

<b>Medical power supply</b> <b>医疗电源</b> <b>Specifications V1.0</b> <b>规格书 V1.0</b>		
客户 Client:		
型号 Model:	DISM-600-375	
规格 Format:		
料号 P/N:		
制作日期 Date:	2024/01/19	
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## Revision history

### 修订记录

<b>NO.</b> 序号	<b>Time of revision</b> 修改时间	<b>Engineer</b> 修改人	<b>version</b> 版本	<b>Remark</b> 备注
1	2024.01.19		V1.0	

## 1 Function Description 功能描述

The DISM-600-375 is a medical-standard power supply designed for 85Vac ~ 264Vac inputs, with 375V/600W, +24Vdc/150W and +5Vsb/1W outputs, 375V can be continuously adjustable from 10-375V via system signals, with a variety of control and alarm signals. System forced air cooling is adopted. The DC output of the power supply has the functions of output overcurrent protection, short circuit protection, output overvoltage and so on. It has the characteristics of high efficiency and low ripple noise. The whole power supply is designed in strict accordance with the safety requirements, the power supply meets the medical standard (MOPP protection level), and the power supply meets the requirements of the third edition of IEC60601-1.

DISM-600-375 是按医疗标准设计的电源，可适用于 85Vac~264Vac 输入，输出包括 375V/600W、+24Vdc/150W 和+5Vsb/1W 输出，375V 可通过系统信号实现 10-375V 连续可调，具有多种控制和告警信号。采用系统强制风冷冷却。该电源直流输出具有输出过流保护、短路保护、输出过压等功能。具有高效率、低纹波噪声等特点。整个电源严格按照安规要求设计，该电源符合医疗标准（MOPP 防护等级），电源满足 IEC60601-1 第三版的要求。

## 2 Environmental Conditions 环境条件

NO 序号	Project 项目	Unit 单位	Least value 最小值	Typical value 典型值	Maximm 最大值	Remark 备注
1	Operating temperature 工作温度	°C	-10		45	Typical value 25°C 40-70°C derated use, see Figure (1) 典型值 25°C 40-70°C降额使用，详见图 (1)
2	Storage temperature 存储温度	°C	-40		70	
3	Relative humidity 相对湿度	%	20		90	
4	Storage humidity 存储湿度	%	5		95	No condensation, in the humidity range of 5 ~ 95% to ensure that no corrosion within the working life (except water corrosion of equipment) 无冷凝，在湿度范围 5~95%情况下要保证工作年限内不腐蚀（设备进水腐蚀除外）
5	Barometric pressure 大气压力	KPa	70		106	

6	Altitude 海拔高度	m	0		4000	When the altitude exceeds 4000m, the operating temperature decreases by 1°C for every 100m increase in altitude 超过 4000m 以上, 海拔高度每升高 100m 工作温度降低 1°C
7	Heat-dissipating method 散热方式					System fan heat dissipation 系统风扇散热

### 3 Electrical characteristics 电气特性

#### 3.1 Input Features 输入特性

NO 序号	Project 项目	Unit 单位	Least value 最小值	Typical value 典型值	Maximum 最大值	Remark 备注
1	Ac input voltage range 交流输入电压范围	Vac	90	110/220	264	
2	Ac input voltage frequency 交流输入电压频率	Hz	47	50/60	63	
3	Maximum input current 最大输入电流	A			9	100Vac input voltage, output full load 100Vac 输入电压, 输出满载
4	Inrush starting current 启动冲击电流	A			15	Input 240Vac, cold start at room temperature 输入 240Vac, 常温下冷启动
5	Efficiency 效率	%		88		Input 220Vac, output full load 输入 220Vac, 输出满载
6	Power factor 功率因数		0.95			110Vac/220Vac input, output full load 110Vac/220Vac 输入, 输出满载

#### 3.2 Output Features 输出特性

NO 序号	Project 项目	Unit 单位	Least value 最小值	Typical value 典型值	Maximm 最大值	Remark 备注
1	Rated output voltage (HV) 额定输出电压(HV)	V	10	375.0	375	The 10-375V is continuously adjustable through an external signal 10-375V 通过外接信号连续可调
2	Rated output voltage (+24V) 额定输出电压(+24V)	V	23.5	24.0	24.5	

