

GENESYS™ Series

Programmable DC Power Supplies

GH1kW in 1U Half-Rack 0-600V / 0-100A

GH1.5kW in 1U Half-Rack 0-600V / 0-150A

G1kW in 1U 0-600V / 0-100A

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

G2.7kW in 1U 0-600V / 0-265A

G3.4kW in 1U 0-600V / 0-340A

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

G7.5kW in 1U 0-1500V / 0-375A

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), MODBUS TCP or EtherCAT

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_.

For units equipped with MODBUS TCP interface option, refer to MODBUS TCP User manual IA761-04-04_.

For units equipped with EtherCAT interface option, refer to EtherCAT User manual IA761-04-05_.

Modbus® is a registered trademark of Schneider Electric, licensed to the Modbus Organization, Inc.

EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

This Manual Covers Models:

1kW Half-Rack:

GH10-100	GH80-12.5	GHB10-100	GHB80-12.5
GH20-50	GH100-10	GHB20-50	GHB100-10
GH30-34	GH150-7	GHB30-34	GHB150-7
GH40-25	GH300-3.5	GHB40-25	GHB300-3.5
GH60-17	GH600-1.7	GHB60-17	GHB600-1.7

1.5kW Half-Rack:

GH10-150	GH80-19	GHB10-150	GHB80-19
GH20-75	GH100-15	GHB20-75	GHB100-15
GH30-50	GH150-10	GHB30-50	GHB150-10
GH40-38	GH300-5	GHB40-38	GHB300-5
GH60-25	GH600-2.6	GHB60-25	GHB600-2.6

1kW:

G10-100	G80-12.5	GB10-100	GB80-12.5
G20-50	G100-10	GB20-50	GB100-10
G30-34	G150-7	GB30-34	GB150-7
G40-25	G300-3.5	GB40-25	GB300-3.5
G60-17	G600-1.7	GB60-17	GB600-1.7

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

2.7kW:

G10-265	G80-34	GB10-265	GB80-34
G20-135	G100-27	GB20-135	GB100-27
G30-90	G150-18	GB30-90	GB150-18
G40-68	G300-9	GB40-68	GB300-9
G60-45	G600-4.5	GB60-45	GB600-4.5

3.4kW:

G10-340	G80-42	GB10-340	GB80-42
G20-170	G100-34	GB20-170	GB100-34
G30-112	G150-22.5	GB30-112	GB150-22.5
G40-85	G300-11.5	GB40-85	GB300-11.5
G60-56	G600-5.6	GB60-56	GB600-5.6

5kW:

G10-500	G100-50	GB10-500	GB100-50
G20-250	G150-34	GB20-250	GB150-34
G30-170	G200-25	GB30-170	GB200-25
G40-125	G300-17	GB40-125	GB300-17
G50-100	G400-13	GB50-100	GB400-13
G60-85	G500-10	GB60-85	GB500-10
G80-65	G600-8.5	GB80-65	GB600-8.5

7.5kW:

G20-375	G150-50	GB20-375	GB150-50
G30-250	G200-37.5	GB30-250	GB200-37.5
G40-188	G300-25	GB40-188	GB300-25
G60-125	G600-12.5	GB60-125	GB600-12.5
G80-94	G1000-7.5	GB80-94	GB1000-7.5
G100-75	G1500-5	GB100-75	GB1500-5

10kW:

GSP10-1000	GSP100-100	GBSP10-1000	GBSP100-100
GSP20-500	GSP150-68	GBSP20-500	GBSP150-68
GSP30-340	GSP200-50	GBSP30-340	GBSP200-50
GSP40-250	GSP300-34	GBSP40-250	GBSP300-34
GSP50-200	GSP400-26	GBSP50-200	GBSP400-26
GSP60-170	GSP500-20	GBSP60-170	GBSP500-20
GSP80-130	GSP600-17	GBSP80-130	GBSP600-17

15kW:

GSP10-1500	GSP100-150	GBSP10-1500	GBSP100-150
GSP20-750	GSP150-102	GBSP20-750	GBSP150-102
GSP30-510	GSP200-75	GBSP30-510	GBSP200-75
GSP40-375	GSP300-51	GBSP40-375	GBSP300-51
GSP50-300	GSP400-39	GBSP50-300	GBSP400-39
GSP60-255	GSP500-30	GBSP60-255	GBSP500-30
GSP80-195	GSP600-25.5	GBSP80-195	GBSP600-25.5

This page intentionally left blank

TABLE OF CONTENTS

GENERAL INFORMATION	1
WARRANTY	1
ENVIRONMENTAL COMPLIANCE	1
LONG-TERM STORAGE METHOD AND LONG-TERM STORAGE PERIOD	2
SAFETY & EMC APPROVALS	4
GENERAL SAFETY INFORMATION	6
INFORMAZIONI GENERALI DI SICUREZZA	10
INFORMACIÓN GENERAL DE SEGURIDAD	14
INFORMATIONS GÉNÉRALES DE SÉCURITÉ	18
ALLGEMEINE SICHERHEITSHINWEISE	22
INFORMAÇÕES GERAIS DE SEGURANÇA	26
PRODUCT SAFETY INSTRUCTIONS	30
CHAPTER 1: GENERAL INFORMATION	33
1.1 User Manual Content	33
1.2 Introduction	33
1.2.1 General Description	33
1.2.2 Multiple Output Power System	33
1.2.3 Control via Communication Ports.....	33
1.2.4 Analog Voltage Programming and Monitoring.....	34
1.2.5 Parallel Operation	34
1.2.6 Serial Operation (Applicable to 10V – 600V Only).....	34
1.2.7 Output Connections.....	34
1.2.8 Cooling and Mechanical Construction.....	34
1.3 Accessories	35
1.3.1 Accessories Provided With the Power Supply	35
1.3.1.1 Input Connector Protection (Includes 3 Parts) *	35
1.3.1.2 AC Input Plug *	35
1.3.1.3 Output Connector / Bus Bars Protection (Full Width Models).....	35
1.3.1.4 Remote Sense Connector for 7.5kW Only	35
1.3.1.5 Output Cover Half Width Models Up to 100VDC Output	35
1.3.1.6 Output Connector Half Width Models Above 100VDC Output	36
1.3.1.7 Serial Link Cable	36
1.3.1.8 Misc. Hardware.....	36
1.3.1.9 Bus Bars Screws Kits (Full Width Models).....	36
1.3.1.10 Bus Bars Screws Kit (Half Width Models)	37
1.3.2 Optional Accessories	37
1.3.2.1 Printed User Manual	37
1.3.2.2 Serial Port Cables	37
1.3.2.3 Paralleling Cable	37
1.3.2.4 Rack Mount kit.....	37
1.3.2.5 Dust Filter (Full Width Models Only)	38
1.3.2.6 AC Cables.....	38
CHAPTER 2: FRONT/REAR PANEL CONTROLS AND CONNECTORS	40
2.1 Introduction	40

2.2	Front Panel Display and Controls	40
2.3	Blank Front Panel	43
2.4	Rear Panel Connectors	44
CHAPTER 3: OUTLINE		47
3.1	1kW Half Width Power Supplies Outline	47
3.2	1.5kW Half Width Power Supplies Outline	49
3.3	1kW Power Supplies Outline	51
3.4	1.7kW / 2.7kW / 3.4kW / 5kW Power Supplies Outline	53
3.5	7.5kW Power Supplies Outline	55
3.6	10kW Power Supplies Outline	57
3.7	15kW Power Supplies Outline	60
CHAPTER 4: INSTALLATION		63
4.1	General	63
4.2	Preparation for Use	63
4.3	Initial Inspection	64
4.4	Rack Mounting (Half Width Models)	64
4.4.1	GH/RM Option kit	64
4.4.2	Single Unit Installation	64
4.4.3	Dual Unit Installation	66
4.4.4	GH\RM Rack Mounting Outline Drawings	68
4.5	Rack Mounting (Full Width Models)	69
4.5.1	Install the Power Supply in a Rack	69
4.5.2	Rack Mount Slides (Optional)	69
4.6	Benchtop Stacking Option (Half Width Models)	72
4.6.1	GH/MO Option kit	72
4.6.2	GH/MO Installation	72
4.7	Location, Mounting and Cooling	73
4.7.1	Foot Snaps Assembly (Applicable for Half Width Models Only)	73
4.8	AC Input Power Connection	73
4.8.1	AC Input Connector	75
4.8.2	AC Input Wire Connection for GH1.5kW	76
4.8.3	AC Input Wire Connection for 1.7kW - 5kW	78
4.8.4	AC Input Wire Connection for 7.5kW	81
4.8.5	AC Input Wire Connection for 10kW - 15kW	83
4.9	Turn-On Check Procedure	87
4.9.1	General	87
4.9.2	Prior to Operation	87
4.9.3	Constant Voltage Check (Standard Power Supply)	87
4.9.4	Constant Voltage Check (Blank Panel Power Supply)	88
4.9.5	Constant Current Check (Standard Power Supply)	88
4.9.6	Constant Current Check (Blank Panel Power Supply)	89
4.10	Connecting the Load	90
4.10.1	Load Wiring	90
4.10.2	Current Carrying Capacity	90
4.10.3	Bus bar Cover Limitation	92
4.10.4	Wire Termination	93
4.10.5	Noise and Impedance Effects	93
4.10.6	Inductive Loads	93
4.10.7	GSP 10kW and 15kW Packing Box Unpack	93
4.10.8	Making the Load Connections	94

4.10.9	Grounding Outputs	114
4.11	Local and Remote Sensing	114
4.11.1	Sense Wiring	114
4.11.2	Local Sensing.....	114
4.11.3	Remote Sensing	114
4.11.4	J8 Sense Connector Technical Information	115
4.12	Repackaging for Shipment	116
CHAPTER 5: SPECIFICATIONS.....		117
5.1	GH1kW Series Specifications.....	117
5.2	GH1.5kW Series Specifications.....	120
5.3	1kW Series Specifications.....	123
5.4	1.7kW Series Specifications.....	126
5.5	2.7kW Series Specifications.....	129
5.6	3.4kW Series Specifications.....	132
5.7	5kW Series Specifications.....	135
5.8	7.5kW Series Specifications.....	138
5.9	10kW Series Specifications.....	141
5.10	15kW Series Specifications.....	144

This page intentionally left blank

GENERAL INFORMATION

Documentation (including this Manual) is subject to change without notice. Refer to TDK-Lambda Technical Data web page for an up-to-date documentation and optional communication interfaces user manuals (including MODBUS-TCP and EtherCAT):

<https://www.emea.lambda.tdk.com/manual>

Drivers and GUIs are updated periodically to support new features. Refer to TDK-Lambda Technical Centre web page for up-to-date drivers and GUIs:

<https://www.emea.lambda.tdk.com/software>

Further technical assistance, if needed, may be obtained at TDK-Lambda Technical Centre:

https://www.emea.lambda.tdk.com/about_global

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 4.12 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://www.emea.lambda.tdk.com/environment_policy. 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.

LONG-TERM STORAGE METHOD AND LONG-TERM STORAGE PERIOD

1. Please keep the product in its carton box.
2. Please do not apply excessive vibration, shock or mechanical stress applied directly on the product.
3. Please keep away from direct sunlight.
4. For long-term storage temperature and humidity, the following conditions shall be used as a guideline:

Temperature range: 5°C ~ 30°C.

Humidity range: 40% ~ 60~ RH.

Please keep away from places where temperature and humidity can change extremely. It can cause condensation on the product or deterioration.

5. For long-term storage period, we recommend to use within 2 years after receiving the product.

There is tendency that the leakage current of an aluminum electrolytic capacitor may increase when stored without usage for a long time.

This phenomenon can be minimized by applying voltage to the aluminum electrolytic capacitor to reduce the increased leakage current through the self-recovery effect of the electrolyte.

For reference, before using products that have been stored for a very long time, please warm-up first for 30 minutes or more without load.

1. Implementation period: 1 year or above after delivery.

2. Electrical continuity condition:

Input voltage: Rated.

Load: 0 Amperes (no load condition).

Ambient temperature: according to product specifications.

Time: 30 minutes or more.

China ROHS

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+ 1kW, 1.7kW, 2.7kW, 3.4kW, 5kW, 7.5kW Series Genesys+ Half-Rack GH1kW, GH1.5kW Series GSP 10kW, GSP 15kW Series
---------------	---

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	X	○	○	○	○	○
机箱 (如适用) / Enclosure (if applicable)	X	○	○	○	○	○
配件 / Accessories	○	○	○	○	○	○

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.
X =	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/T 26572.

SAFETY/EMC Approvals

UL 61010-1 and CSA22.2 No. 61010-1 - cTUVus.

IEC 61010-1 - CB Test Report and Certificate.

EN 61010-1 - TUV Mark, CE Mark.

IEC/EN 61204-3 - Industrial environment.

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

CE “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.

UKCA Marking, when applied to a product covered by this handbook, indicates compliance with the Electrical Equipment (safety) Regulations 2016, Electromagnetic Compatibility Regulations 2016 and Restriction of the Use of Certain Hazardous Substances in Electrical & Electronic Equipment regulation 2012.

UKCA “Declaration of Conformity” in accordance with the preceding directives and standards has been made and is available on a file at our UK representative TDK-Lambda UK Limited, Kingsley Avenue, Ilfracombe, Devon EX34 8ES.

Declarations may be accessed via company web site: https://www.emea.lambda.tdk.com/safety_cert

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. If not installed and used in accordance with the instruction manual, it 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 INFORMATION



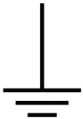
READ SAFETY INSTRUCTIONS

The following safety precautions must be observed during all phases of operation, service and repair of this equipment. Failure to comply with the safety precautions or warnings presented 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.

SYMBOLS AND MARKING ON EQUIPMENT



Caution, risk of danger. When this symbol appears on the equipment, it is important to consult the safety manual to preserve safe operation of the equipment and avoid any potential injury or hazard.



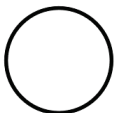
Earth (ground) terminal.



Protective conductor terminal. This is the terminal which is intended for connection to an external conductor for protection against electric shock in case of a fault.



Switch ON position. Powers ON the power supply.



Switch OFF position. Powers OFF the power supply. IMPORTANT: This is NOT the main disconnect device of the equipment. Refer to "DISCONNECT DEVICE" section to learn about the main disconnect device.



Direct current (DC). Indicates that the value next to this symbol is of DC nature.



Alternate current (AC). Indicates that the value next to this symbol is of AC nature.



Caution, hot surface. Indicates that the surface on which this symbol is affixed can be hot and should not be touched without taking care.

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 the limits described in the safety and installation manual. They are not designed for general home or consumer use, and are designed for indoor use.

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, and must be operated within the environmental conditions (temperature, altitude, etc.) specified in the safety and installation manual.

OUTPUT LOADING

The output power taken from the product must not exceed the rating stated on the product label, except as stated in the safety and installation manual. The insulation of the wire connected to the DC output should be in accordance with the output load current and voltage.

INPUT PARAMETERS

These products must be operated within the input parameters stated in the safety and installation manual. The means of connecting this equipment to the supply must only be according to the instructions specified in the safety and installation manual to reduce risk of hazard.

END OF LIFE DISPOSAL

The product 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.

EQUIPMENT OPERATION AND OPERATING CONTROLS

Identification and description of operating controls and their use in all operating modes are stated in the user manual. Operating of the equipment is explained in detail in the user manual.

VENTILATION

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

INPUT AND OUTPUT CABLES

Must use cables with the appropriate voltage and temperature ratings to ensure safe, reliable operation.

ACCESSORIES

Only accessories which meet the manufacturer's specifications shall be used. For identification and instructions for connection of accessories, refer to the safety and installation manual.

HANDLING, LIFTING AND CARRYING

Handling, lifting and carrying of the equipment shall be made only according to the instructions specified in the safety and installation manual to avoid potential personal injury.

DISCONNECT DEVICE

A circuit breaker with current ratings as specified in the safety and installation manual is the main disconnect device of the equipment which reliably shuts off the supply from the equipment. The positioning of the equipment must not make it difficult to operate the disconnect device. The device must be marked as the disconnecting device for the equipment.

NOTE

The switch incorporated in the equipment does NOT act as a main disconnect device and does not cut the supply or power from the equipment. It is added as a means to shut down certain circuits inside the power supply such as the display and the output circuit.

INSTALLATION

Installation of the equipment or the system incorporating the equipment must be in accordance with the installation instructions provided by the manufacturer. The safety of any system incorporating the equipment is the responsibility of the assembler.

IMPROPER USAGE OF THE EQUIPMENT

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

RACK MOUNT SAFETY INSTRUCTIONS

- A) Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Ta) specified by the manufacturer.
- B) Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- C) Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- D) Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- E) Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

USERS

This equipment must be operated by qualified personnel only, who understand the instructions and safety manuals provided with the equipment. If the equipment must be operated by an unqualified personnel, then he/she must be supervised by a qualified personnel.

**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 protects 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.



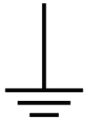
LEGGERE LE ISTRUZIONI DI SICUREZZA

Le seguenti precauzioni di sicurezza devono essere osservate durante tutte le fasi del funzionamento, della manutenzione e della riparazione di questa apparecchiatura. Una mancanza a rispettare gli avvertimenti o le precauzioni di sicurezza presentati in questo documento viola gli standard di sicurezza della progettazione, della fabbricazione e della destinazione d'uso di questa apparecchiatura e può danneggiare le protezioni integrate al suo interno. TDK-Lambda non sarà responsabile per un mancato rispetto di questi requisiti da parte dell'utente.

SIMBOLI E MARCHI SULL'APPARECCHIATURA



Attenzione, possibilità di un pericolo. Quando appare questo simbolo sull'apparecchiatura, è importante consultare il manuale di sicurezza per un funzionamento sicuro dell'apparecchiatura e per evitare una ferita o pericolo potenziali.



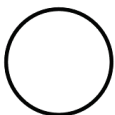
Terminale di terra.



Terminale conduttore protettivo. Questo è il terminale che è destinato al collegamento a un conduttore esterno per protezione contro scossa elettrica in caso di guasto.



Posizione ON dell'interruttore. Accende l'alimentatore.



Posizione OFF dell'interruttore. Spegne l'alimentatore. **IMPORTANTE:** Questo NON è il dispositivo di disattivazione principale dell'apparecchiatura. Vedere la sezione "DISPOSITIVO DI DISATTIVAZIONE" per informazioni sul dispositivo di disattivazione principale.



Corrente continua (CC). Indica che il valore a fianco di questo simbolo è di tipo CC.



Corrente alternata (CA). Indica che il valore a fianco di questo simbolo è di tipo CA.



Attenzione, superficie calda. Indica che la superficie sulla quale è affisso questo simbolo può essere calda e non deve essere toccata senza fare attenzione.

MANUTENZIONE

La manutenzione di questi prodotti non può essere eseguita dal cliente. Le sostituzioni e le modifiche delle parti possono essere eseguite solo da personale di servizio autorizzato di TDK-Lambda. Per riparazioni e modifiche, il prodotto deve essere restituito alla struttura di manutenzione di TDK-Lambda.

COMPONENTI CRITICI

Non è autorizzato l'uso di questi prodotti come componenti critici in sistemi di controllo nucleari, sistemi di supporto vitale o apparecchiatura da usare in ambienti pericolosi senza l'approvazione scritta esplicita dell'amministratore delegato di TDK-Lambda Ltd.

USO DEL PRODOTTO

Questi prodotti sono progettati per essere usati come apparecchiatura autonoma nei limiti descritti nel manuale di sicurezza e di installazione. Non sono progettati per uso del consumatore o domestico generale, e sono progettati per uso in ambienti interni.

AMBIENTALE

Questi prodotti sono IP20, e di conseguenza non devono essere usati prodotti chimici/solventi, detergenti e altri liquidi.

AMBIENTE

Questi prodotti sono progettati per uso in un ambiente con livello di inquinamento 2, categoria di sovratensione II, e devono essere azionati nelle condizioni ambientali (temperatura, altitudine, etc.) specificate nel manuale di sicurezza e di installazione.

CARICO DI USCITA

La potenza di uscita dal prodotto non deve superare la potenza nominale indicata sulla targhetta del prodotto, fatto salvo come specificato nel manuale di sicurezza e di installazione. L'isolamento del cavo collegato all'uscita CC deve essere conforme alla corrente e alla tensione del carico di uscita.

PARAMETRI DI ALIMENTAZIONE

Questi prodotti devono essere azionati nei limiti dei parametri di alimentazione indicati nel manuale di sicurezza e di installazione. I mezzi per collegare questa apparecchiatura all'alimentazione devono essere solo in conformità con le istruzioni specificate nel manuale di sicurezza e di installazione per ridurre il rischio di pericolo.

SMALTIMENTO A FINE VITA

Il prodotto contiene componenti che richiedono uno smaltimento speciale. Accertarsi che l'unità sia smaltita adeguatamente alla fine della sua vita utile e in conformità con le normative locali.

AZIONAMENTO DELL'APPARECCHIATURA E COMANDI

L'identificazione e la descrizione dei comandi e il loro uso in tutte le modalità operative sono specificate nel manuale dell'utente. L'azionamento dell'apparecchiatura è spiegato nei dettagli nel manuale dell'utente.

VENTILAZIONE

Le aperture di ventilazione su questi prodotti non devono essere coperte. Assicurarsi che ci siano almeno 10 cm di spazio fra un'ostruzione e le aperture di ventilazione.

CAVI DI ALIMENTAZIONE E DI USCITA

È necessario utilizzare cavi con la tensione e la temperatura nominale appropriati per assicurare un funzionamento sicuro e fidato.

ACCESSORI

Devono essere usati solo accessori che sono conformi alle specifiche del produttore. Per identificazione e istruzioni per la connessione di accessori, vedere il manuale di sicurezza e di installazione.

MOVIMENTAZIONE, SOLLEVAMENTO E TRASPORTO

La movimentazione, il sollevamento e il trasporto dell'apparecchiatura devono essere eseguiti solo in conformità con le istruzioni specificate nel manuale di sicurezza e di installazione per evitare una potenziale ferita personale.

DISPOSITIVO DI DISATTIVAZIONE

Un interruttore di circuito con i valori di corrente specificati nel manuale di sicurezza e di installazione è il

dispositivo di disattivazione principale dell'apparecchiatura che interrompe l'alimentazione dall'apparecchiatura in modo affidabile. Il posizionamento dell'apparecchiatura non deve causare difficoltà all'azionamento del dispositivo di disattivazione. Il dispositivo deve essere contrassegnato come dispositivo di disattivazione per l'apparecchiatura.

NOTA

l'interruttore incorporato nell'apparecchiatura NON agisce come dispositivo di disattivazione principale e non interrompe l'alimentazione o la corrente dall'apparecchiatura. È aggiunto come mezzo per interrompere determinati circuiti all'interno dell'alimentatore come il display e il circuito di uscita.

INSTALLAZIONE

L'installazione dell'apparecchiatura o del sistema che incorpora l'apparecchiatura deve essere eseguita in conformità con le istruzioni di installazione fornite dal produttore. La sicurezza di un sistema che incorpora l'apparecchiatura è responsabilità dell'assemblatore.

USO IMPROPRIO DELL'APPARECCHIATURA

Se l'apparecchiatura è usata in un modo non specificato dal produttore, la protezione fornita dall'apparecchiatura può essere compromessa.

ISTRUZIONI DI SICUREZZA DEL MONTAGGIO IN RACK

- A) Ambiente di esercizio elevato - Se installata in un gruppo chiuso o in un rack con più unità, la temperatura ambiente di esercizio dell'ambiente rack potrebbe essere maggiore rispetto a quella della stanza. Di conseguenza, occorre prendere in considerazione l'installazione dell'apparecchiatura in un ambiente compatibile con la temperatura ambiente massima (Ta) specificata dal produttore.
- B) Flusso d'aria ridotto - L'installazione dell'apparecchiatura in un rack deve essere tale da non compromettere la quantità di flusso d'aria necessaria per un funzionamento sicuro dell'apparecchiatura.
- C) Carico meccanico - Il montaggio dell'apparecchiatura nel rack deve essere tale da non creare una condizione di pericolo a causa di un carico meccanico non omogeneo.
- D) Sovraccarico del circuito - È necessario valutare il collegamento dell'apparecchiatura al circuito di alimentazione e l'effetto che il sovraccarico dei circuiti potrebbe avere sulla protezione da sovracorrente e il cablaggio di alimentazione. È necessario prendere in appropriata considerazione i valori nominali di targa dell'apparecchiatura quando si affronta questo problema.
- E) Messa a terra affidabile - Deve essere mantenuta una messa a terra affidabile dell'apparecchiatura montata su rack. Deve essere prestata particolare attenzione ai collegamenti di alimentazione diversi dai collegamenti diretti al circuito di derivazione (per esempio uso di prese multiple).

UTENTI

Questa apparecchiatura deve essere azionata solo da personale qualificato che capisce le istruzioni e i manuali di sicurezza forniti con l'apparecchiatura. Se l'apparecchiatura deve essere azionata da personale non qualificato, questo deve essere sotto la supervisione di personale qualificato.

**RISCHIO DI SCOSSA ELETTRICA****AVVERTIMENTO DI ALTA TENSIONE**

Nell'alimentatore sono presenti tensioni pericolose. Per evitare ferite, staccare sempre l'elettricità, scaricare i circuiti e rimuovere fonti esterne di tensione prima di toccare componenti.

AVVERTIMENTO DI CLASSE I

L'unità è un prodotto di Classe I. Per ridurre al minimo il pericolo di scossa elettrica, l'unità deve essere collegata a terra in modo affidabile e installata in modo professionale. Qualsiasi interruzione del conduttore di messa a terra di protezione o scollegamento del terminale di terra di protezione causerà un pericolo potenziale di scossa elettrica che può causare una ferita personale. Avvertimento di rischi elettrici: L'uscita principale dell'unità è energia pericolosa (240VA) e non deve essere accessibile all'utente nell'applicazione finale.

AVVERTIMENTO DI USCITA PERICOLOSA

C'è un pericolo potenziale di scossa quando si usa un alimentatore con una tensione in uscita superiore a 60 VCC. Non accendere l'alimentatore quando la tensione in uscita è superiore a 60 VCC senza una protezione con sbarre collettrici o connettori di uscita montati. Spegnerne l'alimentatore o staccarlo dall'alimentazione CA prima di fare o modificare un collegamento del pannello posteriore.

AVVISO DI FUSIBILE INTERNO

Il fusibile interno protegge l'unità e non deve essere sostituito dall'utente. In caso di difetto interno, l'unità deve essere restituita a TDK-Lambda Ltd. o a uno dei suoi agenti autorizzati.

INFORMACIÓN GENERAL DE SEGURIDAD



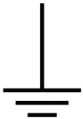
LEA LAS INSTRUCCIONES DE SEGURIDAD

Se deben observar las siguientes precauciones de seguridad durante todas las fases de operación, servicio y reparación de este equipo. El incumplimiento de las precauciones de seguridad o advertencias presentadas en este documento viola los estándares de seguridad de diseño, fabricación y uso previsto de este equipo y puede afectar las protecciones integradas en su interior. TDK-Lambda no se hace responsable por el incumplimiento de estos requisitos por parte del usuario.

SÍMBOLOS Y MARCAS EN EL EQUIPO



Precaución, riesgo de peligro. Cuando aparece este símbolo en el equipo, es importante consultar el manual de seguridad para preservar la operación segura del equipo y evitar posibles lesiones o peligros.



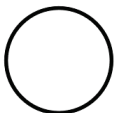
Terminal de tierra.



Terminal conductor de protección. Este es el terminal que está designado para la conexión de un conductor externo para protección contra descargas eléctricas en caso de falla.



Posición de encendido. Enciende la fuente de alimentación.



Posición de apagado. Apaga la fuente de alimentación. **IMPORTANTE:** Este NO es el dispositivo de desconexión principal del equipo. Consulte la sección "DISPOSITIVO DE DESCONEXIÓN" para familiarizarse con el dispositivo de desconexión principal.



Corriente continua (CC). Indica que el valor junto a este símbolo es de naturaleza de CC.



Corriente alterna (CA). Indica que el valor junto a este símbolo es de naturaleza de CA.



Precaución, superficie caliente. Indica que la superficie sobre la que está adherido este símbolo puede estar caliente y debe tocarse con cuidado.

SERVICIO

Estos productos no pueden ser reparados por el cliente. Las sustituciones y modificaciones de piezas son realizadas únicamente por personal de servicio autorizado de TDK-Lambda. Para efectuar reparaciones o modificaciones, el producto debe devolverse al centro de servicio de TDK-Lambda.

COMPONENTES CRÍTICOS

Estos productos no están autorizados para ser usados como componentes críticos en sistemas de control nuclear, sistemas de soporte vital o equipos para uso en entornos peligrosos, sin la aprobación expresa por escrito del Director Gerente de TDK-Lambda Ltd.

USO DEL PRODUCTO

Estos productos están diseñados para usarse como equipo autónomo dentro de los límites descritos en el manual de seguridad e instalación. No están diseñados para uso doméstico o de consumo general, y están diseñados para uso en interiores.

MEDIOAMBIENTAL

Estos productos son IP20 y, por lo tanto, no deben utilizarse productos químicos/solventes, agentes de limpieza y otros líquidos.

AMBIENTE

Estos productos están diseñados para su uso en un entorno de Grado de Contaminación 2, Categoría de Sobretensión II, y deben utilizarse dentro de las condiciones ambientales (temperatura, altitud, etc.) especificadas en el manual de seguridad e instalación.

CARGA DE SALIDA

La potencia de salida tomada del producto no debe exceder el valor nominal indicado en la etiqueta del producto, excepto por lo indicado en el manual de seguridad e instalación. El aislamiento del cable conectado a la salida de CC debe estar de acuerdo con la corriente y el voltaje de carga de salida.

PARÁMETROS DE ENTRADA

Estos productos deben operarse dentro de los parámetros de entrada indicados en el manual de seguridad e instalación. Los medios para conectar este equipo al suministro deben ser únicamente de acuerdo con las instrucciones especificadas en el manual de seguridad e instalación para reducir el riesgo de peligro.

ELIMINACIÓN AL FINAL DE LA VIDA ÚTIL

El producto contiene componentes que requieren una eliminación especial. Asegúrese de que la unidad se deseché correctamente al final de su vida útil y de acuerdo con las normas locales.

OPERACIÓN DEL EQUIPO Y CONTROLES DE OPERACIÓN

La identificación y descripción de los controles de operación y su uso en todos los modos operativos se indican en el manual del usuario. El funcionamiento del equipo se explica en detalle en el manual del usuario.

VENTILACIÓN

Las aberturas de ventilación de estos productos no deben cubrirse. Asegúrese de que haya al menos 10 cm de espacio entre cualquier obstrucción y las aberturas de ventilación.

CABLES DE ENTRADA Y SALIDA

Debe utilizar cables con los valores de voltaje y temperatura adecuados para garantizar un funcionamiento seguro y confiable.

ACCESORIOS

Solo se utilizarán accesorios que cumplan con las especificaciones del fabricante. Para la identificación e instrucciones para la conexión de accesorios, consulte el manual de seguridad e instalación.

MANIPULACIÓN, ALZADO Y TRANSPORTE

La manipulación, alzado y transporte del equipo debe realizarse únicamente de acuerdo con las instrucciones especificadas en el manual de seguridad e instalación para evitar posibles lesiones personales.

DISPOSITIVO DE DESCONEXIÓN

Un disyuntor con valores nominales de corriente especificados en el manual de seguridad e instalación

constituye el dispositivo de desconexión principal del equipo que corta de manera confiable el suministro de energía del equipo. La ubicación del equipo no debe dificultar el funcionamiento del dispositivo de desconexión. El dispositivo debe estar marcado como dispositivo de desconexión del equipo.

NOTA

El interruptor incorporado en el equipo NO actúa como un dispositivo de desconexión principal y no corta el suministro o la energía del equipo. Se agrega como un medio para apagar ciertos circuitos dentro de la fuente de alimentación, tales como la pantalla y el circuito de salida.

INSTALACIÓN

La instalación del equipo o del sistema que incorpora el equipo debe realizarse de acuerdo con las instrucciones de instalación proporcionadas por el fabricante. La seguridad de cualquier sistema en el cual el equipo es incorporado es responsabilidad del ensamblador.

USO INADECUADO DEL EQUIPO

Si el equipo se utiliza de una manera no especificada por el fabricante, la protección proporcionada por el equipo puede verse afectada.

INSTRUCCIONES DE SEGURIDAD PARA MONTAJE EN BASTIDOR

- A) Temperatura ambiente de funcionamiento elevada - si se instala en una unidad de bastidor cerrado o de unidades múltiples, la temperatura ambiente de funcionamiento del entorno del bastidor puede ser mayor que la temperatura ambiente de la habitación. Por lo tanto, se debe considerar instalar el equipo en un entorno compatible con la temperatura ambiente máxima (T_a) especificada por el fabricante.
- B) Flujo de aire reducido - la instalación del equipo en un bastidor debe ser tal que la cantidad de flujo de aire requerida para el funcionamiento seguro del equipo no se vea comprometida.
- C) Carga mecánica - el montaje del equipo en el bastidor debe ser tal que no se provoque una condición peligrosa debido a una carga mecánica desigual.
- D) Sobrecarga del circuito - se debe considerar la conexión del equipo al circuito de suministro y el efecto que la sobrecarga de los circuitos podría tener sobre la protección contra sobre corriente y el cableado de suministro. Se deben considerar de manera apropiada los valores nominales incluidos en la placa de identificación del equipo al abordar este asunto.
- E) Conexión confiable a tierra - se debe mantener una conexión confiable a tierra del equipo montado en bastidor. Se debe prestar especial atención a las conexiones de suministro que no sean conexiones directas al circuito derivado (por ejemplo, uso de regletas de enchufes).

USUARIOS

Este equipo debe ser operado únicamente por personal calificado que comprenda las instrucciones y los manuales de seguridad proporcionados con el equipo. Si el equipo debe ser operado por personal no calificado, entonces éste deberá ser supervisado por personal calificado.



RIESGO DE DESCARGA ELÉCTRICA

ADVERTENCIA DE ALTO VOLTAJE

Hay voltajes peligrosos dentro de la fuente de alimentación. Para evitar lesiones, siempre desconecte la energía, descargue los circuitos y retire las fuentes de voltaje externas antes de tocar los componentes.

ADVERTENCIA DE CLASE I

La unidad es un producto de Clase I. Para minimizar el riesgo de descarga eléctrica, la unidad debe estar conectada a tierra de manera confiable e instalada por un profesional. Cualquier interrupción del conductor de tierra de protección o desconexión del terminal de tierra de protección, causará un riesgo potencial de descarga eléctrica que podría causar lesiones personales. Advertencia de peligros energéticos: La salida principal de la unidad constituye energía peligrosa (240 VA) y no debe ser accesible al usuario en la aplicación final.

ADVERTENCIA DE SALIDA PELIGROSA

Existe un riesgo potencial de descarga eléctrica cuando se utiliza una fuente de alimentación con un voltaje de salida superior a 60 V CC. No encienda la fuente de alimentación cuando el voltaje de salida sea superior a 60 VCC sin que las barras colectoras de salida o la protección de los conectores de salida estén ensamblados. Apague la fuente de alimentación o desconecte la fuente de alimentación de la red de CA antes de realizar o cambiar cualquier conexión del panel trasero.

PRECAUCIÓN DEL FUSIBLE INTERNO

El fusible interno protege la unidad y no debe ser reemplazado por el usuario. En caso de defecto interno, la unidad debe devolverse a TDK-Lambda Ltd. o a uno de sus agentes autorizados.



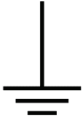
LIRE LES INSTRUCTIONS DE SÉCURITÉ

Les précautions de sécurité suivantes doivent être observées durant toutes les phases de fonctionnement, d'entretien et de réparation de cet équipement. Le non-respect des précautions de sécurité ou des avertissements présentés dans ce document enfreint les normes de sécurité de conception, de fabrication et d'utilisation prévue de cet équipement et peut altérer les protections qui y sont intégrées. TDK-Lambda ne pourra être tenu responsable en cas de non-respect de ces exigences par l'utilisateur.

SYMBOLES ET MARQUAGE SUR L'ÉQUIPEMENT



Avertissement, risque de danger. Lorsque ce symbole apparaît sur l'équipement, il est important de consulter le manuel de sécurité pour préserver un fonctionnement sûr de l'équipement et éviter toute blessure ou danger potentiel.



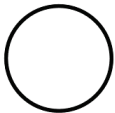
Mise à la terre ; masse.



Borne du conducteur de protection. Il s'agit de la borne destinée au raccordement à un conducteur externe pour la protection contre les chocs électriques en cas de défaillance.



Position de mise en marche (ON). Met sous tension l'alimentation électrique.



Position d'arrêt (OFF). Coupe l'alimentation électrique. **IMPORTANT :** Ceci n'est PAS le dispositif de déconnexion principal de l'équipement. Consultez la section « DISPOSITIF DE DÉCONNEXION » pour en savoir plus sur le dispositif principal de déconnexion.



Courant continu (CC). Indique que la valeur à côté de ce symbole est de nature CC.



Courant alternatif (CA). Indique que la valeur à côté de ce symbole est de nature CA.



Attention : Surface chaude. Indique que la surface sur laquelle ce symbole est apposé peut être chaude et ne doit pas être touchée sans prendre des précautions.

ENTRETIEN

Ces produits ne sont pas réparables par le client. Seul le personnel de service autorisé de TDK-Lambda peut procéder au remplacement ou au changement des pièces. Pour les réparations ou les changements, le produit doit être retourné au centre de service TDK-Lambda.

COMPOSANTS CRUCIAUX

Ces produits ne sont pas autorisés pour une utilisation en tant que composants cruciaux dans les systèmes de contrôle nucléaire, les systèmes de survie ou les équipements destinés à être utilisés dans des environnements dangereux sans l'autorisation écrite expresse du directeur général de TDK-Lambda Ltd.

UTILISATION DU PRODUIT

Ces produits sont conçus pour être utilisés en tant qu'équipement autonome dans les limites décrites dans le manuel d'installation et de sécurité. Ils ne sont pas destinés à un usage domestique général ou à une consommation courante, et sont conçus pour une utilisation en intérieur.

ENVIRONNEMENTAL

Ces produits sont IP20, et par conséquent, les produits chimiques/solvants, les produits de nettoyage et autres liquides ne doivent pas être utilisés.

ENVIRONNEMENT

Ces produits sont conçus pour être utilisés dans un environnement de degré de pollution 2, catégorie de surtension II, et doivent être utilisés dans les conditions environnementales (température, altitude, etc.) spécifiées dans le manuel d'installation et de sécurité.

CHARGE DE SORTIE

La puissance de sortie provenant du produit ne doit pas dépasser la valeur nominale indiquée sur l'étiquette du produit, sauf indication contraire dans le manuel d'installation et de sécurité. L'isolation du fil connecté à la sortie CC doit être conforme au courant et à la tension de charge de sortie.

PARAMÈTRES D'ENTRÉE

Ces produits doivent être utilisés dans le respect des paramètres d'entrée indiqués dans le manuel d'installation et de sécurité. Les moyens de connexion de cet équipement à l'alimentation électrique doivent être conformes aux instructions spécifiées dans le manuel d'installation et de sécurité afin de réduire les risques de danger.

ÉLIMINATION EN FIN DE VIE

Le produit contient des composants nécessitant une élimination spéciale. Veillez à ce qu'il soit éliminé comme il se doit à la fin de sa durée de vie et conformément aux règlements locaux.

FONCTIONNEMENT DE L'ÉQUIPEMENT ET COMMANDES DE FONCTIONNEMENT

L'identification et la description des commandes de fonctionnement ainsi que leur utilisation dans tous les modes d'exploitation sont décrites dans le manuel d'utilisation. Le fonctionnement de l'équipement est expliqué en détail dans ce manuel.

VENTILATION

Les orifices de ventilation de ces produits ne doivent pas être couverts. Veillez à ce qu'il y ait un espace d'au moins 10 cm entre toute entrave et les orifices de ventilation.

CÂBLES D'ENTRÉE ET DE SORTIE

Les câbles doivent être utilisés avec la tension et la température nominales appropriées pour assurer un fonctionnement sûr et fiable.

ACCESSOIRES

Seuls des accessoires conformes aux spécifications du fabricant seront utilisés. Pour l'identification et les instructions de connexion des accessoires, consultez le manuel d'installation et de sécurité.

MANIPULATION, LEVAGE ET TRANSPORT

La manipulation, le levage et le transport de l'équipement seront effectués uniquement conformément aux instructions spécifiées dans le manuel d'installation et de sécurité afin d'éviter d'éventuelles blessures.

DISPOSITIF DE DÉCONNEXION

Un disjoncteur, dont les données limites de courant sont telles que spécifiées dans le manuel d'installation

et de sécurité, est le dispositif principal de déconnexion de l'équipement qui coupe de façon fiable l'alimentation électrique de l'équipement. Le positionnement de l'équipement ne doit pas rendre difficile l'utilisation du dispositif de déconnexion. Ce dispositif doit être marqué en tant que dispositif de déconnexion de l'équipement.

REMARQUE

L'interrupteur intégré dans l'équipement ne doit PAS servir de dispositif de déconnexion principal et ne coupe pas l'alimentation électrique ou le courant de l'équipement. Il est ajouté en tant que moyen de couper certains circuits à l'intérieur de l'alimentation électrique tels que l'affichage et le circuit de sortie.

INSTALLATION

L'installation de l'équipement ou du système intégrant l'équipement doit être conforme aux instructions d'installation fournies par le fabricant. La sécurité de tout système intégrant l'équipement est de la responsabilité du monteur.

UTILISATION INAPPROPRIÉE DE L'ÉQUIPEMENT

Une utilisation de l'équipement non conforme aux spécifications du fabricant comporte un risque d'altérer la protection fournie par l'équipement.

