Bus Supply (20J…)					
Frame Size x Number of Units[1]	Catalog Number[1]	ND DC Bus KW	ND DC Amps	HD DC Bus KW	HD DC Amps	Frame Size	Catalog Number[2]	ND DC Bus kW	ND DC Amps	HD DC Bus kW	HD DC Amps
						F8[3]	20J1F*n*F215…	221	221	176	176
						F8[3]	20J1F*n*F265…	272	272	221	221
						F8[3]	20J1F*n*F330…	339	339	272	272
F10 x 1	20YF325…	376	367	278	272	F8[3]	20J1F*n*F370…	380	380	339	339
						F8[3]	20J1F*n*F415…	426	426	380	380
						F8[3]	20J1F*n*F505…	518	518	426	426
						F9[3]	20J1F*n*F565…	580	580	518	518
						F9	20J1F*n*F650…	667	667	580	580
F10 X 2	2x 20YF325…	714	697	528	517	F9	20J1F*n*F735…	754	754	667	667
						F9	20J1F*n*F820…	842	842	754	754
F10 x 3	3x 20YF325A…	—	—	792	775	F9	20J1F*n*F920…	944	944	842	842
						F10	20J1F*n*F1K0…	1057	1057	944	944
F13 x 1 F10 x 3 F10 x 4	20YF1K0… 3x 20YF325A... 4x 20YF325A…	1193 1072 —	1164 1046 —	— 792 1056	— 775 1034	F10	20J1F*n*F1K1…	1180	1180	1057	1057
F10 x 4	4x 20YF325A…	1429	1395	1056	1034	F10	20J1F*n*F1K4…	1456	1456	1193	1193
F10 x 5	5x 20YF325A…	1786	1743	1321	1292	F11	20J1F*n*F1K8…	1914	1914	1576	1576
F13 X 2 F10 x 6	2x 20YF1K0… 6x 20YF325A…	2267 2143	2212 2092	— 1585	— 1550	F12	20J1F*n*F2K3…	2379	2379	2073	2073

(1) Single and two in parallel available with IP21 Rittal (catalog code A) and IP20 2500 MCC (catalog code P or W) enclosures. More than 2 units in parallel only available with IP21 Rittal (catalog code A) enclosures.

(2) *<n>* In catalog number is enclosure type; catalog code 3= IP21, catalog code 4= IP54.

(3) These ratings have lower maximum external DC bus capacitance specifications than the equivalent PowerFlex 700AFE. Review and determine the external DC bus capacitance (sum of all DC input common bus inverter bus capacitance and connected capacitor banks) on the existing DC bus. If the existing total external DC bus capacitance is greater than the maximum for the selected PowerFlex 755TM bus supply, it may be necessary to select a larger rating for the PowerFlex 755TM bus supply. Maximum external DC bus capacitance specifications for the PowerFlex 755TM bus supply can be found in Appendix A of the Drives in Common Bus Configurations with PowerFlex 755TM Bus Supplies application technique, publication DRIVES-AT005.

Dimensional Cross Reference

Table 20 through Table 23 compare approximate dimensions of both types of bus supply converters. Shaded rows in the table indicate an acceptable cross reference unless noted otherwise. Outline dimensional drawings for both types of bus supply converters are shown in Appendix A.

IMPORTANT Single and two in parallel PowerFlex 700 AFE available with IP21 Rittal (catalog code A) and IP20 2500 MCC (catalog code P or W) enclosures. More than two units in parallel are only available with IP21 Rittal (catalog code A) enclosures.

IMPORTANT The width dimension for parallel PowerFlex 700AFE bus supplies assumes that each enclosure is secured to the adjacent unit. Since paralleling is not a factory option, each installation is different. Analyze your existing parallel AFE arrangement before relying on these dimension comparison tables.

Table 20 - 400V AC Dimensional Cross Reference

PowerFlex 700AFE Bus Supply (20Y…)						PowerFlex 755TM Bus Supply (20J…)				
Frame Size x Number of Units[1]	Catalog Number[1]	Enclosure Type	Width[2] mm (in.)	Height mm (in.)	Depth mm (in.)	Frame Size	Catalog Number[3]	Width[4] mm (in.)	Height IP21/IP54 mm (in.)	Depth IP21/IP54 mm (in.)
						F8	20J1F*n*C302…	1006 (39.6)	2132 (83.9)/ 2291 (90.2)	676 (26.6)/ 721 (38.4)
						F8	20J1F*n*C367…			
						F8	20J1F*n*C460…			
F10 x 1	20YD460…	IP21 Rittal IP20 MCC	1000 (39.4)[5] 1204 (47)	2271 (89.4) 2380 (94)	671 (26.4) 958 (38)	F8	20J1F*n*C540…			
						F8	20J1F*n*C585…			
						F8	20J1F*n*C650…			
						F8	20J1F*n*C750…			
						F8	20J1F*n*C770…			
						F9	20J1F*n*C920…	1406 (55.4)	2132 (83.9)/ 2291 (90.2)	676 (26.6)/ 721 (38.4)
F10 x 2	2x 20YD460…	IP21 Rittal IP20 MCC	2000 (78.8) 2408 (94)	2271 (89.4) 2380 (94)	671 (26.4) 958 (38)	F9	20J1F*n*C1K0…			
						F9	20J1F*n*C1K1…			
						F9	20J1F*n*C1K2…			
F13 x 1 F10 x 3	20YD1K3… 3x 20YD460A…	IP21 Rittal IP20 MCC IP21 Rittal	1800 (71) 2400 (95) 3000 (118.2)	2271 (89.4) 2380 (94) 2271 (89.4)	690 (27.2) 958 (38) 671 (26.4)	F9	20J1F*n*C1K4…			
F13 x 1 F10 x 3	20YD1K3… 3x 20YD460A…	IP21 Rittal IP20 MCC IP21 Rittal	1800 (71)[5] 2400 (95) 3000 (118.2)	2271 (89.4) 2380 (94) 2271 (89.4)	690 (27.2) 958 (38) 671 (26.4)	F10	20J1F*n*C1K6…	2406 (94.7)	2132 (83.9) /2291 (90.2)	676 (26.6) /721 (38.4)
						F10	20J1F*n*C1K7…			
F10 x 4	4x 20YD460A…	IP21 Rittal	4000 (157.6)	2271 (89.4)	671 (26.4)	F10	20J1F*n*C2K1…			
F13 x 2 F10 x 5 F10 x 6	2x 20YD1K3… 5x 20YD460A… 6x 20YD460A…	IP21 Rittal IP20 MCC IP21 Rittal IP21 Rittal	3600 (142) 4800 (190) 5000 (197) 6000 (236.4)	2271 (89.4) 2380 (94) 2271 (89.4) 2271 (89.4)	690 (27.2) 958 (38) 671 (26.4) 671 (26.4)	F11	20J1F*n*C2K8…	2606 (102.6)[6]	2132 (83.9)/ 2291 (90.2)	676 (26.6)/ 721 (38.4)
F10 x 6	6x 20YD460A…	IP21 Rittal	6000 (236.4)	2271 (89.4)	671 (26.4)	F12	20J1F*n*C3K5…	3206 (126.2)[6]	2132 (83.9)/ 2291 (90.2)	676 (26.6)/ 721 (38.4)

(1) Single and two in parallel available with IP21 Rittal (catalog code A) and IP20 2500 MCC (catalog code P or W) enclosures. More than 2 units in parallel only available with IP21 Rittal (catalog code A) enclosures.

(2) The width dimension for parallel PowerFlex 700AFE assumes that each enclosure is secured directly to the adjacent unit. Since paralleling is not a factory option each installation will be different. It is important that you analyze your existing parallel AFE arrangement before relying on these dimension comparison tables.

(3) <*n*> In catalog number is enclosure type; catalog code 3= IP21, catalog code 4= IP54.

(4) Optional wiring bays add to total width. If optional bays are required refer to technical data publication 750-TD100, for dimensions and weights.

(5) The dimensions of these PowerFlex 700AFE units is less than the equivalent PowerFlex 755TM bus supply. Use judgment to ensure there is sufficient space for the migration solution.

(6) Assembled width, frames 11 and 12 are shipped as right and left side enclosures.

Table 21 - 480V AC Dimensional Cross Reference

PowerFlex 700AFE Bus Supply (20Y…)						**PowerFlex 755TM Bus Supply (20J…)**				
Frame Size x Number of Units[1]	Catalog Number[1]	Enclosure Type	Width[2] mm (in.)	Height mm (in.)	Depth mm (in.)	Frame Size	Catalog Number[3]	Width[4] mm (in.)	Height IP21/IP54 mm (in.)	Depth IP21/IP54 mm (in.)
						F8	20J1F*n*D302…	1006 (39.6)	2132 (83.9)/ 2291 (90.2)	676 (26.6)/ 721 (38.4)
						F8	20J1F*n*D361…			
						F8	20J1F*n*D430…			
F10 x 1	20YD460…	IP21 Rittal IP20 MCC	1000(39.4)[5] 1204(47)	2271(89.4) 2380(94)	671(26.4) 958(38)	F8	20J1F*n*D505…			
						F8	20J1F*n*D545…			
						F8	20J1F*n*D617…			
						F8	20J1F*n*D710…			
						F8	20J1F*n*D740…			
						F9	20J1F*n*D800…	1406 (55.4)	2132 (83.9)/ 2291 (90.2)	676 (26.6)/ 721 (38.4)
						F9	20J1F*n*D960…			
F10 x 2	2x 20YD460…	IP21 Rittal IP20 MCC	2000 (78.8) 2408 (94)	2271 (89.4) 2380 (94)	671 (26.4) 958 (38)	F9	20J1F*n*D1K0…			
						F9	20J1F*n*D1K1…			
						F9	20J1F*n*D1K3…			
F10 x 3	3x 20YD460A…	IP21 Rittal	3000 (118.2)	2271 (89.4)	671 (26.4)	F10	20J1F*n*D1K4…	2406 (94.7)	2132 (83.9)/ 2291 (90.2)	676 (26.6)/ 721 (38.4)
F13 x 1 F10 x 3	20YD1K3… 3x 20YD460A…	IP21 Rittal IP20 MCC IP21 Rittal	1800 (71)[5] 2400 (95) 3000 (118.2)	2271 (89.4) 2380 (94) 2271 (89.4)	690 (27.2) 958 (38) 671 (26.4)	F10	20J1F*n*D1K6…			
F10 x 4	4x 20YD460A…	IP21 Rittal	4000 (157.6)	2271 (89.4)	671 (26.4)	F10	20J1F*n*D2K0…			
F10 x 5	5x 20YD460A…	IP21 Rittal	5000 (197)	2271 (89.4)	671 (26.4)	F11	20J1F*n*D2K6…	2606 (102.6)[6]	2132 (83.9)/ 2291 (90.2)	676 (26.6)/ 721 (38.4)
F13 X 2 F10 x 6	2x 20YD1K3… 6x 20YD460A…	IP21 Rittal IP20 MCC IP21 Rittal	3600 (142) 4800 (190) 6000 (236.4)	2271 (89.4) 2380 (94) 2271 (89.4)	690 (27.2) 958 (38) 671 (26.4)	F12	20J1F*n*D3K4…	3206 (126.2)[6]	2132 (83.9)/ 2291 (90.2)	676 (26.6)/ 721 (38.4)

(1) Single and two in parallel available with IP21 Rittal (catalog code A) and IP20 2500 MCC (catalog code P or W) enclosures. More than 2 units in parallel only available with IP21 Rittal (catalog code A) enclosures.

(2) The width dimension for parallel PowerFlex 700AFE assumes that each enclosure is secured directly to the adjacent unit. Since paralleling is not a factory option each installation will be different. It is important that you analyze your existing parallel AFE arrangement before relying on these dimension comparison tables.

(3) <*n*> In catalog number is enclosure type; catalog code 3= IP21, catalog code 4= IP54.

(4) Optional wiring bays add to total width. If optional bays are required refer to technical data publication 750-TD100, for dimensions and weights.

(5) The dimensions of these PowerFlex 700AFE units is less than the equivalent PowerFlex 755TM bus supply. Use judgment to ensure there is sufficient space for the migration solution.

(6) Assembled width, frames 11 and 12 are shipped as right and left side enclosures.

Table 22 - 600V AC Dimensional Cross Reference

PowerFlex 700AFE Bus Supply (20Y…)						PowerFlex 755TM Bus Supply (20J…)				
Frame Size x Number of Units[1]	Catalog Number[1]	Enclosure Type	Width[2] mm (in.)	Height mm (in.)	Depth mm (in.)	Frame Size	Catalog Number[3]	Width[4] mm (in.)	Height IP21/IP54 mm (in.)	Depth IP21/IP54 mm (in.)
						F8	20J1F*n*E242…	1006 (39.6)	2132 (83.9)/ 2291 (90.2)	676 (26.6)/ 721 (38.4)
						F8	20J1F*n*E295…			
						F8	20J1F*n*E355…			
F10 x 1	20YF325…	IP21 Rittal IP20 MCC	1000 (39.4)[5] 1204 (47)	2271 (89.4) 2380 (94)	671 (26.4) 958 (38)	F8	20J1F*n*E395…			
						F8	20J1F*n*E435…			
						F8	20J1F*n*E545…			
F10 x 2	2x 20YF325…	IP21 Rittal IP20 MCC	2000 (78.8) 2408 (94)	2271 (89.4) 2380 (94)	671 (26.4) 958 (38)	F9	20J1F*n*E595…	1406 (55.4)	2132 (83.9)/ 2291 (90.2)	676 (26.6)/ 721 (38.4)
F10 x 2	2x 20YF325…	IP21 Rittal IP20 MCC	2000 (78.8) 2408 (94)	2271 (89.4) 2380 (94)	671 (26.4) 958 (38)	F9	20J1F*n*E690…			
						F9	20J1F*n*E760…			
						F9	20J1F*n*E825…			
F10 x 3	3x 20YF325A…	IP21 Rittal	3000 (118.2)	2271 (89.4)	671 (26.4)	F9	20J1F*n*E980…			
F10 x 3	3x 20YF325A…	IP21 Rittal	3000 (118.2)	2271 (89.4)	671 (26.4)	F10	20J1F*n*E1K1…	2406 (94.7)	2132 (83.9)/ 2291 (90.2)	676 (26.6)/ 721 (38.4)
F13 x 1 F10 x 4	20YF1K0… 4x 20YF325A…	IP21 Rittal IP20 MCC IP21 Rittal	1800 (71)[5] 2400 (95) 4000 (157.6)	2271 (89.4) 2380 (94) 2271 (89.4)	690 (27.2) 958 (38) 671 (26.4)	F10	20J1F*n*E1K2…			
F10 x 4	4x 20YF325A…	IP21 Rittal	4000 (157.6)	2271 (89.4)	671 (26.4)	F10	20J1F*n*E1K5…			
F10 x 5	5x 20YF325A…	IP21 Rittal	5000 (197)	2271 (89.4)	671 (26.4)	F11	20J1F*n*E2K0…	2606 (102.6)[6]	2132 (83.9)/ 2291 (90.2)	676 (26.6)/ 721 (38.4)
F13 x 2 F10 x 6	2x 20YF1K0… 6x 20YF325A…	IP21 Rittal IP20 MCC IP21 Rittal	3600 (142) 4800 (190) 6000 (236.4)	2271 (89.4) 2380 (94) 2271 (89.4)	690 (27.2) 958 (38) 671 (26.4)	F12	20J1F*n*E2K4…	3206 (126.2)[6]	2132 (83.9)/ 2291 (90.2)	676 (26.6)/ 721 (38.4)

(1) Single and two in parallel available with IP21 Rittal (catalog code A) and IP20 2500 MCC (catalog code P or W) enclosures. More than 2 units in parallel only available with IP21 Rittal (catalog code A) enclosures.

(2) The width dimension for parallel PowerFlex 700AFE assumes that each enclosure is secured directly to the adjacent unit. Since paralleling is not a factory option each installation will be different. It is important that you analyze your existing parallel AFE arrangement before relying on these dimension comparison tables.

(3) <*n*> In catalog number is enclosure type; catalog code 3= IP21, catalog code 4= IP54.

(4) Optional wiring bays add to total width. If optional bays are required refer to technical data publication 750-TD100, for dimensions and weights.

(5) The dimensions of these PowerFlex 700AFE units is less than the equivalent PowerFlex 755TM bus supply. Use judgment to ensure there is sufficient space for the migration solution.

(6) Assembled width, frames 11 and 12 are shipped as right and left side enclosures.

Table 23 - 690V AC Dimensional Cross Reference

PowerFlex 700AFE Bus Supply (20Y…)						**PowerFlex 755TM Bus Supply (20J…)**				
Frame Size x Number of Units[1]	Catalog Number[1]	Enclosure Type	Width[2] mm (in.)	Height mm (in.)	Depth mm (in.)	Frame Size	Catalog Number[3]	Width[4] mm (in.)	Height IP21/IP54 mm (in.)	Depth IP21/IP54 mm (in.)
						F8	20J1F*n*F215…	1006 (39.6)	2132 (83.9)/ 2291 (90.2)	676 (26.6)/ 721 (38.4)
						F8	20J1F*n*F265…			
						F8	20J1F*n*F330…			
F10 x 1	20YF325…	IP21 Rittal IP20 MCC	1000 (39.4)[5] 1204 (47)	2271 (89.4) 2380 (94)	671 (26.4) 958 (38)	F8	20J1F*n*F370…			
						F8	20J1F*n*F415…			
						F8	20J1F*n*F505…			
						F9	20J1F*n*F565…	1406 (55.4)	2132 (83.9)/ 2291 (90.2)	676 (26.6)/ 721 (38.4)
						F9	20J1F*n*F650…			
F10 x 2	2x 20YF325…	IP21 Rittal IP20 MCC	2000 (78.8) 2408 (94)	2271 (89.4) 2380 (94)	671 (26.4) 958 (38)	F9	20J1F*n*F735…			
						F9	20J1F*n*F820…			
F10 x 3	3x 20YF325A…	IP21 Rittal	3000 (118.2)	2271 (89.4)	671 (26.4)	F9	20J1F*n*F920…			
						F10	20J1F*n*F1K0…	2406 (94.7)	2132 (83.9)/ 2291 (90.2)	676 (26.6)/ 721 (38.4)
F13 x 1 F10 x 3 F10 x 4	20YF1K0… 3x 20YF325A... 4x 20YF325A…	IP21 Rittal IP20 MCC IP21 Rittal IP21 Rittal	1800 (71)[5] 2400 (95) 3000 (118.2) 4000 (157.6)	2271 (89.4) 2380 (94) 2271 (89.4) 2271 (89.4)	690 (27.2) 958 (38) 671 (26.4) 671 (26.4)	F10	20J1F*n*F1K1…			
F10 x 4	4x 20YF325A…	IP21 Rittal	4000 (157.6)	2271 (89.4)	671 (26.4)	F10	20J1F*n*F1K4…			
F10 x 5	5x 20YF325A…	IP21 Rittal	5000 (197)	2271 (89.4)	671 (26.4)	F11	20J1F*n*F1K8…	2606 (102.6)[6]	2132 (83.9)/ 2291 (90.2)	676 (26.6)/ 721 (38.4)
F13 X 2 F10 x 6	2x 20YF1K0… 6x 20YF325A…	IP21 Rittal IP20 MCC IP21 Rittal	3600 (142) 4800 (190) 6000 (236.4)	2271 (89.4) 2380 (94) 2271 (89.4)	690 (27.2) 958 (38) 671 (26.4)	F12	20J1F*n*F2K3…	3206 (126.2)[6]	2132 (83.9)/ 2291 (90.2)	676 (26.6)/ 721 (38.4)

(1) Single and two in parallel available with IP21 Rittal (catalog code A) and IP20 2500 MCC (catalog code P or W) enclosures. More than 2 units in parallel only available with IP21 Rittal (catalog code A) enclosures.

(2) The width dimension for parallel PowerFlex 700AFE assumes that each enclosure is secured directly to the adjacent unit. Since paralleling is not a factory option each installation will be different. It is important that you analyze your existing parallel AFE arrangement before relying on these dimension comparison tables.

