Technical Data

Original Instructions

Allen-Bradley
by ROCKWELL AUTOMATION

PowerFlex 4 and 40 AC Drives

Bulletin Numbers 22A and 22B

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Summary of Changes

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes.

Topic	Page
Updated template	throughout
Removed section PowerFlex 4 and PowerFlex 40 Configured Drives	throughout
Added Inclusive Language Acknowledgment	2
Updated PC Programming Software	6
Updated Human Interface Module Option Kits and Accessories	10
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Added 140MT motor protectors and 100-E contactors to Drive Ratings – PowerFlex 4	18
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Rockwell Automation recognizes that some of the terms that are currently used in our industry and in this publication are not in alignment with the movement toward inclusive language in technology. We are proactively collaborating with industry peers to find alternatives to such terms and making changes to our products and content. Please excuse the use of such terms in our content while we implement these changes.

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Product Overview

Providing users with powerful motor speed control in a compact, space saving design, the Allen-Bradley® PowerFlex® 4 and PowerFlex 40 AC drives are the smallest and most cost-effective members of the PowerFlex family of drives. Power ratings from 0.2...11 kW (0.25...15 HP) and in voltage classes of 120, 240, 480, and 600 volts are available. The PowerFlex 4 and PowerFlex 40 drives are designed to meet global OEM and End User demands for flexibility, space savings, ease of use, and are cost-effective alternatives for speed control of applications such as machine tools, fans, pumps and conveyors, and material handling systems.







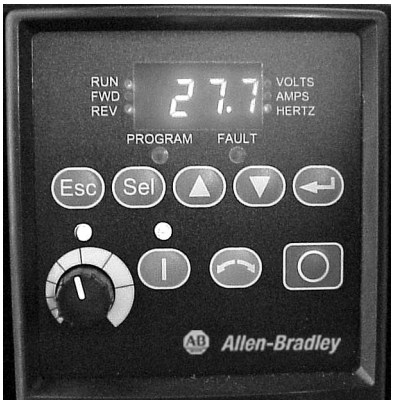
Packaging and Mounting

- Installation can be a virtual snap using the DIN rail mounting feature on A and B frame drives. Panel mounting is also available, providing added flexibility.
- Flange mount drives are available to reduce the overall enclosure size.
- Zero Stacking is allowable for ambient temperatures up to 40 °C (104 °F), saving valuable panel space. 50 °C (122 °F) ambient temperatures are permitted with minimal spacing between drives.
- Integral filtering is available on all 230V single-phase ratings, providing a cost-effective means of meeting EN55011, Class A and B EMC requirements. External filters provide compliance with Class A and B requirements for all PowerFlex 4 and PowerFlex 40 drive ratings.
- An optional IP30, NEMA/UL Type 1 conduit box is easily adapted to the standard IP20 (NEMA Type Open) product, providing increased environmental ratings.
- IP66, NEMA/UL Type 4X/12 (Indoor) for mounting directly in the product environment. Listed by UL to resist dust, dirt, and so on, and survive high-pressure water spray. Also certified by NSF to achieve conformity with international food equipment standards.



Start Up, Programming, and Operation

- An integral keypad provides out of the box operation using the local potentiometer and control keys.
- The 10 most common application parameters are contained in the Basic Program Group, making programming fast and easy.
- The programming keys have the same function as all other PowerFlex drives, so if you can program one PowerFlex drive, you can program them all.
- A 4-digit display with 10 additional LED indicators provides an intuitive display of drive status and information.
- Integral RS-485 communications can be used for programming from a PC. It can also be used in a multi-drop network configuration. A serial converter module provides connectivity to any controller with a DF1 port.
- A NEMA/UL Type 4X remote and NEMA/UL Type 1 handheld LCD keypad provide additional programming and control flexibility, both featuring the popular CopyCat function.



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Optimized Performance

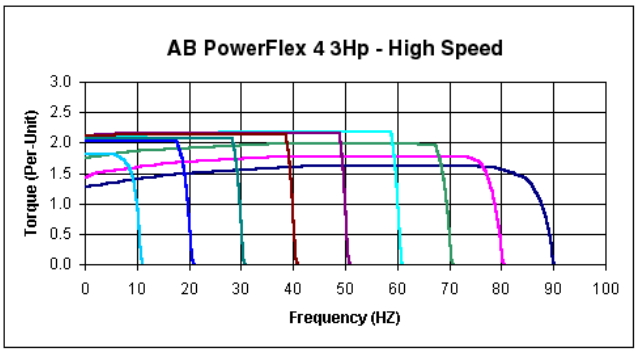
- Removable MOV to ground provides trouble-free operation when used on ungrounded distribution systems.
- A relay precharge limits inrush current.
- An Integral brake transistor, available on all ratings (except no brake version), provides dynamic braking capability with simple low-cost brake resistors.
- DIP switch settable 24V DC sink or source control for control wiring flexibility.
- 150% overload for 60 seconds or 200% overload for 3 seconds provides robust overload protection.
- Adjustable pulse-width modulation (PWM) frequency up to 16 kHz delivers quiet operation.



Sensorless Vector Performance

PowerFlex 4

- Drive automatically provides auto boost (IR compensation) and slip compensation.
- Provides excellent speed regulation and high levels of torque across the entire speed range of the drive, and improved speed regulation even as loading increases.

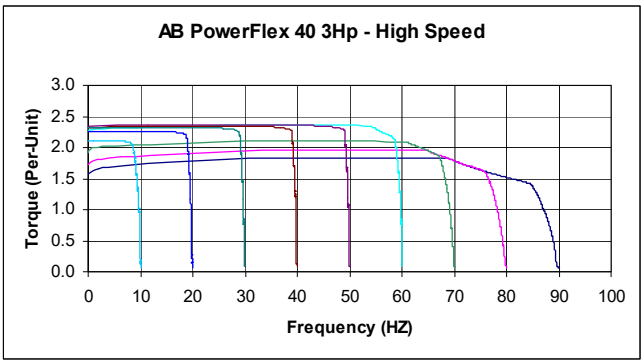


Sensorless Vector Control

PowerFlex 40

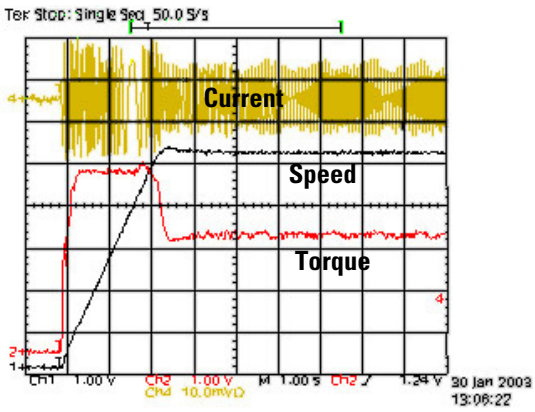
Sensorless Vector Control provides exceptional speed regulation and very high levels of torque across the entire speed range of the drive.

The Autotune feature allows the PowerFlex 40 drive to adapt to individual motor characteristics.



Performance

- This graph depicts the ability of a PowerFlex 40 drive to accelerate into at least 150% load. A PowerFlex 4 drive performs similarly, but with a slightly higher acceleration time.
- At 100% motor load, the drive runs the motor at synchronous speed.
- Excellent current regulation
- Linear acceleration
- Best in class digital input response time and repeatability



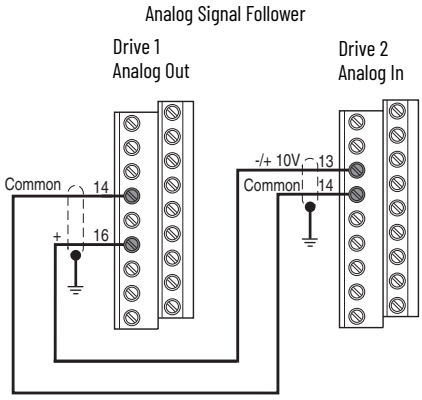
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Performance



- Sensorless Vector Control develops high torque over a wide speed range and adapts to individual motor characteristics.
- Variable PWM allows the drive to output more current at low frequencies.
- Integral PID functionality enhances application flexibility.
- Timer, Counter, Basic Logic, and StepLogic® functions can reduce hardware design costs and simplify control schemes.
  - Timer function: Relay or opto outputs are controlled by the drive performing the timer function. The timer is initiated by activating a digital input that is programmed as "Timer Start."
  - Counter function: Relay or opto outputs are controlled by the drive performing the counter function. The counter function is activated by a digital input that is programmed as "Counter Input."
  - Basic Logic: Relay or opto outputs are controlled by the status of digital inputs that are programmed as "Logic Inputs." Performs basic Boolean logic.
  - StepLogic: Logic-based steps using preset speed settings. Each step can be programmed for a specific speed, direction, and accel/decel profile. Drive outputs can be used to indicate which step is being performed.

I/O



- Two Analog Inputs (one unipolar and one bipolar) are independently isolated from the rest of the drive I/O. These inputs can be toggled between via a digital input.
- Three fixed and four fully programmable Digital Inputs provide application versatility.
- One Analog Output is DIP switch selectable for either 0...10V or 0...20 mA. This scalable, 10-bit output is suitable for metering or as a speed reference for another drive.
- Two Opto Outputs and one form C relay output can be used to indicate various drive, motor or logic conditions.

Communications

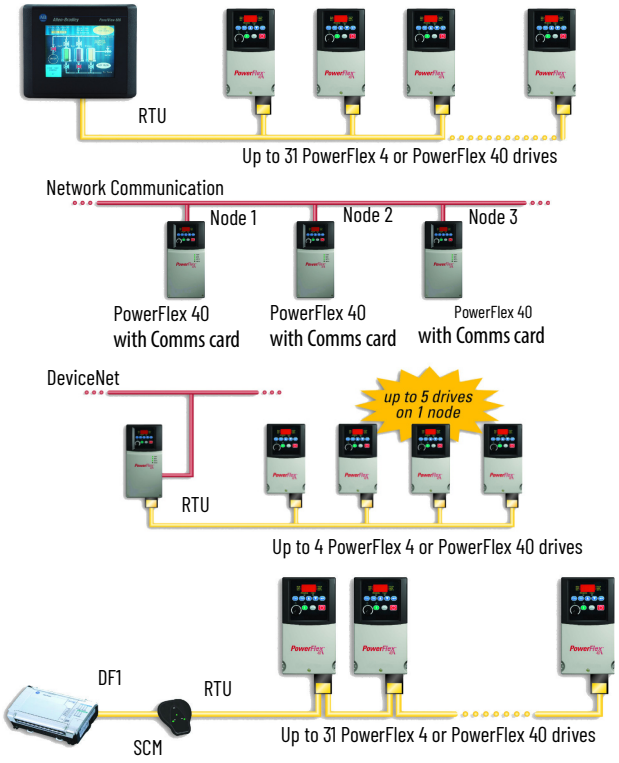


- Integral communication cards such as DeviceNet®, EtherNet/IP™, PROFIBUS DP, LonWorks, and ControlNet® can improve machine performance.
- The DSI Wireless Interface Module (WIM) provides a wireless communication interface between a Pocket PC, laptop computer, or desktop computer equipped with Bluetooth wireless technology, and any Allen-Bradley product supporting the DSI protocol.
- Field installed option allows for future addition of standalone drives to a network.
- Online EDS file creation with RSNetWorx™ providing ease of set-up on a network.

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Versatile Programming and Network Solutions

- PowerFlex 4 and PowerFlex 40 drives are compatible with any device that acts as an RTU Master and supports standard 03 and 06 RTU commands.
- A network can be configured using PowerFlex 40 drives with optional communication cards for high performance and flexible configuration capabilities.
  - BACnet
  - ControlNet
  - DeviceNet
  - EtherNet/IP
  - LonWorks
  - PROFIBUS DP
- A multi-drive solution can be reached using one PowerFlex 40 DeviceNet option, with the ability for up to five drives to reside on one node.
- Integral RS-485 communications enable the drives to be used in a multi-drop network configuration. A serial converter module (SCM) provides connectivity to any controller with a DF1 port. The SCM can be eliminated if the controller acts as an RTU Master.



PC Programming Software

By using an SCM and Connected Components Workbench™ software or DriveTools™ SP software, programming can be greatly simplified.

Connected Components Workbench Software

- Supports plug and play connectivity through a standard USB connection.
- AppView® tool provides parameter groups for several of the most common applications.
- Create and save custom parameter groups using the CustomView™ tool.
- Supports PowerFlex drives, Micro800™ controllers, and PanelView™ component graphic terminals.

DriveTools SP Software

- Online and offline programming capability
- In-grid and dialog-based parameter editing
- Immediate visual indication of drive and communication status when viewing an online drive
- Integrated HTML Help architecture

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Use the following chart to help determine which product is most appropriate for an application.

Feature	PowerFlex® 4	PowerFlex® 40
Catalog Reference	22A	22B
Maximum (kW) HP Rating/Input Voltage	(1.1) 1.5 HP/115V, 1ø	(1.1) 1.5 HP/115V, 1ø
	(2.2) 3 HP/230V, 1ø	(2.2) 3 HP/230V, 1ø
	(3.7) 5 HP/230V, 3ø	(7.5) 10 HP/230V, 3ø
	(3.7) 5 HP/460V, 3ø	(11.0) 15 HP/460V, 3ø
		(11.0) 15 HP/600V, 3ø
Overload Capacity	150% for 60 seconds 200% for 3 seconds	150% for 60 seconds 200% for 3 seconds
IP30, NEMA/UL Type 1 Option	●	●
IP66, NEMA/UL Type 4X/12 (Indoor)	–	● (1)
EMC Filtering	Internal - 1ø, 230V External - All 1ø, 115V, and 3ø Ratings	Internal - 1ø, 230V External - All 1ø, 115V, and 3ø Ratings
DIN Rail Mounting Standard	●	● (Through 5 HP)
Integral Keypad with Speed Pot	●	●
Keypad - Remote LCD	●	●
Keypad CopyCat Function	●	●
Control Type	VHz	Sensorless Vector and VHz
Internal DB Transistor	● Not available on no brake models	●
Preset Speeds	4	8
Carrier Frequency	2...16 kHz	2...16 kHz
Skip Frequency	–	●
Process Control Loop	–	● (PID)
StepLogic Functionality	–	●
Timer/Counter Functions	–	●
Control Voltage	24V sink/source	24V sink/source
Discrete Inputs	3 fixed for START/STOP/REV	3 fixed for START/STOP/REV
	2 fully programmable	4 fully programmable
Analog Input - Unipolar	1 (0...10V or 4...20 mA)	2 (0...10V and 4...20 mA)
Analog Input - Bipolar	–	1 (±10V) (2)
Analog Response	2 Hz (500 ms)	100 Hz (10 ms)
Relay Output	1 - N.O/N.C. dry contact	1 - N.O./N.C. dry contact
Digital/Optocoupler Output	–	2
Analog Output	–	● (0...10V or 4...20 mA)
Integral RS-485	●	●
RS-232 *(Requires use of Serial Converter Module)*	●	●
BACnet	● (3)	●
ControlNet	● (3)	●
DeviceNet	● (3)	●
EtherNet/IP	● (3)	●
LonWorks	● (3)	●
PROFIBUS DP	● (3)	●

(1) Frame B only
(2) When using bipolar input, the 0...10V unipolar input cannot be used.
(3) With 22-XCOMM-DC-BASE external mounting kit

