

LEVEL VI
EFFICIENCY
EMI & EMC



Features

- Meets UL/EN/IEC60601-1-2, 4th edition for EMC*
- Approved to EN/IEC/UL60601-1, 3rd edition with isolation levels which satisfy the 2 MOPP requirements
- Meets DoE Efficiency Level VI Requirements
 - No load input power
 - Average Efficiency
- Up to 60W of AC-DC Power
- Universal Input 90-264Vac Input Range
- Desktop Style Package
- Meets EN55011/CISPR11, FCC Part 15.109 Class B Conducted & Radiated Emissions, with 6db margin
- E-cap life of >7 years
- 3 Year Warranty
- IP22 Rated Enclosure

Description

A high performance AC to DC external power supply family designed for medical applications. The ME60A Medical Series low power external AC-DC power supplies are approved to safety EN/IEC/UL60601-1, 3rd edition and EN/IEC/UL60601-1-11:2010 for Home Healthcare (non-hospital use) applications with and isolation levels which satisfy the 2 MOPP requirements and designed to UL/EN/IEC60601-1-2, 4th edition for EMC*. The ME60A Series models will operate at universal input range of 90 to 264Vac over the wide temperature range of -20°C to +70°C, delivering full rated output power up to +40°C and applicable output power derating at 70°C. These models are available in desktop versions, include an IP22 rating per IEC60529 for the enclosure, and the output cable can be terminated at a variety of output connectors.

*Consult Factory for Table 9 compliance information.

Model Selection

Model Number	Volts	Output Current	Output Power	Ripple & Noise ¹	Line Regulation	Load Regulation	Output Connector	Output Cable	Input Configuration
ME60A0551F01	5.0V	7.00A	35W	75mV pk-pk	±1%	±5%	6 pin Molex Type ²	1150mm, #18AWG	
ME60A0903F01	9.0V	6.00A	56W	90mV pk-pk	±1%	±5%	2.5 x 5.5 x 9.5mm Straight Barrel Type, center positive	9V:1150mm 18AWG All others: 1500mm, #18AWG	Class I Desktop, IEC60320 C14 Receptacle
ME60A1203F01	12.0V	5.00A	60W	120mV pk-pk	±1%	±5%			
ME60A1503F01	15.0V	4.00A	60W	150mV pk-pk	±1%	±5%			
ME60A1803F01	18.0V	3.30A	60W	180mV pk-pk	±1%	±5%			
ME60A2403F01	24.0V	2.70A	60W	240mV pk-pk	±1%	±5%			
ME60A4803F01	48.0V	1.35A	60W	480mV pk-pk	±1%	±5%			
ME60A0551N01	5.0V	7.00A	35W	75mV pk-pk	±1%	±5%	6 pin Molex Type ³	1150mm, #18AWG	
ME60A0903N01	9.0V	6.00A	56W	90mV pk-pk	±1%	±5%	2.5 x 5.5 x 9.5mm Straight Barrel Type, center positive	9V:1150mm 18AWG All others: 1500mm, #18AWG	Class II Desktop, IEC60320 C8 Receptacle
ME60A1203N01	12.0V	5.00A	60W	120mV pk-pk	±1%	±5%			
ME60A1503N01	15.0V	4.00A	60W	150mV pk-pk	±1%	±5%			
ME60A1803N01	18.0V	3.30A	60W	180mV pk-pk	±1%	±5%			
ME60A2403N01	24.0V	2.70A	60W	240mV pk-pk	±1%	±5%			
ME60A4803N01	48.0V	1.35A	60W	480mV pk-pk	±1%	±5%			
ME60A0551Q01	5.0V	7.00A	35W	75mV pk-pk	±1%	±5%	6 pin Molex Type ³	1150mm, #18AWG	
ME60A0903Q01	9.0V	6.00A	56W	90mV pk-pk	±1%	±5%	2.5 x 5.5 x 9.5mm Straight Barrel Type, center positive	9V:1150mm 18AWG All others: 1500mm, #18AWG	Class II Desktop, IEC60320 C18 Receptacle
ME60A1203Q01	12.0V	5.00A	60W	120mV pk-pk	±1%	±5%			
ME60A1503Q01	15.0V	4.00A	60W	150mV pk-pk	±1%	±5%			
ME60A1803Q01	18.0V	3.30A	60W	180mV pk-pk	±1%	±5%			
ME60A2403Q01	24.0V	2.70A	60W	240mV pk-pk	±1%	±5%			
ME60A4803Q01	48.0V	1.35A	60W	480mV pk-pk	±1%	±5%			

Notes:
 1. Measured at the output connector, with noise probe directly across output and load terminated with 0.1µF ceramic and 10µF low ESR capacitors. For 5V models, values listed are typical, 100mV pk-pk maximum.
 2. Molex p/n 39-01-2060 or equivalent. See outline drawing for pinout information.
 3. For Input Class I models: For AC GND connected to output common (-), insert a "B" in the part number where the "A" is located (TE60B1203F01).
 4. All specifications are typical at nominal input, full load, at 25°C ambient unless noted.

