

GENESYS™ Series

Programmable DC Power Supplies

G1.7kW in 1U 0-600V / 0-170A

G5kW in 1U 0-600V / 0-500A

GSP10kW in 2U 0-600V / 0-1000A

GSP15kW in 3U 0-600V / 0-1500A

Built in *LXI* compliant LAN, USB, RS-232 & RS-485 Interface

Optional Interface: IEEE488.2 (GPIB)

SAFETY & INSTALLATION MANUAL

Manual Supplements

The full user manual is available on TDK-Lambda website or can be ordered, refer to User manual IA761-04-02_.

This Manual Covers Models:

1.7kW:

G10-170	G80-21	GB10-170	GB80-21
G20-85	G100-17	GB20-85	GB100-17
G30-56	G150-11.2	GB30-56	GB150-11.2
G40-42	G300-5.6	GB40-42	GB300-5.6
G60-28	G600-2.8	GB60-28	GB600-2.8

5kW:

G10-500	G80-65	GB10-500	GB80-65
G20-250	G100-50	GB20-250	GB100-50
G30-170	G150-34	GB30-170	GB150-34
G40-125	G300-17	GB40-125	GB300-17
G60-85	G600-8.5	GB60-85	GB600-8.5

10kW:

GSP10-1000	GSP80-130	GBSP10-1000	GBSP80-130
GSP20-500	GSP100-100	GBSP20-500	GBSP100-100
GSP30-340	GSP150-68	GBSP30-340	GBSP150-68
GSP40-250	GSP300-34	GBSP40-250	GBSP300-34
GSP60-170	GSP600-17	GBSP60-170	GBSP600-17

15kW:

GSP10-1500	GSP80-195	GBSP10-1500	GBSP80-195
GSP20-750	GSP100-150	GBSP20-750	GBSP100-150
GSP30-510	GSP150-102	GBSP30-510	GBSP150-102
GSP40-375	GSP300-51	GBSP40-375	GBSP300-51
GSP60-255	GSP600-25.5	GBSP60-255	GBSP600-25.5

TABLE OF CONTENTS

WARRANTY	1
ENVIRONMENTAL COMPLIANCE	1
SAFETY & EMC APPROVALS	3
GENERAL SAFETY INSTRUCTIONS.....	4
ALLGEMEINE SICHERHEITSVORSCHRIFTEN.....	6
INSTRUCCIONES DE SEGURIDAD GENERALES.....	8
CONSIGNES GÉNÉRALES DE SÉCURITÉ.....	10
ISTRUZIONI GENERALI DI SICUREZZA	12
INSTRUÇÕES GERAIS DE SEGURANÇA	14
PRODUCT SAFETY INSTRUCTIONS.....	16
CHAPTER 1: GENERAL INFORMATION	22
1.1 User Manual Content	22
1.2 Introduction	22
1.2.1 General Description.....	22
1.2.2 Multiple Output Power System.....	22
1.2.3 Control via LAN, USB or RS232/485 Communication Ports	22
1.2.4 Analog Voltage Programming and Monitoring	23
1.2.5 Parallel Operation	23
1.2.6 Output Connections	23
1.2.7 Cooling and Mechanical Construction	23
1.3 Accessories	23
1.3.1 Accessories Provided With the Power Supply.....	23
1.3.1.1 Input connector protection (includes 3 parts)	23
1.3.1.2 AC input plug	23
1.3.1.3 Output connector / Bus bars protection.....	23
1.3.1.4 Serial link cable.....	24
1.3.1.5 Misc. hardware.....	24
1.3.1.6 Bus bars screws kits.....	24
1.3.2 Optional Accessories.....	25
1.3.2.1 Printed User Manual	25
1.3.2.2 Serial Port Cables.....	25
1.3.2.3 Paralleling Cable	25
1.3.2.4 Dust Filter	25
1.3.2.5 AC Cables	26
CHAPTER 2: FRONT/REAR PANEL CONTROLS AND CONNECTORS	27
2.1 Introduction	27
2.2 Front Panel Display and Controls	27
2.3 Blank Front Panel.....	30
2.4 Rear Panel Connectors	31
CHAPTER 3: OUTLINE	33
3.1 1.7kW / 2.7kW / 3.4kW / 5kW Power Supplies Outline	33
3.2 10kW Power Supply Outline	35
3.3 15kW Power Supply Outline	38
CHAPTER 4: INSTALLATION	41

4.1	General	41
4.2	Preparation for Use	42
4.3	Initial Inspection	42
4.4	Rack Mounting	42
4.4.1	Install the Power Supply in a Rack	42
4.4.2	Rack Mount Slides (Optional)	43
4.5	Location, Mounting and Cooling	44
4.6	AC Input Power Connection	45
4.6.1	AC Input Connector	47
4.6.2	AC Input Wire Connection for 1.7kW ÷ 5kW	48
4.6.3	AC Input Wire Connection for 10kW ÷ 15kW	50
4.7	Turn-On Checkout Procedure	52
4.7.1	General	52
4.7.2	Prior to Operation	53
4.7.3	Constant Voltage Check (Standard Power Supply)	53
4.7.4	Constant Voltage Check (Blank Panel Power Supply)	53
4.7.5	Constant Current Check (Standard Power Supply)	54
4.7.6	Constant Current Check (Blank Panel Power Supply)	54
4.8	Connecting the Load	55
4.8.1	Load Wiring	55
4.8.2	Current Carrying Capacity	55
4.8.3	Bus bar Cover Limitation	57
4.8.4	Wire Termination	57
4.8.5	Noise and Impedance Effects	58
4.8.6	Inductive Loads	58
4.8.7	Making the Load Connections	58
4.8.8	Grounding Outputs	71
4.9	Local and Remote Sensing	71
4.9.1	Sense Wiring	71
4.9.2	Local Sensing	72
4.9.3	Remote Sensing	72
4.9.4	J8 Sense Connector Technical Information	73
4.10	Repackaging for Shipment	73
CHAPTER 5: SPECIFICATIONS		74
5.1	1.7kW Series Specifications	74
5.2	5kW Series Specifications	77
5.3	10kW Series Specifications	80
5.4	15kW Series Specifications	83

WARRANTY

This TDK-Lambda product is warranted against defects in materials and workmanship for a period of five years from date of shipment. During the warranty period, TDK-Lambda will, at its option, either repair or replace products, which prove to be defective.

Limitation of Warranty

The warranty shall not apply to defects resulting from improper or inadequate usage or maintenance by the buyer, buyer supplied products or interfacing. The warranty shall not apply to defects resulting from unauthorized modifications or from operation exceeding the environmental specifications of the product or if the QA seal has been removed or altered by anyone other than TDK-Lambda authorized personnel. TDK-Lambda does not warrant the buyers' circuitry or malfunctions of TDK-Lambda products resulting from the buyers' circuitry. Furthermore, TDK-Lambda does not warrant any damage occurring as a result of the buyer's circuitry or the buyer's - supplied products. No other warranty is expressed or implied.

Warranty Service

This product must be returned to an authorized TDK-Lambda service facility for repairs or other warranty service. For products returned to TDK-Lambda for warranty service, the buyer shall prepay shipping charges to TDK-Lambda and TDK-Lambda shall pay the shipping charges to return the product to the buyer. Refer to section 4.10 for Repackaging for Shipment.

Disclaimer

The information contained in this document is subject to change without notice. TDK-Lambda shall not be liable for errors contained in this document or for incidental or consequential damages in connection with the furnishing, performance or use of this material. No part of this document may be photocopied, reproduced or translated into another language without the prior written consent of TDK-Lambda.

ENVIRONMENTAL COMPLIANCE

TDK-Lambda recognizes its duty and responsibilities towards promoting a sustainable environment. Our policy is to comply with applicable global legislation and to follow TDK Corporation Environmental Policy which goes beyond mandatory International laws.

For additional environmental information, refer to the TDK-Lambda environmental compliance web page at <https://uk.tdk-lambda.com/support/environmental-compliance.aspx>. This page contains the environmental regulations and directives with which TDK-Lambda complies, as well as other environmental information not included in this document.

Waste Electrical and Electronic Equipment (WEEE)



EU Customers: At the end of the product life cycle, all products must be sent to a WEEE recycling center.



中华人民共和国中国电子行业标准 SJ/T11364-2014(中国RoHS2)

People's Republic of China Electronic Industry Standard SJ/T 11364-2014 (China RoHS2)

产品 / Product:	Genesys+ 5kW series, Genesys+1.7kW series GSP/GBSP10kW series, GSP/GBSP15kW series
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零件名称 / Part Name	有毒有害物质或元素 / Hazardous Substances					
	铅 Pb	汞 Hg	镉 Cd	六价铬 Cr6+	多溴联苯 PBB	多溴二苯醚 PBDE
电路模块 / PCB Assembly	×	○	○	○	○	○
机箱(如适用)/ Enclosure (if applicable)	○	○	○	○	○	○
包装 / Packaging	○	○	○	○	○	○

此表依照SJ/T11634-2014规定制定

This table is prepared in accordance with the provisions of SJ/T 11364-2014

○ =	指明产品所有均质材料包含的有害物质要低于GB/T26572限定的要求 Indicates that said hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572
×	指明产品所用的至少一种均质材料包含的有害物质高于GB/T26572限定的要求 Indicates that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T26572.

SAFETY & EMC APPROVALS

SAFETY/EMC Approvals

UL 60950-1 and CSA22.2 No.60950-1 - UL Listed. C-UL for Canada.

IEC 60950-1 - CB Report and Certificate.

EN 60950-1 - CE mark.

IEC/EN 61204-3 - Industrial environment.

Marking of the CE symbol indicates compliance to the EMC Directive and the Low Voltage Directive of the European Union.

A "Declaration of Conformity" in accordance with the preceding directives and standards has been made and is available on a file at our EU representative TDK LAMBDA Germany GmbH, Karl-Bold-Str. 40, Achern.

A "Declaration of Conformity" may be accessed via company web site: www.emea.tdk-lambda.com/manual

WARNING

This product is designed for an industrial environment. In a residential, commercial or light industrial environment it may cause radio interference. The user may be required to take adequate measures to reduce interference.

NOTE

This product is a professional equipment, which is not intended for sale to generic public.

FCC Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

WARNING

Modifications not expressly approved by the party responsible for compliance could void the users' authority to operate the equipment under FCC Rules.

GENERAL SAFETY INSTRUCTIONS

**READ SAFETY INSTRUCTIONS**

The following safety precaution must be observed during all phases of operation, service and repair of this equipment. Failure to comply with the safety precautions or warnings in this document violates safety standards of design, manufacture and intended use of this equipment and may impair the built-in protections within. TDK-Lambda shall not be liable for user's failure to comply with these requirements.

SERVICING:

These products are not customer serviceable. Parts substitutions and modifications are by authorized TDK-Lambda service personnel only. For repairs or modifications, the product must be returned to TDK-Lambda service facility.

CRITICAL COMPONENTS:

These products are not authorized for use as critical components in nuclear control systems, life support systems or equipment for use in hazardous environments without the express written approval of the Managing Director of TDK-Lambda Ltd.

PRODUCT USAGE:

These products are designed for use as standalone equipment within a limits described in product Manual.

ENVIRONMENTAL:

These products are IP20, and therefore chemicals/solvents, cleaning agents and other liquids must not be used.

ENVIRONMENT:

These products are designed for use within a Pollution Degree 2, Overvoltage Category II environment.

OUTPUT LOADING:

The output power taken from the products must not exceed the rating stated on the product label, except as stated in the product Manual.

INPUT PARAMETERS:

These products must be operated within the input parameters stated in the product Manual.

END OF LIFE DISPOSAL:

The products contains components that require special disposal. Make sure that the unit is properly disposed of at the end of its service life and in accordance with local regulations.

**RISK OF ELECTRIC SHOCK**

High Voltage Warning: Dangerous voltages are present within the power supply. To avoid injuries, always disconnect power, discharge circuits and remove external voltage sources before touching components.

Class I Warning: The unit is Class I product. To minimize electrical shock hazard, the unit must be reliably earthed and professionally installed. Any interruption of the protective ground conductor or disconnection of the protective earth terminal will cause a potential shock hazard that might cause personal injury.

Energy Hazards Warning: The main output of the unit is hazardous energy (240VA) and must not be user accessible in the end application.

Hazardous output Warning: There is a potential shock hazard when using a power supply with an output voltage greater than 60VDC. Do not turn ON power supply when output voltage is above 60VDC without output bus-bars/or output connectors protection assembled. Turn OFF power supply or disconnect power supply from AC mains before making or changing any rear panel connection.

Internal fuse Caution: Internal fuse protect the unit and must not be replaced by the user. In case of internal defect, the unit must be returned to TDK-Lambda Ltd. or one of their authorized agents.

**OTHER**

The ventilation openings on these products must not be impeded. Ensure that there is at least 10cm spacing between any obstruction and the ventilation openings.

**LESEN SIE DIE SICHERHEITSVORSCHRIFTEN**

Die folgenden Sicherheitsvorschriften müssen in allen Phasen des Betriebs, der Wartung und der Reparatur der Anlage eingehalten werden. Eine Missachtung der Sicherheitsvorschriften und Warnhinweise aus diesem Handbuch führt zur Verletzung der bestehenden Sicherheitsstandards für Design, Produktion und der zweckbestimmten Verwendung der Anlage und kann die integrierten Schutzvorrichtungen beschädigen.

TDK-Lambda ist nicht für Schäden haftbar, die durch Missachtung dieser Sicherheitsvorschriften durch den Benutzer entstehen können.

WARTUNG:

Diese Produkte können nicht durch den Kunden gewartet werden. Ersatzteilaustausch und Modifikationen dürfen nur durch von TDK-Lambda zugelassenes Personal durchgeführt werden. Für Reparaturen oder Modifikationen muss das Gerät an einen Vertriebspartner von TDK- Lambda geschickt werden.

KRITISCHE KOMPONENTEN:

Diese Produkte sind nicht für die Verwendung als kritische Komponenten in nuklearen Kontrollsystemen, Lebenserhaltungssystemen oder Geräten in gefährlichen Umgebungen geeignet, sofern dies nicht ausdrücklich und in Schriftform durch den Geschäftsführer von TDK- Lambda Ltd. genehmigt wurde.

PRODUKTVERWENDUNG:

Diese Produkte sind für den Einsatz als Standalone-Geräte innerhalb der im Produkthandbuch beschriebenen Grenzen konzipiert.

UMWELT:

Diese Produkte besitzen die Schutzklasse IP20. Aus diesem Grund dürfen keine Chemikalien/Lösungsmittel, Reinigungsmittel und andere Flüssigkeiten verwendet werden.

UMGEBUNG:

Diese Produkte sind für den Einsatz in einer Umgebung mit Verschmutzungsgrad 2, Überspannungskategorie II, konzipiert.

AUSGANGSSTROM:

Der Ausgangsstrom des Produktes darf die Leistung, die auf dem Label des Produktes vermerkt ist, nur dann überschreiten, wenn dies in den Produktgrenzen dieses Handbuches ausgezeichnet ist.

EINGANGSPARAMETER:

Dieses Produkt muss innerhalb der Eingangsparameter betrieben werden, die im Produkthandbuch angegeben sind.

ENTSORGUNG AM ENDE DER BETRIEBSZEIT:

Die Produkte enthalten Komponenten, die unter Sondermüll fallen. Das Gerät muss am Ende der Betriebszeit ordnungsgemäß und in Übereinstimmung mit den regionalen Bestimmungen entsorgt werden.

**GEFAHR VON ELEKTRISCHEM SCHLAG**

Hochspannungswarnung: Innerhalb des Netzteiles gibt es gefährliche Spannungen. Um Personenschäden zu vermeiden, muss vor dem Kontakt mit dem Gerät immer die Stromversorgung unterbrochen, die Stromkreise entladen und externe Spannungsquellen entfernt werden.

Schutzklasse I Warnung: Das Gerät ist ein Produkt der Schutzklasse 1. Zur Vermeidung gefährlicher Energieinhalte und Spannungen, ist das Gerät an eine zuverlässige Schutz Erde anzuschließen und durch Fachleute zu installieren. Jede Unterbrechung des PE-Leiters oder die Trennung der PE-Verbindung kann einen möglichen elektrischen Schlag hervorrufen, der Personenschäden zur Folge haben kann.

Warnung vor Stromschlaggefahr: Der Hauptaussgang dieses Gerätes steht unter gefährlicher Spannung (240 V) und darf im Endgerät, in das es installiert wird, nicht für den Benutzer zugänglich sein.

Warnung vor gefährlichem Ausgang: Es besteht Stromschlaggefahr, wenn eine Stromversorgung mit einer Ausgangsspannung von mehr als 60 V Gleichspannung verwendet wird. Schalten Sie die Stromversorgung nicht EIN, falls die Ausgangsspannung über 60 V Gleichspannung liegt, wenn die Schutzabdeckungen der Stromschienen oder Ausgangsklemmen nicht montiert sind. Schalten Sie die Stromversorgung AUS oder trennen Sie diese von der Netzversorgung, bevor Sie den rückwärtigen Anschluss verbinden oder verändern.

Warnung - Interne Sicherung: Interne Sicherungen schützen das Gerät und dürfen durch den Benutzer nicht ausgetauscht werden. Im Fall von internen Defekten muss das Gerät an TDK- Lambda Ltd. oder einen der autorisierten Vertriebs Händler zurückgeschickt werden.

**WEITERES**

Die Belüftungsöffnungen an diesem Produkt dürfen nicht blockiert werden. Achten Sie darauf, dass mindestens 10 cm Abstand zwischen Hindernissen und den Belüftungsöffnungen bleibt.

**LEER LAS INSTRUCCIONES DE SEGURIDAD**

La siguiente precaución de seguridad debe ser respetada durante todas las fases de funcionamiento, mantenimiento y reparación de este equipo. El incumplimiento de las precauciones o advertencias de seguridad recogidas en este documento infringe las normativas de seguridad de diseño, fabricación y uso previsto de este equipo y puede afectar a las protecciones incorporadas en el mismo. TDK-Lambda no asumirá responsabilidad alguna si el usuario no cumple estos requisitos.

MANTENIMIENTO:

El cliente no debe realizar el mantenimiento de estos productos. Solo el personal de servicio autorizado de TDK-Lambda sustituirá y modificará las piezas. Para cualquier reparación o modificación del producto, este debe ser enviado a un centro de servicio de TDK-Lambda.

COMPONENTES FUNDAMENTALES:

El uso de estos productos como componentes fundamentales en sistemas de control nuclear, sistemas de soporte vital o equipos para el uso en entornos peligrosos queda prohibido sin el consentimiento expreso por escrito del Director General de TDK-Lambda Ltd.

USO DE PRODUCTOS:

Estos productos han sido diseñados para utilizarse como equipo individual dentro de los límites descritos en el manual del producto.

ECOLÓGICOS:

Estos productos son IP20, por lo que no deben utilizarse productos químicos/disolventes, productos de limpieza ni otros líquidos.

MEDIO AMBIENTE:

Estos productos han sido diseñados para utilizarse dentro de un entorno con un nivel de contaminación 2 y categoría de sobretensión II.

CARGA DE SALIDA:

La potencia de salida extraída de los productos no debe exceder la potencia de servicio indicada en la etiqueta del producto, con excepción de lo indicado en el manual del producto.

PARÁMETROS DE ENTRADA:

Estos productos deben utilizarse dentro de los parámetros de entrada indicados en el manual del producto.

ELIMINACIÓN AL FINAL DE LA VIDA ÚTIL:

Los productos contienen componentes que deben eliminarse de forma especial. Asegurarse de que la unidad se elimina de forma adecuada al final de su vida útil y de conformidad con las normas locales.

**RIESGO DE DESCARGAS ELÉCTRICAS**

Advertencia sobre la alta tensión: existen tensiones peligrosas dentro de la fuente de alimentación.

Para evitar lesiones, desenchufe siempre el cable de alimentación, descargue los circuitos y desconecte las fuentes de tensión externas antes de tocar los componentes.

Advertencia sobre la Clase I: la unidad es un producto de Clase I. Para minimizar el riesgo de descargas eléctricas, la unidad debe conectarse a tierra de forma fiable e instalarse de forma profesional. Cualquier interrupción del conductor de tierra de protección o desconexión del borne de tierra de protección supondrá un riesgo potencial de descarga eléctrica que puede llegar a causar daños personales.

Advertencia sobre los peligros de la energía: la salida principal de la unidad es energía peligrosa (240 VA) y no debe ser accesible a los usuarios en el equipo final.

Advertencia sobre la salida peligrosa: existe un peligro de descargas potencial cuando se utiliza una fuente de alimentación con una tensión de salida superior a 60 V CC. No ENCENDER la fuente de alimentación cuando la tensión de salida supere los 60 V CC sin tener montados tubos de conducción de corriente de salida o conectores de salida. APAGAR la fuente de alimentación o desconectar la fuente de alimentación de la red eléctrica CA antes de realizar o cambiar cualquier conexión del panel posterior.

Precaución sobre el fusible interno: el fusible interno protege la unidad y no debe ser sustituido por el usuario. En caso de defecto interno, la unidad deberá enviarse a TDK-Lambda Ltd. o a alguno de sus agentes autorizados.

**INFORMACIÓN ADICIONAL**

No deben obstruirse las aberturas de estos productos. Asegurarse de que hay un mínimo de 10 cm de espacio entre cualquier obstrucción y las aberturas de ventilación.

**LISEZ LES CONSIGNES DE SÉCURITÉ**

Respectez les consignes de sécurité suivantes pendant toutes les phases d'utilisation, d'entretien et de réparation de cet équipement. Le non-respect des consignes de sécurité et des avertissements figurant dans ce document enfreindrait les normes de sécurité relatives à la conception, à la fabrication et à l'usage prévu de cet équipement. Il risquerait également d'en compromettre les protections incorporées. TDK-Lambda décline toute responsabilité en cas de non-respect de ces impératifs de sécurité.

ENTRETIEN:

ces produits n'ont pas été conçus pour être entretenus par le client. Les substitutions et modifications de pièces doivent impérativement être réalisées par un technicien d'entretien agréé par TDK Lambda. Pour les réparations ou les modifications, renvoyez le produit au centre d'entretien TDK Lambda.

COMPOSANTS CRITIQUES:

ces produits n'ont pas été conçus pour être utilisés comme composants critiques de systèmes de commande nucléaire, de survie ou d'équipements utilisés dans des environnements dangereux, sans l'autorisation écrite expresse du directeur général de TDK-Lambda Ltd.

UTILISATION DU PRODUIT:

ces produits ont été conçus pour être utilisés de manière autonome, conformément aux limites indiquées dans le Manuel y afférent.

CONSIDÉRATIONS ENVIRONNEMENTALES:

ces produits étant conformes à la norme de protection IP20, ils ne doivent pas être utilisés avec les produits chimiques/solvants, agents de nettoyage et autres liquides.

ENVIRONNEMENT:

ces produits sont compatibles avec une utilisation dans un milieu soumis à un Degré 2 de pollution, Catégorie de surtension II.

CHARGE DE SORTIE:

la puissance de sortie de ces produits ne doit pas dépasser la valeur indiquée sur leur étiquette, autrement que dans les conditions rappelées dans le Manuel y afférent.

PARAMÈTRES D'ENTRÉE:

ces produits doivent être utilisés avec les paramètres d'entrée indiqués dans leurs Manuels.

MISE AU REBUT EN FIN DE VIE:

ces produits contiennent des composants à soumettre à une procédure de mise au rebut particulière. Veillez à ce que la mise au rebut de ces appareils en fin de vie utile s'effectue en bonne et due forme, conformément à la réglementation en vigueur sur place.

**RISQUE DE CHOC ÉLECTRIQUE**

Avertissement de haute tension: l'alimentation de ces appareils est parcourue par des tensions dangereuses. Pour éviter les blessures, débranchez toujours l'alimentation, déchargez les circuits et retirez les sources de tension extérieures avant de toucher les composants.

Avertissement de Classe I: l'appareil est un produit de Classe I. Pour réduire au minimum le risque de choc électrique, l'appareil doit être relié à la terre et installé par un professionnel. Toute rupture du conducteur de terre ou de la borne de raccordement à la terre de l'appareil, présenterait un risque de choc électrique susceptible de provoquer des blessures.

Avertissement de danger électrique: l'appareil servant principalement à la production d'électricité dangereuse (240 VA), il ne doit pas être accessible par l'utilisateur dans son application finale.

Avertissement de sortie dangereuse: l'utilisation d'une alimentation dont la tension de sortie dépasse 60 V c.c. présente un risque de choc électrique. Ne mettez pas l'alimentation sous tension lorsque la tension de sortie est supérieure à 60 V c.c., avant d'avoir monté des bus- barres ou des connecteurs de sortie. Éteignez l'alimentation ou débranchez-la de l'alimentation secteur avant d'effectuer ou de changer les branchements au panneau arrière.

Précaution relative au coupe-circuit interne: un fusible interne protège l'appareil et ne doit pas être remplacé par l'utilisateur. En cas de défaut interne, renvoyez l'appareil à TDK-Lambda Ltd. ou à l'un de ses agents agréés.

**AUTRE**

Les ouïes d'aération de ces produits doivent être libres de toute entrave. Veuillez à prévoir au moins 10 cm d'espace libre entre une obstruction quelconque et les ouïes d'aération de ces appareils.

**LEGGERE LE ISTRUZIONI DI SICUREZZA**

È necessario attenersi alle seguenti precauzioni di sicurezza, a tutti gli stadi del funzionamento, della manutenzione e della riparazione dell'apparecchiatura. Il mancato rispetto delle precauzioni di sicurezza o delle avvertenze contenute nel presente documento costituisce una violazione degli standard di sicurezza relativi alla progettazione, fabbricazione e uso previsto dell'apparecchiatura, e potrebbe compromettere le protezioni interne di quest'ultima. TDK-Lambda non sarà responsabile per l'inosservanza di tali requisiti da parte dell'utente.

MANUTENZIONE:

Questi prodotti non possono essere sottoposti a manutenzione da parte del cliente. Qualunque sostituzione o modifica dei componenti deve essere affidata esclusivamente al personale di manutenzione di TDK-Lambda. Per eventuali riparazioni o modifiche, il prodotto deve essere inviato al centro assistenza di TDK-Lambda.

COMPONENTI CRITICI:

L'uso di questi prodotti come componenti critici non è autorizzato all'interno di sistemi di controllo nucleari, sistemi salvavita o apparecchiature destinate all'impiego in ambienti pericolosi, senza l'esplicito consenso scritto dell'Amministratore delegato di TDK-Lambda Ltd.

USO DEI PRODOTTI:

Questi prodotti sono destinati all'uso come apparecchiature autonome, entro i limiti indicati nel loro Manuale.

PRECAUZIONI AMBIENTALI:

Questi sono prodotti IP20, pertanto l'utente non deve utilizzare agenti chimici/solventi, agenti per la pulizia e altri liquidi.

CONDIZIONI AMBIENTE:

Questi prodotti sono concepiti per l'uso in ambienti con Grado di inquinamento 2, Categoria di sovratensione II.

CARICO DI USCITA:

La potenza di uscita dai prodotti non deve superare il livello nominale riportato sulla loro etichetta, salvo quanto specificato nel Manuale dei prodotti.

PARAMETRI D'INGRESSO:

Il funzionamento di questi prodotti deve rientrare nei parametri d'ingresso riportati nel loro Manuale.

SMALTIMENTO AL TERMINE DELLA VITA UTILE:

I prodotti contengono componenti che è necessario smaltire in modo speciale. Accertarsi di smaltirli correttamente al termine della loro vita utile e nel rispetto delle norme locali vigenti.

**RISCHIO DI SCOSSA ELETTRICA**

Avvertenza - alta tensione: All'interno dell'alimentatore sono presenti tensioni pericolose. A prevenzione del rischio di infortuni, scollegare sempre le unità dalla rete elettrica, scaricare i circuiti ed eliminare le fonti esterne di tensione prima di toccare i componenti.

Avvertenza - prodotto di Classe I: L'unità è un prodotto di Classe I. Per ridurre al minimo il rischio di scossa elettrica, l'unità deve essere messa a terra e installata in modo professionale e affidabile. In caso di interruzione del conduttore protettivo di terra, o scollegamento del terminale protettivo di terra, vi sarà un rischio di scossa elettrica e conseguenti infortuni alla persona.

Avvertenza - rischi elettrici: L'uscita principale di questa unità è energia pericolosa (240 VA) e non deve essere accessibile da parte dell'utente nell'ambito dell'applicazione finale.

Avvertenza - uscita pericolosa: Vi è un potenziale rischio di scossa elettrica con l'uso di alimentatori la cui tensione in uscita superi 60 V CC. Non ACCENDERE l'alimentatore quando la tensione in uscita è superiore a 60 V CC in assenza di protezioni con sbarre collettive o connettori di uscita. SPEGNERE l'alimentatore o staccarlo dalla presa elettrica a CA prima di eseguire o modificare qualsiasi collegamento sul pannello posteriore.

Precauzione - fusibile interno: Il fusibile interno protegge l'unità e non deve essere sostituito dall'utente. Nell'eventualità di un difetto interno, l'unità deve essere inviata a TDK-Lambda Ltd. o a un suo agente autorizzato.

**ALTRO**

Le aperture di ventilazione su questi prodotti non devono essere ostruite. Controllare che vi sia una distanza minima di 10 cm fra le aperture di ventilazione e qualsiasi eventuale ostruzione.

**LEIA AS INSTRUÇÕES DE SEGURANÇA**

As seguintes precauções de segurança devem ser respeitadas em todas as fases de funcionamento, manutenção e reparação deste equipamento. A não observância dos avisos e precauções de segurança constantes neste documento viola os padrões de segurança da concepção, fabrico e utilização pretendida deste equipamento, podendo danificar as protecções integradas no seu interior. A TDK-Lambda não poderá ser responsabilizada pelo não cumprimento destes requisitos por parte do utilizador.

MANUTENÇÃO:

Estes produtos não são e não podem ser submetidos a manutenção por parte do cliente. As modificações e substituições de peças devem ser realizadas apenas pelo pessoal de assistência autorizado da TDK-Lambda. Para a realização de reparações ou modificações, é necessário devolver o produto a uma unidade de serviço da TDK-Lambda.

COMPONENTES ESSENCIAIS:

Não é autorizada a utilização destes produtos como componentes essenciais de sistemas de controlo nuclear, sistemas de suporte de vida ou equipamento para utilização em ambientes perigosos sem a expressa autorização por escrito do Director-Geral da TDK-Lambda Ltd.

UTILIZAÇÃO DO PRODUTO:

Estes produtos foram concebidos para utilização como equipamento autónomo, dentro dos limites descritos no manual do produto.

AMBIENTAL:

Estes produtos são IP20 e, como tal, não se devem utilizar químicos/solventes, agentes de limpeza e outros líquidos.

AMBIENTE:

Estes produtos foram concebidos para utilização em ambientes da categoria de sobretensão II, com um Nível de Poluição 2.

CARGA DE SAÍDA:

A potência de saída extraída dos produtos não deve exceder a classificação assinalada na etiqueta do produto, excepto quando indicado no manual do produto.

PARÂMETROS DE ENTRADA:

Estes produtos devem ser utilizados dentro dos parâmetros de entrada indicados no manual do produto.

