

PowerFlex 70 and 700 Packages for Fan and Pump Applications

**ATTENTION:**

Read this document and the documents listed in the Additional Resources section about installation, configuration and operation of this equipment before you install, configure, operate or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to 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.

注意:

在安装、配置、操作和维护本产品前，请阅读本文档以及“其他资源”部分列出的有关设备安装、配置和操作的相应文档。除了所有适用规范、法律和标准的相关要求之外，用户还必须熟悉安装和接线说明。

安装、调整、投运、使用、组装、拆卸和维护等各项操作必须由经过适当训练的专业人员按照适用的操作规范实施。

如果未按照制造商指定的方式使用该设备，则可能会损害设备提供的保护。

ATENCIÓN:

Antes de instalar, configurar, poner en funcionamiento o realizar el mantenimiento de este producto, lea este documento y los documentos listados en la sección Recursos adicionales acerca de la instalación, configuración y operación de este equipo. Los usuarios deben familiarizarse con las instrucciones de instalación y cableado y con los requisitos de todos los códigos, leyes y estándares vigentes.

É necessário que as atividades, incluindo instalação, ajustes, colocação em serviço, utilização, montagem, desmontagem e manutenção de conformidade com o código de prática aplicável.

Si este equipo se usa de una manera no especificada por el fabricante, la protección provista por el equipo puede resultar afectada.

ATENÇÃO:

Leia este e os demais documentos sobre instalação, configuração e operação do equipamento que estão na seção Recursos adicionais antes de instalar, configurar, operar ou manter este produto. Os usuários devem se familiarizar com as instruções de instalação e fiação além das especificações para todos os códigos, leis e normas aplicáveis.

É necessário que as atividades, incluindo instalação, ajustes, colocação em serviço, utilização, montagem, desmontagem e manutenção sejam realizadas por pessoal qualificado e especializado, de acordo com o código de prática aplicável.

Caso este equipamento seja utilizado de maneira não estabelecida pelo fabricante, a proteção fornecida pelo equipamento pode ficar prejudicada.

ВНИМАНИЕ:

Перед тем как устанавливать, настраивать, эксплуатировать или обслуживать данное оборудование, прочитайте этот документ и документы, перечисленные в разделе «Дополнительные ресурсы». В этих документах изложены сведения об установке, настройке и эксплуатации данного оборудования. Пользователи обязаны ознакомиться с инструкциями по установке и прокладке соединений, а также с требованиями всех применимых норм, законов и стандартов.

Все действия, включая установку, наладку, ввод в эксплуатацию, использование, сборку, разборку и техническое обслуживание, должны выполняться обученным персоналом в соответствии с применимыми нормами и правилами.

Если оборудование используется не предусмотренным производителем образом, защита оборудования может быть нарушена.

注意:

本製品を設置、構成、稼動または保守する前に、本書および本機器の設置、設定、操作についての参考資料の該当箇所に記載されている文書に目を通してください。ユーザは、すべての該当する条例、法律、規格の要件に加えて、設置および配線の手順に習熟している必要があります。

設置調整、運転の開始、使用、組立て、解体、保守を含む諸作業は、該当する実施規則に従って訓練を受けた適切な作業員が実行する必要があります。

本機器が製造メーカーにより指定されていない方法で使用されている場合、機器により提供されている保護が損なわれる恐れがあります。

ACHTUNG:

Lesen Sie dieses Dokument und die im Abschnitt „Literaturverweise“ genannten Dokumente zur Installation, Konfiguration und Bedienung dieser Ausrüstung sorgfältig durch, bevor Sie dieses Produkt installieren, konfigurieren, bedienen oder instandsetzen. Benutzer müssen sich mit den Anweisungen zur Installation und Verdrahtung vertraut machen und müssen die Anforderungen aller geltenden Vorschriften, Gesetze und Normen kennen.

Aktivitäten wie Installation, Einstellung, Inbetriebnahme, Verwendung, Montage, Demontage und Instandsetzung müssen durch ausreichend geschultes Personal in Übereinstimmung mit den geltenden Durchführungsvorschriften ausgeführt werden.

Wenn diese Ausrüstung in einer Weise verwendet wird, die nicht vom Hersteller angegeben wurde, kann der von der Ausrüstung bereitgestellte Schutz beeinträchtigt sein.

ATTENTION :

Lisez ce document et les documents listés dans la section Ressources complémentaires relatifs à l'installation, la configuration et le fonctionnement de cet équipement avant d'installer, configurer, utiliser ou entretenir ce produit. Les utilisateurs doivent se familiariser avec les instructions d'installation et de câblage en plus des exigences relatives aux codes, lois et normes en vigueur.

Les activités relatives à l'installation, le réglage, la mise en service, l'utilisation, l'assemblage, le démontage et l'entretien doivent être réalisées par des personnes formées selon le code de pratique en vigueur.

Si cet équipement est utilisé d'une façon qui n'a pas été définie par le fabricant, la protection fournie par l'équipement peut être compromise.

