

16 Watt LD16Wxxx –TL Series

CONSTANT CURRENT TRIAC/ELV DIMMABLE LED DRIVERS



PHASE DIMMING
LD16Wxxx –TL
16W

Model: LD16W –TL Series

- Designed for use with Triac or ELV Phase Dimmers 120Vac or 230Vac/240Vac.
- 120Vac Version can be used without dimmer 120/208-277Vac
- Drive Mode: PFC Corrected
- Output Power: 20W Max.
- Input Voltage: 120 or 208-277VAC, 50/60Hz
- Number of Outputs: One
- Output Voltages: 7VDC - 46VDC
- Output Currents: 350mA - 1330mA

Environmental

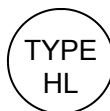
- Operating temperature: Tc 90C Maximum. Reference -30 to +60°C ambient
- Storage temperature range: -40 to +85°C
- Humidity (non-condensing): 5% - 95%RH
- Cooling: Convection
- Vibration Frequency: 5-55Hz/2g, 30 minutes
- Impact resistance: 1g/s
- MTBF@ 40°C: 402,000 hours @ Full Load per MIL-217F Notice 2.

Safety and Compliance

- UL8750, EN61347, CSA 22.2 safety recognized, UL Type HL
- FCC Class B @120VAC, Class A @ 230/277Vac
- Water resistant and Dust Proof Design: IP66, NEMA4, for Dry, Damp, Wet Locations.
- Small compact plastic case.
- Safety Isolation between Primary and Secondary
- Meets EN61000-3-2 & EN61000-3-3 Class C
- Protection: output over-voltage, output over-current, output short circuit, auto-recovery.
- EN614000-4-5: 2kV surge protection.

Electrical Specifications at 25°C

- Input Voltage: 120Vac or 230Vac (208-277Vac)
- Frequency: 50/60HZ
- Power Factor: ≥ 0.90 Full Range no dimmer.
- THD: $\leq 20\%$ Full Range no dimmer
- Inrush current: $< 10A$ at 25C, 120Vac, cold start, Max. Load
- Input current: 0.16A at 120Vac, 60Hz, Maximum Load
- Efficiency: 84% typical at 120Vac, 60Hz
- Line regulation accuracy: $\pm 3\%$
- Load regulation accuracy: $\pm 5\%$
- Dimming Range: CCR Mode See Graph page 2.



IP66



120VAC Constant Current Versions

Part Number ^(1,2)	US Class 2 Type HL	CN Class 2	Output Voltage Range	Output Constant Current	Current Accuracy	Output Power Maximum	Typical Efficiency ⁽³⁾	DIMMER ^(5,6)
LD16W120-46-C0350-TL	YES	YES	28 - 46 VDC	350 mA	$\pm 5\%$	16W	85%	Incan / ELV
LD16W120-36-C0450-TL	YES	YES	22 - 36 VDC	450 mA	$\pm 5\%$	16W	85%	Incan / ELV
LD16W120-30-C0550-TL	YES	YES	18 - 30 VDC	550 mA	$\pm 5\%$	16.5W	84%	Incan / ELV
LD16W120-28-C0600-TL	YES	YES	17 - 28 VDC	600 mA	$\pm 5\%$	16.8W	84%	Incan / ELV
LD16W120-24-C0700-TL	YES	YES	14 - 24 VDC	700 mA	$\pm 5\%$	16.8W	83%	Incan / ELV
LD16W120-14-C1140-TL	YES	YES	8 - 14 VDC	1140 mA	$\pm 5\%$	16W	82%	Incan / ELV
LD16W120-12-C1330-TL	YES	YES	7 - 12 VDC	1330 mA	$\pm 5\%$	16W	82%	Incan / ELV

208-277VAC Constant Current Versions

- For 220/230/240/277Vac version Change Part designator to: LD16W230-XX-CXXXX-TL
- LD16W120, 120Vac Version can be used without dimmer at 120Vac or 208-277Vac.

