Allen-Bradley
by ROCKWELL AUTOMATION

PowerFlex 525 Adjustable Frequency AC Drive

Catalog Number 25B

ATTENTION:
- **Before installing, configuring, operating, or maintaining this product, read this document and the documents that are 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 that is not specified by the manufacturer, the protection that is provided by the equipment may be impaired.
- Solid-state equipment has operational characteristics that differ from those of electromechanical equipment. Safety Guidelines for the Application, Installation, and Maintenance of Solid-state Control, publication SGI-1.1, available from your local Rockwell Automation sales office or online at rok.auto/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 rok.auto/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 rok.auto/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 rok.auto/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 rok.auto/literature o póngase en contacto con su oficina regional de ventas o representante de Rockwell Automation.

ATENÇÃO: Não instale, configure, opere ou mantenha este produto até que você leia a documentação do produto e os documentos na seção Recursos adicionais para a instalação, configuração, operação ou manutenção do equipamento. Para conseguir a documentação, visite rok.auto/literature ou entre em contato con seu escritório de vendas regional ou representante da Rockwell Automation.

ATTENZIONE: Non installare, configurare, attivare o riparare questo prodotto senza avere prima letto la relativa documentazione nonchè i documenti indicati nella sezione Ulteriori Risore riguardanti l'installazione, la configurazione, l'attivazione o la riparazione dell'apparecchiatura. Per la documentazione sul prodotto visitare il sito rok.auto/literature o contattare l'ufficio vendite o il rappresentate Rockwell Automation di zona.

注意：製品の資料および追加資料に記載の装置の取付け、構成、操作、または保守に関する資料をお読みになるまでは、この製品の取付け、構成、操作、または保守を行なわないでください。製品の資料を入手するには、Web サイト：rok.auto/literature にアクセスするか、またはロックウェル・オートメーションの営業または販売代理店までご連絡ください。

주의사항 : 제품 매뉴얼 혹은설치 , 구성 , 가동 , 유지와 관련된 추가 지침서를 완전히 숙지하기 전까지 본 제품을 설치 혹은 가동하 지 마십시오 . 본 제품과 관련된 매뉴얼 혹은 문서를 원하시면 사이트 rok.auto/literature 를 방문해주시거 나 해당 지역의 로크웰 오토메이션대리점으 로 문의하십시오 .

注意：若未阅读产品文档以及 " 其它资源 " 小节中提及的有关安装、配置、运行或维护设备的相关文档，请勿安装、配置、运行或维护本产品。请访问 rok.auto/literature 或联系您当地的销售办事处或罗克韦尔自动化代表，以获取产品文档。

注意：在您完整閱讀本產品相關文件及其他關於安裝、配置、操作或維護設備等資料之前、請勿安裝、配置、操作或維護此產品。您可到下列 網站下載所有產品相關文件 rok.auto/literature，或聯繫洛克威爾自動化當地 辦公室。

ВНИМАНИЕ: Не устанавливайте, не конфигурируйте, не запускайте в эксплуатацию и не поддерживайте работу продукта до прочтения технической документации по продукту и документации в разделе Дополнительные материалы для инсталлирования, конфигурирования, запуска в эксплуатацию и поддержки работы продукта. Чтобы ознакомиться с документацией по продукту, перейдите по ссылке rok.auto/literature или свяжитесь с локальным офисом продаж или представителем Rockwell Automation.

UWAGA: Nie instaluj i nie uruchamiaj tego urządzenia dopóki nie zapoznasz się z instrukcją użytkownika produktu. Aby uzyskać dokumentację produktu przejdź do strony internetowej rok.auto/literature lub skontaktuj się z lokalnym biurem sprzedaży lub przedstawicielstwem firmy Rockwell Automation.

UPOZORNĚNÍ: Neprovádějte instalaci, konfiguraci, provoz ani údržbu, pokud jste dosud nepřečetli dokumentaci k produktu a dokumenty obsažené v sekci Doplňující informace pro instalaci, konfiguraci, provoz a údržbu. Tuto dokumentaci můžete získat na rok.auto/literature nebo od obchodního zástupce společnosti Rockwell Automation.

