



**EN:** This Datasheet/Document is presented by the manufacturer.

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### 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

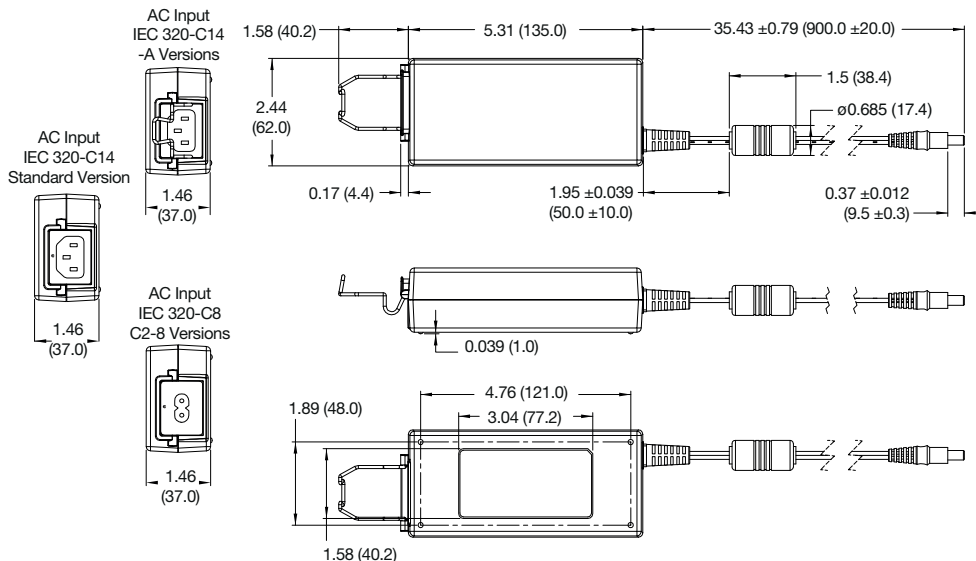
| Output Power | Output Voltage | Output Current | Total Regulation | Model Number <sup>(1,2)</sup> |
|--------------|----------------|----------------|------------------|-------------------------------|
| 80 W         | 12.0 V         | 6.67 A         | ±5%              | ALM85US12                 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

### Notes

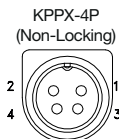
1. For class II versions, add suffix 'C2-8' to the end of the part number e.g. ALM85US24C2-8.

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

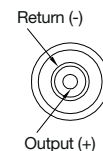


#### 12 & 15 V Versions



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

#### 19 & 24 V Versions



### Notes

- All dimensions shown in inches (mm). Tolerance is 0.02 (0.5) maximum, except output cable length.
- Weight: 0.78 lbs (355 g) approx.
- For European mains lead order part EU-MAINS-IEC for C14 versions, or EU-MAINS-8 for C8 versions.
- For UK mains lead order part UK-MAINS-IEC for C14 versions, or UK-MAINS-8 for C8 versions.

- For US mains lead order part US-MAINS-IEC for C14 versions, or US-MAINS-8 for C8 versions.
- 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 |         |         |       |                                                                                     |

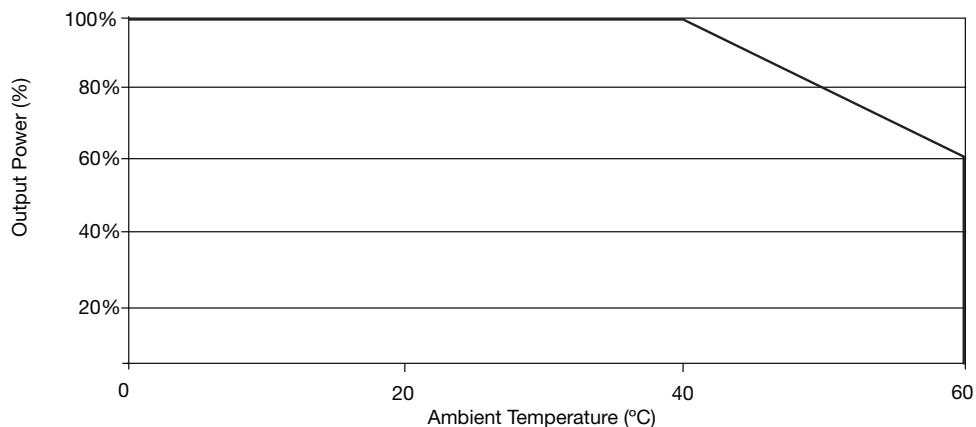
### Output

| 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 | 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

