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Ideal Power Solution

MTP Series High Power DC Power Supply

Overview

The MTP series DC power supply series are high-power DC power supplies developed by iDealTek-Electronics based on IGBT semiconductor components and adopting AC/DC power processing topology with full-bridge phase-shift soft switching technology. The 500KW ~ 2000KW power supplies reflects the company's strong design and manufacturing capabilities in high-power DC power supplies. The DC power supplies within this power range adopt a floor-standing combined cabinet. The width of the cabinet is determined by the rated output power and output voltage of the power supply. Output voltage up to 2000VDC.

- Power range: 500 ~ 2000 KW
- Voltage range: 100.0 ~ 1500 V
- Current range: 100.0 ~ 2000 A
- 2500 ~ 6000*2150*800 industrial cabinet with casters
- Precise voltage and current setting and measurement capabilities
- RS485 Communication port
- OVP, OCP, OTP and short circuit protections.
- CE certified



This high-power 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. It can also be equipped with built-in discharging unit or reverse cut-off function.

The full range of MTP series high-power DC power supplies use digital control circuits. The power output can be set and controlled through the 7-inch LCD touch screen on the front panel. The high-precision and editable LCD ensures comprehensive, intuitive and high-precision output display and measurement functions. At the same time, the full range of MTP high-power DC power supplies are equipped with RS485 interfaces as standard, and follow the MODBUS-RTU international protocol, which can realize remote control of the power supply, output and power supply operating status monitoring.

At present, this series of high-power DC power supplies are mainly used in battery charging testing, DC motor testing, photovoltaic inverter testing, and various cutting-edge applications that require high-power DC output.

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.
- With LCD touch screen for convenient operation, intuitive displays & indications.
- 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.

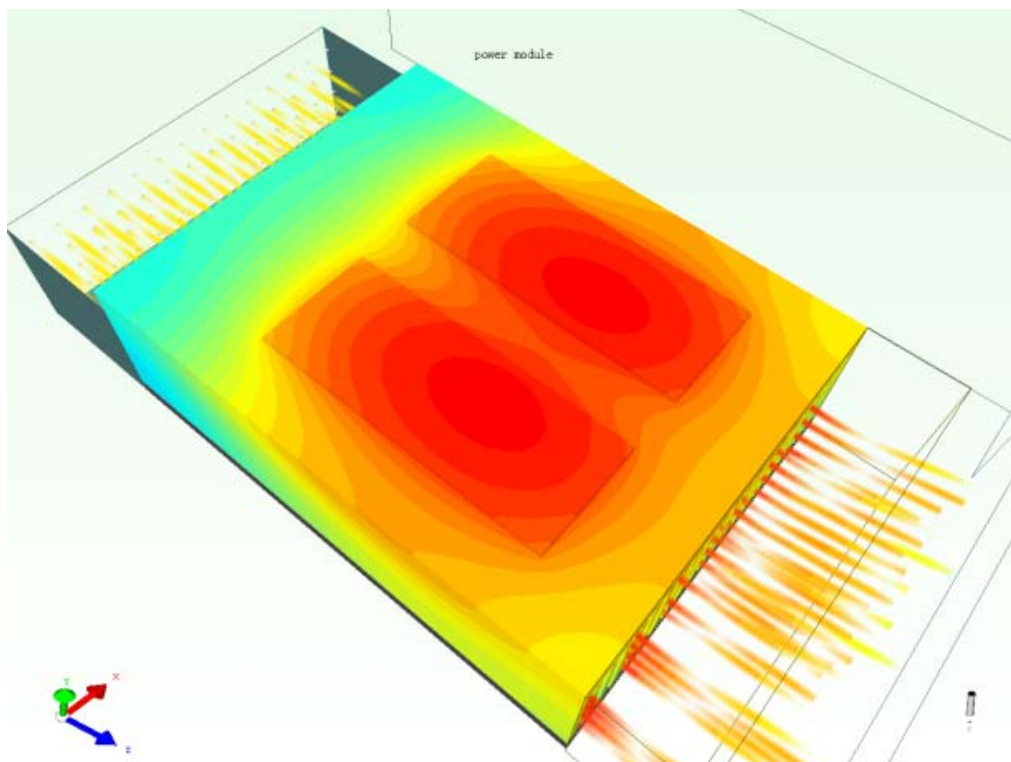


Key technology introduction

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 $\geq 500A$)*

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.

