

GE  
Critical Power

# TLE Series UPS 160/200/225/250 kW with eBoost Technology



The new TLE Series Uninterruptible Power Supply (UPS) is a three-phase high power product with best-in-class multi-mode efficiency for global critical power needs. The TLE platform establishes GE UPS technology leadership in high power applications with industry leading differentiation in efficiency, output power capacity and footprint.

GE's TLE Series UPS is one of the most energy efficient multi-mode UPS in the industry, and provides world-class energy efficiency across the operating load range. The TLE Series delivers efficiency up to 97% in double conversion mode and 99% in eBoost operating mode. This system efficiency substantially reduces operating and cooling costs thus providing a reduced cost of ownership and improved power usage effectiveness (PUE) compared to conventional UPS.

## Features and Benefits

### Technology at Its Best

- Highly reliable and efficient tri-level conversion
- Automatic or manual multi-mode operation

### "Best of Both Worlds" Operating Efficiency

- Up to 97% efficiency in premium protection mode (double conversion)
- Up to 99% efficiency in premium energy save mode (eBoost)

### Electrical Environment Optimization

- Unity (1) Output Power Factor
- High (0.99) Input Power Factor
- Less than 5% Input Current Harmonic Distortion

### Technology at Its Best

- Highly reliable and efficient tri-level conversion
- Automatic or manual multi-mode operation

## Key Applications/Verticals

- Data Centers
- Healthcare Facilities
- Financial Institutions
- Colleges/Universities

- Multi-Mode Efficiency
- Superior Input, Output & Physical Characteristics
- Advanced User Interface
- UPS RPA Paralleling Architecture
- Reliability, Diagnostic & Monitoring Enhancements
- GE Capital Retrofit Program



## TLE Series UPS 160/200/225/250 Technical Datasheet

GENERAL DATA						
Topology		True double conversion (VFI) Transformerless				
Nominal output power at PF = 1		160kVA (160 kW) / 200kVA (200 kW) / 225kVA (225 kW) / 250kVA (250 kW)				
System Efficiency in Double Conversion operating mode @1 PF load, nominal voltage/frequency, energy storage disconnected		25% load	50% load	75% load	100% load	
160kW		94.2%	96.1%	96.4%	96.4%	
200kW		95.0%	96.4%	96.6%	96.5%	
225kW		95.5%	96.6%	96.6%	96.5%	
250kW		95.8%	96.7%	96.5%	96.4%	
System Efficiency in eBoost Operating mode @1 PF load, nominal voltage/frequency, energy storage disconnected		25% load	50% load	75% load	100% load	
160kW		97.0%	98.0%	98.2%	98.2%	
200kW		97.3%	98.3%	98.3%	98.5%	
225kW		97.6%	98.6%	98.8%	98.8%	
250kW		97.7%	98.7%	98.9%	98.9%	
Heat rejection in Double Conversion operating mode @1 PF load, nominal voltage/frequency, energy storage disconnected		25% load	50% load	75% load	100% load	
160kW	BTU/hr / kW	7893 / 2.3	10531 / 3.1	14665 / 4.3	19495 / 5.7	
200kW	BTU/hr / kW	8548 / 2.5	12125 / 3.6	17644 / 5.2	23959 / 7.0	
225kW	BTU/hr / kW	8593 / 2.5	13113 / 3.8	20023 / 5.9	27184 / 8.0	
250kW	BTU/hr / kW	9026 / 2.6	14118 / 4.1	22120 / 6.5	30461 / 8.9	
Heat rejection in eBoost operating mode @1 PF load, nominal voltage/frequency, energy storage disconnected		25% load	50% load	75% load	100% load	
160kW	BTU/hr / kW	4096 / 1.2	3461 / 1.6	7372 / 2.2	9829 / 2.9	
200kW	BTU/hr / kW	4608 / 1.4	5802 / 1.7	7675 / 2.3	10239 / 3.0	
225kW	BTU/hr / kW	4720 / 1.4	5450 / 1.6	6994 / 2.0	9325 / 2.7	
250kW	BTU/hr / kW	5020 / 1.5	5618 / 1.6	7116 / 2.1	9488 / 2.8	
Max Cooling Air (77°F - 86°F / 25°C - 30°C) 160/200/225/250kVA)		1400/1600 CFM				
Audible noise level (at 5 ft./1.52Mts)						
Double Conversion Mode		75 dB(A)				
eBoost Mode		65 dB(A)				
Operating temperature range						
UPS		32°F - 104°F (0°C - 40°C)				
Battery		68°F - 77°F (20°C - 25°C) (Note: Higher temperatures shorten battery life)				
Storage temperature range						
UPS		5°F - 122°F (-15°C to +50°C)				
Battery		32°F - 104°F (0°C - 40°C)				
(VRLA)		Storage time is 3 months at 77°F (25°C) (Note: Higher temperatures shorten battery life)				
Relative Humidity		0-95%, non-condensing				
Maximum Altitude		ft (M)	3281 / 1000 (no derating)			
		ft (M)	4921ft (1500Mts)	6562ft (2000Mts)	8202ft (2500Mts)	9843ft (2500Mts)
		Derating	-2.5%	-5.0%	-7.5%	-10.0%

