ENGLISH

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 (+) or (-) output(s) can be earthed or left floating.

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.

DEUTSCH

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 Netzteiles darf die Leistung, die auf dem Label des Netzteiles 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 Netzteiles 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 (+) oder (-) Ausgänge können geerdet werden oder unangeschlossen bleiben.

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.

FRANÇAIS

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.

Les sorties (+) ou (-) peuvent être raccordées à la terre ou laissées flotttantes.

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.

ITALIANO

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 assogettato 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 i 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.

Le uscite (+) o (-) possono essere messa a terra o lasciate isolate.

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.

ESPAÑOL

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.

La salida o salidas (+) o (-) pueden conectarse a tierra o se las puede dejar flotando.

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.

PORTUGUÊS

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 alimentaçao 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 alimentaçao considerado com um componente, não é dentro do appliquation 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.
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As saídas (+) e (-) podem ser ligadas à terra ou deixadas soltas.

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.

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FPS3000 SEREIS INSTRUCTION MANUAL

			FPS3000-12	FPS3000-24	FPS3000-32	FPS3000-48
1	Rated output voltage	V	12	24	32	48
2	Output voltage set point	V	12+/-1%	24+/-1%	32+/-1%	48+/-1%
3	Output voltage range	V	10.5~13.2	21.5~29.0	28.8~38.4	43.0~58.0
4	Maximum Output Current. Refer to Fig. 1	A	216	120	93	63
5	Maximum output power (*1)	W	2592	2880	2976	3000
6	Input voltage / frequency range (*2)	---	85~265Vrms continuous, 47~63Hz, Single phase			
7	AC input connector	---	FPS3000/P: IEC320 inlet at each FPS1000 unit front panel. FPS3000: Three IEC320 inlets at the rear panel, FPS3000/TB:Terminal Block (Refer to outline drawing)			
8	Maximum input current (at 100/200Vac)	A	12.0/6.0 for each FPS1000 unit installed			
9	Power Factor (Typ)	---	>0.98 at 115/230V and maximum output power for each AC input			
10	Efficiency (Typ) (*3)	%	81/83	84/86	84/86	85/88
11	Inrush current (*4)	A	Less than 40A for each input			
12	Hold-up time	mS	20mS typical, at 100Vac input, rated output voltage and less than 80% of rated load			
13	Maximum line regulation (*5)	---	0.40%			
14	Max load regulation (*6)	---	0.80%			
15	Output noise pk-pk (*7)	mV	150	200	250	300
16	Temperature stability	---	0.1% of rated Vout for 8hrs after 30min warm-up. Constant line,load and temperature.			
17	Temperature coefficient	PPM/°C	200			
18	Remote sensing (*8)	V	Possible. Refer to Instruction Manual.			
19	Parallel operation	---	Possible. Refer to Instruction Manual.			
20	Series operation	---	Possible. Refer to Instruction Manual.			
21	Over current protection	---	105~125% of maximum output current. Refer to Fig. 1			
22	Over voltage protection (*9) (*10)	V	14.3~15.7	31~34	41.5~45.5	62~66
23	Over temperature protection (*10)	---	Inverter shut down method, automatic reset.			
24	Remote On/Off control (*10)	---	By electrical signal or dry contact. ON: 0~0.6V or short. OFF: 2~15V or open.			
25	DC OK signal (*10)	---	Open collector signal. On when Vout 80+/-5% rated output. Max.sink current: 10mA			
26	Over-Temp. warning (*10)	---	Open collector signal. Refer to Instruction Manual.			
27	AC fail signal (*10)	---	Open collector signal. Refer to Instruction Manual.			
28	Auxiliary power supply	---	11.2~12.5VDC. 0.75A Maximum output current.			
29	Vout voltage trimming (*10)	---	Possible, via Vout Trim pin in the I/O connector.			
30	Front panel indicators	---	For each installed FPS1000 unit. AC OK, DC OK, DC FAIL			
31	I²C Interface	---	Optional. Refer to Instruction Manual.			
32	Operating temperatue	---	0~50°C: 100% load. Derate 2%/°C, 50°C to 60°C.			
33	Storage temperature	---	-30~85°C			
34	Operating humidity	---	10~90% RH, no condensation.			
35	Storage humidity	---	10~95% RH, no condensation.			
36	Cooling	---	By internal Fans in each installed FPS1000 unit. Variable speed control.			
37	Vibration	---	Built to meet ETS 300 019			
38	Shock	---	Built to meet ETS 300 019			
39	Conducted emission	---	For each AC input. EN55022B, FCC part 15J-B, VCCI-B			
40	Radiated emission	---	EN55022B, FCC part 15J-B, VCCI-B			
41	Applicable safety standards	---	UL60950-1, EN60950-1			
42	Withstand voltage	---	Input-Output: 3000Vrms, 1min. Input-Ground: 2000Vrms, 1min. Output-Ground: 500Vrms, 1min.			
43	Insulation resistance	---	More than 100Mohm at 25°C and 70% RH. Output-Ground: 500Vdc			
44	Leakage current: Type IEC Inlet	mA	For each AC input. Less Than 1.1mA at 230Vac			
45	Leakage current: Type TB	mA	Less Than 3.5mA at 230Vac			
46	Weight (Typ)	Kg	10.0			
47	Size (W*H*D)	---	440x44x351mm. Refer to Outline Drawing.			

Notes:
*1: For input voltage lower than 100Vac, maximum output power derated by 10%.
*2: For cases where conformance to various safety standards (UL, EN etc.) is required, to be described as 100-240Vac (50/60Hz).
*3: At 100/200Vac, rated load and 25°C ambient temperature.
*4: Not applicable for the noise filter inrush current less than 0.2mS.
*5: From 85~132Vac or 170~265Vac, constant load.
*6: From No-load to Rated load, constant input voltage. Measured at the sensing point in Remote sense.
*7: Measured with JEITA RC-9131A 1:1 probe, 20MHz B.W.
*8: Remote sensing can compensate up to 1V drop on each load wire.
*9: Inverter shut down method. Reset by AC voltage recycle or by On/Off control.
*10:For each installed FPS1000 unit.