ELIMINAÇÃO NO FIM DE VIDA:

Os produtos contêm componentes que necessitam de procedimentos especiais de eliminação. Certifique-se de que a unidade é devidamente eliminada no fim da sua vida útil e que tal é feito em conformidade com os regulamentos locais.



RISCO DE CHOQUE ELÉCTRICO

Aviso de alta tensão: Estão presentes tensões perigosas dentro da fonte de alimentação. Para evitar ferimentos, desligue sempre a energia, descarregue os circuitos e retire as fontes de tensão externas antes de tocar nos componentes.

Aviso de classe I: A unidade é um produto de Classe I. Para reduzir o risco de choque eléctrico, a unidade deve ser ligada à terra de forma fiável e instalada por um profissional. Qualquer interrupção do condutor de terra de protecção ou corte do terminal de terra de protecção poderá originar um risco de choque passível de provocar ferimentos.

Aviso de perigos de energia: A saída principal da unidade constitui energia perigosa (240 VAC) e não deve estar acessível ao utilizador na aplicação final.

Aviso de saída perigosa: Há a possibilidade de existir risco de choque ao utilizar uma fonte de alimentação com tensão de saída superior a 60 V CC. Não LIGUE a fonte de alimentação quando a tensão de saída for superior a 60 V CC e não existir protecção para as barras do bus de saída/conectores de saída. DESLIGUE a fonte de alimentação ou interrompa a ligação entre a fonte de alimentação e a corrente alternada antes de realizar ou alterar qualquer ligação no painel traseiro.

Cuidados com o fusível interno: O fusível interno protege a unidade e não deve ser substituído pelo utilizador. Em caso de defeito interno, a unidade deve ser devolvida à TDK-Lambda Ltd. ou a um dos seus agentes autorizados.



OUTROS

As aberturas de ventilação destes produtos não devem ser obstruídas. Certifique-se de que existe um espaçamento de pelo menos 10 cm entre qualquer obstrução e as aberturas de ventilação.

PRODUCT SAFETY INSTRUCTIONS

CAUTION

The following safety precautions must be followed during all phases of operation, service, and repair of this equipment. Failure to comply with the safety precautions or warnings in this document violates safety standards of design, manufacture and intended use of this equipment and may impair the built-in protections within. TDK-Lambda shall not be liable for user's failure to comply with these requirements.

VORSICHT

Die folgenden Sicherheitsvorschriften müssen vor Inbetriebnahme und in jeglichem Betriebszustand bei Wartungsarbeiten oder Reparatur dieses Geräts beachtet werden. Eine Missachtung der Sicherheitsvorschriften und Warnhinweise aus diesem Handbuch stellt eine Verletzung der Sicherheitsstandards für Design, Herstellung und vorgesehene Benutzung dieses Geräts dar und kann die im Gerät integrierten Schutzfunktionen beeinträchtigen. TDK-Lambda ist nicht haftbar, wenn der Benutzer diese Anforderungen missachtet.

OVERVOLTAGE CATEGORY AND ENVIRONMENTAL CONDITIONS

The **GENESYS™** series units have been assigned to Overvoltage category II.

The **GENESYS™** series units are intended for use in the following operation conditions:

- Indoor use
- Pollution degree 2
- Max. operational altitude: 3000m above sea level (Refer to product Spec. for operating conditions).
- Ambient temperature: 0°C-50°C.

ÜBERSPANNUNGSKATEGORIE UND UMWELTBEDINGUNGEN

Die Geräte der **GENESYS™** Serie wurden der Überspannungskategorie II zugeordnet.

Die Geräte der **GENESYS™** Serie sind zur Benutzung unter folgenden Betriebsbedingungen vorgesehen:

- Benutzung in Innenräumen
- Verschmutzungsgrad 2
- Maximale Einsatzhöhe: 3000 m über Null (siehe Produktspezifikationen für Betriebsbedingungen).
- Umgebungstemperatur: 0 °C – 50 °C.

GROUNDING

This product is a Safety Class1 instrument. To minimize shock hazard, the instrument chassis must be connected to an electrical ground. The instrument must be connected to the AC power supply mains through a three-conductor power cable for Single Phase models and through a four-conductor power cable for Three Phase models with the ground wire firmly connected to an electrical ground (safety ground) at the power outlet.

For instruments designed to be hard-wired to the supply mains, the protective earth terminal must be connected to the safety electrical ground before another connection is made. Any interruption of the protective ground conductor or disconnection of the protective earth terminal will cause a potential shock hazard. That might cause personal injury.

ERDUNG

Bei diesem Produkt handelt es sich um ein Gerät der Schutzklasse 1. Damit gefährliche Energieinhalte und Spannungen vermieden werden, ist das Gehäuse des Gerätes an eine Schutzerde anzuschliessen. Das Gerät muss mit Hilfe eines genormten 3-adrigen Kabels (L, N, PE) bei Modellen mit 1-Phasigem AC-Anschluß bzw. mit einem 4-adrigen Kabel (L1, L2, L3, PE) bei 3-Phasen AC Modellen fest angeschlossen werden. Der PE-Anschluss ist an die vorgesehene Schutzerde anzuschliessen.

Bei der Festverdrahtung des Gerätes ist sicherzustellen, dass der PE-Anschluss als erstes verbunden wird.

Jede mögliche Unterbrechung des PE-Leiters oder Trennung der PE-Masse kann einen möglichen elektrischen Schlag hervorrufen, der einen Personenschaden zur Folge hätte.

LIVE CIRCUITS

Operating personnel must not remove the instrument cover.

No internal adjustment or component replacement is allowed by non-TDK-Lambda qualified service personnel. Never replace components with a power cable connected. To avoid injuries, always disconnect power, discharge circuits, and remove external voltage sources before touching components.

SPANNUNGSFÜHRENDE TEILE

Die Geräteabdeckung darf nicht vom Bedienungspersonal abgenommen werden.

Nur von TDK-Lambda zugelassene Servicekräfte dürfen interne Anpassungen vornehmen oder Komponenten austauschen. Tauschen Sie niemals Komponenten aus, wenn das Versorgungskabel noch mit der Steckdose verbunden ist. Um Verletzungen vorzubeugen, schalten Sie das Netzgerät stromlos, entladen die Schaltkreise und entfernen externe Spannungsquellen, bevor Sie jegliche Komponenten berühren.

PARTS SUBSTITUTIONS & MODIFICATIONS

Parts substitutions and modifications are allowed by authorized TDK-Lambda Ltd. service personnel only. For repairs or modifications, the instrument must be returned to TDK-Lambda Ltd. service facility.

AUSWECHSELN UND VERÄNDERUNG VON BAUTEILEN

Das Auswechseln sowie die Abänderung von Teilen darf nur von autorisierten TDK-Lambda Ltd. Servicekräften vorgenommen werden. Für Reparaturen oder Abänderungen muss das Gerät an die Servicestelle der TDK-Lambda Ltd. zurückgeschickt werden.

AC INPUT

The **GENESYS™** series is designed for use in TN and TT power distribution systems. Do not use AC supply, which exceeds the input voltage and frequency rating of this instrument. The input voltage and frequency ratings of the **GENESYS™** power supply series are: 190-240V~, 47/63Hz for **Three Phase 200V models**, 380-415V~, 47/63Hz for **Three Phase 400V models**, 380-480V~, 47/63Hz for **Three Phase 480V models** and 100-240V~, 47/63Hz for **One Phase models**. For safety reasons, the mains supply voltage fluctuations should not exceed +/-10% of the nominal voltage. Ensure that under heavy load, the AC voltage supplied to the power supply does not fall below the specifications.

NETZEINGANG

Die **GENESYS™** Serie ist für den Einsatz in TN und TT Energieverteilungssystemen vorgesehen. Benutzen Sie keine AC-Versorgung, die dem Eingangsspannungs- und Frequenzwert dieses Geräts nicht entspricht oder ihn überschreitet. Die Eingangsspannungs- und Frequenzwerte der **GENESYS™** Netzgeräte Serie betragen: 190-240V~, 47/63Hz für **dreiphasige 200V Modelle**, 380-415V~, 47/63Hz für **dreiphasige 400V Modelle** und 380-480V~, 47/63Hz für **dreiphasige 480V Modelle**, 100-240V~, 47/63Hz für **einphasige Modelle**. Aus Sicherheitsgründen sollten die Netzspannungsschwankungen +/-10% der Nennspannung nicht überschritten werden. Stellen Sie sicher, dass die am Netzgerät anliegende Wechselstromspannung im Vollast-Betrieb nicht unter den Vorgaben liegt.

ENERGY HAZARD

The output of **GENESYS™** series units is capable of providing the hazardous energy. Therefore, the output and connections must not be user accessible. Customer's final equipment needs to provide adequate protection for service personnel against inadvertent contact with output wires.

GEFÄHRLICHE ENERGIEINHALTE

Am Ausgang der Geräte der **GENESYS™** Serie können gefährliche Energieinhalte anliegen. Deshalb müssen die Ausgangs-Anschlüsse berührungssicher durch den Benutzer ausgeführt sein. Die Endkundenanlagen müssen so aufgebaut sein, dass Servicekräfte nicht versehentlich in Kontakt mit den Ausgangsleitungen kommen können.

FUSES

CAUTION

MULTI-POLE FUSING

The **GENESYS™** power supply units have fuses in all supply conductors. To prevent potential risk of hazard during servicing, the unit shall be fully disconnected from the supply.

Fuses must be changed by authorized TDK-Lambda Ltd. service personnel only. For continued protection against risk of fire, replace only with the same type and rating of the fuse.

SICHERUNGEN

VORSICHT

MEHRFACH ABSICHERUNG

In den Netzgeräten der **GENESYS™** Serie sind Sicherungen in allen Zuleitungen vorgesehen. Die Geräte sollten während der Ausführung von Wartungsarbeiten vollständig vom Versorgungsnetz getrennt werden, um Stromschläge zu vermeiden.

Nur von TDK-Lambda Ltd. autorisierte Servicekräfte dürfen Sicherungen austauschen. Sicherungen dürfen nur durch Sicherungen des angegebenen Typs mit der angegebenen Nennstromstärke ersetzt werden, um weiterhin die angemessenen Brandschutzfunktion zu gewähren.

FUSE RATING

There are no user replaceable fuses in the power supply. Internal fuses are sized for fault protection, and if a fuse was opened, it will indicate that service is required. Fuse replacement should be made by qualified technical personnel. Refer to Table 0-1 for a listing of the fuses.

Models rated 100-240Vac, One Phase	Input AC fuses F1, F2	250VAC, 30A, Fast acting
Models rated 190-240Vac, Three Phase	Input AC fuses F1, F2, F3	250VAC, 30A, Fast acting
Models rated 380-415Vac and 380-480Vac, Three Phase	Input AC fuses F1, F2, F3	500VAC, 16A, Fast acting

Table 0-1: Internal Fuse

SICHERUNGSWERTE

Im Gerät befinden sich keine Sicherungen, die durch den Anwender ersetzt werden können. Die internen Netzsicherungen dienen als Fehlerschutz. Wenn eine solche Sicherung ausgelöst hatte, ist dies ein eindeutiger Hinweis, dass das Gerät gewartet werden muss. Ein Sicherungstausch sollte nur von qualifiziertem technischem Personal ausgewechselt werden. In Tabelle 0-1 sind die Sicherungen aufgelistet.

Modelle Netzspannung 100-240Vac, 1-Phasig	Netzsicherung F1, F2	250VAC, 30A, Flinke Sicherung
Modelle Netzspannung 190-240Vac, 3-Phasig	Netzsicherung F1, F2, F3	250VAC, 30A, Flinke Sicherung
Modelle Netzspannung 380-415Vac und 380-480Vac, 3-Phasig	Netzsicherung F1, F2, F3	500VAC, 16A, Flinke Sicherung

Tabelle 0-1: Interne Sicherungen

WARNING

There is an electric shock hazard when the power supply output is adjusted above 60VDC. Ensure it is not possible to touch simultaneously one of the output terminals and earth (including the power supply's metal enclosure). Ensure it is not possible to touch simultaneously one of the output terminals and metal parts of any external products supplied by the power supply when the output is adjusted above 60VDC.

WARNUNG

Bei einer eingestellten Ausgangsspannung von über 60 VDC besteht die potentielle Gefahr eines elektrischen Stromschlages.

Stellen Sie sicher, dass keine der Ausgangsklemmen und die Erdung (einschließlich des Metallgehäuses des Netzgeräts) gleichzeitig berührt werden können. Dies gilt ebenfalls für Ausgangsklemmen und andere leitfähige Komponenten externer Produkte, die von dem Netzgerät versorgt werden, wenn deren Ausgangsspannung auf über 60 VDC eingestellt ist.

WARNING

There is a potential electrical shock hazard when using a power supply with output voltage greater than 60VDC. Do not turn ON power supply when output voltage is above 60VDC without output protection assembled. Turn OFF power supply or disconnect power supply from AC mains before making or changing any rear panel connection.

WARNUNG

Es besteht die Gefahr eines Stromschlages, wenn eine Stromversorgung mit einer Ausgangsspannung von mehr als 60 VDC benutzt wird. Schalten Sie die Stromversorgung nicht AN, wenn die Ausgangsspannung über 60 VDC liegt und kein Berührungsschutz angebracht ist. Schalten Sie die Stromversorgung AUS oder trennen Sie das Netzkabel vom Versorgungsnetz, bevor Sie irgendwelche Anschlüsse an der Geräterückseite vornehmen oder ändern.

GERÄUSCHPEGEL

Maschinenlärm - Verordnung - 3. GPSGV, der höchste Schalldruckpegel beträgt weniger als 70 dB(A) gemäss EN ISO7779.

SYMBOLS/ ZEICHEN

	Caution, risk of danger. Instruction manual symbol. The instrument will be marked with this symbol when it is necessary for the user to refer to the Safety & Installation or Instruction manual. Achtung Gefahr. Symbol im Benutzerhandbuch. Das Gerät wird mit diesem Symbol gekennzeichnet, wenn der Benutzer auf das Sicherheits- & Installationshandbuch oder die Bedienungsanleitung verwiesen wird.
	Indicates ground terminal. Zeigt einen Erdungsanschluss an.
	Protective Ground Conductor Terminal. Schutzleiterklemme.
	ON (Supply). EIN (Netzversorgung).
	OFF (Supply). AUS (Netzversorgung).
	Direct current (DC). Gleichstrom (DC).
	Alternate current (AC). Wechselstrom (AC).
	Three-Phase Alternating Current (AC) Drei-phasiger Wechselstrom (AC)
	Denotes hazard. A procedure requires specific attention. Not following the procedure correctly could result in a personal injury. A WARNING sign should not be skipped and all indicated conditions must be fully understood and met. Weist auf Gefahren hin, die eine besondere Aufmerksamkeit erfordern. Eine Nichteinhaltung dieser Vorgehensweise, kann zu Körperverletzungen führen. Ein WARN-Hinweis sollte nicht übergangen und alle angeführten Bedingungen müssen eindeutig verstanden und umgesetzt werden.
	Denotes hazard. A procedure requires specific attention. Not following the procedure correctly could result in damage to the equipment. Do not proceed beyond a CAUTION sign until all indicated conditions are fully understood and met. Weist auf Gefahren hin, die eine besondere Aufmerksamkeit erfordern. Wenn die beschriebene Vorgehensweise nicht korrekt durchgeführt wird, kann dadurch das Gerät beschädigt werden. Führen Sie einem VORSICHTS-Hinweis erst durch, wenn Sie alle angezeigten Handlungen eindeutig verstanden und umgesetzt haben.

1.1 User Manual Content

This safety & installation manual contains the operating instructions, installation instructions of the **GENESYS™** 1.7kW ÷ 15kW power supply series. The instructions refer to the standard & Blank Panel power supplies, including the built-in USB, LAN and RS232/485 serial communication. For information related to operation with the optional IEEE communication interface, refer to User manual (chapter 8).

1.2 Introduction

1.2.1 General Description

GENESYS™ Series power supplies are wide output range, high performance switching power supplies. The **GENESYS™** Series is power factor corrected and operates from worldwide AC voltage range continuously. Output voltage and current are continuously displayed and indicators show the complete operating status of the power supply (in the standard units). The Front Panel controls allow the user to set the output parameters, the protection levels (Over-Voltage protection, Under-Voltage protection and Foldback) and preview the settings (in the standard units). The rear panel includes the necessary connectors to control and monitor the power supply operation by remote analog signals or by the built-in serial communication USB, RS232/485, and LAN.
IEEE is optional.

1.2.2 Multiple Output Power System

The **GENESYS™** power supplies series can be configured into a programmable power system of up to 31 units using the built-in LAN, USB, or RS232/RS485 communication port in the power supply and the RS485 linking cable provided with each power supply.
For further information regarding LAN interface, refer to the User manual (Chapter 5) in the CD-ROM.
For further information regarding optional IEEE interface, refer to the User manual (Chapter 8) in the CD-ROM.

1.2.3 Control via LAN, USB or RS232/485 Communication Ports

The following basic functional parameters can be programmed via communication ports:

- Output voltage setting.
- Output current setting.
- Output voltage measurement.
- Output current measurement.
- Output on/off control.
- Foldback protection setting.
- Over-voltage protection setting and readback.
- Under-Voltage protection setting and readback.
- Under-Voltage limit setting and read back.
- Power-supply start up mode (last setting or safe mode).

1.2.4 Analog Voltage Programming and Monitoring

Analog inputs and outputs are provided at the rear panel for analog control of the power supply. The output voltage and the current limit can be programmed by analog voltage or by resistor, and can be monitored by analog voltage. The power supply output can be remotely set to On or Off and analog signals monitor the proper operation of the power supply and the mode of operation (CV/CC).

1.2.5 Parallel Operation

Up to four **GENESYS™** series power supplies of the same output voltage and current rating can be paralleled in master-slave configuration with automatic current sharing to increase available power.

1.2.6 Output Connections

Output connections are made to rear panel Connector. Either the positive or negative terminal may be grounded or the output may be floated. Models up to 100VDC rated output shall not float outputs more than +/- 200VDC above/below chassis ground. Models up to 600VDC rated output shall not float outputs more than +/- 600VDC above/below chassis ground. Contact factory for assistance with higher float voltage applications. Local or remote sense may be used.

1.2.7 Cooling and Mechanical Construction

The **GENESYS™** series is cooled by an internal fan. At installation, care must be taken to allow free airflow into the power supply via the front panel, and out of the power supply via the rear panel.

1.3 Accessories

1.3.1 Accessories Provided With the Power Supply

1.3.1.1 Input connector protection (includes 3 parts)

- Strain relief bracket assembly.
- Strain relief P/N: 5301 5440 by LAPP GROUP for 1.7÷5kW, F7024000 by SIB for 10÷15kW.
- Lock nut P/N: 8216 by AGRO for 1.7÷5kW, 8240 by AGRO for 10÷15kW.

1.3.1.2 AC input plug

- P/N: PC 5/ 3-STCL1-7.62 by Phoenix Contact for 1.7÷3.4kW 1-Phase.
- P/N: PC 5/ 4-STCL1-7,62 by Phoenix Contact for 2.7÷5kW 3-Phase.
- P/N: PC 16/ 4-ST-10,16 by Phoenix Contact for 10÷15kW 3-Phase.

1.3.1.3 Output connector / Bus bars protection

- Output protection assembly (for 1.7÷5kW only).
- Output Plug for output voltage including and above 150VDC:
P/N: IPC 5/ 4-STF-7,62 by Phoenix Contact for 1.7÷5kW.
P/N: IPC 16/ 4-STF-10,16 by Phoenix Contact for 10÷15kW.

1.3.1.4 Serial link cable

Serial link cable for linking power supplies by RS485 communication.

Cable description: 0.5m length, shielded, RJ-45 type plugs, 8 contacts (P/N: GEN/RJ45).

1.3.1.5 Misc. hardware

- DB-26 Connector P/N: 10090769-P264ALF (FCI)
- DB-15 Backshell (used for DB-26 Connector) P/N: 86303638BLF (FCI)
- CD-ROM
- SEMS Screw M3X6 Fe Ni, 2 Pcs.
- Flat head screw M3X8 Fe Ni, 2 Pcs.

1.3.1.6 Bus bars screws kits

Bus bars kits accessories are provided according to Table 1-1: Bus bars Screws Kits Definition.

kW \ V	1.7	2.7	3.4	5	10	15
10	Kit-1	Kit-1	Kit-1	Kit-1	Kit-3	Kit-5
20	Kit-2	Kit-1	Kit-1	Kit-1	Kit-3	Kit-5
30	Kit-2	Kit-2	Kit-1	Kit-1	Kit-3	Kit-5
40	Kit-2	Kit-2	Kit-2	Kit-1	Kit-3	Kit-5
60 ÷ 100	Kit-2	Kit-2	Kit-2	Kit-2	Kit-4	Kit-6

Table 1-1: Bus bars Screws Kits Definition

Bus bars Kit-1

- Hex. Screw M10X25 St. St., Type DIN933, 4 Pcs.
- Hex. Nut M10 St. St., Type DIN493B, 4 Pcs.
- Flat washer M10 St. St., Type DIN125A, 8 Pcs.
- Spring washer M10 St. St., Type DIN127B, 4 Pcs.

Bus bars Kit-2

- Hex. Screw M8X25 St. St., Type DIN933, 2 Pcs.
- Hex. Nut M8 St. St., Type DIN493B, 2 Pcs.
- Flat washer M8 St. St., Type DIN125A, 4 Pcs.
- Spring washer M8 St. St., Type DIN127A, 2 Pcs.

Bus bars Kit-3

- Hex. Screw M10X25 St. St., Type DIN933, 8 Pcs.
- Hex. Nut M10 St. St., Type DIN493B, 8 Pcs.
- Flat washer M10 St. St., Type DIN125A, 16 Pcs.
- Spring washer M10 St. St., Type DIN127B, 8 Pcs.

Bus bars Kit-4

- Hex. Screw M8X25 St. St., Type DIN933, 4 Pcs.
- Hex. Nut M8 St. St., Type DIN493B, 4 Pcs.
- Flat washer M8 St. St., Type DIN125A, 8 Pcs.
- Spring washer M8 St. St., Type DIN127A, 4 Pcs.

Bus bars Kit-5

- Hex. Screw M10X25 St. St., Type DIN933, 12 Pcs.
- Hex. Nut M10 St. St., Type DIN493B, 12 Pcs.
- Flat washer M10 St. St., Type DIN125A, 24 Pcs.
- Spring washer M10 St. St., Type DIN127B, 12 Pcs.

Bus bars Kit-6

- Hex. Screw M8X25 St. St., Type DIN933, 6 Pcs.
- Hex. Nut M8 St. St., Type DIN493B, 6 Pcs.
- Flat washer M8 St. St., Type DIN125A, 12 Pcs.
- Spring washer M8 St. St., Type DIN127A, 6 Pcs.

1.3.2 Optional Accessories**1.3.2.1 Printed User Manual**

- For ordering printed User Manual, the P/N is: G/M

1.3.2.2 Serial Port Cables

- For ordering serial port cables, refer to the User Manual (printed or in the CD-ROM).
- USB/LAN cables are not provided with the power supply.

1.3.2.3 Paralleling Cable

- For ordering paralleling cables, the P/N is: G/P.

1.3.2.4 Dust Filter

- Full Panel 1.7kW ÷ 5kW P/N: G-AFK.
- Blank Panel 1.7kW ÷ 5kW P/N: GB-AFK.
- Full Panel 10kW P/N: GSP10kW-AFK.
- Blank Panel 10kW P/N: GBSP10kW-AFK.
- Full Panel 15kW P/N: GSP15kW-AFK.
- Blank Panel 15kW P/N: GBSP15kW-AFK.

NOTE

Optional accessories will be sent separately from the power supply packing according to order

1.3.2.5 AC Cables

AC Cables are not provided with the power supply. Refer to Table 1-2: Recommended AC Input Cables for recommended AC input cables (customer applied).

AC Input Range	AC Input Cable
100-240~, One phase	Min. 3 X 12AWG (Two wires plus Safety ground), stranded copper, 300V, 60°C minimum, 3m max. length, outer diameter 10÷14mm.
190-240~, Three phase	Min. 4 X 12AWG (Three wires plus Safety ground), stranded copper, 300V, 60°C minimum, 3m max. length, outer diameter 10÷14mm.
380-480~, Three phase	Min. 4 X 16AWG (Three wires plus Safety ground), stranded copper, 600V, 60°C minimum, 3m max. length, outer diameter 10÷14mm.

Table 1-2: Recommended AC Input Cables

CHAPTER 2: FRONT/REAR PANEL CONTROLS AND CONNECTORS

2.1 Introduction

The **GENESYS™** Power Supply series has a full set of controls, indicators (in the standard units) and connectors that allow the user to set up and operate the unit. Before starting to operate the unit, please read the following sections for an explanation of the functions, controls and connector terminals.

- Section 2.2: Front Panel Display and Controls.
- Section 2.3: Blank Front Panel.
- Section 2.4: Rear Panel Connectors.

2.2 Front Panel Display and Controls

Refer to Figure 2-1 and Table 2-1 for description of the Front panel controls.



Figure 2-1: Front Panel Controls and Indicators

No.	Control/Indicator	Description
1	Power Switch	POWER ON/OFF control.
2	Power Supply Model	Model, Voltage & Current Identifier.

No.	Control/Indicator	Description
3	Voltage Encoder and Button	Encoder: A high-resolution detent rotary Encoder adjusting the output voltage and navigating menu. Button: An auxiliary function to accept the voltage-setting value in Preview mode.
4	Voltage Display	4-digit 16-segment Voltage display. Normally displays the output voltage. In Preview mode, the display indicates the program setting of the output voltage. In Menu navigation, the display indicates the selected function.
5	Operation Mode Indicator	CV/CC/CP Operation mode indicator.
6	Current Display	4-digit 16-segment Current display. Normally displays the output current. In Preview mode, the display indicates the program setting of the output current. In menu navigation, the display indicates the selected parameter.
7	Indicators Bar	Refer to the User Manual for description of the front panel Indicators bar.
8	Current Encoder and Button	Encoder: A high-resolution detent rotary Encoder adjusting the output current and navigating menu. Button: An auxiliary function to accept the current-setting value, select menu level, and set parameter value.
9	BACK Button	Return one step back in menu navigation mode.
10	PROG Button / Indicator	Activates the Program / Sequencer menu. The Program menu provides Sequencer function control, Trigger function control, and loads a sequence stored inside the power supply memory. Green LED lights when Program menu is active. If Program menu is active, press PROG button to exit to the main display. *
11	SYST / Lock Front Panel Button / Indicator	Activates the System menu. The System menu provides output sensing point selection (Local / Remote sense), Interlock function control, Enable function control, Power Supply OK signal control, SAVE/RECALL power supply configuration, Programmable Signals control, Preload function control, Display brightness & dimming function control, and reset power supply settings. Green LED lights when System menu is active. If System menu is active, press the SYST button to exit to the main menu. Lock / Unlock Front Panel buttons by pressing the SYST button, followed by current encoder press. *
12	CONF Button / Indicator	Activates the Configuration menu. The Configuration menu provides power supply start mode control, Voltage & Current source control, Analog Programming / Monitoring range selection, Internal Resistance function, Constant power limit function, and Slew-Rate control function. Green LED lights when the Configuration menu is active. If Configuration menu is active, press the CONF button to exit to the main menu. *

No.	Control/Indicator	Description
13	PROT Button / Indicator	Activates the Protection menu. The Protection menu provides OVP setting, UVL setting, UVP function control, Foldback function control, and OCL function ON/OFF control. Green LED lights when the Protection menu is active. If Protection menu is active, press the PROT button to exit to the main menu. *
14	COMM Button / Indicator	Activates the Communication menu. The Communication menu provides communication interface selection, power supply address selection, LAN settings control, communication baud-rate selection, communication language selection, and software revision information. Green LED lights when Communication menu is active. If Communication menu is active, press the COMM button to exit to the main menu. *
15	FINE Button / Indicator	Voltage/Current Fine/Coarse adjustment control. Operates as a toggle switch. In the Fine mode, Voltage and Current encoders operate in high-resolution mode. In the Coarse mode, Voltage and Current encoders operate in standard-resolution (approx. 3 turns for full voltage/current rated scale). Green LED lights when the unit is in Fine mode.
16	PREV Button / Indicator	Press the PREV button to display the Output Voltage and Current Limit settings. The display shows the settings for 5 seconds. If buttons are not pressed for 5 seconds, the display returns back to show actual output voltage and current. If Voltage or Current values are changed, and there is no keypress for 15 seconds, the display returns back to show actual output Voltage and Current. Green LED lights when PREV mode is active.
17	OUT Button / Indicator	Output ON/OFF control. Press OUTPUT to set the output ON or OFF. Green LED lights when DC Output is enabled. Red LED blinks in case of an alarm. Refer to User Manual, Alarms and Protective Functions section.

Table 2-1: Front Panel Controls and Indicators

NOTE

* If a menu is active, and there is no key press within 15 seconds, power supply returns to the main display (OFF or actual Voltage and Current display).

2.3 Blank Front Panel

Refer to Figure 2–2 and Table 2-2 for description of the Blank Front Panel controls and Indicators.



Figure 2–2: Blank Front Panel Controls

No.	Connection	Description
1	Power Switch	POWER ON/OFF control.
2	Power Supply Model	Model, Voltage & Current Identifier.
3	Power LED	Power Supply ON/OFF status LED. Green LED lights when Power Supply is ON (Power Switch ON).
4	REM LED	REMOTE status LED. Green LED lights if power supply is controlled by a remote communication (RS232/485, USB, LAN, OPTional).
5	OUT LED	Output ON/OFF status LED. Green LED lights when DC Output is enabled. Red LED blinks in case of an alarm. Refer to User Manual, Alarms and Protective Functions Section.

Table 2-2: Blank Front Panel Controls

2.4 Rear Panel Connectors

Refer to Figure 2-3 and Table 2-3 for description of the Rear Panel connectors.

