



TRYSTAR®

TrueLITE™
MODEL ELS

58.5 kW to 112.5 kW
THREE PHASE

Centralized Emergency Lighting Inverter

Featuring an intelligent, robust design providing enhanced levels of quality, reliability, and energy savings!

Peak overload capability of 1200% to accommodate inrush current from LED fixtures/drivers!

Meets NFPA 101, 111, NEC, IBC and local codes.
Seismic-Rated Models Available



Applications:

- Correction Facilities
- Theaters / Concert Halls
- Auditoriums
- School / University Buildings
- Conference / Banquet Centers
- Sports Facilities
- Healthcare Facilities
- Worship Facilities
- Shopping Malls
- Casinos
- Subway / Train Stations
- Industrial Manufacturing

DESIGN FEATURES & MONITORING

Trystar is a manufacturer offering the industry's highest quality centralized emergency lighting inverters, capitalizing on many years of expertise.

The **TrueLITE Model ELS** is an LED-compatible emergency lighting inverter designed and built to provide a high level of quality, performance, reliability and energy savings. It is unique in that it offers (4) different modes of operation that are field-selectable based on input power conditions, lighting design, and the desire for high operating efficiency. These modes are **On-Line, Standby-On (ECO-mode), Smart Active, and Standby-Off** (see Page 5 for details).

The **Model ELS** features advanced diagnostics, monitoring, remote communication options, and automatic testing compliant with NFPA 101. All kW sizes are UL 924 Listed as Emergency Lighting and Power Equipment with 90 minutes of battery backup time. Other runtimes and listings are available. (See Page 3.)

Features & Benefits

- ✓ **LED Inrush Compatible** – LED fixtures are frequently designated for emergency egress lighting. With this in mind, the Model ELS has a peak overload capability of 1200% to accommodate the inrush current from LED fixtures / drivers while the inverter is fed from the AC power source, or even while in battery mode !
- ✓ **Full Compliance with NFPA 101** – The Model ELS meets the NFPA 101 definition of a computer-based, self-testing / self-diagnostic emergency lighting system with data-logging. Periodic tests are performed automatically every 30 days, and the results are logged with a date and time stamp. The alarm log provides a history of events, and the ability to generate an NFPA-compliant report.
- ✓ **Reliable Operation** – Compatible with all emergency lighting loads, the Model ELS incorporates galvanic isolation and a robust design with a high overload capacity to deliver reliable emergency power for critical life safety loads.
- ✓ **Battery Care System** – The Model ELS includes a range of features designed to prolong battery life and reduce usage by using different recharging methods. These features include deep discharge protection, current limitation, and voltage compensation based on ambient temperature.
- ✓ **Input Source** – The DSP-controlled, IGBT-based rectifier circuitry provides a high input power factor of 0.99, low input current distortion of $\leq 3\%$, and a “power walk-in” function that limits input current surge seen by the power source.
- ✓ **High Efficiency** – With greater energy savings in mind, the Model ELS will operate in ECO-mode to provide an efficiency rating of up to 98.5%! This is accomplished without compromising the critical features, diagnostics, and monitoring options associated with the Trystar brand.

Monitor & Display

The monitor's wide graphic LCD display allows the user to have a close-up, detailed overview of the inverter status in real time. Features include:

- Operational Diagram
- Status and Alarm Messaging
- Main Operating Values
- Easy Pushbutton Navigation

The user can view all electrical parameters and alarm logs, and gain access to user-programmable settings.

LEDs are used to indicate:

- Main Input Power Present
- Bypass Input Power Present
- Output Normal
- On Battery
- On Bypass
- Alarm Condition

