

UL62368-1  
ANSI/AAMI ES60601-1



BS EN/EN62368-1  
BS EN/EN60335-1  
BS EN/EN61558-1/-2-16  
BS EN/EN60601-1



IEC62368-1  
IEC60335-1  
IEC61558-1/-2-16  
IEC60601-1



AS/NZS 61558-1/-2-16



GB4943.1



## Features

- 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

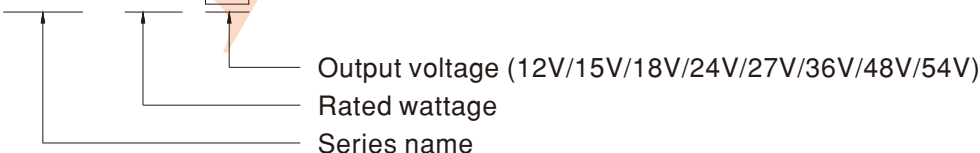
## Description

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 500uA. 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

LOP - 400 - 12



## Applications

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

## GTIN CODE

MW Search: <https://www.meanwell.com/serviceGTIN.aspx>



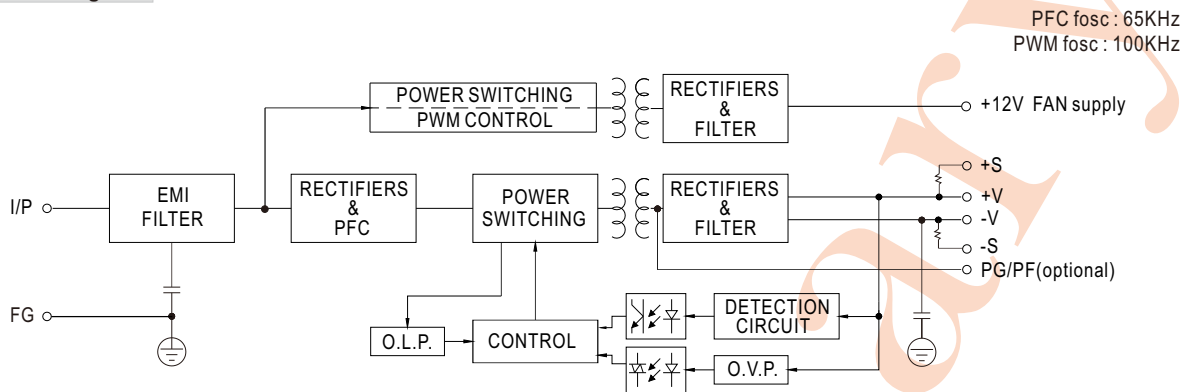
**SPECIFICATION**

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
		23CFM	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
		23CFM	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 < 500uA(rms) @ 264VAC , touch current < 70uA(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	
	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 ; (23CFM) 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									

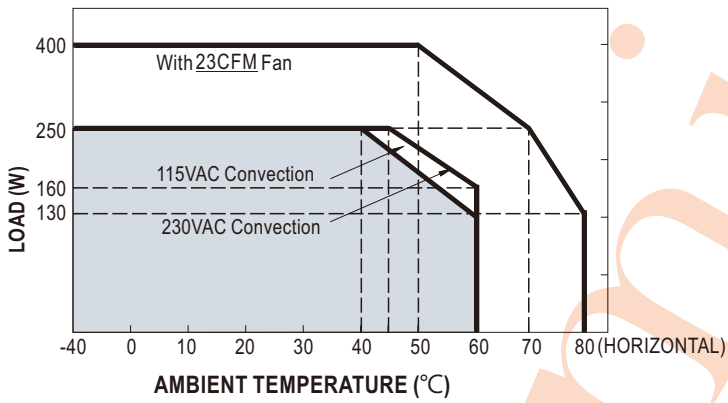


SAFETY & EMC (Note 5)	<b>SAFETY STANDARDS</b>	CB IEC62368-1, IEC60335-1, IEC61558-1/-2-16, IEC60601-1; TUV BS EN/EN62368-1, BS EN/EN60335-1, BS EN/EN61558-1/-2-16, BS EN/EN60601-1; UL UL62368-1, ANSI / AAMI ES60601-1 ; CCC GB4943.1 ; RCM AS/NZS 61558-1/-2-16; EAC TPTC 004 approved.		
	<b>ISOLATION LEVEL</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	
OTHERS	<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 0.1uf &amp; 47uf 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