3	Rated output voltage (+5V) 额定输出电压(+5V)	V	4.5	5.0	5.5		
4	Output power 输出功率	HV	W	0		550	300-330V, duration 0.625S 300-330V, 持续时间 0.625S
				0		425	100-330 V, duration 10S 100-330 V, 持续时间 10S
				0		220	300-330V, continuous 300-330V, 连续
				0		125	100-330V, continuous 100-330V, 连续
				0		150	150-375V, continuous 150-375V, 连续
		+24V	0	50	150	150W duration 10S, continuous power 50W 150W 持续时间 10S, 连续功率 50W	
	+5V	0		1			
5	Ripple noise 纹波噪声	HV	mV	/	/	2500	When measuring, the electronic load is pure resistance mode, the output end of the power supply is in parallel with the 10uF electrolytic capacitor and the 0.1uF ceramic capacitor, the oscilloscope probe is placed at both ends of the capacitor, and the bandwidth is limited to 20MHz 测量时, 电子负载纯电阻模式, 电源的输出端并联 10uF 的电解电容和 0.1uF 的瓷片电容, 示波器探头置于电容的两端, 带宽限制为 20MHz
		+24V				240	
		+5V		/	/	50	
6	Dynamic overshoot amplitude 动态过冲幅度	±%	/	/	6	25% ~ 50% ~ 25% current output, 50% ~ 75% ~ 50% current output, 0.1A/μs	
7	Dynamic recovery time 动态恢复时间	μs	/	/	400	25% ~ 50% ~ 25% 的电流输出, 50% ~ 75% ~ 50% 的电流输出, 0.1A/μs	
8	Overshoot on and off 开、关机过冲	±%	/	/	5	Input 110/220Vac, output full load 输入 110/220Vac, 输出满载	
9	Power-on delay time 开机延迟时间	s	/	/	5	Input 220Vac, output full load 输入 220Vac, 输出满载	
10	Output rise time 输出上升时间	ms	/	/	200	From 10% to 90%, rated input voltage/full load	

						从 10%上升至 90%，额定输入电压/满载
11	Shutdown hold time 关机保持时间	mS	20	/	/	Input 220Vac, full load output down to 80% 输入 220Vac，满载输出降至 80%
12	Capacitive load 容性负载	uF	1000	/	/	Input 220Vac, output full load 输入 220Vac，输出满载

### 3.3 Protective feature 保护特性

NO 序号	Project 项目	Unit 单位	Least value 最小值	Typical value 典型值	Maximm 最大值	Remark 备注	
1	Overvoltage protection point 过压保护点	HV	Vdc	380	410	Locked, output with 0.2A load test 锁死,输出带 0.2A 载测试	
		+24V		25	30	Locked, output with 0.2A load test 锁死,输出带 0.2A 载测试	
2	Overcurrent protection point 过流保护点	HV	A	4.5	/	5.5	Self-recovery, output voltage adjustment to 100V test 可自恢复，输出电压调节到 100V 测试
		+24V		7	10	Self-recoverable 可自恢复	
		+5V		1	3	Self-recoverable 可自恢复	
3	Overpower protection 过功率保护	HV	W	600	700	Self-recoverable 可自恢复	
4	Output short-circuit protection 输出短路保护			Yes 有		The fault can be recovered automatically after the fault is removed 三路均有，去除后故障后可自恢复	
5	Over-temperature protection 过温保护			Yes 有		After the temperature drops (temperature difference above 10 ° C), the power supply resumes output 温度降低后(10°C以上的温差)，电源恢 复输出	

HV overcurrent, overvoltage, short circuit protection, does not affect +24V and +5V; +24V overcurrent, overvoltage, short circuit protection, does not affect HV and +5V; When the +5V is protected by overcurrent, overvoltage, or short circuit, none of the channels has output.

HV 发生过流、过压、短路保护时，不影响+24V 和+5V；+24V 发生过流、过压、短路保护时，不影响 HV 和+5V；+5V 发生过流、过压、短路保护时，所有路均无输出。

**3.4 General characteristic 一般特性**

NO 序号	Project 项目	Specification requirements 规格要求		Remark 备注
1	MTBF(计算值)	KHrs	100	Rated input, output full load 25°C 额定输入, 输出满载 25°C
2	Weight 重量	kg	2.0	