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Catalog Number Explanation

Position

1…3	4	5	6…8	9	10	11	12	13…14
22A	–	A	1P5	N	1	1	4	AA
a		b	c	d	e	f	g	h

a

Drive	
Code	Type
22A	PowerFlex 4
22B	PowerFlex 40

b

Voltage Rating		
Code	Voltage	Phase
V	120V AC	1
A	240V AC	1
B	240V AC	3
D	480V AC	3
E	600V AC	3

c1

Rating		
100…120V 1-phase Input		
Code	Amps	kW (HP)
2P3	2.3	0.4 (0.5)
5P0	5.0	0.75 (1.0)
6P0	6.0	1.1 (1.5)

c2

Rating		
200…240V 1-phase Input		
Code	Amps	kW (HP)
2P3	2.3	0.4 (0.5)
5P0	5.0	0.75 (1.0)
8P0	8.0	1.5 (2.0)
012	12	2.2 (3.0)

c3

Rating		
200…240V 3-phase Input		
Code	Amps	kW (HP)
2P3	2.3	0.4 (0.5)
5P0	5.0	0.75 (1.0)
8P0	8.0	1.5 (2.0)
012	12	2.2 (3.0)
017	17.5	3.7 (5.0)
024	24	5.5 (7.5)
033	33	7.5 (10)

c4

Rating		
380…480V 3-phase Input		
Code	Amps	kW (HP)
1P4	1.4	0.4 (0.5)
2P3	2.3	0.75 (1.0)
4P0	4.0	1.5 (2.0)
6P0	6.0	2.2 (3.0)
010	10.5	4.0 (5.0)
012	12	5.5 (7.5)
017	17	7.5 (10)
024	24	11 (15)

c5

Rating		
460…600V 3-phase Input		
Code	Amps	kW (HP)
1P7	1.7	0.75 (1.0)
3P0	3.0	1.5 (2.0)
4P2	4.2	2.2 (3.0)
6P6	6.6	4.0 (5.0)
9P9	9.9	5.5 (7.5)
012	12	7.5 (10)
019	19	11 (15)

d

Enclosure	
Code	Enclosure
C	IP66, NEMA/UL Type 4X (1)
F	Flange Mount - IP20, NEMA/UL Type Open
H	Replacement Plate Drive - IP20, NEMA/UL Type Open Contact factory for ordering information.
N	Panel Mount - IP20, NEMA/UL Type Open

(1) Check availability before ordering.

e

HIM	
Code	Interface Module
1	Fixed Keypad

f

Emission Class	
Code	Rating
0	Not Filtered
1	Filtered

g

Brake IGBT	
Code	Description
3	Without Brake
4	With Brake

h

Optional	
Code	Purpose
AA…ZZ	Reserved for custom firmware

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Product Selection

Drive Ratings			PowerFlex 4			IP20 Flange Mount [1]	PowerFlex 40			IP66, UL Type 4X Panel Mount	IP20 Flange Mount [1]
Input Voltage	kW	HP	Output Current	Catalog Number	Frame Size	Catalog Number	Output Current	Catalog Number	Frame Size	Catalog Number	Catalog Number
120V 50/60 Hz 1-phase No Filter	0.2	0.25	1.5 A	22A-V1P5N104	A	22A-V1P5F104	–	–	–	–	–
	0.4	0.5	2.3 A	22A-V2P3N104	A	22A-V2P3F104	2.3 A	22B-V2P3N104	B	22B-V2P3C104	22B-V2P3F104
	0.75	1.0	4.5 A	22A-V4P5N104	B	22A-V4P5F104	5.0 A	22B-V5P0N104	B	22B-V5P0C104	22B-V5P0F104
	1.1	1.5	6.0 A	22A-V6P0N104	B	22A-V6P0F104	6.0 A	22B-V6P0N104	B	22B-V6P0C104	22B-V6P0F104
240V 50/60 Hz 1-phase NO BRAKE No Filter	0.2	0.25	1.4 A	22A-A1P4N103	A	–	–	–	–	–	–
	0.4	0.5	2.1 A	22A-A2P1N103	A	–	–	–	–	–	–
	0.75	1.0	3.6 A	22A-A3P6N103	A	–	–	–	–	–	–
	1.5	2.0	6.8 A	22A-A6P8N103	B	–	–	–	–	–	–
	2.2	3.0	9.6 A	22A-A9P6N103	B	–	–	–	–	–	–
240V 50/60 Hz 1-phase NO BRAKE With Integral "S Type" EMC Filter [2]	0.2	0.25	1.4 A	22A-A1P4N113	A	–	–	–	–	–	–
	0.4	0.5	2.1 A	22A-A2P1N113	A	–	–	–	–	–	–
	0.75	1.0	3.6 A	22A-A3P6N113	A	–	–	–	–	–	–
	1.5	2.0	6.8 A	22A-A6P8N113	B	–	–	–	–	–	–
	2.2	3.0	9.6 A	22A-A9P6N113	B	–	–	–	–	–	–
240V 50/60 Hz 1-phase With Integral "S Type" EMC Filter [2]	0.2	0.25	1.5 A	22A-A1P5N114	A	–	–	–	–	–	–
	0.4	0.5	2.3 A	22A-A2P3N114	A	–	2.3 A	22B-A2P3N114	B	–	–
	0.75	1.0	4.5 A	22A-A4P5N114	A	–	5.0 A	22B-A5P0N114	B	–	–
	1.5	2.0	8.0 A	22A-A8P0N114	B	–	8.0 A	22B-A8P0N114	B	–	–
	2.2	3.0	–	–	–	–	12.0 A	22B-A012N114	C	–	–
240V 50/60 Hz 1-phase No Filter	0.2	0.25	1.5 A	22A-A1P5N104	A	22A-A1P5F104	–	–	–	–	–
	0.4	0.5	2.3 A	22A-A2P3N104	A	22A-A2P3F104	2.3 A	22B-A2P3N104	B	22B-A2P3C104	22B-A2P3F104
	0.75	1.0	4.5 A	22A-A4P5N104	A	22A-A4P5F104	5.0 A	22B-A5P0N104	B	22B-A5P0C104	22B-A5P0F104
	1.5	2.0	8.0 A	22A-A8P0N104	B	22A-A8P0F104	8.0 A	22B-A8P0N104	B	22B-A8P0C104	22B-A8P0F104
	2.2	3.0	–	–	–	–	12.0 A	22B-A012N104	C	–	22B-A012F104
240V 50/60 Hz 3-phase No Filter	0.2	0.25	1.5 A	22A-B1P5N104	A	22A-B1P5F104	–	–	–	–	–
	0.4	0.5	2.3 A	22A-B2P3N104	A	22A-B2P3F104	2.3 A	22B-B2P3N104	B	22B-B2P3C104	22B-B2P3F104
	0.75	1.0	4.5 A	22A-B4P5N104	A	22A-B4P5F104	5.0 A	22B-B5P0N104	B	22B-B5P0C104	22B-B5P0F104
	1.5	2.0	8.0 A	22A-B8P0N104	A	22A-B8P0F104	8.0 A	22B-B8P0N104	B	22B-B8P0C104	22B-B8P0F104
	2.2	3.0	12.0 A	22A-B012N104	B	22A-B012F104	12.0 A	22B-B012N104	B	22B-B012C104	22B-B012F104
	3.7	5.0	17.5 A	22A-B017N104	B	22A-B017F104	17.5 A	22B-B017N104	B	22B-B017C104	22B-B017F104
	5.5	7.5	–	–	–	–	24.0 A	22B-B024N104	C	–	22B-B024F104
	7.5	10.0	–	–	–	–	33.0 A	22B-B033N104	C	–	22B-B033F104
480V 50/60 Hz 3-phase No Filter	0.4	0.5	1.4 A	22A-D1P4N104	A	22A-D1P4F104	1.4 A	22B-D1P4N104	B	22B-D1P4C104	22B-D1P4F104
	0.75	1.0	2.3 A	22A-D2P3N104	A	22A-D2P3F104	2.3 A	22B-D2P3N104	B	22B-D2P3C104	22B-D2P3F104
	1.5	2.0	4.0 A	22A-D4P0N104	A	22A-D4P0F104	4.0 A	22B-D4P0N104	B	22B-D4P0C104	22B-D4P0F104
	2.2	3.0	6.0 A	22A-D6P0N104	B	22A-D6P0F104	6.0 A	22B-D6P0N104	B	22B-D6P0C104	22B-D6P0F104
	3.7	5.0	8.7 A	22A-D8P7N104	B	22A-D8P7F104	–	–	–	–	–
	4.0	5.0	–	–	–	–	10.5 A	22B-D010N104	B	22B-D010C104	22B-D010F104
	5.5	7.5	–	–	–	–	12.0 A	22B-D012N104	C	–	22B-D012F104
	7.5	10.0	–	–	–	–	17.0 A	22B-D017N104	C	–	22B-D017F104
	11.0	15.0	–	–	–	–	24.0 A	22B-D024N104	C	–	22B-D024F104 [3]
600V 50/60 Hz 3-phase No Filter	0.75	1.0	–	–	–	–	1.7 A	22B-E1P7N104	B	22B-E1P7C104	22B-E1P7F104
	1.5	2.0	–	–	–	–	3.0 A	22B-E3P0N104	B	22B-E3P0C104	22B-E3P0F104
	2.2	3.0	–	–	–	–	4.2 A	22B-E4P2N104	B	22B-E4P2C104	22B-E4P2F104
	4.0	5.0	–	–	–	–	6.6 A	22B-E6P6N104	B	22B-E6P6C104	22B-E6P6F104
	5.5	7.5	–	–	–	–	9.9 A	22B-E9P9N104	C	–	22B-E9P9F104
	7.5	10.0	–	–	–	–	12.0 A	22B-E012N104	C	–	22B-E012F104
	11.0	15.0	–	–	–	–	19.0 A	22B-E019N104	C	–	22B-E019F104

(1) Meets IP40/54/65 (NEMA 1/12/4/4X) when installed in an enclosure of like rating.
(2) This filter is suitable for use with a cable length of at least 10 meters (33 feet) for Class A and 1 meter for Class B environments.
(3) Requires use of an external DC Bus Inductor or AC Line Reactor.

The highlighted cells apply to PowerFlex 40 drives only.

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User Installed Options

IP30/NEMA 1/UL Type 1 Conversion Kit [1]

Item	Description	Drive Frame	PowerFlex 4 Catalog Number	PowerFlex 40 Catalog Number
IP30/NEMA 1/UL Type 1 Kit	Field installed kit. Converts drive to IP30/NEMA 1/UL Type 1 enclosure. Includes conduit box with mounting screws and plastic top panel.	A	22-JBAA	–
		B	22-JBAB	22-JBAB
		C	–	22-JBAC
IP30/NEMA 1/UL Type 1 Kit with Communication Option	Field installed kit. Converts drive to IP30/NEMA 1/UL Type 1 enclosure. Includes communication option conduit box with mounting screws and plastic top panel.	B	–	22-JBCB
		C	–	22-JBCC

(1) The highlighted cells apply to PowerFlex 40 drives only.

Human Interface Module Option Kits and Accessories

Item	Description	Catalog Number
Remote Human Interface Modules (HIMs)	LCD display, remote panel mount, digital speed control, CopyCat capable, IP66 (NEMA Type 4X/12) indoor use only. Includes 2.0 m (6.6 ft) cable.	22-HIM-C2S
	LCD display, remote handheld, digital speed control, full numeric keypad, CopyCat capable, IP30 (NEMA Type 1). Includes 1.0 m (3.3 ft) cable. Can be panel mounted with an optional bezel kit.	22-HIM-A3
Bezel Kit	Panel mount for LCD display, remote handheld unit, IP30 (NEMA Type 1). Includes a 22-RJ45CBL-C20 cable.	22-HIM-B1
DSI HIM Cable	DSI HIM cable (DSI HIM to RJ45 cable) • 1.0 m (3.3 ft) • 2.9 m (9.51 ft)	22-HIM-H10 22-HIM-H30

Communication Option Kits

Item	Description	Catalog Number
Universal Serial Bus (USB) Converter	Provides a direct, isolated USB connection for use with Connected Components Workbench software and DriveExecutive software. Includes 2.0 m (6.6 ft) USB cable, 20-HIM-H10, and 22-HIM-H10 cables.	1203-USB
DSI Cable	2.0 m (6.6 ft) RJ45 to RJ45 cable, male to male connectors	22-RJ45CBL-C20
Splitter Cable	RJ45 one to two port splitter cable	AK-U0-RJ45-SC1
Terminating Resistors	RJ45 120 Ω resistor (2 pieces)	AK-U0-RJ45-TR1
Terminal Block	RJ45 Two-position terminal block (6 pieces)	AK-U0-RJ45-TB2P
External DSI Communications Kit	External communications kit for 22-COMM communication adapters. Multi-drive capability allows connectivity for up to 5 drives.	22-XCOMM-DC-BASE
External Comms Power Supply	Optional 100...240V AC power supply for external DSI communications kit	20-XCOMM-AC-PS1
Communication Adapters	Embedded communication option for use with the PowerFlex family of drives. Requires a communication adapter cover (ordered separately). • BACnet • ControlNet • DeviceNet • EtherNet/IP • LonWorks • PROFIBUS DP	22-COMM-B 22-COMM-C 22-COMM-D 22-COMM-E 22-COMM-L 22-COMM-P
Compact I/O™ Module	Provides 3 channels that can be individually configured for Single, Multi-drive, and Modbus RTU modes.	1769-SM2
Communication Adapter Covers	Houses the optional communication adapters. These covers add 25 mm (0.98 in.) to the overall depth of the drive. • PowerFlex 40 Drive Frame B • PowerFlex 40 Drive Frame C	22B-CCB 22B-CCC

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Programming Software

Item	Description
Connected Components Workbench Software	Windows-based software packages for programming and configuring Allen-Bradley drives and other Rockwell Automation products. Compatibility: Microsoft Windows® Server 2012[1], Windows Server 2012 R2, Windows Server 2016[1], Windows Server 2019, Windows 10 IoT Enterprise 2016 LTSB 64-bit, Windows 10 IoT Enterprise 2019 LTSC, Windows 10, and Windows 11[2] All supported operating systems require .NET Framework 3.5 SP1 to be installed. You can download Connected Components Workbench Standard Edition software for free at rok.auto/pcdc. To purchase Connected Components Workbench Developer Edition software, visit rok.auto/ccw.
DriveExecutive Software (Download as part of the DriveTools SP software package)	Windows-based software package that provides an intuitive means for monitoring or configuring Allen-Bradley drives and communications adapters online and offline. Compatibility: Microsoft Windows 7, Windows 10, and Windows Server 2019 You can download DriveTool SP software package at rok.auto/pcdc.

(1) Requires Connected Components Workbench software version 20.01.00 or earlier.
(2) Requires Connected Components Workbench software version 20.01.00 or later.

DC Bus Inductors [1]

Input Voltage	kW	HP	Amps	Inductance (mh)	MTE Catalog Number
240V 50/60 Hz 3-phase	5.5	7.5	32	0.85	32RB001
	7.5	10.0	40	0.5	40RB001
480V 50/60 Hz 3-phase	5.5	7.5	18	3.75	18RB004
	7.5	10.0	25	4.0	25RB005
	11.0	15.0	32	2.68	32RB003
600V 50/60 Hz 3-phase	5.5	7.5	12	6.0	12RB004
	7.5	10.0	18	6.0	18RB005
	11.0	15.0	25	4.0	25RB005

(1) The highlighted cells apply to PowerFlex 40 drives only.