주의:

본 제품 설치, 설정, 작동 또는 유지 보수하기 전에 본 문서를 포함하여 설치, 설정 및 작동에 관한 참고 자료 섹션의 문서들을 반드시 읽고 숙지하십시오. 사용자는 모든 관련 규정, 법규 및 표준에서 요구하는 사항에 대해 반드시 설치 및 배선 지침을 숙지해야 합니다.

설치, 조정, 가동, 사용, 조립, 분해, 유지보수 등 모든 작업은 관련 규정에 따라 적절한 교육을 받은 사용자를 통해서만 수행해야 합니다.

본 장비를 제조사가 명시하지 않은 방법으로 사용하면 장비의 보호 기능이 손상될 수 있습니다.

ATTENZIONE

Prima di installare, configurare ed utilizzare il prodotto, o effettuare interventi di manutenzione su di esso, leggere il presente documento ed i documenti elencati nella sezione "Altre risorse", riguardanti l'installazione, la configurazione ed il funzionamento dell'apparecchiatura. Gli utenti devono leggere e comprendere le istruzioni di installazione e cablaggio, oltre ai requisiti previsti dalle leggi, codici e standard applicabili.

Le attività come installazione, regolazioni, utilizzo, assemblaggio, disassemblaggio e manutenzione devono essere svolte da personale adeguatamente addestrato, nel rispetto delle procedure previste.

Qualora l'apparecchio venga utilizzato con modalità diverse da quanto previsto dal produttore, la sua funzione di protezione potrebbe venire compromessa.



DIKKAT:

Bu ürünün kurulumu, yapılandırılması, işletilmesi veya bakımı öncesinde bu dokümanı ve bu ekipmanın kurulumu, yapılandırılması ve işletimi ile ilgili ilave Kaynaklar bölümünde yer listelenmiş dokümanları okuyun. Kullanıcılar yürürlükteki tüm yönetmelikler, yasalar ve standartların gereksinimlerine ek olarak kurulum ve kablolama talimatlarını da öğrenmek zorundadır.

Kurulum, ayarlama, hizmete alma, kullanma, parçaları birleştirme, parçaları sökme ve bakım gibi aktiviteler sadece uygun eğitimleri almış kişiler tarafından yürürlükteki uygulamaya yönetmeliklerine uygun şekilde yapılabilir.

Bu ekipman üretici tarafından belirlenmiş amacın dışında kullanılırsa, ekipman tarafından sağlanan koruma bozulabilir.

注意事項:

在安裝、設定、操作或維護本產品前，請先閱讀此文件以及列於「其他資源」章節中有關安裝、設定與操作此設備的文件。使用者必須熟悉安裝和配線指示，並符合所有法規、法律和標準要求。

包括安裝、調整、交付使用、使用、組裝、拆卸和維護等動作都必須交由已經過適當訓練的人員進行，以符合適用的實作法規。

如果將設備用於非製造商指定的用途時，可能會造成設備所提供的保護功能受損。

POZOR:

Než začnete instalovat, konfigurovat či provozovat tento výrobek nebo provádět jeho údržbu, přečtěte si tento dokument a dokumenty uvedené v části Dodatečné zdroje ohledně instalace, konfigurace a provozu tohoto zařízení. Uživatelé se musejí vedle požadavků všech relevantních vyhlásek, zákonů a norem nutně seznámit také s pokyny pro instalaci a elektrické zapojení.

Činnosti zahrnující instalaci, nastavení, uvedení do provozu, užívání, montáž, demontáž a údržbu musí vykonávat vhodně proškolený personál v souladu s příslušnými prováděcími předpisy.

Pokud se toto zařízení používá způsobem neodpovídajícím specifikaci výrobce, může být narušena ochrana, kterou toto zařízení poskytuje.

UWAGA:

Przed instalacją, konfiguracją, użytkowaniem lub konserwacją tego produktu należy przeczytać niniejszy dokument oraz wszystkie dokumenty wymienione w sekcji Dodatkowe źródła omawiające instalację, konfigurację i procedury użytkowania tego urządzenia. Użytkownicy mają obowiązek zapoznać się z instrukcjami dotyczącymi instalacji oraz oprzewodowania, jak również z obowiązującymi kodeksami, prawem i normami.

Działania obejmujące instalację, regulację, przekazanie do użytkowania, użytkowanie, montaż, demontaż oraz konserwację muszą być wykonywane przez odpowiednio przeszkolony personel zgodnie z obowiązującym kodeksem postępowania.

Jeśli urządzenie jest użytkowane w sposób inny niż określony przez producenta, zabezpieczenie zapewniane przez urządzenie może zostać ograniczone.

OBS!

Läs detta dokument samt dokumentet, som står listat i avsnittet Övriga resurser, om installation, konfigurering och drift av denna utrustning innan du installerar, konfigurerar eller börjar använda eller utföra underhållsarbete på produkten. Användare måste bekanta sig med instruktioner för installation och kabeldragning, förutom krav enligt gällande koder, lagar och standarder.

