Allen-Bradley

Technical Data

PowerFlex® 70 AC Drives

Allen-Bradley
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Bringing Together Leading Brands in Industrial Automation

PowerFlex® 70 AC Drive Technical Data

Optimized Simplicity

PowerFlex® 70 drives are designed to worldwide standards providing out-of-the-box performance around the globe. Available ratings include: 0.5 to 25 Hp output at 240V ac input, 0.5 to 50 Hp output at 480V ac input, 0.5 to 50 Hp output at 600V ac input.

The PowerFlex 70 drive can be used with a full featured LCD Human Interface Module, which provides multilingual text for startup, metering, programming and troubleshooting.

The PowerFlex 70 can be programmed for either Volts per Hertz, Sensorless Vector or Vector Control with Force Technology to cover a wide range of applications from fans to extruders.

Optional internal communication modules provide fast and efficient control and/or data exchange with host controllers over popular interfaces. These interfaces include: DeviceNet™, EtherNet, ControlNet™, Remote I/O, Serial Communications and other open control and communication networks. PC tools such as DriveExplorer™ and DriveTools™ SP assist with programming, monitoring, and troubleshooting the PowerFlex 70.

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Product Overview

Flexible Packaging and Mounting

IP20, NEMA Type 1 – For conventional mounting inside or outside a control cabinet. Conduit plate is vertically removable for easy installation and replacement without disturbing conduit.

IP66, NEMA Type 4X/12 (Indoor Use) – For mounting directly in the production environment. Listed by UL to resist dust, dirt, etc. and to survive high pressure water spray. Also certified by NSF to assure conformity with international food equipment standards.

Flange Type – For mounting heatsink through back of an enclosure, thus removing a large portion of the heat inside a cabinet. The backside is rated IP66 and UL (NEMA) Type 4X/12 for both indoor and outdoor use.

Space Saving Hardware Features

Zero Stacking™ - Drives can be mounted directly next to one another with no reduction of ambient temperature rating (50° C).

Integral EMC Filtering provides a compact, all-in-one package solution for meeting EMC requirements, including CE in Europe.

Integral Dynamic Brake Transistor delivers a cost-effective means of switching regenerative energy without costly external chopper circuits.

Internal Dynamic Brake Resistor requires no extra panel space, and supplies a large amount of braking torque for short periods.

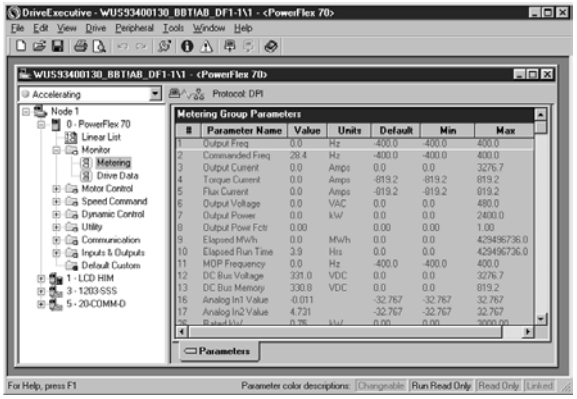
Easy to Use Human Interface Tools

PowerFlex 7-Class LCD Human Interface Modules provide:

- Large and easy to read 7 line backlit display
- Variety of languages (English, French, German, Italian, Spanish, Portuguese, Dutch)
- Alternate function keys for shortcuts to common tasks
- “Calculator-like” number pad for fast and easy data entry (Full Numeric version only)
- Control keys for local start, stop, speed, and direction
- Remote versions for panel mount applications

Family of PC based configuration tools:

- **DriveExplorer and DriveExplorer Lite**: A simple and flexible “On-line” tool for monitoring and configuration while connected to a drive.
- **DriveTools™ SP**: A suite of software tools which provide an intuitive means for programming, troubleshooting and maintaining Allen-Bradley AC and DC drives.



Control and Performance Features

Vector Control with Force Technology ❶ provides outstanding torque and speed regulation, with or without encoder feedback.

Sensorless Vector Control develops high torque over a wide speed range, and adapts to individual motor characteristics.

Fast acting **Current Limit** and **Bus Voltage Regulation** result in maximum acceleration and deceleration without tripping.

Flying Start delivers smooth connection into rotating loads, regardless of commanded direction, without the need for any speed feedback device.

PI Control can eliminate the need for a separate process loop controller.

Inertia Ride-Through offers tripless operation during a prolonged power outage by using the rotating energy stored in high inertia, low friction loads.

User Sets, allowing up to three complete sets of parameter data, can be individually loaded for different batch processes.

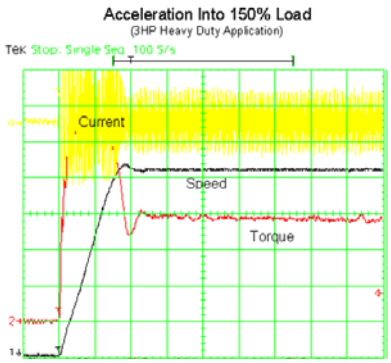
Slip compensation delivers minimum of 0.5% open loop speed regulation across a wide speed range, eliminating the need for speed feedback devices in some applications.

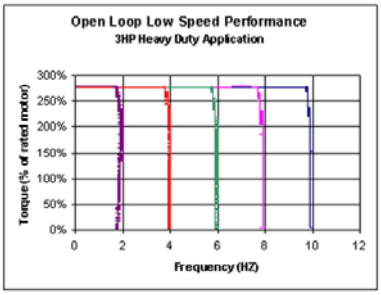
Safe Off Option ❶, the first offering available within the DriveGuard™ series of safety solutions, prevents a drive from delivering rotational energy to motors by integrating a safety circuit with the drive's power switching signals. This solution meets EN 954-1, Category 3.

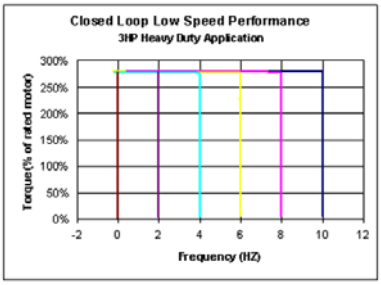
Droop Control ❶ for load sharing applications.

Sleep/Wake Control ❶ for analog control of start and stop.

❶ Feature available for Enhanced Control only.

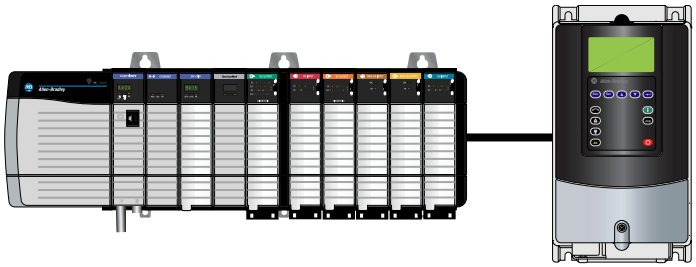






Unsurpassed Capability in Network Communications

PowerFlex 70 drives are fully compatible with Allen-Bradley drive's wide variety of DPI communication adapters, offering the following benefits:



DeviceNet	ControlNet	EtherNet/IP	Remote I/O	RS-485 DF1	PROFIBUS	Interbus	LonWorks	Modbus RTU	Metasys N2	Siemens P1 FLN	Bluetooth®	
✔	✔	✔										**(Unconnected Messaging)** permits other network devices (e.g. PanelView) to communicate directly to a drive without routing the communication through the network scanner.
✔	✔	✔		✔							✔	**Adapter Routing** -- Plug PC into one drive and talk to other Allen-Bradley drives on same network, without being routed through the network scanner.
✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	**Access to 100% of all parameters** over the network.
✔		✔			✔						✔	**AutoBaud** capability makes initial connections less problematic.
✔												**Change Of State** significantly reduces network traffic by configuring control messages to be sent only upon customer defined states. Very flexible configuration for each node (Example: "reference must change by more than 5%").
✔		✔										**Peer Control** provides master slave type control between drives, where one or more slave drives (consumers) can run based on the status of a master drive (producer), which can also significantly reduce network traffic.
✔												**ADR (Automatic Device Replacement)** saves significant time and effort when replacing a drive, by allowing the scanner to be configured to automatically detect a new drive and download the required parameter settings.
✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	**Flexible Fault Configuration** – Adapters can be programmed to take fault based actions such as ramp to stop, cost to stop, and hold last state, as well as send user configurable logic control and speed reference values. In addition, different actions can be taken based on whether the network experienced a serious problem (broken cable etc.) versus a network idle condition (PLC set to "Program").

Catalog Number Explanation

20A	B	2P1	A	3	A	Y	Y	N	N	C	0
Drive	Voltage Rating	Rating	Enclosure	HIM (1)	Documentation	Brake IGBT	Brake Resistor	Emission Class	Comm Slot	Control & I/O (3)	Feedback

Drive

Code	Type
20A	70

Voltage Rating

Code	Voltage	Ph.
B	240V ac	3
C	400V ac	3
D	480V ac	3
E	600V ac	3

Rating — see Output Current tables below.

Enclosure

Code	Enclosure
A	Panel Mount - IP 20, NEMA Type 1
C	Wall/Machine Mount = IP66, NEMA 4X/12 (Indoor Use)
F	Flange Mount - Front = IP 20, NEMA Type 1; Heatsink = IP66, NEMA Type 4X/12
G	Wall/Machine Mount = IP54, NEMA Type 12

HIM (1)

Code	Interface Module
0	Blank HIM
2	Digital LCD HIM
3	Full Numeric LCD HIM
5	Prog. Only LCD HIM

Documentation

Code	Type
A	English Manual (2)
N	No Manual

Brake IGBT

Code	w/Brake IGBT
Y	Yes

Brake Resistor

Code	w/Brake Resistor
Y	Yes
N	No

Emission Class

Code	Rating
A	Filtered (Excluding 600V ac)
	A(4) & B Frames (Optional)
	C, D & E Frames (Standard)
N	Not Filtered
	A & B Frames (Optional)
	C, D & E Frames NA (600V ac only)

Comm Slot

Code	Version
C	ControlNet (Coax)
D	DeviceNet
E	EtherNet/IP
H	RS485 HVAC
R	RIO
S	RS485 DF-1
N	N/A

Control & I/O (3)

Code	Control	Safe-Off
N	Standard	N/A
C	Enhanced	No
G(5)	Enhanced	Yes

Feedback

Code	Feedback
N	N/A
0	None
1	5V/12V Encoder

(1) IP66, NEMA 4X/12 (Code C) is available only with HIM codes 0, 3, or 5.
(2) Multilingual Quick Start also included.
(3) Frame E ratings are only available with Enhanced Control.
(4) Increases A Frame size to B.
(5) Not available as factory installed option for 600V ratings.

Output Current @ 600V 60Hz Input

Code	Amps	kW (Hp)
0P9	0.9	0.37 (0.5)
1P7	1.7	0.75 (1.0)
2P7	2.7	1.5 (2.0)
3P9	3.9	2.2 (3.0)
6P1	6.1	4.0 (5.0)
9P0	9.0	5.5 (7.5)
011	11	7.5 (10)
017	17	11 (15)
022	22	15 (20)
027	27	18.5 (25)
032	32	22 (30)
041	41	30 (40)
052	52	37 (50)

Output Current @ 480V 60Hz Input

Code	Amps	kW (Hp)
1P1	1.1	0.37 (0.5)
2P1	2.1	0.75 (1.0)
3P4	3.4	1.5 (2.0)
5P0	5.0	2.2 (3.0)
8P0	8.0	3.7 (5.0)
011	11	5.5 (7.5)
014	14	7.5 (10)
022	22	11 (15)
027	27	15 (20)
034	34	18.5 (25)
040	40	22 (30)
052	52	30 (40)
065	65	37 (50)

Output Current @ 400V 50Hz Input

Code	Amps	kW (Hp)
1P3	1.3	0.37 (0.5)
2P1	2.1	0.75 (1.0)
3P5	3.5	1.5 (2.0)
5P0	5.0	2.2 (3.0)
8P7	8.7	4.0 (5.0)
011	11.5	5.5 (7.5)
015	15.4	7.5 (10)
022	22	11 (15)
030	30	15 (20)
037	37	18.5 (25)
043	43	22 (30)
060	60	30 (40)
072	72	37 (50)

Output Current @ 240V 60Hz Input

Code	Amps	kW (Hp)
2P2	2.2	0.37 (0.5)
4P2	4.2	0.75 (1.0)
6P8	6.8	1.5 (2.0)
9P6	9.6	2.2 (3.0)
015	15.3	4.0 (5.0)
022	22	5.5 (7.5)
028	28	7.5 (10)
042	42	11 (15)
054	54	15 (20)
070	70	18.5 (25)

Output Current @ 208V 60Hz Input

Code	Amps	kW (Hp)
2P2	2.5	0.37 (0.5)
4P2	4.8	0.75 (1.0)
6P8	7.8	1.5 (2.0)
9P6	11	2.2 (3.0)
015	17.5	4.0 (5.0)
022	25.3	5.5 (7.5)
028	32.2	7.5 (10)
042	43	11 (15)
054	62.1	15 (20)
070	78.2	18.5 (25)

Stock Products Program

PowerFlex 70 Drives — Panel Mount - IP 20, NEMA Type 1

200-240V ac, Three-Phase Drives (For pricing information, refer to the PowerFlex 70 Price List, Publication 20A-PL001…)

Output Amps						Nominal Power Ratings				IP20, NEMA Type 1 with HIM	
240V ac Input ❶			208V ac Input			Normal Duty		Heavy Duty		Catalog Number	
Cont.	1 Min.	3 Sec.	Cont.	1 Min.	3 Sec.	kW	Hp	kW	Hp	*20A…*	Frame Size
2.2	2.4	3.3	2.5	2.7	3.7	0.37	0.5	0.25	0.33	B2P2A3AYNNNC0	A
4.2	4.8	6.4	4.8	5.5	7.4	0.75	1.0	0.55	0.75	B4P2A3AYNNNC0	A
6.8	9.0	12	7.8	10.3	13.8	1.5	2.0	1.1	1.5	B6P8A3AYNNNC0	B
9.6	10.6	14.4	11	12.1	16.5	2.2	3.0	1.5	2.0	B9P6A3AYNNNC0	B
15.3	17.4	23.2	17.5	19.2	26.2	4.0	5.0	3.0	3.0	B015A3AYNANC0	C
22	24.2	33	25.3	27.8	37.9	5.5	7.5	4.0	5.0	B022A3AYNANC0	D
28	33	44	32.2	37.9	50.6	7.5	10	5.5	7.5	B028A3AYNANC0	D
42	46.2	63	43	55.5	74	11	15	7.5	10	B042A3AYNANC0	D
54	63	84	62.1	72.4	96.6	15	20	11	15	B054A3AYNANC0	E
70	81	108	78.2	93.1	124	18.5	25	15	20	B070A3AYNANC0	E

380-480V ac, Three-Phase Drives (For pricing information, refer to the PowerFlex 70 Price List, Publication 20A-PL001…)

Output Amps						Nominal Power Ratings				IP20, NEMA Type 1 with HIM	
480V ac Input ❶			380-400V ac Input			Normal Duty		Heavy Duty		Catalog Number	
Cont.	1 Min.	3 Sec.	Cont.	1 Min.	3 Sec.	kW	Hp	kW	Hp	*20A…*	Frame Size
1.1	1.2	1.6	1.3	1.4	1.9	0.37	0.5	0.25	0.33	D1P1A3AYNNNC0	A
2.1	2.4	3.2	2.1	2.4	3.2	0.75	1.0	0.55	0.75	D2P1A3AYNNNC0	A
3.4	4.5	6.0	3.5	4.5	6.0	1.5	2.0	1.1	1.5	D3P4A3AYNNNC0	A
5.0	5.5	7.5	5.0	5.5	7.5	2.2	3.0	1.5	2.0	D5P0A3AYNNNC0	B
8.0	8.8	12	8.7	9.9	13.2	4.0	5.0	3.0	3.0	D8P0A3AYNNNC0	B
11	12.1	16.5	11.5	13	17.4	5.5	7.5	4.0	5.0	D011A3AYNANC0	C
14	16.5	22	15.4	17.2	23.1	7.5	10	5.5	7.5	D014A3AYNANC0	C
22	24.2	33	22	24.2	33	11	15	7.5	10	D022A3AYNANC0	D
27	33	44	30	33	45	15	20	11	15	D027A3AYNANC0	D
34	40.5	54	37	45	60	18.5	25	15	20	D034A3AYNANC0	D
40	51	68	43	56	74	22	30	18.5	25	D040A3AYNANC0	D
52	60	80	60	66	90	30	40	22	30	D052A3AYNANC0	E
65	78	104	72	90	120	37	50	30	40	D065A3AYNANC0	E

Standard Drives Selection

PowerFlex 70 Drives — Panel Mount - IP 20, NEMA Type 1

200-240V ac, Three-Phase Drives (For pricing information, refer to the PowerFlex 70 Price List, Publication 20A-PL001…)

Output Amps						Nominal Power Ratings				IP20, NEMA Type 1 with HIM	
240V ac Input ❶			208V ac Input			Normal Duty		Heavy Duty		Catalog Number	
Cont.	1 Min.	3 Sec.	Cont.	1 Min.	3 Sec.	kW	Hp	kW	Hp	*20A…*	Frame Size
2.2	2.4	3.3	2.5	2.7	3.7	0.37	0.5	0.25	0.33	B2P2A0AYNNNC0	A
4.2	4.8	6.4	4.8	5.5	7.4	0.75	1.0	0.55	0.75	B4P2A0AYNNNC0	A
6.8	9.0	12	7.8	10.3	13.8	1.5	2.0	1.1	1.5	B6P8A0AYNNNC0	B
9.6	10.6	14.4	11	12.1	16.5	2.2	3.0	1.5	2.0	B9P6A0AYNNNC0	B
15.3	17.4	23.2	17.5	19.2	26.2	4.0	5.0	3.0	3.0	B015A0AYNANC0	C
22	24.2	33	25.3	27.8	37.9	5.5	7.5	4.0	5.0	B022A0AYNANC0	D
28	33	44	32.2	37.9	50.6	7.5	10	5.5	7.5	B028A0AYNANC0	D
42	46.2	63	43	55.5	74	11	15	7.5	10	B042A0AYNANC0	D
54	63	84	62.1	72.4	96.6	15	20	11	15	B054A0AYNANC0	E
70	81	108	78.2	93.1	124	18.5	25	15	20	B070A0AYNANC0	E