INSTRUCTIONS DE SÉCURITÉ DU MONTAGE EN RACK

A) Température ambiante de fonctionnement élevée : Si l'équipement est installé dans un rack fermé ou comportant plusieurs unités, la température ambiante de fonctionnement de l'environnement du rack peut être supérieure à la température ambiante de la pièce. Par conséquent, il convient d'envisager d'installer l'équipement dans un environnement compatible avec la température ambiante maximale (T_{ma}) spécifiée par le fabricant.

B) Débit d'air réduit : L'installation de l'équipement dans un rack doit être telle que la quantité de débit d'air nécessaire pour un fonctionnement sûr de l'équipement ne soit pas compromise.

C) Chargement mécanique : Le montage de l'équipement dans le rack doit être exempt de toute condition dangereuse due à une charge mécanique inégale.

D) Surcharge des circuits : Il convient de tenir compte de la connexion de l'équipement au circuit d'alimentation et de l'effet que la surcharge des circuits pourrait avoir sur la protection contre la surintensité et le câblage d'alimentation électrique. Il est recommandé à cet effet de tenir compte des valeurs nominales indiquées sur les plaques signalétiques de l'équipement.

E) Mise à la terre fiable : Une mise à la terre fiable des équipements montés en rack doit être préservée. Une attention particulière doit être apportée aux connexions électriques autres que les connexions directes au circuit de dérivation (l'utilisation de multiprises, par exemple).

UTILISATEURS

Cet équipement ne doit être utilisé que par du personnel qualifié comprenant les instructions et les manuels de sécurité fournis avec l'équipement. Si l'équipement doit être utilisé par du personnel non qualifié, celui-ci doit être supervisé par du personnel qualifié.



RISQUE DE CHOC ÉLECTRIQUE

AVERTISSEMENT HAUTE TENSION

Des tensions dangereuses sont présentes dans l'alimentation électrique. Pour éviter les blessures, débrancher toujours l'alimentation, décharger les circuits et retirer les sources de tension externes avant de toucher les composants.

AVERTISSEMENT CLASSE I

L'unité est un produit de Classe I. Pour réduire les risques de choc électrique, l'unité nécessite une mise à la terre fiable et une installation professionnelle. Toute interruption du conducteur de protection ou déconnexion de la borne de protection entraînera un risque potentiel de choc électrique pouvant entraîner des dommages corporels. Avertissement de risques énergétiques : la sortie principale de l'unité est une énergie dangereuse (240 VA) et ne doit pas être accessible à l'utilisateur dans l'application finale.

AVERTISSEMENT SORTIE DANGEREUSE

Un risque de choc électrique existe lors de l'utilisation d'une alimentation électrique avec une tension de sortie supérieure à 60 V CC. Ne pas mettre l'alimentation électrique sous tension lorsque la tension de sortie est supérieure à 60 V CC sans barres omnibus de sortie/ou protection des connecteurs de sortie assemblés. Éteindre l'alimentation électrique ou couper l'alimentation électrique du secteur AC avant d'effectuer ou de changer une connexion du panneau arrière.

ATTENTION FUSIBLE INTERNE

Le fusible interne protège l'unité et ne doit pas être remplacé par l'utilisateur. En cas de défaut interne, l'unité doit être renvoyée à TDK-Lambda Ltd. ou à l'un de ses agents agréés.



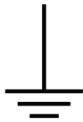
LESEN SIE DIE SICHERHEITSHINWEISE

Die folgenden Sicherheitsvorkehrungen müssen in allen Phasen des Betriebs, der Wartung und der Reparatur dieses Geräts eingehalten werden. Die Nichteinhaltung der in diesem Dokument aufgeführten Sicherheitsvorkehrungen oder Warnhinweise verstößt gegen die Sicherheitsstandards bei der Konstruktion, Herstellung und dem bestimmungsgemäßen Gebrauch dieses Geräts und kann die eingebauten Schutzvorrichtungen beeinträchtigen. TDK-Lambda haftet nicht für die Nichteinhaltung dieser Anforderungen durch den Benutzer.

SYMBOLE UND KENNZEICHNUNGEN AUF GERÄTEN



Vorsicht, Risiko einer Gefahr. Wenn dieses Symbol auf dem Gerät erscheint, ist es wichtig, das Sicherheitshandbuch zu konsultieren, um den sicheren Betrieb des Geräts zu erhalten und mögliche Verletzungen oder Gefahren zu vermeiden.



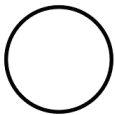
Schutzleiterklemme (Erdung).



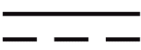
Schutzleiterklemme. Dies ist die Klemme, die für den Anschluss an einen externen Leiter zum Schutz gegen elektrischen Schlag im Falle eines Fehlers vorgesehen ist.



Schalterstellung EIN. Schaltet die Spannungsversorgung EIN.



Schalterstellung AUS. Schaltet die Spannungsversorgung aus. **WICHTIG:** Dies ist NICHT die Haupttrennvorrichtung des Geräts. Lesen Sie den Abschnitt "TRENNVORRICHTUNG", um mehr über die Haupttrennvorrichtung zu erfahren.



Gleichstrom (DC). Zeigt an, dass der Wert neben diesem Symbol Gleichstromcharakter hat.



Wechselstrom (AC). Zeigt an, dass der Wert neben diesem Symbol Wechselstromcharakter hat.



Vorsicht, heiße Oberfläche. Weist darauf hin, dass die Oberfläche, auf der dieses Symbol angebracht ist, heiß sein kann und nicht unvorsichtig berührt werden sollte.

WARTUNG

Diese Produkte sind nicht vom Kunden zu warten. Der Austausch von Teilen und Änderungen dürfen nur von autorisiertem TDK-Lambda Servicepersonal vorgenommen werden. Für Reparaturen oder Änderungen muss das Produkt an die TDK-Lambda-Service-Stelle geschickt werden.

KRITISCHE KOMPONENTEN

Diese Produkte sind ohne ausdrückliche schriftliche Genehmigung des Geschäftsführers von TDK-Lambda Ltd. nicht zur Verwendung als kritische Komponenten in nuklearen Kontrollsystemen, lebenserhaltenden Systemen oder Geräten für den Einsatz in gefährlichen Umgebungen zugelassen.

PRODUKTVERWENDUNG

Diese Produkte sind für die Verwendung als eigenständige Geräte innerhalb der im Benutzerhandbuch beschriebenen Grenzen konzipiert. Sie sind nicht für den allgemeinen Heim- oder Verbrauchergebrauch und für die Verwendung in Innenräumen vorgesehen.

UMWELT

Diese Produkte entsprechen der Schutzart IP20, daher dürfen keine Chemikalien/Lösungsmittel, Reinigungsmittel und andere Flüssigkeiten verwendet werden.

UMGEBUNG

Diese Produkte sind für den Einsatz in einer Umgebung des Verschmutzungsgrads 2, Überspannungskategorie II, ausgelegt und müssen innerhalb der im Benutzerhandbuch angegebenen Umgebungsbedingungen (Temperatur, Höhe usw.) betrieben werden.

AUSGANGSBELASTUNG

Die vom Produkt entnommene Ausgangsleistung darf die auf dem Produktetikett angegebene Nennleistung nicht überschreiten, es sei denn, dies ist im Benutzerhandbuch angegeben. Die Isolierung der an den DC-Ausgang angeschlossenen Leitung sollte dem Ausgangslaststrom und der Ausgangsspannung entsprechen.

EINGABEPARAMETER

Diese Produkte müssen innerhalb der im Sicherheits- und Installationshandbuch angegebenen Eingangsparameter betrieben werden. Der Anschluss dieses Geräts an die Stromversorgung darf nur gemäß den Anweisungen im Sicherheits- und Installationshandbuch erfolgen, um das Gefahrenrisiko zu verringern.

ENTSORGUNG AM LEBENSENDE

Das Produkt enthält Komponenten, die eine spezielle Entsorgung erfordern. Stellen Sie sicher, dass das Gerät am Ende seiner Lebensdauer ordnungsgemäß und in Übereinstimmung mit den örtlichen Vorschriften entsorgt wird.

GERÄTEBEDIENUNG UND BETRIEBSKONTROLLEN

Kennzeichnung und Beschreibung der Bedienelemente und deren Verwendung in allen Betriebsarten sind im Benutzerhandbuch angegeben. Die Bedienung des Geräts wird im Benutzerhandbuch ausführlich erklärt.

LÜFTUNG

Die Lüftungsöffnungen an diesen Produkten dürfen nicht abgedeckt werden. Stellen Sie sicher, dass ein Abstand von mindestens 10 cm zwischen einem Hindernis und den Lüftungsöffnungen besteht.

EINGANGS- UND AUSGANGSKABEL

Sie müssen Kabel mit den entsprechenden Spannungs- und Temperaturwerten verwenden, um einen sicheren und zuverlässigen Betrieb zu gewährleisten.

ZUBEHÖR

Es darf nur Zubehör verwendet werden, das den Spezifikationen des Herstellers entspricht. Die Kennzeichnung und die Hinweise zum Anschluss von Zubehör finden Sie im Benutzerhandbuch.

HANDHABUNG, HEBEN UND TRAGEN

Die Handhabung, das Heben und Tragen des Geräts darf nur gemäß den Anweisungen im Benutzerhandbuch erfolgen, um mögliche Personenschäden zu vermeiden.

UNTERBRECHUNGSVORRICHTUNG

Ein Leitungsschutzschalter mit den im Benutzerhandbuch angegebenen Stromstärken ist die Haupttrennvorrichtung des Geräts, die die Versorgung des Geräts zuverlässig abschaltet. Die Positionierung des Geräts darf es nicht erschweren, die Trennvorrichtung zu bedienen. Das Gerät muss als Trennvorrichtung für das Gerät gekennzeichnet sein.

HINWEIS

Der in das Gerät eingebaute Schalter fungiert NICHT als Haupttrennvorrichtung und unterbricht nicht die Versorgung oder den Strom des Geräts. Er wird als Mittel zum Abschalten bestimmter Schaltkreise innerhalb des Netzteils, wie z. B. der Anzeige und des Ausgangskreises, hinzugefügt.

EINBAU

Der Einbau des Geräts oder der Anlage, in die das Gerät eingebaut ist, muss in Übereinstimmung mit den vom Hersteller bereitgestellten Installationsanweisungen erfolgen. Die Sicherheit eines Systems, das das Gerät enthält, liegt in der Verantwortung des Monteurs.

NICHT BESTIMMUNGSGEMÄSSE VERWENDUNG DES GERÄTS

Wenn das Gerät auf eine Weise verwendet wird, die nicht vom Hersteller angegeben ist, kann der vom Gerät gebotene Schutz beeinträchtigt werden.

SICHERHEITSHINWEISE FÜR DIE RACKMONTAGE

- A) Erhöhte Betriebsumgebung - Wenn das Gerät in einem geschlossenen oder mehrgliedrigen Rack installiert wird, kann die Betriebsumgebungstemperatur der Rack-Umgebung höher sein als die Raumtemperatur. Daher sollte die Installation des Geräts in einer Umgebung in Betracht gezogen werden, die mit der vom Hersteller angegebenen maximalen Umgebungstemperatur (T_{ma}) kompatibel ist.
- B) Reduzierter Luftstrom - Die Installation der Geräte in einem Rack sollte so erfolgen, dass der für den sicheren Betrieb der Geräte erforderliche Luftstrom nicht beeinträchtigt wird.
- C) Mechanische Belastung - Die Montage der Geräte im Rack sollte so erfolgen, dass kein gefährlicher Zustand durch ungleichmäßige mechanische Belastung entsteht.
- D) Überlastung des Stromkreises - Der Anschluss des Geräts an den Versorgungsstromkreis und die Auswirkungen, die eine Überlastung der Stromkreise auf den Überstromschutz und die Versorgungskabel haben könnte, sollten berücksichtigt werden. Berücksichtigen Sie in diesem Zusammenhang die Angaben auf dem Typenschild des Geräts.
- E) Zuverlässige Erdung - Die zuverlässige Erdung von Geräten im Rack sollte beibehalten werden. Besondere Aufmerksamkeit sollte anderen Versorgungsanschlüssen als dem direkten Anschluss an den Abzweigstromkreis (z. B. Verwendung von Steckdosenleisten) gewidmet werden.

BENUTZER

Dieses Gerät darf nur von qualifiziertem Personal bedient werden, das die mit dem Gerät gelieferten Anweisungen und Sicherheitshandbücher versteht. Wenn das Gerät von unqualifiziertem Personal bedient werden muss, dann muss dieses von qualifiziertem Personal beaufsichtigt werden.



GEFAHR EINES ELEKTRISCHEN SCHLAGES

WARNUNG VOR HOCHSPANNUNG

Innerhalb der Spannungsversorgung liegen gefährliche Spannungen an. Um Verletzungen zu vermeiden, schalten Sie vor dem Berühren von Bauteilen immer die Stromversorgung ab, entladen Sie Stromkreise und entfernen Sie externe Spannungsquellen.

KLASSE I WARNUNG

Das Gerät ist ein Produkt der Klasse I. Um die Gefahr eines elektrischen Schlages zu minimieren, muss das Gerät zuverlässig geerdet und fachgerecht installiert werden. Jede Unterbrechung des Schutzleiters oder Abtrennung der Schutzerdungsklemme führt zu einer potenziellen Stromschlaggefahr, die zu Verletzungen führen kann. Energiegefahren Warnung: Der Hauptausgang des Geräts stellt gefährliche Energie dar (240VA) und darf in der Endanwendung nicht für den Benutzer zugänglich sein.

GEFÄHRLICHE AUSGÄNGE WARNUNG

Bei Verwendung eines Netzteils mit einer Ausgangsspannung von mehr als 60 VDC besteht die Gefahr eines Stromschlags. Schalten Sie die Stromversorgung nicht ein, wenn die Ausgangsspannung über 60 VDC liegt, ohne dass die Ausgangssammelschienen und/oder der Schutz der Ausgangsanschlüsse montiert sind. Schalten Sie die Stromversorgung aus oder trennen Sie sie vom Stromnetz, bevor Sie Anschlüsse an der Rückseite vornehmen oder ändern.

INTERNE SICHERUNG WARNUNG

Die interne Sicherung schützt das Gerät und darf nicht durch den Benutzer ausgetauscht werden. Im Falle eines internen Defekts muss das Gerät an TDK-Lambda Ltd. oder eine ihrer autorisierten Vertretungen zurückgeschickt werden.



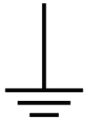
LEIA AS INSTRUÇÕES DE SEGURANÇA

As seguintes precauções de segurança deverão ser estritamente observadas durante todas as fases de operação, serviço e reparação deste equipamento. O não cumprimento das instruções ou avisos de segurança apresentados neste documento viola os padrões de segurança, concepção, fabrico e a utilização pretendida deste equipamento, e poderá afetar as proteções nele incorporadas. A TDK-Lambda não poderá ser responsável pelo não cumprimento destes requisitos por parte do utilizador.

SÍMBOLOS E MARCAÇÕES NO EQUIPAMENTO



Cuidado, perigo. Quando este símbolo aparece no equipamento, torna-se importante consultar o manual de segurança, de forma a preservar a sua operação segura e evitar qualquer dano ou perigo.



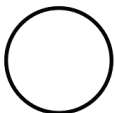
Terminal de Terra.



Terminal condutor de proteção. Este é o terminal destinado a ser conectado a um condutor externo, para proteção contra choques elétricos em caso de uma falha.



Interrutor na posição LIGADO. Liga a fonte de alimentação.



Interrutor na posição DESLIGADO. Desliga a fonte de alimentação. **IMPORTANTE:** Este NÃO é o dispositivo principal que desconecta o equipamento. Consulte a secção “DISPOSITIVO DE DESCONEXÃO” para saber mais acerca do dispositivo principal de desconexão.



Corrente contínua (DC). Indica que o valor junto deste símbolo é de natureza DC.



Corrente alternada (AC). Indica que o valor junto deste símbolo é de natureza AC.



Cuidado, superfície quente. Indica que a superfície em que este símbolo está afixado poderá estar quente e não deve ser tocada sem o devido cuidado.

MANUTENÇÃO

A manutenção destes produtos não deve ser efetuada pelo cliente. As substituições de peças e modificações deverão ser efetuadas apenas por pessoal de manutenção autorizado da TDK-Lambda. Quando os produtos necessitarem de reparações ou modificações, deverão ser enviados para um local de manutenção da TDK- Lambda.

COMPONENTES CRÍTICOS

Não é permitida a utilização destes produtos como componentes críticos em sistemas de controlo nuclear, sistemas de suporte de vida, ou equipamento para utilização em ambientes perigosos, sem a expressa autorização escrita do Diretor-Geral da TDK-Lambda Ltd.

UTILIZAÇÃO DOS PRODUTOS

Estes produtos foram concebidos para utilização como equipamento autónomo, dentro dos limites descritos no manual do utilizador e para utilização em espaços interiores. Os produtos não foram concebidos para serem utilizados pelo consumidor em geral.

AMBIENTAL

Estes produtos são IP20 e, portanto, químicos/solventes, agentes de limpeza e outros líquidos, não deverão ser usados.

AMBIENTE

Estes produtos foram concebidos para uma utilização em ambientes de Categoria de Sobretenção II, Poluição de Grau 2 e deverão ser operados em condições ambientais (temperatura, altitude, etc.) especificadas no manual do utilizador.

POTÊNCIA DE SAÍDA

A potência de saída obtida do produto não deverá exceder a classificação mencionada no rótulo do produto, exceto se mencionado no manual do utilizador. O isolamento do cabo conectado à saída DC deverá estar de acordo com a corrente e tensão da carga de saída.

PARÂMETROS D ENTRADA

Estes produtos deverão ser operados em observação dos parâmetros de entrada mencionados no manual do utilizador. Os meios de conexão deste equipamento à fonte de alimentação deverão estar de acordo com as instruções especificadas no manual do utilizador, para reduzir os riscos de perigo.

ELIMINAÇÃO EM FIM DE VIDA

O produto contém componentes que requerem condições especiais para eliminação. Assegure-se que a unidade é apropriadamente descartada no fim da sua vida útil e de acordo com os regulamentos locais.

OPERAÇÃO DO EQUIPAMENTO E CONTROLOS DE OPERAÇÃO

A identificação e descrição dos controlos de operação e sua utilização em todos os modos de operação estão descritos no manual do utilizador. A operação do equipamento encontra-se detalhadamente explicada no manual do utilizador.

VENTILAÇÃO

As aberturas de ventilação nestes produtos não deverão ser cobertas. Assegure-se que há um espaço de pelo menos 10cm entre as aberturas de ventilação e qualquer obstrução.

CABOS DE ENTRADA E SAÍDA

Deverão ser utilizados cabos com classificação de tensão e temperatura apropriadas, para assegurar uma operação segura e fiável.

ACESSÓRIOS

Somente acessórios em conformidade com as especificações do fabricante deverão ser utilizados. Consulte o manual do utilizador, para obter instruções sobre conexão de acessórios e sua identificação.

MANUSEAMENTO, ELEVAÇÃO E TRANSPORTE

O manuseamento, elevação e transporte do equipamento deverá ser efetuado somente de acordo com as instruções especificadas no manual do utilizador, para evitar danos pessoais potenciais.

DISCONNECT DEVICE

Um disjuntor com potência de corrente conforme especificada no manual do utilizador é o dispositivo principal de desconexão do equipamento, que desliga de forma eficaz a fonte de alimentação do equipamento. O posicionamento do equipamento não deve dificultar a operação do dispositivo de

desconexão. O dispositivo deverá estar marcado como dispositivo de desconexão para o equipamento.

NOTA

O interruptor incorporado no equipamento NÃO funciona como um dispositivo principal de desconexão e não corta a fonte de alimentação ou potência do equipamento. O interruptor funciona apenas como uma forma de desligar certos circuitos dentro da fonte de alimentação, tais como o ecrã e o circuito de saída.

INSTALAÇÃO

A instalação do equipamento ou do sistema que incorpora o equipamento deverá ser efetuada de acordo com as instruções de instalação fornecidas pelo fabricante. A segurança de qualquer sistema que incorpore o equipamento é da responsabilidade do profissional que procedeu à sua instalação.

UTILIZAÇÃO IMPRÓPRIA DO EQUIPAMENTO

Se o equipamento for utilizado de forma não especificada pelo fabricante, a proteção proporcionada pelo equipamento poderá ser afetada.

INSTRUÇÕES DE SEGURANÇA PARA MONTAGEM EM BASTIDOR

A) Ambiente de Operação Elevado – Se a instalação for efetuada num bastidor fechado ou com várias unidades montadas, a temperatura ambiente do bastidor deverá ser mais alta do que a temperatura ambiente do local. Desta forma, deverá ser levado em consideração que o equipamento deve ser instalado num ambiente compatível com a temperatura ambiente máxima (T_{ma}) especificada pelo fabricante.

B) Fluxo de Ar Reduzido - A instalação do equipamento num bastidor deverá ser de forma a não comprometer a quantidade do fluxo de ar requerido para um funcionamento seguro do equipamento.

C) Carga Mecânica – A montagem do equipamento no bastidor deverá respeitar a uniformidade da distribuição de peso, de forma a evitar condições de perigo devido a uma carga mecânica desequilibrada.

D) Sobrecarga de Circuito – Deve ser dada a devida atenção à conexão do equipamento ao circuito de alimentação e o efeito que a sobrecarga de circuitos poderá ter na proteção de sobretensão e cablagem de alimentação. As informações constantes no rótulo dos equipamentos deverão sempre ser levadas em consideração, quando esta questão é abordada.

E) Ligação a Terra Eficaz – O equipamento montado em bastidor deverá ter uma ligação a terra eficaz. Deve ser dada atenção particular às conexões da alimentação, que não as conexões diretas ao circuito derivado (por exemplo: utilização de extensões elétricas).

UTILIZADORES

Este equipamento deverá ser operado apenas por pessoal qualificado, que entenda os manuais de instruções e segurança fornecidos com o equipamento. Se o equipamento puder ser operado por pessoal sem qualificações específicas, este deverá estar sob a supervisão de um profissional qualificado.



RISCO DE CHOQUE ELÉTRICO

AVISO DE ALTA TENSÃO

Tensões perigosas estão presentes na fonte de alimentação. De forma a evitar ferimentos/danos, desconecte sempre a alimentação e os circuitos de descarga e remova as fontes externas de tensão, antes de tocar em qualquer componente.

AVISO CLASSE I

A unidade é um produto de Classe I. Para minimizar o perigo de choque elétrico, a unidade deverá possuir uma ligação a terra eficaz, instalada por um profissional. Qualquer seccionamento ou desconexão do condutor de ligação ao terminal de terra causa um perigo potencial de choque elétrico e pode ocasionar ferimentos pessoais. Aviso de Perigo de Tensão: A saída principal da unidade possui tensão perigosa (240VA) e não deve ser acessível pelo utilizador final.

AVISO DE TENSÃO DE SAÍDA PERIGOSA

Existe um risco potencial de choque elétrico, quando se utiliza uma fonte alimentação com uma tensão de saída maior do que 60VDC. NÃO LIGUE a fonte de alimentação, quando a tensão de saída é superior a 60VDC, sem que esteja montada proteção de barramentos ou conectores de saída. DESLIGUE a fonte de alimentação ou desconecte a alimentação AC antes de fazer ou alterar qualquer conexão do painel traseiro.

PRECAUÇÃO FUSÍVEL INTERNO

O fusível interno protege a unidade e não deve ser substituído pelo utilizador. No caso de defeito interno, a unidade deverá ser devolvida a TDK-Lambda Ltd. ou a um dos seus agentes autorizados.

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.

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 (Refer to product Spec. for operating conditions).

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 (L, N, PE or L1, L2, PE) for Single Phase models and through a four-conductor power cable (L1, L2, L3, PE) 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.

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.

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.

AC INPUT

The **GENESYS™** series is designed for use in TN and TT power distribution systems. It shall be connected to Star/Y power distribution systems (Delta is not supported).

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 GH1kW / GH1.5kW, G1kW / G1.7kW models, 170-240V~, 47/63Hz for G2.7kW / G3.4kW **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.

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.

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.

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.

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.

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.

This page intentionally left blank

CHAPTER 1: GENERAL INFORMATION**1.1 User Manual Content**

This safety & installation manual contains the operating instructions and installation instructions of the **GENESYS™** 1kW - 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, IEEE Option chapter. For information related to operation with the optional MODBUS TCP or EtherCAT communication interfaces, refer to MODBUS TCP or EtherCAT manuals. For information related to operation with IS420 and/or Power Sink, refer to the User manual, IS420 or Power Sink chapter.

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 communications RS232/485, USB and LAN. IEEE, MODBUS TCP and EtherCAT are optional.

1.2.2 Multiple Output Power System

The **GENESYS™** power supplies series can be configured into a programmable power system of up to 32 units using the built-in LAN, USB, or RS232/RS485 communication ports in the power supply and the RS485 linking cable provided with each power supply.

For further information regarding optional IEEE interface, refer to the User manual, IEEE chapter.

For further information regarding optional MODBUS TCP or EtherCAT interfaces, refer to MODBUS TCP or EtherCAT manuals.

For further information regarding optional IS420 interface, refer to the User manual, IS420 chapter.

For further information regarding Power Sink module, refer to the User manual, Power Sink chapter.

1.2.3 Control via 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. Refer to User Manual (IA761-04-02_) for operation instructions.

1.2.6 Serial Operation (Applicable to 10V – 600V Only)

NOTES

- | |
|--|
| <ol style="list-style-type: none">1. Section 1.2.6 is not applicable for power supplies above 600V.2. It is prohibited to connect power supplies above 600V in series. |
|--|

Power supplies of the same model (up to two units) can be connected in series to obtain increased output voltage. Refer to User Manual (IA761-04-02_) for operation instructions.

1.2.7 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 above 100VDC up to 600VDC rated output shall not float outputs more than +/- 600VDC above/below chassis ground.

Models above 600VDC up to 1000VDC rated output shall not float outputs more than +/- 1000VDC above/below chassis ground.

Models above 1000VDC up to 1500VDC rated output shall not float outputs more than + 1500VDC above chassis ground, when the negative pole is connected to chassis ground.

Furthermore, outputs shall not float more than - 1000VDC below chassis ground, when the positive pole is connected to chassis ground.

Contact factory for assistance with higher float voltage applications.

Local or remote sense may be used.

WARNING

If power supply output reaches 60VDC or above, output terminals are hazardous.
--

1.2.8 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 5420 by LAPP GROUP for GH1.5kW, 5301 5440 by LAPP GROUP for G+1.7-5kW, F7022500 by SIB for G+7.5kW, F7024000 by SIB for GSP10-15kW 3-Phase 208, F7022500 by SIB for GSP10-15kW 3-Phase 400/480.
- Lock nut P/N: 8211 by AGRO for GH1.5kW, 8216 by AGRO for G+1.7-5kW, 8225 by AGRO for G+7.5kW, 8240 by AGRO for GSP10-15kW 3-Phase 208, 8225 by AGRO for GSP10-15kW 3-Phase 400/480.

NOTE

* Not applicable for 1kW power supplies

1.3.1.2 AC Input Plug *

- P/N: PC 5/ 3-STCL1-7,62 by Phoenix Contact for GH1.5kW, G+1.7kW, G+2.7~3.4kW 1-Phase.
- P/N: PC 5/ 4-STCL1-7,62 by Phoenix Contact for G+2.7-5kW 3-Phase and G+7.5kW 3-Phase 400.
- P/N: PC6/ 4-STF-10,16 by Phoenix Contact for G+7.5kW 3-Phase 208.
- P/N: PC 16/ 4-ST-10,16 by Phoenix Contact for 10-15kW 3-Phase.

NOTE

* Not applicable for 1kW power supplies

1.3.1.3 Output Connector / Bus Bars Protection (Full Width Models)

- Output protection assembly (for 1-7.5kW only).
- Output Plug for output voltage including and above 150VDC (excluding 7.5kW):
P/N: IPC 5/ 4-STF-7,62 by Phoenix Contact for 1-5kW.
P/N: IPC 16/ 4-STF-10,16 by Phoenix Contact for 10-15kW.

NOTES

1. GSP output bus bars protection assembled at the factory (including insulators).
2. 7.5kW power supplies' output terminals are bus bars.

1.3.1.4 Remote Sense Connector for 7.5kW Only

- P/N: GIC 2,5 HCV/ 3-ST-7,62 by Phoenix Contact.

1.3.1.5 Output Cover Half Width Models Up to 100VDC Output

- Output bus bars cover.
- Sems screw M3X40, Type DIN 7985A, Inox A2, 1 Pc.
- Flat Washer M3, Type DIN433, Inox A2, 1 Pc.

1.3.1.6 Output Connector Half Width Models Above 100VDC Output

- P/N: GIC 2.5/4-ST-7,62 by Phoenix Contact.
- Output terminal plugs P/N: MB-01F, 2 Pcs.

1.3.1.7 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).

1.3.1.8 Misc. Hardware

- DB-26 Connector P/N: 10090769-P264ALF (FCI).
- DB-15 Backshell (used for DB-26 Connector) P/N: 86303638BLF (FCI).
- Sems Screw M3X8 Fe Ni - 2 Pcs for 1-5kW, 4 Pcs for 10kW, 6 Pcs for 15kW.
- Flat head screw M3X8 Fe Ni - 2 Pcs for 1-5kW, 4 Pcs for 10-15kW (for full width models).
- Foot snaps and matching push rivets, 4Pcs (for half width models).
- Safety & Installation Manual.

1.3.1.9 Bus Bars Screws Kits (Full Width Models)

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

<div style="display: inline-block; transform: rotate(-45deg);">V</div> <div style="display: inline-block; transform: rotate(45deg);">kW</div>	1	1.7	2.7	3.4	5	7.5	10	15
10	Kit-1	Kit-1	Kit-1	Kit-1	Kit-1	---	Kit-3	Kit-5
20	Kit-2	Kit-2	Kit-1	Kit-1	Kit-1	Kit-1	Kit-3	Kit-5
30	Kit-2	Kit-2	Kit-1	Kit-1	Kit-1	Kit-1	Kit-3	Kit-5
40	Kit-2	Kit-2	Kit-1	Kit-1	Kit-1	Kit-1	Kit-3	Kit-5
50 - 100	Kit-2	Kit-2	Kit-2	Kit-2	Kit-2	Kit-1	Kit-4	Kit-6
150 - 1500	---	---	---	---	---	Kit-2	---	---

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 DIN439B, 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 DIN439B, 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 DIN439B, 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 DIN439B, 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 DIN439B, 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 DIN439B, 6 Pcs.
- Flat washer M8 St. St., Type DIN125A, 12 Pcs.
- Spring washer M8 St. St., Type DIN127A, 6 Pcs.

1.3.1.10 Bus Bars Screws Kit (Half Width Models)

- Hex. Screw M6X16 St. St., Type DIN933, 2 Pcs.
- Hex. Nut M6 St. St., Type DIN439B, 2 Pcs.
- Flat washer M10 St. St., Type DIN125A, 4 Pcs.
- Spring washer M10 St. St., Type DIN127B, 2 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.
- 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 Rack Mount kit

- Refer to section 4.4 (for half width models)

1.3.2.5 Dust Filter (Full Width Models Only)

- Full Panel 1kW - 7.5kW P/N: G-AFK.
- Blank Panel 1kW - 7.5kW 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.

1.3.2.6 AC Cables

For 1kW power supplies only:

AC Cables are not provided with the power supply. Please choose suitable cable for your AC-Network in accordance to power supply specification.

If an AC cable is required, it should be ordered according to the following:

Part no.	Market	Description
Z-U	USA	13A 125V, non shielded, 2m typical length, with IEC60320-1, type C15 connector on one end and NEMA-5-15P type plug on the other end.
Z-E	Europe	10A 250V, non shielded, 2m typical length, with IEC60320-1, type C15 connector on one end and IEC60884-1 type plug on the other end.
Z-J	Japan	15A 125V, non shielded, 2m typical length, with IEC60320-1, type C15 connector on one end and Japan JIS C8303 type plug on the other end
Z-C	China	10A 250V, non shielded, 2m typical length, with IEC60320-1, type C15 connector on one end and China GB2099 or GB1002 type plug on the other end.

Cable identification: LIVE - Brown; NEUTRAL - Blue; EARTH - Green/Yellow

For 1.7kW / 2.7kW / 3.4kW / 5kW / 7.5kW / 10kW / 15kW Power Supplies:

AC Cables are not provided with the power supply. For recommended AC input cables (customer applied), refer to Table 1-2: Recommended AC Input Cables for 1.7kW - 5kW, Table 1-3:

Recommended AC Input Cables for 7.5kW or Table 1-4: Recommended AC Input Cables for 10kW - 15kW.

AC Input Range	AC Input Cable
100-240~, One phase	Min. 3 X 2.5mm ² (Two wires plus Safety ground), stranded copper, 300V, 105°C minimum, 3m max. length, outer diameter 10-14mm.
170-240~, One phase	
190-240~, Three phase	Min. 4 X 2.5mm ² (Three wires plus Safety ground), stranded copper, 300V, 105°C minimum, 3m max. length, outer diameter 10-14mm.
380-480~, Three phase	Min. 4 X 1.5mm ² (Three wires plus Safety ground), stranded copper, 600V, 105°C minimum, 3m max. length, outer diameter 10-14mm.

Table 1-2: Recommended AC Input Cables for 1.7kW - 5kW

AC Input Range	AC Input Cable
190-240~, Three phase	Min. 4 X 4mm ² . Three wires plus Safety ground, stranded copper, 300V, 105°C minimum, 3m max. length, outer diameter 14-32mm.
380-480~, Three phase	Min. 4 X 2.5mm ² . Three wires plus Safety ground, stranded copper, 600V, 105°C minimum, 3m max. length, outer diameter 9-18mm.

Table 1-3: Recommended AC Input Cables for 7.5kW

AC Input Range	AC Input Cable
190-240~, Three phase	Min. 4 X 10mm ² . Three wires plus Safety ground, stranded copper, 300V, 105°C minimum, 3m max. length, outer diameter 18-32mm.
380-480~, Three phase	Min. 4 X 4mm ² . Three wires plus Safety ground, stranded copper, 600V, 105°C minimum, 3m max. length, outer diameter 9-18mm.

Table 1-4: Recommended AC Input Cables for 10kW - 15kW

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.

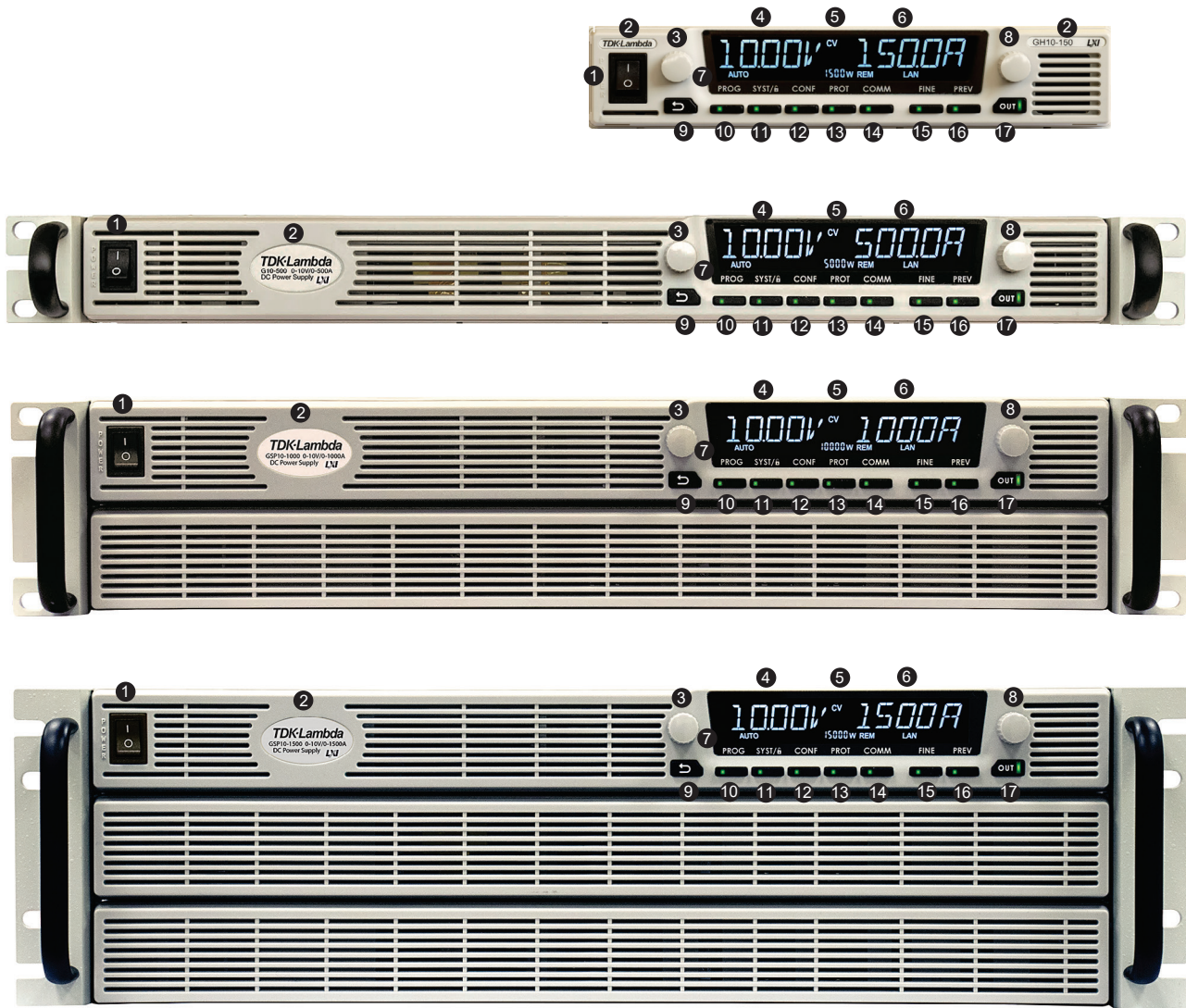


Figure 2-1: Front Panel Controls and Indicators

No.	Control/Indicator	Description
1	Power Switch	POWER ON/OFF control.
2	Power Supply Model	Model, Voltage & Current Identifier.
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 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 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	<p>Activates the Protection menu.</p> <p>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.</p> <p>If Protection menu is active, press the PROT button to exit to the main menu. *</p>
14	COMM Button / Indicator	<p>Activates the Communication menu.</p> <p>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.</p> <p>Green LED lights when Communication menu is active.</p> <p>If Communication menu is active, press the COMM button to exit to the main menu. *</p>
15	FINE Button / Indicator	<p>Voltage/Current Fine/Coarse adjustment control.</p> <p>Operates as a toggle switch.</p> <p>In the Fine mode, Voltage and Current encoders operate in high-resolution mode.</p> <p>In the Coarse mode, Voltage and Current encoders operate in standard-resolution (approx. 3 turns for full voltage/current rated scale).</p> <p>Green LED lights when the unit is in Fine mode.</p>
16	PREV Button / Indicator	<p>Press the PREV button to display the Output Voltage and Current Limit settings.</p> <p>The display shows the settings for 5 seconds.</p> <p>If buttons are not pressed for 5 seconds, the display returns back to show actual output voltage and current.</p> <p>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.</p> <p>Green LED lights when PREV mode is active.</p>
17	OUT Button / Indicator	<p>Output ON/OFF control. Press OUTPUT to set the output ON or OFF.</p> <p>Green LED lights when DC Output is enabled.</p> <p>Red LED blinks in case of an alarm. Refer to User Manual, Alarms and Protective Functions section.</p>

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.

