ALM® 12V7s DATA SHEET

NEC ENERGY SOLUTIONS

HIGH PERFORMANCE, LONG LASTING, SAFE BATTERIES FOR TOUGH, CRITICAL APPLICATIONS

NEC Energy Solutions ALM® family of lithium-ion batteries offers exceptional performance and long operating life.

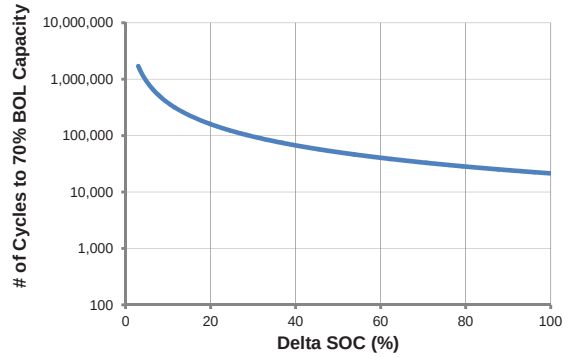
The ALM 12V7s delivers significant advantages over lead-acid batteries:

- High energy capacity even under high discharge rate and deep cycling
- Industry-leading service life in both cycling and float applications
- Integrated, redundant safety protection circuits

ALM 12V7s vs. Typical Lead-Acid Equivalent	
Available Energy (at 1hr rate)	**Up to 40% greater**
Cycle Life (to 50% DOD)	**10–50X longer**
Calendar/Float Life	**Up to 5X longer**
Charging Time	**10–100X faster**
Weight (Kg)	**50% lighter**

Long Life

- Exceptional 100% deep discharge cycle life
- Superior float, calendar, and shelf life
- Excellent partial state-of-charge endurance



Number of cycles is dependent upon average SOC, charge/discharge rates, temperature and calendar time. Actual results will depend on specific use cases. Contact NEC Energy Solutions for more details.

High Performance

- High rate power delivery with consistent energy capacity
- Fast, simple charging. Compatible with most lead acid chargers
- Scalable arrays up to 48V, 50Ah (4S10P) without external Battery Monitoring System (BMS)

Robust Safety

- EverSafe™ battery technology. Protection at the cell, battery, and system level
- Fast response short circuit protection
- Safe, proven, high-performance Nanophosphate® LiFePO4 chemistry
- Sealed ABS plastic case (UL 94-5VA flame retardant)
- Environmentally friendly; cells contain no lead or cadmium

Tough, Critical Applications

- Strong performance and long life across temperature extremes
- Light weight with superior energy density
- Simple, scalable system configurability up to 2.6kWh of energy

UPS SYSTEMS

TELECOM BACKUP POWER

INDUSTRIAL

OFF-GRID POWER

MEDICAL EQUIPMENT

406014-03EN-5

The ALM® 12V7s is available with nominal and high power (HP) models to match application requirements. The ALM 12V7s EverSafe™ battery technology provides protection against operation under many unsafe conditions such as over voltage, under voltage, over temperature and short circuit.

Electrical Characteristics at 25°C	12V7s	12V7s HP
Nominal Voltage	13.2 V	
Nominal Capacity[1]	5 Ah	
Available Energy (BOL)	66 Wh	
Max. Charge/Discharge Current Pulse (1 sec)	29 A	57 A
Max. Inrush Current (Charge or Discharge)	240 A	
Max. Continuous Discharge Current (to 100% Depth of Discharge)	23 A[2]	45 A[2]
Max. Continuous Charge Current	23 A[2]	45 A[2]
Max. Charge Voltage	16 V	
Max. Charger Voltage (w/o damage)	60 V	
Recommended Float Voltage	13.6 - 14.4 V	
Charge time @ max rate	15 min. @ 4C	6.7 min. @ 9C
Min. Float Voltage	13.6 V	
Under-voltage Limit (min)	8 V	
Operating Temperature[3]	-40 to +60°C	
Recommended Storage Temperature[4]	-40 to +35°C	
Transportation[5]	-40 to +70°C	

1. Minimum Capacity - 4.8V at beginning of life (BOL)
2. Duration of maximum constant current is thermally limited by internal electronics and depends on ambient temperature
3. Charge and discharge power, and energy availability, will be limited at the low and high ends of the specified operating temperature range
4. Storage at higher temperature reduces the battery's life
5. Transportation up to two weeks