Dynamic Brake Resistors – PowerFlex 4

Drive Ratings			Minimum Resistance Ω	Catalog Number [1][2]	Fuse Protection [3]		
Input Voltage	kW	HP			BR-	DC+/BR+	DC-
120V 50/60 Hz 1-phase	0.2	0.25	60	AK-R2-091P500	PV-10A10F	1000GH-016	1000GH-016
	0.4	0.5	60	AK-R2-091P500	PV-10A10F	1000GH-016	1000GH-016
	0.75	1.0	60	AK-R2-091P500	PV-10A10F	1000GH-016	1000GH-016
	1.1	1.5	60	AK-R2-091P500	PV-10A10F	1000GH-016	1000GH-016
240V 50/60 Hz 1-phase	0.2	0.25	60	AK-R2-091P500	PV-10A10F	1000GH-016	1000GH-016
	0.4	0.5	60	AK-R2-091P500	PV-10A10F	1000GH-016	1000GH-016
	0.75	1.0	60	AK-R2-091P500	PV-10A10F	1000GH-016	1000GH-016
	1.5	2.0	60	AK-R2-091P500	PV-10A10F	1000GH-025	1000GH-025
240V 50/60 Hz 3-phase	0.2	0.25	60	AK-R2-091P500	PV-10A10F	1000GH-016	1000GH-016
	0.4	0.5	60	AK-R2-091P500	PV-10A10F	1000GH-016	1000GH-016
	0.75	1.0	60	AK-R2-091P500	PV-10A10F	1000GH-016	1000GH-016
	1.5	2.0	60	AK-R2-091P500	PV-10A10F	1000GH-025	1000GH-025
	2.2	3.0	48	AK-R2-047P500	PV-12A10F	1000GH-032	1000GH-032
	3.7	5.0	32	AK-R2-047P500	PV-20A10F	1000GH-040	1000GH-040
480V 50/60 Hz 3-phase	0.4	0.5	121	AK-R2-360P500	PV-10A10F	1000GH-016	1000GH-016
	0.75	1.0	121	AK-R2-360P500	PV-10A10F	1000GH-016	1000GH-016
	1.5	2.0	121	AK-R2-360P500	PV-10A10F	1000GH-025	1000GH-025
	2.2	3.0	97	AK-R2-120P1K2	PV-12A10F	1000GH-025	1000GH-025
	3.7	5.0	97	AK-R2-120P1K2	PV-12A10F	1000GH-025	1000GH-025

(1) The resistors that are listed in this table are rated for 5% duty cycle.
(2) Use of Rockwell Automation resistors is always recommended. The resistors that are listed have been carefully selected to optimize performance in various applications. Alternative resistors can be used, however, care must be taken when making a selection. See the PowerFlex Dynamic Braking Resistor Calculator Application Technique, publication PFLEX-AT001.
(3) For IEC applications, DC Fuse is mandatory when these terminals are connected. Connect the fuse close to the terminal. Use the specified part number. PV-xxxxxx fuse is from Bussman. 1000GH-xxx fuse is from Hinode.

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Dynamic Brake Resistors – PowerFlex 40

Drive Ratings			Minimum Resistance Ω	Catalog Number (1)(2)	Fuse Protection (3)		
Input Voltage	kW	HP			BR-	DC+/BR+	DC-
120V 50/60 Hz 1-phase	0.4	0.5	48	AK-R2-091P500	PV-12A10F	1000GH-016	1000GH-016
	0.75	1.0	48	AK-R2-091P500	PV-12A10F	1000GH-016	1000GH-016
	1.1	1.5	48	AK-R2-091P500	PV-12A10F	1000GH-016	1000GH-016
240V 50/60 Hz 1-phase	0.4	0.5	48	AK-R2-091P500	PV-12A10F	1000GH-016	1000GH-016
	0.75	1.0	48	AK-R2-091P500	PV-12A10F	1000GH-016	1000GH-016
	1.5	2.0	48	AK-R2-091P500	PV-12A10F	1000GH-025	1000GH-025
	2.2	3.0	32	AK-R2-047P500	PV-20A10F	1000GH-032	1000GH-032
240V 50/60 Hz 3-phase	0.4	0.5	48	AK-R2-091P500	PV-12A10F	1000GH-016	1000GH-016
	0.75	1.0	48	AK-R2-091P500	PV-12A10F	1000GH-016	1000GH-016
	1.5	2.0	48	AK-R2-091P500	PV-12A10F	1000GH-025	1000GH-025
	2.2	3.0	32	AK-R2-047P500	PV-20A10F	1000GH-032	1000GH-032
	3.7	5.0	19	AK-R2-047P500	PV-30A10F	1000GH-040	1000GH-040
	5.5	7.5	13	AK-R2-030P1K2	PV-50A10F	1000GH-050	1000GH-050
	7.5	10.0	10	AK-R2-030P1K2	PV-63A10F	1000GH-063	1000GH-063
480V 50/60 Hz 3-phase	0.4	0.5	97	AK-R2-360P500	PV-12A10F	1000GH-016	1000GH-016
	0.75	1.0	97	AK-R2-360P500	PV-12A10F	1000GH-016	1000GH-016
	1.5	2.0	97	AK-R2-360P500	PV-12A10F	1000GH-016	1000GH-016
	2.2	3.0	97	AK-R2-120P1K2	PV-12A10F	1000GH-016	1000GH-016
	4.0	5.0	77	AK-R2-120P1K2	PV-15A10F	1000GH-032	1000GH-032
	5.5	7.5	55	AK-R2-120P1K2	PV-20A10F	1000GH-040	1000GH-040
	7.5	10.0	39	AK-R2-120P1K2	PV-30A10F	1000GH-040	1000GH-040
	11.0	15.0	24	AK-R2-120P1K2 (4)	PV-50A10F	1000GH-050	1000GH-050
600V 50/60 Hz 3-phase No Filter	0.75	1.0	120	AK-R2-360P500	PV-10A10F	1000GH-016	1000GH-016
	1.5	2.0	120	AK-R2-360P500	PV-10A10F	1000GH-016	1000GH-016
	2.2	3.0	82	AK-R2-120P1K2	PV-15A10F	1000GH-016	1000GH-016
	4.0	5.0	82	AK-R2-120P1K2	PV-15A10F	1000GH-025	1000GH-025
	5.5	7.5	51	AK-R2-120P1K2	PV-20A10F	1000GH-025	1000GH-025
	7.5	10.0	51	AK-R2-120P1K2	PV-20A10F	1000GH-032	1000GH-032
	11.0	15.0	51	AK-R2-120P1K2 (4)	PV-20A10F	1000GH-040	1000GH-040

(1) The resistors that are listed in this table are rated for 5% duty cycle.
(2) Use of Rockwell Automation resistors is always recommended. The resistors that are listed have been carefully selected to optimize performance in various applications. Alternative resistors can be used, however, care must be taken when making a selection. See the PowerFlex Dynamic Braking Resistor Calculator Application Technique, publication PFLEX-AT001.
(3) For IEC applications, DC Fuse is mandatory when these terminals are connected. Connect the fuse close to the terminal. Use the specified part number. PV-xxxxxx fuse is from Bussman. 1000GH-xxx fuse is from Hinode.
(4) Requires two resistors that are wired in parallel.

3% Line Reactors (1)

Input Voltage	kW	HP	Fundamental Amps	Max Continuous Amps	Inductance (mh)	Watts Loss	Catalog Number (2)
240V 50/60 Hz 3-phase	0.2	0.25	2	3	12.0	7.5 W	1321-3R2-A
	0.4	0.5	4	6	12.0	21 W	1321-3R4-D
	0.75	1.0	8	12	3.0	29 W	1321-3R8-B
	1.5	2.0	8	12	1.5	19.5 W	1321-3R8-A
	2.2	3.0	12	18	1.25	26 W	1321-3R12-A
	3.7	5.0	18	27	0.8	36 W	1321-3R18-A
	5.5	7.5	25	37.5	0.5	48 W	1321-3R25-A
	7.5	10.0	35	52.5	0.4	49 W	1321-3R35-A

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3% Line Reactors [1] (Continued)

Input Voltage	kW	HP	Fundamental Amps	Max Continuous Amps	Inductance (mh)	Watts Loss	Catalog Number [2]
480V 50/60 Hz 3-phase	0.4	0.5	2	3	20.0	11.3 W	1321-3R2-B
	0.75	1.0	4	6	9.0	20 W	1321-3R4-C
	1.5	2.0	4	6	6.5	20 W	1321-3R4-B
	2.2	3.0	8	12	5.0	25.3 W	1321-3R8-C
	3.7	5.0	8	12	3.0	29 W	1321-3R8-B
	4.0	5.0	12	18	2.5	31 W	1321-3R12-B
	5.5	7.5	12	18	2.5	31 W	1321-3R12-B
	7.5	10.0	18	27	1.5	43 W	1321-3R18-B
	11.0	15.0	25	37.5	1.2	52 W	1321-3R25-B
600V 50/60 Hz 3-phase No Filter	0.75	1.0	2	3	20.0	11.3 W	1321-3R2-B
	1.5	2.0	4	6	6.5	20 W	1321-3R4-B
	2.2	3.0	4	6	6.5	20 W	1321-3R4-B
	4.0	5.0	8	12	5.0	25.3 W	1321-3R8-C
	5.5	7.5	12	18	2.5	31 W	1321-3R12-B
	7.5	10.0	12	18	2.5	31 W	1321-3R12-B
	11.0	15.0	18	27	1.5	43 W	1321-3R18-B

(1) The highlighted cells apply to PowerFlex 40 drives only.
(2) Catalog numbers that are listed are for 3% impedance open style units. NEMA Type 1 and 5% impedance reactor types are also available. See the 1321 Power Conditioning Products Technical Data, publication 1321-TD001.

EMC Filters – PowerFlex 4

PowerFlex 4				
Drive Ratings			S Type Filter Catalog Number [1]	L Type Filter Catalog Number [2]
Input Voltage	kW	HP		
120V 50/60 Hz 1-phase	0.2	0.25	–	22-RF010-AL
	0.4	0.5	–	22-RF010-AL
	0.75	1.0	–	22-RF018-BL
240V 50/60 Hz 1-phase	0.2	0.25	[3]	22-RF010-AL
	0.4	0.5	[3]	22-RF010-AL
	0.75	1.0	[3]	22-RF010-AL
	1.5	2.0	[3]	22-RF018-BL
240V 50/60 Hz 3-phase	0.2	0.25	22-RF9P5-AS	22-RF9P5-AL
	0.4	0.5	22-RF9P5-AS	22-RF9P5-AL
	0.75	1.0	22-RF9P5-AS	22-RF9P5-AL
	1.5	2.0	22-RF9P5-AS	22-RF9P5-AL
	2.2	3.0	22-RF021-BS	22-RF021-BL
	3.7	5.0	22-RF021-BS	22-RF021-BL
480V 50/60 Hz 3-phase	0.4	0.5	22-RF5P7-AS	22-RF5P7-AL
	0.75	1.0	22-RF5P7-AS	22-RF5P7-AL
	1.5	2.0	22-RF5P7-AS	22-RF5P7-AL
	2.2	3.0	22-RF012-BS	22-RF012-BL
	4.0	5.0	22-RF012-BS	22-RF012-BL

(1) This filter is suitable for use with a cable length up to 10 m (33 ft) for Class A and 1 meter for Class B environments.
(2) This filter is suitable for use with a cable length up to 100 m (330 ft) for Class A and 5 meters for Class B environments.
(3) Drives are available in these ratings with internal "S Type" filters.

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EMC Filters – PowerFlex 40 [1]

PowerFlex 40				
Drive Ratings			**S Type Filter Catalog Number [2]**	**L Type Filter Catalog Number [3]**
Input Voltage	**kW**	**HP**		
120V 50/60 Hz 1-phase	0.4	0.5	–	22-RF018-BL
	0.75	1.0	–	22-RF018-BL
	1.1	1.5	–	22-RF018-BL
240V 50/60 Hz 1-phase	0.4	0.5	[4]	22-RF018-BL
	0.75	1.0	[4]	22-RF018-BL
	1.5	2.0	[4]	22-RF018-BL
	2.2	3.0	[4]	22-RF025-CL
240V 50/60 Hz 3-phase	0.4	0.5	22-RF021-BS [5]	22-RF021-BL
	0.75	1.0	22-RF021-BS [5]	22-RF021-BL
	1.5	2.0	22-RF021-BS [5]	22-RF021-BL
	2.2	3.0	22-RF021-BS [5]	22-RF021-BL
	3.7	5.0	22-RF021-BS [5]	22-RF021-BL
	5.5	7.5	22-RF034-CS	22-RF034-CL
	7.5	10.0	22-RF034-CS	22-RF034-CL
480V 50/60 Hz 3-phase	0.4	0.5	22-RF012-BS	22-RF012-BL
	0.75	1.0	22-RF012-BS	22-RF012-BL
	1.5	2.0	22-RF012-BS	22-RF012-BL
	2.2	3.0	22-RF012-BS	22-RF012-BL
	4.0	5.0	22-RF012-BS	22-RF012-BL
	5.5	7.5	22-RF018-CS	22-RF018-CL
	7.5	10.0	22-RF018-CS	22-RF018-CL
	11.0	15.0	22-RF026-CS	22-RF026-CL
600V 50/60 Hz 3-phase	0.75	1.0	–	22-RF8P0-BL
	1.5	2.0	–	22-RF8P0-BL
	2.2	3.0	–	22-RF8P0-BL
	4.0	5.0	–	22-RF8P0-BL
	5.5	7.5	–	22-RF015-CL
	7.5	10.0	–	22-RF015-CL
	11.0	15.0	–	22-RF024-CL

(1) The highlighted cells apply to PowerFlex 40 drives only.
(2) This filter is suitable for use with a cable length up to 10 m (33 ft) for Class A and 1 meter for Class B environments.
(3) This filter is suitable for use with a cable length up to 100 m (330 ft) for Class A and 5 meters for Class B environments.
(4) Drives are available in these ratings with internal "S Type" filters.
(5) The filter must be Series B or later.

PowerFlex 4 and PowerFlex 40 Spare Parts [1]

Description	Catalog Number
PowerFlex 4 fan replacement kit - Frame A	SK-U1-FAN1-A1
PowerFlex 4/40 fan replacement kit - Frame B, 1 fan	SK-U1-FAN1-B1
PowerFlex 4/40 fan replacement kit - Frame B, 2 fans	SK-U1-FAN2-B1
PowerFlex 40 fan replacement kit - Frame C, 1 fan	SK-U1-FAN1-C1
PowerFlex 40 fan replacement kit - Frame C, 1 fan (15 HP)	SK-U1-FAN1-C2
PowerFlex 4 frame A cover with power terminal guard	SK-U1-ACVR1-A1
PowerFlex 4 frame B cover with power terminal guard	SK-U1-ACVR1-B1
PowerFlex 40 frame B cover with power terminal guard	SK-U1-BCVR1-B1
PowerFlex 40 frame C cover with power terminal guard	SK-U1-BCVR1-C1

(1) The highlighted cells apply to PowerFlex 40 drives only.

