EN	**TP960.481 Installation Manual**	**Power Supply 3-Phase, 48 V, 20 A, 960 W**
DE	**TP960.481 Installationsanleitung**	**Stromversorgung 3-Phase, 48 V, 20 A, 960 W**
FR	**TP960.481 Manuel d'installation**	**Alimentation d'Énergie 3-Phase, 48 V, 20 A, 960 W**
ES	**TP960.481 Manual de instalación**	**Fuente De Alimentación 3-Phase, 48 V, 20 A, 960 W**
IT	**TP960.481 Manuale di Installazione**	**Gruppo di alimentazione 3-Phase, 48 V, 20 A, 960 W**
PT	**TP960.481 Manual de instalação**	**Fonte De Alimentação 3-Phase, 48 V, 20 A, 960 W**

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Read this first! — English

Before operating this device, please read this manual thoroughly and retain this manual for future reference! This device may only be installed and put into operation by qualified personnel. If damage or malfunction should occur during operation, immediately turn power off and send device to the factory for inspection. The device does not contain serviceable parts. The information presented in this document is believed to be accurate and reliable and may change without notice. For any clarifications the English translation will be used.

⚠ WARNING **Risk of electrical shock, fire, personal injury, or death:**

- Turn power off before working on the device. Protect against inadvertent re-powering.
- Do not open, modify or repair the device.
- Use caution to prevent any foreign objects from entering the housing.
- Do not use in wet locations or in areas where moisture or condensation can be expected.
- Do not touch during power-on and immediately after power-off. Hot surfaces may cause burns.

Vor Inbetriebnahme lesen! — Deutsch

Bitte lesen Sie diese Warnungen und Hinweise sorgfältig durch, bevor Sie das Gerät in Betrieb nehmen. Bewahren Sie die Anleitung zum Nachlesen auf. Das Gerät darf nur durch fachkundiges und qualifiziertes Personal installiert werden. Bei Funktionsstörungen oder Beschädigungen schalten Sie sofort die Versorgungsspannung ab und senden das Gerät zur Überprüfung ins Werk. Das Gerät beinhaltet keine Servicebauteile. Die angegebenen Daten dienen allein der Produktbeschreibung und sind nicht als zugesicherte Eigenschaften im Rechtssinne aufzufassen. Im Zweifelsfall gilt der englische Text.

⚠ WARNUNG **Missachtung nachfolgender Punkte kann einen elektrischen Schlag, Brände, schwere Unfälle oder Tod zur Folge haben:**

- Schalten Sie die Eingangsspannung vor Installations-, Wartungs- oder Änderungsarbeiten ab und sichern Sie diese gegen unbeabsichtigtes Wiedereinschalten.
- Führen Sie keine Änderungen oder Reparaturversuche am Gerät durch. Gerät nicht öffnen!
- Verhindern Sie das Eindringen von Fremdkörpern, wie z.B. Büroklammern und Metallteilen.
- Betreiben Sie das Gerät nicht in feuchter Umgebung oder in einer Umgebung, bei der mit Betauung oder Kondensation zu rechnen ist.
- Gehäuse nicht während des Betriebes oder kurz nach dem Abschalten berühren. Heiße Oberflächen können Verletzungen verursachen.

A lire avant mise sous tension! — Français

Veuillez lire ces instructions de montage et d'entretien avant de mettre l'alimentation sous tension. Conservez ce manuel qui vous sera toujours utile. Cette alimentation ne doit être installée que par du personnel qualifié et compétent. En cas de dommage ou dysfonctionnement, coupez immédiatement la tension d'alimentation et retournez l'appareil à l'usine pour vérification. ! L'alimentation ne contient pas de pièces échangeables Les données indiquées dans ce document servent uniquement à donner une description du produit et n'ont aucune valeur juridique. En cas de divergences, le texte anglais fait foi.