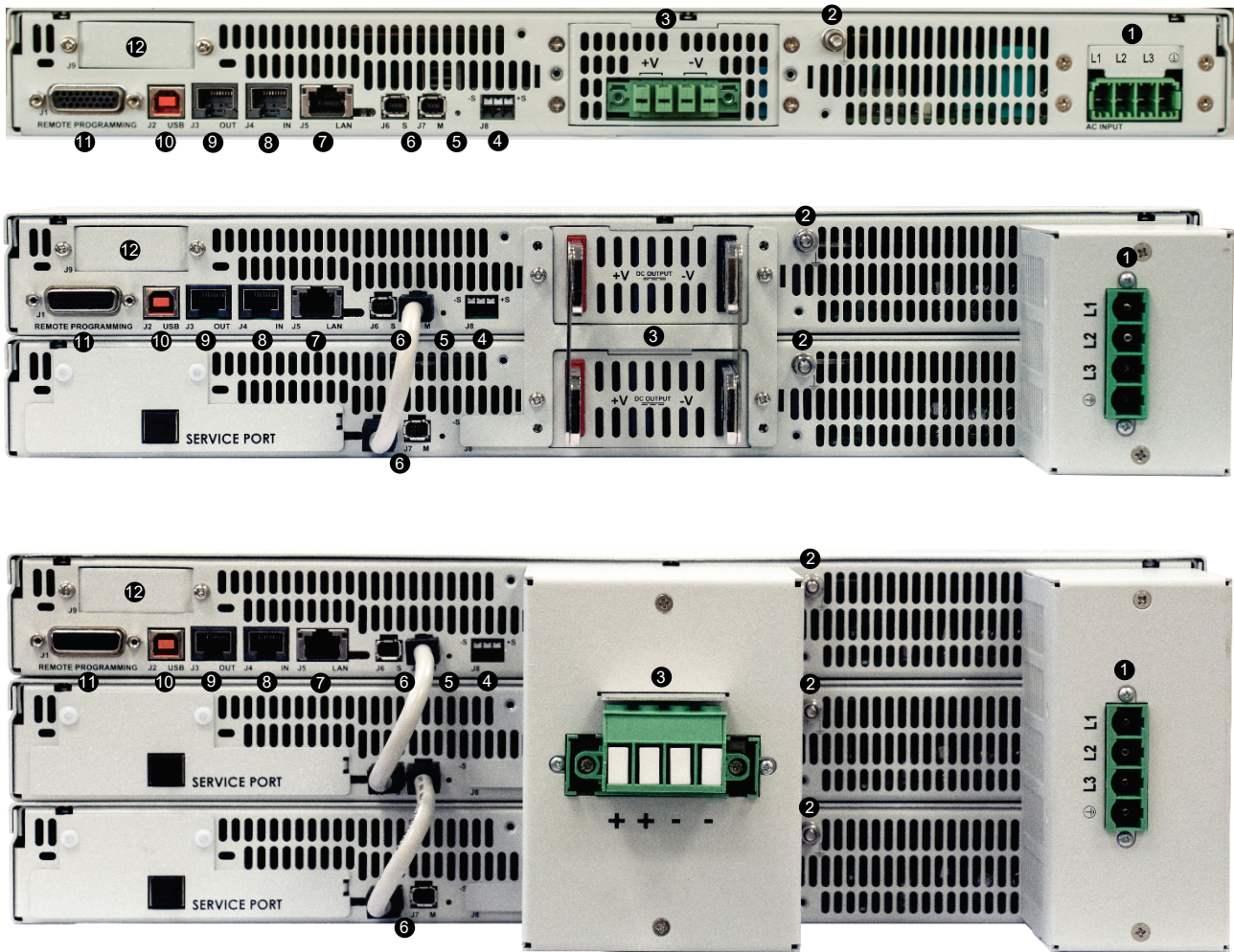


Figure 2-3: Rear Panel Connectors and Controls

No.	Connection	Description
1	AC Input Connector	Connector type: 1.7kW ÷ 3.4kW 1-Phase: PC 5/ 3-G-7,62 PHOENIX CONTACT. 2.7kW ÷ 5kW 3-Phase: PC 5/ 4-G-7,62 PHOENIX CONTACT. 10kW ÷ 15kW: DFK—PC 16/ 4-ST-10,16 PHOENIX CONTACT.
2	Ground Stud	Functional Ground connection M4x8 Stud
3	DC output Bus bars / Connector	Bus bars for 10V to 100V models. 150V to 600V Connector type: IPC 5/ 4-GF-7,62 PHOENIX CONTACT for 1.7kW ÷ 5kW models. IPC 16/ 4-STF-10,16 PHOENIX CONTACT for 10kW ÷ 15kW models.
4	Remote sense connector	Connector for remote sensing connections. Connect to the load for regulation of the load voltage and compensation of load wire drop.
5	Reset button	Set default Power Supply settings.
6	Paralleling Connectors	Master/Slave connectors, mini I/O type.

7	LAN Connector + Indicators	LAN interface connector, RJ-45 type + LXI indicators. Connector type: UDE P/N: 26-31024KB91-1.
8	Serial In connector	RJ-45 type connector, used for connecting power supplies to RS232 or RS485 port of a computer for remote control purposes. When using several power supplies in a power system, the first unit Remote-In is connected to the computer and the remaining units are chained, Remote-In to Remote-Out. Connector type: Molex 95540-2881.
9	Serial Out connector	RJ-45 type connector, used for chaining power supplies to/from a serial communication bus. Connector type: Molex 95540-2881.
10	USB Connector	USB interface connector, type B. Connector type: SAMTEC P/N: USBR-B-S-F-O-TH.
11	Isolated control and signals	Isolated analog Control and monitoring signals, isolated from the output potential. Connector type: WE P/N: 618026325223.
12	Optional Interface	Position for optional communication interface.

Table 2-3: Rear Panel Connectors and Controls
CAUTION

To prevent ground loops and to maintain the isolation of the power supply when programming from J1, use an ungrounded programming source.

VORSICHT

Um Erdschleifen zu verhindern und die Isolierung auf dem Netzgerät aufrecht zu erhalten, wenn Sie von J1 programmieren, müssen Sie eine ungeerdete Programmierquelle benutzen.

WARNING

There is a potential shock hazard at the output when using a power supply with an output greater than 60VDC. Use wires with minimum insulation rating equivalent to the maximum output voltage of the power supply.

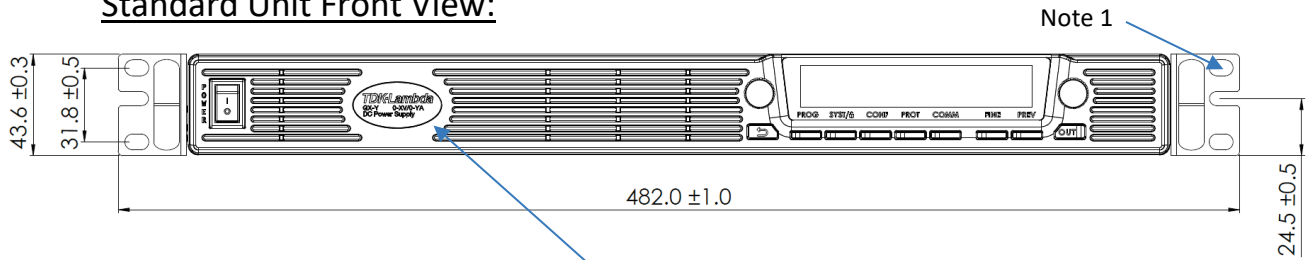
WARNUNG

Bei Einsatz einer Stromversorgung mit einer Ausgangsspannung von über 60VDC besteht die Gefahr eines elektrischen Schlags. Verwenden Sie nur Leitungen mit Isolationsklassen, die mindestens für die maximale Ausgangsspannung der Stromversorgung geeignet sind.

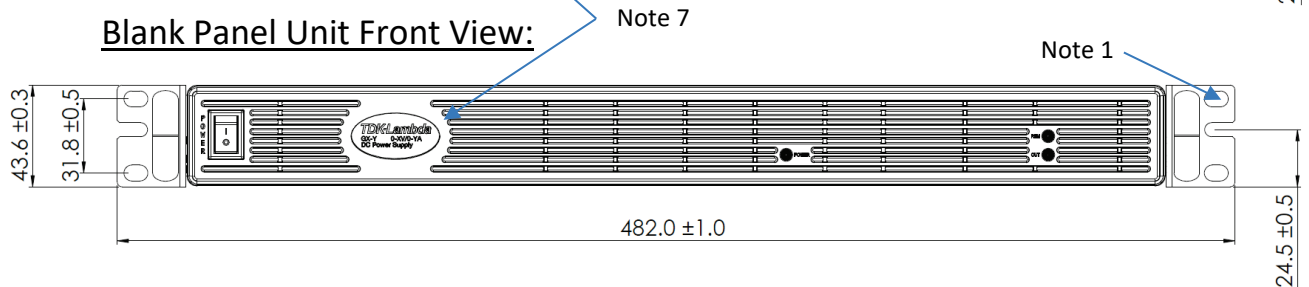
CHAPTER 3: OUTLINE

3.1 1.7kW / 2.7kW / 3.4kW / 5kW Power Supplies Outline

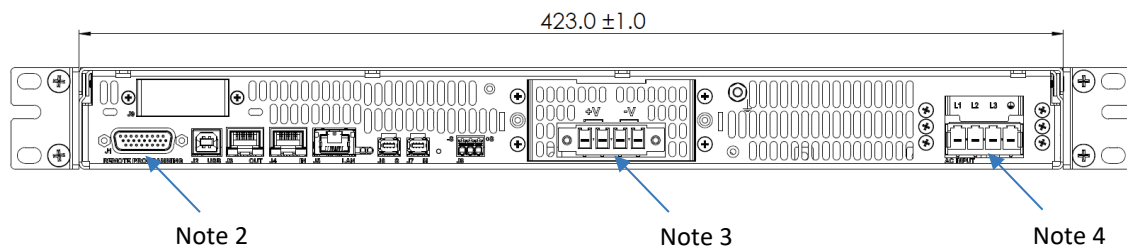
Standard Unit Front View:



Blank Panel Unit Front View:



Standard & Blank Panel Units Rear View:



Standard & Blank Panel Units Side View:

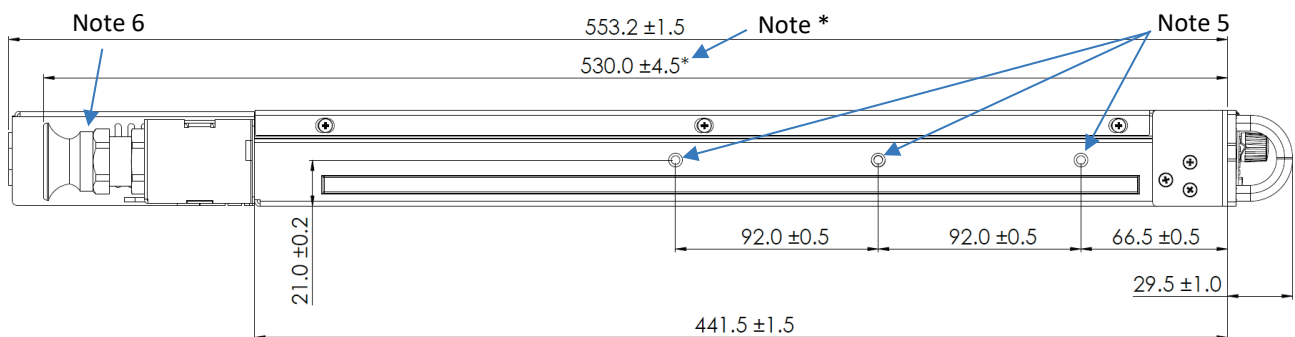
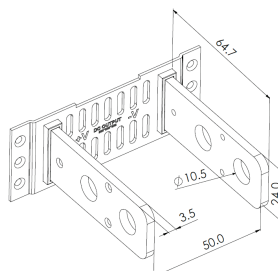


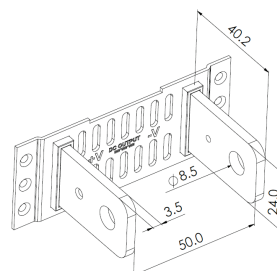
Table 1

V \ kW	1.7	2.7	3.4	5
10	L1	L1	L1	L1
20	L2	L1	L1	L1
30	L2	L2	L1	L1
40	L2	L2	L2	L1
60~100	L2	L2	L2	L2

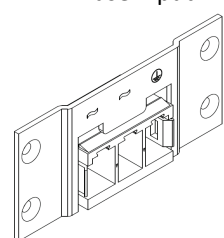
Bus-bar Detail L1



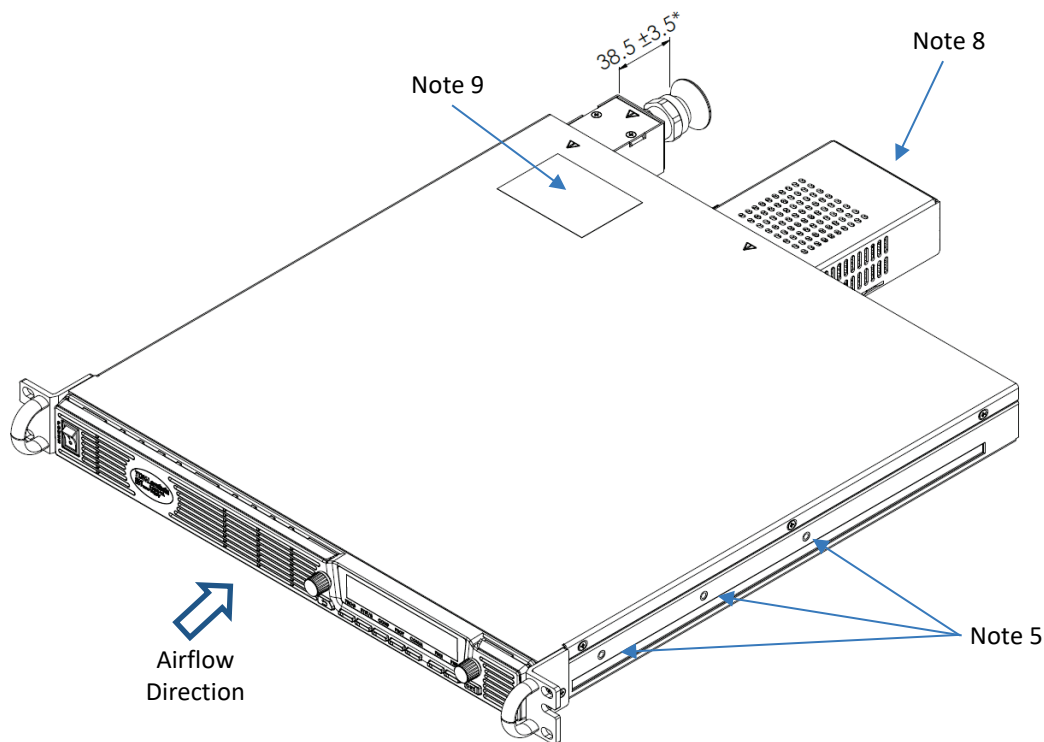
Bus-bar Detail L2



Note 4
1-Phase input



Dimensions are in mm.



NOTES:

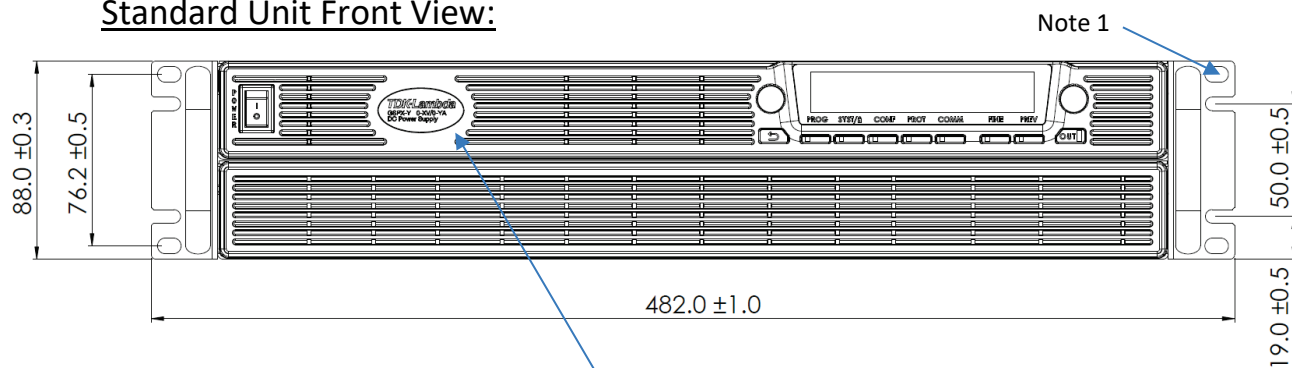
1. Mounting holes for 19" rack. Use M6x16 screws to fix the unit to the rack.
2. Isolated control and signals connector. Mating plug supplied with power supply.
3. Bus bars for 10V to 100V models. See Table 1, Bus-bar Detail L1 and Bus-bar Detail L2. 150V to 600V models connector shown (mating plug supplied with power supply).
4. AC input connector (3-Phase shown). Refer to 1-Phase input drawing.
5. Mounting holes for chassis slides, GENERAL DEVICES P/N: CC3001-00-S160 or equivalent.
Use #10-32x0.38inch x3 screws each slide.
Ensure that the screws do not penetrate more than 6.0mm into the unit.
6. AC cable strain relief, LAPP GROUP P/N: 5301 5440 (supplied with the power supply).
7. Model name, output rating and company logo are shown here according to the specifications.
8. Output enclosure (supplied with the power supply).
9. AC input rating and safety approval symbols are shown here according to the specifications.

*. Strain Relief tolerance is dependent on the width of the wire used and tightening strength.

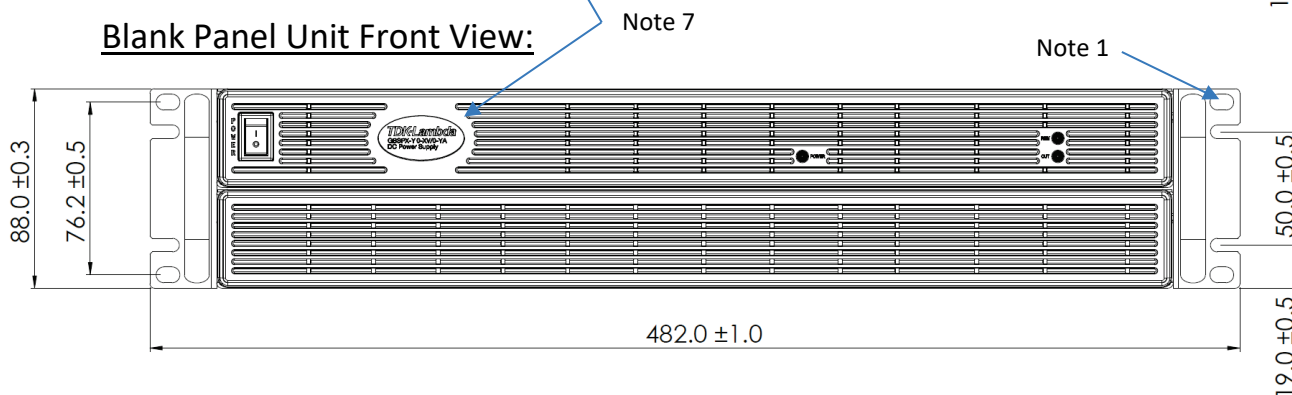
Dimensions are in mm.

3.2 10kW Power Supply Outline

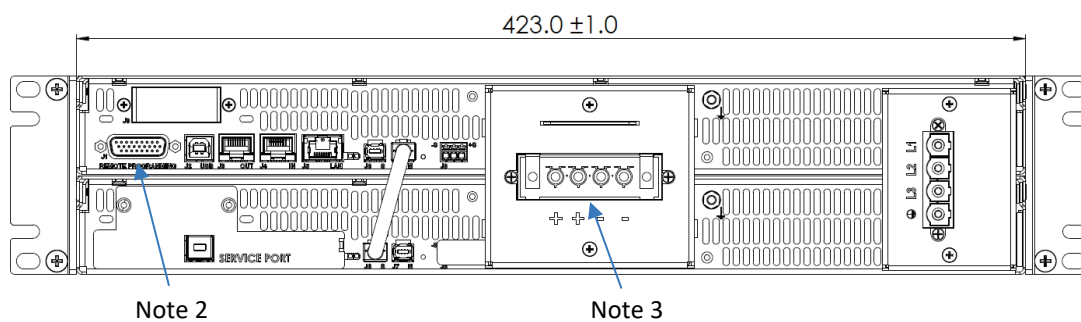
Standard Unit Front View:



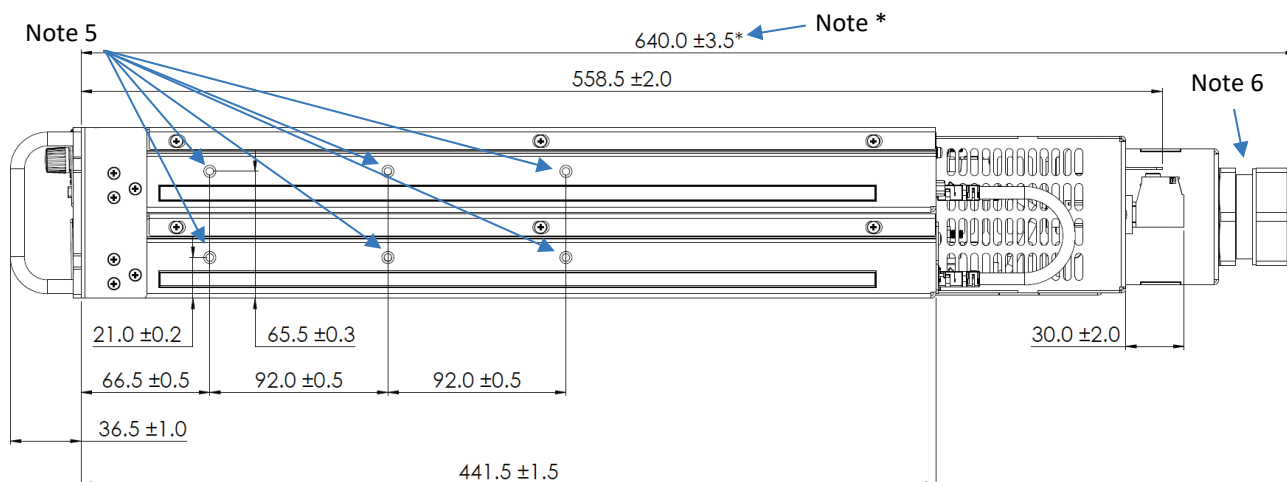
Blank Panel Unit Front View:



Standard & Blank Panel Units Rear View:



Standard & Blank Panel Units Side View (150V ~ 600V):



Dimensions are in mm.

Standard & Blank Panel Units Side View (10V ~ 100V):

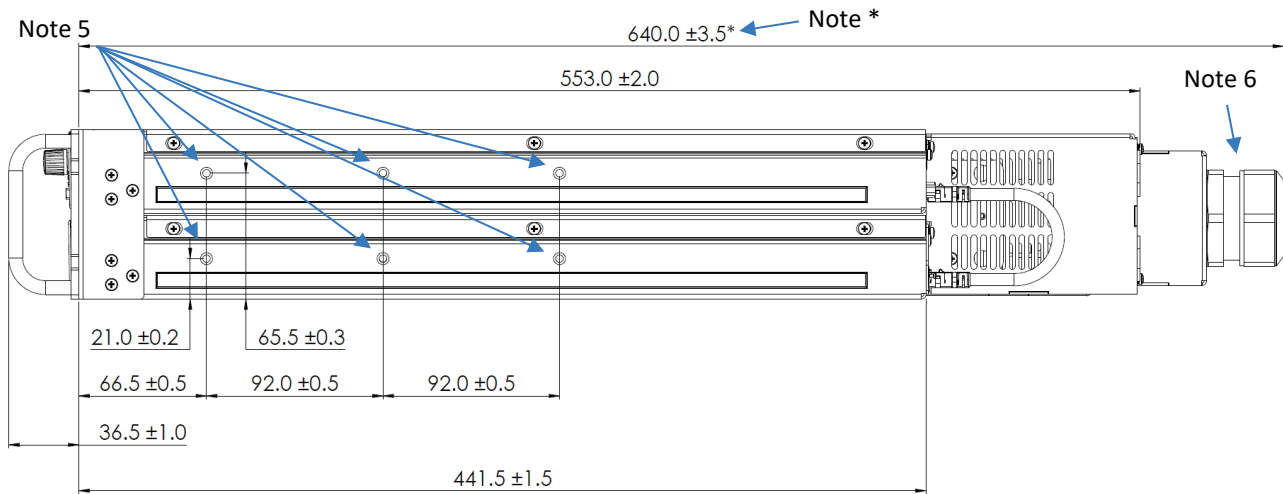
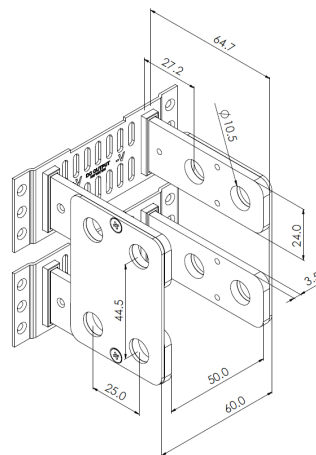


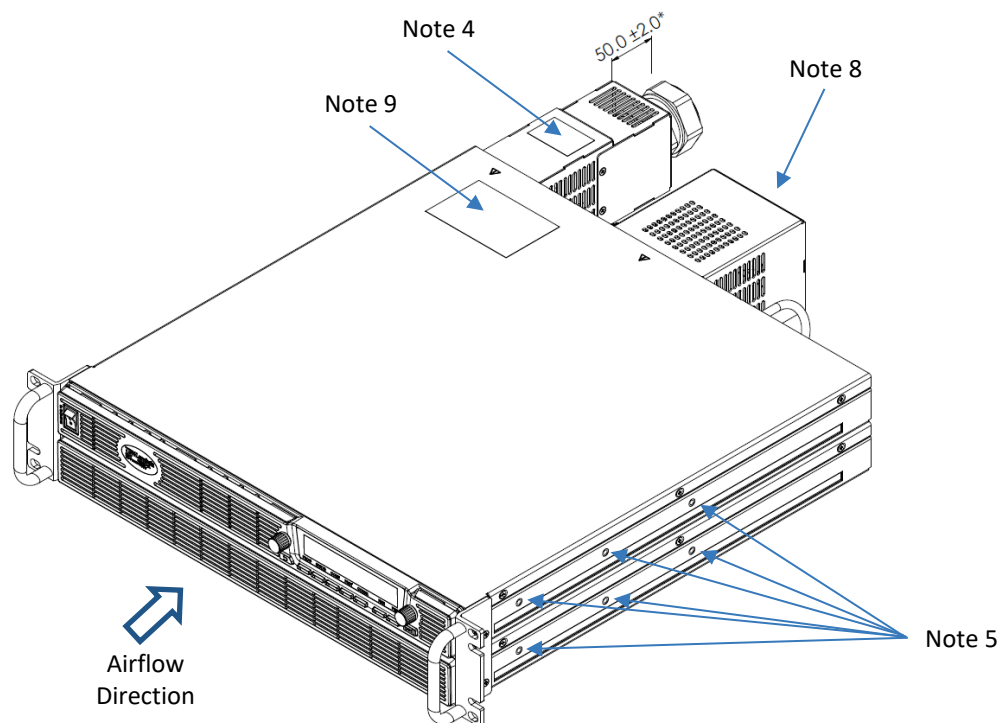
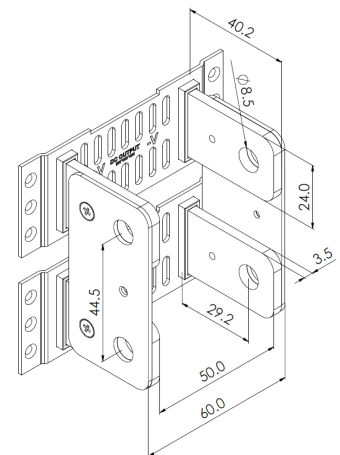
Table 1

V	kW	10
10	L1	
20	L1	
30	L1	
40	L1	
60~100	L2	

Bus-bar Detail L1



Bus-bar Detail L2



Dimensions are in mm.

NOTES:

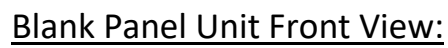
1. Mounting holes for 19" rack. Use M6x16 screws to fix the unit to the rack.
2. Isolated control and signals connector. Mating plug supplied with power supply.
3. Bus bars for 10V to 100V models. See Table 1, Bus-bar Detail L1 and Bus-bar Detail L2. 150V to 600V models connector shown (mating plug supplied with power supply).
4. High leakage current warning label.
5. Mounting holes for chassis slides, GENERAL DEVICES P/N: CC3001-00-S160 or equivalent.
Use #10-32x0.38inch x3 screws each slide.
Ensure that the screws do not penetrate more than 6.0mm into the unit.
6. AC cable strain relief, SIB P/N: F7024000 (supplied with the power supply).
7. Model name, output rating and company logo are shown here according to the specifications.
8. Output enclosure (supplied with the power supply) for 10~100V only.
9. AC input rating and safety approval symbols are shown here according to the specifications.

*. Strain Relief tolerance is dependent on the width of the wire used and tightening strength.

Dimensions are in mm.

