

Allen-Bradley 22B-D6P0N104

PowerFlex 40 AC Drive

Selected official Rockwell Automation technical data

MODEL-SPECIFIC DOCUMENT SET

Catalog number: 22B-D6P0N104

Product family: PowerFlex 40

Official publication: 22-TD001J-EN-P

Only relevant official source pages are included.

Original technical content and diagrams remain unchanged.

Quotation and documentation support

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Product Overview

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



Packaging and Mounting

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



Start Up, Programming, and Operation

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



PowerFlex 4 and 40 AC Drives Technical Data

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

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

(1) Frame B only

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

(3) With 22-XCOMM-DC-BASE external mounting kit



PowerFlex 4 and 40 AC Drives Technical Data

Catalog Number Explanation

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

a	
Drive	
Code	Type
22A	PowerFlex 4
22B	PowerFlex 40

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

c1		
Rating		
100...120V 1-phase Input		
Code	Amps	kW (HP)
2P3	2.3	0.4 (0.5)
5P0	5.0	0.75 (1.0)
6P0	6.0	1.1 (1.5)

c2		
Rating		
200...240V 1-phase Input		
Code	Amps	kW (HP)
2P3	2.3	0.4 (0.5)
5P0	5.0	0.75 (1.0)
8P0	8.0	1.5 (2.0)
012	12	2.2 (3.0)

c3		
Rating		
200...240V 3-phase Input		
Code	Amps	kW (HP)
2P3	2.3	0.4 (0.5)
5P0	5.0	0.75 (1.0)
8P0	8.0	1.5 (2.0)
012	12	2.2 (3.0)
017	17.5	3.7 (5.0)
024	24	5.5 (7.5)
033	33	7.5 (10)

c4		
Rating		
380...480V 3-phase Input		
Code	Amps	kW (HP)
1P4	1.4	0.4 (0.5)
2P3	2.3	0.75 (1.0)
4P0	4.0	1.5 (2.0)
6P0	6.0	2.2 (3.0)
010	10.5	4.0 (5.0)
012	12	5.5 (7.5)
017	17	7.5 (10)
024	24	11 (15)

c5		
Rating		
460...600V 3-phase Input		
Code	Amps	kW (HP)
1P7	1.7	0.75 (1.0)
3P0	3.0	1.5 (2.0)
4P2	4.2	2.2 (3.0)
6P6	6.6	4.0 (5.0)
9P9	9.9	5.5 (7.5)
012	12	7.5 (10)
019	19	11 (15)

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

(1) Check availability before ordering.

e	
HIM	
Code	Interface Module
1	Fixed Keypad

f	
Emission Class	
Code	Rating
0	Not Filtered
1	Filtered

g	
Brake IGBT	
Code	Description
3	Without Brake
4	With Brake

h	
Optional	
Code	Purpose
AA...ZZ	Reserved for custom firmware



PowerFlex 4 and 40 AC Drives Technical Data

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

Drive Ratings – PowerFlex 40

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



PowerFlex 4 and 40 AC Drives Technical Data

Drive Ratings – PowerFlex 40 (Continued)

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

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

(2) The AIC ratings of the Bulletin 140M/140MT devices can vary. See the Motor Protection Circuit Breaker and Motor Circuit Protector Specifications Technical Data, publication [140-TD005](#) or [140M-TD002](#).

(3) Manual Self-protected (Type E) Combination Motor Controller, UL Listed for 208 Wye or Delta, 240 Wye or Delta, 480Y/277 or 600Y/347. Not UL Listed for use on 480V or 600V Delta/Delta, corner ground, or high-resistance ground systems.

(4) When using a Manual Self-protected (Type E) Combination Motor Controller, the drive must be installed in a ventilated or non-ventilated enclosure with the minimum volume that is specified in this column. Application-specific thermal considerations may require a larger enclosure.

(5) 200...240V AC – 1-phase drives are also available with an integral EMC filter. Catalog suffix changes from N104 to N114 or N103 to N113.