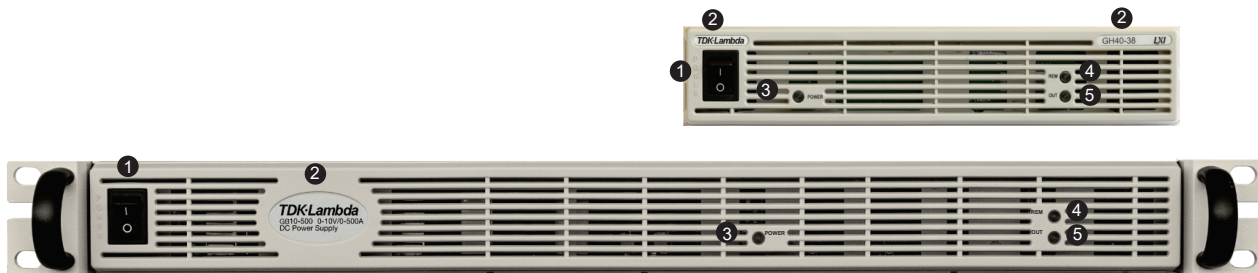


Figure 2–2: Blank Front Panel Controls

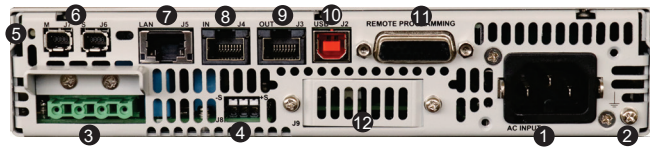
No.	Connection	Description
1	Power Switch	POWER ON/OFF control.
2	Power Supply Model	Model, Voltage & Current Identifier.
3	Power LED	Power Supply ON/OFF status LED. Green LED lights when Power Supply is ON (Power Switch ON).
4	REM LED	REMOTE status LED. Green LED lights if power supply is controlled 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

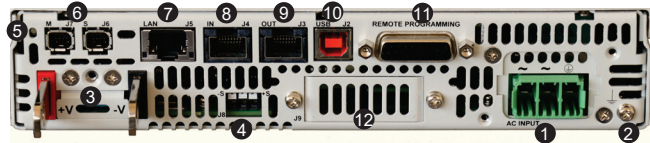
2.4 Rear Panel Connectors

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

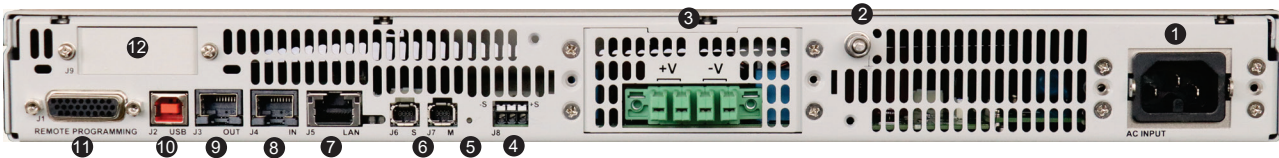
1kW Half-Rack:



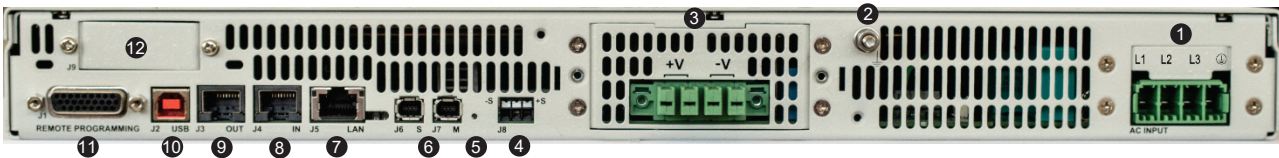
1.5kW Half-Rack:



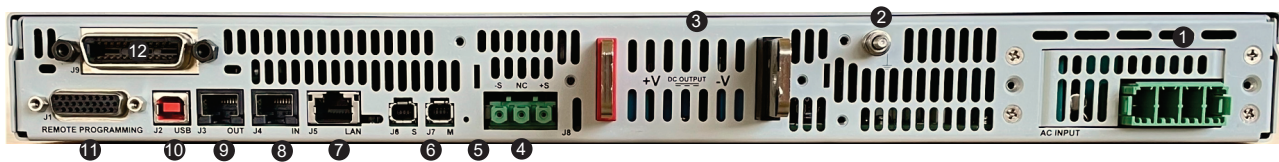
1kW Full-Rack:



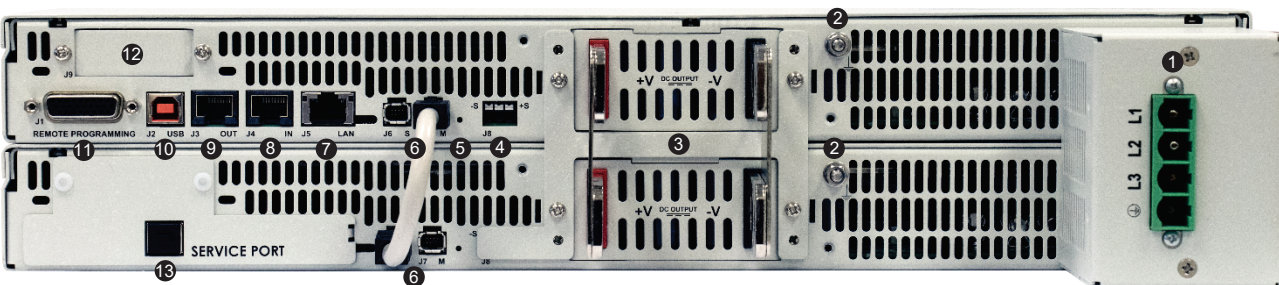
1.7kW ~ 5kW Full-Rack:



7.5kW Full-Rack:



10kW Full-Rack:



15kW Full-Rack:

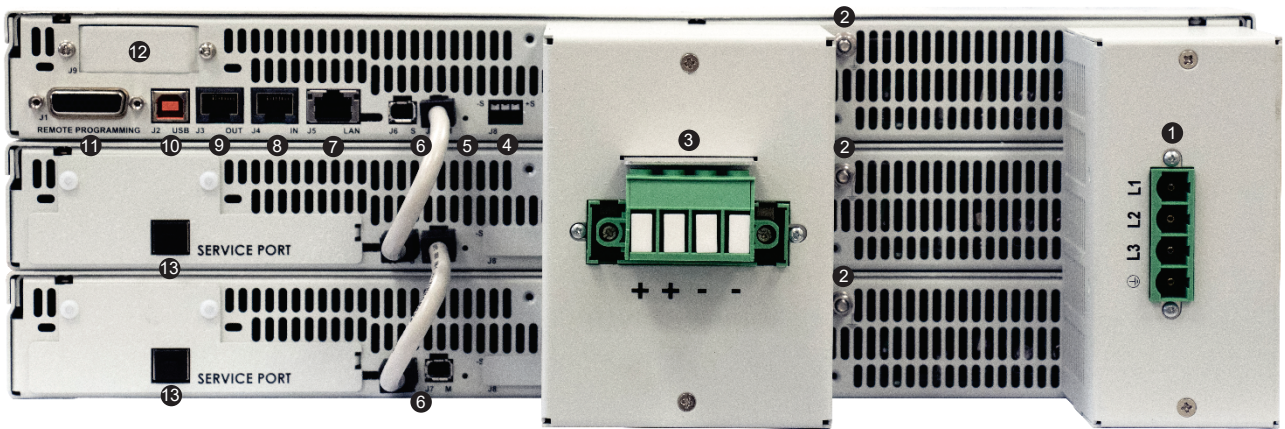


Figure 2-3: Rear Panel Connectors and Controls

No.	Connection	Description
1	AC Input Connector	Connector type: 1kW: IEC 320-C16 1.5kW - 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. 7.5kW 3-Phase 208: PC6-16/4-GF-10,16 PHOENIX CONTACT. 7.5kW 3-Phase 480: PC 5/ 4-G-7,62 PHOENIX CONTACT. 10kW - 15kW: DFK—PC 16/ 4-ST-10,16 PHOENIX CONTACT.
2	Ground Stud (full width models) Ground Screw (half width models)	Functional Ground connection M4x15 Stud. Functional Ground connection M3x8 Screw.
3	DC output bus bars / Connector	<u>1kW ~ 5kW:</u> Bus-bars for 10V to 100V models. 150V to 600V Connector type: GIC 2.5/ 4-G-7,62 PHOENIX CONTACT for Half-Rack models. IPC 5/ 4-GF-7,62 PHOENIX CONTACT for Full-Rack up to 5kW models. <u>7.5kW:</u> Bus-bars for all models. <u>10kW ~ 15kW:</u> DFK-IPC 16/ 4-STF-10,16 PHOENIX CONTACT for 10kW ~ 15kW models.
4	Remote sense connector	A Connector for remote sensing connections. Connect to the load for regulation of the load voltage and compensation of load wire drop. 1kW ~ 5kW: SPT-THR 1, 5/ 3-H-3, 5 P26 PHOENIX CONTACT. 7.5kW: GIC 2,5 HCV/ 3-ST-7,62 - 1745632. 10kW ~ 15kW: SPT-THR 1, 5/ 3-H-3, 5 P26 PHOENIX CONTACT.
5	Reset button	Set default Power Supply settings. Refer to the User manual for detailed functionality.
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. Refer to the User manual for detailed indicators functionality.

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 Serial-In is connected to the computer and the remaining units are chained, Remote-Out to Remote-In. 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 analog control and monitor signals (J1)	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.
13	Service Port	Service port for factory use. USB interface connector, type B. Connector type: SAMTEC P/N: USBR-B-S-F-O-TH.

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.

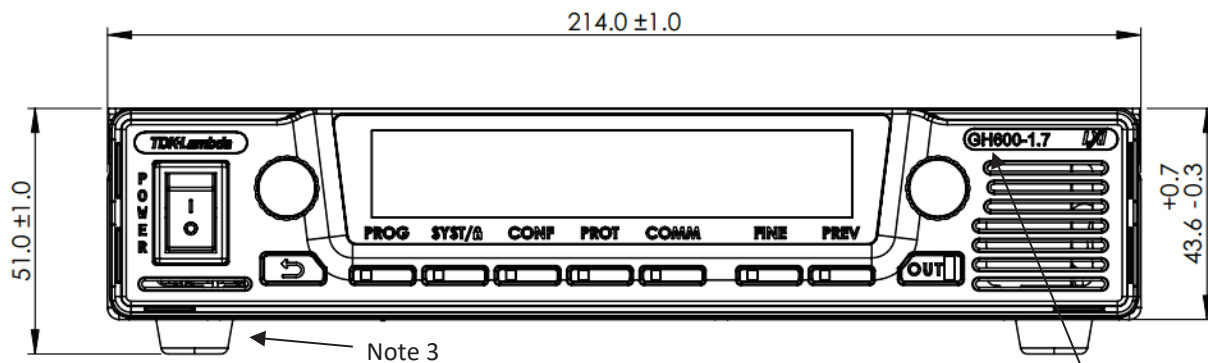
WARNING

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.

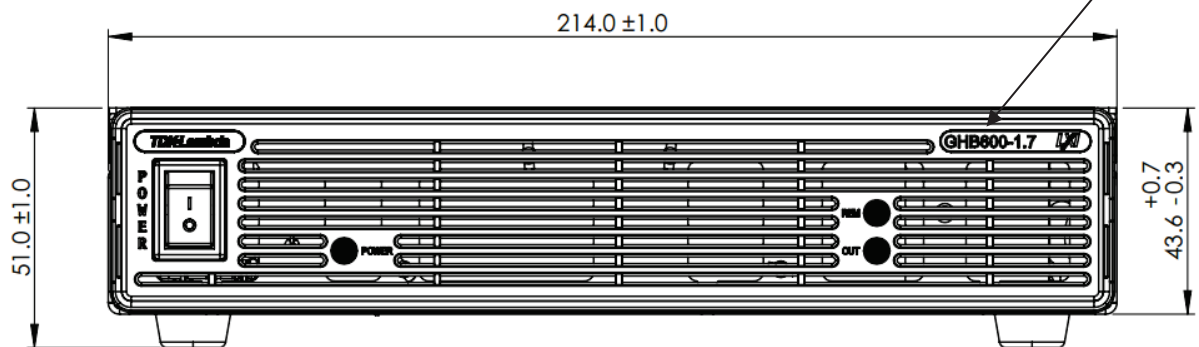
CHAPTER 3: OUTLINE

3.1 1kW Half Width Power Supplies Outline

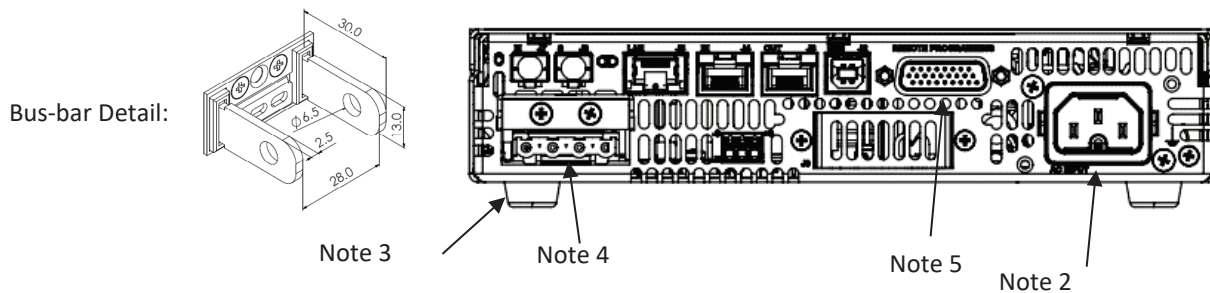
Standard Unit Front View:



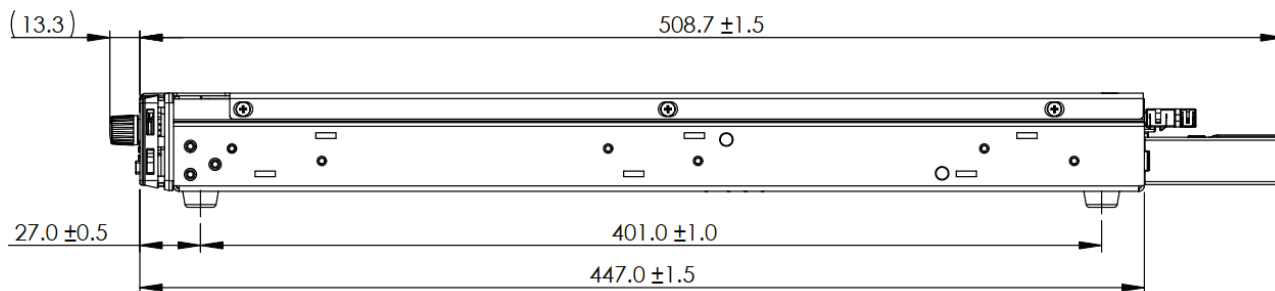
Blank Panel Unit Front View:



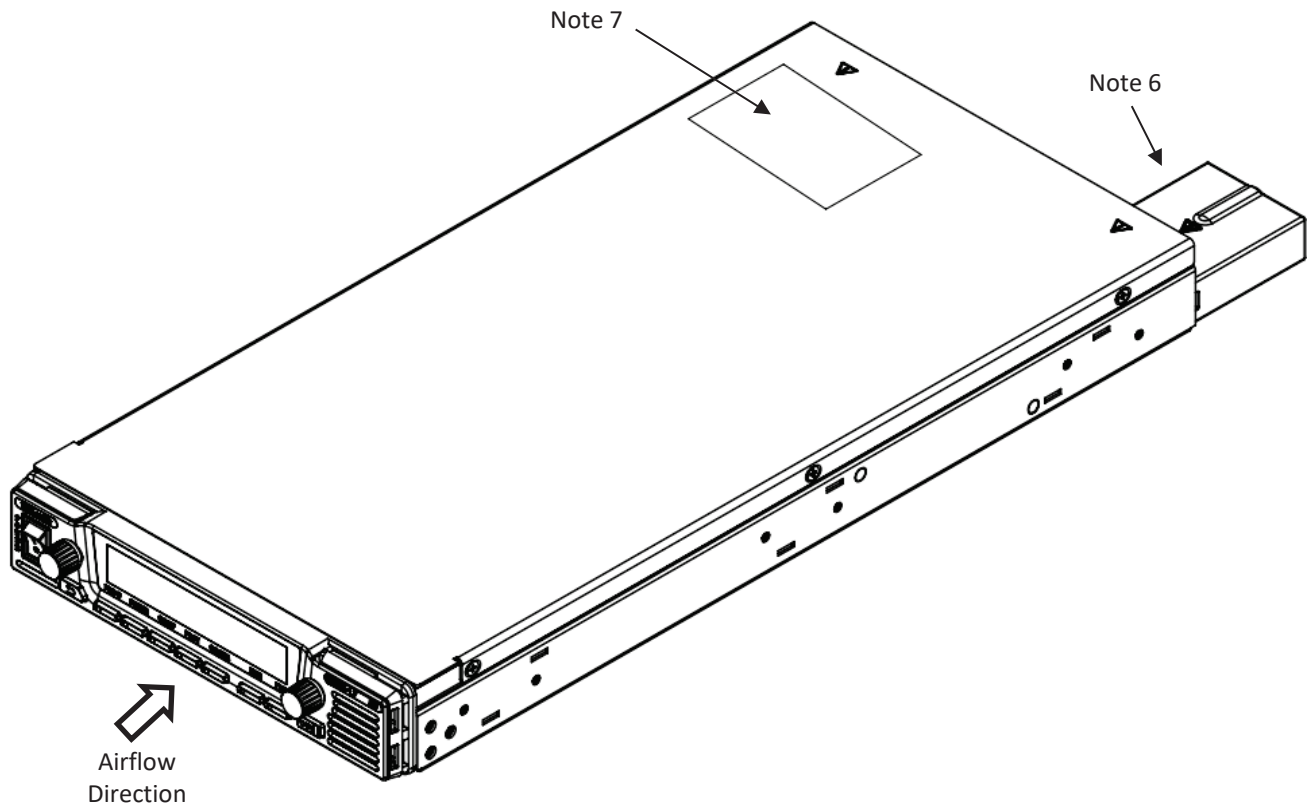
Standard & Blank Panel Units Rear View:



Standard & Blank Panel Units Side View:



Dimensions are in mm.



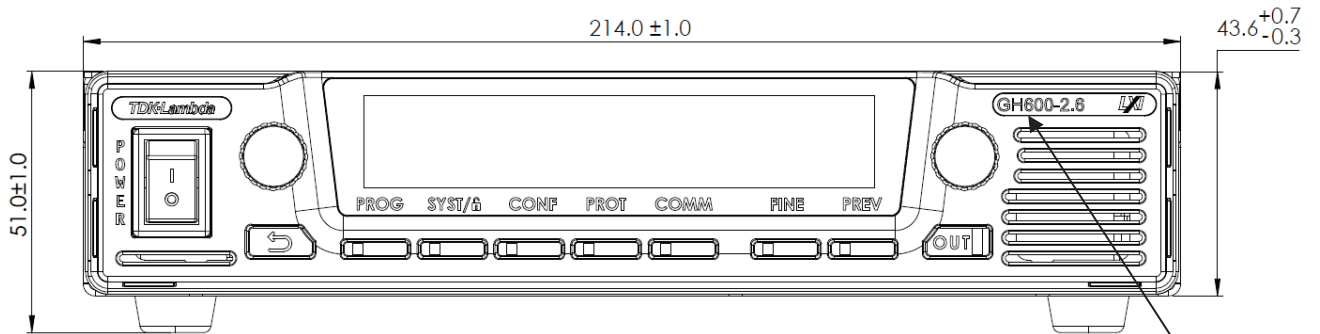
NOTES:

1. Model name and output rating are shown here according to the specifications.
2. AC Input connector (IEC320-C16 AC INLET).
3. Foot snaps are supplied in accessories kit.
4. Bus bars for 10V to 100V models, See Bus-bar detail. Connector for 150V to 600V models as shown (mating plug supplied with power supply).
5. Isolated control and signals connector. Mating plug supplied with power supply.
6. Output enclosure for models up to 100VDC output (supplied with the power supply).
7. AC input rating and safety approval symbols are shown here according to the specifications.

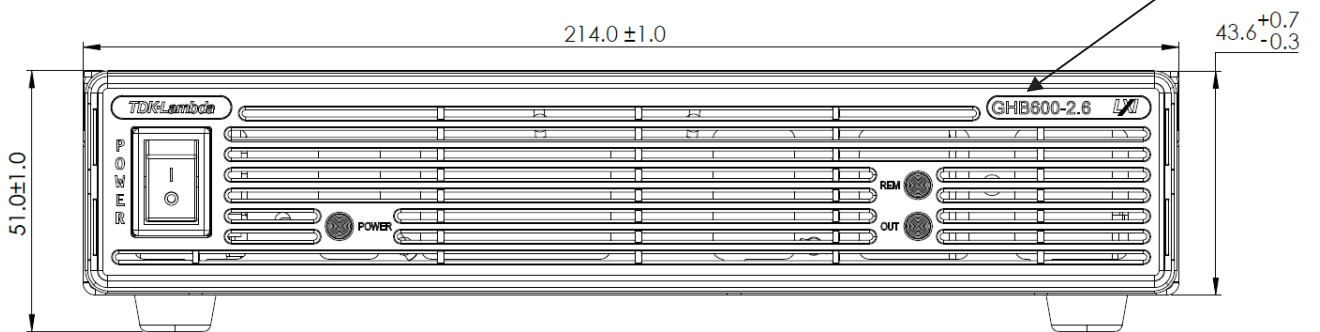
Dimensions are in mm.

3.2 1.5kW Half Width Power Supplies Outline

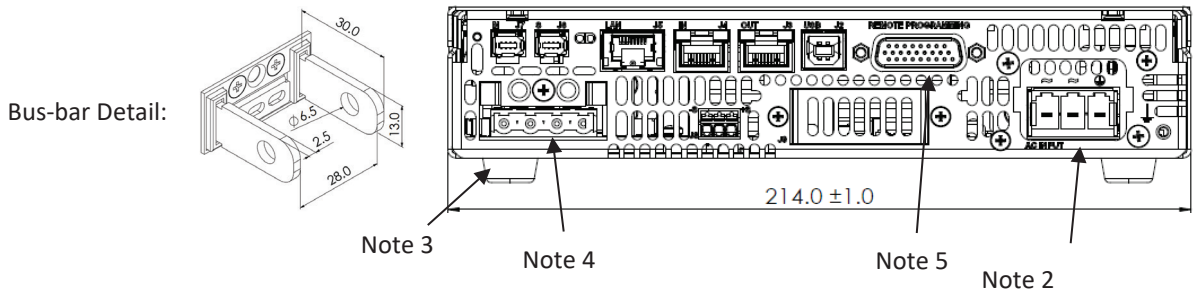
Standard Unit Front View:



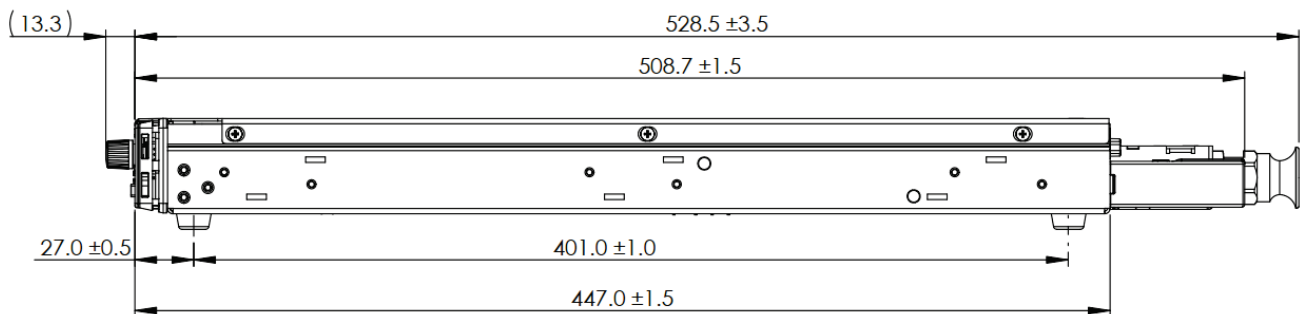
Blank Panel Unit Front View:



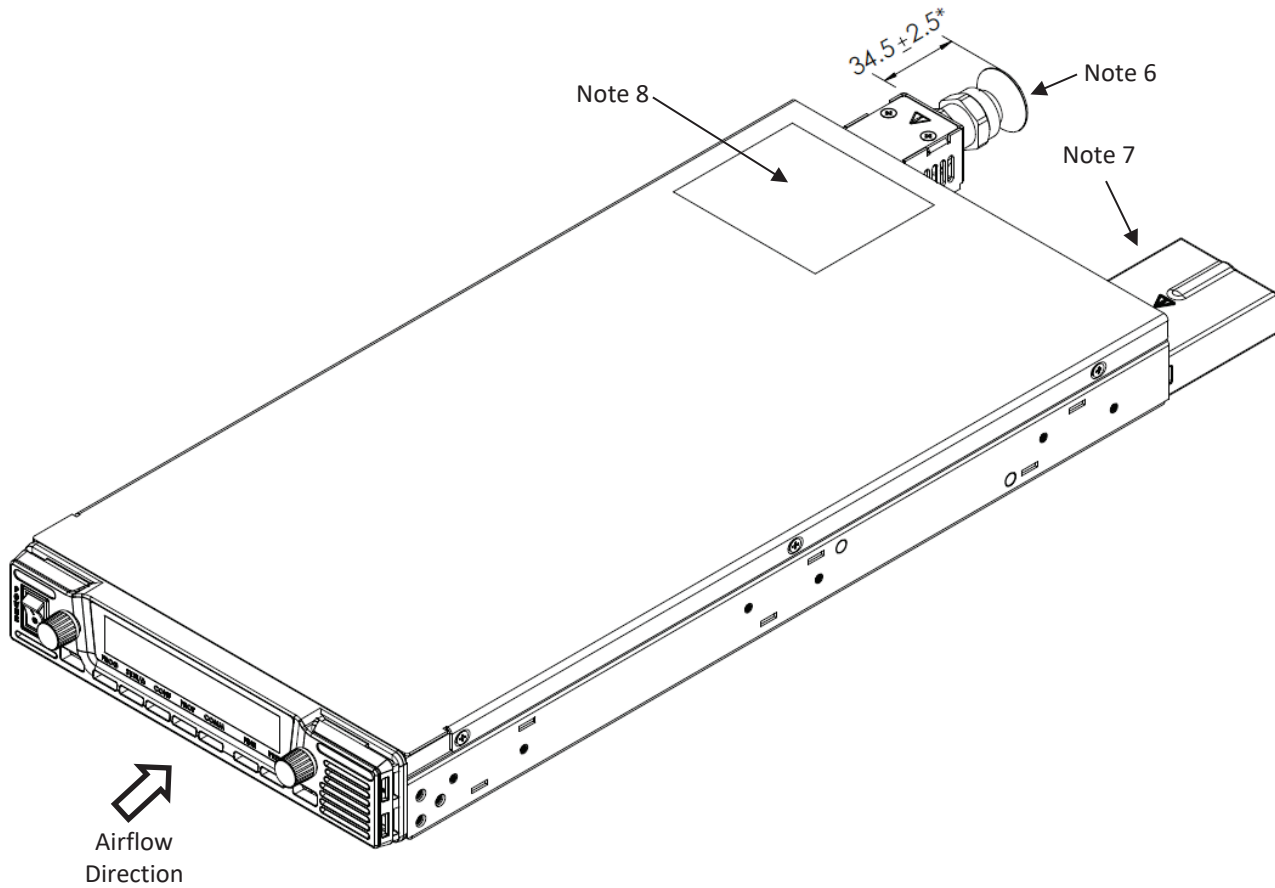
Standard & Blank Panel Units Rear View:



Standard & Blank Panel Units Side View:



Dimensions are in mm.



NOTES:

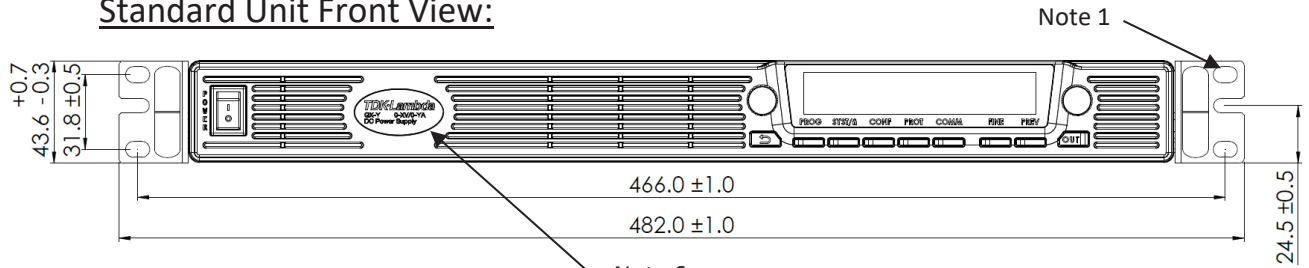
1. Model name and output rating are shown here according to the specifications.
2. AC Input connector (mating plug supplied with power supply).
3. Foot snaps are supplied in accessories kit.
4. Bus bars for 10V to 100V models, See Bus-bar detail. Connector for 150V to 600V models as shown (mating plug supplied with power supply).
5. Isolated control and signals connector. Mating plug supplied with power supply.
6. AC cable strain relief, LAPP GROUP P/N: 5301 5420 (supplied with the power supply).
7. Output enclosure for models up to 100VDC output (supplied with the power supply).
8. 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.

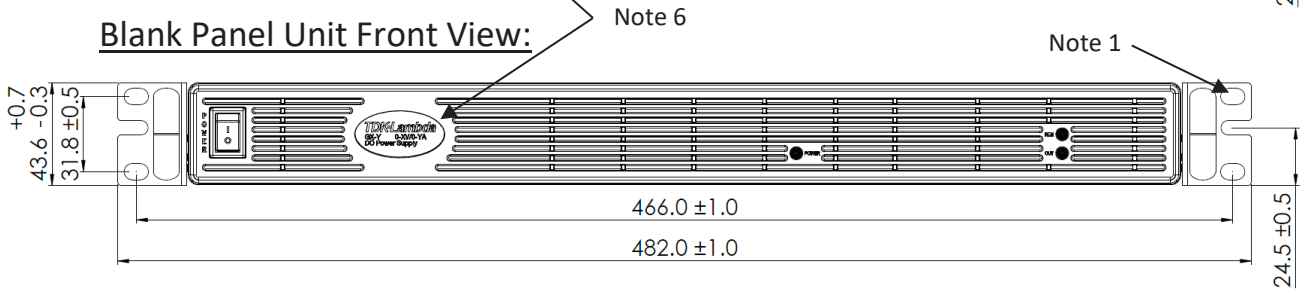
Dimensions are in mm.

3.3 1kW Power Supplies Outline

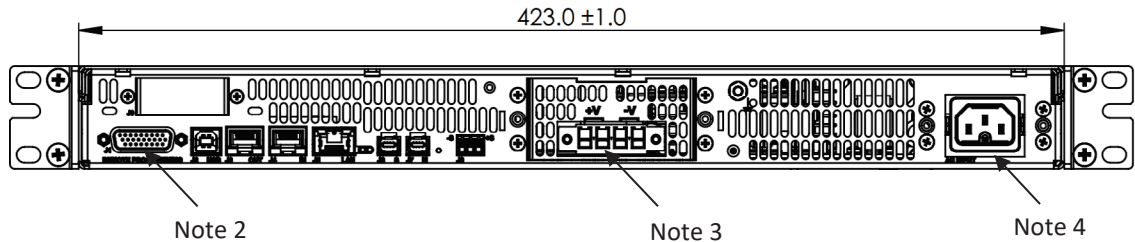
Standard Unit Front View:



Blank Panel Unit Front View:



Standard & Blank Panel Units Rear View:



Standard & Blank Panel Units Side View:

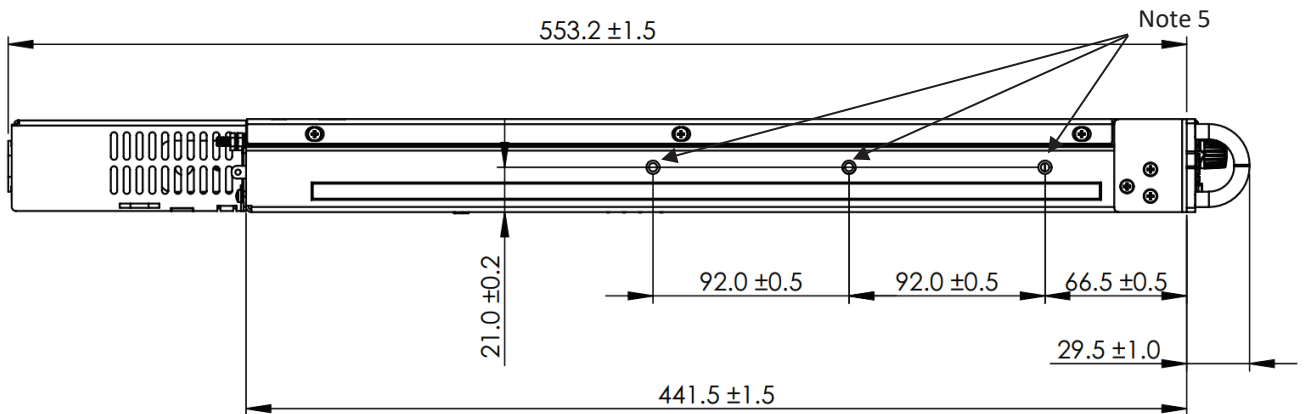
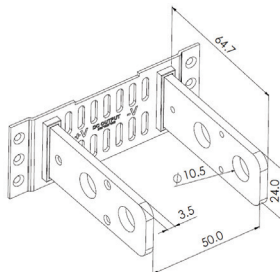


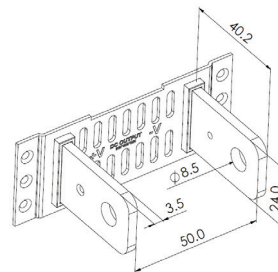
Table 3-1

V	kW	
	1	
10	L1	
20	L2	
30	L2	
40	L2	
50~100	L2	

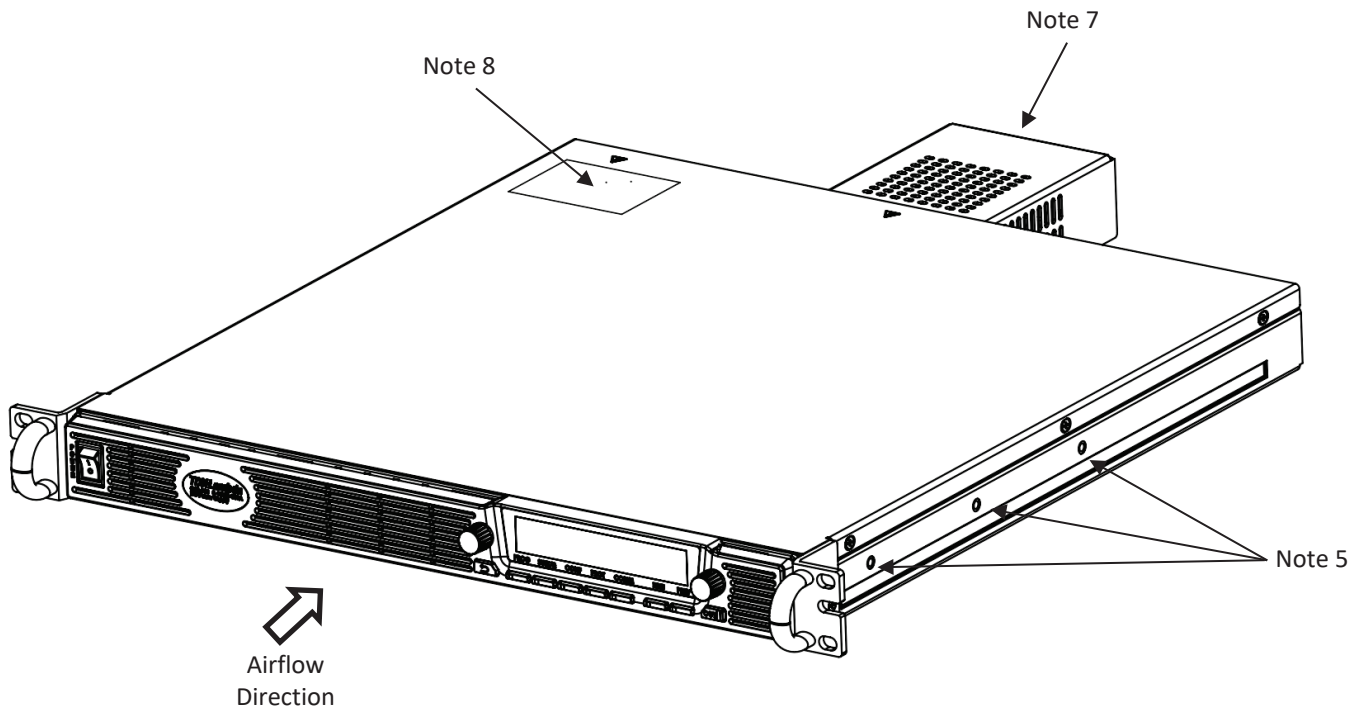
Bus-bar Detail L1



Bus-bar Detail L2



Dimensions are in mm.



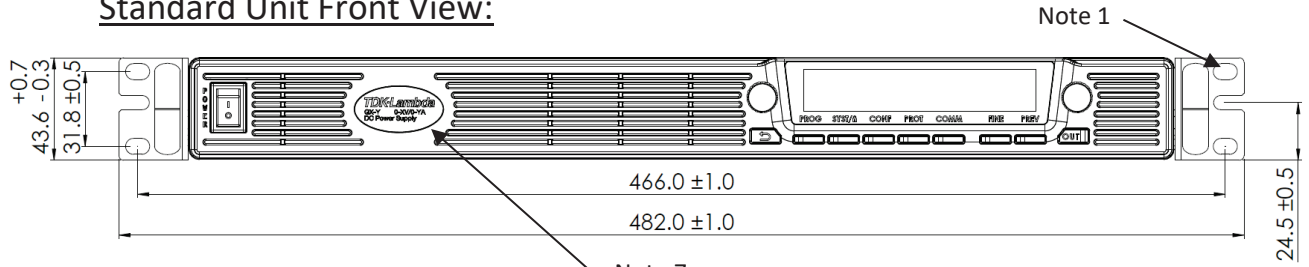
NOTES:

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

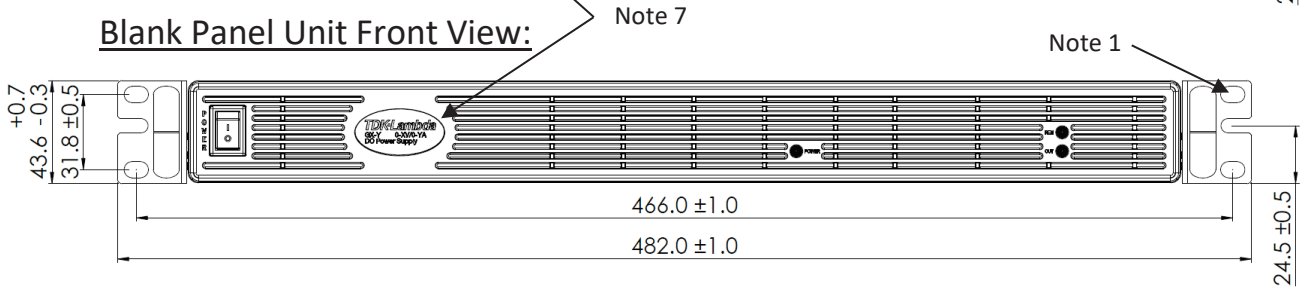
Dimensions are in mm.

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

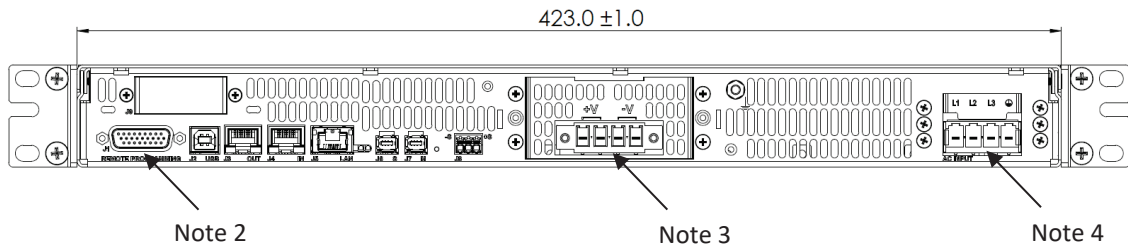
Standard Unit Front View:



Blank Panel Unit Front View:



Standard & Blank Panel Units Rear View:



Standard & Blank Panel Units Side View:

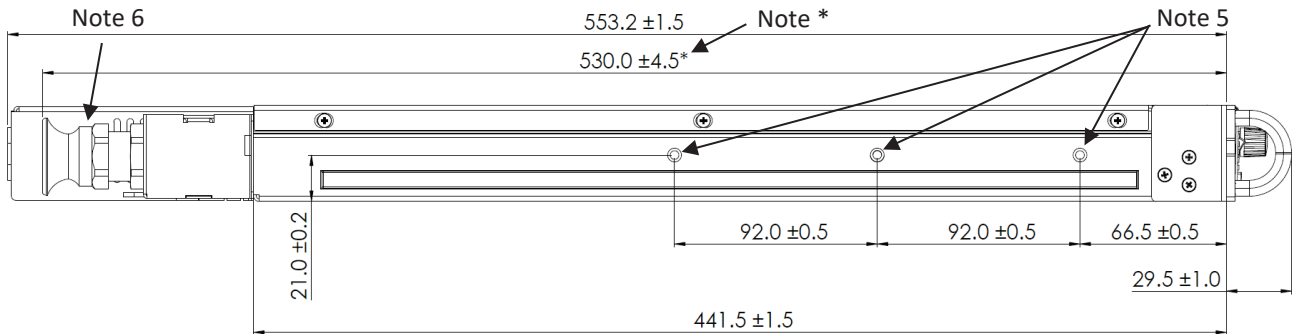
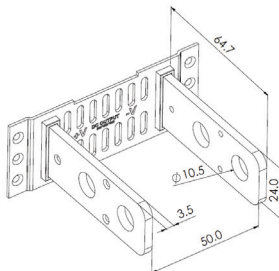


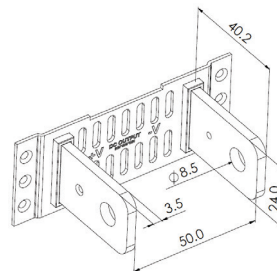
Table 3-2

V	kW			
	1.7	2.7	3.4	5
10	L1	L1	L1	L1
20	L2	L1	L1	L1
30	L2	L1	L1	L1
40	L2	L1	L1	L1
50~100	L2	L2	L2	L2

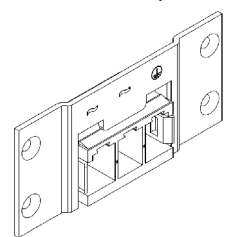
Bus-bar Detail L1



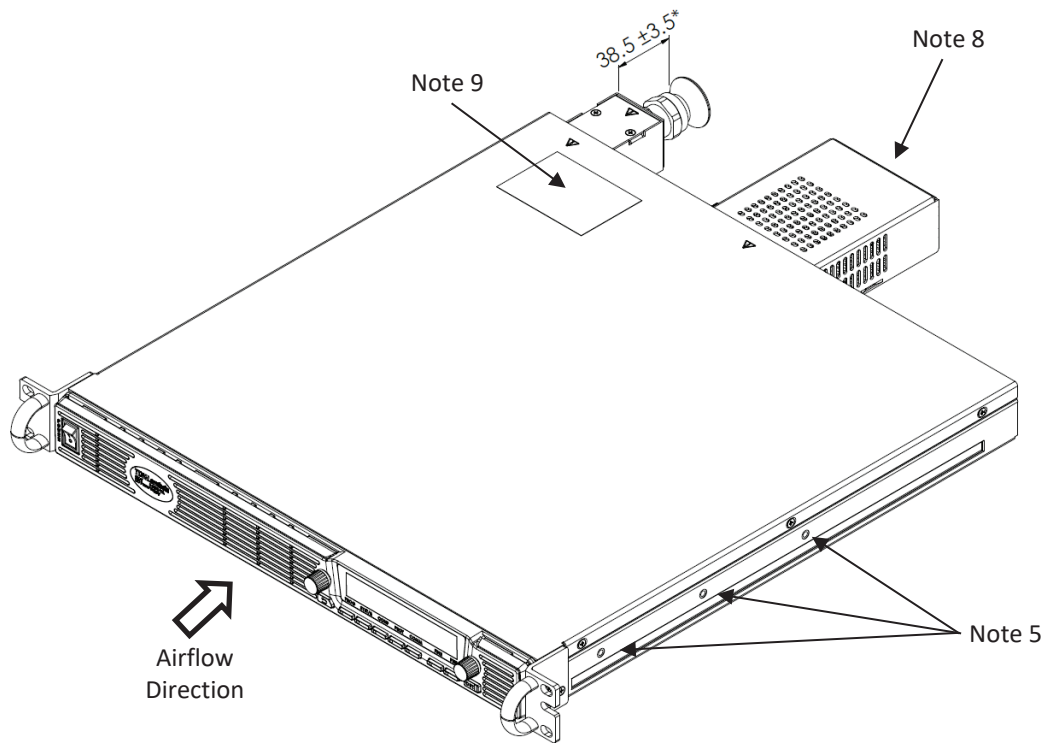
Bus-bar Detail L2



Note 4
1-Phase input



Dimensions are in mm.