3.3 15kW Power Supply Outline

Note 1



Note 7

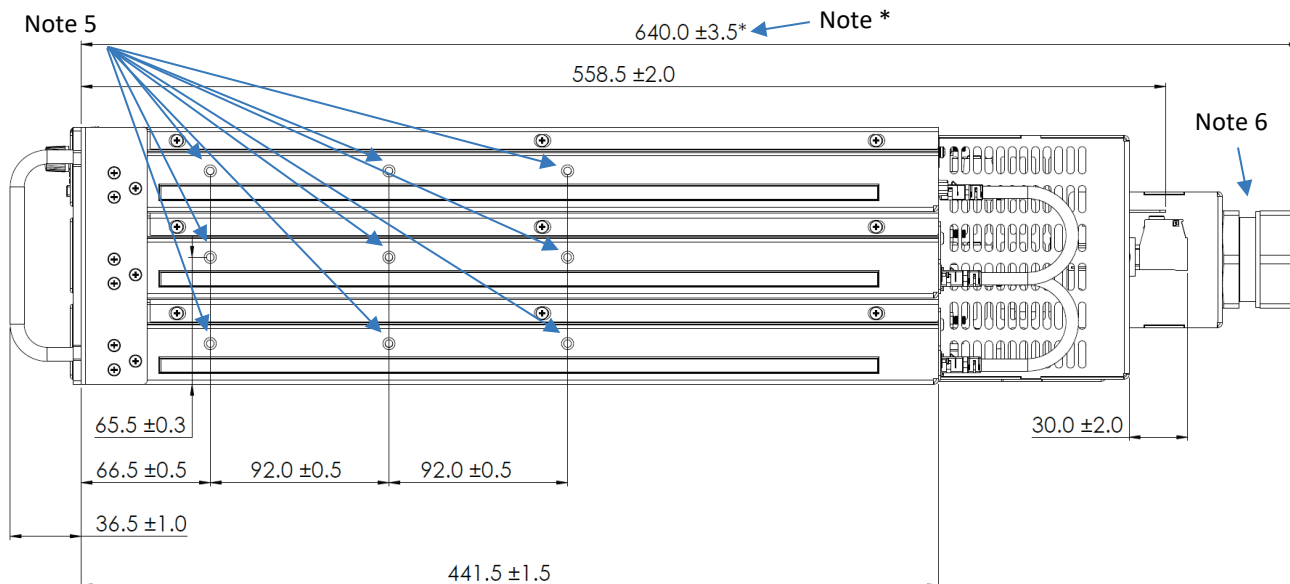
Note 1



Note 3

38

Standard & Blank Panel Units Side View (150V ~ 600V):



Standard & Blank Panel Units Side View (10V ~ 100V):

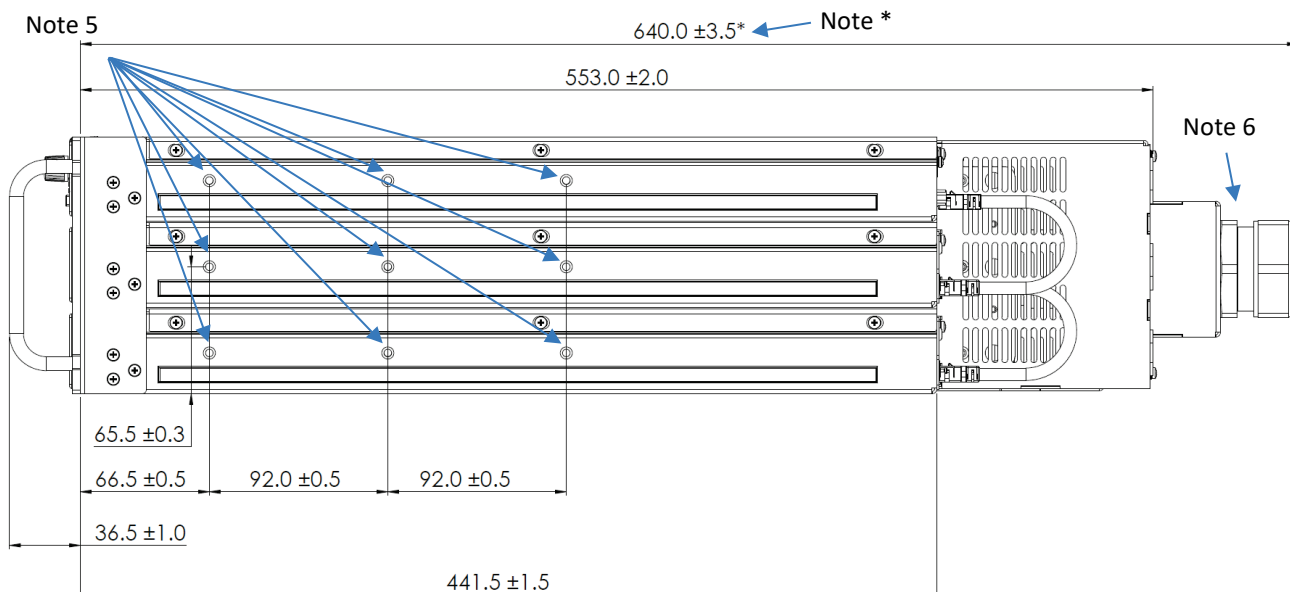
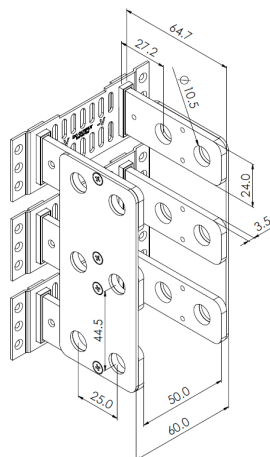


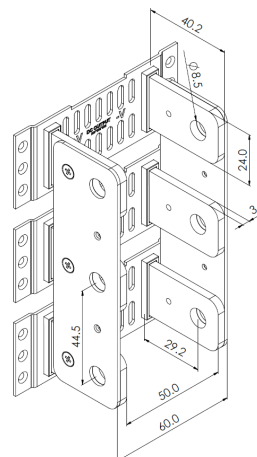
Table 1

V	kW	15
10	L1	
20	L1	
30	L1	
40	L1	
60~100	L2	

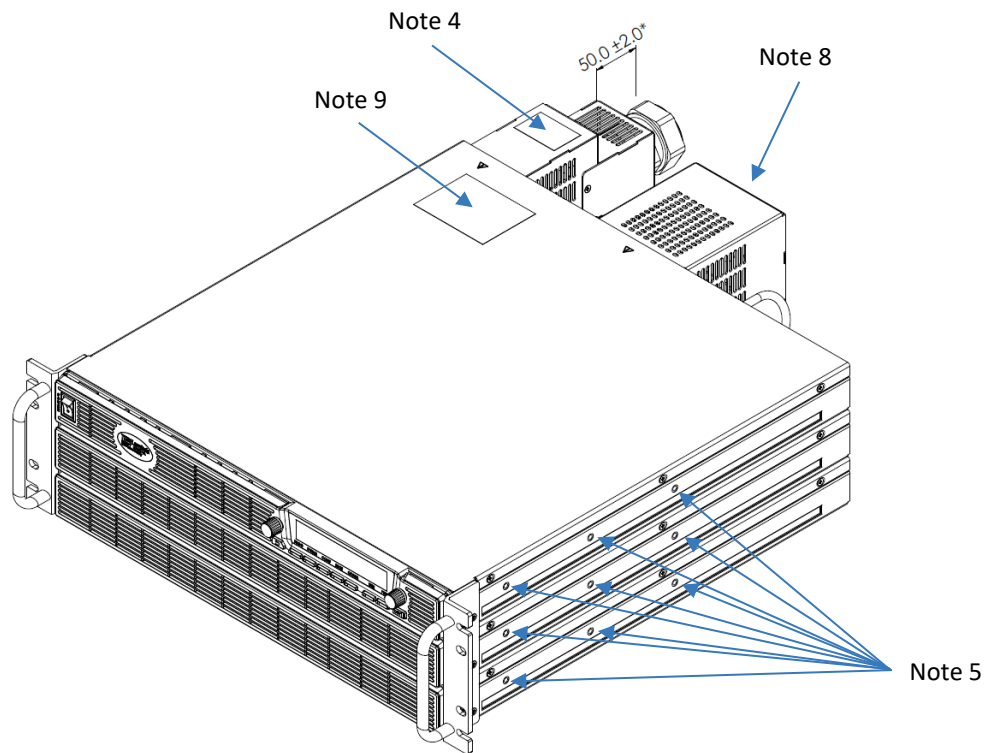
Bus-bar Detail L1



Bus-bar Detail L2



Dimensions are in mm.



NOTES:

1. Mounting holes for 19" rack. Use M6x16 screws to fix the unit to the rack.
2. Isolated control and signals connector. Mating plug supplied with power supply.
3. Bus bars for 10V to 100V models. See Table 1, Bus-bar Detail L1 and Bus-bar Detail L2. 150V to 600V models connector shown (mating plug supplied with power supply).
4. High leakage current warning label.
5. Mounting holes for chassis slides, GENERAL DEVICES P/N: CC3001-00-S160 or equivalent. Use #10-32x0.38inch x3 screws each slide. Ensure that the screws do not penetrate more than 6.0mm into the unit.
6. AC cable strain relief, SIB P/N: F7024000 (supplied with the power supply).
7. Model name, output rating and company logo are shown here according to the specifications.
8. Output enclosure (supplied with the power supply) for 10~100V only.
9. AC input rating and safety approval symbols are shown here according to the specifications.

*. Strain Relief tolerance is dependent on the width of the wire used and tightening strength.

Dimensions are in mm.

CHAPTER 4: INSTALLATION

CAUTION

Observe all torque guidelines within this manual. Over torque may damage unit or accessories. Such damage is not covered under manufacturer's warranty.

VORSICHT

Beachten Sie alle Drehmoment-Richtlinien in diesem Handbuch. Wird ein zu großes Drehmoment eingestellt bzw. verwendet, können dadurch das Gerät oder die Zubehörteile beschädigt werden. Solche Schäden sind nicht von der Hersteller-Garantie abgedeckt.

4.1 General

This chapter contains instructions for initial inspection, preparation for use and repackaging for shipment. Connection to PC, setting the communication port and linking **GENESYS™** power supplies are described in the User manual.

NOTE

GENESYS™ power supplies generate magnetic fields, which might affect the operation of other instruments. If your equipment is susceptible to magnetic fields, do not position it adjacent to the power supply.

NOTIZ

Die **GENESYS™** Netzgeräte können magnetische Felder erzeugen, die den Betrieb anderer Geräte möglicherweise beeinträchtigen. Wenn Ihr Gerät empfindlich gegenüber magnetischen Feldern ist, positionieren Sie diese nicht in der Nähe des Netzgeräts.

WARNING

15kW GSP / GBSP Power Supply systems must be carried by both handles.

WARNUNG

Die 15-kW-GSP / GBSP-Stromversorgungssysteme müssen an beiden Handgriffen getragen werden.

4.2 Preparation for Use

In order to be operational, the power supply must be connected to an appropriate AC source. The AC source voltage should be within the power supply specification. Do not apply power before reading the safety instructions and Section 4.6.

Table 4-1 below, describes the basic setup procedure. Follow the instructions in Table 4-1 in the sequence given to prepare the power supply for use.

Step no.	Item	Description	Reference
1	Inspection	Initial physical inspection of the power supply	Section 4.3
2	Installation	Installing the power supply, Ensuring adequate ventilation.	Section 4.4 Section 0
3	AC source	AC source requirements Connecting the power supply to the AC source.	Safety instructions Section 4.6
4	Test	Turn-on checkout procedure.	Section 4.7
5	Load connection	Wire size selection. Local /Remote sensing. Single or multiple loads.	Section 4.8
6	Default setting	The power supply setting at shipment.	User Manual

Table 4-1: Basic Setup Procedure

4.3 Initial Inspection

Prior to shipment this power supply was inspected and found free of mechanical or electrical defects. Upon unpacking of the power supply, inspect for any damage which may have occurred in transit. The inspection should confirm that there is no exterior damage to the power supply such as broken knobs or connectors and that the front panel and meter faces are not scratched or cracked. Keep all packing material until the inspection has been completed. If damage is detected, file a claim with carrier immediately and notify the TDK-Lambda sales or service facility nearest you.

4.4 Rack Mounting

The **GENESYS™** power supply series is designed to fit in a standard 19" equipment rack.

4.4.1 Install the Power Supply in a Rack

1. Use the front panel rack-mount brackets to install the power supply in the rack.
2. Use a support bar to provide adequate support for the rear of the power supply. Do not obstruct the air exhaust at the rear panel of the Unit.

4.4.2 Rack Mount Slides (Optional)

Use rack mount slides: General Devices Catalog Number: C-300-S-116. Part/Drawing Number: CC3001-00-0160 or equivalent to install the unit in a standard 19" equipment rack. Refer to Figure 4-1, Figure 4-2 and Figure 4-3 for slides assembly instructions. Use three #10-32x0.38"(max.) screws at each side. To prevent internal damage, use the specified screw length only.

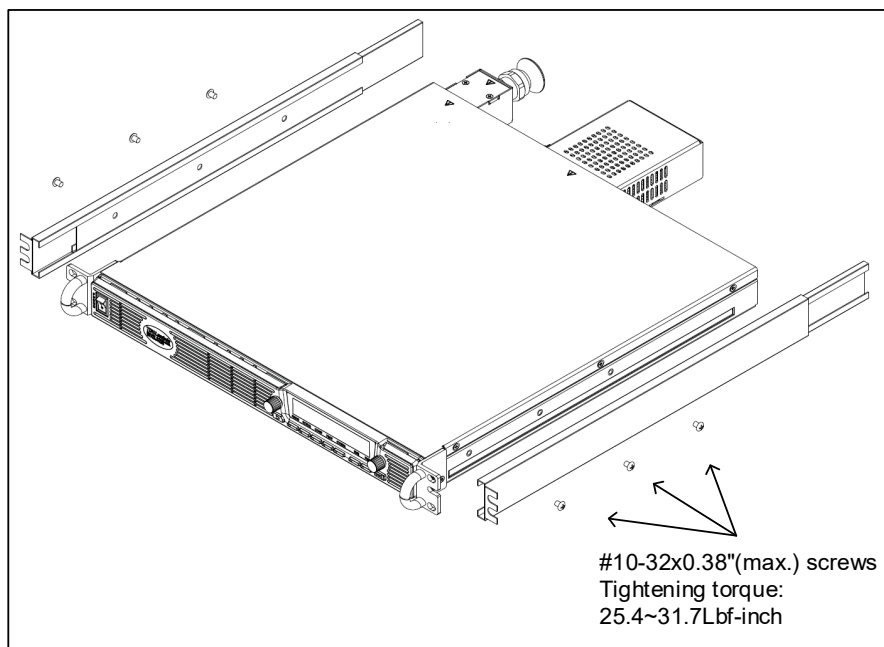


Figure 4-1: 1.7 ÷ 5kW Rack – Mount Slides Assembly

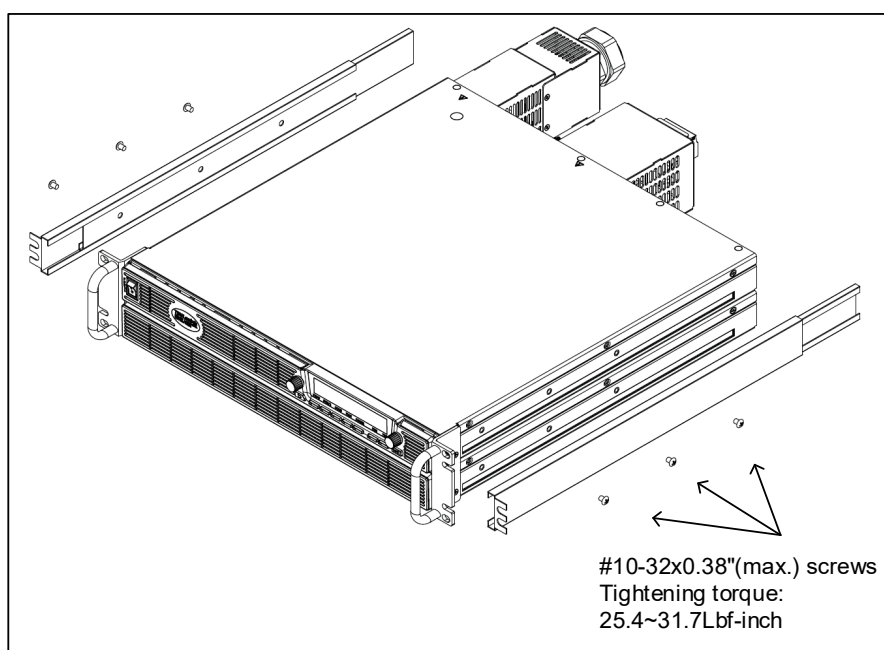


Figure 4-2: 10kW Rack – Mount Slides Assembly

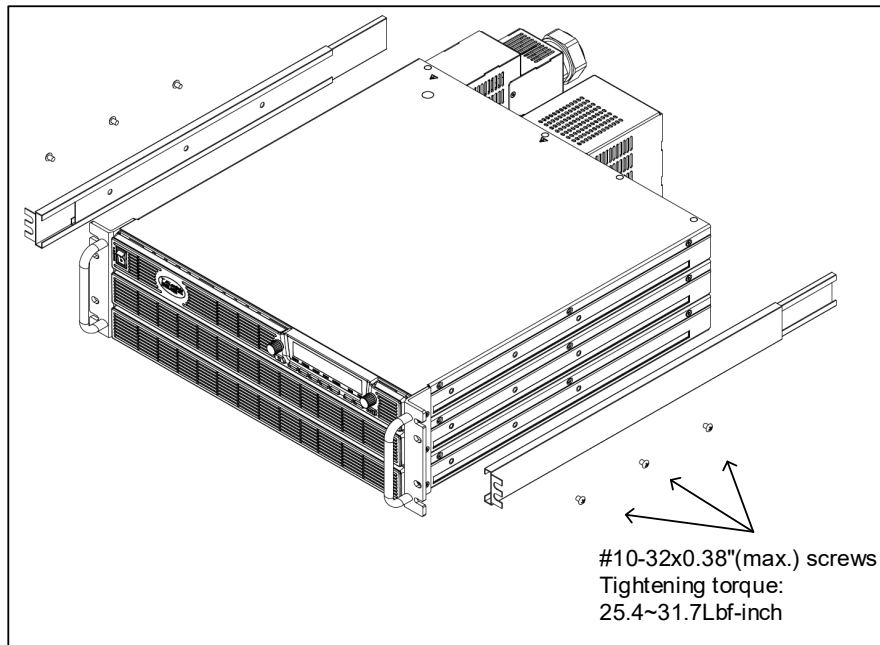


Figure 4-3: 15kW Rack – Mount Slides Assembly

NOTES

1. 10kW and 15kW power supplies can be mounted on a single rack mount slide (each side).
2. For 10kW power supply, it is possible to mount rack mount slides on the top or the bottom unit.
3. For 15kW power supply, it is recommended to mount rack mount slides on the middle unit.

4.5 Location, Mounting and Cooling

This power supply is fan cooled. The air intake is at the front panel and the exhaust is at the rear panel. Upon installation allow cooling air to reach the front panel ventilation inlets.

CAUTION

Allow minimum 10cm (4") of unrestricted air space at the front and the rear of the unit. The power supply should be used in an area where the ambient temperature does not exceed +50°C.

VORSICHT

Halten Sie vor und hinter dem Gerät einen lichten Mindestabstand von 10 cm ein. Das Netzgerät sollte nur in Arbeitsbereichen benutzt werden, in denen die Umgebungstemperatur +50 °C nicht übersteigt.

4.6 AC Input Power Connection

This Power supply shall be connected to the AC source via protective device (Circuit breaker, fuses, etc...) with the following maximum ratings:

- 30A for 1.7kW up to 5kW.
- 60A for 10kW.
- 90A for 15kW.

WARNING

There is a potential electrical shock hazard when using a power supply without input protection. Do not connect power supply to AC supply line without input protection properly assembled.

WARNUNG

Es besteht die Gefahr eines Stromschlags, wenn ein Netzgerät ohne Berührungsschutz in Betrieb genommen wird. Schließen Sie das Netzgerät nicht an Ihren Versorgungskreis an, wenn der Berührungsschutz nicht ordnungsgemäß angebracht wurde.

CAUTION

Connection of this power supply to an AC source should be made by an electrician or other qualified personnel.

VORSICHT

Nur Elektriker oder anderes Fachpersonal sollten dieses Netzgerät an die Wechselstromquelle anschließen.

CAUTION

There is a potential shock hazard if the power supply chassis (with cover in place) is not connected to an electrical safety ground via the safety ground terminal in the AC input connector.

VORSICHT

Es besteht die Gefahr eines möglichen Stromschlages, wenn das Gehäuse des Netzgeräts (auch mit aufgesetzter Abdeckung) nicht über den vorgesehenen Schutzleiteranschluss an dem Wechselstrom-Eingangsanschluss mit der elektrischen Schutzterde verbunden ist.

WARNING

Some components inside the power supply are at AC voltage even when the On/Off switch is in the "Off" position. To avoid electric shock hazard, disconnect the AC cord and load, and wait two minutes before removing cover. Cover removal is allowed **only by TDK-Lambda qualified service personnel**.

WARNUNG

An einigen Komponenten im Innern des Netzgeräts liegt auch dann noch Wechselspannung an, wenn der Netzschalter bereits auf AUS steht. Um die Gefahr eines Stromschlags zu verhindern, trennen Sie das Netzkabel vom Versorgungsnetz und warten dann zwei Minuten, bevor Sie die Schutzabdeckung abnehmen. **Nur qualifizierte Servicekräfte von TDK-Lambda dürfen die Gehäuse-Abdeckung abnehmen.**

CAUTION

AC Input Wires No Conductor Pretreatment: All kinds of copper conductors can be clamped without pretreatment (Solid, Flexible, with ferrule, with/without plastic sleeve). It is forbidden to solder the conductors. The solder tin yields and fractures under high pressure. The result is an increased contact resistance and an excessive temperature rise. In addition, corrosion caused by pickling or fluxes has been observed on soldered conductor ends. Notch fractures at the transition point from the rigid to the flexible conductor area are also possible.

VORSICHT

Wechselstrom- Zuleitungen - Der Innenleiter muss nicht vorbereitet werden:

Alle Arten von Kupferleitungen können ohne Vorbehandlung fest geklemmt werden (feste, flexible Leiter, mit Aderendhülse, mit/ohne Kunststoffhülse). Es ist verboten, die Leiter vorab zu verlöten. Das Lötzinn gibt unter Druck nach und bricht. Dies führt zu einem erhöhten Kontaktwiderstand und erzeugt dadurch einen übermäßigen Temperaturanstieg. Zusätzlich wurde auf gelöteten Leiterenden Korrosion durch Einsatz von Beiz- oder Flussmitteln beobachtet. Kerbenbrüche am Übergangspunkt vom starren zum flexiblen Leiterbereich sind ebenfalls möglich.

CAUTION

The power supply ON/OFF switch is not the main "disconnect device" and does not completely disconnect all the circuits from the AC source. An appropriately rated "disconnect device" such as circuit breaker, industrial plug complying with IEC 60309 or with a comparable national standard, etc., shall be provided in the final installation. The "disconnect device" shall disconnect all supply lines simultaneously. The "disconnect device" must be easily accessible.

VORSICHT

Der eingebaute EIN- / AUS-Schalter des Netzgeräts ist nicht die Haupt-„Trennvorrichtung“ und trennt somit nicht alle Schaltkreise vollständig von der Wechselstromquelle. Eine entsprechend bemessene „Trennvorrichtung“ wie ein Sicherungsautomat, eine industrieller Steckanschluß der kompatibel mit der IEC 60309 oder einem vergleichbarem nationalen Standard ist, usw., sollen in der endgültigen System-Installation vorhanden sein. Diese „Trennvorrichtung“ sollte alle Versorgungsleitungen gleichzeitig unterbrechen und muss für das Service-Personal einfach zugänglich sein.

4.6.1 AC Input Connector

1. Ensure that the AC cable is disconnected from any electrical potential before making any connection to the power supply.

The AC input connector is a header (refer to Table 2-3: Rear Panel Connectors and Controls), located in the rear panel. The mating plug has screws connections (Refer to Section 1.3.1.2), and is provided in the accessories kit.

2. Use suitable wires and tightening torque to connect the mating plug:
 - Wire diameter: Refer to Table 1-2: Recommended AC Input Cables.
 - Tightening torque: 4.5-5.3 Lbf-inch. (0.5-0.6Nm).

AC Input Cord

WARNING

AC input cord is not provided with the power supply.

Refer to Section 1.3.2.5 for details for the recommended AC input cables and to Section 4.6 for disconnect device requirement.

WARNUNG

Die Netzzuleitung ist nicht im Lieferumfang bei der Auslieferung des Netzgerätes.

4.6.2 AC Input Wire Connection for 1.7kW ÷ 5kW

1. Strip the outside insulation of the AC cable approx. 10cm. Trim the wires so that the ground wire is 10mm longer than the other wires. Strip 10mm at the end of each of the wires.
2. Insert the Cable gland into the Strain relief bracket Assembly as shown in Figure 4-4.
3. Tighten the plastic nut (supplied in the accessories box), from the inside part of the bracket by using manual force only.

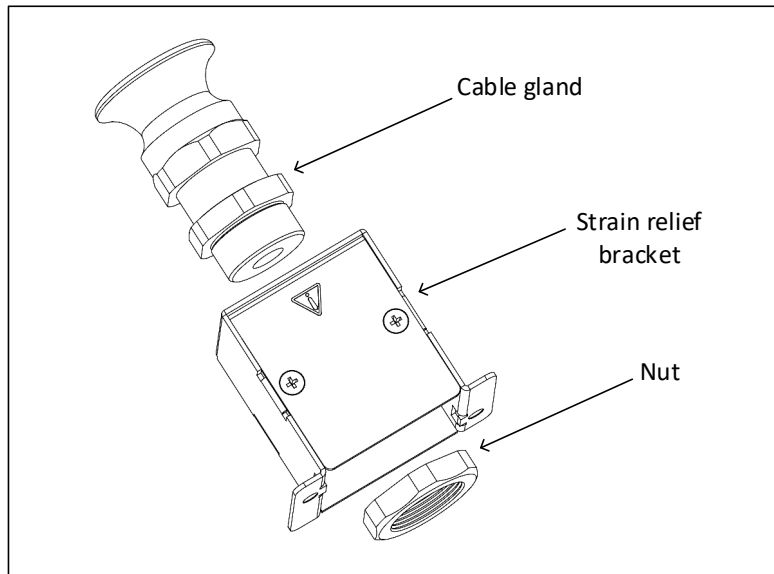


Figure 4-4: Insertion of the Plastic Nut into Strain Relief Bracket

4. Unscrew the conical cable entry part, until it will not apply any stress to the AC cable.
5. Insert the AC cable through the conic cable gland entry and the strain relief bracket as shown in Figure 4-5 (4-wires are shown, it applies to 1-Phase, 3-wires as well).

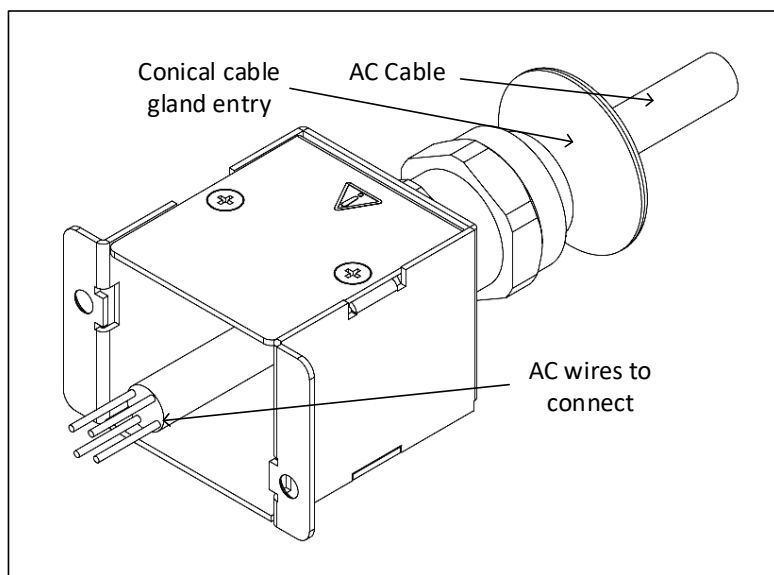


Figure 4-5: Stripped Wires Inserted Through

6. Insert the AC wires into the AC input connector as shown in Figure 4-6 (3-Phase is shown, it applies to 1-Phase as well).
7. Tighten the screws, tightening torque: 4.5-5.3 Lbf-inch. (0.5-0.6Nm).

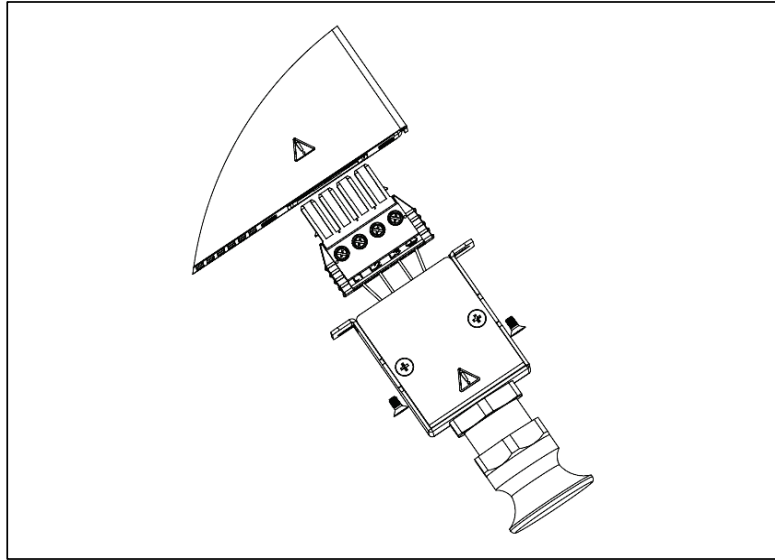


Figure 4-6: AC Wires Fixed to the AC Connector

8. After fixing the wires, close by manual force the cable gland conic entry part until the AC cable will be well tightened. Beware not to apply excessive force.
9. At this stage, the cable is securely fastened inside the strain relief assembly.
10. To fix the strain relief release assembly, unscrew two of the rear panel screws as shown in Figure 4-7 (3-Phase is shown, it applies to 1-Phase as well). Do not reuse these screws.

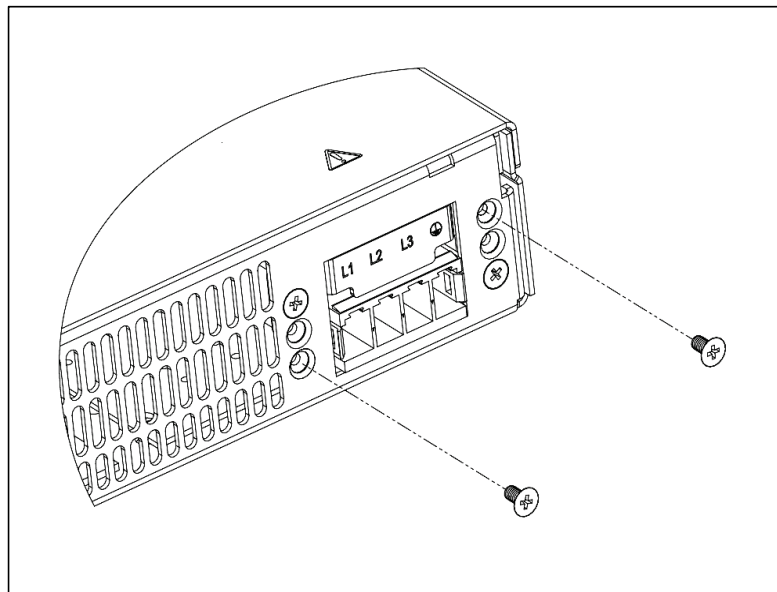


Figure 4-7: Unscrew the Rear Panel Screws

11. Fix the strain relief assembly, by two M3x8 Flat head screws, supplied in the accessories box, as shown in Figure 4-8. Tightening torque: 4.7-5.7 Lbf-inch. (0.53-0.64Nm).

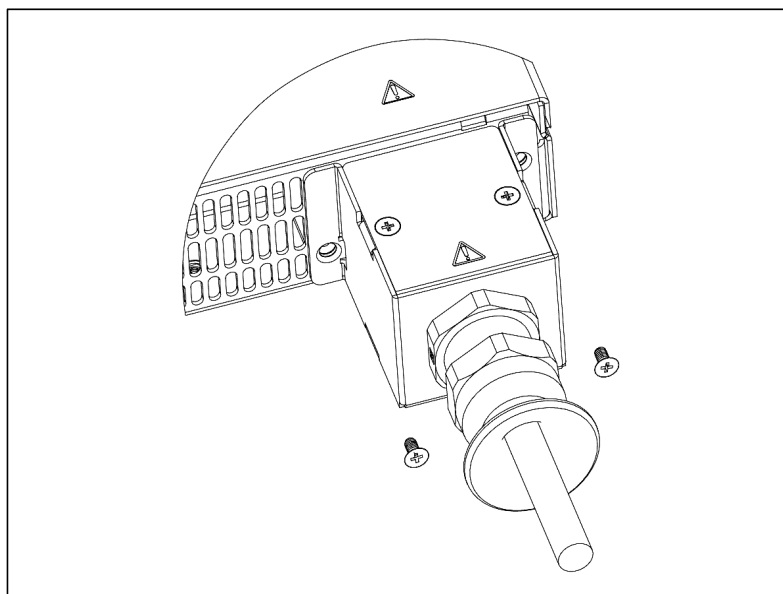


Figure 4-8: Strain Relief Assembled to Power Supply Rear Panel

4.6.3 AC Input Wire Connection for 10kW ÷ 15kW

1. Strip the outside insulation of the AC cable approx. 10cm. Trim the wires so that the ground wire is 10mm longer than the other wires. Strip 10mm at the end of each of the wires.
2. Insert the Cable gland into the Strain relief bracket Assembly as shown in Figure 4-9.
3. Tighten the plastic nut (supplied in the accessories box), from the inside part of the bracket by using manual force only.