380-480V ac, Three-Phase Drives (For pricing information, refer to the PowerFlex 70 Price List, Publication 20A-PL001…)

Output Amps						Nominal Power Ratings				IP20, NEMA Type 1 with HIM	
480V ac Input ❶			380-400V ac Input			Normal Duty		Heavy Duty		Catalog Number	
Cont.	1 Min.	3 Sec.	Cont.	1 Min.	3 Sec.	kW	Hp	kW	Hp	*20A…*	Frame Size
1.1	1.2	1.6	1.3	1.4	1.9	0.37	0.5	0.25	0.33	D1P1A0AYNNNC0	A
2.1	2.4	3.2	2.1	2.4	3.2	0.75	1.0	0.55	0.75	D2P1A0AYNNNC0	A
3.4	4.5	6.0	3.5	4.5	6.0	1.5	2.0	1.1	1.5	D3P4A0AYNNNC0	A
5.0	5.5	7.5	5.0	5.5	7.5	2.2	3.0	1.5	2.0	D5P0A0AYNNNC0	B
8.0	8.8	12	8.7	9.9	13.2	4.0	5.0	3.0	3.0	D8P0A0AYNNNC0	B
11	12.1	16.5	11.5	13	17.4	5.5	7.5	4.0	5.0	D011A0AYNANC0	C
14	16.5	22	15.4	17.2	23.1	7.5	10	5.5	7.5	D014A0AYNANC0	C
22	24.2	33	22	24.2	33	11	15	7.5	10	D022A0AYNANC0	D
27	33	44	30	33	45	15	20	11	15	D027A0AYNANC0	D
34	40.5	54	37	45	60	18.5	25	15	20	D034A0AYNANC0	D
40	51	68	43	56	74	22	30	18.5	25	D040A0AYNANC0	D
52	60	80	60	66	90	30	40	22	30	D052A0AYNANC0	E
65	78	104	72	90	120	37	50	30	40	D065A0AYNANC0	E

500-600V ac, Three-Phase Drives (For pricing information, refer to the PowerFlex 70 Price List, Publication 20A-PL001…)

Output Amps			Nominal Power Ratings				IP20, NEMA Type 1 with HIM	
600V ac Input			Normal Duty		Heavy Duty		Catalog Number	
Cont.	1 Min.	3 Sec.	kW	Hp	kW	Hp	*20A…*	Frame Size
0.9	1.0	1.4	0.37	0.5	0.25	0.33	E0P9A0AYNNNC0	A
1.7	1.9	2.6	0.75	1.0	0.55	0.75	E1P7A0AYNNNC0	A
2.7	3.6	4.8	1.5	2.0	1.1	1.0	E2P7A0AYNNNC0	A
3.9	4.3	5.8	2.2	3.0	1.5	1.5	E3P9A0AYNNNC0	B
6.1	6.7	9.1	4.0	5.0	3.0	3.0	E6P1A0AYNNNC0	B
9.0	9.9	13.5	5.5	7.5	4.0	5.0	E9P0A0AYNNNC0	C
11	13.5	18	7.5	10	5.5	7.5	E011A0AYNNNC0	C
17	18.7	25.5	11	15	7.5	10	E017A0AYNNNC0	D
22	25.5	34	15	20	11	15	E022A0AYNNNC0	D
27	33	44	18.5	25	15	20	E027A0AYNNNC0	D
32	40.5	54	22	30	18.5	25	E032A0AYNNNC0	D
41	48	64	30	40	22	30	E041A0AYNANC0	E
52	61.5	82	37	50	30	40	E052A0AYNANC0	E

❶ Catalog code corresponds to output amps in these columns. Drive must be programmed to lower voltage to obtain higher currents shown at right.

PowerFlex 70 Drives — Wall / Machine Mount - IP 66, NEMA Type 4X/12 (Indoor Use)

200-240V ac, Three-Phase Drives (For pricing information, refer to the PowerFlex 70 Price List, Publication 20A-PL001…)

Output Amps						Nominal Power Ratings				IP66, NEMA Type 4X/12 with HIM	
240V ac Input ❶			208V ac Input			Normal Duty		Heavy Duty		Catalog Number	Frame
Cont.	1 Min.	3 Sec.	Cont.	1 Min.	3 Sec.	kW	Hp	kW	Hp	*20A…*	Size
2.2	2.4	3.3	2.5	2.7	3.7	0.37	0.5	0.25	0.33	B2P2C3AYNNNC0	B
4.2	4.8	6.4	4.8	5.5	7.4	0.75	1.0	0.55	0.75	B4P2C3AYNNNC0	B
6.8	9.0	12	7.8	10.3	13.8	1.5	2.0	1.1	1.5	B6P8C3AYNNNC0	B
9.6	10.6	14.4	11	12.1	16.5	2.2	3.0	1.5	2.0	B9P6C3AYNNNC0	B
15.3	17.4	23.2	17.5	19.2	26.2	4.0	5.0	3.0	3.0	B015C3AYNANC0	D
22	24.2	33	25.3	27.8	37.9	5.5	7.5	4.0	5.0	B022C3AYNANC0	D
28	33	44	32.2	37.9	50.6	7.5	10	5.5	7.5	B028C3AYNANC0	D
42	46.2	63	42	55.5	74	11	15	7.5	10	B042C3AYNANC0	D
54	63	84	62.1	72.4	96.6	15	20	11	15	B054C3AYNANC0	E
70	81	108	78.2	93.1	124	18.5	25	15	20	B070C3AYNANC0	E

380-480V ac, Three-Phase Drives (For pricing information, refer to the PowerFlex 70 Price List, Publication 20A-PL001…)

Output Amps						Nominal Power Ratings				IP66, NEMA Type 4X/12 with HIM	
480V ac Input ❶			380-400V ac Input			Normal Duty		Heavy Duty		Catalog Number	Frame
Cont.	1 Min.	3 Sec.	Cont.	1 Min.	3 Sec.	kW	Hp	kW	Hp	*20A…*	Size
1.1	1.2	1.6	1.3	1.4	1.9	0.37	0.5	0.25	0.33	D1P1C3AYNNNC0	B
2.1	2.4	3.2	2.1	2.4	3.2	0.75	1.0	0.55	0.75	D2P1C3AYNNNC0	B
3.4	4.5	6.0	3.5	4.5	6.0	1.5	2.0	1.1	1.5	D3P4C3AYNNNC0	B
5.0	5.5	7.5	5.0	5.5	7.5	2.2	3.0	1.5	2.0	D5P0C3AYNNNC0	B
8.0	8.8	12	8.7	9.9	13.2	4.0	5.0	3.0	3.0	D8P0C3AYNNNC0	B
11	12.1	16.5	11.5	13	17.4	5.5	7.5	4.0	5.0	D011C3AYNANC0	D
14	16.5	22	15.4	17.2	23.1	7.5	10	5.5	7.5	D014C3AYNANC0	D
22	24.2	33	22	24.2	33	11	15	7.5	10	D022C3AYNANC0	D
27	33	44	30	33	45	15	20	11	15	D027C3AYNANC0	D
34	40.5	54	37	45	60	18.5	25	15	20	D034C3AYNANC0	D
40	51	68	43	56	74	22	30	18.5	25	D040C3AYNANC0	D
52	60	80	60	66	90	30	40	22	30	D052C3AYNANC0 ❷	E
65	78	104	72	90	120	37	50	30	40	D065C3AYNANC0 ❷	E

500-600V ac, Three-Phase Drives (For pricing information, refer to the PowerFlex 70 Price List, Publication 20A-PL001…)

Output Amps			Nominal Power Ratings				IP66/NEMA Type 4X/12 with HIM	
600V ac Input			Normal Duty		Heavy Duty		Catalog Number	Frame
Cont.	1 Min.	3 Sec.	kW	Hp	kW	Hp	*20A…*	Size
0.9	1.0	1.4	0.37	0.5	0.25	0.33	E0P9C3AYNNNC0	B
1.7	1.9	2.6	0.75	1.0	0.55	0.75	E1P7C3AYNNNC0	B
2.7	3.6	4.8	1.5	2.0	1.1	1.0	E2P7C3AYNNNC0	B
3.9	4.3	5.8	2.2	3.0	1.5	1.5	E3P9C3AYNNNC0	B
6.1	6.7	9.1	4.0	5.0	3.0	3.0	E6P1C3AYNNNC0	B
9.0	9.9	13.5	5.5	7.5	4.0	5.0	E9P0C3AYNNNC0	D
11	13.5	18	7.5	10	5.5	7.5	E011C3AYNNNC0	D
17	18.7	25.5	11	15	7.5	10	E017C3AYNNNC0	D
22	25.5	34	15	20	11	15	E022C3AYNNNC0	D
27	33	44	18.5	25	15	20	E027C3AYNNNC0	D
32	40.5	54	22	30	18.5	25	E032C3AYNNNC0	D
41	48	64	30	40	22	30	E041C3AYNANC0	E
52	61.5	82	37	50	30	40	E052C3AYNANC0	E

❶ Catalog code corresponds to output amps in these columns. Drive must be programmed to lower voltage to obtain higher currents shown at right.

❷ Frame E ratings are only available with Enhanced Control.

PowerFlex 70 Drives — Wall / Machine Mount - IP 54, NEMA Type 12

200-240V ac, Three-Phase Drives (For pricing information, refer to the PowerFlex 70 Price List, Publication 20A-PL001…)

Output Amps						Nominal Power Ratings				IP66, NEMA Type 4X/12 with HIM	
240V ac Input ❶			208V ac Input			Normal Duty		Heavy Duty		Catalog Number *20A…*	Frame Size
Cont.	1 Min.	3 Sec.	Cont.	1 Min.	3 Sec.	kW	Hp	kW	Hp		
54	63	84	62.1	72.4	96.6	15	20	11	15	B054G3AYNANC0	E
70	81	108	78.2	93.1	124	18.5	25	15	20	B070G3AYNANC0	E

380-480V ac, Three-Phase Drives (For pricing information, refer to the PowerFlex 70 Price List, Publication 20A-PL001…)

Output Amps						Nominal Power Ratings				IP66, NEMA Type 4X/12 with HIM	
480V ac Input ❶			380-400V ac Input			Normal Duty		Heavy Duty		Catalog Number *20A…*	Frame Size
Cont.	1 Min.	3 Sec.	Cont.	1 Min.	3 Sec.	kW	Hp	kW	Hp		
52	60	80	60	66	90	30	40	22	30	D052G3AYNANC0	E
65	78	104	72	90	120	37	50	30	40	D065G3AYNANC0	E

500-600V ac, Three-Phase Drives (For pricing information, refer to the PowerFlex 70 Price List, Publication 20A-PL001…)

Output Amps						Nominal Power Ratings				IP66, NEMA Type 4X/12 with HIM	
600V ac Input ❶			500-600V ac Input			Normal Duty		Heavy Duty		Catalog Number *20A…*	Frame Size
Cont.	1 Min.	3 Sec.	Cont.	1 Min.	3 Sec.	kW	Hp	kW	Hp		
41	48	64	41	48	64	30	40	22	30	E041G3AYNANC0	E
52	61.5	82	52	61.5	82	37	50	30	40	E052G3AYNANC0	E

PowerFlex 70 Drives — Flange Mount ❶ - Front Chassis = IP 20, NEMA Type 1; Heatsink = IP 66, NEMA Type 4X/12

200-240V ac, Three-Phase Drives (For pricing information, refer to the PowerFlex 70 Price List, Publication 20A-PL001…)

Output Amps						Nominal Power Ratings				Flange Type with HIM	
240V ac Input þ			208V ac Input			Normal Duty		Heavy Duty		Catalog Number *20A…*	Frame Size
Cont.	1 Min.	3 Sec.	Cont.	1 Min.	3 Sec.	kW	Hp	kW	Hp		
2.2	2.4	3.3	2.5	2.7	3.7	0.37	0.5	0.25	0.33	B2P2F3AYNNNC0	A
4.2	4.8	6.4	4.8	5.5	7.4	0.75	1.0	0.55	0.75	B4P2F3AYNNNC0	A
6.8	9.0	12	7.8	10.3	13.8	1.5	2.0	1.1	1.5	B6P8F3AYNNNC0	B
9.6	10.6	14.4	11	12.1	16.5	2.2	3.0	1.5	2.0	B9P6F3AYNNNC0	B
15.3	17.4	23.2	17.5	19.2	26.2	4.0	5.0	3.0	3.0	B015F3AYNANC0	C
22	24.2	33	25.3	27.8	37.9	5.5	7.5	4.0	5.0	B022F3AYNANC0	D
28	33	44	32.2	37.9	50.6	7.5	10	5.5	7.5	B028F3AYNANC0	D
42	46.2	63	43	55.5	74	11	15	7.5	10	B042F3AYNANC0	D
54	63	84	62.1	72.4	96.6	15	20	11	15	B054F3AYNANC0	E
70	81	108	78.2	93.1	124	18.5	25	15	20	B070F3AYNANC0	E

380-480V ac, Three-Phase Drives (For pricing information, refer to the PowerFlex 70 Price List, Publication 20A-PL001…)

Output Amps						Nominal Power Ratings				Flange Type with HIM	
480V ac Input ❷			380-400V ac Input			Normal Duty		Heavy Duty		Catalog Number *20A…*	Frame Size
Cont.	1 Min.	3 Sec.	Cont.	1 Min.	3 Sec.	kW	Hp	kW	Hp		
1.1	1.2	1.6	1.3	1.4	1.9	0.37	0.5	0.25	0.33	D1P1F3AYNNNC0	A
2.1	2.4	3.2	2.1	2.4	3.2	0.75	1.0	0.55	0.75	D2P1F3AYNNNC0	A
3.4	4.5	6.0	3.5	4.5	6.0	1.5	2.0	1.1	1.5	D3P4F3AYNNNC0	A
5.0	5.5	7.5	5.0	5.5	7.5	2.2	3.0	1.5	2.0	D5P0F3AYNNNC0	B
8.0	8.8	12	8.7	9.9	13.2	4.0	5.0	3.0	3.0	D8P0F3AYNNNC0	B
11	12.1	16.5	11.5	13	17.4	5.5	7.5	4.0	5.0	D011F3AYNANC0	C
14	16.5	22	15.4	17.2	23.1	7.5	10	5.5	7.5	D014F3AYNANC0	C
22	24.2	33	22	24.2	33	11	15	7.5	10	D022F3AYNANC0	D
27	33	44	30	33	45	15	20	11	15	D027F3AYNANC0	D
34	40.5	54	37	45	60	18.5	25	15	20	D034F34YNANC0	D
40	51	68	43	56	74	22	30	18.5	25	D040F3AYNANC0	D
52	60	80	60	66	90	30	40	22	30	D052F3AYNANC0	E
65	78	104	72	90	120	37	50	30	40	D065F3AYNANC0	E

500-600V ac, Three-Phase Drives (For pricing information, refer to the PowerFlex 70 Price List, Publication 20A-PL001…)

Output Amps			Nominal Power Ratings				Flange Type with HIM	
600V ac Input			Normal Duty		Heavy Duty		Catalog Number *20A…*	Frame Size
Cont.	1 Min.	3 Sec.	kW	Hp	kW	Hp		
0.9	1.0	1.4	0.37	0.5	0.25	0.33	E0P9F3AYNNNC0	A
1.7	1.9	2.6	0.75	1.0	0.55	0.75	E1P7F3AYNNNC0	A
2.7	3.6	4.8	1.5	2.0	1.1	1.0	E2P7F3AYNNNC0	A
3.9	4.3	5.8	2.2	3.0	1.5	1.5	E3P9F3AYNNNC0	B
6.1	6.7	9.1	4.0	5.0	3.0	3.0	E6P1F3AYNNNC0	B
9.0	9.9	13.5	5.5	7.5	4.0	5.0	E9P0F3AYNNNC0	C
11	13.5	18	7.5	10	5.5	7.5	E011F3AYNNNC0	C
17	18.7	25.5	11	15	7.5	10	E017F3AYNNNC0	D
22	25.5	34	15	20	11	15	E022F3AYNNNC0	D
27	33	44	18.5	25	15	20	E027F3AYNNNC0	D
32	40.5	54	22	30	18.5	25	E032F3AYNNNC0	D
41	48	64	30	40	22	30	E041F3AYNANC0	E
52	61.5	82	37	50	30	40	E052F3AYNANC0	E

❶ Provides a method for heatsink to be external to customer enclosure. Front chassis = IP20, NEMA Type 1; Rear Heatsink = IP66 UL Type 4X/12 for indoor/outdoor use.

❷ Catalog code corresponds to output amps in these columns. Drive must be programmed to lower voltage to obtain higher currents shown at right.

Accessories

HIM (Blank Plate)
20-HIM-A0
Cat Code: 0

LCD Digital Speed
20-HIM-A2
Cat Code: 2

LCD Full Numeric
20-HIM-A3
Cat Code: 3

LCD Programmer Only
20-HIM-A5
Cat Code: 5

DPI NEMA 1 WIM
20-WIM-N1
Cat Code: 8

DPI NEMA 4 WIM
Remote (Panel Mount)
Cat Code: 8

Remote (Panel Mount)
Full Numeric

20-HIM-C3 20-HIM-C3S

Remote (Panel Mount)
Programmer Only

20-HIM-C5 20-HIM-C5S

LCD NEMA 4X/12 ❷
No HIM (Blank)
Cat Code: 0

LCD NEMA 4X/12 ❷
Full Numeric
Cat Code: 3

LCD NEMA 4X/12 ❷
Programmer Only
Cat Code: 5

Human Interface Modules (HIM) Option Kits

Handheld/Local (Drive Mount) Type ❶	Catalog Number	
	User Installed	Factory Installed (position 9)
Blank Plate ❷	20-HIM-A0	0
LCD Display, Digital Speed	20-HIM-A2	2
LCD Display, Full Numeric Keypad ❷	20-HIM-A3	3
LCD Display, Programmer Only ❷	20-HIM-A5	5
DPI NEMA 1 WIM	20-WIM-N1	8
Remote (Panel Mount) IP 66, UL Type 4x/12 ❸		
LCD Display, Full Numeric Keypad	20-HIM-C3 ❹	–
	20-HIM-C3S ❺	–
LCD Display, Programmer Only	20-HIM-C5 ❹	–
	20-HIM-C5S ❺	–
DPI NEMA 4 WIM	20-WIM-N4S	–

❶ Mounts to either IP20, NEMA Type 1 or Flange Type.