NOTES:

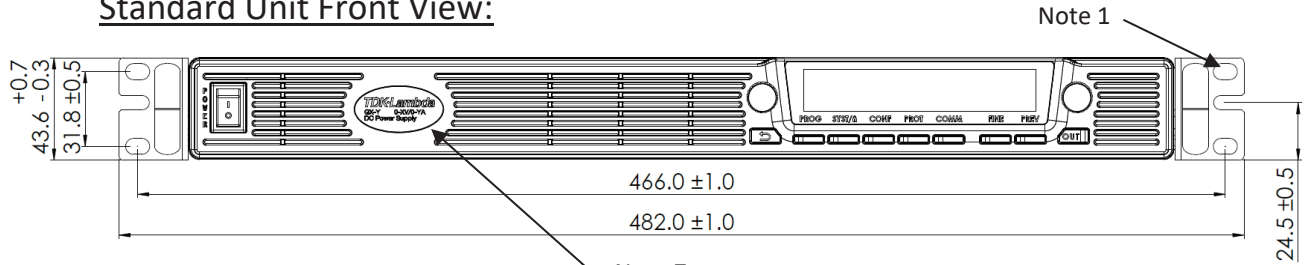
1. Mounting holes for 19" rack. Use M6x16 screws to fix the unit to the rack.
2. Isolated control and signals connector. Mating plug supplied with power supply.
3. Bus bars for 10V to 100V models. See Table 3-2, Bus-bar Detail L1 and Bus-bar Detail L2. 150V to 600V models connector shown (mating plug 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.
6. Use #10-32x0.38inch x3 screws each slide.
7. Ensure that the screws do not penetrate more than 6.0mm into the unit.
8. AC cable strain relief, LAPP GROUP P/N: 5301 5440 (supplied with the power supply).
9. Model name, output rating and company logo are shown here according to the specifications.
10. Output enclosure (supplied with the power supply).
11. 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.

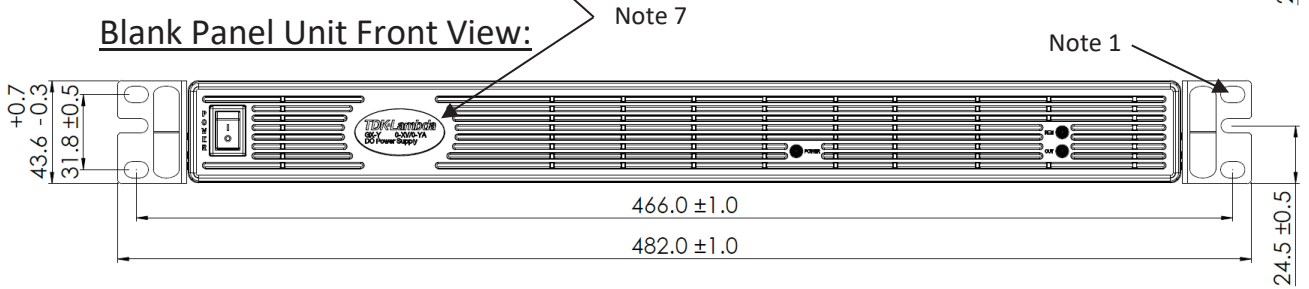
Dimensions are in mm.

3.5 7.5kW Power Supplies Outline

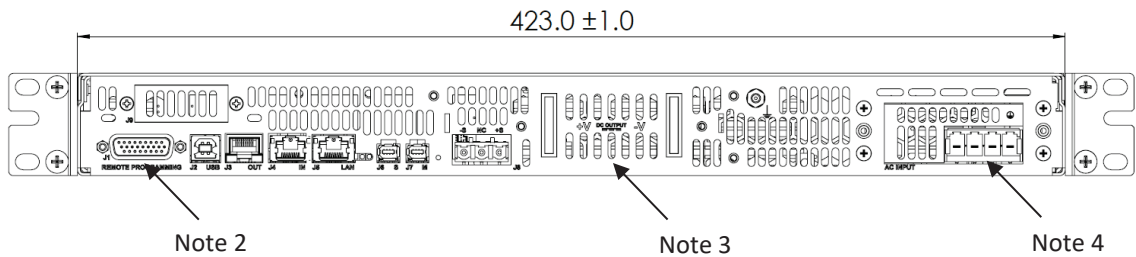
Standard Unit Front View:



Blank Panel Unit Front View:



Standard & Blank Panel Units Rear View:



Standard & Blank Panel Units Side View:

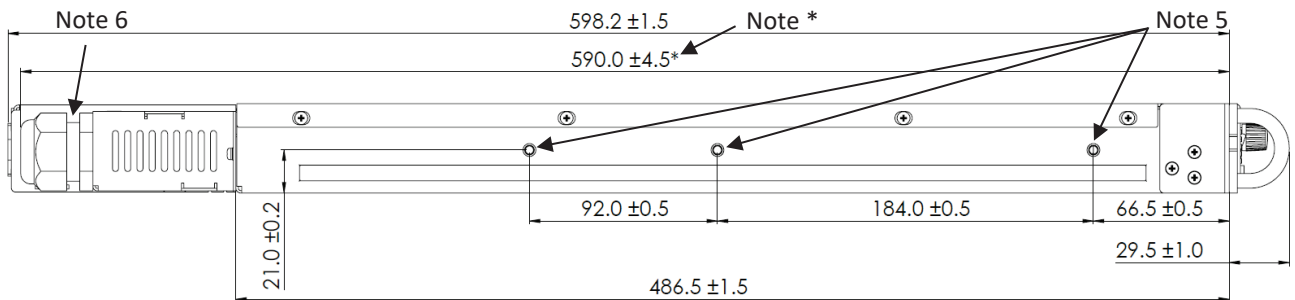
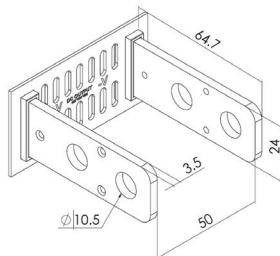


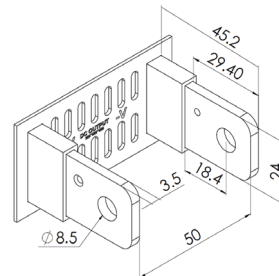
Table 3-3

V	kW	7.5
20~100		L1
150~1500		L2

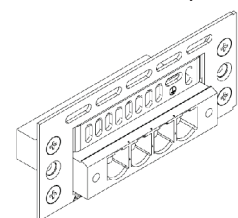
Bus-bar Detail L1



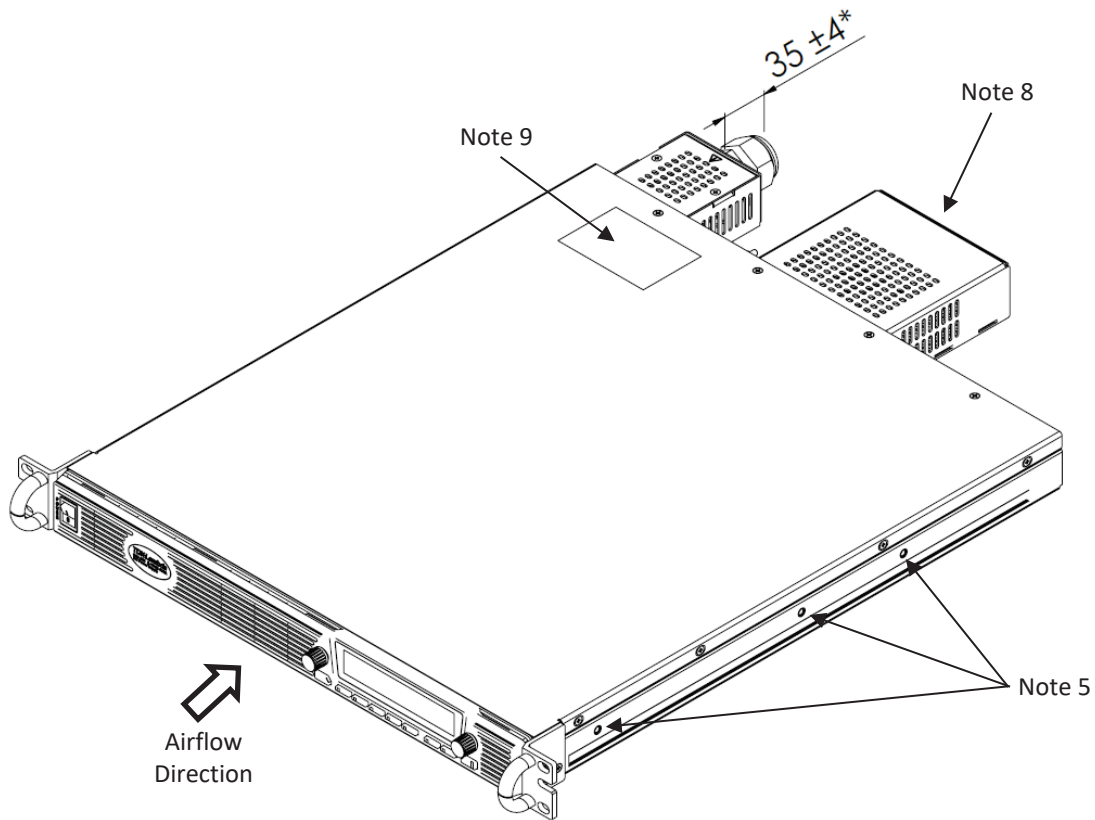
Bus-bar Detail L2



Note 4
3-Phase 208 input



Dimensions are in mm.



NOTES:

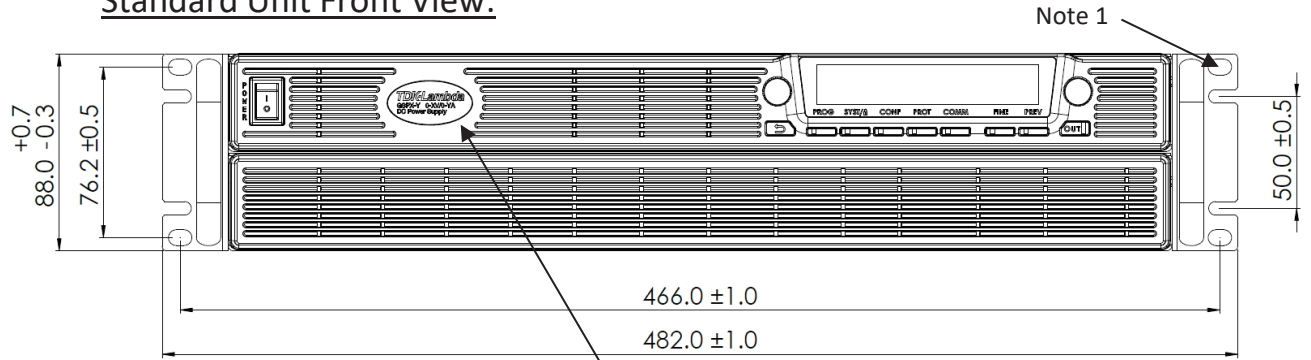
1. Mounting holes for 19" rack. Use M6x16 screws to fix the unit to the rack.
2. Isolated control and signals connector. Mating plug supplied with power supply.
3. Bus bars for 20V to 1500V models. See Table 3-3, Bus-bar Detail L1 and Bus-bar Detail L2.
4. AC input connector (3-Phase 480 shown). Refer to 3-Phase 208 input drawing.
5. Mounting holes for chassis slides, GENERAL DEVICES P/N: CC3001-00-S160 or equivalent.
6. Use #10-32x0.38inch x3 screws each slide.
7. Ensure that the screws do not penetrate more than 6.0mm into the unit.
8. AC cable strain relief, SIB P/N: F7022500 (supplied with the power supply).
9. Model name, output rating and company logo are shown here according to the specifications.
10. Output enclosure (supplied with the power supply).
11. 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.

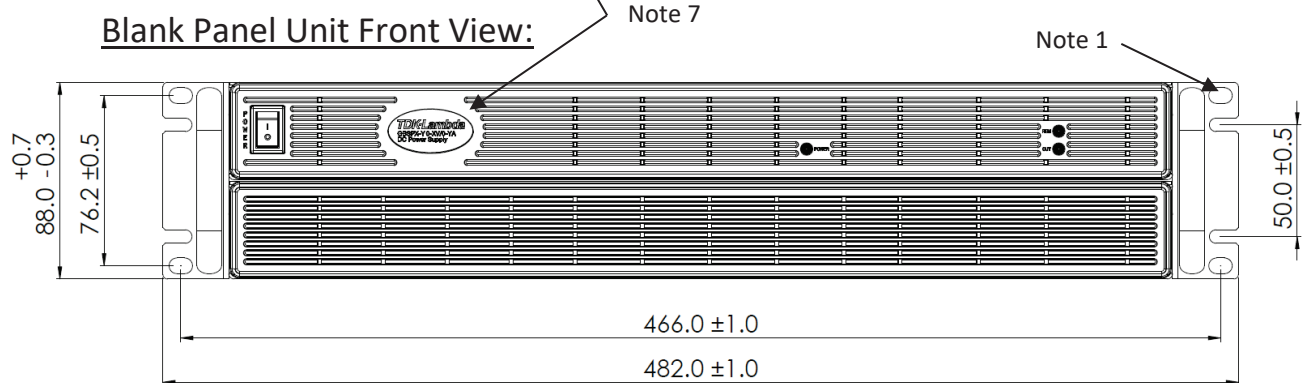
Dimensions are in mm.

3.6 10kW Power Supplies Outline

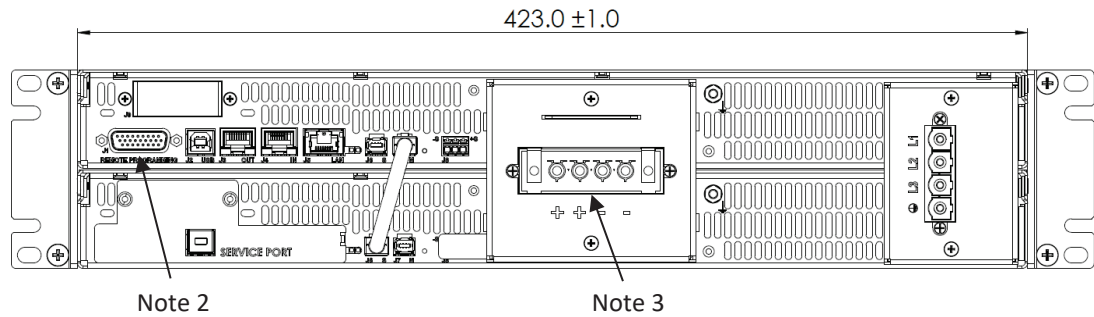
Standard Unit Front View:



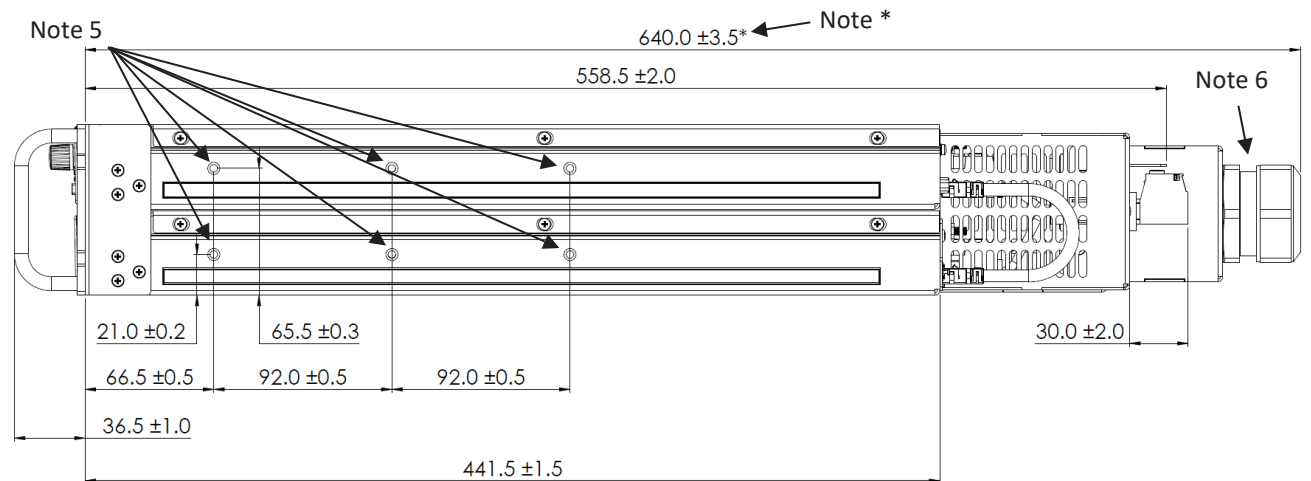
Blank Panel Unit Front View:



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):

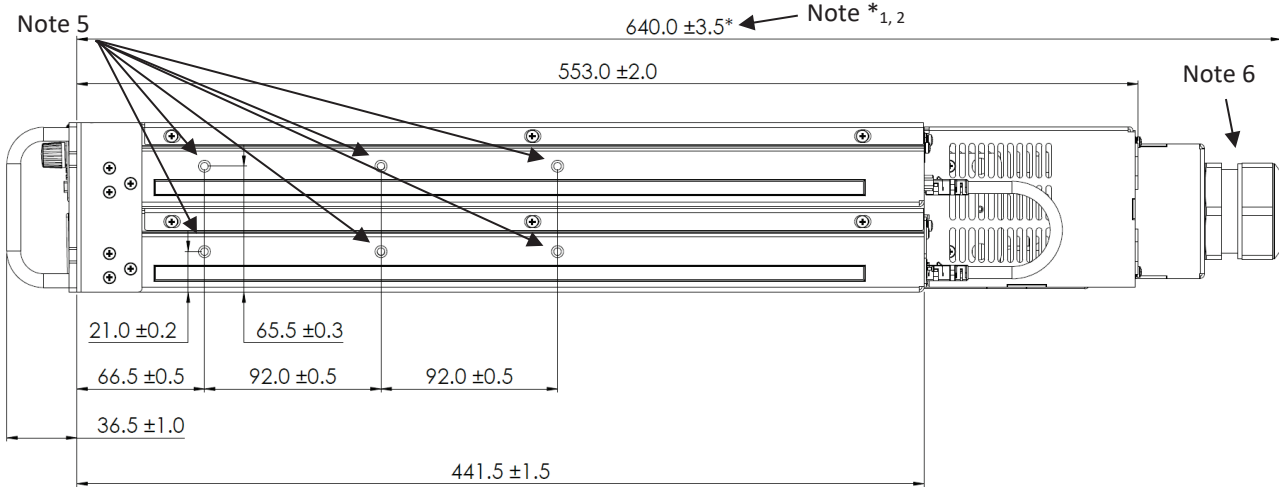
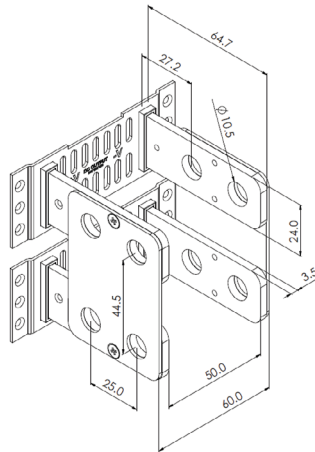


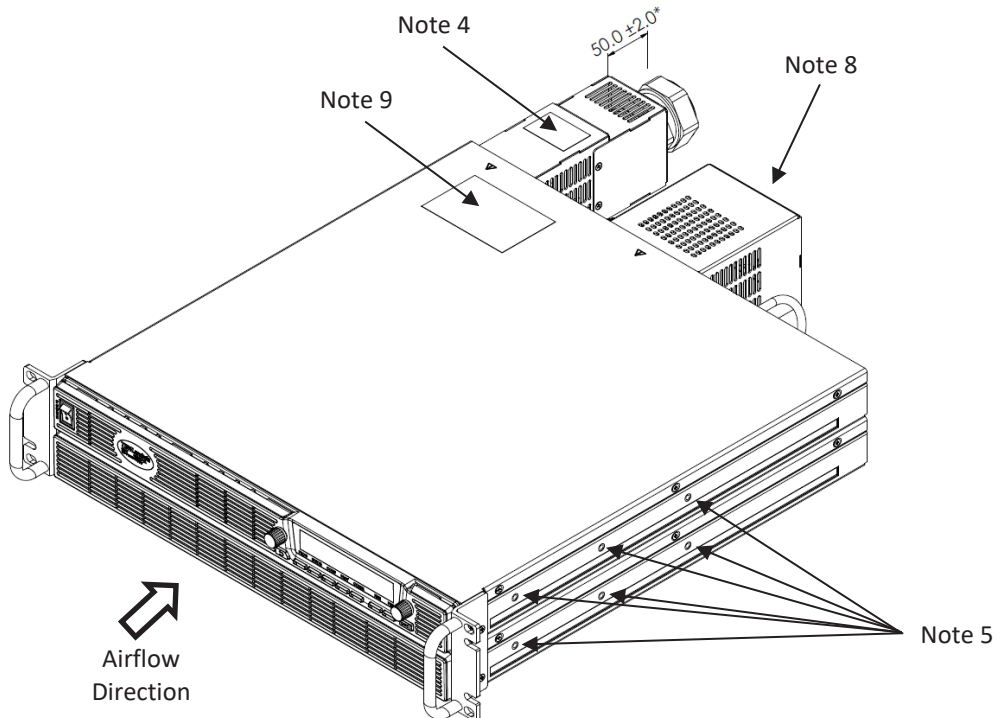
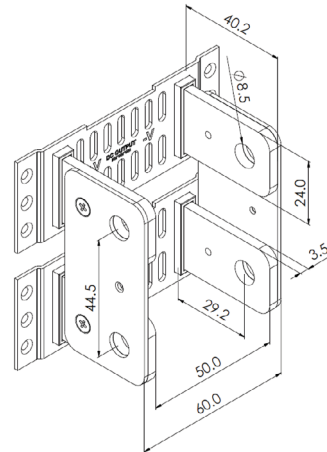
Table 3-3

kW \ V	10
10	L1
20	L1
30	L1
40	L1
50~100	L2

Bus-bar Detail L1



Bus-bar Detail L2



Dimensions are in mm.

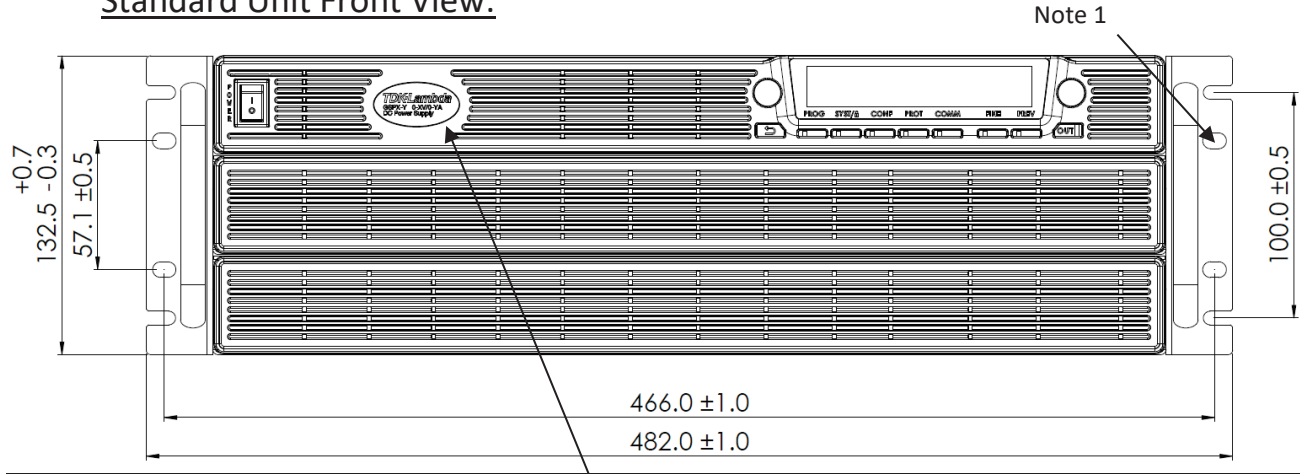
NOTES:

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 3.3, Bus-bar Detail L1 and Bus-bar Detail L2. 150V to 600V models connector shown (mating plug assembled).
 4. High leakage current warning label.
 5. Mounting holes for chassis slides, GENERAL DEVICES P/N: CC3001-00-S160 or equivalent.
 6. Use #10-32x0.38inch x3 screws each slide.
 7. Ensure that the screws do not penetrate more than 6.0mm into the unit.
 8. AC cable strain relief, SIB P/N: F7024000 (supplied with the power supply).
 9. Model name, output rating and company logo are shown here according to the specifications.
 10. Output enclosure (supplied with the power supply) for 10~100V only.
 11. AC input rating and safety approval symbols are shown here according to the specifications.
- *₁. Dimension of 3-Phase 208Vac input. 3-Phase 400/480Vac dimension is 627.0 ±3.5
- *₂. Strain Relief tolerance is dependent on the width of the wire used and tightening strength.

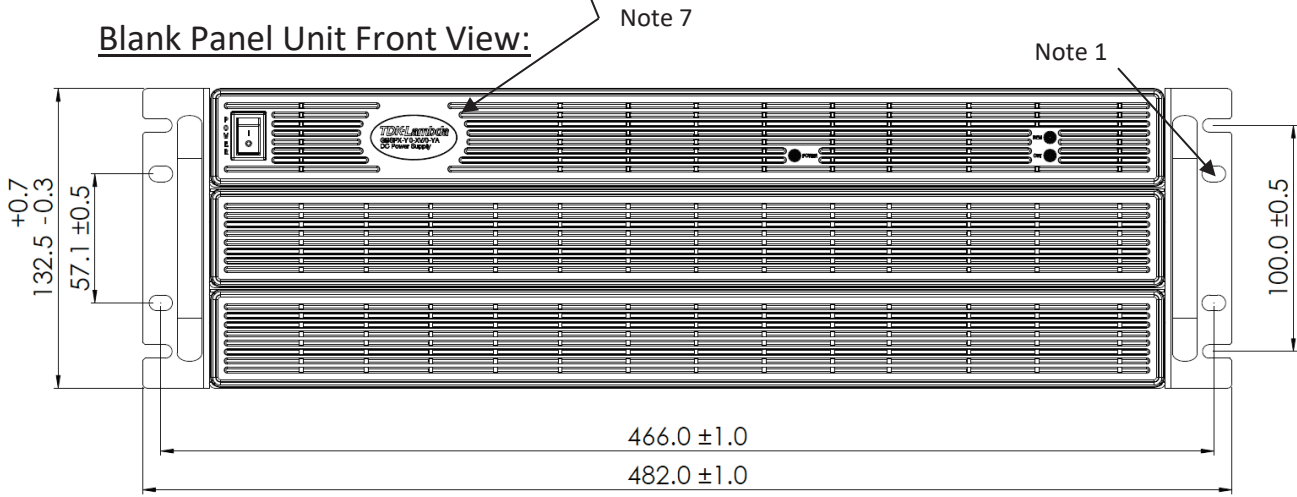
Dimensions are in mm.

3.7 15kW Power Supplies Outline

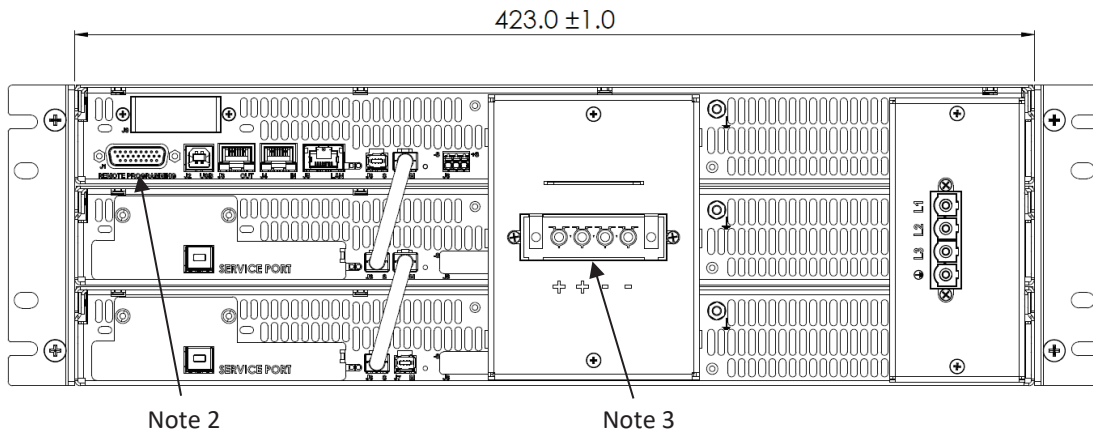
Standard Unit Front View:



Blank Panel Unit Front View:

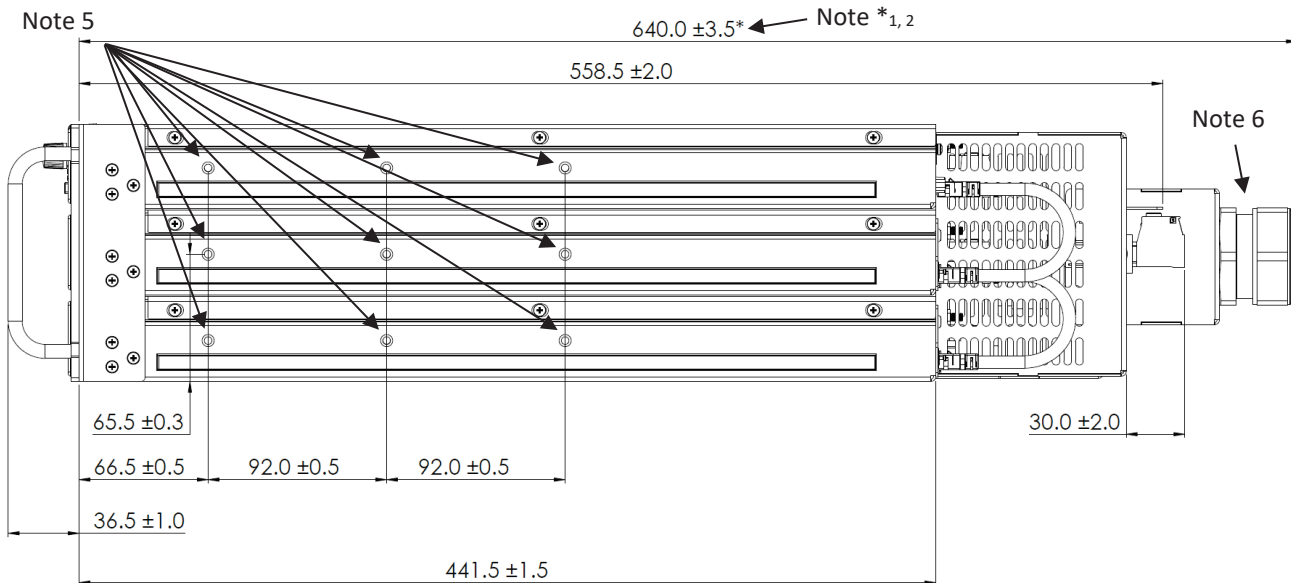


Standard & Blank Panel Units Rear View:



Dimensions are in mm.

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



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

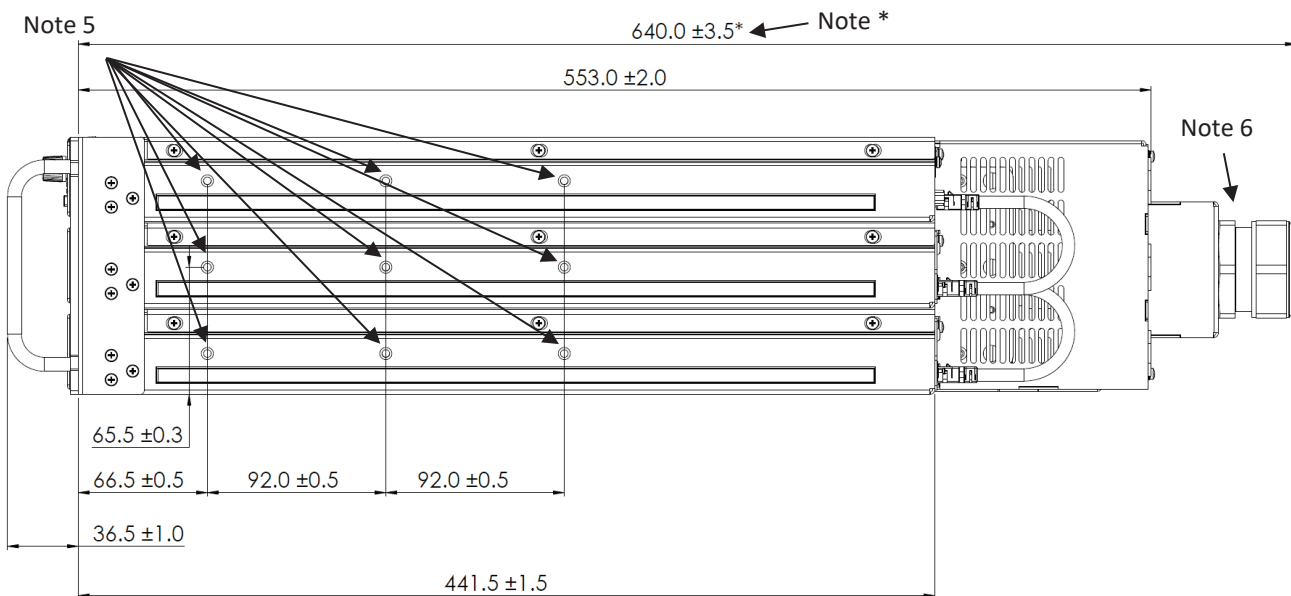
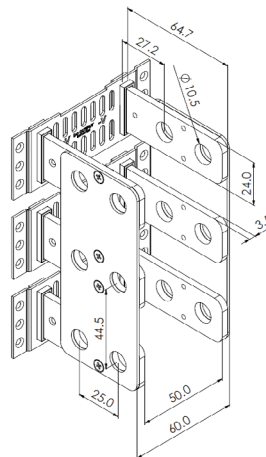


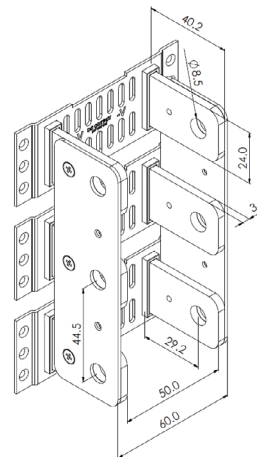
Table 3-4

V	kW	15
10		L1
20		L1
30		L1
40		L1
50~100		L2

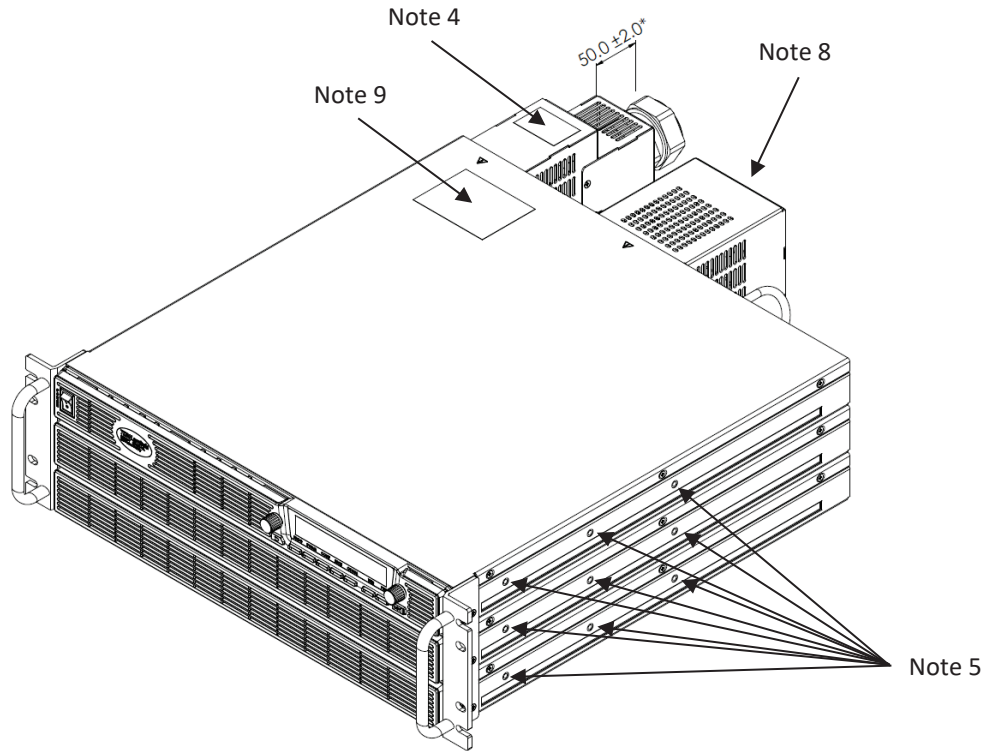
Bus-bar Detail L1



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

*₁. Dimension of 3-Phase 208Vac input. 3-Phase 400/480Vac dimension is 627.0 ±3.5

*₂. 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.

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.

WARNING

15kW GSP / GBSP power supply systems must be carried by holding as close as possible to its center of mass or with both handles only. Do not apply any mechanical stress on front panel handles, input bracket or output bracket.

4.2 Preparation for Use

In order to be operational, the power supply must be connected to an appropriate AC mains. The AC mains voltage should be within the power supply specification. Do not apply power before reading the safety instructions and Section 4.8.

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 4.5 Section 4.6 Section 4.7
3	AC mains	AC mains requirements. Connecting the power supply to the AC mains.	Section 4.8
4	Test	Turn-on checkout procedure.	Section 4.9
5	Load connection	Wire size selection. Local / Remote sensing. Single or multiple loads.	Section 4.10
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 (Half Width Models)

To install a GH1.5kW unit or two units side-by-side in to a standard 19" Rack in 1U (1.75") height, order option kit P/N: GH/RM. The rack mount kit allows the units to be zero stacked for maximum system flexibility and power density without increasing the 1U height of the units.

4.4.1 GH/RM Option kit

- Right and left corners
- Connection bracket (used only for dual unit installation)
- Blank panel (used only for single unit installation)
- Right and left fixing brackets
- Handles, 2 Pcs
- Flat head screws M3X6, 6Pcs
- Flat head screws M3X8, 6Pcs
- Flat head screws M3X10, 3Pcs
- Flat head screws M4X8, 4Pcs
- Sems screws M3X8, 5Pcs
- HEX. Nut M3, 3Pcs
- Flat washer M3, 3Pcs
- Spring washer M3, 3Pcs

4.4.2 Single Unit Installation

In a single unit rack mount assembly, the unit can be assembled on the left half side or on the right half side of the assembly. The assembly below describes installation of a GH unit on the right half side and a blank panel on the left half side.

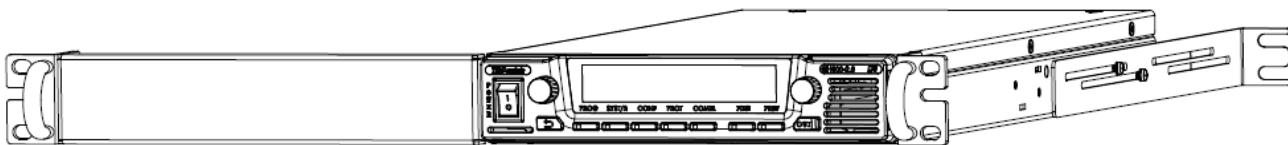


Figure 4-1: Single Unit Installation

NOTES

- | |
|---|
| <ol style="list-style-type: none">1. All M3 screws tightening torque is 4.7-5.7 Lbf-inch (0.53-0.64Nm).2. All M4 screws tightening torque is 12.5-13.5 Lbf-inch (1.41-1.52Nm). |
|---|

1. Fix handle to left corner, then fix the left corner to the blank panel as shown in Figure 4-2.

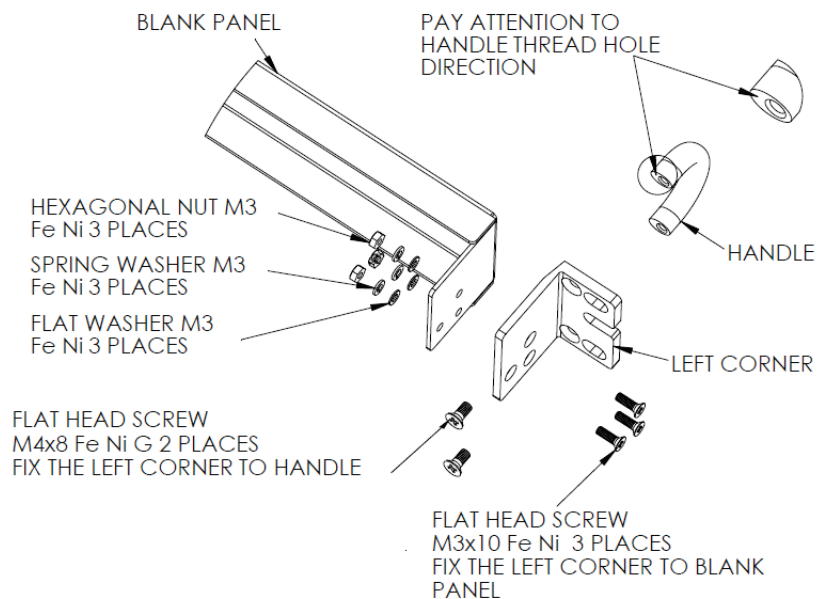


Figure 4-2: Left Corner Assembly to Blank Panel

2. Fix handle to the right corner, then fix the right corner to the power supply as shown in Figure 4-3.
3. Fix the right fixing bracket to the power supply as shown in Figure 4-3. Adjust the location of the fixing bracket to fit the depth of the cabinet.