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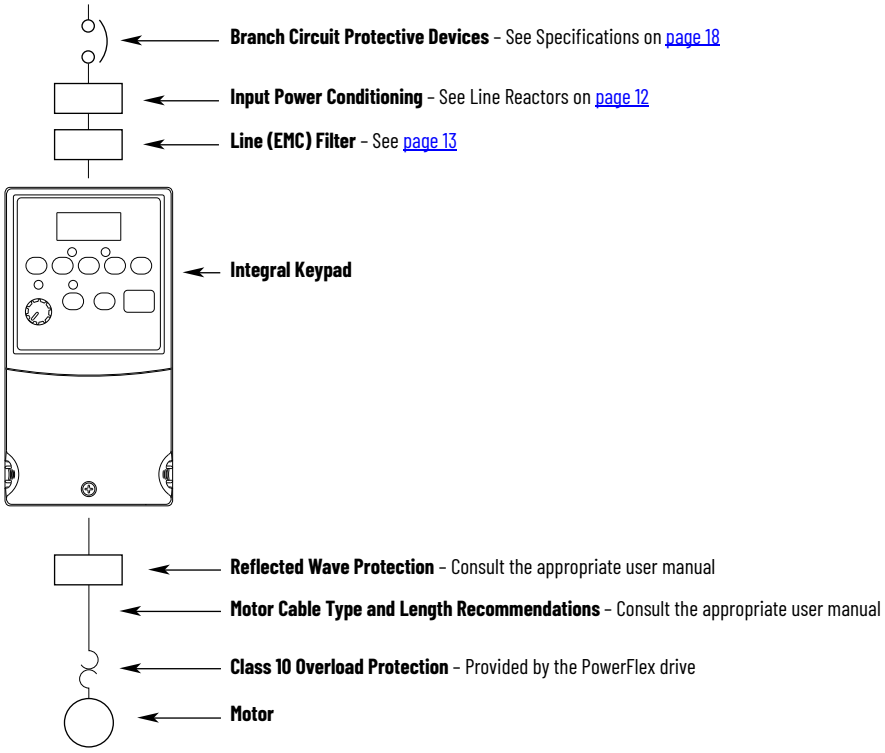
Installation Considerations

PowerFlex 4 and PowerFlex 40 drives have the following built-in protective features to help simplify installation.

- Ground fault protection while starting and running delivers reliable operation
- Electronic motor overload protection increases motor life
- Removable MOV to ground delivers compatibility with ungrounded systems
- 6 kV transient protection provides increased robustness for 380...480V system voltages

There are many other factors that must be considered for optimal performance in any given application. The block diagram below highlights the primary installation considerations. Consult the PowerFlex 4 Adjustable Frequency AC Drive User Manual, publication 22A-UM001 or PowerFlex 40 Adjustable Frequency AC Drive User Manual, publication 22B-UM001, available online at rok.auto/literature, for detailed recommendations on input power conditioning, CE conformance (EMC filtering), dynamic braking, reflected wave protection, motor cable types, and motor cable distances.

Block Diagram

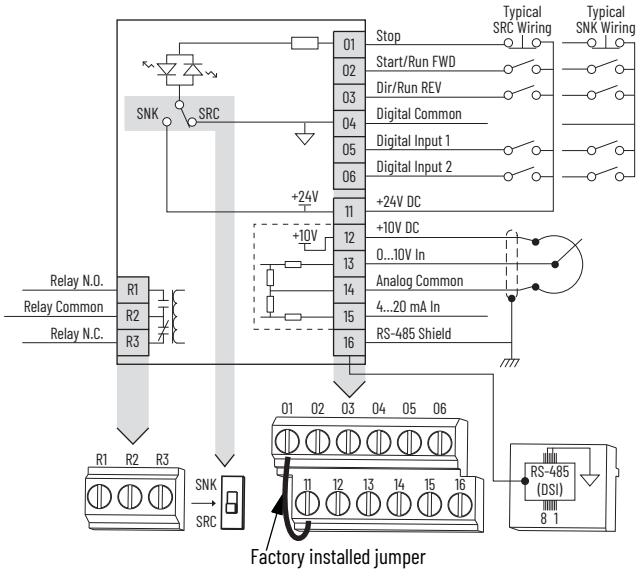


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Control Wiring

PowerFlex 4

- The control logic is 24V DC and can be set for either Sink or Source control via a DIP switch setting.
- Control terminal screws are sized for a conventional blade screwdriver.
- I/O Terminals 1, 2, and 3 are dedicated for Stop, Start, and Reverse operation respectively. These I/O Terminals can be programmed for 2-wire or 3-wire operation to meet application requirements.
- I/O Terminals 4 and 5 are programmable and provide added flexibility. Programmable functions include:
  - Local Control
  - Preset Frequencies
  - Jog
  - RS-485 Control
  - Second Accel/Decel
  - Auxiliary Fault
  - Clear Fault
- Speed can be controlled via a 0...10V input or 4...20 mA input. Both are electrically isolated from the drive.
- One form C relay can be programmed to provide the status of a wide variety of drive conditions.
- The drive is shipped with a jumper that is installed between I/O Terminals 01 and 11 to allow out of box operation from the keypad.



PowerFlex 4 Drive Control Wiring

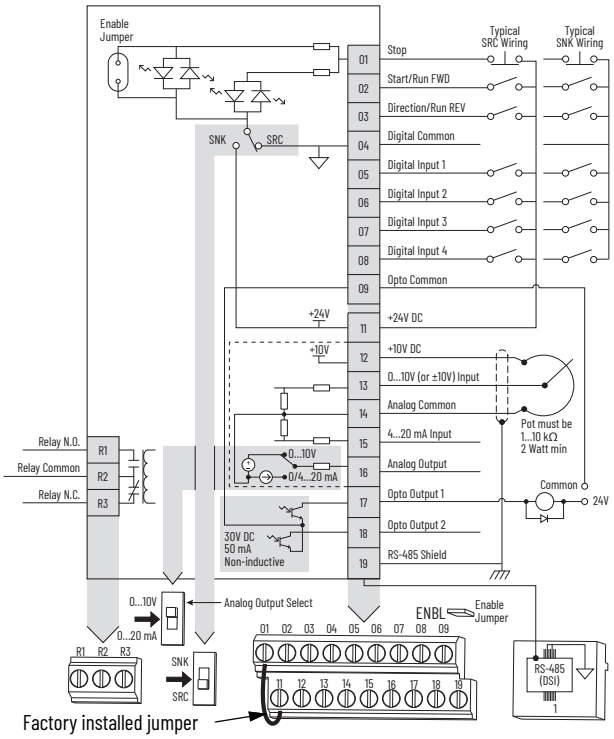
No.	Signal	Default	Description
R1	Relay N.O.	Fault	Normally open contact for output relay.
R2	Relay Common	–	Common for output relay.
R3	Relay N.C.	Fault	Normally closed contact for output relay.
Sink/Source DIP Switch		Source (SRC)	Inputs can be wired as Sink (SNK) or Source (SRC) via DIP switch setting.
01	Stop (1)	Coast	The factory-installed jumper or a normally closed input must be present for the drive to start.
02	Start/Run FWD	Not Active	Command comes from the integral keypad by default. To disable reverse operation, see A095 [Reverse Disable].
03	Direction/Run REV	Not Active	
04	Digital Common	–	For digital inputs. Electronically isolated with digital inputs from analog I/O.
05	Digital Input 1	Preset Freq	Program with A051 [Digital In1 Sel].
06	Digital Input 2	Preset Freq	Program with A052 [Digital In2 Sel].
11	+24V DC	–	Drive supplied power for digital inputs. Maximum output current is 100 mA.
12	+10V DC	–	Drive supplied power for 0...10V external potentiometer. Maximum output current is 15 mA.
13	0...10V In (1)	Not Active	For external 0...10V input supply (input impedance = 100 kΩ) or potentiometer wiper.
14	Analog Common	–	For 0...10V In or 4...20 mA In. Electronically isolated with analog inputs from digital I/O.
15	4...20 mA In (1)	Not Active	For external 4...20 mA input supply (input impedance = 250 Ω).
16	RS-485 (DSI) Shield	–	The terminal should be connected to safety ground - PE when using the RS-485 (DSI) communications port.

(1) Only one analog frequency source may be connected at a time. If multiple references are connected simultaneously, an undetermined frequency reference results.

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PowerFlex 40

- The control logic is 24V DC and can be set for either Sink or Source control via a DIP switch setting.
- Control terminal screws are sized for a conventional blade screwdriver.
- I/O Terminals 1, 2, and 3 are dedicated for Stop, Start, and Reverse operation respectively. These I/O Terminals can be programmed for 2-wire or 3-wire operation to meet application requirements.
- I/O Terminals 5, 6, 7, and 8 are programmable and provide added flexibility. Programmable functions include Local Control, Jog, Second Accel/Decel, Clear Fault, Preset Frequencies, RS-485 Control, and Auxiliary Fault.
- Speed can be controlled via a 0...10V input and/or 4...20 mA input. Both inputs are independently isolated from the rest of the drive and can be used for applications such as PID. Voltage input can be programmed for bipolar operation.
- The drive is shipped with a jumper that is installed between I/O Terminals 01 and 11 to allow out of box operation from the keypad.



PowerFlex 40 Drive Control Wiring

No.	Signal	Default	Description
R1	Relay N.O.	Fault	Normally open contact for output relay.
R2	Relay Common	–	Common for output relay.
R3	Relay N.C.	Fault	Normally closed contact for output relay.
Analog Output Select DIP Switch		0...10V	Sets analog output to either voltage or current. Setting must match A065 [Analog Out Sel].
Sink/Source DIP Switch		Source (SRC)	Inputs can be wired as Sink (SNK) or Source (SRC) via DIP switch setting.
01	Stop	Coast	The factory-installed jumper or a normally closed input must be present for the drive to start.
02	Start/Run FWD	Not Active	Command comes from the integral keypad by default. To disable reverse operation, see A095 [Reverse Disable].
03	Direction/Run REV	Not Active	
04	Digital Common	–	For digital inputs. Electronically isolated with digital inputs from analog I/O and opto outputs.
05	Digital Input 1	Preset Freq	Program with A051 [Digital In1 Sel].
06	Digital Input 2	Preset Freq	Program with A052 [Digital In2 Sel].
07	Digital Input 3	Local	Program with A053 [Digital In3 Sel].
08	Digital Input 4	Jog Forward	Program with A054 [Digital In4 Sel].
09	Opto Common	–	For opto-coupled outputs. Electronically isolated with opto outputs from analog I/O and digital inputs.
11	+24V DC	–	Referenced to Digital Common. Drive supplied power for digital inputs. Maximum output current is 100 mA.
12	+10V DC	–	Referenced to Analog Common. Drive supplied power for 0...10V external potentiometer. Maximum output current is 15 mA.
13	±10V In (1)	Not Active	For external 0...10V (unipolar) or ±10V (bipolar) input supply (input impedance = 100 kΩ) or potentiometer wiper.
14	Analog Common	–	For 0...10V In or 4...20 mA In. Electronically isolated with analog inputs and outputs from digital I/O and opto outputs.
15	4...20 mA In (1)	Not Active	For external 4...20 mA input supply (input impedance = 250 Ω).
16	Analog Output	OutFreq 0-10	The default analog output is 0...10V. To covert to a current value, change the Analog Output Select DIP Switch to 0...20 mA. Program with A065 [Analog Out Sel]. The max analog value can be scaled with A066 [Analog Out High]. Maximum Load: • 4...20 mA = 525 Ω (10.5V) • 0...10V = 1 kΩ (10 mA)
17	Opto Output 1	MotorRunning	Program with A058 [Opto Out1 Sel]
18	Opto Output 2	At Frequency	Program with A061 [Opto Out2 Sel]
19	RS-485 (DSI) Shield	–	The terminal should be connected to safety ground - PE when using the RS-485 (DSI) communications port.

(1) 0...10V In and 4...20 mA In are distinct input channels and may be connected simultaneously Inputs may be used independently for speed control or jointly when operating in PID mode.

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Specifications

Drive Ratings — PowerFlex 4

Catalog Number	Output Ratings		Input Ratings			Branch Circuit Protection				Power Dissipation	
	kW (HP)	Amps	Voltage Range	kVA	Amps	Fuses (1)	140M/140MT Motor Protectors (2)(3)	Contactors	Min Enclosure Volume (4) (in.^{3})	Internal	Total
100...120V AC (±10%) — 1-phase Input, 0...230V 3-phase Output											
22A-V1P5N104	0.2 (0.25)	1.5	90...126	0.75	6.0	10	140M-C2E-C10 140MT-C3E-C10	100-C09 100-E09	1655	10	25
22A-V2P3N104	0.4 (0.5)	2.3	90...126	1.15	9.0	15	140M-C2E-C16 140MT-C3E-C16	100-C12 100-E12	1655	9	30
22A-V4P5N104	0.75 (1.0)	4.5	90...126	2.25	18.0	30	140M-D8E-C20 140MT-D9E-C20	100-C23 100-E26	1655	12	50
22A-V6P0N104	1.1 (1.5)	6.0	90...126	3.00	24.0	40	140M-F8E-C32	100-C37 100-E38	1655	12	70
200...240V AC (±10%) — 1-phase Input, 0...230V 3-phase Output (No Brake) (5)											
22A-A1P4N103	0.2 (0.25)	1.4	180...265	0.7	3.2	6	140M-C2E-B40 140MT-C3E-B40	100-C09 100-E09	1655	10	25
22A-A2P1N103	0.4 (0.5)	2.1	180...265	1.05	5.3	10	140M-C2E-B63 140MT-C3E-B63	100-C09 100-E09	1655	9	30
22A-A3P6N103	0.75 (1.0)	3.6	180...265	1.8	9.2	15	140M-C2E-C16 140MT-C3E-C16	100-C12 100-E12	1655	12	50
22A-A6P8N103	1.5 (2.0)	6.8	180...265	3.4	14.2	25	140M-C2E-C16 140MT-C3E-C16	100-C16 100-E16	1655	16	80
22A-A9P6N103	2.2 (3.0)	9.6	180...265	4.8	19.6	30	140M-D8E-C25 140MT-D9E-C25	100-C23 100-E26	1655	11	110
200...240V AC (±10%) — 1-phase Input, 0...230V 3-phase Output (5)											
22A-A1P5N104	0.2 (0.25)	1.5	180...265	0.75	5.0	10	140M-C2E-B63 140MT-C3E-B63	100-C09 100-E09	1655	10	25
22A-A2P3N104	0.4 (0.5)	2.3	180...265	1.15	6.0	10	140M-C2E-B63 140MT-C3E-B63	100-C09 100-E09	1655	9	30
22A-A4P5N104	0.75 (1.0)	4.5	180...265	2.25	10.0	15	140M-C2E-C16 140MT-C3E-C16	100-C12 100-E12	1655	12	50
22A-A8P0N104	1.5 (2.0)	8.0	180...265	4.0	18.0	30	140M-D8E-C20 140MT-D9E-C20	100-C23 100-E26	1655	16	80
200...240V AC (±10%) — 3-phase Input, 0...230V 3-phase Output											
22A-B1P5N104	0.2 (0.25)	1.5	180...265	0.75	1.8	3	140M-C2E-B25 140MT-C3E-B25	100-C09 100-E09	1655	10	25
22A-B2P3N104	0.4 (0.5)	2.3	180...265	1.15	2.5	6	140M-C2E-B40 140MT-C3E-B40	100-C09 100-E09	1655	9	30
22A-B4P5N104	0.75 (1.0)	4.5	180...265	2.25	5.2	10	140M-C2E-C10 140MT-C3E-C10	100-C09 100-E09	1655	12	50
22A-B8P0N104	1.5 (2.0)	8.0	180...265	4.0	9.5	15	140M-C2E-C16 140MT-C3E-C16	100-C12 100-E12	1655	16	80
22A-B012N104	2.2 (3.0)	12.0	180...265	5.5	15.5	25	140M-C2E-C16 140MT-C3E-C16	100-C16 100-E16	1655	16	115
22A-B017N104	3.7 (5.0)	17.5	180...265	8.6	21.0	35	140M-F8E-C25	100-C23 100-E26	1655	16	165
380...480V AC (±10%) — 3-phase Input, 0...460V 3-phase Output											
22A-D1P4N104	0.4 (0.5)	1.4	340...528	1.4	1.8	3	140M-C2E-B25 140MT-C3E-B25	100-C09 100-E09	1655	15	30
22A-D2P3N104	0.75 (1.0)	2.3	340...528	2.3	3.2	6	140M-C2E-B40 140MT-C3E-B40	100-C09 100-E09	1655	13	40
22A-D4P0N104	1.5 (2.0)	4.0	340...528	4.0	5.7	10	140M-C2E-B63 140MT-C3E-B63	100-C09 100-E09	1655	13	60
22A-D6P0N104	2.2 (3.0)	6.0	340...528	5.9	7.5	15	140M-C2E-C10 140MT-C3E-C10	100-C09 100-E09	1655	17	90
22A-D8P7N104	3.7 (5.0)	8.7	340...528	8.6	9.0	15	140M-C2E-C16 140MT-C3E-C16	100-C16 100-E16	1655	14	145

(1) Recommended Fuse Type: UL Class J, CC, T, or Type BS88; 600V (550V) or equivalent.
(2) The AIC ratings of the Bulletin 140M/140MT devices can vary. See the Motor Protection Circuit Breaker and Motor Circuit Protector Specifications Technical Data, publication 140-TD005 or 140M-TD002.

