Product Information

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PowerFlex 525 Adjustable Frequency AC Drive

Catalog Number 25B

ATTENTION:
- **Before installing, configuring, operating or maintaining this product, read this document and the documents listed in the Additional Resources section for installing, configuring, or operating equipment. Users should familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.**
- Installation, adjustments, putting into service, use, assembly, disassembly, and maintenance shall be carried out by suitably trained personnel in accordance with applicable code of practice.
- If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- Solid state equipment has operational characteristics differing from those of electromechanical equipment. Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls, publication SGI-1.1, available from your local Rockwell Automation sales office or online at http://www.rockwellautomation.com/literature describes some important differences between solid state equipment and hard-wired electromechanical devices.

ATTENTION: Do not install, configure, operate or maintain this product until you have read the product documentation and the documents in the Additional Resources section for installing, configuring, operating or maintaining equipment. To get the product documentation go to http://www.rockwellautomation.com/literature or contact your local sales office or Rockwell Automation representative.
ATTENTION: Ne pas installer, configurer, exploiter ou maintenir ce produit tant que vous n'avez pas lu sa documentation et les documents de la rubrique Documents connexes pour l'installation, la configuration, l'exploitation et la maintenance de l'équipement. Pour obtenir de la documentation, rendez-vous sur le site http://www.rockwellautomation.com/literature ou contactez votre agence commerciale Rockwell Automation locale ou son représentant.
ACHTUNG: Für die Installation, Konfiguration, den Betrieb und die Wartung dieses Produkt lesen Sie sich bitte zunächst die Produktdokumentation sowie die Dokumente im Abschnitt "Weitere Informationen" durch. Die entsprechende Produktdokumentation finden Sie unter http://www.rockwellautomation.com/literature oder kontaktieren Sie Ihr lokales Vertriebsbüro bzw. einen Rockwell Automation-Mitarbeiter.
ATENCIÓN: No instale, configure, opere ni mantenga este producto hasta que haya leído la documentación del producto y los documentos en la sección Recursos adicionales para la instalación, configuración, operación o mantenimiento de equipo. Para conseguir la documentación, diríjase a http://www.rockwellautomation.com/literature o póngase en contacto con su oficina regional de ventas o representante de Rockwell Automation.
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Additional Resources

These documents contain additional information concerning the installation, programming, and application of the AC drive.

English	The user manual is available in multiple languages at http://www.rockwellautomation.com/literature. Select publication language and type "520-UM001" in the search field.
Deutsch	Das benutzer handbuch steht in mehreren Sprachen unter http://www.rockwellautomation.com/literature zur Verfügung. Wählen Sie Ihre Sprache aus, und geben Sie „520-UM001" in das Suchfeld ein.
Français	La manuel utilisateur est disponible dans différentes langues à l'adresse suivante: http://www.rockwellautomation.com/literature. Sélectionner la langue puis taper « 520-UM001 » dans le champ de recherche.
Italiano	La manuale d'uso è disponibile in varie lingue sul sito http://www.rockwellautomation.com/literature. Selezionare la lingua desiderata e digitare "520-UM001" nel campo di ricerca.
Español	Puede encontrar el manual del usuario en varios idiomas en http://www.rockwellautomation.com/literature. Selecione el idioma de publicación y escriba "520-UM001" en el campo de búsqueda.
Português	O manual de usuário está disponível em várias línguas em http://www.rockwellautomation.com/literature. Seleccione a língua de publicação e entre com "520-UM001" no espaço de busca.
한국의	사용자 매뉴얼http://www.rockwellautomation.com/literature에서 여러 언어로 사용할 수있습니다. 출판 언어와 유형을 선택하십시오"520-UM001"검색.필드에있다
中文 (简体)	从以下网页可以获得用户手册的多种语言的版本: http://www.rockwellautomation.com/literature。 请选择出版物的语言,并在搜索栏输入"520-UM001"印。
日本	ユーザーズマニュアルの多言語版はWebサイト http://www.rockwellautomation.com/literature にて入手できます。出版言語を選択し、検索フィールドに「520-UM001」とタイプしてください。
Русский	Руководство пользователя на других языках можно найти по адресу http://www.rockwellautomation.com/literature. Выберите язык и введите в окно поиска «520-UM001».
中文 (繁體)	以下網頁提供使用手冊的多國語言版本: http://www.rockwellautomation.com/literature。請選擇出版語言，並於搜尋欄鍵入"520-UM001"即可。
Český	Uživatelská příručka je k dispozici ve více jazykových verzích na adrese http://www.rockwellautomation.com/literature. Zvolte jazyk publikace a do vstupního pole pro vyhledávání zadejte „520-UM001".
Polski	Instrukcja obsługi dostępna jest w wielu językach na stronie http://www.rockwellautomation.com/literature. Wybrać język publikacji, w polu wyszukiwania wpisać "520-UM001".

PowerFlex® 525 Adjustable Frequency AC Drive User Manual, publication 520-UM001: Detailed information on the parameters and specifications of the PowerFlex 525 drive.

AC Drive Installation Considerations, publication DRIVES-IN003: Provides additional information needed to properly install PowerFlex AC drives.

Wiring and Grounding Guidelines for Pulse Width Modulated (PWM) AC Drives, publication DRIVES-IN001: Provides basic information needed to properly wire and ground PWM AC drives.

Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1: Provides general guidelines for installing a Rockwell Automation industrial system.