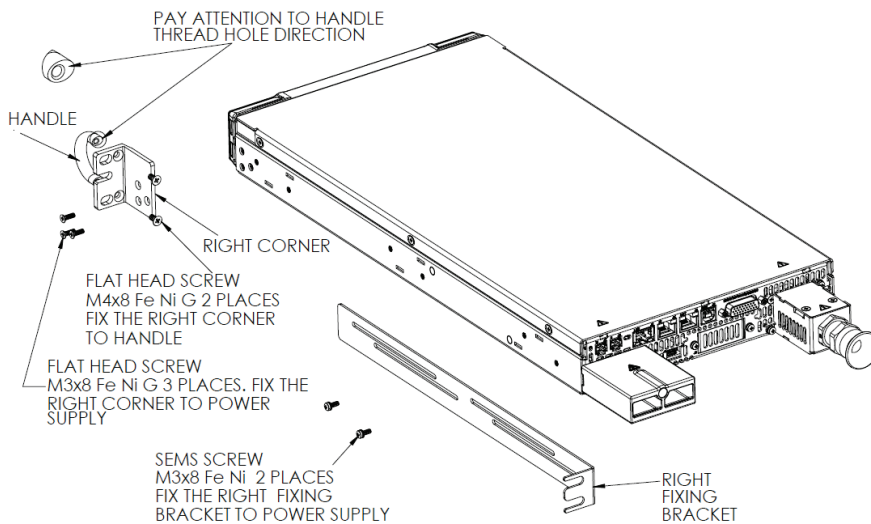


Figure 4-3: Right Corner and Fixing Bracket Assembly to Power Supply

4. Fix the blank panel to the left side of the power supply as shown in Figure 4-4.

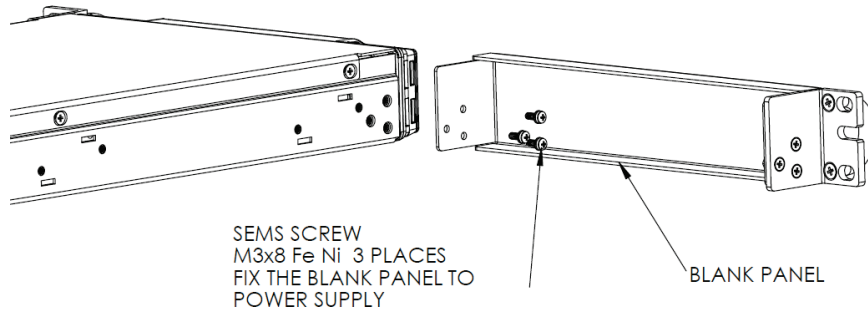


Figure 4-4: Blank Panel Assembly to Power Supply

4.4.3 Dual Unit Installation

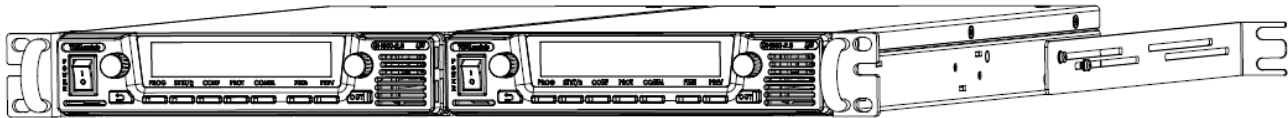


Figure 4-5: Dual Unit Installation

CAUTION

Do not apply any stress on the units' front panel during assembly or disassembly. Stress on the front panel may damage the unit. Such damage is not covered under manufacturer's warranty.

NOTES

1. All M3 screws tightening torque is 4.7-5.7 Lbf-inch (0.53-0.64Nm).
2. All M4 screws tightening torque is 12.5-13.5 Lbf-inch (1.41-1.52Nm).

1. Insert the connection bracket to the rectangular holes in the right wall of the left half side power supply.
2. Push the connection bracket toward the rear side of the power supply and then fix the bracket to the chassis with 6 flat head screws as shown in Figure 4-6.

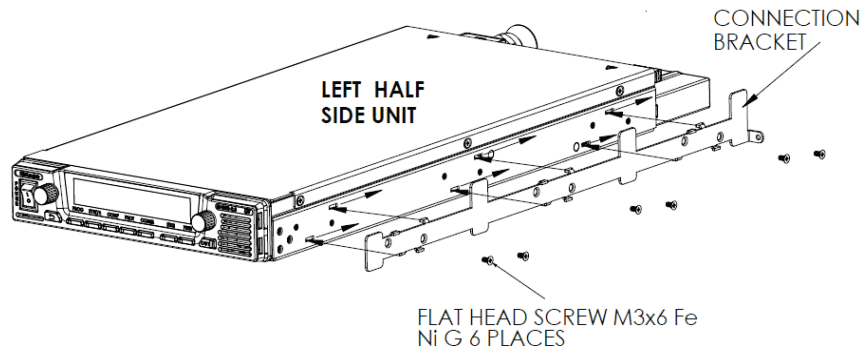


Figure 4-6: Connection Bracket Fixing to Left Unit

- Place the two units side-by-side on a flat surface and remove the ground screw of the right half side unit as shown in Figure 4-7.

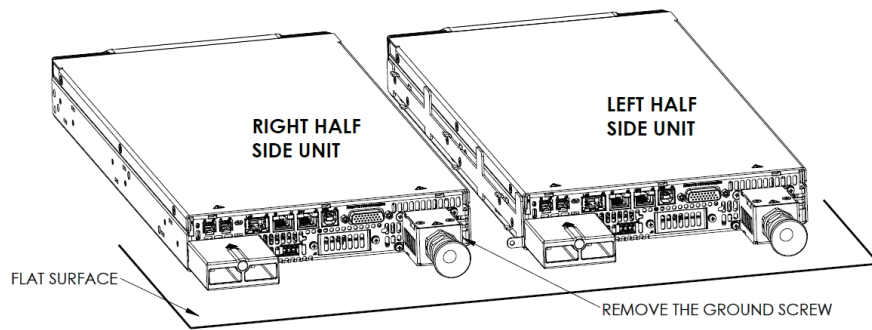


Figure 4-7: Prepare the Units for Assembly

- Assemble the right half side unit to connection bracket as shown in Figure 4-8.

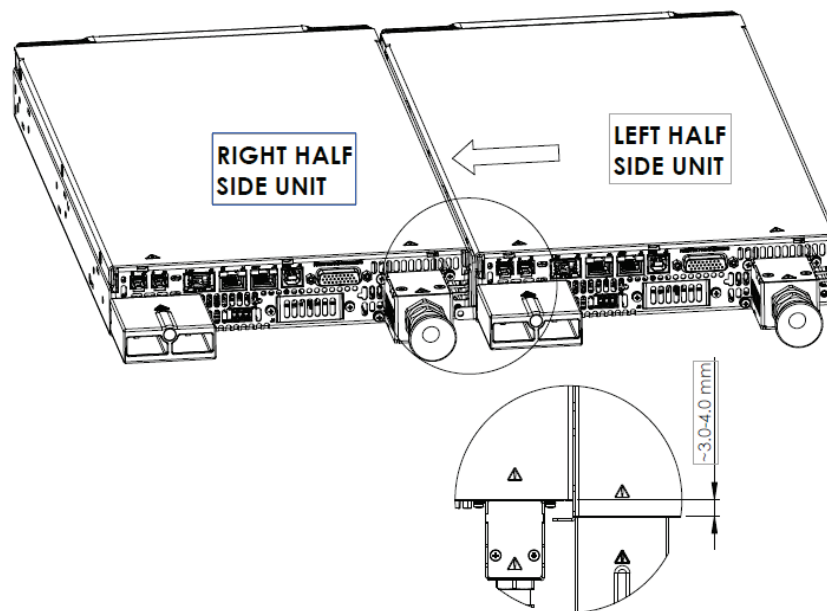


Figure 4-8: Assembly

- Push the left half side unit forward while holding the right half side unit still.
- Tighten the ground screw previously unscrewed (Sems screw M3X8), back to the rear panel through the hole in the connection bracket as shown in Figure 4-9.

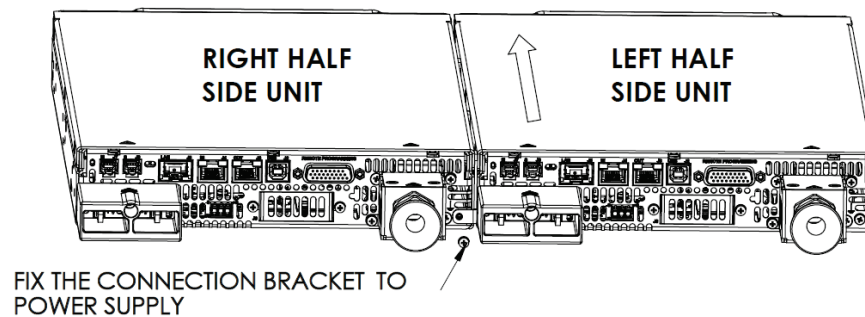


Figure 4-9: Assembly Lock

- Fix the left and right corners and handles to the front side of the units, and the left and right fixing brackets to the side of the units as shown in Figure 4-10.

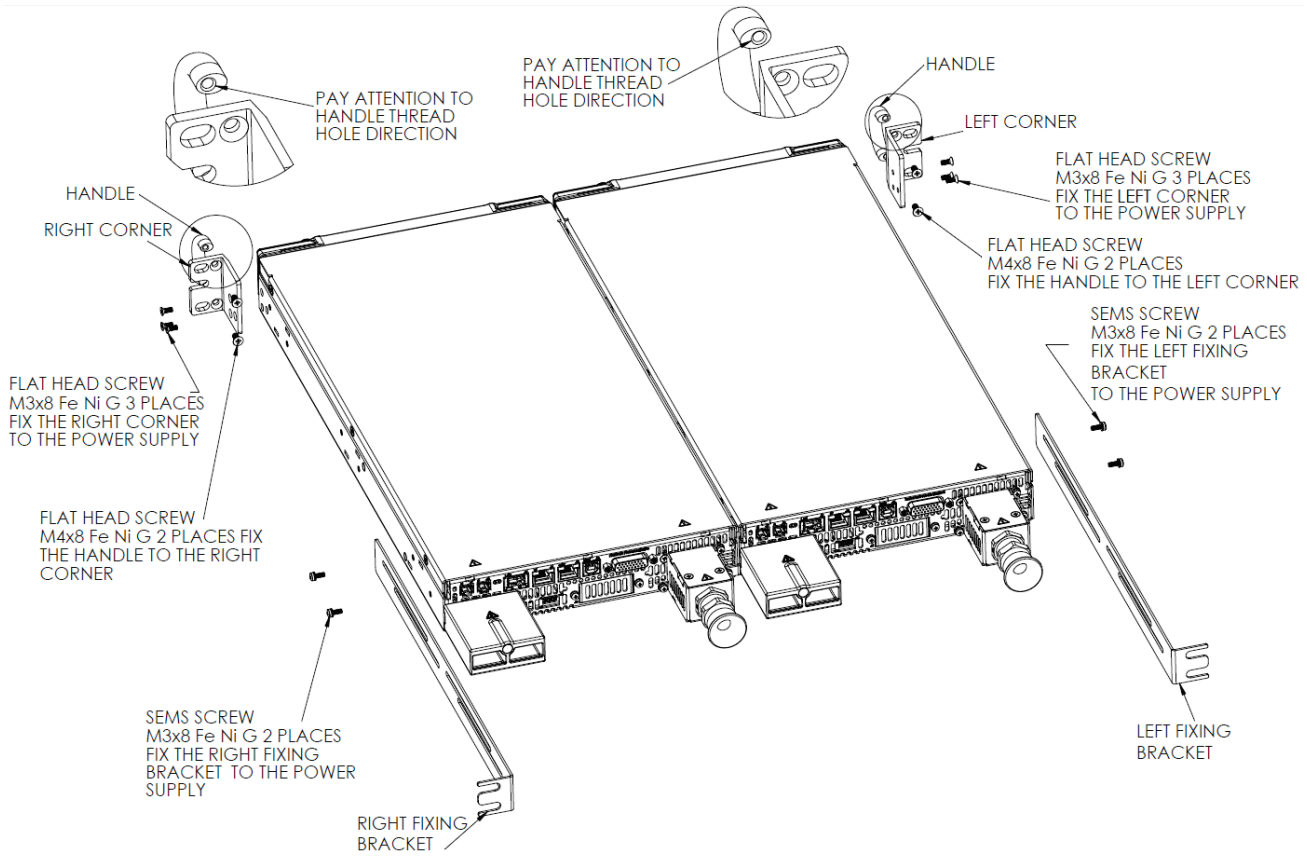


Figure 4-10: Assembly Completion

4.4.4 GH\RM Rack Mounting Outline Drawings

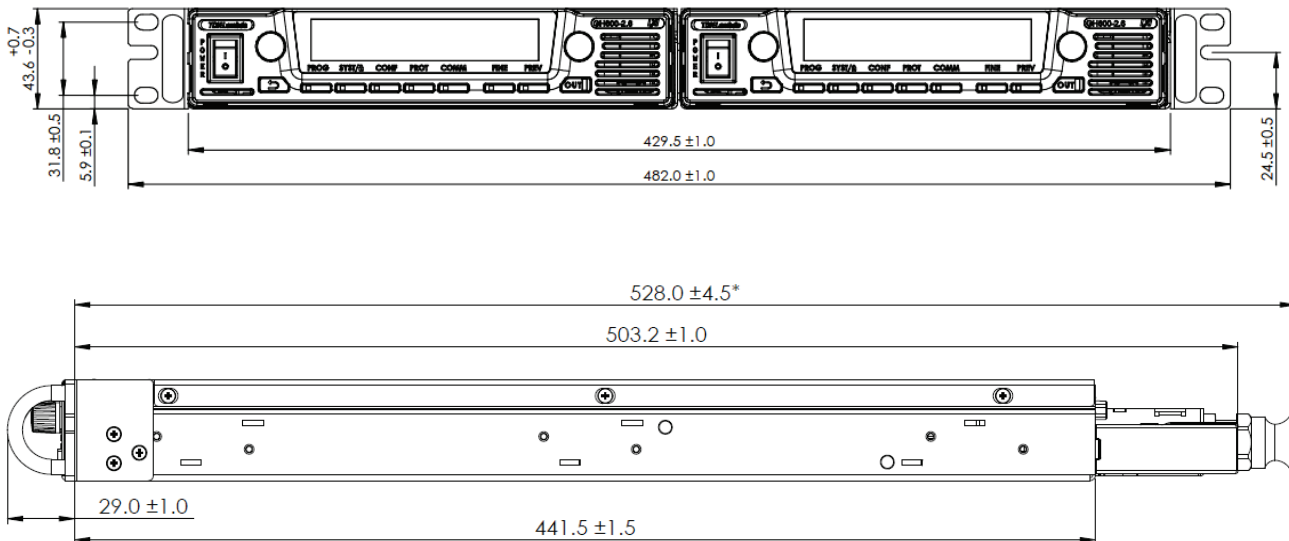


Figure 4-11: GH/RM Rack Mount Outline

4.5 Rack Mounting (Full Width Models)

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

4.5.1 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.

4.5.2 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 4-12, Figure 4-14 and Figure 4-15 for slides assembly instructions. Use three #10-32x0.38"(max.) screws at each side. To prevent internal damage, use the specified screw length only.

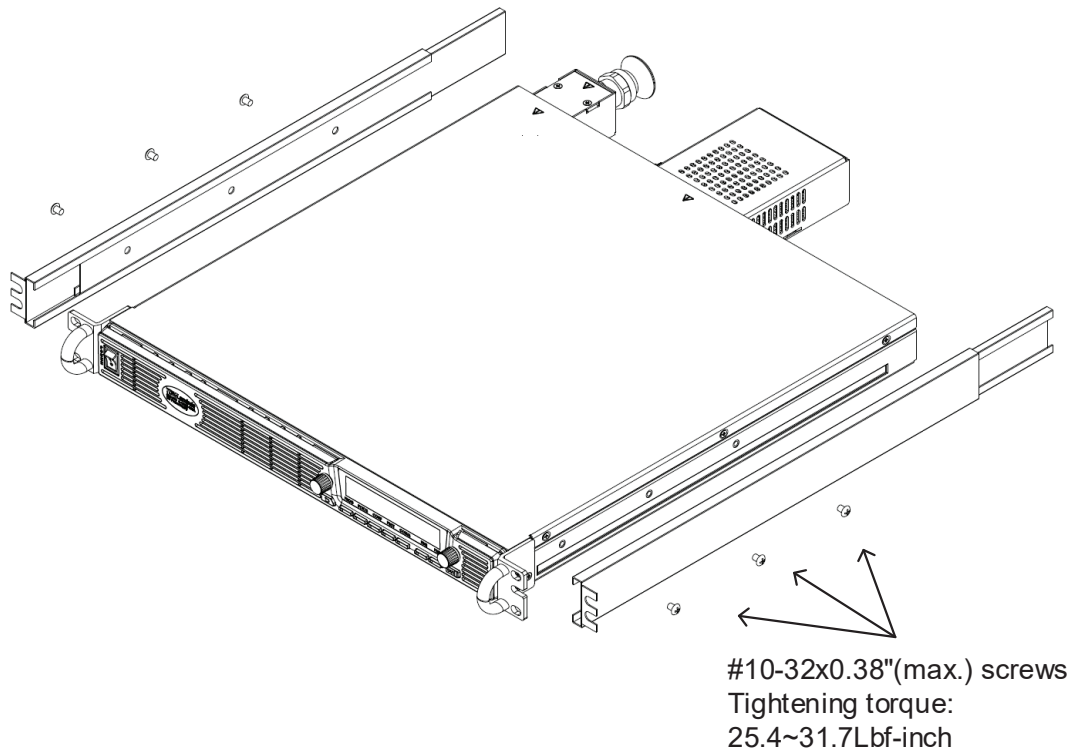


Figure 4-12: 1 – 1kW Up to 5kW Rack – Mount Slides Assembly

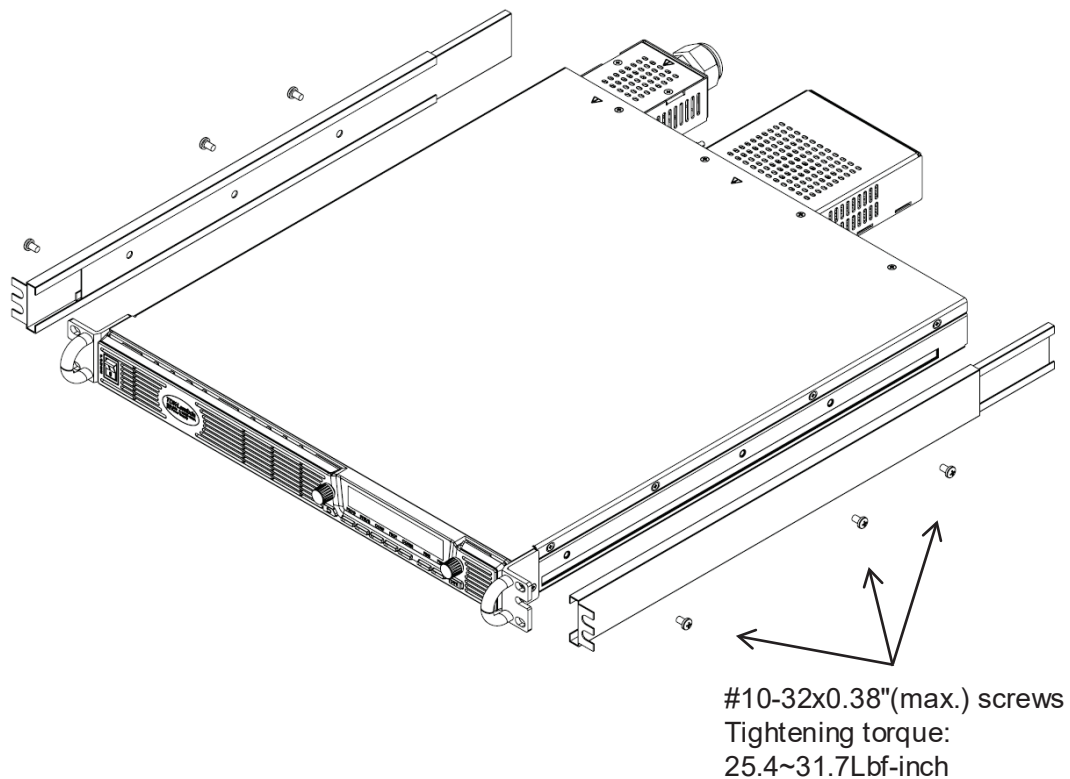


Figure 4-13: 1 – 7.5kW Rack – Mount Slides Assembly

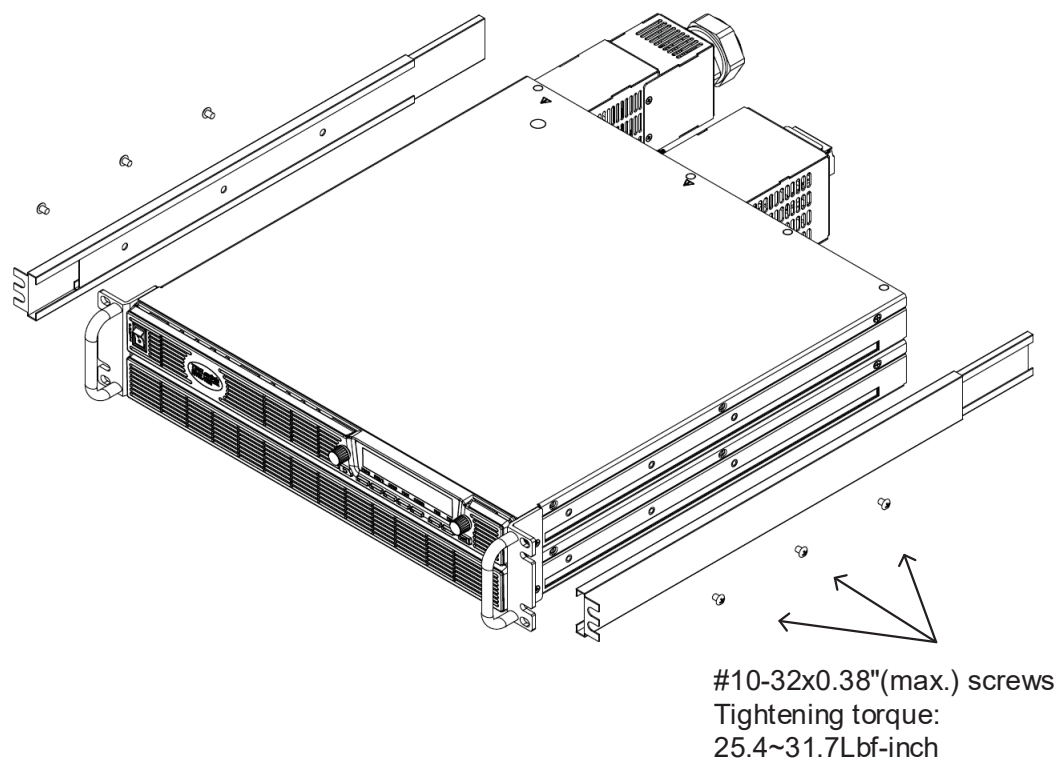


Figure 4-14: 10kW Rack – Mount Slides Assembly

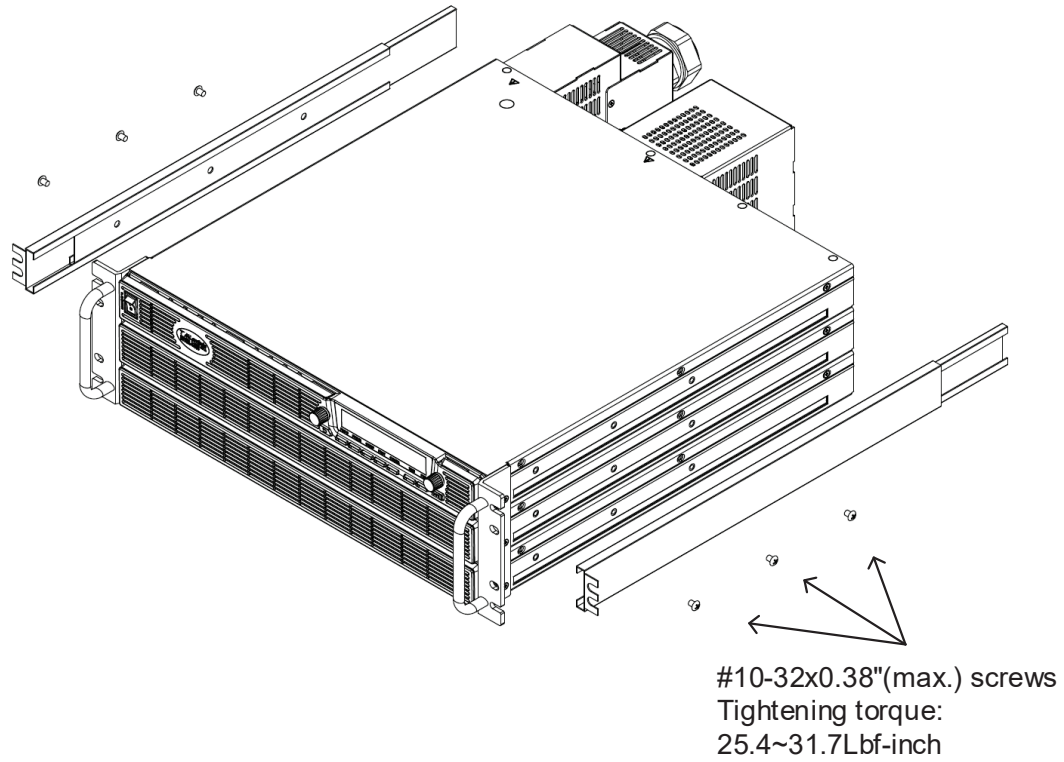


Figure 4-15: 15kW Rack – Mount Slides Assembly

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.

4.6 Benchtop Stacking Option (Half Width Models)

A benchtop zero stacking kit for benchtop applications is available for two units, three units and four units. P/N: GH/MO-2U, GH/MO-3U, GH/MO-4U.

4.6.1 GH/MO Option kit

GH/MO-2U:

- 2U plates, 2Pcs
- Sems screw M3X8, 8Pcs

GH/MO-3U:

- 3U plates, 2Pcs
- Sems screw M3X8, 12Pcs

GH/MO-4U:

- 4U plates, 2Pcs
- Sems screw M3X8, 16Pcs

4.6.2 GH/MO Installation

NOTES

1. All M3 screws tightening torque is 4.7-5.7 Lbf-inch(0.53-0.64Nm).
2. All M4 screws tightening torque is 12.5-13.5 Lbf-inch(1.41-1.52Nm).

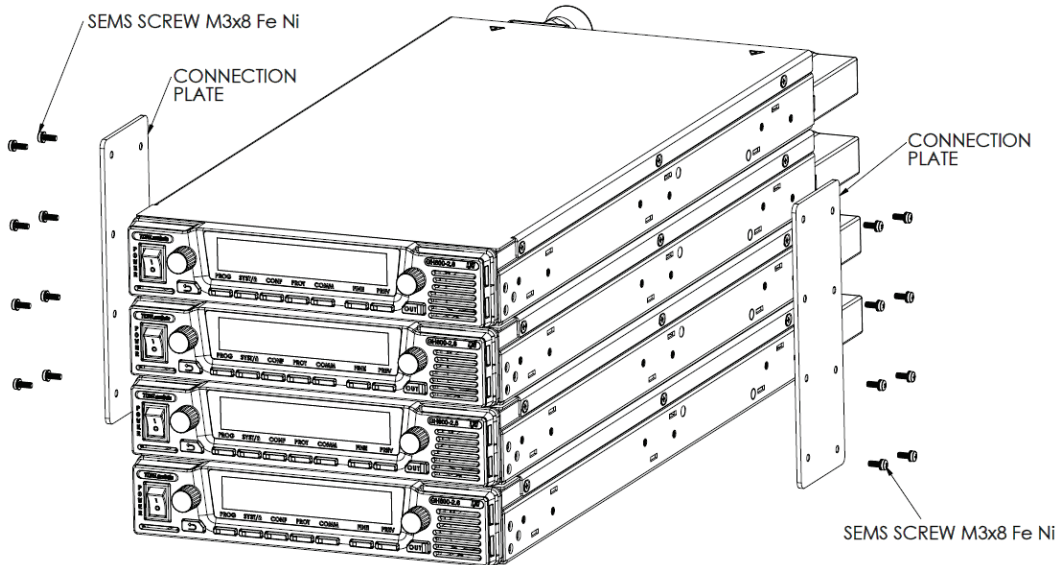


Figure 4-16: GH/MO Assembly

4.7 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 (refer to product Spec. for operating conditions).

4.7.1 Foot Snaps Assembly (Applicable for Half Width Models Only)

In the accessories kit, 4 foot snaps and 4 push rivets are supplied for the client's usage. The usage is optional. Assembly according to Figure 4-17.

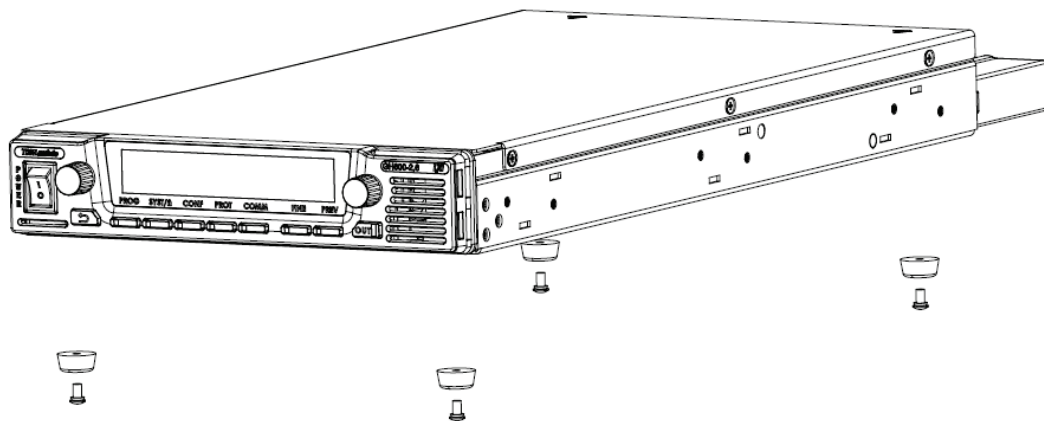


Figure 4-17: Foot Snaps Assembly

4.8 AC Input Power Connection

This Power supply shall be connected to the AC mains via protective device (circuit breaker, fuses, etc...) which disconnect each current-carrying conductors with the following maximum ratings:

- 20A for 1kW.
- 30A for 1.5kW up to 3.4kW 1-Phase.
- 30A for 2.7kW up to 5kW 3-Phase 208Vac.
- 20A for 2.7kW up to 5kW 3-Phase 400/480Vac.
- 50A for 7.5kW 3-Phase 208Vac.
- 30A for 7.5kW 3-Phase 400/480Vac.
- 63A for 10kW 3-Phase 208Vac.
- 40A for 10kW 3-Phase 400/480Vac.
- 80A for 15kW 3-Phase 208Vac.
- 63A for 15kW 3-Phase 400/480Vac.

The device must be suitably located and easily reached.

The device must be marked as the disconnecting device for the equipment.

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.

CAUTION

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

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.

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**.

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.

CAUTION

The power supply ON/OFF switch is not the main "disconnect device" and does not completely disconnect all the circuits from the AC mains. 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.

4.8.1 AC Input Connector

For GH1kW / G+1kW:

An IEC connector is provided on the rear panel for connecting the unit to the AC power source with an AC cord. The IEC connector also provides the safety ground connection while the AC cord is plugged into an appropriate AC receptacle.

For GH1.5kW / G+1.7kW / G+2.7kW / G+3.4kW / G+5kW / G+7.5kW / GSP10kW / GSP15kW Power Supplies:

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

Refer to Section 1.3.2.6 for details for the recommended AC input cables and to Section 4.8 for disconnect device requirement.

WARNING

AC input cord is not provided with the power supply.
--

4.8.2 AC Input Wire Connection for GH1.5kW

1. Strip the outside insulation of the AC cable approx. 3cm. 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 4-18.
3. Tighten the plastic nut (supplied in the accessories box), from the inside part of the bracket by using manual force only.

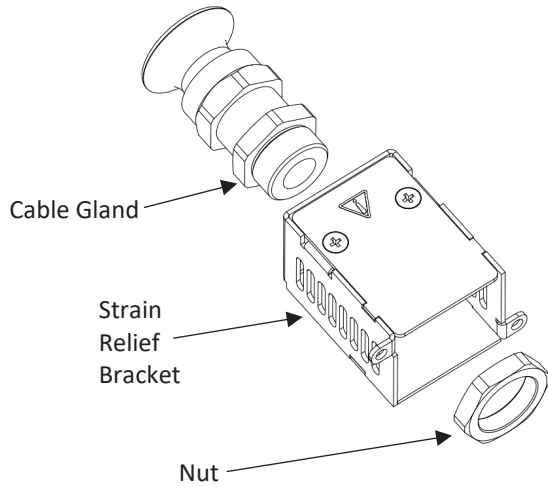


Figure 4-18: Insertion of the Plastic Nut into Strain Relief Bracket

4. Unscrew the conical cable entry part, until it is possible to insert the AC cable.
5. Insert the AC cable through the conic cable gland entry and the strain relief bracket as shown in Figure 4-19 (4-wires are shown, it applies to 1-Phase, 3-wires as well).

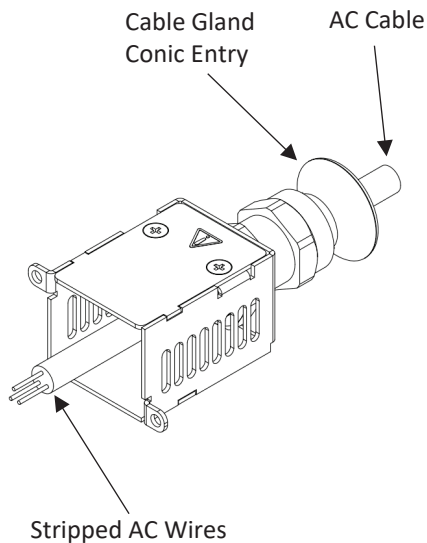


Figure 4-19: Stripped Wires Inserted Through

6. Insert the AC wires into the AC input connector as shown in Figure 4-20.
7. Tighten the screws, tightening torque: 4.5-5.3 Lbf-inch. (0.5-0.6Nm).

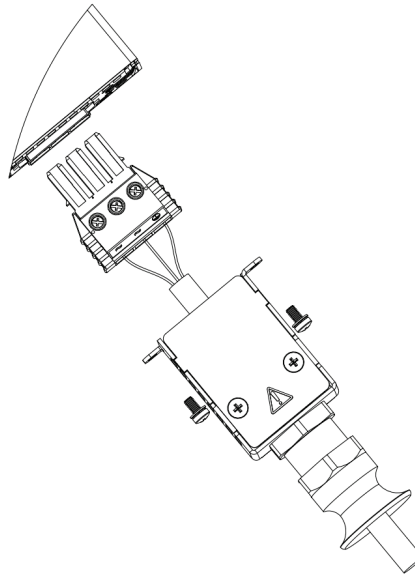


Figure 4-20: AC Wires Fixed to the AC Connector

8. Insert the AC input connector to the power supply.
9. Fix the strain relief release assembly to the rear panel with two M3x8 Sems screws as shown in Figure 4-21. The Sems screws are supplied in the accessories kit. Tightening torque: 4.7-5.7 Lbf-inch. (0.53-0.64Nm).
10. After fixing the strain relief close by manual force the cable gland conic entry part until the AC cable will be well tightened. Beware not to apply excessive force.

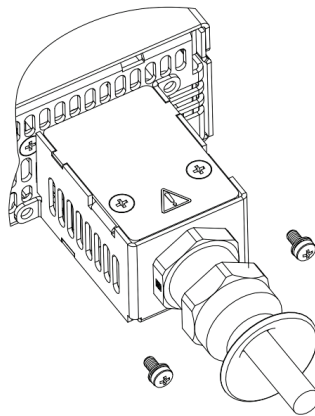


Figure 4-21: Strain Relief Assembled to Power Supply Rear Panel

4.8.3 AC Input Wire Connection for 1.7kW - 5kW

1. Strip the outside insulation of the AC cable approx. 5cm. 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 4-22.
3. Tighten the plastic nut (supplied in the accessories box), from the inside part of the bracket by using manual force only.

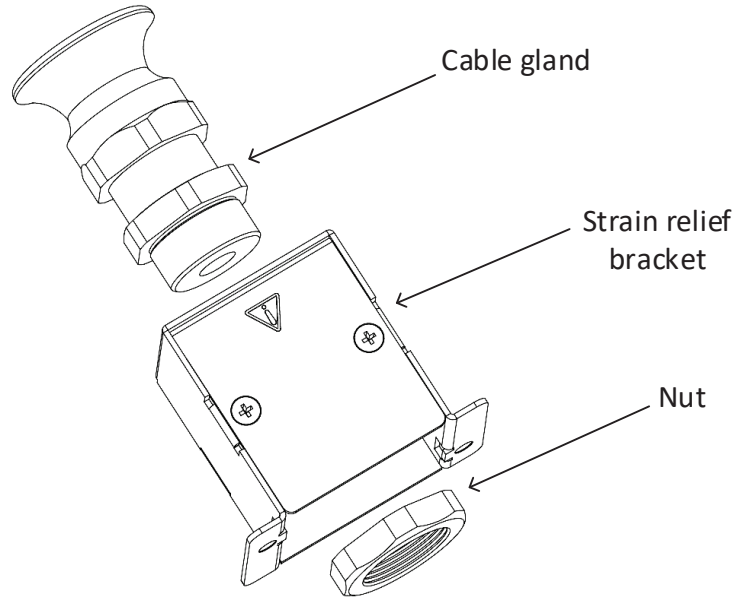


Figure 4-22: Insertion of the Plastic Nut into Strain Relief Bracket

4. Unscrew the conical cable entry part, until it is possible to insert the AC cable.
5. Insert the AC cable through the conic cable gland entry and the strain relief bracket as shown in Figure 4-23 (4-wires are shown for 3-Phase, it applies to 3-wires for 1-Phase as well).

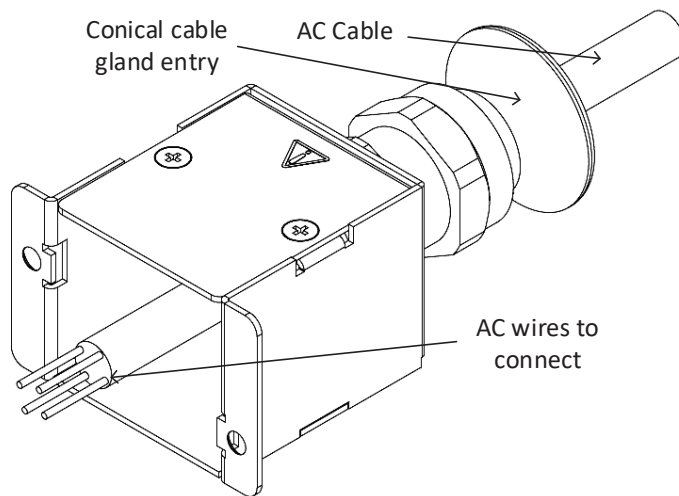


Figure 4-23: Stripped Wires Inserted Through

6. Insert the AC wires into the AC input connector as shown in Figure 4-24.
7. Tighten the screws, tightening torque: 4.5-5.3 Lbf-inch. (0.5-0.6Nm).

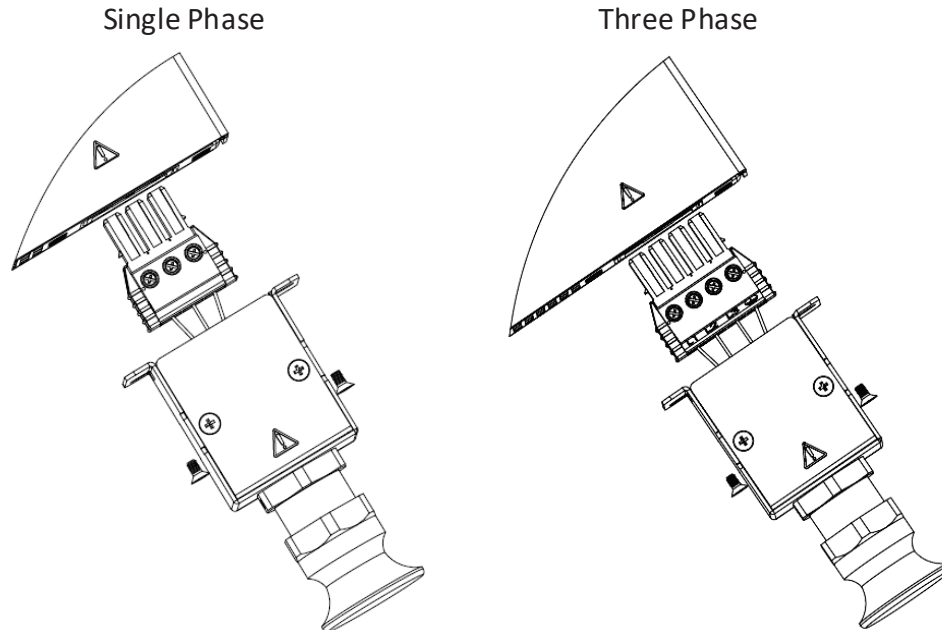


Figure 4-24: AC Wires Fixed to the AC Connector

8. To fix the strain relief release assembly, unscrew two of the rear panel screws as shown in Figure 4-25. Do not reuse these screws.

