

### ■ Features

- MEAN WELL Patent Number: ZL 202223277512.1
- 5"×3" compact size with **low profile (27.5mm)**
- 80~264Vac input with PFC, No load power consumption<0.5W
- **Global certificates in multi-fields**  
 (ITE 62368-1, Medical 60601-1, Household 60335-1, Industrial 61558-1/-2-16)
- **150%peak load @ 3s**
- **250W** convection, **400W** with FAN **23CFM** forced-cooled
- Suitable for **Class I** or **Class II** installations
- Over voltage category **III (OVC III)**
- **-40 ~ +80°C** wide range operation temperature
- High efficiency up to 95%
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Extremely low leakage current
- Operating altitude up to **5000 meters**
- Built-in 12V/0.5A for external FAN
- Built-in Remote sense
- 3 years warranty

### ■ Applications

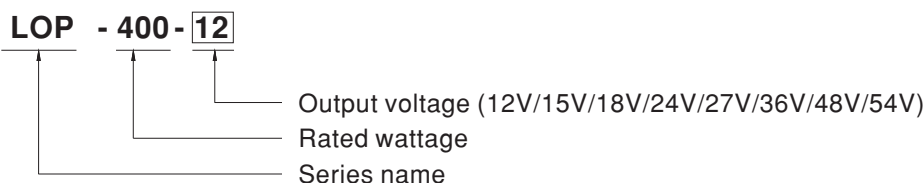
- Industrial automation machinery
- Industrial control system
- Mechanical and electrical equipment
- Electronic instruments, equipments or apparatus
- Power sourcing equipment of PoE
- Medical devices

### ■ Description

LOP-400 is a 400W highly reliable green PCB type low profile power supply with a high power density (24.6W/in<sup>3</sup>) on the 5" by 3" footprint. It accepts 80~264VAC input and offers various output voltages between 12V and 54V. The working efficiency is up to 95% and the extremely low no load power consumption is down below 0.5W.

LOP-400 is able to be used for both Class I (with FG) and Class II (no FG) system design. LOP-400 is equipped with complete protection functions; It is complied with the international safety regulations such as IEC/BS EN/EN/UL62368-1, IEC/BS EN/EN60335-1, IEC/BS EN/EN61558-1/-2-16, IEC/BS EN/EN60601-1. LOP-400 serves as a high price-to-performance power supply solution for various industrial applications. The extremely low leakage current is less than 500 μA. In addition, it conforms to the international medical regulations (2\*MOPP) and EMC BS EN/EN55011, perfectly fitting all kinds of BF rated "patient contact" medical system equipment.