General Specifications

<u>Parameter</u>	<u>Specification</u>	<u>Parameter</u>	<u>Specification</u>
AC Input	100-240Vac, ±10%, 47-63Hz, 1Ø	Turn On Time	Less than 1 sec @115Vac, full load
Input Current	100Vac: 1.5A, 240Vac: 0.7A	Hold-up Time	20mS min., at full Load, 100Vac input
Inrush Current	264Vac, cold start: will not exceed 40A	Overtemperature Protection	Will shutdown upon an overtemperature condition, auto-recovery.
Input Fuses	F1, F2: 2A, 250Vac fuses (line & neutral lines) provided on all models	Overload Protection	130 to 180% of rating, Hiccup Mode
Earth Leakage Current (Input to Ground)	<500µA@264Vac, 60Hz, NC <1mA@264Vac, 60Hz, SFC	Short Circuit Protection	Hiccup Mode, auto recovery.
Patient Leakage Current (Output to Earth)	<100µA@264Vac, 60Hz, NC <500µA@264Vac, 60Hz, SFC	Overvoltage Protection	130 to 150% of output voltage (max. 60V on 48V model), hiccup mode
Efficiency	>88%, typical	Isolation	Input-Output: 2 MOPP Input-Ground: 1 MOPP Output-Ground: 1 MOPP
Output Power	60W continuous – See models chart for specific voltage model ratings.	Safety Standards	EN/IEC/UL60601-1, 3rd edition
No Load Input Power	<0.210W (meets DoE Efficiency Level VI Requirements)	Operating Temperature	-20°C to +70°C. See curve for derating.
Ripple and Noise	See models chart on pg 1.	Storage Temperature	-40°C to +85°C
Output Voltage	See models chart on pg 1.	Altitude	Operating: to 5000m. Non-operating: -500 to 40,000 ft.
Transient Response	500µs response time for return to within 0.5% of final value for any 50% load step over the range of 5% to 100% of rated load, $\Delta i/\Delta t < 0.2A/\mu s$. Max. voltage deviation is +/-3.5%.	Relative Humidity	5% to 95%, non-condensing
Regulation	See models chart on pg 1.	Drop Test	1.4m from table top to wooden platform, 4 faces.
Vibration	Operating: 0.003g/Hz, 1.5grms overall, 3 axes, 10 min/axis, 1-500Hz. Non-Oper.: random waveform, 3 minutes per axis, 3 axes and Sine waveform, Vib. frequency/acceleration: 10-500Hz/1g, sweep rate of 1 octave / minutes, Vibration time of 10 sweeps / axes, 3 axes	Shock	Operating: Half-sine, 20gpk, 10mS, 3 axes, 6 shocks total Non-Operating: Half-sine waveform, impact acceleration of 100G, Pulse duration of 6 mS, Number of shocks: 3 for each of the three axis
Dimensions	W: 2.67" x L: 4.25" x H: 1.29" W: 67.9mm x L: 108mm x H: 32.7mm	MTBF	>250,000 hours, full load, 110 & 220Vac input, 25°C amb., per Telcordia 332 Issue 6.
Weight	400g	E-Cap Life	>7 year life based on calculations at 115Vac/60Hz & 230Vac/50Hz, ambient 25°C at 24 hrs per day, 365 days/year, 6 power up cycles per day. (80% load on 5V, 12V model)