(3) <*n*> In catalog number is enclosure type; catalog code 3= IP21, catalog code 4= IP54.

(4) Optional wiring bays add to total width. If optional bays are required refer to technical data publication 750-TD100, for dimensions and weights.

(5) The dimensions of these PowerFlex 700AFE units is less than the equivalent PowerFlex 755TM bus supply. Use judgment to ensure there is sufficient space for the migration solution.

(6) Assembled width, frames 11 and 12 are shipped as right and left side enclosures.

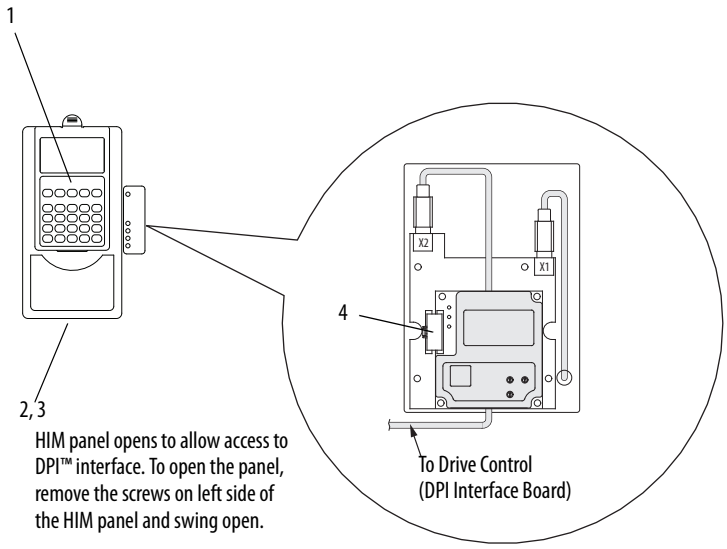
Device Ports and Main Control Board I/O

PowerFlex 700AFE Bus Supply

The PowerFlex 700AFE bus supply has limited options to add external equipment. The PowerFlex 755TM bus supply has many optional I/O and communication modules.

The PowerFlex 700AFE main control board has fixed I/O module configurations that you cannot modify. There are a number of cable connection points that allow various HIM and communication connections.

Figure 6 - PowerFlex 700AFE Device Connector Locations



No.	Connector (1)	Description
1	DPI port 1	HIM connection when installed in AFE.
2	DPI port 2	Cable connection for handheld and remote options.
3	DPI port 3 or 2	Splitter cable that is connected to DPI Port 2, which provides an additional port.
4	DPI port 5	Cable connection for communications adapter.

(1) There is no port 4 on PowerFlex 7-Class products. Port 4 only exists on legacy SCANport™ products.

Figure 7 - PowerFlex 700AFE Main Control Board I/O Slots and Jumper Locations

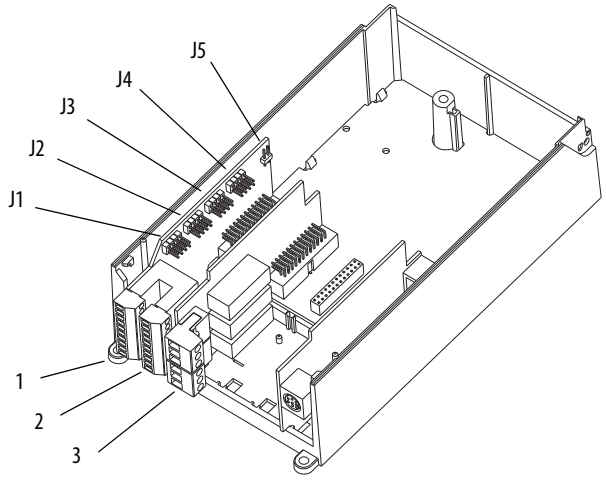


Table 24 - PowerFlex 700AFE Main Control Board I/O and Jumper Locations

No.	Description
1	Analog I/O signals
2	24V DC Digital Inputs
3	Relay Digital Outputs
J1	Analog In 1 voltage/current select
J2	Analog In 2 voltage/current select
J3	Analog Out 1 voltage/current select
J4	Analog Out 2 voltage/current select
J5	Hardware Enable

See the PowerFlex 700AFE User Manual, publication 20Y-UM001 for I/O connector wiring and analog configuration jumpers.

See Hardware Enable Circuits on page 55 for information on how to use Hardware Enable.

ATTENTION: Digital Inputs 1, 3, 4, and 5, and Digital Outputs 1 and 2 are factory-wired and programmed to operate from the controls on the front of the enclosure door. Do not change the wiring and programming for those digital inputs and outputs, or the system will malfunction.

IMPORTANT If the existing PowerFlex 700AFE system uses any of the available analog I/O, you need to supply and configure an appropriate PowerFlex 750 I/O option module for the replacement PowerFlex 755TM bus supply. See Chapter 2 for more details.

PowerFlex 755TM Bus Supply

The PowerFlex 755TM bus supply connectors, embedded devices, and installed option modules such as I/O and communication adapters have unique port number assignments. Connectors and embedded devices have fixed port numbers that cannot be changed. Option modules are assigned a port number when installed.

Table 25 - PowerFlex 755TM Bus Supply Device Port Assignment

Port	Device	Description
00	Host main control board	Fixed port for the main control board and embedded dual port EtherNet.
01	20-HIM-A6 20-HIM-C6S	Fixed port at HIM cradle connector. Splitter cable connector provides Port 01 when HIM cradle connect is not used.
02	DPI port	8-pin round mini-DIN connector for handheld/remote HIM, 1203-USB, or splitter cable connections.
03	Splitter cable	Connects to DPI port 02. Provides port 02 and port 03.
04…08	I/O option modules	Valid port(s)
	20-750-1132C-2R (24V DC)	04…08
	20-750-1133C-1R2T (24V DC)	
	20-750-1132D-2R (120V AC)	
	20-750-2262C-2R (24V DC)	
	20-750-2263C-1R2T (24V DC)	
	20-750-2262D-2R (120V AC)	
	20-750-ATEX[(1)(2)]	04…06 (bottom row only)
	Communication option modules	
	20-750-DNET	04…06 (bottom row only)
	20-750-CNETC	
	20-750-ENETR	
	20-750-PNET	
	20-750-PNET2P	
	Safety option modules	
	20-750-S[(1)(3)]	04…08
	20-750-S1[(1)(3)]	04…06 (bottom row only)
	20-750-S3[(1)(3)]	04…06 (bottom row only)
	Feedback option modules	
	20-750-ENC-1[(1)]	04…08
	20-750-DENC-1[(1)]	04…08 04…06 (bottom row only), when used with 20-750-S1
	20-750-UFB-1[(1)]	04…06 (bottom row only)
	AMCI RD750[(1)]	04…05 (third party AMCI option module)
09	Application parameters	Not used with PowerFlex 755TM bus supply converter

Table 25 - PowerFlex 755TM Bus Supply Device Port Assignment (Continued)

10	Motor side inverter primary control parameters	Not used with PowerFlex 755TM bus supply converter
11	Motor side inverter secondary control parameters	
12	Motor side inverter parameters	
13	Line side converter control parameters	Fixed port for the line side converter control parameters
14	Line side converter power parameters	Fixed port for the line side converter power parameters

(1) These option modules can be installed and are valid choices, however, none of these option module can be used to control or affect operation of the PowerFlex 755TM bus supply.
(2) Requires compatible 20-750-113x I/O module. See PowerFlex 750-Series ATEX Option Module user manual, publication 750-UM003.
(3) Only one Safety option module can be installed.

See publication 750-IN100 for detailed information on option modules and port installation recommendations.

Figure 8 - PowerFlex 755TM Bus Supply Main Control Board I/O and Jumper Locations

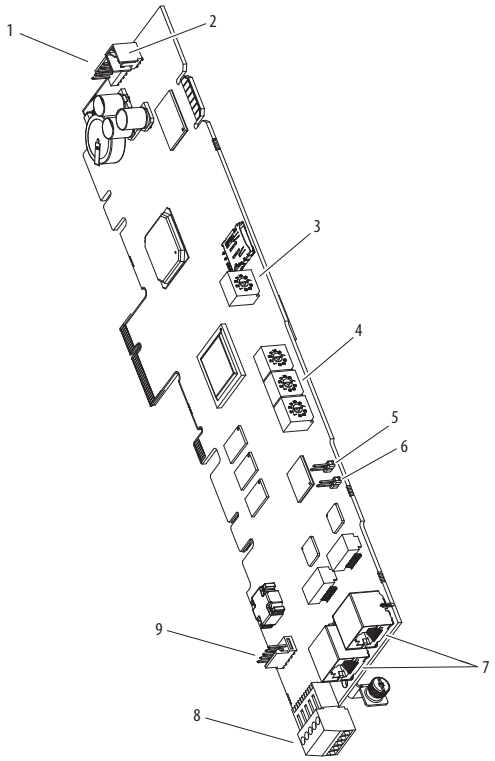


Table 26 - Main Control Board Details

Item	Name	Description
1	HIM Connector	DPI Port 01 (HIM Cradle) connection.
2	Fan Connector	Power supply for internal cooling fan.
3	Control Selector	Rotary switch for setting the programming mode.
4	Embedded EtherNet/IP(1) Address Selectors	Rotary switches for setting lowest octet of EtherNet/IP address (forces address to 192.168.1.*xxx*). See publication 750-PM100 for instructions on setting the IP address.
5	SAFETY Jumper	Safety enable jumper. Removed when safety option is installed. Safety option modules do not function with line side converter, so this jumper must be installed if this is a line side converter hardware configuration.
6	ENABLE Jumper	Hardware enable jumper. TB1 becomes an Enable when this jumper is removed. See Hardware Enable Circuits on page 55 for more information.
7	Built-in EtherNet/IP(1) Connectors	Network cable connections.
8	TB1	I/O terminal block.
9	DPI Port 2	DPI Port 02, cable connection to 8-pin round mini-DIN chassis-mounted connector. Mini-DIN connector that is used for handheld/remote HIM option and 1203-USB connections.

(1) Refer to the PowerFlex Drives with TotalFORCE Control Built-in EtherNet/IP Adapter User Manual, publication 750COM-UM009 for detailed configuration information.

Hardware Enable Circuits

The PowerFlex 700AFE bus supply digital input 6 can be programmed for any available digital input functions, including hardware enable. It has a hardware enable jumper (J5) on the main control board (Figure 7 on page 51). By default, hardware enable is not used, jumper (J5) is installed, so digital input 6 can be configured for other uses. If hardware enable is used, jumper (J5) is removed, which requires a hardware enable contact wired to Di 6. Verify that parameter P226 [Digital In6 Sel] is set to '1' (Enable).

The PowerFlex 755TM bus supply Main Control Board Port 0, Digital input Di 0 can be configured for any available digital input functions, including DI ENABLE. See Figure 8 on page 54 to identify the ENABLE jumper (J7). By default, hardware enable is not used and the ENABLE jumper (J7) is installed. If hardware enable is used, ENABLE jumper (J7) is removed.

If the Main Control Board Port 0, Di 0 is used for the hardware enable input, verify that 0: P105 [DI L Enable] is set = 0: P100.0 [Digital In Sts].

TIP If desired, a digital input on an installed I/O option module can also be assigned to the hardware ENABLE input by setting 0: P105 [DI L Enable] = to the Port and digital input status parameter and bit on the I/O option module that will be used as the hardware ENABLE.

Customer Power Terminal Comparison

This section compares the customer power terminals of the bus supplies.

PowerFlex 700AFE Bus Supply Customer Power Terminal Locations and Specifications

Figure 9 - PowerFlex 700AFE Frame 10 Power Terminal Locations in IP20 2500 MCC Style Enclosure

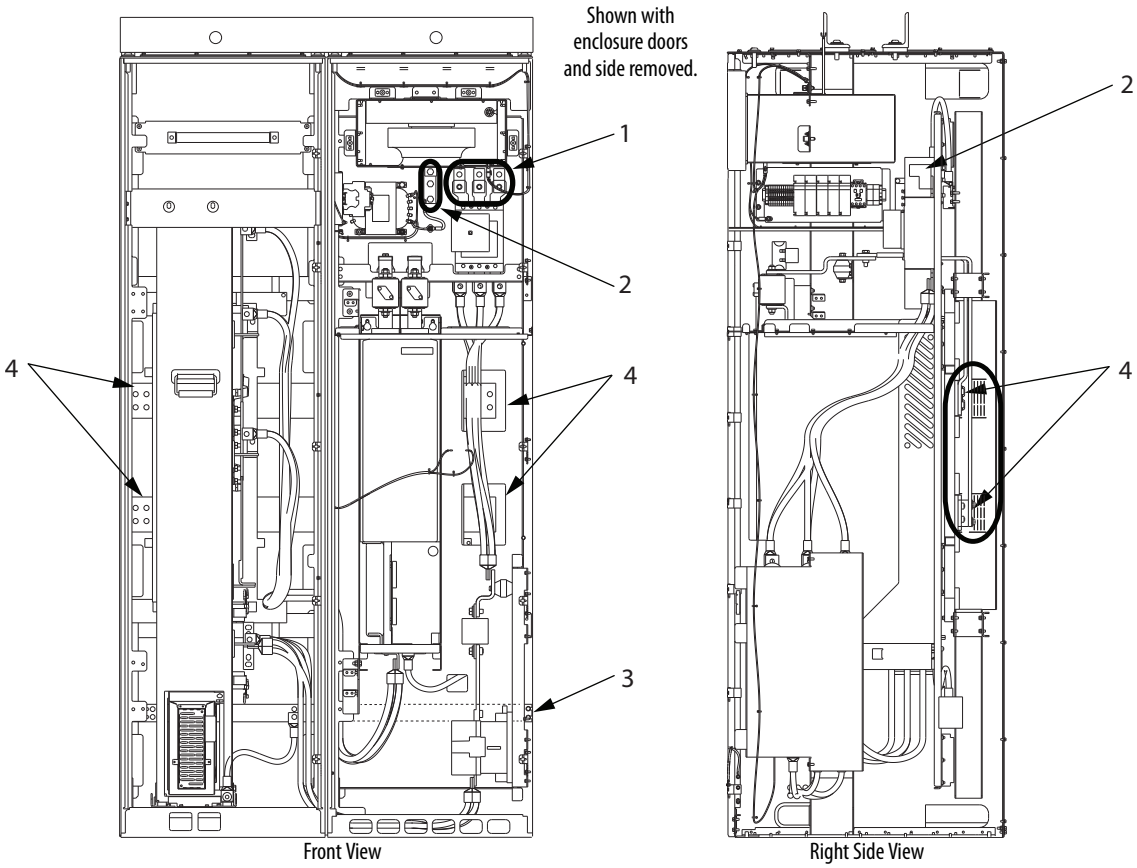


Table 27 - PowerFlex 700AFE Frame 10 IP20 MCC Power Terminal Specifications

Item	Name	Frame	Description	Wire Size Range[1] [2]		Torque	Terminal Bolt Size[3] [4]
				Max	Min	Recommended	
1	Input power terminals L1, L2, L3[1]	10	Input power	240 mm^2 (500 MCM)	95 mm^2 (3/0 AWG)	40 N•m (354 lb•in)	—
2	SHLD terminal, line PE, ground[3]	10	Terminating point for wiring shields	300 mm^2 (600 MCM)	2.1 mm^2 (14 AWG)	40 N•m (354 lb•in)	M5-M10
3	SHLD terminal, motor PE, ground[3]						
4	DC bus[3] (DC–, DC+)	10	DC output (using cable)	240 mm^2 (500 MCM)	2.1 mm^2 (14 AWG)	70 N•m (620 lb•in)	M12
			DC output (using splice kit SK-Y1-BUSSPLICE-F10)	—	—	40 N•m (354 lb•in)	M10

(1) Maximum/minimum sizes that the terminals can accept. These sizes are not recommendations.

(2) Do **not** exceed maximum wire size. Parallel connections can be required.

(3) These connections are bus bar type terminations and require the use of lug type connectors.

(4) Apply counter-torque to the nut on the other side of terminations when tightening or loosening the terminal bolt to avoid damage to the terminal.

Figure 10 - PowerFlex 700 AFE Frame 13 Power Terminal Locations in IP21 Rittal Enclosure

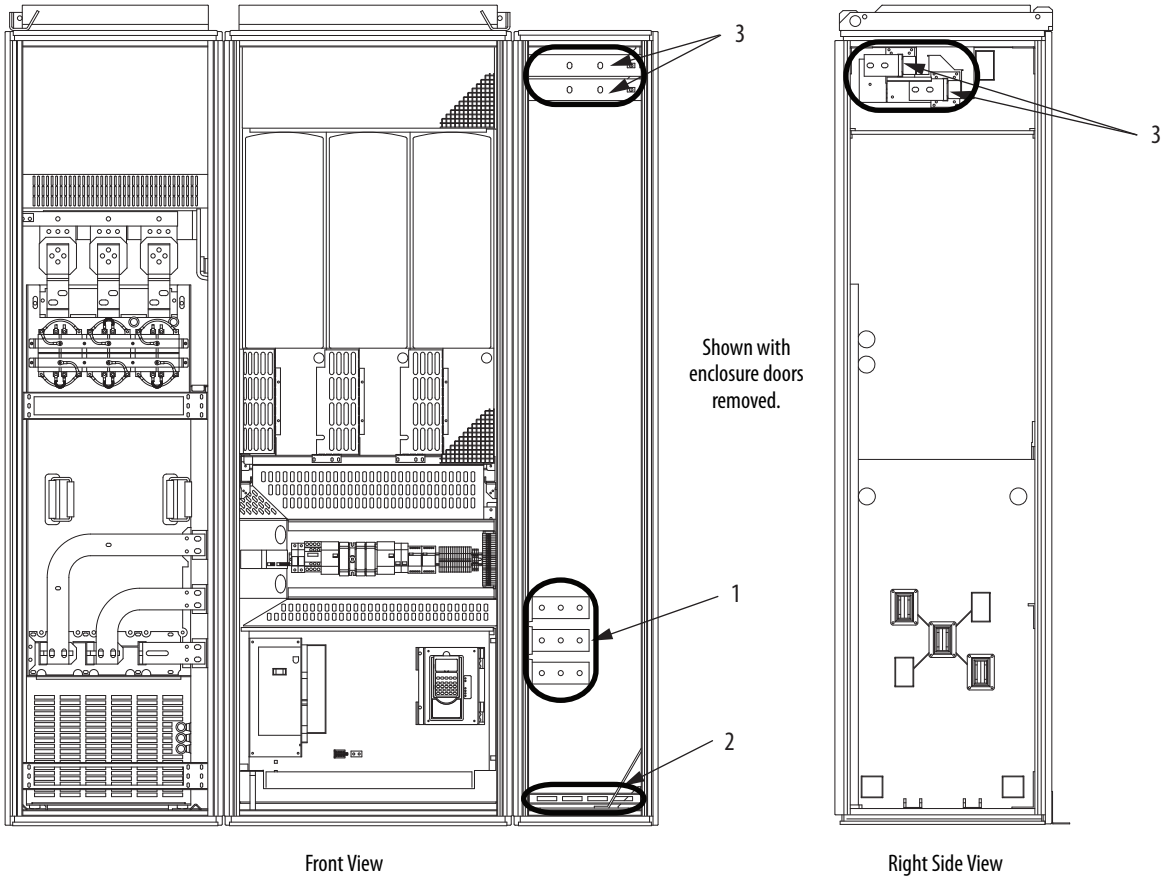


Table 28 - PowerFlex 700 AFE Frame 13 Power Terminal Specifications in IP21 Rittal Enclosure

Item	Name	Frame	Description	Wire Size Range (1) (2)		Torque	Terminal Bolt Size (3) (4)
				Maximum	Minimum	Recommended	
1	Input power terminals L1, L2, L3 (1)	13	Input power	300 mm^2 (600 MCM)	2.1 mm^2 (14 AWG)	70 N•m (620 lb•in)	M12
2	SHLD terminal, PE, ground (3)	13	Terminating point for wiring shields	300 mm^2 (600 MCM)	2.1 mm^2 (14 AWG)	40 N•m (354 lb•in)	M10
3	DC bus (3) (DC–, DC+)	13	DC output	300 mm^2 (600 MCM)	2.1 mm^2 (14 AWG)	70 N•m (620 lb•in)	M12

(1) Maximum/minimum sizes that the terminals accept. These sizes are not recommendations.