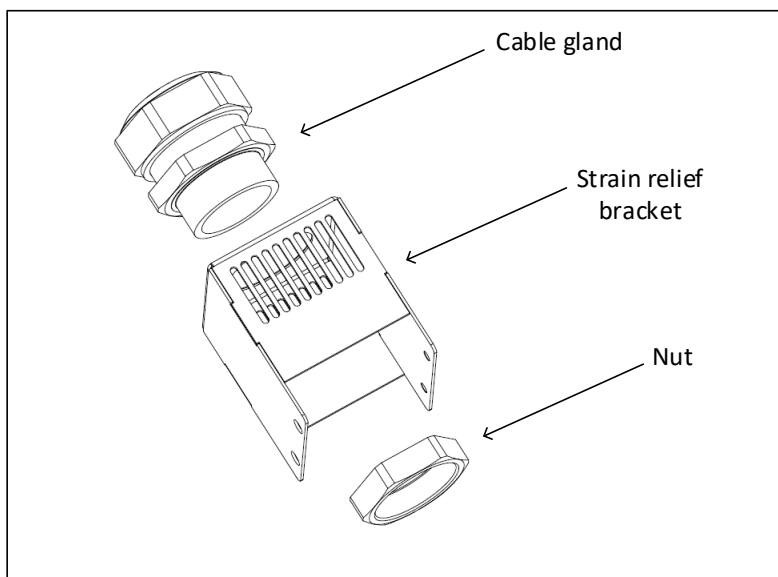


Figure 4-9: Insertion of the Plastic Nut into Strain Relief Bracket

4. Unscrew the conical cable entry part, until it will not apply any stress to the AC cable.

5. Insert the AC cable through the conic cable gland entry and the strain relief bracket as shown in Figure 4-10.

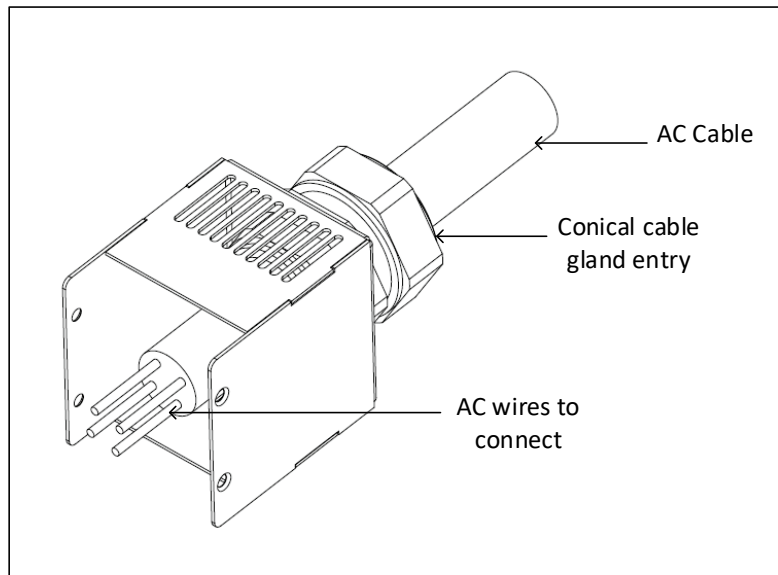


Figure 4-10: Stripped Wires Inserted Through

6. Insert the AC wires into the AC input connector as shown in Figure 4-11 (10kW is shown, it applies to 15kW as well).
7. Tighten the screws, tightening torque: 4.5-5.3 Lbf-inch. (0.5-0.6Nm).

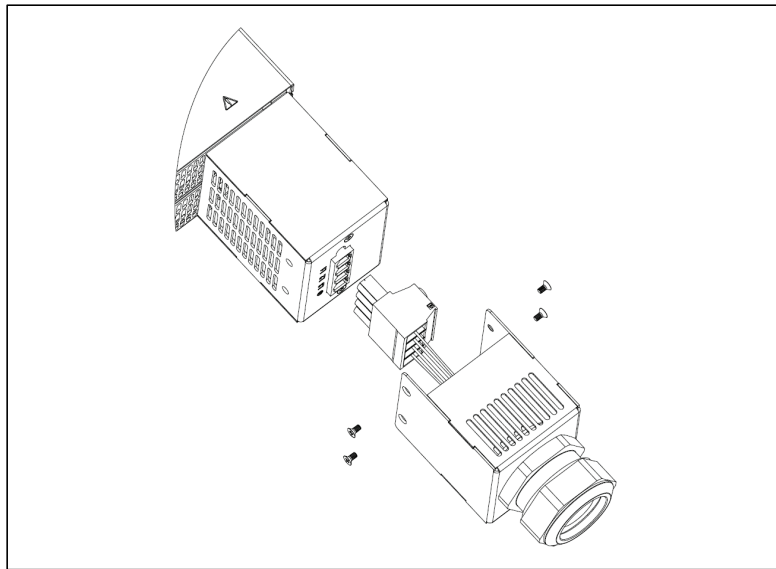


Figure 4-11: AC Wires Fixed to the AC Connector

8. After fixing the wires, close by manual force the cable gland conic entry part until the AC cable will be well tightened. Beware not to apply excessive force.
9. At this stage, the cable is securely fastened inside the strain relief assembly.

10. Fix the strain relief assembly, by 4 M3x8 Flat head screws, supplied in the accessories box, as shown in Figure 4-12 (10kW is shown, it applies to 15kW as well). Tightening torque: 4.7-5.7 Lbf-inch. (0.53-0.64Nm).

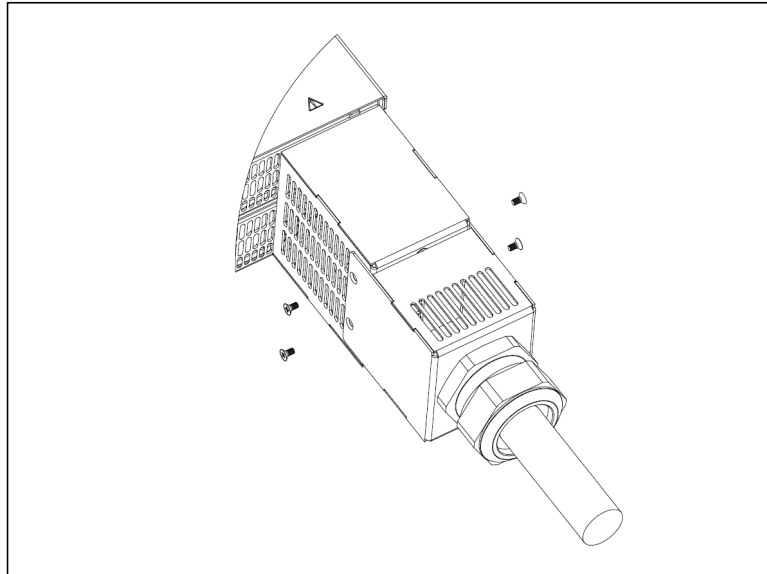


Figure 4-12: Strain Relief Assembled to Power Supply Rear Panel

4.7 Turn-On Checkout Procedure

WARNING

There is a potential electrical shock hazard when using a power supply without output protection. Do not turn ON power without output protection properly assembled. Turn OFF power supply or disconnect power supply from AC mains before making or changing any rear panel connection.

WARNUNG

Wenn ein Netzgerät ohne Berührungsschutz benutzt wird, besteht die Gefahr eines Stromschlags. Schalten Sie das Gerät nicht EIN, wenn der Berührungsschutz nicht ordnungsgemäß angebracht ist. Schalten Sie das Netzgerät AUS oder trennen das Netzgerät vom Versorgungsnetz ab, bevor Sie irgendwelche Anschlüsse an der Geräterückseite vornehmen oder ändern.

4.7.1 General

The following procedure ensures that the power supply is operational and may be used as a basic incoming inspection check. Refer to Figure 2-1 and Figure 2-3 for the location of the controls indicated in the procedure. Please note that this procedure is valid for standard units. For blank units, all the parameters settings and status reading can be made by using communication interfaces. Refer to the User manual for further information.

4.7.2 Prior to Operation

1. Ensure that the power supply is configured to the default setting:
2. Power On/Off switch at Off position.
3. Ensure that the protection of output terminals is mounted and properly assembled.
4. Connect the unit to an AC source as described in Section 4.6.
5. Connect a DVM with appropriate cables for the rated voltage to the output terminals.
6. Turn the front panel Power switch to On.
7. When power supply is turned ON and all LCD Display segments and LEDs illuminate momentarily, then the LCD display shows: "OUT OFF" (not applicable to Blank Panel power supply).
8. The power supply operating status is then displayed (not applicable to Blank Panel power supply).

4.7.3 Constant Voltage Check (Standard Power Supply)

1. Turn on the output by pressing OUT button so the OUT LED illuminates.
2. Observe the power supply Voltage display and rotate the Voltage encoder.
3. Ensure that the output voltage varies while the Voltage encoder is rotated. The minimum control range is from zero to the maximum rated output for the power supply model.
4. Compare the DVM reading with the front panel Voltage display to verify the accuracy of the Voltage display.
5. Ensure that the front panel CV indication on the LCD screen is active.
6. Turn off the front panel Power switch.

4.7.4 Constant Voltage Check (Blank Panel Power Supply)

1. Connect a USB cable from a PC to J2 (USB interface connector). Refer to Table 2-3: Rear Panel Connectors and Controls.
2. Run terminal communication software and send the following commands to turn power supply output ON:
3. INST:NSEL 6
4. OUTP 1
5. * Remember to use Carriage Return after each command.
6. Ensure that the output voltage varies while sending VOLT <XX> command. The control range is from zero to the maximum rated output for the power supply model.
7. * XX – Programmed voltage value.
8. Compare the DVM reading with the power supply readback voltage to verify the accuracy of the voltage readback. Send MEAS:VOLT? command to read power supply output voltage.
9. Turn off the front panel Power switch.

4.7.5 Constant Current Check (Standard Power Supply)

1. Ensure that the front panel Power switch is at Off position and the DVM connected to the output terminals shows zero voltage.
2. Connect a DC shunt across the output terminals.
3. Ensure that the shunt and the wires current ratings are higher than the power supply rating.
4. Connect a DVM to the shunt.
5. Turn the front panel Power switch to On position.
6. Turn on the output by pressing the OUT button so the OUT LED illuminates.
7. Observe the power supply Current display and rotate the Current encoder.
8. Ensure that the output current varies while the Current encoder is rotated. The minimum control range is from zero to the maximum rated output for the power supply model.
9. Compare the DVM reading with the front panel Current display to verify the accuracy of the Current display.
10. Ensure that the front panel CC indication on the LCD screen is active.
11. Turn off the front panel Power switch.
12. Remove the shunt from the power supply output terminals.

4.7.6 Constant Current Check (Blank Panel Power Supply)

1. Ensure that the front panel Power switch is at Off position and the DVM connected to the output terminals shows zero voltage.
2. Connect a DC shunt across the output terminals.
3. Ensure that the shunt and the wires current ratings are higher than the power supply rating.
4. Connect a DVM to the shunt.
5. Connect a USB cable from a PC to J2 (USB interface connector). Refer to Table 2-3: Rear Panel Connectors and Controls.
6. Turn the front panel Power switch to On position.
7. Run terminal communication software and send the following commands to turn power supply output ON:
8. INST:NSEL 6
9. OUTP 1
10. * Remember to use Carriage Return after each command.
11. Ensure that the output current readback varies while sending CURR <YY> command. The control range is from zero to the maximum rated output for the power supply model. Send MEAS:CURR? command to read power supply output current.
12. * YY – Programmed current value.

13. Compare the DVM reading with the readback current to verify the accuracy of the digital readback.
14. Turn off the front panel Power switch.
15. Remove the shunt from the power supply output terminals.

4.8 Connecting the Load

1. Turn off the AC input power before making or changing any rear panel connection.
2. Ensure that all connections are securely tightened before applying power.

WARNING

There is a potential shock hazard when using a power supply with an output voltage greater than 60VDC. Turn off the AC input power before making or changing any rear panel connection.

Ensure that the protection of output plug is mounted and properly assembled for power supplies when output voltage exceed 60VDC. Ensure that all connections are securely tightened before applying power.

WARNUNG

Bei Einsatz eines Netzgeräts mit einer Ausgangsspannung von über 60 VDC besteht das Risiko eines Stromschlags. Schalten Sie die AC-Eingangsspannung immer AUS, bevor Sie irgendwelche Anschlüsse an der Geräterückseite vornehmen oder verändern. Stellen Sie sicher, dass die Schutzabdeckung des Ausgangssteckers ordnungsgemäß angebracht ist, wenn Ausgangsspannungen von mehr als 60 VDC auftreten können. Stellen Sie sicher, dass alle Verbindungen sicher und fest angeschlossen sind, bevor Sie Spannung anlegen.

4.8.1 Load Wiring

The following considerations should be made to select wiring for connecting the load to the power supply:

- Current carrying capacity of the wire (refer to Section 4.8.2)
- Insulation rating of the wire should be at least equivalent to the maximum output voltage of the power supply.
- Maximum wire length and voltage drop (refer to Section 4.8.2)
- Noise and impedance effects of the load wiring (refer to Section 4.8.5).

4.8.2 Current Carrying Capacity

Two factors must be considered when selecting the wire size:

- Wires should be at least heavy enough not to overheat while carrying the power supply load current at the rated load, or the current that would flow in the event the load wires were shorted, whichever is greater.

- Wire size should be selected to enable voltage drop per lead to be less than 1.0V at the rated current. Although units will compensate higher voltage drop in each load wire (refer to the specifications). It is recommended to minimize the voltage drop (1V maximum) to prevent excessive output power consumption from the power supply and poor dynamic response to load changes. Please refer to Table 4-2 for the recommended wires types to limit voltage drop in American and European dimensions respectively.

Output current	Recommended wires (mm ²)	Recommended wires (AWG)	Recommended lugs/Connector
0A ÷ 10A	1	16 AWG	For 1.7kW ÷ 5kW: Phoenix contact IPC 5/ 4-STF-7,62. For 10kW ÷ 15kW: Phoenix contact IPC 16/ 4-STF-10,16 (Supplied in Accessories kit)
10A ÷ 25A	2.5	12 AWG	For 1.7kW ÷ 5kW: Phoenix contact IPC 5/ 4-STF-7,62. For 10kW ÷ 15kW: Phoenix contact IPC 16/ 4-STF-10,16 (Supplied in Accessories kit)
25A ÷ 40A	6 For 1.7kW ÷ 5kW: Solid/Flexible/With ferrule without plastic sleeve	8 AWG	For 1.7kW ÷ 5kW: Phoenix contact IPC 5/ 4-STF-7,62. For 10kW ÷ 15kW: Phoenix contact IPC 16/ 4-STF-10,16 (Supplied in Accessories kit)
40A ÷ 60A	10	6 AWG	For 1.7kW ÷ 5kW: 6 AWG Panduit LCMA10-8-C Or equivalent. For 10kW ÷ 15kW: Phoenix contact IPC 16/ 4-STF-10,16 (Supplied in Accessories kit). * For higher current, connect 2 6 AWG cables in parallel per terminal
60A ÷ 80A	16	4 AWG	4 AWG Panduit LCMA16-8-C Or equivalent
80A ÷ 100A	25	2 AWG	2 AWG Panduit LCMA25-8-C Or equivalent
100A ÷ 160A	50	"0" AWG	"0" AWG Panduit LCMD50-10CD-X Or equivalent
160A ÷ 190A	70	3/0 = 000	3/0 = 000 Panduit LCMD70-10CD-X Or equivalent
190A ÷ 260A	95	4/0 = 0000	4/0 = 0000 Panduit LCMD95-10CD-X Or equivalent
260A ÷ 500A	95 X 2 In Parallel	4/0 = 0000 (2 In Parallel)	4/0 = 0000 (2 In Parallel) Panduit LCMD95-10CD-X Or equivalent

Output current	Recommended wires (mm ²)	Recommended wires (AWG)	Recommended lugs/Connector
500A ÷ 1000A	95 X 2 In Parallel per bus-bar hole 4 wires per terminal	4/0 = 0000 (2 In Parallel per bus-bar hole) 4 wires per terminal	4/0 = 0000 (2 In Parallel) Panduit LCMD95-10CD-X Or equivalent
1000A ÷ 1500A	95 X 2 In Parallel per bus-bar hole 6 wires per terminal	4/0 = 0000 (2 In Parallel per bus-bar hole) 6 wires per terminal	4/0 = 0000 (2 In Parallel) Panduit LCMD95-10CD-X Or equivalent

Table 4-2: Recommended Cable Size for Output Connection

4.8.3 Bus bar Cover Limitation

Bus bar cover has a limited hole diameter. Choose load wires with insulation to fit into output protection cover. Refer to Table 4-2 for the recommended cable. Wires insulation should fit into the specifications in Figure 4-13.

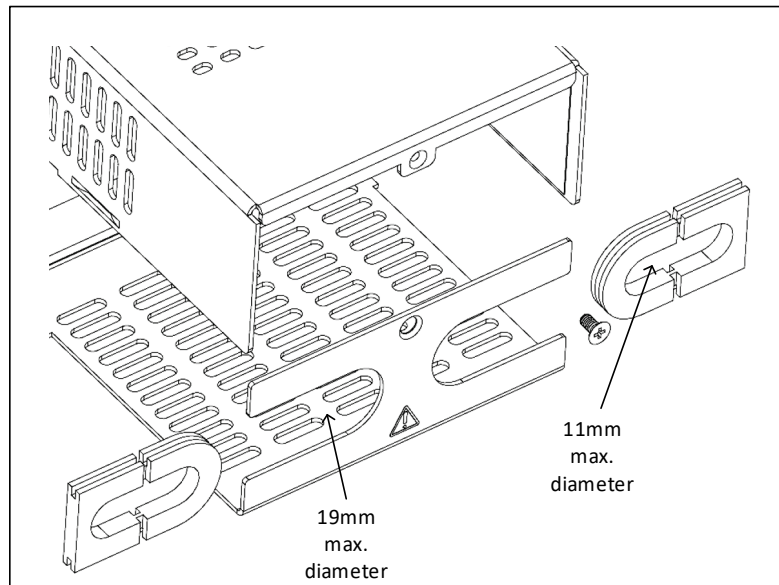


Figure 4-13: Bus bar Cover Wire Diameter Limitation

4.8.4 Wire Termination

The wires should be properly terminated with terminals securely attached. DO NOT use non-terminated wires for load connection at the power supply.

CAUTION

Reversing the sense wires might cause damage to the power supply in local and remote sensing. (Do not connect -S to +V or +S to -V.)

VORSICHT

Ein verpolter Anschluss der Fühlerleitungen an die Last, kann zu einem Defekt der Stromversorgung sowohl bei lokalem als auch bei entferntem Sensebetrieb führen.
(Niemals die Anschlüsse des –S auf +V bzw. +S auf –V verschalten.)

4.8.5 Noise and Impedance Effects

To minimize the noise pickup or radiation, the load wires and remote sense wires should be twisted pairs to the shortest possible length. Shielding of sense leads may be necessary in high noise environments. Where shielding is used, connect the shield to the chassis via a rear panel Ground screw. Even if noise is not a concern, the load and remote sense wires should be twisted-pairs to reduce coupling, which might impact the stability of power supply. The sense leads should be separated from the power leads.

4.8.6 Inductive Loads

Inductive loads can produce voltage spikes that may be harmful to the power supply. A diode should be connected across the output. The diode voltage and current rating should be greater than the power supply maximum output voltage and current rating. Connect the cathode to the positive output and the anode to the negative output of the power supply.

Where positive load transients such as back EMF from a motor may occur, connect a surge suppressor across the output to protect the power supply. The breakdown voltage rating of the suppressor must be approximately 10% higher than the maximum output voltage of the power supply.

4.8.7 Making the Load Connections**WARNING**

Hazardous voltages may exist at the outputs and the load connections when using a power supply with a **rated** output greater than 40V. To protect personnel against accidental contact with the hazardous voltages, ensure that the load and its connections have no accessible live parts. Ensure that the load wiring insulation rating is greater than, or equal to, the maximum output voltage of the power supply. Ensure that the protection of output Connector/ Bus bars is properly assembled.

WARNUNG

An den Ausgängen und den Ladungsanschlüssen kann gefährliche Spannung anliegen, wenn ein Netzgerät mit einer Nennleistung von mehr als 40V benutzt wird. Vergewissern Sie sich, dass es an der Last und ihren Anschlüssen keine berührbaren spannungsführenden Teile gibt, um das Personal vor unbeabsichtigtem Kontakt mit gefährlicher Spannung zu schützen. Vergewissern Sie sich, dass die Nennisolierung des stromführenden Leiters höher als die maximale Ausgangsspannung des Netzteils ist oder ihr entspricht. Vergewissern Sie sich, dass der Schutz des Ausgangsleiters / Stromanschlusses ordnungsgemäß installiert ist.

CAUTION

Ensure that the load wiring mounting hardware does not short the output terminals. Heavy connecting cables must have some form of strain relief to prevent loosening the connections or bending the bus bars.

VORSICHT

Vergewissern Sie sich, dass die Befestigungsmaterialien der Lastverdrahtung die Ausgangsklemmen nicht kurzschließt. Schwere Verbindungskabel müssen über eine Art von Zugentlastung verfügen, um ein Lösen der Verbindungen oder Verbiegen der Stromanschlüsse zu verhindern.

For All 1.7kW, 2.7kW, 3.4kW, 5kW, 10kW and 15kW models:

1. Prepare suitable wires and lugs according to the recommendations in Table 4-2.
2. Assemble and solder the lugs properly.

CAUTION

For high current outputs, it is very important to make the output connections properly, and follow the instructions. Improper connections may result in excessive temperature rise or power supply going into protection mode (if voltage drop on load wires is higher than specified in the specifications).

VORSICHT

Es ist sehr wichtig, bei hohen Stromabgaben die Ausgangsanschlüsse ordnungsgemäß herzustellen und die Anweisungen zu befolgen. Unsachgemäße Anschlüsse können zu einem übermäßigen Temperaturanstieg führen oder der Grund dafür sein, dass das Netzgerät in den Schutzmodus schaltet (wenn der Spannungsabfall auf den stromführenden Leitern die Spezifikationen überschreitet).

For 1.7kW 10V ÷ 20V, 2.7kW 10V ÷ 30V, 3.4kW 10V ÷ 40V and 5kW 10V ÷ 60V models:

3. Open the output protection assembly (supplied in the accessories kit) by unscrewing the screw in the rear side as shown in Figure 4-14. Remove both plastic protectors.

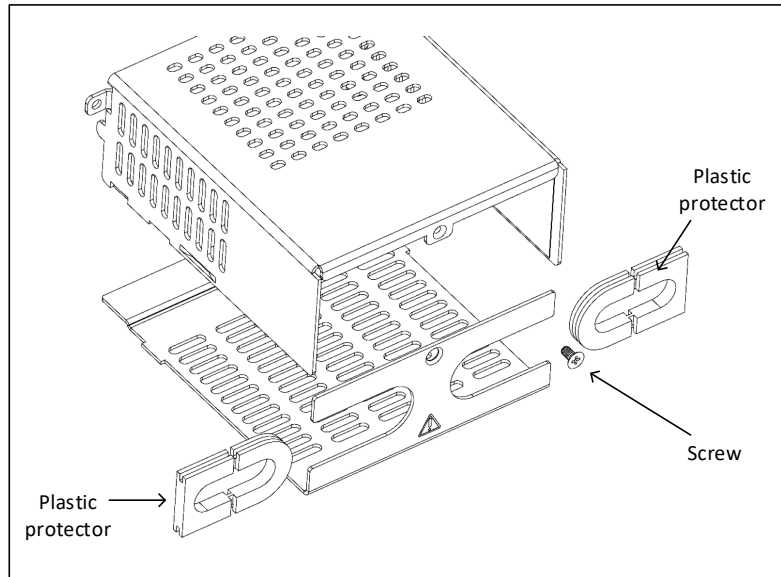


Figure 4-14: Disassembly of Output Protection

For 5kW 10V and 3.4kW 10V models only:

4. Fix the wires to the Bus bars as shown in Figure 4-15.
5. Close the output protection assembly. In this model, the plastic protectors will not be assembled.

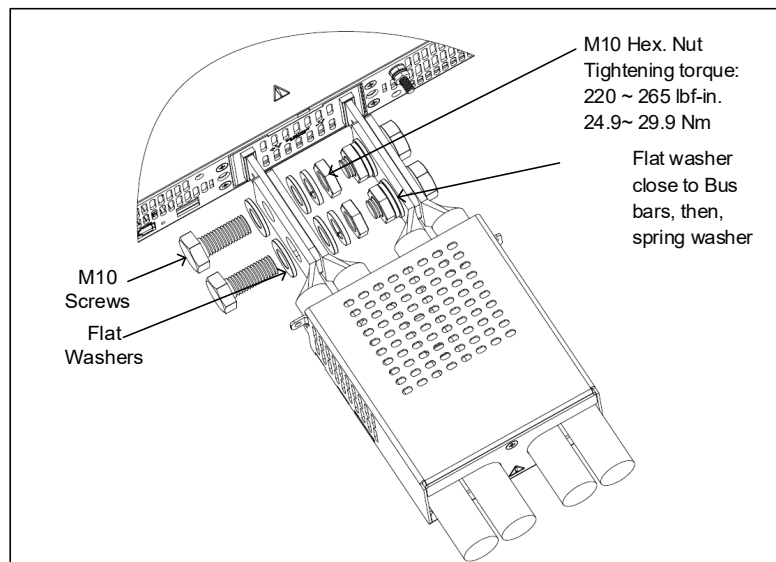


Figure 4-15: 10V Wires Assembly

For 1.7kW 10V ÷ 20V, 2.7kW 10V ÷ 30V, 3.4kW 20V ÷ 40V and 5kW 20V ÷ 60V models:

4. Remove & separate each plastic protector into two parts by cutting the plastic bridge between both parts, as shown in Figure 4-16.
5. Insert back to the protection assembly only the specified part, as shown in Figure 4-16.

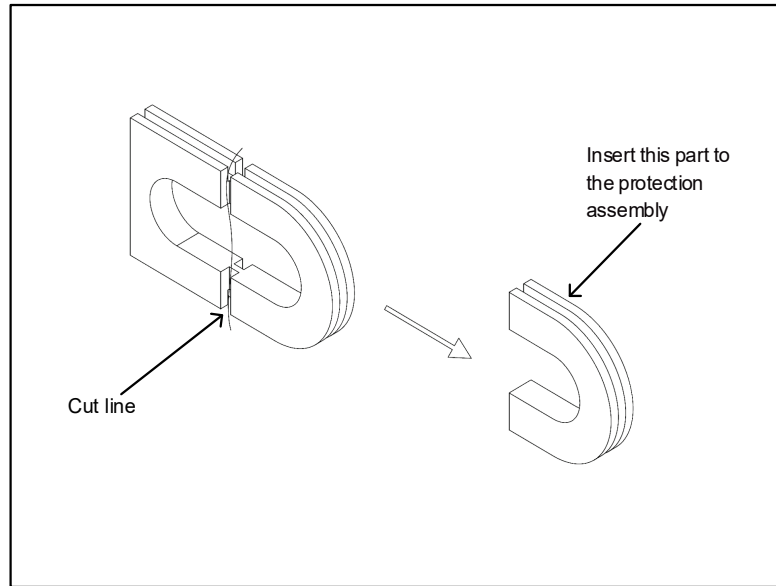


Figure 4-16: Plastic Protectors Separation

6. Fix the wires to the bus bars as shown in Figure 4-17. Close the output protection assembly with one part of the plastic protector assembled on each side, as shown in Figure 4-17.

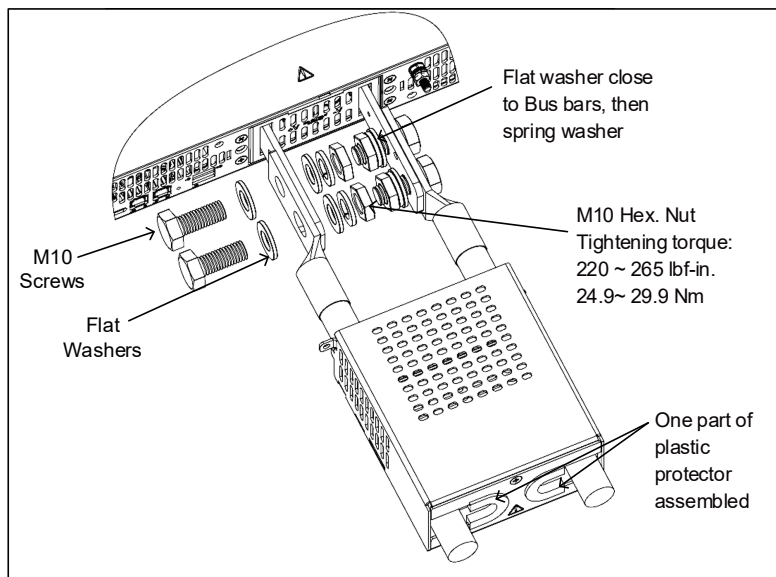


Figure 4-17: Wires Assembly

7. Assemble the Bus bars protection assembly to the rear panel of the power supply, by using two M3X6 Sems screws from the accessories kit, as shown in Figure 4-18.