⚠ AVERTISSEMENT **Prendre en compte les points suivants, afin d'éviter toute détérioration électrique, incendie, dommage aux personnes ou mort:**

- Mettre l'alimentation hors tension avant toute intervention sur celle-ci et s'assurer qu'il n'y a pas risque de redémarrage.
- Ne pas ouvrir, modifier ou réparer l'alimentation.
- Veiller à ce qu'aucun objet ne rentre en contact avec l'intérieur de l'alimentation (trombones, pièces métalliques).
- Ne pas faire fonctionner l'appareil dans un environnement humide ou dans un environnement où il peut y avoir de la condensation.
- Ne pas toucher le carter pendant le fonctionnement ou directement après la mise hors tension. Surface chaude risquant d'entraîner des blessures.

Lea primero! — Español

Conserve este manual como referencia para futuras consultas. La fuente de alimentación solo puede ser instalada y puesta en funcionamiento por personal cualificado. Por favor lea detenidamente este manual antes de conectar la fuente de alimentación. Si se produce un fallo o mal funcionamiento durante la operación, desconecte inmediatamente la tensión de alimentación. En ambos casos, el equipo debe ser inspeccionado en fábrica. La información presentada en este documento es exacta y fiable en cuanto a la descripción del producto y puede cambiar sin aviso. En casa de duda, prevalece el texto inglés.

⚠ ADVERTENCIA **Riesgo de descarga eléctrica, incendio, accidente grave o muerte:**

- Desconectar la tensión de red antes de trabajar en la fuente de alimentación. Evite una posible reconexión involuntaria.
- No realizar ninguna modificación o reparación de la unidad. No abrir la unidad.
- Evitar la introducción en la carcasa de objetos extraños.
- No usar el equipo en ambientes húmedos. No operar el equipo en ambientes donde se espere la formación de rocío o condensación.
- No tocar durante el funcionamiento ni inmediatamente después del apagado. El calor de la superficie puede causar quemaduras graves.

Leggere prima questa parte! — Italiano

Prima di collegare il sistema di alimentazione elettrica si prega di leggere attentamente le seguenti avvertenze. Conservare le istruzioni per la consultazione futura. Il sistema di alimentazione elettrica deve essere installato solo da personale competente e qualificato. Se durante il funzionamento si verificano anomalie o guasti, scollegare immediatamente la tensione di alimentazione. In entrambi i casi è necessario far controllare l'apparecchio dal produttore! I dati sono indicati solo a scopo descrittivo del prodotto e non vanno considerati come caratteristiche garantite dell'apparecchio. In caso di differenze o problemi è valido il testo inglese

⚠ AVVERTENZA **Il mancato rispetto delle seguenti norme può provocare folgorazione elettrica, incendi, gravi incidenti e perfino la morte:**

- Prima di eseguire interventi di installazione, di manutenzione o di modifica scollegare la tensione di rete ed adottare tutti i provvedimenti necessari per impedirne il ricollegamento non intenzionale.
- Non tentare di aprire, di modificare o di riparare da soli l'apparecchio.
- Impedire la penetrazione di corpi estranei nell'apparecchio, ad esempio fermagli o altri oggetti metallici.
- Non far funzionare l'apparecchio in un ambiente umido. Non far funzionare l'apparecchio in un ambiente soggetto alla formazione di condensa o di rugiada.
- Non toccare quando acceso e subito dopo lo spegnimento. La superficie calda può causare scottature.

Leia primeiro! — Português

Recomendamos a leitura cuidadosa das seguintes advertências e observações, antes de colocar em funcionamento a fonte de alimentação. Guarde as Instruções para futura consulta, em casos de dúvida. A fonte de alimentação deverá ser instalada apenas por profissionais da área, tecnicamente qualificados. Se por acaso, durante a utilização ocorrer algum defeito de funcionamento ou dano, desligue imediatamente a tensão de alimentação. Em ambos os casos, será necessária uma verificação na Fábrica! Os dados mencionados têm como finalidade somente a descrição do produto, e não devem ser interpretados como propriedades garantidas no sentido jurídico. Em caso de duvidas aplica-se o texto em inglês.

