

PowerFlex 40 Advanced Features

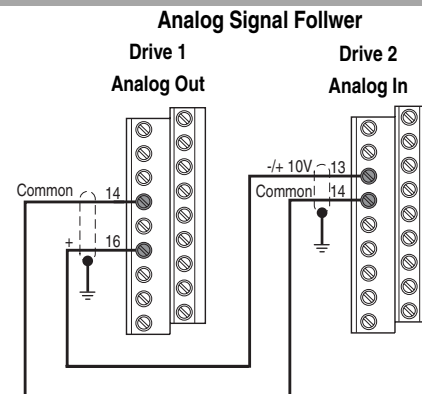
Performance

- **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 controlled by drive performing timer function. Timer is initiated by activating a digital input programmed as “Timer Start.”
 - **Counter function:** Relay or opto outputs controlled by drive performing counter function. Counter function is activated by a digital input programmed as “Counter Input.”
 - **Basic Logic:** Relay or opto outputs controlled by status of digital inputs 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 (2) 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 (3) fixed and four (4) fully programmable Digital Inputs** provide application versatility.
- **One (1) Analog Output** is DIP switch selectable for either 0-10V or 0-20mA. This scalable, 10-bit output is suitable for metering or as a speed reference for another drive.
- **Two (2) Opto Outputs** and one (1) form C relay output can be used to indicate various drive, motor or logic conditions.



Communications

- Integral communication cards such as **DeviceNet™**, **EtherNet/IP** and **Profibus** can improve machine performance.
- **Field installed option** allows for future addition of stand-alone drives to a network.
- **Online EDS file creation** with RS NetWorx providing ease of set-up on a network.

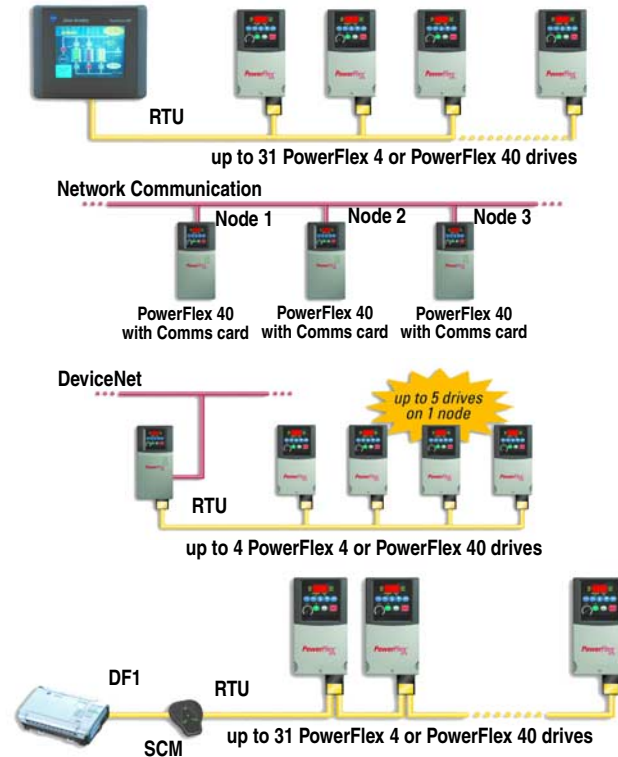


Shaded areas are applicable to PowerFlex 40 only.

For further information visit: www.abpowerflex.com or www.ab.com/support/abdrives

Versatile Programming and Network Solutions

- PowerFlex 4 and PowerFlex 40 are compatible with any device that acts as a 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.
 - DeviceNet
 - EtherNet/IP
 - Profibus
- A multi-drive solution can be reached using a single PowerFlex 40 DeviceNet option, with the ability for up to five (5) drives to reside on one (1) node.
- Integral RS485 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 a RTU Master.

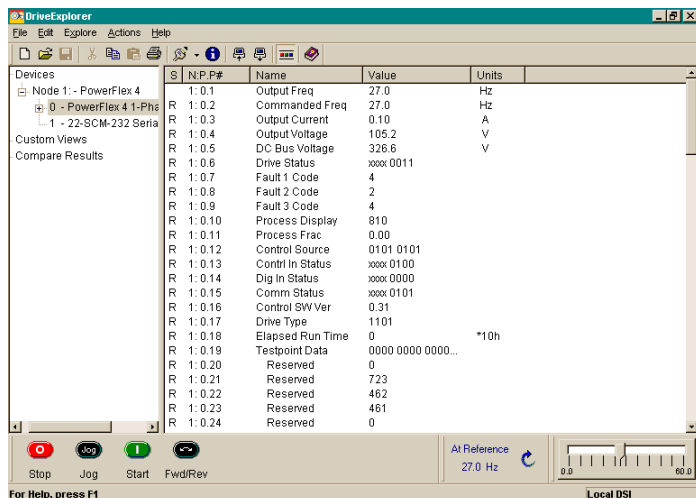


PC Programming Software

Through the use of a Serial Converter Module and DriveExplorer™ or DriveTools™ SP software, programming can be greatly simplified.