(2) Do **not** exceed maximum wire size. Parallel connections can be required.

(3) These connections are bus bar type terminations and require the use of lug type connectors.

(4) Apply counter-torque to the nut on the other side of terminations when tightening or loosening the terminal bolt to avoid damage to the terminal.

Figure 11 - PowerFlex 700AFE Frame 13 IP20 MCC Power Terminal Locations

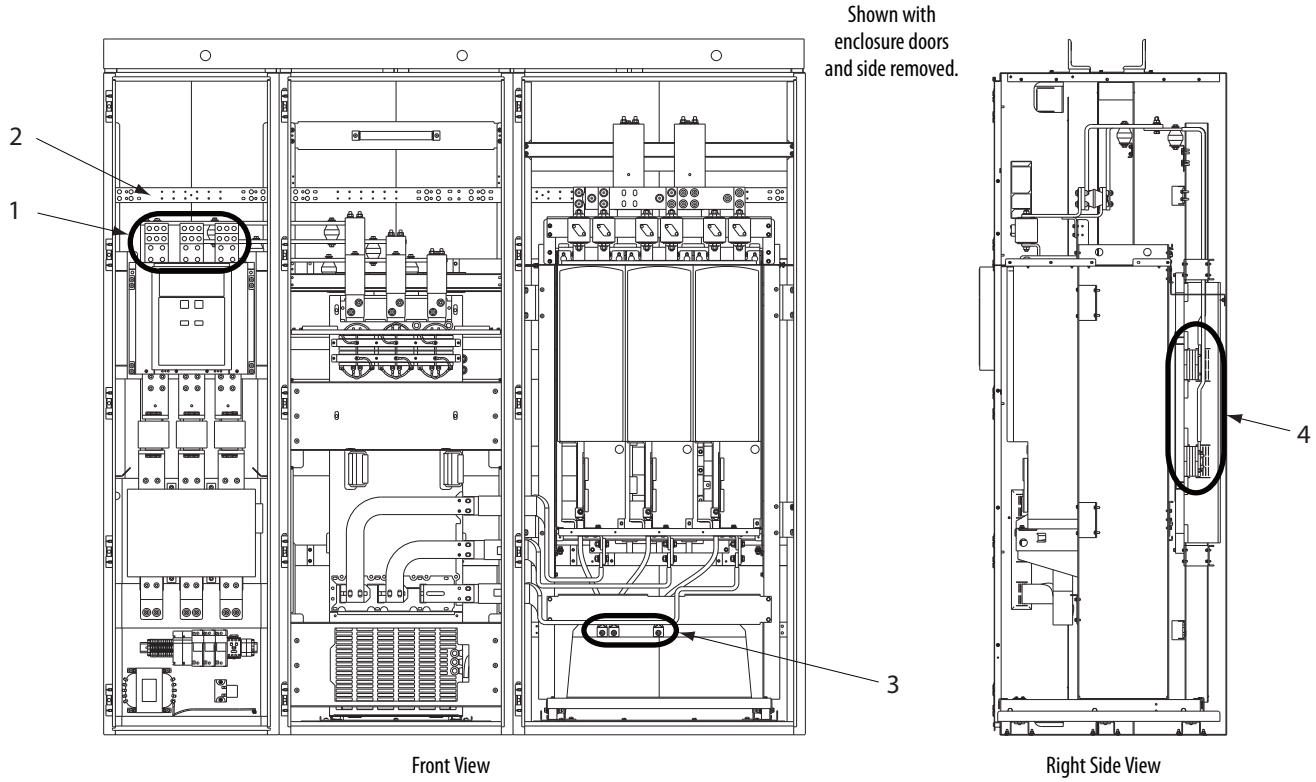


Table 29 - PowerFlex 700AFE Frame 13 IP21 Rittal Power Terminal Specifications

Item	Name	Frame	Description	Wire Size Range[1] [2]		Torque	Terminal Bolt Size[3] [4]
				Max	Min	Recommended	
1	Input power terminals L1, L2, L3[1]	13	Input power	380 mm^2 (750 MCM)	53 mm^2 (1/0 AWG)	50 N•m (442 lb•in)	—
2	SHLD terminal, line PE, ground[3]	13	Terminating point for wiring shields	300 mm^2 (600 MCM)	2.1 mm^2 (14 AWG)	40 N•m (354 lb•in)	M5-M10
3	SHLD terminal, motor PE, ground[3]						
4	DC bus[3] (DC–, DC+)	13	DC output (using cable)	380 mm^2 (750 MCM)	2.1 mm^2 (14 AWG)	70 N•m (620 lb•in)	M12
			DC output (using right-side splice kit SK-Y1-BUSSPLICE-F13R)	—	—	40 N•m (354 lb•in)	M10
			DC output (using left-side splice kit SK-Y1-BUSSPLICE-F13L)	—	—		

(1) Maximum/minimum sizes that the terminals can accept. These sizes are not recommendations.

(2) Do **not** exceed maximum wire size. Parallel connections can be required.

(3) These connections are bus bar type terminations and require the use of lug type connectors.

(4) Apply counter-torque to the nut on the other side of terminations when tightening or loosening the terminal bolt to avoid damage to the terminal.

Figure 12 - PowerFlex 700AFE Frame 10 Power Terminal Locations in IP21 Rittal Enclosure

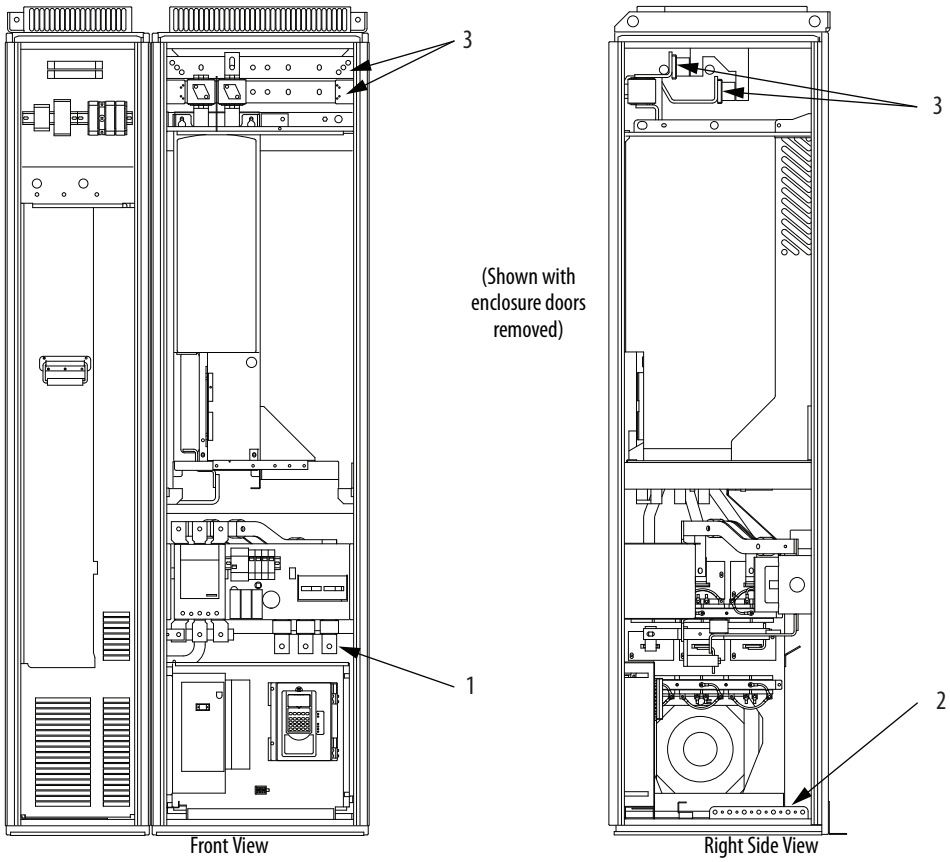


Table 30 - PowerFlex 700AFE Frame 10 Power Terminal Specifications in IP21 Rittal Enclosure

Item	Name	Frame	Description	Wire Size Range (1) (2)		Torque	Terminal Bolt Size (3)(4)
				Max	Min	Recommended	
1	Input power terminals L1, L2, L3 (1)	10	Input power	300 mm^2 (600 MCM)	2.1 mm^2 (14 AWG)	40 N•m (354 lb•in)	M10
2	SHLD terminal, PE, ground (3)	10	Terminating point for wiring shields	300 mm^2 (600 MCM)	2.1 mm^2 (14 AWG)	40 N•m (354 lb•in)	M10
3	DC bus (3) (DC–, DC+)	10	DC output	300 mm^2 (600 MCM)	2.1 mm^2 (14 AWG)	70 N•m (620 lb•in)	M12

(1) Maximum/minimum sizes that the terminals accept. These sizes are not recommendations.

(2) Do **not** exceed maximum wire size. Parallel connections can be required.

(3) These connections are bus bar type terminations and require the use of lug type connectors.

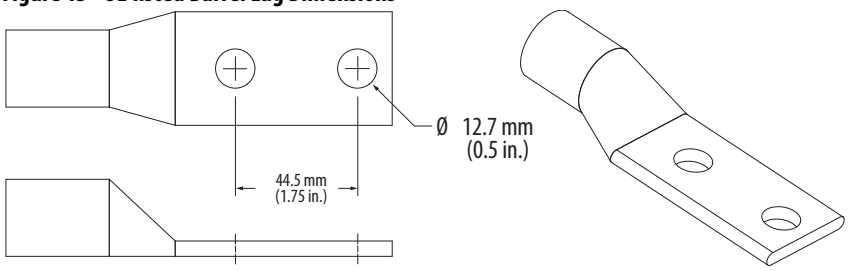
(4) Apply counter-torque to the nut on the other side of terminations when tightening or loosening the terminal bolt to avoid damage to the terminal.

PowerFlex 755TM Bus Supply Customer Power Terminal Locations and Specifications

Customer Power Connections

AC line input power and output motor connections are made by using customer-supplied barrel lugs that are either crimp or mechanical type. Barrel lugs that are used to make the power cable connections to bus bars must have the dimensions in the following graphic.

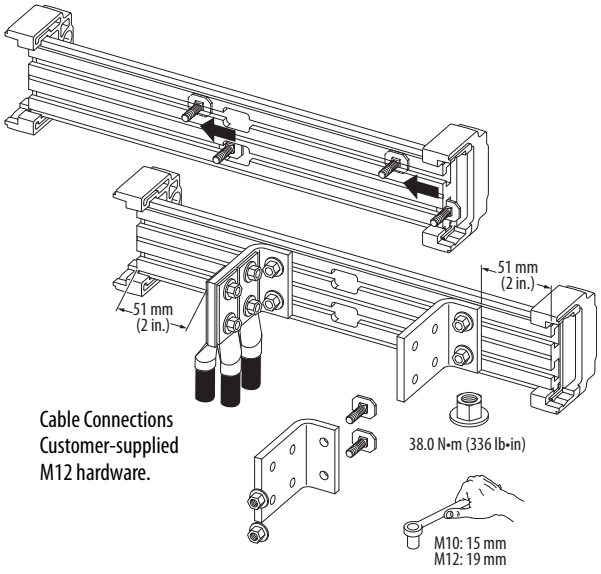
Figure 13 - UL-listed Barrel Lug Dimensions



Use the vendor-recommended tooling to fasten crimp type terminals to cabling. Torque mechanical type terminals according to vendor instructions.

L-Bracket Connections

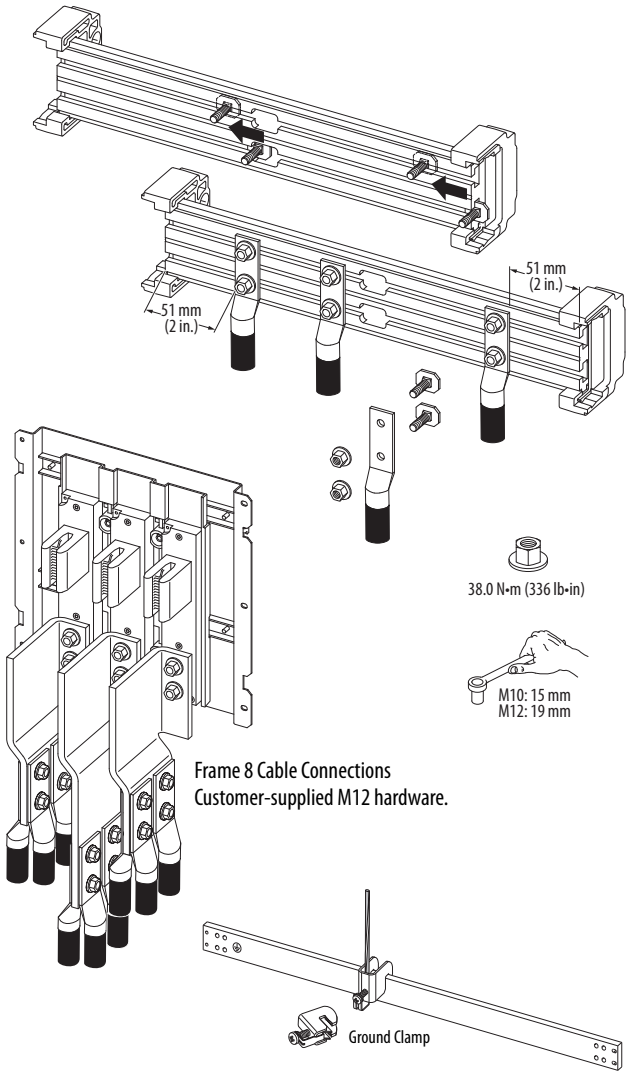
Power cable connections in entry and exit wire bay are made using L-brackets. The M10 hardware that is required to fasten the L-brackets to the extruded bus bar is provided. Wires with appropriate barrel lugs can be bolted to both sides of the L-brackets if necessary. Up to four conductors can be attached to each L-bracket. Attach the conductors to the L-brackets using M12 or 0.5 in. diameter bolts, nuts, and washers. Belleville spring washers, or equivalent, are recommended. Keep the L-bracket connections at least 51 mm (2 in.) away from the ends of the extruded bus bar.



Bus Bar Connections

AC line input power and output motor cables with appropriate barrel lugs are connected directly to bus bars and use the fastening hardware provided. Keep the wire connections at least 51 mm (2 in.) away from the ends of the extruded bus bar. Clamp kits, SK-RM-GRNDCLMP-*nn*, are available for making connections to the PE ground bar.

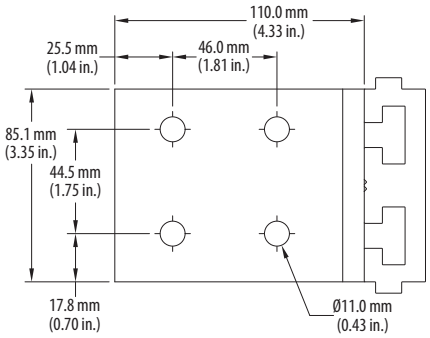
Figure 14 - Bus Bar Connections



Additional Power Terminal L-Brackets

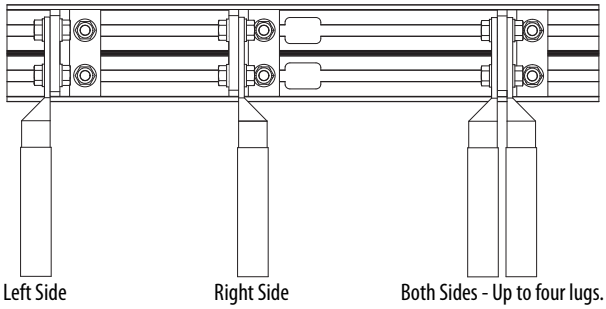
PowerFlex 755T entry and exit wire bays come equipped with L-brackets. If an application requires additional L-brackets, kit number 20-750-MLBRKT-F8M is available. Each kit contains three L-brackets and mounting hardware.

Figure 15 - L-Bracket Approximate Dimensions



When using mechanical barrel lugs, which may be large, be sure to maintain adequate spacing to adjacent wires, terminals, and other parts.

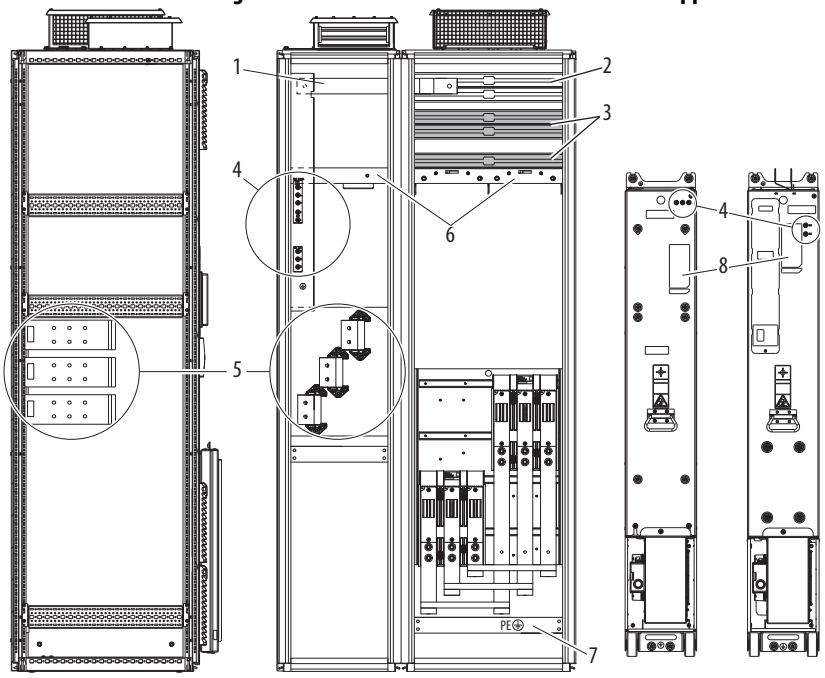
Figure 16 - Typical Barrel Lug Connection to L-Bracket Options



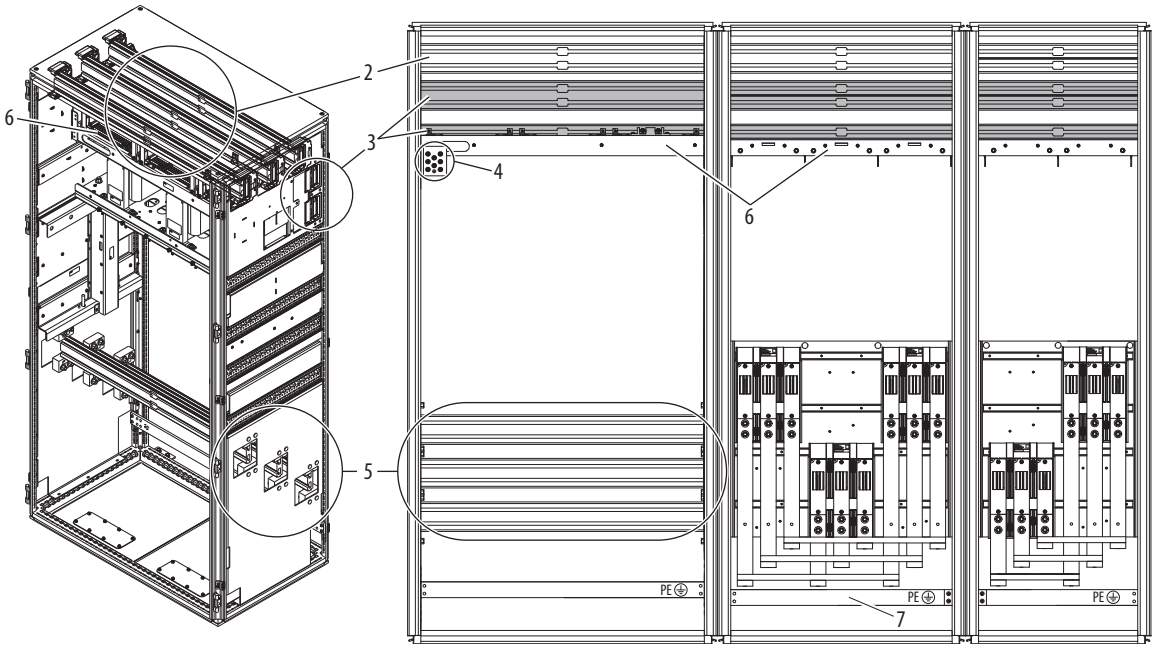
IMPORTANT PowerFlex 755T products may require multiple conductors in parallel. Wire size and number of conductors must be determined by the customer based on drive rated current, local codes, operating conditions, and specific application needs. When using multiple conductors per phase, symmetrical spacing of the input and output power cabling over the span of the bus bar for each phase is required.