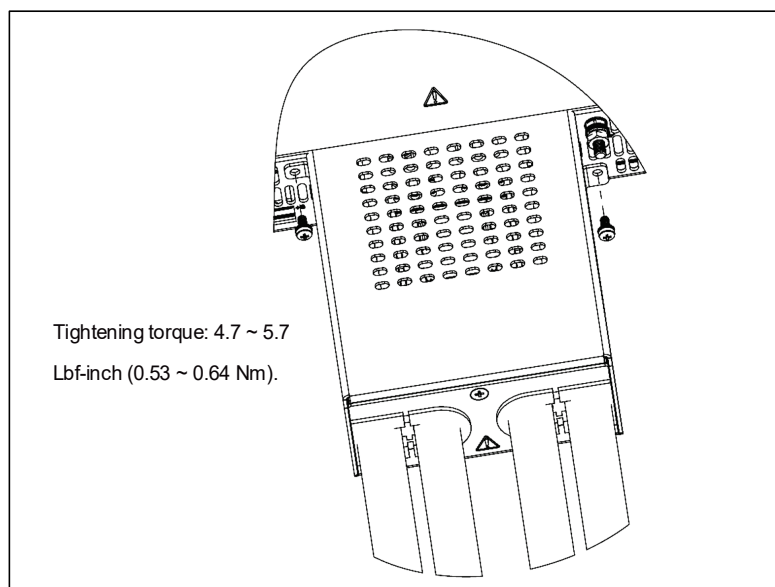


Figure 4-18: Fixing Bus bars protection assembly to the rear panel

For 1.7kW 30V ÷ 100V, 2.7kW 40V ÷ 60V, 3.4kW 60V ÷ 100V and 5kW 80V ÷ 100V models:

4. The recommended wires according to Table 4-2 can be inserted through the output protection assembly. No need to open the output protection assembly. Refer to Figure 4-19:

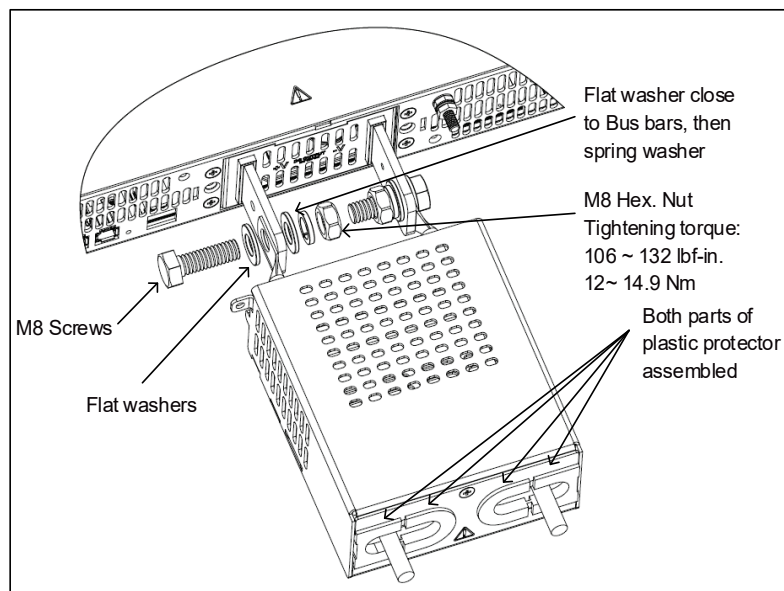


Figure 4-19: Wires assembly

5. Assemble the bus bars protection as shown in Figure 4-18.

For 10kW and 15kW 10V ÷ 40V models:

1. Open the output protection assembly by unscrewing bus bar cover and rear cover screws as shown in Figure 4-20 (15kW is shown, it applies to 10kW as well. For 10kW, there are 4 Bus bar cover screws only).
2. Disassemble Protection insulator as shown in Figure 4-20 (15kW is shown, it applies to 10kW as well).

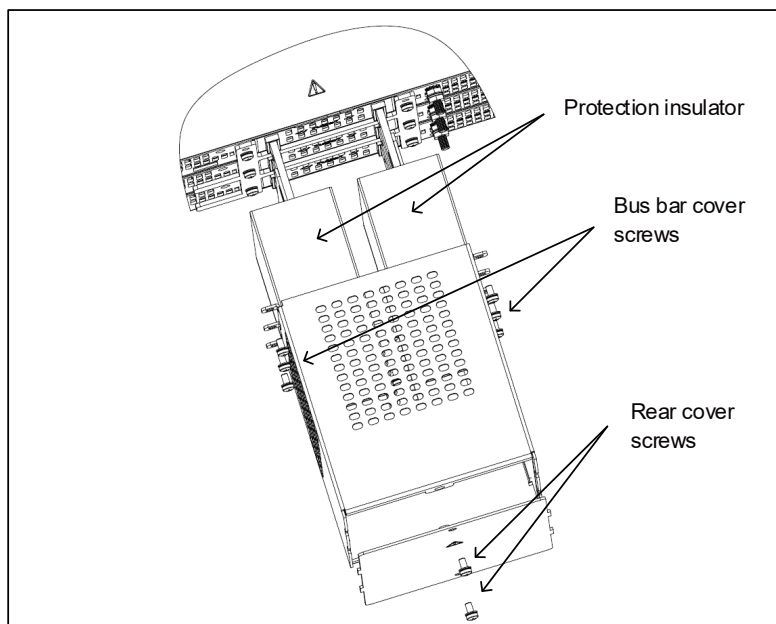


Figure 4-20: Disassembly of Output Protection

For 10kW and 15kW 10V model only:

3. Fix the wires to the Bus bars as shown in Figure 4-21 (15kW is shown, it applies to 10kW as well).

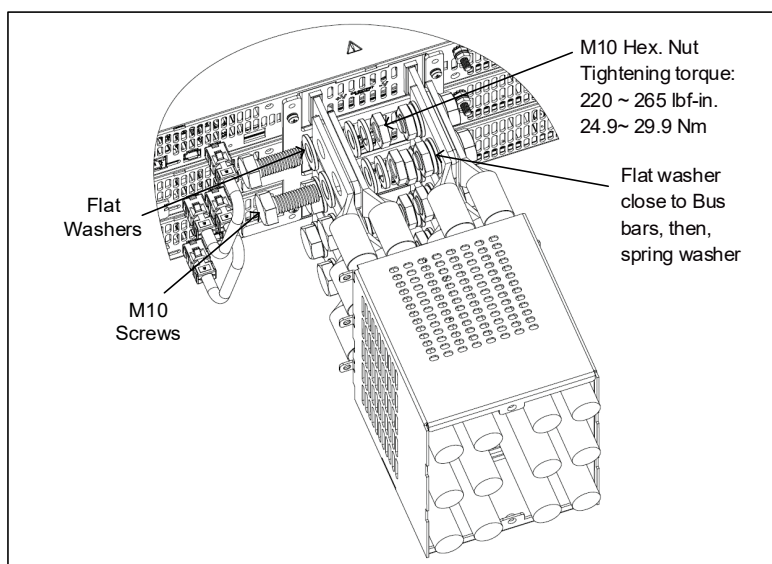


Figure 4-21: Assembly of 10V Wires

For 10kW and 15kW 20V ÷ 40V models:

3. Fix the wires to the Bus bars as shown in Figure 4-22 (15kW is shown, it applies to 10kW as well).

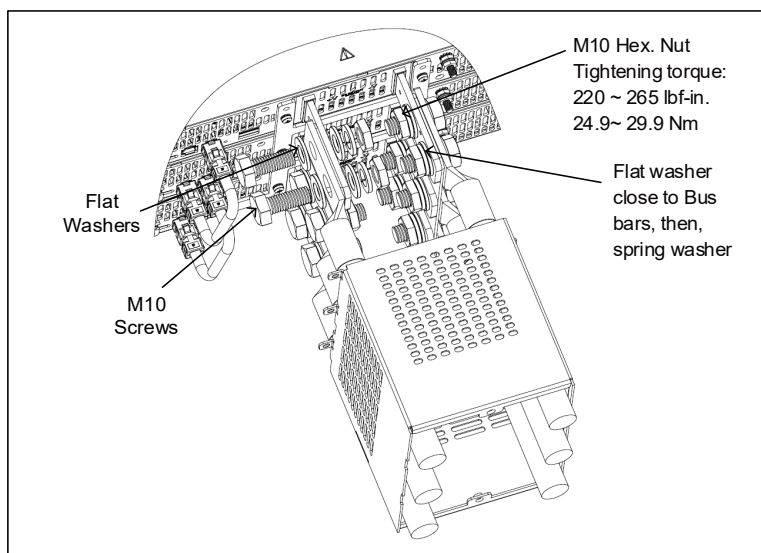


Figure 4-22: Assembly of 20V ÷ 40V Wires

4. Assemble the protection insulators prior assembling the Bus bar cover. The protection insulators are flexible, open in its bottom side. Open the insulators and cover the bus bars by sliding over the bus bars from top to bottom, as shown in Figure 4-23 (15kW is shown, it applies to 10kW as well).

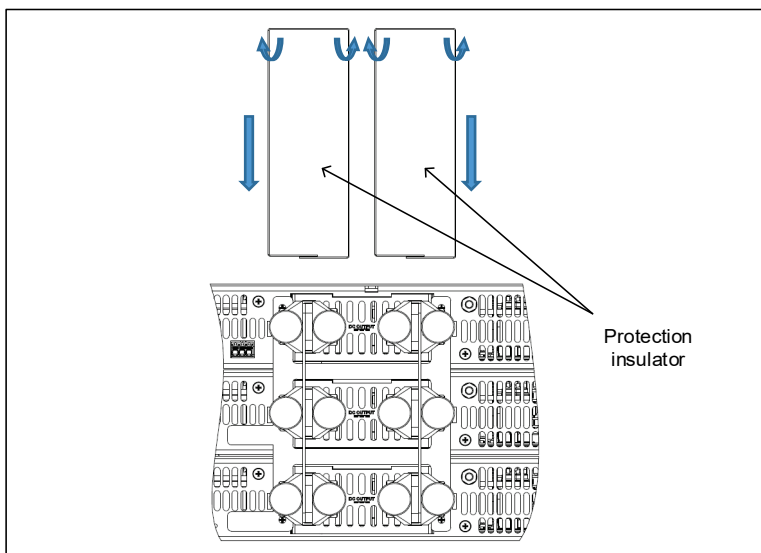


Figure 4-23: Assembly of 10V Wires Protection Insulator

For 10kW and 15kW 10V model only:

5. Assemble the bus bars protection assembly to the rear panel of the power supply, by using 6 M3x6 Sems screws, as shown in Figure 4-24 (15kW is shown, it applies to 10kW as well. For 10kW, there are 4 screws only).

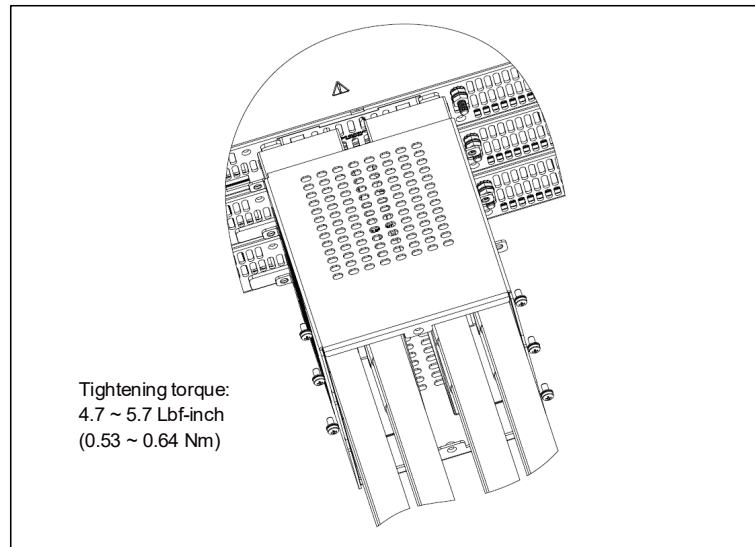


Figure 4-24: Assembly of 10V Wires Protection Cover

For 10kW and 15kW 20V ÷ 40V models:

5. Assemble the bus bars protection assembly to the rear panel of the power supply, by using 6 M3x6 Sems screws, as shown in Figure 4-25 (15kW is shown, it applies to 10kW as well. For 10kW, there are 4 screws only).
6. Assemble the rear cover of the bus bars protection assembly, by using 2 M3x6 Sems screws, as shown in Figure 4-25 (15kW is shown, it applies to 10kW as well. For 10kW, there are 4 Bus bar protection cover screws only).

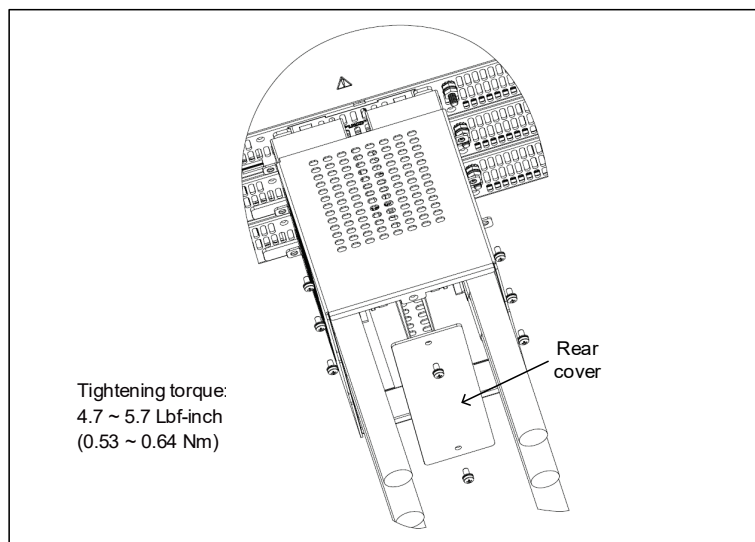


Figure 4-25: Assembly of 20V ÷ 40V Wires Protection Cover

For 10kW and 15kW 60V ÷ 100 models:

1. Open the output protection assembly by unscrewing bus bar cover and rear cover screws as shown in Figure 4-26 (15kW is shown, it applies to 10kW as well. For 10kW, there are 4 Bus bar protection cover screws only).

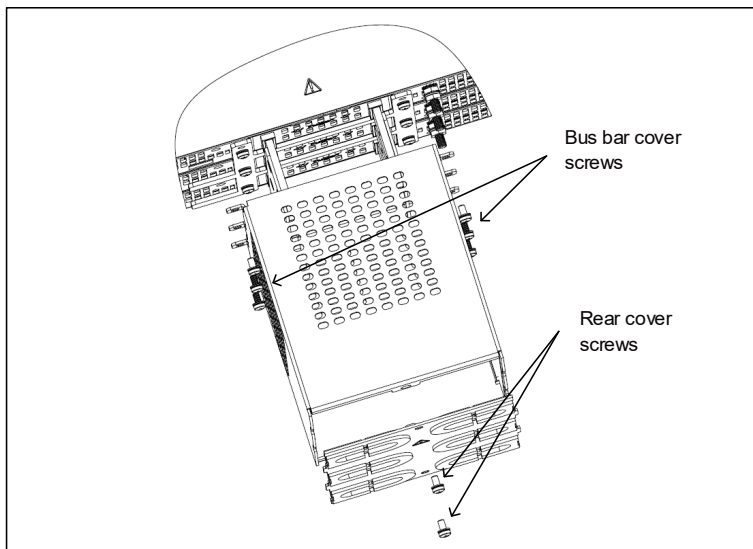


Figure 4-26: Disassembly of Output Protection

2. Fix the wires to the Bus bars as shown in Figure 4-27 (15kW is shown, it applies to 10kW as well).

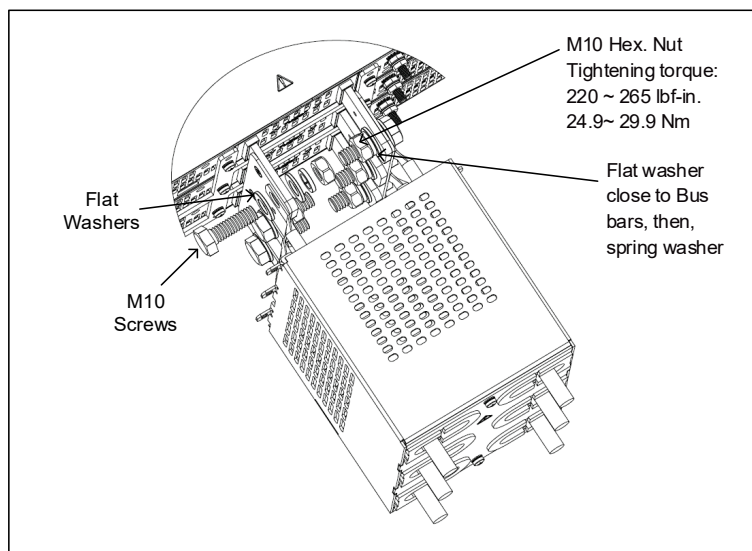


Figure 4-27: Assembly of 60V ÷ 100V Wires

3. Assemble the bus bars protection assembly to the rear panel of the power supply, by using 6 M3x6 Sems screws, as shown in Figure 4-24 (15kW is shown, it applies to 10kW as well. For 10kW, there are 4 screws only).

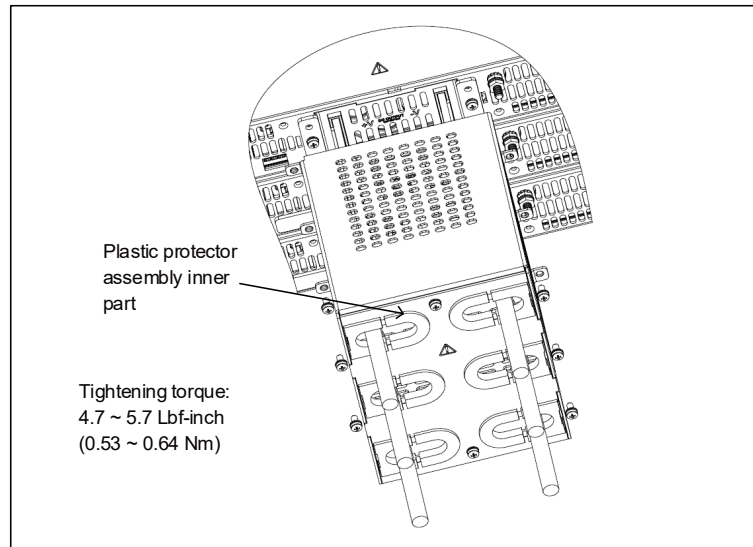


Figure 4-28: Assembly of 60V ÷ 100V Wires Protection Cover

NOTE

In case thicker wires are required, separate the plastic protector assembly and install only the inner part, refer to Figure 4-28 and Figure 4-16.

For 1.7kW ÷ 15kW 150V to 600V models:

WARNING

There is a potential shock hazard when using a power supply with an output voltage greater than 60VDC. Do not turn ON power supply when output voltage is above 60VDC without output plug protection assembled. Ensure that the protection of output plug is mounted and properly assembled.

WARNUNG

Bei Einsatz eines Netzgeräts mit mehr als 60VDC Nennspannung besteht das Risiko eines Stromschlags. Schalten Sie kein Netzgerät mit einer Ausgangsspannung von mehr als 60VDC EIN, wenn die Schutzabdeckung des Ausgangssteckers nicht installiert ist.

CAUTION

Output Wires No Conductor Pretreatment: All kinds of copper conductors can be clamped without pretreatment (Solid, Flexible, with ferrule, with/without plastic sleeve). It is forbidden to solder the conductors. The solder tin yields and fractures under high pressure. The result is an increased contact resistance and an excessive temperature rise. In addition, corrosion caused by pickling or fluxes has been observed on soldered conductor ends. Notch fractures at the transition point from the rigid to the flexible conductor area are also possible.

VORSICHT

Ausgangsleitungen Keine Leitervorbehandlung: Alle Arten von Kupferleitungen können ohne Vorbehandlung fest geklemmt werden (feste, flexible, mit Aderendhülse, mit/ohne Kunststoffhülse). Es ist verboten, die Leiter zu löten. Das Lötzinn gibt unter Druck nach und bricht. Dies führt zu einem erhöhten Kontaktwiderstand und einem übermäßigen Temperaturanstieg. Zusätzlich wurde auf gelöteten Leiterenden von Beiz- oder Flussmitteln verursachter Rost beobachtet. Kerbenbrüche am Übergangspunkt vom starren zum flexiblen Leiterbereich sind ebenfalls möglich.

The 150V to 600V models have four terminal wire clamp output connector. The two left terminals are positive outputs and the other two right terminals are the negative outputs.

The connector requirements are as follows:

- 1.7kW ÷ 5kW Connector type: IPC 5/ 4-STF-7,62 (Phoenix Contact).
- 10kW ÷ 15kW Connector type: IPC 16/ 4-STF-10,16 (Phoenix Contact).
- Wires for 1.7kW ÷ 5kW: AWG8 to AWG16, according to Table 4-2.
- Wires for 10kW ÷ 15kW: AWG6 to AWG16, according to Table 4-2.

Follow the below instructions for connection of the load wires to the power supply:

1. Refer to Table 4-2 for the recommended load wires. Strip approx. 10mm at the end of each wires

For 1.7kW ÷ 5kW, 150V ÷ 600V models:

2. Loosen the mating connector terminal screws.
3. Insert the wires through the output protection assembly as shown in Figure 4-29.
4. Insert the stripped wires into the terminals and tighten the terminal screws securely (see Figure 4-29). Tightening torque: 6.2-7 Lbf-inch. (0.7-0.8Nm).
5. Tighten the mating connector to the power supply rear panel (see Figure 4-29). Tightening torque: 6.2-7 Lbf-inch. (0.7-0.8Nm).

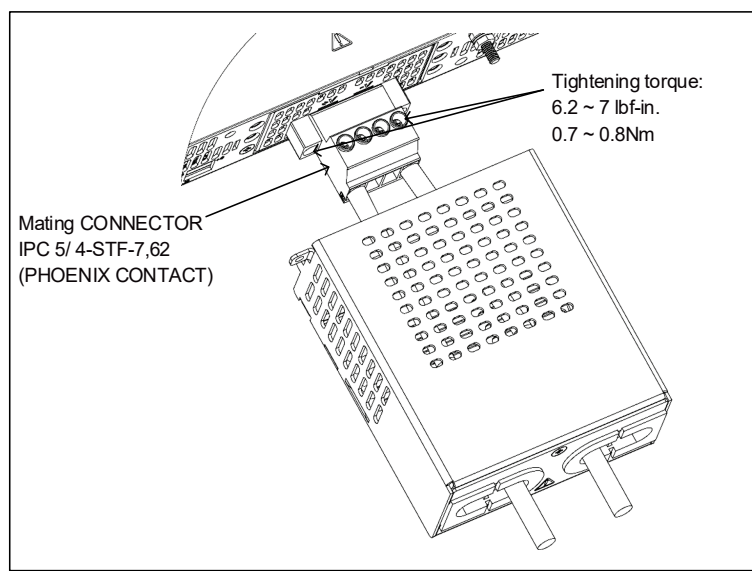


Figure 4-29: Load Wires Connection to The Output Plug

6. Fix the output protection assembly to the rear panel of the power supply and tighten the screws as shown in Figure 4-30. Tightening torque: 4.7 ÷ 5.7 Lb.-inch (0.53 ÷ 0.64 Nm).

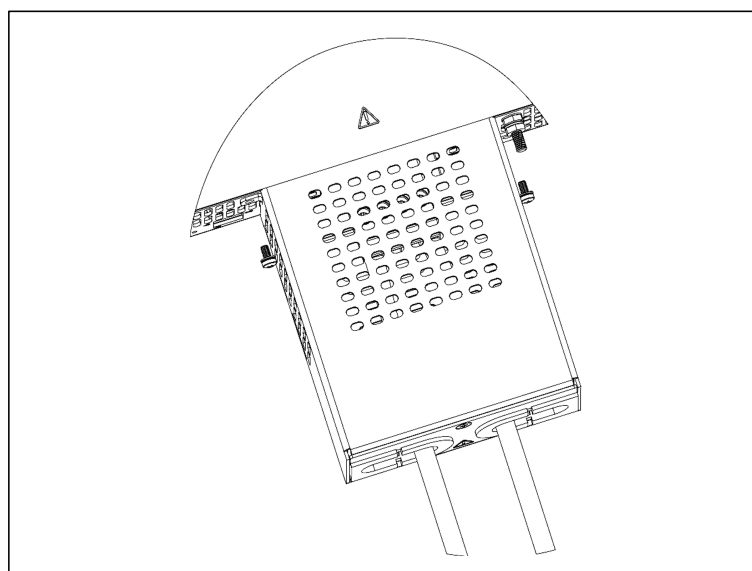


Figure 4-30: Output Connector Protection Assembly

For 10kW ÷ 15kW, 150V ÷ 600V models:

2. Unscrew the mating connector from the power supply rear panel and loosen the terminal screws, remove the plastic protectors. Refer to Figure 4-31 (15kW is shown, it applies to 10kW as well).

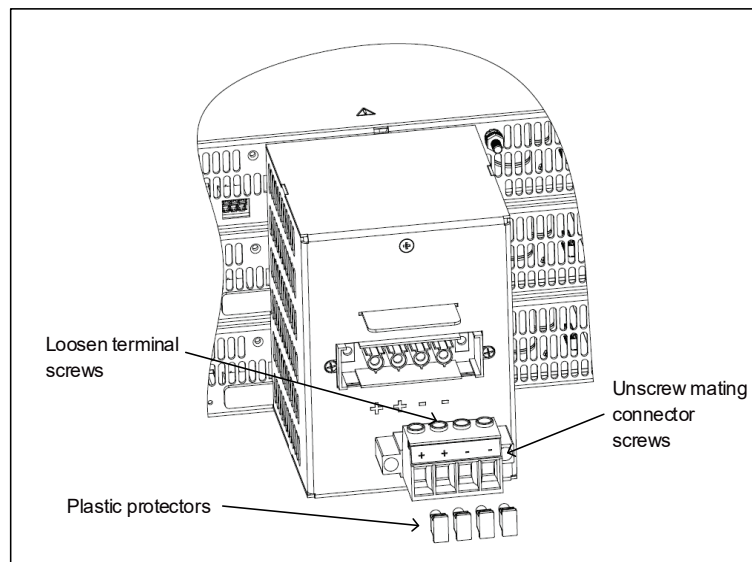


Figure 4-31: Output Connector Disassembly

3. Insert the stripped wires into the terminals and tighten the terminal screws securely (see Figure 4-32, 15kW is shown, it applies to 10kW as well). Tightening torque: 15-15.9 Lbf-inch. (1.7-1.8Nm).
4. Tighten the mating connector to the power supply rear panel (see Figure 4-32, 15kW is shown, it applies to 10kW as well). Tightening torque: 15-15.9 Lbf-inch. (1.7-1.8Nm).

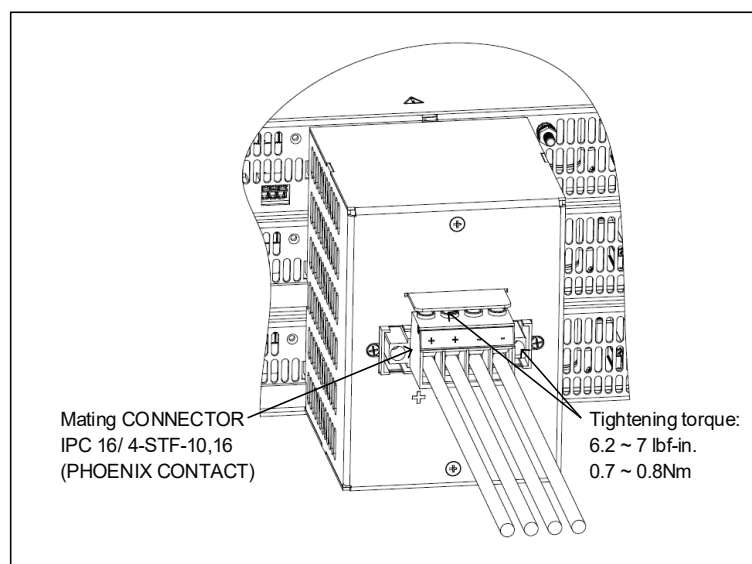


Figure 4-32: Load Wires Connection to the Output Plug

WARNING

For 15kW, all 4 wires **must** be connected. For 10kW, 2 wires can be used.

WARNUNG

Bei den 15kW Modellen, **müssen** alle 4 Lastleitungen angeschlossen sein. Bei den 10kW Modellen, reichen 2 Lastleitungen aus.

4.8.8 Grounding Outputs

Either the positive or negative output terminals can be grounded. To avoid noise problems caused by common-mode current flowing from the load to ground, it is recommended to ground the output terminal as close as possible to the power supply chassis ground.

Always use two wires to connect the load to the power supply regardless of how the system is grounded.

NOTE

When grounding output terminals as a part of series connection, several precautions must be taken into consideration. Refer to the User manual, Section 4.4.

WARNING

There is a potential shock hazard at the RS232/485, LAN, USB and the IEEE ports when using power supplies in series with combined voltage greater than 600V, and the Positive Output of the Power Supply is grounded. Do not connect the Positive Output to ground when using the RS232/485, LAN or IEEE.

WARNUNG

Wenn in Reihe geschaltete Netzgeräte mit einer kombinierten Spannung von mehr als 600V benutzt werden und der positive Ausgang des Netzgeräts geerdet ist, besteht das Risiko eines Stromschlags an den RS232/485, LAN-, USB- und IEEE-Ports. Schließen Sie den positiven Ausgang nicht an die Masse an, wenn Sie RS232/485, LAN oder IEEE benutzen.

4.9 Local and Remote Sensing

The rear panel J8 sense connector may be used to configure the power supply for remote sensing of the output voltage. Refer to Figure 2-3 for sense connector location.

4.9.1 Sense Wiring

WARNING

There is a potential shock hazard at the sense connector when using a power supply with an output voltage greater than 60VDC. Remote sense wires should have a minimum insulation rating equivalent or greater than the maximum output voltage of the power supply. Ensure that the connections at the load end are shielded to prevent accidental contact with the hazardous voltages.

WARNUNG

Bei Netzgeräten mit einer Ausgangsspannung von mehr als 60VDC besteht an der Sense-Buchse die Gefahr eines elektrischen Schlags. Fühler-Leitungen sollten eine minimale Nennisolierung besitzen, die größer als die maximale Ausgangsspannung des Netzgeräts ist oder ihr entspricht. Vergewissern Sie sich, dass die Anschlüsse am Ladungsende geschützt sind, um versehentlichen Kontakt mit gefährlichen Spannungen zu verhindern.

4.9.2 Local Sensing

The power supply is shipped with unconnected J8 sense connector. In this configuration, the unit is sensing the output voltage at the output terminals. Refer to Table 4-3 for J8 terminals assignment. This method does not compensate for voltage drop on the load wires, therefore it is recommended only for low load current applications or where the load regulation is less critical.

4.9.3 Remote Sensing

WARNUNG

There is a potential shock hazard at the sense point when using power supply with an output voltage greater than 60VDC. Ensure that the connections at the load end are shielded to prevent accidental contact with the hazardous voltages.

WARNUNG

Bei Einsatz eines Netzgeräts mit einer Ausgangsspannung von mehr als 60VDC besteht am Sense-Punkt das Risiko eines elektrischen Schlags. Vergewissern Sie sich, dass die Anschlüsse am Last-Ende geschützt sind, um versehentlichen Kontakt mit gefährlicher Spannung zu vermeiden.

CAUTION

When using shielded sense wires, ground the shield in one place only. The location can be the power supply chassis or one of the output terminals.

VORSICHT

Wenn Sie abgeschirmte Sense-Leitungen verwenden, erden Sie die Abschirmung nur an einer Seite. Dies kann entweder am Gehäuse des Netzteils oder an eine der Ausgangsanschlüsse erfolgen.

Terminal	Function
J8 - Negative	Remote negative sense (-S).
J8 - Positive	Remote positive sense (+S).

Table 4-3: J8 Terminals

Use remote sense where the load regulation at the load end is critical. In remote sense, the power supply will compensate for voltage drop on the load wires.

Refer to the specifications for the maximum allowable voltage drop on load wires.

The voltage drop is subtracted from the total voltage available at the output. Follow the instructions below to configure the power supply for remote sensing:

1. Ensure that the Power supply AC connection is Off.
2. Connect the negative sense lead to terminal J8 (-S) and the positive sense lead to terminal J8 (+S).
3. Turn On the power supply.

NOTE

In order to ensure correct operation in remote sense mode, ensure that the voltage drop on the sensing wires meets product specifications.
--

4.9.4 J8 Sense Connector Technical Information

- J8 connector type: SPT-THR 1, 5/ 3-H-3, 5 P26, Phoenix contact.
- Wire AWG: 24 up to 18.
- Wire type: Solid, Flexible conductor or conductor with ferrule without plastic sleeve: up to 1.5mm².
- Conductor with ferrule with plastic sleeve: up to 0.75mm².