**TECHNICAL DATA SHEET - 160 / 200 / 225 / 250 kW UL LISTED**

Enclosure	
Type	Indoor (IP20) and NEMA PE 1
Safety	Internal dead front construction
Cooling	Forced Air
Color	Black (RAL 9005)
Installation	
Rigging	Suitable for handling by forklift
Mounting	Floor mounting holes provided
Installation and maintenance access	Front access required for normal maintenance
Conduit Entry	Top and Bottom standard
Standards	ETL Listed to UL 1778, ANSI C62.41b
Electrostatic discharge immunity	4kV contact / 8kV air discharge
Configuration	
Standard	Stand-alone
Optional	Redundant Parallel Architecture (RPA) - up to 6 modules may be paralleled in any combination for redundancy or capacity
Fault current rating	UPS is designed for installation in an electrical system up to 65kA

**RECTIFIER**

Configuration	Three phases rectifier bridge with three level IGBT technology
Input	
Voltage	480VAC, 3-phase, 4 wire + ground OR 3 wire + ground (+/- 15% without battery discharge)
Frequency	60Hz, +/-10% (54-66Hz)
Harmonic Current Distortion	<5%
Power Factor (Typical)	0.99 lagging
Inrush current	Limited by soft-start circuit
Power walk-in	30 seconds (Adjustable)
Output Voltage Tolerance	+/- 1%
DC ripple voltage	+/- 1%
DC ripple current	Max. 5% of battery capacity expressed in amps

<b>UPS RATING vs. CURRENT LIMITS</b>		160 kVA/kW	200 kVA/kW	225 kVA/kW	250 kVA/kW
Nominal input (100% load)	Current[A]:	201.6	251.7	283.5	315.0
(1 PF load, fully chrg'd bat.)	kVA	167.6	209.3	235.7	261.9
	kW	165.9	207.2	233.3	259.2
Maximum input (100% load)	Current[A]:	228.9	279.0	310.2	341.7
(1 PF load, max. chrg current)	kVA	190.3	232.0	257.9	284.1
	kW	188.4	229.7	255.3	281.2
Max. charge current	A:	45	45	45	45

## TLE Series UPS 160/200/225/250 Technical Datasheet

BATTERY					
Battery compatibility	Lead-acid or NiCd, VRLA or flooded				
Number of cells	240 (lead-acid)				
Float voltage at 68°F (20°C)	540VDC				
Minimum discharge voltage	396VDC (adjustable)				
Recharge time	10 times the discharge time				
Battery ground fault detection	Standard				
Automatic and manual battery test	Standard				
Common battery in parallel system	Up to 3 units				
UPS RATING		160 kVA/kW	200 kVA/kW	225 kVA/kW	250 kVA/kW
@100% load, 1 PF	kWB:	166.6	208.2	234.3	260.0
Maximum Discharge Current (1.65V cell)	A:	421	526	592	658
INVERTER					
Nominal output voltage	480VAC, 3-phase, 4 wire + ground or 3 wire + ground				
Inverter bridge	Three phases inverter bridge with three level IGBT technology IGBT				
Output waveform	True sine wave				
Output voltage tolerance					
Static	+/- 1%				
Load step 0% - 100% - 0%	+/- 3%, recovering to within +/- 1% in 1 cycle				
Load step 0% - 50% - 0%	+/-2%, recovering to within +/- 1% in 1 cycle				
100% unbalanced load (Ph-N)	+/- 3%				
Output voltage distortion					
100% linear load	3% THD maximum				
100% non-linear load (per IEC 62040)	5% THD maximum				
Crest factor capability	< 3:1				
Output neutral rating	200%				
Phase displacement					
100% balanced load	120° +/- 1%				
100% unbalanced load	120° +/- 2%				
Output frequency					
Free running	60Hz, +/- 0.1%				
Synchronized with utility	+/- 4% (adjustable from 57.6Hz to 62.4Hz)				
Overload capability (on inverter)	125% at 1 PF for 1 minutes				
	150% at 1 PF for 30 seconds				
Short circuit capability (on inverter)	220% for 100 ms, electronically limited				
UPS RATING	(kW)	160 kVA/kW	200 kVA/kW	250 kVA/kW	250 kVA/kW
Maximum Output Current @ 1 PF	A	192.5	240.6	270.6	300.7