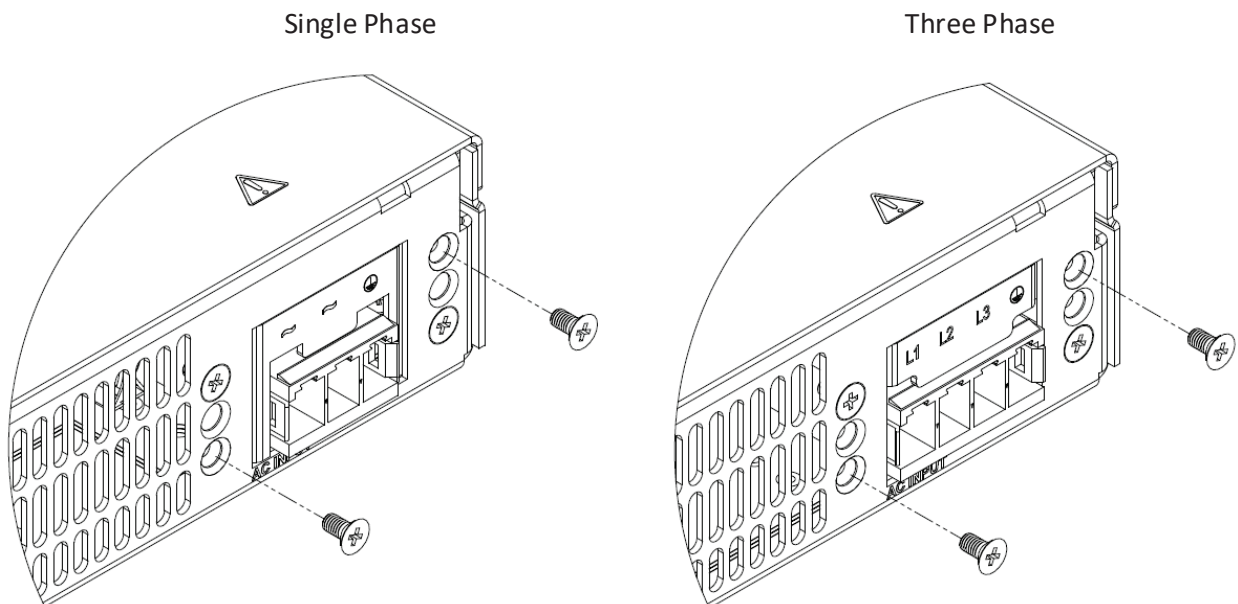


Figure 4-25: Unscrew the Rear Panel Screws

9. Fix the strain relief assembly, by two M3x8 Flat head screws, supplied in the accessories box, as shown in Figure 4-26. Tightening torque: 4.7-5.7 Lbf-inch. (0.53-0.64Nm). Remember to connect AC input connector into power supply AC input plug.

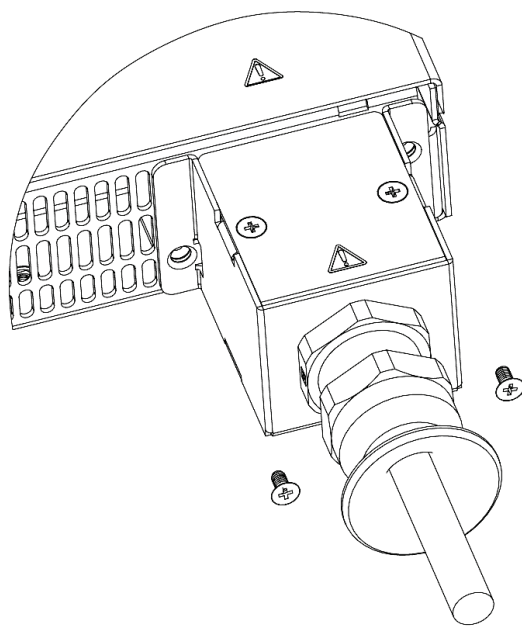


Figure 4-26: Strain Relief Assembled to Power Supply Rear Panel

10. Close (by manual force) the cable gland conic entry part until the AC cable is tightened. Beware not to apply excessive force.

4.8.4 AC Input Wire Connection for 7.5kW

1. Strip the outside insulation of the AC cable approx. 5cm. 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 4-27.
3. Tighten the plastic nut (supplied in the accessories box), from the inside part of the bracket by using manual force only.

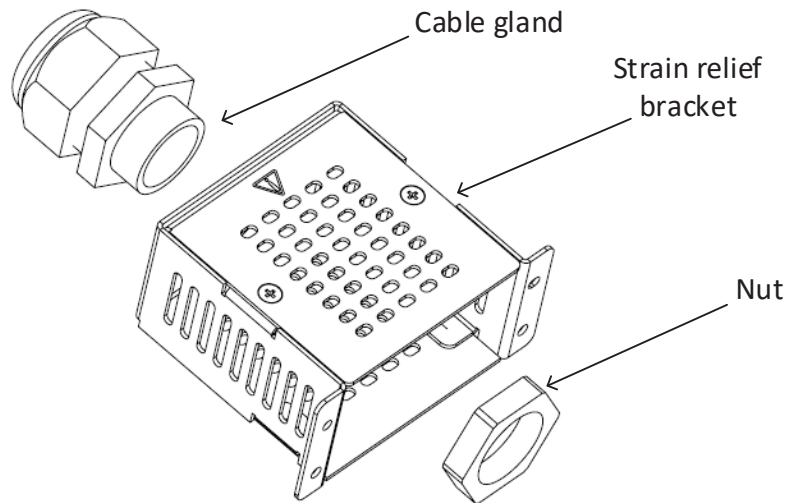


Figure 4-27: Insertion of the Plastic Nut into Strain Relief Bracket

4. Unscrew the conical cable entry part, until it is possible to insert the AC cable.
5. Insert the AC cable through the cable gland entry and the strain relief bracket as shown in Figure 4-28.

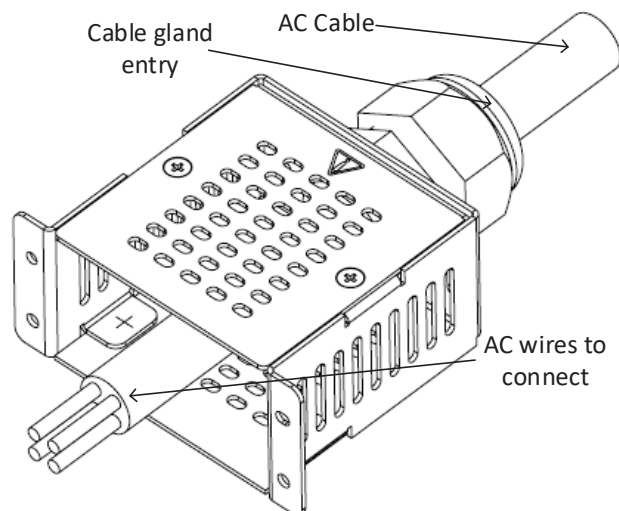


Figure 4-28: Stripped Wires Inserted Through

6. Insert the AC wires into the AC input connector as shown in Figure 4-29.
7. Tighten the screws, tightening torque: 4.5-5.3 Lbf-inch. (0.5-0.6Nm).

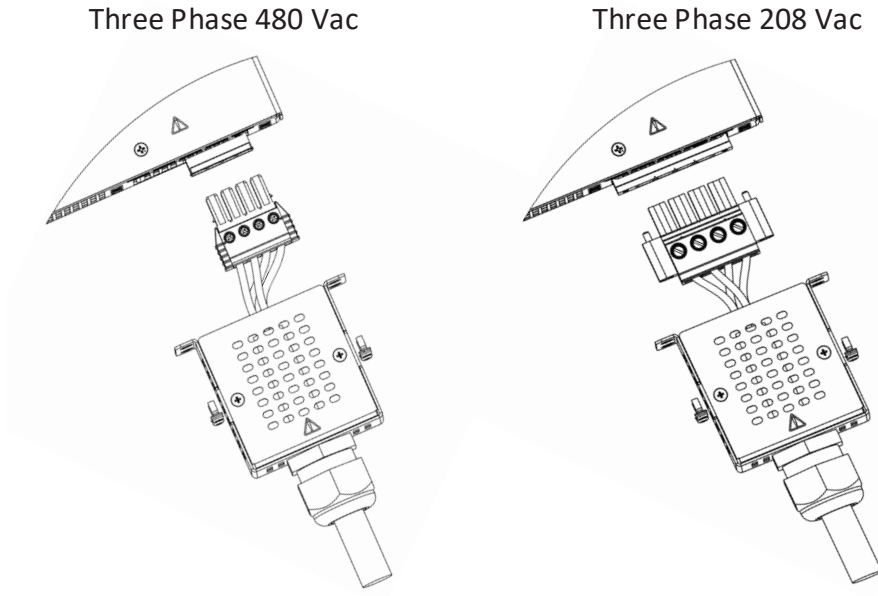


Figure 4-29: AC Wires Fixed to the AC Connector

8. Fix the strain relief assembly, by two M3x8 Sems screws, supplied in the accessories box, as shown in Figure 4-30. Tightening torque: 4.7-5.7 Lbf-inch. (0.53-0.64Nm). Remember to connect AC input connector into power supply AC input plug.

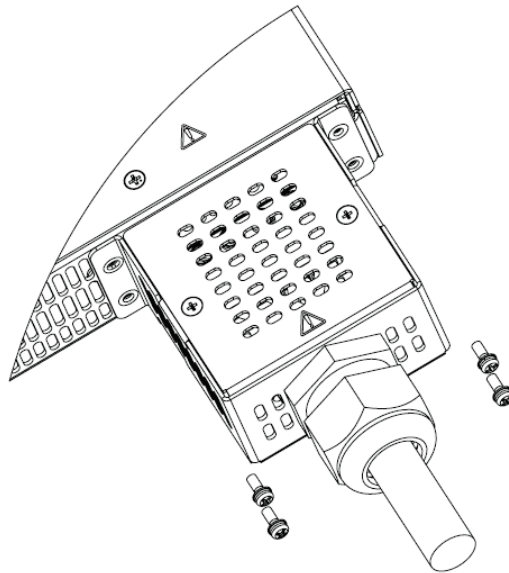


Figure 4-30: Strain Relief Assembled to Power Supply Rear Panel

9. Close (by manual force) the cable gland conic entry part until the AC cable is tightened. Beware not to apply excessive force.

4.8.5 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. For 3-Phase 208, refer to Figure 4-31. For 3-Phase 400/480, refer to Figure 4-32.
3. Tighten the plastic nut (supplied in the accessories box), from the inside part of the bracket by using manual force only.

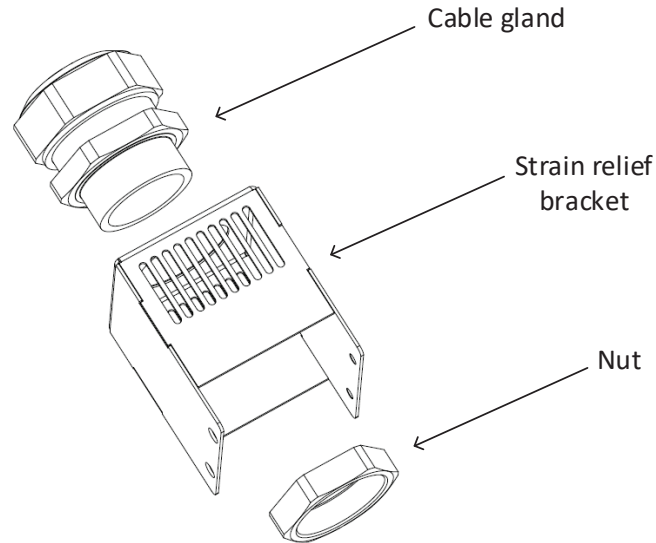


Figure 4-31: Insertion of the Plastic Nut into 3-Phase 200 Strain Relief Bracket

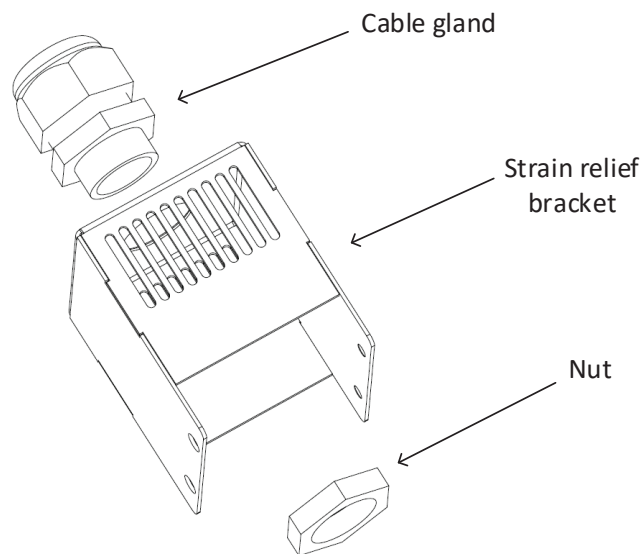


Figure 4-32: Insertion of the Plastic Nut into 3-Phase 400/480 Strain Relief Bracket

4. Unscrew the conical cable entry part, until it is possible to insert the AC cable.
5. Insert the AC cable through the conic cable gland entry and the strain relief bracket. For 3-Phase 208, refer to Figure 4-33. For 3-Phase 400/480, refer to Figure 4-34.

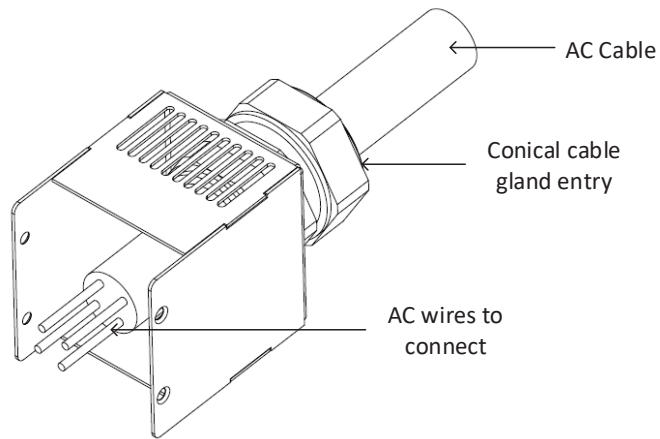


Figure 4-33: Stripped Wires Inserted Through 3-Phase 208 Strain Relief Bracket

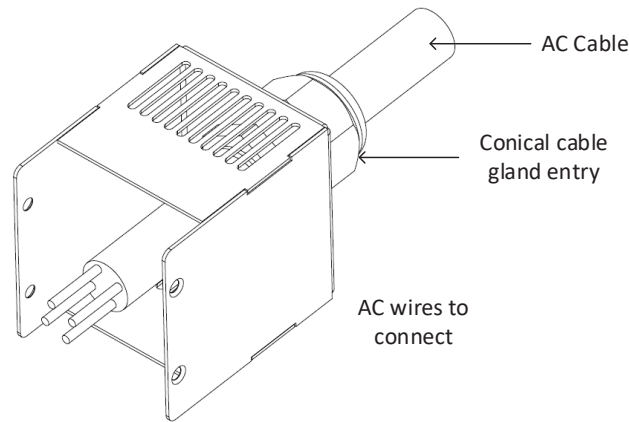


Figure 4-34: Stripped Wires Inserted Through 3-Phase 400/480 Strain Relief Bracket

6. Insert the AC wires into the AC input connector. For 3-Phase 208, refer to Figure 4-35. For 3-Phase 400/480, refer to Figure 4-36 (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).

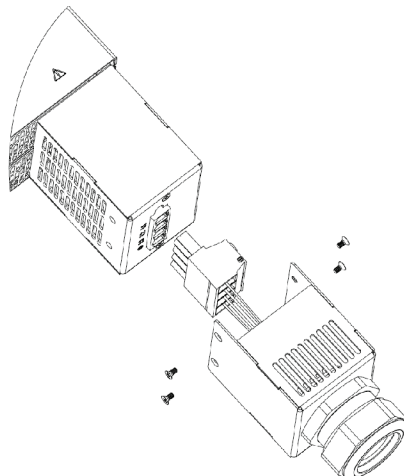


Figure 4-35: AC Wires Fixed to the 3-Phase 208 AC Connector

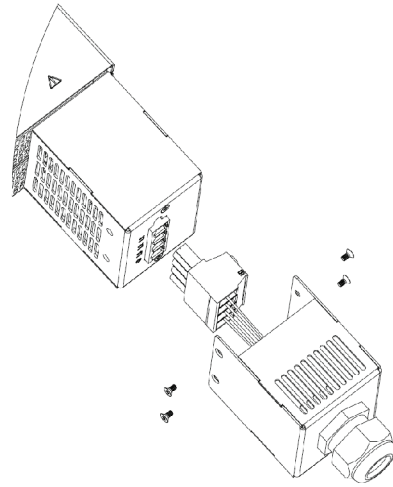


Figure 4-36: AC Wires Fixed to the 3-Phase 400/480 AC Connector

8. Fix the strain relief assembly, by 4 M3x8 Flat head screws, supplied in the accessories box, For 3-Phase 208, refer to Figure 4-37. For 3-Phase 400/480, refer to Figure 4-38 (10kW is shown, it applies to 15kW as well). Use short screwdriver, Z-shaped Phillips screwdriver or Phillips bit ratchet as shown in Figure 4-39 (dimensions are in mm). Remember to connect AC input connector into power supply AC input plug.

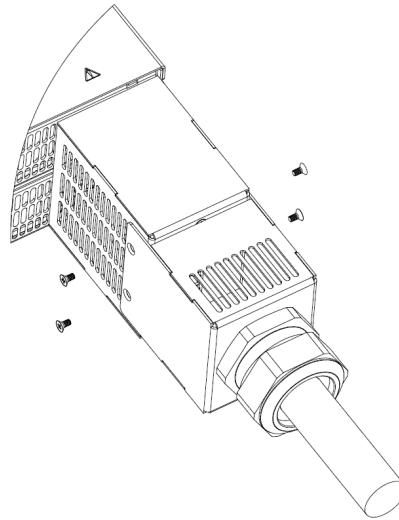


Figure 4-37: Strain Relief Assembled to 3-Phase 208 Power Supply Rear Panel

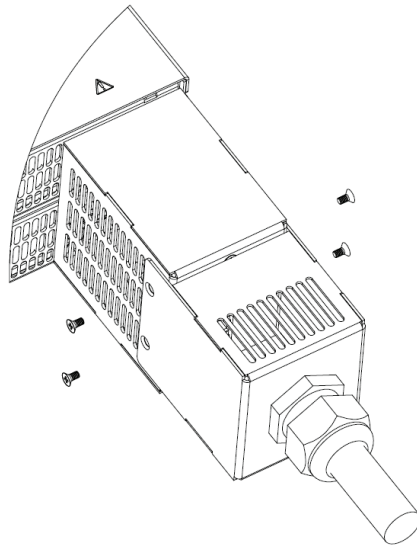


Figure 4-38: Strain Relief Assembled to 3-Phase 400/480 Power Supply Rear Panel

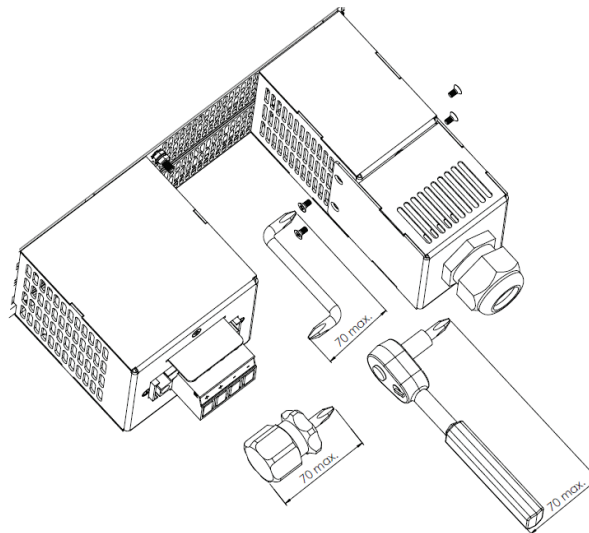


Figure 4-39: Strain Relief Assembly Maximum Tools Length

9. Close (by manual force) the cable gland conic entry part until the AC cable is tightened. Beware not to apply excessive force.

4.9 Turn-On Check 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.

4.9.1 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.

4.9.2 Prior to Operation

1. Power On/Off switch at Off position.
2. Ensure that the protection of output terminals is mounted and properly assembled.
3. Connect the unit to an AC mains as described in Section 4.8.
4. Connect a DVM with appropriate cables for the rated voltage to the output terminals.
5. Turn the front panel Power switch to On.
6. Ensure that the power supply is configured to the default setting (refer to User Manual IA761-04-02_, Parameter Setting Memory section).
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).

4.9.3 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.

4.9.4 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:

```
INST:NSEL 6
```

```
OUTP 1
```

* Remember to use Carriage Return character (ASCII 13, 0x0D) after each command.

3. 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.
* XX – Programmed voltage value.
4. 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.
5. Turn off the front panel Power switch.

4.9.5 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.

4.9.6 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:

```
INST:NSEL 6
```

```
OUTP 1
```

* Remember to use Carriage Return character (ASCII 13, 0x0D) after each command.

8. 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:CURRE? command to read power supply output current.
* YY – Programmed current value.
9. Compare the DVM reading with the readback current to verify the accuracy of the digital readback.
10. Turn off the front panel Power switch.
11. Remove the shunt from the power supply output terminals.

4.10 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.

4.10.1 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 4.10.2)
- 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 4.10.2)
- Noise and impedance effects of the load wiring (refer to Section 4.10.5).

4.10.2 Current Carrying Capacity

Two factors must be considered when selecting the wire size:

- Wires should have enough current carrying capacity to prevent 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 1V 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 half width models) and to Table 4-3 (for full width models) for the recommended wires types to limit voltage drop in American and European dimensions respectively.

For Half Width Models

Output current	Recommended wires (mm ²)	Recommended wires (AWG)	Recommended Connector
0A - 10A	2	14AWG	Phoenix contact GIC-2.5/4-ST-7,62. (Supplied in Accessories kit)
10A - 20A	4	10 AWG	
20A - 40A	6	8 AWG	
40A - 80A	16	4 AWG	
80A - 160A	16	4 AWG	Connect two 4 AWG cables in parallel per terminal

Table 4-2: Recommended Cable Size for Output Connection

For Full Width Models

Output current	Recommended wires (mm ²)	Recommended wires (AWG)	Recommended lugs/Connector
0A - 10A	1	16 AWG	For 1kW - 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	For 1kW - 1.7kW: 4 For 1.7kW 150V: 2.5 For 2.7kW – 7.5kW: 2.5	For 1kW - 1.7kW: 10 AWG For 1.7kW 150V: 12 AWG For 2.7kW – 7.5kW: 12 AWG	For 1.7kW – 150V: Phoenix contact IPC 5/ 4-STF-7,62. For 2.7kW - 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 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 10kW - 15kW: Phoenix contact IPC 16/ 4-STF-10,16 (Supplied in Accessories kit) * For higher current, connect two "6" AWG cables in parallel per terminal
60A - 80A	16	4 AWG	* For 2.7kW 40V refer to "0" AWG, 50mm ²
80A - 100A	25	2 AWG	* For 2.7kW 30V refer to "0" AWG, 50mm ² ** For 3.4kW 40V refer to "0" AWG, 50mm ²
100A - 160A	50	"0" AWG	
160A - 190A	70	3/0 = 000	
190A - 260A	95	4/0 = 0000	
260A - 500A	95 X 2 In Parallel	4/0 = 0000 (2 In Parallel)	
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	
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	

Table 4-3: Recommended Cable Size for Output Connection

WARNING

Pay attention to selected cables voltage. Selected cable should meet the required voltage insulation according to power supply output voltage.

4.10.3 Bus bar Cover Limitation

WARNING

The output bus bars are capable of providing hazardous energy and hazardous voltages may exist at the outputs. To protect personnel against accidental contact with the hazardous voltages or/and hazardous energy, ensure that both plastic protectors are installed in the output protection assembly in any case of operation, except if separately permitted in other sections in this manual.

Bus bar cover has a limited hole diameter. Choose load wires with insulation to fit into output protection cover. Refer to Table 4-3 for the recommended cable. Wires insulation should fit into the specifications in Figure 4-40, Figure 4-41 and Figure 4-42.

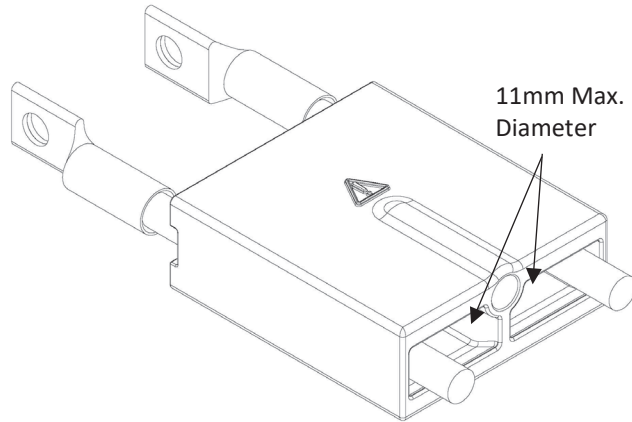


Figure 4-40: Bus Bar Cover Wire Diameter Limitation (Half Width Models)

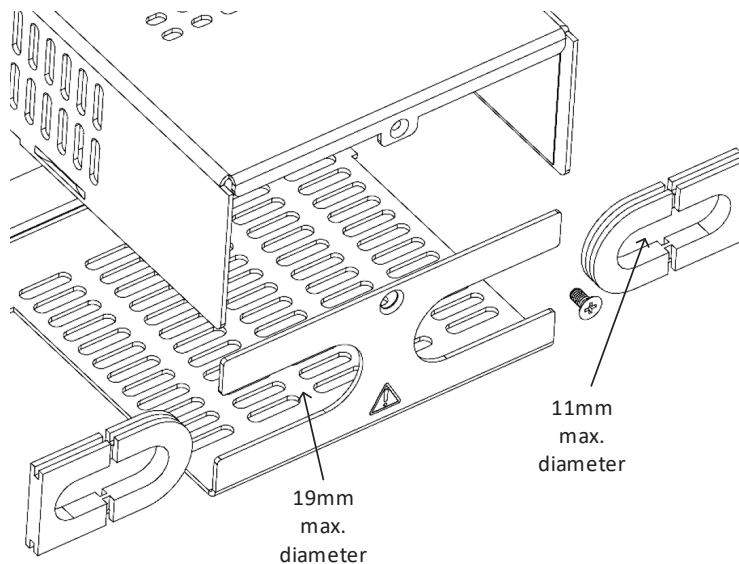


Figure 4-41: Bus bar Cover Wire Diameter Limitation (Full Width Models 1-5kW)

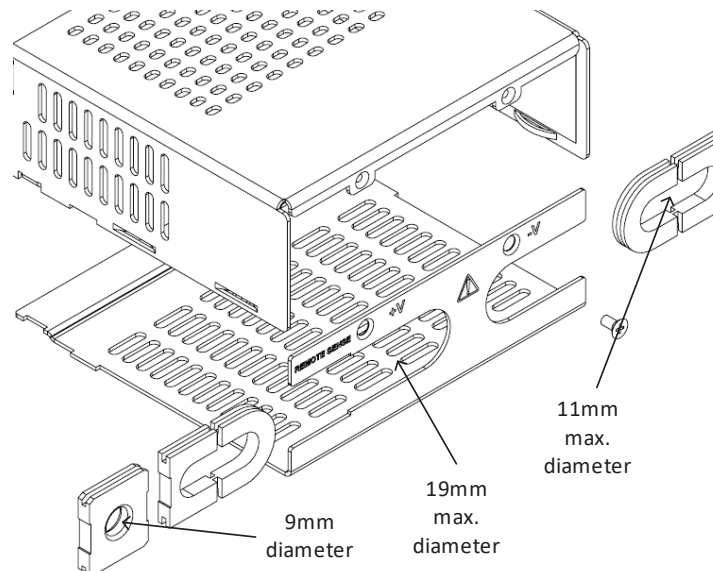


Figure 4-42: Bus bar Cover Wire Diameter Limitation (7.5kW)

4.10.4 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.

4.10.5 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.

4.10.6 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.

4.10.7 GSP 10kW and 15kW Packing Box Unpack

GSP (10kW / 15kW) series power supply considered as heavy unit. Follow unpack instructions carefully to avoid injury and/or GSP unit damage.

1. Open the packing box.
2. Gently remove the accessories box, front foam panel, rear foam panel and thin foam cover as shown in Figure 4-43.

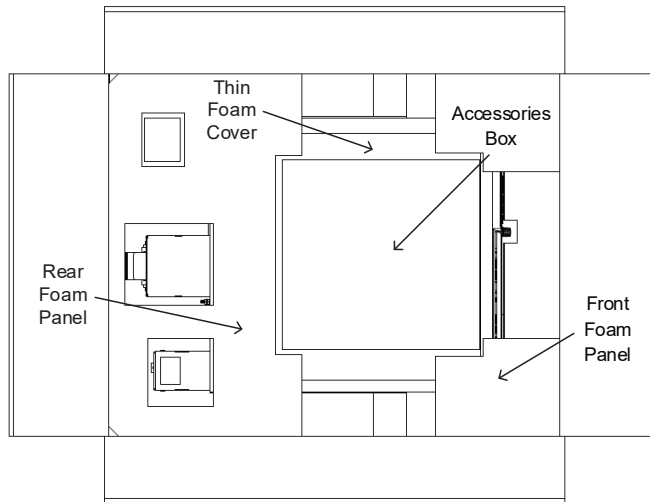


Figure 4-43: GSP Unpack – Accessories Box, Foam Panels and Foam Cover

3. Insert your hands into the side recesses (Lift Slots) and lift the power supply parallel to ground surface as shown in Figure 4-44. Do not tilt the power supply against foam panels to avoid damage. Keep it parallel to ground until it is totally free out of foam panels.

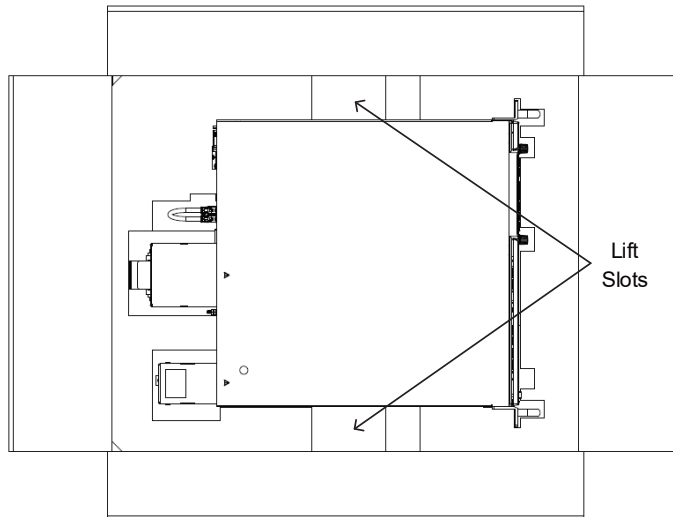


Figure 4-44: GSP Unpack – Power Supply Lift Out of the Box

4.10.8 Making the Load Connections

WARNING

Hazardous voltages exist at power outputs with output greater or equal to 60Vdc. 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.

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.

For All 1kW, 1.5kW, 1.7kW, 2.7kW, 3.4kW, 5kW, 7.5kW, 10kW and 15kW Models:

4. Prepare suitable wires and lugs according to the recommendations in Table 4-2 and Table 4-3.
5. 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).

For 1kW 10V and 1.5kW 10V Half Width Model:

3. Fix the wires to the Bus bars as shown in Figure 4-45.

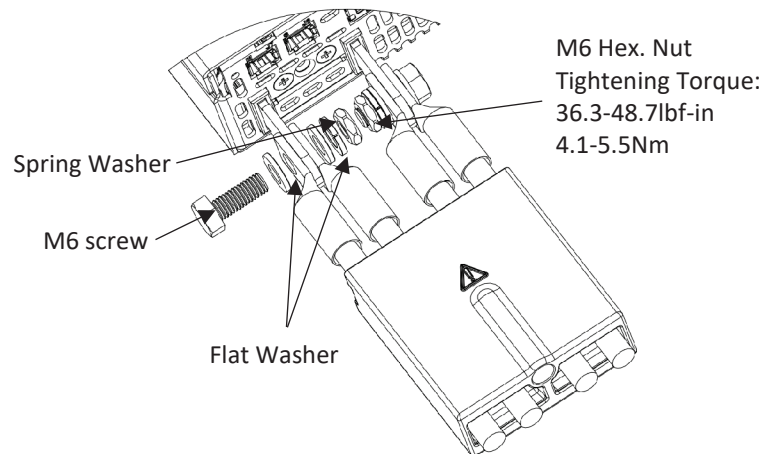


Figure 4-45: 10V Model Wires Assembly

For 1kW 20V - 100V and 1.5kW 20V – 100V Half Width Models:

3. Fix the wires to the Bus bars as shown in Figure 4-46.

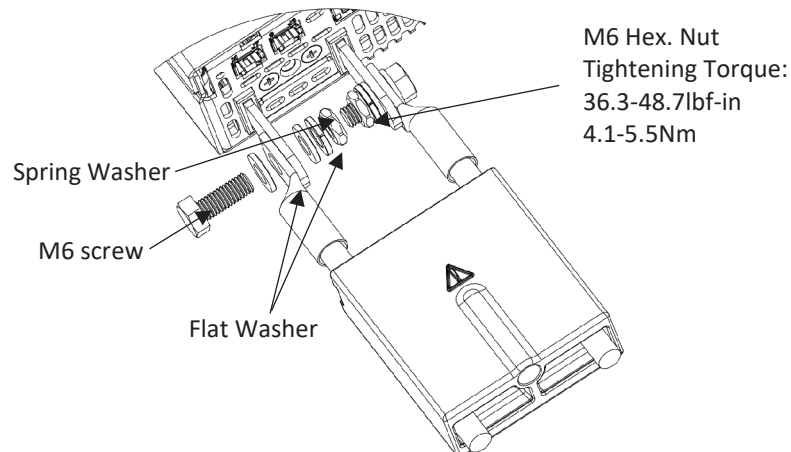


Figure 4-46: 20V-100V Wires Assembly

For 10V - 100V Half Width Models:

- 4. Fix the Bus bar cover to the rear panel of the power supply using M3X40 Sems screw from the accessories kit, as shown in Figure 4-47.

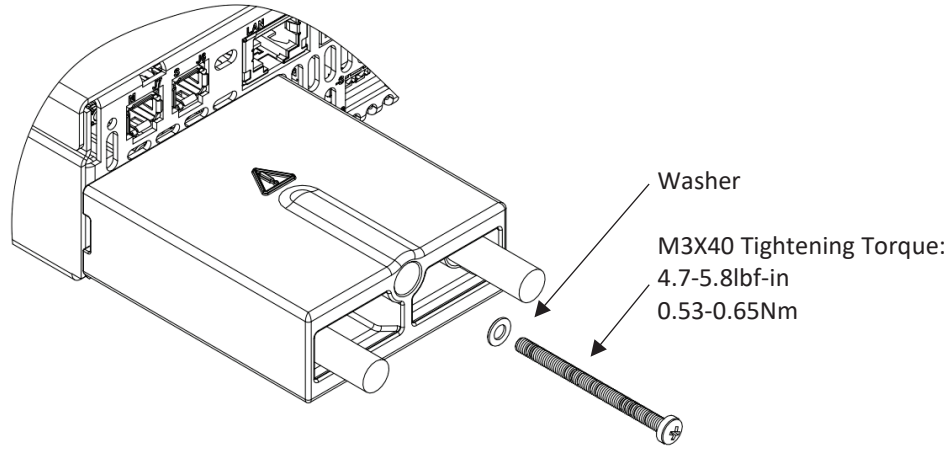


Figure 4-47: Fixing Bus Bars Cover to the Rear Panel

For 1kW Up to 5kW 10V - 100V Full Width Models:

- 6. Open the output protection assembly (supplied in the accessories kit) by unscrewing the screw in the rear side as shown in Figure 4-48. Remove both plastic protectors.

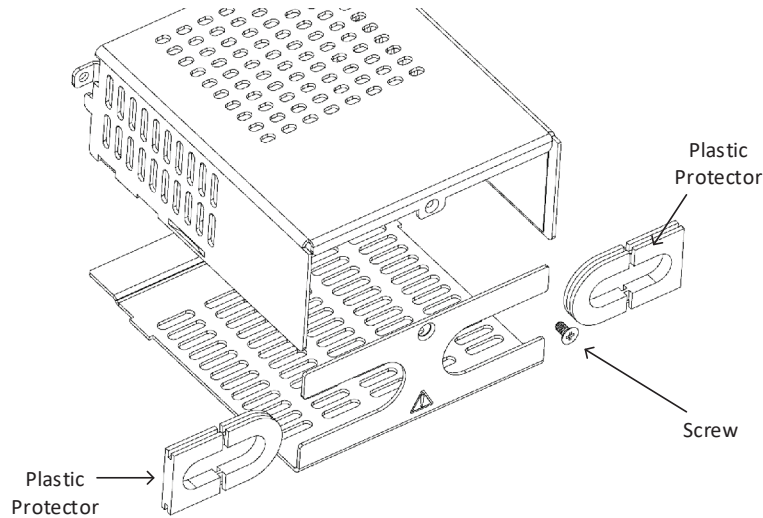


Figure 4-48: Disassembly of Output Protection (1kW Up to 5kW Full Width)

For 7.5kW Full Width Models:

3. Open the output protection assembly (supplied in the accessories kit) by unscrewing the screws in the rear side as shown in Figure 4-49. Remove both plastic protectors and sense protector.

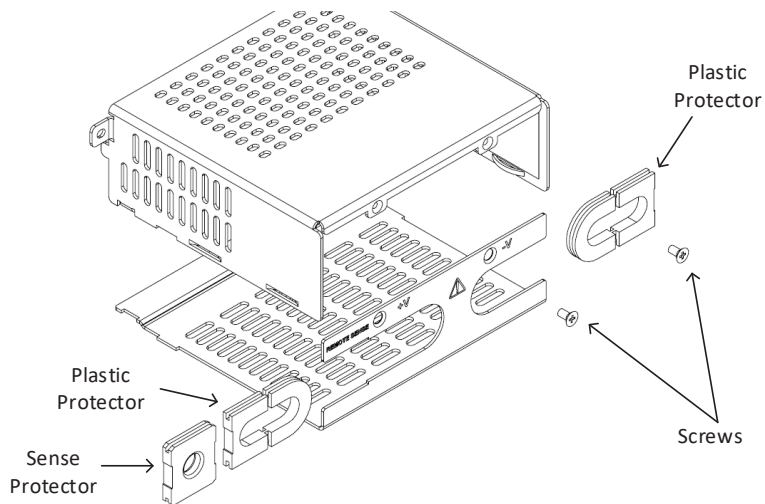


Figure 4-49: Disassembly of Output Protection (7.5kW)

For 5kW 10V and 3.4kW 10V Full Width Models Only:

4. Fix the wires to the Bus bars as shown in Figure 4-50. In this model, the plastic protectors will not be assembled.

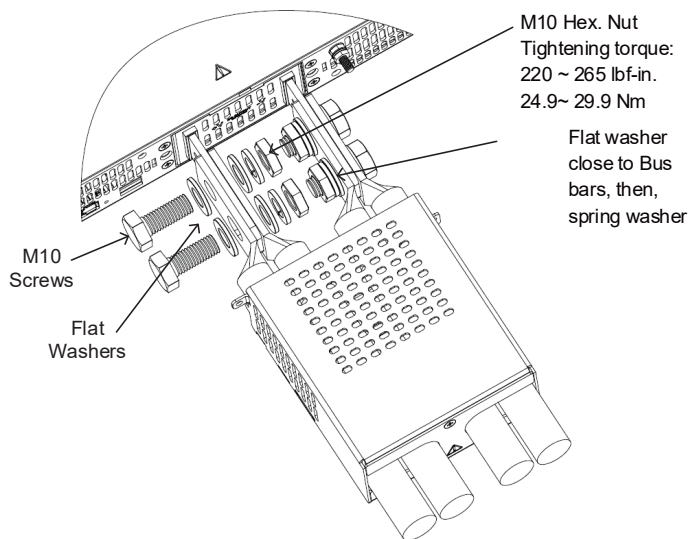


Figure 4-50: 10V 3.4kW and 5kW Wires Assembly

For 7.5kW 20V Model Only:

- 4. Fix the wires to the Bus bars as shown in Figure 4-51. In this model, the plastic protectors will not be assembled. Assemble only the sense protector.