**4 Safety and EMC requirements 安规和 EMC 要求**

NO 序号	Project 项目	Standard requirement 指标要求		Remark 备注
1	Security feature 安全特性			
1.1	Anti- Electricity Strong Degree 抗电强度	input- output 输入-输出	4000Vac/5mA/1min	No flash arc, no breakdown 无飞弧、无 击穿
		input-ground 输入-大地	3000Vac/5mA/1min	
		HV-ground HV-大地	3000Vac/5mA/1min	
		HV-LV	3000Vac/5mA/1min	
		LV-ground LV-大地	500Vac/5mA/1min	
1.2	Absolutely edge Electricity Hinder 绝缘电阻	input- output 输入-输出	$\geq 10M\Omega@500Vdc$	
		input-ground 输入-大地	$\geq 10M\Omega@500Vdc$	
		output-ground 输出-大地	$\geq 10M\Omega@500Vdc$	
1.3	To the floor drain current 对地漏电流		$\leq 0.5mA$	264Vac, 50Hz input 264Vac、 50Hz 输入
	Single fault leakage current 单一故障漏电流		$\leq 0.5mA$	
1.4	Contact leakage current 接触漏电流		$\leq 0.1 mA$	
	Single fault leakage current 单一故障漏电流		$\leq 0.5 mA$	
4.2	EMC characteristics EMC 特性			
	Project 项目	Standard 标准	Condition 条件	Remark 备注
2.1	Conducted susceptibility 传导抗扰	IEC60601-1-2 EN60601-1-2	CLASS B	

2.2	Radiated susceptibility 辐射抗扰	IEC60601-1-2 EN60601-1-2	CLASS B	
2.3	Conducted susceptibility 传导抗扰	IEC61000-4-6	0.15—80MHz3V, 80% AM (1kHz)	Criterion: A 判据: A
2.4	Radiated susceptibility 辐射抗扰	IEC61000-4-3	80—2000MHz 10V/m,80% AM(1kHz)	Criterion: A 判据: A
2.5	Surge 浪涌	EN61000-4-5	Differential mode $\pm 2kV$ / common mode $\pm 4kV$ 差模 $\pm 2kV$ /共模 $\pm 4kV$	Criterion: A 判据: R
			Differential mode $\pm 1kV$ / common mode $\pm 2kV$ 差模 $\pm 1kV$ /共模 $\pm 2kV$	Criterion: B 判据: B
2.6	(ESD)静电	EN61000-4-2	Contact: $\pm 6kV$ Air: $\pm 8kV$ 接触: $\pm 6kV$ 空气: $\pm 8kV$	Criterion: B 判据: B
			Contact: $\pm 8kV$ Air: $\pm 15kV$ 接触: $\pm 8kV$ 空气: $\pm 15kV$	Criterion: R 判据: R
2.7	EFT	EN61000-4-4	$\pm 2kV$	Criterion: A 判据: A
2.8	Harmonic wave Voltage flicker and fluctuation 谐波 电压闪烁和波动	EN 61000-3-3	CLASS B	
2.9	Voltage drop and short interruption 电压跌落和短时中断	EN61000-4-11	Drop to 70%Ut for 500ms Drop to 40% Ut, duration 200ms Drops to 0% Ut for a duration of 5000ms Drop to 0% Ut for a duration of 10ms 跌落到 70%Ut, 持续时间 500ms 跌落到 40%Ut, 持续时间 200ms 跌落到 0%Ut, 持续时间 5000ms 跌落到 0%Ut, 持续时间 10ms	Criterion: C The test was carried out at each phase of 0°, 90°, 180° and 270° 判据: C 在 0°、90°、 180°、270° 各相位均进 行试验

Immunity item performance criteria 抗扰度项目性能判据:

A: The performance of the power supply did not decrease in any way during the entire test process, which is exactly the same as the indicators specified in the power supply specification.

A: 电源在整个测试过程中, 性能没有任何降低, 完全和电源规格书中规定的指标相同。

B: During the test, the performance of the power supply is allowed to decrease temporarily, but it can return to normal after the test.



B: 测试过程中, 电源的性能允许暂时降低, 但测试结束后能够恢复正常。

C: Short-term loss of function is allowed, but the test can be returned to normal automatically or with manual intervention.

C: 允许出现短时的功能丧失, 但测试结束能够自动或者人工干预下恢复正常。

R: Damage to devices other than safety devices is not allowed during the test.