Summary of Changes

This publication contains new or updated information. Changes throughout this revision are marked by change bars, as shown to the left of this paragraph.

Mounting Considerations

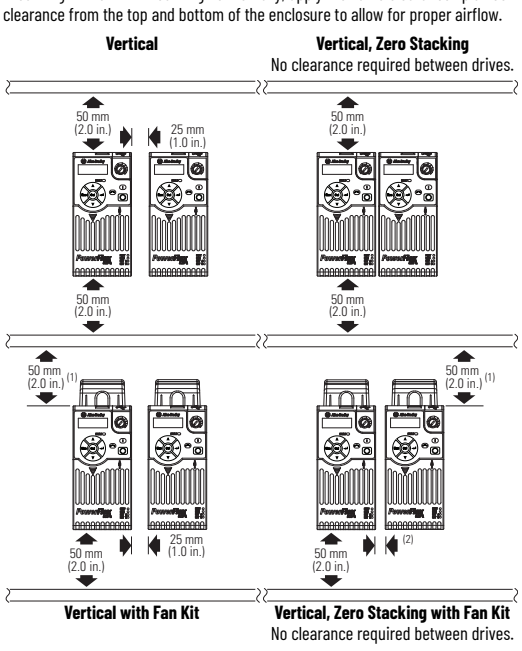
- Mount the drive upright on a flat, vertical, and level surface.

Frame	Screw Size	Screw Torque
A	M5 (#10...24)	1.56...1.96 N•m (14...17 lb•in)
B	M5 (#10...24)	1.56...1.96 N•m (14...17 lb•in)
C	M5 (#10...24)	1.56...1.96 N•m (14...17 lb•in)
D	M5 (#10...24)	2.45...2.94 N•m (22...26 lb•in)
E	M8 (5/16 in.)	6.0...7.4 N•m (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 the same clearances plus 50 mm (2.0 in.) clearance from the top and bottom of the 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			
		Minimum	Maximum (No Derate)	Maximum (Derate)(2)	Maximum with Fan Kit (Derate)(3)(5)
Vertical	IP20/Open Type	-20 °C (-4 °F)	50 °C (122 °F)	60 °C (140 °F)	70 °C (158 °F)
	IP30/NEMA 1/UL Type 1		45 °C (113 °F)	55 °C (131 °F)	–
Vertical, Zero Stacking	IP20/Open Type		45 °C (113 °F)	55 °C (131 °F)	65 °C (149 °F)
	IP30/NEMA 1/UL Type 1		40 °C (104 °F)	50 °C (122 °F)	–
Horizontal with Control Module Fan Kit(4)(5)	IP20/Open Type		50 °C (122 °F)	–	70 °C (158 °F)
Horizontal, Zero Stacking with Control Module Fan Kit(4)(5)	IP20/Open Type		45 °C (113 °F)	–	65 °C (149 °F)

(1) IP30/NEMA 1/UL Type 1 rating requires installation of the PowerFlex 520-series IP30/NEMA 1/UL Type 1 option kit, catalog number 25-JBAx.
(2) For catalogs 25B-D1P4N104 and 25B-E0P9N104, the temperature that is listed under the Maximum (Derate) column is reduced by 5 °C (9 °F) for all mounting methods.
(3) For catalogs 25B-D1P4N104 and 25B-E0P9N104, the temperature that is listed under the Maximum 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

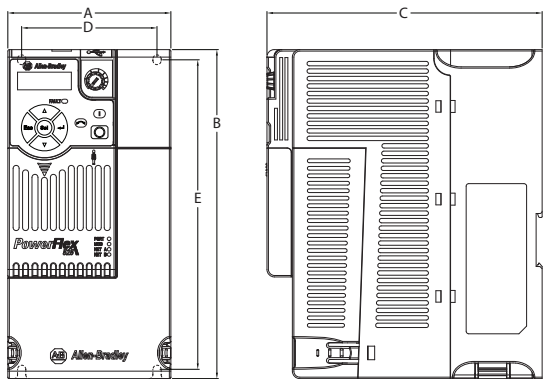
PowerFlex 525 Frames

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

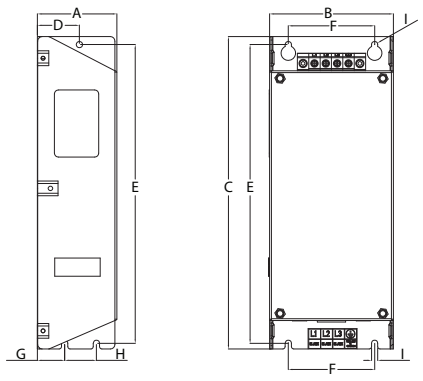
Dimensions are in mm and (in.). Weights are in kg and (lb).



