ALM200 Series

AC-DC Power Supplies

200 Watts

- Medical & IT Safety Approvals
- Energy Efficiency Level VI & EU CoC Tier 2 Compliant
- 4th Edition Medical EMC
- IP32 Environmental Rating
- Class I and Class II Versions
- <0.15 W Standby Power
- 0 °C to 60 °C Operation
- Low Earth Leakage Current
- 3 Year Warranty

GREEN **XP** POWER

The ALM200 series of medical external power supplies is fully approved to international medical & IT safety standards. It has been designed with very high efficiency and low standby power, enabling it to meet the latest environmental legislation. The unit has a fully sealed enclosure complying with IP32 and a smooth surface finish making it easier to wipe down in a clinical setting.
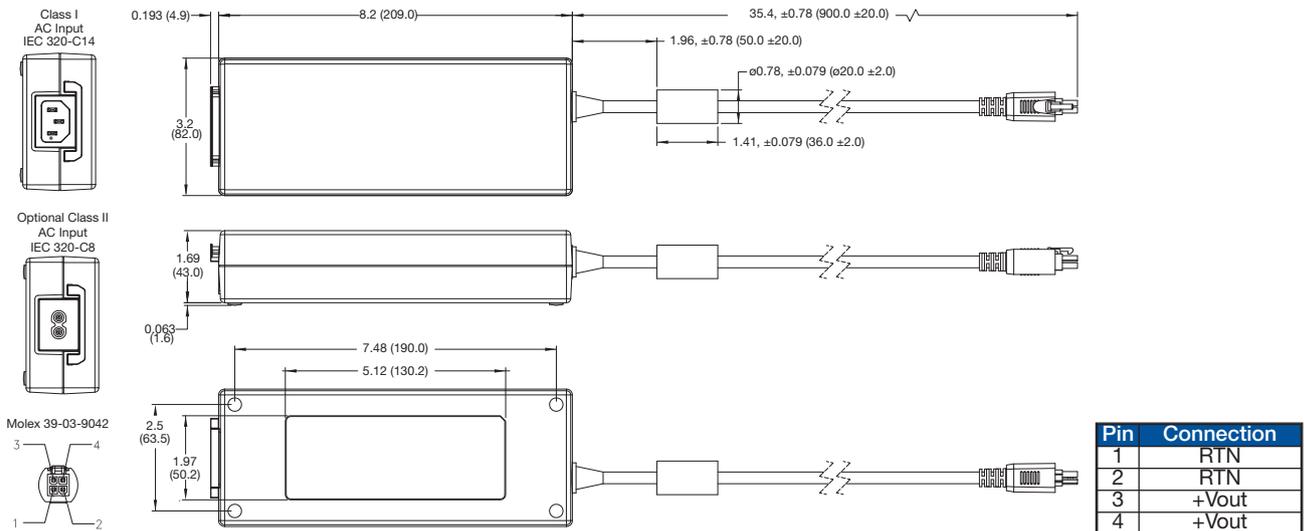
Dimensions:

ALM200:
8.23 x 3.23 x 1.69" (209.0 x 82.0 x 43.0 mm)

Models & Ratings

Output Power	Output Voltage	Output Current	Load Regulation	Efficiency[4]	Model Number[1,2,3]
200 W	12.0 V	16.7 A	3.5%	91.7%	ALM200PS12
	15.0 V	13.4 A		92.4%	ALM200PS15
	19.0 V	10.6 A		92.8%	ALM200PS19
	24.0 V	8.4 A	3.0%	92.2%	ALM200PS24
	48.0 V	4.2 A		92.4%	ALM200PS48

Notes

1. For class II versions, add suffix 'C2-8' to the end of the part number e.g. ALM200PS24C2-8.
2. For optional input connector retention clip add suffix '-A' to the model number, e.g. ALM200PS24-A (not available for C2 versions)
3. Power de-rated <100 VAC for 12 & 15 V models, refer to input specifications.
4. Typical average value measured at 25%, 50%, 75% and 100% load at 230VAC

Mechanical Details

Class I
AC Input
IEC 320-C14

0.193 (4.9)   8.2 (209.0)   35.4, ±0.78 (900.0 ±20.0)
1.96, ±0.78 (50.0 ±20.0)
ø0.78, ±0.079 (ø20.0 ±2.0)
3.2 (82.0)
1.41, ±0.079 (36.0 ±2.0)

