

### 85 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



#### Dimensions:

**ALM85:**  
5.315 x 2.441 x 1.457" (135.0 x 62.0 x 37.0 mm)

The ALM85 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.

### Models & Ratings

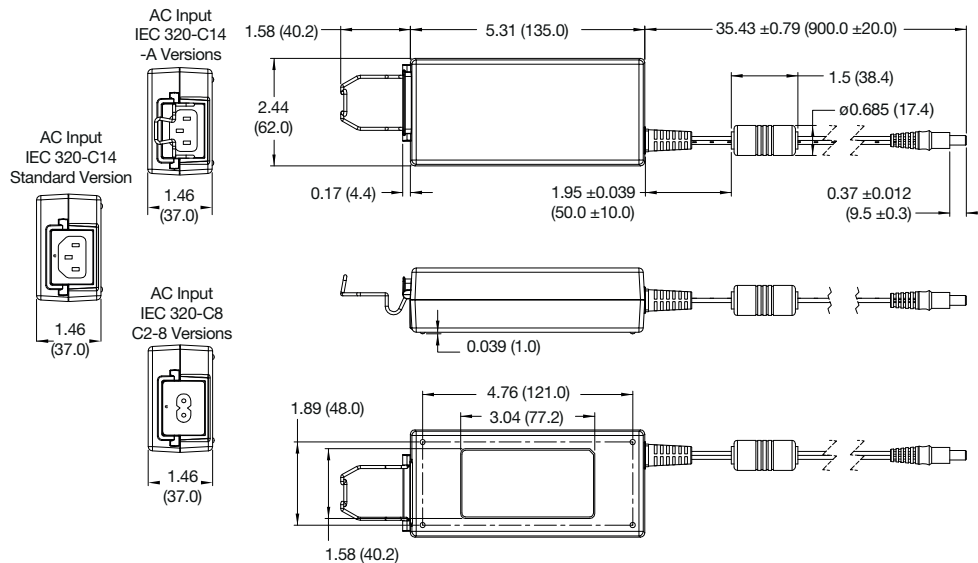
Output Power	Output Voltage	Output Current	Total Regulation	Model Number <sup>(1,2)</sup>
80 W	12.0 V	6.67 A	±5%	ALM85US12
	15.0 V	5.33 A		ALM85US15
85 W	19.0 V	4.47 A		ALM85US19
	24.0 V	3.54 A		ALM85US24

#### Notes

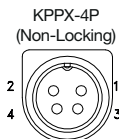
1. For class II versions, add suffix 'C2-8' to the end of the part number e.g. ALM85US24C2-8.

2. For optional input connector retention clip add suffix '-A' to the model number, e.g. ALM85US24-A (not available for C2 versions)

### Mechanical Details

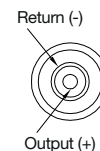


#### 12 & 15 V Versions



Pin	Connection
1	+Vout
2	+Vout
3	RTN
4	RTN
Shell	Not Connected

#### 19 & 24 V Versions



#### Notes

1. All dimensions shown in inches (mm). Tolerance is 0.02 (0.5) maximum, except output cable length.
2. Weight: 0.78 lbs (355 g) 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: 12 V & 15 V: 4 pin power din with pin 1 & 2 - positive and pin 3 & 4 - return, equivalent to KPPX-4P (non-locking). 19 V & 24 V: DC barrel jack; 5.5 outer diameter, 2.5 mm inner diameter with centre positive.

### Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage	80		264	VAC	Derate linearly from 100% load at 90 VAC to 80% load at 80 VAC. 300 VAC/5 s maximum
Input Frequency	47		63	Hz	
Input Current		1.7/0.9		A	Measured at 115/230 VAC
Inrush Current			60/120	A	115/230 VAC, cold start at 25 °C
Power Factor					EN61000-3-2 Class A
Earth Leakage Current			250	µA	264 VAC, 60 Hz
No Load Input Power			0.15	W	
Input Protection	T3.15A/250 VAC internal fuse in both line & neutral				