Notes

- Typical efficiency for LD16W120 measured at 120Vac, LD16W230 measured at 230Vac input, full load, no dimmer.
- All versions are $\sim \leq 15\%$ to $\sim 100\%$ CCR Dimmable with any good quality proper power phase dimmer. Refer to page 2
- For LD16W120 use any good quality 120VAC $\leq 600W$ Incandescent (Triac) or ELV (Electronic Low Voltage) dimmer. Refer to page 2.
- For LD16W230 use any good quality 230Vac $\leq 500W$ Incandescent (Triac) or ELV (Electronic Low Voltage) dimmer. Refer to page 2.
- LD16W230 version will also work with 277Vac phase dimmers but loading must meet minimum requirements of dimmer being used.

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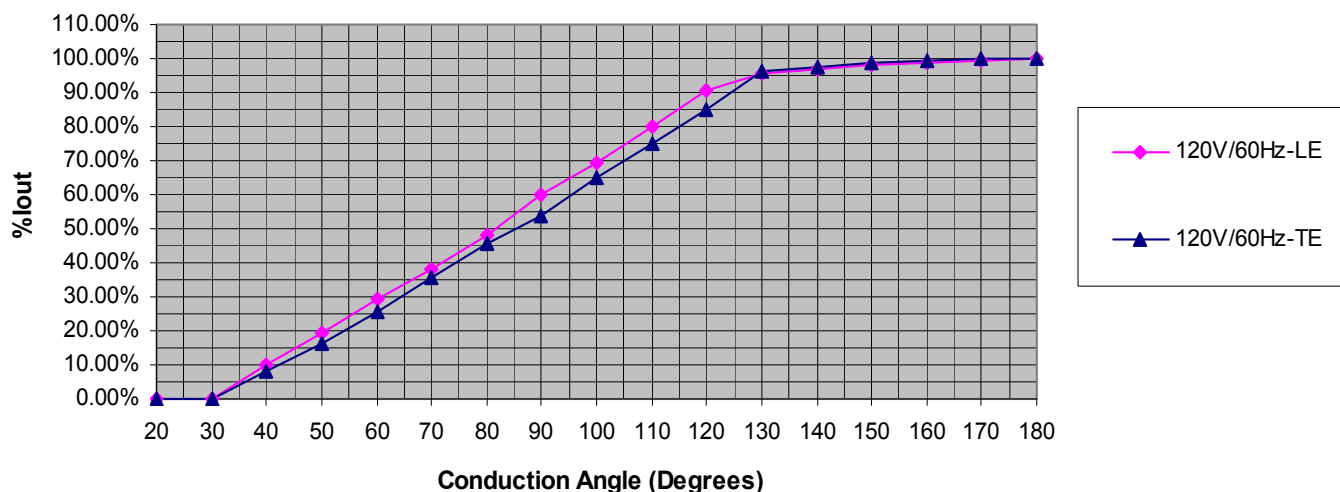
LED Optimized Drivers
Triac & ELV Dimmable

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Typical Dimming Curves:

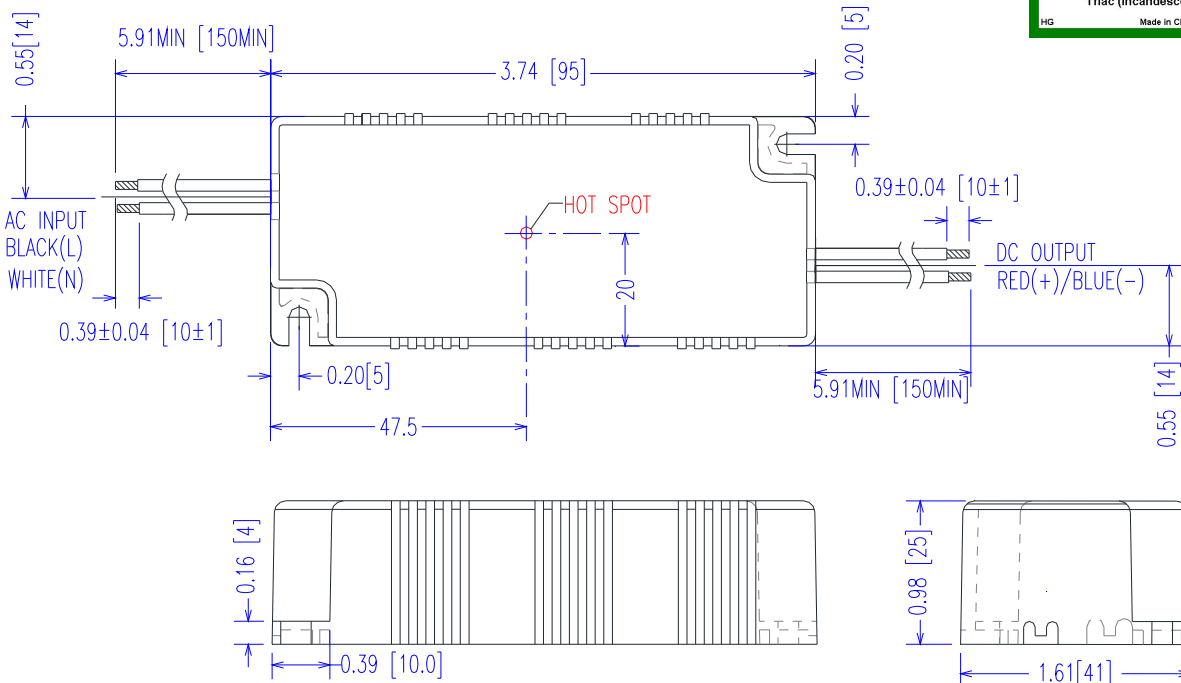
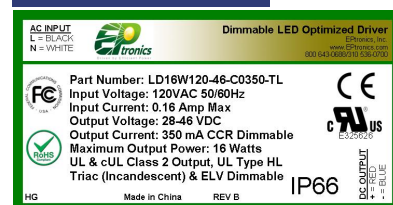
%Output Current vs. Conduction Angle in Degrees



Mechanical Dimensions: Inches [mm]

Material: Black PC ABS Plastic Case
Fully Encapsulated
Weight: 165 grams (5.8 oz) Typical

Labeling Example



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Input Specifications

Parameter	Min.	Typ.	Max.	Notes/Conditions
Input Voltage	108 Vac	120 Vac	132 Vac	120 Vac Nominal Value Note: LD20W120, 120Vac Version can be used without dimmer at 120Vac or 208-277Vac
	208Vac	230Vac	300Vac	230Vac Nominal Value (220/230/240/277)
Input Frequency	47 Hz	—	63 Hz	50/60Hz Nominal
Input AC Current	—	—	0.21 A	Measured at 120Vac/60Hz Input, Output Full load.
	—	—	0.16 A	Measured at 230Vac/60Hz Input, Output Full load.
Inrush Current (Peak)	—	2A	10A	Measured at 277Vac/60Hz Input, Output Full Load, Ta 25°C, Cold Start 50% Ipeak duration $\approx 750 \mu\text{sec}$ ($1/2 \cdot I_p^{2 \cdot t}$)
Inrush Current (I^2t)	—	—	0.038 A ² s	
Leakage Current	—	—	0.28mA	Measured at 120Vac/60Hz Input, Output Full load.
	—	—	0.75mA	Measured at 277Vac/60Hz Input, Output Full load.
THD	—	—	20%	Measured at 120 or 230Vac Input, Output $\geq 60\%$ Load, No Dimmer
Power Factor (PF)	0.90	—	—	Measured at 120 or 230Vac Input, Output $\geq 60\%$ Load, No Dimmer

Output Specifications

Parameter	Min.	Typ.	Max.	Notes/Conditions
DC Output Voltage	Per Table	—	Per Table	Per Tables on Page 1
DC Output Constant Current	-5%	Per Table	+5%	Per Tables on Page 1
Output Power	—	—	Per Table	Per Tables on Page 1
Ripple & Noise (Vpk-pk)	—	—	10%	20 MHz BW, Full load output in parallel with 0.1 μF ceramic & 10 μF Electrolytic.
Ripple (Ipk-pk)	—	—	55%	20 MHz BW, Full load output in parallel with 0.1 μF ceramic & 10 μF Electrolytic. 120 Hz component
Start-up Time	—	700 mS	1000 mS	Measured at 120Vac/60Hz Input, Output Full load.
Hold-up Time	—	30 mS	—	Typical @ 120/277Vac Input, Output Full load.