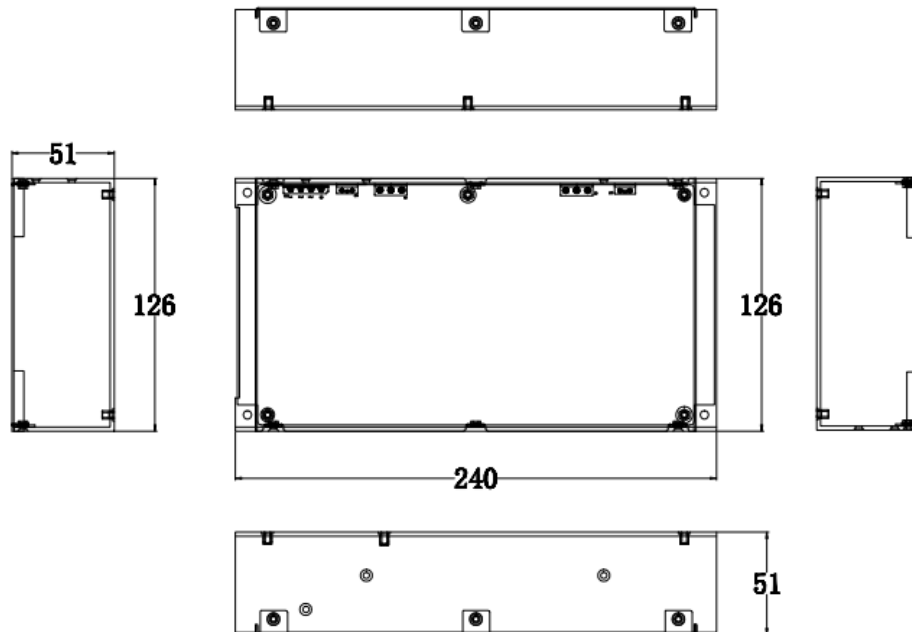
R: 测试过程中不允许出现除保险器件外其它器件的损坏。

## 5 Mechanical structure requirements 机械结构要求

### 5.1 External structural dimension 外形结构尺寸:

length × width × height = 240 × 126 × 51 mm

长 × 宽 × 高 = 240 × 126 × 51 mm



# 结构图

## 尺寸: 240\*126\*51mm

Tolerance of outline dimension is  $\pm 0.5$  mm, others are  $\pm 0.2$  mm in the diagram;

外形尺寸公差为  $\pm 0.5$  mm, 图中公差为  $\pm 0.2$  mm;

## 5.2 Terminal Definition 端子定义

Socket 插座	Pin number 引脚序号	Pin definition 引脚定义	Remark 备注
AC input 交流输入 (CON1)	1	FG/ Earth FG/大地 (⊕)	C4201WR-F-5P 4.2*5P, 第2、第4PIN 为空 the second and fourth pins are empty
	3	AC/N N line AC/N N 线	
	5	AC/L L line AC/L L 线	
HV DC output HV 直流输出 (CON2)	1	HV+	5569-2P
	2	HV-	
LV DC output LV 直流输出 (CON3, +24V)	1	+24Vo	5569-4P
	2	+24Vo	
	3	-24Vo	
	4	-24Vo	
控制接口 1 (CON4) A2006WR- 2x10P	1	GND	
	2	GND	
	3	MCP3001-I/SN -DO	HV voltage value to digital output HV 电压值转数字输出
	4	MCP3001-I/SN -CS	HV control signal (input) HV 控制信号 (输入)
	5	MCP4811T-E/MS -CS	HV control signal (input) HV 控制信号 (输入)
	6	MCP3001-I/SN -SCK 和 MCP4811T-E/MS - SCK 共用 (share)	HV control signal (input) HV 控制信号 (输入)
	7	MCP4811T-E/MS -SDI	HV control signal (input) HV 控制信号 (输入)
	8	HV Power Good Active Low	HV PG signal HV PG 信号
	9	HV Enable Active Low, 悬空关断, 拉低使能	HV output only works HV 输出始能
	10	GND	
	11	GND	
	12	W25Q64FVZPIG - CS	FLASH
	13	GND	
	14	MAX6627MTA+T - CS	Temp. Sensor
	15	MAX6627MTA+T - SCK 和 W25Q64FVZPIG -CLK 共用 (share)	Temp. Sensor FLASH

	16	MAX6627MTA+T - SDO 和 W25Q64FVZPIG - DO 共用 (share)	Temp. Sensor FLASH
	17	W25Q64FVZPIG - DI	FLASH
	18	GND	
	19	24V Voltage Sense -	
	20	24V Voltage Sense +	
Control interface 2 (CON5) 2.5mm pitch XH side bending connectors 控制接口 2 (CON5) 2.5mm 间距 XH 侧弯连接器	1	Continuous standby output, output 5Vsb/ 1W when the AC side is powered 连续待机输出, 交流侧有电即输出 5Vsb/ 1W	+5VSB output +5VSB 的输出
	2	+5Vsb reference ground	
	3	+5Vsb 参考地	
	4	LV Power Good , 24V normal operation output low level 24V 正常工作时输出低电平	LV PG
	5	+5Vsb reference ground +5Vsb 参考地	
	6	Low voltage (24V) The main route overhangs and shuts off. Enable the low voltage function 低压 (24V) 主路悬空关断, 拉低使能	CMOS 3.3V