

General Safety Instructions:

READ SAFETY INSTRUCTIONS

Servicing:

These products are not customer serviceable TDK-Lambda UK LTD and their authorised agents only are permitted to carry out repairs.

Critical Components:

These products are not authorised 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 EMEA.

Product Usage:

These products are designed for use within a host equipment which restricts access to authorised competent personnel.

This product is a component power supply and is only to be installed by qualified persons within other equipment and must be not operated as a stand alone product.

This product is for sale to business to business customers and can be obtained via distribution channels. It is not intended for sale to end users.

This product is a component power supply and does not fall within the scope of the EMC directive. Compliance with the EMC directive must be considered in the final installation. Please contact your local TDK-Lambda office.

Environmental:

These products are IPX0, and therefore chemicals/solvents, cleaning agents and other liquids must not be used.

Environment:

This power supply is a switch mode power supply for use in applications within a Pollution Degree 2, overvoltage category II environment. Material Group IIIb PCB's are used within it.

Output Loading:

The output power taken from the power supply must not exceed the rating stated on the power supply label, except as stated in the product limitations in this handbook.

Input Parameters:

This product must be operated within the input parameters stated in the product limitations in this handbook.

End of Life Disposal:

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



RISK OF ELECTRIC SHOCK

High Voltage Warning:

Dangerous voltages are present within the power supply. The professional installer must protect service personnel from inadvertent contact with these dangerous voltages in the end equipment.

WARNING: When installed in a Class 1 end equipment, this product must be reliably earthed and professionally installed.

The unit cover(s)/chassis (where applicable) must not be made user accessible.

The mains input connector is not acceptable for use as field wiring terminals.

For encased products, do not use mounting screws, which penetrate the unit more than; See drawings.

Internal fuses protect the unit and must not be replaced by the user. In case of internal defect, the unit must be returned to TDK-Lambda UK LTD or one of their authorised agents.

A suitable mechanical, electrical and fire enclosure must be provided by the end use equipment for mechanical, electric shock and fire hazard protection.

Energy Hazards:

The main output of this product is capable of providing hazardous energy (240VA). Final equipment manufacturers must provide protection to service personnel against inadvertent contact with the output terminals.

The unit cover/chassis, where applicable, is designed to protect skilled personnel from hazards. They must not be used as part of the external covers of any equipment where they may be accessible to operators, since under full load conditions, part or parts of the unit chassis may reach temperatures in excess of those considered safe for operator access.

Allgemeine Sicherheitsvorschriften:

LESEN SIE DIE SICHERHEITSVORSCHRIFTEN

Wartung:

Diese Produkte können nicht durch den Kunden gewartet werden. Nur TDK-Lambda UK LTD. und deren zugelassene Vertriebshändler sind zur Durchführung von Reparaturen berechtigt.

Kritische Komponenten:

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

Produktverwendung:

Diese Produkte sind zur Verwendung innerhalb von Host-Anlagen gedacht, die einen auf das Fachpersonal beschränkten Zugang haben.

Dieses Produkt ist eine Stromversorgungs-Komponente und sie darf nur von qualifiziertem Personal in andere Geräte eingebaut werden und sie darf NICHT als eigenständiges ("Stand-Alone") Gerät betrieben werden.

Dieses Produkt ist für den Verkauf an Geschäftskunden entwickelt worden und es kann über Distributionskanäle bezogen werden.

Es ist NICHT für den Verkauf an Endkunden gedacht und konzipiert.

Dieses Produkt ist eine Stromversorgungsbaugruppe und sie fällt NICHT in den Bereich der EMV Direktive.

Die Konformität mit der EMV Richtlinie muss in der finalen Gesamtinstallation betrachtet werden.

Bitte kontaktieren Sie Ihr regionales TDK-Lambda Vertriebsbüro im Falle von Rückfragen.

Umwelt:

Diese Produkte sind IPX0, aus diesem Grund dürfen keine Chemikalien/Lösungsmittel, Reinigungsmittel und andere Flüssigkeiten verwendet werden.

Umgebung:

Dieses Netzteil ist ein Schaltnetzteil zur Verwendung in einer Umgebung mit einem Verschmutzungsgrad 2, Überspannungskategorie II. Materialgruppe IIIb mit darin verwendeten PCBs.

Ausgangsstrom:

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

Eingangsparameter:

Dieses Produkt muss innerhalb der Eingangsparameter, die in den Produktgrenzen dieses Handbuches angegeben sind, betrieben werden.

Entsorgung am Ende der Betriebszeit:

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

**GEFAHR DURCH ELEKTRISCHEN SCHLAG****Hochspannungswarnung:**

Innerhalb des Netztesles gibt es gefährliche Spannungen. Der Elektroinstallateur muss das Wartungspersonal vor versehentlichem Kontakt mit den gefährlichen Spannungen im Endgerät schützen.

WARNUNG! Falls Sie unser Netzgerät in eine Anwendung mit Schutzklasse 1 eingebaut haben, stellen Sie sicher, dass es fachgerecht installiert und zuverlässig geerdet ist.

Die Abdeckung des Gerätes/das Gehäuse darf für den Benutzer nicht zugänglich sein.

Der Haupteingangsanschluss ist nicht für die Verwendung als Feldverdrahtungsanschluss geeignet.

Für ummantelt Produkte, verwenden Sie keine Schrauben, die das Gerät mehr als durchdringen; siehe Zeichnung. Eine interne Sicherung schützt das Gerät und darf durch den Benutzer nicht ausgetauscht werden. Im Fall von internen Defekten muss das Gerät an TDK-Lambda UK LTD oder einen der autorisierten Vertriebshändler zurückgeschickt werden.

Ein geeignetes mechanisches, elektrisches und brandgeschütztes Gehäuse muss als Schutz vor der Gefahr von mechanischen Risiken, Stromschlägen und Brandschutz in dem Endgerät vorgesehen werden.

Gefahren durch elektrische Energie:

Von bestimmten Modulen kann je nach Einstellung der Ausgangsspannung gefährliche elektrische Energie ausgehen (240 VA). Die Endgerätehersteller müssen einen Schutz für Servicepersonal vor unbeabsichtigtem Kontakt mit den Ausgangsanschlüssen dieser Module vorsehen. Kann aufgrund der Einstellung gefährliche elektrische Energie auftreten, dürfen die Modulanschlüsse für den Benutzer nicht zugänglich sein.

Die Geräteabdeckung/das Gehäuse ist so entworfen, dass das Fachpersonal vor Gefahren geschützt wird. Sie dürfen nicht als Teil der externen Abdeckung für Geräte verwendet werden, die für den Betreiber zugänglich sein müssen, da Teile oder das gesamte Gerätegehäuse unter voller Auslastung übermäßige Temperaturen erreichen kann, die für den Zugang des Betreibers nicht mehr als sicher betrachtet werden.

Consignes générales de sécurité:

LIRE LES CONSIGNES DE SECURITE

Entretien:

Ces produits ne peuvent pas être réparés par l'utilisateur. Seuls, TDK-Lambda UK LTD et ses agents agréés sont autorisés à effectuer des réparations.

Composants critiques:

Ces produits ne doivent pas être utilisés en tant que composants critiques dans des systèmes de commande nucléaire, dans des systèmes de sauvetage ou dans des équipements utilisés dans des environnements dangereux, sans l'autorisation écrite expresse du directeur général de TDK-Lambda EMEA.

Utilisation du produit:

Ces produits sont conçus pour être utilisés dans un équipement hôte dont l'accès n'est autorisé qu'aux personnes compétentes.

Ce produit est une alimentation considérée comme un composant devant être installé par des personnes qualifiées, dans un autre équipement. Il ne doit pas être utilisé en tant que produit fini.

Ce produit est destiné à la vente entre entreprises et peut être obtenu via des canaux de distribution.

Il n'est pas prévu à la vente pour les particuliers.

Ce produit est une alimentation considérée comme un composant, il ne relève pas du champ d'application de la directive CEM. Le respect de la directive CEM doit être pris en compte dans l'installation finale. Veuillez contacter votre bureau TDK-Lambda le plus proche.

Environnement:

Ces produits sont IPX0, et donc on ne doit pas utiliser des produits chimiques/solvants, des produits de nettoyage et d'autres liquides.

