



Industrial

### FEATURES AND BENEFITS

Meets DoE efficiency level VI requirements

- No load input power
- Average efficiency

Up to 240W of AC-DC power

Universal input 90-264VAC input range

IP22 rated enclosure

Meets "Heavy Industrial" levels of EN61000 EMC requirements

Meets EN55011/CISPR11, FCC Part 15.109 Class B conducted & radiated emissions, with 6db margin

Approved to EN/IEC/UL60950-1, 2nd edition, Am. 2

E-cap life of >7 years

3 years warranty

Optional AC input on/off switch



### MODEL SELECTION

Model Number <sup>4</sup>	Volts	Output Current	Output Power	Ripple & Noise <sup>1</sup>	Line Regulation	Load Regulation	Output Cable & Connector	Input Configuration
TE240A1251F01	12.0V	16.6A	200W	120mV pk-pk	±1%	±5%	6 pin Molex type, p/n 39-01-2060 or equivalent See outline drawing for pinout information	Class I Desktop, IEC60320 C14 receptacle
TE240A1551F01	15.0V	13.3A	200W	150mV pk-pk	±1%	±5%		
TE240A2451F01	24.0V	10.0A	240W	240mV pk-pk	±1%	±5%		
TE240A2851F01	28.0V	8.60A	240W	280mV pk-pk	±1%	±5%		
TE240A4851F01	48.0V	5.00A	240W	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 47µF low ESR capacitors.

2. The DC output is floating. For Input Class I models, AC GND is connected to output common (-), on models with the letter "B" inserted in the model number where the "A" is located.(TE240B1251F01).

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

4. Consult factory for availability of 28V output model.

### INPUT

AC Input	100-240VAC, ±10%, 47-63Hz, 1Ø
Input Current	115VAC: 2.4A, 230VAC: 1.2A
Inrush Current	264VAC, Cold start: will not exceed 60A
Input Fuses	F1, F2: 3.15A, 250VAC fuses (line & neutral lines) provided on all models
Earth Leakage Current	Input-GND: <500µA @ 264VAC, 60Hz, NC Output-GND: <4mA @ 264VAC, 60Hz, NC
Efficiency	Meets US DoE efficiency level VI average efficiency levels
No Load Input Power	<0.210W per DoE efficiency level VI requirements

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

### OUTPUT

Hold-Up Time	20ms at full load, 100VAC input
Turn On Time	Less than 1 sec @115VAC, Full load
Output Power	240W continuous – See models chart for specific voltage model ratings
Output Voltage	See models chart on pg 1
Ripple and Noise	See models chart on pg 1
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, Δi/Δt< 0.2A/µs Max voltage deviation is +/-3.5%

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



### PROTECTION

Overtemperature Protection	Will shutdown upon an over-temperature condition, Auto-recovery
Overload Protection	115 to 160% of rating, Hiccup mode
Short Circuit Protection	Hiccup mode, Auto recovery
Overvoltage Protection	110 to 130% of output voltage (max 60V on 48V model), Hiccup mode
Safety Drop Test	1.4m from table top to wooden platform, 6 faces

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

### SAFETY

Safety Standards	EN/CSA/UL/IEC 60950-1, 2nd edition, Am 2
Shock	Operating: Half-sine, 20gpk, 10ms, 3 axes, 6 shocks total Non-operating: Half-sine waveform, impact acceleration of 50G, Pulse duration of 6 ms, Number of shocks: 3 for each of the three axis

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

### ISOLATION SPECIFICATIONS

Isolation	Input-Output: 4,000VAC Input-Ground: 1,500VAC Output-Ground: 500VAC
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Notes : All specifications are typical at nominal input, full load, at 25°C ambient unless noted.