❷ Available only as factory installed for IP66, NEMA Type 4X/12 and IP54, NEMA Type 12 drives.

❸ For indoor use only.

❹ Includes a 1 meter PowerFlex HIM Interface Cable (20-HIM-H10).

❺ Includes a 3 meter 1202-C30 cable.

Human Interface Module/Communication Interface Cables

Description	Catalog No.
Bezel Kit for LCD HIMs, NEMA 1 ❻	20-HIM-B1
PowerFlex HIM Interface Cable, 1 m (39 in.) ❼	20-HIM-H10
HIM/Comm Cable Kit (Male-Female) ❽	
0.33 Meters (1.1 Feet)	1202-H03
1 Meter (3.3 Feet)	1202-H10
3 Meter (9.8 Feet)	1202-H30
9 Meter (29.5 Feet)	1202-H90

Description	Catalog No.
DPI Cable Kit with Connectors, Tools and 100 m (328 ft.) Cable	1202-CBL-KIT-100M
DPI Cable Connector Kit	1202-TB-KIT-SET
Comm Option Cable Kit	
0.33 Meters (1.1 Feet)	1202-C03
1 Meter (3.3 Feet)	1202-C10
3 Meter (9.8 Feet)	1202-C30
9 Meter (29.5 Feet)	1202-C90
DPI/SCANport™ One to Two Port Splitter Cable	1203-S03

❻ Includes an interface cable (1202-C30) for connection to drive.

❼ Required only when HIM is used as handheld or remotely mounted.

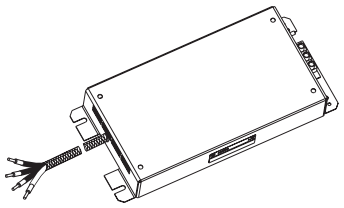
❽ Required in addition to 20-HIM-H10 for distances up to 100 Meters (328 Feet) maximum.

Accessories, Continued

EMC Filters

Description	Frame	Catalog Number	
		User Installed	Factory Installed (Position 13)
External 1-Phase 200-240V, 8A Filter	A	20A-RF-08-A1	N/A
External 3-Phase 200-480V, 5A Filter	A	20A-RF-05-A3	N/A
Internal 3-Phase 200-480 Filter❶	B, C, D	–	A

❶ Standard on Frames C and D. Optional on Frame B (Frame A ratings increase to Frame B).



EMC Filter
20A-RF-08-A1
20A-RF-05-A3

Communication Options

Description	Catalog No. User Installed	Factory Installed (Position 14)
ControlNet Communication Adapter (Coax)	20-COMM-C	C
DeviceNet Communication Adapter	20-COMM-D	D
EtherNet/IP Communication Adapter	20-COMM-E	E
RS485 HVAC Communication Adapter (Modbus RTU, Metasys N2, Siemens P1)	20-COMM-H	H
Interbus Communication Adapter	20-COMM-I	N/A
LonWorks Communication Adapter	20-COMM-L	N/A
PROFIBUS DP Communication Adapter	20-COMM-P	N/A
ControlNet Communication Adapter (Fiber)	20-COMM-Q	N/A
Remote I/O Communication Adapter	20-COMM-R	R
RS485 DF-1 Communication Adapter	20-COMM-S	S
External DPI Communications Kit for 20-COMM-C, -D, -E and -Q adapters. Multi-Drive capability allows connectivity for up to 5 drives.	20-XCOMM-DC-BASE	N/A
External DPI I/O Option Board	20-XCOMM-IO-OPT1	N/A
External Comms Power Supply. Optional 100-240V ac power supply for external DPI communications kits.	20-XCOMM-AC-PS1	N/A
Compact I/O Module (3 Channel)	1769-SM1	N/A
Smart Self-powered Serial Converter (RS-232) includes 1203-SFC and 1202-C10 Cables	1203-SSS	N/A
Serial Null Modem Adapter	1203-SNM	N/A

Communication
Adapter
20-COMM-D

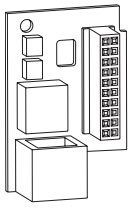
Other Options

Description	Catalog No.		
	User Installed	Factory Installed (Position 15)	(Position 16)
DriveGuard™ Safe-Off Board ❷	20A-DG01	G	N/A
Service Connection Board ❸	SK-M9-SCB1	N/A	N/A
5V/12V Encoder Option Board	20A-ENC-1	N/A	1
115 Volt AC Interface Card	AK-M9-115VAC-1	N/A	N/A
Frame E Flange Gasket	AK-M9-GASKET1-E4	N/A	N/A

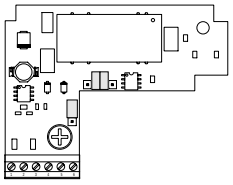
❷ Works only with PowerFlex 70 Enhanced Control.

❸ Provides temporary DPI/HIM connection for NEMA 1 and Flange drives with cover removed.

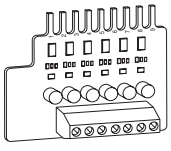
DriveGuard™ Safe-Off Option
20A-DG01
Cat Code: G



Service Connection Board
SK-M9-SCB1



5V/12V Encoder Option Board
20A-ENC-1
Cat Code: 1



115V Interface Card
AK-M9-115VAC-1

Accessories, Continued

Dynamic Brake Resistors

Application requirements should be thoroughly evaluated to determine what size (and thus type) will be sufficient. Publication PFLEX-AT001..., *Dynamic Braking Resistor Calculator*, provides a method based on application data such as load inertia.

Small Duty Internal DB Resistors

Limited duty resistors mount directly to the back surface of the drive and require no extra panel space. Internal resistors are non-destructive and do not require a resistor overheat external safety circuit.

PowerFlex 70 AC Drive			Small Duty Internal DB Resistor								
Normal Duty kW (Hp)	Heavy Duty kW (Hp)	Min DB Res Ohms ±10%	Part Number	Resistance Ohms ±5%	Continuos Power kW	Max Energy kJ	Max Braking Torque % of ND Motor	Application Type 1 Braking Torque % of ND Motor	Application Type 1 Duty Cycle	Application Type 2 Braking Torque % of ND Motor	Application Type 2 Duty Cycle
200-240 Volt AC Input Drives											
0.37 (0.5)	0.25 (0.33)	33	20AB-DB1-A	62	0.048	8.3	307%	100%	25.9%	150%	17.3%
0.75 (1.0)	0.55 (0.75)	33	20AB-DB1-A	62	0.048	7.3	300%	100%	12.8%	150%	8.5%
1.5 (2.0)	1.1 (1.5)	33	20AB-DB1-B	62	0.028	0.8	160%	100%	3.7%	150%	2.5%
2.2 (3.0)	1.5 (2.0)	33	20AB-DB1-B	62	0.028	0.8	109%	100%	2.5%	109%	2.3%
4.0 (5.0)	3.0 (3.0)	30	20AB-DB1-C	62	0.040	0.8	60%	60%	3.3%	N/A	N/A
5.5 (7.5)	4.0 (5.0)	23	20AB-DB1-D	22	0.036	0.9	117%	100%	1.3%	117%	1.1%
7.5 (10)	5.5 (7.5)	23	20AB-DB1-D	22	0.036	0.9	86%	86%	1.1%	N/A	N/A
400-480 Volt AC Input Drives											
0.37 (0.5)	0.25 (0.33)	68	20AD-DB1-A	115	0.048	8.3	320%	100%	25.9%	150%	17.3%
0.75 (1.0)	0.55 (0.75)	68	20AD-DB1-A	115	0.048	9.0	259%	100%	12.8%	150%	8.5%
1.5 (2.0)	1.1 (1.5)	68	20AD-DB1-A	115	0.048	2.4	243%	100%	6.4%	150%	4.3%
2.2 (3.0)	1.5 (2.0)	68	20AD-DB1-B	115	0.028	0.9	206%	100%	2.5%	150%	1.7%
4.0 (5.0)	3.0 (3.0)	68	20AD-DB1-B	115	0.028	0.9	129%	100%	1.4%	129%	1.1%
5.5 (7.5)	4.0 (5.0)	74	20AD-DB1-C	115	0.04	0.9	94%	94%	1.5%	N/A	N/A
7.5 (10)	5.5 (7.5)	74	20AD-DB1-C	115	0.04	0.9	69%	69%	1.5%	N/A	N/A
11 (15)	7.5 (10)	44	20AD-DB1-D	62	0.036	0.8	87%	87%	0.8%	N/A	N/A
15 (20)	11 (15)	31	20AD-DB1-D	62	0.036	0.8	64%	64%	0.8%	N/A	N/A
500-600 Volt AC Input Drives											
0.37 (0.5)	0.25 (0.33)	117	20AD-DB1-A	115	0.048	8.3	287%	100%	25.9%	150%	17.3%
0.75 (1.0)	0.55 (0.75)	117	20AD-DB1-A	115	0.048	9.0	263%	100%	12.8%	150%	8.5%
1.5 (2.0)	1.1 (1.5)	117	20AD-DB1-A	115	0.048	2.4	243%	100%	6.4%	150%	4.3%
2.2 (3.0)	1.5 (2.0)	117	20AD-DB1-B	115	0.028	0.9	202%	100%	2.5%	150%	1.7%
4.0 (5.0)	3.0 (3.0)	80	20AD-DB1-B	115	0.028	0.9	193%	100%	1.4%	150%	0.9%
5.5 (7.5)	4.0 (5.0)	80	20AD-DB1-C	115	0.04	0.9	147%	100%	1.5%	147%	1.0%
7.5 (10)	5.5 (7.5)	80	20AD-DB1-C	115	0.04	0.9	108%	100%	1.1%	108%	1.0%
11 (15)	7.5 (10)	48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
15 (20)	11 (15)	48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Medium Duty External DB Resistors

These resistors provide a larger duty cycle capability than the internal type. Includes an internal thermal switch for use in external safety circuit.

PowerFlex 70 AC Drive			Medium Duty External DB Resistor								
Normal Duty kW (Hp)	Heavy Duty kW (Hp)	Min DB Res Ohms ±10%	Part Number	Resistance Ohms ±5%	Continuos Power kW	Max Energy kJ	Max Braking Torque % of ND Motor	Application Type 1 Braking Torque % of ND Motor	Application Type 1 Duty Cycle	Application Type 2 Braking Torque % of ND Motor	Application Type 2 Duty Cycle
200-240 Volt AC Input Drives											
0.37 (0.5)	0.25 (0.33)	33	AK-R2-091P500	91	0.086	17	293%	100%	46%	150%	31%
0.75 (1.0)	0.55 (0.75)	33	AK-R2-091P500	91	0.086	17	218%	100%	23%	150%	15%
1.5 (2.0)	1.1 (1.5)	33	AK-R2-091P500	91	0.086	17	109%	100%	11%	109%	11%
2.2 (3.0)	1.5 (2.0)	33	AK-R2-047P500	47	0.166	33	144%	100%	15%	144%	11%
4.0 (5.0)	3.0 (3.0)	30	AK-R2-047P500	47	0.166	33	79%	79%	11%	N/A	N/A
5.5 (7.5)	4.0 (5.0)	23	AK-R2-030P1K2	30	0.26	52	90%	90%	10%	N/A	N/A
7.5 (10)	5.5 (7.5)	23	AK-R2-030P1K2	30	0.26	52	66%	66%	10%	N/A	N/A
400-480 Volt AC Input Drives											
0.37 (0.5)	0.25 (0.33)	68	AK-R2-360P500	360	0.086	17	305%	100%	47%	150%	31%
0.75 (1.0)	0.55 (0.75)	68	AK-R2-360P500	360	0.086	17	220%	100%	23%	150%	15%
1.5 (2.0)	1.1 (1.5)	68	AK-R2-360P500	360	0.086	17	110%	100%	12%	110%	11%
2.2 (3.0)	1.5 (2.0)	68	AK-R2-120P1K2	120	0.26	52	197%	100%	24%	150%	16%
4.0 (5.0)	3.0 (3.0)	68	AK-R2-120P1K2	120	0.26	52	124%	100%	13%	124%	10%
5.5 (7.5)	4.0 (5.0)	74	AK-R2-120P1K2	120	0.26	52	90%	90%	10%	N/A	N/A
7.5 (10)	5.5 (7.5)	74	AK-R2-120P1K2	120	0.26	52	66%	66%	10%	N/A	N/A
11 (15)	7.5 (10)	44	See Note 3	60	0.52	104	90%	90%	10%	N/A	N/A
15 (20)	11 (15)	31	See Note 3	60	0.52	104	66%	66%	10%	N/A	N/A
500-600 Volt AC Input Drives											
0.37 (0.5)	0.25 (0.33)	117	AK-R2-360P500	360	0.086	17	274%	100%	46%	150%	31%
0.75 (1.0)	0.55 (0.75)	117	AK-R2-360P500	360	0.086	17	251%	100%	23%	150%	15%
1.5 (2.0)	1.1 (1.5)	117	AK-R2-360P500	360	0.086	17	172%	100%	11%	150%	8%
2.2 (3.0)	1.5 (2.0)	117	AK-R2-120P1K2	120	0.26	52	193%	100%	24%	150%	16%
4.0 (5.0)	3.0 (3.0)	80	AK-R2-120P1K2	120	0.26	52	185%	100%	13%	150%	9%
5.5 (7.5)	4.0 (5.0)	80	AK-R2-120P1K2	120	0.26	52	141%	100%	9%	141%	7%
7.5 (10)	5.5 (7.5)	80	AK-R2-120P1K2	120	0.26	52	103%	100%	7%	103%	7%
11 (15)	7.5 (10)	48	See Note 3	60	0.52	104	141%	100%	9%	141%	7%
15 (20)	11 (15)	48	See Note 3	60	0.52	104	103%	100%	7%	103%	7%

Note 1: Always check resistor ohms against minimum resistance for drive being used.

Note 2: Duty cycle listed is based on full speed to zero speed deceleration.
For constant regen at full speed, duty cycle capability is half of what is listed.
Application Type 1 represents maximum capability up to 100% braking torque where possible.
Application Type 2 represents more than 100% braking torque where possible, up to a maximum of 150%.

Note 3: For 11 and 15 kW (15 and 20 Hp) applications, use two 7.5 kW (10 Hp) size resistors wired in parallel.

Accessories, Continued

Input and Output Line Reactors – 240V, 60 Hz, Three-Phase

Drive Catalog Number	Duty	Hp	Input Line Reactor ❶		Output Line Reactor ❶	
			IP 00 (Open Style)	IP 11 (Nema Type 1)	IP 00 (Open Style)	IP 11 (Nema Type 1)
			Catalog Number	Catalog Number	Catalog Number	Catalog Number
3% Impedance – 240V, 60 Hz, Three-Phase						
20AB2P2	Heavy Duty	0.33	1321-3R2-D	1321-3RA2-D	1321-3R2-D	1321-3RA2-D
20AB2P2	Normal Duty	0.5	1321-3R2-D	1321-3RA2-D	1321-3R2-D	1321-3RA2-D
20AB4P2	Heavy Duty	0.75	1321-3R4-A	1321-3RA4-A	1321-3R4-A	1321-3RA4-A
20AB4P2	Normal Duty	1.0	1321-3R4-A	1321-3RA4-A	1321-3R4-A	1321-3RA4-A
20AB6P8	Heavy Duty	1.5	1321-3R8-A	1321-3RA8-A	1321-3R8-A	1321-3RA8-A
20AB6P8	Normal Duty	2.0	1321-3R8-A	1321-3RA8-A	1321-3R8-A	1321-3RA8-A
20AB9P6	Heavy Duty	2.0	1321-3R8-A	1321-3RA8-A	1321-3R12-A	1321-3RA12-A
20AB9P6	Normal Duty	3.0	1321-3R12-A	1321-3RA12-A	1321-3R12-A	1321-3RA12-A
20AB015	Heavy Duty	3.0	1321-3R12-A	1321-3RA12-A	1321-3R18-A	1321-3RA18-A
20AB015	Normal Duty	5.0	1321-3R18-A	1321-3RA18-A	1321-3R18-A	1321-3RA18-A
20AB022	Heavy Duty	5.0	1321-3R18-A	1321-3RA18-A	1321-3R25-A	1321-3RA25-A
20AB022	Normal Duty	7.5	1321-3R25-A	1321-3RA25-A	1321-3R25-A	1321-3RA25-A
20AB028	Heavy Duty	7.5	1321-3R25-A	1321-3RA25-A	1321-3R35-A	1321-3RA35-A
20AB028	Normal Duty	10	1321-3R35-A	1321-3RA35-A	1321-3R35-A	1321-3RA35-A
20AB042	Heavy Duty	10	1321-3R35-A	1321-3RA35-A	1321-3R45-A	1321-3RA45-A
20AB042	Normal Duty	15	1321-3R45-A	1321-3RA45-A	1321-3R45-A	1321-3RA45-A
20AB054	Heavy Duty	15	1321-3R45-A	1321-3RA45-A	1321-3R55-A	1321-3RA55-A
20AB054	Normal Duty	20	1321-3R55-A	1321-3RA55-A	1321-3R55-A	1321-3RA55-A
20AB070	Heavy Duty	20	1321-3R55-A	1321-3RA55-A	1321-3R80-A	1321-3RA80-A
20AB070	Normal Duty	25	1321-3R80-A	1321-3RA80-A	1321-3R80-A	1321-3RA80-A
5% Impedance – 240V, 60 Hz, Three-Phase						
20AB2P2	Heavy Duty	0.33	1321-3R2-A	1321-3RA2-A	1321-3R2-A	1321-3RA2-A
20AB2P2	Normal Duty	0.5	1321-3R2-A	1321-3RA2-A	1321-3R2-A	1321-3RA2-A
20AB4P2	Heavy Duty	0.75	1321-3R4-B	1321-3RA4-B	1321-3R4-B	1321-3RA4-B
20AB4P2	Normal Duty	1.0	1321-3R4-B	1321-3RA4-B	1321-3R4-B	1321-3RA4-B
20AB6P8	Heavy Duty	1.5	1321-3R8-B	1321-3RA8-B	1321-3R8-B	1321-3RA8-B
20AB6P8	Normal Duty	2.0	1321-3R8-B	1321-3RA8-B	1321-3R8-B	1321-3RA8-B
20AB9P6	Heavy Duty	2.0	1321-3R8-B	1321-3RA8-B	1321-3R12-B	1321-3RA12-B
20AB9P6	Normal Duty	3.0	1321-3R12-B	1321-3RA12-B	1321-3R12-B	1321-3RA12-B
20AB015	Heavy Duty	3.0	1321-3R12-B	1321-3RA12-B	1321-3R18-B	1321-3RA18-B
20AB015	Normal Duty	5.0	1321-3R18-B	1321-3RA18-B	1321-3R18-B	1321-3RA18-B
20AB022	Heavy Duty	5.0	1321-3R18-B	1321-3RA18-B	1321-3R25-B	1321-3RA25-B
20AB022	Normal Duty	7.5	1321-3R25-B	1321-3RA25-B	1321-3R25-B	1321-3RA25-B
20AB028	Heavy Duty	7.5	1321-3R25-B	1321-3RA25-B	1321-3R35-B	1321-3RA35-B
20AB028	Normal Duty	10	1321-3R35-B	1321-3RA35-B	1321-3R35-B	1321-3RA35-B
20AB042	Heavy Duty	10	1321-3R35-B	1321-3RA35-B	1321-3R45-B	1321-3RA45-B
20AB042	Normal Duty	15	1321-3R45-B	1321-3RA45-B	1321-3R45-B	1321-3RA45-B
20AB054	Heavy Duty	15	1321-3R45-B	1321-3RA45-B	1321-3R55-B	1321-3RA55-B
20AB054	Normal Duty	20	1321-3R55-B	1321-3RA55-B	1321-3R55-B	1321-3RA55-B
20AB070	Heavy Duty	20	1321-3R55-B	1321-3RA55-B	1321-3R80-B	1321-3RA80-B
20AB070	Normal Duty	25	1321-3R80-B	1321-3RA80-B	1321-3R80-B	1321-3RA80-B

❶ Input line reactors were sized based on the NEC fundamental motor amps. Output line reactors were sized based on the VFD rated output currents.