V/I	FPS3000-12	FPS3000-24	FPS3000-32	FPS3000-48
V1	12V	24V	32V	48V
V2	13.2V	29V	38.4V	58V
I1	198A	99A	78A	51.75A
I2	216A	120A	93A	63A

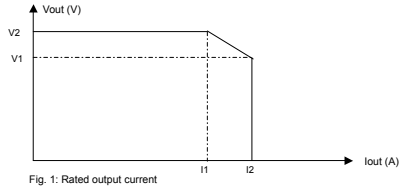


Fig. 1: Rated output current

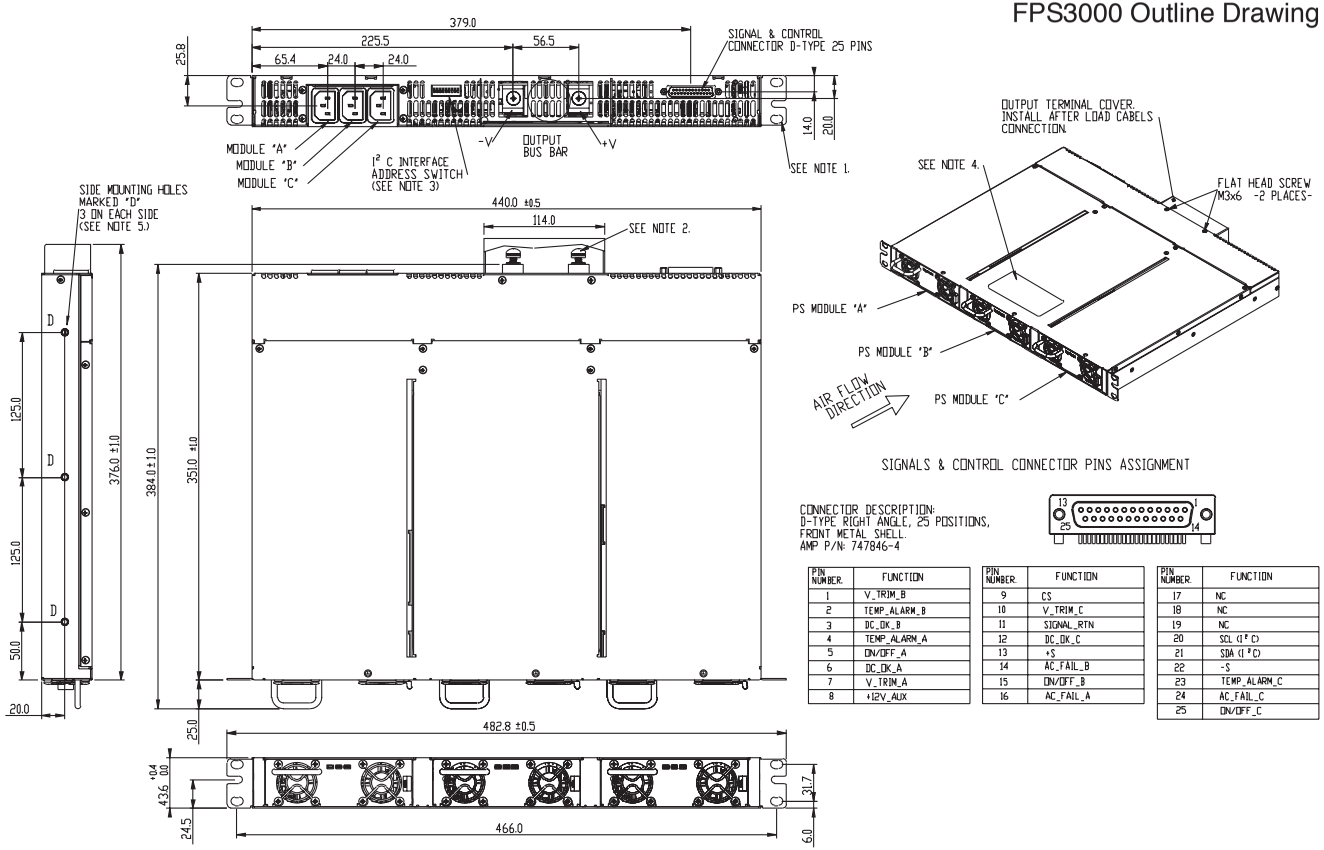
REAR PANEL IN/OUT CONNECTOR PINS FUNCTION DESCRIPTION

Refer to the following table for description of the control and supervisory signals provided at the rear In/Out connector.
Refer to Fig. 1-1~6-1 for typical connections for operation.