Mounting Considerations

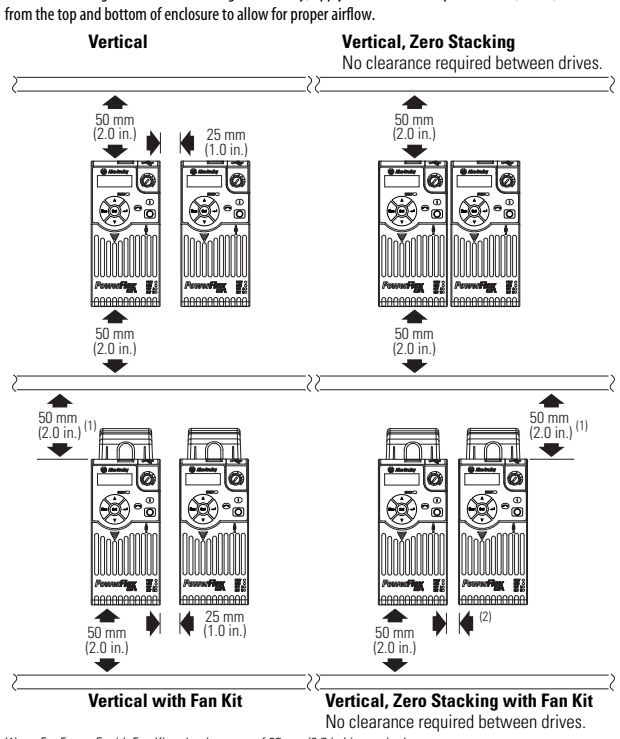
- Mount the drive upright on a flat, vertical and level surface.

Frame	Screw Size	Screw Torque
A	M5 (#10...24)	1.56...1.96 Nm (14...17 lb-in.)
B	M5 (#10...24)	1.56...1.96 Nm (14...17 lb-in.)
C	M5 (#10...24)	1.56...1.96 Nm (14...17 lb-in.)
D	M5 (#10...24)	2.45...2.94 Nm (22...26 lb-in.)
E	M8 (5/16 in.)	6.0...7.4 Nm (53...65 lb-in.)

- Protect the cooling fan by avoiding dust or metallic particles.
- Do not expose to a corrosive atmosphere.
- Protect from moisture and direct sunlight.

Minimum Mounting Clearances

Vertical mounting is shown. If mounting horizontally, apply same clearances plus 50 mm (2.0 in.) clearance from the top and bottom of enclosure to allow for proper airflow.



(1) For Frame E with Fan Kit only, clearance of 95 mm (3.7 in.) is required.
(2) For Frame E with Fan Kit only, clearance of 12 mm (0.5 in.) is required.

Ambient Operating Temperatures

Mounting	Enclosure Rating(1)	Ambient Temperature			
		Min.	Max. (No Derate)	Max. (Derate)(2)	Max. with Fan Kit (Derate)(3)(5)
Vertical	IP 20/Open Type	-20 °C (-4 °F)	50 °C (122 °F)	60 °C (140 °F)	70 °C (158 °F)
	IP 30/NEMA 1/UL Type 1		45 °C (113 °F)	55 °C (131 °F)	–
Vertical, Zero Stacking	IP 20/Open Type		45 °C (113 °F)	55 °C (131 °F)	65 °C (149 °F)
	IP 30/NEMA 1/UL Type 1		40 °C (104 °F)	50 °C (122 °F)	–
Horizontal with Control Module Fan Kit(4)(5)	IP 20/Open Type		50 °C (122 °F)	–	70 °C (158 °F)
Horizontal, Zero Stacking with Control Module Fan Kit(4)(5)	IP 20/Open Type		45 °C (113 °F)	–	65 °C (149 °F)

(1) IP 30/NEMA 1/UL Type 1 rating requires installation of the PowerFlex 520-Series IP 30/NEMA 1/UL Type 1 option kit, catalog number 25-JBAx.
(2) For catalogs 25B-D1P4N104 and 25B-E0P9N104, the temperature listed under the Max. (Derate) column is reduced by 5 °C (9 °F) for all mounting methods.
(3) For catalogs 25B-D1P4N104 and 25B-E0P9N104, the temperature listed under the Max. with Fan Kit (Derate) column is reduced by 10 °C (18 °F) for vertical and vertical with zero stacking mounting methods only.
(4) Catalogs 25B-D1P4N104 and 25B-E0P9N104 cannot be mounted using either of the horizontal mounting methods.
(5) Requires installation of the PowerFlex 520-Series Control Module Fan Kit, catalog number 25-FANx-70C.

Drive Dimensions

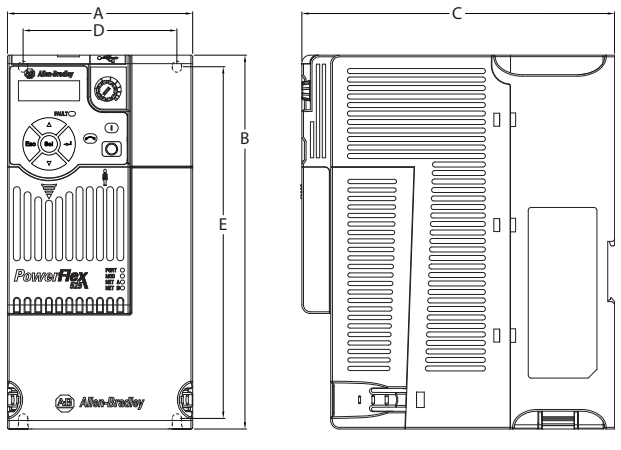
PowerFlex 525 Frames

Ratings are in kW and (HP).