Environnement fonctionnel :

Cette alimentation fonctionne en mode commutation pour utilisation dans des applications fonctionnant dans un environnement avec Degré de Pollution 2 et catégorie de surtension II. Elle utilise des cartes des circuits imprimés (PCB) de Groupe IIIb.

Intensité soutirée:

L'intensité soutirée de l'alimentation ne doit pas dépasser l'intensité nominale marquée sur la plaque signalétique, sauf indications contraires dans les limitations du produit décrit dans ce manuel.

Paramètres d'entrée:

Ce produit doit être utilisé à l'intérieur des paramètres d'entrée indiqués dans les limitations du produit dans ce manuel.

Elimination en fin de vie:

L'alimentation contient des composants nécessitant des dispositions spéciales pour leur élimination. Vérifiez que cette alimentation est mise au rebut correctement en fin de vie utile et conformément aux réglementations locales en vigueur.



RISQUE DE CHOC ELECTRIQUE

Attention-Danger haute tension:

Des tensions dangereuses sont présentes dans l'alimentation. L'installateur doit protéger le personnel d'entretien contre un contact involontaire avec ces tensions dangereuses dans l'équipement final.

AVERTISSEMENT: Si ce produit est installé dans un équipement final de classe I, il doit être mis à la terre de manière fiable et installé par un professionnel averti.

Le couvercle/châssis de l'alimentation ne doit pas être accessible à l'utilisateur. Le connecteur d'entrée d'alimentation principale ne doit pas être utilisé comme borne de raccordement.

N'utilisez pas de vis pénétrant dans le module sur une profondeur supérieure à : Voir dessins.

Un fusible interne protège le module et ne doit pas être remplacé par l'utilisateur. En cas de défaut interne, le module doit être renvoyé à TDK-Lambda UK LTD ou l'un de ses agents agréés.

Une enceinte appropriée doit être prévue par l'utilisateur final pour assurer la protection contre les chocs mécaniques, les chocs électriques et l'incendie.

Energies dangereuses :

Certains modules peuvent générer une énergie dangereuse (240 VA) selon le réglage de tension de sortie. Le fabricant de l'équipement final doit assurer la protection des techniciens d'entretien contre un contact involontaire avec les bornes de sortie de ces modules. Si une telle tension dangereuse risque de se produire, les bornes ou les connexions du module ne doivent pas être accessibles par l'utilisateur.

Le couvercle et le châssis du module sont conçus pour protéger des personnels expérimentés. Ils ne doivent pas être utilisés comme couvercles extérieurs d'un équipement, accessible aux opérateurs car en condition de puissance maximum, des parties du châssis peuvent atteindre des températures considérées comme dangereuses pour l'opérateur.

Norme generali di sicurezza:

SI PREGA DI LEGGERE LE NORME DI SICUREZZA

Manutenzione:

Il cliente non può eseguire alcuna manutenzione su questi prodotti. L'esecuzione delle eventuali riparazioni è consentita solo a TDK-Lambda UK LTD e ai suoi agenti autorizzati.

Componenti critici:

Non si autorizza l'uso di questi prodotti come componenti critici all'interno di sistemi di controllo nucleari, sistemi necessari alla sopravvivenza o apparecchiature destinate all'impiego in ambienti pericolosi, senza l'esplicita approvazione scritta dell'Amministratore Delegato di TDK-Lambda EMEA.

Uso dei prodotti:

Questi prodotti sono progettati per l'uso all'interno di un'apparecchiatura ospite che limiti l'accesso al solo personale competente e autorizzato.

Questo prodotto è da considerarsi come un alimentatore professionale componente e come tale deve essere installato da personale qualificato all'interno di altre apparecchiature e non può essere utilizzato come prodotto indipendente.

Questo prodotto non è inteso per la vendita al dettaglio o agli utilizzatori finali.

Questo alimentatore è da considerarsi come un componente e come tale non è assoggettato dagli scopi della direttiva EMC. Conformità alla direttiva EMC deve essere considerata nell'installazione finale di utilizzo. Gli uffici di TDK-Lambda Sas Succursale Italiana sono a vostra disposizione per ulteriori ragguagli.

Condizioni ambientali:

Questi prodotti sono classificati come IPX0, dunque non devono essere utilizzati sostanze chimiche/solventi, prodotti per la pulizia o liquidi di altra natura.

Ambiente:

Questo prodotto è un alimentatore a commutazione, destinato all'uso in applicazioni rientranti in ambienti con le seguenti caratteristiche: Livello inquinamento 2, Categoria sovratensione II. Questo prodotto contiene schede di circuiti stampati in materiali di Gruppo IIIb.

Carico in uscita:

La potenza in uscita ottenuta dall'alimentatore non deve superare la potenza nominale indicata sulla targhetta dell'alimentatore, fatto salvo dove indicato nei limiti per il prodotto specificati in questo manuale.

Parametri di alimentazione:

Questo prodotto deve essere utilizzato entro i parametri di alimentazione indicati nei limiti per il prodotto, specificati in questo manuale.

Smaltimento:

L'unità contiene componenti che richiedono procedure speciali di smaltimento. Accertarsi che l'unità venga smaltita in modo corretto al termine della vita utile e nel rispetto delle normative locali.



RISCHIO DI SCOSSA ELETTRICA

Avvertimento di alta tensione:

All'interno dell'alimentatore sono presenti tensioni pericolose. Gli installatori professionali devono proteggere il personale di manutenzione dal rischio di contatto accidentale con queste tensioni pericolose all'interno dell'apparecchiatura finale.

ATTENZIONE: Se installato in un'attrezzatura di classe I, questo prodotto deve essere collegato a terra in modo affidabile ed installato in modo professionale.

I coperchi/il telaio dell'unità non devono essere accessibili da parte dell'utente.

Il connettore dell'alimentazione principale non può essere utilizzato come terminale di collegamento di campo.

Non utilizzare viti che penetrano nell'unità per più di : Vedi disegni

Un fusibile interno protegge l'unità e non deve essere sostituito dall'utente. Nell'eventualità di un difetto interno, restituire l'unità a TDK-Lambda UK LTD o a uno dei suoi agenti autorizzati.

L'apparecchiatura finale deve includere una recinzione meccanica, elettrica e antincendio per proteggere dai pericoli di natura meccanica, dalle scosse elettriche e dai pericoli di incendio.

Pericoli energetici:

Alcuni moduli sono in grado di erogare energia pericolosa (240 VA) a seconda della tensione in uscita impostata. I produttori delle apparecchiature finali sono tenuti a proteggere il personale di manutenzione dal rischio di contatto accidentale con questi terminali dei moduli di uscita. Se impostati su livelli che non escludono l'erogazione di energia pericolosa, questi terminali o collegamenti non devono risultare accessibili da parte dell'utente.

Il coperchio/telaio dell'unità è realizzato per proteggere il personale esperto dai pericoli. Non deve essere usato come parte degli involucri esterni di qualsiasi apparecchiatura, se risulta accessibile da parte degli addetti, poiché è possibile che in condizioni di pieno carico una o più parti del telaio dell'unità giunga/giungano a temperature superiori ai limiti considerati sicuri per l'accesso da parte degli addetti.

Instrucciones generales de seguridad:

LEA LAS INSTRUCCIONES DE SEGURIDAD

Servicio:

Estos productos no pueden ser reparados por los clientes. TDK-Lambda UK LTD. y sus agentes autorizados son los únicos que pueden llevar a cabo las reparaciones.

Componentes fundamentales:

Estos productos no pueden ser utilizados como componentes fundamentales en sistemas de control nuclear, sistemas de soporte vital o equipos a utilizar en entornos peligrosos sin el consentimiento expreso por escrito del Director General de TDK-Lambda EMEA.

Uso de los productos:

Estos productos han sido diseñados para ser utilizados en un equipo central que restrinja el acceso al personal cualificado autorizado.

Este producto es una fuente de alimentación y sólo puede ser instalado por personal cualificado dentro de otros equipos y no debe ser tratado como un producto independiente. Este producto debe ser vendido entre empresas profesionales y solo puede obtenerse a través de los canales de distribución. No está destinado para la venta a usuarios finales

Este producto es una fuente de alimentación y no se ve afectada por la directiva EMC. El cumplimiento de la directiva EMC se debe considerar en la instalación final. Por favor, póngase en contacto con su oficina local de TDK – Lambda.

Medioambiental:

Estos productos son IPX0 y, por tanto, no pueden utilizarse sustancias químicas/disolventes, agentes de limpieza ni otros líquidos.