STATIC BYPASS		
Input configuration	Single input (standard) or dual input (optional)	
Primary components	Fully rated continuous duty static switch	
	Back feed protection + Semiconductor fuse for clearing fault currents	
Transfer limits	+/- 10% of nominal output voltage (adjustable)	
Overload capability (on bypass)	110% continuous	
	150% for 1 minute	
Short circuit capability (on bypass)	1000% for 1/2 cycle (non-repetitive)	
eBoost™ OPERATING MODE		
Input wiring configuration	480VAC, 3-phase, 4 wire + ground OR 3 wire + ground	
Output waveform	Continuously monitored	
Transfer time to Inverter	<2ms (typical)	
Transfer limits		
Steady-state RMS tolerance	+/-20 Vrms (adjustable)	
Instantaneous voltage distortion (with respect to Normal Sine wave)	Magnitude	+/-75Vp
	Duration	500µs (adjustable)
Steady-state frequency tolerance	+/-3 Hz	
Instantaneous phase shift	0.15 radians (8.5 Deg)	
EXTERNAL INTERFACE		
Alarm contacts (voltage-free)		
Standard	6 user defined contacts (form 'C') (1A / 24V DC)	
Optional	12 user defined contacts (form 'C') (1A / 24V DC)	
	(23 selectable signals include aux. Inputs 1 & 2)	
Communication	RS-232 / SNMP / MODBUS	
Input signals	Emergency Power Off (user supplied N.C. contact)	
	Aux. input 1 * (default = On Generator)	
	Aux. input 2 * (configurable)	
	* Status displayed on LCD panel	
Diagnostics	Internal Waveform Capture. Input and output w/pre and post event data (Field Service Only)	

# TLE Series UPS 160/200/225/250 Technical Datasheet

## FRONT PANEL CONTROLS, SIGNALS & ALARMS

Touch Screen Graphic Display



Mimic Diagram	Represents operational status of the UPS on Home Page of LCD	
Operation	Visual indicator when load is on inverter OR load is on bypass	
	BLINK during service check	
Alarm	Visual indicator and audible signal, activates approx. 3 minutes (adjustable) before complete and automatic load shutdown due to the battery is fully discharged and the load cannot be transferred on utility or Over temperature or overload condition (>125%) and the load cannot be transferred on utility.	
Warning LED	Visual indicator and audible signal active when any alarm condition is present	
	BLINK when alarm is active and not acknowledged	
Load Level / Battery Run Time	Bar graph status indicator on Home Page of LCD	
	Load level in %, Battery run time in min.	
Multilanguage Graphic LCD	Display of UPS metering functions , event history, configuration of parameters and helps perform critical UPS Operations	
	Supports 14 Languages(Chinese, Czech, Dutch, English, Espanola, Francais, German, Italiano, Polish, Portuguese, Russian, Slovensko, Soumi, Swedish)	
Touch screen Push Buttons	Inverter On	Inverter Off

## OPTIONAL FEATURES

RPA	-Redundant Parallel Operation
eBoost™ (Multi-Mode)	-High Efficiency Operating Mode for Single and Multi module applications
Dual Input	-Integral to UPS cabinet. No additional cabinet required
Input/Output Transformers	-Available in external cabinets for isolation or voltage transformation
External Maintenance Bypass	-Available in external or as a part of output switchgear cabinet
Protection Software	-PC operated remote monitoring, control and diagnostics
SNMP Communication	-Ethernet interface for network connection

MECHANICAL DATA

160/200/225/250 kW Enclosure



Dimensions (inches / mm)	Width (W)	Depth (D)	Height (H)
	44.10/1120	34.06/865	75.00/1905
Configuration	Weight (lbs./ Kg)	floor load (lbs./sq ft / Kg/sq m)	
	1323/600	127/620	

UPS BLOCK DIAGRAM

	Standard configuration	With separate Bypass Mains
1 Rectifier		
2 Inverter		
3 Static Bypass		
4 Load switch		
5 Utility		
6 Load Output		
7 External Battery		
8 RPA Cable Saver Inductor		
9 Booster/Charger		
FB/CB3 Battery Fuses or Circuit Breaker		
F1, F2, F3 AC Input Fuses or Circuit Breaker		

With separate Bypass Utility:  
connect a single input Neutral to Bypass Utility (inside the UPS, common neutral for Bypass and Rectifier)