Optional Class II
AC Input
IEC 320-C8

1.69 (43.0)
0.063 (1.6)

Molex 39-03-9042

7.48 (190.0)
5.12 (130.2)
2.5 (63.5)
1.97 (50.2)

Pin	Connection
1	RTN
2	RTN
3	+Vout
4	+Vout

Notes

1. All dimensions shown in inches (mm). Tolerance is 0.02 (0.5) maximum, except output cable length.
2. Weight: 2.01 lbs (910 kg) approx.
3. For European mains lead order part EU-MAINS-IEC for C14 versions, or EU-MAINS-8 for C8 versions.
4. For UK mains lead order part UK-MAINS-IEC for C14 versions, or UK-MAINS-8 for C8 versions.
5. For US mains lead order part US-MAINS-IEC for C14 versions, or US-MAINS-8 for C8 versions.
6. Output connector: 4 pin molex Mini-Fit part number 39-03-9042 housing with 45750 crimp terminals and mates with molex header 46999-0516 or equivalent.

ALM200 Series

AC-DC Power Supplies

XP Power

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage	80		264	VAC	19, 24 & 48V models: Derate linearly from 100% load at 90 VAC to 80% load at 80 VAC. 300 VAC/5 s maximum. 12 & 15 V models: Derate linearly from 100% load at 100 VAC to 95% load at 90 VAC and then derate linearly 80% load at 80 VAC, 300 VAC/5 s maximum.
Input Frequency	47		63	Hz	
Input Current		2.0/1.0		A	Measured at 115/230 VAC
Inrush Current			160	A	230 VAC, cold start at 25 °C
Power Factor		>0.9			EN61000-3-2 Class A
Earth Leakage Current			250	µA	264 VAC, 60 Hz
No Load Input Power			0.15	W	
Input Protection	T5A/250 VAC internal fuse in both line & neutral				

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage	12		48	VDC	See Models and Ratings table
Initial Set Accuracy			±2	%	At 50% load
Minimum Load					No minimum load required
Start Up Delay		1	1.5	s	
Start Up Rise Time			40	ms	
Hold Up Time	20	30		ms	Full load and 115/230 VAC
Line Regulation			±0.5	%	
Load Regulation				%	See Models and Ratings table
Transient Response			4	%	Maximum deviation, recovering to less than 1% within 500 µs for 50-75-50% load change
Ripple and Noise			1.5	% pk-pk	20 MHz bandwidth, measured with 20 MHz Bandwidth and 10 µF electrolytic in parallel with 0.1 µF ceramic capacitor.
Overshoot		5	10	%	At turn on / turn off
Overload Protection	115		175	%	
Overvoltage Protection			150	%	Recycle mains to reset
Short Circuit Protection	Trip and restart (hiccup), auto resetting				
Thermal Protection	Measured internally, auto resetting				
Temperature Coefficient		0.02		%/°C	
Patient Leakage Current			95	µ A	264 VAC, 60 Hz

Environmental

| Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	0		+60	°C	Derate from 100% load at 40 °C to 35% load at 60 °C
Cooling	Natural convection				
Operating Humidity	5		95	%RH	Non-condensing
Storage Temperature	-25		+80	°C	
Operating Altitude			5000	m	
Shock	IEC68-2-27, 30 g, 11 ms half sine, 3 times in each of 6 axes				
Vibration	IEC68-2-6, 10-500 Hz, 2 g 10 mins/sweep, 60 mins for each of 3 axes				