### RELIABILITY

MTBF	>250,000 hours, Full load, 110 & 220VAC input, 25°C amb, per Telcordia 332 Issue 6
E-Cap Life	>7 years 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 12V model at 115VAC)

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

### ENVIRONMENT

Operating Temperature	-20°C to +70°C. Derate above 40°C. Start Up at -30°C, Full load, (warmup period before all parameters are within published specifications)
Temperature Derating	See derating curves
Vibration	Operating: 0.003g/Hz, 1.5grms overall, 3 axes, 10 min/axis, 1-500Hz. Non-operating: 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
Case Temperature	Case temperatures are within regulatory guidelines. Care should be taken to avoid prolonged contact with skin or other heat sensitive surfaces
Altitude	Operating: to 5,000m (derate to TBD temp. above 3,000m) Non-operating: -500 to 40,000 ft
Relative Humidity	5% to 95%, Non-condensing
Storage Temperature	-40°C to +85°C
Weight	700g
Dimensions	W: 2.65" x L: 8.3" x H: 1.7" W: 67.4mm x L: 212.4mm x H: 45mm

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



### EMI/EMC COMPLIANCE

Conducted Emissions	EN55011/CISPR22 Class B, FCC Part 15.107, Class B: 6db margin typ at 115 and 230VAC
Radiated Emissions	EN55022/CISPR22 Class B, FCC Part 15.109, Class B: 3db margin typ at 115 and 230VAC
Common Mode Noise	High frequency (100kHz-20MHz): <20mA pk-pk Low frequency (50-120Hz): <5Vrms
Electro-Static Discharge (ESD) Immunity on Power Ports	EN55024/IEC61000-4-2, Level 4: +/- 8kV contact, +/- 15kV air, Criteria A
Radiated RF EM Fields Susceptibility	EN55022/EN61000-4-3, 10V/m, 80MHz-2.7GHz, 80% AM at 1kHz
Electrical Fast Transients (EFT)/Bursts	EN55024/IEC61000-4-4, Level 4, +/- 4kV, 100kHz rep rate, 40A, Criteria A
Surges, Line to Line (Diff Mode) and Line to GND (CMN Mode)	EN55024/IEC61000-4-5, Level 4, +/-2kV DM, +/-4kV CM, Criteria A
Conducted Disturbances Induced by RF Fields	EN55022/IEC61000-4-6, 10Vrms – Level 3, in ISM and amateur radio bands between 0.15MHz and 80MHz, 80% AM at 1kHz
Rated Power Frequency Magnetic Fields	EN55024/IEC1000-4-8, Level 4: 30A/m, 50/60 Hz
Voltage Interruptions, Dips, Sags & Surges	EN55024/IEC61000-4-11: --100% dip for 20ms, Criteria A --100% dip for 500ms (250/300 cycles), Criteria B --60% dip for 100ms, Criteria B --30% dip for 500ms, Criteria A
Harmonic Current Emissions	EN55011/EN61000-3-2, Class A
Flicker Test	EN61000-3-3

Notes : Performance criteria are based on EN55024. According to the standards, performance criteria are defined as following:

- A – Normal performance during and after the test
- B – Temporary degradation, self-recoverable
- C – Temporary degradation, operator intervention required to recover the operation
- D – Permanent damage

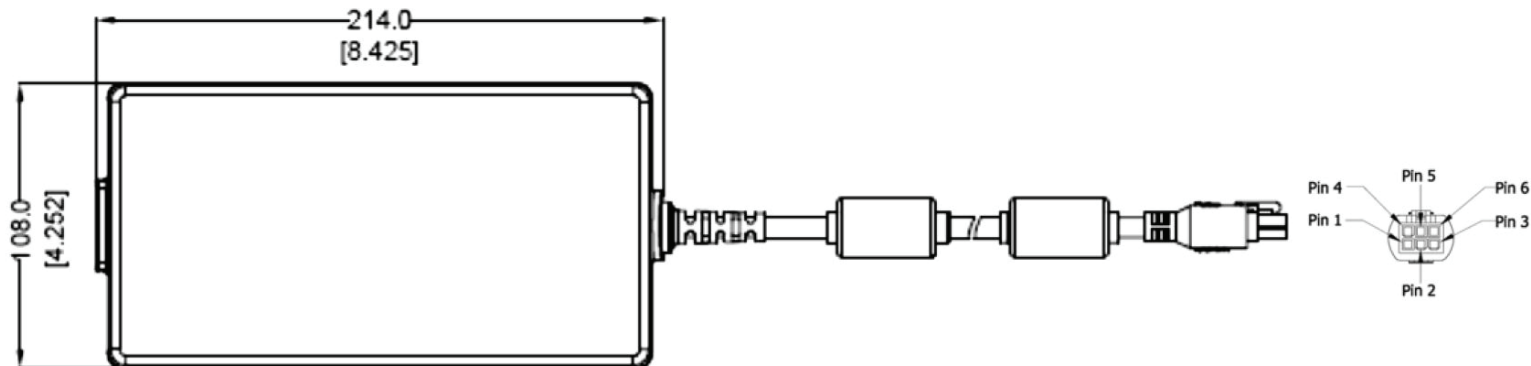
### CONNECTOR INFORMATION

Check with SL Power for suitability of specific connectors with certain models. Other connector options or different pinouts will require a modified model.