Environmental Specifications

Parameter	Min.	Typ.	Max.	Notes/Conditions
Case Temperature (Tc)	-30 °C	—	+90 °C	Measured at location specified on case.
Operating Temperature (Ta)	-30 °C	—	+60 °C	This is a reference range. Tc controls temperature range.
Storage Temperature (Ts)	-40 °C	—	+85 °C	Non operating temperature range.
Operating Humidity	—	—	95% RH	Relative Humidity, non-condensing.
Vibration	5 Hz	—	55 Hz	2G, 10 minutes/1 cycle, period 30 minutes, each along X, Y, Z axis.
MTBF	402,000 Hours	—	—	MIL-HDBK-217F Notice 2, Ta = 25C, Output Full Load.

Protection Specifications

Parameter	Min.	Typ.	Max.	Notes/Conditions
Output Short Circuit (SCP)	—	—	—	No Damage, Auto recovery after short is removed.
Output Over Current (OCP)	—	—	+8% Io	Constant Current Limiting circuit.
Output Over Voltage (OVP)	—	—	120% Vo	No Damage, Auto recovery after fault is removed.

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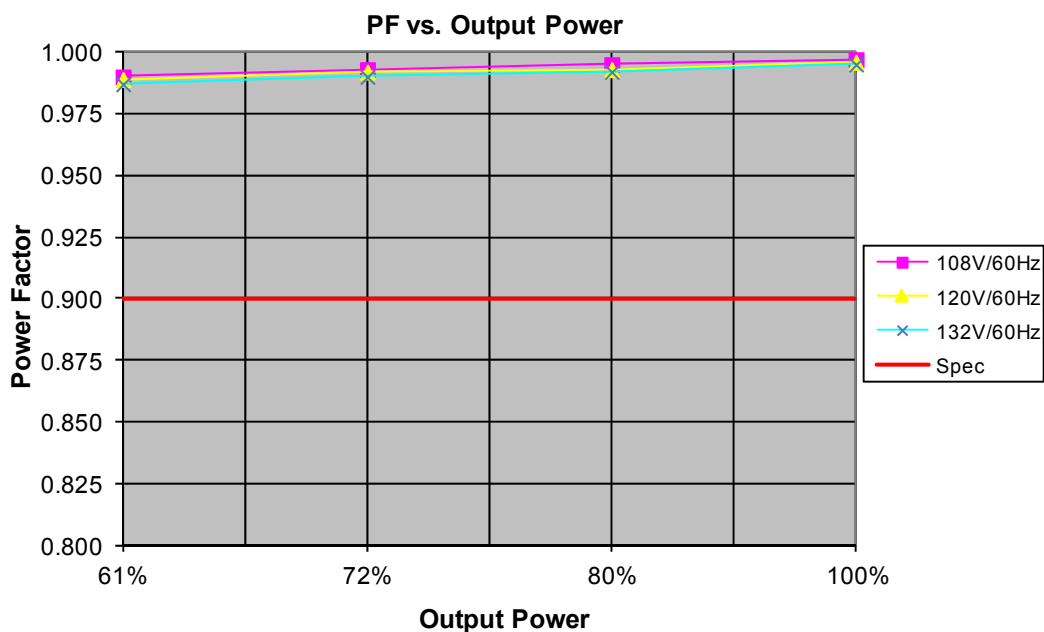
Safety Compliance

Safety	Notes/Standards
UL/CUL	UL8750, UL1310 for UL Class 2 & CAN/CSA C22.2 No. 250.13, UL Type HL
CE	EN61347-1, EN61347-2-13
Withstand Voltage	Input to Output: 3750 Vac
Isolation Resistance	Input to Output: >100 MΩ, 500VDC @ 25 °C, 70 % RH
Dimming Circuit	AC Phase Dimmable. Incandescent Forward Phase or ELV reverse phase.