When using multiple conductors per phase, wires must be arranged so that each conduit, bundle, or cable contains equal numbers of conductors from all three phases.

Figure 17 - PowerFlex 755TM Frames 8…12 Bus Supplies



Frame 8 bus supply shown (IP21).



Frame 10 bus supply shown. Layout is typical for Frames 10 through 12.

Item	Name	Description
1	AC Link	Connects AC circuit breaker to LCL fuse assembly
2	AC Bus	AC power supply
3	DC Bus	DC+, DC-
4	Test points	DC+, DC- and R/L1, S/L2, T/L3 voltage test point sockets

Item	Name	Description
5	Power Bus	R/L1, S/L2, T/L3 AC line input power connections
6	Control Bus	120/240V and 24V AC control power supply connections
7	PE Grounding Bar	Terminating point to chassis ground for incoming AC line and motor shield. PE ground bar clamps, kit number SK-RM-GRNDCLMP-*nn*, are available.
8	Nameplate	Power module and LCL filter module nameplate locations

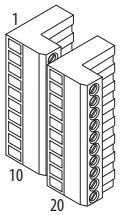
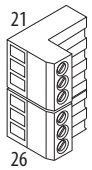
Control Terminal Comparison

This section compares the control terminal blocks of the PowerFlex 700AFE and PowerFlex 755TM bus supplies.

PowerFlex 700AFE Digital and Analog I/O

Inputs and outputs on the PowerFlex 700AFE converter are mostly predefined factory defaults that interface with the standard door-mounted operator control devices. Standard default I/O descriptions are shown Table 31.

Table 31 - PowerFlex 700AFE Control Terminals

	No.	Signal	Factory Default[1]	Description
	1	Analog In 1 (–)[2]	Depends on parameter settings	Isolated[3], bipolar, differential, 9-bit & sign, 88 kΩ input impedance. A jumper selects 0…10V, ±10V, or 4-20 mA. Default: 0…10V (Ri = 200 kΩ), 4-20 mA (Ri = 100 Ω).
	2	Analog In 1 (+)[2]		
	3	Analog In 2 (–)[2]		
	4	Analog In 2 (+)[2]		
	5	–10V Pot Reference	—	2 kΩ min, 10 mA max load, 1% accuracy
	6	Pot Common (GND)	—	For (+) and (–) 10V pot references
	7	+10V Pot Reference	—	2 kΩ min, 10 mA max load, 1% accuracy
	8	Analog Out 1 (+)[2]	Depends on parameter settings	Bipolar (current out is not bipolar), 9-bit and sign, 2 kΩ min load. A jumper selects 0…10V, ±10V, or 4-20 mA.
	9	Analog Out Common	—	
	10	Analog Out 2 (+)[2]	Depends on parameter settings	
	11	Digital In 1	RunCmd	24V DC - Opto isolated (250V) Low State: less than 5V DC High State: greater than 20V DC, 11.2 mA DC On-Time: < 16.7 ms, Off-Time < 1 ms Hardware ENABLE: Digital In 6 is jumper selectable for Hardware Enable. See Hardware Enable Circuits on page 55.
	12	Digital In 2	Ext. Reset	
	13	Digital In 3	Enable Mcont	
	14	Digital In 4	Contactor Ack	
	15	Digital In 5	LCL Temp	
	16	Digital In 6	Depends on parameter and jumper settings	
	17	Digital In Common	—	Allows source or sink operation.
	18			
	19	+24V DC[4]	—	+24V DC internal power supply output.
	20	24V Common[4]	—	Common for internal 24V DC power supply.
	21	Digital Out 1 – N.C.[5]	Contact Ctrl	Max. resistive load: 240V AC/30V DC – 1200VA, 150 W Max. current: 5A, min. load: 10 mA Max. inductive load: 20V AC/30V DC – 840VA, 105 W Max. current: 3.5A, min. load: 10 mA
	22	Digital Out 1 Common	—	
	23	Digital Out 1 – N.O. [5]	Contact Ctrl	
	24	Digital Out 2 – N.C. [5]	Fault	
	25	Digital Out 2/3 Com.	—	
	26	Digital Out 3 – N.O. [5][6]	Active	

(1) **Important:** Digital Inputs 1, 3, 4, and 5, and Digital Outputs 1 and 2 are factory-wired and programmed to operate from the controls on the front of the enclosure. Digital Output 3 is programmable and factory-wired for +24V DC only. Do not change the wiring and programming for those digital inputs and outputs, or it results in malfunction of the system.

(2) **Important:** Input must be configured with a jumper. AFE damage can occur if jumper is not installed properly. See Analog I/O Configuration in PowerFlex 700AFE User Manual, publication 20Y-UM001.

(3) Differential Isolation - External source must be maintained at less than 160V regarding PE. Input provides high common mode immunity.

(4) 150 mA maximum load. Can be used to provide control power from an external 24V source when main power is not applied.

(5) Contacts in an unpowered state. Any relay that is programmed as Fault or Alarm energizes (pick up) when power is applied to the AFE, and de-energizes (drop out) when a fault or alarm exists. Relays selected for other functions energize only when that condition exists and de-energizes when the condition is removed.

(6) When this output is configured as active, it can be wired to the Enable input of the connected drives to prevent the AFE from supplying power when the AFE is inactive.

PowerFlex 755TM Bus Supply I/O Option Modules

The main control board has one digital input that is typically used for hardware ENABLE. Optional 750-Series I/O modules must be added if additional digital and analog I/O is required. See publication 750-IN100 for detailed information about option modules.

Notes:

Bus Supply Hardware and Parameter Conversion

The PowerFlex 700AFE bus supply has limited I/O and control options. Most of the available I/O options have equivalent PowerFlex 755T devices as indicated in Table 32.

Table 32 - I/O Comparison

Device or Function	PowerFlex 700AFE	PowerFlex 755TM Bus Supply
Digital and Analog I/O	(s) 6 x digital input 3 x digital output 2 x analog input 2 x analog output	(o) 20-750-2262C-2R(1)

(1) The 20-750-2262C-2R option module only has two relay outputs. If three relay outputs are required to match the PowerFlex 700AFE on board I/O, then another or additional I/O option module may be required for the PowerFlex 755TM bus supply.

See Specification and Feature Comparison on page 33 for more information about compatible PowerFlex 755T communication protocols and devices.

See the PowerFlex 750 TotalFORCE installation manual, publication 750-IN100, for details of I/O and feedback option module terminal wiring and specifications.

Configuration Software and HIM Versions

There are several tools available for configuring PowerFlex 755T parameters. You must use a compatible Human Interface Module (HIM) or configuration software package to migrate to the new bus supply.

The 755TM bus supply uses similar HIMs and configuration software packages as the PowerFlex 700AFE bus supply, but knowing the software versions of each drive is essential to understand if the available software packages are compatible.

Older configuration software tools do not support the PowerFlex 755T product. We recommend that you use the latest available versions of software configuration tools such as Studio 5000 Logix Designer application, RSLogix™ 5000 software, or Connected Components Workbench™ software for full featured configuration capabilities.

- Connected Components Workbench (CCW) can configure PowerFlex 755T product parameters directly via EtherNet/IP connection from your computer to the PowerFlex 755T product Embedded or option module EtherNet/IP communication port.

- If your computer is connected to Logix controller EtherNet/IP architecture that supports drive Add-on Profiles (AOP), you can use RSLogix or Studio 5000 to configure the PowerFlex 755T parameters via Embedded or option module EtherNet/IP communication port.
- To make a direct connection from your computer USB port to the PowerFlex 755T product DPI port, you need an external 1203-USB communication protocol converter and appropriate connection cables to configure PowerFlex 755T product parameters.

Table 33 - PowerFlex 755T Configuration Tools

Configuration Tool	PowerFlex 755TM Bus Supply, with Firmware V1.0
DriveExplorer	Not supported
DriveTools SP/DriveExecutive	Not supported
Connected Components Workbench (CCW)(1)	V10.000 and later
RSLogix 5000	V20.001 and later
Drive AOP	V1.02 PowerFlex 755T and later
Studio 5000	V21.003 and later
Drive AOP	V1.02 PowerFlex 755T and later
HIM(2)	20-HIM-A6/-C6S

(1) Separate installer update is required to use PowerFlex 755T with CCW V10.

(2) Assisted Startup using the HIM not available at initial release.

Parameter Comparison

Use Table 34 through Table 37 to cross-reference commonly used and modified PowerFlex 700AFE bus supply parameters with equivalent parameters in the PowerFlex 755TM bus supply.

PowerFlex 700AFE Parameter Assignment

Uses linear parameter numbering and direct parameter assignments for most user parameters, so the port number is not specified or is internally referenced to fixed port locations, like the HIM (ports 1, 2) and DPI communication (port 5).

PowerFlex 755T with TotalFORCE Control Parameter Assignment

Uses indirect parameter numbers to create parameter assignments or to select data sources and destinations. The maximum value for indirect parameter assignments is 159999.15.

The left most one or two digits are the port number, the right most four digits are the parameter number and, if applicable, the two digits after the decimal point are the bit number. This port, parameter, bit format is how internal values of assignable parameter values are handled. Parameter selections or assignments are calculated using this formula:

$$\text{Parameter Value} = (10{,}000 \times \text{Port Number} + \text{Parameter Number}).\text{bit}$$

For example, parameter 0:120 [DI M Run] will be assigned to an I/O option module in port 4 using a run contact that is wired to digital input 1 (port 4, parameter 1 [Dig In Sts], bit-1). In this example, parameter 0:120 [DI M Run] would be set = (10000*4 + 1).01 = 40001.01.

IMPORTANT The parameters in Table 34 through Table 37 do not represent an exhaustive list. Many applications may require modification of other parameters that are not shown in the following table. Review all parameters to verify that the new bus supply will operate satisfactorily as a migration solution.

IMPORTANT The parameter comparisons in Table 34 through Table 37 relate similar parameter functions. However, data type, units, and scaling may be different between the old and new bus supply parameters. This is especially true for DataLink parameters that are produced/consumed by a Logix controller or PLC. Most parameters within the PowerFlex 755T, including DataLinks, are real type. However, PowerFlex 700AFE parameters are integer type with scaling factors applied.

Table 34 - Parameter Comparison

PowerFlex 700AFE Bus Supply			PowerFlex 755TM Bus Supply		
Parameter, Bit	**Display Name**	**Read/ Write**	**Port:Parameter.Bit**	**Display Name**	**Read/ Write**
P001	Input Voltage	RO	13:2	AC Line Voltage	RO
P003	Total Current	RO	13:6	AC Line Current	RO
P011	DC Bus Volt	RO	0:3	DC Bus Volts	RO
P012	DC Bus Current	RO	—		
P040	Nom Input Volt	RW	13:25	Rated Volts	RO
P045	Rated Line Current	RW	13:26	Rated Amps	RO
P046	Stop/Start Mode	RW	0:63	LS Start Mode(1)	RW
P051, B5	Control Options	RW	13:40.3	Conv Options Cfg	RW
P060	DC Volt Ref Sel	RW	13:45	DC Bus Ref Sel	RW
P061	DC Volt Ref	RW	13:48	DC BusRef Preset(2)	RW
P062	DC Volt Kp	RW	13:57	u Volt Reg Kp(3)	RW
P063	DC Volt Ki	RW	13:59	u Volt Reg Ki(3)	RW
P075	Motor Power Lmt	RW	13:105	Motor Power Lmt	RW
P076	Regen Power Lmt	RW	13:104	Regen Power Lmt	RW

Table 34 - Parameter Comparison (Continued)

PowerFlex 700AFE Bus Supply			PowerFlex 755TM Bus Supply		
Parameter, Bit	**Display Name**	**Read/ Write**	**Port:Parameter.Bit**	**Display Name**	**Read/ Write**
P077	Current Lmt Val	RW	13:100	Current Limit	RW
P090	Param Access Lvl	RW	0:30	Access Level	RW
P095	Cnvrtr Status 1	RO	13:225	Line Side Sts 1	RO
P096	Cnvrtr Status 2	RO	14:1100	ACP0 Status	RO
P097	Cnvrtr Alarm 1	RO	13:258	Alarm Status A	RO
P098	Cnvrtr Alarm 2	RO	13:259	Alarm Status B	RO
P100	Start Inhibits	RO	13:235	L Start Inhibits	RO
P124…P130	Fault 1…4 Codes	RO	13:240	Fault Status A	RO
			13:241	Fault Status B	RO
P154	Logic Mask	RW	0:41	Logic Mask Cfg	RW
			0:42	Auto Mask	RW
P156	Stop Owner	RO	0:260	Stop Owner	RO
P157	Start Owner	RO	0:261	Start Owner	RO
P158	Fault Clr Owner	RO	0:264	Clear Flt Owner	RO

(1) Default for PowerFlex 755TM Bus Supply is 'Conv Logic'.
(2) Only used if 13:54 is set to 'Manual'.
(3) Only used if 13:54 is set to 'User Entered'.

Table 35 - Analog I/O Parameter Comparison

PowerFlex 700AFE Bus Supply			PowerFlex 755TM Bus Supply[(1)]		
Parameter, Bit	**Display Name**	**Read/ Write**	**Port:Parameter.Bit**	**Display Name**	**Read/ Write**
P022	Analog In1 Value	RO	x:50	Anlg In0 Value	RO
P201	Analog In 1 Hi	RW	x:51	Anlg In0 Hi	RW
P202	Analog In 1 Lo	RW	x:52	Anlg In0 Lo	RW
P203	Analog In 1 Loss	RW	x:53	Anlg In0 LssActn	RW
P023	Analog In2 Value	RO	x:60	Anlg In1 Value	RO
P204	Analog In 2 Hi	RW	x:61	Anlg In1 HI	RW
P205	Analog In 2 Lo	RW	x:62	Anlg In1 Lo	RW
P206	Analog In 2 Loss	RW	x:63	Anlg In1 LssActn	RW
P207	Anlg Out Config	RW	x:70	Anlg Out Type	RW
P208	Anlg Out Absolute	RW	x:71	Anlg Out Abs	RW
P209	Analog Out1 Sel	RW	x:75	Anlg Out0 Sel	RW
P210	Analog Out 1 Hi	RW	x:80	Anlg Out0 Hi	RW
P211	Analog Out 1 Lo	RW	x:81	Anlg Out0 Lo	RW
P212	Analog Out 2 Sel	RW	x:85	Anlg Out1 Sel	RW
P213	Analog Out 2 Hi	RW	x:90	Anlg Out1 Hi	RW
P214	Analog Out 2 Lo	RW	x:91	Anlg Out1 Lo	RW
P215	Anlg Out1 Scale	RW	x:78…79	Anlg Out0 DataHi, Anlg Out0 DataLo	RW

Table 35 - Analog I/O Parameter Comparison (Continued)

PowerFlex 700AFE Bus Supply			PowerFlex 755TM Bus Supply(1)		
Parameter, Bit	**Display Name**	**Read/ Write**	**Port:Parameter.Bit**	**Display Name**	**Read/ Write**
P216	Anlg Out2 Scale	RW	x:88…89	Anlg Out1 DataHi, Anlg Out1 DataLo	RW
P217	Anlg Out 1 Setpt	RW	x:76	Anlg Out0 Stpt	RW
P218	Anlg Out 2 Setpt	RW	x:86	Anlg Out1 Stpt	RW

(1) With 2262C-2R or 2262D-2R -Series I/O Module. The 'x' in the Port:Parameter.Bit column is the physical port where the I/O module is installed.

Table 36 - Digital I/O Parameter Comparison

PowerFlex 700AFE Bus Supply			PowerFlex 755TM Bus Supply(1)		
Parameter, Bit	**Display Name**	**Read/ Write**	**Port:Parameter.Bit**	**Display Name**	**Read/ Write**
P221…P226	Digital Inx Sel	RW	0:105,112,119,123	DI L Enable, DI L Stop, DI L Start, DI L Run	RW
P229	Digital Out2 Sel	RW	x:10	RO0 Sel	RW
P230	Dig Out2 Invert	RW	x:6.0	Dig Out RO0 Invert	RW
P233	Digital Out3 Sel	RW	x:20	RO1 Sel	RW
P234	Digital Out3 Invert	RW	x:6.1	Dig Out RO1 Invert	RW

(1) With 2262C-2R or 2262D-2R -Series I/O Module. The 'x' in the Port:Parameter.Bit column is the physical port where the I/O module is installed.

Table 37 - Communication Parameter Comparison

PowerFlex 700AFE Bus Supply			PowerFlex 755TM Bus Supply		
Parameter, Bit	**Display Name**	**Read/ Write**	**Port:Parameter.Bit**	**Display Name**	**Read/ Write**
Port 5, P04…07	IP Addr Cfg 1, 2, 3, 4	RW	0:302…305	IP Addr Cfg 1, 2, 3, 4	RW
Port 5, P08…P11	Subnet Cfg 1, 2, 3, 4	RW	0:306…309	Subnet Cfg 1, 2, 3, 4	RW
P170…P177	Data In	RW	0:321…336	DL From Net	RW
P180…P187	Data Out	RW	0:340…355	DL To Net	RW

Bus Supply Hardware Configuration

The PowerFlex 700AFE bus supply was typically used as 'stand-alone' bus supply. In most cases, the PowerFlex 700AFE operates independent of an automation controller or PLC using the operator control devices on the enclosure door.

That said, most drive systems incorporate a communication link between the bus supply and the controller. In most cases, the controller is programmed to read and update monitor data, status, alarm, and fault parameters of the bus supply. However, there are many applications that use network communication to control certain aspects of the bus supply operation. See Chapter 3 for more information.

PowerFlex 700AFE Bus Supply Control Devices

The PowerFlex 700AFE IP20/IP21 enclosed DC bus supplies came from the factory with certain door mounted operator control devices (selector switches, pushbuttons, pilot lamps, and so on) prewired to the included digital I/O. These operator devices are configured by default to control the bus supply without connection to an automation controller or PLC. IGBT modulation can also be controlled via the communication Logic Command Word Bit-0 "Stop" and Bit-1 "Start".

Figure 18 and Figure 19 show typical power and control circuit wiring of a frame 10 MCC enclosure. The significant difference between the IP20 2500 MCC and IP21 Rittal versions is that the IP21 Rittal design uses a motor-operated circuit breaker, MCCB instead of an AC contactor. Similar wiring diagrams for the PowerFlex 700AFE in IP21 Rittal enclosure can be found in publication 20Y-UM001.