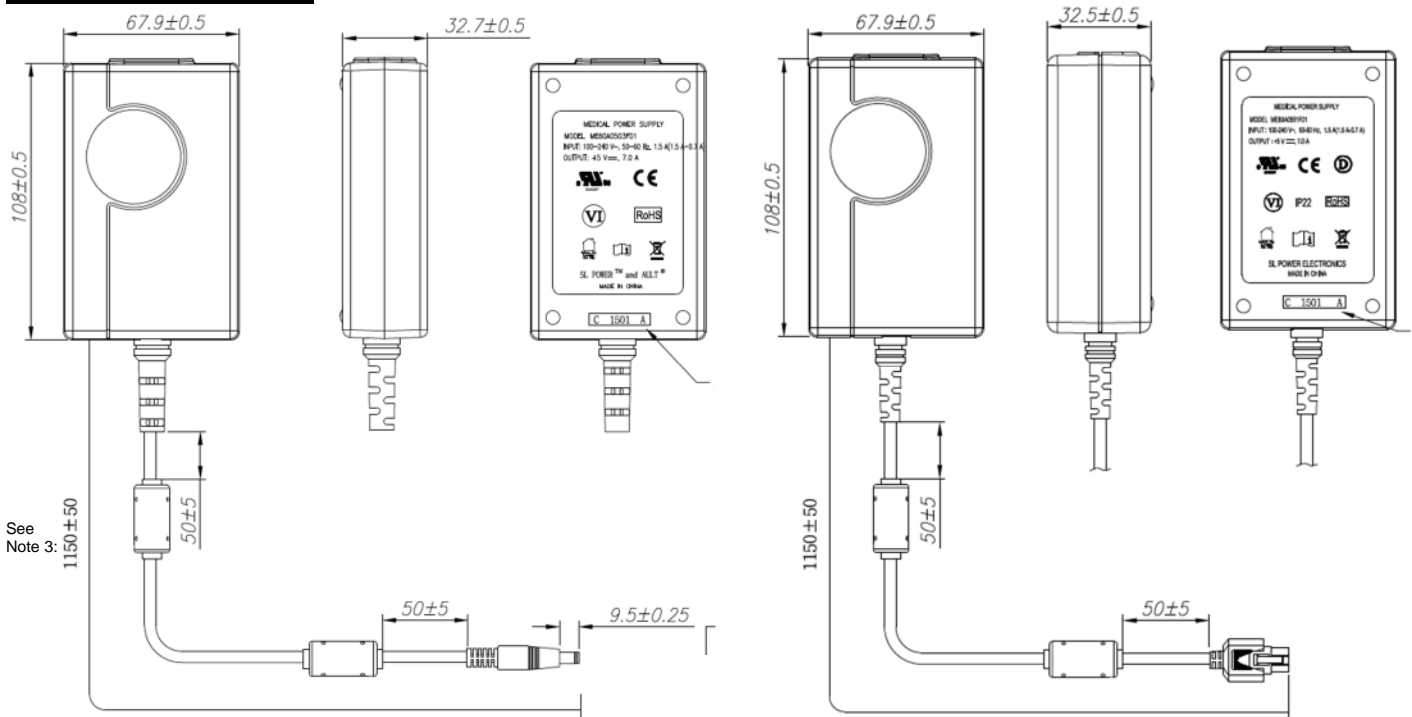
All specifications are typical at nominal input, full load, at 25°C ambient unless noted.

EMI/EMC Compliance

Parameter	Specification
Conducted Emissions:	EN55011/CISPR11 Class B, FCC Part 15.107, Class B: 6db margin typ, at 115 and 230Vac
Radiated Emissions:	EN55011/CISPR11 Class B, FCC Part 15.109, Class B: 3db margin typ, at 115 and 230Vac
Common Mode Noise:	High Frequency (100kHz-20MHz): <40mA pk-pk
Electro-Static Discharge (ESD) Immunity on Power ports:	EN55024/IEC61000-4-2, Level 4: +/- 8kV contact, +/- 15kV air, Criteria A IEC60601-1-2, 4 th Edition, Table 4
Radiated RF EM Fields Susceptibility	EN55022/EN61000-4-3, 10V/m, 80MHz-2.7GHz, 80% AM at 1kHz IEC60601-1-2, 4 th Edition, Table 4
Electrical Fast Transients (EFT) /Bursts:	EN55024/IEC61000-4-4, Level 4, +/- 4.4kV, 100Khz rep rate, 40A, Criteria A IEC60601-1-2, 4 th Edition, Table 5
Surges, Line to Line (Diff Mode) and Line to GND (CMN Mode)	EN55024/IEC61000-4-5, Level 4, +/-2kV DM, +/-4kV CM, Criteria A Surpasses IEC60601-1-2, 4 th Edition requirements.
Conducted Disturbances induced by RF Fields	EN55022/IEC61000-4-6, 3.6V/m – Level 4, 0.15 to 80MHz; and 12V/m) in ISM and amateur radio bands between 0.15Mhz and 80Mhz, 80% AM at 1KHz IEC60601-1-2, 4 th Edition, Table 5
Rated Power frequency magnetic fields	EN55024/IEC1000-4-8, Level 4: 30 A/m, 50/60 Hz IEC60601-1-2, 4 th Edition, Table 4
Voltage Interruptions, Dips, Sags & Surges	EN55024/IECEN61000-4-11: --100% dip for 10 mS, at 0, 45, 90, 135, 180, 225, 270 and 315 degrees, 100% dip for 20mS, 0 deg., Criteria A --100% dip for 500mS (250/300 cycles), Criteria B --60% dip for 100mS, Criteria B --30% dip for 500mS, Criteria A IEC60601-1-2, 4 th Edition, Table 5
Harmonic Current Emissions	EN55011/EN61000-3-2, Class A
Flicker Test	EN61000-3-3