DriveExplorer Software

- View and modify drive and adapter parameters in a method similar to the file management capability of Microsoft Windows Explorer.
- Operate the drive via an on-screen Control Bar, which is a tool that allows you to start, stop, and change the speed reference of the drive.
- Save, restore and print parameter information.
- Compare current parameters with factory defaults or previously saved parameter values.
- Edit, upload and download parameters.



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 online drive
- Integrated HTML Help architecture

Feature Comparison

Use the chart below to assist in determining 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 (2.2) 3 HP/230V, 1ø (3.7) 5 HP/230V, 3ø (3.7) 5 HP/460V, 3ø	(1.1) 1.5 HP/115V, 1ø (2.2) 3 HP/230V, 1ø (7.5) 10 HP/230V, 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
NEMA 1/IP30 Option	●	●
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	V/Hz	Sensorless Vector & V/Hz
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 2 fully programmable	3 fixed for START/STOP/REV 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) ❶
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 RS485	●	●
RS232 (Requires use of Serial Converter Module)	●	●
DeviceNet		●
EtherNet/IP		●
Profibus		●

❶ When using bipolar input, the 0-10V unipolar input cannot be used.

Catalog Number Explanation

Position								
1-3	4	5	6-8	9	10	11	12(1)	13-14
22A	-	A	1P5	N	1	1	4	AA
Drive	Dash	Voltage Rating	Rating	Enclosure	HIM	Emission Class	Version	Optional

Code

22A PowerFlex 4
22B PowerFlex 40

Code Version

3 No Brake IGBT
4 Standard

Code Voltage Ph.

V 120V AC 1
A 240V AC 1
B 240V AC 3
D 480V AC 3
E 600V AC 3

Code Rating

0 Not Filtered
1 Filtered

Code Interface Module

1 Fixed Keypad

Code Purpose

AA Reserved for
Thru custom firmware
ZZ

Code Enclosure

N Panel Mount - IP 20 (NEMA Type Open)
F Flange Mount - IP 20 (NEMA Type Open)
H Replacement Plate Drive - IP 20 (NEMA Type Open)
- Contact factory for ordering information.

Output Current @ 100-120V Input

Code	Amps	kW (HP)
1P5	1.5	0.2 (0.25)
2P3	2.3	0.4 (0.5)
4P5	4.5	0.75 (1.0)
5P0	5.0	0.75 (1.0)
6P0	6.0	1.1 (1.5)

Output Current @ 200-240 Input, NO BRAKE (2)

Code	Amps	kW (HP)
1P4	1.4	0.2 (0.25)
2P1	2.1	0.4 (0.5)
3P6	3.6	0.75 (1.0)
6P8	6.8	1.5 (2.0)
9P6	9.6	2.2 (3.0)

Output Current @ 200-240V Input

Code	Amps	kW (HP)
1P5	1.5	0.2 (0.25)
2P3	2.3	0.4 (0.5)
4P5	4.5	0.75 (1.0)
5P0	5.0	0.75 (1.0)
8P0	8.0	1.5 (2.0)
012	12.0	2.2 (3.0)
017	17.5	3.7 (5.0)
024	24.0	5.5 (7.5)
033	33.0	7.5 (10.0)

Output Current @ 380-480V 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)
8P7	8.7	3.7 (5.0)
010	10.5	4.0 (5.0)
012	12.0	5.5 (7.5)
017	17.0	7.5 (10.0)
024	24.0	11.0 (15.0)

Output Current @ 460-600V 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	12.0	7.5 (10.0)
019	19.0	11.0 (15.0)

(1) Position 12 of the Catalog Number now indicates drive version. All PowerFlex 4 and 40 drives are equipped with RS485 communication.
(2) PowerFlex 4 option only.

