Product Information

Ultra3000 Digital Servo Drives

Allen-Bradley

Catalog Numbers 2098-DSD-005, 2098-DSD-010, 2098-DSD-020, 2098-DSD-005X, 2098-DSD-010X, 2098-DSD-020X, 2098-DSD-005-SE, 2098-DSD-010-SE, 2098-DSD-020-SE, 2098-DSD-005-DN, 2098-DSD-010-DN, 2098-DSD-020-DN, 2098-DSD-005X-DN, 2098-DSD-010X-DN, 2098-DSD-020X-DN, 2098-DSD-030, 2098-DSD-075, 2098-DSD-150, 2098-DSD-030X, 2098-DSD-075X, 2098-DSD-150X, 2098-DSD-030-SE, 2098-DSD-075-SE, 2098-DSD-150-SE, 2098-DSD-030-DN, 2098-DSD-075-DN, 2098-DSD-150-DN, 2098-DSD-030X-DN, 2098-DSD-075X-DN, 2098-DSD-150X-DN, 2098-DSD-HV030, 2098-DSD-HV050, 2098-DSD-HV100, 2098-DSD-HV150, 2098-DSD-HV220, 2098-DSD-HV030X, 2098-DSD-HV050X, 2098-DSD-HV100X, 2098-DSD-HV150X, 2098-DSD-HV220X, 2098-DSD-HV030-SE, 2098-DSD-HV050-SE, 2098-DSD-HV100-SE, 2098-DSD-HV150-SE, 2098-DSD-HV220-SE, 2098-DSD-HV030-DN, 2098-DSD-HV050-DN, 2098-DSD-HV100-DN, 2098-DSD-HV150-DN, 2098-DSD-HV220-DN, 2098-DSD-HV030X-DN, 2098-DSD-HV050X-DN, 2098-DSD-HV100X-DN, 2098-DSD-HV150X-DN, 2098-DSD-HV220X-DN

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.

El personal debidamente capacitado debe realizar las actividades relacionadas a la instalación, ajustes, puesta en servicio, uso, ensamblaje, desensamblaje y mantenimiento de conformidad con el código de práctica aplicable.

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 „Weitere Informationen“ aufgeführten Dokumente, die Informationen zu Installation, Konfiguration und Bedienung dieses Produkts enthalten, bevor Sie dieses Produkt installieren, konfigurieren, bedienen oder warten. Anwender müssen sich neben den Bestimmungen aller anwendbaren Vorschriften, Gesetze und Normen zusätzlich mit den Installations- und Verdrahtungsanweisungen vertraut machen. Arbeiten im Rahmen der Installation, Anpassung, Inbetriebnahme, Verwendung, Montage, Demontage oder Instandhaltung dürfen nur durch ausreichend geschulte Mitarbeiter und in Übereinstimmung mit den anwendbaren Ausführungsvorschriften vorgenommen werden. Wenn das Gerät in einer Weise verwendet wird, die vom Hersteller nicht vorgesehen ist, kann die Schutzfunktion 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.

DİKKAT: Bu ürünün kurulumu, yapılandırılması, işletilmesi veya bakımı öncesinde bu dokümanı ve bu ekipmanın kurulumu, yapılandırılması ve işletimi ile ilgili İlave 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 uygulama 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。

包括安装、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 vyhlášek, 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 bedradingsinstructies, 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 related products from Rockwell Automation.

Resource	Description
Ultra3000 Digital Servo Drives Installation Manual, publication 2098-IN003	Provides mounting, wiring, and connecting procedures for the Ultra™ 3000 and standard Allen-Bradley® motors that are recommended for use with the Ultra3000 drives.
Ultra3000 Digital Servo Drives Integration Manual, publication 2098-IN005	Provides information on configuring and troubleshooting the Ultra3000 drives.
Kinetix Servo Drives Specifications Technical Data, publication GMC-TD003	Provides product specifications for Kinetix Integrated Motion over EtherNet/IP, Integrated Motion over sercos interface, EtherNet/IP networking, and component servo-drive families.
Kinetix Motion Control Selection Guide, publication GMC-SG001	Provides information to help make initial decisions for the motion control products that are best suited for your system requirements.
System Design for Control of Electrical Noise Reference Manual, publication GMC-RM001	Outlines the practices that minimize the possibility of noise-related failures and that comply with noise regulations.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications 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: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequences.