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(3) Manual Self-protected (Type E) Combination Motor Controller, UL Listed for 208 Wye or Delta, 240 Wye or Delta, 480Y/277 or 600Y/347. Not UL Listed for use on 480V or 600V Delta/Delta, corner ground, or high-resistance ground systems.
(4) When using a Manual Self-protected (Type E) Combination Motor Controller, the drive must be installed in a ventilated or non-ventilated enclosure with the minimum volume that is specified in this column. Application-specific thermal considerations may require a larger enclosure.
(5) 200...240V AC — 1-phase drives are also available with an integral EMC filter. Catalog suffix changes from N104 to N114 or N103 to N113.

Drive Ratings — PowerFlex 40

Catalog Number	Output Ratings		Input Ratings			Branch Circuit Protection				Power Dissipation	
	kW (HP)	Amps	Voltage Range	kVA	Amps	Fuses (1)	140M/140MT Motor Protectors (2)(3)	Contactors	Min Enclosure Volume (4) ($in.^3$)	Internal	Total
100...120V AC (±10%) — 1-phase Input, 0...230V 3-phase Output											
22B-V2P3N104	0.4 (0.5)	2.3	90...132	1.15	9.0	15	140M-C2E-C16 140MT-C3E-C16	100-C12 100-E12	1655	9	30
22B-V5P0N104	0.75 (1.0)	5.0	90...132	2.45	20.3	35	140M-D8E-C20 140MT-D9E-C20	100-C23 100-E26	1655	12	55
22B-V6P0N104	1.1 (1.5)	6.0	90...132	3.0	24.0	40	140M-F8E-C32	100-C37 100-E38	1655	12	70
200...240V AC (±10%) — 1-phase Input, 0...230V 3-phase Output (5)											
22B-A2P3N104	0.4 (0.5)	2.3	180...264	1.15	6.0	10	140M-C2E-B63 140MT-C3E-B63	100-C09 100-E09	1655	9	30
22B-A5P0N104	0.75 (1.0)	5.0	180...264	2.45	12.0	20	140M-C2E-C16 140MT-C3E-C16	100-C12 100-E12	1655	12	55
22B-A8P0N104	1.5 (2.0)	8.0	180...264	4.0	18.0	30	140M-D8E-C20 140MT-D9E-C20	100-C23 100-E26	1655	16	80
22B-A012N104	2.2 (3.0)	12.0	180...264	5.5	25.0	40	140M-F8E-C32	100-C37 100-E38	2069	11	110
200...240V AC (±10%) — 3-phase Input, 0...230V 3-phase Output											
22B-B2P3N104	0.4 (0.5)	2.3	180...264	1.15	2.5	6	140M-C2E-B40 140MT-C3E-B40	100-C09 100-E09	1655	9	30
22B-B5P0N104	0.75 (1.0)	5.0	180...264	2.45	5.7	10	140M-C2E-C10 140MT-C3E-C10	100-C09 100-E09	1655	12	55
22B-B8P0N104	1.5 (2.0)	8.0	180...264	4.0	9.5	15	140M-C2E-C16 140MT-C3E-C16	100-C12 100-E12	1655	16	80
22B-B012N104	2.2 (3.0)	12.0	180...264	5.5	15.5	25	140M-C2E-C16 140MT-C3E-C16	100-C23 100-E26	1655	16	115
22B-B017N104	3.7 (5.0)	17.5	180...264	8.6	21.0	35	140M-F8E-C25	100-C23 100-E26	1655	16	165
22B-B024N104	5.5 (7.5)	24.0	180...264	11.8	26.1	40	140M-F8E-C32	100-C37 100-E38	2069	28	225
22B-B033N104	7.5 (10.0)	33.0	180...264	16.3	34.6	60	140M-F8E-C45	100-C60 100-E65	2069	28	290
380...480V AC (±10%) — 3-phase Input, 0...460V 3-phase Output											
22B-D1P4N104	0.4 (0.5)	1.4	342...528	1.4	1.8	3	140M-C2E-B25 140MT-C3E-B25	100-C09 100-E09	1655	15	30
22B-D2P3N104	0.75 (1.0)	2.3	342...528	2.3	3.2	6	140M-C2E-B40 140MT-C3E-B40	100-C09 100-E09	1655	13	40
22B-D4P0N104	1.5 (2.0)	4.0	342...528	4.0	5.7	10	140M-C2E-B63 140MT-C3E-B63	100-C09 100-E09	1655	13	60
22B-D6P0N104	2.2 (3.0)	6.0	342...528	5.9	7.5	15	140M-C2E-C10 140MT-C3E-C10	100-C09 100-E09	1655	17	90
22B-D010N104	4.0 (5.0)	10.5	342...528	10.3	13.0	20	140M-C2E-C16 140MT-C3E-C16	100-C23 100-E26	1655	14	150
22B-D012N104	5.5 (7.5)	12.0	342...528	11.8	14.2	25	140M-D8E-C20 140MT-D9E-C20	100-C23 100-E26	2069	23	160
22B-D017N104	7.5 (10.0)	17.0	342...528	16.8	18.4	30	140M-D8E-C20 140MT-D9E-C20	100-C23 100-E26	2069	24	200
22B-D024N104	11.0 (15.0)	24.0	342...528	23.4	26.0	50	140M-F8E-C32	100-C43 100-E40	2069	25	285
460...600V AC (±10%) — 3-phase Input, 0...575V 3-phase Output											
22B-E1P7N104	0.75 (1.0)	1.7	414...660	2.1	2.3	6	140M-C2E-B25 140MT-C3E-B25	100-C09 100-E09	1655	13	40

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Drive Ratings — PowerFlex 40 (Continued)

Catalog Number	Output Ratings		Input Ratings			Branch Circuit Protection				Power Dissipation	
	kW (HP)	Amps	Voltage Range	kVA	Amps	Fuses (1)	140M/140MT Motor Protectors (2)(3)	Contactors	Min Enclosure Volume (4) (in.^{3})	Internal	Total
22B-E3P0N104	1.5 (2.0)	3.0	414...660	3.65	3.8	6	140M-C2E-B40 140MT-C3E-B40	100-C09 100-E09	1655	13	60
22B-E4P2N104	2.2 (3.0)	4.2	414...660	5.2	5.3	10	140M-D8E-B63 140MT-D9E-B63	100-C09 100-E09	1655	17	90
22B-E6P6N104	4.0 (5.0)	6.6	414...660	8.1	8.3	15	140M-D8E-C10 140MT-D9E-C10	100-C09 100-E09	1655	14	150
22B-E9P9N104	5.5 (7.5)	9.9	414...660	12.1	11.2	20	140M-D8E-C16 140MT-D9E-C16	100-C16 100-E16	2069	23	160
22B-E012N104	7.5 (10.0)	12.2	414...660	14.9	13.7	25	140M-D8E-C16 140MT-D9E-C16	100-C23 100-E26	2069	24	200
22B-E019N104	11.0 (15.0)	19.0	414...660	23.1	24.1	40	140M-F8E-C25	100-C30 100-E30	2069	25	285

(1) Recommended Fuse Type: UL Class J, CC, T, or Type BS88; 600V (550V) or equivalent.
(2) The AIC ratings of the Bulletin 140M/140MT devices can vary. See the Motor Protection Circuit Breaker and Motor Circuit Protector Specifications Technical Data, publication 140-TD005 or 140M-TD002.
(3) Manual Self-protected (Type E) Combination Motor Controller, UL Listed for 208 Wye or Delta, 240 Wye or Delta, 480Y/277 or 600Y/347. Not UL Listed for use on 480V or 600V Delta/Delta, corner ground, or high-resistance ground systems.
(4) When using a Manual Self-protected (Type E) Combination Motor Controller, the drive must be installed in a ventilated or non-ventilated enclosure with the minimum volume that is specified in this column. Application-specific thermal considerations may require a larger enclosure.
(5) 200...240V AC — 1-phase drives are also available with an integral EMC filter. Catalog suffix changes from N104 to N114 or N103 to N113.

Technical Specifications

Input/Output Ratings	Output Frequency:	PowerFlex 4: 0...240 Hz (Programmable) PowerFlex 40: 0...400 Hz (Programmable)
	Efficiency:	97.5% (Typical)
Approvals	UL508C, CSA C 22.2 No. 14, EN 61800-3, EMC Directive 2014/30/EU: EN 61800-3 LV Directive 2014/35/EU: EN 61800-5-1, KCC-REM-RAA-22A KCC-REM-RAA-22B	
Control Inputs	Digital SRC (Source) Mode: SNK (Sink) Mode:	Input Current = 6 mA 18...24V = On; 0...6V = Off 0...6V = On; 18...24V = Off
	Analog 4...20 mA Analog: 0...10V DC Analog: External Pot:	 250 Ω input impedance 100 kΩ input impedance 1...10 kΩ, 2 Watt minimum
Control Output – Programmable Output (Form C relay)	Resistive Rating Opto Outputs (PF 40): Analog Outputs (PF 40):	3.0 A @ 30V DC, 3.0 A @ 125V AC, 3.0 A @ 240V AC 30V DC, 50 mA 10-bit, 0...10V, 1 kΩ minimum
	Inductive Rating Opto Outputs (PF 40): Analog Outputs (PF 40):	0.5 A @ 30V DC, 0.5 A @ 125V AC, 0.5 A @ 240V AC Non-inductive 10-bit, 4...20 mA, 525 Ω maximum
Fuses and Circuit Breakers	Recommended Fuse Type:	UL Class J, CC, T, or Type BS88; 600V (550V) or equivalent.
	Recommended Circuit Breakers:	HMCP circuit breaker or equivalent.
Protective Features	Motor Protection:	I^2t Overload Protection, 150% for 60 s, 200% for 3 s (provides Class 10 protection)
	Overcurrent:	200% hardware limit, 300% instantaneous fault
	Control Ride-through:	Minimum Ride-through is 0.5 s - Typical value is 2 s
	Faultless Power Ride-through:	100 milliseconds
	Over Voltage:	100...120V AC Input – Trip occurs @ 405V DC bus voltage (= 150V AC incoming line) 200...240V AC Input – Trip occurs @ 405V DC bus voltage (= 290V AC incoming line) 380...480V AC Input – Trip occurs @ 810V DC bus voltage (= 575V AC incoming line) 460...600V AC Input (PF 40) – Trip occurs @ 1005V DC bus voltage (= 711V AC incoming line)
	Under Voltage:	100...120V AC Input – Trip occurs @ 210V DC bus voltage (= 75V AC incoming line) 200...240V AC Input – Trip occurs @ 210V DC bus voltage (= 150V AC incoming line) 380...480V AC Input – Trip occurs @ 390V DC bus voltage (= 275V AC incoming line) 460...600V AC Input (PF 40) If P042 = 1 "High Voltage" trip occurs @ 487V DC bus voltage (344V AC incoming line); If P042 = 0 "Low Voltage" trip occurs @ 390V DC bus voltage (275V AC incoming line)
Dynamic Braking	Internal brake IGBT included with all ratings except No Brake drives (22A-AxPxN103 or 22A-AxPxN113). See Product Selection on page 9 for ordering information.	

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Technical Specifications (Continued)

Environment	Altitude:	1000 m (3300 ft) maximum without derating
	Ambient Operating Temperature:	IP20, NEMA/UL Type Open: –10…+50 °C (14…122 °F) IP30, NEMA/UL Type 1: –10…+40 °C (14…104 °F) IP66, NEMA/UL Type 4X/12 (PF 40): –10…+40 °C (14…104 °F)
	Cooling Method:	Fan, all drive ratings
	Storage Temperature:	–40…+85 °C (–40…+185 °F)
	Atmosphere:	**Important:** Drive **must not** be installed in an area where the ambient atmosphere contains volatile or corrosive gas, vapors, or dust. If the drive is not going to be installed for a period of time, it must be stored in an area where it will not be exposed to a corrosive atmosphere.
	Relative Humidity:	0…95% noncondensing
	Shock (operating):	15 g peak for 11 ms duration (±1.0 ms)
	Vibration (operating):	1 g peak, 5…2000 Hz
Control	Carrier Frequency:	2…16 kHz. Drive rating based on 4 kHz.
	Frequency Accuracy:	Digital Input: Within ±0.05% of set output frequency. Analog Input: Within 0.5% of maximum output frequency. Analog Output (PF 40): ±2% of full scale, 10-bit resolution.
	Speed Regulation:	Open Loop with Slip Compensation: ±2% of base speed across a 40:1 speed range. (PF 40): 1% of base speed across a 60:1 speed range.
	Stop Modes:	Multiple programmable stop modes including - Ramp, Coast, DC Brake, Ramp to Hold, and S-curve.
	Accel/Decel:	Two independently programmable accel and decel times. Each time can be programmed from 0…600 s in 0.1 s increments.
	Intermittent Overload:	150% overload capability for up to 1 minute, 200% overload capability for up to 3 s.
	Electronic Motor Overload Protection:	Provides class 10 motor overload protection according to NEC article 430 and motor overtemperature protection according to NEC article 430.126 (A) (2). UL 508C File 29572.
Electrical	Voltage Tolerance:	120V, 200…240V, 380…480V, 460…600V: ±10%
	Frequency Tolerance:	48…63 Hz
	Displacement Power Factor:	0.98 across entire speed range
	Maximum Short Circuit Rating:	100,000 A symmetrical

Parameter Descriptions

Parameter Descriptions [(1)]