Product Selection

Drive Ratings			PowerFlex 4			IP 20 Flange Mount	PowerFlex 40			IP 20 Flange Mount
Input Voltage	KW	HP	Output Current	Catalog Number	Frame Size	Catalog Number	Output Current	Catalog Number	Frame Size	Catalog Number
120V 50/60 Hz 1-Phase No Filter	0.2	0.25	1.5A	22A-V1P5N104	A	22A-V1P5F104	—	—	—	—
	0.4	0.5	2.3A	22A-V2P3N104	A	22A-V2P3F104	2.3A	22B-V2P3N104	B	22B-V2P3F104
	0.75	1.0	4.5A	22A-V4P5N104	B	22A-V4P5F104	5.0A	22B-V5P0N104	B	22B-V5P0F104
	1.1	1.5	6.0A	22A-V6P0N104	B	22A-V6P0F104	6.0A	22B-V6P0N104	B	22B-V6P0F104
240V 50/60 Hz 1-Phase NO BRAKE No Filter	0.2	0.25	1.4A	22A-A1P4N103	A	—	—	—	—	—
	0.4	0.5	2.1A	22A-A2P1N103	A	—	—	—	—	—
	0.75	1.0	3.6A	22A-A3P6N103	A	—	—	—	—	—
	1.5	2.0	6.8A	22A-A6P8N103	B	—	—	—	—	—
	2.2	3.0	9.6	22A-A9P6N103	B	—	—	—	—	—
240V 50/60 Hz 1-Phase NO BRAKE With Integral “S Type” EMC Filter ❶	0.2	0.25	1.4A	22A-A1P4N113	A	—	—	—	—	—
	0.4	0.5	2.1A	22A-A2P1N113	A	—	—	—	—	—
	0.75	1.0	3.6A	22A-A3P6N113	A	—	—	—	—	—
	1.5	2.0	6.8A	22A-A6P8N113	B	—	—	—	—	—
	2.2	3.0	9.6	22A-A9P6N113	B	—	—	—	—	—
240V 50/60 Hz 1-Phase With Integral “S Type” EMC Filter ❶	0.2	0.25	1.5A	22A-A1P5N114	A	—	—	—	—	—
	0.4	0.5	2.3A	22A-A2P3N114	A	—	2.3A	22B-A2P3N114	B	—
	0.75	1.0	4.5A	22A-A4P5N114	A	—	5.0A	22B-A5P0N114	B	—
	1.5	2.0	8.0A	22A-A8P0N114	B	—	8.0A	22B-A8P0N114	B	—
	2.2	3.0	—	—	—	—	12.0A	22B-A012N114	C	—
240V 50/60 Hz 1-Phase No Filter	0.2	0.25	1.5A	22A-A1P5N104	A	22A-A1P5F104	—	—	—	—
	0.4	0.5	2.3A	22A-A2P3N104	A	22A-A2P3F104	2.3A	22B-A2P3N104	B	22B-A2P3F104
	0.75	1.0	4.5A	22A-A4P5N104	A	22A-A4P5F104	5.0A	22B-A5P0N104	B	22B-A5P0F104
	1.5	2.0	8.0A	22A-A8P0N104	B	22A-A8P0F104	8.0A	22B-A8P0N104	B	22B-A8P0F104
	2.2	3.0	—	—	—	—	12.0A	22B-A012N104	C	22B-A012F104
240V 50/60 Hz 3-Phase No Filter	0.2	0.25	1.5A	22A-B1P5N104	A	22A-B1P5F104	—	—	—	—
	0.4	0.5	2.3A	22A-B2P3N104	A	22A-B2P3F104	2.3A	22B-B2P3N104	B	22B-B2P3F104
	0.75	1.0	4.5A	22A-B4P5N104	A	22A-B4P5F104	5.0A	22B-B5P0N104	B	22B-B5P0F104
	1.5	2.0	8.0A	22A-B8P0N104	A	22A-B8P0F104	8.0A	22B-B8P0N104	B	22B-B8P0F104
	2.2	3.0	12.0A	22A-B012N104	B	22A-B012F104	12.0A	22B-B012N104	B	22B-B012F104
	3.7	5.0	17.5A	22A-B017N104	B	22A-B017F104	17.5A	22B-B017N104	B	22B-B017F104
	5.5	7.5	—	—	—	—	24.0A	22B-B024N104	C	22B-B024F104
	7.5	11	—	—	—	—	33.0A	22B-B033N104	C	22B-B033F104
480V 50/60 Hz 3-Phase No Filter	0.4	0.5	1.4A	22A-D1P4N104	A	22A-D1P4F104	1.4A	22B-D1P4N104	B	22B-D1P4F104
	0.75	1.0	2.3A	22A-D2P3N104	A	22A-D2P3F104	2.3A	22B-D2P3N104	B	22B-D2P3F104
	1.5	2.0	4.0A	22A-D4P0N104	A	22A-D4P0F104	4.0A	22B-D4P0N104	B	22B-D4P0F104
	2.2	3.0	6.0A	22A-D6P0N104	B	22A-D6P0F104	6.0A	22B-D6P0N104	B	22B-D6P0F104
	3.7	5.0	8.7A	22A-D8P7N104	B	22A-D8P7F104	—	—	—	—
	4.0	5.0	—	—	—	—	10.5A	22B-D010N104	B	22B-D010F104
	5.5	7.5	—	—	—	—	12.0A	22B-D012N104	C	22B-D012F104
	7.5	10.0	—	—	—	—	17.0A	22B-D017N104	C	22B-D017F104
	11.0	15.0	—	—	—	—	24.0A	22B-D024N104	C	22B-D024F104
	600V 50/60 Hz 3-Phase No Filter	0.75	1.0	—	—	—	—	1.7A	22B-E1P7N104	B
1.5		2.0	—	—	—	—	3.0A	22B-E3P0N104	B	22B-E3P0F104
2.2		3.0	—	—	—	—	4.2A	22B-E4P2N104	B	22B-E4P2F104
4.0		5.0	—	—	—	—	6.6A	22B-E6P6N104	B	22B-E6P6F104
5.5		7.5	—	—	—	—	9.9A	22B-E9P9N104	C	22B-E9P9F104
7.5		10.0	—	—	—	—	12.0A	22B-E012N104	C	22B-E012F104
11.0		15.0	—	—	—	—	19.0A	22B-E019N104	C	22B-E019F104