### ■ Model Encoding

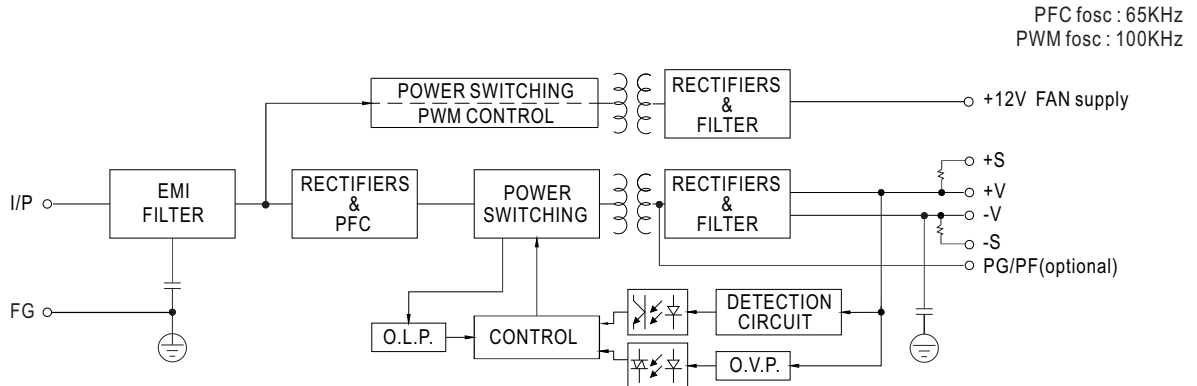


**SPECIFICATION**

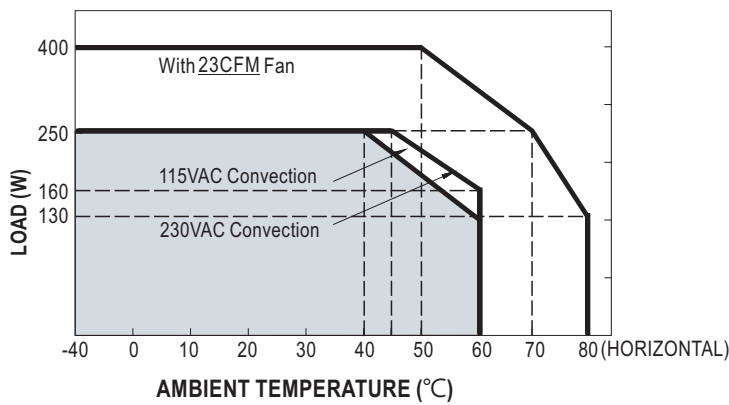
MODEL		LOP-400-12	LOP-400-15	LOP-400-18	LOP-400-24	LOP-400-27	LOP-400-36	LOP-400-48	LOP-400-54	
OUTPUT	DC VOLTAGE	12V	15V	18V	24V	27V	36V	48V	54V	
	CURRENT	Peak(3sec.)	50A	40A	33.3A	25A	22.2A	16.7A	12.5A	11.1A
		<u>23CFM</u>	33.3A	26.7A	22.2A	16.7A	14.9A	11.2A	8.4A	7.5A
		Convection	20.8A	16.7A	13.9A	10.5A	9.3A	7.1A	5.3A	4.75A
	RATED POWER	Peak(3sec.)	600W	600W	599.4W	600W	599.4W	601.2W	600W	599.4W
		<u>23CFM</u>	399.6W	400.5W	399.6W	400.8W	402.3W	403.2W	403.2W	405W
		Convection	249.6W	250.5W	250.2W	252W	251.1W	255.6W	254.4W	256.5W
	RIPPLE & NOISE (max.) Note.2	120mVp-p	150mVp-p	180mVp-p	200mVp-p	200mVp-p	250mVp-p	250mVp-p	250mVp-p	250mVp-p
	VOLTAGE ADJ. RANGE (MAIN OUTPUT)	11.4~12.6V	14.3~15.8V	17.1~18.9V	22.8~25.2V	25.6 ~ 28.4V	34.2 ~37.8V	45.6 ~50.4V	52 ~58V	
	VOLTAGE TOLERANCE Note.3	±3.0%	±3.0%	±3.0%	±2.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%
	LINE REGULATION	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	LOAD REGULATION	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%
	SETUP, RISE TIME	1000ms, 30ms/230VAC      1500ms, 30ms/115VAC at full load								
	HOLD UP TIME (Typ.)	30ms@250W load , 16ms@400W load								
INPUT	VOLTAGE RANGE Note.4	80 ~ 264VAC		113 ~ 370VDC						
	FREQUENCY RANGE	47 ~ 63Hz								
	POWER FACTOR	PF>0.95/230VAC PF>0.98/115VAC at full load								
	EFFICIENCY (Typ.)	94%	94.5%	95%	94.5%	95%	95%	95%	95%	95%
	AC CURRENT (Typ.)	4.2A/115VAC		2.1A/230VAC						
	INRUSH CURRENT (Typ.)	COLD START 40A/115VAC			80A/230VAC					
	LEAKAGE CURRENT	Earth leakage current < 500 $\mu$ A(rms) @ 264VAC , touch current < 70 $\mu$ A(rms) @ 264VAC								
PROTECTION	OVERLOAD	105 ~ 150% rated output power, Protection type : Hiccup after 3 sec, recovers automatically after fault condition is removed								
	OVER VOLTAGE	13.2 ~ 15.6V	16.5 ~ 19.5V	19.8 ~ 23.4V	26.4 ~ 31.2V	29.7 ~ 35.1V	39.6 ~ 46.8V	52.8 ~ 62.4V	59.4 ~ 67.5V	
		Protection type : Shut down o/p voltage, re-power on to recover								
OVER TEMPERATURE	Protection type : Shut down o/p voltage, recovers automatically after temperature goes down									
FUNCTION	EXTERNAL FAN SUPPLY	12V@0.5A for driving a fan / 12V@0.2A for without fan ; <u>(23CFM)</u> tolerance -15% ~+15% at main output 20% rated current								
	REMOTE SENSE	The remote sensing compensates voltage drop on the load wiring up to 0.5V								
	POWER GOOD / POWER FAIL (optional)	500ms>PG>10ms ; The TTL signal goes high with 10ms to 500ms delay after power set up ; The TTL signal goes low at least 1ms before Vo below 90% of rated value ; TTL(0 ~ 1V), TTH(2 ~ 5V)								
ENVIRONMENT	WORKING TEMP.	-40 ~ +80°C (Refer to "Derating Curve")								
	WORKING HUMIDITY	20 ~ 90% RH non-condensing								
	STORAGE TEMP., HUMIDITY	-40 ~ +85°C, 10 ~ 95% RH non-condensing								
	TEMP. COEFFICIENT	±0.03%/°C (0 ~ 50°C)								
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes								

