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Ideal Power Solution

MTP Series Switching Mode DC Power Supply

Model: MTP – 0100 – 0150T

- Power range: 15 KW
- Voltage range: 0 ~ 100.0 V
- Current range: 0 ~ 150.0 A
- 5U / 19-inch standard chassis
- Precise voltage and current setting and measurement capabilities
- Line voltage drop remote sensing & compensation function.
- OVP, OCP, OTP and short circuit protections etc.
- CE certified



Overview

MTP series high-precision DC test power supply adopts full-bridge phase-shift soft-switching technology, high output efficiency and small size; it has two-stage conversion circuit structure and double closed-loop control circuit system to ensure power supply with high stability and good output precision.

It can meet the testing needs of power electronics industry, electronic device industry, new energy motor industry and power battery industry.

Block diagram



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.

Specifications

Input	Connection mode	Three – phase, four – wire + GND
	Voltage	380V±10%
	Frequency	50Hz/60Hz±5Hz
Output	Rated power	15 kW
	Output voltage adjusting range	0V ~ 100.0 V
	Output current adjusting range	0A ~ 150.0 A
	Output voltage precision	0.5%FS

	Output current precision	0.5%FS	
	Line regulation	$\leq 0.2\%FS$	
	Load regulation	$\leq 0.2\%FS$	
	Temperature drift	$0.04\%FS/^{\circ}C$	
	Time drift	0.3%FS	
	Ripple (Vr.m.s.)	$\leq 0.5\% F.S$ (measured @ rated voltage with 80%-100% resistive loading)	
	Response time	$\leq 10ms$ (measured @ 10%-90% resistive loading)	
	Efficiency	$\geq 88\%$ (measured @ 80%-100% resistive loading)	
	Working ability	Withstand long-term continual working.	
Setting & Display	Control mode	Local	Front panel button control
		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 0.1V
Current		Four-digit display with a minimum resolution of 0.1A	
Automatic voltage compensation			$\leq 5V$
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.
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 $85^{\circ}C$.
	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	≤60dB
	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*222*550 (19" 5U standard chassis)

Functions

1. Working modes

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.

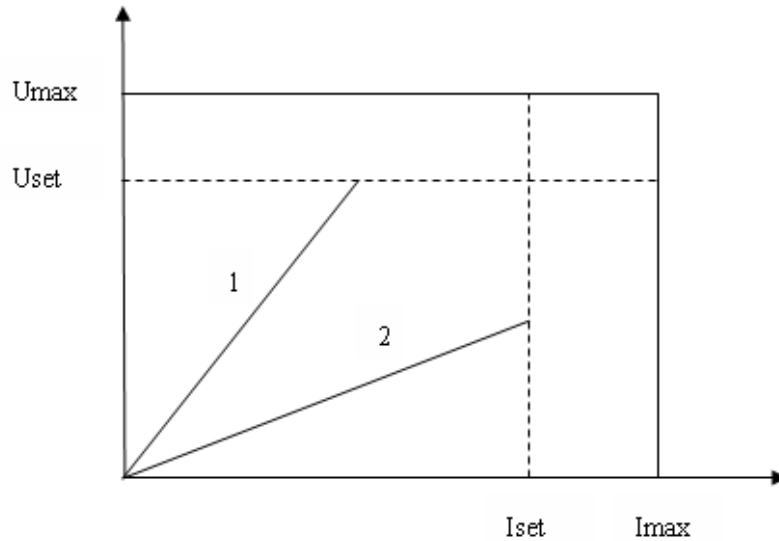
(1). CV / CC mode

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

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

2. 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.

3. Automatic line voltage drop compensation function

Power supply has automatic line voltage drop compensation terminals, connect the terminals to load ends; power supply could automatically detect load end voltage value and make voltage compensation for line voltage drop. Meanwhile, this function could detect if load connection is reverse connected or not.

4. Self-discharging function

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

5. Short-circuit protection

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

If the power supply has short-circuit 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.

6. Communication port

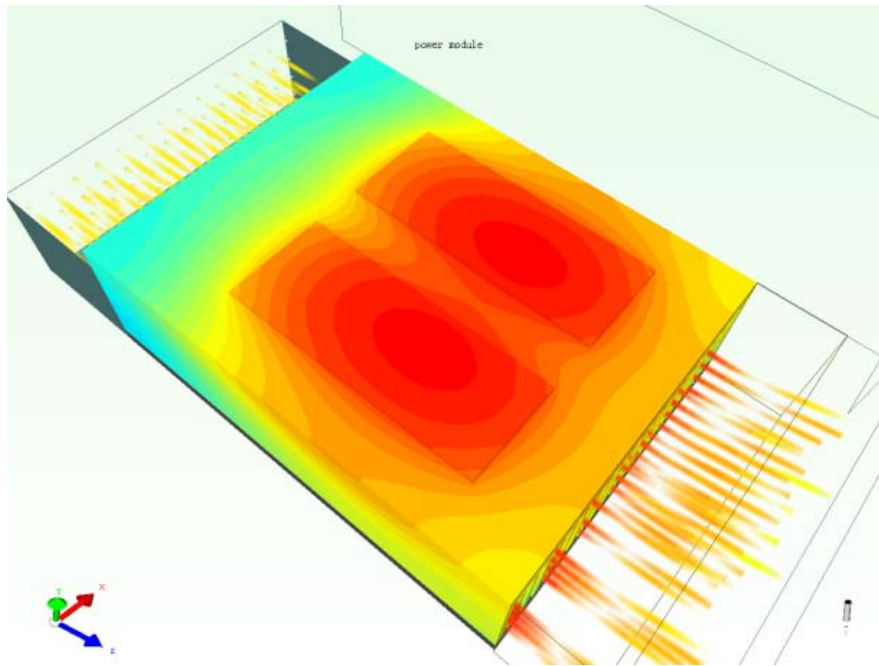
Power supply equipped with RS485 communication port for remote control and monitoring via PC.

Key technology introduction

1. 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.



2. 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.

3. Core component

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



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.