



D Series

Single-Phase Central Lighting Inverters

FEATURES

Application

Designed for indoor installation in commercial or industrial applications.

Operation

When normal utility-supplied power is present, the LSN model central lighting inverter provides load-side line conditioning with "brownout" protection, and charges the system batteries when required. When utility-supplied power is interrupted, or the voltage varies from predetermined limits, the system will automatically and instantaneously transfer to emergency mode without interruption to connected loads. DC battery-derived emergency power is inverted to AC power and supplied in a pure sine wave output form for 90 minutes (standard run time). A low voltage battery disconnect circuit prevents "deep discharge" damage to the batteries during prolonged power outages. When normal power is restored the system will automatically restart, providing power to connected loads and recharging the batteries. The charging circuit will bring the batteries to full recharge within UL time standards.

Construction

The LSN cabinet is constructed of steel, finished with a light gray paint and features locking cabinetry and password-protected user interface for security. Louvers at front and top of cabinet allow venting.

Catalog Number	
Comments	Type

LSN LIFE SAFETY NETWORK



ORDERING GUIDE

Model	Capacity	Battery Type	Output Circuit Breaker Type	Output Circuit Breaker Ampere Rating ⁷	Output Circuit Breaker Supervision			
D LSN Central Lighting Inverter	01 1.0KVA	S 10-year VRLA Lead-Calcium	Blank Normally On N Normally Off	15	Blank Monitored U Unmonitored			
	02 2.0KVA							
Input Voltage (VAC) ²	27 2.7KVA	G 20-year VRLA Lead-Calcium	Output Voltage ^{2,3,4} (VAC)	Output Circuit Breaker Voltage Rating	Output Circuit Breaker Quantity ⁶			
	37 3.7KVA							
	48 4.8KVA	N 25-year Nickel Cadmium				120	A 120VAC	01 to 20
	55 5.5KVA					120/208	B 240VAC	
	66 6.6KVA					120/240 ⁵	C 277VAC	
	83 8.3KVA					120/277	D 208VAC	
	10 10.0KVA					347		
	12 12.5KVA							
	15 15.0KVA							
	17 17.5KVA							

Other Options & Accessories

Options	Accessories
EML Email Device	DSFK Seismic Kit ¹²
RSP Remote Status Panel	Service Options
SMT System Monitoring Terminal including Emergency Power Off Terminal	FSL Factory Start-Up ¹³
AR Alternate Runtime ⁸	
SBC Short Battery Cabinet ⁹	
IBS Internal Maintenance Bypass Switch (Make Before Break)	
C10 10 Amp Charger Upgrade ¹⁰	
C20 20 Amp Charger Upgrade ¹¹	
CL60 Cabinet Locks	
S Seismic Qualified ¹²	

- (1) Requires a provided external transformer for 208VAC or 240VAC input.
- (2) Refer to Specifications table for available Input/Output voltage combinations.
- (3) Other voltages available. Consult factory.
- (4) External transformer may be provided.
- (5) Loading may not exceed 50% of the system's total rating on any 120VAC leg.
- (6) Normally On circuit breakers: a maximum of 14 monitored, single pole positions or 20 unmonitored, single pole positions may be specified. Normally Off circuit breakers: a maximum of 8 single pole positions (monitored or unmonitored) may be specified.
- (7) Normally Off circuit breakers: a maximum rating of 20 amps.
- (8) Specify runtime in minutes when ordering. Example: AR120.
- (9) Available with 1.0, 2.0, 2.7, 3.7, 5.5, and 6.6KVA Series with S batteries only.
- (10) Available on 1.0 KVA - 4.8KVA Series.
- (11) Available on 5.5 KVA - 17.5KVA Series. Not available with 120V input on 6.6KVA and above. Not available with 208V input on 12.5 KVA and above. Not available with 240V input on 15.0 KVA and above.
- (12) Type S Battery in standard height cabinet only; See system configuration for 90-minute run time.
- (13) Start-Up is non-cancellable / non-returnable and must be performed by an Authorized Service Center within 6 months of battery shipment to increase the inverter warranty to 2 years. Order a quantity of 1 per system. Systems powered up by others are done so at their own risk.