SAFETY & EMC (Note 5)	<b>SAFETY STANDARDS</b>	CB IEC62368-1, IEC60335-1, IEC61558-1/-2-16, IEC60601-1; TUV BS EN/EN62368-1, BS EN/EN60335-1, BS EN/EN61558-1/-2-16, BS EN/EN60601-1(3.2 Version); UL UL62368-1, ANSI / AAMI ES60601-1(3.2 Version) ; CCC GB4943.1 ; RCM AS/NZS 61558-1/-2-16; EAC TPTC 004 approved.		
	<b>ISOLATION LEVEL</b>	Primary-Secondary: 2xMOPP, Primary-Earth:1xMOPP, Secondary-Earth:1xMOPP		
	<b>OVER VOLTAGE CATEGORY</b>	IEC/EN 61558-1/-2-16(OVC III, altitude up to 2000M ) IEC/EN/UL 62368-1 (OVC II, altitude up to 5000M ) IEC/EN 60335-1 (OVC II, altitude up to 5000M ) IEC/EN 60601-1 (OVC II, altitude up to 4000M )		
	<b>PROTECTIVE EXTRA-LOW VOLTAGE</b>	IEC/EN61558-2-16 (SELV ) IEC/EN/UL 62368-1 (SELV / ES1 )		
	<b>WITHSTAND VOLTAGE</b>	I/P-O/P:4KVAC I/P-FG:2KVAC O/P-FG:1.5KVAC		
	<b>ISOLATION RESISTANCE</b>	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C/ 70% RH		
	<b>EMC EMISSION</b>	<b>Parameter</b>	<b>Standard</b>	<b>Test Level / Note</b>
		Conducted & Radiated	BS EN/EN55032(CISPR32) BS EN/EN55011(CISPR11)	Class I : Class B , Class II : Class A
			BS EN/EN55014(CISPR32)	Class I : Class B
		Harmonic Current	BS EN/EN61000-3-2	Class A
Voltage Flicker	BS EN/EN61000-3-3	-----		
<b>EMC IMMUNITY</b>	BS EN/EN55035,BS EN/EN61000-6-2			
	<b>Parameter</b>	<b>Standard</b>	<b>Test Level /Note</b>	
	ESD	BS EN/EN61000-4-2	Level 4, 15KV air ; Level 4, 8KV contact	
	Radiated Susceptibility	BS EN/EN61000-4-3	Level 3, 10V/m( 80MHz~2.7GHz ) Table 9, 9~28V/m( 385MHz~5.78GHz )	
	EFT/Burest	BS EN/EN61000-4-4	Level 3, 2KV	
	Surge	BS EN/EN61000-4-5	Level 4, 4KV/Line-FG ; 2KV/Line-Line	
	Conducted	BS EN/EN61000-4-6	Level 3, 10V	
	Magnetic Field	BS EN/EN61000-4-8	Level 4, 30A/m	
Voltage Dips and interruptions	BS EN/EN61000-4-11	>95% dip 0. 5 periods, 100% dip 1 periods, 30% dip 25 periods, >95% interruptions 250 periods		
<b>OTHERS</b>	<b>MTBF</b>	1696.4K hrs min. Telcordia SR-332 (Bellcore) ; 231.2K hrs min. MIL-HDBK-217F (25°C)		
	<b>DIMENSION</b>	127*76.2*27.5mm (L*W*H)		
	<b>PACKING</b>	0.39Kg; 36pcs/15Kg/0.96CUFT		
<b>NOTE</b>	<p>1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25 of ambient temperature.</p> <p>2. Ripple &amp; noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1<math>\mu</math>f &amp; 47<math>\mu</math>f parallel capacitor.</p> <p>3. Tolerance : includes set up tolerance, line regulation and load regulation.</p> <p>4. Derating may be needed under low input voltages. Please check the derating curve for more details.</p> <p>5. The power supply is considered a component which will be installed into a final equipment. All the EMC tests are been executed by mounting the unit on a 360mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on <a href="http://www.meanwell.com">http://www.meanwell.com</a>)</p> <p>※ Product Liability Disclaimer : For detailed information, please refer to <a href="https://www.meanwell.com/serviceDisclaimer.aspx">https://www.meanwell.com/serviceDisclaimer.aspx</a></p>			