Frame	1-Phase 100...120V	1-Phase 200...240V	1-Phase 200...240V w/ Filter	3-Phase 200...240V	3-Phase 380...480V	3-Phase 380...480V w/ Filter	3-Phase 525...600V
A	0.4 (0.5)	0.4...0.75 (0.5...1.0)	0.4...0.75 (0.5...1.0)	0.4...2.2 (0.5...3.0)	0.4...2.2 (0.5...3.0)	0.4...2.2 (0.5...3.0)	0.4...2.2 (0.5...3.0)
B	0.75...1.1 (1.0...1.5)	1.5...2.2 (2.0...3.0)	1.5...2.2 (2.0...3.0)	3.7 (5.0)	4.0 (5.0)	4.0 (5.0)	3.70 (5.00)
C	–	–	–	5.5 (7.5)	5.5...7.5 (7.5...10.0)	5.5...7.5 (7.5...10.0)	5.5...7.5 (7.5...10.0)
D	–	–	–	7.5 (10.0)	11.0...15.0 (15.0...20.0)	11.0...15.0 (15.0...20.0)	11.0...15.0 (15.0...20.0)
E	–	–	–	11.0...15.0 (15.0...20.0)	–	18.5...22.0 (25.0...30.0)	18.5...22.0 (25.0...30.0)

IP20/Open Type

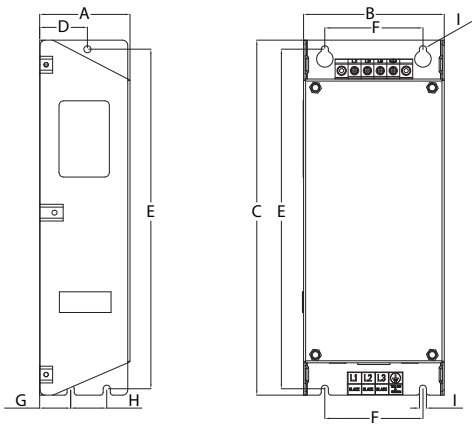
Dimensions are in mm and (in.). Weights are in kg and (lb).



Frame	A	B	C	D	E	Ship Weight
A	72 (2.83)	152 (5.98)	172 (6.77)	57.5 (2.26)	140 (5.51)	1.1 (2.4)
B	87 (3.43)	180 (7.09)	172 (6.77)	72.5 (2.85)	168 (6.61)	1.6 (3.5)
C	109 (4.29)	220 (8.66)	184 (7.24)	90.5 (3.56)	207 (8.15)	2.3 (5.0)
D	130 (5.12)	260 (10.24)	212 (8.35)	116 (4.57)	247 (9.72)	3.9 (8.6)
E	185 (7.28)	300 (11.81)	279 (10.98)	160 (6.30)	280 (11.02)	12.9 (28.4)

EMC Filters

See the PowerFlex 525 User Manual for instructions on complying with the EMC Directive.
Dimensions are in mm and (in.).



Frame	A	B	C	D	E	F	G	H	I
A	55.0 (2.17)	72.0 (2.83)	234.0 (9.21)	30.0 (1.18)	223.0 (8.78)	54.0 (2.13)	20.0 (0.79)	23.0 (0.91)	5.5 (0.22)
B	70.0 (2.76)	87.0 (3.43)	270.0 (10.63)	35.0 (1.38)	258.0 (10.16)	58.0 (2.28)	25.0 (0.98)	24.0 (0.94)	5.5 (0.22)
C	70.0 (2.76)	109.0 (4.29)	275.0 (10.83)	37.0 (1.46)	263.0 (10.35)	76.0 (2.99)	25.0 (0.98)	28.0 (1.10)	5.5 (0.22)
D	80.0 (3.15)	130.0 (5.12)	310.0 (12.20)	33.0 (1.30)	298.0 (11.73)	90.0 (3.54)	33.0 (1.30)	28.0 (1.10)	5.5 (0.22)
E	80.0 (3.15)	155.0 (6.10)	390.0 (15.35)	32.0 (1.26)	375.0 (14.76)	110.0 (4.33)	33.0 (1.30)	28.0 (1.10)	5.5 (0.22)