Åtgärder som installation, justering, service, användning, montering, demontering och underhållsarbete måste utföras av personal med lämplig utbildning enligt lämpligt bruk.

Om denna utrustning används på ett sätt som inte anges av tillverkaren kan det hända att utrustningens skyddsanordningar försätts ur funktion.

LET OP:

Lees dit document en de documenten die genoemd worden in de paragraaf Aanvullende informatie over de installatie, configuratie en bediening van deze apparatuur voordat u dit product installeert, configureert, bediend of onderhoudt. Gebruikers moeten zich vertrouwd maken met de installatie en de bedradinginstructies, naast de vereisten van alle toepasselijke regels, wetten en normen.

Activiteiten zoals het installeren, afstellen, in gebruik stellen, gebruiken, monteren, demonteren en het uitvoeren van onderhoud mogen uitsluitend worden uitgevoerd door hiervoor opgeleid personeel en in overeenstemming met de geldende praktijkregels.

Indien de apparatuur wordt gebruikt op een wijze die niet is gespecificeerd door de fabrikant, dan bestaat het gevaar dat de beveiliging van de apparatuur niet goed werkt.

Additional Resources

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




PowerFlex 70 Packages		PowerFlex 700 Packages	
English	The installation instructions are available in multiple languages at http://rockwellautomation.com/literature . Select publication language and type "20A-IN009" in the search field.	English	The installation instructions are available in multiple languages at http://rockwellautomation.com/literature . Select publication language and type "20B-IN019" in the search field.
Deutsch	Die Installationsanweisungen kann in mehreren Sprachen unter http://rockwellautomation.com/literature gelesen werden. Bitte Ihre Sprache anwählen und "20A-IN009" im Suchfeld eintippen.	Deutsch	Die Installationsanweisungen kann in mehreren Sprachen unter http://rockwellautomation.com/literature gelesen werden. Bitte Ihre Sprache anwählen und "20B-IN019" im Suchfeld eintippen.
Français	Les instructions d'installation sont disponibles dans différentes langues à l'adresse suivante: http://rockwellautomation.com/literature . Sélectionner la langue puis taper << 20A-IN009 >> dans le champ de recherche.	Français	Les instructions d'installation sont disponibles dans différentes langues à l'adresse suivante: http://rockwellautomation.com/literature . Sélectionner la langue puis taper << 20B-IN019 >> dans le champ de recherche.
Italiano	Le istruzioni per l'installazione disponibile in varie lingue sul sito http://rockwellautomation.com/literature . Selezionare la lingua desiderata e digitare "20A-IN009" nel campo di ricerca.	Italiano	Le istruzioni per l'installazione disponibile in varie lingue sul sito http://rockwellautomation.com/literature . Selezionare la lingua desiderata e digitare "20B-IN019" nel campo di ricerca.
Español	Puede encontrar las instrucciones de instalación en varios idiomas en http://rockwellautomation.com/literature . Seleccione el idioma de publicación y escriba "20A-IN009" en el campo de búsqueda.	Español	Puede encontrar las instrucciones de instalación en varios idiomas en http://rockwellautomation.com/literature . Seleccione el idioma de publicación y escriba "20B-IN019" en el campo de búsqueda.
Português	Pode encontrar esta folha de instruções em várias línguas em http://rockwellautomation.com/literature . Selecione a língua desejada e entre com "20A-IN009" no espaço de busca.	Português	Pode encontrar esta folha de instruções em várias línguas em http://rockwellautomation.com/literature . Selecione a língua desejada e entre com "20B-IN019" no espaço de busca.
Dutch	De installatie-instructies is beschikbaar in diverse talen op: http://rockwellautomation.com/literature . Kies taal van publicatie en tik "20A-IN009" in het zoekveld.	-	-
中文 (简体)	从以下网页可以获得安装说明多种语言的版本： http://rockwellautomation.com/literature 。 请选择出版物的语言，并在搜索栏输入 "20A-IN009" 印	中文 (简体)	从以下网页可以获得安装说明多种语言的版本： http://rockwellautomation.com/literature 。 请选择出版物的语言，并在搜索栏输入 "20B-IN019" 印
English	PowerFlex 70 and 700 Packages for Fan and Pump Applications Installation Instructions, publication 21VW-IN001 : provides basic installation and operation instructions for fan and pump applications.	English	PowerFlex 70 and 700 Packages for Fan and Pump Applications Installation Instructions, publication 21VW-IN001 : provides basic installation and operation instructions for fan and pump applications.
English	PowerFlex 70 AC Drives User Manual, publication 20A-UM001 : Provides information needed to install, start, and troubleshoot the PowerFlex 70 adjustable frequency AC drive.	English	PowerFlex 700 Vector Control User Manual (v4.001 & up), publication 20B-UM002 : Provides information needed to install, start, and troubleshoot the PowerFlex 700 adjustable frequency AC drive.
English	PowerFlex 70 Technical Data, publication 20A-TD001 : Provides technical data regarding the PowerFlex 70 adjustable frequency AC drives for a variety of industrial applications.	English	PowerFlex 700 Adjustable Frequency AC Drive Technical Data, publication 20B-TD001 : Provides technical data regarding the PowerFlex 700 adjustable frequency AC drives for a variety of industrial applications.