Accessories, Continued

Input and Output Line Reactors – 480V, 60 Hz, Three-Phase

Drive Catalog Number	Duty	Hp	Input Line Reactor ❶		Output Line Reactor ❶	
			IP 00 (Open Style)	IP 11 (Nema Type 1)	IP 00 (Open Style)	IP 11 (Nema Type 1)
			Catalog Number	Catalog Number	Catalog Number	Catalog Number
3% Impedance – 480V, 60 Hz, Three-Phase						
20AD1P1	Heavy Duty	0.33	1321-3R1-C	1321-3RA1-C	1321-3R2-B	1321-3RA2-B
20AD1P1	Normal Duty	0.5	1321-3R1-C	1321-3RA1-C	1321-3R2-B	1321-3RA2-B
20AD2P1	Heavy Duty	0.75	1321-3R2-A	1321-3RA2-A	1321-3R2-A	1321-3RA2-A
20AD2P1	Normal Duty	1.0	1321-3R2-A	1321-3RA2-A	1321-3R2-A	1321-3RA2-A
20AD3P4	Heavy Duty	1.5	1321-3R4-C	1321-3RA4-C	1321-3R4-B	1321-3RA4-B
20AD3P4	Normal Duty	2.0	1321-3R4-B	1321-3RA4-B	1321-3R4-B	1321-3RA4-B
20AD5P0	Heavy Duty	2.0	1321-3R4-B	1321-3RA4-B	1321-3R8-C	1321-3RA8-C
20AD5P0	Normal Duty	3.0	1321-3R8-C	1321-3RA8-C	1321-3R8-C	1321-3RA8-C
20AD8P0	Heavy Duty	3.0	1321-3R8-C	1321-3RA8-C	1321-3R8-B	1321-3RA8-B
20AD8P0	Normal Duty	5.0	1321-3R8-B	1321-3RA8-B	1321-3R8-B	1321-3RA8-B
20AD011	Heavy Duty	5.0	1321-3R8-B	1321-3RA8-B	1321-3R12-B	1321-3RA12-B
20AD011	Normal Duty	7.5	1321-3R12-B	1321-3RA12-B	1321-3R12-B	1321-3RA12-B
20AD014	Heavy Duty	7.5	1321-3R12-B	1321-3RA12-B	1321-3R18-B	1321-3RA18-B
20AD014	Normal Duty	10	1321-3R18-B	1321-3RA18-B	1321-3R18-B	1321-3RA18-B
20AD022	Heavy Duty	10	1321-3R18-B	1321-3RA18-B	1321-3R25-B	1321-3RA25-B
20AD022	Normal Duty	15	1321-3R25-B	1321-3RA25-B	1321-3R25-B	1321-3RA25-B
20AD027	Heavy Duty	15	1321-3R25-B	1321-3RA25-B	1321-3R25-B	1321-3RA25-B
20AD027	Normal Duty	20	1321-3R35-B	1321-3RA35-B	1321-3R25-B	1321-3RA25-B
20AD034	Heavy Duty	20	1321-3R35-B	1321-3RA35-B	1321-3R35-B	1321-3RA35-B
20AD034	Normal Duty	25	1321-3R35-B	1321-3RA35-B	1321-3R35-B	1321-3RA35-B
20AD040	Heavy Duty	25	1321-3R35-B	1321-3RA35-B	1321-3R45-B	1321-3RA45-B
20AD040	Normal Duty	30	1321-3R45-B	1321-3RA45-B	1321-3R45-B	1321-3RA45-B
20AD052	Heavy Duty	30	1321-3R45-B	1321-3RA45-B	1321-3R55-B	1321-3RA55-B
20AD052	Normal Duty	40	1321-3R55-B	1321-3RA55-B	1321-3R55-B	1321-3RA55-B
20AD065	Heavy Duty	40	1321-3R55-B	1321-3RA55-B	1321-3R80-B	1321-3RA80-B
20AD065	Normal Duty	50	1321-3R80-B	1321-3RA80-B	1321-3R80-B	1321-3RA80-B
5% Impedance – 480V, 60 Hz, Three-Phase						
20AD1P1	Heavy Duty	0.33	1321-3R1-B	1321-3RA1-B	1321-3R2-C	1321-3RA2-C
20AD1P1	Normal Duty	0.5	1321-3R1-B	1321-3RA1-B	1321-3R2-C	1321-3RA2-C
20AD2P1	Heavy Duty	0.75	1321-3R2-C	1321-3RA2-C	1321-3R2-B	1321-3RA2-B
20AD2P1	Normal Duty	1.0	1321-3R2-B	1321-3RA2-B	1321-3R2-B	1321-3RA2-B
20AD3P4	Heavy Duty	1.5	1321-3R4-D	1321-3RA4-D	1321-3R4-D	1321-3RA4-D
20AD3P4	Normal Duty	2.0	1321-3R4-D	1321-3RA4-D	1321-3R4-D	1321-3RA4-D
20AD5P0	Heavy Duty	2.0	1321-3R4-D	1321-3RA4-D	1321-3R8-D	1321-3RA8-D
20AD5P0	Normal Duty	3.0	1321-3R8-D	1321-3RA8-D	1321-3R8-D	1321-3RA8-D
20AD8P0	Heavy Duty	3.0	1321-3R8-D	1321-3RA8-D	1321-3R8-C	1321-3RA8-C
20AD8P0	Normal Duty	5.0	1321-3R8-C	1321-3RA8-C	1321-3R8-C	1321-3RA8-C
20AD011	Heavy Duty	5.0	1321-3R8-C	1321-3RA8-C	1321-3R12-C	1321-3RA12-C
20AD011	Normal Duty	7.5	1321-3R12-C	1321-3RA12-C	1321-3R12-C	1321-3RA12-C
20AD014	Heavy Duty	7.5	1321-3R12-C	1321-3RA12-C	1321-3R18-C	1321-3RA18-C
20AD014	Normal Duty	10	1321-3R18-C	1321-3RA18-C	1321-3R18-C	1321-3RA18-C
20AD022	Heavy Duty	10	1321-3R18-C	1321-3RA18-C	1321-3R25-C	1321-3RA25-C
20AD022	Normal Duty	15	1321-3R25-C	1321-3RA25-C	1321-3R25-C	1321-3RA25-C
20AD027	Heavy Duty	15	1321-3R25-C	1321-3RA25-C	1321-3R25-C	1321-3RA25-C
20AD027	Normal Duty	20	1321-3R35-C ❷	1321-3RA35-C ❷	1321-3R25-C	1321-3RA25-C
20AD034	Heavy Duty	20	1321-3R35-C ❷	1321-3RA35-C ❷	1321-3R35-C	1321-3RA35-C
20AD034	Normal Duty	25	1321-3R35-C	1321-3RA35-C	1321-3R35-C	1321-3RA35-C
20AD040	Heavy Duty	25	1321-3R35-C	1321-3RA35-C	1321-3R45-C	1321-3RA45-C
20AD040	Normal Duty	30	1321-3R45-C	1321-3RA45-C	1321-3R45-C	1321-3RA45-C
20AD052	Heavy Duty	30	1321-3R45-C	1321-3RA45-C	1321-3R55-C	1321-3RA55-C
20AD052	Normal Duty	40	1321-3R55-C	1321-3RA55-C	1321-3R55-C	1321-3RA55-C
20AD065	Heavy Duty	40	1321-3R55-C	1321-3RA55-C	1321-3R80-C	1321-3RA80-C
20AD065	Normal Duty	50	1321-3R80-C	1321-3RA80-C	1321-3R80-C	1321-3RA80-C

❶ Input line reactors were sized based on the NEC fundamental motor amps. Output line reactors were sized based on the VFD rated output currents.

❷ Reactors sized at 4% impedance.

Accessories, Continued

Input and Output Line Reactors – 600V, 60 Hz, Three-Phase

Drive Catalog Number	Duty	Hp	Input Line Reactor ❶		Output Line Reactor ❶	
			IP 00 (Open Style)	IP 11 (Nema Type 1)	IP 00 (Open Style)	IP 11 (Nema Type 1)
			Catalog Number	Catalog Number	Catalog Number	Catalog Number
3% Impedance – 480V, 60 Hz, Three-Phase						
20AE0P9	Heavy Duty	0.33	1321-3R1-C	1321-3RA1-C	1321-3R1-B	1321-3RA1-B
20AE0P9	Normal Duty	0.5	1321-3R1-C	1321-3RA1-C	1321-3R1-B	1321-3RA1-B
20AE1P7	Heavy Duty	0.75	1321-3R2-B	1321-3RA2-B	1321-3R2-B	1321-3RA2-B
20AE1P7	Normal Duty	1.0	1321-3R2-B	1321-3RA2-B	1321-3R2-B	1321-3RA2-B
20AE2P7	Heavy Duty	1.5	1321-3R2-A	1321-3RA2-A	1321-3R4-D	1321-3RA4-D
20AE2P7	Normal Duty	2.0	1321-3R4-C	1321-3RA2-C	1321-3R4-D	1321-3RA4-D
20AE3P9	Heavy Duty	2.0	1321-3R4-C	1321-3RA4-C	1321-3R4-C	1321-3RA4-C
20AE3P9	Normal Duty	3.0	1321-3R4-C	1321-3RA4-C	1321-3R4-C	1321-3RA4-C
20AE6P1	Heavy Duty	3.0	1321-3R4-C	1321-3RA4-C	1321-3R8-C	1321-3RA8-C
20AE6P1	Normal Duty	5.0	1321-3R8-C	1321-3RA8-C	1321-3R8-C	1321-3RA8-C
20AE9P0	Heavy Duty	5.0	1321-3R8-C	1321-3RA8-C	1321-3R12-C	1321-3RA12-C
20AE9P0	Normal Duty	7.5	1321-3R12-C	1321-3RA12-C	1321-3R12-C	1321-3RA12-C
20AE011	Heavy Duty	7.5	1321-3R12-C	1321-3RA12-C	1321-3R12-B	1321-3RA12-B
20AE011	Normal Duty	10	1321-3R12-B	1321-3RA12-B	1321-3R12-B	1321-3RA12-B
20AE017	Heavy Duty	10	1321-3R12-B	1321-3RA12-B	1321-3R18-C	1321-3RA18-C
20AE017	Normal Duty	15	1321-3R18-B	1321-3RA18-B	1321-3R18-C	1321-3RA18-C
20AE022	Heavy Duty	15	1321-3R18-B	1321-3RA18-B	1321-3R25-B	1321-3RA25-B
20AE022	Normal Duty	20	1321-3R25-B	1321-3RA25-B	1321-3R25-B	1321-3RA25-B
20AE027	Heavy Duty	20	1321-3R25-B	1321-3RA25-B	1321-3R35-C	1321-3RA35-C
20AE027	Normal Duty	25	1321-3R35-C	1321-3RA35-C	1321-3R35-C	1321-3RA35-C
20AE032	Heavy Duty	25	1321-3R35-C	1321-3RA35-C	1321-3R35-B	1321-3RA35-B
20AE032	Normal Duty	30	1321-3R35-B	1321-3RA35-B	1321-3R35-B	1321-3RA35-B
20AE041	Heavy Duty	30	1321-3R35-B	1321-3RA35-B	1321-3R45-B	1321-3RA45-B
20AE041	Normal Duty	40	1321-3R45-B	1321-3RA45-B	1321-3R45-B	1321-3RA45-B
20AE052	Heavy Duty	40	1321-3R45-B	1321-3RA45-B	1321-3R55-B	1321-3RA55-B
20AE052	Normal Duty	50	1321-3R55-B	1321-3RA55-B	1321-3R55-B	1321-3RA55-B
5% Impedance – 480V, 60 Hz, Three-Phase						
20AE0P9	Heavy Duty	0.33	1321-3R1-A	1321-3RA1-A	1321-3R1-B	1321-3RA1-B
20AE0P9	Normal Duty	0.5	1321-3R1-B	1321-3RA1-B	1321-3R1-B	1321-3RA1-B
20AE1P7	Heavy Duty	0.75	1321-3R2-C	1321-3RA2-C	1321-3R2-C	1321-3RA2-C
20AE1P7	Normal Duty	1.0	1321-3R2-C	1321-3RA2-C	1321-3R2-C	1321-3RA2-C
20AE2P7	Heavy Duty	1.5	1321-3R2-B	1321-3RA2-B	1321-3R4-D ❷	1321-3RA4-D ❷
20AE2P7	Normal Duty	2.0	1321-3R4-D ❷	1321-3RA4-D ❷	1321-3R4-D ❷	1321-3RA4-D ❷
20AE3P9	Heavy Duty	2.0	1321-3R4-D ❷	1321-3RA4-D ❷	1321-3R4-D	1321-3RA4-D
20AE3P9	Normal Duty	3.0	1321-3R4-D	1321-3RA4-D	1321-3R4-D	1321-3RA4-D
20AE6P1	Heavy Duty	3.0	1321-3R4-D	1321-3RA4-D	1321-3R8-D	1321-3RA8-D
20AE6P1	Normal Duty	5.0	1321-3R8-D	1321-3RA8-D	1321-3R8-D	1321-3RA8-D
20AE9P0	Heavy Duty	5.0	1321-3R8-D	1321-3RA8-D	1321-3R12-C ❷	1321-3RA12-C ❷
20AE9P0	Normal Duty	7.5	1321-3R12-C ❷	1321-3RA12-C ❷	1321-3R12-C ❷	1321-3RA12-C ❷
20AE011	Heavy Duty	7.5	1321-3R12-C ❷	1321-3RA12-C ❷	1321-3R12-C	1321-3RA12-C
20AE011	Normal Duty	10	1321-3R12-C	1321-3RA12-C	1321-3R12-C	1321-3RA12-C
20AE017	Heavy Duty	10	1321-3R12-C	1321-3RA12-C	1321-3R18-C	1321-3RA18-C
20AE017	Normal Duty	15	1321-3R18-C	1321-3RA18-C	1321-3R18-C	1321-3RA18-C
20AE022	Heavy Duty	15	1321-3R18-C	1321-3RA18-C	1321-3R25-C	1321-3RA25-C
20AE022	Normal Duty	20	1321-3R25-C	1321-3RA25-C	1321-3R25-C	1321-3RA25-C
20AE027	Heavy Duty	20	1321-3R25-C ❷	1321-3RA25-C ❷	1321-3R35-C ❷	1321-3RA35-C ❷
20AE027	Normal Duty	25	1321-3R35-C ❷	1321-3RA35-C ❷	1321-3R35-C ❷	1321-3RA35-C ❷
20AE032	Heavy Duty	25	1321-3R35-C ❷	1321-3RA35-C ❷	1321-3R35-C ❷	1321-3RA35-C ❷
20AE032	Normal Duty	30	1321-3R35-C ❷	1321-3RA35-C ❷	1321-3R35-C ❷	1321-3RA35-C ❷
20AE041	Heavy Duty	30	1321-3R35-C ❷	1321-3RA35-C ❷	1321-3R45-C	1321-3RA45-C
20AE041	Normal Duty	40	1321-3R45-C	1321-3RA45-C	1321-3R45-C	1321-3RA45-C
20AE052	Heavy Duty	40	1321-3R45-C	1321-3RA45-C	1321-3R55-C	1321-3RA55-C
20AE052	Normal Duty	50	1321-3R55-C	1321-3RA55-C	1321-3R55-C	1321-3RA55-C

❶ Input line reactors were sized based on the NEC fundamental motor amps. Output line reactors were sized based on the VFD rated output currents.

❷ Reactors sized at 4% impedance.

Packaged Drives Overview

The PowerFlex 70 Packaged Drives Program allows users to create drive packages based on their specific needs. This program enhances stand-a-lone drive functionality through additional control, power and packaging options which are ideal for OEM and end users with special installation needs.

