



DATE:	LOCATION:
TYPE:	PROJECT:
CATALOG #:	

LSN D Series

SINGLE-PHASE CENTRAL LIGHTING INVERTERS



FEATURES

- Uninterruptible emergency AC power system
- 90 minute emergency operation supplied standard
- “No Break” design transfers the load instantaneously when normal power is interrupted
- Single-phase
- For normally-on and normally-off loads
- User interface module includes multiple LED indicators and audible alarms to provide system status
- Overload and short circuit protection



SPECIFICATIONS

APPLICATION

- Indoor Commercial
- Indoor Industrial

OPERATION

- Automatic, programmable self-diagnostic 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

- Steel Cabinet
- Light grey paint finish
- Locking cabinetry and password-protected user interface for security
- Louvers at front and top of cabinet allow venting.

INSTALLATION

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

CERTIFICATIONS/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; type G batteries; 347V input/output)
- ANSI C62.41: ANSI C62.45 (Cat. A & B)
- FCC class A
- National Electrical Code (NFPA 70)
- Life Safety Code (NFPA 101)
- NFPA 111 (Stored Emergency Power Supply Systems - SEPSS)
- NEMA Type 1 Cabinetry
- OSHA, state and local codes

WARRANTY

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

BATTERY WARRANTY INFORMATION

Battery Type	Full	Pro-rata
S (VRLA lead-calcium)	1 year	9 years
G (VRLA lead-calcium)	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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ORDERING GUIDE

Example: D120-01S120/208-N2007U-EML

CATALOG # _____

D		Input Voltage ²		Capacity	Battery Type	Output Voltage (VAC) ^{2,3,4}	Output Circuit Breaker Type	Output Circuit Breaker Voltage Rating	Output Circuit Breaker Ampere Rating ⁶	Output Circuit Breaker Quantity ⁷	Output Circuit Breaker Supervision			
D	LSN Central Lighting Inverter	120	120VAC	01	1.0KVA	S	Blank	Normally On	A	15	01 - 20	Blank		
		208	208VAC	02	2.0KVA								10-year VRLA Lead-Calcium	Monitored
		240	240VAC	27	2.7KVA								G	Normally Off
		277	277VAC	37	3.7KVA	20-year VRLA Lead-Calcium								
		347	347VAC	48	4.8KVA	120	120/208	30						
				55	5.5KVA	120/240 ⁵	35							
				66	6.6KVA	277	40							
				83	8.3KVA	347	50							
				10	10.0KVA		60							
				12	12.5KVA ¹		80							
				15	15.0KVA ¹									
				17	17.5KVA									

Options And Accessories	
EML	Email Device
RSP	Remote Status Panel
SMT	System Monitoring Terminal Including Emergency Power Off Terminal
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
S	Seismic Qualified ¹²
Accessories	
DSFK_	Seismic Kit ¹²
Service Options	
FSL	Factory Start-Up ¹³

Notes:

- Requires a provided external transformer for 208VAC or 240VAC input.
- Refer to Specifications table (page 4) for available Input/Output voltage combinations.
- Other voltages available. Consult factory.
- External transformer may be provided.
- Loading may not exceed 50% of the system's total rating on any 120VAC leg.
- Normally Off circuit breakers: a maximum rating of 20 amps
- 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.
- Specify runtime in minutes when ordering. Example: AR120.
- Available with 1.0, 2.0, 2.7, 3.7, 5.5, and 6.6KVA Series with S batteries only.
- Available on 1.0 KVA - 4.8KVA Series.
- 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.
- Type S Battery in standard height cabinet only; See system configuration for 90-minute run time.
- 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 INFORMATION

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 (OSHDP OSP-0365-10), and ASCE7-10 SDS=2.0g for z/h=1 and SDS=2.5g for z/h=0, Ip=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.



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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, 277 Input: 347 / Output: 120, 120/240, 120/347, 347							Input: 277 / Output: 120, 120/240, 120/277, 277 Input: 347 / Output: 120, 120/240, 120/347, 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	240/80A	240/100A	240/100A	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:

Main Output Overcurrent Protection: Circuit breaker, output fuse

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.

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 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⁾

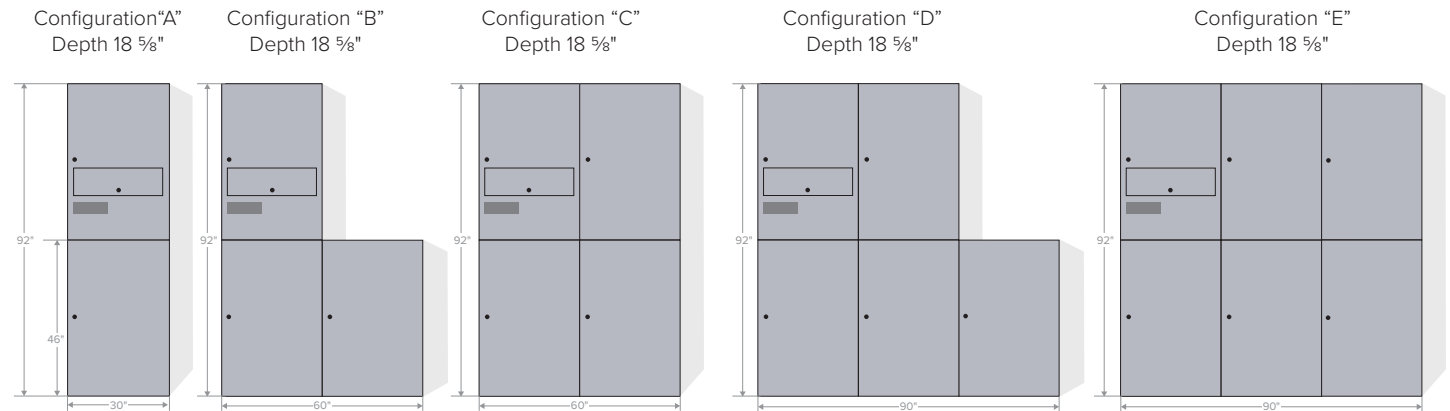
TYPE G BATTERY

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

DIMENSIONS



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.

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