You can view or download publications at <http://www.rockwellautomation.com/literature/>. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Additional Resources (continued)

Resource	Description
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.
Industry Installation Guidelines for Pulse Width Modulated (PWM) AC Drives Application Technique, publication DRIVES-AT003	Provides basic information for different enclosure systems, and power and grounding considerations needed to properly install a PWM AC drive.
Product certification website, http://www.rockwellautomation.com/products/certification/	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at <http://www.rockwellautomation.com/literature/>. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

-  **ATTENTION:** Only qualified personnel familiar with adjustable frequency AC drives and associated machinery should plan or implement the installation, start-up, and subsequent maintenance of the system. Failure to comply may result in personal injury and/or equipment damage.
-  **ATTENTION:** An incorrectly applied or installed drive can result in component damage or a reduction in product life. Wiring or application errors such as under sizing the motor, incorrect or inadequate AC supply, or excessive surrounding air temperatures may result in malfunction of the system.
-  **ATTENTION:** 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.

Maximum Surrounding Air Temperature

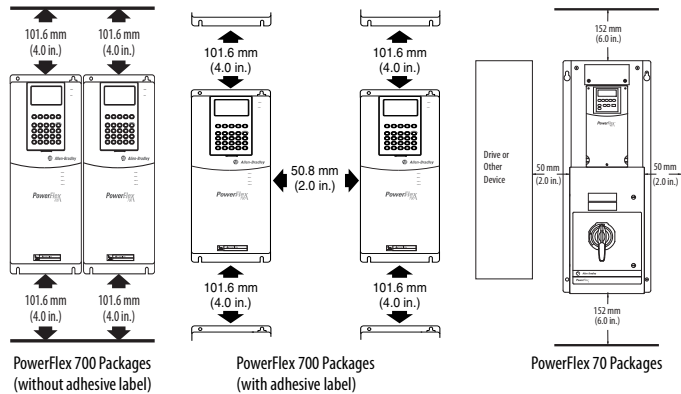
Drive	Enclosure Rating	Temperature Range	Frame Size
PowerFlex 70 packages	Open Type, IP 20, NEMA/UL Type 1	0...50 °C (32...122 °F)	B...E
PowerFlex 700 ⁽¹⁾ packages	IP20, NEMA/UL Type 1 (with top label) ⁽²⁾	0...40 °C (32...104 °F)	4 (all ratings)
		0...50 °C (32...122 °F)	5, 6 (most ratings) ⁽³⁾

- (1) PowerFlex 700 (frames 4...6) are designed to operate at 0...40 °C (32...104 °F) ambient. To operate the drive in installations between 41...50 °C (106...122 °F), see the information below and see pages 4 and 5 for exceptions.
- (2) Removing the adhesive top label from the drive changes the NEMA/UL enclosure rating from Type 1 to Open. Frames 5 and 6 do not have a top label.
- (3) Refer to pages 4 and 5 for exceptions.

Minimum Mounting Clearance

Specified vertical clearance requirements are intended to be from the drive to the closest object that can restrict airflow through the drive heat sink and chassis. The drive must be mounted in a vertical orientation as shown, and must make full contact with the mounting surface. Do not use standoffs or spacers. In addition, inlet air temperature must not exceed the product specification.

IMPORTANT Some drives are equipped with an adhesive label on the top of the chassis. Removing the adhesive label from the drive changes the NEMA/UL enclosure rating from Type 1 Enclosed to Open Type.



Approximate Drive Weights

Drive	Frame	Weight ⁽¹⁾ , kg (lb)
PowerFlex 70 packages	B	3.60 (7.9)
	C	6.89 (15.2)
	D	9.25 (20.4)
	E	18.60 (41.0)

Drive	Frame	Weight ⁽¹⁾ , kg (lb)
PowerFlex 700 packages	4	24.49 (54.0)
	5	37.19 (82.0)
	6	71.44 (157.5)

(1) Weights include HIM and Standard I/O.

Leakage Current

- PowerFlex 70 and 700 packages for fan and pump applications produce leakage current in the protective earthing conductor which exceeds 3.5 mA AC and/or 10 mA DC. The minimum size of the protective earthing (grounding) conductor used in the application must comply with local safety regulations for high protective earthing conductor current equipment.
- PowerFlex 70 and 700 packages for fan and pump applications produce DC current in the protective earthing conductor and may reduce the ability of a residual current device (RCD) or residual current monitor (RCM) of type A or AC to provide protection for the drive and other equipment in the installation.

