



User's Manual



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 TPTC004



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, **2 x MOPP**, suitable for **BF** medical applications
- Operating altitude up to **5000 meters**
- Built-in 12V/0.5A for external FAN
- Built-in Remote sense
- 3 years warranty

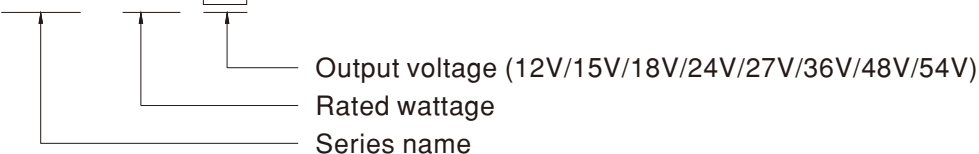
Description

The LOP-400 is a 400W highly reliable, energy-efficient, low-profile open frame type power supply. With a high power density of 24.6W/in³ within the standard size of 5" x 3", it features a universal input voltage range of 80~264VAC, making it suitable for global applications. The series offers a comprehensive selection of standard voltages, including 12V/15V/18V/24V/27V/36V/48V/54V, and comes in a complete range of models.

The main features of the LOP-400 include: low standby power (<0.5W), high efficiency (up to 95%), capable of providing 250W under natural air cooling and 400W with an additional fan. It has a 150% @ 3 seconds overload capacity, a wide operating temperature range of -40 to +80°C, compliance with OVCIII, suitable for Class I (with FG) or Class II (without FG) systems. The product has obtained multiple safety certifications, including 62368-1/60601-1/61558-1/60335-1, and is designed to meet 2xMOPP and extremely low touch leakage current <70 μA, making it suitable for BF class medical devices. With high product safety and excellent EMC performance, it is versatile and applicable in various fields such as ITE, medical, industrial control, home automation and more. It is a cost-effective slim open frame type power supply.

Model Encoding

LOP - 400 - 12



Applications

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

GTIN CODE

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



400W 5"×3" Low Profile Open Frame Power Supply

LOP-400 series**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 < 500 μ A(rms) @ 264VAC , touch current < 70 μ 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 or re-power on to recover								
FUNCTION	EXTERNAL FAN SUPPLY	12V@0.5A for driving a fan (23CFM) / 12V@0.2A for without fan ; 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								



400W 5"×3" Low Profile Open Frame Power Supply

LOP-400 series

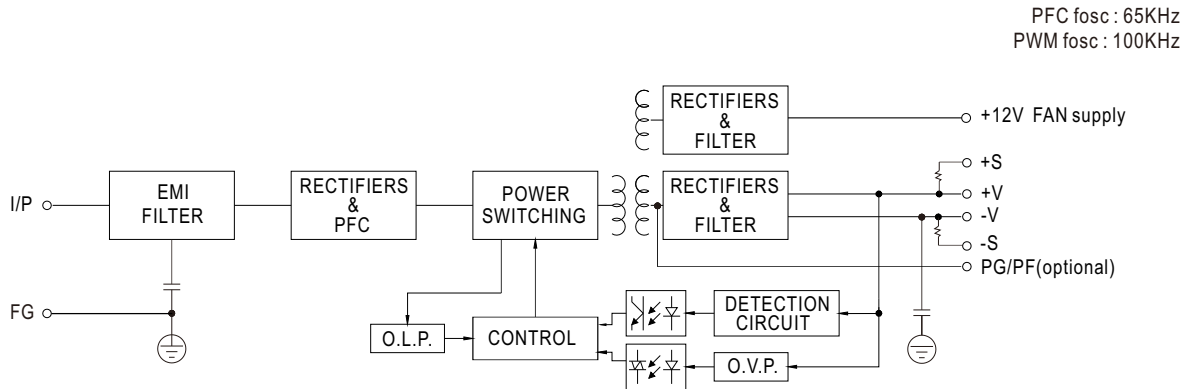
SAFETY & EMC (Note 5)	SAFETY STANDARDS	CB IEC62368-1, IEC60335-1, IEC61558-1/-2-16, IEC60601-1; TUV BS EN/EN62368-1, BS EN/EN60335-1, BS EN/EN61558-1/-2-16, BS EN/EN60601-1(3.2 Version); UL UL62368-1, ANSI / AAMI ES60601-1(3.2 Version) ; CCC GB4943.1 ; RCM AS/NZS 61558-1/-2-16; EAC TPTC 004 approved.		
	ISOLATION LEVEL	Primary-Secondary: 2xMOPP, Primary-Earth:1xMOPP, Secondary-Earth:1xMOPP		
	OVER VOLTAGE CATEGORY	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)		
	PROTECTIVE EXTRA-LOW VOLTAGE	IEC/EN61558-2-16 (SELV, 12~48V) IEC/EN/UL 62368-1 (SELV / ES1, 12~48V)		
	WITHSTAND VOLTAGE	I/P-O/P:4KVAC I/P-FG:2KVAC O/P-FG:1.5KVAC		
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH		
	EMC EMISSION	Parameter	Standard	Test Level / Note
		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	-----	
EMC IMMUNITY	BS EN/EN55035,BS EN/EN61000-6-2			
	Parameter	Standard	Test Level /Note	
	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	MTBF	1696.4K hrs min. Telcordia SR-332 (Bellcore) ; 231.2K hrs min. MIL-HDBK-217F (25°C)		
	DIMENSION	127*76.2*27.5mm (L*W*H)		
	PACKING	0.39Kg; 24pcs/11.5Kg/1.0CUFT		
NOTE	<p>1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature.</p> <p>2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1μF & 47μF 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 https://www.meanwell.com/Upload/PDF/EMI_statement_en.pdf)</p> <p>※ Product Liability Disclaimer : For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx</p>			