**Block Diagram**

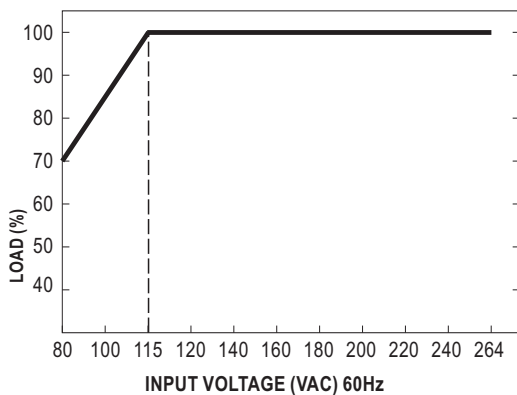


**Derating Curve**



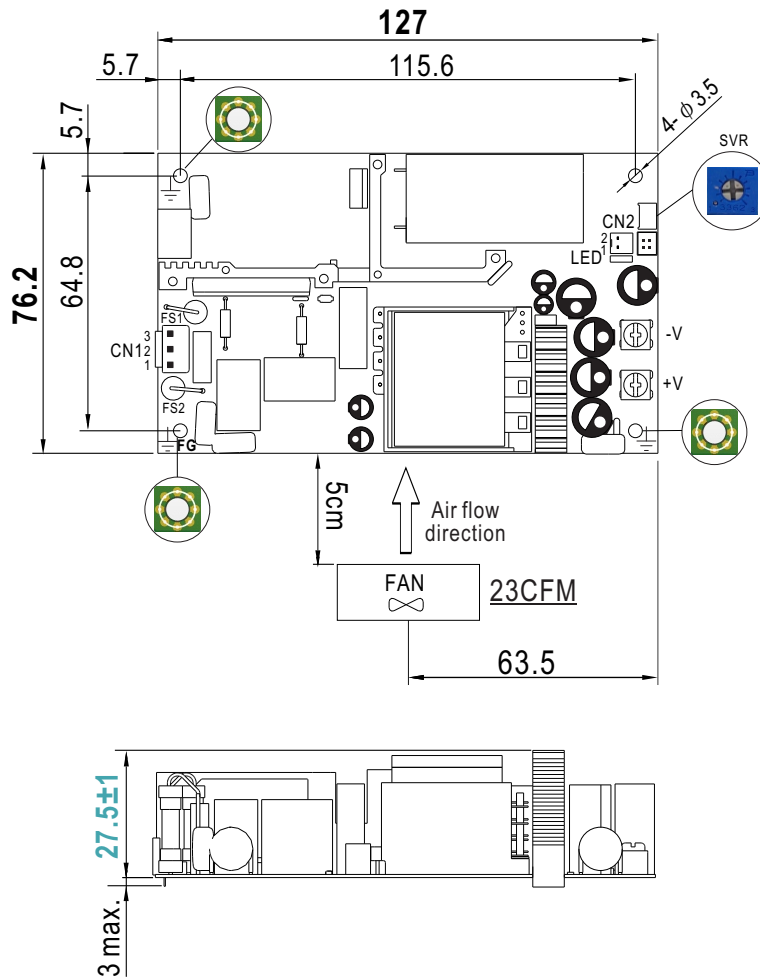
Cooling	Max. Output Power
Free air convection	250W
Force-cooled with external Fan	400W

**Output Derating VS Input Voltage**



■ Mechanical Specification

Unit:mm



AC Input Connector (CN1) : JST B3P-VH or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1	AC/L	JST VHR or equivalent	JST SVH-21T-P1.1 or equivalent
2	No Pin		
3	AC/N		

FAN Connector(CN2) : TKP 8812-2 or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1	DC COM	TKP 2502 or equivalent	TKP 8811 or equivalent
2	+12V		

Note:

Class I System: Mounting holes marked with  $\perp$  have to be connected to safety earth.

Class II System: Unnecessary to connect with safety earth.

⚠ HS1,HS2,HS3,HS4 can not be shorted

DC Output Connector

Assignment	Output Terminals
-V	M3.5 Pan HD screw in 2 positions
+V	Torque to 8 lbs-in(90cNm)max.