Figure 18 - PowerFlex 700AFE Bus Supply, Frame 10, IP20 2500 MCC, Sample Wiring Diagram

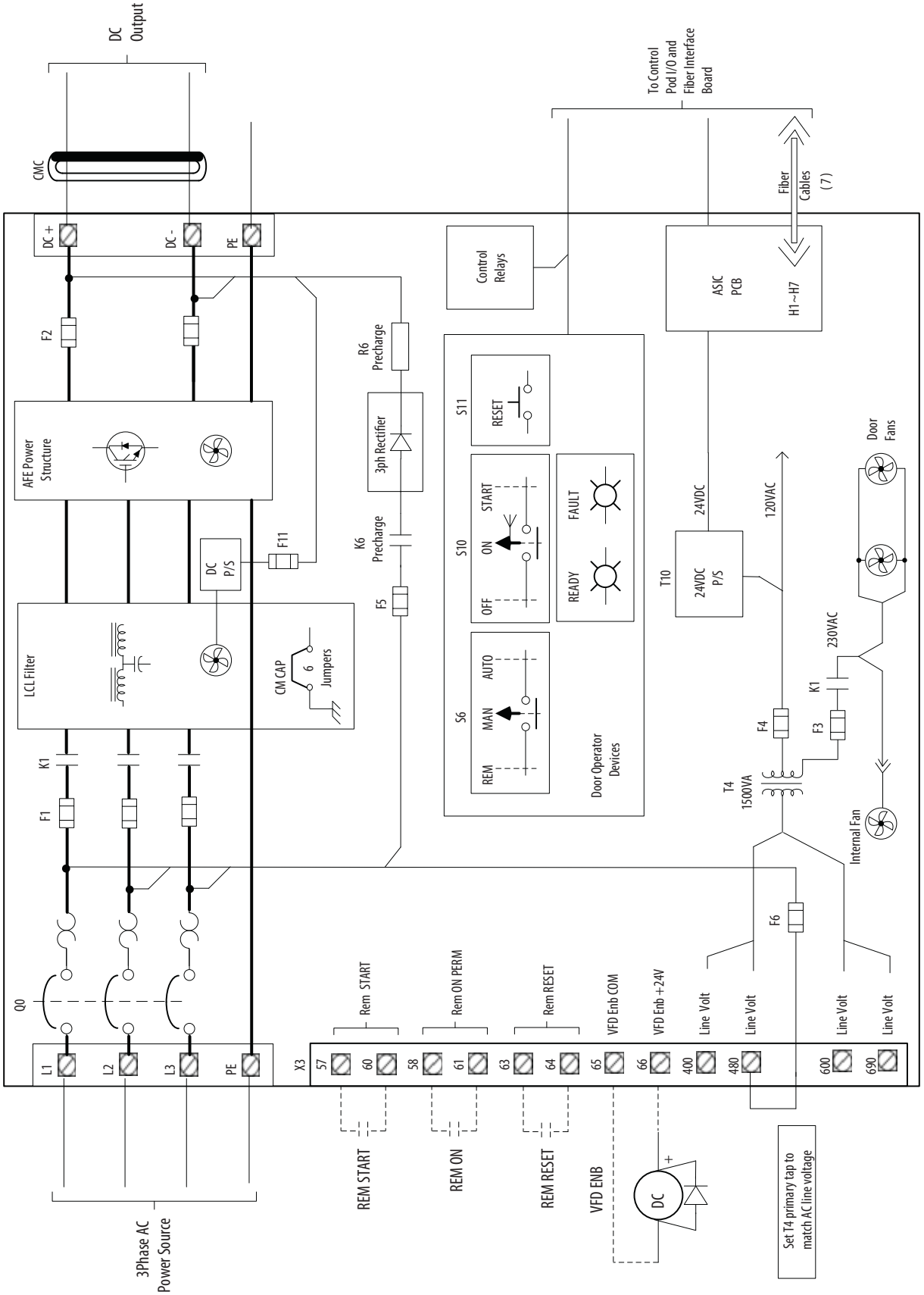
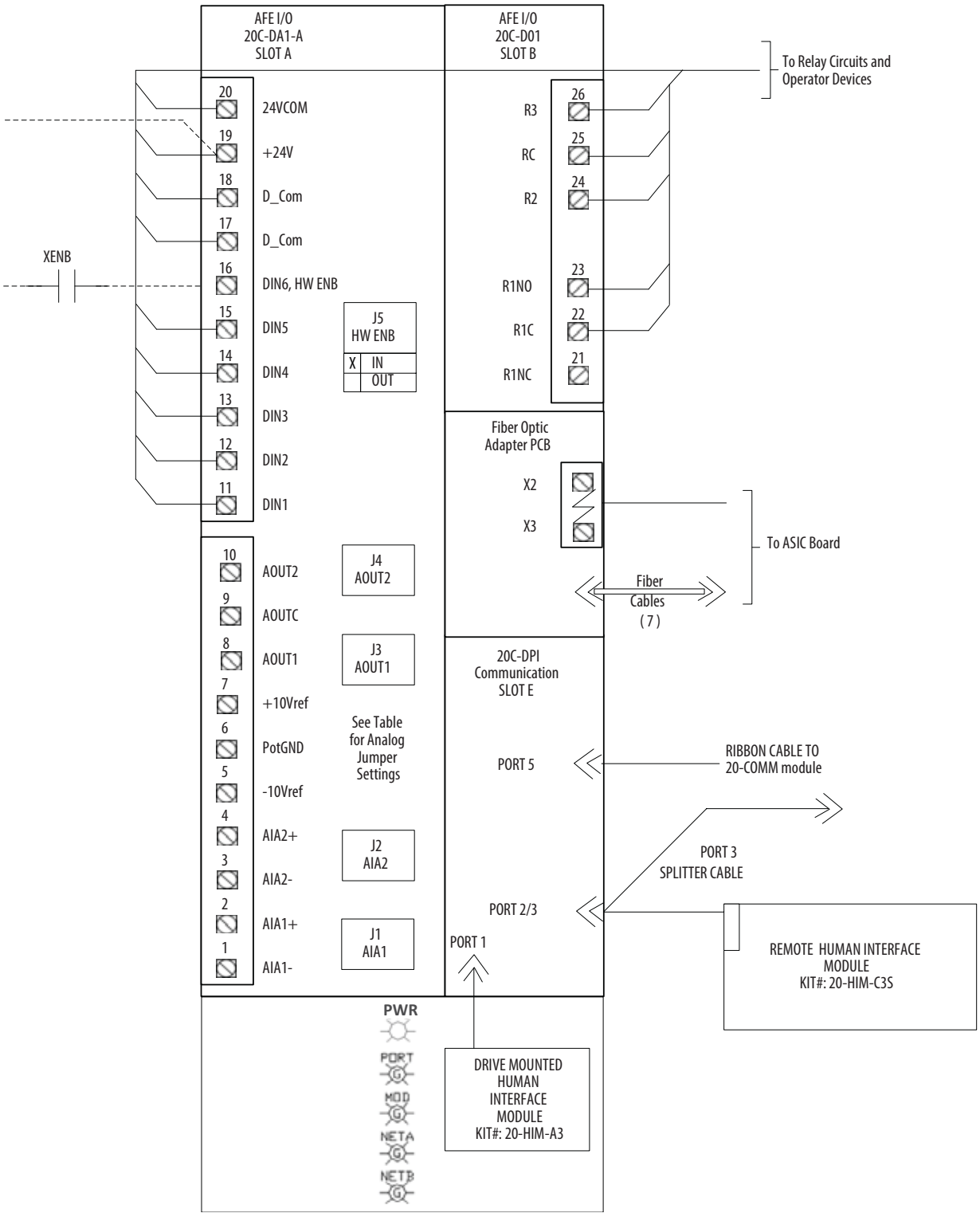


Figure 19 - PowerFlex 700AFE Control Module



See publication 20Y-UM001 for a detailed explanation of the PowerFlex 700AFE default control method.

PowerFlex 755TM Bus Supply Control

The PowerFlex 755TM bus supply excludes any standard or optional door-mounted operator devices. Precharge normally occurs when the input disconnect (FD1) is closed. When precharge is completed, the AC input MCB circuit breaker (CB1) is closed automatically, but IGBT modulation does not automatically begin. Line side converter manual IGBT modulation start/stop/run functions must be controlled via hardwired digital I/O or through the communication Logic Command Word. See publication 750-PM100 for detailed parameter settings for controlling the line side converter.

When line-side converter modulation is stopped, the converter IGBT transistors are disabled, however, diode rectifiers in the IGBT power devices are active. In this case, there is DC bus voltage available even when IGBT modulation is stopped but available DC output power is reduced. See monitor file parameter 13: 28 [Derated Amps] to understand and monitor the line side converter derating when IGBT modulation is stopped.

The PowerFlex 755TM bus supply power circuit configuration is fundamentally different in design compared to the PowerFlex 700AFE bus supply. Because of this difference, startup/shutdown methods for energizing AC power, precharging, and controlling of IGBT modulation is through different methods.

Table 38 outlines the differences in startup/shutdown and fault handling between the bus supplies.

Table 38 - Operation Comparison

Operating Condition	PowerFlex 700AFE Bus Supply, IP21 Rittal	PowerFlex 700AFE Bus Supply, IP20 2500 MCC	PowerFlex 755TM Bus Supply
3 PH, AC power application	• Manually energize the main incoming disconnect circuit breaker (Q0).	• Manually energize the main incoming disconnect circuit breaker (Q0).	• Manually energize the input disconnect switch (FD1).
	• Initiation of precharge sequence depends on input from door operator or remote devices are switched to on/start. • Precharge contactor (K6) is energized to supply a separate reduced DC power source to charge the DC bus.	• Initiation of the precharge sequence depends on input from door operator or that the remote devices are switched to on/start. • Precharge contactor (K6) is energized to supply a separate reduced DC power source to charge the DC bus.	• Precharge is initiated immediately. • Precharge contactor (M1) is energized to supply reduced AC to LCL filter and converter. Diodes within the IGBT devices are used to charge the DC bus.
	• When precharge is completed, the MCCB (Q1) is energized supplying full 3 PH, AC power to the converter.	• When precharge is completed, the AC contactor (K1) is energized supplying full 3 PH, AC power to the converter.	• When precharge is completed, the motor-operated MCB circuit breaker (CB1) is automatically energized supplying full 3 PH, AC power to the converter.
	• When MCCB (Q1) closes and provided there are no start inhibits, the relay logic automatically energizes a Digital input configured to start IGBT modulation.	• When the AC contactor (K1) is energized and there are no start inhibits, the relay logic automatically energizes a Digital input that is configured to start IGBT modulation.	• When the MCB (CB1) is energized and there are no start inhibits, the user-configured IGBT modulation stop/start/run control starts IGBT modulation.
AFE is switched off/ stopped	• The door operator or remote devices are switched to off.	• The door operator or remote devices are switched to off.	• User-configured IGBT modulation stop/ start/run control requests stop IGBT modulation.
	• IGBT modulation stops immediately. • The MCCB (Q1) is de-energized. • DC bus output voltage decays toward zero. • Initiation of precharge sequence and restart of IGBT modulation requires input from the door operator or remote devices.	• IGBT modulation stops immediately. • The AC contactor (K1) is de-energized. • DC bus output voltage decays toward zero. • Initiation of precharge sequence and restart of IGBT modulation requires input from the door operator or remote devices.	• IGBT modulation stops immediately. • The MCB (CB1) stays energized. • DC bus output drops to rectification voltage provided by the IGBT device diodes. • Provided there are no start inhibits, IGBT modulation is restarted by the user-configured stop/start/run control.
	• If the button on the HIM is pressed, IGBT modulation is stopped, but the MCCB (Q1) stays energized. • DC bus output drops to rectification voltage provided by the IGBT device diodes.	• If the button on the HIM is pressed, IGBT modulation is stopped but the AC contactor (K1) stays energized. • DC bus output will drop to rectification voltage provided by the IGBT device diodes.	• If Line Side stop(1) is true, IGBT modulation is stopped but the AC circuit breaker MCB (CB1) stays energized. • DC bus output drops to rectification voltage that is provided by the IGBT device diodes.
AFE is operating with IGBT modulation, followed by opening the input disconnect or loss of 3 PH AC power	• Loss of AC power or manually de-energize the main incoming disconnect circuit breaker (Q0).	• Loss of AC power or manually de-energize the main incoming disconnect circuit breaker (Q0).	• Loss of AC power or manually de-energize the input disconnect switch (FD1).
	• Loss of AC power and control power causes a fault and start/run inhibit. IGBT modulation l stops immediately.	• Loss of AC power and control power causes a fault and start/run inhibit. IGBT modulation stops immediately.	• Loss of AC power and control power causes a fault and start/run inhibit. IGBT modulation stops immediately.
	• The MCCB (Q1) de-energizes.	• The AC contactor (K1) de-energizes.	• The MCB (CB1) de-energizes.

(1) Line Side stop functionality can only be initiated by digital input 0:112 [DI L Stop] or by communication to Logix controller Add-On-Profile (AOP) Logic Command tags (Table 40). The HIM red button does not stop IGBT modulation.

Figure 20 and Figure 21 show typical power and control power connections for a frame 8 PowerFlex 755TM bus supply with the optional control transformer (-C1 option code). The user-supplied 24V DC auxiliary control power is shown connected, but the bus supply functions without this power supply.

Figure 20 - PowerFlex 755TM Bus Supply, Sample Frame 8 Wiring Diagram

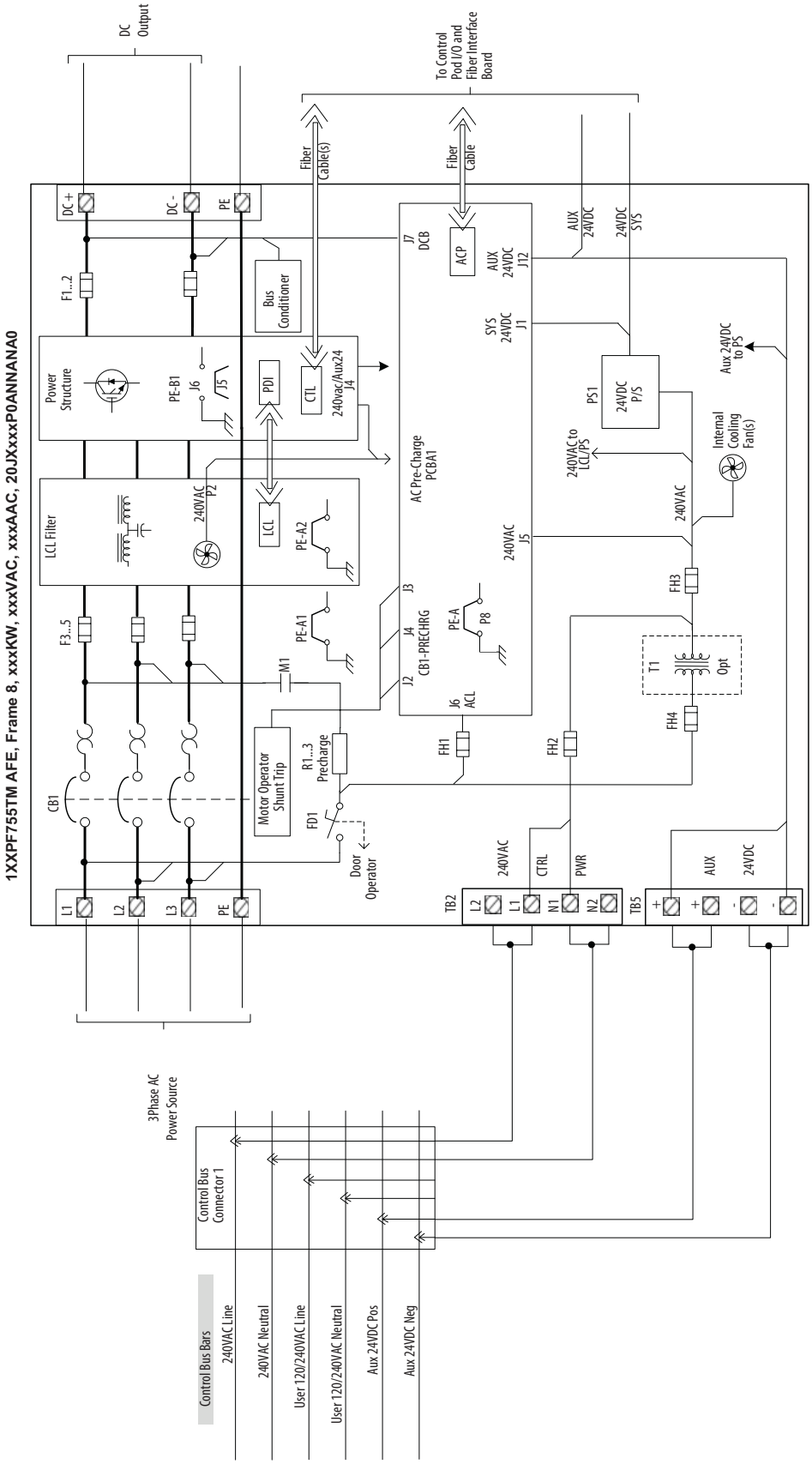
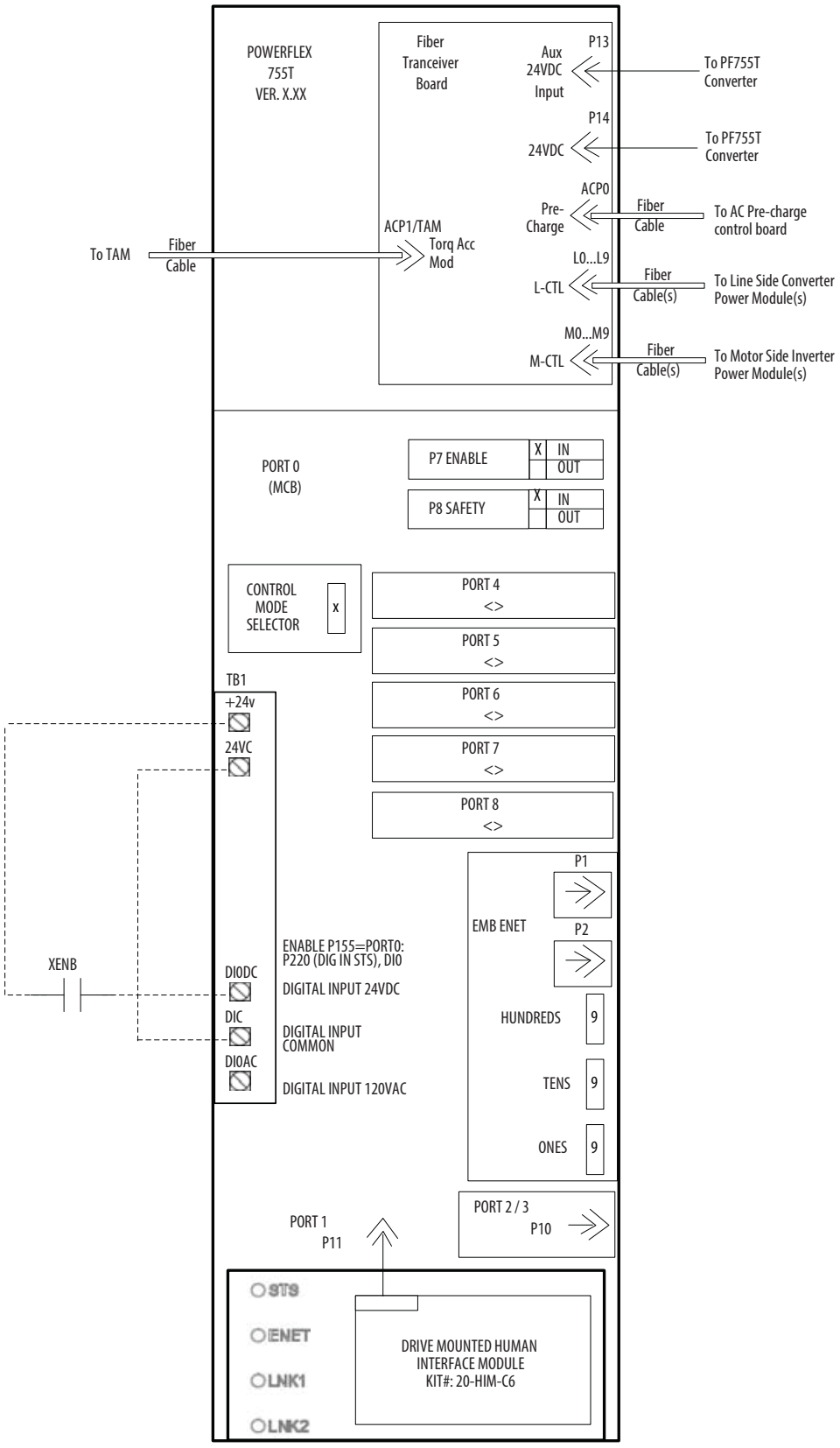


Figure 21 - PowerFlex 755TM Bus Supply Control Pod



Communication Configuration

A PowerFlex 700AFE bus supply with a communication option card can usually be replaced with a PowerFlex 755T communication option card. The process to migrate can vary significantly depending on the communication option in the PowerFlex 700AFE bus supply and the controller type communicating with the bus supply.