⚠ ATENÇÃO **A não observância ou o incumprimento dos pontos a seguir mencionados, poderá causar uma descarga elétrica, incêndios, acidentes graves ou morte:**

- Antes de trabalhos de instalação, manutenção ou modificação, desligue a tensão de alimentação, protegendo-a contra uma nova ligação involuntária.
- Não efectue nenhuma modificação ou tentativa de reparação no aparelho. Quando necessário contacte o seu distribuidor. Não abra o aparelho.
- Proteger a fonte de alimentação contra a introdução inadvertida de corpos metálicos, como por ex., clipes ou outras peças de metal.
- Não usar o aparelho em ambientes húmidos. Não usar o aparelho em ambientes propensos a condensações.
- Não tocar enquanto estiver em funcionamento, nem após a desligar. A superficie poderá estar quente e provocar lesões.

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Product Description

The TP960.481 is a DIN rail mountable power supply for 3-phase mains systems, which provides a floating, stabilized and galvanically separated SELV output voltage.

Intended Use

The device is designed for industrial environments. Do not use in residential, commercial and light-industrial environments.

This device is designed for installation in an enclosure and is intended for commercial use, such as in industrial control, process control, monitoring, measurement equipment or the like.

Do not use this device in equipment, where malfunctioning may cause severe personal injury or threaten human life without additional appropriate safety devices, that are suited for the end-application.

If this device is used in a manner outside of its specification, the protection provided by the device may be impaired.

Installation Instructions

Install device in an enclosure providing protection against electrical, mechanical and fire hazards.

The device is designed, tested and approved for branch circuits up to 32 A (IEC) and 30 A (UL) without additional protection device. If an external fuse is utilized, do not use circuit breakers smaller than 6 A B- or C-Characteristic to avoid a nuisance tripping of the circuit breaker.

Install the device onto a DIN rail according to EN 60715 with the input terminals on the bottom of the device. Other mounting orientations require a reduction in output current.

Make sure that the wiring is correct by following all local and national codes. Use appropriate copper cables that are designed for the maximum operating temperature in the application. Ensure that all strands of a stranded wire enter the terminal connection. Use ferrules for wires on the input terminals.

The device is designed for pollution degree 2 areas in controlled environments. No condensation or frost is allowed.

The enclosure of the device provides a degree of protection of IP20. The enclosure does not provide protection against spilled liquids.

For TN, TT mains systems with earthed neutral and IT star mains systems with insulation monitoring the device is designed for overvoltage category III zones up to 2000 m and for overvoltage category II zones up to 5000 m. For TN, TT, IT delta mains systems or IT star mains systems without insulation monitoring the device is intended for overvoltage category II zones up to 2000 m.

The device is designed for convection cooling and does not require an external fan. Do not obstruct airflow and do not cover ventilation grid!

The device is designed for altitudes up to 5000 m. Above 2000 m a reduction in output current of 1.25 A per 1000 m is required and the operation is limited according the mains systems description above.

Keep the following minimum installation clearances: 30 mm on bottom, 40 mm on top, 5 mm left and right side. Increase the 5 mm to 15 mm in case the adjacent device is a heat source. When the device is permanently loaded with less than 50 %, the 5 mm can be reduced to zero.

The maximum surrounding air temperature is +70 °C. The operational temperature is the same as the ambient or surrounding air temperature and is defined 3 cm below the device.

The device is designed to operate in areas between 5 % and 95 % relative humidity.

Functional Description

The output is electronically protected against no-load, overload and short circuit and can supply any kind of loads, including unlimited inductive or capacitive loads.

Do not apply return voltages from the load to the output terminals higher than 63 V.

The output voltage can be adjusted in 6 steps (48 V, 50 V, 52 V, 54 V, 55 V, 56 V) with a small flat-blade screwdriver on the front.

The green Status LED reports an output voltage above 90 % of the adjusted voltage of a running device.

The DC OK relay monitors the output voltage and the contact is closed when the Status LED is green. Contact ratings: 60 Vdc 0.3 A, 30 Vdc 1 A, 30 Vac 0.5 A for resistive loads.