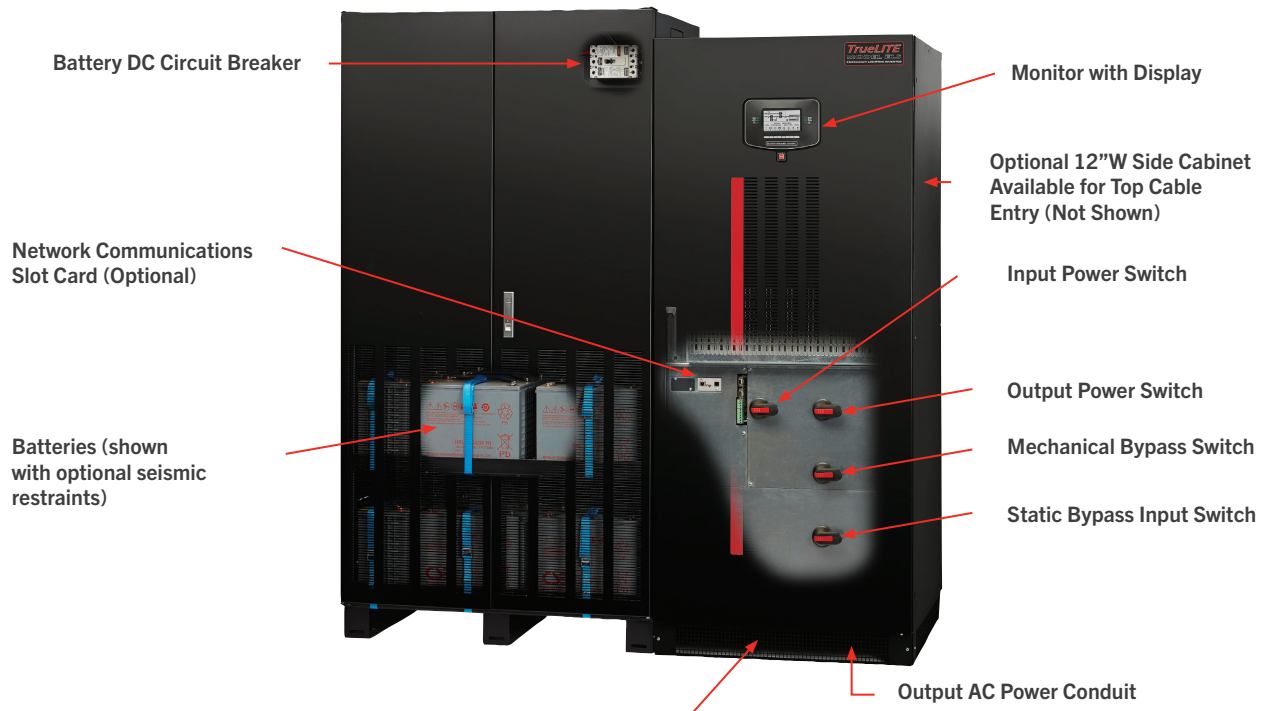
Automatic battery testing is factory-set to occur every 30 days. Results are logged with a time and date stamp, and a pass or fail indication. Failed battery tests result in an audible and visual alarm.



Monitor and Example Display Screen

The display screen indicates “Normal Operation” (without alarms), with 40% output load and battery 70% charged. Numbers and icons are displayed to indicate each key's function.

PRODUCT LAYOUT & OPTIONS



Note: "Dead Front" Allows Operation of Power Switches & Bypass, but Prevents Physical Contact with Live Connections

Input AC Power Conduit (Single or Dual Source Configuration)

Inverter Options

Battery Runtimes

All UL 924 models listed as Emergency Lighting and Power Equipment are provided with a standard 90 minutes of battery backup. Optional runtimes of 30, 60, and 120 minutes are available and UL 924 listed as "Auxiliary Lighting and Power Equipment".

C-UL models listed to CSA C22.2 No. 141-15 are available with a runtime of 30, 60, or 90 minutes.

Consult factory for other runtimes.

Wall Mounted Maintenance Bypass

A 3-Breaker Maintenance Bypass is available in 14K, 35K, or 65K AIC ratings for 480/277V applications. The compact wall-mount design contains three circuit breakers (inverter input, inverter output, and maintenance bypass). A Kirk Key interlock system protects the breakers. In addition,

an SKRU (solenoid key release unit) option is available for added security. Adjustable electronic trip circuit breakers are available upon request. The Wall Mounted Maintenance Bypass enclosure dimensions are 30" W x 10"D x 36" H, and it weighs 110 lbs.