❶ This filter is suitable for use with a cable length of at least 10 meters for Class A and 1 meter for Class B environments.

Shaded areas denote options for PowerFlex 40 only.

For further information visit: www.abpowerflex.com or www.ab.com/support/abdrives

User Installed Options

IP30/NEMA 1/UL Type 1 Conversion Kit

Item	Description	Drive Frame	PowerFlex 4 Catalog Number ②	PowerFlex 40 Catalog Number ②
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

Human Interface Module Option Kits and Accessories

Item	Description	Catalog Number ②
Remote Human Interface Modules (HIMs)	LCD Display, Remote Panel Mount, Digital Speed Control, Full Numeric Keypad, CopyCat capable, IP66 (NEMA Type 4X/12) indoor use only, Includes 2.9 meter cable.	22-HIM-C2S ① 22-HIM-C2
	LCD Display, Remote Handheld, Digital Speed Control, Full Numeric Keypad, CopyCat capable, IP30 (NEMA Type 1), Includes 1.0 meter cable, Panel Mount with 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 Meter (3.3 Feet) 2.9 Meter (9.51 Feet)	22-HIM-H10
		22-HIM-H30

Communication Option Kits

Item	Description	Catalog Number ②
Serial Converter Module (RS485 to RS232)	Provides serial communication via DF1 protocol for use with DriveExplorer™ and DriveExecutive™ software. Smart Self-powered Serial Converter (RS-232) includes: DSI to RS232 serial converter DriveExplorer Lite Version 3.01 or later 1203-SFC and 22-RJ45CBL-C20 Cables	22-SCM-232
DSI Cable	2.0 meter RJ45 to RJ45 cable, male to male connectors.	22-RJ45CBL-C20
Communication Adapters	Embedded communication option for use with the PowerFlex family of drives. Requires a Communication Adapter Cover (Ordered Separately). DeviceNet EtherNet/IP Profibus	22-COMM-D 22-COMM-E 22-COMM-P
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
Serial Cable	2.0 meter serial cable with a locking low profile connector to connect to the serial converter and a 9-pin sub-miniature D female connector to connect to a computer.	1203-SFC
Null Cable Converter	For use when connecting the serial converter to DriveExplorer on a handheld PC.	1203-SNM
Splitter Cable	RJ45 one to two port splitter cable.	AK-U0-RJ45-SC1
Terminating Resistors	RJ45 120 Ohm resistor (2 pieces).	AK-U0-RJ45-TR1
Terminal Block	RJ45 Two position terminal block (5 pieces).	AK-U0-RJ45-TB2P

PC Programming Software

Item	Description	Catalog Number
DriveTools SP Software, Version 2.02 or later	“Windows” based software package that provides an intuitive means for monitoring or configuring Allen-Bradley drives and communications adapters online and offline. Compatibility: Windows 98, ME, NT, 4.0 (Service Pack 3 or later), 2000 and XP. ③	9303-4DTE01ENE
DriveExplorer™ Software, Version 4.02 or later	“Windows” based software package that provides an intuitive means for monitoring or configuring Allen-Bradley drives and communications adapters online and offline. Compatibility: Windows 98, ME, NT, 4.0 (Service Pack 3 or later), 2000 and XP. ③	9306-4EXP01ENE

① The 22-HIM-C2S is smaller than the 22-HIM-C2 and cannot be used as a direct replacement.