Pin No	Function	Description
1	V_TRIM_B	Connection for output voltage trimming of FPS1000 unit "B". The voltage can be trimmed within its range specifications.
2	TEMP_ALARM_B	Open collector signal, referenced to pin 11 (Signal Return). On when the internal temperature of FPS1000 unit "B" is within safe limit, Off approx. 10°C below Thermal shut down. The maximum sink current is 10mA and the maximum external voltage is 15V.
3	DC_OK_B	Open collector signal, referenced to pin 11 (Signal Return). On when the output voltage of FPS1000 unit "B" is higher than Vout ≥ 80% +/-5%. The maximum sink current: 10mA and the maximum external voltage is 15V.
4	TEMP_ALARM_A	Open collector signal, referenced to pin 11 (Signal Return). On when the internal temperature of FPS1000 unit "A" is within safe limit, Off approx. 10°C below Thermal shut down. The maximum sink current is 10mA and the maximum external voltage is 15V.
5	ON/OFF_A	Turns the output of FPS1000 unit "A" to On and Off by electrical signal or dry contact between pin 5 and pin 11 (Signal Return). 0~0.6V or Short: On, 2~15V or Open: Off. The maximum sink current is 2.6 mA
6	DC_OK_A	Open collector signal, referenced to pin 11 (Signal Return). On when the output voltage of FPS1000 unit "A" is higher than Vout ≥ 80% +/-5%. The maximum sink current: 10mA and the maximum external voltage is 15V.
7	V_TRIM_A	Connection for output voltage trimming of FPS1000 unit "A". The voltage can be trimmed within its range specifications.
8	+12V_AUX	Auxiliary voltage output, 11.2~12.5V, referenced to pin 11 (Signal Return). The maximum load current is 0.25A. This output has built in Oring diode and is not controlled by the On/Off control.
9	CS	Current sharing signal. When FPS-S1U racks are connected in parallel, the CS pins of the units should be connected to allow current balance between units.
10	V_TRIM_C	Connection for output voltage trimming of FPS1000 unit "C". The voltage can be trimmed within its range specifications.
11	SIGNAL_RETURN	Return for the following control and supervisory signals: On/Off, DC_OK, Over_temperature Alarm, AC_Fail, Auxiliary 12V supply. The Signal return is isolated from the output terminals.
12	DC_OK_C	Open collector signal, referenced to pin 11 (Signal Return). On when the output voltage of FPS1000 unit "C" is higher than Vout ≥ 80% +/-5%. The maximum sink current: 10mA and the maximum external voltage is 15V.
13	+SENSE	Positive sensing. The +Sense signal should be connected to the positive terminal of the load. The +Sense and -Sense leads should be twisted pair to minimize noise pick-up effect. The maximum load wires drop compensation is 1V/wire.
14	AC_FAIL_B	Open collector signal, referenced to pin 11 (Signal Return). On when the input voltage of FPS1000 unit "B" is ≥85Vrms. The maximum sink current is 10mA, and the maximum external voltage is 15Vdc.
15	ON/OFF_B	Turns the output of FPS1000 unit "B" to On and Off by electrical signal or dry contact between pin 15 and pin 11 (Signal Return). 0~0.6V or Short: On, 2~15V or Open: Off. The maximum sink current is 2.6 mA
16	AC_FAIL_A	Open collector signal, referenced to pin 11 (Signal Return). On when the input voltage of FPS1000 unit "A" is ≥85Vrms. The maximum sink current is 10mA, and the maximum external voltage is 15Vdc.
17	NC	Not connected
18	NC	Not connected
19	NC	Not connected
20	SCL (I^2C)	Serial Clock used in the I^2C interface option. Refer to the I^2C interface description in the FPS1000 Instruction Manual.
21	SDA (I^2C)	Serial Data used in the I^2C interface option. Refer to the I^2C interface description in the FPS1000 Instruction Manual.
22	-SENSE	Negative sensing. The -Sense signal should be connected to the negative terminal of the load. The -Sense and +Sense leads should be twisted pair to minimize noise pick-up effect. The maximum load wires drop compensation is 1V/wire.
23	TEMP_ALARM_C	Open collector signal, referenced to pin 11 (Signal Return). On when the internal temperature of FPS1000 unit "C" is within safe limit, Off approx. 10°C below Thermal shut down. The maximum sink current is 10mA and the maximum external voltage is 15V.
24	AC_FAIL_C	Open collector signal, referenced to pin 11 (Signal Return). On when the input voltage of FPS1000 unit "C" is ≥85Vrms. The maximum sink current is 10mA, and the maximum external voltage is 15Vdc.
25	ON/OFF_C	Turns the output of FPS1000 unit "C" to On and Off by electrical signal or dry contact between pin 25 and pin 11 (Signal Return). 0~0.6V or Short: On, 2~15V or Open: Off. The maximum sink current is 2.6 mA

Table 1: Rear In/Out connector pins function description (J1)

FPS3000 Outline Drawing



SIGNALS & CONTROL CONNECTOR PINS ASSIGNMENT

CONNECTOR DESCRIPTION:
D-TYPE RIGHT ANGLE, 25 POSITIONS,
FRONT METAL SHELL.
AMP P/N: 747846-4

PIN NUMBER	FUNCTION
1	V_TRIM_B
2	TEMP_ALARM_B
3	DC_OK_B
4	TEMP_ALARM_A
5	ON/OFF_A
6	DC_OK_A
7	V_TRIM_A
8	+12V_AUX

PIN NUMBER	FUNCTION
9	CS
10	V_TRIM_C
11	SIGNAL_RTN
12	DC_OK_C
13	+S
14	AC_FAIL_B
15	ON/OFF_B
16	AC_FAIL_A

PIN NUMBER	FUNCTION
17	NC
18	NC
19	NC
20	SCL (I²C)
21	SDA (I²C)
22	-S
23	TEMP_ALARM_C
24	AC_FAIL_C
25	ON/OFF_C

NOTES:
1. MOUNTING HOLES FOR 19" RACK. USE M6x12 TO FIX THE UNIT TO A RACK.
2. M6x16 SCREWS FOR LOAD WIRES FIXING. USE M6 LUG FOR THE LOAD WIRES. RECOMMENDED TIGHTENING TORQUE 42~36 Kgf.cm
3. REFER TO INSTRUCTION MANUAL FOR SETTING DETAILS.
4. MODEL NAME , VOLTAGE AND CURRENT RATING AND SAFETY APPROVALS SYMBOLS ARE SHOWN HERE ACCORDING TO THE SPECIFICATIONS.
5. MOUNTING HOLES M5 FOR MOUNTING BRACKETS , USE M5x8 SCREWS TO FIX THE BRACKETS TO THE CHASSIS. SCREWS MUST NOT PENETRATE THE CHASSIS MORE THAN 6 mm.

