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Ideal Power Solution

MTP Series High Power DC Power Supply

- Power range: 1.5 ~ 3 KW
- Voltage range: 30.00 ~ 600.0 V
- Current range: 3.50 ~ 100.0 A
- 19-inch / 2U rack-mounted chassis
- Precise voltage and current setting and measurement capabilities
- RS485 Communication port
- OVP, OCP, OTP and short circuit protections.
- CE certified



Overview

The MTP series DC power supplies are High Power DC power supplies developed by iDealTek-Electronics based on IGBT semiconductor components, adopting AC/DC power processing topology with full-bridge phase-shift soft-switching technology.

The 3KW model is the only one in this series of DC power supplies that adopts single-phase 220Vac input with output power at 3KW with output voltage ranges from 30Vdc to 600Vdc.

It integrates the main control part and IGBT drive part of the power supplies and uses high-quality miniaturized single-phase input semiconductor devices and customized miniaturized

heat dissipation to make the 3KW DC Power Supply into a 19-inch standard 2U rack-mounted chassis for convenient system integration and installation, while ensuring the high-precision, low-ripple and high-efficiency output characteristics of this series of DC power supplies, the power density and dynamic response speed of the 3KW DC power supply are improved.

Some models of MTP – 3KW DC power supplies still retain the unique 2 times rated current overload capacity (except for high-current output models), which can cope with inductive and mixed load requirements for high-current output at the moment of starting.

At present, this series of high-power DC power supplies are mainly used in the testing of small brushless motors, the power electronics industry, and the electronic device industry.

Features

- Isolated input and output for safe operation.
- CV & CC output mode, output voltage and current continuously adjustable in full scale.
- Multi-stage filtering circuit adopted to reduce harmonic interference to the power grid.
- Double closed-loop circuit, fast response speed and stable output.
- Full-bridge phase-shifting soft switching technology, the overall efficiency is up to 88%.
- With RS485 communication interface, in line with MODBUS-RTU communication protocol.
- Amorphous high-frequency transformers and potted inductance adopted to give smaller temperature rise and better reliability.
- The input and output terminals are equipped with safety shielding to ensure the safety of installation.

Principle Introduction

This series of High-power AC - DC power supplies are equipped with a reliable two-stage conversion mechanism drive logic circuit and a fast control loop optimized by iDealTek-Electronics. Which balances the requirements of low output ripple and fast DC output response speed, making this series of High-power switching power supplies can provide high-precision, low ripple, high-stability and High-power DC output with fast response speed feature of the switching power supply. All MTP series DC power supplies are equipped with a short-term 2 times rated current overload capacity (Except for some high-current output models) to cope with the inductive and mixed load's demand for high-current output at the moment of starting.

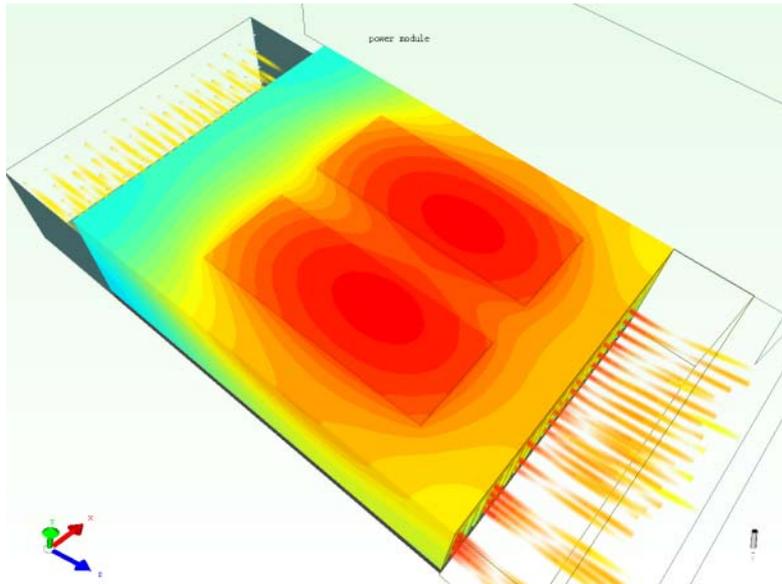


Key technology introduction

Air duct design

Full-sealing independent "Chimney" type air duct design adopted, the inner circuit uses independent cooling fan to improve the product heat dissipation effect, and the air inlet has dustproof measures, which greatly reduces dust and debris entering the power supply. The radiator and fan can be cleaned and maintained separately

The heat dissipation system undergoes rigorous simulation and actual testing, and is designed with reliability in consideration of national standards and enterprise standards to ensure that the device with low temperature rise and long life.