Network Communications

An optional network adapter slot card integrates the **Model ELS** into an Ethernet TCP/IP, BACnet/IP or MODBUS TCP/IP network with a specific IP address. This communication option provides remote monitoring of the inverter status, battery tests, alarm conditions, and electrical measurements via a web browser, without the need for any external software. Remote notification of alarms and status are available via SNMP, e-mail, or the user's building management system.

An optional serial communications slot card allows for monitoring using MODBUS/JBUS protocols on RS485 or PROFIBUS.

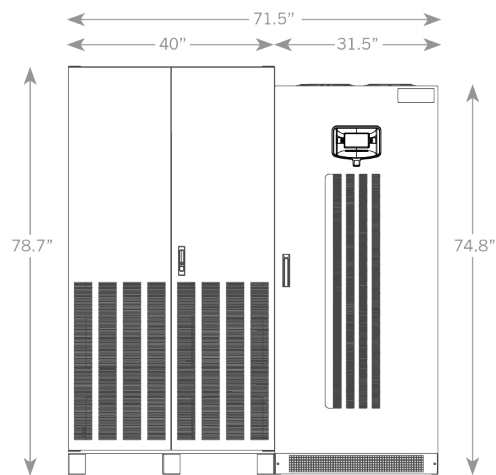
Status / Alarm Relay Contacts

In addition to the 3 standard programmable alarm contacts provided, up to 2 expansion relay cards are available; each with 6 additional programmable alarm contacts. All alarm contacts are rated for 5 amps at 250V. Alarm contacts can be programmed via the inverter display panel. There are over 20 specific alarms from which to choose.

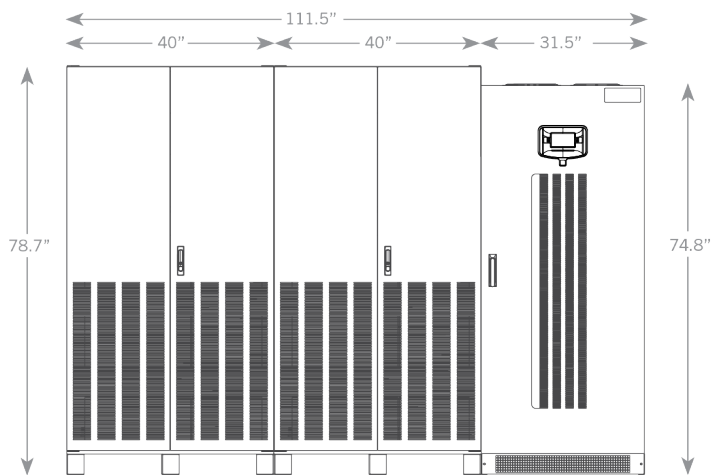
CABINET OUTLINE DRAWINGS

In each of the (4) cabinet configurations below, the inverter cabinet depth is 33.5" and is the deepest of all the cabinets in that configuration. **Specific inverter models and their cabinet configurations, weights, and BTU's are detailed in the Model Number matrix on the Back Cover.**