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OPTIONS AND ACCESSORIES

Suffix	Options	Description
EML	Email Device	A device that automatically notifies the user of system test results and alarm conditions. The Email Device sends detailed notifications to up to six pre-programmed email addresses. Requires customer supplied CAT5 cable connected to user network.
RSP	Remote Status Panel	Provides remote annunciation for the LSN inverter to indicate inverter and alarm status. Owner-installed option. Must be installed within 1,000 ft. of the LSN inverter. Seven-conductor-minimum, 22AWG wire for connection from options board to Remote Status Panel must be supplied by installer.
SMT	System Monitoring Terminals including Emergency Power Off Terminal	Provides connections points for Inverter and Alarm Relays (low power contacts change status with either inverter or alarm events), and Remote Status Panel (allows the addition of an RSP at any time). Provides a set of terminals to which an Emergency Power Off switch can be wired. Closing the switch will immediately shut down the system. Note: the EPO option requires the SMT option.
AR	Alternate Runtime	Runtimes other than the standard 90 minutes may be specified. When ordering alternate runtimes, specify discharge time required in minutes. Example: AR30
SBC	Short Battery Cabinet	For applications where headroom is limited. Reduces the overall height by 15 inches. Available on systems with ratings from 1.0, 2.0, 2.7, 3.7, 5.5, and 6.6KVA series with Type S batteries only. Dimensions: 31"H x 30"W x 18 5/8"D.
C10 C20	Charger Upgrades	10 Amp charger upgrade. Available on 1.0KVA - 4.8KVA Series. 20 Amp charger upgrade. Available on 5.5KVA - 17.5KVA Series.
CL60	Cabinet Locks	Universal cabinet locks for all electronic and battery cabinets.
	Monitored Circuit Breakers	Monitored output circuit breakers (normally-on or normally-off) will sound an alarm when tripped. See Ordering Guide.
	Normally-On Circuit Breakers	Specified when connected loads are to be energized at all times. See Ordering Guide.
	Normally-Off Circuit Breakers	Specified when connected loads are only energized during emergency operation. A user-programmable retransfer delay (up to 999 seconds) to normal utility power is provided. See Ordering Guide.
IBS	Internal Maintenance Bypass Switch	A three-position "make before break" service switch mounted inside the cabinet. Compatible with all input/output combinations and any combination or quantity of output circuit breakers.
S	Seismic Qualified	Unit provided as a seismic tested and qualified inverter. Unit will continue to operate during and after a seismic event when installed per instructions. Complies with UBC-1997, IBC-2012, CBC 2013 (OSHPD OSP-0365-10), and ASCE7-10 $S_{DS}=2.0g$ for $z/h=1$ and $S_{DS}=2.5g$ for $z/h=0, I_p=1.5$. Available for systems with standard height battery cabinets only.
Suffix	Accessories	Description
FSL	Factory Start-Up	Inspection, start-up, testing, calibration of system and user training by Dual-Lite factory authorized technician.
DSFK	Seismic Kit	Certified to seismic requirements in CBC 2007, Cat. D through calculations only.

FEATURES

Installation

Input power entry point is from the cabinet top. Bottom channels for lifting straps and wall brackets for anchoring. Servicing is accessible from cabinet front.

Compliances

UL 924 Listed, Emergency Lighting and Power Equipment (standard 90 minute run time), type S battery, all voltages except 347V
 UL & CUL 1778 Listed, Uninterruptible Power Supply Equipment (alternate run times; types G and N batteries; 347V input/output)
 ANSI C62.41: ANSI C62.45 (Cat. A & B)
 National Electrical Code (NFPA 70)
 Life Safety Code (NFPA 101)
 NEMA Type 1 Cabinetry
 OSHA, state and local codes
 Made in U.S.A.

Warranty

Two years full on all components from date of shipment when a Factory Start-Up is ordered; one year full when a Factory Start-Up is not ordered. Batteries are covered under a separate warranty:

Battery Type	Full	Pro-rata
S (VRLA lead-calcium)	1 year	9 years
G (VRLA lead-calcium)	1 year	14 years
N (wet nickel-cadmium)	1 year	14 years

Batteries must be connected to an energized charging circuit within 90 days from date of shipment or warranty is void.