IMPORTANT Refer to the respective communication adapter user manuals. The manuals provide important configuration, installation, wiring, and programming processes required for proper operation.

This section describes the network options that are compatible with the PowerFlex 755TM bus supplies. Because of the wide variety of networks, processors, and drive options available, use this section to understand the types of network communication that are available for the PowerFlex 755T products, and determine the correct communication option for your bus supply migration.

In some cases, it is necessary to remap and translate reference, status, control, and Datalink registers if PLC-5, SLC, or certain MircoLogix controllers are communicating with the PowerFlex 755TM bus supply.

Use Table 39 to cross reference the existing PowerFlex 700AFE communication module to a compatible PowerFlex 755T communication module. If your existing communication protocol does not have a compatible PowerFlex 755T communication module, contact an Authorized Rockwell Automation Distributor specialist, Solution Partner, Recognized System Integrator, or Rockwell Automation account manager to discuss engineered solutions for custom migrations.

Table 39 - Communication Protocol Adapter Cross Reference Guide

Protocol	PowerFlex 700AFE Communication Adapters	PowerFlex 755T Communication Adapters	
EtherNet I/P	20-COMM-E single port 20-COMM-ER dual port	Embedded dual port EtherNet 20-750-ENETR dual port	User Manual, publication 750COM-UM009 User Manual, publication, 750COM-UM008
ControlNet Coax	20-COMM-C	20-750-CNETC	User Manual, publication, 750COM-UM003
ControlNet Fiber	20-COMM-Q	—(1)	—
DeviceNet	20-COMM-D	20-750-DNET	User Manual, publication, 750COM-UM002
HVAC Modbus RTU	20-COMM-H	—(1)	
CANopen	20-COMM-K	—(1)	
Interbus	20-COMM-I	—(1)	
LonWorks	20-COMM-L	—(1)	
Modbus/TCP	20-COMM-M	—(1)	
Profibus DPV1	20-COMM-P	20-750-PBUS	User Manual, publication, 750COM-UM004
ProfiNet	—	20-750-PNET single port 20-750-PNET2P dual port	User Manual, publication, 750COM-UM006 750COM-UM007
Remote I/O	20-COMM-R(2)	—(1)	
RS485 DF1	20-COMM-S	—(1)	
USB	1203-USB	1203-USB	

(1) Future product releases may permit the use of selected 20-COMM-*x* communication adapters.
(2) This item has End-of-Life status.

PowerFlex 755T 20-COMM-*x* Network Adapter Compatibility

At initial release, 20-COMM-*x* adapters cannot be used with PowerFlex 755T products.

Scaling of Reference and Feedback

The PowerFlex 700AFE bus supply parameters for DC bus voltage 'Reference' and 'Feedback' tag data are in scaled engineering units x 10. A Logix tag value of 6000 written to the 16-bit predefined output Datalink will produce an internal value of 6000 and parameter P061 [DC Volt Ref] value displayed as 600.0V.

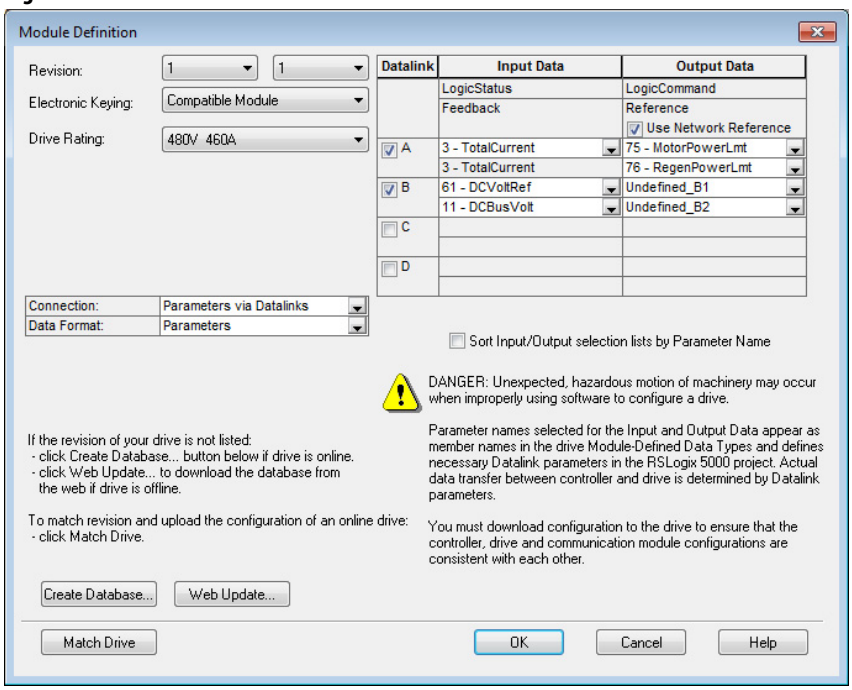
The PowerFlex 755TM bus supply DC bus voltage 'Reference' and 'Feedback' tag data are in engineering units. A Logix tag value of 600.0 written to a 32-bit predefined output Datalink will produce a parameter 13: P48 [DC BusRef Preset] value of 600.0V.

PowerFlex 700AFE DPI Communications

The PowerFlex 700AFE bus supply supports 16-bit [INT] and 32-bit [DINT] Datalinks, which can be selected on the Logix module definition screen (for details, see the communication adapter documentation). The PowerFlex 700AFE with 20-COMM-X communication option module supports 8 input and 8 output 16-bit Datalinks. If a 32-bit parameter is assigned to a Datalink, it consumes two contiguous 16-bit Datalinks. When using Logix V16 and later, PowerFlex 700AFE internal parameter values and Logix Datalink tags automatically have the same data type and scaling factor.

Figure 22 shows the Module Definition dialog box for a PowerFlex 700AFE bus supply with 20-COMM-E EtherNet/IP adapter using a 32-bit parameter (A1/A2) along with two 16-bit parameters (B1 and B2) on the Input and two 16-bit parameters (A1 and A2) on the Output.

Figure 22 - Module Definition



PowerFlex 755TM Bus Supply Communications

The PowerFlex 755T product supports 16 input and 16 output 32-bit Datalinks when using Embedded EtherNet or 20-750-ENETR communication option module. When using Logix V16 and later, PowerFlex 755T parameters and Logix Datalink tags automatically have the same data type and scaling factor. Figure 23 and Figure 24 show similar 32-bit Datalinks when using a PowerFlex 755TM bus supply with embedded EtherNet/IP communication.

Figure 23 - Connection Formats - Inputs

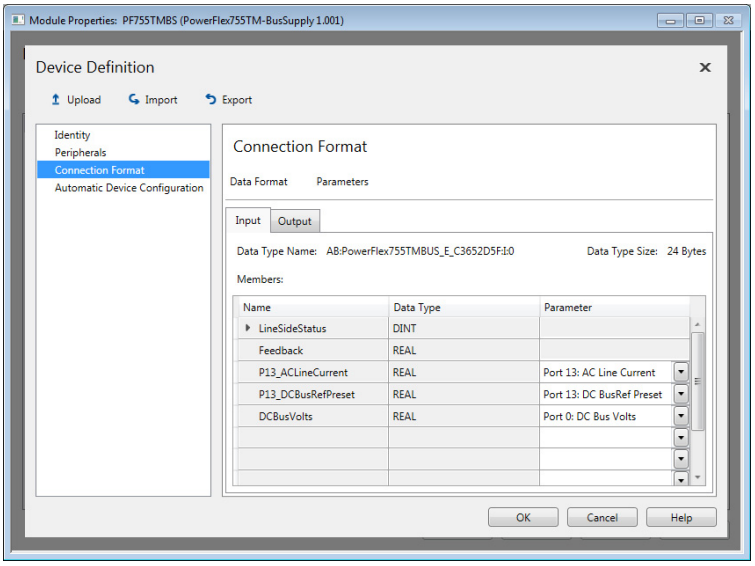
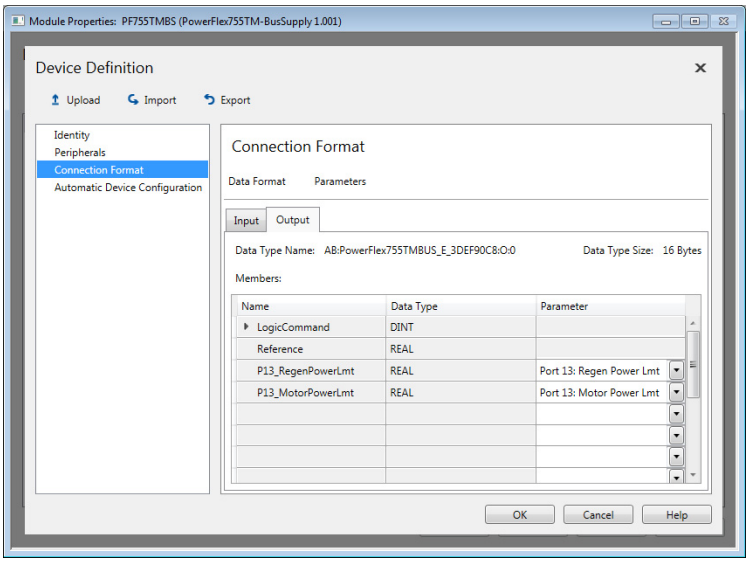


Figure 24 - Connection Formats - Outputs



Logic Command Word Comparison

Table 40 shows the line side converter communication Logic Command Word comparison that applies to the Logix Add-On-Profile (AOP). The Logic Command Word functions are predefined by the AOP and associated tags are automatically assigned in the Logix project.

- "Start" is a momentary command, that is, a transition from '0' to '1' performs the start function. A '1' to '0' transition of the "Start" command has no effect on operation and does NOT perform a stop function.
- The "Run" command is a maintained function. A '0' to '1' transition of the "Run" command performs the run function. A '1' to '0' transition of the "Run" command performs a stop function.
- The "Stop" command must transition from '0' to '1' to perform a stop function. The "Start" and "Run" commands are inhibited if the "Stop" command is '1'. The "Start" or "Run" commands must transition from '0' to '1' after a stop command in order to perform the start or run functions.

Table 40 - Line Side Logic Command Word Comparison

Command Description	PowerFlex 700AFE Bus Supply :0.LogicCommand_ "TagName"	PowerFlex 755TM Bus Supply :0.LogicCommand_ "TagName"
Stop IGBT Modulation	Bit 0 "Stop"	Bit 0 "Stop"
Start IGBT Modulation	Bit 1 "Start"	Bit 1 "Start"
Clear Faults	Bit 3 "Clear Fault"	Bit 3 "Clear Fault"
Communication Control Digital Output	Bit 7 "Cmd LogicOut"	Not applicable (A Datalink is required to control a Digital Output via communication. For example x:7 [Dig Out Setpoint] can be assigned to an Output Datalink, where x = slot/port of optional I/O module)
Run IGBT Modulation	—	Bit 18 "Run"

Datalink Handling Comparison

Datalink examples using a Logix controller with Logix V16 and later firmware. Sample numerical data is interpreted as shown in Table 41.

Table 41 - Datalink Handling Comparison

Example Data	Comm Option	Datalink; Parameter Information	Parameter Value in PowerFlex	Tag Value in Logix(1) (2)
Total Input AC Amps	PowerFlex 700AFE Bus Supply; 20-COMM-E/ER	Input Datalink A1; P3 [Total Current], Input Datalink A2; P3 [Total Current], Type 'DINT', units 'Amps'	Internal value; =12893 P3 displayed as; 12893/10 = 1289.3	12893
	PowerFlex 755TM Bus Supply; Embedded Ethernet	Input Datalink 01; 13:6 [AC Line Current], Type 'DINT', units 'Amps'	458.9	458.9
Motoring Power Limit	PowerFlex 700AFE Bus Supply; 20-COMM-E/ER	Output Datalink A1; P75 [Motor Power Lmt] Type 'INT', units '%'	Internal value; =2257 P75 displayed as; 2257/10 = 225.7	2257
	PowerFlex 755TM Bus Supply; Embedded Ethernet	Output Datalink 01; 13:105 [Motor Power Lmt], Type 'DINT', units '%'	75.6	75.6
Regen Power Limit	PowerFlex 700AFE Bus Supply; 20-COMM-E/ER	Output Datalink A2; P76 [Regen Power Lmt], Type 'INT', units '%'	Internal value; =1100 P76 displayed as; 1100/10 = 110.0	1100
	PowerFlex 755TM Bus Supply; Embedded Ethernet	Output Datalink 02; 13:104 [Regen Power Lmt], Type 'DINT', units '%'	110.0	110.0
Network Bus Voltage Reference	PowerFlex 700AFE Bus Supply; 20-COMM-E/ER	Predefined Output Datalink; DPI Port 5, 'Reference', Type 'INT'	—	6000
	PowerFlex 755TM Bus Supply; Embedded Ethernet	Predefined Output Datalink; 'Reference', Type 'REAL'	—	600.0
Bus Voltage Reference	PowerFlex 700AFE Bus Supply; 20-COMM-E/ER	Input Datalink B1; P61 [DC Volt Ref], Type 'INT', units 'VDC'	Internal value; = 6000 P61 displayed as; 6000/10 = 600.0	6000
	PowerFlex 755TM Bus Supply; Embedded Ethernet	Input Datalink 02; 13: P48 [DC BusRef Preset], Type 'REAL', units 'VDC'	600.0	600.0
Network Bus Voltage Feedback	PowerFlex 700AFE Bus Supply; 20-COMM-E/ER	Predefined Input Datalink; DPI Port 5, 'Feedback', Type 'INT'	—	5667
	PowerFlex 755TM Bus Supply; Embedded Ethernet	Predefined Input Datalink; 'Feedback', Type 'REAL'	—	566.7
Bus Voltage Feedback	PowerFlex 700AFE Bus Supply; 20-COMM-E/ER	Input Datalink B2; P11 [DC Bus Volt], Type 'INT', units 'VDC'	Internal value; = 5667 P11 displayed as; 5667/10 = 566.7	5667
	PowerFlex 755TM Bus Supply; Embedded Ethernet	Input DataLink 03; 0: P3 [DC Bus Volts], Type 'REAL', units 'VDC'	566.7	566.7

(1) When using Logix V16 and later, Datalink scaling is automatically applied.

(2) When using Logix V15 and earlier, Datalink bit-scaling may need to be done in application programs. See 16-bit Processors (PLC-5, SLC 500, and MicroLogix 1100/1400) on page 85.

16-bit Processors (PLC-5, SLC 500, and MicroLogix 1100/1400)

The PowerFlex 755T products are 32-bit, whereas the PLC-5®, SLC 500, and MicroLogix 1100/1400 processor modules are 16-bit. Any application that uses a 16-bit processor with a PowerFlex 755T product Embedded EtherNet/IP or communication option module must include a review to determine the types of data that are passed, and if the 16-bit processor can process the data.

For information on how to use a PLC-5, SLC 500, or MicroLogix 1100/1400 controller, see publication 750COM-AT001.

Notes:

Enclosure Information

Dimension and Enclosure Types

Enclosure and dimensional information based on the compatible migration solutions are shown in Table 16 through Table 23.

IMPORTANT The width dimension for parallel PowerFlex 700AFE assumes that each AFE enclosure is secured directly to the adjacent unit. Since paralleling is not a factory option, each installation is different. You must analyze your existing parallel PowerFlex 700AFE arrangement before relying on these dimension comparison tables.

Figure 25 - Frame 10 PowerFlex 700AFE and Frame 8 PowerFlex 755TM Bus Supply Comparison