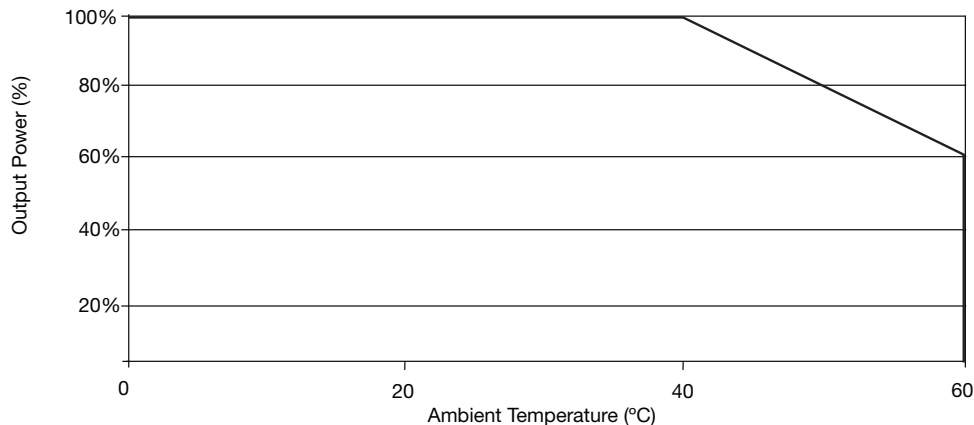
### Output

Characteristic	Min.	Typ.	Max.	Units	Notes & Conditions
Output Voltage	12		24	VDC	See Models and Ratings table
Initial Set Accuracy			±2	%	At 50% load
Minimum Load					No minimum load required
Start Up Delay			2	s	
Start Up Rise Time			150	ms	
Hold Up Time	10/20			ms	Full load and 115/230 VAC
Line Regulation			±0.5	%	
Total Regulation			±5	%	
Transient Response			4	%	Maximum deviation, recovering to less than 1% within 500 µs for 25% step load
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			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	
Patent 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 60% load at 60 °C
Cooling	Natural convection				
Operating Humidity	5		95	%RH	Non-condensing
Storage Temperature	-20		+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

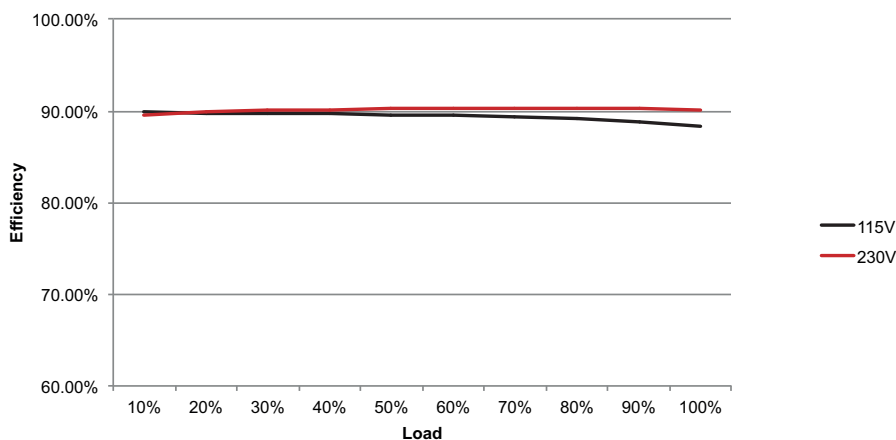


### General

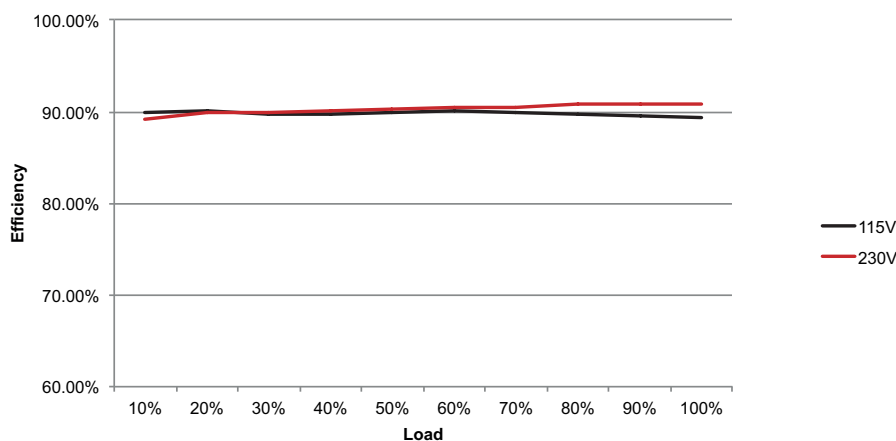
Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency	88			%	See curves.
Isolation: Input to Output Input to Ground Output to Ground			4000	VAC	2 x MOPP
			1500	VAC	1 x MOPP (Class I versions only)
			500	VAC	Class I versions only
Switching Frequency		65 KHz		kHz	PWM
Power Density		4.55		W/in <sup>3</sup>	
Mean Time Between Failure		>300		kHrs	MIL-HDBK-217F at 25 °C GB
Weight		0.78 (355)		lb (g)	