Parameter Number	Parameter Name	Description	Factory Default
Display Group			
d001	Output Freq	Output frequency present at T1, T2, and T3 (U, V, and W)	Read-only
d002	Commanded Freq	Value of the active frequency command	Read-only
d003	Output Current	Output current present at T1, T2, and T3 (U, V, and W)	Read-only
d004	Output Voltage	Output voltage present at T1, T2, and T3 (U, V, and W)	Read-only
d005	DC Bus Voltage	Present DC bus voltage level	Read-only
d006	Drive Status	Present operating condition of the drive	Read-only
d007…d009	Fault x Code	A code that represents a drive fault	Read-only
d010	Process Display	The output frequency scaled by parameter A099 [Process Factor]	Read-only
d012	Control Source	Displays the source of the Start Command and Speed Reference	Read-only
d013	Contrl In Status	Status of the control terminal block control inputs	Read-only
d014	Dig In Status	Status of the control terminal block digital inputs	Read-only
d015	Comm Status	Status of the communications ports	Read-only
d016	Control SW Ver	Main Control Board software version	Read-only
d017	Drive Type	Used by Rockwell Automation field service personnel	Read-only
d018	Elapsed Run Time	Accumulated time drive is outputting power	Read-only
d019	Testpoint Data	The present value of the function selected in parameter A102 [Testpoint Sel]	Read-only
d020	Analog In 0-10V	The present value of the voltage at I/O Terminal 13 (100.0% = 10V)	Read-only
d021	Analog In 4-20mA	The present value of the current at I/O Terminal 15 (0.0% = 4 mA, 100.0% = 20 mA)	Read-only
d022	Output Power	Output power present at T1, T2, and T3 (U, V, and W)	Read-only

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Parameter Descriptions [1] (Continued)

Parameter Number	Parameter Name	Description	Factory Default
d023	Output Power Fctr	The angle in electrical degrees between motor voltage and motor current	Read-only
d024	Drive Temp	Present operating temperature of the drive power section	Read-only
d025	Counter Status	The current value of the counter when the counter is enabled	Read-only
d026	Timer Status	The current value of the timer when the timer is enabled	Read-only
d028	Stp Logic Status	When P038 [Speed Reference] is set to 6 "Stp Logic", this parameter displays the current StepLogic profile as defined by parameters A140...A147 [Stp Logic x]	Read-only
d029	Torque Current	Displays the current value of the motor torque current as measured by the drive	Read-only
Basic Program Group			
P031	Motor NP Volts	20 to drive rated volts	Based on Drive Rating
P032	Motor NP Hertz	10...240 Hz	60 Hz
		15...400 Hz	60 Hz
P033	Motor OL Current	0.0 A to (Drive Rated Amps x 2) in units of 0.1 A	Based on Drive Rating
P034	Minimum Freq	0.0...240.0 Hz	0.0 Hz
		0.0...400.0 Hz	0.0 Hz
P035	Maximum Freq	0...240 Hz	60 Hz
		0...400 Hz	60 Hz
P036	Start Source	6 settings; Keypad, 3-wire, 2-wire, 2-wire Level Sensitive, 2-wire High Speed, Comm Port	Keypad
		7 settings; Keypad, 3-wire, 2-wire, 2-wire Level Sensitive, 2-wire High Speed, Comm Port, Momentary FWD/REV	Keypad
P037	Stop Mode	8 settings; Ramp-Clear Fault, Coast-Clear Fault, DC Brake-Clear Fault, DC Brake w/Shutoff-Clear Fault, Ramp, Coast, DC Brake, DC Brake w/Shutoff	Ramp, CF (Clear Fault)
		10 settings; Ramp-Clear Fault, Coast-Clear Fault, DC Brake-Clear Fault, DC Brake w/Shutoff-Clear Fault, Ramp, Coast, DC Brake, DC Brake w/Shutoff, Ramp Stop w/EM Brake Control-Clear Fault, Ramp Stop w/EM Brake Control	Ramp, CF (Clear Fault)
P038	Speed Reference	6 settings; Drive Potentiometer, Internal Freq, 0...10V Input/Remote Potentiometer, 4...20 mA Input, Preset Freq 0...3, Communications Port	Drive Pot
		8 settings; Drive Potentiometer, Internal Freq, 0...10V Input/Remote Potentiometer, 4...20 mA Input, Preset Freq 0...7, Communications Port, Step Logic, Analog In Mult	Drive Pot
P039	Accel Time 1	0.0...600.0 seconds	10.0 Secs
P040	Decel Time 1	0.1...600.0 seconds	10.0 Secs
P041	Reset To Defalts	Used to reset the drive to factory default settings	Ready/Idle
P042	Voltage Class	Sets the voltage class of 600V drives – Low Voltage (460/480V) or High Voltage (575/600V)	High Voltage (575/600V)
P043	Motor OL Ret	Enables/Disables the Motor Overload Retention function.	Disabled
Advanced Program Group			
A051 A052	Digital In1 Sel Digital In2 Sel	16 settings; Not Used, Accel 2 and Decel 2, Jog, Auxiliary Fault, Preset Frequencies, Local, Comm Port, Clear Fault, Ramp Stop Clear Fault, Coast Stop Clear Fault, DC Brake Clear Fault, Jog Forward, Jog Reverse, 10V In Control, 20 mA In Control, Analog Invert	Preset Freq
		28 settings; Not Used, Accel 2 and Decel 2, Jog, Auxiliary Fault, Preset Frequencies, Local, Comm Port, Clear Fault, Ramp Stop - Clear Fault, Coast Stop - Clear Fault, DC Brake - Clear Fault, Jog Forward, Jog Reverse, 10V In Control, 20 mA In Control, PID Disable, MOP Up, MOP Down, Timer Start, Counter In, Reset Timer, Reset Counter, Reset Timer and Counter, Logic In1, Logic In2, Current Limit2, Analog Invert, EM Brake Release	
A053	Digital In3 Sel	28 settings; Not Used, Accel 2 and Decel 2, Jog, Auxiliary Fault, Preset Frequencies, Local, Comm Port, Clear Fault, Ramp Stop - Clear Fault, Coast Stop - Clear Fault, DC Brake - Clear Fault, Jog Forward, Jog Reverse, 10V In Control, 20 mA In Control, PID Disable, MOP Up, MOP Down, Timer Start, Counter In, Reset Timer, Reset Counter, Reset Timer and Counter, Logic In1, Logic In2, Current Limit2, Analog Invert, EM Brake Release	Local
A054	Digital In4 Sel		Jog Forward
A055	Relay Out Sel	13 different settings for various drive status conditions	Ready/Fault
		24 different settings for various drive status conditions	Ready/Fault
A056	Relay Out Level	0.0...9999	0.0
A058	Opto Out1 Sel	24 settings; Ready/Fault, At Frequency, Motor Running, Reverse, Motor Overload, Ramp Regulator, Above Frequency, Above Current, Above DC Voltage, Retries Exceeded, Above Analog Voltage, Logic In1, Logic In2, Logic 1 & 2, Logic 1 or 2, Step Logic Out, Timer Out, Counter Out, Above PF Angle, Analog Input Loss, Param Control, Nonrecoverable Fault, EM Brake Control, Above Frequency Command	MotorRunning
A059	Opto Out1 Level	0.0...9999	0.0

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Parameter Descriptions [1] (Continued)

Parameter Number	Parameter Name	Description	Factory Default
A061	Opto Out2 Sel	24 settings; Ready/Fault, At Frequency, Motor Running, Reverse, Motor Overload, Ramp Regulator, Above Frequency, Above Current, Above DC Voltage, Retries Exceeded, Above Analog Voltage, Logic In1, Logic In2, Logic 1 & 2, Logic 1 or 2, Step Logic Out, Timer Out, Counter Out, Above PF Angle, Analog Input Loss, Param Control, Nonrecoverable Fault, EM Brake Control, Above Frequency Command	At Frequency
A062	Opto Out2 Level	0.0...9999	0.0
A064	Opto Out Logic	Determines the logic (N.O. or N.C.) of the opto outputs, 4 settings - NO/NO, NC/NO, NO/NC, NC/NC	NO/NO
A065	Analog Out Sel	Sets the analog output signal mode, various settings	Output Freq 0...10, 0V = 0 Hz
A066	Analog Out High	0...800%	100%
A067	Accel Time 2	0.0...600.0 s	20.0 s
A068	Decel Time 2	0.1...600.0 s	20.0 s
A069	Internal Freq	0.0...240.0 Hz	60.0 Hz
		0.0...400.0 Hz	60.0 Hz
A070	Preset Freq 0	0.0...240.0 Hz	0.0 Hz
		0.0...400.0 Hz	0.0 Hz
A071	Preset Freq 1	0.0...240.0 Hz	5.0 Hz
		0.0...400.0 Hz	5.0 Hz
A072	Preset Freq 2	0.0...240.0 Hz	10.0 Hz
		0.0...400.0 Hz	10.0 Hz
A073	Preset Freq 3	0.0...240.0 Hz	20.0 Hz
		0.0...400.0 Hz	20.0 Hz
A074	Preset Freq 4	0.0...400.0 Hz	30.0 Hz
A075	Preset Freq 5	0.0...400.0 Hz	40.0 Hz
A076	Preset Freq 6	0.0...400.0 Hz	50.0 Hz
A077	Preset Freq 7	0.0...400.0 Hz	60.0 Hz
A078	Jog Frequency	0.0 to (Value set in P035 [Maximum Freq]	10.0 Hz
A079	Jog Accel/Decel	0.1...600.0 s	10.0 s
A080	DC Brake Time	0.0...90.0 s	0.0 s
		0.0...99.9 s	0.0 s
A081	DC Brake Level	0.0 to (Drive Rated Amps x 1.8)	Drive Rated Amps x 0.05
A082	DB Resistor Sel	Used to set the percent duty cycle for external dynamic braking	Disabled
A083	S Curve %	0...100%	0% (Disabled)
A084	Boost Select	14 boost settings (in % of P031 [Motor NP Volts]), redefines the volts per Hertz curve	5.0 (2.5 for 5 HP drives)
		15 boost settings (in % of P031 [Motor NP Volts]), redefines the volts per Hertz curve	5.0, CT (2.5 CT for 5...15 HP drives)
A085	Start Boost	0.0...25.0%	2.5%
A086	Break Voltage	0.0...100.0%	25.0%
A087	Break Frequency	0.0...400.0 Hz	15.0 Hz
A088	Maximum Voltage	20 to Drive Rated Volts	Drive Rated Volts
A089	Current Limit 1	0.1 to (Drive Rated Amps x 1.8)	Drive Rated Amps x 1.5
A090	Motor OL Select	3 settings; No Derate, Minimum Derate, Maximum Derate	No Derate
A091	PWM Frequency	2.0...16.0 kHz	4.0 kHz
A092	Auto Rstrt Tries	0...9	0
A093	Auto Rstrt Delay	0.0...300.0 s	1.0 s
A094	Start At PowerUp	2 settings; Disabled, Enabled	Disabled
A095	Reverse Disable	2 settings; Reverse Enabled, Reverse Disabled	Rev Enabled
A096	Flying Start En	2 settings; Disabled, Enabled	Disabled
A097	Compensation	4 settings; Disabled, Electrical, Mechanical, Both	Electrical
A098	SW Current Trip	Software instantaneous trip, 0.0 to (Drive Rated Amps x 2)	0.0 (Disabled)
A099	Process Factor	0.1...999.9	30.0
A100	Fault Clear	Resets a fault and clears the fault queue	Ready/Idle

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Parameter Descriptions [1] (Continued)

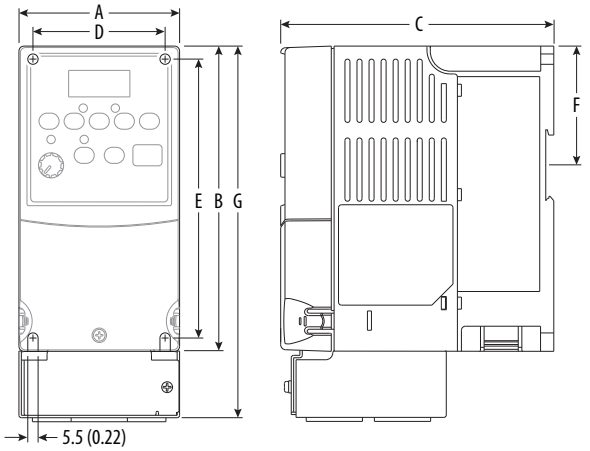
Parameter Number	Parameter Name	Description	Factory Default
A101	Program Lock	Protects parameters against change by unauthorized personnel	Unlocked
A102	Testpoint Sel	Used by Rockwell Automation field service personnel	400
A103	Comm Data Rate	6 settings; 1200, 2400, 4800, 9600, 19.2K, 38.4K	9600
A104	Comm Node Addr	1...247	100
A105	Comm Loss Action	4 settings; Fault, Coast-to-Stop, Stop, Continue Last Speed	Fault
A106	Comm Loss Time	0.1...60.0 s	5.0 s
A107	Comm Format	6 settings; RTU 8-N-1, RTU 8-E-1, RTU 8-O-1, RTU 8-N-2, RTU 8-E-2, RTU 8-O-2	RTU 8-N-1
A108	Language	10 settings; English, Francais, Espanol, Italiano, Deutsch, Reserved, Portugues, Reserved, Reserved, Nederlands	English
A109	Anlg Out Setpt	0.0/100.0%	100.0%
A110	Anlg In 0-10V Lo	0.0...100.0%	0.0%
A111	Anlg In 0-10V Hi	0.0...100.0%	100.0%
A112	Anlg In4-20mA Lo	0.0...100.0%	0.0%
A113	Anlg In4-20mA Hi	0.0...100.0%	100.0%
A114	Slip Hertz @ FLA	0.0...10.0 Hz	2.0 Hz
A115	Process Time Lo	0.00...99.99	0.00
A116	Process Time Hi	0.00...99.99	0.00
A117	Bus Reg Mode	0/1	Enabled
A118	Current Limit 2	0.1 to (Drive Rated Amps x 1.8)	Drive Rated Amps x 1.5
A119	Skip Frequency	0...400 Hz	0 Hz
A120	Skip Freq Band	0.0...30.0 Hz	0.0 Hz
A121	Stall Fault Time	6 settings; 60 Seconds, 120 Seconds, 240 Seconds, 360 Seconds, 480 Seconds, Fit Disabled	60 Seconds
A122	Analog In Loss	7 settings; Disabled, Fault (F29), Stop, Zero Ref, Min Freq Ref, Max Freq Ref, Int Freq Ref	Disabled
A123	10V Bipolar Enbl	2 settings; Uni-Polar In, Bi-Polar In	Uni-Polar In
A124	Var PWM Disable	2 settings; Enabled, Disabled	Enabled
A125	Torque Perf Mode	2 settings; V/Hz, Sensorless Vector	Sensrls Vect
A126	Motor NP FLA	Drive Rated Amps x 0.1/2	Drive Rated Amps
A127	Autotune	3 settings; Ready/Idle, Static Tune, Rotate Tune	Ready/Idle
A128	IR Voltage Drop	0.0...230.0 VAC	Based on Drive Rating
A129	Flux Current Ref	0.00 to Motor NP FLA	Based on Drive Rating
A130	PID Trim Hi	0.0...400.0	60.0
A131	PID Trim Lo	0.0...400.0	0.0
A132	PID Ref Sel	9 settings; PID Disabled, PID Setpoint, 0...10V Input, 4...20 mA Input, Comm Port, Setpoint - Trim, 0...10V - Trim, 4...20 mA - Trim, Comm - Trim	PID Disabled
A133	PID Feedback Sel	3 settings; 0...10V Input, 4...20 mA Input, Comm Port	0...10V Input
A134	PID Prop Gain	0.00...99.99	0.01
A135	PID Integ Time	0.0...999.9 s	0.1 s
A136	PID Diff Rate	0.00...99.99 (1/secs)	0.01 (1/Secs)
A137	PID Setpoint	0.0...100.0%	0.0%
A138	PID Deadband	0.0...10.0%	0.0%
A139	PID Preload	0.0...400.0 Hz	0.0 Hz
A140...A147	Stp Logic 0-7	0001...bAFF	00F1
A150...157	Stp Logic Time 0-7	0.0...999.9 s	30.0 s
A160	EM Brk Off Delay	0.01/10.00 s	2.00 s
A161	EM Brk On Delay	0.01/10.00 s	2.00 s
A162	MOP Reset Sel	2 settings; Zero MOP Ref, Save MOP Ref	Save MOP Ref
A163	DB Threshold	0.0...110.0%	100.0%
A164	Comm Write Mode	2 settings; Save, RAM Only	Save
A165	Anlg Loss Delay	0.0...20.0 s	0.0 s
A166	Analog In Filter	0...14	0

(1) The highlighted cells apply to PowerFlex 40 drives only.