Modular design

The power supply follows the modular design concept and requirements. According to the analysis of product characteristics and functions, each subsystem will use components with independent functions. By the Laminated busbar structure and the use of standardized long-term verified power units, the loop sense is effectively reduced, and the reliability of the product operation is greatly improved.

Core component

The key and important core devices are all internationally renowned brands, and high-quality devices to ensure the stability and reliability of product operation.

Featured functions

CV / OC with 2 times overload ability (*except for models with $\geq 50A$*)

The power supply has two working modes: CV / CC mode and CV / OC mode, customers can select different working modes according to actual use requirements.

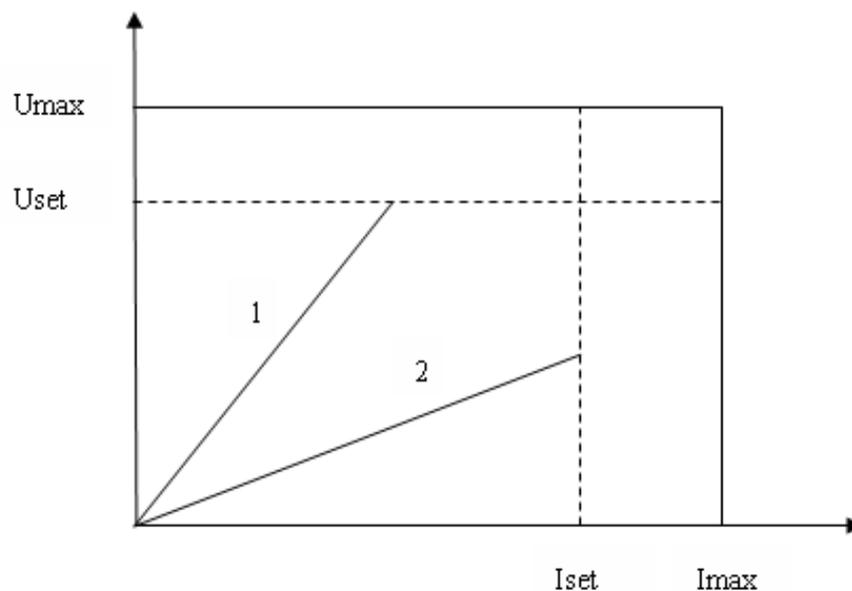
- (1). CV / CC mode

Under CV / CC mode, the output voltage and current of power supply are continuously adjustable from 0 to the rated value.

Power supply works either in constant voltage (CV) or constant current (CC) state, the CV & CC working state are automatically switchable, the switching conditions are determined by the voltage & current set values and the customer's load resistance value. For details, please refer to the following figure.

In CV state, the output voltage is adjustable and regulated; the output current varies with the output voltage value and the customer load resistance.

In CC state, the output current is adjustable and regulated, the output voltage varies with the output current value and the customer load resistance.



(2). CV / OC mode

Under CV / OC (over current) mode, besides CV function, power supply still has over-current working ability, (OCP is invalid in this mode), detailed parameters as below:

0% ~ 100% rated current value → continuous working with load

100% ~ 125% rated current value → withstand 600s continuous working

125% ~ 150% rated current value → withstand 60s continuous working

150% ~ 200% rated current value → withstand 5s continuous working

Power supply automatic protected and stops output when Max. Over-current time exceeded.

OVP & OCP value setting function

OVP and OCP value could be set via front control interface, power supply could automatically stop output when output voltage or output current exceeds the set protection values.

OVP: over voltage protection value.

OCP: over current protection value.

Automatic line voltage drop compensation function

The power supply has an automatic line voltage drop compensation detection terminal (comsense). Connect the terminals to the load ends. The power supply will automatically detect the voltage value of the load ends and automatically compensate for the line voltage drop caused by the power line. At the same time, it can be customized to detect whether the battery terminals are connected reversely to realize the anti-reverse protection function for battery charging.

Fast self-discharge function

The power supply has built-in discharging circuit, which can quickly release the electrical energy in the output capacitor after the power supply stops outputting, so as to prevent personal injury caused by accidentally touching the output terminal right after the power supply stops.

Short-circuit protection

The power supply can adapt to two kinds of short-circuit conditions as below:

If the power supply has short-circuited before starting output, then power supply can be normally started and running continuously for a long time.

If power supply has a sudden short-circuit during running with load, then power supply would automatically stop output and gives sound alarm, LEDs on front panel would display corresponding alarm code.