FPS3000 SAFETY INSTRUCTIONS

SAFETY APPROVALS

SAFETY APPROVALS
UL 60950-1 and CSA22.2 No.60950-1 - UL Recognized. C-UL for Canada.
IEC 60950-1 - CB Report and Certificate.
EN 60950-1 - CE mark.
Marking by the CE Symbol indicates compliance to the Low Voltage Directive of the European Union.
A "Declaration of Conformity" in accordance with the preceding directives and standards has been made and is on file at our EU representative TDK LAMBDA UK, located at Kingsley Avenue, Ilfracombe, Devon EX34 8ES, UK.

A "Declaration of Conformity" may be accessed via company website www.uk.tdk-lambda.com/technical-data

SAFETY INSTRUCTIONS

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

Vorsicht: Die folgenden Sicherheitsvorschriften müssen vor Inbetriebnahme und in jedem Betriebszustand bei Service oder Reparatur beachtet werden. Missachtung der Sicherheitsvorschriften und Warnhinweise aus diesem Handbuch führen zur Verletzung der bestehenden Sicherheitsstandards. Bei Betrieb des Gerätes ausserhalb dem bestimmungsgemässen Einsatz können die im Gerät integrierten Schutzfunktionen beeinträchtigt werden. TDK-Lambda ist nicht haftbar für Schäden, die durch Missachtung dieser Sicherheitsvorschriften entstehen können.

CAUTION: FPS3000 units are not authorized for use as critical component 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.

Vorsicht: Dieses Produkt ist nicht für die Verwendung als kritische Komponente in nuklearen Steuerungssystemen, lebenserhaltenden Systemen oder Geräte für den Einsatz in gefährlichen Umgebungen, ohne die ausdrückliche schriftliche Genehmigung durch TDK-Lambda zugelassen

INSTALLATION (OVERVOLTAGE) CATEGORY& ENVIRONMENTAL CONDITIONS

The FPS3000 units have been evaluated to Overvoltage category II.
The FPS3000 units intended for use in the following operation conditions:
* Indoor use
* Pollution degree 2
* Max. operational altitude: 3000m above sea level
*Ambient temperature: -10°C-50°C at 100% load, up to 70°C with output de-rating applied (See Specification)

GROUNDING

FPS3000 units are Class I product. To minimize electrical shock hazard, the FPS3000 units must be connected to an electrical ground. The instruments must be connected to the AC power supply mains through a three conductor power cable, 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 any other 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.

Erdungskonzept
Dieses Produkt ist ein Gerät der Schutzklasse 1. Zur Vermeidung von gefährlichen Energieinhalten und Spannungen, ist das Gehäuse an eine Schutzerde anzuschliessen. Der PE-Anschluss ist an einen festen Erder anzuschliessen. Bei Festverdrahtung des Gerätes ist sicherzustellen, dass der PE Anschluss als erstes angeklemmt wird. Jede mögliche Unterbrechung des PE-Leiters oder Trennung der PE Verbindung kann einen möglichen elektrischen Schlag hervorrufen, der Personenschäden zur Folge hätte.

LIVE CIRCUITS

Operating personnel must not remove the FPS3000 units cover.
No internal adjustment or component replacement is allowed by non-TDK Lambda qualified service personnel. Never replace components with power cables connected. To avoid injuries, always disconnect power, discharge circuits and remove external voltage sources before touching components.

Restricted Access Area: FPS3000 units should only be installed in a Restricted Access Area.
Access should be available to service personnel only.

Spannungsführende Teile

Die Geräteabdeckung darf nicht durch Endanwender geöffnet werden. Interne Modifikationen, sowie Bauteileaustausch ist nur durch TDK-Lambda qualifiziertes Personal erlaubt. Vor Austausch von Bauteilen ist das Netzkabel bzw. die Versorgungsspannung zu trennen. Energieversorgungsanschlüsse sind immer zu trennen, um Personenschäden durch gefährliche Energieinhalte und Spannungen auszuschliessen. Die Stromkreise sind zu entladen, externe Spannungsquellen sind zu entfernen, bevor auf Bauteile bzw. Komponenten Ebene gearbeitet wird.

PARTS SUBSTITUTIONS & MODIFICATIONS

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

CAUTION

Risk of electrical shock and energy hazard.
Disconnecting one power supply line disconnects only one power supply module. To isolate the unit completely, disconnect all power supply lines. Terminal blocks should only be used by professional workers to connect AC cables.

ATTENTION

Risque de choc et de danger e'lectriques. Le de'branchement d'une seule alimenttation stabilise'e ne de'branche uniquement qu'un module "Alimentation Stabilise'e". Pour isoler completement le module en cause, il faut de'brancher toutes les alimentations stabilise'es.

ACHTUNG

Spannungsfuehrende Teile - Gefahr durch elektrischen Schlag order hohe Energieinhalte. Alle Netzstecker der einzelnen Komponenten bzw. der Einschuebe muessen getrennt werden, damit das System "spannungsfrei" ist.

Die Eingangsklemme der Stromversorgung ist nur innerhalb eines Gesamtsystemes zu verwenden.

Do not connect FPS3000 units to mains supply exceeding the input voltage and frequency rating. The input voltage and frequency rating is: 100-240V~, 50/60Hz. For safety reasons, the mains supply voltage fluctuations should not exceed +/-10% of nominal voltage.
The leakage current of the end use equipment not exceed 3.5mA.

ENERGY HAZARD

The main output of FPS3000 units is capable of providing hazardous energy. Due to hazardous energy level the output and connections therefore must not be user accessible. Manufacturer's final equipment must provide protection to service personnel against inadvertent contact with output bus bars.