In order to connect the wires to the sense connector, strip up to 8mm of wire insulation. Insert the wire into the terminal, while pressing on the white pusher. After full insertion, release the white pusher for wire locking inside the terminal.

4.10 Repackaging for Shipment

To ensure safe transportation of the instrument, contact the TDK-Lambda sales or service facility near you for Return Authorization and shipping information.

Please attach a tag to the power supply describing the problem and specifying the owner, model number and serial number of the power supply.

Refer to Warranty Information for further instructions.

CHAPTER 5: SPECIFICATIONS

5.1 1.7kW Series Specifications

OUTPUT RATING		10-170	20-85	30-56	40-42	60-28	80-21	100-17	150-11.2	300-5.6	600-2.8
1.Rated output voltage (*1)	V	10	20	30	40	60	80	100	150	300	600
2.Rated output current (*2)	A	170	85	56	42	28	21	17	11.2	5.6	2.8
3.Rated output power	W	1700	1700	1680	1680	1680	1680	1700	1680	1680	1680

INPUT CHARACTERISTICS		V	10	20	30	40	60	80	100	150	300	600
1.Input voltage/freq. (*3)	---	85~265Vac continuous, 47~63Hz, single phase.										
2.Maximum input current at 100% load (at 100Vac/200Vac)	A	20/10										
3.Power Factor (Typ.)	---	0.99 @ 100Vac, 0.98 @ 200Vac, rated output power.										
4.Efficiency (Typ. at 100Vac/200Vac, rated output)	%	86/88	87/89	87/89	87/89	87/89	87/89	88/90	88/90	88/90	88/90	88/90
5.Inrush current (*5)	---	Less than 50A.										

CONSTANT VOLTAGE MODE		V	10	20	30	40	60	80	100	150	300	600
1.Max. Line regulation (*6)	---	0.01% of rated output voltage.										
2.Max. Load regulation (*7)	---	0.01% of rated output voltage +2mV.										
3.Ripple and noise (p-p, 20MHz) (*8)	mV	50	50	50	60	60	75	75	75	120	350	
4.Ripple r.m.s. 5Hz~1MHz (*8)	mV	6	6	6	6	7	7	12	8	20	60	
5.Temperature coefficient	---	50PPM/°C from rated output voltage, following 30 minutes warm-up.										
6.Temperature stability	---	0.01% of rated Vout over 8hrs interval following 30 minutes warm-up. Constant line, load & temperature.										
7.Warm-up drift	---	Less than 0.01% of rated output voltage +2mV over 30 minutes following power on.										
8.Remote sense compensation/wire (*10)	V	1	1	1.5	2	3	4	5	5	5	5	
9.Up-prog. response time (*11)	mS	20	20	20	20	20	20	20	50	100	100	
10.Down-prog. response time (*12)	Full load	mS	30	30	60	60	60	60	120	220	200	
	No load	mS	450	700	1000	1200	1500	1700	2600	2900	4600	4600
11.Transient response time	---	Time for output voltage to recover within 0.5% of its rated output for a load change 10~90% of rated output current. Output set point: 10~100%, Local sense. Less than 1mS for models up to and including 100V. 2mS for models above 100V.										
12.Hold-up time	---	16mS Typical. Rated output power.										

CONSTANT CURRENT MODE		V	10	20	30	40	60	80	100	150	300	600
1.Max. Line regulation (*6)	---	0.01% of rated output current +2mA.										
2.Max. Load regulation (*9)	---	0.02% of rated output current +5mA.										
3.Ripple r.m.s. @ 10% rated voltage (*13)	mA	420	160	100	60	50	30	20	10	8	3	
4.Ripple r.m.s. @ rated voltage. B.W 5Hz~1MHz	mA	250	120	70	60	50	20	20	10	8	3	
5.Temperature coefficient	---	10V~100V models: 100PPM/°C from rated output current, following 30 minutes warm-up. 150V~600V models: 70PPM/°C from rated output current, following 30 minutes warm-up.										
6.Temperature stability	---	0.01% of rated Iout over 8hrs. interval following 30 minutes warm-up. Constant line, load & temperature.										
7.Warm-up drift	---	10V~100V models: Less than +/-0.25% of rated output current over 30 minutes following power on. 150V~600V models: Less than +/-0.15% of rated output current over 30 minutes following power on.										

ANALOG PROGRAMMING AND MONITORING (ISOLATED FROM THE OUTPUT)

1.Vout voltage programming	---	0~100%, 0~5V or 0~10V, user selectable. Accuracy and linearity: +/-0.15% of rated Vout.										
2.Iout voltage programming (*14)	---	0~100%, 0~5V or 0~10V, user selectable. Accuracy and linearity: +/-0.4% of rated Iout.										
3.Vout resistor programming	---	0~100%, 0~5/10KΩ full scale, user selectable. Accuracy and linearity: +/-0.5% of rated Vout.										
4.Iout resistor programming (*14)	---	0~100%, 0~5/10KΩ full scale, user selectable. Accuracy and linearity: +/-0.5% of rated Iout.										
5.Output voltage monitor	---	0~5V or 0~10V, user selectable. Accuracy: +/-0.5%.										
6.Output current monitor (*14)	---	0~5V or 0~10V, user selectable. Accuracy: +/-0.5%.										

SIGNALS AND CONTROLS (ISOLATED FROM THE OUTPUT)

1.Power supply OK #1 signal	---	Power supply output monitor. Open collector. Output On: On. Output Off: Off. Maximum Voltage: 30V. Maximum Sink Current: 10mA.										
2.CV/CC signal	---	CV/CC Monitor. Open collector. CC mode: On. CV mode: Off. Maximum Voltage: 30V. Maximum Sink Current: 10mA.										
3.LOCAL/REMOTE Analog control	---	Enable/Disable analog programming control by electrical signal or dry contact. Remote: 0~0.6V or short. Local: 2~30V or open.										
4.LOCAL/REMOTE Analog signal	---	Analog programming control monitor signal. Open collector. Remote: On. Local: Off. Maximum Voltage: 30V. Maximum Sink Current: 10mA.										
5.ENABLE/DISABLE signal	---	Enable/Disable PS output by electrical signal or dry contact. 0~0.6V or short, 2~30V or open. User selectable logic.										
6.INTERLOCK (ILC) control	---	Enable/Disable PS output by electrical signal or dry contact. Output ON: 0~0.6V or short. Output OFF: 2~30V or open.										
7.Programmed signals	---	Two open drain programmable signals. Maximum voltage 25V. Maximum sink current 100mA (shunted by 27V zener).										
8.TRIGGER IN / TRIGGER OUT signals	---	Maximum low level input voltage = 0.8V. Minimum high level input voltage = 2.5V. Maximum high level input = 5V positive edge trigger. tw = 10us minimum. Tr, Tf = 1us maximum. Min delay between 2 pulses 1ms.										
9.DAISY_IN/SO control signal	---	By electrical Voltage: 0~0.6V/2~30V or dry contact.										
10.DAISY_OUT/PS_OK #2 signal	---	4~5V = OK, 0V (500Ω impedance) = Fail.										

FUNCTIONS AND FEATURES

1.Parallel operation	---	Possible. Up to 4 identical units in Master/Slave mode. Refer to instruction manual.
2.Series operation	---	Possible. Two identical units. Refer to instruction manual.
3.Daisy chain	---	Power supplies can be connected in Daisy chain to synchronize their turn-on and turn-off.
4.Constant power control	---	Limits the output power to a programmed value. Programming via the communication ports or the front panel.
5.Output resistance control	---	Emulates series resistance. Resistance range: 1~1000mΩ. Programming via the communication ports or the front panel.
6.Slew rate control	---	Programmable Output rise and Output fall slew rate. Programming range: 0.0001~999.99 V/mS. or A/mS. Programming via communication ports or front panel.
7.Arbitrary waveforms	---	Profiles of up to 100 steps can be stored in 4 memory cells. Activation by command via communication ports or front panel.

PROGRAMMING AND READBACK (USB, LAN, RS232/485, Optional IEEE (*16) Interface)

	V	10	20	30	40	60	80	100	150	300	600
1.Vout programming accuracy (*15)	---	0.05% of rated output voltage									
2.Iout programming accuracy (*14)	---	0.1% of actual output current+0.2% of rated output current									
3.Vout programming resolution	---	0.002% of rated output voltage									
4.Iout programming resolution	---	0.002% of rated output current									
5.Vout readback accuracy	---	0.05% of rated output voltage									
6.Iout readback accuracy (*14)	---	0.2% of rated output current									
7.Vout readback resolution	% of rated output voltage	0.011%	0.006%	0.004%	0.003%	0.002%	0.002%	0.011%	0.007%	0.004%	0.002%
8.Iout readback resolution	% of rated output current	0.007%	0.002%	0.003%	0.003%	0.005%	0.006%	0.007%	0.010%	0.003%	0.004%

PROTECTIVE FUNCTIONS

	V	10	20	30	40	60	80	100	150	300	600
1.Foldback protection	---	Output shut-down when power supply changes mode from CV or Power Limit to CC mode or from CC or Power Limit to CV mode. User presetable. Reset by AC input recycle in autostart mode, by Power Switch, by OUTPUT button, by rear panel or by communication.									
2.Over-voltage protection (OVP)	---	Output shut-down. Reset by AC input recycle in autostart mode, by Power Switch, by OUTPUT button, by rear panel or by communication.									
3.Over-voltage programming range	V	0.5~12	1~24	2~36	2~44.1	5~66.15	5~88.2	5~110.25	5~165.37	5~330.75	5~661.5
4.Over-voltage programming accuracy	---	+/-1% of rated output voltage									
5.Output under voltage limit (UVL)	---	Prevents from adjusting Vout below limit. Does not apply in analog programming. Preset by front panel or communication port.									
6.Over temperature protection	---	Shuts down the output. Auto recovery by autostart mode.									
7.Output under voltage protection (UVP)	---	Prevents adjustment of Vout below limit. P.S output turns Off during under voltage condition. Reset by AC input recycle in autostart mode, by Power Switch, by OUTPUT button, by rear panel or by communication.									

FRONT PANEL

1.Control functions	---	Multiple options with 2 Encoders.
	---	Vout/Iout/Power Limit manual adjust.
	---	OVP/UVL/UVP manual adjust.
	---	Protection Functions - OVP, UVL, UVP, Foldback, OCL, ENA, ILC.
	---	Communication Functions - Selection of LAN, RS232, RS485, USB or Optional communication interface.
	---	Output ON/OFF, Front Panel Lock.
	---	Communication Functions - Selection of Baud Rate, Address, IP and communication language.
	---	Analog Control Functions - Selection Voltage/resistive programming 5V/10V, 5KΩ/10KΩ programming.
2.Display	---	Analog Monitor Functions - Selection of Voltage/Current Monitoring 5V/10V.
	---	Vout: 4 digits, accuracy: 0.05% of rated output voltage +/-1 count. Iout: 4 digits, accuracy: 0.2% of rated output current +/-1 count.
3.Front Panel Buttons Indications	---	OUTPUT ON, ALARM, PREVIEW, FINE, COMMUNICATION, PROTECTION, CONFIGURATION, SYSTEM, SEQUENCER.
4.Front Panel Display Indications	---	Voltage, Current, Power, CV, CC, CP, External Voltage, External Current, Address, LFP, Autostart, Safestart, Foldback V/I, Remote (communication), RS/USB/LAN/Optional communication interface, Trigger, Load/Store Cell.

ENVIRONMENTAL CONDITIONS

1.Operating temperature	---	0~50°C, 100% load.
2.Storage temperature	---	-30~85°C.
3.Operating humidity	---	20~90% RH (no condensation).
4.Storage humidity	---	10~95% RH (no condensation).
5.Altitude	---	Operating: 10000ft (3000m), output current derating 2%/100m or Ta derating 1°C/100m above 2000m. Non-operating: 40000ft (12000m).

MECHANICAL

1.Cooling	---	Forced air cooling by internal fans. Airflow direction: From front panel to power supply rear.
2.Weight	Kg	Less than 5Kg.
3.Dimensions (WxHxD)	mm	W: 423, H: 43.6, D: 441.5 (Without busbars and busbars cover), W: 423, H: 43.6, D: 553.2 (Including busbars and busbars cover) (Refer to Outline drawing).
4.Vibration	---	MIL-810G, method 514.6, Procedure I, test condition Annex C - 2.1.3.1
5.Shock	---	Less than 20G, half sine, 11mS. Unit is unpacked.

SAFETY/EMC

1.Safety standards	---	UL60950-1, CSA22.2 No.60950-1, IEC60950-1, EN60950-1.
1.1.Interface classification	---	Vout≤40V Models: Output, J1, J2, J3, J4, J5, J6, J7, J8 (sense) and J9 (communication options) are SELV. 60≤Vout≤600V Models: Output and J8 (sense) are hazardous, J1, J2, J3, J4, J5, J6, J7 and J9 (communication options) are SELV.
1.2.Withstand voltage	---	Vout≤40V Models: Input - Output (SELV): 4242VDC 1min, Input - Ground: 2835VDC 1min. 60V≤Vout≤100V Models: Input - Output: 4242VDC 1min, Input - SELV: 4242VDC 1min. Output - SELV: 850VDC 1min, Output - Ground: 1500VDC 1min, Input - Ground: 2835VDC 1min. 100V<Vout≤600V Models: Input - Output: 4242VDC 1min, Input - SELV: 4242VDC 1min Output - SELV: 1275VDC 1min, Output - Ground: 2500VDC 1min. Input - Ground: 2835VDC 1min.
1.3.Insulation resistance	---	More than 100Mohm at 25°C, 70%RH.
2.EMC standards (*4)	---	IEC/EN61204-3 Industrial environment.
2.1.Conducted emission	---	IEC/EN61204-3 Industrial environment, Annex H table H.1, FCC Part 15-A, VCCI-A.
2.2.Radiated emission	---	IEC/EN61204-3 Industrial environment, Annex H table H.3 and H.4, FCC Part 15-A, VCCI-A.

NOTES:

*1: Minimum voltage is guaranteed to maximum 0.1% of rated output voltage.

*2: Minimum current is guaranteed to maximum 0.2% of rated output current.

*3: For cases where conformance to various safety standards (UL, IEC, etc...) is required, to be described as 100-240Vac (50/60Hz).

*4: Signal and control ports interface cables length: Less than 3m, DC output power port cables length: Less than 30m.

*5: Not including EMI filter inrush current, less than 0.2mS.

*6: 85~132Vac or 170~265Vac. Constant load.

*7: From No-Load to Full-Load, constant input voltage. Measured at the sensing point in Remote Sense.

*8: For 10V~150V models: Measured with JEITA RC-9131C (1:1) probe. For 300~600V models: Measured with 100:1 probe.

*9: For load voltage change, equal to the unit voltage rating, constant input voltage.

*10: The maximum voltage on the power supply terminals must not exceed the rated voltage.

*11: From 10% to 90% or 90% to 10% of Rated Output Voltage, with rated, resistive load.

*12: From 90% to 10% of Rated Output Voltage.

*13: For 10V model, the ripple is measured at 2V and rated output current. For other models, the ripple is measured at 10% of rated output voltage. B.W 5Hz~1MHz.

*14: The Constant Current programming, readback and monitoring accuracy do not include the warm-up and Load regulation thermal drift.

*15: Measured at the sensing point.

*16: Maximum ambient temperature for IEEE option is 40°C.

5.2 5kW Series Specifications

OUTPUT RATING

		10-500	20-250	30-170	40-125	60-85	80-65	100-50	150-34	300-17	600-8.5
1.Rated output voltage (*1)	V	10	20	30	40	60	80	100	150	300	600
2.Rated output current (*2)	A	500 (*3)	250	170	125	85	65	50	34	17	8.5
3.Rated output power	W	5000	5000	5100	5000	5100	5200	5000	5100	5100	5100

INPUT CHARACTERISTICS

INPUT CHARACTERISTICS		V	10	20	30	40	60	80	100	150	300	600
1.Input voltage/freq. 3 phase, 3 wire+ground (*4)		---	3-Phase, 200V models: 170~265Vac, 47~63Hz (Covers 200/230Vac).									
			3-Phase, 400V models: 342~460Vac, 47~63Hz (Covers 380/400/415Vac).									
			3-Phase, 480V models: 342~528Vac, 47~63Hz (Covers 380/400/415/440/460/480Vac).									
2.Maximum Input current at 100% load	3-Phase, 200V models:	---	17.5A @ 200Vac.									
	3-Phase, 400V models:		9.2A @ 380Vac.									
	3-Phase, 480V models:		9.2A @ 380Vac.									
3.Power Factor (Typ.)		---	0.94 @ 200/380Vac, rated output power.									
4.Efficiency (Typ.) (*5)		%	89.5	91	91	91	91	91	91	91	92	92
5.Inrush current (*6)		---	Less than 50A.									

CONSTANT VOLTAGE MODE

	V	10	20	30	40	60	80	100	150	300	600
1.Max. Line regulation (*7)	---	0.01% of rated output voltage.									
2.Max. Load regulation (*8)	---	0.01% of rated output voltage +5mV.									
3.Ripple and noise (p-p, 20MHz) (*9)	mV	75	75	75	75	75	80	90	120	200	480
4.Ripple r.m.s. 5Hz~1MHz (*9)	mV	8	10	12	12	12	15	15	20	60	100
5.Temperature coefficient	---	50PPM/°C from rated output voltage, following 30 minutes warm-up.									
6.Temperature stability	---	0.01% of rated Vout over 8hrs. interval following 30 minutes warm-up. Constant line, load & temperature.									
7.Warm-up drift	---	Less than 0.05% of rated output voltage +2mV over 30 minutes following power on.									
8.Remote sense compensation/wire (*10)	V	2	2	5	5	5	5	5	5	5	5
9.Up-prog. response time (*11)	mS	30	30	30	30	50	50	50	50	50	100
10.Down-prog. response time	Full load (*11) No load (*12)	50 300	50 600	80 800	80 900	80 1000	100 1200	100 1900	100 2000	100 3000	200 3000
11.Transient response time	---	Time for output voltage to recover within 0.5% of its rated output for a load change 10~90% of rated output current. Output set point: 10~100%, Local sense. Less than 1mS for models up to and including 100V. 2mS for models above 100V.									
12.Hold-up time	---	5mS Typical. Rated output power.									

CONSTANT CURRENT MODE

	V	10	20	30	40	60	80	100	150	300	600
1.Max. Line regulation (*7)	---	0.05% of rated output current.									
2.Max. Load regulation (*13)	---	0.08% of rated output current.									
3.Ripple r.m.s. @ 10% rated voltage (*14)	mA	1200	600	300	150	100	70	45	45	15	8
4.Ripple r.m.s. @ rated voltage. B.W 5Hz~1MHz	mA	700	300	150	75	50	35	23	23	7.5	4
5.Temperature coefficient	---	10V~100V models: 100PPM/°C from rated output current, following 30 minutes warm-up. 150V~600V models: 70PPM/°C from rated output current, following 30 minutes warm-up.									
6.Temperature stability	---	0.01% of rated Iout over 8hrs. interval following 30 minutes warm-up. Constant line, load & temperature.									
7.Warm-up drift	---	10V~100V models: Less than +/-0.25% of rated output current over 30 minutes following power on. 150V~600V models: Less than +/-0.15% of rated output current over 30 minutes following power on.									

ANALOG PROGRAMMING AND MONITORING (ISOLATED FROM THE OUTPUT)

1.Vout voltage programming	---	0~100%, 0~5V or 0~10V, user selectable. Accuracy and linearity: +/-0.15% of rated Vout.									
2.Iout voltage programming (*15)	---	0~100%, 0~5V or 0~10V, user selectable. Accuracy and linearity: +/-0.4% of rated Iout.									
3.Vout resistor programming	---	0~100%, 0~5/10KΩ full scale, user selectable. Accuracy and linearity: +/-0.5% of rated Vout.									
4.Iout resistor programming (*15)	---	0~100%, 0~5/10KΩ full scale, user selectable. Accuracy and linearity: +/-0.5% of rated Iout.									
5.Output voltage monitor	---	0~5V or 0~10V, user selectable. Accuracy: +/-0.5%.									
6.Output current monitor (*15)	---	0~5V or 0~10V, user selectable. Accuracy: +/-0.5%.									

SIGNALS AND CONTROLS (ISOLATED FROM THE OUTPUT)

1.Power supply OK #1 signal	---	Power supply output monitor. Open collector. Output On: On. Output Off: Off. Maximum Voltage: 30V. Maximum Sink Current: 10mA.									
2.CV/CC signal	---	CV/CC Monitor. Open collector. CC mode: On. CV mode: Off. Maximum Voltage: 30V. Maximum Sink Current: 10mA.									
3.LOCAL/REMOTE Analog control	---	Enable/Disable analog programming control by electrical signal or dry contact. Remote: 0~0.6V or short. Local: 2~30V or open.									
4.LOCAL/REMOTE Analog signal	---	Analog programming control monitor signal. Open collector. Remote: On. Local: Off. Maximum Voltage: 30V. Maximum Sink Current: 10mA.									
5.ENABLE/DISABLE signal	---	Enables/Disables PS output by electrical signal or dry contact. 0~0.6V or short, 2~30V or open. User selectable logic.									
6.INTERLOCK (ILC) control	---	Enables/Disables PS output by electrical signal or dry contact. Output ON: 0~0.6V or short. Output OFF: 2~30V or open.									
7.Programmed signals	---	Two open drain programmable signals. Maximum voltage 25V. Maximum sink current 100mA (shunted by 27V zener).									
8.TRIGGER IN / TRIGGER OUT signals	---	Maximum low level input voltage = 0.8V. Minimum high level input voltage = 2.5V. Maximum high level input = 5V positive edge trigger: tw = 10us minimum. Tr, Tf = 1us maximum. Min delay between 2 pulses 1ms.									
9.DAISY_IN/SO control signal	---	By electrical Voltage: 0~0.6V/2~30V or dry contact.									
10.DAISY_OUT/PS_OK #2 signal	---	4~5V = OK, 0V (500Ω impedance) = Fail.									

FUNCTIONS AND FEATURES

1.Parallel operation	---	Possible. Up to 4 identical units in Master/Slave mode. Refer to instruction manual.
2.Series operation	---	Possible. Two identical units. Refer to instruction manual.
3.Daisy chain	---	Power supplies can be connected in Daisy chain to synchronize their turn-on and turn-off.
4.Constant power control	---	Limits the output power to a programmed value. Programming via the communication ports or the front panel.
5.Output resistance control	---	Emulates series resistance. Resistance range: 1~1000mΩ. Programming via communication ports or front panel.
6.Slew rate control	---	Programmable Output rise and Output fall slew rate. Programming range: 0.0001~999.99 V/mS. or A/mS. Programming via communication ports or front panel.
7.Arbitrary waveforms	---	Profiles of up to 100 steps can be stored in 4 memory cells. Activation by command via communication ports or front panel.

PROGRAMMING AND READBACK (USB, LAN, RS232/485, Optional IEEE (*19) (*20) Interface)

	V	10	20	30	40	60	80	100	150	300	600	
1.Vout programming accuracy (*16)	---	0.05% of rated output voltage.										
2.Iout programming accuracy (*15)	---	0.1% of actual output current +0.2% of rated output current.										
3.Vout programming resolution	---	0.002% of rated output voltage.										
4.Iout programming resolution	---	0.002% of rated output current.										
5.Vout readback accuracy	---	0.05% of rated output voltage.										
6.Iout readback accuracy (*15)	---	0.2% of rated output current.										
7.Vout readback resolution	% of rated output voltage	0.011%	0.006%	0.004%	0.003%	0.002%	0.002%	0.011%	0.007%	0.004%	0.002%	
8.Iout readback resolution	% of rated output current	0.003%	0.005%	0.006%	0.009%	0.002%	0.002%	0.003%	0.004%	0.006%	0.002%	

PROTECTIVE FUNCTIONS

PROTECTIVE FUNCTIONS	V	10	20	30	40	60	80	100	150	300	600
1.Foldback protection	---	Output shut-down when power supply changes mode from CV or Power Limit to CC mode or from CC or Power Limit to CV mode. User presetable. Reset by AC input recycle in autostart mode, by Power Switch, by OUTPUT button, by rear panel or by communication.									
2.Over-voltage protection (OVP)	---	Output shut-down. Reset by AC input recycle in autostart mode, by Power Switch, by OUTPUT button, by rear panel or by communication.									
3.Over-voltage programming range	V	0.5~12	1~24	2~36	2~44.1	5~66.15	5~88.2	5~110.25	5~165.37	5~330.75	5~661.5
4.Over-voltage programming accuracy	---	+/-1% of rated output voltage.									
5.Output under voltage limit (UVL)	---	Prevents from adjusting Vout below limit. Does not apply in analog programming. Preset by front panel or communication port.									
6.Over temperature protection	---	Shuts down the output. Auto recovery by autostart mode.									
7.Output under voltage protection (UVP)	---	Prevents adjustment of Vout below limit. P.S output turns Off during under voltage condition. Reset by AC input recycle in autostart mode, by Power Switch, by OUTPUT button, by rear panel or by communication.									

FRONT PANEL

1.Control functions	---	Multiple options with 2 Encoders.
	---	Vout/Iout/Power Limit manual adjust.
	---	OVP/UVL/UVP manual adjust.
	---	Protection Functions - OVP, UVL, UVP, Foldback, OCL, ENA, ILC.
	---	Communication Functions - Selection of LAN, RS232, RS485, USB or Optional communication interface.
	---	Output ON/OFF. Front Panel Lock.
	---	Communication Functions - Selection of Baud Rate, Address, IP and communication language.
	---	Analog Control Functions - Selection Voltage/resistive programming 5V/10V, 5KΩ/10KΩ programming.
2.Display	---	Analog Monitor Functions - Selection of Voltage/Current Monitoring 5V/10V.
	---	Vout: 4 digits, accuracy: 0.05% of rated output voltage +/-1 count.
3.Front Panel Buttons Indications	---	Iout: 4 digits, accuracy: 0.2% of rated output current +/-1 count.
	---	OUTPUT ON, ALARM, PREVIEW, FINE, COMMUNICATION, PROTECTION, CONFIGURATION, SYSTEM, SEQUENCER.
4.Front Panel Display Indications	---	Voltage, Current, Power, CV, CC, CP, External Voltage, External Current, Address, LFP Autostart, Safetstart, Foldback V/I, Remote (communication), RS/USB/LAN/Optional communication interface, Trigger, Load/Store Cell.

ENVIRONMENTAL CONDITIONS

1.Operating temperature	---	0~50°C, 100% load.
2.Storage temperature	---	-30~85°C.
3.Operating humidity	---	20~90% RH (no condensation).
4.Storage humidity	---	10~95% RH (no condensation).
5.Altitude (*17)	---	Operating: 10000ft (3000m), output current derating 2%/100m or Ta derating 1°C/100m above 2000m. Non-operating: 40000ft (12000m).

MECHANICAL

1.Cooling	---	Forced air cooling by internal fans. Airflow direction: From front panel to power supply rear.
2.Weight	Kg	Less than 7.5Kg.
3.Dimensions (WxHxD)	mm	W: 423, H: 43.6, D: 441.5 (Without busbars and busbars cover), W: 423, H: 43.6, D: 553.2 (Including busbars and busbars cover). Refer to Outline drawing.
4.Vibration	---	MIL-810G, method 514.6, Procedure I, test condition Annex C - 2.1.3.1
5.Shock	---	Less than 20G, half sine, 11mS. Unit is unpacked.

SAFETY/EMC

1.Safety standards	---	UL60950-1, CSA22.2 No.60950-1, IEC60950-1, EN60950-1.
1.1.Interface classification	---	Vout≤40V Models: Output, J1, J2, J3, J4, J5, J6, J7, J8 (sense) and J9 (communication options) are SELV. 60≤Vout≤600V Models: Output and J8 (sense) are hazardous, J1, J2, J3, J4, J5, J6, J7 and J9 (communication options) are SELV.
1.2.Withstand voltage	---	Vout≤40V Models: Input - Output (SELV): 4242VDC 1min, Input - Ground: 2835VDC 1min. 60V≤Vout≤100V Models: Input - Output: 4242VDC 1min, Input - SELV: 4242VDC 1min. Output - SELV: 850VDC 1min, Output - Ground: 1500VDC 1min, Input - Ground: 2835VDC 1min. 100V<Vout≤600V Models: Input - Output: 4242VDC 1min, Input - SELV: 4242VDC 1min. Output - SELV: 1275VDC 1min, Output - Ground: 2500VDC 1min. Input - Ground: 2835VDC 1min.
1.3.Insulation resistance	---	More than 100Mohm at 25°C, 70%RH.
2.EMC standards (*18)	---	IEC/EN61204-3 Industrial environment.
2.1.Conducted emission	---	IEC/EN61204-3 Industrial environment, Annex H table H.1, FCC Part 15-A, VCCI-A.
2.2.Radiated emission	---	IEC/EN61204-3 Industrial environment, Annex H table H.3 and H.4, FCC Part 15-A, VCCI-A.

NOTES:

- *1: Minimum voltage is guaranteed to maximum 0.1% of rated output voltage.
- *2: Minimum current is guaranteed to maximum 0.2% of rated output current.
- *3: Derate 5A/1°C above 40°C.
- *4: For cases where conformance to various safety standards (UL, IEC, etc...) is required, to be described as 190-240Vac (50/60Hz) for 3-Phase 200V models
380~415Vac (50/60Hz) for 3-Phase 400V models and 380~480Vac (50/60Hz) for 3-Phase 480V models.
- *5: 3-Phase 200V models: At 200Vac input voltage, 3-Phase 400/480V: At 380Vac input voltage. With rated output power.
- *6: Not including EMI filter inrush current, less than 0.2mS.
- *7: 3-Phase 200V models: 170~265Vac, 3-Phase 400V models: 342~460Vac, 3-Phase 480V models: 342~528Vac. Constant load.
- *8: From No-Load to Full-Load, constant input voltage. Measured at the sensing point in Remote Sense.
- *9: For 10V~150V models: Measured with JEITA RC-9131C (1:1) probe. For 300~600V models: Measured with 100:1 probe.
- *10: The maximum voltage on the power supply terminals must not exceed the rated voltage.
- *11: From 10% to 90% or 90% to 10% of Rated Output Voltage, with rated, resistive load.
- *12: From 90% to 10% of Rated Output Voltage.
- *13: For load voltage change, equal to the unit voltage rating, constant input voltage.
- *14: For 10V model, the ripple is measured at 2V and rated output current. For other models, the ripple is measured at 10% of rated output voltage. B.W 5Hz~1MHz.
- *15: The Constant Current programming, readback and monitoring accuracy do not include the warm-up and Load regulation thermal drift.
- *16: Measured at the sensing point.
- *17: For 10V model Ta derating 2°C/100m.
- *18: Signal and control ports interface cables length: Less than 3m, DC output power port cables length: Less than 30m.
- *19: Max. ambient temperature for IEEE is 40°C.
- *20: For 10V model only: Max. output current for IEEE is 400A up to 40°C and 450A up to 30°C.

