Product Overview

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

Reference Materials

For additional PowerFlex 4 and 40 data and general drive information, refer to the following publications:

Title	Publication	Online
PowerFlex 4 User Manual	22A-UM001	www.rockwellautomation.com/literature
PowerFlex 40 User Manual	22B-UM001	
Wiring and Grounding Guidelines for PWM AC Drives	DRIVES-IN001	
Preventive Maintenance of Industrial Control and Drive System Equipment	DRIVES-TD001	
Safety Guidelines for the Application, Installation and Maintenance of Solid State Control	SGI-1.1	

For other information, contact Allen-Bradley Drives Technical Support:

Title	Online
Allen-Bradley Drives Technical Support	www.ab.com/support/abdrives

Shaded areas are applicable to PowerFlex 40 only.

Use the chart below to assist in determining which product is most appropriate for an application.

Feature	PowerFlex® 4	PowerFlex® 40
Catalog Reference	22A	22B
Maximum (kW)HP Rating/Input Voltage	(1.1) 1.5 HP/115V, 1ø	(1.1) 1.5 HP/115V, 1ø
	(2.2) 3 HP/230V, 1ø	(2.2) 3 HP/230V, 1ø
	(3.7) 5 HP/230V, 3ø	(7.5) 10 HP/230V, 3ø
	(3.7) 5 HP/460V, 3ø	(11.0) 15 HP/460V, 3ø
		(11.0) 15 HP/600V, 3ø
Overload Capacity	150% for 60 seconds 200% for 3 seconds	150% for 60 seconds 200% for 3 seconds
IP30, NEMA/UL Type 1 Option	●	●
IP66, NEMA/UL Type 4X/12 (Indoor)		● (2)
EMC Filtering	Internal - 1ø, 230V External - All 1ø, 115V and 3ø Ratings	Internal - 1ø, 230V External - All 1ø, 115V and 3ø Ratings
DIN Rail Mounting Standard	●	● (Through 5 HP)
Integral Keypad with Speed Pot	●	●
Keypad - Remote LCD	●	●
Keypad CopyCat Function	●	●
Control Type	V/Hz	Sensorless Vector & V/Hz
Internal DB Transistor	● Not available on no brake models.	●
Preset Speeds	4	8
Carrier Frequency	2…16 kHz	2…16 kHz
Skip Frequency		●
Process Control Loop		● (PID)
StepLogic Functionality		●
Timer/Counter Functions		●
Control Voltage	24V sink/source	24V sink/source
Discrete Inputs	3 fixed for START/STOP/REV	3 fixed for START/STOP/REV
	2 fully programmable	4 fully programmable
Analog Input - Unipolar	1 (0…10V or 4…20 mA)	2 (0…10V and 4…20 mA)
Analog Input - Bipolar		1 (+/- 10V) (3)
Analog Response	2 Hz (500 ms)	100 Hz (10 ms)
Relay Output	1 - N.O/N.C. dry contact	1 - N.O./N.C. dry contact
Digital/Optocoupler Output		2
Analog Output		● (0…10V or 4…20 mA)
Integral RS485	●	●
RS232 *(Requires use of Serial Converter Module)*	●	●
BACnet	● (1)	●
ControlNet	● (1)	●
DeviceNet	● (1)	●
EtherNet/IP	● (1)	●
LonWorks	● (1)	●
PROFIBUS DP	● (1)	●

(1) With 22-XCOMM-DC-BASE External mounting kit.

(2) Frame B only.

(3) When using bipolar input, the 0…10V unipolar input cannot be used.

Catalog Number Explanation

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

a

Drive	
Code	Type
22A	PowerFlex 4
22B	PowerFlex 40

b

Voltage Rating		
Code	Voltage	Ph.
V	120V ac	1
A	240V ac	1
B	240V ac	3
D	480V ac	3
E	600V ac	3

c1

Rating		
100-120V Single-Phase Input		
Code	Amps	kW (Hp)
2P3	2.3	0.4 (0.5)
5P0	5.0	0.75 (1.0)
6P0	6.0	1.1 (1.5)

c2

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

c3

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

c4

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

c5

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

d

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

* Check availability before ordering.