The program has three levels:

Quick Ship

Quick Ship products are intended to meet faster than normal delivery requirements. Pre-defined catalog strings are offered to support shipping one to three business days from date of order entry. The current offering is based on NEMA 1 (IP20) and NEMA 4/12 (IP65), 480V, top of frame ratings for frames A-C and frame D @ 20 Hp. These packages are a subset of the Standard Packaged Drives Program noted below and can be ordered through the Passport order entry system. *This program uses the Standard Control version of the PowerFlex 70.*

Standard Packaged Drives

The Standard Packaged Drives Program allows users to create drive packages based on their specific needs. A complete drive package may be specified by assembling a single catalog number string that includes a base drive and all required options. Packaging is available for 480V requirements in NEMA Type 1 (IP20), NEMA 4/12 (IP65) indoor, and NEMA 3/4 (IP65) outdoor. The program consists of a fully defined catalog string identified within the price sheet. Focused on higher volume, repeat business, the standard designs provide consistent manufacturing and minimizes customer resources by reducing engineering, manufacturing and installation time. Typical delivery is 10 business days from order entry and can be ordered through the Passport order entry system. *This program uses the Enhanced Control version of the PowerFlex 70.*

Engineered Drives

The Engineered Drives Program offers users the ability to create drive packages beyond the Standard Packaged Drives offering. Packaging is available for 208V, 240V, 480V and 600V requirements. *This program supports both the Standard and the Enhanced Control versions of the PowerFlex 70.* Options may or may not be defined within this publication. Product can be ordered by:

- Assembling a catalog string from the options listed in this publication.
  Engineered options that are listed within this publication will be specified by the heading "*Engineered Drives Program Only*" and will have varied lead-times.
- Entering a custom quote request for additional options not listed.
  A custom quote will require a Passport quote using "SP-SDB-CUSTOM" as the line item part number and entering a description of the base catalog string and custom options in the Competitive Summary. For questions or help with a custom quote please contact the Engineered Drives Group at 262-512-8415.

Quick Ship Program ❶

The Quick Ship Program order entry system has been simplified, minimizing the time required to place an order. To enter your order, type in the first 14 characters of the string and the system will complete the rest.

Program Features

- Standard Control
- 480V top of frame NEMA Type 1 or NEMA Type 4/12 packages
- Pre-determined catalog numbers
- Delivery within 1 to 3 business days of order entry

Standard Features

- Four different 480V PowerFlex 70 flange mount drives [21AQD]
- NEMA Type 1 (IP 20) [-AA] or NEMA Type 4/12 (IP 65) indoor enclosure [-AF]
- Full Numeric LCD HIM, door mounted [-C3]
- Fuse Disconnect [-DS]
- 115V ac Control Power Transformer [-CF]
- Hand/Off/Auto Selector Switch [-D1A]
- Drive Run Pilot Light [-D2A]
- Drive Fault Pilot Light [-D2B]
- Control Power On Pilot Light [-D3A]
- Drive Fault Control Relay [-JF]
- Drive Run Control Relay [-JR]

Quick Ship Catalog Entry

Frame	Normal Duty Hp	Heavy Duty Hp	Type in Catalog Number	Name Plated Catalog Number	Dimensions (in inches)	Approx. Weight (in lbs.)
IP20, NEMA Type 1						
A	2.0	1.5	21AQD3P4-AA-DS	21AQD3P4-AA-DS-C3-CF-D1A-D2A-D2B-D3A-JF-JR	32h x 24w x 16d	225
B	5.0	3.0	21AQD8P0-AA-DS	21AQD8P0-AA-DS-C3-CF-D1A-D2A-D2B-D3A-JF-JR	32h x 24w x 16d	225
C	10	7.5	21AQD014-AA-DS	21AQD014-AA-DS-C3-CF-D1A-D2A-D2B-D3A-JF-JR	32h x 24w x 16d	235
D	20	15	21AQD027-AA-DS	21AQD027-AA-DS-C3-CF-D1A-D2A-D2B-D3A-JF-JR	38h x 24w x 16d	250
IP65, NEMA Type 4/12						
A	2.0	1.5	21AQD3P4-AF-DS	21AQD3P4-AF-DS-C3-CF-D1A-D2A-D2B-D3A-JF-JR	32h x 24w x 16d	225
B	5.0	3.0	21AQD8P0-AF-DS	21AQD8P0-AF-DS-C3-CF-D1A-D2A-D2B-D3A-JF-JR	32h x 24w x 16d	225
C	10	7.5	21AQD014-AF-DS	21AQD014-AF-DS-C3-CF-D1A-D2A-D2B-D3A-JF-JR	32h x 24w x 16d	235
D	20	15	21AQD027-AF-DS	21AQD027-AF-DS-C3-CF-D1A-D2A-D2B-D3A-JF-JR	38h x 24w x 16d	250

❶ Consult factory for orders larger than one drive per frame size.

Standard Packaged Drives Program

NEMA Type 1
NEMA Type 4/12 Indoor
NEMA Type 3/4 Outdoor

- Enhanced Control
- Flange Mount Drive
- Welded Construction
- 480V Rating

All Enclosure Types

- Drive Input Protection Options
- Input/Output Contactors
- Bypass Options
- Input/Output Line Reactor Options
- 115V Control Power Options
- Control Interface and Feedback Options
- Human Interface Modules
- Motor Interface Options
- Operator Devices
- Drawing and Test Options

Engineered Drives Program

- Drive Packages beyond the Standard Packaged Drives Program
- Enhanced and Standard Control
- Defined and Undefined Options
- Pre-determined Options or Custom Quotation

Approximate Dimensions – Standard Packaged Drives Program

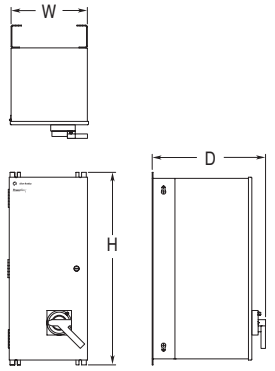


Figure 1

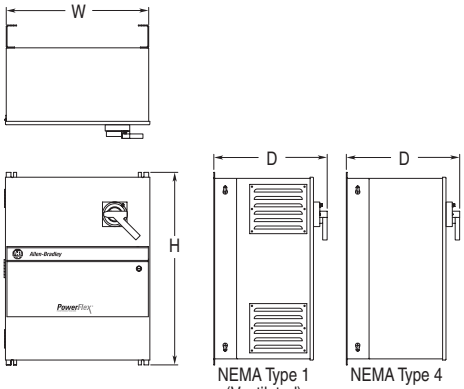


Figure 2

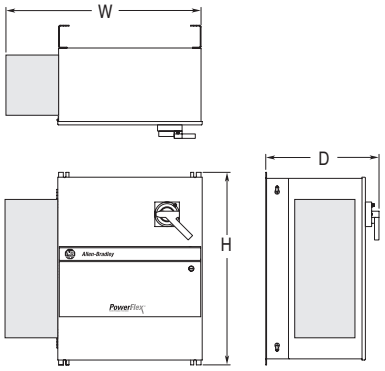


Figure 3

Maximum Enclosure Dimensions

Ratings				Enclosure Style for Flange Mounted Drives															
				NEMA Type 1, Option Code A				NEMA Type 4/12 Indoor, Option Code D						NEMA Type 3/4, Option Code E					
				B0, C1, C5, S1, S9…S13, S16, P1…P3 or P6, Drive Mounted Options & All HIMs		All Options		B0, C1, C5, S1, S9…S13, S16, P1…P3 or P6, Drive Mounted Options & All NEMA 4 HIMs		All Options Less Line Reactor		All Options		B0, C1, C5, S1, S9…S13, S16, P1…P3 or P6, Drive Mounted Options		All Options Less Line Reactor		All Options	
ND Hp	HD Hp	Drive Frame Size	Power Flex 70 Flange Drive Cat. No.	Figure	Style	Figure	Style	Figure	Style	Figure	Style	Figure	Style	Figure	Style	Figure	Style	Figure	Style
480V ac, Three-Phase Drives																			
0.5	0.33	A	D1P1	1	1	2	3	1	1	2	3	2	3	1	1	2	3	2	3
1.0	0.75	A	D2P1	1	1	2	3	1	1	2	3	2	3	1	1	2	3	2	3
2.0	1.5	A	D3P4	1	1	2	3	1	1	2	3	2	3	1	1	2	3	2	4
3.0	2.0	B	D5P0	1	1	2	3	1	1	2	3	2	4	1	1	2	3	2	5
5.0	3.0	B	D8P0	1	1	2	3	1	1	2	3	2	4	1	1	2	3	2	5
7.5	5.0	C	D011	1	1	2	3	1	1	2	3	2	4	1	1	2	3	2	5
10	7.5	C	D014	1	1	2	3	1	1	2	3	2	4	1	1	2	3	2 or 3 ❶	5 or 8 ❶
15	10	D	D022	1	1	2	4	1	1	2	4	2	5	1	1	2	4	2 or 3 ❶	5 or 8 ❶
20	15	D	D027	1	1	2	4	1	1	2	4	2	5	1	1	2	4	3	8
25	20	D	D034	1	1	2	4	1	1	2	4	2	5	1	1	2	5	3	8
30	25	D	D040	1	1	2	4	1	1	2	4	2	5	1	1	2	5	3	8
40	30	E	D052	1	2	2	6	1	2	2	6	2	7	1	2	2	6	3	9
50	40	E	D065	1	2	2	6	1	2	2	6	2	7	1	2	2	6	3	9

❶ Figure 2, Style 5 when one line reactor selected. Figure 3, Style 8 when two line reactors selected.

Enclosure Dimensions

Figure	Style	Enclosure Rating	Option Code (Position d)	Dimensions	
				H x W x D *(mm)*	H x W x D *(in)*
1	1	NEMA 1	A	812.8 x 330.2 x 484.1	32 x 13 x 19.06
1	2	NEMA 1	A	1,270.0 x 406.4 x 484.1	50 x 16 x 19.06
2	3	NEMA 1	A	812.8 x 609.6 x 484.1	32 x 24 x 19.06
2	4	NEMA 1	A	965.2 x 609.6 x 484.1	38 x 24 x 19.06
2	6	NEMA 1	A	1,270.0 x 762.0 x 484.1	50 x 30 x 19.06
1	1	NEMA 4/12 Indoor, NEMA 4 Outdoor	D or E	812.8 x 330.2 x 484.1	32 x 13 x 19.06
1	2	NEMA 4/12 Indoor, NEMA 4 Outdoor	D or E	1,270.0 x 406.4 x 484.1	50 x 16 x 19.06
2	3	NEMA 4/12 Indoor, NEMA 4 Outdoor	D or E	812.8 x 609.6 x 484.1	32 x 24 x 19.06
2	4	NEMA 4/12 Indoor, NEMA 4 Outdoor	D or E	965.2 x 609.6 x 484.1	38 x 24 x 19.06
2	5	NEMA 4/12 Indoor, NEMA 4 Outdoor	D or E	1,270.0 x 609.6 x 484.1	50 x 24 x 19.06
2	6	NEMA 4/12 Indoor, NEMA 4 Outdoor	D or E	1,270.0 x 762.0 x 484.1	50 x 30 x 19.06
2	7	NEMA 4/12 Indoor, NEMA 4 Outdoor	D or E	1,270.0 x 914.4 x 484.1	50 x 36 x 19.06
3	8	NEMA 4/12 Indoor, NEMA 4 Outdoor	D or E	812.8 x 831.9 x 484.1	50 x 32.75 x 19.06
3	9	NEMA 4/12 Indoor, NEMA 4 Outdoor	D or E	1,270.0 x 984.3 x 484.1	50 x 38.75 x 19.06

❶ Depth includes 6.35 mm (2.5 in) for Operator Handle when ordered.

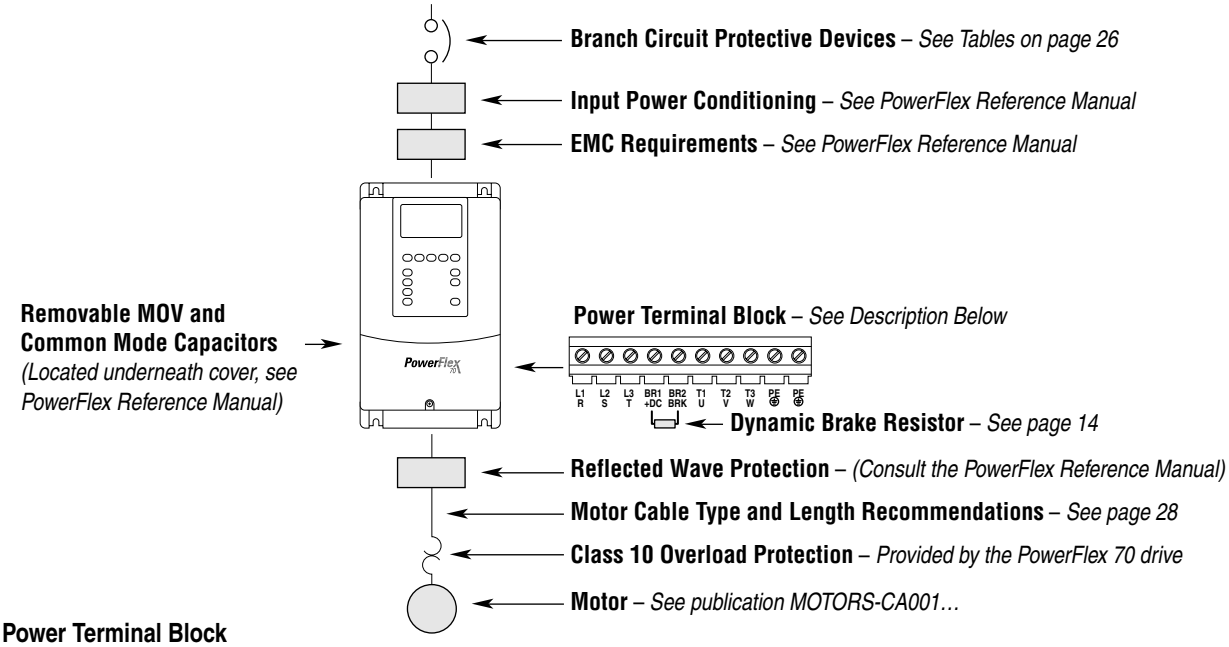
Power Wiring

The PowerFlex 70 has the following built in protective features to help simplify installation:

- Ground fault protection during start-up and running helps ensure reliability
- Electronic motor moverload protection increases motor life
- Removable MOV to ground and common mode capacitors to ground, ensures compatibility with ungrounded systems
- 6kV transient protection 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 Reference Manual*, Publication PFLEX-RM001…, available on-line at www.ab.com/manuals/dr, for detailed recommendations on input power conditioning, CE conformance (EMC filtering), dynamic braking, reflected wave protection, motor cables types and motor cable distances.

Block Diagram



Power Terminal Block

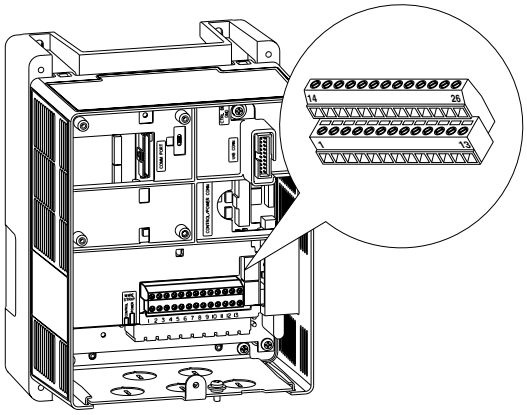
Terminal	Description	Notes
R	R (L1)	AC Line Input Power
S	S (L2)	AC Line Input Power
T	T (L3)	AC Line Input Power
BR1	DC Brake	Dynamic Brake Resistor Connection
BR2	DC Brake	Dynamic Brake Resistor Connection
U	U (T1)	To Motor
V	V (T2)	To Motor
W	W (T3)	To Motor
PE	PE Ground	
PE	PE Ground	
-DC	DC Bus (–)	
+DC	DC Bus (+)	

Power Wiring

		Wire Size Range ❶		Torque	
Name	Frame	Maximum	Minimum	Maximum	Recommended
Power Terminal Block	A, B, & C	3.5 mm^2 (12 AWG)	0.3 mm^2 (22 AWG)	0.66 N-m (5.5 lb.-in.)	0.6 N-m (5 lb.-in.)
	D	8.4 mm^2 (8 AWG)	0.8 mm^2 (18 AWG)	1.7 N-m (15 lb.-in.)	1.4 N-m (12 lb.-in.)
	E	25.0 mm^2 (3 AWG)	2.5 mm^2 (14 AWG)	2.71 N-m (24 lb.-in.)	2.71 N-m (24 lb.-in.)
SHLD terminal	All	—	—	1.6 N-m (14 lb.-in.)	1.6 N-m (14 lb.-in.)

❶ Maximum/minimum sizes that the terminal block will accept - these are not recommendations.

Control Wiring



No.	Signal	Factory Default	Description	Related Param.
1	Digital In1 Sel	Stop – CF (CF = Clear Fault)	11.2 mA @ 24V dc 19.2V minimum on state 3.2V maximum off state Important: Use only 24V dc, not suitable for 115V ac circuitry. Inputs can be wired as sink or source.	361 - 366
2	Digital In2 Sel	Start		
3	Digital In3 Sel	Auto/Man		
4	Digital In4 Sel	Speed Sel 1		
5	Digital In5 Sel	Speed Sel 2		
6	Digital In6 Sel	Speed Sel 3		
7	24V Common	–	Drive supplied power for Digital In1-6 inputs. 150mA maximum load.	
8	Digital In Common	–		
9	+24V dc	–		
10	+10V Pot Reference	–	2 k ohm minimum load.	
11	Digital Out 1 – N.O. ❶	NOT Fault	Max Resistive Load: 250V ac / 30V dc, 50 VA / 60 Watts Max Inductive Load: 250V ac / 30V dc, 25 VA / 30 Watts Minimum DC Load: 10 µA, 10 mV dc	380 - 387
12	Digital Out 1 Common			
13	Digital Out 1 – N.C. ❶	Fault		
14	Analog In 1 (– Volts)	Voltage – Reads value at 14 & 15 ❷	Non-isolated, 0 to +10V, 10 bit, 100k ohm input impedance. ❸	320 - 327
15	Analog In 1 (+ Volts)			
16	Analog In 1 (– Current)		Non-isolated, 4-20mA, 10 bit, 100 ohm input impedance. ❸	
17	Analog In 1 (+ Current)			
18	Analog In 2 (– Volts)	Voltage – Reads value at 18 & 19 ❷	Isolated, bipolar, differential, 0 to +10V unipolar (10 bit) or ±10V bipolar (10 bit & sign), 100k ohm input impedance.❹	
19	Analog In 2 (+ Volts)			
20	Analog In 2 (– Current)		Isolated, 4-20mA, 10 bit & sign, 100 ohm input impedance. ❹	
21	Analog In 2 (+ Current)			
22	10V Pot Common Analog Out (– Volts) Analog Out (– Current)	Output Freq ❷	0 to +10V, 10 bit, 10k ohm (2k ohm minimum) load. 0 to 20mA, 10 bit, 400 ohm maximum load. ❺ Referenced to chassis ground. Common if internal 10V supply (terminal 10) is used.	341 - 344
23	Analog Out (+ Volts) Analog Out (+ Current)			
24	Digital Out 2 – N.O.	Run	See description at No.s 11-13.	380 - 387
25	Digital Out 2 Common			
26	Digital Out 2 – N.C.			