TDK-Lambda

5.3 10kW Series Specifications

OUTPUT RATING

		10-1000	20-500	30-340	40-250	60-170	80-130	100-100	150-68	300-34	600-17
1.Rated output voltage (*1)	V	10	20	30	40	60	80	100	150	300	600
2.Rated output current (*2)	A	1000 (*3)	500	340	250	170	130	100	68	34	17
3.Rated output power	W	10000	10000	10200	10000	10200	10400	10000	10200	10200	10200

INPUT CHARACTERISTICS

	V	10	20	30	40	60	80	100	150	300	600
1.Input voltage/freq. 3 phase, 3 wire+ground (*4)	---	3-Phase, 200V models: 170~265Vac, 47~63Hz (Covers 200/230Vac). 3-Phase, 400V models: 342~460Vac, 47~63Hz (Covers 380/400/415Vac). 3-Phase, 480V models: 342~528Vac, 47~63Hz (Covers 380/400/415/440/460/480Vac).									
2.Maximum Input current at 100% load	3-Phase, 200V models:	35A @ 200Vac.									
	3-Phase, 400V models:	18.4A @ 380Vac.									
	3-Phase, 480V models:	18.4A @ 380Vac.									
3.Power Factor (Typ.)	---	0.94 @ 200/380Vac, rated output power.									
4.Efficiency (Typ.) (*5)	%	89.5	90	91	91	91	91	91	91	92	92
5.Inrush current (*6)	---	Less than 100A.									

CONSTANT VOLTAGE MODE

	V	10	20	30	40	60	80	100	150	300	600
1.Max. Line regulation (*7)	---	0.01% of rated output voltage.									
2.Max. Load regulation (*8)	---	0.01% of rated output voltage +5mV.									
3.Ripple and noise (p-p, 20MHz) (*9)	mV	75	75	75	75	75	80	90	120	200	480
4.Ripple r.m.s. 5Hz~1MHz (*9)	mV	8	10	12	12	12	15	15	20	60	100
5.Temperature coefficient	---	50PPM/°C from rated output voltage, following 30 minutes warm-up.									
6.Temperature stability	---	0.01% of rated Vout over 8hrs interval following 30 minutes warm-up. Constant line, load & temperature.									
7.Warm-up drift	---	Less than 0.05% of rated output voltage +2mV over 30 minutes following power on.									
8.Remote sense compensation/wire (*10)	V	2	2	5	5	5	5	5	5	5	5
9.Up-prog. response time (*11)	mS	30	30	30	30	50	50	50	50	50	100
10.Down-prog. response time:	Full load (*11)	50	50	80	80	80	100	100	100	100	200
	No load (*12)	300	600	800	900	1000	1200	1900	2000	3000	3000
11.Transient response time	---	Time for output voltage to recover within 0.5% of its rated output for a load change 10~90% of rated output current. Output set point: 10~100%, Local sense. Less than 1mS for models up to and including 100V. 2mS for models above 100V.									
12. Start-up delay	---	Less than 7Sec.									
13.Hold-up time	---	5mS Typical. Rated output power.									

CONSTANT CURRENT MODE

	V	10	20	30	40	60	80	100	150	300	600
1.Max. Line regulation (*7)	---	0.05% of rated output current.									
2.Max. Load regulation (*13)	---	0.08% of rated output current.									
3.Ripple r.m.s. @ 10% rated voltage (*14)	mA	1500	1200	600	300	150	100	70	45	15	10
4.Ripple r.m.s. @ rated voltage. B.W 5Hz~1MHz	mA	1200	700	300	150	75	50	35	23	7.5	6
5.Temperature coefficient	---	10V~100V models: 100PPM/°C from rated output current, following 30 minutes warm-up. 150V~600V models: 70PPM/°C from rated output current, following 30 minutes warm-up.									
6.Temperature stability	---	0.01% of rated Iout over 8hrs. interval following 30 minutes warm-up. Constant line, load & temperature.									
7.Warm-up drift	---	10V~100V models: Less than +/-0.25% of rated output current over 30 minutes following power on. 150V ~ 600V models: Less than +/-0.15% of rated output current over 30 minutes following power on.									

ANALOG PROGRAMMING AND MONITORING (ISOLATED FROM THE OUTPUT)

1.Vout voltage programming	---	0~100%, 0~5V or 0~10V, user selectable. Accuracy and linearity: +/-0.15% of rated Vout.
2.Iout voltage programming (*15)	---	0~100%, 0~5V or 0~10V, user selectable. Accuracy and linearity: +/-0.4% of rated Iout.
3.Vout resistor programming	---	0~100%, 0~5/10KΩ full scale, user selectable. Accuracy and linearity: +/-0.5% of rated Vout.
4.Iout resistor programming (*15)	---	0~100%, 0~5/10KΩ full scale, user selectable. Accuracy and linearity: +/-0.5% of rated Iout.
5.Output voltage monitor	---	0~5V or 0~10V, user selectable. Accuracy: +/-0.5%.
6.Output current monitor (*15)	---	0~5V or 0~10V, user selectable. Accuracy: +/-0.5%.

SIGNALS AND CONTROLS (ISOLATED FROM THE OUTPUT)

1.Power supply OK #1 signal	---	Power supply output monitor. Open collector. Output On: On. Output Off: Off. Maximum Voltage: 30V. Maximum Sink Current: 10mA.
2.CV/CC signal	---	CV/CC Monitor. Open collector. CC mode: On. CV mode: Off. Maximum Voltage: 30V. Maximum Sink Current: 10mA.
3.LOCAL/REMOTE Analog control	---	Enable/Disable analog programming control by electrical signal or dry contact. Remote: 0~0.6V or short. Local: 2~30V or open.
4.LOCAL/REMOTE Analog signal	---	Analog programming control monitor signal. Open collector. Remote: On. Local: Off. Maximum Voltage: 30V. Maximum Sink Current: 10mA.
5.ENABLE/DISABLE signal	---	Enable/Disable PS output by electrical signal or dry contact. 0~0.6V or short, 2~30V or open. User selectable logic.
6.INTERLOCK (ILC) control	---	Enable/Disable PS output by electrical signal or dry contact. Output ON: 0~0.6V or short. Output OFF: 2~30V or open.
7.Programmed signals	---	Two open drain programmable signals. Maximum voltage 25V. Maximum sink current 100mA (shunted by 27V zener).
8.TRIGGER IN / TRIGGER OUT signals	---	Maximum low level input voltage = 0.8V. Minimum high level input voltage = 2.5V. Maximum high level input = 5V positive edge trigger: tw = 10us minimum. Tr,Tf = 1us maximum. Min delay between 2 pulses 1ms.
9.DAISY_IN/SO control signal	---	By electrical Voltage: 0~0.6V/2~30V or dry contact.
10.DAISY_OUT/PS_OK #2 signal	---	4~5V = OK, 0V (500Ω impedance) = Fail.

FUNCTIONS AND FEATURES

1.Parallel operation	---	Consult with manufacturer
2.Series operation	---	Consult with manufacturer
3.Daisy chain	---	Power supplies can be connected in Daisy chain to synchronize their turn-on and turn-off.
4.Constant power control	---	Limits the output power to a programmed value. Programming via the communication ports or the front panel.
5.Output resistance control	---	Emulates series resistance. Resistance range: 1~1000mΩ. Programming via the communication ports or the front panel.
6.Slew rate control	---	Programmable Output rise and Output fall slew rate. Programming range: 0.0001~999.99 V/mS. or A/mS. Programming via communication ports or front panel.
7.Arbitrary waveforms	---	Profiles of up to 100 steps can be stored in 4 memory cells. Activation by command via communication ports or front panel.

PROGRAMMING AND READBACK (USB, LAN, RS232/485, Optional IEEE (*19) (*20) Interface)

	V	10	20	30	40	60	80	100	150	300	600
1.Vout programming accuracy (*16)	---	0.05% of rated output voltage.									
2.Iout programming accuracy (*15)	---	0.3% of rated output current.									
3.Vout programming resolution	---	0.002% of rated output voltage.									
4.Iout programming resolution	---	0.002% of rated output current.									
5.Vout readback accuracy	---	0.05% of rated output voltage.									
6.Iout readback accuracy (*15)	---	0.2% of rated output current.									
7.Vout readback resolution	% of rated output voltage	0.011%	0.006%	0.004%	0.003%	0.002%	0.002%	0.011%	0.007%	0.004%	0.002%
8.Iout readback resolution	% of rated output current	0.012%	0.003%	0.004%	0.005%	0.007%	0.009%	0.012%	0.002%	0.003%	0.006%

PROTECTIVE FUNCTIONS

	V	10	20	30	40	60	80	100	150	300	600
1.Foldback protection	---	Output shut-down when power supply changes mode from CV or Power Limit to CC mode or from CC or Power Limit to CV mode. User presetable. Reset by AC input recycle in autostart mode, by Power Switch, by OUTPUT button, by rear panel or by communication.									
2.Over-voltage protection (OVP)	---	Output shut-down. Reset by AC input recycle in autostart mode, by Power Switch, by OUTPUT button, by rear panel or by communication.									
3.Over-voltage programming range	V	0.5~12	1~24	2~36	2~44.1	5~66.15	5~88.2	5~110.25	5~165.37	5~330.75	5~661.5
4.Over-voltage programming accuracy	-	+/-1% of rated output voltage.									
5.Output under voltage limit (UVL)	---	Prevents from adjusting Vout below limit. Does not apply in analog programming. Preset by front panel or communication port.									
6.Over temperature protection	---	Shuts down the output. Auto recovery by autostart mode.									
7.Output under voltage protection (UVP)	---	Prevents adjustment of Vout below limit. P.S output turns Off during under voltage condition. Reset by AC input recycle in autostart mode, by Power Switch, by OUTPUT button, by rear panel or by communication.									

FRONT PANEL

1.Control functions	---	Multiple options with 2 Encoders.
	---	Vout/Iout/Power Limit manual adjust.
	---	OVP/UVL/UVP manual adjust.
	---	Protection Functions - OVP, UVL, UVP, Foldback, OCL, ENA, ILC.
	---	Communication Functions - Selection of LAN, RS232, RS485, USB or Optional communication interface.
	---	Output ON/OFF. Front Panel Lock.
	---	Communication Functions - Selection of Baud Rate, Address, IP and communication language.
	---	Analog Control Functions - Selection Voltage/resistive programming 5V/10V, 5KΩ/10KΩ programming.
	---	Analog Monitor Functions - Selection of Voltage/Current Monitoring 5V/10V.
2.Display	---	Vout: 4 digits, accuracy: 0.05% of rated output voltage +/-1 count.
	---	Iout: 4 digits, accuracy: 0.2% of rated output current +/-1 count.
3.Front Panel Buttons Indications	---	OUTPUT ON, ALARM, PREVIEW, FINE, COMMUNICATION, PROTECTION, CONFIGURATION, SYSTEM, SEQUENCER.
4.Front Panel Display Indications	---	Voltage, Current, Power, CV, CC, CP, External Voltage, External Current, Address, LFP Autostart, Safetstart, Foldback V/I, Remote (communication), RS/USB/LAN/Optional communication interface, Trigger, Load/Store Cell.

ENVIRONMENTAL CONDITIONS

1.Operating temperature	---	0~50°C, 100% load.
2.Storage temperature	---	-30~85°C.
3.Operating humidity	---	20~90% RH (no condensation).
4.Storage humidity	---	10~95% RH (no condensation).
5.Altitude (*17)	---	Operating: 10000ft (3000m), output current derating 2%/100m or Ta derating 1°C/100m above 2000m. Non-operating: 40000ft (12000m).

MECHANICAL

1.Cooling	---	Forced air cooling by internal fans. Airflow direction: From front panel to power supply rear.
2.Weight	Kg	Less than 15.5Kg.
3.Dimensions (WxHxD)	mm	W: 423, H: 88.0, D: 441.5 (Without busbars and busbars cover), W: 423, H: 88.0, D: 640.0 (Including busbars and strain relief) (Refer to Outline drawing).
4.Vibration	---	MIL-810G, method 514.6, Procedure I, test condition Annex C - 2.1.3.1
5.Shock	---	Less than 20G, half sine, 11mS. Unit is unpacked.

SAFETY/EMC

1.Safety standards	---	UL60950-1, CSA22.2 No.60950-1, IEC60950-1, EN60950-1.
1.1.Interface classification	---	Vout≤40V Models: Output, J1, J2, J3, J4, J5, J6, J7, J8 (sense) and J9 (communication options) are SELV. 60≤Vout≤600V Models: Output and J8 (sense) are hazardous, J1, J2, J3, J4, J5, J6, J7 and J9 (communication options) are SELV.
1.2.Withstand voltage	---	Vout≤40V Models: Input - Output (SELV): 4242VDC 1min, Input - Ground: 2835VDC 1min. 60V≤Vout≤100V Models: Input - Output: 4242VDC 1min, Input - SELV: 4242VDC 1min. Output - SELV: 850VDC 1min, Output - Ground: 1500VDC 1min, Input - Ground: 2835VDC 1min. 100V<Vout≤600V Models: Input - Output: 4242VDC 1min, Input - SELV: 4242VDC 1min Output - SELV: 1275VDC 1min, Output - Ground: 2500VDC 1min. Input - Ground: 2835VDC 1min.
1.3.Insulation resistance	---	More than 100Mohm at 25°C, 70%RH.
2.EMC standards (*18)	---	IEC/EN61204-3 Industrial environment.
2.1.Conducted emission	---	IEC/EN61204-3 Industrial environment, Annex H table H.1, FCC Part 15-A, VCCI-A.
2.2.Radiated emission	---	IEC/EN61204-3 Industrial environment, Annex H table H.3 and H.4, FCC Part 15-A, VCCI-A.

NOTES:

*1: Minimum voltage is guaranteed to maximum 0.1% of rated output voltage.

*2: Minimum current is guaranteed to maximum 0.2% of rated output current.

*3: Derate 10A/1°C above 40°C.

*4: For cases where conformance to various safety standards (UL, IEC, etc...) is required, to be described as 190-240Vac (50/60Hz) for 3-Phase 200V models
380~415Vac (50/60Hz) for 3-Phase 400V models and 380~480Vac (50/60Hz) for 3-Phase 480V models.

*5: 3-Phase 200V models: At 200Vac input voltage, 3-Phase 400/480V: At 380Vac input voltage. With rated output power.

*6: Not including EMI filter inrush current, less than 0.2mS.

*7: 3-Phase 200V models: 170~265Vac, 3-Phase 400V models: 342~460Vac, 3-Phase 480V models: 342~528Vac. Constant load.

*8: From No-Load to Full-Load, constant input voltage. Measured at the sensing point in Remote Sense.

*9: For 10V~150V models: Measured with JEITA RC-9131C (1:1) probe. For 300~600V models: Measured with 100:1 probe.

*10: The maximum voltage on the power supply terminals must not exceed the rated voltage.

*11: From 10% to 90% or 90% to 10% of Rated Output Voltage, with rated, resistive load.

*12: From 90% to 10% of Rated Output Voltage.

*13: For load voltage change, equal to the unit voltage rating, constant input voltage.

*14: For 10V model, the ripple is measured at 2V and rated output current. For other models, the ripple is measured at 10% of rated output voltage. B.W 5Hz~1MHz.

*15: The Constant Current programming, readback and monitoring accuracy do not include the warm-up and Load regulation thermal drift.

*16: Measured at the sensing point.

*17: For 10V model, Ta derating 2°C/100m.

*18: Signal and control ports interface cables length: Less than 3m, DC output power port cables length: Less than 30m.

*19: Max. ambient temperature for using IEEE is 40C.

*20: For 10V model only: Max. output current for using IEEE is 800A up to 40C and 900A up to 30C.

5.4 15kW Series Specifications

OUTPUT RATING

		10-1500	20-750	30-510	40-375	60-255	80-195	100-150	150-102	300-51	600-25.5
1.Rated output voltage (*1)	V	10	20	30	40	60	80	100	150	300	600
2.Rated output current (*2)	A	1500 (*3)	750	510	375	255	195	150	102	51	25.5
3.Rated output power	W	15000	15000	15300	15000	15300	15600	15000	15300	15300	15300

INPUT CHARACTERISTICS

	V	10	20	30	40	60	80	100	150	300	600
1.Input voltage/freq. 3 phase, 3 wire+ground (*4)	---	3-Phase, 200V models: 170~265Vac, 47~63Hz (Covers 200/230Vac). 3-Phase, 400V models: 342~460Vac, 47~63Hz (Covers 380/400/415Vac). 3-Phase, 480V models: 342~528Vac, 47~63Hz (Covers 380/400/415/440/460/480Vac).									
2.Maximum Input current at 100% load	3-Phase, 200V models:	52.5A @ 200Vac.									
	3-Phase, 400V models:	27.6A @ 380Vac.									
	3-Phase, 480V models:	27.6A @ 380Vac.									
3.Power Factor (Typ.)	---	0.94 @ 200/380Vac, rated output power.									
4.Efficiency (Typ.) (*5)	%	89.5	90	91	91	91	91	91	91	92	92
5.Inrush current (*6)	---	Less than 150A.									

CONSTANT VOLTAGE MODE

	V	10	20	30	40	60	80	100	150	300	600
1.Max. Line regulation (*7)	---	0.01% of rated output voltage.									
2.Max. Load regulation (*8)	---	0.01% of rated output voltage +5mV.									
3.Ripple and noise (p-p, 20MHz) (*9)	mV	75	75	75	75	75	80	90	120	200	480
4.Ripple r.m.s. 5Hz~1MHz (*9)	mV	8	10	12	12	12	15	15	20	60	100
5.Temperature coefficient	---	50PPM/°C from rated output voltage, following 30 minutes warm-up.									
6.Temperature stability	---	0.01% of rated Vout over 8hrs interval following 30 minutes warm-up. Constant line, load & temperature.									
7.Warm-up drift	---	Less than 0.05% of rated output voltage +2mV over 30 minutes following power on.									
8.Remote sense compensation/wire (*10)	V	2	2	5	5	5	5	5	5	5	5
9.Up-prog. response time (*11)	mS	30	30	30	30	50	50	50	50	50	100
10.Down-prog. response time:	Full load (*11)	50	50	80	80	80	100	100	100	100	200
	No load (*12)	300	600	800	900	1000	1200	1900	2000	3000	3000
11.Transient response time	---	Time for output voltage to recover within 0.5% of its rated output for a load change 10~90% of rated output current. Output set point: 10~100%, Local sense. Less than 1mS for models up to and including 100V. 2mS for models above 100V.									
12. Start-up delay	---	Less than 7Sec.									
13.Hold-up time	---	5mS Typical. Rated output power.									

CONSTANT CURRENT MODE

	V	10	20	30	40	60	80	100	150	300	600
1.Max. Line regulation (*7)	---	0.05% of rated output current.									
2.Max. Load regulation (*13)	---	0.08% of rated output current.									
3.Ripple r.m.s. @ 10% rated voltage (*14)	mA	2000	1200	600	300	180	100	70	45	15	10
4.Ripple r.m.s. @ rated voltage. B.W 5Hz~1MHz	mA	1200	700	300	150	90	60	35	23	7.5	6
5.Temperature coefficient	---	10V~100V models: 100PPM/°C from rated output current, following 30 minutes warm-up. 150V~600V models: 70PPM/°C from rated output current, following 30 minutes warm-up.									
6.Temperature stability	---	0.01% of rated Iout over 8hrs. interval following 30 minutes warm-up. Constant line, load & temperature.									
7.Warm-up drift	---	10V~100V models: Less than +/-0.25% of rated output current over 30 minutes following power on. 150V ~ 600V models: Less than +/-0.15% of rated output current over 30 minutes following power on.									

ANALOG PROGRAMMING AND MONITORING (ISOLATED FROM THE OUTPUT)

1.Vout voltage programming	---	0~100%, 0~5V or 0~10V, user selectable. Accuracy and linearity: +/-0.15% of rated Vout.
2.Iout voltage programming (*15)	---	0~100%, 0~5V or 0~10V, user selectable. Accuracy and linearity: +/-0.4% of rated Iout.
3.Vout resistor programming	---	0~100%, 0~5/10KΩ full scale, user selectable. Accuracy and linearity: +/-0.5% of rated Vout.
4.Iout resistor programming (*15)	---	0~100%, 0~5/10KΩ full scale, user selectable. Accuracy and linearity: +/-0.5% of rated Iout.
5.Output voltage monitor	---	0~5V or 0~10V, user selectable. Accuracy: +/-0.5%.
6.Output current monitor (*15)	---	0~5V or 0~10V, user selectable. Accuracy: +/-0.5%.

SIGNALS AND CONTROLS (ISOLATED FROM THE OUTPUT)

1.Power supply OK #1 signal	---	Power supply output monitor. Open collector. Output On: On. Output Off: Off. Maximum Voltage: 30V. Maximum Sink Current: 10mA.
2.CV/CC signal	---	CV/CC Monitor. Open collector. CC mode: On. CV mode: Off. Maximum Voltage: 30V. Maximum Sink Current: 10mA.
3.LOCAL/REMOTE Analog control	---	Enable/Disable analog programming control by electrical signal or dry contact. Remote: 0~0.6V or short. Local: 2~30V or open.
4.LOCAL/REMOTE Analog signal	---	Analog programming control monitor signal. Open collector. Remote: On. Local: Off. Maximum Voltage: 30V. Maximum Sink Current: 10mA.
5.ENABLE/DISABLE signal	---	Enable/Disable PS output by electrical signal or dry contact. 0~0.6V or short, 2~30V or open. User selectable logic.
6.INTERLOCK (ILC) control	---	Enable/Disable PS output by electrical signal or dry contact. Output ON: 0~0.6V or short. Output OFF: 2~30V or open.
7.Programmed signals	---	Two open drain programmable signals. Maximum voltage 25V. Maximum sink current 100mA (shunted by 27V zener).
8.TRIGGER IN / TRIGGER OUT signals	---	Maximum low level input voltage = 0.8V. Minimum high level input voltage = 2.5V. Maximum high level input = 5V positive edge trigger: tw = 10us minimum. Tr,Tf = 1us maximum. Min delay between 2 pulses 1ms.
9.DAISY_IN/SO control signal	---	By electrical Voltage: 0~0.6V/2~30V or dry contact.
10.DAISY_OUT/PS_OK #2 signal	---	4~5V = OK, 0V (500Ω impedance) = Fail.

FUNCTIONS AND FEATURES

1.Parallel operation	---	Consult with manufacturer.
2.Series operation	---	Consult with manufacturer.
3.Daisy chain	---	Power supplies can be connected in Daisy chain to synchronize their turn-on and turn-off.
4.Constant power control	---	Limits the output power to a programmed value. Programming via the communication ports or the front panel.
5.Output resistance control	---	Emulates series resistance. Resistance range: 1~1000mΩ. Programming via the communication ports or the front panel.
6.Slew rate control	---	Programmable Output rise and Output fall slew rate. Programming range: 0.0001~999.99 V/mS. or A/mS. Programming via communication ports or front panel.
7.Arbitrary waveforms	---	Profiles of up to 100 steps can be stored in 4 memory cells. Activation by command via communication ports or front panel.

PROGRAMMING AND READBACK (USB, LAN, RS232/485, Optional IEEE (*19) (*20) Interface)

	V	10	20	30	40	60	80	100	150	300	600
1.Vout programming accuracy (*16)	---	0.05% of rated output voltage									
2.Iout programming accuracy (*15)	---	0.3% of rated output current									
3.Vout programming resolution	---	0.002% of rated output voltage									
4.Iout programming resolution	---	0.002% of rated output current									
5.Vout readback accuracy	---	0.05% of rated output voltage									
6.Iout readback accuracy (*15)	---	0.2% of rated output current									
7.Vout readback resolution	% of rated output voltage	0.011%	0.006%	0.004%	0.003%	0.002%	0.002%	0.011%	0.007%	0.004%	0.002%
8.Iout readback resolution	% of rated output current	0.012%	0.003%	0.003%	0.004%	0.005%	0.006%	0.008%	0.012%	0.003%	0.005%

PROTECTIVE FUNCTIONS

	V	10	20	30	40	60	80	100	150	300	600
1.Foldback protection	---	Output shut-down when power supply changes mode from CV or Power Limit to CC mode or from CC or Power Limit to CV mode. User presetable. Reset by AC input recycle in autostart mode, by Power Switch, by OUTPUT button, by rear panel or by communication.									
2.Over-voltage protection (OVP)	---	Output shut-down. Reset by AC input recycle in autostart mode, by Power Switch, by OUTPUT button, by rear panel or by communication.									
3.Over-voltage programming range	V	0.5~12	1~24	2~36	2~44.1	5~66.15	5~88.2	5~110.25	5~165.37	5~330.75	5~661.5
4.Over-voltage programming accuracy	-	+/-1% of rated output voltage									
5.Output under voltage limit (UVL)	---	Prevents from adjusting Vout below limit. Does not apply in analog programming. Preset by front panel or communication port.									
6.Over temperature protection	---	Shuts down the output. Auto recovery by autostart mode.									
7.Output under voltage protection (UVP)	---	Prevents adjustment of Vout below limit. P.S output turns Off during under voltage condition. Reset by AC input recycle in autostart mode, by Power Switch, by OUTPUT button, by rear panel or by communication.									

FRONT PANEL

1.Control functions	---	Multiple options with 2 Encoders.
	---	Vout/Iout/Power Limit manual adjust.
	---	OVP/UVL/UVP manual adjust.
	---	Protection Functions - OVP, UVL, UVP, Foldback, OCL, ENA, ILC.
	---	Communication Functions - Selection of LAN, RS232, RS485, USB or Optional communication interface.
	---	Output ON/OFF, Front Panel Lock.
	---	Communication Functions - Selection of Baud Rate, Address, IP and communication language.
	---	Analog Control Functions - Selection Voltage/resistive programming 5V/10V, 5KΩ/10KΩ programming.
	---	Analog Monitor Functions - Selection of Voltage/Current Monitoring 5V/10V.
2.Display	---	Vout: 4 digits, accuracy: 0.05% of rated output voltage +/-1 count.
	---	Iout: 4 digits, accuracy: 0.2% of rated output current +/-1 count.
3.Front Panel Buttons Indications	---	OUTPUT ON, ALARM, PREVIEW, FINE, COMMUNICATION, PROTECTION CONFIGURATION SYSTEM, SEQUENCER.
4.Front Panel Display Indications	---	Voltage, Current, Power, CV, CC, CP, External Voltage, External Current, Address, LFP Autostart, Safetstart, Foldback V/I, Remote (communication), RS/USB/LAN/Optional communication interface, Trigger, Load/Store Cell.

ENVIRONMENTAL CONDITIONS

1.Operating temperature	---	0~50°C, 100% load.
2.Storage temperature	---	-30~85°C.
3.Operating humidity	---	20~90% RH (no condensation).
4.Storage humidity	---	10~95% RH (no condensation).
5.Altitude (*17)	---	Operating: 10000ft (3000m), output current derating 2%/100m or Ta derating 1°C/100m above 2000m. Non-operating: 40000ft (12000m).

MECHANICAL

1.Cooling	---	Forced air cooling by internal fans. Airflow direction: From front panel to power supply rear.
2.Weight	Kg	Less than 23.5Kg.
3.Dimensions (WxHxD)	mm	W: 423, H: 132.5, D: 441.5 (Without busbars and busbars cover), W: 423, H: 132.5, D: 640.0 (Including busbars and strain relief) (Refer to Outline drawing).
4.Vibration	---	MIL-810G, method 514.6, Procedure I, test condition Annex C - 2.1.3.1
5.Shock	---	Less than 20G, half sine, 11mS. Unit is unpacked.

SAFETY/EMC

1.Safety standards	---	UL60950-1, CSA22.2 No.60950-1, IEC60950-1, EN60950-1.
1.1.Interface classification	---	Vout≤40V Models: Output, J1, J2, J3, J4, J5, J6, J7, J8 (sense) and J9 (communication options) are SELV. 60≤Vout≤600V Models: Output and J8 (sense) are hazardous, J1, J2, J3, J4, J5, J6, J7 and J9 (communication options) are SELV.
1.2.Withstand voltage	---	Vout≤40V Models: Input - Output (SELV): 4242VDC 1min, Input - Ground: 2835VDC 1min. 60V≤Vout≤100V Models: Input - Output: 4242VDC 1min, Input - SELV: 4242VDC 1min. Output - SELV: 850VDC 1min, Output - Ground: 1500VDC 1min, Input - Ground: 2835VDC 1min. 100V<Vout≤600V Models: Input - Output: 4242VDC 1min, Input - SELV: 4242VDC 1min Output - SELV: 1275VDC 1min, Output - Ground: 2500VDC 1min. Input - Ground: 2835VDC 1min.
1.3.Insulation resistance	---	More than 100Mohm at 25°C, 70%RH.
2.EMC standards (*18)	---	IEC/EN61204-3 Industrial environment.
2.1.Conducted emission	---	IEC/EN61204-3 Industrial environment, Annex H table H.1, FCC Part 15-A, VCCI-A.
2.2.Radiated emission	---	IEC/EN61204-3 Industrial environment, Annex H table H.3 and H.4, FCC Part 15-A, VCCI-A.

NOTES:

- *1: Minimum voltage is guaranteed to maximum 0.1% of rated output voltage.
- *2: Minimum current is guaranteed to maximum 0.2% of rated output current.
- *3: Derate 10A/1°C above 40°C.
- *4: For cases where conformance to various safety standards (UL, IEC, etc...) is required, to be described as 190-240Vac (50/60Hz) for 3-Phase 200V models
380~415Vac (50/60Hz) for 3-Phase 400V models and 380~480Vac (50/60Hz) for 3-Phase 480V models.
- *5: 3-Phase 200V models: At 200Vac input voltage, 3-Phase 400/480V: At 380Vac input voltage. With rated output power.
- *6: Not including EMI filter inrush current, less than 0.2mS.
- *7: 3-Phase 200V models: 170~265Vac, 3-Phase 400V models: 342~460Vac, 3-Phase 480V models: 342~528Vac. Constant load.
- *8: From No-Load to Full-Load, constant input voltage. Measured at the sensing point in Remote Sense.
- *9: For 10V~150V models: Measured with JEITA RC-9131C (1:1) probe. For 300~600V models: Measured with 100:1 probe.
- *10: The maximum voltage on the power supply terminals must not exceed the rated voltage.
- *11: From 10% to 90% or 90% to 10% of Rated Output Voltage, with rated, resistive load.
- *12: From 90% to 10% of Rated Output Voltage.
- *13: For load voltage change, equal to the unit voltage rating, constant input voltage.
- *14: For 10V model, the ripple is measured at 2V and rated output current. For other models, the ripple is measured at 10% of rated output voltage. B.W 5Hz~1MHz.
- *15: The Constant Current programming, readback and monitoring accuracy do not include the warm-up and Load regulation thermal drift.
- *16: Measured at the sensing point.
- *17: For 10V model, Ta derating 2°C/100m.
- *18: Signal and control ports interface cables length: Less than 3m, DC output power port cables length: Less than 30m.
- *19: Max. ambient temperature for using IEEE is 40C.
- *20: For 10V model only: Max. output current for using IEEE is 1200A up to 40C and 1350A up to 30C.

NOTES

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NOTES

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