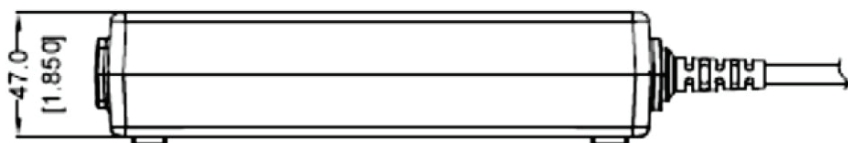
Connector No.	Description	Connector No.	Description
12	5 pin DIN-180 male connector (Pins 3, 5 = (+), pins 1, 2, 4 = (-))	49	4 pin snap n lock, Kycon kpp-4P or equivalent (Pin 1, 3 = (+), pin 2, 4 = (-))
22	6 pin DIN male connector (Pins 1, 2 = (+), pins 4, 5 = (-))	51	6 pin Minifit-Molex 39-01-2060 or equivalent (Pin 1, 4 = (+), pin 3, 6 = (-)) (Standard)
23	8 pin DIN male connector (Pins 3, 7 = (+), pins 1, 4, 6, 8 = (-), shell = FG)	65	Stripped and Tinned Leads
48	3 pin snap n lock, Kycon kpp-3P or equivalent (Pin 1=(+), pin 2 = (-))		



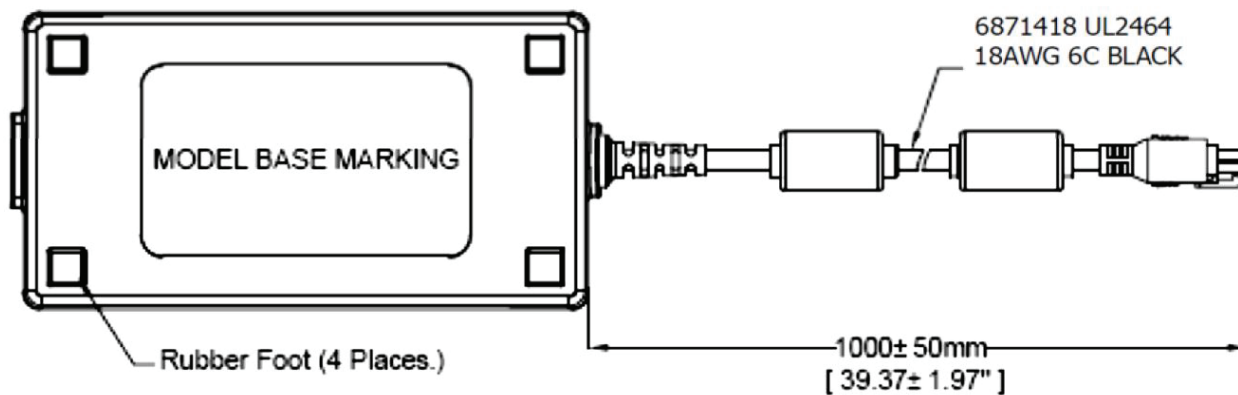
### MECHANICAL DRAWING



ut IEC320/C14 Inlet



Connector Pinout:		
	12V Model	24V, 28V, 48V
Pin 1	+Vo	+Vo
Pin 2	RTN	NC
Pin 3	RTN	RTN
Pin 4	+Vo	+Vo
Pin 5	+Vo	NC
Pin 6	RTN	RTN



- Notes:
1. The DC output is floating (ungrounded). For grounded output option (DC Return (-) to AC GND), change the letter "A" to "B" in the model number – TE240B1251F01. Class I input models only.
  2. All dimensions in mm.
  3. The unit should not be covered or enclosed to protect against excessive case temperature rise.