FUSE

The FPS3000 units consist of FPS-S1U rack with three FPS1000 units installed.
There are no fuses in the FPS-S1U rack.
FPS1000 internal fuse is sized for fault protection and if a fuse was opened it would indicate that service is required. Fuse replacement should be made by qualified technical personnel.
FPS1000 unit's fuse ratings are described below. F101: F20A H 250Vac; F102: 6.3A 400VDC

SICHERUNGEN

Vor Anschluss an die Netzversorgung ist die Aufstellanleitung zu beachten!
1. Absicherung: F101: F20A H 250VAC; F102: 6.3A 400VDC
2. Die Gehaeuseabdeckung darf nur im stromlosen Zustand geoeffnet werden.

ACHTUNG: Sicherungen duerfen nur durch geschulte Service Personen getauscht werden.

Überstromschutz

Eine leicht zugängliche Vorsicherung mit 20A max. pro Eingang muss in der Hausinstallation vorgesehen werden

SYMBOLS

CAUTION Risk of Electrical Shock.

Instruction manual symbol. The instrument will be marked with this symbol when it is necessary for the user to refer to the instruction manual.

Indicates hazardous voltage.

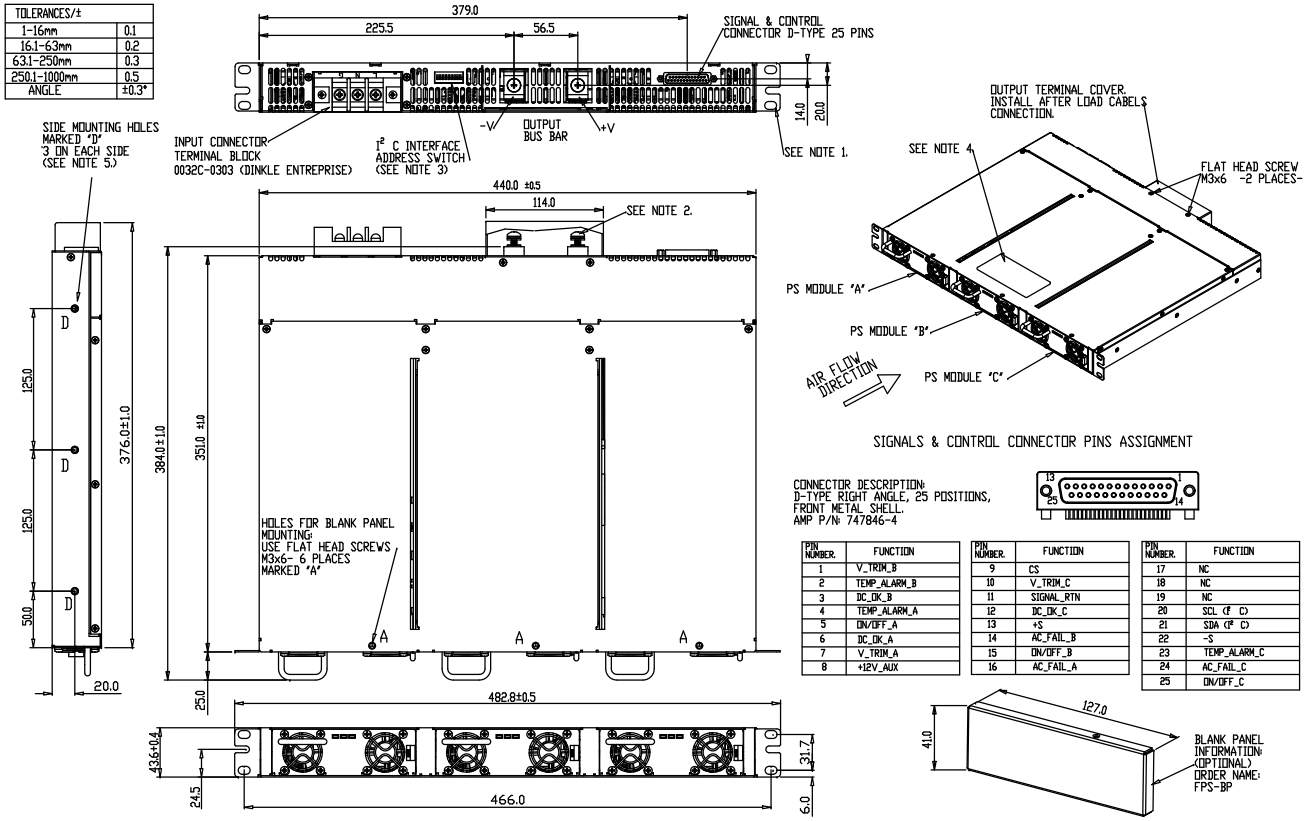
Indicates ground terminal.

Protective Ground Conductor Terminal

WARNING — Denotes hazard. An attention to a procedure is called. Not following the procedure correctly could result in personal injury. A WARNING sign should not be skipped and all indicated conditions must be fully understood and met.

CAUTION — Denotes hazard. An attention to a procedure is called. Not following the procedure correctly could result in damage to the equipment.