② For pricing information, refer to the PowerFlex 4 and 40 AC Drives Price List, publication 22-PL001x-EN-P.

③ See www.ab.com/drive/ for support devices.

User Installed Options

DC Bus Inductors

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

Dynamic Brake Resistors

Drive Ratings			PowerFlex 4	PowerFlex 40
Input Voltage	kW	HP	Catalog Number ❶	Catalog Number ❶
120V 50/60 Hz 1-Phase	0.2	0.25	AK-R2-091P500	–
	0.4	0.5	AK-R2-091P500	–
	0.75	1.0	AK-R2-091P500	–
	1.1	1.5	AK-R2-091P500	–
240V 50/60 Hz 1-Phase	0.2	0.25	AK-R2-091P500	–
	0.4	0.5	AK-R2-091P500	–
	0.75	1.0	AK-R2-091P500	–
	1.5	2.0	AK-R2-091P500	–
	2.2	3.0	–	AK-R2-047P500
240V 50/60 Hz 3-Phase	0.2	0.25	AK-R2-091P500	–
	0.4	0.5	AK-R2-091P500	–
	0.75	1.0	AK-R2-091P500	–
	1.5	2.0	AK-R2-091P500	–
	2.2	3.0	AK-R2-047P500	–
	3.7	5.0	AK-R2-047P500	–
	5.5	7.5	–	AK-R2-030P1K2
7.5	10.0	–	AK-R2-030P1K2	
480V 50/60 Hz 3-Phase	0.4	0.5	AK-R2-360P500	–
	0.75	1.0	AK-R2-360P500	–
	1.5	2.0	AK-R2-360P500	–
	2.2	3.0	AK-R2-120P1K2	–
	4.0	5.0	AK-R2-120P1K2	–
	5.5	7.5	–	AK-R2-120P1K2
600V 50/60 Hz 3-Phase No Filter	0.75	1.0	–	AK-R2-360P500
	1.5	2.0	–	AK-R2-360P500
	2.2	3.0	–	AK-R2-120P1K2
	4.0	5.0	–	AK-R2-120P1K2
	5.5	7.5	–	AK-R2-120P1K2
	7.5	10.0	–	AK-R2-120P1K2
11.0	15.0	–	AK-R2-120P1K2❷	

❶ Resistors listed in this table are rated for a minimum 5% duty cycle. See publication no. PFLEX-AT001x-EN-P for additional information.

❷ Requires two resistors wired in parallel.

3% Line Reactors

Input Voltage	kW	HP	Fundamental Amps	Max Contin- uous Amps	Inductance mh	Watts Loss	Catalog Number ❶	
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	
	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		

❶ Catalog numbers listed are for 3% impedance open style units. NEMA Type 1 and 5% impedance reactor types are also available. Refer to publication 1321-TD001x-EN-P.

Shaded areas are applicable to PowerFlex 40 only.

For further information visit: www.abpowerflex.com or www.ab.com/support/abdrives

User Installed Options

PowerFlex 4 EMC Filters

Drive Ratings			S Type Filter	L Type Filter
Input Voltage	kW	HP	Catalog Number ❶	Catalog Number ❷
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	❸	22-RF010-AL
	0.4	0.5	❸	22-RF010-AL
	0.75	1.0	❸	22-RF010-AL
	1.5	2.0	❸	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

PowerFlex 40 EMC Filters

Drive Ratings			S Type Filter	L Type Filter	
Input Voltage	kW	HP	Catalog Number ❶	Catalog Number ❷	
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	❸	22-RF018-BL	
	0.75	1.0	❸	22-RF018-BL	
	1.5	2.0	❸	22-RF018-BL	
	2.2	3.0	❸	22-RF025-CL	
240V 50/60 Hz 3-Phase	0.4	0.5	22-RF021-BS ❹	22-RF021-BL	
	0.75	1.0	22-RF021-BS ❹	22-RF021-BL	
	1.5	2.0	22-RF021-BS ❹	22-RF021-BL	
	2.2	3.0	22-RF021-BS ❹	22-RF021-BL	
	3.7	5.0	22-RF021-BS ❹	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
480V 50/60 Hz 3-Phase	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-RF008-BL
		1.5	2.0	–	22-RF008-BL
2.2		3.0	–	22-RF008-BL	
4.0		5.0	–	22-RF008-BL	
5.5		7.5	–	22-RF015-CL	
7.5		10.0	–	22-RF015-CL	
11.0		15.0	–	22-RF024-CL	

- ❶ This filter is suitable for use with a cable length up to 10 meters for Class A and 1 meter for Class B environments.
- ❷ This filter is suitable for use with a cable length up to 100 meters for Class A and 5 meters for Class B environments.
- ❸ Drives are available in these ratings with internal "S Type" filters.
- ❹ Filter must be Series B or later.