### INPUT CONFIGURATIONS

#### AC Input Receptacle Options



IEC320 - C14  
Class I  
Grounded  
(F)



IEC320 - C18  
Class II  
Ungrounded  
(Q)



IEC320 - C8  
Class II  
"Shaver"  
(N)

Check with SL Power for availability of class II input models.

### EFFICIENCY LEVEL VI INFORMATION:

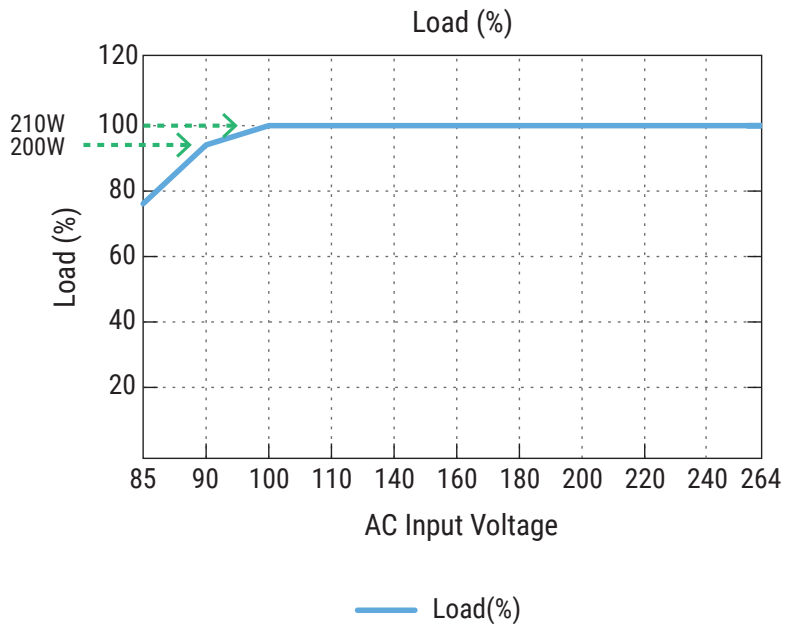
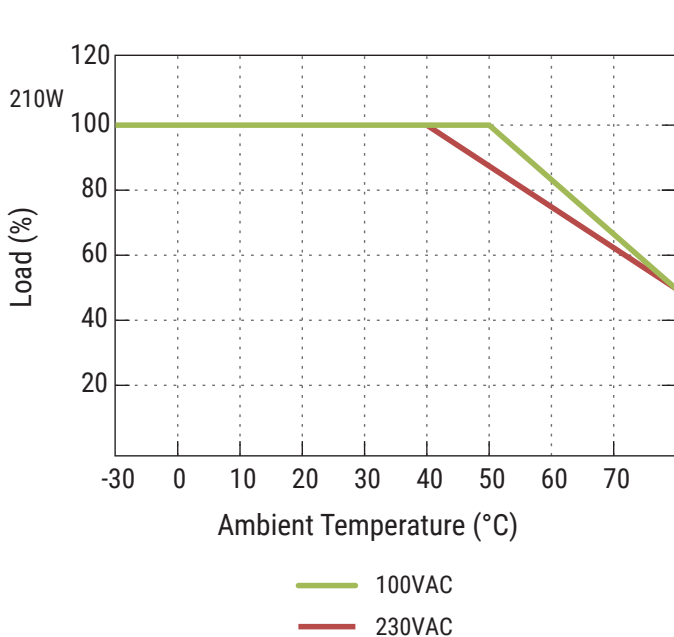
TE240 Series