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® 520-series Adjustable Frequency AC Drive User Manual for instructions on how to comply 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

See the PowerFlex 520-series Adjustable Frequency AC Drive User Manual for fuses and circuit breakers for non-UL applications.

Fuses and Circuit Breakers – UL 61800-5-1 Applications

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/MT 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	140MT-C3E-C10 140MT-D9E-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	140MT-D9E-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	140MT-D9E-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	140MT-D9E-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	140MT-D9E-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	140MT-D9E-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

Fuses and Circuit Breakers – UL 61800-5-1 Applications (Continued)

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/MT Motor Protectors (3) (4) (5)	Contactors	
	HP	kW	HP	kW	Amps							
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	140MT-D9E-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	140MT-D9E-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	140MT-D9E-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	140MT-D9E-C16	100-C23	107.0
25B-B017N104	5.0	4.0	5.0	4.0	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	Not available for this drive rating	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	140MT-C3E-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	140MT-C3E-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	140MT-C3E-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	140MT-C3E-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	140MT-D9E-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	140MT-D9E-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	140MT-D9E-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	140MT-C3E-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	140MT-C3E-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	140MT-C3E-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	140MT-C3E-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	140MT-D9E-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	140MT-D9E-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	140MT-D9E-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	140MT-C3E-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	140MT-C3E-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	140MT-C3E-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	140MT-D9E-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	140MT-D9E-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	140MT-D9E-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	140MT-D9E-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/MT devices can vary. See publication 140-TD005 or 140M-TD002.
(4) Bulletin 140M/MT devices with adjustable current range must have the current trip set to the minimum range that the device does not trip.
(5) Manual Self-Protected (Type E) Combination Motor Controller, UL Listed for 208V Wye or Delta, 240V Wye or Delta, 480V Y/277 or 600V Y/347. Not UL Listed for use on 480V or 600V Delta/Delta, corner ground, or high-resistance ground systems.

Wiring

See the PowerFlex 520-series Adjustable Frequency AC Drive User Manual for instructions on how to wire the power terminals and control terminals.

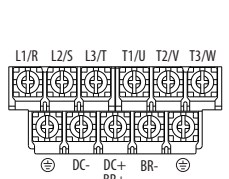
Power Wiring

Recommended Shielded Wire

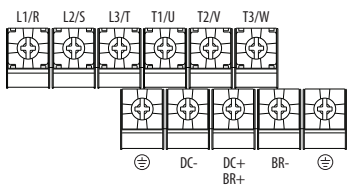
Location	Rating/Type
Standard (Option 1)	600V, 90 °C (194 °F) XHHW2/RHW-2 Anixter B209500-B209507, Belden 29501-29507, or equivalent
Standard (Option 2)	Tray rated 600V, 90 °C (194 °F) RHH/RHW-2 Anixter OLF-7xxxxx or equivalent
Class I & II; Division I & II	Tray rated 600V, 90 °C (194 °F) RHH/RHW-2 Anixter 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. Verify that all terminal screws are tightened to the recommended torque before you apply power to the drive.