Motor Overload Protection - PowerFlex 70 Drives

Electronic motor overload protection: 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 E59272.

Motor Overload Protection - PowerFlex 700 Drives with Standard Control

PowerFlex 700 drives with standard control, identified by an N, A, or B in position 15 of the catalog number, only provide Class 10 motor overload protection according to NEC article 430. They do not provide speed sensitive overload protection, thermal memory retention and motor over-temperature sensing according to NEC article 430.126 (A) (2). If such protection is needed in the end-use product, it must be provided by additional means.

Motor Overload Protection - PowerFlex 700 Drives with Vector Control

PowerFlex 700 drives with vector control, identified by a C or D in position 15 of the catalog number, provide 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 E59272.

Short Circuit Current Rating

Maximum short circuit rating: 100,000 amps symmetrical.

Branch Circuit Short Circuit Protection

Integral solid state short circuit protection does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electric Code (NEC) and any additional local codes, or the equivalent. The tables on the following pages provide drive ratings (including continuous, 1 minute, and 3 second) and recommended AC line input fuse and circuit breaker information. Both types of short circuit protection are acceptable for UL and IEC requirements. Sizes listed are the recommended sizes based on 40 °C (104 °F) and the U.S. N.E.C. Other country, state, or local codes may require different ratings.

Fuse and Circuit Breaker Ratings

The tables on the following pages provide recommended AC line input fuse and circuit breaker information. See Fusing and Circuit Breakers below for UL and IEC requirements. Sizes listed are the recommended sizes based on 40 °C (104 °F) and the U.S. NEC. Other country, state, or local codes can require different ratings.

Fusing

The recommend fuse types are listed below. If available current ratings do not match those listed in the tables provided, choose the next higher fuse rating.

- UL – UL Class J should be used.

Circuit Breakers

The “non-fuse” listings in the following tables include inverse time circuit breakers and instantaneous trip circuit breakers (motor circuit protectors). If one of these is chosen as the desired protection method, the following requirements apply:

- UL - Only inverse time circuit breakers are acceptable for UL installations.

PowerFlex 70 Packages Input Drive Ratings and Input Protection

See the tables below for three-phase input drive ratings and input protection devices for the PowerFlex 70 packages for fan and pump applications.

208V AC Three-phase Input Drive Ratings and Input Protection Devices (see page 4 for notes)

Drive Catalog Number	Frame	HP Rating		Input Ratings		Output Amps			Dual Element Time Delay Fuse		Non-Time Delay Fuse		Circuit Breaker ⁽³⁾	Motor Circuit Protector ⁽⁵⁾
		ND	HD	Amps	kVA	Cont.	1 Min.	3 Sec.	Min. ⁽¹⁾	Max. ⁽²⁾	Min. ⁽¹⁾	Max. ⁽²⁾	Max. ⁽⁴⁾	Max. ⁽⁴⁾
20AB4P2	B	1	0.75	5.6	2	4.8	5.5	7.4	10	10	10	17.5	15	7
20AB6P8	B	2	1.5	10	3.6	7.8	10.3	13.8	15	15	15	30	30	15
20AB9P6	B	3	2	14	5.1	11	12.1	16.5	20	25	20	40	40	30
20AB015	C	5	3	16	5.8	17.5	19.2	26.6	20	35	20	70	70	30
20AB022	D	7.5	5	23.3	8.3	25.3	27.8	37.9	30	50	30	100	100	30
20AB028	D	10	7.5	29.8	10.7	32.2	37.9	50.6	40	70	40	125	125	50
20AB042	D	15	10	39.8	14.3	43	55.5	74	60	100	60	175	175	70

480V AC Three-phase Input Drive Ratings and Input Protection Devices (see page 4 for notes)

Drive Catalog Number	Frame	HP Rating		Input Ratings		Output Amps			Dual Element Time Delay Fuse		Non-Time Delay Fuse		Circuit Breaker ⁽³⁾	Motor Circuit Protector ⁽⁵⁾
		ND	HD	Amps	kVA	Cont.	1 Min.	3 Sec.	Min. ⁽¹⁾	Max. ⁽²⁾	Min. ⁽¹⁾	Max. ⁽²⁾	Max. ⁽⁴⁾	Max. ⁽⁴⁾
20AD2P1	B	1	0.75	2.4	2	2.1	2.4	3.2	3	6	3	8	15	3
20AD3P4	B	2	1.5	3.8	3.2	3.4	4.5	6	6	6	6	12	15	7
20AD5P0	B	3	2	5.6	4.7	5	5.5	7.5	10	10	10	20	20	15
20AD8P0	B	5	3	9.8	8.4	8	8.8	12	15	15	15	30	30	15
20AD011	C	7.5	5	9.4	7.9	11	12.1	16.5	15	20	15	40	40	15
20AD014	C	10	7.5	12.4	10.4	14	16.5	22	20	30	20	50	50	20
20AD022	D	15	10	19.9	16.6	22	24.2	33	25	45	25	80	80	30
20AD027	D	20	15	24.8	20.6	27	33	44	35	60	35	100	100	50
20AD034	D	25	20	31.2	25.9	34	40.5	54	40	70	40	125	125	50
20AD040	D	30	25	36.7	30.5	40	51	68	50	90	50	150	150	50
20AD052	E	40	30	47.7	39.7	52	60	80	60	110	60	200	200	70
20AD065	E	50	40	59.6	49.6	65	78	104	80	125	80	250	250	100