Fuses and Circuit Breakers

Catalog No.(1)	Output Ratings					Input Ratings			Branch Circuit Protection			IP20/Open Type Watts Loss
	Normal Duty		Heavy Duty			Voltage Range	kVA	Max Amps(2)	Fuse Ratings Min./Max.	140M Motor Protectors (3) (4) (5)	Contactors	
	HP	kW	HP	kW	Amps							
100...120V AC (-15%, +10%) – 1-Phase Input, 0...230V 3-Phase Output												
25B-V2P5N104	0.5	0.4	0.5	0.4	2.5	85...132	1.3	9.6	16/20	140M-C2E-C10	100-C12	27.0
25B-V4P8N104	1.0	0.75	1.0	0.75	4.8	85...132	2.5	19.2	25/40	140M-D8E-C20	100-C23	53.0
25B-V6P0N104	1.5	1.1	1.5	1.1	6.0	85...132	3.2	24.0	32/50	140M-F8E-C25	100-C23	67.0
200...240V AC (-15%, +10%) – 1-Phase Input, 0...230V 3-Phase Output												
25B-A2P5N104	0.5	0.4	0.5	0.4	2.5	170...264	1.7	6.5	10/16	140M-C2E-C10	100-C09	29.0
25B-A4P8N104	1.0	0.75	1.0	0.75	4.8	170...264	2.8	10.7	16/25	140M-C2E-C16	100-C12	50.0
25B-A8P0N104	2.0	1.5	2.0	1.5	8.0	170...264	4.8	18.0	25/40	140M-F8E-C25	100-C23	81.0
25B-A011N104	3.0	2.2	3.0	2.2	11.0	170...264	6.0	22.9	32/50	140M-F8E-C25	100-C37	111.0
200...240V AC (-15%, +10%) – 1-Phase Input with EMC Filter, 0...230V 3-Phase Output												
25B-A2P5N114	0.5	0.4	0.5	0.4	2.5	170...264	1.7	6.5	10/16	140M-C2E-C10	100-C09	29.0
25B-A4P8N114	1.0	0.75	1.0	0.75	4.8	170...264	2.8	10.7	16/25	140M-C2E-C16	100-C12	53.0
25B-A8P0N114	2.0	1.5	2.0	1.5	8.0	170...264	4.8	18.0	25/40	140M-F8E-C25	100-C23	84.0
25B-A011N114	3.0	2.2	3.0	2.2	11.0	170...264	6.0	22.9	32/50	140M-F8E-C25	100-C37	116.0
200...240V AC (-15%, +10%) – 3-Phase Input, 0...230V 3-Phase Output												
25B-B2P5N104	0.5	0.4	0.5	0.4	2.5	170...264	1.2	2.7	6/6	140M-C2E-B40	100-C09	29.0
25B-B5P0N104	1.0	0.75	1.0	0.75	5.0	170...264	2.7	5.8	10/16	140M-C2E-B63	100-C09	50.0
25B-B8P0N104	2.0	1.5	2.0	1.5	8.0	170...264	4.3	9.5	16/20	140M-C2E-C10	100-C12	79.0
25B-B011N104	3.0	2.2	3.0	2.2	11.0	170...264	6.3	13.8	20/32	140M-C2E-C16	100-C23	107.0
25B-B017N104	5.0	3.7	5.0	3.7	17.5	170...264	9.6	21.1	32/45	140M-F8E-C25	100-C23	148.0
25B-B024N104	7.5	5.5	7.5	5.5	24.0	170...264	12.2	26.6	35/63	140M-F8E-C32	100-C37	259.0
25B-B032N104	10.0	7.5	10.0	7.5	32.2	170...264	15.9	34.8	45/70	140M-F8E-C45	100-C43	323.0
25B-B048N104	15.0	11.0	15.0	11.0	48.3	170...264	20.1	44.0	63/90	140M-F8E-C45	100-C60	584.0
25B-B062N104	20.0	15.0	15.0	11.0	62.1	170...264	25.6	56.0	70/125	–	100-C72	708.0
380...480V AC (-15%, +10%) – 3-Phase Input, 0...460V 3-Phase Output												
25B-D1P4N104	0.5	0.4	0.5	0.4	1.4	323...528	1.7	1.9	3/6	140M-C2E-B25	100-C09	27.0
25B-D2P3N104	1.0	0.75	1.0	0.75	2.3	323...528	2.9	3.2	6/10	140M-C2E-B40	100-C09	37.0
25B-D4P0N104	2.0	1.5	2.0	1.5	4.0	323...528	5.2	5.7	10/16	140M-C2E-B63	100-C09	80.0
25B-D6P0N104	3.0	2.2	3.0	2.2	6.0	323...528	6.9	7.5	10/16	140M-C2E-C10	100-C09	86.0
25B-D010N104	5.0	4.0	5.0	4.0	10.5	323...528	12.6	13.8	20/32	140M-C2E-C16	100-C23	129.0
25B-D013N104	7.5	5.5	7.5	5.5	13.0	323...528	14.1	15.4	20/35	140M-D8E-C20	100-C23	170.0
25B-D017N104	10.0	7.5	10.0	7.5	17.0	323...528	16.8	18.4	25/40	140M-D8E-C20	100-C23	221.0
25B-D024N104	15.0	11.0	15.0	11.0	24.0	323...528	24.1	26.4	35/63	140M-F8E-C32	100-C37	303.0
25B-D030N104	20.0	15.0	15.0	11.0	30.0	323...528	30.2	33.0	45/70	140M-F8E-C45	100-C43	387.0
380...480V AC (-15%, +10%) – 3-Phase Input with EMC Filter, 0...460V 3-Phase Output												
25B-D1P4N114	0.5	0.4	0.5	0.4	1.4	323...528	1.7	1.9	3/6	140M-C2E-B25	100-C09	27.0
25B-D2P3N114	1.0	0.75	1.0	0.75	2.3	323...528	2.9	3.2	6/10	140M-C2E-B40	100-C09	37.0
25B-D4P0N114	2.0	1.5	2.0	1.5	4.0	323...528	5.2	5.7	10/16	140M-C2E-B63	100-C09	81.0
25B-D6P0N114	3.0	2.2	3.0	2.2	6.0	323...528	6.9	7.5	10/16	140M-C2E-C10	100-C09	88.0
25B-D010N114	5.0	4.0	5.0	4.0	10.5	323...528	12.6	13.8	20/32	140M-C2E-C16	100-C23	133.0
25B-D013N114	7.5	5.5	7.5	5.5	13.0	323...528	14.1	15.4	20/35	140M-D8E-C20	100-C23	175.0
25B-D017N114	10.0	7.5	10.0	7.5	17.0	323...528	16.8	18.4	25/40	140M-D8E-C20	100-C23	230.0
25B-D024N114	15.0	11.0	15.0	11.0	24.0	323...528	24.1	26.4	35/63	140M-F8E-C32	100-C37	313.0
25B-D030N114	20.0	15.0	15.0	11.0	30.0	323...528	30.2	33.0	45/70	140M-F8E-C45	100-C43	402.0
25B-D037N114	25.0	18.5	20.0	15.0	37.0	323...528	30.8	33.7	45/70	140M-F8E-C45	100-C43	602.0
25B-D043N114	30.0	22.0	25.0	18.5	43.0	323...528	35.6	38.9	50/80	140M-F8E-C45	100-C60	697.0
525...600V AC (-15%, +10%) – 3-Phase Input, 0...575V 3-Phase Output												
25B-E0P9N104	0.5	0.4	0.5	0.4	0.9	446...660	1.4	1.2	3/6	140M-C2E-B25	100-C09	22.0
25B-E1P7N104	1.0	0.75	1.0	0.75	1.7	446...660	2.6	2.3	3/6	140M-C2E-B25	100-C09	32.0
25B-E3P0N104	2.0	1.5	2.0	1.5	3.0	446...660	4.3	3.8	6/10	140M-C2E-B40	100-C09	50.0
25B-E4P2N104	3.0	2.2	3.0	2.2	4.2	446...660	6.1	5.3	10/16	140M-C2E-B63	100-C09	65.0
25B-E6P6N104	5.0	3.7	5.0	3.7	6.6	446...660	9.1	8.0	10/20	140M-C2E-C10	100-C09	95.0
25B-E9P9N104	7.5	5.5	7.5	5.5	9.9	446...660	12.8	11.2	16/25	140M-C2E-C16	100-C16	138.0
25B-E012N104	10.0	7.5	10.0	7.5	12.0	446...660	15.4	13.5	20/32	140M-C2E-C16	100-C23	164.0
25B-E019N104	15.0	11.0	15.0	11.0	19.0	446...660	27.4	24.0	32/50	140M-F8E-C25	100-C30	290.0
25B-E022N104	20.0	15.0	15.0	11.0	22.0	446...660	31.2	27.3	35/63	140M-F8E-C32	100-C30	336.0
25B-E027N104	25.0	18.5	20.0	15.0	27.0	446...660	28.2	24.7	35/50	140M-F8E-C32	100-C30	466.0
25B-E032N104	30.0	22.0	25.0	18.5	32.0	446...660	33.4	29.2	40/63	140M-F8E-C32	100-C37	562.0