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Product Dimensions

Approximate Dimensions



Dimensions are in millimeters and (inches). Weights are in kilograms and (pounds).

Frame	A	B (1)	C	D	E	F	G (2)	Shipping Weight
A	80 (3.15)	152 (5.98)	136 (5.35)	67 (2.64)	140 (5.51	59.3 (2.33)	185 (7.28)	1.4 (3.1)
B	100 (3.94)	180 (7.09)	136 (5.35)	87 (3.43)	168 (6.61)	87.4 (3.44)	213 (8.39)	2.2 (4.9)
C (3)	130 (5.1)	260 (10.2)	180 (7.1)	116 (4.57)	246 (9.7)	–	320 (12.6)	4.3 (9.5)

(1) Overall height of the standard IP20/Open Type drive
(2) Overall height of the drive with IP30/NEMA 1/UL Type 1 option kit installed
(3) Frame C applies to PowerFlex 40 drives only.

Ratings are in kW and (HP).

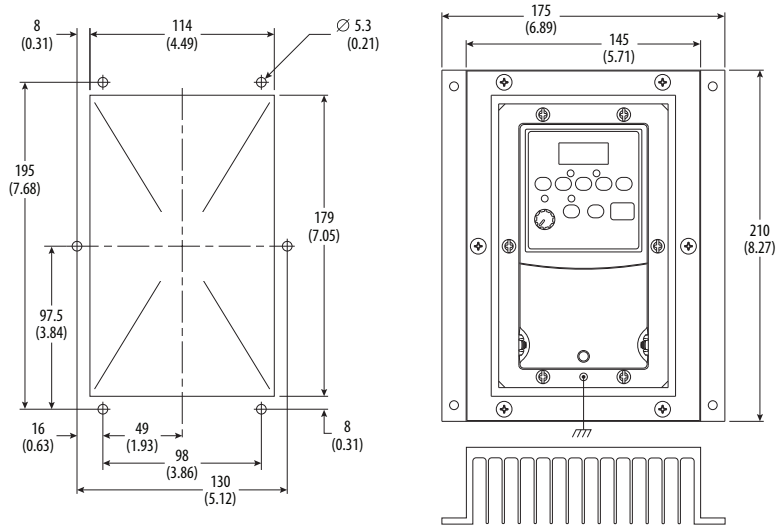
PowerFlex 4 – Frame	120V AC – 1-phase	240V AC – 1-phase	240V AC – 3-phase	480V AC – 3-phase
A	0.2 (0.25) 0.4(0.5)	0.2 (0.25) 0.4 (0.5) 0.75 (1.0)	0.2 (0.25) 0.4 (0.5) 0.75 (1.0) 1.5 (2.0)	0.4 (0.5) 0.75 (1.0) 1.5 (2.0)
B	0.75 (1.0) 1.1 (1.5)	1.5 (2.0)	2.2 (3.0) 3.7 (5.0)	2.2 (3.0) 3.7 (5.0)

PowerFlex 40 – Frame	120V AC – 1-phase	240V AC – 1-phase	240V AC – 3-phase	480V AC – 3-phase	600V AC – 3-phase
B	0.4 (0.5) 0.75 (1.0) 1.1 (1.5)	0.4 (0.5) 0.75 (1.0) 1.5 (2.0)	0.4 (0.5) 0.75 (1.0) 1.5 (2.0) 2.2 (3.0) 3.7 (5.0)	0.4 (0.5) 0.75 (1.0) 1.5 (2.0) 2.2 (3.0) 4.0 (5.0)	0.75 (1.0) 1.5 (2.0) 2.2 (3.0) 4.0 (5.0)
C	–	2.2 (3.0)	5.5 (7.5) 7.5 (10.0)	5.5 (7.5) 7.5 (10.0) 11.0 (15.0)	5.5 (7.5) 7.5 (10.0) 11.0 (15.0)

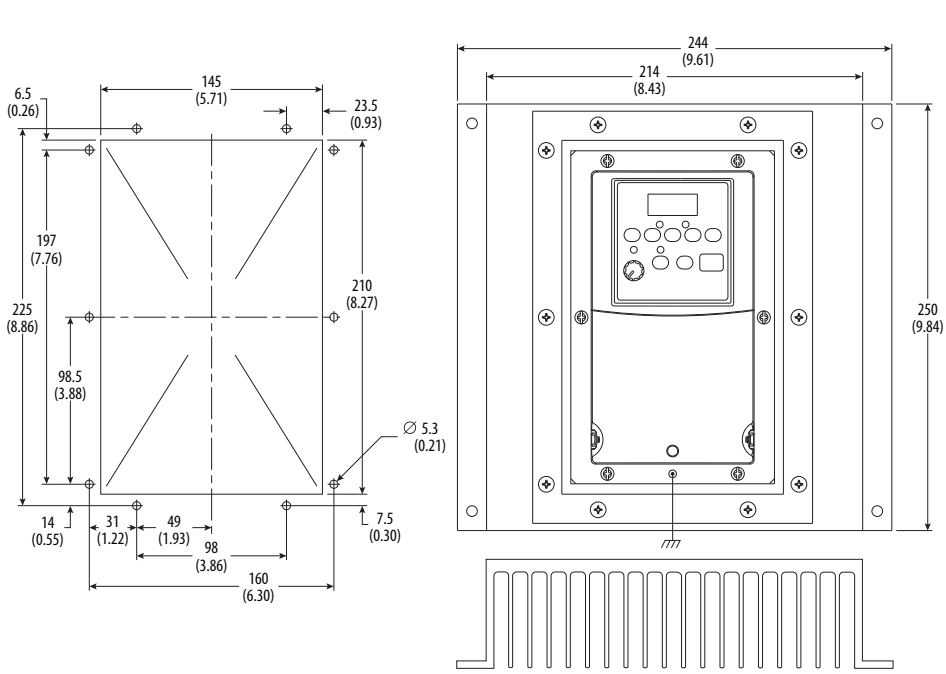
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Flange Mount Drive

Dimensions are in millimeters and (inches).



Frame A — PowerFlex 4 only

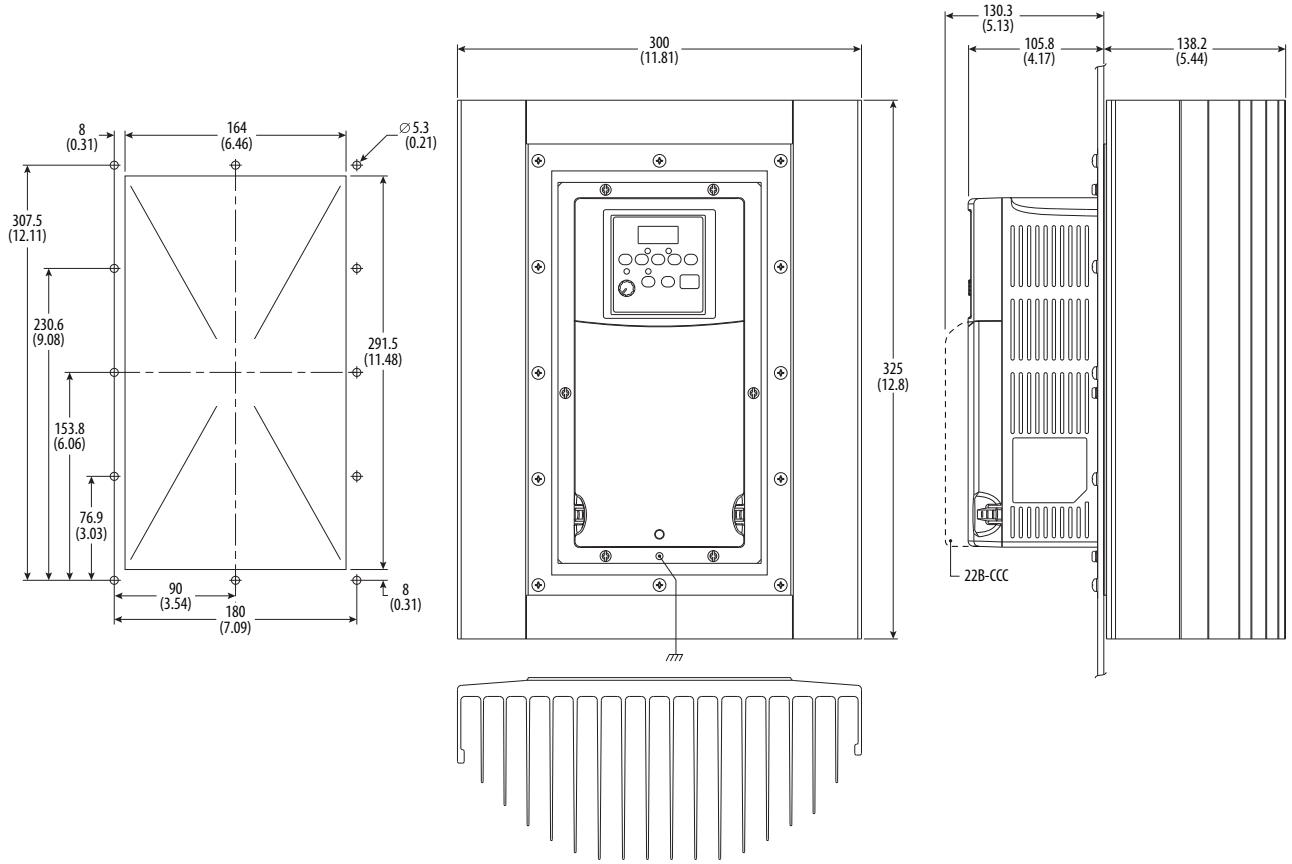


Frame B — PowerFlex 4 and PowerFlex 40

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Flange Mount Drive *(Continued)*

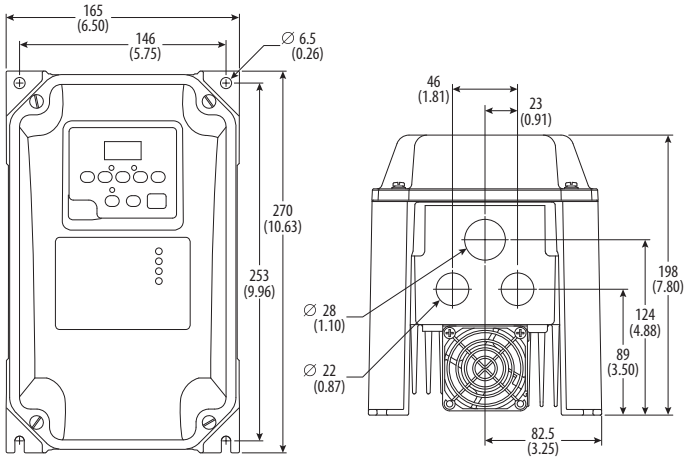
Dimensions are in millimeters and (inches).



Frame C — PowerFlex 40 only

IP66, NEMA/UL Type 4X/12

Dimensions are in millimeters and (inches).

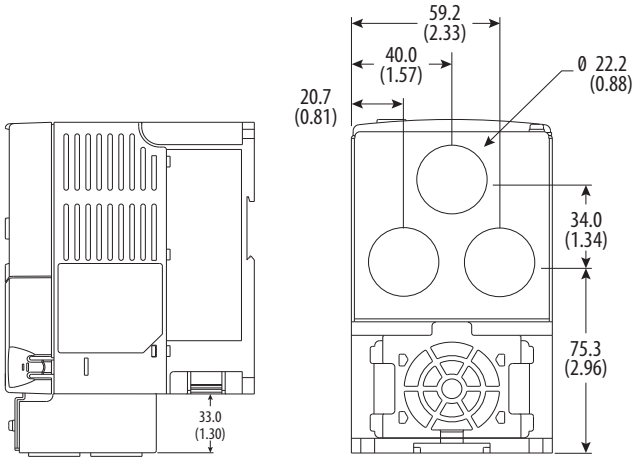


Frame B — PowerFlex 40 only

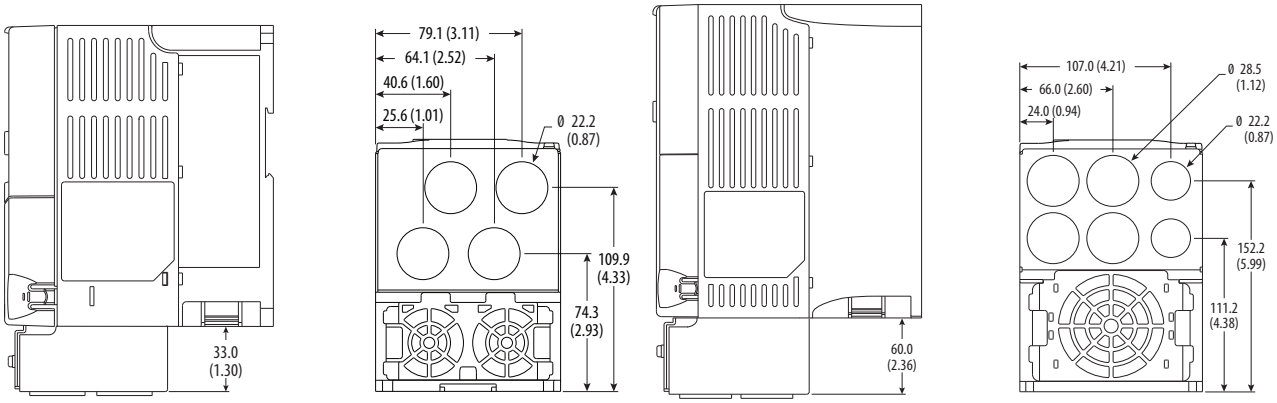
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IP30, NEMA/UL Type 1 Option Kit without Communication Options

PowerFlex 4 uses frames A and B. PowerFlex 40 uses frames B and C. Dimensions are in millimeters and (inches).