600V AC Three-phase Input Drive Ratings and Input Protection Devices (see page 4 for notes)

Drive Catalog Number	Frame	HP Rating		Input Ratings		Output Amps			Dual Element Time Delay Fuse		Non-Time Delay Fuse		Circuit Breaker ⁽³⁾	Motor Circuit Protector ⁽⁵⁾
		ND	HD	Amps	kVA	Cont.	1 Min.	3 Sec.	Min. ⁽¹⁾	Max. ⁽²⁾	Min. ⁽¹⁾	Max. ⁽²⁾	Max. ⁽⁴⁾	Max. ⁽⁴⁾
20AE3P9	B	3	2	4.4	4.5	3.9	4.3	5.9	6	8	6	15	15	7
20AE6P1	B	5	3	7.5	7.8	6.1	6.7	9.2	10	12	10	20	20	15
20AE9P0	C	7.5	5	7.7	8	9	9.9	13.5	10	20	10	35	35	15
20AE011	C	10	7.5	9.8	10.1	11	13.5	18	15	20	15	40	40	15
20AE017	D	15	10	15.3	15.9	17	18.7	25.5	20	35	20	60	60	30
20AE022	D	20	15	20	20.8	22	25.5	34	25	45	25	80	80	30
20AE027	D	25	20	24.8	25.7	27	33	44	35	60	35	100	100	50
20AE032	D	30	25	29.4	30.5	32	40.5	54	40	70	40	125	125	50
20AE041	E	40	30	37.6	39.1	41	48	64	50	90	50	150	150	100
20AE052	E	50	40	47.7	49.6	52	61.5	82	60	110	60	200	200	100

(1) Minimum protection device size is the lowest rated device that supplies maximum protection without nuisance tripping.
 (2) Maximum protection device size is the highest rated device that supplies drive protection. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum.
 (3) Circuit Breaker - inverse time breaker. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum.
 (4) Maximum allowable rating by US NEC. Exact size must be chosen for each installation.
 (5) Motor Circuit Protector - instantaneous trip circuit breaker. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum.

PowerFlex 700 Packages Input Drive Ratings and Input Protection Devices

See the tables below for input drive ratings and input protection devices for the PowerFlex 700 packages for fan and pump applications.

480V AC Input Drive Ratings and Input Protection Devices (see page 5 for notes)

Drive Catalog Number	Frame	Hp Rating		PWM Freq.	Temp.	Input Ratings		Output Amps			Dual Element Time Delay Fuse		Non-Time Delay Fuse		Circuit Breaker ⁽⁴⁾	Motor Circuit Protector ⁽⁶⁾
		ND	HD	kHz	°C	Amps	kVA	Cont.	1 Min.	3 Sec.	Min. ⁽²⁾	Max. ⁽³⁾	Min. ⁽²⁾	Max. ⁽³⁾	Max. ⁽⁵⁾	Max. ⁽⁵⁾
20BD077 ⁽¹⁾	4	60	—	4	50	72.3	60.1	77	85	116	100	170	100	300	300	100
		—	50	4	50	59.6	49.6	65	98	130	80	125	80	250	250	100
20BD096 ⁽¹⁾	5	75	—	4	50	90.1	74.9	96	106	144	125	200	125	350	350	125
		—	60	4	50	72.3	60.1	77	116	154	100	170	100	300	300	100
20BD125 ⁽¹⁾	5	100	—	4	50	117	97.6	125	138	163	150	250	150	500	375	150
		—	75	4	50	90.1	74.9	96	144	168	125	200	125	350	350	125
20BD156 ⁽¹⁾	6	125	—	4	50	147	122	156	172	234	200	350	200	600	450	250
		—	100	4	50	131	109	125	188	250	175	250	175	500	375	250
20BD180 ⁽¹⁾	6	150	—	4	50	169	141	180	198	270	225	400	225	600	500	250
		—	125	4	50	147	122	156	234	312	200	350	200	600	450	250
20BD248 ⁽¹⁾	6	200	—	2	45	233	194	248	273	372	300	550	300	700	700	400
		—	150	2	50	169	141	180	270	360	225	400	225	600	500	250

600V AC Input Drive Ratings and Input Protection Devices (see page 5 for notes)