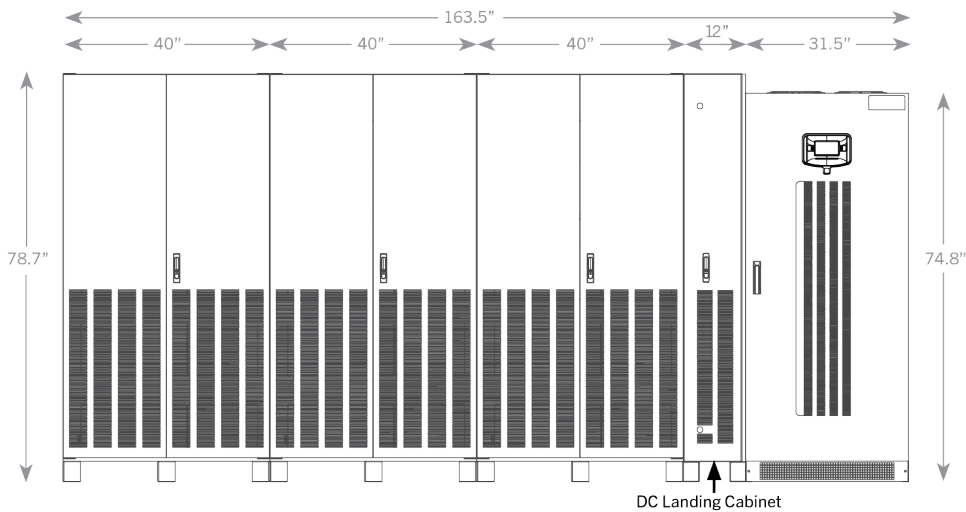
Configuration A



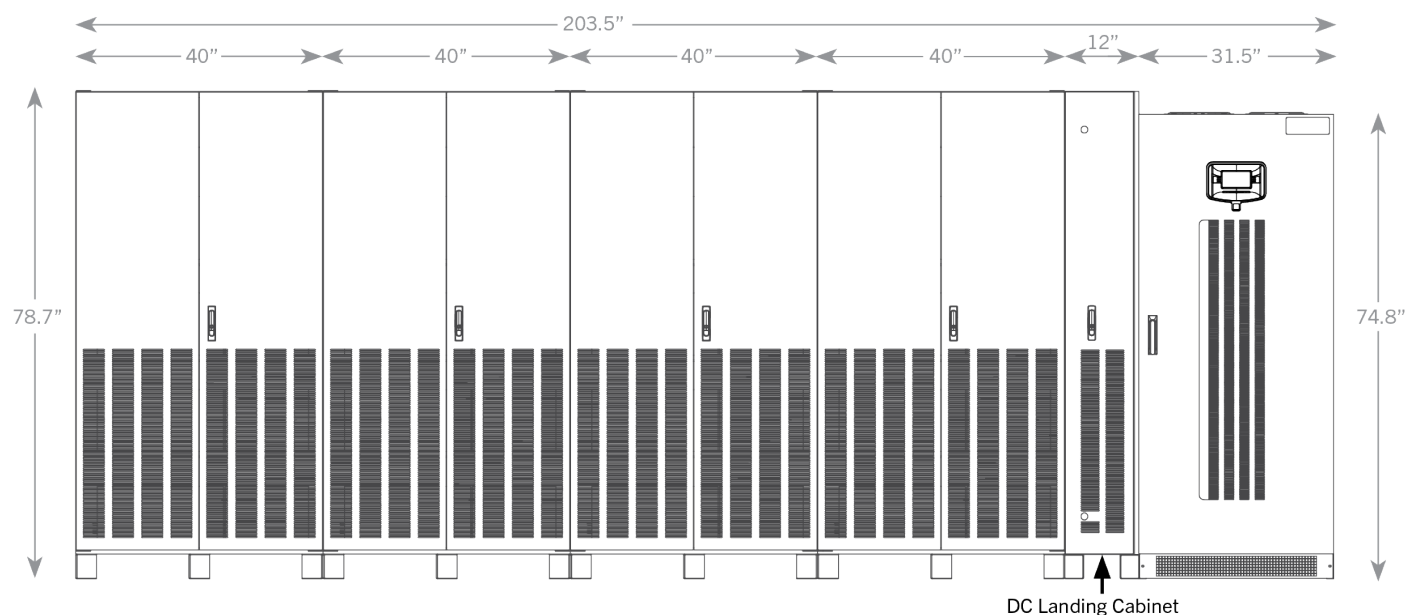
Configuration B



Configuration C



Configuration D



A field-installed DC Landing Cabinet is included whenever (3) or (4) battery cabinets are provided, and is reflected in the dimensions of Configurations C and D above. The DC cable connections from each battery cabinet's circuit breaker are landed on the positive and negative bus bars within the landing cabinet. A single DC connection is then made from the landing cabinet to the inverter's DC input.