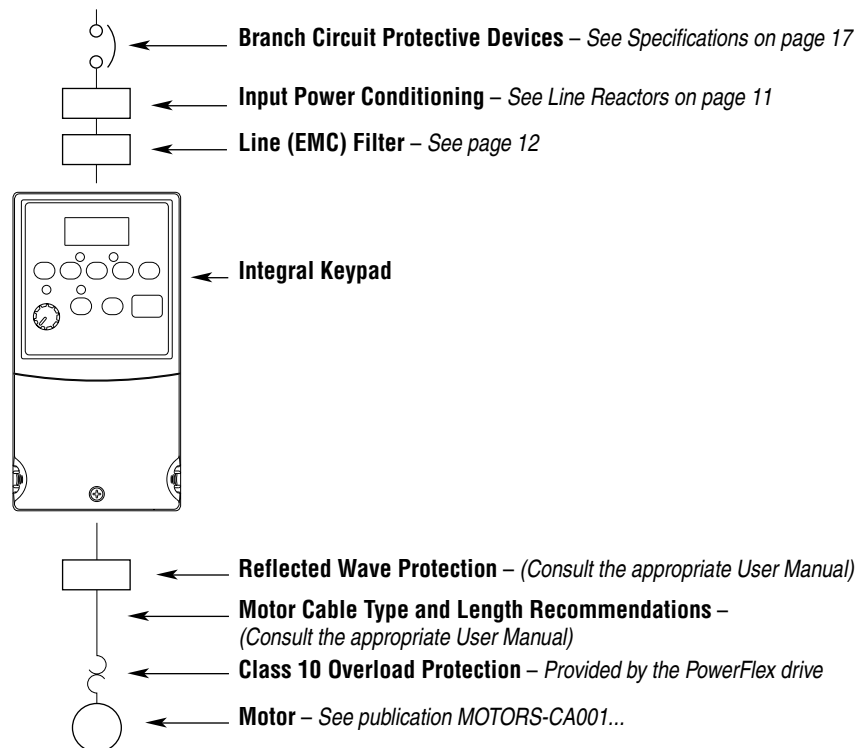
Installation Considerations

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

- Ground fault protection while starting and running ensures reliable operation
- Electronic motor overload protection increases motor life
- Removable MOV to ground ensures compatibility with ungrounded systems
- 6kV 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 or PowerFlex 40 *User Manual*, Publications 22A-UM001... or 22B-UM001... available online at www.ab.com/manuals/dr, for detailed recommendations on input power conditioning, CE conformance (EMC filtering), dynamic braking, reflected wave protection, motor cable types and motor cable distances.

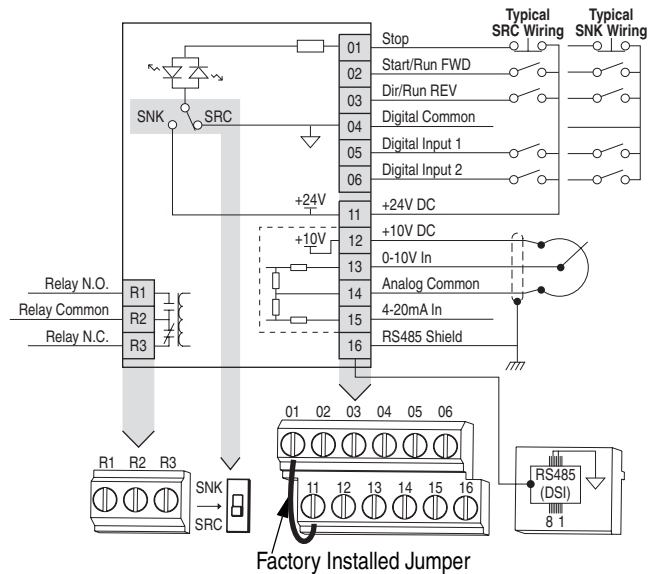
Block Diagram



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 screw driver.
- 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- 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
 - Jog
 - Second Accel/Decel
 - Clear Fault
 - Preset Frequencies
 - RS485 Control
 - Auxiliary 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 installed between I/O Terminals 01 and 11 to allow out of box operation from the keypad.