SHOCK HAZARD: Labels may be on or inside the equipment (for example, drive or motor) to alert people that dangerous voltage may be present.

IMPORTANT Identifies information that is critical for successful application and understanding of the product.

ATTENTION: Only qualified personnel familiar with servo drives and associated machinery should plan or implement the installation, startup, and subsequent maintenance of the system. Failure to comply can 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 undersizing the motor, incorrect or inadequate AC supply, or excessive surrounding-air temperatures can 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 immediately, it must be stored in a corrosive atmosphere.

Input Power Circuit-protection Specifications

These fuses and Allen-Bradley circuit breakers are recommended for use with 2098-DSD-*xxx* and 2098-DSD-HV*xxx* servo drives.

Ultra3000 Servo Drives			UL Applications			IEC (non-UL) Applications
			Bussmann Fuses			
Drive Cat. No.	Drive Voltage, nom	Phase	Class J	Class CC	Motor Protection CB, Self-protected CMC Cat. No.	Motor Protection CB Cat. No.
2098-DSD-005	230V AC	Single phase	LPJ-6SP	FNQ-R-6	N/A	N/A
2098-DSD-010		Single phase	LPJ-10SP	FNQ-R-10		
2098-DSD-020		Single phase	LPJ-20SP	FNQ-R-20		
2098-DSD-030		Single phase	LPJ-30SP	FNQ-R-30		
2098-DSD-075		Three phase	LPJ-30SP	FNQ-R-30		
2098-DSD-150		Three phase	LPJ-60SP	N/A		
2098-DSD-*xxx*		Auxiliary input power	LPJ-10SP	FNQ-R-10		
2098-DSD-HV030	460V AC	Three phase	LPJ-5SP	KTK-R-5	140M-F8E-C16	140M-F8E-C16
2098-DSD-HV050		Three phase	LPJ-8SP	KTK-R-8	140M-F8E-C20	140M-F8E-C20
2098-DSD-HV100		Three phase	LPJ-17-1/2SP	KTK-R-20	140M-F8E-C32	140M-F8E-C32
2098-DSD-HV150		Three phase	LPJ-30SP	KTK-R-30	140M-F8E-C45	140M-F8E-C45
2098-DSD-HV220		Three phase	LPJ-35SP	N/A	N/A	N/A
2098-DSD-HV*xxx*		Auxiliary input power	LPJ-10SP	FNQ-R-10		

ATTENTION: Do not use circuit protection devices on the output of an AC drive as an isolating disconnect switch or motor overload device. These devices are designed to operate on sine-wave voltage and the drive PWM waveform does not allow it to operate properly. As a result, damage to the device occurs.

IMPORTANT Follow the wire size information as shown in Power Wiring Requirements on page 3 and select the fuse for the appropriate temperature rating of the wire. Auxiliary input fuses must not exceed 13A.

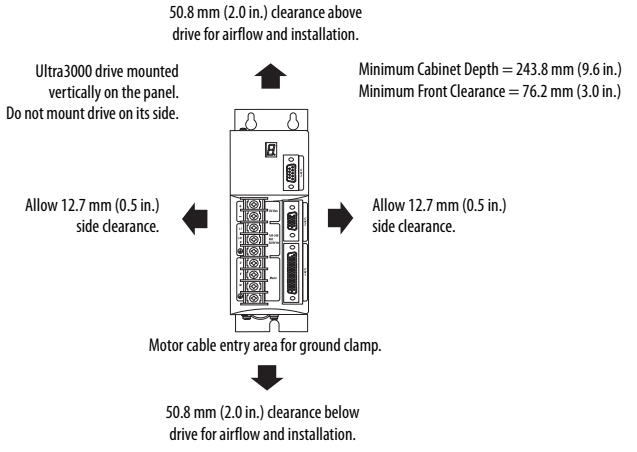
System Mounting Requirements

There are several things to consider when preparing to mount the Ultra3000 drives:

- The Ultra3000 drives must be enclosed in a grounded conductive enclosure offering protection as defined in standard EN 60529 (IEC 529) to IP22 in order to comply with UL and CE requirements. A NEMA 4X enclosure exceeds these requirements providing protection to IP66.
- The ambient temperature where you install the Ultra3000 drives must not exceed 55 °C (131 °F).
- Install the Ultra3000 drives vertically on the panel (see Minimum Clearance Requirements on page 3 for mounting orientation).
- Install the panel on a flat, rigid, vertical surface that is not subjected to shock, vibration, moisture, oil mist, dust, or corrosive vapors.
- Maintain minimum clearances (see Minimum Clearance Requirements on page 3 for proper airflow, easy module access, and proper cable bend radius).
- Ultra3000 drives can operate at elevations to 1000 m (3280 ft) without derating. However, the continuous current rating must be de-rated by 3% for each additional 300 m (984 ft) up to 3000 m (9842 ft). Consult your local Allen-Bradley representative prior to operating above 3000 m (9842 ft).

ATTENTION: Plan the installation of your system so that you can perform all cutting, drilling, tapping, and welding with the system removed from the enclosure. Because the system is of the open type construction, be careful to keep any metal debris from falling into it. Metal debris or other foreign matter can become lodged in the circuitry, which can result in damage to components.

Minimum Clearance Requirements



Weight Specifications

Drive Cat. No.	Weight, approx kg (lb)	
2098-DSD-005*x-xx*	1.8	(4.1)
2098-DSD-010*x-xx*	2.1	(4.6)
2098-DSD-020*x-xx*	2.1	(4.6)
2098-DSD-030*x-xx*	6.2	(13.6)
2098-DSD-075*x-xx*	9.3	(20.6)
2098-DSD-150*x-xx*	14.1	(31.0)

Drive Cat. No.	Weight, approx kg (lb)	
2098-DSD-HV030*x-xx*	8.55	(18.8)
2098-DSD-HV050*x-xx*	8.55	(18.8)
2098-DSD-HV100*x-xx*	10.44	(22.96)
2098-DSD-HV150*x-xx*	10.44	(22.96)
2098-DSD-HV220*x-xx*	14.1	(31.0)

Leakage Current

- Ultra3000 drives produce leakage current in the protective-earthing conductor that exceeds 3.5 mA AC and/or 10 mA DC. The minimum size of the protective-earthing (grounding) conductor that is used in the application must comply with local safety regulations for high protective-earthing conductor current equipment.
- Ultra3000 drives produce DC current in the protective-earthing conductor and can 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.

Short-circuit Current Rating

Drive Cat. No.	Input Power Type	Short-circuit Current Rating with No Fuse Restrictions	Short-circuit Current Rating with Fuse Restrictions
2098-DSD-*xxx-xx* or 2098-DSD-*xxxX-xx*	Input Power and Auxiliary Input Power	Suitable for use on a circuit capable of delivering not more than 5000 rms symmetrical amperes, 240V maximum.	Suitable for use on a circuit capable of delivering not more than 200,000 rms symmetrical amperes, 240V maximum, when protected by high interrupting capacity, current-limiting fuses meeting UL 198C (Class CC, G, J, L, R, T).
2098-DSD-HV*xxx-xx* or 2098-DSD-HV*xxxX-xx*		Suitable for use on a circuit capable of delivering not more than 5000 rms symmetrical amperes, 480V maximum.	Suitable for use on a circuit capable of delivering not more than 200,000 rms symmetrical amperes, 480V maximum, when protected by high interrupting capacity, current-limiting fuses meeting UL 198C (Class CC, G, J, L, R, T).

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.

Motor Overload Protection

This servo drive uses solid-state motor overload protection that operates in accordance with UL requirements. Motor overload protection is provided by algorithms (thermal memory) that predict actual motor temperature that is based on operating conditions as long as control power is continuously applied. However, when control power is removed, thermal memory is not retained. In addition to thermal memory protection, this drive provides an input for an external temperature sensor/thermistor device, which is embedded in the motor, to support the UL requirement for motor overload protection. Some motors that are supported by this drive do not contain temperature sensors/thermistors; therefore, motor overload protection against excessive consecutive motor-overloads with power cycling is not supported. This servo drive meets the following UL requirements for solid-state overload protection.

Motor Overload Protection Trip Point	Value
Ultimately	100% overload
Within 8 minutes	200% overload
Within 20 seconds	600% overload

ATTENTION: To avoid damage to your motor due to overheating caused by excessive, successive motor overload trips, follow the wiring diagram that is provided in the user manual for your motor and drive combination.