Medio ambiente:

Esta fuente de alimentación es una fuente de alimentación de modo conmutado a utilizar en aplicaciones dentro de un entorno con un Grado de contaminación 2 y una Categoría de sobretensión II. En él se utilizan policloruros de bifenilo del Grupo de materiales IIIb.

Carga de salida:

La potencia de salida tomada de la fuente de alimentación no puede sobrepasar el valor nominal indicado en la etiqueta de la fuente de alimentación, excepto en los casos indicados en las limitaciones del producto en este manual.

Parámetros de entrada:

Este producto debe ser utilizado dentro de los parámetros de entrada indicados en las limitaciones del producto en este manual.

Desecho de la unidad:

La unidad contiene componentes que deben ser desechados de una manera especial. Asegúrese de desechar correctamente la unidad al final de su vida útil y conforme a las normas locales vigentes.



PELIGRO DE DESCARGAS ELÉCTRICAS

Advertencia de alta tensión:

En esta fuente de alimentación hay tensiones peligrosas. El instalador profesional debe proteger al personal de servicio contra cualquier contacto accidental con estas tensiones peligrosas en el equipo final.

ADVERTENCIA: La instalación de este producto en un equipo de clase I la deben llevar a cabo profesionales y el producto debe estar conectado a tierra.

Debe impedirse el acceso de los usuarios a la cubierta o cubiertas y al chasis de la unidad.

El conector de entrada de la red no es apto para ser utilizado a modo de bornes de cableado de campo.

No utilice tornillos de montaje susceptibles de penetrar en la unidad más de: Ver dibujos.

Un fusible interno protege la unidad y este no debe ser nunca reemplazado por el usuario. En caso de existir algún defecto interno, la unidad debe ser enviada a TDK-Lambda UK LTD o a uno de sus agentes autorizados.

El equipo de uso final debe constituir un recinto de protección mecánica, eléctrica y contra incendios de protección mecánica, contra descargas eléctricas y contra el peligro de incendios.

Peligros de energía:

Algunos módulos pueden generar energía peligrosa (240VA) dependiendo de la configuración de la tensión de salida. Los fabricantes de equipos finales deben proteger al personal de servicio contra un contacto accidental con estos bornes de salida de los módulos. Si se configura de modo que pueda generarse energía peligrosa, hay que evitar que el usuario pueda acceder a los bornes o conexiones del módulo.

La cubierta/chasis de la unidad ha sido diseñada para que proteja a las personas cualificadas de los peligros. No deben ser utilizadas como parte de las cubiertas externas de cualquier equipo al que pueden acceder los operarios, ya que bajo unas condiciones de carga completa, la pieza o piezas del chasis de la unidad pueden alcanzar temperaturas superiores a las consideradas seguras para el acceso de los operarios.

Instruções gerais de segurança:

LEIA AS INSTRUÇÕES DE SEGURANÇA

Manutenção:

Estes produtos não são podem ser submetidos a manutenção por parte do cliente. Apenas a TDK-Lambda UK LTD e os seus agentes autorizados têm permissão para realizar reparações.

Componentes essenciais:

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

Utilização do produto:

Estes produtos foram concebidos para utilização dentro de um equipamento de alojamento que apenas permita o acesso a pessoal qualificado autorizado.

Este produto é uma alimentação considerado com um componente para ser instalado por pessoas qualificadas, em outros equipamentos. Não deve ser usado como um produto acabado.

Este produto é destinado para venda entre as empresas e pode ser obtido através de canais de distribuição.

Não se destina à venda aos particulares.

Este produto é uma alimentação considerado com um componente, não é dentro do application âmbito da directiva CEM.

Conformidade com a directiva CEM devem ser considerados na instalação final.

Entre em contacto com seu escritório TDK-Lambda mais próximo.

Ambiental:

Estes produtos são IPX0 e, como tal, não se devem utilizar químicos/solventes, agentes de limpeza e outros líquidos.

Ambiente:

Esta fonte de alimentação é uma fonte de alimentação do modo de comutação para utilização em aplicações com um Nível de Poluição 2 e ambientes da categoria de sobretensão II. São utilizadas placas de circuitos impressos do grupo de materiais IIIb.

Carga de saída:

A potência de saída extraída da fonte de alimentação não deve exceder a classificação assinalada na etiqueta da fonte de alimentação, excepto quando indicado nas limitações do produto neste guia.

Parâmetros de entrada:

Este produto deve ser utilizado dentro dos parâmetros de entrada indicados nas limitações do produto neste guia.

Eliminação no fim de vida:

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



RISCO DE CHOQUE ELÉCTRICO

Aviso de alta tensão:

Estão presentes tensões perigosas dentro da fonte de alimentação. O profissional que realizar a instalação deve proteger o pessoal de assistência contra contactos inadvertidos com estas tensões perigosas do equipamento final.

AVISO: Quando instalado num equipamento de Classe I, este produto deve ser ligado à terra de forma fiável e instalado por um profissional.

O chassis/cobertura(s) da unidade não deve estar acessível ao utilizador.

O conector de entrada de alimentação não deve ser utilizado como terminal de cablagens no local.

Não utilize parafusos de montagem, uma vez que estes penetrarão na unidade em mais do que: Veja os desenhos

Existe um fusível interno que protege a unidade e que não deve ser substituído pelo utilizador. Em caso de defeito interno, a unidade deve ser devolvida à TDK-Lambda UK LTD ou a um dos seus agentes autorizados.

O equipamento de utilização final deve fornecer um bastidor com protecção mecânica, eléctrica e contra incêndios adequada.

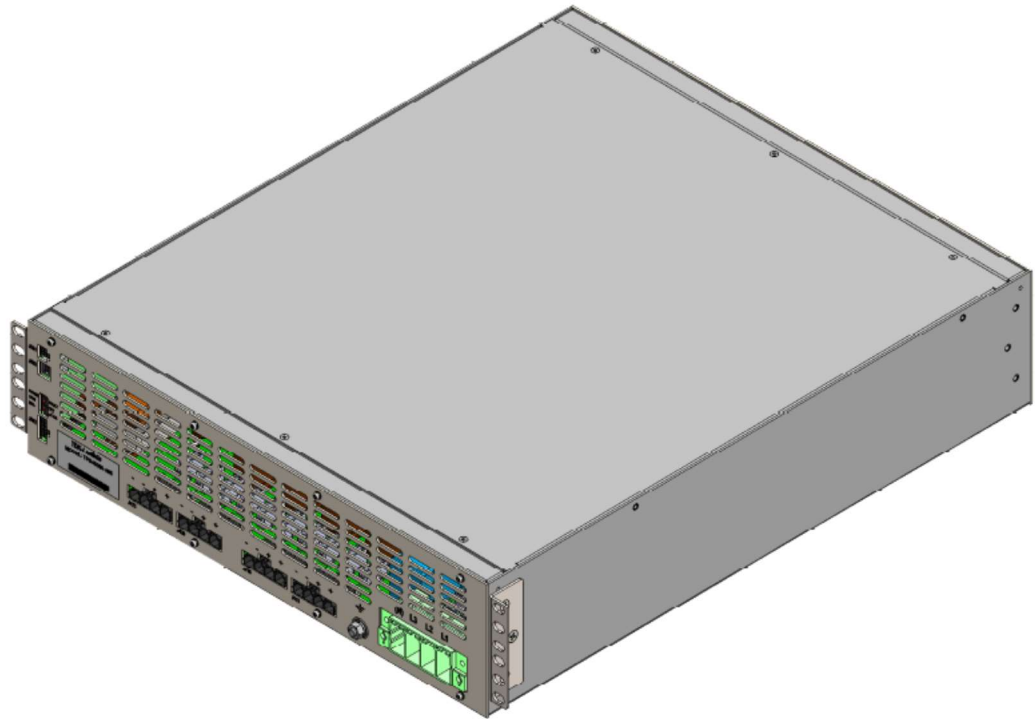
Perigos de energia:

Alguns módulos tem a capacidade de fornecer energia perigosa (240 VA), de acordo com a configuração da tensão de saída. O equipamento final do fabricante deve garantir que o pessoal de assistência está protegido contra contactos inadvertidos com estes terminais de saída do módulo. Se essa energia perigosa for produzida, as ligações e os terminais do módulo não devem ser acessíveis pelos utilizadores.