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.

	30V DC	125V AC	240V AC
Resistive	3.0 A	3.0 A	3.0 A
Inductive	0.5 A	0.5 A	0.5 A

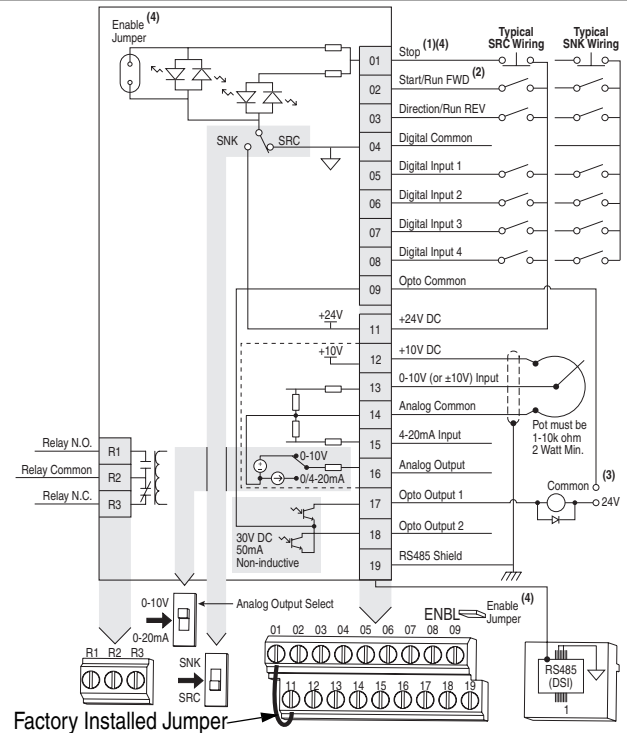
Sink/Source DIP Switch	Source (SRC)	Inputs can be wired as Sink (SNK) or Source (SRC) via DIP Switch setting.	
01	Stop ⁽¹⁾	Coast	The factory installed jumper or a normally closed input must be present for the drive to start.
02	Start/Run FWD	Not Active	Command comes from the integral keypad by default. 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 100mA.
12	+10V DC	–	Drive supplied power for 0-10V external potentiometer. Maximum output current is 15mA.
13	0-10V In ⁽¹⁾	Not Active	For external 0-10V input supply (input impedance = 100k ohm) or potentiometer wiper.
14	Analog Common	–	For 0-10V In or 4-20mA In. Electronically isolated with analog inputs from digital I/O.
15	4-20mA In ⁽¹⁾	Not Active	For external 4-20mA input supply (input impedance = 250 ohm).
16	RS485 (DSI) Shield	–	Terminal should be connected to safety ground - PE when using the RS485 (DSI) communications port.

⁽¹⁾ Only one analog frequency source may be connected at a time. If more than one reference is connected at the same time, an undetermined frequency reference will result.

Control Wiring

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 screw driver.
- 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- 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, RS485 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 installed between I/O Terminals 01 and 11 to allow out of box operation from the keypad.



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	-	
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 100mA.
12	+10V DC	-	Referenced to Analog Common. Drive supplied power for 0-10V external potentiometer. Maximum output current is 15mA.
13	±10V In (1)	Not Active	For external 0-10V (unipolar) or ±10V (bipolar) input supply (input impedance = 100k ohm) or potentiometer wiper.
14	Analog Common	-	For 0-10V In or 4-20mA In. Electronically isolated with analog inputs and outputs from digital I/O and opto outputs.

Control Wiring

No.	Signal	Default	Description
15	4-20mA In (1)	Not Active	For external 4-20mA input supply (input impedance = 250 ohm).
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 0-20mA. Program with A065 [Analog Out Sel]. Max analog value can be scaled with A066 [Analog Out High]. Maximum Load:4-20mA = 525 ohm (10.5V) 0-10V = 1k ohm (10mA)
17	Opto Output 1	MotorRunning	Program with A058 [Opto Out1 Sel]
18	Opto Output 2	At Frequency	Program with A061 [Opto Out2 Sel]
19	RS485 (DSI) Shield	-	Terminal should be connected to safety ground - PE when using the RS485 (DSI) communications port.

(1) 0-10V In and 4-20mA 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.

Specifications

Drive Ratings — PowerFlex 4

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

❶ Recommended Fuse Type: UL Class J, CC, T or Type BS88; 600V (550V) or equivalent.