Derating Curve
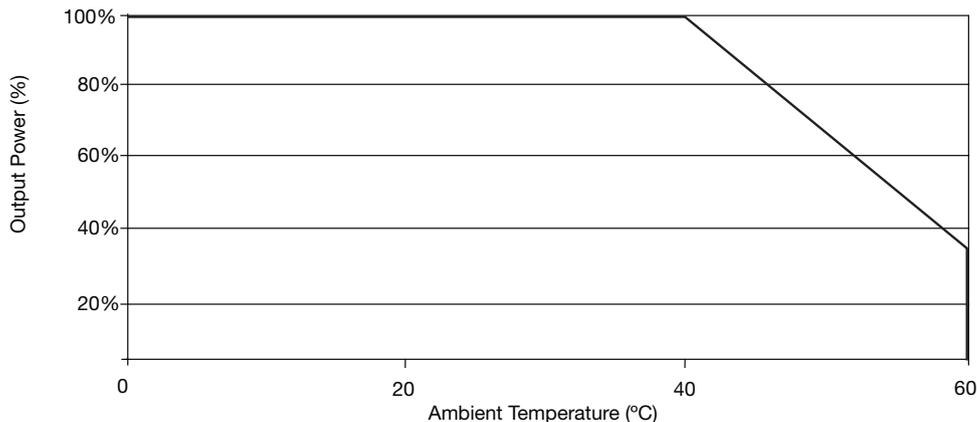
General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		92		%	See Models and Ratings table
Isolation: Input to Output			4000	VAC	2 x MOPP
Input to Ground			1800	VAC	1 x MOPP (Class I versions only)
Output to Ground			500	VAC	Class I versions only
Switching Frequency	45		140	kHz	PFC
	85		190		Main Converter
Power Density		6.4		W/in³	
Mean Time Between Failure		>300		kHrs	MIL-HDBK-217F at 25 °C GB
Weight		2.01 (910)		lb (g)	

Efficiency Curves

ALM200PS12
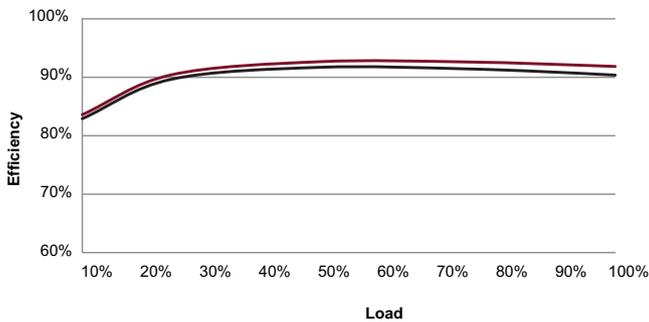
ALM200PS24
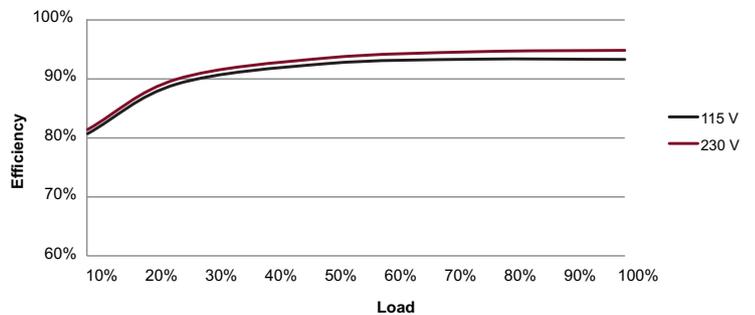
EMC: Emissions

Phenomenon	Standard	Test Level	Notes & Conditions
Emissions	EN55032	Level B	Conducted & Radiated
Harmonic Current	EN61000-3-2	Class A	
Voltage Flicker	EN61000-3-3		

EMC: Immunity

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD	EN61000-4-2	3	A	±15 kV air/±8 kV contact
Radiated	EN61000-4-3	10 V/m	A	80-2700 MHz. IEC60601-1-2 Ed.4 at other frequencies
EFT/Burst	EN61000-4-4	3	A	
Surge	EN61000-4-5	Installation Class 3	A	
Conducted	EN61000-4-6	10 V	A	
Magnetic Fields	EN61000-4-8	4	A	
Dips and Interruptions	EN61000-4-11	Dip: 30% 500 ms	A	
		Dip: 60% 200 ms	A/B	High Line/Low Line
		Dip: 20% 5000 ms	A	
		Int: 100% 10 ms	A	
		Int: 100% 20 ms	A	
		Int: 100% 5000 ms	B	
	EN60601-1-2	Dip: 30% 25 AC Cycles	A	
		Dip: 60% 5 AC Cycles	A	230 VAC 100% load, 100 VAC 25% load
		Int: 100% 0.5 AC Cycles	A	
		Int: 100% 1.0 AC Cycles	A	
		Int: 100% 250 AC Cycles	B	

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