SPECIFICATIONS

Power

Ratings (kVA/kW)	58.5, 72, 90, 112.5 at 1.0 (unity) power factor
Topology	True on-line double conversion uninterruptible power with selectable ECO-mode for higher efficiency operation

Electrical Input

NOMINAL VOLTAGE	480/277 VAC, THREE PHASE (WYE), 60HZ
Voltage Range	+15% to -10% at full load without battery usage. +15%, -30% voltage tolerance, load dependent or with battery assistance
Operating Frequency	57 Hz to 63 Hz
Power Factor	0.99 at nominal voltage and battery charge from 25% to 100% of the load
Current Harmonics	≤ 3% THD at 100% load
Power Walk-In	0 to 30 seconds (programmable)

Electrical Output

Nominal Voltage	480/277 VAC, three phase (wye), 60Hz
Voltage Regulation	± 1% with balanced load; ± 3% with 100% unbalanced load
Frequency	±0.05% while in battery operation mode
Overload	Up to: 110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute
LED Inrush Rating	Peak overload capability of 1200% to accommodate inrush current from LED fixtures / drivers
Voltage Distortion	2% THD maximum with linear load; 3% THD with non-linear load
Efficiency	On-Line mode 93%; Standby-On (ECO-mode) / Smart Active modes up to 98.5%

Battery

Type	Valve-regulated, sealed lead acid, maintenance-free
Testing	NFPA 101 compliant automatic periodic self-testing, as well as a manual test feature

Runtimes	Standard and optional runtimes available (See Page 3 for battery runtimes)
Nominal Voltage	480 VDC
Charger	3-stage, temperature compensated, < 1% ripple filtered
Recharge Time	24 hour recharge (runtimes up to 90 minutes), UL 924 and CSA compliant

Certifications

Safety	UL 924 Listed - Emergency Lighting and Power Equipment C-UL Listed to CSA C22.2 No. 141-15 - Emergency Lighting Equipment UL 924 Listed - Auxiliary Lighting and Power Equipment NFPA 101, 111, NEC, and local codes
EMI Compliance	FCC Part 15, Subpart J, Class A
Quality	ISO 9001:2015

General

Electrical	Input Single source or a dual source input. The dual
Configuration	source configuration allows one source to feed the main input and a second source (or circuit) to feed the inverter bypass input.
Diagnostics	Continuous system self-check, including battery health
Static Bypass	Automatic bypass on overload or system failure
Internal Bypass	Mechanical bypass switch that provides an uninterrupted bypass of the inverter system
Maintenance Bypass	Optional, external, wall mounted, 3-CB wrap-around bypass (see Page 3 for details)
On-Line Mode	Under all input power conditions, the inverter output supplies the load with power that is isolated, as well as voltage and frequency regulated output supplies the load with power that is isolated, as well as voltage and frequency regulated
Standby-On Mode (ECO-Mode)	When the bypass input source is within voltage and frequency limits, it powers the load and provides an operating efficiency up to 98.5%
Smart Active Mode	Automatically defines whether to operate in Standby-On (ECO-Mode) or On-Line Mode based on the quality / stability of the incoming power source

Standby-Off Mode	Output of the inverter is normally off and exclusively feeds emergency lighting that is only meant to be energized in the case of a power outage
Emergency Power	Guarded EPO push button, and REPO Off (EPO) connection for customer's normally closed contact or push button

Communications

Monitor and Display	A wide graphic LCD display provides the user a detailed overview of the inverter's status, electrical parameters, battery measurements, and features a one-line operational diagram (See Page 2 for details)
Network Communications	Optional remote monitoring and reporting via Ethernet TCP/IP, BACnet/IP, MODBUS TCP/IP, or MODBUS RS485 (See Page 3 for details)
Relay Interface	3 (Form C) output relay contacts reflect On Static Bypass, Battery Discharging, and End of Battery Discharging. These 3 contacts are user-programmable and may be reassigned to display other available event/alarm messages.

Environmental

Operating	20°C to 30°C for UL 924 Listed models Temperature Emergency Lighting and Power Equipment, and C-UL Listed models to CSA C22.2 No. 141-150°C to 40°C for UL 924 Auxiliary Lighting and Power Equipment Listed models. Optimum battery performance and life at 25°C
Storage Temperature	Inverter at -20°C to 50°C. Battery storage at 25°C for 6 months before charging is required. For each 9°C rise, reduce storage time by half
Relative Humidity	< 95% non-condensing
Audible Noise in (ECO-Mode)	< 65 dba at 1 meter (58.5kW – 90kW models) < 68 dba at 1 meter (112.5kW model)
Elevation	3281 feet (1000 meters) without derating