Drive Catalog Number	Frame	Hp Rating		PWM Freq.	Temp.	Input Ratings		Output Amps			Dual Element Time Delay Fuse		Non-Time Delay Fuse		Circuit Breaker ⁽⁴⁾	Motor Circuit Protector ⁽⁶⁾
		ND	HD	kHz	°C	Amps	kVA	Cont.	1 Min.	3 Sec.	Min. ⁽²⁾	Max. ⁽³⁾	Min. ⁽²⁾	Max. ⁽³⁾	Max. ⁽⁵⁾	Max. ⁽⁵⁾
20BE062	4	60	50	2	50	58.2	60.5	62	78	104	80	125	80	225	225	100
20BE077 ⁽¹⁾	5	75	—	2	50	72.3	75.1	77	85	116	90	150	90	300	300	100
		—	60	2	50	58.2	60.5	63	94	126	90	125	90	250	250	100
20BE099 ⁽¹⁾	5	100	—	2	40	92.9	96.6	99	109	126	125	200	125	375	375	150
		—	75	2	40	72.3	75.1	77	116	138	100	175	100	300	300	100
20BE125 ⁽¹⁾	6	125	—	2	50	117	122	125	138	188	150	250	150	375	375	250
		—	100	2	50	93	96.6	99	149	198	125	200	125	375	375	150
20BE144 ⁽¹⁾	6	150	—	2	50	135	141	144	158	216	175	300	175	400	400	250
		—	125	2	50	117	122	125	188	250	150	275	150	375	375	250

(1) Drives have dual current ratings; one for normal duty applications, and one for heavy duty applications. The drive may be operated at either rating.

(2) Minimum protection device size is the lowest rated device that supplies maximum protection without nuisance tripping.

(3) Maximum protection device size is the highest rated device that supplies drive protection. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum.

(4) Circuit Breaker - inverse time breaker. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum.

(5) Maximum allowable rating by US NEC. Exact size must be chosen for each installation.

(6) Motor Circuit Protector - instantaneous trip circuit breaker. For US NEC minimum size is 125% of motor FLA. Ratings shown are maximum.

Wire Recommendations

These wire recommendations are for the PowerFlex 70 and PowerFlex 700 packages for fan and pump applications.

Type	Wire Types	Description
Power (1) (2)	Standard 600V, 90 °C (194 °F) XHHW2/RHW-2 Anixter B209500-B209507, Belden 29501-29507, or equivalent	Four tinned copper conductors with XLPE insulation. Copper braid/aluminum foil combination shield and tinned copper drain wire. PVC jacket.

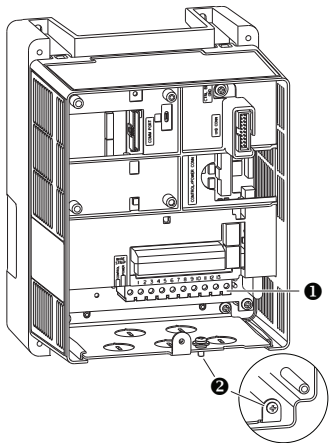
(1) Control and signal wires should be separated from power wires by at least 0.3 m (1 ft).

(2) The use of shielded wire for AC input power may not be necessary but is always recommended.

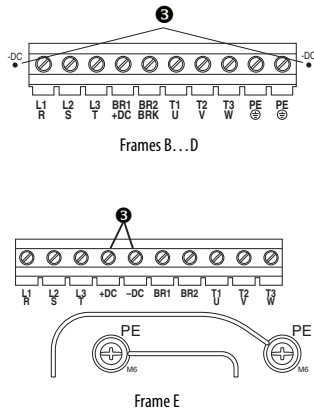
PowerFlex 70 Terminal Block Locations and Specifications

This section provides information on the terminal block locations and specifications for the PowerFlex 70 package for fan and pump applications.

Typical Terminal Block Location



Power Terminal Blocks



No.	Name	Description	Frame	Wire Size Range ⁽¹⁾		Torque	
				Max mm ² (AWG)	Min mm ² (AWG)	Max N-m (lb-in)	Recommended N-m (lb-in)
❶	Power terminal block	Input power, motor connections, and PE	B, C	3.5 (12)	0.3 (22)	0.66 (5.5)	0.6 (5)
			D	8.4 (8)	0.8 (18)	1.7 (15)	1.4 (12)
			E	25.0 (3)	2.5 (14)	2.71 (24)	2.71 (24)
❷	SHLD terminal	Terminating point for wiring shields	All	—	—	1.6 (14)	1.6 (14)

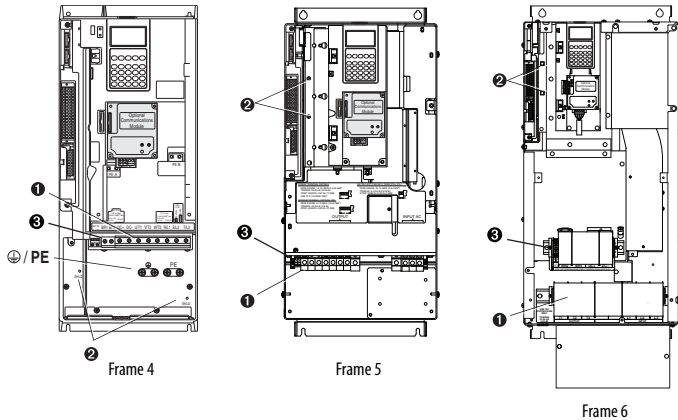
(1) Maximum/minimum sizes that the terminal block will accept – these are not recommendations.