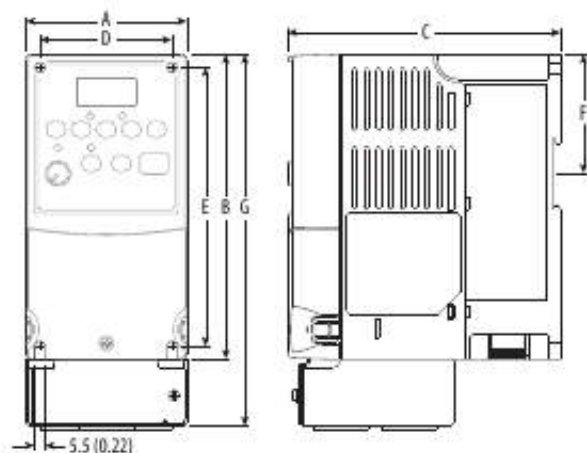
Technical Specifications

Input/Output Ratings	Output Frequency:	PowerFlex 4: 0...240 Hz (Programmable) PowerFlex 40: 0...400 Hz (Programmable)
	Efficiency:	97.5% (Typical)
Approvals	     	
Control Inputs	Digital SRC (Source) Mode: SNK (Sink) Mode:	Input Current = 6 mA 18...24V = On; 0...6V = Off 0...6V = On; 18...24V = Off
	Analog 4...20 mA Analog: 0...10V DC Analog: External Pot:	250 Ω input impedance 100 k Ω input impedance 1...10 k Ω , 2 Watt minimum
Control Output - Programmable Output (Form C relay)	Resistive Rating Opto Outputs (PF 40): Analog Outputs (PF 40):	3.0 A @ 30V DC, 3.0 A @ 125V AC, 3.0 A @ 240V AC 30V DC, 50 mA 10-bit, 0...10V, 1 k Ω minimum
	Inductive Rating Opto Outputs (PF 40): Analog Outputs (PF 40):	0.5 A @ 30V DC, 0.5 A @ 125V AC, 0.5 A @ 240V AC Non-inductive 10-bit, 4...20 mA, 525 Ω maximum
Fuses and Circuit Breakers	Recommended Fuse Type:	UL Class J, CC, T, or Type BS88; 600V (550V) or equivalent.
	Recommended Circuit Breakers:	HMCP circuit breaker or equivalent.
Protective Features	Motor Protection:	I ² t Overload Protection, 150% for 60 s, 200% for 3 s (provides Class 10 protection)
	Overcurrent:	200% hardware limit, 300% instantaneous fault
	Control Ride-through:	Minimum Ride-through is 0.5 s - Typical value is 2 s
	Faultless Power Ride-through:	100 milliseconds
	Over Voltage:	100...120V AC Input - Trip occurs @ 405V DC bus voltage (= 150V AC incoming line) 200...240V AC Input - Trip occurs @ 405V DC bus voltage (= 290V AC incoming line) 380...480V AC Input - Trip occurs @ 810V DC bus voltage (= 575V AC incoming line) 460...600V AC Input (PF 40) - Trip occurs @ 1005V DC bus voltage (= 711V AC incoming line)
	Under Voltage:	100...120V AC Input - Trip occurs @ 210V DC bus voltage (= 75V AC incoming line) 200...240V AC Input - Trip occurs @ 210V DC bus voltage (= 150V AC incoming line) 380...480V AC Input - Trip occurs @ 390V DC bus voltage (= 275V AC incoming line) 460...600V AC Input (PF 40) If PO42 = 1 "High Voltage" trip occurs @ 487V DC bus voltage (344V AC incoming line); If PO42 = 0 "Low Voltage" trip occurs @ 390V DC bus voltage (275V AC incoming line)
Dynamic Braking	Internal brake IGBT included with all ratings except No Brake drives (22A-AxPxN103 or 22A-AxPxN113). See Product Selection on page 9 for ordering information.	



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 (5.5)	59.3 (2.33)	185 (7.28)	1.4 (3.1)
B	100 (3.94)	180 (7.09)	136 (5.35)	87 (3.43)	168 (6.61)	87.4 (3.44)	213 (8.39)	2.2 (4.9)
C ⁽³⁾	130 (5.1)	260 (10.2)	180 (7.1)	116 (4.57)	246 (9.7)	—	320 (12.6)	4.3 (9.5)

(1) Overall height of the standard IP20/Open Type drive

(2) Overall height of the drive with IP30/NEMA 1/UL Type 1 option kit installed

(3) Frame C applies to PowerFlex 40 drives only.

Ratings are in kW and (HP).

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

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