❶ Contacts shown in unpowered state. Relays change state when drive is powered.

❷ These inputs/outputs are dependent on a number of parameters. See “Related Parameters.”

❸ Differential Isolation - External source must be less than 10V with respect to PE.

❹ Differential Isolation - External source must be maintained at less than 160V with respect to PE. Input provides high common mode immunity.

❺ Analog output current is only available with Enhanced Control drives.

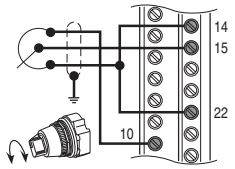
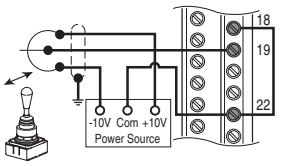
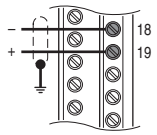
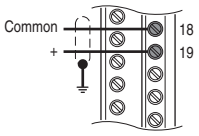
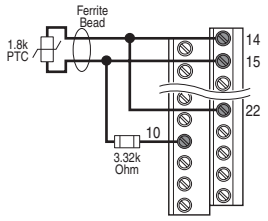
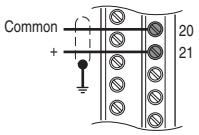
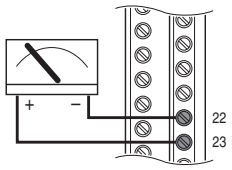
Control Wiring, Continued

I/O Wiring

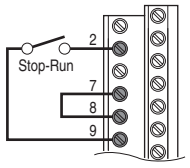
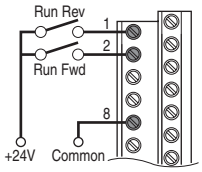
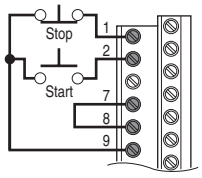
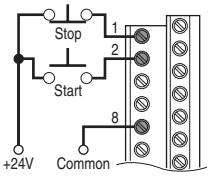
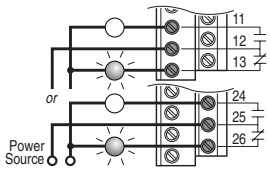
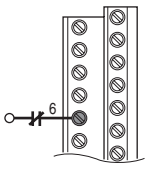
	Wire Size Range ❶		Torque	
Name	**Maximum**	**Minimum**	**Maximum**	**Recommended**
I/O Terminal Block	1.5 mm² (16 AWG)	0.05 mm² (30 AWG)	0.55 N-m (4.9 lb.-in.)	0.5 N-m (4.4 lb.-in.)

❶ Maximum/minimum sizes that the terminal block will accept - these are not recommendations.

I/O Wiring Examples

Input/Output	Connection Example	Required Parameter Settings
Potentiometer Unipolar Speed Reference 10k Ohm Pot. Recommended (2k Ohm minimum)		Select Speed Reference source: Param. 090 = 1 “Analog In 1” Adjust Scaling: Param. 091, 092, 322, 323 Check Results: Param. 016
Joystick Bipolar Speed Reference ±10V Input		Set Direction Mode: Param. 190 = 1 “Bipolar” Adjust Scaling: Param. 091, 092, 325, 326 Check Results: Param. 017
Analog Input Bipolar Speed Reference ±10V Input		Adjust Scaling: Param. 091, 092, 325, 326 Check Results: Param. 017
Analog Input Unipolar Speed Reference 0 to +10V Input		Adjust Scaling: Param. 091, 092, 325, 326 Check Results: Param. 017
Analog Input, PTC PTC OT set > 5V PTC OT cleared < 4V PTC Short < 0.2V		Set Fault Config 1: Param. 238, Bit #7 = 1 “Enabled” Set Alarm Config 1: Param. 259, Bit #11 = 1 “Enabled”
Analog Input Unipolar Speed Reference 4-20 mA Input		Configure Input for Current: Param. 320, Bit #1 = 1 “Current” Adjust Scaling: Param. 091, 092, 325, 326 Check Results: Param. 017
Analog Output Unipolar 0 to +10V Output. Can Drive a 2k Ohm load (25 mA short circuit limit)		Select Source Value: Param. 342 Adjust Scaling: Param. 343, 344

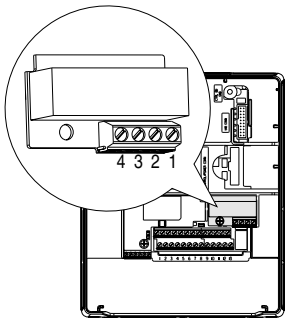
Control Wiring, Continued

Input/Output	Connection Example	Required Parameter Settings
2 Wire Control Non-Reversing	Internal Supply 	Disable Digital Input 1: Param. 361 = 0 “Not Used” Set Digital Input 2: Param. 362 = 7 “Run”
2 Wire Control Reversing	External Supply 	Set Digital Input 1: Param. 361 = 8 “Run Forward” Set Digital Input 2: Param. 362 = 9 “Run Reverse”
3 Wire Control	Internal Supply 	Use factory default parameter settings.
3 Wire Control	External Supply 	Use factory default parameter settings.
Digital Output Form C Relays Energized in Normal State.		Select Source: Param. 380, 384
Enable Input Shown in enabled state.		Standard Control Configure with parameter 366 Enhanced Control Configure with parameter 366 For dedicated hardware Enable: Remove Enable Jumper

Safe Off Board

Terminal Description

No.	Signal	Description
1	Monitor - N.C.	Normally closed contacts for monitoring relay status. Maximum Resistive Load: 250V ac / 30V dc / 50 VA / 60 Watts Maximum Inductive Load: 250V ac / 30V dc / 25 VA / 30 Watts
2	Common - N.C.	
3	+24V dc	Connections for user supplied power to energize coil.
4	24V Common	



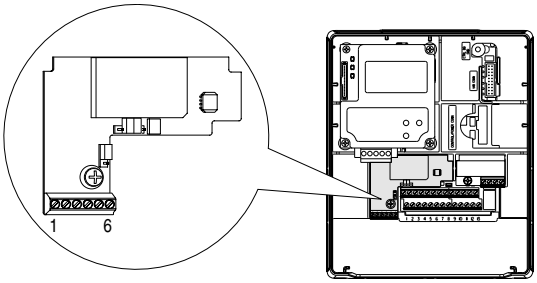
Connection Examples

For detailed connection examples refer to the DriveGuard™ Safe-Off Option for PowerFlex 70 AC Drives *User Manual*, publication PFLEX-UM001….

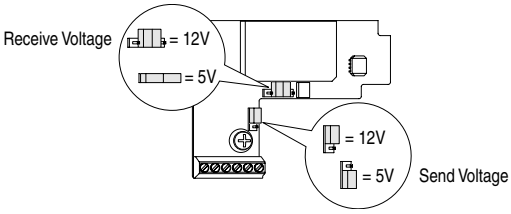
Encoder Board

Terminal Description

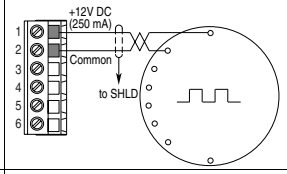
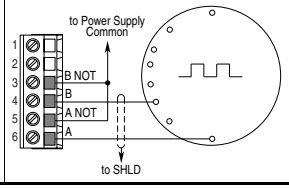
No.	Signal	Description
1	5V/12V Power	Internal power source 250 mA (isolated).
2	Power Return	
3	Encoder B (NOT)	Single channel or quadrature B input.
4	Encoder B	
5	Encoder A (NOT)	Single channel or quadrature A input.
6	Encoder A	

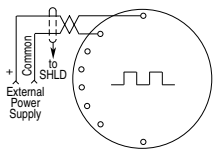
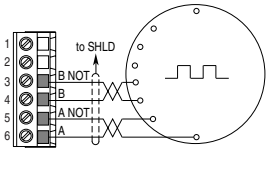


Jumper Settings



Connection Examples

I/O	Connection Example
Encoder Power – Internal Drive Power Internal (drive) 12V dc, 250mA	
Encoder Signal – Single-Ended, Dual Channel	

I/O	Connection Example
Encoder Power – External Power Source	
Encoder Signal – Differential, Dual Channel	

Branch Circuit Protection Devices and Power Dissipation

Drive Catalog Number	Frame❾	Hp Rating		Input Ratings		Output Amps			Input Branch Circuit Protection Devices										Power Dissipation ❽	
									Dual Element Time Delay Fuse		Non-Time Delay Fuse		❸ Circuit Breaker	❹ Motor Circuit Protector	140M Motor Starter with Adjustable Current Range ❺ ❻					
		ND	*HD*	*Amps*	*kVA*	*Cont.*	*1 Min.*	*3 Sec.*	❶ *Min.*	❷ *Max.*	❶ *Min.*	❷ *Max.*	*Amps*	*Amps*	*Available Catalog Numbers* ❼				*Internal*	*Total*
208 Volt AC Input																				
20AB2P2	A	0.5	0.33	2.9	1.1	2.5	2.7	3.7	6	6	6	10	15	7	140M-C2E-B40	140M-D8E-B40	–	–	19.2	31.4
20AB4P2	A	1	0.75	5.6	2	4.8	5.5	7.4	10	10	10	17.5	15	7	140M-C2E-B63	140M-D8E-B63	–	–	20.5	51.2
20AB6P8	B	2	1.5	10	3.6	7.8	10.3	13.8	15	15	15	30	30	15	140M-C2E-C10	140M-D8E-C10	140M-F8E-C10	–	22.6	67.2
20AB9P6	B	3	2	14	5.1	11	12.1	16.5	20	25	20	40	40	30	140M-C2E-C16	140M-D8E-C16	140M-F8E-C16	–	25.4	92.7
20AB015	C	5	3	16	5.8	17.5	19.2	26.6	20	35	20	70	70	30	140M-C2E-C20	140M-D8E-C20	140M-F8E-C20	–	33.2	174.5
20AB022	D	7.5	5	23.3	8.3	25.3	27.8	37.9	30	50	30	100	100	30	140M-C2E-C25	140M-D8E-C25	140M-F8E-C25	140-CMN-2500	34.2	239.9
20AB028	D	10	7.5	29.8	10.7	32.2	37.9	50.6	40	70	40	125	125	50	–	–	140M-F8E-C32	140-CMN-4000	48.1	318.5
20AB042	D	15	10	39.8	14.3	43	55.5	74	60	100	60	175	175	70	–	–	140M-F8E-C45	140-CMN-6300	40.3	425.9
20AB054	E	20	15	57.5	20.7	62.1	72.4	96.6	80	125	80	200	200	100	–	–	–	140-CMN-6300	44.9	539.5
20AB070	E	25	20	72.3	26.0	78.2	93.1	124	90	175	90	300	300	100	–	–	–	140-CMN-9000	51.6	702.3
240 Volt AC Input																				
20AB2P2	A	0.5	0.33	2.5	1.1	2.2	2.4	3.3	3	4.5	3	8	15	3	140M-C2E-B25	140M-D8E-B25	–	–	19.2	31.4
20AB4P2	A	1	0.75	4.8	2	4.2	4.8	6.4	6	9	6	15	15	7	140M-C2E-B63	140M-D8E-B63	–	–	20.5	51.2
20AB6P8	B	2	1.5	8.7	3.6	6.8	9	12	15	15	15	25	25	15	140M-C2E-C10	140M-D8E-C10	140M-F8E-C10	–	22.6	67.2
20AB9P6	B	3	2	12.2	5.1	9.6	10.6	14.4	20	20	20	35	35	15	140M-C2E-C16	140M-D8E-C16	140M-F8E-C16	–	25.4	92.7
20AB015	C	5	3	13.9	5.8	15.3	17.4	23.2	20	30	20	60	60	30	140M-C2E-C16	140M-D8E-C16	140M-F8E-C16	–	33.2	174.5
20AB022	D	7.5	5	19.9	8.3	22	24.4	33	25	45	25	80	80	30	140M-C2E-C25	140M-D8E-C25	140M-F8E-C25	140-CMN-2500	34.2	239.9
20AB028	D	10	7.5	25.7	10.7	28	33	44	35	60	35	110	110	50	–	–	140M-F8E-C32	140-CMN-4000	48.1	318.5
20AB042	D	15	10	38.7	16.1	42	46.2	63	50	90	50	150	150	50	–	–	140M-F8E-C45	140-CMN-6300	40.3	425.9
20AB054	E	20	15	49.8	20.7	54	63	84	60	100	60	200	200	100	–	–	–	140-CMN-6300	44.9	539.5
20AB070	E	25	20	64.5	26.8	70	81	108	90	150	90	275	275	100	–	–	–	140-CMN-9000	51.6	702.3
400 Volt AC Input																				
20AC1P3	A	0.37	0.25	1.6	1.1	1.3	1.4	1.9	3	3	3	5	15	3	140M-C2E-B16	–	–	–	17.9	29.4
20AC2P1	A	0.75	0.55	2.5	1.8	2.1	2.4	3.2	4	6	4	8	15	7	140M-C2E-B25	140M-D8E-B25	–	–	19.5	47.3
20AC3P5	A	1.5	1.1	4.3	3	3.5	4.5	6	6	6	6	12	15	7	140M-C2E-B63	140M-D8E-B63	–	–	21.6	65.2
20AC5P0	B	2.2	1.5	6.5	4.5	5	5.5	7.5	10	10	10	20	20	15	140M-C2E-C10	140M-D8E-C10	140M-F8E-C10	–	24.0	88.6
20AC8P7	B	4	3	11.3	7.8	8.7	9.9	13.2	15	17.5	15	30	30	15	140M-C2E-C16	140M-D8E-C16	140M-F8E-C16	–	28.2	127.7
20AC011	C	5.5	4	11	7.6	11.5	13	17.4	15	25	15	45	40	15	140M-C2E-C16	140M-D8E-C16	140M-F8E-C16	–	27.8	167.8
20AC015	C	7.5	5.5	15.1	10.4	15.4	17.2	23.1	20	30	20	60	60	20	140M-C2E-C16	140M-D8E-C16	140M-F8E-C16	–	32.0	225.3
20AC022	D	11	7.5	21.9	15.2	22	24.2	33	30	45	30	80	80	30	140M-C2E-C25	140M-D8E-C25	140M-F8E-C25	140-CMN-2500	34.2	339.6
20AC030	D	15	11	30.3	21	30	33	45	40	60	40	120	120	50	–	–	140M-F8E-C32	140-CMN-4000	42.9	475.8
20AC037	D	18.5	15	35	24.3	37	45	60	50	80	50	125	140	50	–	–	140M-F8E-C45	140-CMN-4000	40.5	404.3
20AC043	D	22	18.5	40.7	28.2	43	56	74	60	90	60	150	160	70	–	–	–	140-CMN-6300	41.5	438.3
20AC060	E	30	22	56.8	39.3	60	66	90	80	125	80	225	240	80	–	–	–	140-CMN-6300	50.0	550.8
20AC072	E	37	30	68.9	47.8	72	90	120	90	150	90	250	280	100	–	–	–	140-CMN-9000	57.7	689.7
480 Volt AC Input																				
20AD1P1	A	0.5	0.33	1.3	1.1	1.1	1.2	1.6	3	3	3	4	15	3	140M-C2E-B16	–		–	17.9	29.4
20AD2P1	A	1	0.75	2.4	2	2.1	2.4	3.2	3	6	3	8	15	3	140M-C2E-B25	140M-D8E-B25	–	–	19.5	47.3
20AD3P4	A	2	1.5	3.8	3.2	3.4	4.5	6	6	6	6	12	15	7	140M-C2E-B40	140M-D8E-B40	–	–	21.6	65.2
20AD5P0	B	3	2	5.6	4.7	5	5.5	7.5	10	10	10	20	20	15	140M-C2E-B63	140M-D8E-B63	–	–	24.0	88.6
20AD8P0	B	5	3	9.8	8.4	8	8.8	12	15	15	15	30	30	15	140M-C2E-C10	140M-D8E-C10	140M-F8E-C10	–	28.2	127.7
20AD011	C	7.5	5	9.5	7.9	11	12.1	16.5	15	20	15	40	40	15	140M-C2E-C16	140M-D8E-C16	140M-F8E-C16	–	27.8	167.8
20AD014	C	10	7.5	12.5	10.4	14	16.5	22	20	30	20	50	50	20	140M-C2E-C16	140M-D8E-C16	140M-F8E-C16	–	32.0	225.3
20AD022	D	15	10	19.9	16.6	22	24.2	33	25	45	25	80	80	30	140M-C2E-C25	140M-D8E-C25	140M-F8E-C25	–	34.2	339.6
20AD027	D	20	15	24.8	20.6	27	33	44	35	60	35	100	100	50	–	–	140M-F8E-C32	140-CMN-2500	42.9	475.8
20AD034	D	25	20	31.2	25.9	34	40.5	54	40	70	40	125	125	50	–	–	140M-F8E-C45	140-CMN-4000	40.5	404.3
20AD040	D	30	25	36.7	39.7	40	51	68	50	90	50	150	150	50	–	–	140M-F8E-C45	140-CMN-4000	41.5	438.3
20AD052	E	40	30	47.7	39.7	52	60	80	60	110	60	200	200	70	–	–	–	140-CMN-6300	50.0	550.8
20AD065	E	50	40	59.6	49.6	65	78	104	80	125	80	250	250	100	–	–	–	140-CMN-9000	57.7	689.7

❶ Minimum protection device size is the lowest rated device that supplies maximum protection without nuisance tripping.

❷ Maximum protection device size is the highest rated device that supplies drive protection.

❸ Circuit breaker - inverse time breaker.

❹ Motor Circuit Protector - instantaneous trip circuit breaker.