The AC OK relay signalizes the status of the AC mains voltage and the contact is closed when the AC input voltage is the rated input range. In case of failure the contact opens and the Status LED turns yellow. Contact ratings: 60 Vdc 0.3 A, 30 Vdc 1 A, 30 Vac 0.5 A for resistive loads. In case of AC undervoltage the output voltage is off and the Status LED turns red.

The device is equipped with an overtemperature protection. In case of a high temperature, the output shuts down, the Status LED flashes red and the device re-starts automatically after cooling down.

Devices can be paralleled to increase the output power. Make sure to use a separate star point and the correct terminal with the appropriate current rating. The output voltage shall be adjusted to the same voltage setting to get the same load conditions on all devices, or leave the devices on the factory settings. Energize all units at the same time. It also might be necessary to cycle the input power (turn-off for at least five seconds), if the output was in overload or short circuit. If more than three devices are connected in parallel, a diode, fuse or circuit breaker with a rating of 40 A is required on each output. If devices are connected in parallel, maximum one ground connection of the output voltage is allowed.

The current share bus is established by connecting bus pins 4.5 and 4.6 in a daisy-chain. It distributes the current evenly for power supplies operating in parallel. Adjust the output voltage potentiometer to the same values. The current share bus is able to compensate up to 0.4 V voltage difference.

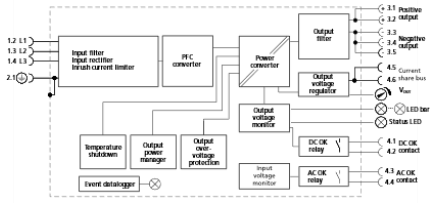
Do not connect devices in series for higher output voltages.

Technical Data

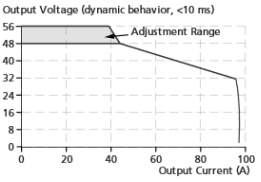
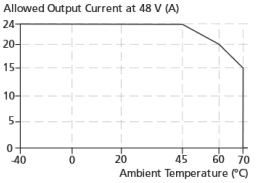
All values are typical figures specified at 3x 400 Vac 50 Hz input voltage, symmetrical phase voltages, 48 V, 20 A output load, +25 °C ambient temperature and after a 5 minutes run-in time unless otherwise noted.

Output voltage	DC 48 V	nominal
Adjustment range	48 – 56 Vdc	factory setting 48 V
Output current	24 – 20.6 A	up to +45 °C ambient
	20 – 17.1A	up to +60 °C ambient
	16.8 – 14.4 A	at +70 °C ambient
Short term (15 s)	40 A	up to +40 °C ambient
Derating	linearly 12.8 W/K	+45 °C to +60 °C
	linearly 15 W/K	+60 °C to + 70°C
Input voltage AC	3AC 380 – 500 V	-15 / +10 %
Mains frequency	50 – 60 Hz	±6 %
Input current AC	1.53 / 1.23 A	at 3x400 / 500Vac
Power factor	0.93 / 0.93	at 3x400 / 500 Vac
Input inrush current	no inrush current peak	
Efficiency	97.2 / 97.1 %	at 3x400 / 500 Vac
Power losses	27 / 28 W	at 3x400 / 500 Vac
Hold-up time	29 / 29 ms	at 3x400 / 500 Vac
Temperature range	-40 to +70 °C	
Max. wire size (stranded wire)	4 mm²	input terminals
Wire size AWG	AWG 20-10	input terminals
Max. wire diameter	2.8 mm	input terminals
Wire stripping length	11 mm	input terminals
Max. wire size (stranded wire)	4 mm²	output terminals
Wire size AWG	AWG 20-10	output terminals
Max. wire diameter	2.8 mm	output terminals
Wire stripping length	11 mm	output terminals
Max. wire size (stranded wire)	1.5 mm²	signal terminals
Wire size AWG	AWG 28-14	signal terminals
Max. wire diameter	1.5 mm	signal terminals
Wire stripping length	8 mm	signal terminals
Size (wxhxd)	79x124x136 mm	without DIN rail
Weight	1100 g	

Functional Diagram



Output Characteristic



Temperature Range