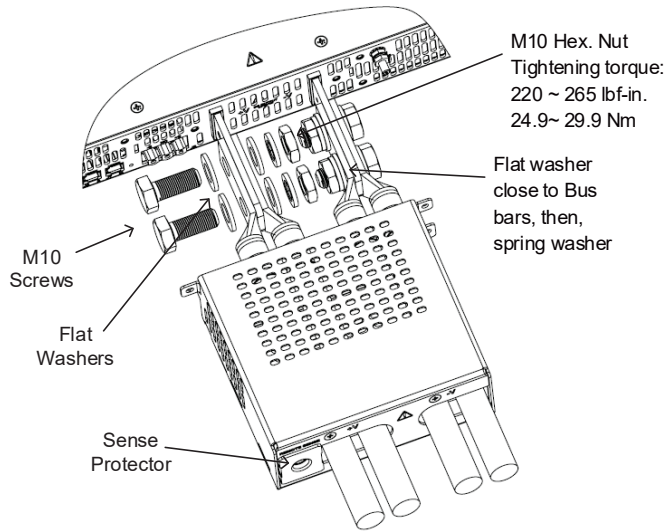


Figure 4-51: 10V 7.5kW Wires Assembly

For 1kW / 1.7kW 10V, 2.7kW 10V - 40V, 3.4kW 20V - 40V, 5kW 20V - 40V Full Width and 7.5kW 30 - 60V Models:

- 4. Remove & separate each plastic protector into two parts by cutting the plastic bridge between both parts, as shown in Figure 4-52.
- 5. Insert back to the protection assembly only the specified part, as shown in Figure 4-52.

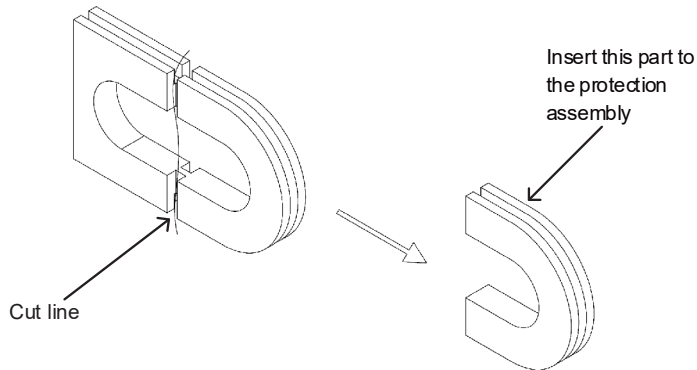


Figure 4-52: Plastic Protectors Separation

- Fix the wires to the bus bars as shown in Figure 4-53. Close the output protection assembly with one part of the plastic protector assembled on each side, as shown in Figure 4-53. For 7.5kW assemble sense protector as well, refer to Figure 4-54 for 7.5kW output protection assembly.

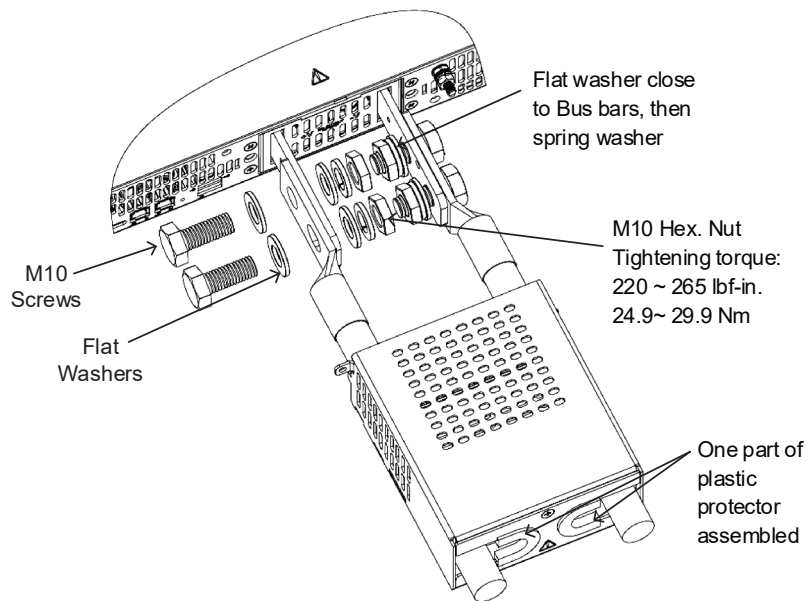


Figure 4-53: Wires Assembly

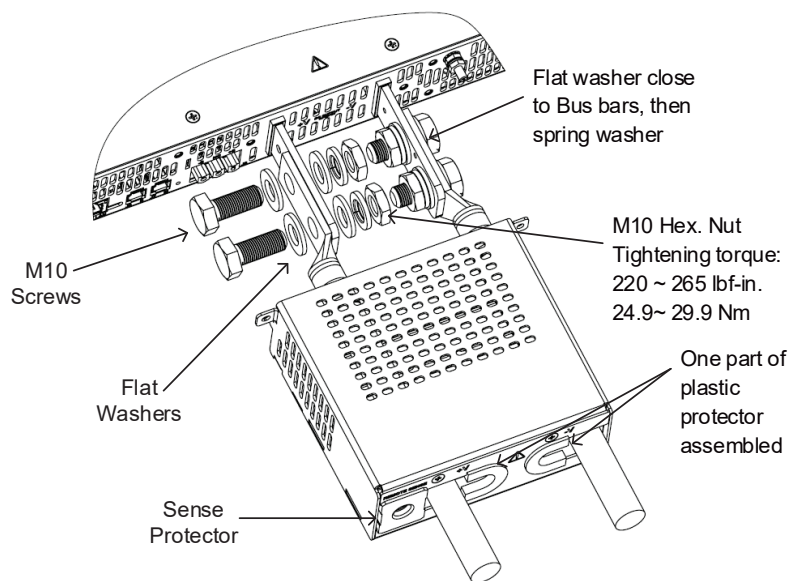


Figure 4-54: 7.5kW Wires Assembly

For 1kW / 1.7kW 20V - 100V, 2.7kW 60V - 100V, 3.4kW 60V - 100V, 5kW 50V - 100V Full Width and 7.5kW 80 - 1500V Models:

- The recommended wires according to Table 4-2 and Table 4-3 can be inserted through the output protection assembly. No need to open the output protection assembly, refer to Figure 4-55. For 7.5kW assemble sense protector as well, refer to Figure 4-56 for 7.5kW output protection assembly.

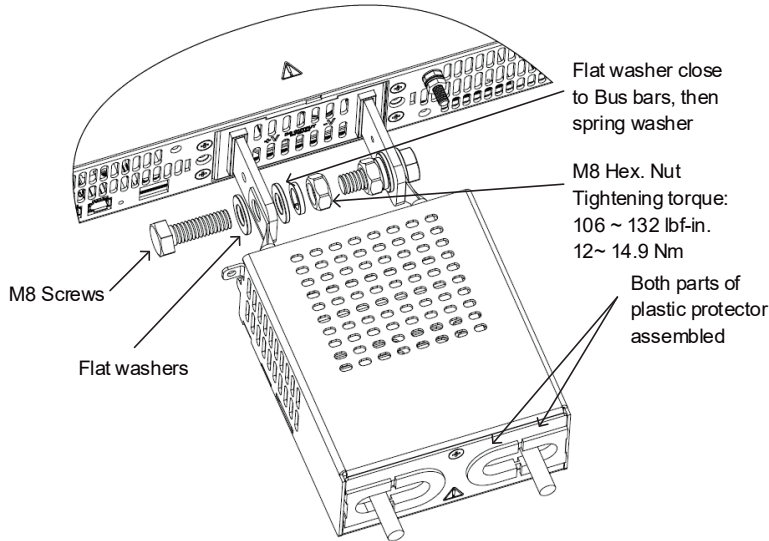


Figure 4-55: Wires Assembly

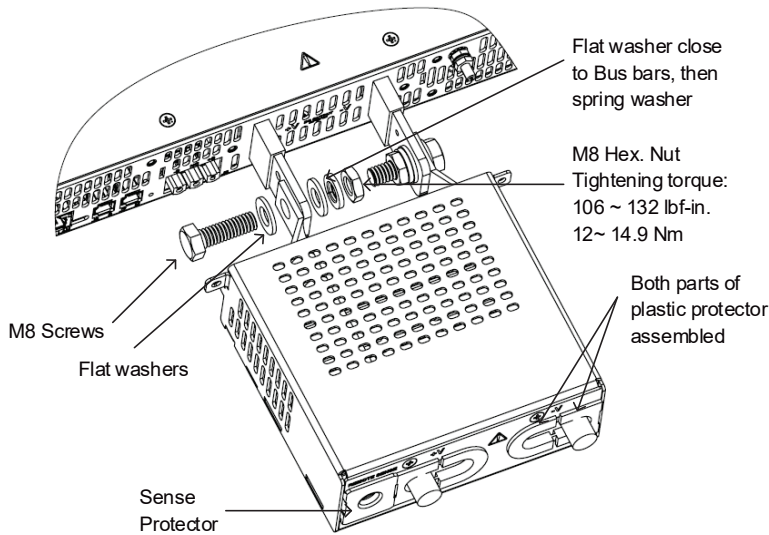


Figure 4-56: 7.5kW Wires Assembly

For 7.5kW Remote Sense Plug Assembly:

If remote sensing connection is to be used, remember to assemble remote sense plug prior bus bars protection assembly to the rear panel of the power supply.

Insert the stripped wires into remote sense plug terminals (with or without ferrules) and tighten the terminal screws securely (see Figure 4-57). Tightening torque: 4.4-5.3 Lbf-inch. (0.5-0.6Nm).

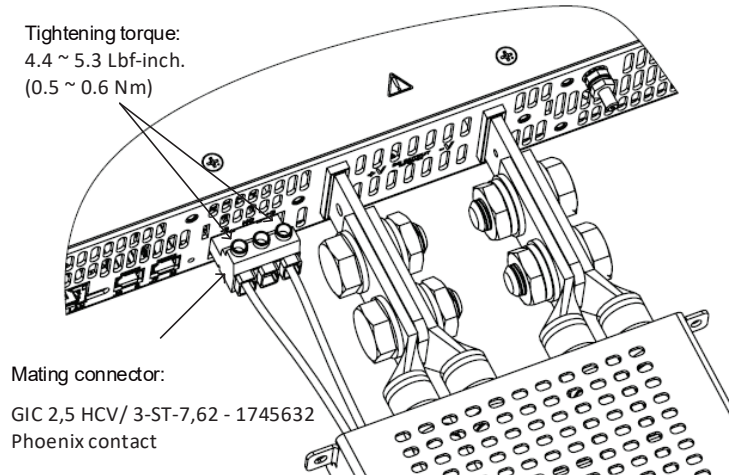


Figure 4-57: 7.5kW Remote Sense Plug Assembly

NOTE

7.5kW, 20V model is shown. Remote sense plug assembly applies to 7.5kW series, all models.

For 1kW - 5kW 10V - 100V Full Width Models:

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 4-58.

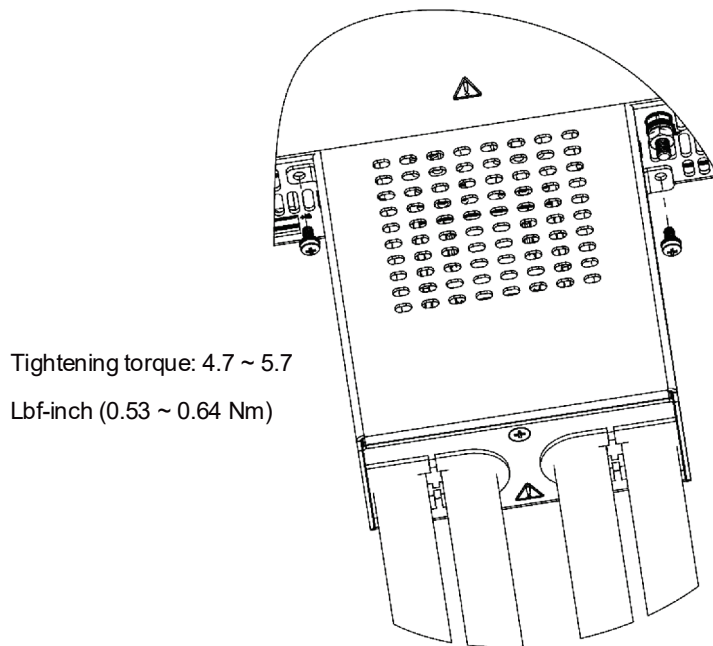


Figure 4-58: Fixing Bus Bars Protection Assembly to the Rear Panel

For 7.5kW Models:

Assemble the Bus bars protection assembly to the rear panel of the power supply, by using three M3X6 Sems screws from the accessories kit, as shown in Figure 4-59.

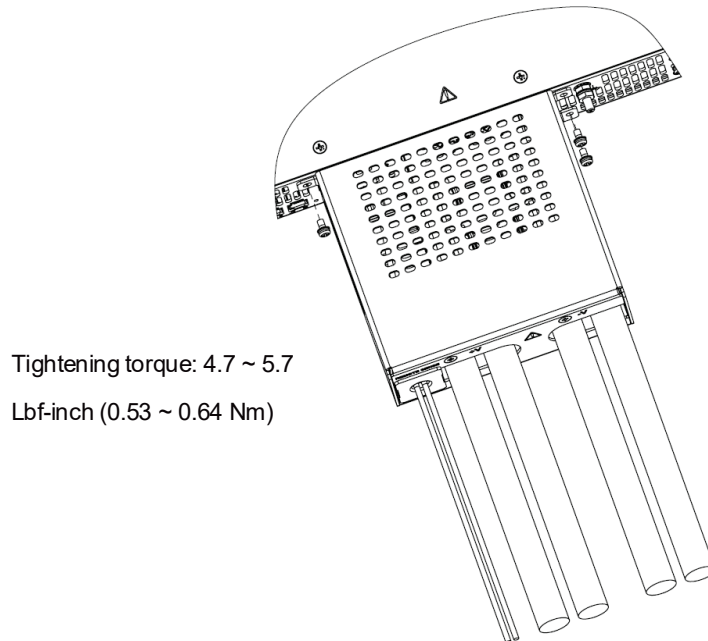


Figure 4-59: Fixing Bus Bars Protection Assembly to the Rear Panel

NOTE

Remember to pull remote sense wires through bus bars protection assembly.

For 10kW and 15kW 10V - 40V Full Width Models:

NOTE

All bus bars must be tightened by screw and nut, even if load wire (lug) is not connected.

1. Open the output protection assembly by unscrewing bus bar cover and rear cover screws as shown in Figure 4-60 (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 4-60 (15kW is shown, it applies to 10kW as well).

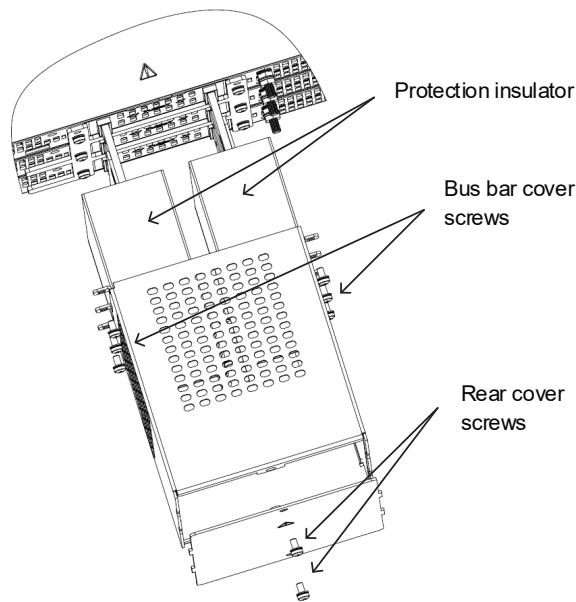


Figure 4-60: Disassembly of Output Protection

WARNING

The output bus bars are capable of providing hazardous energy, when using a power supply with output voltage rated from 10VDC up to 40VDC. To protect personnel against accidental contact with the hazardous energy, ensure that the rear cover is installed on the output protection assembly in any case of operation, except if separately permitted in other sections in this manual.

For 10kW and 15kW 10V Model Only:

NOTE

All bus bars must be tightened by screw and nut, even if load wire (lug) is not connected.

3. Fix the wires to the Bus bars as shown in Figure 4-61 (15kW is shown, it applies to 10kW as well).

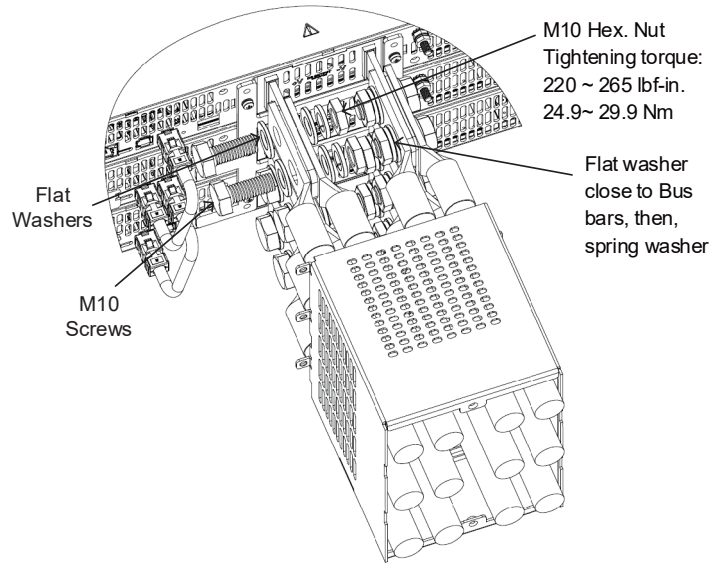


Figure 4-61: Assembly of 10V Wires

For 10kW and 15kW 20V - 40V models:

NOTE

All bus bars must be tightened by screw and nut, even if load wire (lug) is not connected.

3. Fix the wires to the Bus bars as shown in Figure 4-62 (15kW is shown, it applies to 10kW as well).

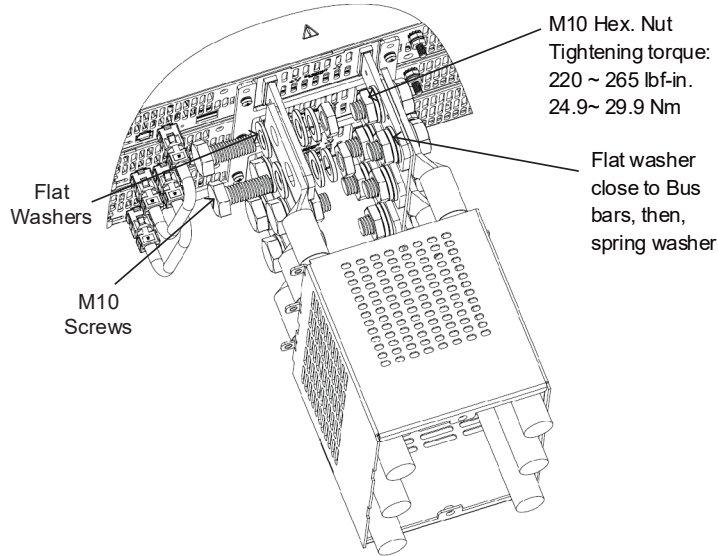


Figure 4-62: Assembly of 20V - 40V Wires

- 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 4-63 (15kW, 10V model is shown, it applies to 10kW-15kW, 10V-40V models as well).

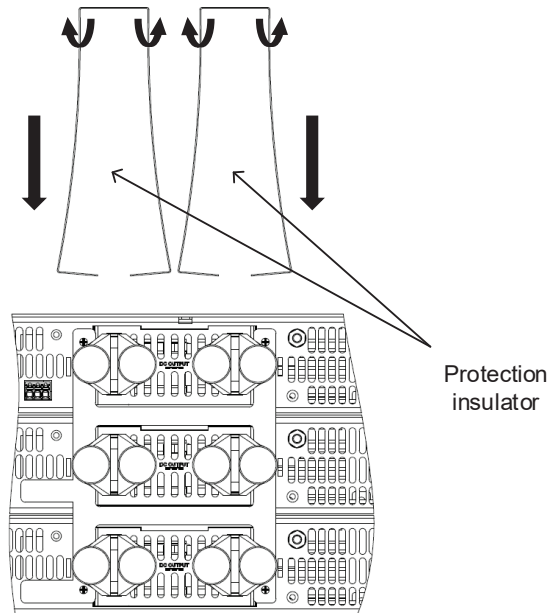


Figure 4-63: Assembly of 10V-40V Wires Protection Insulator

For 10kW and 15kW 10V Model Only:

- Assemble the bus bars protection assembly to the rear panel of the power supply, by using 6 M3x8 Sems screws, as shown in Figure 4-64 (15kW is shown, it applies to 10kW as well. For 10kW, there are 4 screws only).

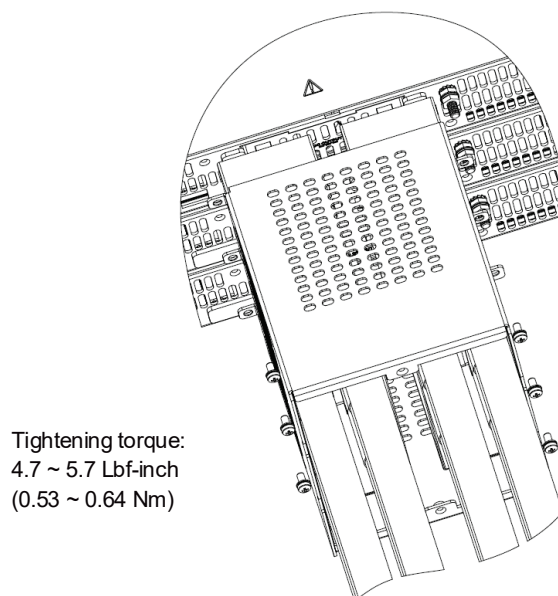
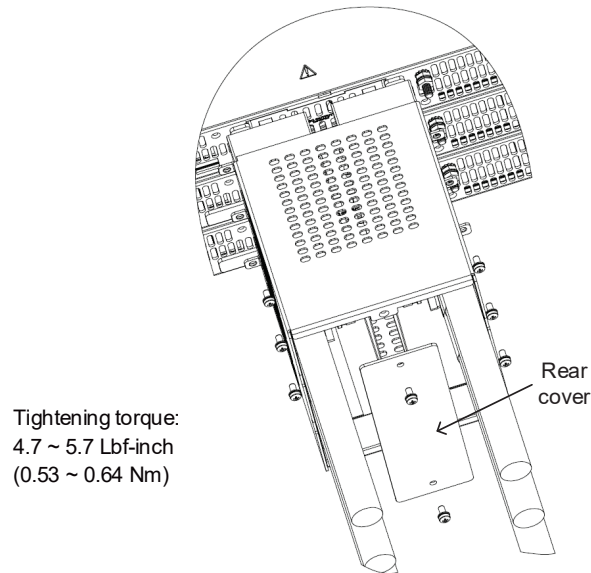


Figure 4-64: Assembly of 10V Wires Protection Cover

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 M3x8 Sems screws, as shown in Figure 4-65 (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 4-65 (15kW is shown, it applies to 10kW as well. For 10kW, there are 4 Bus bar protection cover screws only).

**Figure 4-65: Assembly of 20V - 40V Wires Protection Cover**

For 10kW and 15kW 50V - 100 Models:

1. Open the output protection assembly by unscrewing bus bar cover and rear cover screws as shown in Figure 4-66 (15kW is shown, it applies to 10kW as well. For 10kW, there are 4 Bus bar protection cover screws only).

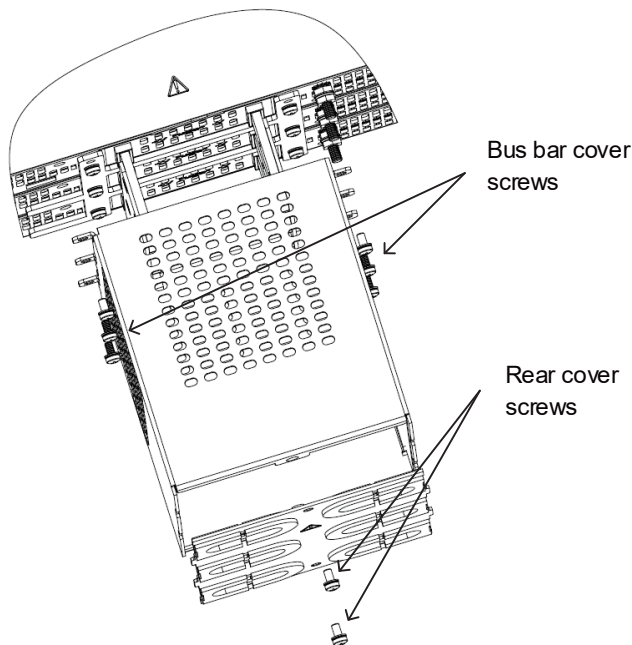


Figure 4-66: Disassembly of Output Protection

2. Fix the wires to the Bus bars as shown in Figure 4-67 (15kW is shown, it applies to 10kW as well).

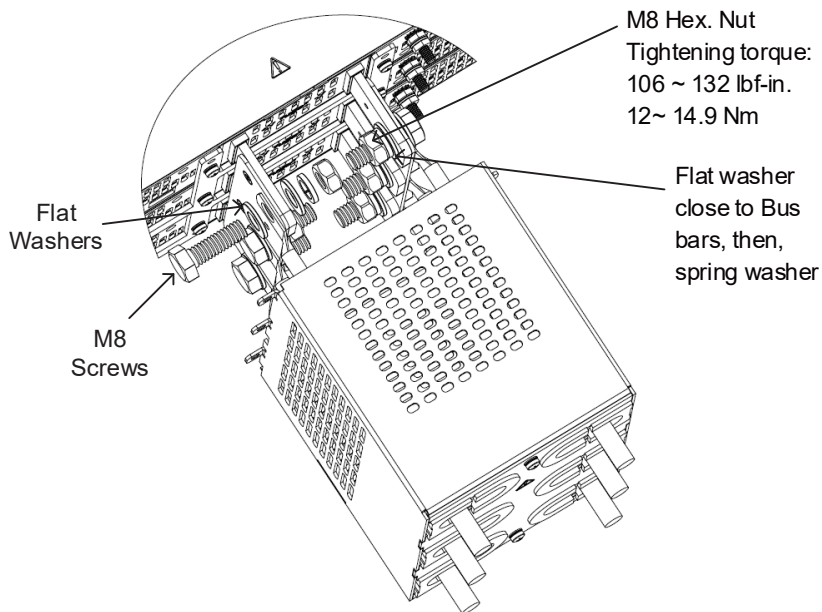


Figure 4-67: Assembly of 50V - 100V Wires

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 4-68 (15kW is shown, it applies to 10kW as well. For 10kW, there are 4 screws only).

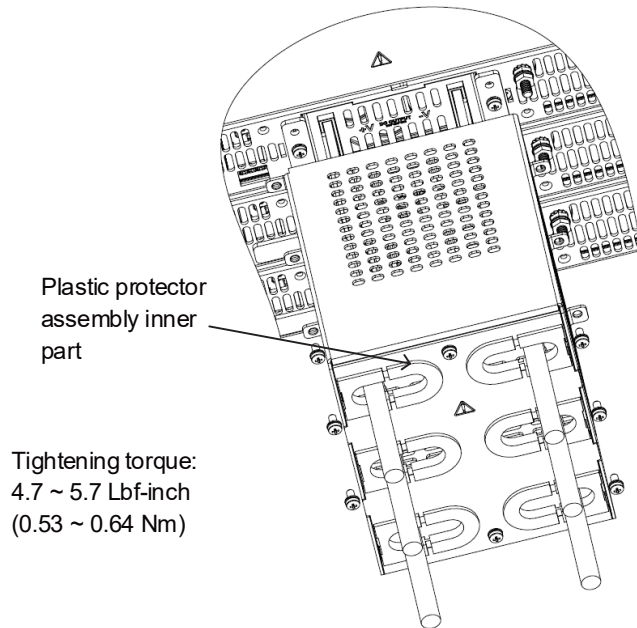


Figure 4-68: Assembly of 50V - 100V Wires Protection Cover

NOTE

In case thicker wires are required, separate the plastic protector assembly and install only the inner part, refer to Figure 4-68 and Figure 4-52.

For 1kW - 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 without output plug protection assembled. Ensure that the protection of output plug is mounted and properly assembled.

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.

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

The connector requirements are as follows:

For half width models:

- Connector type: GIC 2.5/ 4-G-7,62 (Phoenix Contact).
- Plug type: GIC 2.5/ 4-ST-7,62 (Phoenix Contact).
- Wires: AWG12 to AWG24, according to Table 4-2 and Table 4-3.

For full width models:

- 1kW - 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 1kW - 5kW: AWG8 to AWG16, according to Table 4-2 and Table 4-3.
- Wires for 10kW - 15kW: AWG6 to AWG16, according to Table 4-3.

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

1. Refer to Table 4-2 and Table 4-3 for the recommended load wires. Strip approx. 10mm at the end of each wire.

For 1kW - 5kW, 150V - 600V Half Width Models:

2. Insert the stripped wires into the terminals and tighten the terminal screws securely (see Figure 4-69). Tightening torque: 4.4-5.3 Lbf-inch. (0.5-0.6Nm).

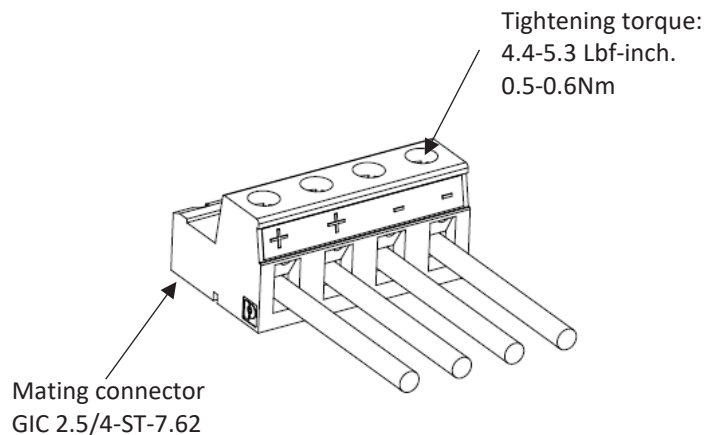


Figure 4-69: Four Wires Connection to The Output Plug

3. In case only two wires are connected to the load, insert the terminal plugs provided in the accessories kit to the vacant terminals as shown in Figure 4-70.

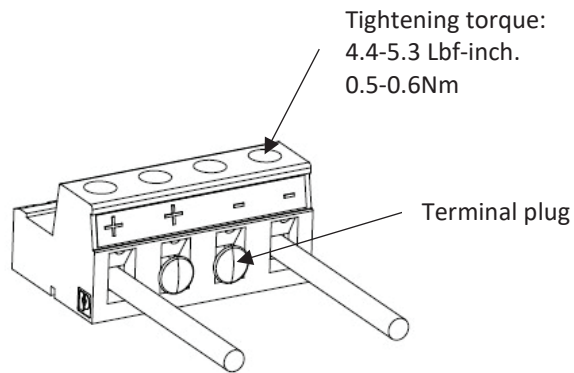


Figure 4-70: Two Wires Connection to The Output Plug

4. Fix the output connector to the output header as shown in Figure 4-71.

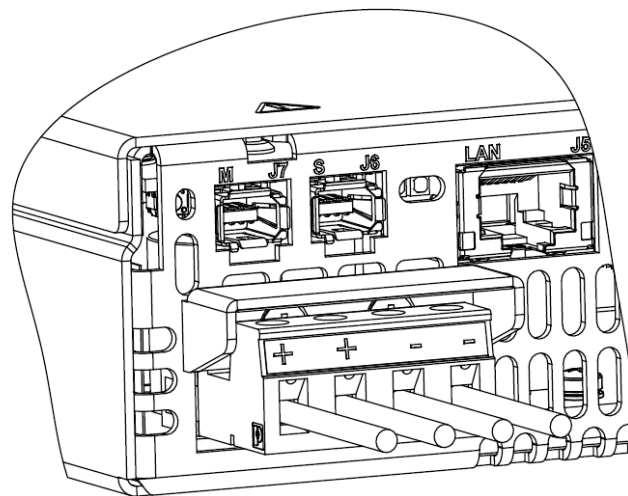


Figure 4-71: Output Plug Connection to P.S output

For 1kW - 5kW, 150V - 600V Full Width Models:

2. Loosen the mating connector terminal screws.
3. Insert the wires through the output protection assembly as shown in Figure 4-72.
4. Insert the stripped wires into the terminals and tighten the terminal screws securely (see Figure 4-72). Tightening torque: 6.2-7 Lbf-inch. (0.7-0.8Nm).
5. Tighten the mating connector to the power supply rear panel (see Figure 4-72). Tightening torque: 6.2-7 Lbf-inch. (0.7-0.8Nm).

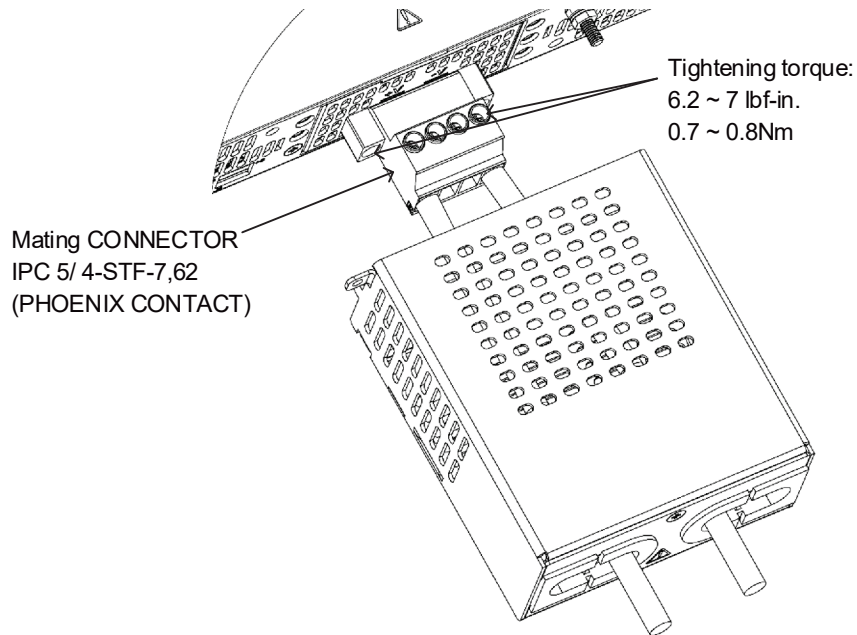


Figure 4-72: Load Wires Connection to The Output Plug

6. Fix the output protection assembly to the rear panel of the power supply and tighten the screws as shown in Figure 4-73. Tightening torque: 4.7 - 5.7 Lb.-inch (0.53 - 0.64 Nm).

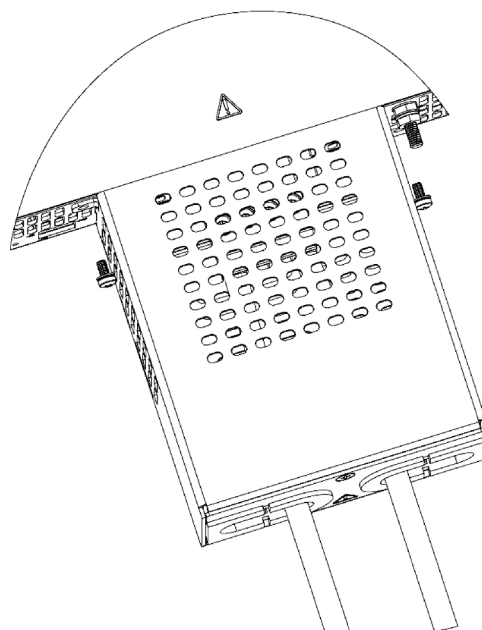
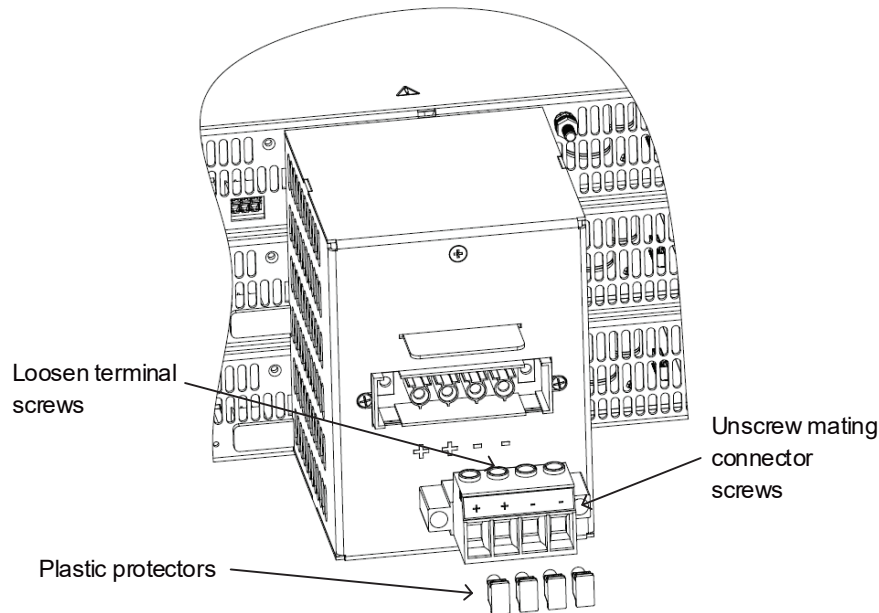


Figure 4-73: Output Connector Protection Assembly

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 4-74 (15kW is shown, it applies to 10kW as well).

**Figure 4-74: Output Connector Disassembly****WARNING**

The output connectors are capable of providing hazardous energy and hazardous voltages may exist at the outputs, when using a power supply with output voltage greater than 60VDC. To protect personnel against accidental contact with the hazardous voltages or/and hazardous energy, ensure that the plastic protectors are installed in the output plug terminals in any case of operation, except if separately permitted in other sections in this manual. For 10kW models only, in the case of a two-wire connection, one for each polarity, install the plastic protectors to the remaining two terminals.

3. Insert the stripped wires into the terminals and tighten the terminal screws securely (see Figure 4-75, 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 4-75, 15kW is shown, it applies to 10kW as well). Tightening torque: 15-15.9 Lbf-inch. (1.7-1.8Nm).

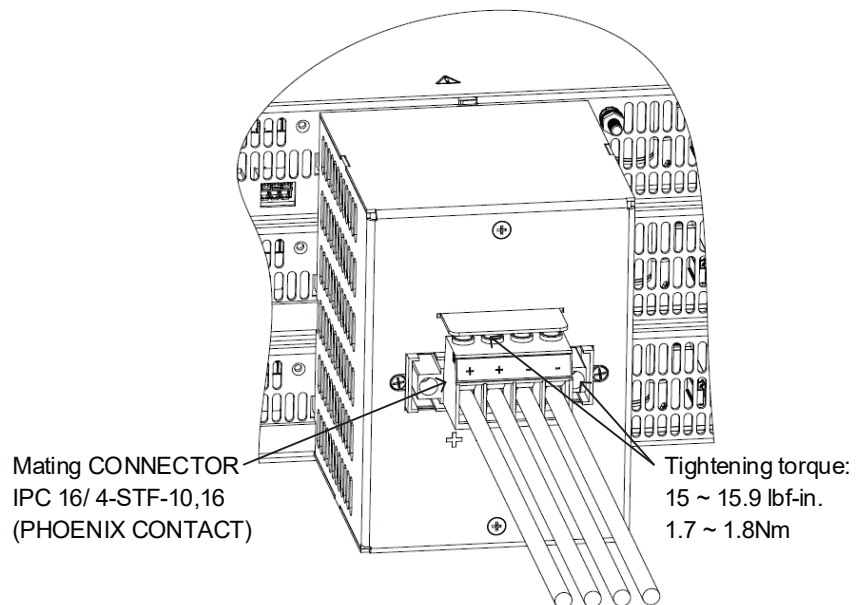


Figure 4-75: Load Wires Connection to the Output Plug

WARNING

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

4.10.9 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 (IA761-04-02_), Series Operation section.

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.

4.11 Local and Remote Sensing

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

4.11.1 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.

4.11.2 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 4-4 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.

4.11.3 Remote Sensing

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.)

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.

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

Table 4-4: 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. Set voltage sensing setting to remote sense via front panel or communication.
4. 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.

4.11.4 J8 Sense Connector Technical Information

For all models **except 7.5kW**:

- 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.

For **7.5kW** model:

- J8 Sense plug: GIC 2,5 HCV/ 3-ST-7,62 - 1745632, Phoenix contact.
- Wire AWG: 24 up to 12.
- Wire type: Solid, Flexible conductor or conductor with ferrule without plastic sleeve: up to 2.5mm².
- Conductor with ferrule with plastic sleeve: up to 2.5mm².

In order to connect the wires to the sense connector, strip up to 8mm of wire insulation. Insert the wire into the sense plug. Insert the sense plug unto the sense connector.

4.12 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 GH1kW Series Specifications

Unless otherwise noted, specifications are warranted over the ambient temperature range of 0° to 50° Celsius.

OUTPUT RATING		10-100	20-50	30-34	40-25	60-17	80-12.5	100-10	150-7	300-3.5	600-1.7
1. Rated output voltage (*1)	V	10	20	30	40	60	80	100	150	300	600
2. Rated output current (*2)	A	100	50	34	25	17	12.5	10	7	3.5	1.7
3. Rated output power	W	1000	1000	1020	1000	1020	1000	1000	1050	1050	1020

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	12.5/6.5										
3. Power Factor (Typ.)	---	0.99 @ 100Vac, 0.98 @ 200Vac, rated output power.										
4. Efficiency (Typ. at 100Vac/200Vac)(*17)	%	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	200	500	
4. Ripple r.m.s. 5Hz~1MHz (*8)	mV	6	6	6	7	7	10	20	20	50	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 0.01% 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	5
9. Up-prog. response time (*11)	mS	35	35	35	35	35	35	40	50	100	100	
10. Down-prog. response time (*12)	Full load	30	30	60	60	60	60	80	120	220	220	
	No load	500	700	900	1200	1500	1700	2000	2500	3300	3500	
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 1.5mS for 10V model, less than 1ms for models up to and including 100V. 2mS for models above 100V.										
12. Start-up delay	---	Less than 6Sec.										
13. Hold-up time	---	20mS Typical. Rated output power.										