O chassis/cobertura da unidade está concebido de forma a proteger o pessoal especializado de perigos. Não devem ser utilizados como parte das coberturas externas de qualquer equipamento em que possam estar acessíveis aos operadores, uma vez que em condições de carga máxima, algumas peças do chassis da unidade podem atingir temperaturas superiores às consideradas seguras para o acesso do operador.

TDK·Lambda

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⚠ GENERAL SAFETY INSTRUCTIONS

High Voltage Warning

Dangerous voltages are present within the power supply.

Critical Components

This product is not authorized for use as a critical component in nuclear control systems, life support systems or equipment for use in hazardous environments without the express written approval of the Engineering Director of TDK-Lambda Americas.

Servicing

This product is not customer serviceable.

Unit repairs shall only be carried out by TDK- Lambda Americas or their Authorized agents.

Contact: TDK-Lambda Americas
401 Mile of Cars Way, Suite 325
National City, CA 91950
Tel 619-575-4400
Fax 619-575-7185

Safety Class of Protection

The unit is designed for the following parameters: Material Group IIIb, Pollution Degree 2, Overvoltage Category II, Class 1 (earthed), Indoor use. The unit is considered as fixed and rated IPX0. The TPF45000-385 are capable of providing hazardous energy (>240VA). The final equipment should provide protection to service personnel against inadvertent contact with the PSU output terminals.

Installation

This product is designed for use within other equipment which restricts access to Authorized competent personnel only. The unit covers/chassis must not be made user accessible.

The mains input connector is not acceptable for use as field wiring terminals.

The appliance must be securely mounted and the Ground Stud properly bonded to the main protective earth contact before any connection to AC mains supply is made.

The ventilation openings must not be impeded – ensure a space at least 5cm between any obstruction and the ventilation openings.

BEFORE USING THE POWER SUPPLY UNIT

Be sure to read this instruction manual thoroughly before using this product. Pay attention to all cautions and warnings before using this product. Incorrect usage could lead to an electrical shock, damage to the unit or a fire hazard.

⚠ DANGER

- Never use this product in locations where flammable gas or ignitable substances are present.

⚠ WARNING

- Do not make unauthorized changes to power supply unit, otherwise you might have electric shock and void your warranty.
- Do not touch this unit and the internal components in operation or shortly after shut down. They might have high voltage or high temperature and as the unit dissipates its heat so the surface of the unit is hot. You might receive electric shock or burn.
- When the unit is operating, keep your hands and face away from it; you might be injured by an accident.
- Do not use unit under unusual conditions such as emission of smoke or abnormal smell and sound etc. It might cause fire and electric shock. In such case, please contact us; do not repair by yourself, as it is dangerous for the user.
- Do not drop or insert anything into unit. It might cause failure and fire.
- Do not operate these units under condensation condition. It might cause fire and electric shock.

CAUTION

- As a component part, compliance with the standard will be based upon installation in the final application. This product must be installed in a restricted access location, accessible to authorized competent personnel only. The outputs of these products are energy hazards. The equipment has been evaluated for use in a Pollution Degree 2 environment.
- This product is designed for use within other equipment or enclosures which restrict access to authorized competent personnel only and must not be user accessible. Confirm connections to input/output terminals and signal terminals are correct as indicated in the instruction manual.
- Input voltage, Output current, Output power, ambient temperature and ambient humidity should be used within specifications, otherwise the unit will be damaged.
- For application equipment, which requires very high reliability (Nuclear related equipment, traffic control equipment, medical equipment, etc.), please provide fail safety function in the equipment.
- Do not use the product in environment with strong electromagnetic field, corrosive gas and conductive substance.
- Do not operate and store this unit at an environment where condensation occurs. In such case, waterproof treatment is necessary
- Never operate the unit under over current or shorted conditions for 30 seconds or more and out of Input Voltage Range as specification. Insulation failure, smoking, burning or other damage might occur to the unit.
- The output voltage of this power supply unit is considered to be a hazardous energy level (The voltage is 2V or more and the electric power is 240VA or more). Prevention from direct contact with output terminal is highly necessary. While installing or servicing this power supply unit, avoid dropping tools by mistake or direct contact with output terminal. This might cause an electrical shock. While repairing this power supply unit, the AC input power must be switched off and the input and output voltage should be level.
- The application circuits and their parameter are for reference only. Be sure to verify effectiveness of application circuits and their parameters before finalizing circuit design.
- Do not inject abnormal voltage to output terminal and signal terminal from the outside. The injection of reverse voltage or over voltage exceeding nominal output voltage to output terminals might cause damage to internal components.
- This information in this document is subject to change without prior notice. For actual design-in, please refer to the latest publications of data sheet, etc., for the most up-to date specifications of the unit.

Note: CE Marking, when applied to a product or packing material for a product covered by this handbook, indicates compliance with the Low Voltage Directive and RoHS Directive.

Note: UKCA Marking, when applied to a product or packing material for a product covered by this handbook, indicates compliance with the Electrical Equipment (Safety) Regulations and Restriction of the Use of Certain Hazardous Substances in Electrical & Electronic Equipment Regulations.

Ratings, Specifications and Features

Emissions		
AC Line Conducted Emissions	EN 55032:2015	(0.15-30 MHz) Class A with external filter *
Radiated RF Emissions	EN 55032:2015	0-1000 MHz Class A with external filter *
Immunity		
Electrostatic Discharge	IEC61000-4-2: 2008	+/-8 kV Air +/-4 kV Contact
RF Radiated Fields	EN 61000-4-3: 2006 +A1:2008 +A2:2010	3 V/m from 80-1000 MHz; (80% AM at 1kHz)
Electrical Fast Transients	EN61000-4-4: 2004+A1:2010	Power line pulses of ± 1 kV; I/O line pulses of ± 0.5 kV
Lightning Surge	IEC61000-4-5: 2005	± 4 kV common mode ± 2 kV differential mode
Conducted RF Common Mode	EN61000-4-6: 2009	150 kHz - 80 MHz at 3 Vrms 1 kHz 80% amplitude modulated
Power Frequency Magnetic Field	IEC61000-4-8:2009	30A/m (Continuous), 300A/m (Short)
Voltage Dips/Short Variations	IEC61000-4-11:2004	Dip to 0% of nom. line for 0.5 cycles - Criteria C Dip to 0% of nom. line for 1 cycles - Criteria C Dip to 40% of nom. line for 0.2 seconds - Criteria C Dip to 70% of nom. line for 0.5 seconds - Criteria C Dip to 80% of nom. line for 5 seconds - Criteria C
Voltage Dips/Short Variations	SEMI F47-0706	Dip to 50% of nom. line for 10 cycles - Criteria C Dip to 70% of nom. line for 25 cycles - Criteria C Dip to 80% of nom. line for 50 cycles - Criteria C

Table 1

*With appropriate installation

Maximum Ratings		
	Units	
Output Voltage Range	V	385
Rated Output Current (Power) ¹	A(W)	110 (42000)
Maximum Output Current (Power) ^{1,2}	A(W)	116 (45000)
Maximum Output Power with Dropped Phase	W	15000W
Minimum Load – Unit Enabled	A	0.5A (200W)
Minimum Load – Unit Inhibited ³	Ω	50
Operating Temperature	°C	-10°C to 50°C.
Start-up Temperature	°C	-20°C to +50°C

Table 2

¹ Load needs to remain off until the output voltage has reached 370VDC. If a load is drawn before the output has reached an appropriate voltage, the unit may go into a fault mode and shutdown. The DCOK signal will start to conduct when the output voltage has reached the appropriate level.

² Maximum output current (Power) allowable between 380VAC and 504VAC input.