Frame A – 22-JBAA

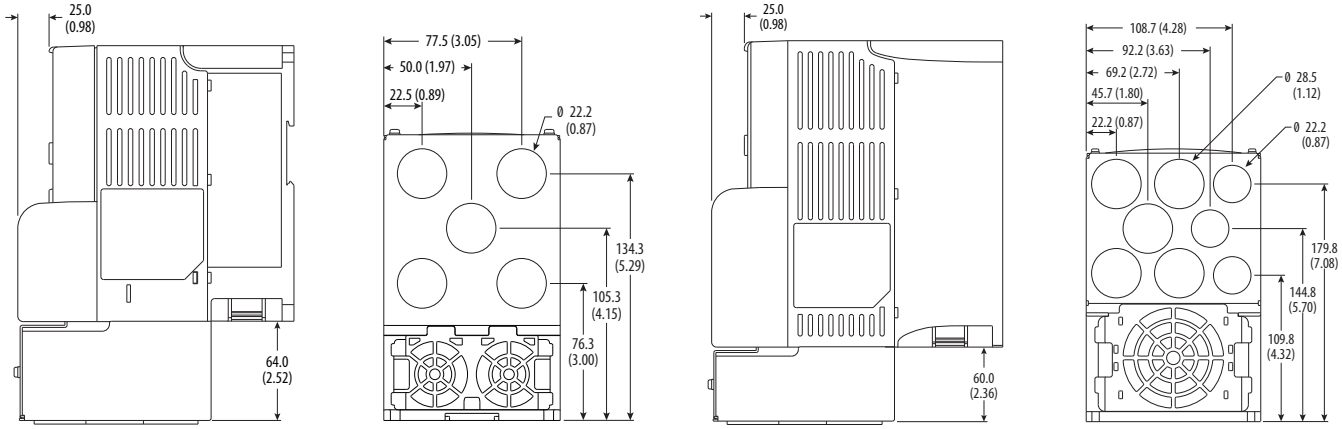


Frame B – 22-JBAB

Frame C – 22-JBAC

PowerFlex 40 IP30/NEMA 1/UL Type 1 Option Kit with Communication Option

Dimensions are in millimeters and (inches).



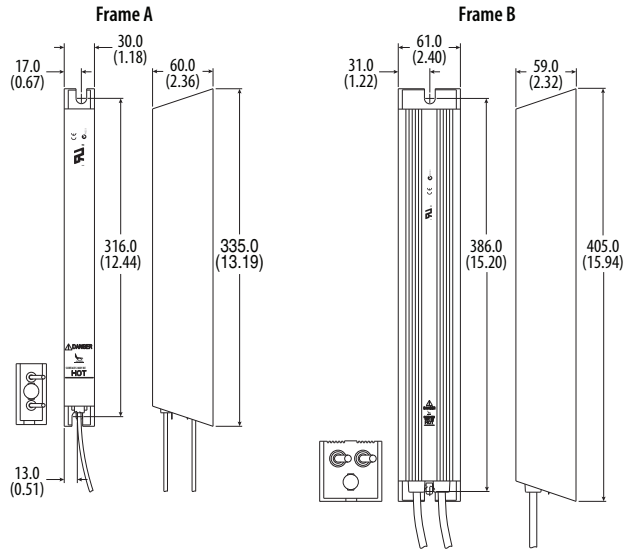
Frame B – 22-JBCB

Frame C – 22-JBCC

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Dynamic Brake Resistors

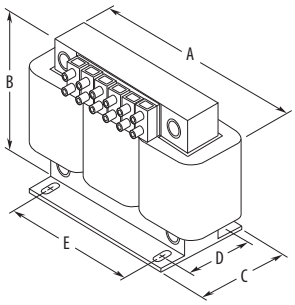
Dimensions are in millimeters and (inches).



Frame	Catalog Number
A	AK-R2-091P500, AK-R2-047P500, AK-R2-360P500
B	AK-R2-030P1K2, AK-R2-120P1K2

Bulletin 1321-3R Series Line Reactors

Dimensions are in millimeters and (inches). Weights are in kilograms and (pounds).



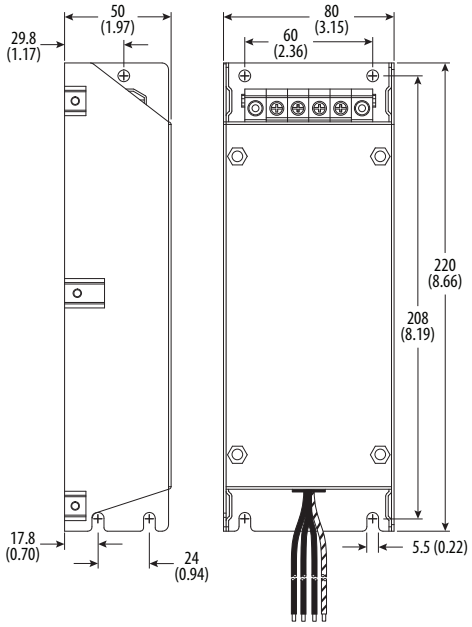
Catalog Number	A	B	C	D	E	Weight
1321-3R2-A	112 (4.40)	104 (4.10)	70 (2.75)	50 (1.98)	37 (1.44)	1.8 (4)
1321-3R2-B	112 (4.40)	104 (4.10)	70 (2.75)	50 (1.98)	37 (1.44)	1.8 (4)
1321-3R4-A	112 (4.40)	104 (4.10)	76 (3.00)	50 (1.98)	37 (1.44)	1.8 (4)
1321-3R4-B	112 (4.40)	104 (4.10)	76 (3.00)	50 (1.98)	37 (1.44)	1.8 (4)
1321-3R4-C	112 (4.40)	104 (4.10)	86 (3.38)	60 (2.35)	37 (1.44)	2.3 (5)
1321-3R8-A	152 (6.00)	127 (5.00)	76 (3.00)	53 (2.10)	51 (2.00)	3.1 (7)
1321-3R8-B	152 (6.00)	127 (5.00)	76 (3.00)	53 (2.10)	51 (2.00)	3.6 (8)
1321-3R8-C	152 (6.00)	127 (5.00)	85 (3.35)	63 (2.48)	51 (2.00)	4.9 (11)
1321-3R12-A	152 (6.00)	127 (5.00)	76 (3.00)	53 (2.10)	51 (2.00)	4.1 (9)
1321-3R12-B	152 (6.00)	127 (5.00)	76 (3.00)	53 (2.10)	51 (2.00)	4.5 (10)
1321-3R18-A	152 (6.00)	133 (5.25)	79 (3.10)	54 (2.13)	51 (2.00)	4.1 (9)
1321-3R18-B	152 (6.00)	133 (5.25)	86 (3.40)	63 (2.48)	51 (2.00)	5.4 (12)
1321-3R25-A	183 (7.20)	146 (5.76)	85 (3.35)	60 (2.35)	76 (3.00)	4.9 (11)
1321-3R35-A	193 (7.60)	146 (5.76)	91 (3.60)	66 (2.60)	76 (3.00)	6.3 (14)

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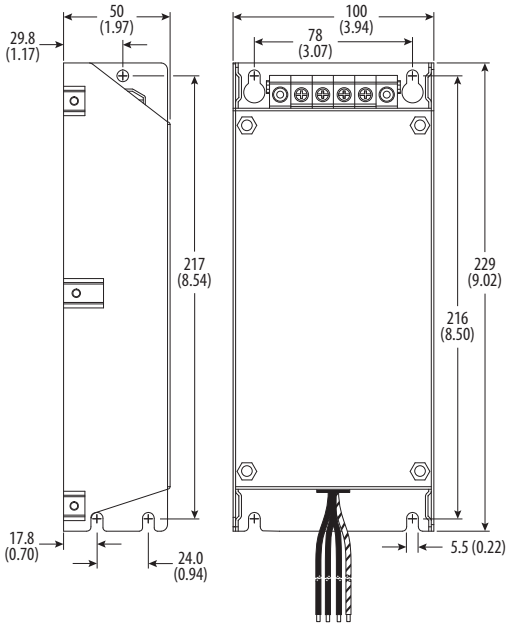
EMC Line Filters

Dimensions are in millimeters and (inches).

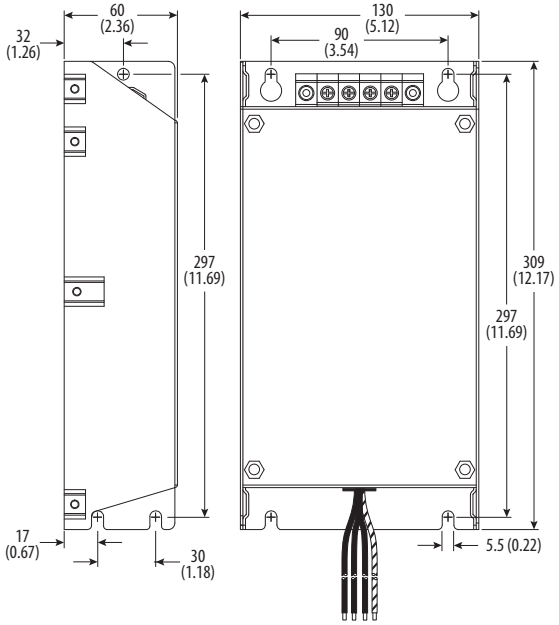
Frame A EMC Line Filters
Catalog Numbers: 22-RF5P7-AS, 22-RF5P7-AL; 22-RF9P5-AS, 22-RF9P5-AL; 22-RF010-AL



Frame B EMC Line Filters
Catalog Numbers: 22-RF8P0-BL, 22-RF012-BS, 22-RF012-BL; 22-RF018-BL; 22-RF021-BS, 22-RF021-BL



Frame C EMC Line Filters
Catalog Numbers: 22-RF015-CL; 22-RF018-CS, 22-RF018-CL; 22-RF024-CL; 22-RF025-CL; 22-RF026-CS, 22-RF026-CL; 22-RF034-CS, 22-RF034-CL

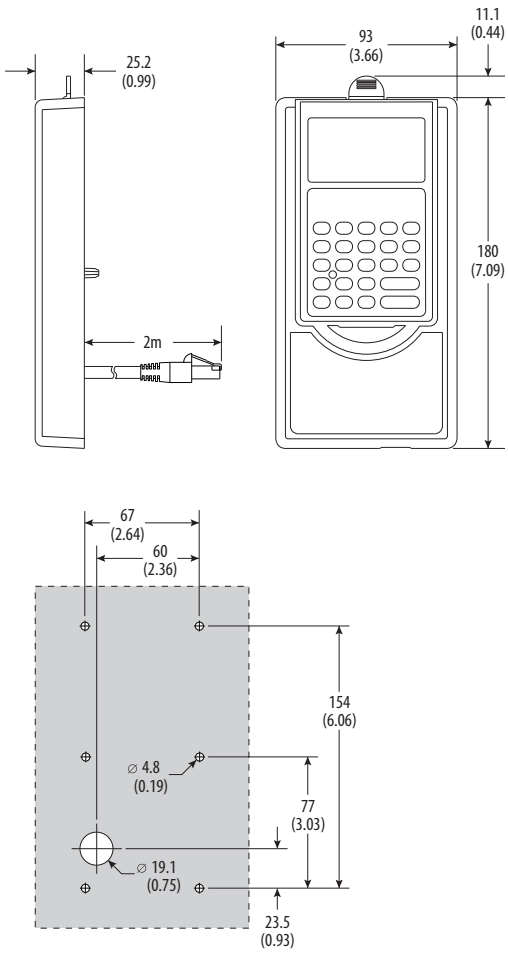


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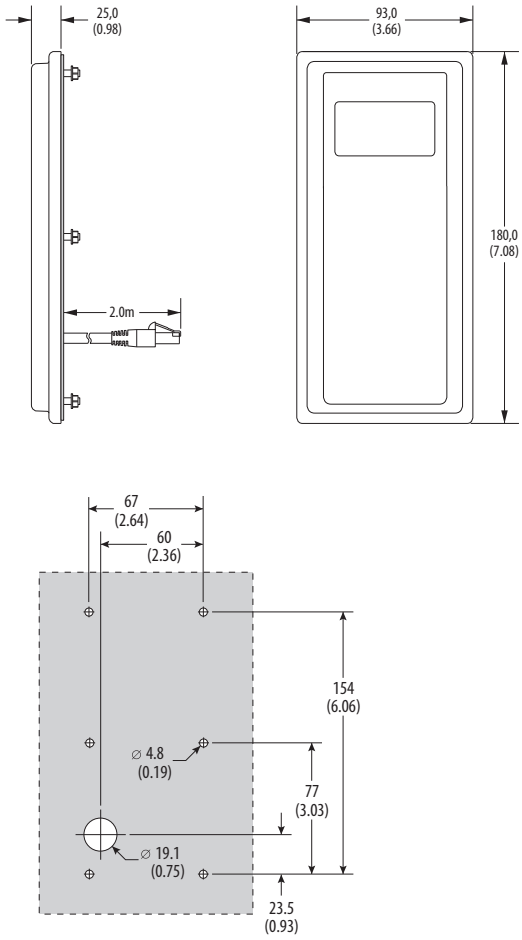
Human Interface Module (HIM) Dimensions

Dimensions are in millimeters and (inches).

NEMA Type 1 Bezel
Catalog Number: 22-HIM-B1



NEMA Type 4X/12 Remote (Panel Mount) HIM
Catalog Number: 22-HIM-C2S



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Additional Resources

These documents contain additional information concerning related products from Rockwell Automation. You can view or download publications at rok.auto/literature.

Resource	Description
PowerFlex 4 Adjustable Frequency AC Drive User Manual, publication 22A-UM001	Describes how to configure, use, and troubleshoot PowerFlex 4 drives.
PowerFlex 40 Adjustable Frequency AC Drive User Manual, publication 22B-UM001	Describes how to configure, use, and troubleshoot PowerFlex 40 drives.
PowerFlex Dynamic Braking Resistor Calculator Application Technique, publication PFLEX-AT001	Provides information on dynamic braking and how to determine dynamic braking requirements.
PowerFlex AC Drive Performance Specifications per Ecodesign Regulation (EU) 2019/1781 and UK SI 2021 No. 745 Technical Data, publication PFLEX-TD003	Provides specifications per Ecodesign Regulation (EU) 2019/1781 and UK SI 2021 No. 745, including efficiency class.
Drives in Common Bus Configurations Application Technique, publication DRIVES-AT002	Provide the necessary guidelines, considerations, and limitations for the proper application of PowerFlex drives used in common bus configurations.
Wiring and Grounding Guidelines for Pulse Width Modulated (PWM) AC Drives Installation Instructions, publication DRIVES-IN001	Describes how to install, protect, wire, and ground pulse-width modulated AC drives.
Preventive Maintenance Checklist of Industrial Control and Drive System Equipment Service Bulletin, publication DRIVES-TD001	Provides a checklist and guidelines for performing preventive maintenance.
EtherNet/IP Network Devices User Manual, publication ENET-UM006	Describes how to configure and use EtherNet/IP devices to communicate on the EtherNet/IP network.
Ethernet Reference Manual, publication ENET-RM002	Describes basic Ethernet concepts, infrastructure components, and infrastructure features.
Safety Guidelines for the Application, Installation, and Maintenance of Solid-state Control, publication SGI-1.1	Designed to harmonize with NEMA Standards Publication No. ICS 1.1-1987 and provides general guidelines for the application, installation, and maintenance of solid-state control in the form of individual devices or packaged assemblies incorporating solid-state components.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Selection and Configuration tools, rok.auto/systemtools	Helps configure complete, valid catalog numbers and build complete quotes based on detailed product information.
Rockwell Automation Global Short-circuit Current Ratings (SCCR) Tool, rok.auto/sccr	Provides coordinated high-fault branch circuit solutions for motor starters, soft starters, and component drives.
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.

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