Terminal	Description	Notes
BR1	DC brake (+)	DB resistor connection
BR2	DC brake (-)	Important: Do not connect an internal and external DB resistor at the same time. This can violate the minimum allowed DB resistance and cause drive damage.
+DC	DC bus (+)	❸ Test point on Frames B...D located to the left or right of the power terminal block. Frame E has dedicated terminals.
-DC	DC bus (-)	
PE	PE ground	—
U, V, W	U (T1), V (T2), W (T3)	To the motor.
R, S, T	R (L1), S (L2), T (L3)	AC line input power.

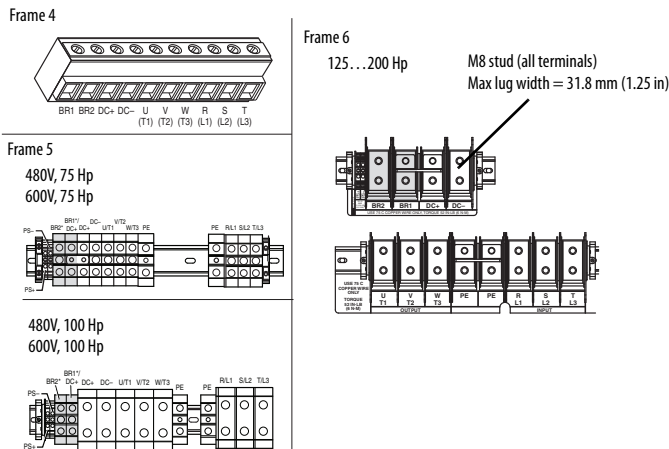
PowerFlex 700 Terminal Block Locations and Specifications

This section provides information on the terminal block locations and specifications for the PowerFlex 700 package for fan and pump applications.

Typical Terminal Block Location



Power Terminal Blocks



Note: Shaded BR1 and BR2 terminals are only present on drives ordered with the brake option.

No.	Name	Frame	Description	Wire Size Range ⁽¹⁾		Torque		
				Max mm ² (AWG)	Min mm ² (AWG)	Max N-m (lb-in)	Recommended N-m (lb-in)	
❶	Power terminal block	4	Input power and motor connections	35.0 (1)	10.0 (8)	4.0 (35)	4.0 (35)	
		5	Input power, BR1, BR2, DC+, DC-, PE, and motor connections	50.0 (1/0)	4.0 (12)	Refer to the terminal block label inside the drive.		
		5	100 Hp	Input power, DC+, DC-, and motor	70.0 (2/0)	10.0 (8)		
				BR1, BR2, and PE terminals	50.0 (1/0)	4.0 (12)		
6	Input power, DC+, DC-, BR1, BR2, PE, motor connections	150.0 mm ² (300 MCM) ⁽²⁾	2.5 (14)	6.0 (52)	6.0 (52)			
❷	SHLD terminal	4...6	Terminating point for wiring shields	—	—	1.6 (14)	1.6 (14)	
❸	AUX terminal block	5, 6	Auxiliary Control Voltage PS+, PS- ⁽³⁾	4.0 (12)	0.5 (22)	0.6 (5.3)	0.6 (5.3)	

(1) Maximum/minimum wire sizes that the terminal block will accept – these are not recommendations.
 (2) Two wires connected in parallel to any of these terminals using two lugs may be required.
 (3) External control power: UL Installation, frame 5 – 80 W, 90 mA. Refer to the PowerFlex 700 Vector Control User Manual (v4.001 & up), publication 208-UM002 for further information.

Terminal	Description	Notes
BR1	DC brake (+)	DB resistor connection – connecting an internal and external resistor can cause damage to the drive.
BR2	DC brake (-)	Twisted pair wiring must be used from these terminals to the resistor. Wiring must be routed separately from other cabling.
DC+	DC bus (+)	DC input/brake connections (chopper and resistor)
DC-	DC bus (-)	
PE	PE ground	See PowerFlex 700 Terminal Block Locations and Specifications on page 6 for location on frame 4 drives.
PS+	AUX (+)	Auxiliary control voltage
PS-	AUX (-)	
	Motor ground	See PowerFlex 700 Terminal Block Locations and Specifications on page 6 for location on frame 4 drives.
U	U (T1)	To motor/load.
V	V (T2)	
W	W (T3)	
R	R (L1)	AC line input power:
S	S (L2)	• Three-phase = R, S, and T.
T	T (L3)	• Single-phase = R and S only (refer to user manual for details).

Notes:

Rockwell Automation Support

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 the installation instructions. 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.

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