❷ Refer to Bulletin 140M Motor Protectors Selection Guide, publication 140-SG001... to determine the frame and breaking capacity required for your application.

❸ 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.

Shaded areas are applicable to PowerFlex 40 only.

Specifications

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 Motor Protectors ②	Contactors	Internal	Total
100 - 120V AC – 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	100-C12	9	30
22B-V5P0N104	0.75 (1.0)	5.0	90-132	2.45	20.3	35	140M-D8E-C20	100-C23	12	55
22B-V6P0N104	1.1 (1.5)	6.0	90-132	3.0	24.0	40	140M-F8E-C32	100-C37	12	70
200 - 240V AC – 1-Phase Input, 0 - 230V 3-Phase Output ③										
22B-A2P3N104	0.4 (0.5)	2.3	180-264	1.15	6.0	10	140M-C2E-B63	100-C09	9	30
22B-A5P0N104	0.75 (1.0)	5.0	180-264	2.45	12.0	20	140M-C2E-C16	100-C12	12	55
22B-A8P0N104	1.5 (2.0)	8.0	180-264	4.0	18.0	30	140M-D8E-C20	100-C23	16	80
22B-A012N104	2.2 (3.0)	12.0	180-264	5.5	25.0	40	140M-F8E-C32	100-C37	11	110
200 - 240V AC – 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	100-C07	9	30
22B-B5P0N104	0.75 (1.0)	5.0	180-264	2.45	5.7	10	140M-C2E-C10	100-C09	12	55
22B-B8P0N104	1.5 (2.0)	8.0	180-264	4.0	9.5	15	140M-C2E-C16	100-C12	16	80
22B-B012N104	2.2 (3.0)	12.0	180-264	5.5	15.5	25	140M-C2E-C16	100-C23	16	115
22B-B017N104	3.7 (5.0)	17.5	180-264	8.6	21.0	35	140M-F8E-C25	100-C23	16	165
22B-B024N104	5.5 (7.5)	24.0	180-264	11.8	26.1	40	140M-F8E-C32	100-C37	28	225
22B-B033N104	7.5 (10.0)	33.0	180-264	16.3	34.6	60	140M-G8E-C45	100-C60	28	290
380 - 480V AC – 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	100-C07	15	30
22B-D2P3N104	0.75 (1.0)	2.3	342-528	2.3	3.2	6	140M-C2E-B40	100-C07	13	40
22B-D4P0N104	1.5 (2.0)	4.0	342-528	4.0	5.7	10	140M-C2E-B63	100-C09	13	60
22B-D6P0N104	2.2 (3.0)	6.0	342-528	5.9	7.5	15	140M-C2E-C10	100-C09	17	90
22B-D010N104	4.0 (5.0)	10.5	342-528	10.3	13.0	20	140M-C2E-C16	100-C23	14	150
22B-D012N104	5.5 (7.5)	12.0	342-528	11.8	14.2	25	140M-D8E-C20	100-C23	23	160
22B-D017N104	7.5 (10.0)	17.0	342-528	16.8	18.4	30	140M-D8E-C20	100-C23	24	200
22B-D024N104	11.0 (15.0)	24.0	342-528	23.4	26.0	50	140M-F8E-C32	100-C43	25	285
460 - 600V AC – 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	100-C09	13	40
22B-E3P0N104	1.5 (2.0)	3.0	414-660	3.65	3.8	6	140M-C2E-B40	100-C09	13	60
22B-E4P2N104	2.2 (3.0)	4.2	414-660	5.2	5.3	10	140M-C2E-B63	100-C09	17	90
22B-E6P6N104	4.0 (5.0)	6.6	414-660	8.1	8.3	15	140M-C2E-C10	100-C09	14	150
22B-E9P9N104	5.5 (7.5)	9.9	414-660	12.1	11.2	20	140M-C2E-C16	100-C16	23	160
22B-E012N104	7.5 (10.0)	12.2	414-660	14.9	13.7	25	140M-C2E-C16	100-C23	24	200
22B-E019N104	11.0 (15.0)	19.0	414-660	23.1	24.1	40	140M-D8E-C25	100-C30	25	285

① Recommended Fuse Type: UL Class J, CC, T or Type BS88; 600V (550V) or equivalent.

② Refer to Bulletin 140M Motor Protectors Selection Guide, publication 140-SG001... to determine the frame and breaking capacity required for your application.

③ 200-240V AC - 1-Phase drives are also available with an integral EMC filter. Catalog suffix changes from N104 to N114 or N103 to N113.