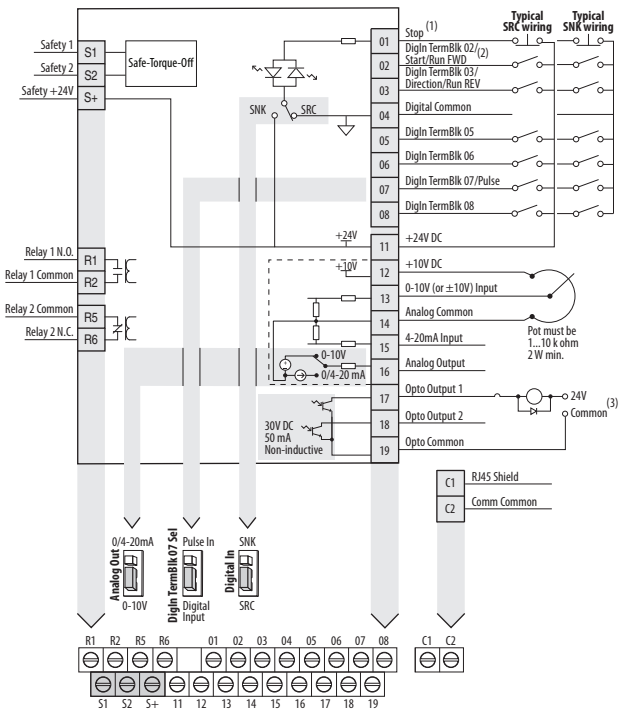
Power Terminal Block Specifications

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 N•m (15.6...19.1 lb•in)
B	8.4 mm² (8 AWG)	2.1 mm² (14 AWG)	1.76...2.16 N•m (15.6...19.1 lb•in)
C	8.4 mm² (8 AWG)	2.1 mm² (14 AWG)	1.76...2.16 N•m (15.6...19.1 lb•in)
D	13.3 mm² (6 AWG)	5.3 mm² (10 AWG)	1.76...2.16 N•m (15.6...19.1 lb•in)
E	26.7 mm² (3 AWG)	8.4 mm² (8 AWG)	3.09...3.77 N•m (27.3...33.4 lb•in)

(1) Maximum/minimum sizes that the terminal block accepts. These are not recommendations.

Control Terminal Block

Control I/O Wiring Block Diagram



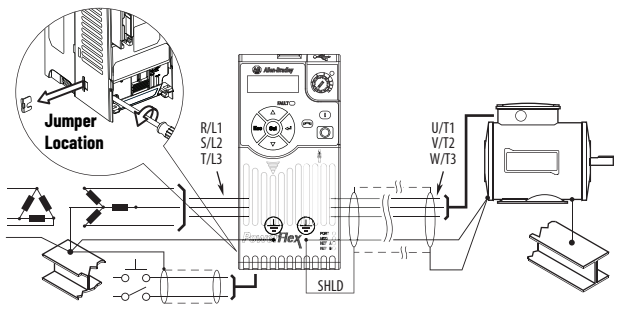
(1)

IMPORTANT I/O Terminal 01 is always a stop input. The drive setting determines the stopping mode.
The drive is shipped with a jumper that is 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 help prevent damage to the output.

General Grounding Requirements



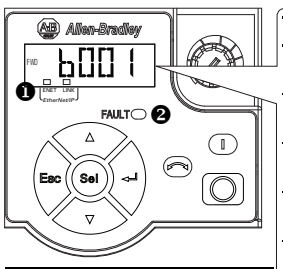
IMPORTANT The MOV to ground jumper must be removed if the drive is installed on an ungrounded (IT mains) or resistive grounded distribution system.
Tighten screw after jumper removal.

Prepare For Drive Startup

ATTENTION: Power must be applied to the drive to perform the following startup 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 feature allows you to easily configure parameters, troubleshoot faults, and view diagnostic items without using a separate device.



No.	Display/LED (Color)
1	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
2	Fault Status (Red)

Key	Name	Key	Name
Esc	Escape	Enter	
	Up Arrow Down Arrow		
Sel	Select		Stop

Menu	Parameter Group and 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	Keys	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 flashes.	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 parameters in this AppView group to the CustomView group. The LCD display shows 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	Keys	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 shows a confirmation.		

To delete parameters from the CustomView parameter group:

Step	Keys	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 shows 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.

Fault Code Descriptions

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. Motor regeneration can also cause bus overvoltage. 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 heatsink 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 the 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 that the 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 canceledAppendixby 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. Update with newer firmware revision. Replace drive if fault cannot be cleared.