³**Critical Note: If minimum load is not present while the unit is inhibited, the output can slowly be charged to unsafe levels. DO NOT remove output load connectors while unit is inhibited. Turn off AC input voltage before removing output connectors.**

Input Specifications		
	Units	
Input Voltage (nominal)		VAC 400/480 (50/60Hz) Three Phase Delta
Input Voltage (threshold)		VAC 360-528VAC (47-63Hz) Three Phase Delta, VAC 208-305VAC (47-63Hz) Three Phase Wye,
Input Current (RMS) Per Phase 400-480VAC input	A	75A @ 400VAC / 65A @ 480VAC (per phase)
Inrush Current (Peak, at cold start) Per Phase, 400-480VAC input *	A	Less than 150A per phase
Power Factor (at rated output power)	-	0.94 typical @ 400/480VAC line
Input EMI Conducted Emissions	-	FCC Class A, CISPR 22 Class A
Efficiency (at rated output power)	%	98 typical @ 400/480VAC line

Table 3

*excluding initial spike charging EMI capacitors lasting <2mS

Output Performance Specifications		
	Units	
Max Voltage Line Regulation	%	Less than 2%
Max Voltage Load Regulation	%	Less than 3%
Total Regulation	%	Less than 8%
Warm up Drift	%	Less than 3%
Temperature Stability	-	0.2% of rated Vout for 8hrs after 30min warm-up. Constant line, load & temp.
Temperature Coefficient	ppm/°C	400ppm/C
Output Ripple, JEITA RC-9131C ⁴	Vrms	<10
Remote Sense Compensation (Total)	V	Not applicable

Table 4

⁴See Ripple and Noise Notes for Details on Jeita RC-9131C method; All Three Phases present

Protective Functions		
	Units	
OCP TYPE	-	Foldback with delayed shutdown (latch). Manual reset by input cycling or remote control via the PMBus Interface.
OCP KNEE POINT	-	>116A
KNEE POINT PROTECTION	-	NONE. NO DAMAGE AT KNEE POINT
S/C PROTECTION	-	DAMAGE occurs if shorted during live operation. Will protect itself if started into a short circuit.
OVP TYPE	-	Latched shutdown. Manual reset by input cycling or remote control via the PMBus Interface.
OVP RANGE	-	395 +5/-1V
OVP RESET TIME	s	Not applicable
FAN FAIL	-	Blocked fan and fan failure detection. Manual reset by input cycling or remote control via the PMBus Interface.
OTP	-	Latch type. Manual reset by input cycling or remote control via the PMBus Interface.

Table 5

Operating Modes	
Series Operation	No
Parallel Operation	No

Table 6

Status Indicators	
DC OK	LED: GREEN when output >370VDC Turns OFF when output <350VDC
PHASE	LED: GREEN when all three phases of AC input are present, RED if: a) One of the Input AC Phases is low or lost (Applicable for 400/480 with 30% Load or greater). b) An internal fuse is open in one or more power modules.
ENA	LED: Green when the TPF45000-385 is commanded to turn ON either via I ² C command or via the hardware PSON signal.
FAULT	LED: RED if: a) AC power is applied to the unit and the output is OFF. b) One or more of the Fans is rotating slow or not working at all. c) DC Buss in one or more of the power modules is out of limit. d) OTP Condition. e) The unit is turned OFF via I ² C command or via the hardware PSON signal.
OTW	LED: RED when internal temperature approaches OTP setpoint This LED is normally OFF
OTP	LED: RED if any power module has been turned OFF due to over temperature condition This LED is normally OFF

Table 7

Remote Control Features	
Remote On/Off Control	On/Off control: Via signal connector. PSON High / Low thresholds: 6.0V / 0.6V 20V Maximum allowable. -20V Minimum allowable Signal applied between terminals 1 (PSON1) and 2 (PSON2) on Signal Connector. ISOLATED from Primary

Table 8

PMBus Features	
Output Voltage Monitoring	Output voltage monitoring via the PMBus. For reference only, no accuracy specified
Input Voltage Monitoring	Input voltage monitoring via the PMBus. Accuracy of the input reading is +/- 6% of full scale Measurement range is 200-310VAC (equivalent Line to Neutral)
Output Current Monitoring	Output current monitoring via the PMBus. Accuracy of the current reading is +/-12% of full scale above 50% load Measurement range is 0-110%
Internal Temperature Monitoring	Internal temperature monitoring via the PMBus. For reference only, no accuracy specified. Measurement range is 0-150°C
Remote On/Off Control	Supply ON/OFF control via the PMBus
Status Information	Status Information via the PMBus. See Table 13 for details on available status information
Product Information	Product information via the PMBus. Factory Programmed. Manufacturer ID, Model, Revision, Manufacturer location, Manufacturing Date and Serial Number

Table 9

Input, Output and Signal Connections	
Input	4 Pin connector. Recommended mating connector: Phoenix Contact 1762615
DC Output	Four parallel 4 pin connectors. It is recommended to split the output load equally across the four connectors. Do not exceed 50A on any individual connector. Recommended mating connector: MOLEX P/N: 42816-0412 Recommended receptacle contacts: MOLEX P/N: 42815-0114
Small Signal Connector	10 Pin connector. See Table 11 for pin configuration. Recommended mating connector: MOLEX P/N: 43025-1000 Recommended receptacle contacts: MOLEX P/N: 43030-0002
I ² C Bus Port	4 Pin connector: See Table 12 for pin configuration Recommended mating connector: MOLEX P/N: 43025-0400 Recommended receptacle contacts: MOLEX P/N: 43030-0002
USB Port	USB-Type B connector Used for I ² C communications Requires Microchip MCP2221 Driver and MCP2221 I ² C /SMBus Terminal These files are available at: https://www.microchip.com/en-us/product/MCP2221#document-table

Table 10

Small Signal Connector		
Name	Terminal Location	Description
ON/OFF (PSON1)	1	Remote On/Off control. See Remote Control Features section for additional details.
ON/OFF (PSON2)	2	Remote On/Off control. See Remote Control Features section for additional details.
AUX (+)	3	Auxiliary Output Voltage 13-15V, 0.2A Isolated Terminal 3 used for Return.
AUX (-)	4	Return for AUX (+)
RTN	5	Return for Phase Alarm, Fault alarm, DCOK, OTP and OTW signals
PHASE ALARM	6	Open collector. Max. sink current: 5mA. Off (open) when OK, ON (closed) when input phase missing (Applicable for 400/480 with 30% Load or greater). Open collector. Non Polarized, 60V peak, Max. sink current: 5mA _{DC} . 2Ω ON resistance, Isolated Terminal 5 used for Return.
FAULT ALARM	7	Conducts when Fault occurs Open collector. Non Polarized, 60V peak, Max. sink current: 5mA _{DC} . 2Ω ON resistance, Isolated Terminal 5 used for Return.
DC OK	8	Conducts when V _{out} is greater than 370VDC Open collector. Non Polarized, 60V peak, Max. sink current: 5mA _{DC} . 2Ω ON resistance, Isolated Terminal 5 used for Return.
OTP	9	Over Temperature Protection Conducts when any module shuts down due to over temperature condition Open collector. Non Polarized, 60V peak, Max. sink current: 5mA _{DC} . 2Ω ON resistance, Isolated Terminal 5 used for Return.
OTW	10	Over Temperature Warning Conducts when any module gets close to its OTP threshold. Open collector. Non Polarized, 60V peak, Max. sink current: 5mA _{DC} . 2Ω ON resistance, Isolated Terminal 5 used for Return.

Table 11

I ² C Bus Port		
Name	Terminal Location	Description
SMB GND	1	Return for I ² C
SMB ALERT	2	Interrupt Line for I ² C
SDA	3	Data Line for I ² C
SCL	4	Clock Line for I ² C