(1) Normal and Heavy duty ratings are available for this drive.
(2) When the drive is controlling motors with lower amp ratings, refer to the drive nameplate for drive input current rating.
(3) The AIC ratings of the Bulletin 140M Motor Protector Circuit Breakers may vary. See Bulletin 140M Motor Protection Circuit Breakers Application Ratings.
(4) Bulletin 140M with adjustable current range should have the current trip set to the minimum range that the device will not trip.
(5) 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.

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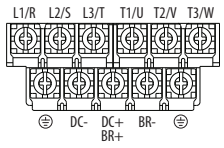
Power Wiring

Recommended Shielded Wire

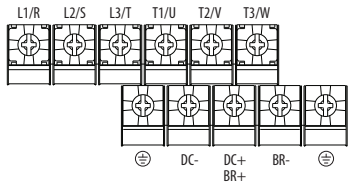
Location	Rating/Type
Standard (Option 1)	600V, 90 °C (194 °F) XHHW2/RHW-2 Anixter B209500-B209507, Belden 29501-29507, or equivalent
Standard (Option 2)	Tray rated 600V, 90 °C (194 °F) RHH/RHW-2 Anixter OLF-7xxxxx or equivalent
Class I & II; Division I & II	Tray rated 600V, 90 °C (194 °F) RHH/RHW-2 Anixter 7V-7xxxx-3G or equivalent

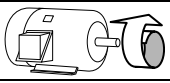
Power Terminal Block

Frame A, B, C and D



Frame E



Terminal	Description
L1/R, L2/S, L3/T	Input Line Voltage Connection
T1/U, T2/V, T3/W	Motor Phase Connection =  Switch any two motor leads to change forward direction.
DC+, DC-	DC Bus Connection
BR+, BR-	Dynamic Brake Resistor Connection
⏚	Safety Ground – PE

IMPORTANT Terminal screws may become loose during shipment. Ensure that all terminal screws are tightened to the recommended torque before applying power to the drive.

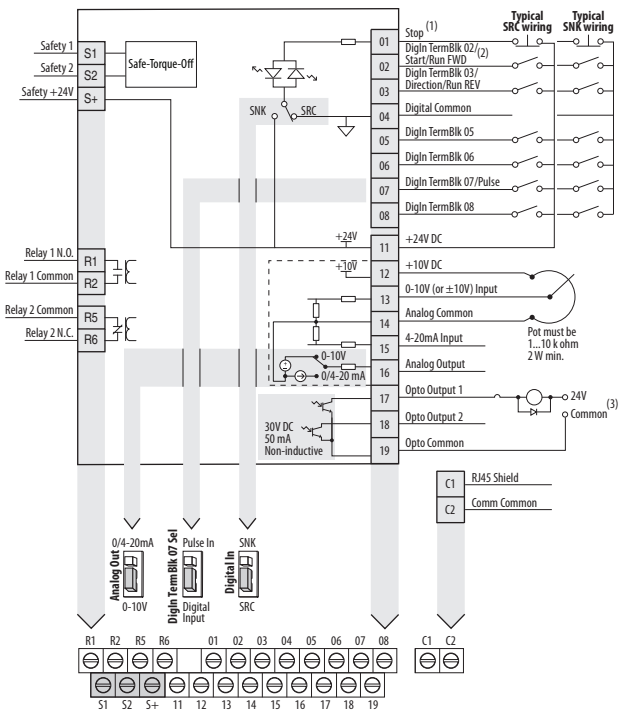
Power Terminal Block Specifications

Frame	Maximum Wire Size[1]	Minimum Wire Size[1]	Torque
A	5.3 mm² (10 AWG)	0.8 mm² (18 AWG)	1.76...2.16 Nm (15.6...19.1 lb-in.)
B	8.4 mm² (8 AWG)	2.1 mm² (14 AWG)	1.76...2.16 Nm (15.6...19.1 lb-in.)
C	8.4 mm² (8 AWG)	2.1 mm² (14 AWG)	1.76...2.16 Nm (15.6...19.1 lb-in.)
D	13.3 mm² (6 AWG)	5.3 mm² (10 AWG)	1.76...2.16 Nm (15.6...19.1 lb-in.)
E	26.7 mm² (3 AWG)	8.4 mm² (8 AWG)	3.09...3.77 Nm (27.3...33.4 lb-in.)