Start-Up must be performed by an Authorized Service Center within 6 months of inverter shipment and will increase the inverter warranty to 2 years. Order quantity of 1 per system. Systems powered up by others are done so at their own risk.



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SPECIFICATIONS

KVA/KW Rating	1.0K	2.0K	2.7K	3.7K	4.8K	5.5K	6.6K	8.3K	10.0K	12.5K	15.0K	17.5K
Power Factor Range	.8 lead to .75 lag											
Input/Output Voltage Combinations Available – Single Phase (VAC) ^{(1) (2)}	Input: 120 / Output: 120/240, 120/277, 277, 120/347, 347 Input: 208 / Output: 120, 120/208, 208, 120/240 Input: 240 / Output: 120, 120/240							Input: 208 / Output: 120, 120/208, 208, 120/240 Input: 240 / Output: 120, 120/240		–		
	Input: 277 / Output: 120, 120/240, 120/277 Input: 347 / Output: 120, 120/240, 120/347							Input: 277 / Output: 120, 120/240, 120/277 Input: 347 / Output: 120, 120/240, 120/347				
AC Input Circuit Breaker Rating – 120/277V	120/30A	120/40A	120/50A	120/60A	120/60A	120/80A	120/100A	–	–	–	–	–
	208/20A	208/30A	208/30A	208/50A	208/50A	208/50A	208/60A	208/80A	208/100A	208/100A	208/100A	–
	240/20A	240/20A	240/30A	240/30A	240/30A	240/40A	240/60A	240/80A	240/80A	240/100A	240/100A	–
	277/30A	277/30A	277/30A	277/30A	277/30A	277/40A	277/50A	277/60A	277/70A	277/90A	277/100A	277/100A
	347/15A	347/15A	347/20A	347/20A	347/25A	347/25A	347/30A	347/50A	347/50A	347/60A	347/80A	347/80A
Output Voltage and Maximum Output Current in Amperes	120/8.3	120/16.7	120/22.5	120/30.8	120/40.0	120/45.8	120/55.0	120/69.2	120/83.3	120/104.0	120/125	120/146
	240/4.2	240/8.3	240/11.3	240/15.4	240/20.0	240/22.9	240/27.5	240/34.6	240/41.7	240/52.1	240/62.5	240/72.9
	277/3.6	277/7.2	277/9.7	277/13.4	277/17.3	277/19.9	277/23.8	277/29.9	277/36.1	277/45.1	277/54.2	277/63.2
	347/2.9	347/5.8	347/7.8	347/10.7	347/13.8	347/15.9	347/19.0	347/23.9	347/28.8	347/36.0	347/43.2	347/50.4
Standard Charger Size	5 Amps					10 Amps				15 Amps		
System DC Voltage	96	96	96	96	96	96	96	144	144	144	144	144
Heat Output (BTU/Hr)	175	350	473	648	840	963	1,155	1,453	1,750	2,188	2,625	3,063

⁽¹⁾ On systems with 120/240VAC output, loading may not exceed 50% of the system's total KVA rating on any 120V leg. Loading beyond 50% on any 120V leg will cause an unsafe condition and transformer failure will occur. Call our Service Line at 800-848-6439 for alternate load connection configurations.
⁽²⁾ An external transformer will be provided for 12.5K and 15.0K configurations with 208VAC and 240VAC input.

Electrical

System Short Circuit Rating: 42K AIC, RMS symmetrical
 Surge Voltage Test: Per UL 924
 Input Power Connection: Terminal block
 Input Circuit Breaker: Sized to system rating
 Power Factor: Unity 1.0 (KW = KVA)
 Power Consumption: Offline, 98% efficient
 Inverter Design: Pulse width modulation via IGBT circuitry
 IGBT Frequency Switching Rate: 16K Hz per second
 Input Voltage:

1.0 - 6.6KW/KVA	8.3 - 17.5KW/KVA ¹
120, 208, 240, 277, 347VAC	208, 240, 277, 347

¹ Input voltage on 17.5KVA model limited to 277 and 347VAC only.