Table 12

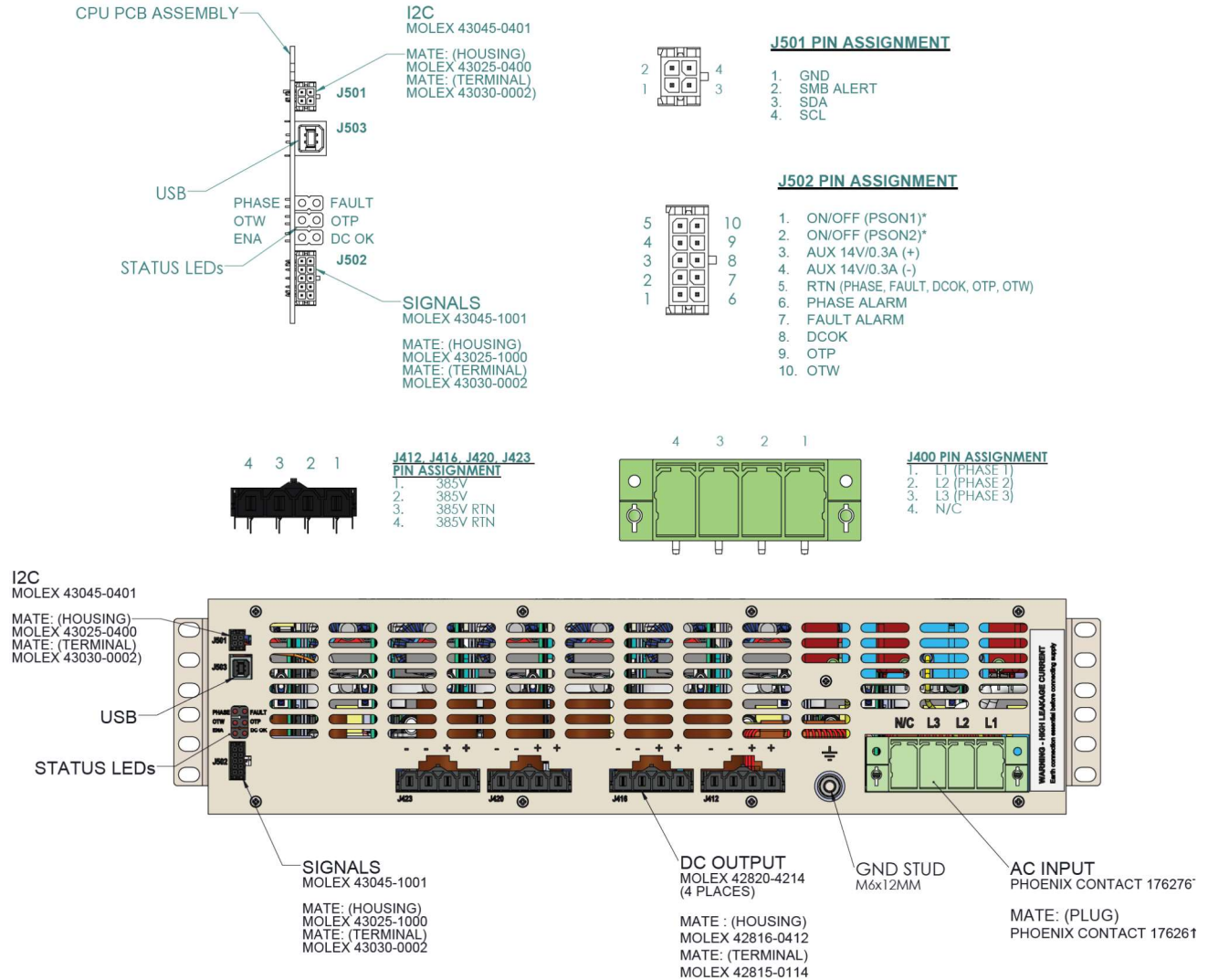


Figure 1: Pin assignments

Ripple and Noise Notes

Ripple and Noise is measured according to the description below in accordance with JEITA RC-9131C (Sections 7.16, 7.17 and 7.18).

The measurement connection is shown in Fig. 3-1.

C1 (0.1 μ F Ceramic Capacitor), C2 (47 μ F Aluminum Electrolytic Capacitor) must be connected in parallel at 30cm from the output terminals, along the load cable. Attach a maximum 1.5m 50 Ω coaxial cable from the ceramic capacitor electrodes to a filter attachment installed on the oscilloscope. The filter attachment consists of C3 (4700pF film capacitor) in series with R (50 Ω resistor). Use 100MHz bandwidth oscilloscope or equivalent.

In general, output ripple voltage and output spike noise voltage can be reduced by increasing external capacitance.

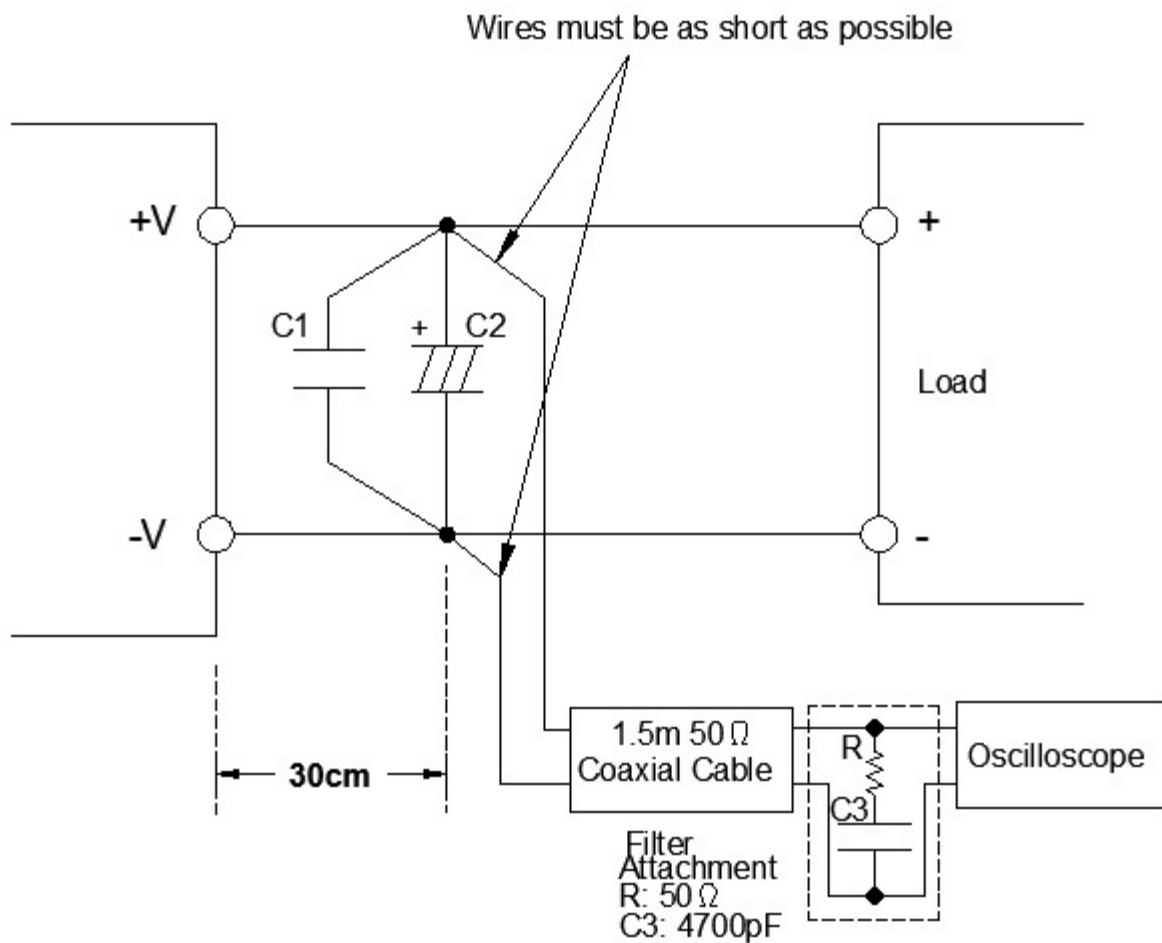
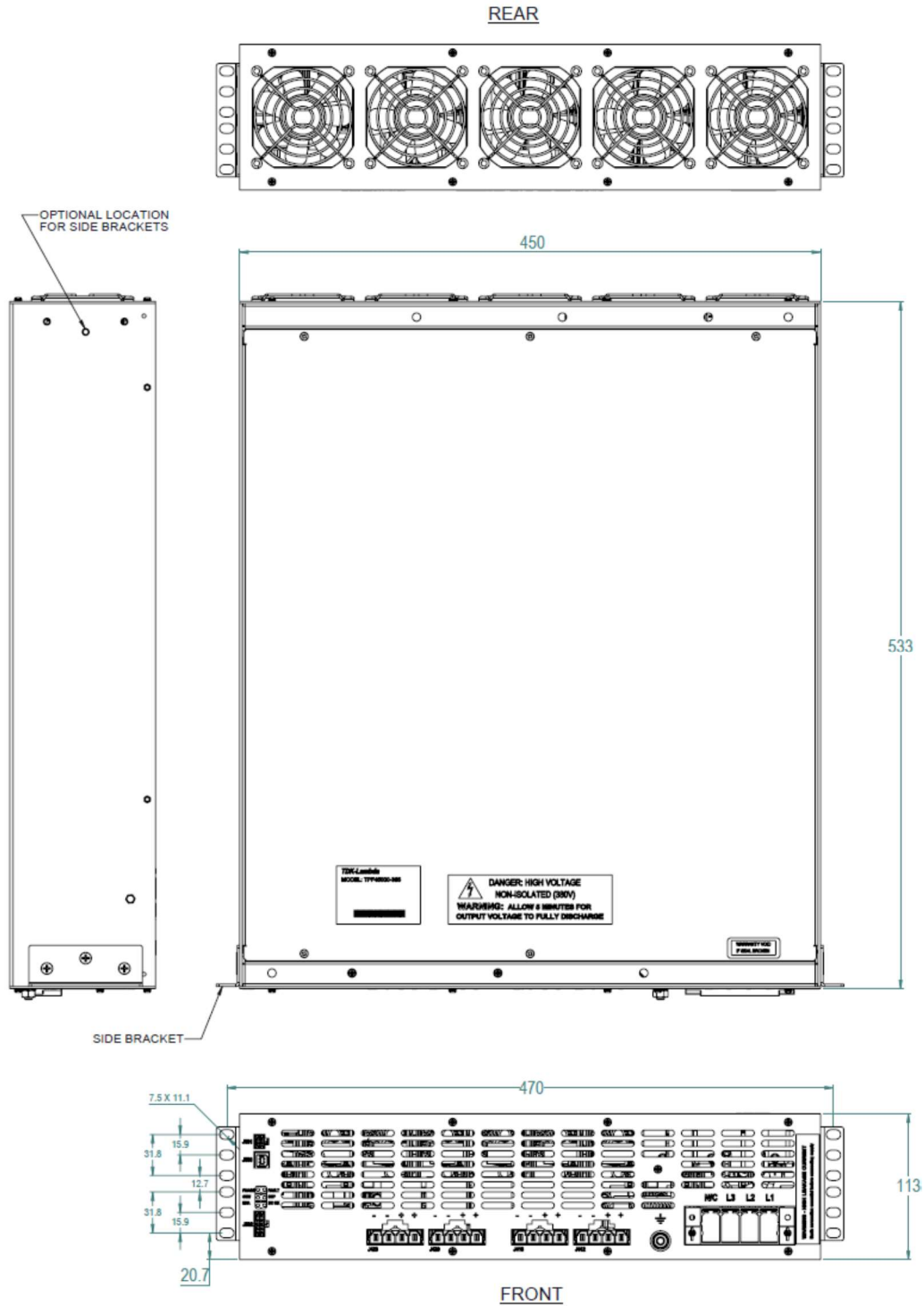