Fault Code Descriptions (Continued)

No.	Fault	Description
F107	Replaced C-P	The control module was mounted to a power module with another power rating. Set P053 [Reset to Defalts] to any of the reset options.
F109	Mismatch C-P	The control module was mounted to another 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 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 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 is attempted a number of times based on the value that is set in parameter A541 [Auto Rstrt Tries].

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

Specifications

Input/Output Ratings

Output Frequency:
0...500 Hz
(Programmable)
Efficiency:
97.5% (Typical)

Approvals

UL 508C
UL 61800-5-1
CSA C22.2 No 274
NM EN 61800-5-1
NM EN 61800-3
EN 61800-3
LV Directive 2014/35/EU: EN 61800-5-1
EMC Directive 2014/30/EU: EN 61800-3
Machine Directive 2006/42/EC: EN 61800-5-2
ATEX Directive 2014/34/EU: EN 50495
RoHS Directive 2011/65/EU & AMD 2015/863
II (2) G D
UKSI 2016 No. 1101 (LV): EN 61800-5-1
UKSI 2016 No. 1091 (EMC): EN 61800-3
UKSI 2008 No. 1597 (MD): EN 61800-5-2
UKSI 2016 No. 1107 (Ex): EN 50495
UKSI 2012 No. 3032 (RoHS): EN IEC 63000
Low Voltage TP TC 004/2011
EMC TP TC 020/2011
Article 58-2 of Radio Waves Act, Clause 3
SEMI F47: AC 156, SEMI F47
Lloyds Register: Approval Certificate LR22506741TA

Digital Control Inputs (Input Current = 6 mA)

SRC (Source) Mode:
18...24V = ON
0...6V = OFF

SNK (Sink) Mode:
0...6V = ON
18...24V = OFF

Analog Control Inputs

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
Resistive Rating: 3.0 A @ 30V DC, 125V AC and 240V AC
Inductive Rating: 0.5 A @ 30V DC, 125V AC and 240V AC

Opto Outputs
30V DC, 50 mA
Non-inductive

Analog Outputs (10-bit)
0...10V: 1 kΩ min
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

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation. You can view or download publications at rok.auto/literature.

Resource	Description
PowerFlex 520-series Adjustable Frequency AC Drive User Manual, publication 520-UM001	Provides detailed information on the parameters and specifications of the PowerFlex 523 and PowerFlex 525 drives.
AC Drive Installation Considerations, publication DRIVES-IN003	Provides additional information that is needed to install PowerFlex AC drives properly.
Wiring and Grounding for Pulse Width Modulated (PWM) AC Drives, publication DRIVES-IN001	Provides basic information that is needed to wire and ground PWM AC drives properly.
Industrial Automation Wiring and Grounding, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
PowerFlex AC Drive Performance Specifications per Ecodesign Regulation (EU) 2019/1781, publication PFLEX-TD003	Provides specifications per Ecodesign Regulation (EU) 2019/1781 and UK SI 2021 No. 745, including efficiency class.
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.

Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, and product notification updates.	rok.auto/support
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Technical Documentation Center	Quickly access and download technical specifications, installation instructions, and user manuals.	rok.auto/techdocs
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes.	rok.auto/pcdc

Documentation Feedback

Your comments help us serve your documentation needs better. If you have any suggestions on how to improve our content, complete the form at rok.auto/docfeedback.

Waste Electrical and Electronic Equipment (WEEE)

At the end of life, this equipment should be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental compliance information on its website at rok.auto/pec.

Connect with us.

rockwellautomation.com — expanding **human possibility**®

AMERICAS: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
EUROPE/MIDDLE EAST/AFRICA: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2663 0600, Fax: (32) 2 663 0640
ASIA PACIFIC: Rockwell Automation SEA Pte Ltd., 2 Corporation Road, #04-05, Main Lobby, Corporation Place, Singapore 618494, Tel: (65) 6510-6608, Fax: (65) 6510-6699
UNITED KINGDOM: Rockwell Automation Ltd., Pitfield, Kiln Farm, Milton Keynes, MK11 3DR, United Kingdom, Tel: (44)(1908) 838-800, Fax: (44)(1908) 261-917

Publication 520-PC001H-EN-P - July 2023 | Supersedes Publication 520-PC001G-EN-P - January 2022

5012621907
PF525