PRODUCT SELECTION GUIDE

MODEL NUMBER GUIDE

Product	Input	Output	Freq	Output kVA / kW	Battery	Network Communications	Relay Contacts
ELS	N = 480/277V	N = 480/277V	X = 60Hz	58.5KW 72KW 90KW 112.5KW	S = 90 min D = 60 min C = 30 min N = Other Battery Option	0 = None 1 = Ethernet TCP/IP, MODBUS TCP/IP, BACnet/IP, or MODBUS RS485	0 = Standard Alarm Contacts & REPO 1 = Standard Alarm Contacts & REPO, plus Expansion Relay Card

Note: ADD A -S SUFFIX TO MODEL NUMBER FOR SEISMIC-RATED MODELS

Model Number Example: **ELS - NNX - 90KW - S10 - S**

Description: 90kW UL924 Listed Emergency Lighting Inverter, 480/277 VAC Input - Output, 90 Minutes Runtime, Network Communications, Standard Alarm Contacts & REPO, Seismic-Rated.

ELS MODEL NUMBERS							
MODEL NUMBERS	kVA / kW	BATTERY RUNTIME (MINUTES)	INVERTER WEIGHT (LBS)	TOTAL BATTERY WEIGHT (LBS) ¹	BTU / HR (FULL LOAD) ³		CABINET ONFIGURATION ⁴
					ON-LINE MODE	ECO-MODE	
ELS - NNX - 58.5KW - S**	58.5	90	1500	8960	13,964	2992	B
ELS - NNX - 58.5KW - D**	58.5	60	1500	7040	13,964	2992	B
ELS - NNX - 58.5KW - C**	58.5	30	1500	4480	13,964	2992	A
ELS - NNX - 72KW - S**	72	90	1500	13,710 ²	17,186	3683	C
ELS - NNX - 72KW - D**	72	60	1500	8960	17,186	3683	B
ELS - NNX - 72KW - C**	72	30	1500	5690	17,186	3683	B
ELS - NNX - 90KW - S**	90	90	1610	13,710 ²	21,483	4604	C
ELS - NNX - 90KW - D**	90	60	1610	10,830 ²	21,483	4604	C
ELS - NNX - 90KW - C**	90	30	1610	7040	21,483	4604	B
ELS - NNX - 112.5KW - S**	112.5	90	1742	18,190 ²	26,854	5754	D
ELS - NNX - 112.5KW - D**	112.5	60	1742	13,710 ²	26,854	5754	C
ELS - NNX - 112.5KW - C**	112.5	30	1742	8960	26,854	5754	B

¹ Total battery weight includes all battery cabinets with batteries installed. Add total battery weight and inverter weight together for a total system weight.

² Total battery weight also includes the DC Landing Cabinet.

³ Only On-Line Mode and ECO-mode BTU/HR are shown above. ECO-mode BTU/HR reflects Standby-On Mode. BTU/HR in Smart Active Mode may be higher, depending on the quality of the incoming power source. BTU/HR in Standby-Off Mode will not exceed ECO-mode levels. See Page 5 for descriptions of each of these modes.

⁴ See Page 4 for cabinet configuration illustrations and dimensions.

Seismic-Rated Models: Optional seismic-rated models are designed and tested in accordance with applicable portions of the following standards:

- ICC - AC156: "Acceptance Criteria for Seismic Certification by Shake-Table Testing of Nonstructural Components and Systems"
- ASCE 7-10
- International Building Code — IBC 2015

Seismic-rated models are designed for floor mounting using seismic brackets provided. Consult factory for details. Seismic and standard unit weights are the same.

Warranty: Trystar guarantees the inverter to be free of defects in material and workmanship for a period of (2) years following shipment from the factory. Inverters installed within the contiguous United States (lower 48 states) and Canada include a startup service, after which a 1st year factory authorized on-site labor warranty is provided. Batteries are covered under a 1-year full, 14-year pro-rated warranty. Consult factory for details.

Contact us and/or consult our website for additional details about the **TrueLITE Model ELS** and other Trystar **Emergency Lighting Inverters**.



TRYSTAR®