Figure 2: Output Ripple Voltage (including Spike Noise) Measurement Method

Mechanical Drawing

Overall dimensions for the TPF45000-385 is shown below:



The unit weight is approximately 30 kg and should be installed onto a shelf or support bracket/rails. Secure in place using M6 or 12/24 hardware into the two side brackets provided.

PMBus Interface

The TPF45000-385 has Power Management Bus (PMBus) hardware.

The PMBUS interface includes:

- Monitoring the Input Voltage (+/- 6% of Full Scale).
- Monitoring the Output Current (+/-12% of Full scale above 50% load).
- Monitoring the Output Voltage.
- Monitoring the Internal Temperature (For reference only, no accuracy specified).
- Programming the Output ON/OFF.
- Reading and Clearing Faults.
- Reading the Manufacturing Related Data (Model Name, Serial No, Manufacturing Date, etc.).

ATTENTION:

The PMBus supports:

- 100 KHz Operation.
- Block Read Protocol.
- Group Command Protocol.
- Direct Command Format for Monitoring and Programming
- Functions. Ver. 1.1 of PMBus Specifications.

ADDRESSING (A1, A0 inputs)

To communicate with the TPF45000-385, the master must first address the slave devices via a slave address byte. The slave address byte consists of seven address bits and a direction bit that indicates the intent to execute a read or write operation.

The 7 bit address has a constant part and variable part:

Constant part of address consists of 5 Most Significant Bits A6, A5, A4, A3 and A2 and always equals 01000.

Variable part of address consists of 2 Least Significant bits: A1 and A0 that allow up to 4 TPF45000-385 to be connected on a single bus. These two bits are assigned using the hardware connections of the TPF45000-385 address connector inside the unit.

The variable address lines (A1 and A0) are internally pulled up by resistors to +5V and can be left open for <1> address or connected for <0> address.

The Address Space contains these 4 possible addresses:

A6	A5	A4	A3	A2	A1	A0	R/W Byte	Hex Address
0	1	0	0	0	0	0	x	40h
0	1	0	0	0	0	1	x	42h
0	1	0	0	0	1	0	x	44h
0	1	0	0	0	1	1	x	46h

In case more than one unit is connected to PMBus, each unit must be set to its own unique address. Duplicate addressing is not allowed.

Note: The TPF45000-385 is always considered a slave device.

SERIAL CLOCK (SCL)

This line is clocked by the Master which controls the PMBUS. It is connected to +5.0V (referenced to "SIG_GND") via a 5.0kΩ pull-up resistor inside the TPF45000-385.

SERIAL DATA (SDA)

This is a Bi-Directional line which is connected to +5.0V (referenced to "SIG_GND") via a 5.0kΩ pull up resistor inside the TPF45000-385.

ALERT

ALERT is used to indicate to the HOST about any Faults/Error/Warning Conditions.

This line is connected to +5.0V (referenced to "SIG_GND") via a 3.0kΩ pull up resistor.

This Signal is HIGH to indicate that no fault/error/warning is present. If some fault/error/warning occurs, the signal will go LOW.

The Master must poll multiple units after receiving ALERT to retrieve fault/error/warning information.

Note: The TPF45000-385 does not respond to Alert Response Address.

PMBus COMMAND SET

- **OPERATION MODE**

This command is used to set the way you control the output of the TPF45000-385. Setting the Operation Mode to “*Remote Mode*” allow you to control the output using the “OPERATION ON/OFF” command via the I²C only.

In the “*Local Mode*” you can control the output using the “PSON” pins on the Signals connector only. The default is the “*Local Mode*”.

Command code	Type	Data sent
D8h	R/W Byte	00h=Remote
D8h	R/W Byte	80h=Local

- **OPERATION (ON/OFF)**

If the TPF45000-385 is turned OFF with the “*OPERATION OFF*” command, it can be turned ON with the “*OPERATION ON*” command.

Command code	Type	Data sent
01h	R/W Byte	00h=OFF
01h	R/W Byte	80h=ON

Note: This command will not work in the “*Local Mode*”.

- **CLEAR FAULTS**

This command is used to clear the “STATUS REGISTERS” after any fault occurs.

If the CLEAR_FAULTS command is not sent after any fault occurs, the “STATUS REGISTERS” will not be cleared.

ALERT signal will remain “LOW” until a “CLEAR_FAULTS” command is sent.

If a Fault or Warning is still present after “CLEAR_FAULTS” is sent, “STATUS REGISTERS” will be updated and the ALERT signal will be “LOW” again.

Command code	Type	#Data bytes
03h	Send Byte	0

- **READ_STATUS**

This Command is used to read the status of the TPF45000-385. The Status information is stored in a special register called the “STATUS REGISTER”

The Status reports 6 different types of Faults and Warnings.

Command Used	Type	#Data bytes
D0h	Read Word	1

Fault is indicated by “1”. No fault is indicated by”0”.

Faults	Type	Bit # in Status Register	Meaning	Output behavior
ON/OFF	FAULT	0	Global Output Enabled/Output Disabled	Output ON or OFF
OTW	WARNING	1	Internal temperature ~ 10°C below OTP limit.	Output ON
OTP	FAULT	2	Internal temperature higher than safe limit	Output OFF
DCOK	WARNING	3	Output Voltage < 85~95% of Set Vout on one or more modules	Output ON or OFF
PHASEOK	WARNING	4	One Input Phase Low or Out	Output ON
FANOK	FAULT/WARNING	5	Fan is rotating slow or Stopped	Output ON
ENA	WARNING	6	Module Output Enabled/Output Disabled	
ERROR	WARNING	7	I ² C Error	Output ON

Table 13

- **READ_OTP_STATUS**

This Command is used to determine which of the 10 modules inside the TPF45000-385 set the Over Temp Protection (OTP) Bit in the “STATUS REGISTER”.

Command Used	Type	#Data bytes
DBh	Read Word	2

Module in Fault is indicated by “1”.