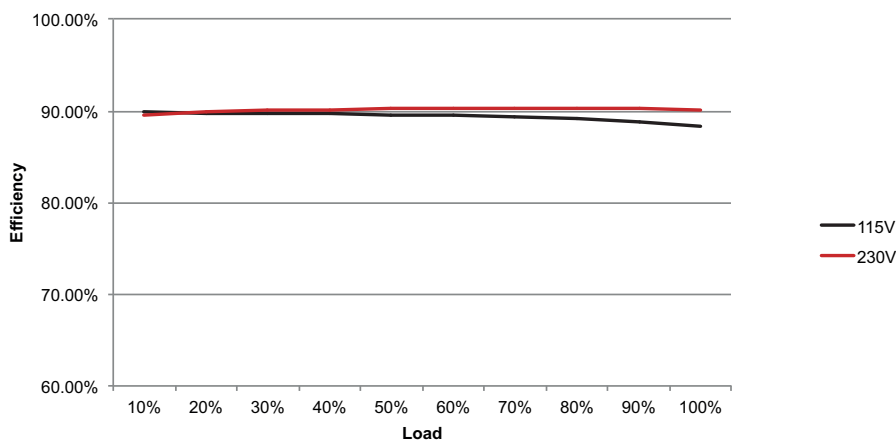


### General

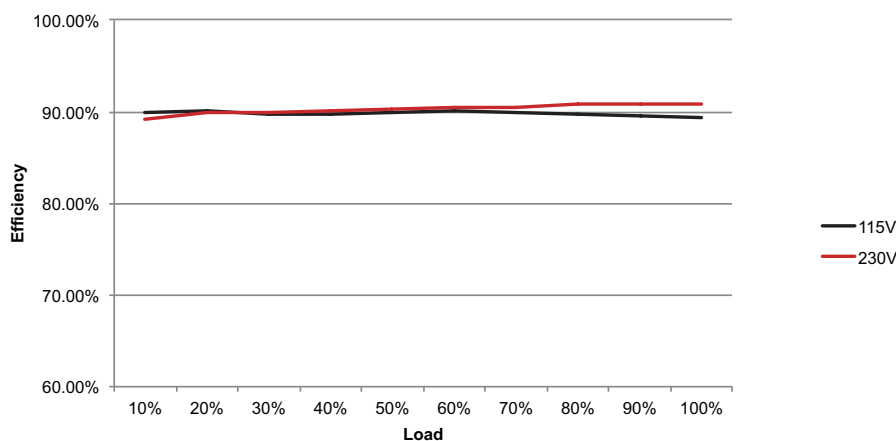
| Characteristic                                                    | Minimum | Typical    | Maximum | Units             | Notes & Conditions               |
|-------------------------------------------------------------------|---------|------------|---------|-------------------|----------------------------------|
| Efficiency                                                        | 88      |            |         | %                 | See curves.                      |
| Isolation: Input to Output<br>Input to Ground<br>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        | EN55032, EN55011 | Level B    | Conducted & Radiated |
| Harmonic Current | EN61000-3-2      | Class A    |                      |
| Voltage Flicker  | EN61000-3-3      |            |                      |

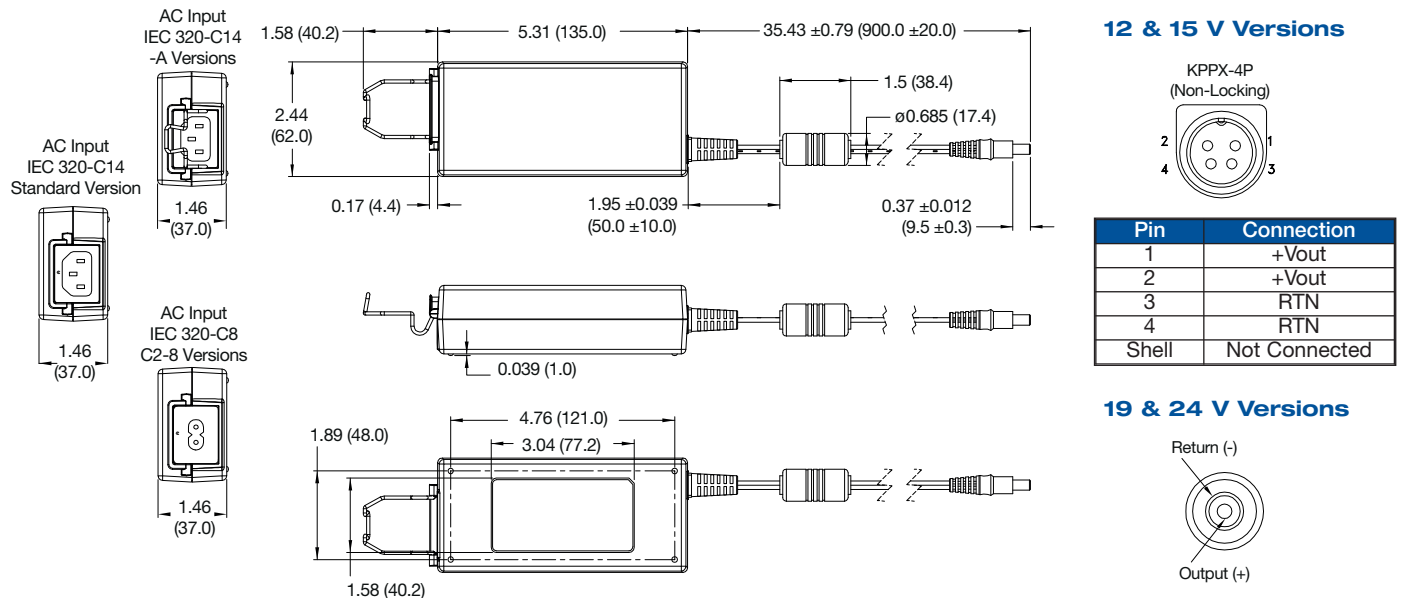
### EMC: Immunity

| 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        |                                                     |
|                        |              | Int: 100% 5000 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            | UL62368-1               | Information Technology |
| TUV           | EN62368-1               |                        |
| CB            | IEC60950-1 & IEC62368-1 |                        |
| CE            | LVD                     |                        |
| UL            | ANSI/AAMI ES 60601-1    | Medical                |
| CSA           | CSA C22.2 No. 60601     |                        |
| TUV           | EN60601-1               |                        |
| CB            | IEC60601-1              |                        |

### Mechanical Details



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