FPS3000/TB Outline Drawing



SIGNALS & CONTROL CONNECTOR PINS ASSIGNMENT

CONNECTOR DESCRIPTION:
D-TYPE RIGHT ANGLE, 25 POSITIONS,
FRONT METAL SHELL.
AMP P/N: 747846-4

PIN NUMBER.	FUNCTION
1	V_TRIM_B
2	TEMP_ALARM_B
3	DC_OK_B
4	TEMP_ALARM_A
5	ON/OFF_A
6	DC_OK_A
7	V_TRIM_A
8	+12V_AUX

PIN NUMBER.	FUNCTION
9	CS
10	V_TRIM_C
11	SIGNAL_RTN
12	DC_OK_C
13	+S
14	AC_FAIL_B
15	ON/OFF_B
16	AC_FAIL_A

PIN NUMBER.	FUNCTION
17	NC
18	NC
19	NC
20	SCL (I² C)
21	SDA (I² C)
22	-S
23	TEMP_ALARM_C
24	AC_FAIL_C
25	ON/OFF_C

NOTES
1. MOUNTING HOLES FOR 19" RACK. USE M6x12 TO FIX THE UNIT TO A RACK.
2. M6x16 SCREWS FOR LOAD WIRES FIXING. USE M6 LUG FOR THE LOAD WIRES. RECOMMENDED TIGHTENING TORQUE 42~56 Kgf.cm
3. REFER TO INSTRUCTION MANUAL FOR SETTING DETAILS.
4. MODEL NAME , VOLTAGE AND CURRENT RATING AND SAFETY APPROVALS SYMBOLS WILL BE SHOWN HERE ACCORDING TO THE SPECIFICATIONS.
5. MOUNTING HOLES M5 FOR MOUNTING BRACKETS , USE M5x8 SCREWS TO FIX THE BRACKETS TO THE CHASSIS. SCREWS MUST NOT PENETRATE THE CHASSIS MORE THAN 6 mm.
6. THE FPS-S1U/TB RACK IS SHOWN WITH 3 FPS1000 UNITS INSTALLED.

TDK·Lambda

FPS3000 CONNECTIONS FOR OPERATION

1. REMOTE SENSING*

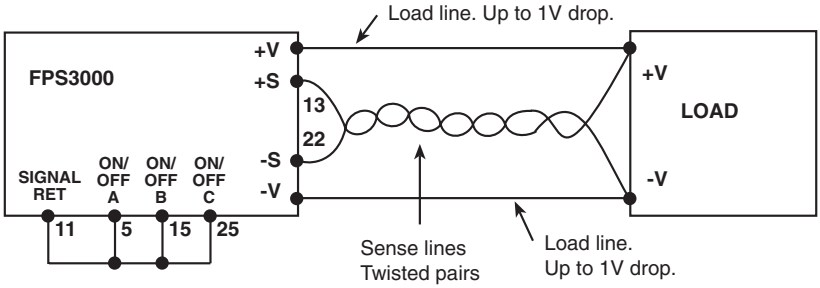
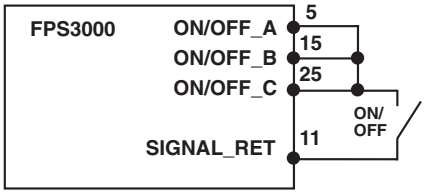


Fig 1-1

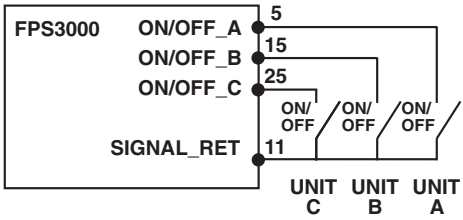
* In Local sense applications, the +/- sense have to be connected to the +/-V terminals of the FPS3000 prior to operating the FPS1000 units plugged in.

2. ON/OFF CONTROL



On/Off by single On/Off control

Fig 2-1



Individual unit On/Off control

Fig 2-2

3. OUTPUT VOLTAG TRIMMING

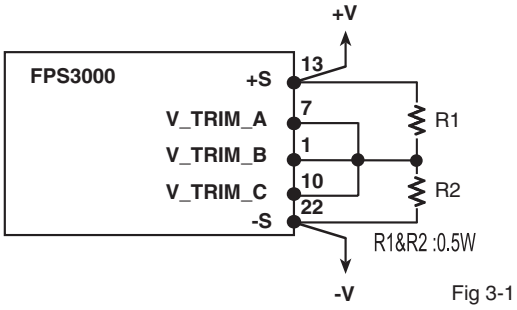


Fig 3-1

FPS3000-12

$R_2 = 0.0324 * V_{out}^2 - 1.1298 * V_{out} + 9.9342$

R1(KΩ)= 5(KΩ)-R2(KΩ)

FPS3000-24

$R_2 = 0.0785 * V_{out}^2 - 5.819 * V_{out} + 105.132$

R1(KΩ)=20(KΩ) -R2(KΩ)

FPS3000-32

$R_2 = 0.0463 * V_{out}^2 - 4.5805 * V_{out} + 109.49$

R1(KΩ)=20(KΩ) -R2(KΩ)

FPS3000-48

$R_2 = 0.0497 * V_{out}^2 - 7.2795 * V_{out} + 259.04$

R1(KΩ)=50(KΩ) -R2(KΩ)

4. SUPERVISORY SIGNALS

Signals are accessible at the J1-DB25 Female connector on the rear panel of the rack.
Fig 4-1 shows typical connection for FPS1000 unit 'A' Inside the rack.
Units 'B' and 'C' connections (refer to Table 1).

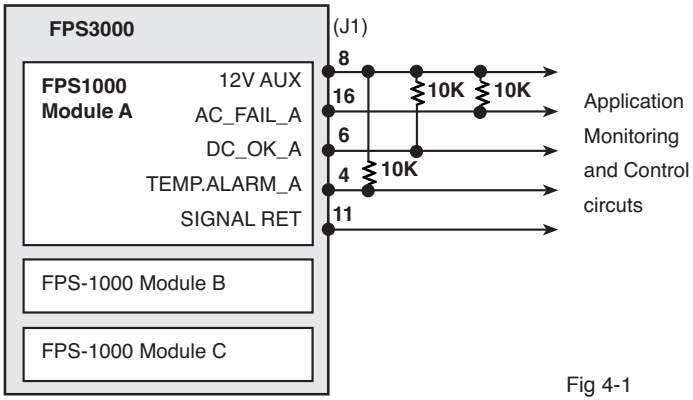


Fig 4-1

Note: AC_FAIL, DC_OK and TEMP.ALARM are open collector signals.