Frame 10 PowerFlex 700AFE **Frame 8 PowerFlex 755TM Bus Supply**

MCC IP20 Rittal IP21

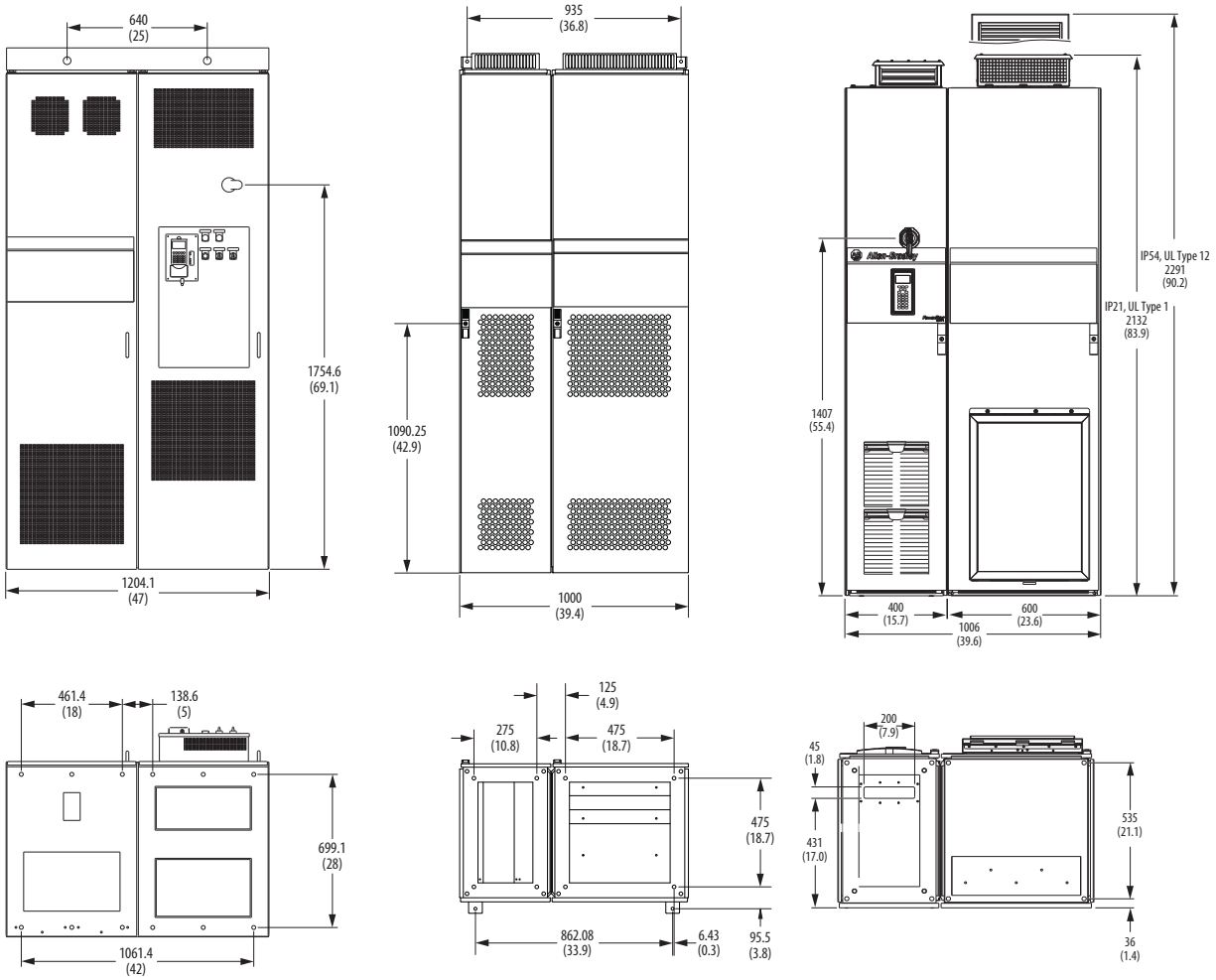


Figure 26 - Frame 13 PowerFlex 700AFE and Frame 9 755TM Bus Supply Comparison

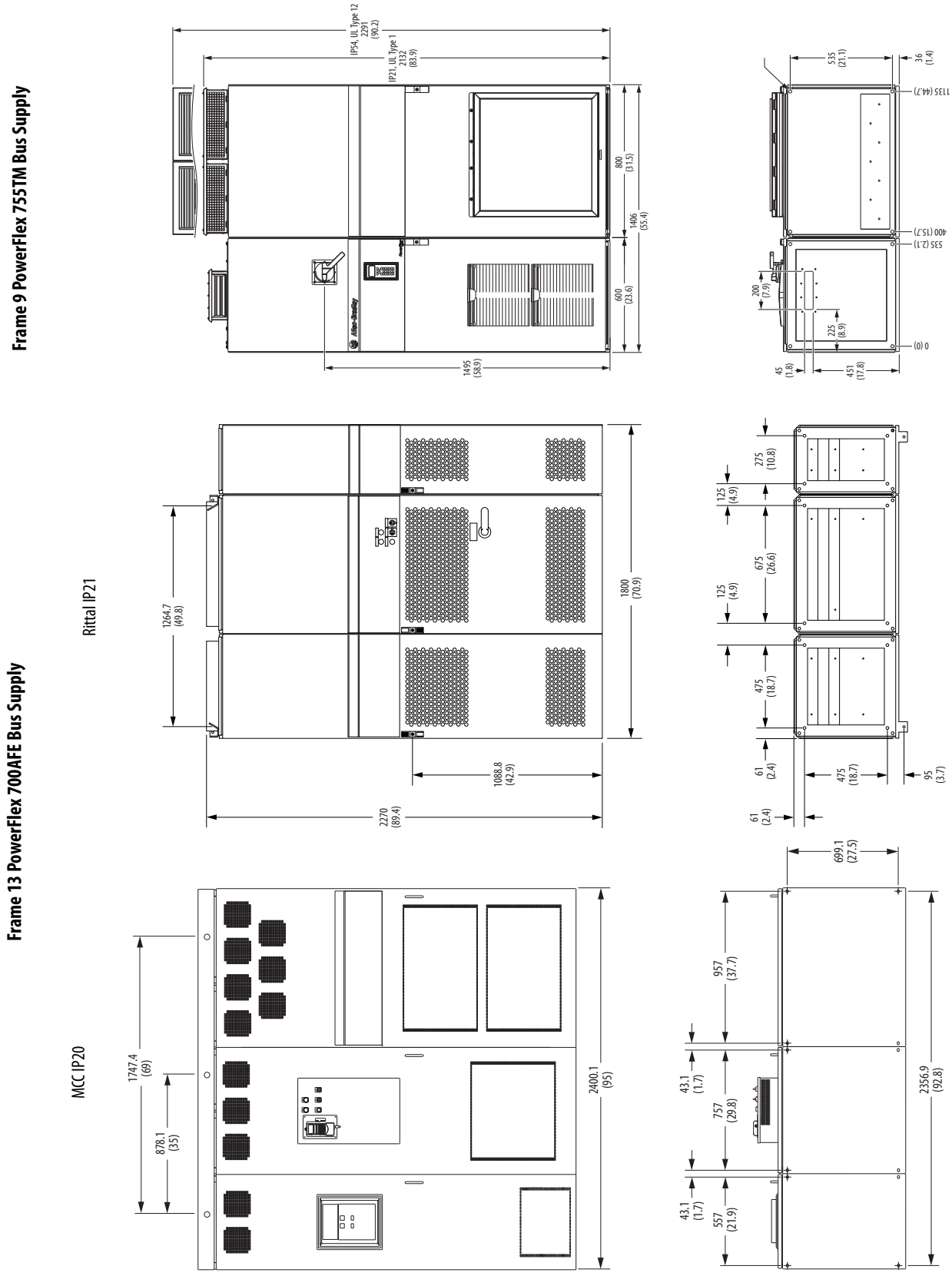
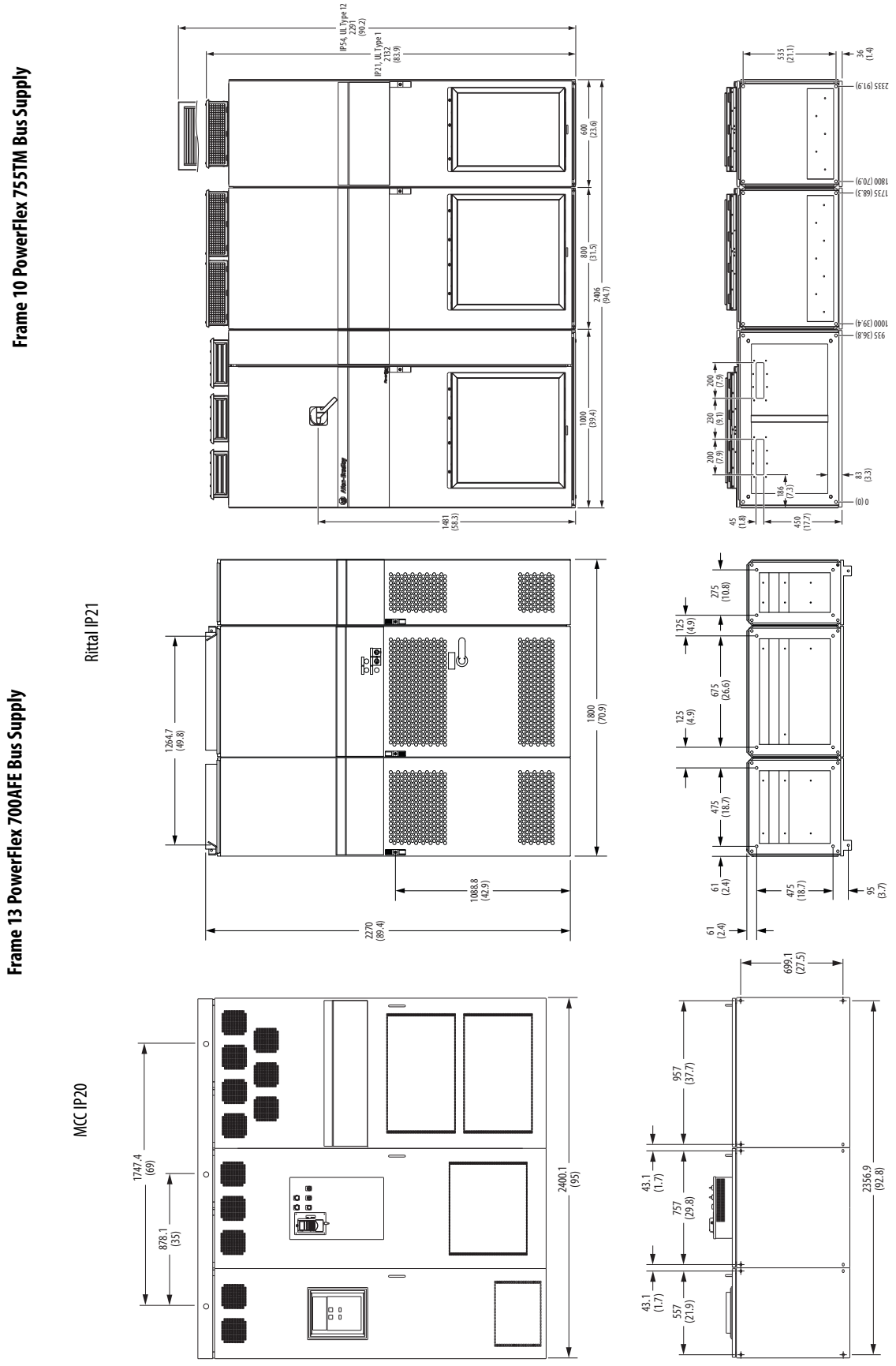


Figure 27 - Frame 13 PowerFlex 700AFE and Frame 10 755TM Bus Supply Comparison



Cooling and Airflow Comparison

This section describes cooling and airflow requirements for the PowerFlex 700AFE and PowerFlex 755TM bus supplies. Compare the requirements for the existing bus supply to the equivalent PowerFlex 755TM bus supply to confirm the location can support the requirements of the migration solution.

PowerFlex 700AFE Installation Requirements

See the PowerFlex 700AFE user manual, publication 20Y-UM001, for detailed environmental specifications for frame 10 and 13 bus supplies.

Table 42 - Environmental Specifications

Frame Size	Surrounding Air Temperature (2)		Minimum Airflow	
	Normal Duty	Heavy Duty	Power Module	LCL Filter
10	0…40 °C (32…104 °F)	0…40 °C (32…104 °F)	1400 m^3/hr (824 cfm)	1100 m^3/hr (647 cfm)
13 (1)			4200 m^3/hr (2472 cfm)	1300 m^3/hr (765 cfm)

(1) The frame 13 690V noncondensing AFE has only normal duty operation at nominal rated power and maximum ambient temperature at 35 °C (95 °F).
(2) For a PowerFlex 700AFE in the IP20 2500 MCC Style enclosure, this air means surrounding the outside of the enclosure.

Figure 28 - Frame 10 in IP20 2500 MCC Style Enclosure

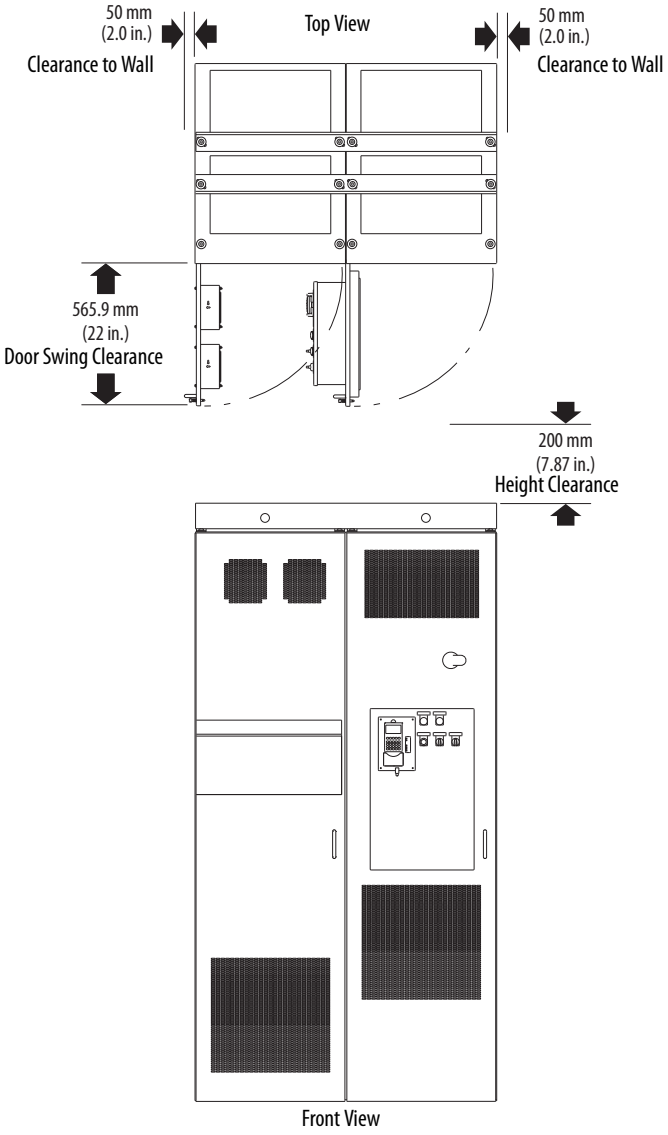


Figure 29 - Frame 13 in IP20 2500 MCC Style Enclosure

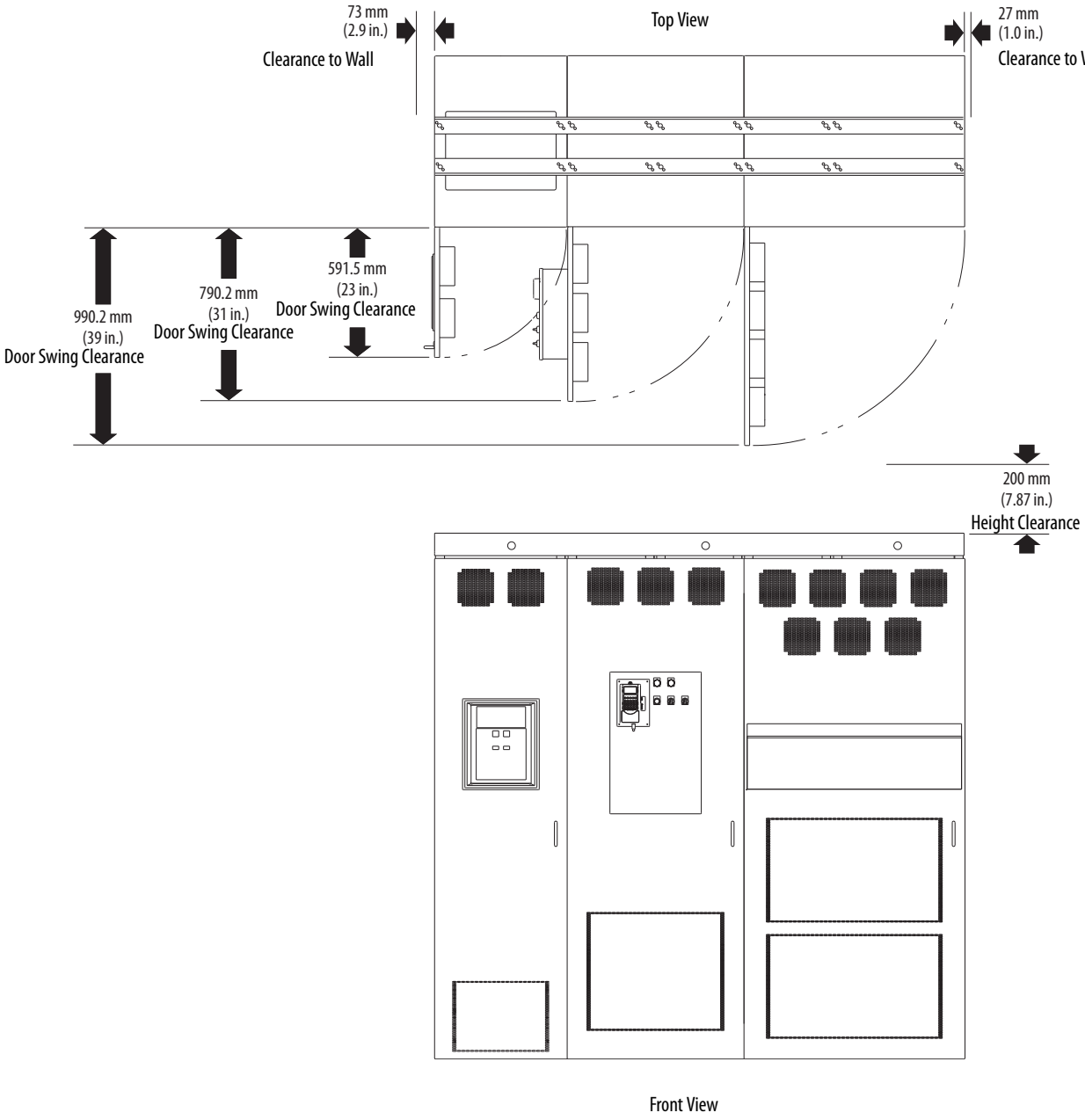


Figure 30 - Frame 10 in IP21 Rittal Enclosure

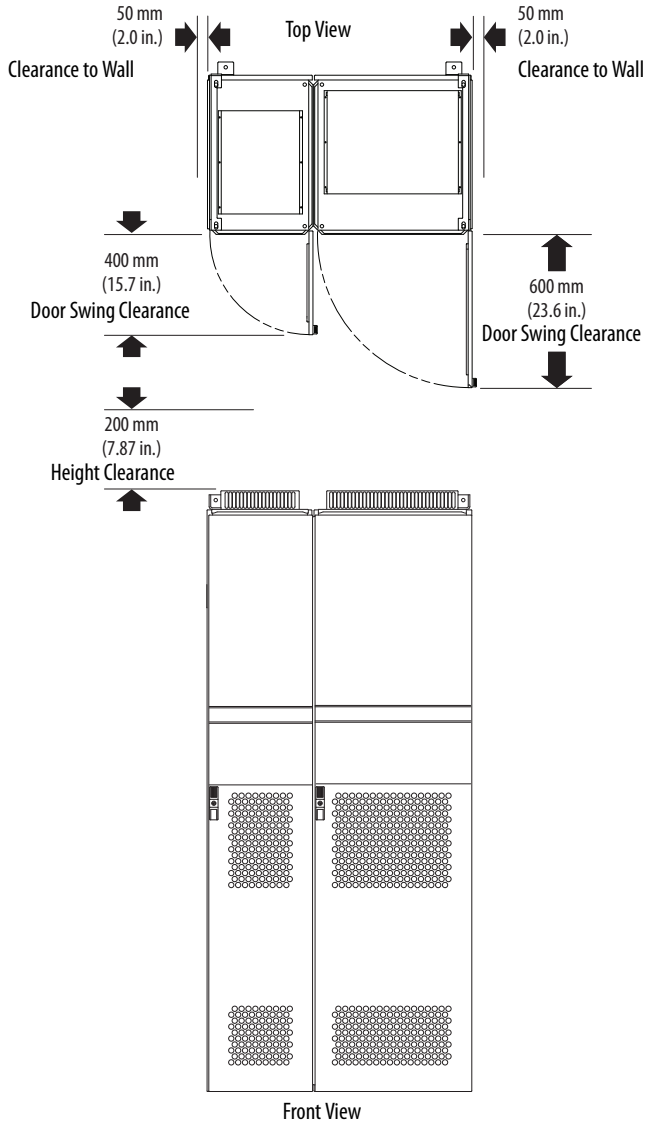
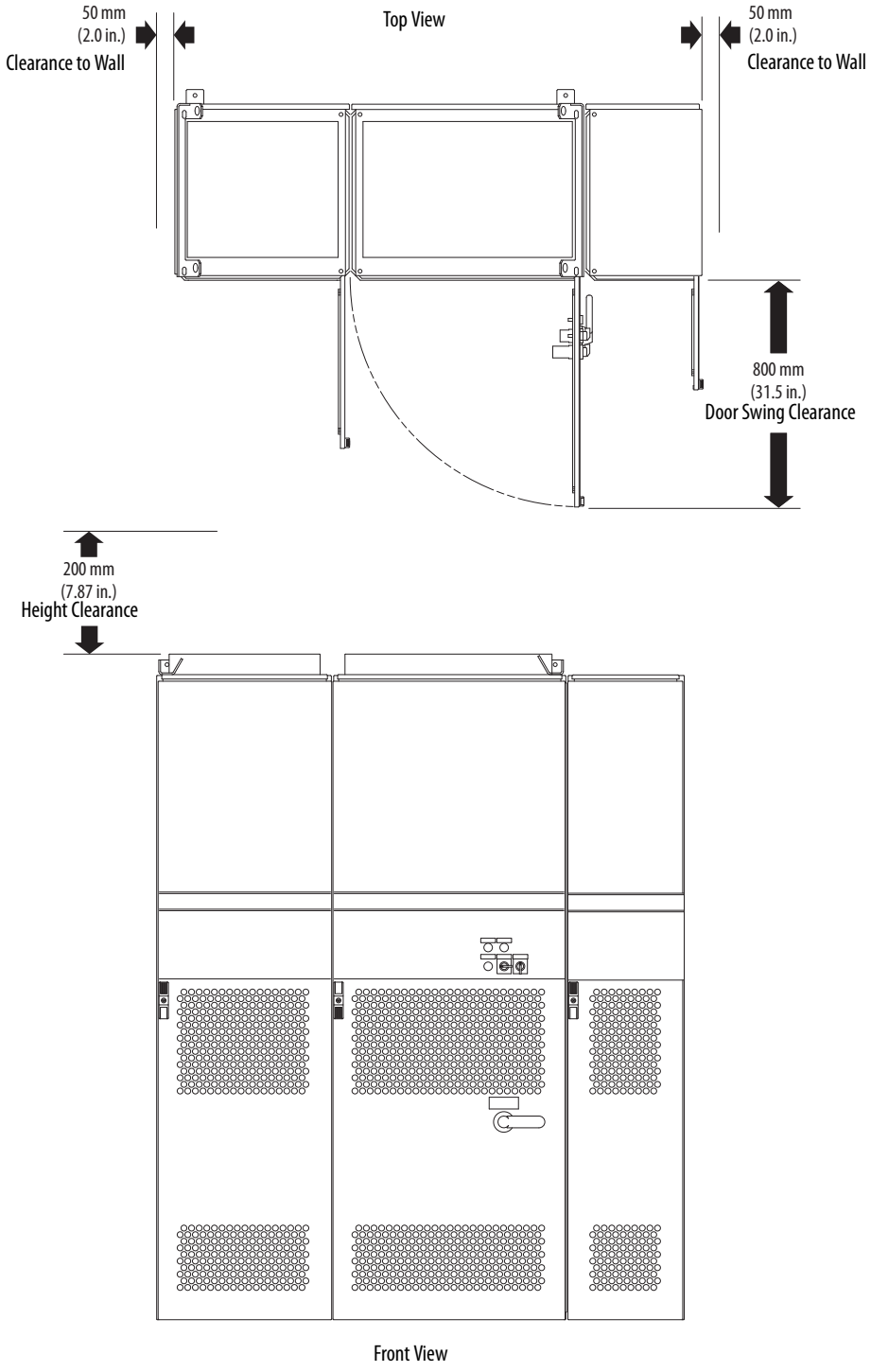


Figure 31 - Frame 13 in IP21 Rittal Enclosure



PowerFlex 755TM Bus Supply Installation Requirements

Environmental Conditions

- Elevation above sea level without derating must be less than 1000 m (3250 ft).
- Ambient air temperature without derating must be between -20...+40 °C (-4...+104 °F).
- Relative humidity must be less than 95%, noncondensing.
- The product must be installed indoors; there must be no dripping water or other fluids in the room.
- Cooling air must be clean without significant concentrations of sand, corrosive or conductive dust (defined by IEC 721-1 as being less than 0.2 mg/m^3 of dust), or explosive gas.
- Free from significant vibration.