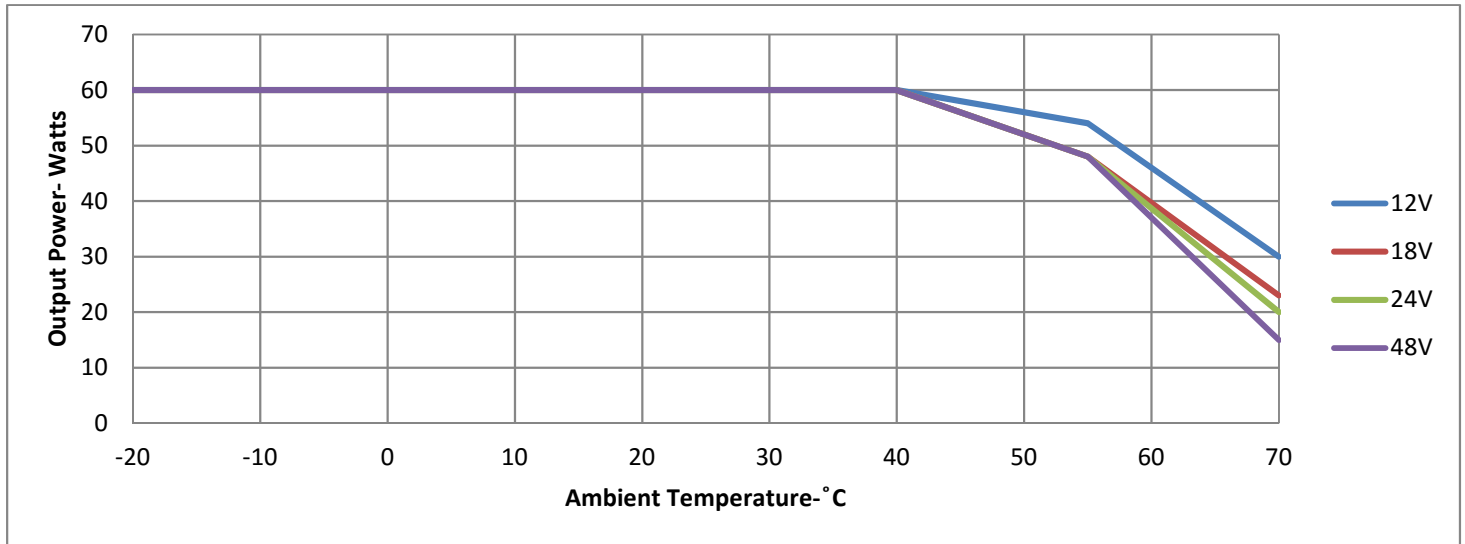
All specifications are typical at nominal input, full load, at 25°C ambient unless noted. Consult factory for information regarding testing for or usage under special environments.

Mechanical Drawing



- Notes:**
- 1) All dimensions in mm.
 - 2) Other options are available.
 - 3) Cable length on 12V through 48V models is 1500mm, nominal.
 - 4) The unit should not be covered or enclosed to protect against excessive case temperature rise.