Specifications			
Input	Connection mode	Single – phase, two – wire + GND	
	Voltage	220V±10%	
	Frequency	50Hz/60Hz±5Hz	
Output	Rated power	* kW	
	Output voltage adjusting	0V ~ ***V	
	Output current adjusting	0A ~ ***A	
	Output voltage precision	0.5%FS	
	Output current precision	0.5%FS	
	Line regulation	≤0.2%FS	
	Load regulation	≤0.2%FS	
	Temperature drift	0.04%FS/°C	
	Time drift	0.3%FS	
	Ripple (Vr.m.s.)	≤0.5% F.S (measured @ rated voltage with 80%-100% resistive loading)	
	Response time	≤10ms (measured @ 10%-90% resistive loading)	
	Efficiency	≥88% (measured @ 80%-100% resistive loading)	
	Working ability	Withstand long-term continual working.	
	Setting & Display	Control mode	Local
Remote			RS485 communication interface. In line with MODBUS-RTU standard.
Display mode		LED digital display	
Set & Display error		Voltage	0.5%FS
		Current	0.5%FS

	Display resolution	Voltage	Four-digit display with a minimum resolution of 0.01V ($U_e \leq 30V$)
			Four-digit display with a minimum resolution of 0.1V ($30V < U_e < 1000V$)
			Four-digit display with a minimum resolution of 1V ($U_e \geq 1000V$)
		Current	Four-digit display with a minimum resolution of 0.01A ($I_e \leq 50A$)
			Four-digit display with a minimum resolution of 0.1A ($50A < I_e < 1000A$)
			Four-digit display with a minimum resolution of 1A ($I_e \geq 1000A$)
Automatic voltage compensation		$\leq 5V$ ($U_e \leq 100V$)	
		$\leq 10V$ ($100V < U_e \leq 300V$)	
		$\leq 15V$ ($300V < U_e \leq 1000V$)	
Over-loading ability		<p>$I_{out} \leq 1.25 I_e$, output shutdown after 600s.</p> <p>$I_{out} \leq 1.5 I_e$, output shutdown after 60s.</p> <p>$I_{out} \leq 2 I_e$, output shutdown after 5s</p> <p>$I_{out} > 2 I_e$, output shutdown immediately.</p>	
Protection & Monitoring functions	Output over voltage protection (OVP)	Output over voltage protection value settable. Power supply automatically cuts off output and alarms when output has over voltage.	
	Output over current protection (OCP)	Output over current protection value settable. Power supply automatically cuts off output and alarms when the output has over current.	
	Over temperature protection (OTP)	Power supply automatically cuts off output and alarms when the internal temperature of the power supply exceeds 85 °C.	
	Output short-circuit protection	Power supply automatically cuts off output and alarms when the output has short-circuit.	
	Automatic voltage compensation protection	Output over compensation protection / compensation line reverse-connected protection	
Noise		$\leq 55dB$	
Protection degree		IP20	
Cooling method		Forced air cooling	

Safety features	Insulation resistance	≥20MΩ
	Withstand voltage ability	60s test @ 2000VDC, no flash-over or spark-over.
	Grounding inductance resistance	≤100mΩ
Working conditions	Ambient temperature	0°C ~ 45°C
	Humidity	10% ~ 90%(non-condensing)
	Height	≤2000m
Size (W*H*D) (mm)		500*88*500 (19" 2U standard chassis)

Optional functions

- Analog control via 0 ~ 5V / 0 ~ 10V or 4mA ~ 20mA signal. (+AC)
- Output power-limiting function (+PL)
- Built-in automatic energy discharging unit (+EDU)
- 24V interlock circuit (+ILK)

Standard model list

Model	MTP-0030-0100S	MTP-0060-0050S	MTP-0120-0025S	MTP-0150-0020S	MTP-0200-0015S	MTP-0300-0010S	MTP-0600-0005S
Rated power	3KW						
Rated voltage	30.00V	60.0V	120.0V	150.0V	200.0V	300.0V	600.0V
Rated current	100.0A	50.00A	25.00A	20.00A	15.00A	10.00A	5.00A

Installation environment

- Ambient temperature: Please have the power source working in safe temperature range (0°C ~ 45°C) or it would affect life of power source.
- Please install the power source at least 50cm distant from surroundings to have better

ventilation.

- Please install the power source away from vibration (less than 0.6G), especially equipment like puncher.
- Keep the power source away from direct sunshine, humidity or place with water globule.
- Keep the power source from corrosive, flammable & explosive gas.
- Keep the power source away from oil stain, dust & metallic dust.