CONSTANT CURRENT MODE		V	10	20	30	40	60	80	100	150	300	600
1. Max. Line regulation (*6)	---	0.02% of rated output current +2mA.										
2. Max. Load regulation (*9)	---	0.02% of rated output current +5mA.										
3. Ripple r.m.s. 5Hz~1MHz (*13)	mA	≤420	≤160	≤100	≤60	≤50	≤30	≤20	≤10	≤8	≤5	
4. 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.										
5. Temperature stability	---	0.01% of rated Iout over 8hrs. interval following 30 minutes warm-up. Constant line, load & temperature.										
6. 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% of rated Vout.										
6. Output current monitor (*14)	---	0~5V or 0~10V, user selectable. Accuracy: +/-0.5% of rated Iout.										

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 (*16) Interfaces)

	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	---	0.0025% 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									0.25% 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	0.011%	0.003%	0.004%	0.005%	0.007%	0.009%	0.011%	0.015%	0.004%	0.007%	

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 presettable. 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, 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 3.5Kg.
3.Dimensions (WxHxD)	mm	W: 214, H: 43.6, D: 432 (Without busbars and busbars cover), W: 214, H: 43.6, D: 493 (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	---	UL61010-1, CSA22.2 No.61010-1, IEC61010-1, EN61010-1.
1.1.Interface classification	---	Vouts50V Models: Output, J1, J2, J3, J4, J5, J6, J7, J8 (sense) and J9 (communication options) are Non Hazardous. 60sVouts600V Models: Output and J8 (sense) are Hazardous. J1, J2, J3, J4, J5, J6, J7 and J9 (communication options) are Non Hazardous.
1.2.Withstand voltage	---	Vouts50V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Input – Ground: 2835VDC 1min. 60V≤Vouts100V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Output & J8 (sense) – J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 850VDC 1min. Output & J8 (sense) – Ground: 1500VDC 1min. Input – Ground: 2835VDC 1min. 100V<Vouts600V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Output & J8 (sense) – J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 1275VDC 1min. Output & J8 (sense) – Ground: 2500VDC 1min. Input – Ground: 2835VDC 1min.
1.3.Isolation resistance	---	>100Mohm at 25°C, 70%RH, Output to Ground 500VDC.
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.

REVISION:

IA882-01-01B

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~300V models: Measured with JEITA RC-9131C (1:1) probe. For models above 200V: 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% of Rated Output Voltage at rated resistive load.
- *12: From 90% to 10% of Rated Output Voltage.
- *13: For 10V model, the ripple is measured at 20~100% of rated output voltage and rated output current. For other models, the ripple is measured at 10~100% of rated output voltage and rated output current. 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.
- *17: Ta=25°C, rated output power.

5.2 GH1.5kW Series Specifications

Unless otherwise noted, specifications are warranted over the ambient temperature range of 0° to 50° Celsius.

OUTPUT RATING		10-150	20-75	30-50	40-38	60-25	80-19	100-15	150-10	300-5	600-2.6
1. Rated output voltage (*1)	V	10	20	30	40	60	80	100	150	300	600
2. Rated output current (*2)	A	150	75	50	38	25	19	15	10	5	2.6
3. Rated output power at 100Vac≤Vins≤265Vac, Ta≤50	W	1500	1500	1500	1520	1500	1520	1500	1500	1500	1560

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	18.5/9										
3. Power Factor (Typ.)	---	0.99 @ 100Vac, 0.98 @ 200Vac, rated output power.										
4. Efficiency (Typ. at 100Vac/200Vac)(*17)	%	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	130	75	180	500	
4. Ripple r.m.s. 5Hz~1MHz (*8)	mV	6	6	6	7	7	8	30	20	45	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 0.01% 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	20	20	20	20	20	20	20	30	30	40	
10. Down-prog. response time (*12)	Full load	20	20	20	30	30	50	50	60	70	80	
	No load	300	500	600	900	1200	1300	1700	2200	2700	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 6Sec.										
13. Hold-up time	---	20mS 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. 5Hz~1MHz (*13)	mA	≤250	≤130	≤100	≤60	≤50	≤30	≤40	≤10	≤8	≤5	
4. 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.										
5. Temperature stability	---	0.01% of rated Iout over 8hrs. interval following 30 minutes warm-up. Constant line, load & temperature.										
6. 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% of rated Vout.										
6. Output current monitor (*14)	---	0~5V or 0~10V, user selectable. Accuracy: +/-0.5% of rated Iout.										

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 (*16) Interfaces)

	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	---	0.0025% 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	0.01%	0.002%	0.003%	0.003%	0.005%	0.006%	0.007%	0.015%	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. Reset 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	---	OUTPUT ON, ALARM, PREVIEW, FINE, COMMUNICATION, PROTECTION, CONFIGURATION, SYSTEM, SEQUENCER.
	---	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	---	100Vac≤Vin≤265Vac: 0~50°C, 100% load. 85Vac≤Vin<100Vac: 0~45°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 3.5Kg.
3.Dimensions (WxHxD)	mm	W: 214, H: 43.6, D: 432 (Without busbars and busbars cover), W: 214, H: 43.6, D: 493 (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	---	UL61010-1, CSA22.2 No.61010-1, IEC61010-1, EN61010-1.
1.1.Interface classification	---	Vouts<50V Models: Output, J1, J2, J3, J4, J5, J6, J7, J8 (sense) and J9 (communication options) are Non Hazardous. 60<Vout<600V Models: Output and J8 (sense) are Hazardous. J1, J2, J3, J4, J5, J6, J7 and J9 (communication options) are Non Hazardous.
1.2.Withstand voltage	---	Vouts<50V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Input – Ground: 2835VDC 1min. 60V<Vout<100V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Output & J8 (sense) – J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 850VDC 1min. Output & J8 (sense) – Ground: 1500VDC 1min. Input – Ground: 2835VDC 1min. 100V<Vout<600V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Output & J8 (sense) – J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 1275VDC 1min. Output & J8 (sense) – Ground: 2500VDC 1min. Input – Ground: 2835VDC 1min.
1.3.Isolation resistance	---	>100Mohm at 25°C, 70%RH, Output to Ground 500VDC.
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.

REVISION:
IA762-01-01B

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 200~600V 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% of Rated Output Voltage at rated resistive load.
- *12: From 90% to 10% of Rated Output Voltage.
- *13: For 10V model, the ripple is measured at 20~100% of rated output voltage and rated output current. For other models, the ripple is measured at 10~100% of rated output voltage and rated output current. 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.
- *17: Ta=25°C, rated output power.

5.3 1kW Series Specifications

Unless otherwise noted, specifications are warranted over the ambient temperature range of 0° to 50° Celsius.

OUTPUT RATING		10-100	20-50	30-34	40-25	60-17	80-12.5	100-10	150-7	300-3.5	600-1.7
1. Rated output voltage (*1)	V	10	20	30	40	60	80	100	150	300	600
2. Rated output current (*2)	A	100	50	34	25	17	12.5	10	7	3.5	1.7
3. Rated output power	W	1000	1000	1020	1000	1020	1000	1000	1050	1050	1020

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	12.5/6.5										
3. Power Factor (Typ.)	---	0.99 @ 100Vac, 0.98 @ 200Vac, rated output power.										
4. Efficiency (Typ. at 100Vac/200Vac, rated output) (*17)	%	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	500	
4. Ripple r.m.s. 5Hz~1MHz (*8)	mV	6	6	6	7	7	10	12	9	20	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 0.01% 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	35	35	35	35	35	35	40	50	100	100	
10. Down-prog. response time (*12)	Full load	30	30	60	60	60	60	80	120	220	220	
	No load	500	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 1.5mS for 10V model, less than 1ms for models up to and including 100V. 2mS for models above 100V.										
12. Start-up delay	---	Less than 6Sec.										
13. Hold-up time	---	20mS Typical. Rated output power.										

CONSTANT CURRENT MODE		V	10	20	30	40	60	80	100	150	300	600
1. Max. Line regulation (*6)	---	0.02% of rated output current +2mA.										
2. Max. Load regulation (*9)	---	0.02% of rated output current +5mA.										
3. Ripple r.m.s. 5Hz~1MHz (*13)	mA	≤420	≤160	≤100	≤60	≤50	≤30	≤20	≤10	≤8	≤5	
4. 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.										
5. Temperature stability	---	0.01% of rated Iout over 8hrs. interval following 30 minutes warm-up. Constant line, load & temperature.										
6. 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% of rated Vout.										
6. Output current monitor (*14)	---	0~5V or 0~10V, user selectable. Accuracy: +/-0.5% of rated Iout.										

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 (*16) Interfaces)

	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.									0.25% 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	0.011%	0.003%	0.004%	0.005%	0.007%	0.009%	0.011%	0.015%	0.004%	0.007%

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. Reset 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	---	OUTPUT ON, ALARM, PREVIEW, FINE, COMMUNICATION, PROTECTION, CONFIGURATION, SYSTEM, SEQUENCER.
	---	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	---	UL61010-1, CSA22.2 No.61010-1, IEC61010-1, EN61010-1.
1.1.Interface classification	---	Vouts50V Models: Output, J1, J2, J3, J4, J5, J6, J7, J8 (sense) and J9 (communication options) are Non Hazardous. 60sVouts600V Models: Output and J8 (sense) are Hazardous. J1, J2, J3, J4, J5, J6, J7 and J9 (communication options) are Non Hazardous.
1.2.Withstand voltage	---	Vouts50V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Input – Ground: 2835VDC 1min. 60V≤Vouts100V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Output & J8 (sense) – J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 850VDC 1min. Output & J8 (sense) – Ground: 1500VDC 1min. Input – Ground: 2835VDC 1min. 100V<Vouts600V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Output & J8 (sense) – J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 1275VDC 1min. Output & J8 (sense) – Ground: 2500VDC 1min. Input – Ground: 2835VDC 1min.
1.3.Isolation resistance	---	>100Mohm at 25°C, 70%RH, Output to Ground 500VDC.
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.

REVISION:

IA881-01-01B

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 200~600V 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% of Rated Output Voltage at rated resistive load.
- *12: From 90% to 10% of Rated Output Voltage.
- *13: For 10V model, the ripple is measured at 20~100% of rated output voltage and rated output current. For other models, the ripple is measured at 10~100% of rated output voltage and rated output current. 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.
- *17: Ta=25°C, rated output power.

5.4 1.7kW Series Specifications

Unless otherwise noted, specifications are warranted over the ambient temperature range of 0° to 50° Celsius.

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) (*17)	%	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	500	
4. Ripple r.m.s. 5Hz~1MHz (*8)	mV	6	6	6	7	7	10	12	8	20	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 0.01% 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	20	20	20	20	20	20	25	50	100	100	
10. Down-prog. response time (*12)	Full load	30	30	60	60	60	60	60	120	220	200	
	No load	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. Start-up delay	---	Less than 6Sec.										
13. 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. 5Hz~1MHz (*13)	mA	≤420	≤160	≤100	≤60	≤50	≤30	≤20	≤10	≤8	≤5	
4. 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.										
5. Temperature stability	---	0.01% of rated Iout over 8hrs. interval following 30 minutes warm-up. Constant line, load & temperature.										
6. 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% of rated Vout.										
6. Output current monitor (*14)	---	0~5V or 0~10V, user selectable. Accuracy: +/-0.5% of rated Iout.										

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 (*16) Interfaces)

	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. Reset 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	---	OUTPUT ON, ALARM, PREVIEW, FINE, COMMUNICATION, PROTECTION, CONFIGURATION, SYSTEM, SEQUENCER.
	---	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	---	UL61010-1, CSA22.2 No.61010-1, IEC61010-1, EN61010-1.
1.1.Interface classification	---	Vouts<50V Models: Output, J1, J2, J3, J4, J5, J6, J7, J8 (sense) and J9 (communication options) are Non Hazardous. 60<Vout<600V Models: Output and J8 (sense) are Hazardous. J1, J2, J3, J4, J5, J6, J7 and J9 (communication options) are Non Hazardous.
1.2.Withstand voltage	---	Vouts<50V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Input – Ground: 2835VDC 1min. 60V<Vout<100V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Output & J8 (sense) – J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 850VDC 1min. Output & J8 (sense) – Ground: 1500VDC 1min. Input – Ground: 2835VDC 1min. 100V<Vout<600V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Output & J8 (sense) – J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 1275VDC 1min. Output & J8 (sense) – Ground: 2500VDC 1min. Input – Ground: 2835VDC 1min.
1.3.Isolation resistance	---	>100Mohm at 25°C, 70%RH, Output to Ground 500VDC.
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.

REVISION:
IA845-01-01C

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 200~600V 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% of Rated Output Voltage at rated resistive load.
- *12: From 90% to 10% of Rated Output Voltage.
- *13: For 10V model, the ripple is measured at 20~100% of rated output voltage and rated output current. For other models, the ripple is measured at 10~100% of rated output voltage and rated output current. 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.
- *17: Ta=25°C, rated output power.

5.5 2.7kW Series Specifications

Unless otherwise noted, specifications are warranted over the ambient temperature range of 0° to 50° Celsius.

OUTPUT RATING		10-265	20-135	30-90	40-68	60-45	80-34	100-27	150-18	300-9	600-4.5
1. Rated output voltage (*1)	V	10	20	30	40	60	80	100	150	300	600
2. Rated output current (*2)	A	265	135	90	68	45	34	27	18	9	4.5
3. Rated output power	W	2650	2700	2700	2720	2700	2720	2700	2700	2700	2700

INPUT CHARACTERISTICS		V	10	20	30	40	60	80	100	150	300	600	
1. Input voltage/freq. 3-Phase, 3 wire+ground (*4) 1-Phase, 2 wire+ground	---	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). 1-Phase models: 170~265Vac, 47~63Hz (Covers 200/208/230/240).											
2. Maximum input current at 100% load (*20)	3-Phase, 200V models 3-Phase, 400V models 3-Phase, 480V models 1-Phase models	---	10A @ 200Vac. 5.5A @ 380Vac. 5.5A @ 380Vac. 16.5A @ 200Vac.										
3. Power Factor (Typ.)	---	For 3-Phase: 0.94 @ 200/380Vac, rated output power. For 1-Phase: 0.99 @ 200Vac, rated output power.											
4. Efficiency (Typ.) (*5) (*20)	%	88	89	89.5	90	90	90.5	90.5	90.5	90.5	90.5	90.5	
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	80	80	100	120	200	480	
4. Ripple r.m.s. 5Hz~1MHz (*9)	mV	8	10	10	12	15	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)	mS	50	50	80	80	80	100	100	100	100	200
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 6Sec.										
13. Hold-up time	---	For 3-Phase: 7mS Typical, rated output power. For 1-Phase: 10mS 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. 5Hz~1MHz for 3-Phase (*14)	mA	≤800	≤450	≤300	≤150	≤100	≤70	≤45	≤30	≤12	≤5	
4. Ripple r.m.s. 5Hz~1MHz for 1-Phase (*14)	mA	≤1200	≤600	≤300	≤300	≤200	≤100	≤60	≤40	≤12	≤8	
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% of rated Vout.										
6. Output current monitor (*15)	---	0~5V or 0~10V, user selectable. Accuracy: +/-0.5% of rated Iout.										

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 (*19) Interfaces)

	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	0.005%	0.008%	0.002%	0.002%	0.003%	0.004%	0.005%	0.007%	0.002%	0.003%	

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. Reset 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	---	OUTPUT ON, ALARM, PREVIEW, FINE, COMMUNICATION, PROTECTION, CONFIGURATION, SYSTEM, SEQUENCER.
	---	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 6.25Kg.
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	---	UL61010-1, CSA22.2 No.61010-1, IEC61010-1, EN61010-1.
1.1.Interface classification	---	Vout≤50V Models: Output, J1, J2, J3, J4, J5, J6, J7, J8 (sense) and J9 (communication options) are Non Hazardous. 60≤Vout≤600V Models: Output and J8 (sense) are Hazardous. J1, J2, J3, J4, J5, J6, J7 and J9 (communication options) are Non Hazardous.
1.2.Withstand voltage	---	Vout≤50V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Input – Ground: 2835VDC 1min. 60V≤Vout≤100V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Output & J8 (sense) – J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 850VDC 1min. Output & J8 (sense) – Ground: 1500VDC 1min. Input – Ground: 2835VDC 1min. 100V<Vout≤600V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Output & J8 (sense) – J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 1275VDC 1min. Output & J8 (sense) – Ground: 2500VDC 1min. Input – Ground: 2835VDC 1min.
1.3.Isolation resistance	---	>100Mohm at 25°C, 70%RH, Output to Ground 500VDC.
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.

REVISION:

IA903-01-02C

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.

*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, 380~480Vac (50/60Hz) for 3-Phase 480V models and 190-240Vac (50/60Hz) for 1-Phase models.

*5: 3-Phase 200V models: At 200Vac input voltage, 3-Phase 400/480V models: At 380Vac input voltage, 1-Phase models: At 200Vac input voltage. At 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, 1-Phase models: 170~265Vac. 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 200~600V 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% of Rated Output Voltage at 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 20~100% of rated output voltage and rated output current. For other models, the ripple is measured at 10~100% of rated output voltage and rated output current. 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.

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

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

*20: Typ. at Ta=25°C, rated output power.

5.6 3.4kW Series Specifications

Unless otherwise noted, specifications are warranted over the ambient temperature range of 0° to 50° Celsius.

OUTPUT RATING		10-340	20-170	30-112	40-85	60-56	80-42	100-34	150-22.5	300-11.5	600-5.6
1. Rated output voltage (*1)	V	10	20	30	40	60	80	100	150	300	600
2. Rated output current (*2)	A	340 (*3)	170	112	85	56	42	34	22.5	11.5	5.6
3. Rated output power	W	3400	3400	3360	3400	3360	3360	3400	3375	3450	3360

INPUT CHARACTERISTICS		V	10	20	30	40	60	80	100	150	300	600	
1. Input voltage/freq. 3-Phase, 3 wire+ground (*4) 1-Phase, 2 wire+ground	---	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). 1-Phase models: 170~265Vac, 47~63Hz (Covers 200/208/230/240).											
2. Maximum input current at 100% load (*20)	3-Phase, 200V models	---	12.5A @ 200Vac.										
	3-Phase, 400V models	---	6.5A @ 380Vac.										
	3-Phase, 480V models	---	6.5A @ 380Vac.										
	1-Phase models	---	21A @ 200Vac.										
3. Power Factor (Typ.)	---	For 3-Phase: 0.94 @ 200/380Vac, rated output power. For 1-Phase: 0.99 @ 200Vac, rated output power.											
4. Efficiency (Typ.) (*5) (*20)	%	88	89	89.5	90	90	90.5	90.5	90.5	90.5	90.5	90.5	
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	80	80	100	120	200	480	
4. Ripple r.m.s. 5Hz~1MHz (*9)	mV	8	10	10	12	15	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)	Full load (*11)	mS	30	30	30	30	50	50	50	50	50	100
	No load (*12)	mS	50	50	80	80	80	100	100	100	100	200
10. Down-prog. response time	Full load (*11)	mS	450	600	800	900	1100	1300	2100	2000	3200	3100
	No load (*12)	mS	450	600	800	900	1100	1300	2100	2000	3200	3100
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 6Sec.										
13. Hold-up time	---	For 3-Phase: 7mS Typical, rated output power. For 1-Phase: 10mS 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. 5Hz~1MHz for 3-Phase (*14)	mA	≤800	≤450	≤300	≤150	≤100	≤70	≤45	≤30	≤12	≤5	
4. Ripple r.m.s. 5Hz~1MHz for 1-Phase (*14)	mA	≤1200	≤600	≤300	≤300	≤200	≤100	≤60	≤40	≤12	≤8	
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% of rated Vout.										
6. Output current monitor (*15)	---	0~5V or 0~10V, user selectable. Accuracy: +/-0.5% of rated Iout.										

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 high 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 (*19) Interfaces)

	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	0.004%	0.007%	0.010%	0.002%	0.003%	0.004%	0.004%	0.006%	0.010%	0.003%	

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. Reset 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	---	OUTPUT ON, ALARM, PREVIEW, FINE, COMMUNICATION, PROTECTION, CONFIGURATION, SYSTEM, SEQUENCER.
	---	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 (*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 6.25Kg.
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	---	UL61010-1, CSA22.2 No.61010-1, IEC61010-1, EN61010-1.
1.1.Interface classification	---	Vouts<50V Models: Output, J1, J2, J3, J4, J5, J6, J7, J8 (sense) and J9 (communication options) are Non Hazardous. 60<Vout<600V Models: Output and J8 (sense) are Hazardous. J1, J2, J3, J4, J5, J6, J7 and J9 (communication options) are Non Hazardous.
1.2.Withstand voltage	---	Vouts<50V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Input – Ground: 2835VDC 1min. 60V<Vout<100V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Output & J8 (sense) – J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 850VDC 1min. Output & J8 (sense) – Ground: 1500VDC 1min. Input – Ground: 2835VDC 1min. 100V<Vout<600V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Output & J8 (sense) – J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 1275VDC 1min. Output & J8 (sense) – Ground: 2500VDC 1min. Input – Ground: 2835VDC 1min.
1.3.Isolation resistance	---	>100Mohm at 25°C, 70%RH, Output to Ground 500VDC.
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.

REVISION:
IA903-01-01C

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 4A/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, 380~480Vac (50/60Hz) for 3-Phase 480V models and 190-240Vac (50/60Hz) for 1-Phase models.
- *5: 3-Phase 200V models: At 200Vac input voltage, 3-Phase 400/480V models: At 380Vac input voltage, 1-Phase models: At 200Vac input voltage. At 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, 1-Phase models: 170~265Vac. 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 200~600V 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% of Rated Output Voltage at 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 20~100% of rated output voltage and rated output current. For other models, the ripple is measured at 10~100% of rated output voltage and rated output current. 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: Maximum ambient temperature for IEEE option is 40°C.
- *20: Typ. at Ta=25°C, rated output power.

5.7 5kW Series Specifications

Unless otherwise noted, specifications are warranted over the ambient temperature range of 0° to 50° Celsius.

OUTPUT RATING		10-500	20-250	30-170	40-125	50-100	60-85	80-65	100-50	150-34	200-25	300-17	400-13	500-10	600-8.5
1. Rated output voltage (*1)	V	10	20	30	40	50	60	80	100	150	200	300	400	500	600
2. Rated output current (*2)	A	500 (*3)	250	170	125	100	85	65	50	34	25	17	13	10	8.5
3. Rated output power	W	5000	5000	5100	5000	5000	5100	5200	5000	5100	5000	5100	5200	5000	5100

INPUT CHARACTERISTICS		V	10	20	30	40	50	60	80	100	150	200	300	400	500	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) (*22)		%	89 (*21)	91	91	91	90	91	91	91	91	91	92	92	92	92
5. Inrush current (*6)		---	Less than 50A.													

CONSTANT VOLTAGE MODE		V	10	20	30	40	50	60	80	100	150	200	300	400	500	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	75	80	90	120	200	200	400	450	480
4. Ripple r.m.s. 5Hz~1MHz (*9)		mV	8	10	12	12	12	12	15	15	20	45	60	80	80	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	5	5	5	5
9. Up-prog. response time (*11)		mS	30	30	30	30	50	50	50	50	50	50	50	100	100	100
10. Down-prog. response time	Full load (*11)	mS	50	50	80	80	80	80	80	100	100	100	100	150	200	200
	No load (*12)	mS	300	600	800	900	950	1000	1200	1900	2000	2000	3000	4000	4000	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 5Sec.													
13. Hold-up time		---	5mS Typical. Rated output power.													

CONSTANT CURRENT MODE		V	10	20	30	40	50	60	80	100	150	200	300	400	500	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. 5Hz~1MHz (*14)		mA	≤1200	≤600	≤300	≤150	≤130	≤100	≤70	≤45	≤45	≤45	≤15	≤12	≤10	≤8
4. 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.													
5. Temperature stability		---	0.01% of rated Iout over 8hrs. interval following 30 minutes warm-up. Constant line, load & temperature.													
6. 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% of rated Vout.
6. Output current monitor (*15)	---	0~5V or 0~10V, user selectable. Accuracy: +/-0.5% of rated Iout.

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 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 (*19) (*20) Interfaces)

	V	10	20	30	40	50	60	80	100	150	200	300	400	500	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%	0.003%	0.002%	0.002%	0.011%	0.007%	0.005%	0.004%	0.003%	0.003%	0.002%	
8.Iout readback resolution	% of rated output current	0.003%	0.005%	0.006%	0.009%	0.011%	0.002%	0.002%	0.003%	0.004%	0.004%	0.006%	0.008%	0.011%	0.002%	

PROTECTIVE FUNCTIONS

	V	10	20	30	40	50	60	80	100	150	200	300	400	500	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 presettable. 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	5~55.125	5~66.15	5~88.2	5~110.25	5~165.37	5~220.5	5~330.75	5~441	5~551.25	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	---	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 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	---	UL61010-1, CSA22.2 No.61010-1, IEC61010-1, EN61010-1.
1.1.Interface classification	---	Vout≤50V Models: Output, J1, J2, J3, J4, J5, J6, J7, J8 (sense) and J9 (communication options) are Non Hazardous. 60≤Vout≤600V Models: Output and J8 (sense) are Hazardous. J1, J2, J3, J4, J5, J6, J7 and J9 (communication options) are Non Hazardous.
1.2.Withstand voltage	---	Vout≤50V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Input – Ground: 2835VDC 1min. 60V≤Vout≤100V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Output & J8 (sense) – J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 850VDC 1min. Output & J8 (sense) – Ground: 1500VDC 1min. Input – Ground: 2835VDC 1min. 100V<Vout≤600V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Output & J8 (sense) – J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 1275VDC 1min. Output & J8 (sense) – Ground: 2500VDC 1min. Input – Ground: 2835VDC 1min.
1.3.Isolation resistance	---	>100Mohm at 25°C, 70%RH, Output to Ground 500VDC.
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.

REVISION:

IA761-01-01E

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 200~600V 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% of Rated Output Voltage at 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 20~100% of rated output voltage and rated output current. For other models, the ripple is measured at 10~100% of rated output voltage and rated output current. 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.
- *21: For 10V model only: For 3-Phase 200V efficiency is 88.5%
- *22: Typ. at Ta=25°C, rated output power.

5.8 7.5kW Series Specifications

Unless otherwise noted, specifications are warranted over the ambient temperature range of 0° to 50° Celsius.

OUTPUT RATING		20-375	30-250	40-188	60-125	80-94	100-75	150-50	200-37.5	300-25	600-12.5	1000-7.5	1500-5
1. Rated output voltage (*1)	V	20	30	40	60	80	100	150	200	300	600	1000	1500
2. Rated output current (*2)	A	375	250	188	125	94	75	50	37.5	25	12.5	7.5	5
3. Rated output power	W	7500	7500	7520	7500	7520	7500	7500	7500	7500	7500	7500	7500

INPUT CHARACTERISTICS		V	20	30	40	60	80	100	150	200	300	600	1000	1500
1. Input voltage/freq. 3 phase, 3 wire+ground (*4)	---	3-Phase, 200V models: 170~265Vac, 47~63Hz (Covers 200/230Vac). 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:	---	25.5A @ 200Vac.											
	3-Phase, 480V models:	---	13.5A @ 380Vac.											
3. Power Factor (Typ.)	---	0.94 @ 200/380Vac, rated output power.												
4. Efficiency (Typ.) (*5) (*3)	%	91	**	91	**	**	91	91	**	**	92	**	92	
5. Inrush current (*6)	---	Less than 65A.												

CONSTANT VOLTAGE MODE		V	20	30	40	60	80	100	150	200	300	600	1000	1500
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	80	*	80	**	**	90	150	**	**	450	**	1300	
4. Ripple r.m.s. 5Hz~1MHz (*9)	mV	10	*	8	**	**	15	20	**	**	100	**	500	
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									5			
9. Up-prog. response time (*11)	mS	30	*	30	**	**	50	50	**	**	100	**	200	
10. Down-prog. response time	Full load (*11)	mS	50	*	80	**	**	100	100	**	**	100	**	100
	No load (*12)	mS	600	*	100	**	**	1500	2500	**	**	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 5Sec.												
13. Hold-up time	---	5mS Typical. Rated output power.												

CONSTANT CURRENT MODE		V	20	30	40	60	80	100	150	200	300	600	1000	1500
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. 5Hz~1MHz (*14)	mA	≤900	**	≤300	**	**	≤70	≤45	**	**	≤14	**	≤5	
4. Temperature coefficient	---	20V~100V models: 100PPM/°C from rated output current, following 30 minutes warm-up.												
	---	150V~1500V models: 70PPM/°C from rated output current, following 30 minutes warm-up.												
5. Temperature stability	---	0.01% of rated Iout over 8hrs. interval following 30 minutes warm-up. Constant line, load & temperature.												
6. Warm-up drift	---	20V~100V models: Less than +/-0.25% of rated output current over 30 minutes following power on.												
	---	150V~1500V 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% of rated Vout.												
6. Output current monitor (*15)	---	0~5V or 0~10V, user selectable. Accuracy: +/-0.5% of rated Iout.												

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 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 (*17) (*20) Interfaces)

	V	20	30	40	60	80	100	150	200	300	600	1000	1500
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	0.006%	0.004%	0.003%	0.002%	0.002%	0.011%	0.007%	0.005%	0.004%	0.002%	0.011%	0.007%
8.Iout readback resolution	% of rated output current	0.003%	0.005%	0.006%	0.009%	0.002%	0.002%	0.003%	0.003%	0.005%	0.009%	0.002%	0.003%

PROTECTIVE FUNCTIONS

	V	20	30	40	60	80	100	150	200	300	600	1000	1500
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	1~24	2~36	2~44.1	5~66.15	5~88.2	5~110.25	5~165.37	5~220.5	5~330.75	5~661.5	5~1212.75	5~1653.75
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 1500m. 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 8.5Kg.
3.Dimensions (WxHxD)	mm	W: 423, H: 43.6, D: 486.5 (Without busbars and busbars cover), W: 423, H: 43.6, D: 598.1 (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	---	UL61010-1, CSA22.2 No.61010-1, IEC61010-1, EN61010-1.
1.1.Interface classification	---	Vout≤50V Models: Output, J1, J2, J3, J4, J5, J6, J7, J8 (sense) and J9 (communication options) are Non Hazardous. 60≤Vout≤1500V Models: Output and J8 (sense) are Hazardous. J1, J2, J3, J4, J5, J6, J7 and J9 (communication options) are Non Hazardous.
1.2.Withstand voltage	---	Vout≤50V Models: Input – Output and J8 (sense), J1, J2, J3, J4, J5, J6, J7 and J9 (communication options): 4242VDC 1min. Input – Ground: 2835VDC 1min. 60V≤Vout≤100V Models: Input – Output and J8 (sense), J1, J2, J3, J4, J5, J6, J7 and J9 (communication options): 4242VDC 1min. Output and J8 (sense) – J1, J2, J3, J4, J5, J6, J7 and J9 (communication options): 850VDC 1min. Output and J8 (sense) – Ground: 1500VDC 1min. Input – Ground: 2835VDC 1min. 100V<Vout≤600V Models: Input – Output and J8 (sense), J1, J2, J3, J4, J5, J6, J7 and J9 (communication options): 4242VDC 1min. Output and J8 (sense) – J1, J2, J3, J4, J5, J6, J7 and J9 (communication options): 1275VDC 1min. Output and J8 (sense) – Ground: 2500VDC 1min. Input – Ground: 2835VDC 1min. 1000V<Vout≤1500V Models: Input – Output and J8 (sense), J1, J2, J3, J4, J5, J6, J7 and J9 (communication options): 4000VDC 1min. Output and J8 (sense) – J1, J2, J3, J4, J5, J6, J7 and J9 (communication options): 2000VDC 1min. Output and J8 (sense) – Ground: 3280VDC 1min. Input – Ground: 2835VDC 1min.
1.3.Isolation resistance	---	>100Mohm at 25°C, 70%RH, Output to Ground 500VDC.
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.

REVISION:
IA922-01-01

NOTES:

****: Coming soon**

- *1: Minimum voltage is guaranteed to maximum 0.15% of rated output voltage for 20V and 30V models; 0.1% of rated output voltage for 40V~1500V models.
- *2: Minimum current is guaranteed to maximum 0.2% of rated output current.
- *3: Typ. At Ta=25°C, rated output power.
- *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 and 380~480Vac (50/60Hz) for 3-Phase 480V models.
- *5: 3-Phase 200V models: At 200Vac input voltage, 3-Phase 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 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 200~1500V 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% of Rated Output Voltage at 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 20~100% of rated output voltage and rated output current. For other models, the ripple is measured at 10~100% of rated output voltage and rated output current. 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: Max. ambient temperature for IEEE is 40°C.
- *18: Signal and control ports interface cables length: Less than 3m, DC output power port cables length: Less than 30m.

5.9 10kW Series Specifications

Unless otherwise noted, specifications are warranted over the ambient temperature range of 0° to 50° Celsius.

OUTPUT RATING		10-1000	20-500	30-340	40-250	50-200	60-170	80-130	100-100	150-68	200-50	300-34	400-26	500-20	600-17
1. Rated output voltage (*1)	V	10	20	30	40	50	60	80	100	150	200	300	400	500	600
2. Rated output current (*2)	A	1000 (*3)	500	340	250	200	170	130	100	68	50	34	26	20	17
3. Rated output power	W	10000	10000	10200	10000	10000	10200	10400	10000	10200	10000	10200	10400	10000	10200

INPUT CHARACTERISTICS		V	10	20	30	40	50	60	80	100	150	200	300	400	500	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: 3-Phase, 400V models: 3-Phase, 480V models:	---	35A @ 200Vac. 18.4A @ 380Vac. 18.4A @ 380Vac.													
3. Power Factor (Typ.)		---	0.94 @ 200/380Vac, rated output power.													
4. Efficiency (Typ.) (*5) (*23)		%	89 (*21)	90	91	91	90	91	91	91	91	91	92	92	91	92
5. Inrush current (*6)		---	Less than 100A.													

CONSTANT VOLTAGE MODE		V	10	20	30	40	50	60	80	100	150	200	300	400	500	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	75	80	90	120	200	200	400	450	480
4. Ripple r.m.s. 5Hz~1MHz (*9)		mV	8	10	12	12	12	12	15	15	20	45	60	80	80	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	5	5	5	5
9. Up-prog. response time (*11)		mS	30	30	30	30	50	50	50	50	50	50	50	100	100	100
10. Down-prog. response time	Full load (*11) No load (*12)	mS	50 300	50 600	80 800	80 900	80 950	80 1000	80 1200	100 1900	100 2000	100 2500	100 3000	150 4000	200 4000	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. Start-up delay		---	Less than 7Sec.													
13. Hold-up time		---	5mS Typical. Rated output power.													

CONSTANT CURRENT MODE		V	10	20	30	40	50	60	80	100	150	200	300	400	500	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 5Hz~1MHz (*14) (Ta=25°C)		mA	1500	1200	600	300	200	150	100	70	45	45	15	15	12	10
4. Ripple r.m.s. @ 100% rated voltage 5Hz~1MHz (Ta=25°C)		mA	1200	700	300	150	100	75	50	35	23	23	7.5	7.5	8	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 (*22)	---	0~5V or 0~10V, user selectable. Accuracy: +/-0.5% of rated Vout.														
6. Output current monitor (*15) (*22)	---	0~5V or 0~10V, user selectable. Accuracy: +/-0.5% of rated Iout.														

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 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 (*19) (*20) Interfaces)

	V	10	20	30	40	50	60	80	100	150	200	300	400	500	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%	0.003%	0.002%	0.002%	0.011%	0.007%	0.005%	0.004%	0.003%	0.003%	0.002%	
8.Iout readback resolution	% of rated output current	0.012%	0.003%	0.004%	0.005%	0.006%	0.007%	0.009%	0.012%	0.002%	0.003%	0.003%	0.004%	0.006%	0.005%	

PROTECTIVE FUNCTIONS

	V	10	20	30	40	50	60	80	100	150	200	300	400	500	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 presettable. 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	5~55.125	5~66.15	5~88.2	5~110.25	5~165.37	5~220.5	5~330.75	5~441	5~551.25	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	---	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	---	UL61010-1, CSA22.2 No.61010-1, IEC61010-1, EN61010-1.
1.1.Interface classification	---	Vout≤50V Models: Output, J1, J2, J3, J4, J5, J6, J7, J8 (sense) and J9 (communication options) are Non Hazardous. 60≤Vout≤600V Models: Output and J8 (sense) are Hazardous. J1, J2, J3, J4, J5, J6, J7 and J9 (communication options) are Non Hazardous.
1.2.Withstand voltage	---	Vout≤50V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Input – Ground: 2835VDC 1min. 60V≤Vout≤100V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Output & J8 (sense) – J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 850VDC 1min. Output & J8 (sense) – Ground: 1500VDC 1min. Input – Ground: 2835VDC 1min. 100V<Vout≤600V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Output & J8 (sense) – J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 1275VDC 1min. Output & J8 (sense) – Ground: 2500VDC 1min. Input – Ground: 2835VDC 1min.
1.3.Isolation resistance	---	>60Mohm at 25°C, 70%RH, Output to Ground 500VDC.
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.

REVISION:

IA813-01-01F

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 200~600V 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% of Rated Output Voltage at 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 40C.
- *20: For 10V model only: Max. output current for IEEE is 800A up to 40C and 900A up to 30C.
- *21: For 10V model only: For 3-Phase 200V efficiency is 88.5%.
- *22: For steady state only.
- *23: Typ. At Ta=25°C, rated output power.

5.10 15kW Series Specifications

Unless otherwise noted, specifications are warranted over the ambient temperature range of 0° to 50° Celsius.

OUTPUT RATING		10-1500	20-750	30-510	40-375	50-300	60-255	80-195	100-150	150-102	200-75	300-51	400-39	500-30	600-25.5
1. Rated output voltage (*1)	V	10	20	30	40	50	60	80	100	150	200	300	400	500	600
2. Rated output current (*2)	A	1500 (*3)	750	510	375	300	255	195	150	102	75	51	39	30	25.5
3. Rated output power	W	15000	15000	15300	15000	15000	15300	15600	15000	15300	15000	15300	15600	15000	15300

INPUT CHARACTERISTICS		V	10	20	30	40	50	60	80	100	150	200	300	400	500	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: 3-Phase, 400V models: 3-Phase, 480V models:	---	52.5A @ 200Vac. 27.6A @ 380Vac. 27.6A @ 380Vac.													
3. Power Factor (Typ.)	---	0.94 @ 200/380Vac, rated output power.														
4. Efficiency (Typ.) (*5) (*23)	%	89 (*21)	90	91	91	90	91	91	91	91	91	91	92	92	91	92
5. Inrush current (*6)	---	Less than 150A.														

CONSTANT VOLTAGE MODE		V	10	20	30	40	50	60	80	100	150	200	300	400	500	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	75	80	90	120	200	200	400	450	480	
4. Ripple r.m.s. 5Hz~1MHz (*9)	mV	8	10	12	12	12	12	15	15	20	45	60	80	80	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	5	5	5	5	5
9. Up-prog. response time (*11)	mS	30	30	30	30	50	50	50	50	50	50	50	100	100	100	100
10. Down-prog. response time	Full load (*11) No load (*12)	mS	50 300	50 600	80 800	80 900	80 950	80 1000	100 1200	100 1900	100 2000	100 2500	150 3000	150 4000	200 4000	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. Start-up delay	---	Less than 7Sec.														
13. Hold-up time	---	5mS Typical. Rated output power.														

CONSTANT CURRENT MODE		V	10	20	30	40	50	60	80	100	150	200	300	400	500	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 5Hz~1MHz (*14) (Ta=25°C)	mA	2000	1200	600	300	250	180	100	70	45	45	15	15	12	10	
4. Ripple r.m.s. @ 100% rated voltage 5Hz~1MHz (Ta=25°C)	mA	1200	700	300	150	130	90	60	35	23	23	7.5	7.5	8	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 (*22)	---	0~5V or 0~10V, user selectable. Accuracy: +/-0.5% of rated Vout.														
6. Output current monitor (*15) (*22)	---	0~5V or 0~10V, user selectable. Accuracy: +/-0.5% of rated Iout.														

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 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 (*19) (*20) Interfaces)

	V	10	20	30	40	50	60	80	100	150	200	300	400	500	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%	0.003%	0.002%	0.002%	0.011%	0.007%	0.005%	0.004%	0.003%	0.003%	0.002%	
8.Iout readback resolution	% of rated output current	0.012%	0.003%	0.003%	0.004%	0.004%	0.005%	0.006%	0.008%	0.012%	0.002%	0.003%	0.003%	0.003%	0.005%	

PROTECTIVE FUNCTIONS

	V	10	20	30	40	50	60	80	100	150	200	300	400	500	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	5~55.125	5~66.15	5~88.2	5~110.25	5~165.37	5~220.5	5~330.75	5~441	5~551.25	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	---	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	---	UL61010-1, CSA22.2 No.61010-1, IEC61010-1, EN61010-1.
1.1.Interface classification	---	Vout≤50V Models: Output, J1, J2, J3, J4, J5, J6, J7, J8 (sense) and J9 (communication options) are Non Hazardous. 60≤Vout≤600V Models: Output and J8 (sense) are Hazardous. J1, J2, J3, J4, J5, J6, J7 and J9 (communication options) are Non Hazardous.
1.2.Withstand voltage	---	Vout≤50V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Input – Ground: 2835VDC 1min. 60V≤Vout≤100V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Output & J8 (sense) – J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 850VDC 1min. Output & J8 (sense) – Ground: 1500VDC 1min. Input – Ground: 2835VDC 1min. 100V<Vout≤600V Models: Input – Output & J8 (sense), J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 4242VDC 1min. Output & J8 (sense) – J1, J2, J3, J4, J5, J6, J7 & J9 (communication options): 1275VDC 1min. Output & J8 (sense) – Ground: 2500VDC 1min. Input – Ground: 2835VDC 1min.
1.3.Isolation resistance	---	>60Mohm at 25°C, 70%RH, Output to Ground 500VDC.
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.

REVISION:

IA852-01-01E

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 15A/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 200~600V 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% of Rated Output Voltage at 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 40C.
- *20: For 10V model only: Max. output current for IEEE is 1200A up to 40C and 1350A up to 30C.
- *21: For 10V model only: For 3-Phase 200V efficiency is 88.5%.
- *22: For steady state only.
- *23: Typ. At Ta=25°C, rated output power.