e

HIM	
Code	Interface Module
1	Fixed Keypad

f

Emission Class	
Code	Rating
0	Not Filtered
1	Filtered

g

Brake IGBT	
Code	Description
3	Without Brake
4	With Brake

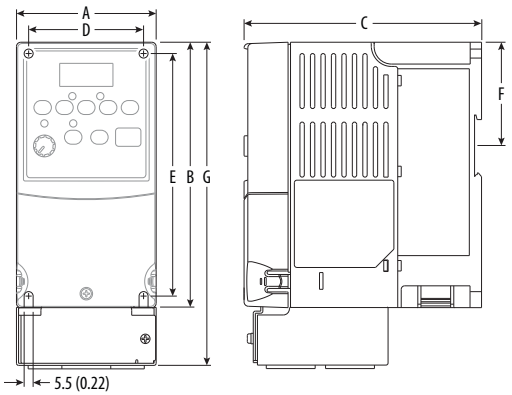
h

Optional	
Code	Purpose
AA through ZZ	Reserved for custom firmware

Input/Output Ratings	Output Frequency:	PowerFlex 4: 0…240 Hz (Programmable) PowerFlex 40: 0…400 Hz (Programmable)
	Efficiency:	97.5% (Typical)
Approvals	UL508C c UL CSA C 22.2 No. 14 EN 61800-3 CE	LV Directive 73/23/EEC LV: EN 50178, EN 60204 EMC Directive 89/336/EEC EMC: EN 61800-3
Control Inputs	Digital	Input Current = 6 mA
	SRC (Source) Mode:	18…24V = On, 0…6V = Off
	SNK (Sink) Mode:	0…6V = On, 18…24V = Off
	Analog	
	4…20 mA Analog:	250 ohm input impedance
	0…10V DC Analog:	100k ohm input impedance
	External Pot:	1…10k ohms, 2 Watt minimum
Control Output – Programmable Output (form C relay)	Resistive Rating	3.0A at 30V DC, 3.0A at 125V AC, 3.0A at 240V AC
	Opto Outputs (PF 40):	30V DC, 50 mA
	Analog Outputs (PF 40):	10-bit, 0…10V, 1k ohm minimum
	Inductive Rating	0.5A at 30V DC, 0.5A at 125V AC, 0.5A at 240V AC
	Opto Outputs (PF 40):	Non-inductive
	Analog Outputs (PF 40):	10 bit, 4…20 mA, 525 ohm maximum
Fuses and Circuit Breakers	Recommended Fuse Type:	UL Class J, CC, T or Type BS88; 600V (550V) or equivalent.
	Recommended Circuit Breakers:	HMCP circuit breaker or equivalent.
Protective Features	Motor Protection:	I^2t Overload Protection, 150% for 60 sec., 200% for 3 sec. (provides Class 10 protection)
	Overcurrent:	200% hardware limit, 300% instantaneous fault
	Control Ride Through:	Minimum Ride Through is 0.5 sec. - typical value is 2 seconds
	Faultless Power Ride Through:	100 milliseconds
	Over Voltage:	100…120V AC Input – Trip occurs at 405V DC bus voltage (= 150V AC incoming line) 200…240V AC Input – Trip occurs at 405V DC bus voltage (= 290V AC incoming line) 380…480V AC Input – Trip occurs at 810V DC bus voltage (= 575V AC incoming line) 460…600V AC Input (PF 40) – Trip occurs at 1005V DC bus voltage (= 711V AC incoming line)
	Under Voltage:	100…120V AC Input – Trip occurs at 210V DC bus voltage (= 75V AC incoming line) 200…240V AC Input – Trip occurs at 210V DC bus voltage (= 150V AC incoming line) 380…480V AC Input – Trip occurs at 390V DC bus voltage (= 275V AC incoming line) 460…600V AC Input (PF 40) If P042 = 1 "High Voltage" trip occurs at 487V DC bus voltage (344V AC incoming line); If P042 = 0 "Low Voltage" trip occurs at 390V DC bus voltage (275V AC incoming line)
Dynamic Braking	Internal brake IGBT included with all ratings except No Brake drives (Cat. Nos. 22A-AxPxN103 or 22A-AxPxN113). Refer to page 11 for ordering information.	
Environment	Altitude:	1000 m (3300 ft.) maximum without derating
	Ambient Operating Temperature:	IP20, NEMA/UL Type Open: –10 to 50 degrees C (14 to 122 degrees F) IP30, NEMA/UL Type 1: –10 to 40 degrees C (14 to 104 degrees F) IP66, NEMA/UL Type 4X/12 (PF 40): –10 to 40 degrees C (14 to 104 degrees F)
	Cooling Method:	Fan, all drive ratings
	Storage Temperature:	–40 to 85 degrees C (–40 to 185 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:	0 to 95% non-condensing
	Shock (operating):	15G peak for 11ms duration (±1.0ms)
	Vibration (operating):	1G peak, 5 to 2000 Hz
Control	Carrier Frequency:	2…16 kHz. Drive rating based on 4 kHz.
	Frequency Accuracy:	Digital Input: Within ±0.05% of set output frequency. Analog Input: Within 0.5% of maximum output frequency. Analog Output (PF 40): ±2% of full scale, 10-bit resolution.
	Speed Regulation:	Open Loop with Slip Compensation: ±2% of base speed across a 40:1 speed range. (PF 40): 1% of base speed across a 60:1 speed range.
	Stop Modes:	Multiple programmable stop modes including - Ramp, Coast, DC-Brake, Ramp-to-Hold and S Curve.
	Accel/Decel:	Two independently programmable accel and decel times. Each time may be programmed from 0…600 seconds in 0.1 second increments.
	Intermittent Overload:	150% overload capability for up to 1 minute, 200% overload capability for up to 3 seconds.
	Electronic Motor Overload Protection:	Provides class 10 motor overload protection according to NEC article 430 and motor over-temperature protection according to NEC article 430.126 (A) (2). UL 508C File 29572.
Electrical	Voltage Tolerance:	120V, 200…240V, 380…480V, 460…600V: ±10%
	Frequency Tolerance:	48…63 Hz
	Displacement Power Factor:	0.98 across entire speed range
	Maximum Short Circuit Rating:	100,000 Amps symmetrical

Product Dimensions

Approximate Dimensions



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

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

(1) Overall height of standard IP 20/Open Type Drive.
(2) Overall height of drive with IP 30/NEMA 1/UL Type 1 option kit installed.

Ratings are in kW and (HP).

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

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

Shaded areas are applicable to PowerFlex 40 only.