Table 43 - Environmental Specifications

Ambient temperature	IP21, UL Type 1: -20…+40 °C (-4…+104 °F) frames 8…12, all ratings IP54, UL Type 12: -20…+40 °C (-4…+104 °F) frames 8…12, all ratings
	Ambient temperature of 50 °C (122 °F) or 55 °C (134 °F) with derating.
Storage temperature	-40…+70 °C (-40…+158 °F)
Relative humidity	5…95% noncondensing
Atmospheric protection	Harsh environment is defined as a copper or silver reactivity level greater than 1000 angstroms per 30 days exposure. No condensation allowed. Maximum allowable humidity is 60% in the presence of corrosive gases. See ISA-71.04-2013 for details on how to measure reactivity levels on copper and silver test coupons.

Table 44 - Airflow Requirements

Frame	755TL and 755TR Drives		755TM Bus Supplies		755TM Common Bus Inverters	
	CFM (ft^3/min)	**CMS** (m^3/sec)	**CFM** (ft^3/min)	**CMS** (m^3/sec)	**CFM** (ft^3/min)	**CMS** (m^3/sec)
8	2375	1.12	1675	0.79	975	0.46
9	3775	1.78	2375	1.12	1675	0.79
10	6500	3.07	4400	2.08	2375	1.12
11	7900	3.73	5100	2.41	3075	1.45
12	10,000	4.72	6500	3.07	3775	1.78

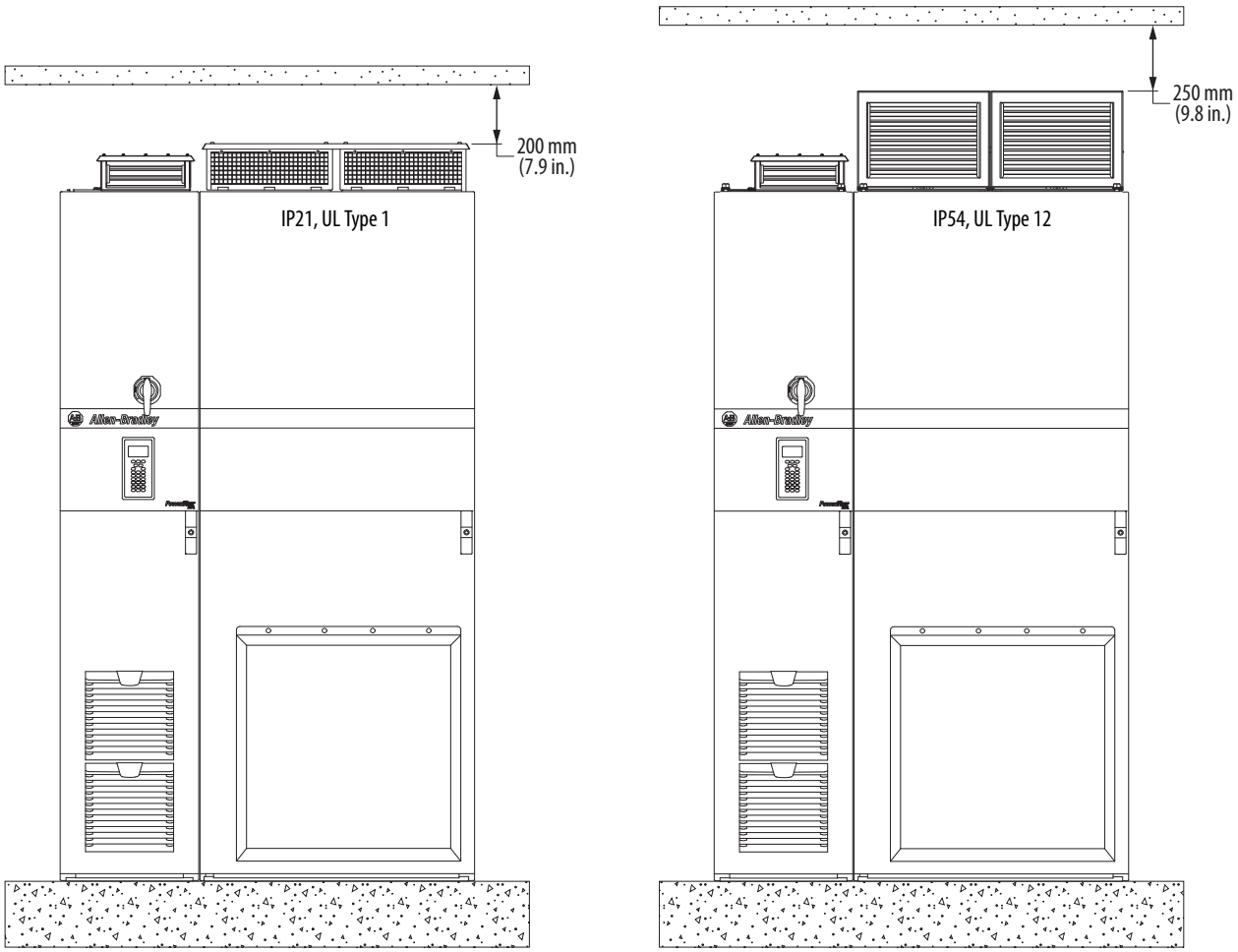
Mounting Requirements

- Install the product upright on a flat and level surface.
- Verify that the product cabinet is square, vertical, and stable.
- Verify that the filter and debris screens are installed.
- Protect the cooling fan by avoiding dust or metallic particles.
- Do not expose to a corrosive atmosphere.
- Protect from moisture and direct sunlight.
- The product must be anchored on a level floor. See outline dimension drawings for the anchor point sizes and locations.

Minimum Clearances

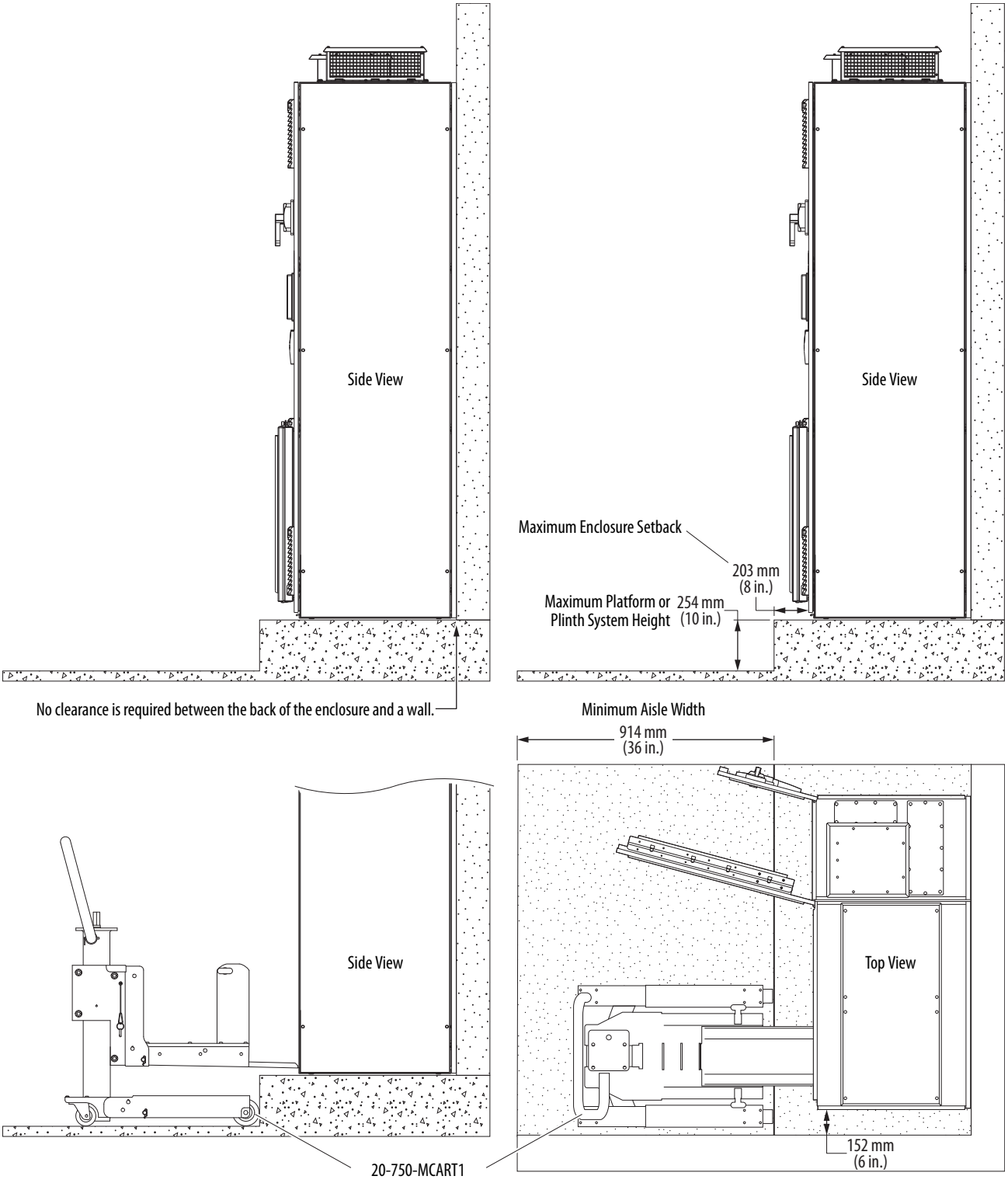
Specified vertical clearance requirements are intended to be from the product to the closest object that can restrict airflow through the cabinet. The product must be mounted in a vertical orientation as shown and must make full contact with the mounting surface. Inlet air temperature must not exceed the product specification. See Table 11 on page 36.

Figure 32 - Minimum Overhead Clearances



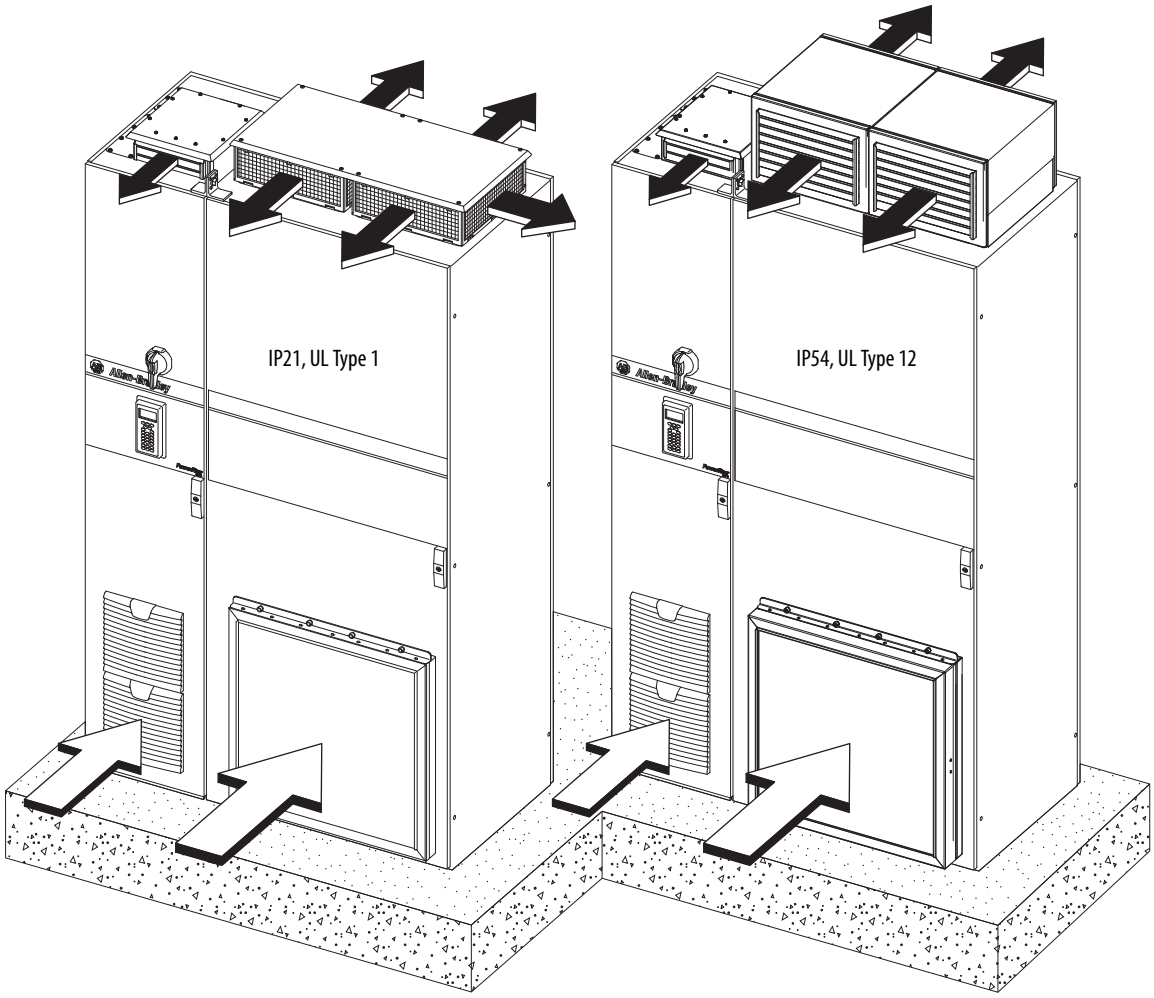
PowerFlex 755T products can be mounted on a service pad or platform. The platform height and enclosure setback measurements that are indicated in Figure 33 are the maximum that is allowed for by the PowerFlex 750-Series service cart (20-750-MCART1). The platform height measurement is also an installation limit per NEC requirements for the disconnect switch.

Figure 33 - Mounting Clearances for IGBT Access and Disconnect Switch Height



Airflow through the enclosure must not be impeded. Regular inspection and replacement of the filter media is required to maintain proper cooling. See the PowerFlex 750-Series Products with TotalFORCE Control Hardware Service Manual, publication 750-TG100 for filter media maintenance schedules.

Figure 34 - Airflow Clearances

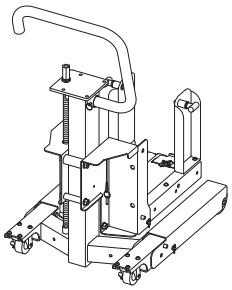


PowerFlex 755T Product Equipment Handling Options

This section lists options that are recommended to handle, transport, and store major product components.

Module Service Cart

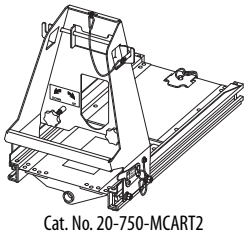
The PowerFlex 750-series service cart is designed to handle and transport LCL filter modules and power modules. The service cart has an adjustable curb height of 0...254 mm (0...10 in.) and curb offset/reach of 0...203 mm (0...8.0 in.).



Cat. No. 20-750-MCART1

DC Precharge Module Service Lift

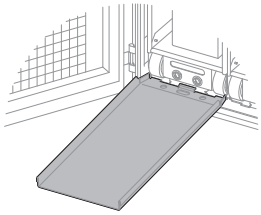
The PowerFlex 755T DC precharge module service lift allows you to remove and install DC precharge modules. This service lift must be used in conjunction with the 20-750-MCART1 module service cart.



Cat. No. 20-750-MCART2

Power Module Service Ramp

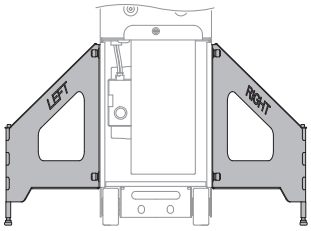
The PowerFlex 755T power module service ramp allows you to remove and install power modules, catalog numbers 20-750-MI1-*xnnxnn*, 20-750-MI2-*xnnxnn*, and 20-750-MI3-*xnnxnn,* from the cabinet.



Cat. No. 20-750-MRAMP1

Power and Filter Module Storage Hardware

Power and LCL filter module storage hardware is designed to help stabilize modules during storage.



Cat. No. 20-750-MINV-ATIP

IP00 Open Type Power Structures

There are many possible engineered solutions for the IP00, NEMA/UL Type Open power structure installations. Contact an authorized Rockwell Automation Distributor specialist, Solution Partner, Recognized System Integrator, or Rockwell Automation account manager if you are interested in migrating your PowerFlex 700AFE open type bus supply converter to a PowerFlex 755TM open type bus supply converter.

Follow this link for a list of Solution Partners and Recognized System Integrators:

http://www.software.rockwell.com/corporate/sp/RASISearchResults.cfm?Programlevel=SP

ATTENTION: Only qualified personnel familiar with adjustable frequency AC drives and associated machinery should plan or implement the installation, startup, and subsequent maintenance of the system. Failure to comply may result in personal injury and/or equipment damage.

IMPORTANT IP00, NEMA/UL type open installations are not standard solutions. These installations are engineered solutions, and migration to a PowerFlex 755TM open type solution requires a careful technical review of your existing PowerFlex 700AFE installation, and careful technical planning and design of the PowerFlex 755TM open type solution.

The installation instructions below provide technical information for installing the PowerFlex 700 high power and PowerFlex 755TM open type products in a customer-supplied enclosure. Review these instructions for technical specifications and information that can help you engineer a solution for your IP00, NEMA/UL Type Open migration.

- PowerFlex Active Front End User Manual, publication 20Y-UM001
- PowerFlex Active Front End – Frame 10 Hardware Service Manual, publication 20Y-TG001
- PowerFlex Active Front End – Frame 13 Hardware Service Manual, publication 20Y-TG002.
- PowerFlex 755TM IP00 Open Type Kits Installation Instructions, publication 750-IN101
- PowerFlex 755TM IP00 Open Type Kits Technical Data, publication 750-TD101.

Rockwell Automation Support

Use the following resources to access support information.

Technical Support Center	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	https://rockwellautomation.custhelp.com/
Local Technical Support Phone Numbers	Locate the phone number for your country.	http://www.rockwellautomation.com/global/support/get-support-now.page
Direct Dial Codes	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	http://www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	http://www.rockwellautomation.com/global/literature-library/overview.page
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	http://www.rockwellautomation.com/global/support/pcdc.page

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Publication 750-RM003A-EN-P - April 2018