❺ Bulletin 140M with adjustable current range should have the current trip set to the minimum range that the device will not trip.

❻ Manual Self-Protector (Type E) Combination Motor Controller, UL Listed for 208 Wye, 240 Wye or Delta, 480Y/277 or 600y/347. Not UL listed for use on 480V or 600V Delta/Delta Systems.

❼ The AIC ratings of the Bulletin 140M Motor Protector may vary without testing. See Publication 140M-SG001B-EN-P.

❽ At 4kHz PWM frequency. See *PowerFlex Reference Manual* for derating above 4kHz.

❾ For internally filtered drives, Frame A increases to Frame B. For enclosure Code C (IP66, NEMA 4X/12), Frame A increases to Frame B and Frame C increases to Frame D.

Branch Circuit Protection Devices and Power Dissipation, Continued)

Drive Catalog Number	Frame❾	Hp Rating		Input Ratings		Output Amps			Input Branch Circuit Protection Devices									Power Dissipation ❽	
									Dual Element Time Delay Fuse		Non-Time Delay Fuse		❸ Circuit Breaker	❹ Motor Circuit Protector	140M Motor Starter with Adjustable Current Range ❺ ❻				
		ND	*HD*	*Amps*	*kVA*	*Cont.*	*1 Min.*	*3 Sec.*	❶ *Min.*	❷ *Max.*	❶ *Min.*	❷ *Max.*	*Amps*	*Amps*	*Available Catalog Numbers ❼*				*Internal*	*Total*
600 Volt AC Input																				
20AE0P9	A	0.5	0.33	1.3	1.3	0.9	1.1	1.4	3	3	3	3.5	15	3	140M-C2E-B16	–	–	–	17.9	29.4
20AE1P7	A	1	0.75	1.9	2	1.7	2	2.6	3	6	3	6	15	3	140M-C2E-B25	140M-D8E-B25	–	–	19.5	47.3
20AE2P7	A	2	1.5	3	3.1	2.7	3.6	4.8	4	6	4	10	15	7	140M-C2E-B40	140M-D8E-B40	–	–	21.6	65.2
20AE3P9	B	3	2	4.4	4.5	3.9	4.3	5.9	6	8	6	15	15	7	140M-C2E-B63	140M-D8E-B63	–	–	24.0	88.6
20AE6P1	B	5	3	7.5	7.8	6.1	6.7	9.2	10	12	10	20	20	15	140M-C2E-C10	140M-D8E-C10	140M-F8E-C10	–	28.2	127.7
20AE9P0	C	7.5	5	7.7	8	9	9.9	13.5	10	20	10	35	35	15	140M-C2E-C10	140M-D8E-C10	140M-F8E-C10	–	27.8	167.8
20AE011	C	10	7.5	9.8	10.1	11	13.5	18	15	20	15	40	40	15	140M-C2E-C16	140M-D8E-C16	140M-F8E-C16	–	32.0	225.3
20AE017	D	15	10	15.3	15.9	17	18.7	25.5	20	35	20	60	60	30	140M-C2E-C20	140M-D8E-C20	140M-F8E-C20	–	34.2	339.6
20AE022	D	20	15	20	20.8	22	25.5	34	25	45	25	80	80	30	140M-C2E-C25	140M-D8E-C25	140M-F8E-C25	140-CMN-2500	42.9	475.8
20AE027	D	25	20	24.8	25.7	27	33	44	35	60	35	100	100	50	–	–	140M-F8E-C25	140-CMN-2500	42.4	323.8
20AE032	D	30	25	29.4	30.5	32	40.5	54	40	70	40	125	125	50	–	–	140M-F8E-C32	140-CMN-4000	43.4	355.3
20AE041	E	40	30	37.6	39.1	41	48	64	50	90	50	150	150	100	–	–	140M-F8E-C45	140-CMN-4000	51.8	441.7
20AE052	E	50	40	47.7	49.6	52	61.5	82	60	110	60	200	200	100	–	–	–	140-CMN-6300	59.9	561.3

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❸ Circuit breaker - inverse time breaker.

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❻ Manual Self-Protector (Type E) Combination Motor Controller, UL Listed for 208 Wye, 240 Wye or Delta, 480Y/277 or 600y/347. Not UL listed for use on 480V or 600V Delta/Delta Systems.

❼ The AIC ratings of the Bulletin 140M Motor Protector may vary without testing. See Publication 140M-SG001B-EN-P.

❽ At 4kHz PWM frequency. See *PowerFlex Reference Manual* for derating above 4kHz.

❾ For internally filtered drives, Frame A increases to Frame B. For enclosure Code C (IP66, NEMA 4X/12), Frame A increases to Frame B and Frame C increases to Frame D.

Maximum Lead Lengths (in feet)

480V Hp Rating	Carrier Freq. (kHz)	1000 Volt Motor			1200 Volt Motor			1488 Volt Motor NEMA MG1-1998			1600 Volt Motor 1329 R/L		
		Shld. ❶	Shld. ❷	Un-Shld.	Shld. ❶	Shld. ❷	Un-Shld.	Shld. ❶	Shld. ❷	Un-Shld.	Shld. ❶	Shld. ❷	Un-Shld.
0.5	2	NA	60	40	NA	175	60	NA	175	150	NA	175	150
	4	NA	60	40	NA	175	60	NA	175	130	NA	175	150
	6	NA	60	40	NA	175	50	NA	175	130	NA	175	150
	8	NA	60	40	NA	175	50	NA	175	130	NA	175	150
	10	NA	60	40	NA	175	50	NA	175	130	NA	175	150
1	2	NA	70	30	NA	275	55	NA	275	180	NA	275	350
	4	NA	70	30	NA	250	55	NA	250	180	NA	250	300
	6	NA	70	30	NA	250	55	NA	250	170	NA	250	280
	8	NA	70	30	NA	250	55	NA	250	160	NA	250	260
	10	NA	70	30	NA	200	55	NA	250	160	NA	250	240
2	2	NA	70	40	NA	275	75	NA	275	500	NA	275	500
	4	NA	70	40	NA	250	75	NA	250	400	NA	250	400
	6	NA	70	40	NA	250	75	NA	250	360	NA	250	400
	8	NA	70	40	NA	240	75	NA	250	260	NA	250	400
	10	NA	70	40	NA	220	75	NA	250	260	NA	250	400
3	2	NA	70	40	NA	220	75	NA	425	600	NA	425	600
	4	NA	70	40	NA	220	75	NA	400	520	NA	400	600
	6	NA	70	40	NA	220	75	NA	425	520	NA	425	600
	8	NA	70	40	NA	220	75	NA	400	380	NA	400	580
	10	NA	70	40	NA	220	75	NA	400	380	NA	400	550
5	2	NA	80	40	NA	280	80	NA	450	600	NA	450	600
	4	NA	80	40	NA	280	80	NA	400	600	NA	400	600
	6	NA	80	40	NA	280	80	NA	400	560	NA	400	600
	8	NA	80	40	NA	280	80	NA	300	400	NA	300	600
	10	NA	80	40	NA	280	80	NA	300	360	NA	300	580
7.5	2	NA	50	40	NA	300	60	NA	400	600	NA	400	600
	4	NA	50	40	NA	300	60	NA	400	600	NA	400	600
	6	NA	50	40	NA	300	60	NA	400	520	NA	400	600
	8	NA	50	40	NA	300	60	NA	400	400	NA	400	560
	10	NA	50	40	NA	300	60	NA	300	320	NA	300	500
10	2	NA	50	40	NA	300	60	NA	400	600	NA	400	600
	4	NA	50	40	NA	300	60	NA	400	600	NA	400	600
	6	NA	50	40	NA	300	60	NA	400	560	NA	400	600
	8	NA	50	40	NA	300	60	NA	400	440	NA	400	560
	10	NA	50	40	NA	300	60	NA	300	380	NA	300	520
15	2	NA	80	50	NA	600	80	NA	600	600	NA	600	600
	4	NA	80	50	NA	400	80	NA	600	600	NA	600	600
	6	NA	80	50	NA	400	80	NA	600	600	NA	600	600
	8	NA	80	50	NA	400	80	NA	600	500	NA	600	600
	10	NA	80	50	NA	400	80	NA	600	400	NA	600	480
20-50	2	NA	70	50	NA	600	80	NA	600	600	NA	600	600
	4	NA	70	50	NA	400	80	NA	600	600	NA	600	600
	6	NA	70	50	NA	200	80	NA	600	600	NA	600	600
	8	NA	70	50	NA	160	80	NA	600	600	NA	600	600
	10	NA	70	50	NA	160	80	NA	600	340	NA	600	600

❶ Cable is Belden 295xx series or equivalent.

❷ Cable is Alcatel C1202 or equivalent. Shielded cable with twisted conductors and no filler.

Notes

– 1000V motor is defined as one assembled without phase paper. 1200V motor is defined as one assembled with phase paper. 1488V motor meets NEMA MG 1-1998 section 31 standard where the insulation can withstand voltage spikes of 3.1 x rated motor voltage due to inverter operation (inverter duty motor). 1600V motor is a 1329R or 1329L. Operation at nominal line voltage. To increase the distance between the drive and the motor, some mitigation device needs to be added to the system (i.e. an RWR or Terminator).

– Shading indicates limited due to cable charging current.

– NA = Data Not Available at time of publication.

Control and Performance

Category	Specification						
Protection	PowerFlex 70 Drive		200-208V Drive	240V Drive	380/400 Drive	480V Drive	600V Drive
	AC Input Overvoltage Trip:		247VAC	285VAC	475VAC	570VAC	690VAC
	AC Input Undervoltage Trip:		120VAC	138VAC	233VAC	280VAC	345VAC
	Bus Overvoltage Trip:		350VDC	405VDC	675VDC	810VDC	1013VDC
	Bus Undervoltage Trip:		176VDC	204VDC	339VDC	407VDC	998VDC
	Nominal Bus Voltage:		281VDC	324VDC	540VDC	648VDC	810VDC
	All Drives						
	Heat Sink Thermistor:		Monitored by microprocessor overtemp trip				
	Drive Overcurrent Trip Software Current Limit: Hardware Current Limit: Instantaneous Current Limit:		 20-160% of rated current 200% of rated current (typical) 220-300% of rated current (dependent on drive rating)				
	Line transients:		up to 6000 volts peak per IEEE C62.41-1991				
	Control Logic Noise Immunity:		Showering arc transients up to 1500V peak				
	Power Ride-Thru:		15 milliseconds at full load				
	Logic Control Ride-Thru:		0.5 seconds minimum, 2 seconds typical				
	Ground Fault Trip:		Phase-to-ground on drive output				
	Short Circuit Trip:		Phase-to-phase on drive output				
Environment	Altitude:		1000 m (3300 ft) max. without derating				
	Maximum Surrounding Air Temperature without derating: IP20, NEMA Type 1 IP66, NEMA Type 4X/12 Flange Type		 0 to 50 degrees C (32 to 122 degrees F) 0 to 40 degrees C (32 to 104 degrees F) 0 to 50 degrees C (32 to 122 degrees F)				
	Storage Temperature (all const.):		–40 to 70 degrees C (–40 to 158 degrees 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:		5 to 95% non-condensing				
	Shock:		15G peak for 11ms duration (±1.0 ms)				
	Vibration:		0.152 mm (0.006 in.) displacement, 1G peak				
Agency Certification	Type 1, IP30	Flange Type	Type 4X/12, IP66				
	✔	✔	✔	cULus	Listed to UL508C and CAN/CSA-C2.2 No. 14-M91		
		✔			Listed to UL508C for plenums (Rear heatsink only)		
	✔	✔	✔	CE	Marked for all applicable European Directives ❶ EMC Directive (89/336/EEC) EN 61800-3 Adjustable Speed electrical power drive systems Low Voltage Directive (73/23/EEC) EN 50178 Electronic Equipment for use in Power Installations		
	✔	✔	✔	C N223	Certified to AS/NZS, 1997 Group 1, Class A		
	✔	✔	✔	NSF	Certified to Criteria C-2, 1983.		
	✔	✔	✔	TÜV Rheinland EMC; TÜV EN 50178; TÜV Rheinland FS	Certified to EN 954-1, Category 3 for 240V, 400V, and 480V ratings of PowerFlex 70 Enhanced Control with DriveGuard Safe-Off option.		
	✔	✔	✔		TUV Approved to EN 954-1, Category 3 for 600V ratings of PowerFlex 70 Enhanced Control with DriveGuard Safe-Off option.		
	The drive is also designed to meet the appropriate portions of the following specifications: NFPA 70 - US National Electrical Code NEMA ICS 3.1 - Safety standards for Construction and Guide for Selection, Installation and Operation of Adjustable Speed Drive Systems. IEC 146 - International Electrical Code.						

❶ Applied noise impulses may be counted in addition to the standard pulse train causing erroneously high (pulse frequency) readings.

Control and Performance, Continued

Category	Specification		
Electrical	Voltage Tolerance:	–10% of minimum, +10% of maximum. See the PowerFlex *User Manual*, publication 20A-UM001…, for Full Power and Operating Range.	
	Frequency Tolerance:	47-63 Hz.	
	Input Phases:	Three-phase input provides full rating for all drives. Single-phase operation provides 50% of rated current.	
	Displacement Power Factor All Drives:	0.98 across entire speed range.	
	Efficiency:	97.5% at rated amps, nominal line volts.	
	Maximum Short Circuit Rating:	200,000 Amps symmetrical.	
	Actual Short Circuit Rating:	Determined by AIC rating of installed fuse/circuit breaker.	
Control	Method:	Sine coded PWM with programmable carrier frequency. Ratings apply to all drives.	
	Carrier Frequency:	2, 3, 4, 5, 6, 7, 8, 9 & 10 kHz Standard. 2, 4, 8 & 12 kHz E C . Drive rating based on 4 kHz	
	Output Voltage Range:	0 to rated motor voltage	
	Output Frequency Range:	0 to 400 Hz Standard. 0 to 500 Hz E C .	
	Frequency Accuracy Digital Input: Analog Input:	Within ±0.01% of set output frequency. Within ±0.4% of maximum output frequency.	
	Frequency Control	Speed regulation - with Slip Compensation 0.5% of base speed across 40:1 speed range 40:1 operating range 10 rad/sec bandwidth	(Volts per Hertz Mode) Standard E C
		Speed regulation - with Slip Compensation 0.5% of base speed across 80:1 speed range 80:1 operating range 20 rad/sec bandwidth	(Sensorless Vector Mode) Standard E C
		Speed regulation - with feedback 0.1% of base speed across 80:1 speed range 80:1 operating range 20 rad/sec bandwidth	(Sensorless Vector Mode) E C
	Speed Control	Speed regulation - without feedback 0.1% of base speed across 120:1 speed range 120:1 operating range 30 rad/sec bandwidth	(Vector Control Mode) E C
		Speed regulation - with feedback 0.001% of base speed across 120:1 speed range 1000:1 operating range 125 rad/sec bandwidth	(Vector Control Mode) E C
	Torque Regulation	Torque regulation - without feedback +/-10%	E C
		Torque regulation - with feedback +/-5%	E C
	Selectable Motor Control:	Sensorless Vector with full tuning. Standard V/Hz with full custom capability and vector control.	
	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 may be programmed from 0-3600 seconds in 0.1 sec. increments	
	Intermittent Overload:	110% Overload capability for up to 1 minute 150% Overload capability for up to 3 seconds	
	Current Limit Capability:	Proactive Current Limit programmable from 20 to 160% of rated output current. Independently programmable proportional and integral gain.	
	Electronic Motor Overload Protection:	Class 10 protection with speed sensitive response. Investigated by U.L. to comply with N.E.C. Article 430. U.L. File E59272, volume 12.	
Encoder	Type:	Incremental, dual channel	
	Supply:	5V/12V Configurable +/-5%	
	Quadrature:	90° +/-27° at 25° C.	
	Duty Cycle:	50% +10%	
	Requirements	Encoders must be line driver type, quadrature (dual channel) or pulse (single channel), single-ended or differential and capable of supplying a minimum of 10 mA per channel. The Encoder Interface Board accepts 5V or 12V dc square-wave with a minimum high state voltage of 3.5V dc (5V mode) and 7.0V dc (12V mode). Maximum low state voltage is 1V dc (for both 5V and 12V modes). Maximum input frequency is 250 kHz.	

Parameter List

Shaded rows denote Enhanced Control parameters.