Input Voltage Range: Invert, +10%, - 12%; boost, -8%
 Input Frequency: 60 Hz, ±3%
 Synchronizing Slew Rate: 1 Hz per second, nominal
 Transfer Time: "No break" switching; instantaneous
 Output Wave Shape: True AC sine wave
 Output Frequency: Normal: synchronized to utility;
 Inverter: ±0.05, 60 Hz, +0.05 Hz
 Output Voltage:

1.0 - 6.6KW/KVA	8.3 - 17.5KW/KVA
120, 240, 277, 347, 120/240 ¹ , 120/277	120, 240, 277, 347, 120/240 ¹ , 120/277

⁽¹⁾ On systems with 120/240VAC output, loading may not exceed 50% of the system's total KVA rating on any 120V leg. Loading beyond 50% on any 20V leg will cause an unsafe condition and transformer failure will occur. Call factory for alternate load configurations.

Main Output Overcurrent Protection: Circuit breaker, output fuse
 Optional Output Circuit Breakers: Normally-On or Normally-Off, monitored or unmonitored, per customer requirements.
 See "Ordering Guide".
 Output Regulation: (static) ±5% (5% to 100% resistive load)
 Output Distortion: Less than 5% THD (linear load)
 Battery Circuit Breaker: Sized to system rating

Battery Cabinet Short Circuit Breaker Protection: Circuit breaker and fuses
 Overload Rating: 150% momentary; 120% for five minutes, 110% for 10 minutes
 Two way communication: DB9/RS232 standard
 Overload/Short Circuit Protection: Circuit breakers and fuses
 AC Lockout: Prevents battery discharge following installation when AC power is not present
 Output Voltage Regulation: Automatic boost tap circuit maintains output voltage during utility low voltage "brownout" periods without switching to battery power
 Low Voltage Battery Disconnect: Protects the batteries from damaging "deep discharge" conditions during prolonged power outages
 Time Delay Retransfer: Supplied with "normally off" optional output circuit breakers. Holds the unit in emergency mode after normal AC power is restored, allowing utility power to stabilize and voltage sensitive lighting to resume normal operation. Delay time is user programmable.
 Test Means: Spectron[®] self-test/self-diagnostic microprocessor controlled circuitry; manual programmable testing
 Indicators: Visual LED indicators, visual graphic display (2 lines, 40 characters), audible alarm system, RS232 two-way communication. Security: Password protected user interface; locking cabinets
 Interior Relative Humidity: 95% non-condensing

Battery/Charging System Specifications

Standard Run Time: 90 minutes per UL 924. Optional run times available via UL 1778 listing.
 Charger: Three-step float, temperature compensated. 5 amp, 10 amp, or 15 amp, depending on system rating.
 Bus Voltage: 96VDC or 144VDC (system rating dependent)
 Battery Condition Monitoring System: Standard
 Recharge Cycle: Within UL requirements
 Type: Non-spillable "S" Series standard; optional type G and type N available. See "Battery" section on following page.
 DC Switch: Provides isolation and back-feed protection
 Operating Temperature Range: 20°C to 30°C (68°F to 86°F)



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System Configurations for 90-Minute Runtime

Type S Battery Maintenance-Free VRLA Lead-Calcium – 10-Year Design Life Expectancy at 25°C (77°F)

Standard LSN system battery; lead calcium grid alloy with electrolyte trapped in absorbent glass mat (AGM) separators. Completely sealed and requires no addition of water over its life expectancy. Polypropylene case and cover includes UL recognized low pressure safety release vents. No gassing will occur in normal use.