5. PARALLEL OPERATION

5.1. Remote sensing and current balance

Two FPS3000 units of the same output voltage rating can be connected in parallel. The built-in Oring diodes on the main output and on the +12V auxiliary voltage in each FPS1000 unit allow N+1 operation. By connecting the CS signal between the paralleled units, automatic current balance is achieved, with +/-10% accuracy. For input voltages less than 100Vac, maximum output Power derated by 10% of the Power rating.

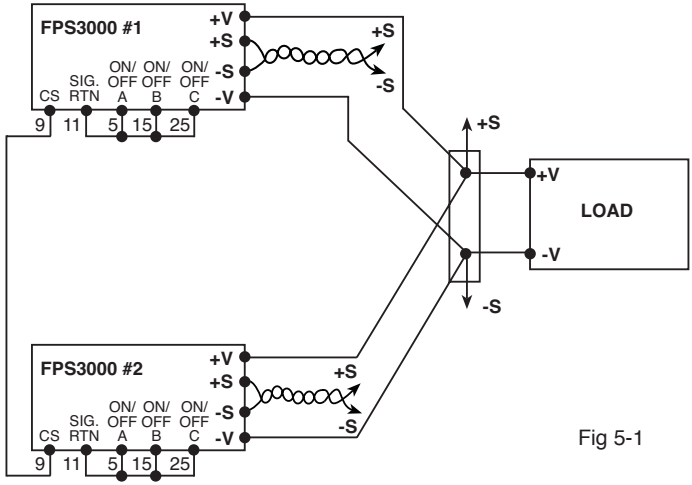


Fig 5-1

6. SERIES OPERATION

Up to 2 units of the same voltage and current rating can be used for increased output voltage
It is recommended that diodes be connected in parallel with each unit output to prevent revese voltage.
Each diode should be rated to at least the power supply rated output voltage and output current.

CAUTION

Series operation is not applicable for units with I2C bus option.

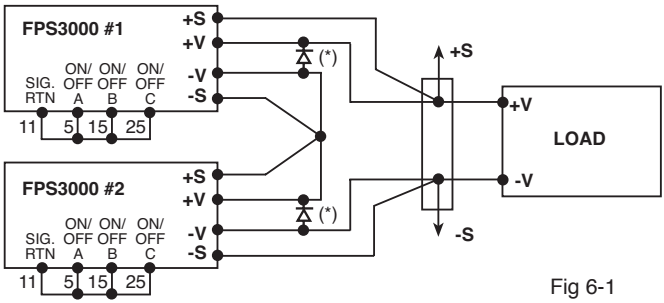


Fig 6-1

(*) Diodes are user supplied

FPS3000 REAR PANEL DIP SWITCH SETTING

MODULES LOCATION

Three FPS1000 module of the same output voltage rating are pluged into the FPS3000.

Module 'A' is on the left ,module 'C' is on the right
For modules location refer to Fig. 7-1

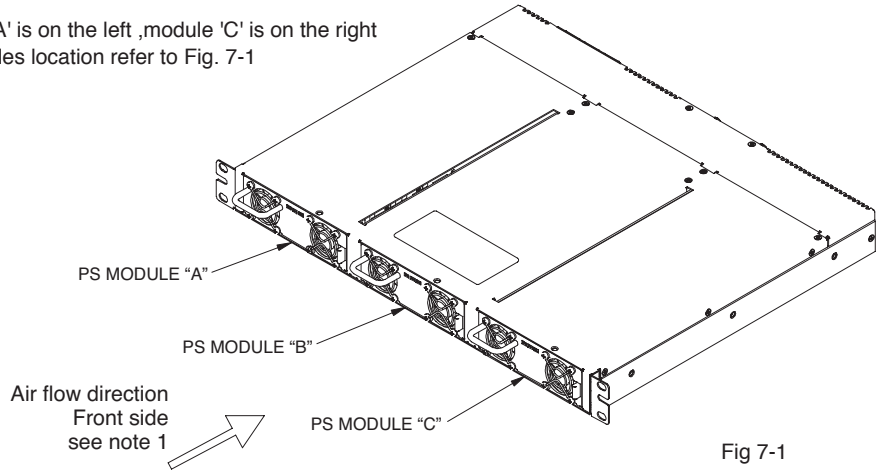


Fig 7-1

Note1: Forced air cooling allow minimum 50mm of unrestricted air space at the rear of the unit.
Do not obsruct air flow to the unit front panel

I2C BUS INTERFACE OPTION

ADDRESSING (A0, A1, A2).

The rear panel 9 positions DIP switch is used to select the I2C bus address for the individual FPS1000/S units inside the rack. Each unit should have its own I2C address to communicate over the I2C bus. Each address is made of three DIP switch positions as shown in Fig. 7-2. Which can be used to address single Power supply with 8 different addresses.

The DIP switch down position is logic level "1" and the up position is logic level "0".

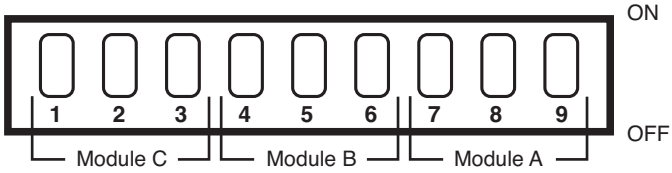


Fig 7-2

Fig. 7-2: I2C address SW1 DIP switch - Rear Panel poit view

Note: Address are applicable when modules FPS1000/S (I2C option) are used

I²C BUS INTERFACE OPTION

INTRODUCTION

The I²C interface option includes facilities to monitor operating parameters of the power supply. The parameters are then transferred to the host PC if demanded, over a standard I²C bus.
The following data can be monitored for the individual units connected to the I²C bus:
1. Status of the unit.
2. Actual output voltage, output current and internal temperature of the unit.
3. Manufacturing related data (model, serial number, manufacturing date etc…).