(1) Maximum/minimum sizes that the terminal block will accept – these are not recommendations.

Control Terminal Block

Control I/O Wiring Block Diagram



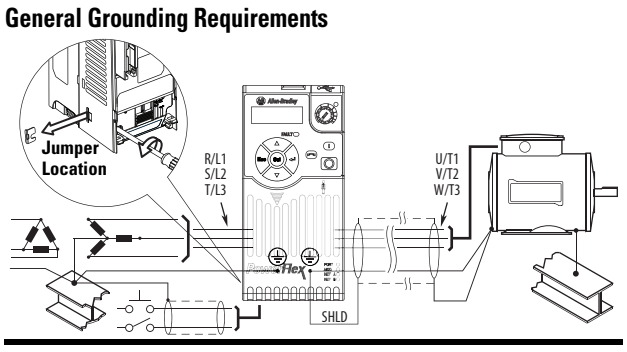
(1)

IMPORTANT I/O Terminal 01 is always a stop input. The stopping mode is determined by the drive setting.
The drive is shipped with a jumper installed between I/O Terminals 01 and 11. Remove this jumper when using I/O Terminal 01 as a stop or enable input.

(2) Two wire control shown. For three wire control use a momentary input ⏀ on I/O Terminal 02 to command a start. Use a maintained input ⏁ for I/O Terminal 03 to change direction.

(3) When using an opto output with an inductive load such as a relay, install a recovery diode parallel to the relay as shown, to prevent damage to the output.

General Grounding Requirements



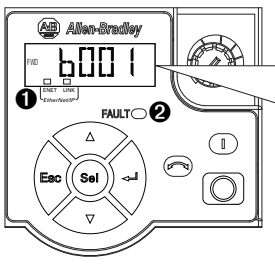
IMPORTANT The MOV to ground jumper must be removed if the drive is installed on an ungrounded (IT mains) or resistive grounded distribution system.
Tighten screw after jumper removal.

Prepare For Drive Start-Up

ATTENTION: Power must be applied to the drive to perform the following start-up procedures. Some of the voltages present are at incoming line potential. To avoid electric shock hazard or damage to equipment, only qualified service personnel should perform the following procedure. Thoroughly read and understand the procedure before beginning. If an event does not occur while performing this procedure, **Do Not Proceed. Remove All Power** including user supplied control voltages. User supplied voltages may exist even when main AC power is not applied to the drive. Correct the malfunction before continuing.

LCD Display with QuickView™ Technology

QuickView™ technology enables text to scroll across the LCD display of the PowerFlex 520-series drive. This allows you to easily configure parameters, troubleshoot faults and view diagnostic items without using a separate device.



No.	Display/LED (Color)
❶	ENET (Steady) – Adapter connected to network and drive controlled via Ethernet. ENET (Flashing) – Adapter connected to network but drive not controlled via Ethernet.
	LINK (Steady) – Adapter connected to network but not transmitting data. LINK (Flashing) – Adapter connected to network and transmitting data.
❷	Fault Status (Red)

Key	Name	Key	Name
Esc	Escape	⏎	Enter
▲ ▼	Up Arrow Down Arrow		
Sel	Select	◎	Stop

Menu	Parameter Group & Description
b	**Basic Display** Commonly viewed drive operating conditions.
P	**Basic Program** Commonly used programmable functions.
t	**Terminal Blocks** Programmable terminal functions.
C	**Communications** Programmable communication functions.
L	**Logic** Programmable logic functions.
d	**Advanced Display** Advanced drive operating conditions.
A	**Advanced Program** Remaining programmable functions.
F	**Fault and Diagnostic** Consists of list of codes for specific fault conditions.
M	**Modified** Functions from the other groups with values changed from default.
N	**Network** Network functions that are shown only when a comm card is used.
G	**AppView and CustomView** Functions from the other groups organized for specific applications.

Key	Name	Key	Name
▯	Start	⏁	Reverse
	Potentiometer		

AppView™ Parameter Groups

The parameters in the AppView™ parameter groups can be quickly added to the CustomView™ parameter group by doing the following:

Step	Key(s)	Example Displays
1. Press the Up Arrow or Down Arrow to scroll to an AppView group (G1...G8).	▲ or ▼	
2. Press Enter or Sel to enter a group. The rightmost digit of the last viewed parameter in that group will flash.	⏎ or Sel	
3. Press the Up Arrow or Down Arrow to scroll to the command G1->GC.	▲ or ▼	
4. Press Enter or Sel to add all the parameters in this AppView group to the CustomView group. The LCD display will show a confirmation.	⏎ or Sel	

CustomView™ Parameter Group

You can copy one entire AppView™ parameter group to the CustomView™ parameter group as shown above or add individual parameters as show below.