System Capacity	1.0K	2.0K	2.7K	3.7K	4.8K	5.5K	6.6K	8.3K	10.0K	12.5K	15.0K	17.5K
System Configuration	A	A	A	A	A	B ⁽¹⁾	B ⁽¹⁾	B ⁽¹⁾	B ⁽¹⁾	B ⁽¹⁾	C ⁽¹⁾	C ⁽¹⁾
Total Weight (lbs.)*	838	1,116	1,122	1,222	1,492	1,926	2,130	2,475	2,829	2,861	4,121	4,393
Seismic Kit Configuration	DSFKA1					DSFKB1 ⁽¹⁾		DSFKB2 ⁽¹⁾	DSFKB3 ⁽¹⁾	DSFKC1 ⁽¹⁾		

Type G Battery Maintenance-Free VRLA Lead-Calcium – 20-Year Design Life Expectancy at 27°C (80°F)

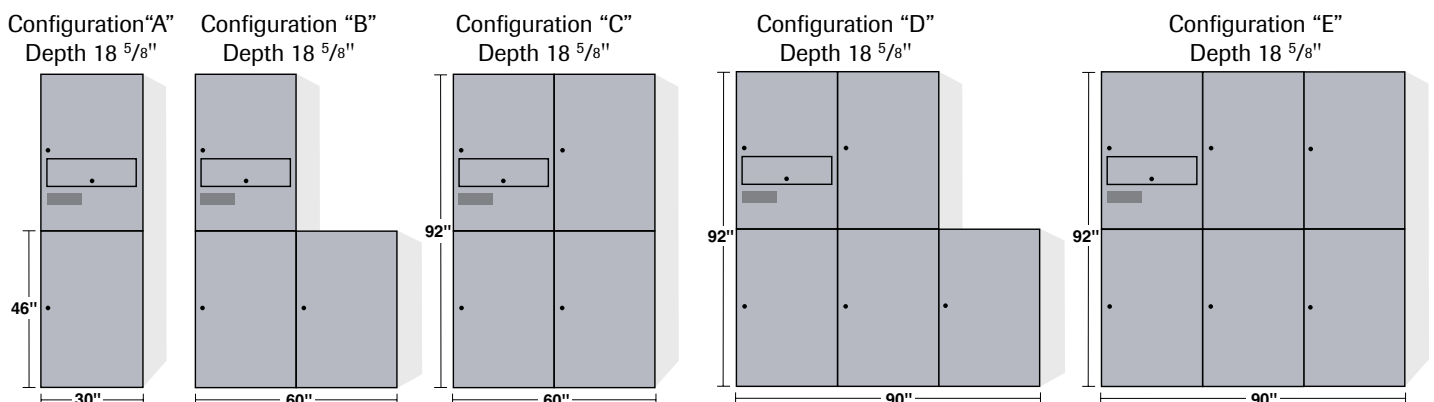
Optional LSN system battery; plates are separated by a highly porous glass mat, which functions as the electrolyte retainer. Provides the highest possible oxygen recombination. Completely sealed and requires no addition of water over its life expectancy. ABS flame retardant case and lid.

System Capacity	1.0K	2.0K	2.7K	3.7K	4.8K	5.5K	6.6K	8.3K	10.0K	12.5K	15.0K	17.5K
System Configuration	A	A	A	A	B	B	B	B	B	D	D	D
Total Weight (lbs.)*	1,365	1,384	1,390	1,472	1,684	2,062	2,630	2,679	3,589	3,657	4,885	5,491

Type N Battery Wet-Cell Nickel-Cadmium – 25-Year Design Life Expectancy at 25°C (77°F)

Optional LSN system battery; pocket plate nickel-cadmium elements in an alkaline electrolyte. Polypropylene containers are standard; each cell is provided with a flip-top, flame arresting, UL recognized vent cap. Covers provide dead-top isolation. Maintainable "wet-cell" construction, requires the addition of distilled water over its life expectancy.

System Capacity	1.0K	2.0K	2.7K	3.7K	4.8K	5.5K	6.6K	8.3K	10.0K	12.5K	15.0K	17.5K
System Configuration	B	B	B	B	B	B	B	D	D	E	E	Consult Factory
Total Weight (lbs.)*	1,075	1,486	1,644	1,894	2,232	2,532	2,812	3,481	3,940	4,720	5,505	Consult Factory



Consult factory for alternate runtimes and battery cabinet configurations. External transformer (not illustrated) is provided for 12.5K and 15.0K configurations with 208VAC and 240VAC input. Transformer cabinet dimensions are 18" W x 28" H x 15" D and weighs 250 lbs.

⁽¹⁾Add 12" of space to the width between cabinet stacks for seismic qualified option or DSFK seismic kits.