Module	Bit # in 1 st Byte	Meaning
1	0	Internal temperature of Module #1 in OTP condition
2	1	Internal temperature of Module #2 in OTP condition
3	2	Internal temperature of Module #3 in OTP condition
4	3	Internal temperature of Module #4 in OTP condition
5	4	Internal temperature of Module #5 in OTP condition
6	5	Internal temperature of Module #6 in OTP condition
7	6	Internal temperature of Module #7 in OTP condition
8	7	Internal temperature of Module #8 in OTP condition

Module	Bit # in 2 st Byte	Meaning
9	0	Internal temperature of Module #9 in OTP condition
10	1	Internal temperature of Module #10 in OTP condition



Module #10 Module #1

- **READ_DC_STATUS**

This Command is used to determine which of the 10 modules inside the TPF45000-385 set the Output Fault (DCOK) Bit in the “STATUS REGISTER”.

Command Used	Type	#Data bytes
DCh	Read Word	2

Module in Fault is indicated by “1”.

Module	Bit # in 1 st Byte	Meaning
1	0	Output Voltage < 85~95% of Set Vout on Module #1
2	1	Output Voltage < 85~95% of Set Vout on Module #2
3	2	Output Voltage < 85~95% of Set Vout on Module #3
4	3	Output Voltage < 85~95% of Set Vout on Module #4
5	4	Output Voltage < 85~95% of Set Vout on Module #5
6	5	Output Voltage < 85~95% of Set Vout on Module #6
7	6	Output Voltage < 85~95% of Set Vout on Module #7
8	7	Output Voltage < 85~95% of Set Vout on Module #8

Module	Bit # in 2 st Byte	Meaning
9	0	Output Voltage < 85~95% of Set Vout on Module #9
10	1	Output Voltage < 85~95% of Set Vout on Module #10

- **READ_PHASE_STATUS**

This Command is used to determine which of the 10 modules inside the TPF45000-385 set the Input Phase Fault (PHASEOK) Bit in the “STATUS REGISTER”.

Command Used	Type	#Data bytes
DDh	Read Word	2

Module in Fault is indicated by “1”.

Module	Bit # in 1 st Byte	Meaning
1	0	One Input Phase Low or Out on Module #1
2	1	One Input Phase Low or Out on Module #2
3	2	One Input Phase Low or Out on Module #3
4	3	One Input Phase Low or Out on Module #4
5	4	One Input Phase Low or Out on Module #5
6	5	One Input Phase Low or Out on Module #6
7	6	One Input Phase Low or Out on Module #7
8	7	One Input Phase Low or Out on Module #8

Module	Bit # in 2 st Byte	Meaning
9	0	One Input Phase Low or Out on Module #9
10	1	One Input Phase Low or Out on Module #10

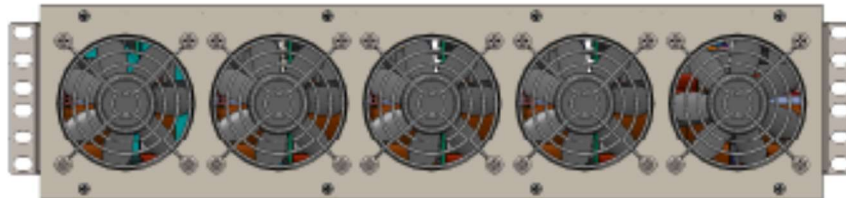
- **READ_FAN_STATUS**

This Command is used to determine the Fan(s) that set the Fan warning (FANOK) Bit in the “STATUS REGISTER” of the TPF45000-385.

Command Used	Type	#Data bytes
DFh	Read Byte	1

Fan in Fault is indicated by “1”.

Module	Bit #	Meaning
1	0	Fan #1 is rotating slow or Stopped
2	1	Fan #2 is rotating slow or Stopped
3	2	Fan #3 is rotating slow or Stopped
4	3	Fan #4 is rotating slow or Stopped
5	4	Fan #5 is rotating slow or Stopped



Fan #1 Fan #5

- **READ_ENA_STATUS**

This Command is used to determine which of the 10 modules inside the TPF45000-385 set the Output Enabled/Output Disabled (ENA) Bit in the “STATUS REGISTER”.

Command Used	Type	#Data bytes
DEh	Read Word	2

Module in Disable Mode is indicated by “1”.

Module	Bit # in 1 st Byte	Meaning
1	0	Vout of Module #1 Disabled
2	1	Vout of Module #2 Disabled
3	2	Vout of Module #3 Disabled
4	3	Vout of Module #4 Disabled
5	4	Vout of Module #5 Disabled
6	5	Vout of Module #6 Disabled
7	6	Vout of Module #7 Disabled
8	7	Vout of Module #8 Disabled

Module	Bit # in 2 st Byte	Meaning
9	0	Vout of Module #9 Disabled
10	1	Vout of Module #10 Disabled

- **READ_OPERATING_HOURS**

This Command is used to retrieve the Hours that the TPF45000-385 is been operational since first powered up.

Command Used	Type	#Data bytes
E0h	Read Word	2

The two bytes represent hours.

The total operating hours can be calculated by converting the data to decimal values, then multiply the High Byte by 255 and add the low byte.

Example: Assume the data received is 0x03, 0x45 → 03, 69 → 3*255+69=834Hrs

COMMANDS TO READ MANUFACTURING INVENTORY DETAILS

Command Name	Command code	Type	#Data bytes
PMBUS_REVISION	98h	Read Byte	1
MFR_ID	99h	Read Block	10
MFR_MODEL	9Ah	Read Block	12
MFR_REVISION	9Bh	Read Block	11
MFR_LOCATION	9Ch	Read Block	3
MFR_DATE	9Dh	Read Block	8
MFR_SERIAL	9Eh	Read Block	20

All details except for <PMBUS_REVISION> are stored in ASCII format.

MFR_REVISION:

Ex: 0x48,0x3A,0x50,0x32,0x3B,0x46,0x3A,0x30,0x2E,0x31,0x3B

H : P 2 ; F : 0 . 1 ;

Hardware follows by Firmware Rev.

MFR_DATE:

Ex: 0x30,0x33,0x2D,0x30,0x31,0x2D,0x31,0x37

M M - D D - Y Y

MONITORING FUNCTIONS

For Monitoring functions use the following equation

$$X = (Y * 10^{-R} - b) / m$$

Where **Y** - digital value received from the supply.

X is the normal value (V, A, °C)

m, b, R - coefficients that are explained in Table 1.

Table 1

Physical value	Physical Unit	Min. Value	Max. Value	m	b	R
Input Voltage monitoring	V	225	300	353	-28233	-2
Output Voltage monitoring	V	0	385	25575	0	-4
Output Current monitoring	%	0	110	100	0	0
Temperature monitoring	°C	0	150	23	4750	-1

m, b, R coefficients can also be recovered from the EEPROM and are stored in ASCII Format.

Ex:

```
0x4D,0x3A,0x30,0x31,0x33,0x39,0x42,0x3A,0x2D,0x30,0x33,0x39,0x52,0x3A,0x30,0x30
M : 0 1 3 9 B : - 0 3 9 R : 0 0
```

Command name	Command code	Type	#Data bytes
MFR_Vin_MON_COEFF	DAh	Read Block	16
MFR_Vout_MON_COEFF	D3h	Read Block	16
MFR_Iout_MON_COEFF	D5h	Read Block	16
MFR_TEMP_MON_COEFF	D7h	Read Block	16

- **READ_VIn**

This Command is used to retrieve the measured Input voltage of the TPF45000-385.

Command Used	Type	#Data bytes
88h	Read Word	2

Example:

Hex read back = 0x01, 0xE2. Converted to Decimal = 482. $V_{in} = ((482 * 10^2) + 28233) / 353 = 216.52V_{ac}$

- **READ_VOut**

This Command is used to retrieve the measured Output voltage of the TPF45000-385.

Command Used	Type	#Data bytes
8Bh	Read Word	2

- **READ_Iout**

This Command is used to retrieve the measured Output Load Current of the TPF45000-385.

Command Used	Type	#Data bytes
8Ch	Read Byte	1

Example:

Hex read back = 0x0C. Converted to Decimal = 12. $I_{out} = ((12 * 10^0) + 0) / 100 = 12\%$.

- **READ_Temperature**

This Command is used to retrieve the measured maximum internal temperature of the TPF45000-385.

Command Used	Type	#Data bytes
8Dh	Read Word	2

Example:

Hex read back = 0x02, 0x1F. Converted to Decimal = 543. $V_{in} = (543 * 10^1) - 4750 / 23 = 29.56^{\circ}C$