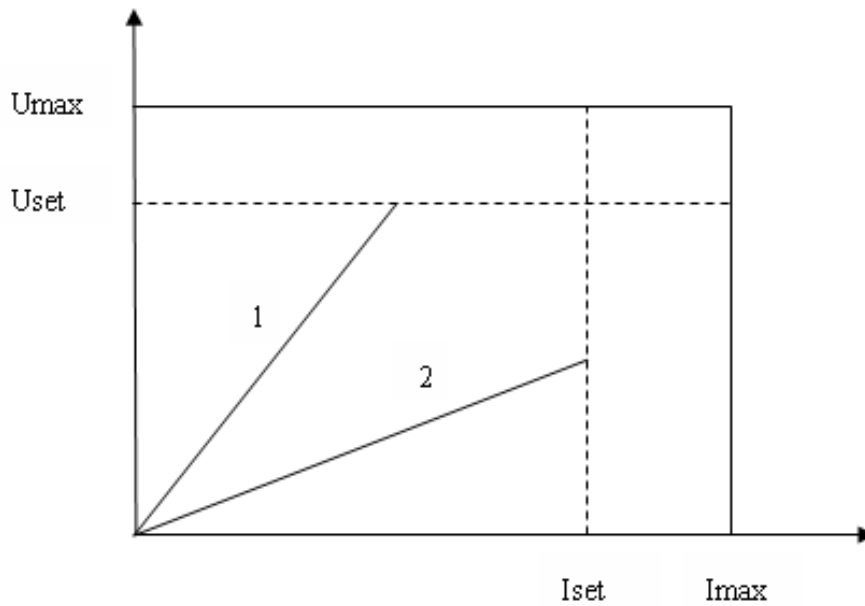
(1). CV / CC mode

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.

LCD touch screen operation / display function

The power supply adopts LCD touch screen for output parameters setting, working status and alarm information monitoring.

The LCD screen has memory function which can automatically save the power failure occurrence time and fault phenomenon for easy query in real time.

Also, the touch screen has lock screen function, which can automatically lock screen when the operation is not performed for a long time. Thereby preventing the wrong operation from changing the power output state by mistake.

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	Three – phase, four – wire + GND	
	Voltage	380V±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	≤20ms (measured @ 10%-90% resistive loading)	
	Efficiency	≥88% (measured @ 80%-100% resistive loading)	
	Working ability	Withstand long-term continual working.	
Setting & Display	Control mode	Local	Front panel LCD touch screen.
		Remote	RS485 communication interface. In line with MODBUS-RTU standard.
	Display mode	Touch screen display items as below: 1. Real-time working state display (fault state, running state, stop state, emergency stop state) 2. Working mode display (CV / CC) 3. Output voltage / current display. 4. Power supply system and fault information queriable.	
	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		$I_{out} \leq 1.25 I_e$, output shutdown after 600s. $I_{out} \leq 1.5 I_e$, output shutdown after 60s. $I_{out} \leq 2 I_e$, output shutdown after 5s $I_{out} > 2 I_e$, output shutdown immediately.	
Protection & Monitoring functions	Input protection	Input lack voltage and lack phase protection.	
	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		$\leq 88dB$	
Protection degree		IP20	

Cooling method		Forced air cooling
Safety features	Insulation resistance	$\geq 20M\Omega$
	Withstand voltage ability	60s test @ 2000VDC, no flash-over or spark-over.
	Grounding inductance resistance	$\leq 100m\Omega$
Working conditions	Ambient temperature	0°C ~ 45°C
	Humidity	10% ~ 90%(non-condensing)
	Height	$\leq 2000m$
Size (W*H*D) (mm)		(2500 ~ 6000)*2150*800

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-0500-1000T	MTP-0600-0835T	MTP-0750-0667T	MTP-0900-0556T	MTP-1000-0500T
Rated power	500KW				
Rated voltage	500.0V	600.0V	750.0V	900.0V	1000V
Rated current	1000A	835.0A	667.0A	556.0A	500.0A
Model	MTP-0500-1600T	MTP-0600-1335T	MTP-0750-1067T	MTP-0900-0889T	MTP-1000-0800T
Rated power	800KW				
Rated voltage	500.0V	600.0V	750.0V	900.0V	1000V
Rated current	1600A	1335A	1067A	889.0A	800.0A
Model	MTP-0500-2000T	MTP-0900-1111T			
Rated power	1MW				

Rated voltage	500.0V	900.0V			
Rated current	2000A	1111A			

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.