Single-Voltage External AC-DC Power Supply, Basic-Voltage		
Nameplate Output Power ( $P_{out}$ )	Minimum Average Efficiency in Active Mode (expressed as a decimal)	Maximum Power in No-Load Mode [W]
$P_{out} \leq 1 \text{ W}$	$\geq 0.5 \times P_{out} + 0.16$	$\leq 0.100$
$1 \text{ W} < P_{out} \leq 49 \text{ W}$	$\geq 0.071 \times \ln(P_{out})$ $0.0014 \times P_{out} + 0.67$	$\leq 0.100$
$49 \text{ W} < P_{out} \leq 250 \text{ W}$	$\geq 0.880$	$\leq 0.210$
$P_{out} > 250 \text{ W}$	$\geq 0.875$	$\leq 0.500$
Single-Voltage External AC-DC Power Supply, Low-Voltage		
Nameplate Output Power ( $P_{out}$ )	Minimum Average Efficiency in Active Mode (expressed as a decimal)	Maximum Power in No-Load Mode [W]
$P_{out} \leq 1 \text{ W}$	$\geq 0.517 \times P_{out} + 0.087$	$\leq 0.100$
$1 \text{ W} < P_{out} \leq 49 \text{ W}$	$\geq 0.0834 \times \ln(P_{out})$ $0.0014 \times P_{out} + 0.609$	$\leq 0.100$
$49 \text{ W} < P_{out} \leq 250 \text{ W}$	$\geq 0.870$	$\leq 0.210$
$P_{out} > 250 \text{ W}$	$\geq 0.875$	$\leq 0.500$

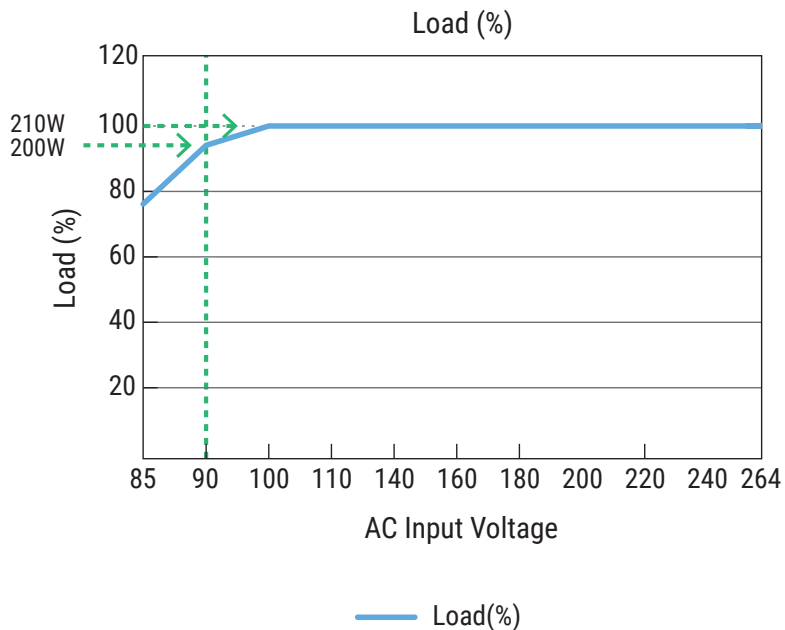
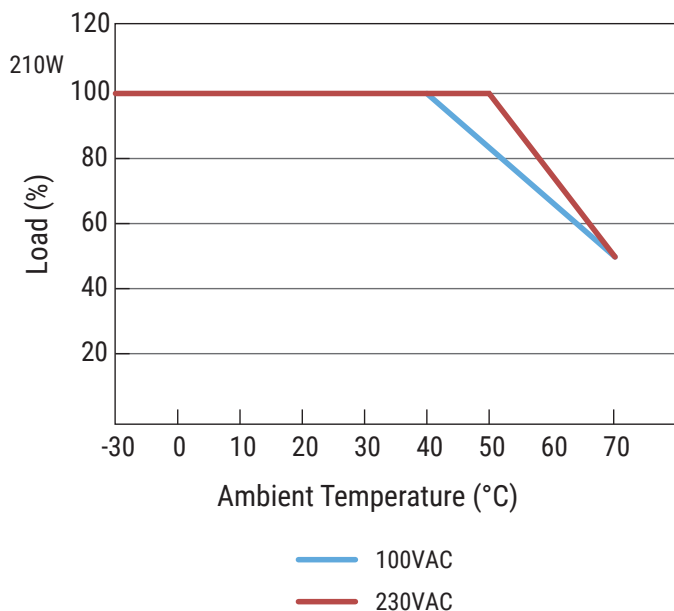
In addition, TE150 Series will meet the EU Code of Conduct, Version 5, Tier 2 requirements. (<0.150W no load input power)



## PERFORMANCE CURVES



## 12V Model Derating Curves



## 24V thru 48V Derating Curves

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