ADDRESSING (A0, A1, A2).

Three address lines allow up to eight FPS1000 units to be addressed on a single I²C bus. The address lines are internally pulled-up to +5V by resistors. Addressing of a unit is achieved by hard-wiring an address line to the -Sense to set it to "0" or leaving the address line open to set it to "1".

SERIAL CLOCK

This line is clocked by the processor which controls the I²C bus. It should be connected to +5V (referenced to -Sense) via a pull-up resistor of 2KΩ. The I²C interface is designed to run with a serial clock speed of 100KHz.

SERIAL DATA

This line is a bidirectional data line. It should be connected to +5V (referenced to -Sense) via a pull-up resistor of 2KΩ.

OPERATION AND FUNCTIONS

1. DIGITAL STATUS

Digital status functions are provided by a PCF8574, 8-bit Register. It provides a single 8-bit word when read by the I²C controller.
Fault is indicated by "1" and Good level is indicated by "0". The register information is as follows:

BIT	FUNCTION	MEANING
0	Output Fail	Output voltage is < 80% +/-5% of Vo rated
1	Over Temperature Protection	Internal temperature is over 80°C. Supply turns off.
2	Temperature Alarm	Internal temperature is over 70°C. Supply is on.
3	Fan Fail	Failure of an internal fan.
4	AC Input Fail	Input voltage < 85Vac
5	Not Used	Always "0".
6	Not Used	Always "0".
7	Not Used	Always "0".

PCF8574 slave address:

Bit	7	6	5	4	3	2	1	0
Value	0	1	0	0	A2	A1	A0	R/W

2. EEPROM FUNCTIONS

A 256 bytes EEPROM is included in the I²C option. The EEPROM type is AT24C02 and it is programmed at the factory with the following data:

ADDRESS	BYTES	DATA
0	4	Number of fields
4	16	Manufacturer
20	20	Serial number
40	16	Revision
56	16	Country of manufacture
72	16	Model name
88	16	Output voltage
104	16	Date of manufacture
254	2	Checksum

The slave EEPROM address is:

Bit	7	6	5	4	3	2	1	0
Value	1	0	1	0	A2	A1	A0	R/W

3. ANALOG FUNCTIONS

Analogue functions are provided by a single PCF8591, 4-channel 8-bit A/D converter. When this device is read by the serial bus controller it provides an 8-bit word with the following information:
Channel 1: Output voltage, channel 2: Output current, channel 3: Internal temperature.

The PCF8591 slave address is:

Bit	7	6	5	4	3	2	1	0
Value	1	0	0	1	A2	A1	A0	R/W

The PCF8591 device initially requires a control byte to be written to the configuration register. The control byte is as follows:

Bit	7	6	5	4	3	2	1	0
Value	0	A	0	0	0	B	C	D

When a single channel is to be read, A,B,C and D should be determined as follows:

A/D channel	A	B	C	D
Voltage	0	0	0	0
Current	0	0	0	1
Temperature	0	0	1	0

To read all channels with a single control byte, A and B have to be "1", C and D have to be "0". This control byte sets the A/D so that on every read data from each channel is read. Note that on each read. a conversion is started for a particular channel and the result which will be displayed and will be of the previous read. (i.e. the previous channel).
Thus second read cycle gives result of the actual channel.
Note: the first result from a sequence of reads should not be considered.

A/D SCALING

The A/D readback has to be scaled to obtain a correct value for the voltage, current and the temperature. Note that the voltage reading is made inside the power supply unit before the "Oring" diode and is typically 0.5V higher than the actual output voltage.
The following scaling should be employed:

VALUE=BYTE VALUExRESOLUTION

Refer to the following table for the scaling of the A/D channels:

FPS1000-12/S	Range	Resolution	Accuracy
Voltage	0~15V	0.0586 V/Bit	+/-2% of full scale
Current	0~80A	0.312 A/Bit	+/-10% of full scale
Temperature	0~100°C	0.391°C/Bit	+/-3°C of full scale

FPS1000-24/S	Range	Resolution	Accuracy
Voltage	0~30V	0.1171V/Bit	+/-2% of full scale
Current	0~50A	0.1953A/Bit	+/-10% of full scale
Temperature	0~100°C	0.391°C/Bit	+/-3°C of full scale

FPS1000-32/S	Range	Resolution	Accuracy
Voltage	0~40V	0.1563V/Bit	+/-2% of full scale
Current	0~50A	0.1953A/Bit	+/-10% of full scale
Temperature	0~100°C	0.391°C/Bit	+/-3°C of full scale

FPS1000-48/S	Range	Resolution	Accuracy
Voltage	0~60V	0.2344V/Bit	+/-2% of full scale
Current	0~25A	0.0977A/Bit	+/-10% of full scale
Temperature	0~100°C	0.391°C/Bit	+/-3°C of full scale

The measurement range is from 0 to the maximum value listed in the range column. The resolution or scale of reading is linear over the entire range and provides a linear output on the A/D converter.

Model: FPS1000-48 /S
Measurements and calculation examples
Output voltage readback
1. Output voltage (at the output terminals): 48.0V
2. Voltage before the "Oring" diode: 48.0V+0.5V=48.5V
3. Hex readback: CE (1100 1110).
4. Convert the hex readback to decimal: 206
5. Calculate measured Vout: Vout=206*0.2344=48.286V

CAUTION

Series operation is not applicable for units with I^2C bus option.