Refer to your servo-drive user manual for the interconnect diagram that illustrates the wiring between your motor and drive.

Power Wiring Requirements

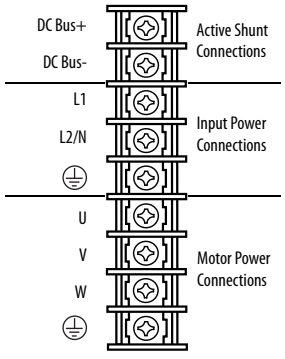
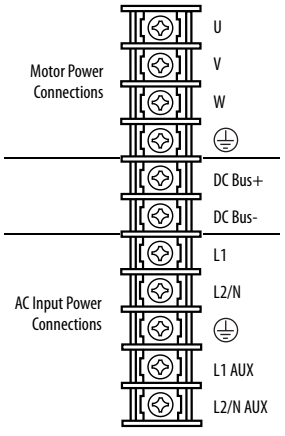
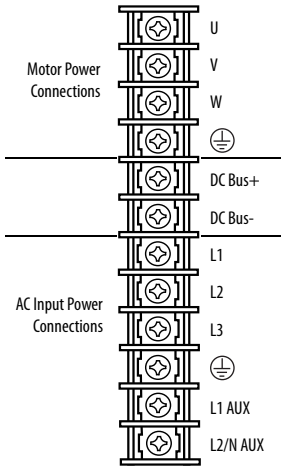
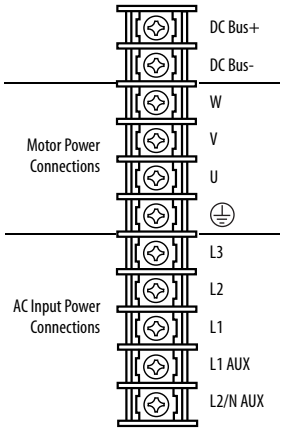
Wire should be copper with 75 °C (167 °F) minimum rating, unless otherwise noted. Phasing of main AC power is arbitrary and earth ground connection is required for safe and proper operation.

IMPORTANT The National Electrical Code and local electrical codes take precedence over the values and methods provided.

Drive Cat. No.	Description	Connects to Terminals TB1	Recommended Wire Size mm² (AWG)	Terminal Block Torque Values N•m (lb•in)
2098-DSD-005*x-xx*	Input Power(1) 100...240V AC Single-phase	L1, L2/N, and ⏚	1.5 (16)	1.25 (11)
2098-DSD-010*x-xx*			2.5 (14)	
2098-DSD-020*x-xx*			3 (12)	
2098-DSD-030*x-xx*	Input Power(1) 100...240V AC Single-phase	L1, L2/N, ⏚ L1 AUX, and L2/N AUX	6 (10)	
2098-DSD-075*x-xx*	Input Power(1) 100...240V AC Three-phase	L1, L2, L3, ⏚ L1 AUX, and L2/N AUX	10 (8)	4.0 (35)
2098-DSD-150*x-xx*				
2098-DSD-HV030*x-xx*	Input Power(1) 230...480V AC Three-phase	⏚ L3, L2, L1 L1 AUX, and L2/N AUX	2.5 (14)	1.25 (11)
2098-DSD-HV050*x-xx*				
2098-DSD-HV100*x-xx*			4 (12)	
2098-DSD-HV150*x-xx*			6 (10)	
2098-DSD-HV220*x-xx*			10 (8)	
All Ultra3000 drives (200V- and 400V-class)	Motor Power	U, V, W, and ⏚	Motor power cable depends on motor/drive combination.	

(1) The input power can be optionally isolated through a transformer.

TB1 Terminal Positions

Drive Cat. No. 2098-DSD-005*x-xx*, 2098-DSD-010*x-xx*, and 2098-DSD-020*x-xx*	Drive Cat. No. 2098-DSD-030*x-xx*	Drive Cat. No. 2098-DSD-075*x-xx* and 2098-DSD-150*x-xx*	Drive Cat. No. 2098-DSD-HV*xxx-xx* and2098-DSD-HV*xxx*X-*xx*
			

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