Step	Key(s)	Example Displays
1. Press the Up Arrow or Down Arrow to scroll to the CustomView group (GC).	▲ or ▼	
2. Press Enter to view the parameters that can be added to the CustomView group.	⏎	
3. Press the Up Arrow or Down Arrow to scroll through the list of parameters.	▲ or ▼	
4. Press Enter to add the parameter to the CustomView group. The LCD display will show a confirmation.	⏎	

To delete parameters from the CustomView parameter group:

Step	Key(s)	Example Displays
1. Press the Up Arrow or Down Arrow to scroll to the CustomView group (GC).	▲ or ▼	
2. Press Enter to view the parameters that are in the CustomView group.	⏎	
3. Press the Up Arrow or Down Arrow to scroll to the command GC---.	▲ or ▼	
4. Press Enter or Sel to view the parameters that are stored in the CustomView group.	⏎ or Sel	
5. Press the Up Arrow or Down Arrow to scroll through the list of parameters.	▲ or ▼	
6. Press Enter to delete the parameter from the CustomView group. The LCD display will show a confirmation.	⏎	

Fault Codes

To clear a fault – press the Stop key if P045 [Stop Mode] is set to a value between 0...3, cycle power, set A551 [Fault Clear] to 1 or 2, or cycle digital input if t062, t063, t065...t068 [DigIn TermBlk xx] is set to 13.

No.	Fault	Description
F000	No Fault	–
F002[1]	Auxiliary Input	Check remote wiring. Verify communications programming for intentional fault.
F003	Power Loss	Monitor the incoming AC line for low voltage or line power interruption. Check input fuses. Reduce load.
F004[1]	UnderVoltage	Monitor the incoming AC line for low voltage or line power interruption.
F005[1]	OverVoltage	Monitor the AC line for high line voltage or transient conditions. Bus overvoltage can also be caused by motor regeneration. Extend the decel time or install dynamic brake resistor.
F006[1]	Motor Stalled	Increase P041, A442, A444 or A446 [Accel Time x] or reduce load so drive output current does not exceed the current set by parameter A484 or A485 [Current Limit x]. Check for overhauling load.
F007[1]	Motor Overload	An excessive motor load exists. Reduce load so drive output current does not exceed the current set by parameter P033 [Motor OL Current]. Verify A530 [Boost Select] setting.
F008[1]	Heatsink OvrTmp	Check for blocked or dirty heat sink fins. Verify that ambient temperature has not exceeded the rated ambient temperature. Check fan.
F009[1]	CC OvrTmp	Check product ambient temperature. Check for airflow obstruction. Check for dirt or debris. Check Fan.
F012	HW OverCurrent	Check programming. Check for excess load, improper A531 [Boost Select] setting, DC brake volts set too high or other causes of excess current.
F013[2]	Ground Fault	Check the motor and external wiring to the drive output terminals for a grounded condition.
F015	Load Loss	Verify connections between motor and load. Verify level and time requirements.
F021[1]	Output Ph Loss	Verify motor wiring and motor.
F029[1]	Analog In Loss	An analog input is configured to fault on a signal loss. A signal loss has occurred. Check for broken/loose connections at inputs. Check parameters.
F033	Auto Rstrt Tries	Correct the cause of the fault and manually clear.
F038	Phase U to Gnd	Check the wiring between the drive and motor. Check motor for grounded phase. Replace drive if fault cannot be cleared.
F039	Phase V to Gnd	
F040	Phase W to Gnd	
F041	Phase UV Short	Check the motor and drive output terminal wiring for a shorted condition. Replace drive if fault cannot be cleared.
F042	Phase UW Short	
F043	Phase VW Short	
F048[1]	Params Defaulted	The drive was commanded to write default values to EEPROM. Clear the fault or cycle power to the drive. Program the drive parameters as needed.
F059[1]	Safety Open	Both of the safety inputs (Safety 1, Safety 2) are not enabled. Check safety input signals. If not using safety, verify and tighten jumper for I/O terminals S1, S2 and S+.
F063[1]	SW OverCurrent	Verify connections between motor and load. Verify level and time requirements.
F064	Drive Overload	Reduce load or extend Accel Time.
F070	Power Unit	Check maximum ambient temperature has not been exceeded. Cycle power. Replace drive if fault cannot be cleared.
F071	DSI Net Loss	Cycle power. Check communications cabling. Check Modbus or DSI setting. Check Modbus or DSI status.
F072	Opt Net Loss	Cycle power. Check communications cabling. Check network adapter setting. Check external network status.
F073	EN Net Loss	Cycle power. Check communications cabling. Check EtherNet/IP setting. Check external network status.
F080	Autotune Failure	The autotune function was either cancelled by the user of failed. Restart procedure.
F081	DSI Comm Loss	Cycle power. Check communications cabling. Check Modbus or DSI setting. Check Modbus or DSI status. Modify using C125 [Comm Loss Action]. Connecting I/O terminals C1 and C2 to ground may improve noise immunity. Replace wiring, Modbus master device or control module.
F082	Opt Comm Loss	Cycle power. Reinstall option card in drive. Modify using C125 [Comm Loss Action]. Replace wiring, port expander, option card or control module.
F083	EN Comm Loss	Cycle power. Check EtherNet/IP setting. Check drive's Ethernet settings and diagnostic parameters. Modify using C125 [Comm Loss Action]. Replace wiring, Ethernet switch or control module.
F091	Encoder Loss	Check Wiring. If P047, P049 or P051 [Speed Referencex] = 16 "Positioning" and A535 [Motor Fdbk Type] = 5 "Quad Check", swap the Encoder channel inputs or swap any two motor leads. Replace encoder.
F094	Function Loss	Close input to the terminal and cycle power.
F100	Parameter Chksum	Set P053 [Reset to Defalts] to 2 "Factory Rset".
F101	External Storage	Set P053 [Reset to Defalts] to 2 "Factory Rset".
F105	C Connect Err	Clear fault and verify all parameter settings. Do not remove or install the control module while power is applied.
F106	Incompat C-P	The control module could not recognize the power module. Cycle power. Flash with newer firmware version. Replace drive if fault cannot be cleared.
F107	Replaced C-P	The control module was mounted to a power module with a different power rating. Set P053 [Reset to Defalts] to any of the reset options.
F109	Mismatch C-P	The control module was mounted to a different drive type power module. Set P053 [Reset to Defalts] to any of the reset options.
F110	Keypad Membrane	Keypad membrane failure/disconnected. Cycle power. Replace control module if fault cannot be cleared.
F111	Safety Hardware	Safety input enable hardware malfunction. One of the safety inputs is not enabled. Check safety input signals. If not using safety, verify and tighten jumper for I/O terminals S1, S2 and S+. Replace control module if fault cannot be cleared.
F114	uC Failure	Cycle power. Replace control module if fault cannot be cleared.
F122	I/O Board Fail	Cycle power. Replace drive or control module if fault cannot be cleared.
F125	Flash Update Req	Perform a firmware flash update operation to attempt to load a valid set of firmware.
F126	NonRecoverablErr	Clear fault or cycle power to the drive. Replace drive or control module if fault cannot be cleared.
F127	DSIFlashUpdatReq	Perform a firmware flash update operation using DSI communications to attempt to load a valid set of firmware.