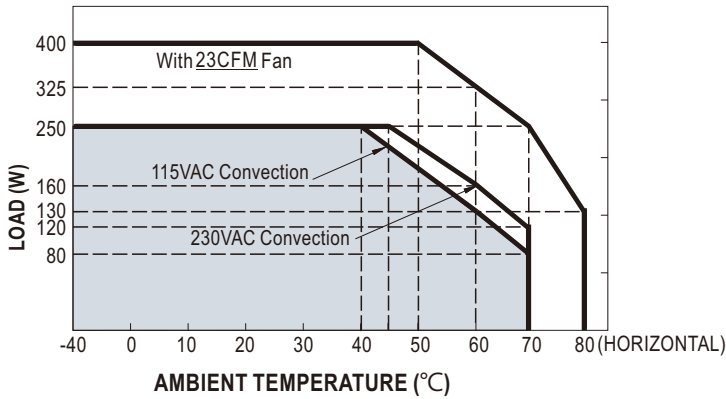
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LOP-400 series

Block Diagram

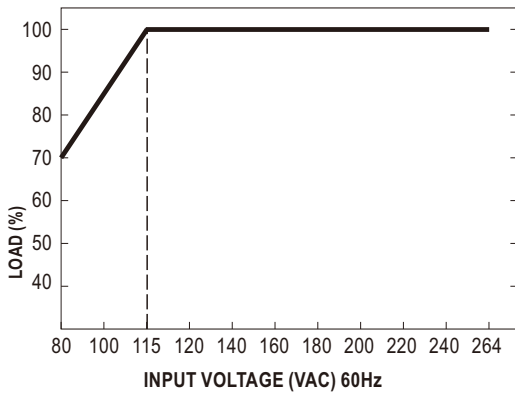


Derating Curve



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

Output Derating VS Input Voltage



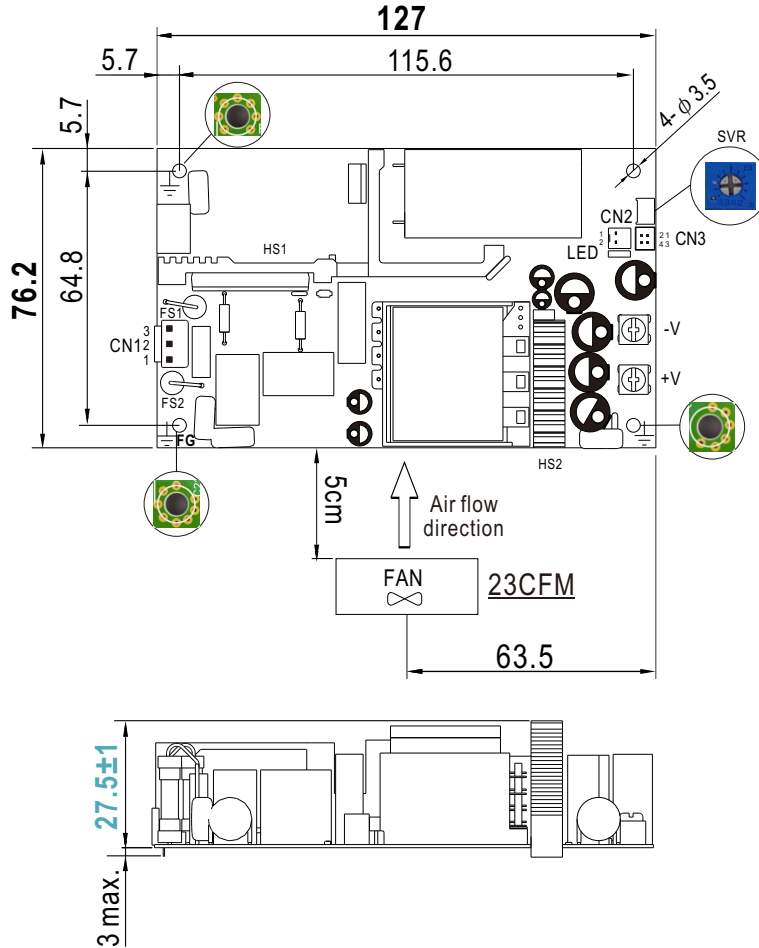


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Mechanical Specification

(Unit: mm , tolerance ± 1mm)



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		

DC Output Connector

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

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 cannot be shorted

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	+12Vaux		

Function Connector(CN3): TKP DH21-2X2 or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1	-R.S	TKP DH2 or equivalent	TKP or equivalent
2	+R.S		
3	DC COM		
4	PG(optional)		

Installation Manual

Please refer to : <http://www.meanwell.com/manual.html>