Derating Chart:



Connector Information

Standard models include a 2.5 x 5.5 x 9.5mm straight barrel type connector (Ault #3), center positive (6-pin Molex type - #51 – on 5V models). Other standard options are listed below. The “03” in the standard model number is replaced by the applicable digits below:

<p>No.02</p>  <p>CONNECTOR</p> <ul style="list-style-type: none"> • 2.1 x 5.5 x 9.5mm straight barrel plug - Center Positive 	<p>No.03</p>  <p>CONNECTOR</p> <ul style="list-style-type: none"> • 2.5 x 5.5 x 9.5mm straight barrel plug Center Positive (Standard Models) 	<p>No.12</p>  <p>CONNECTOR</p> <ul style="list-style-type: none"> • 5 pin DIN-180 male connector (Pins 3, 5 = (+), pins 1, 2, 4 = (-)) 	<p>No.22</p>  <p>CONNECTOR</p> <ul style="list-style-type: none"> • 6 pin DIN male connector (Pins 1, 2 = (+), pins 4, 5 = (-)) 	<p>No.23</p>  <p>CONNECTOR</p> <ul style="list-style-type: none"> • 8 pin DIN male connector (Pins 3, 7 = (+), pins 1, 4, 6, 8 = (-), shell = FG) 	<p>No.32</p>  <p>CONNECTOR</p> <ul style="list-style-type: none"> • 9 pin "D" type, female (Pin 8 = (+), pin 5 = (-), all others = NC)
<p>No.33</p>  <p>CONNECTOR</p> <ul style="list-style-type: none"> • 2.5 x 5.5 x 12.5mm straight barrel plug - Center Positive 	<p>No.40</p>  <p>CONNECTOR</p> <ul style="list-style-type: none"> • 2.1 x 5.5 x 9.5mm right angle barrel plug (high retention) Center Positive 	<p>No.41</p>  <p>CONNECTOR</p> <ul style="list-style-type: none"> • 2.5 x 5.5 x 9.5mm right angle barrel plug (high retention) Center Positive 	<p>No.42</p>  <p>CONNECTOR</p> <ul style="list-style-type: none"> • 2.1 x 5.5 x 11mm straight barrel plug (high retention) Center Positive 	<p>No.43</p>  <p>CONNECTOR</p> <ul style="list-style-type: none"> • 2.1 x 5.5 x 11mm straight barrel plug (high retention) Center Positive 	<p>No.44</p>  <p>CONNECTOR</p> <ul style="list-style-type: none"> • 2.1 x 5.5 x 9.5mm straight barrel plug, locking - Center Positive
<p>No.45</p>  <p>CONNECTOR</p> <ul style="list-style-type: none"> • 902.5 x 5.5 x 9.5mm straight barrel plug, locking Center Positive 	<p>No.48</p>  <p>CONNECTOR</p> <ul style="list-style-type: none"> • 3 pin Snap n Lock, Kycon Kpp-3P or equivalent (Pin 1 = (+), pin 2 = (-)) 	<p>No.49</p>  <p>CONNECTOR</p> <ul style="list-style-type: none"> • 4 pin Snap n Lock, Kycon Kpp-4P or equivalent (Pins 1, 3 = (+), pins 2, 4 = (-)) 	<p>No.51</p>  <p>CONNECTOR</p> <ul style="list-style-type: none"> • 6 pin Minifit - Molex 39-01-2060 or equivalent (Pins 1, 4 = (+), pins 3, 6 = (-)) 	<p>No.65</p>  <p>CONNECTOR</p> <ul style="list-style-type: none"> • Stripped and Tinned Leads 	<p>No.70</p>  <p>CONNECTOR</p> <ul style="list-style-type: none"> • 2.1 x 5.5 x 11mm right angle barrel plug (high retention) Center Positive
<p>No.71</p>  <p>CONNECTOR</p> <ul style="list-style-type: none"> • 2.5 x 5.5 x 11mm right angle barrel plug (high retention) Center Positive 	<p>No.72</p>  <p>CONNECTOR</p> <ul style="list-style-type: none"> • 2.1 x 5.5 x 9.5mm straight barrel plug (high retention, no spark) Center Positive 	<p>No.73</p>  <p>CONNECTOR</p> <ul style="list-style-type: none"> • 2.5 x 5.5 x 9.5mm straight barrel plug (high retention, no spark) Center Positive 	<p>No.74</p>  <p>CONNECTOR</p> <ul style="list-style-type: none"> • EIAJ#5 style connector Center Positive 	<p>No.99</p>  <p>CONNECTOR</p> <ul style="list-style-type: none"> • Micro USB 	

These are the most common standard connectors. SL Power has the capability to incorporate any non-standard output connector. All output connectors are limited by wattage range and application type. The SL Power applications team is available to provide professional support and can be contacted here: info@slpower.com.