EMC Compliance

Standard	Notes/Conditions
FCC, 47CFR Part 15	Class B @120Vac, Class A @ 230/277Vac
EN 55015	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment.
EN 61000-3-2	Part 3-2: Limits for harmonic current emissions Class C, ≥80% Rated Power
EN 61000-3-3	Part 3-3: Limitation of voltage changes, voltage fluctuations and flicker.
EN 61000-4-5	Part 4-5: Surge Immunity test, 2 kV L-N, 4 kV L-FG & N-FG
Energy Star	Energy Star transient protection: Ballast or driver shall comply with ANSI/IEEE C62.41.1-2002 and ANSI/IEEE C62.41.2-2002, Category A operation. The line transient shall consist of seven strikes of a 100 kHz ring wave, 2.5 kV level, for both common mode and differential mode.

Power Factor Curves (Typical) - Direct Connect to AC (No Dimmer)



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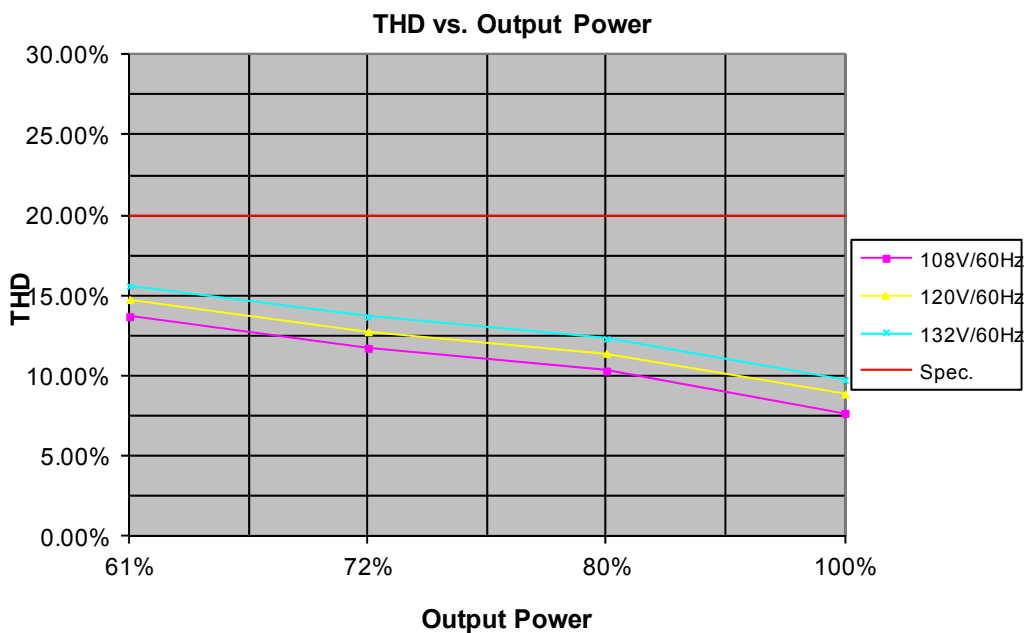
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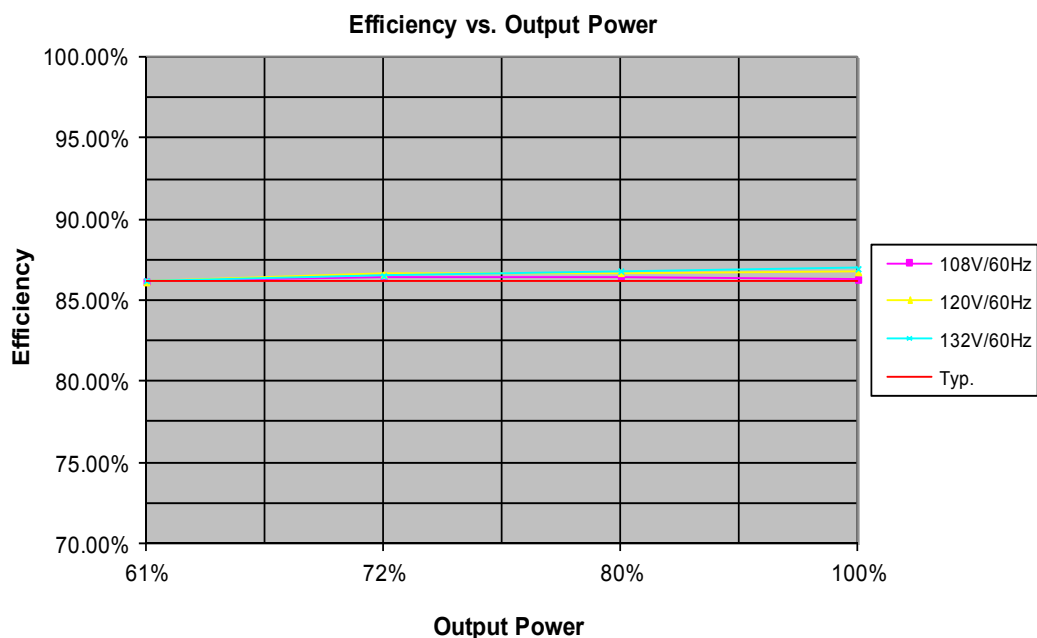
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THD Curves (Typical) - Direct Connect to AC (No Dimmer)