(1) This fault may be cleared by the auto-restart routine and will be attempted a number of times based on the value set in parameter A541 [Auto Rstrt Tries].

(2) This fault may be cleared by the auto-restart routine and will be attempted only once. It ignores the value set in parameter A541 [Auto Rstrt Tries].

Specifications

Input/Output Ratings	Approvals
Output Frequency: 0...500 Hz (Programmable) Efficiency: 97.5% (Typical)	UL508C, CSA 22.2, N223, TÜV Rheinland, FS LV Directive 2006/95/EC: EN 61800-5-1 EMC Directive 2004/108/EC: EN 61800-3 Machine Directive 2006/42/EC: EN 60261 ATEX Directive 94/9/EC: EN 50495 Low Voltage TR CU 004/2011 EMC TR CU 020/2011 II (2) G D **AC156** **KCC:** Article 58-2 of Radio Waves Act, Clause 3 **Lloyds Register:** Approval Certificate 12/10068(E1)

Digital Control Inputs (Input Current = 6 mA)		Analog Control Inputs
SRC (Source) Mode: 18...24V = ON 0...6V = OFF	SNK (Sink) Mode: 0...6V = ON 18...24V = OFF	4-20 mA Analog: 250 Ω input impedance 0-10V DC Analog: 100 kΩ input impedance External Pot: 1...10 kΩ, 2 W min.

Control Output		
Programmable Output, Form A and Form B	Opto Outputs	Analog Outputs (10-bit)
Resistive Rating: 3.0 A @ 30V DC, 125V AC and 240V AC	30V DC, 50 mA	0-10V: 1 kΩ min.
Inductive Rating: 0.5 A @ 30V DC, 125V AC and 240V AC	Non-inductive	4-20 mA: 525 Ω max.

Fuses and Circuit Breakers
Recommended Fuse Type: UL Class J, T or Type BS88; 600V (550V) or equivalent.
Recommended Circuit Breakers: HMCP or equivalent.
Protective Features
Motor Protection: I^2t overload protection – 150% for 60 s, 200% for 3 s (Provides Class 10 protection)
Overcurrent: 200% hardware limit, 300% instantaneous fault
Over Voltage: 100...120V AC Input – Trip occurs @ 405V DC bus voltage (equivalent to 150V AC incoming line) 200...240V AC Input – Trip occurs @ 405V DC bus voltage (equivalent to 290V AC incoming line) 380...480V AC Input – Trip occurs @ 810V DC bus voltage (equivalent to 575V AC incoming line) 525...600V AC Input – Trip occurs @ 1005V DC bus voltage (equivalent to 711V AC incoming line)
Under Voltage: 100...120V AC Input – Trip occurs @ 190V DC bus voltage (equivalent to 75V AC incoming line) 200...240V AC Input – Trip occurs @ 190V DC bus voltage (equivalent to 150V AC incoming line) 380...480V AC Input – Trip occurs @ 390V DC bus voltage (equivalent to 275V AC incoming line) 525...600V AC Input – If P038 = 3 "600V" trip occurs @ 487V DC bus voltage (344V AC incoming line); – If P038 = 2 "480V" trip occurs @ 390V DC bus voltage (275V AC incoming line)
Control Ride Through: Minimum ride through is 0.5 s - typical value 2 s
Faultless Power Ride Through: 100 ms

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Rockwell Automation provides technical information on the Web to assist you in using its products.
At http://www.rockwellautomation.com/support/, you can find technical manuals, a knowledge base of FAQs, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools.
For an additional level of technical phone support for installation, configuration, and troubleshooting, we offer TechConnect support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit http://www.rockwellautomation.com/support/.

Installation Assistance

If you experience a problem within the first 24 hours of installation, review the information that is contained in this manual.
You can contact Customer Support for initial help in getting your product up and running.

United States or Canada	1.440.646.3434
Outside United States or Canada	Use the Worldwide Locator at http://www.rockwellautomation.com/support/americas/phone_en.html, or contact your local Rockwell Automation representative.

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Rockwell Automation tests all of its products to ensure that they are fully operational when shipped from the manufacturing facility.
However, if your product is not functioning and needs to be returned, follow these procedures.

United States	Contact your distributor. You must provide a Customer Support case number (call the phone number above to obtain one) to your distributor to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for the return procedure.

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