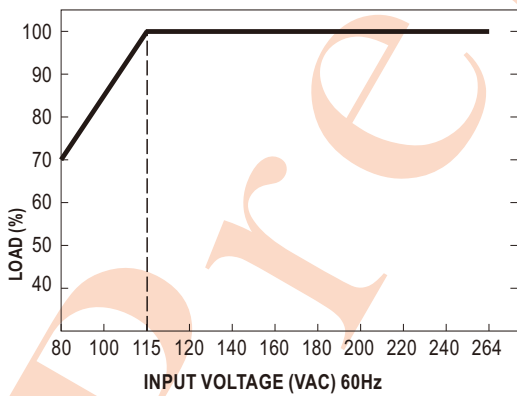


### Derating Curve

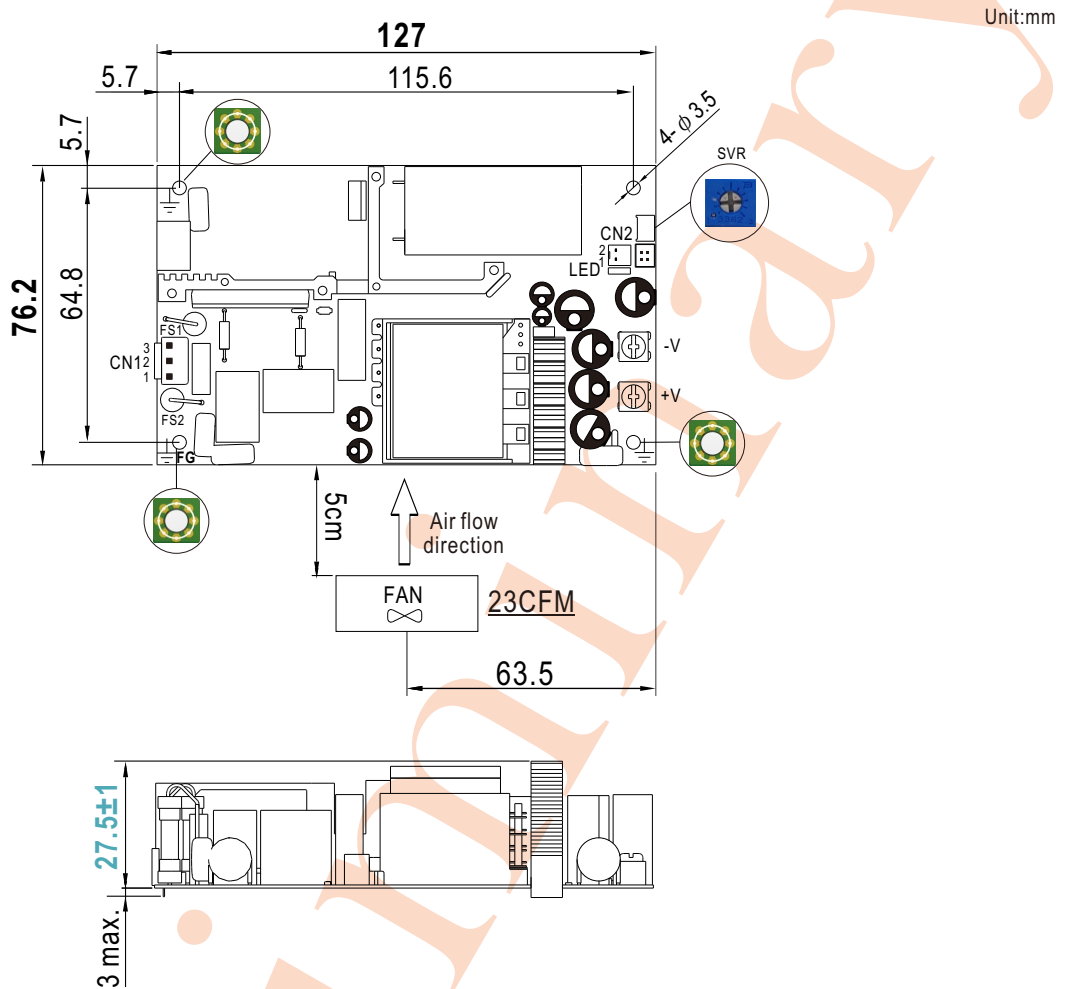


Cooling	Max. Output Power
Free air convection	250W
Force-cooled with external Fan	400W

### Output Derating VS Input Voltage



## Mechanical Specification



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 Torque to 8 lbs-in(90cNm)max.
+V	

## Installation Manual

Please refer to : <http://www.meanwell.com/webnet/search/InstallationSearch.html>