Efficiency Curve (Typical) - Direct Connect to AC (No Dimmer)



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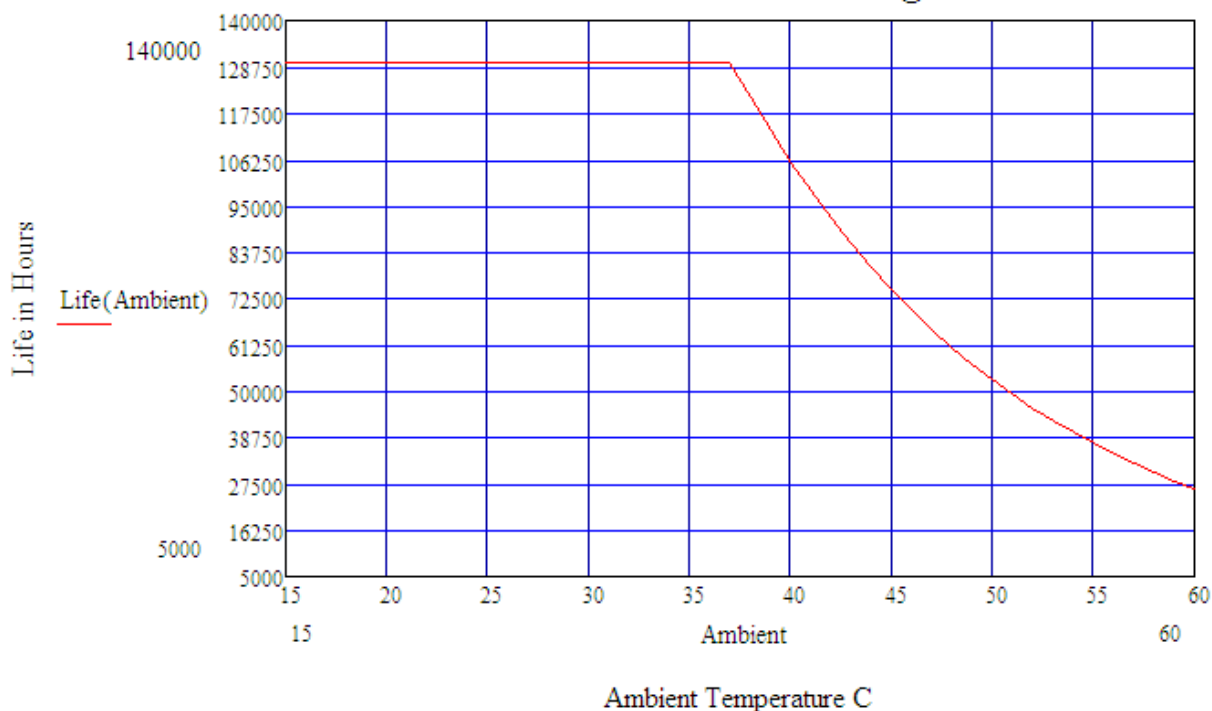
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Life vs. Ambient Temperature

LD16W Estimated Life Full Load @ 120Vac



Life vs. Case (Tc) Temperature

LD16W Estimated Life Full Load @ 120Vac