Parameter Name	Number	Group
Accel Mask	281	Masks & Owners
Accel Owner	293	Masks & Owners
Accel Time X	140, 141	Ramp Rates
Alarm Config 1	259	Alarms
Alarm X @ Fault	229, 230	Diagnostics
Analog In X Hi	322, 325	Analog Inputs
Analog In X Lo	323, 326	Analog Inputs
Analog In X Loss	324, 327	Analog Inputs
Analog In1 Value	16	Metering
Analog In2 Value	17	Metering
Analog Out1 Hi	343	Analog Outputs
Analog Out1 Lo	344	Analog Outputs
Analog Out1 Sel	342	Analog Outputs
Anlg In Config	320	Analog Inputs
Anlg In Sqr Root	321	Analog Inputs
Anlg Out Absolut	341	Analog Outputs
Anlg Out Config	340	Analog Outputs
Anlg Out1 Scale	354	Analog Outputs
Anlg Out1 Setpt	377	Analog Outputs
Auto Rstrt Delay	175	Restart Modes
Auto Rstrt Tries	174	Restart Modes
AutoMan Cnfg	192	HIM Ref Config
Autotune	61	Torq Attributes
Autotune Torque	66	Torq Attributes
Break Frequency	72	Volts per Hertz
Break Voltage	71	Volts per Hertz
Bus Reg Gain	160	Stop/Brake Modes
Bus Reg Kd	165	Stop/Brake Modes
Bus Reg Ki	160	Stop/Brake Modes
Bus Reg Kp	164	Stop/Brake Modes
Bus Reg Mode X	161, 162	Stop/Brake Modes
Commanded Freq	2	Metering
Commanded Torque	24	Metering
Compensation	56	Torq Attributes
Control Status	440	Torq Attributes
Control SW Ver	29	Drive Data
Current Lmt Gain	149	Load Limits
Current Lmt Sel	147	Load Limits
Current Lmt Val	148	Load Limits
Current Rate Limit	154	Load limits
Data In XX	300-307	Datalinks
Data Out XX	310-317	Datalinks
DB Resistor Type	163	Stop/Brake Modes
DB While Stopped	145	Stop/Brake Modes
DC Brake Level	158	Stop/Brake Modes
DC Brake Lvl Sel	157	Stop/Brake Modes
DC Brake Time	159	Stop/Brake Modes
DC Bus Memory	13	Metering
DC Bus Voltage	12	Metering
Decel Mask	282	Masks & Owners
Decel Owner	294	Masks & Owners
Decel Time X	142, 143	Ramp Rates
Dig In Status	216	Diagnostics
Dig Out Setpt	379	Digital Outputs
Dig Out Status	217	Diagnostics
Dig OutX Level	381, 385	Digital Outputs
Dig OutX OffTime	383, 387	Digital Outputs
Dig OutX OnTime	382, 386	Digital Outputs
DigIn DataLogic	411	Digital Inputs
Digital InX Sel	361-366	Digital Inputs
Digital OutX Sel	380, 384	Digital Outputs
Direction Mask	279	Masks & Owners
Direction Mode	190	Direction Config
Direction Owner	291	Masks & Owners
DPI Data Rate	270	Comm Control
DPI Port Select	274	Comm Control
DPI Port Value	275	Comm Control
DPI Ref Select	298	Comm Control
Drive Alarm X	211, 212	Diagnostics
Drive Checksum	203	Drive Memory
Drive Logic Rslt	271	Comm Control
Drive OL Count	219	Diagnostics
Drive OL Mode	150	Load Limits
Drive Ramp Rslt	273	Comm Control
Drive Ref Rslt	272	Comm Control
Drive Status X	209, 210	Diagnostics
Drive Temp	218	Diagnostics
Droop RPM @ FLA	152	Stop/Brake Modes
Dyn UserSet Actv	206	Drive Memory
Dyn UsrSet Cnfg	204	Drive Memory
Dyn UserSet Sel	205	Drive Memory
Elapsed kWh	14	Metering
Elapsed MWh	9	Metering
Elapsed Run Time	10	Metering
Enc Position Fdbk	414	Speed Feedback
Encoder PPR	413	Speed Feedback
Encoder Speed	415	Speed Feedback
Fault Amps	225	Diagnostics
Fault Bus Volts	226	Diagnostics
Fault Clear	240	Faults
Fault Clear Mode	241	Faults
Fault Clr Mask	283	Masks & Owners
Fault Clr Owner	295	Masks & Owners
Fault Config 1	238	Faults
Fault Frequency	224	Diagnostics
Fault X Code	243-249	Faults
Fault X Time	244-250	Faults
Fdbk Filter Sel	416	Speed Feedback
Feedback Select	80	Spd Mode & Limits
Flux Braking	166	Stop/Brake Modes
Flux Current	5	Metering
Flux Current Ref	63	Torq Attributes
Flux Up Mode	57	Torq Attributes
Flux Up Time	58	Torq Attributes
Flying Start En	169	Restart Modes
Flying StartGain	170	Restart Modes
Gnd Warn Level	177	Restart Modes
HighRes Ref	308	Datalinks
Inertia Autotune	67	Torq Attributes
IR Voltage Drop	62	Torq Attributes
Ixo Voltage Drop	64	Torq Attributes
Jog Mask	278	Masks & Owners
Jog Owner	290	Masks & Owners
Jog Speed	100	Discrete Speeds
Jog Speed 1	100	Discrete Speeds
Jog Speed 2	108	Discrete Speeds
Kf Speed Loop	447	Speed Regulator
Ki Speed Loop	445	Speed Regulator
Kp Speed Loop	446	Speed Regulator
Language	201	Drive Memory
Last Stop Source	215	Diagnostics
Load Frm Usr Set	198	Drive Memory
Load Loss Level	187	Power Loss
Load Loss Time	188	Power Loss
Local Mask Act	598	Security
Local Mask	285	Masks & Owners
Local Owner	297	Masks & Owners
Logic Mask	276	Masks & Owners

Parameter List, Continued

Parameter Name	Number	Group
Man Ref Preload	193	HIM Ref Config
Maximum Freq	55	Torq Attributes
Maximum Speed	82	Spd Mode & Limits
Maximum Voltage	54	Torq Attributes
Minimum Speed	81	Spd Mode & Limits
MOP Frequency	11	Metering
MOP Mask	284	Masks & Owners
MOP Owner	296	Masks & Owners
MOP Rate	195	MOP Config
Motor Cntl Sel	53	Torq Attributes
Motor Fdbk Type	412	Speed Feedback
Motor NP FLA	42	Motor Data
Motor NP Hertz	43	Motor Data
Motor NP Power	45	Motor Data
Motor NP RPM	44	Motor Data
Motor NP Volts	41	Motor Data
Motor OL Count	220	Diagnostics
Motor OL Factor	48	Motor Data
Motor OL Hertz	47	Motor Data
Motor Poles	49	Motor Data
Motor Type	40	Motor Data
Mtr NP Pwr Units	46	Motor Data
Neg Torque Limit	437	Torq Attributes
Notch Filter K	420	Speed Feedback
Notch FilterFreq	419	Speed Feedback
Output Current	3	Metering
Output Freq	1	Metering
Output Power	7	Metering
Output Powr Fctr	8	Metering
Output Voltage	6	Metering
Overspeed Limit	83	Spd Mode & Limits
Param Access Lvl	196	Drive Memory
PI BW Filter	139	Process PI
PI Configuration	124	Process PI
PI Control	125	Process PI
PI Deriv Time	459	Process PI
PI Error Meter	137	Process PI
PI Fdback Meter	136	Process PI
PI Feedback Hi	462	Process PI
PI Feedback Lo	463	Process PI
PI Feedback Sel	128	Process PI
PI Integral Time	129	Process PI
PI Lower Limit	131	Process PI
PI Output Meter	138	Process PI
PI Preload	133	Process PI
PI Prop Gain	130	Process PI
PI Reference Hi	460	Process PI
PI Reference Lo	461	Process PI
PI Reference Sel	126	Process PI
PI Ref Meter	135	Process PI
PI Setpoint	127	Process PI
PI Status	134	Process PI
PI Upper Limit	132	Process PI
Pos Torque Limit	436	Torq Attributes
Port Mask Act	595	Security
Power Loss Mode	184	Power Loss
Power Loss Time	185	Power Loss
Power Up Marker	242	Faults
Powerup Delay	167	Restart Modes
Preset Speed X	101-107	Discrete Speeds
PWM Frequency	151	Load Limits
Ramped Speed	22	Metering
Rated Amps	28	Drive Data
Rated kW	26	Drive Data
Rated Volts	27	Drive Data

Parameter Name	Number	Group
Reference Mask	280	Masks & Owners
Reference Owner	292	Masks & Owners
Regen Power Lim	153	Load Limits
Reset Meters	200	Drive Memory
Reset To Defalts	197	Drive Memory
Rev Speed Limit	454	Spd Mode & Limits
Run Boost	70	Volts per Hertz
S Curve %	146	Ramp Rates
Save HIM Ref	192	HIM Ref Config
Save MOP Ref	194	MOP Config
Save To User Set	199	Drive Memory
Shear Pin Time	189	Load Limits
Skip Freq Band	87	Spd Mode & Limits
Skip Frequency X	84-86	Spd Mode & Limits
Sleep Level	182	Restart Modes
Sleep Time	183	Restart Modes
Sleep Wake Mode	178	Restart Modes
Sleep Wake Ref	179	Restart Modes
Slip Comp Gain	122	Slip Comp
Slip RPM @ FLA	121	Slip Comp
Slip RPM Meter	123	Slip Comp
Speed Desired BW	449	Speed Regulator
Speed Feedback	25	Metering
Speed Loop Meter	451	Speed Regulator
Speed Mode	80	Spd Mode & Limits
Speed Reference	23	Metering
Speed Ref Source	213	Diagnostics
Speed Ref X Hi	91, 94	Speed Reference
Speed Ref X Lo	92, 95	Speed Reference
Speed Ref X Sel	90, 93	Speed Reference
Speed /Torque Mod	88	Spd Mode & Limits
Start At PowerUp	168	Restart Modes
Start Inhibits	214	Diagnostics
Start Mask	277	Masks & Owners
Start Owner	289	Masks & Owners
Start/Acc Boost	69	Volts per Hertz
Status X @ Fault	227, 228	Diagnostics
Stop/Brk Mode X	155, 156	Stop/Brake Modes
Stop Owner	288	Masks & Owners
SV Boost Filter	59	Torq Attributes
TB Man Ref Hi	97	Speed Reference
TB Man Ref Lo	98	Speed Reference
TB Man Ref Sel	96	Speed Reference
Testpoint X Data	235, 237	Diagnostics
Testpoint X Sel	234, 236	Diagnostics
Torq Current Ref	441	Torq Attributes
Torque Current	4	Metering
Torque Perf Mode	53	Torq Attributes
Torque Ref A Hi	428	Torq Attributes
Torque Ref A Lo	429	Torq Attributes
Torque Ref A Sel	427	Torq Attributes
Torque Setpoint1	435	Torq Attributes
Total Inertial	450	Speed Regulator
Trim % Setpoint	116	Speed Trim
Trim Hi	119	Speed Trim
Trim In Select	117	Speed Trim
Trim Lo	120	Speed Trim
Trim Out Select	118	Speed Trim
Voltage Class	202	Drive Memory
Wake Level	180	Restart Modes
Wake Time	181	Restart Modes
Write Mask Act	597	Security
Write Mask Cfg	596	Security

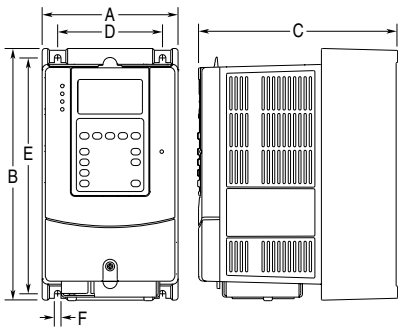
Approximate Dimensions – PowerFlex 70 Drives

Rating/Frame Size Cross-Reference

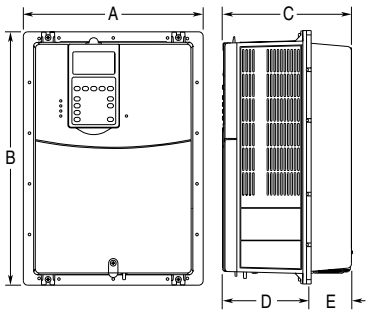
Output Power		Frame Size								
		200-240V			400-480V			500-600V		
kW ND (HD)	Hp ND (HD)	Without Internal Filter	With Internal Filter	IP66, NEMA Type 4X/12	Without Internal Filter	With Internal Filter	IP66, NEMA Type 4X/12	Without Internal Filter	With Internal Filter	IP66, NEMA Type 4X/12
0.37 (0.25)	0.5 (0.33)	A	B	B	A	B	B	A	–	B
0.75 (0.55)	1.0 (0.75)	A	B	B	A	B	B	A	–	B
1.5 (1.1)	2.0 (1.5)	B	B	B	A	B	B	A	–	B
2.2 (1.5)	3.0 (2.0)	B	B	B	B	B	B	B	–	B
4.0 (3.0)	5.0 (3.0)	–	C	D	B	B	B	B	–	B
5.5 (4.0)	7.5 (5.0)	–	D	D	–	C	D	C	–	D
7.5 (5.5)	10 (7.5)	–	D	D	–	C	D	C	–	D
11 (7.5)	15 (10)	–	D	D	–	D	D	D	–	D
15 (11)	20 (15)	–	D	D	–	D	D	D	–	D
18.5 (15)	25 (20)	–	D	D	–	D	D	–	–	–
22 (18.5)	30 (25)	–	–	–	–	D	D	–	–	–
30 (22)	40 (30)	–	–	–	–	E	E	–	–	–
37 (30)	50 (40)	–	–	–	–	E	E	–	–	–

PowerFlex 70 Frames A-D

IP20/66, NEMA Type 1/4X/12



Flange Mount



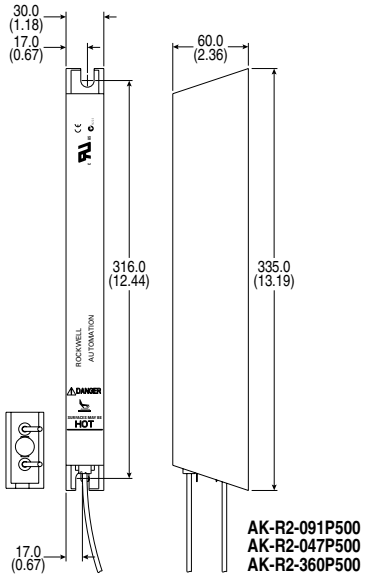
Dimensions are in millimeters and (inches).

Frame	A	B	C	D	E	F	Drive Weight ❶ *kg (lbs.)*
IP20, NEMA Type 1							
A	122.4 (4.82)	225.7 (8.89)	179.8 (7.08)	94.2 (3.71)	211.6 (8.33)	5.8 (0.23)	2.71 (6.0)
B	171.7 (6.76)	234.6 (9.24)	179.8 (7.08)	122.7 (4.83)	220.2 (8.67)	5.8 (0.23)	3.60 (7.9)
C	185.0 (7.28)	300.0 (11.81)	179.8 (7.08)	137.6 (5.42)	285.6 (11.25)	5.8 (0.23)	6.89 (15.2)
D	219.9 (8.66)	350.0 (13.78)	179.8 (7.08)	169.0 (6.65)	335.6 (13.21)	5.8 (0.23)	9.25 (20.4)
E	280.3 (11.04)	555.8 (21.88)	207.1 (8.15)	200.0 (7.87)	491.0 (19.33)	6.9 (0.27)	18.60 (41.0)
IP66, NEMA Type 4X/12							
B	171.7 (6.76)	239.8 (9.44)	203.3 (8.00)	122.7 (4.83)	220.2 (8.67)	5.8 (0.23)	3.61 (8.0)
D	219.9 (8.66)	350.0 (13.78)	210.7 (8.29)	169.0 (6.65)	335.6 (13.21)	5.8 (0.23)	9.13 (20.1)
E	280.3 (11.04)	555.8 (21.88)	219.8 (8.65)	200.0 (7.87)	491.0 (19.33)	6.9 (0.27)	18.60 (41.0)
Flange Mount							
A	156.0 (6.14)	225.8 (8.89)	178.6 (7.03)	123.0 (4.84)	55.6 (2.19)	–	2.71 (6.0)
B	205.2 (8.08)	234.6 (9.24)	178.6 (7.03)	123.0 (4.84)	55.6 (2.19)	–	3.60 (7.9)
C	219.0 (8.62)	300.0 (11.81)	178.6 (7.03)	123.0 (4.84)	55.6 (2.19)	–	6.89 (15.2)
D	248.4 (9.78)	350.0 (13.78)	178.6 (7.03)	123.0 (4.84)	55.6 (2.19)	–	9.25 (20.4)
E	280.3 (11.04)	555.8 (21.88)	207.1 (8.15)	117.2 (4.61)	89.9 (3.54)	–	18.60 (41.0)

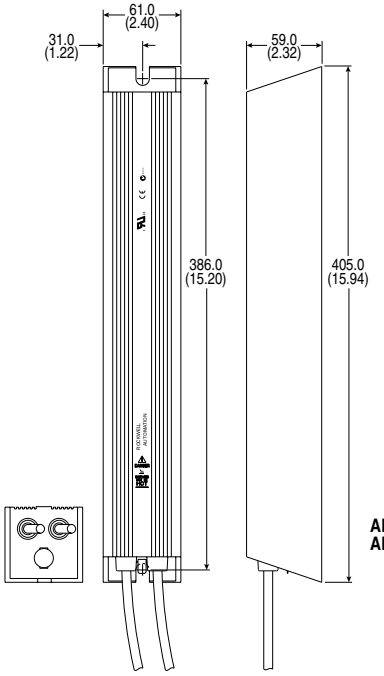
❶ Weights include HIM and Standard I/O.

Approximate Dimensions – Medium Duty External Dynamic Brake Resistors

Dimensions are in millimeters and (inches).



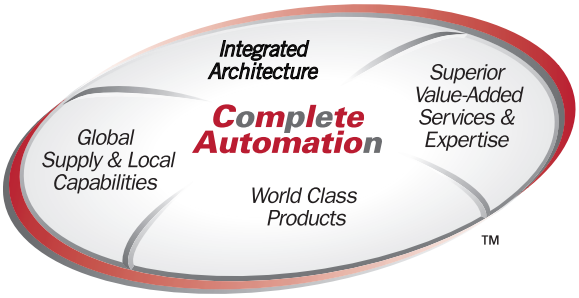
AK-R2-091P500
AK-R2-047P500
AK-R2-360P500



AK-R2-030P1K2
AK-R2-120P1K2

Catalog Number	Ohms	Watts	Frame Size
AK-R2-091P500	91	86	A
AK-R2-047P500	47	166	A
AK-R2-360P500	360	86	A
AK-R2-030P1K2	30	260	B
AK-R2-120P1K2	120	260	B

Notes



The Allen-Bradley PowerFlex family of AC drives provides a single-source solution for virtually any drive application requirement ranging from 0.2 to 6,770 kW (0.25 to 8,500 hp). Significant commonality across multiple platforms including networks, operator interface, programming and hardware make PowerFlex drives easy to start up, operate and maintain. Multi-lingual programming, operator interface text and voltage-sensitive defaults in PowerFlex drives will help global OEMs and end-users save time and money during set-up, integration and maintenance of virtually any automation system.

Rockwell Automation supports drive users whenever and wherever needed, providing drive specialists and manufacturing expertise for unmatched service and support around the globe. In fact, one of every five Rockwell Automation employees is in the field with users every day. Rockwell Automation also offers a full spectrum of value-added services and expertise to help simplify maintenance and enhance productivity.

Rockwell Automation is committed to helping its customers meet ever-changing demands. PowerFlex drives illustrate our commitment to user productivity through timely delivery of world-class products and continued backward compatibility to minimize life-cycle costs. Count on Rockwell Automation to be your Complete Automation™ partner – now and in the future.

For further information on PowerFlex drives visit our web site at: **www.abpowerflex.com**

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Publication 20A-TD001G-EN-P — May 2005
Supersedes 20A-TD001F-EN-P — January 2005