### Efficiency Curves

#### ALM85US12



#### ALM85US24



### EMC: Emissions

Phenomenon	Standard	Test Level	Notes & Conditions
Emissions	EN55022	Level B	Conducted & Radiated
Harmonic Current	EN61000-3-2	Class A	
Voltage Flicker	EN61000-3-3		

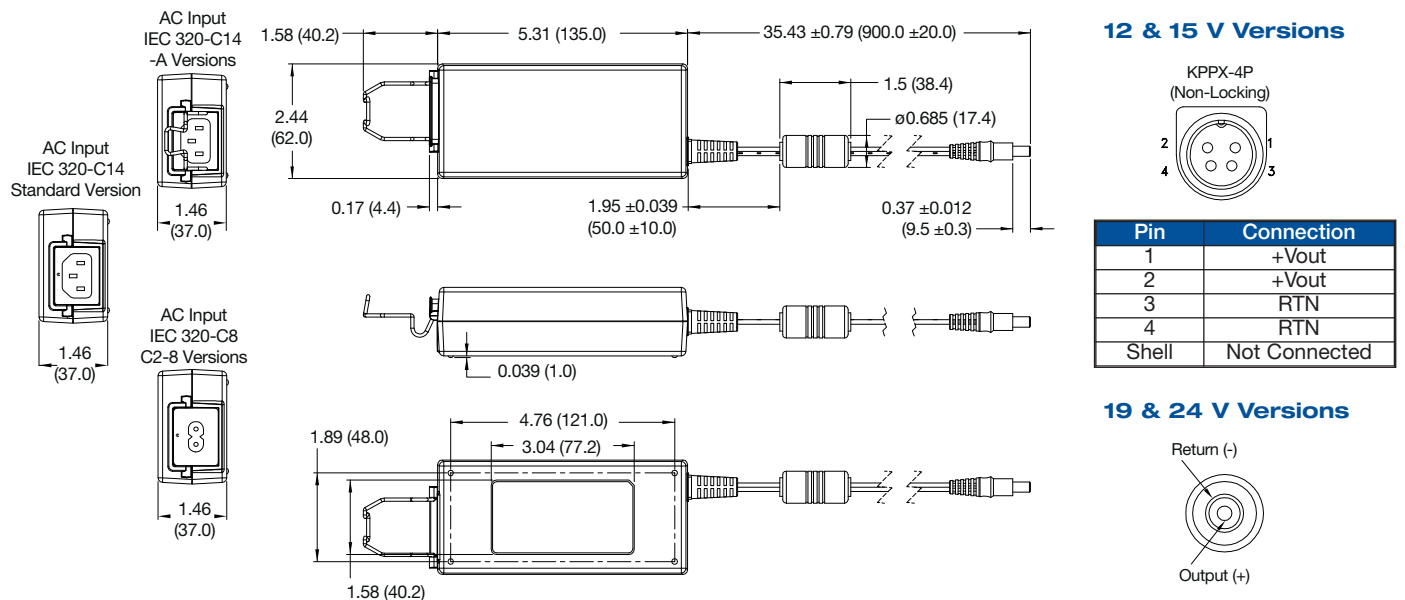
### EMC: Immunity

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/B	High Line/Low Line
		Dip: 60% 200 ms	A/B	High Line/Low Line
		Dip: 80% 5000 ms	B	
		Int: 100% 10 ms	A	
		Int: 100% 20 ms	B	
	EN60601-1-2	Dip: 30% 25 AC Cycles	A	230 VAC 100% load, 100 VAC 80%
		Dip: 60% 5 AC Cycles	A	230 VAC 100% load, 100 VAC 30%
		Int: 100% 0.5 AC Cycles	A	
		Int: 100% 1.0 AC Cycles	A	230 VAC 100% load, 100 VAC 50%
		Int: 100% 250 AC Cycles	B	

### Safety Approvals

Safety Agency	Safety Standard	Notes & Conditions
UL	UL60950-1 2nd Edition	Information Technology
TUV	EN60950-1	
CB	IEC60950-1	
CE	LVD	
UL	ANSI/AAMI ES 60601-1	Medical
CSA	CSA C22.2 No. 60601	
TUV	EN60601-1	
CB	IEC60601-1	

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