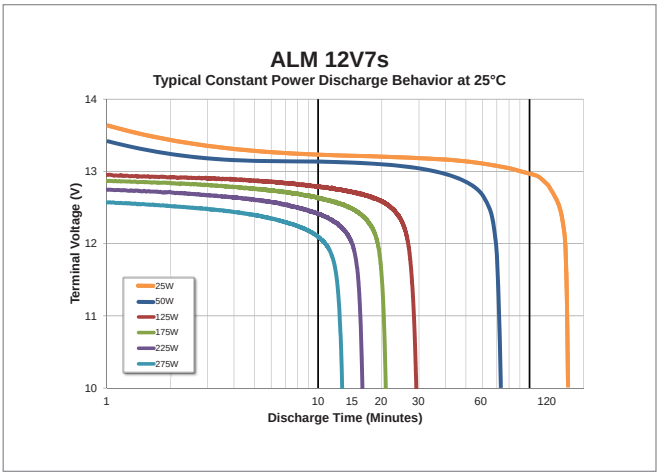
SAFETY AND COMPLIANCE

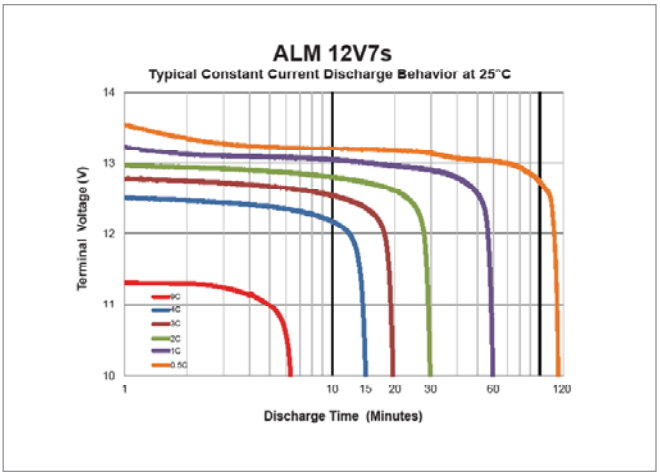
IEC62133; UL 1973

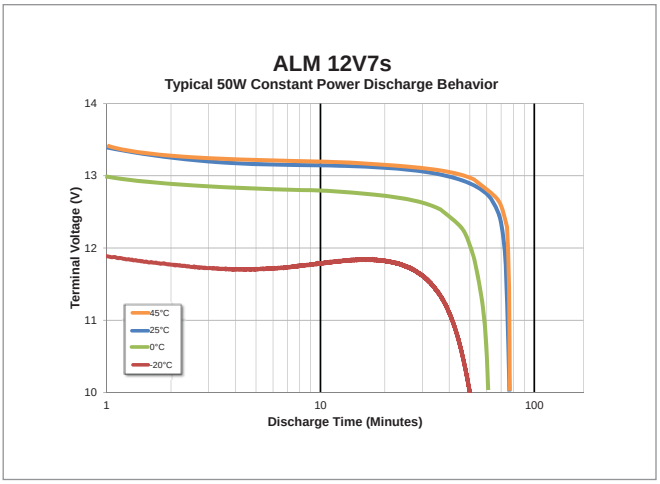
REACH, RoHS and Battery Directive (2006/66/EC)

Meets FCC 47CFR 15 Class B, IEC61000-6-1,-2, -3, -4, ICES-003

UN Manual of Tests and Criteria Part III subsection 38.3







Constant Power Discharge Characteristics in Watts @ 25°C	End Voltage	Up to 7.5 min	15 min	30 min	45 min	60 min	90 min	120 min
	10V	410	237	122	83	66	43	32.5

Constant Current Discharge Characteristics in Amps @ 25°C	End Voltage	Up to 7.5 min	15 min	30 min	45 min	60 min	90 min	120 min
	10V	40	20	10	6.7	5	3.3	2.5

TELECOMMUNICATIONS POWER SYSTEMS

Communications gear, whether in public or private networks, must meet critical up-time requirements, despite being deployed in harsh and difficult to access locations. The ALM® 12V7s dramatically exceed the performance and life expectations of traditional back-up power solutions, whether in stable, weak, or off-grid environments. ALM 12V7s is ideal for:

- Small cells, Private wireless, OSP, Customer premise equipment

UPS SYSTEMS

Uninterruptible Power Supplies are ubiquitous not only in data centers and small offices, but also in a broad array of industrial applications – anywhere where computers are used in critical applications. The exceptional power delivery capabilities, long life, and light weight ALM® 12V7s enable UPS systems including:

- Industrial Automation, Server UPS

OFF-GRID OR WEAK-GRID POWER SYSTEMS

Off-grid power systems demand fast and frequent charge and discharge cycles, often in harsh environments with portability requirements. The ALM® 12V7s' long cycle life, fast charging, and light weight are ideal for these challenging applications:

- Oil / gas / mining, remote sensors, electronic road signs, lighting

INDUSTRIAL SYSTEMS

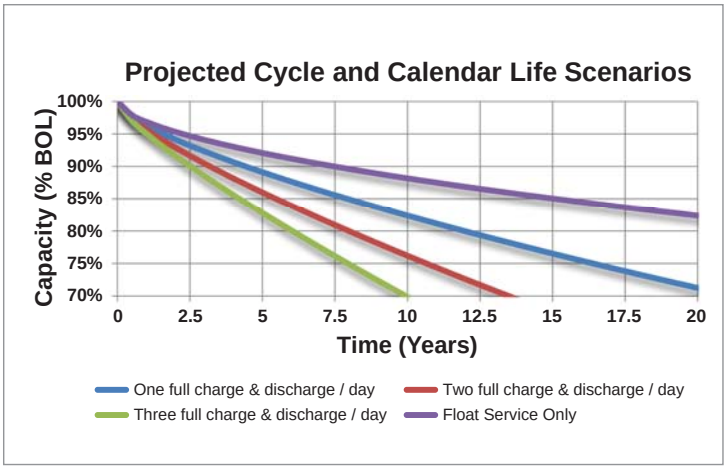
Most applications have a combination of frequent and deep charge/discharge cycles and harsh environmental conditions. The ALM® 12V7s offers consistent power delivery across state-of-charge, fast recharging, light weight, long life, and robust safety. Such applications include;

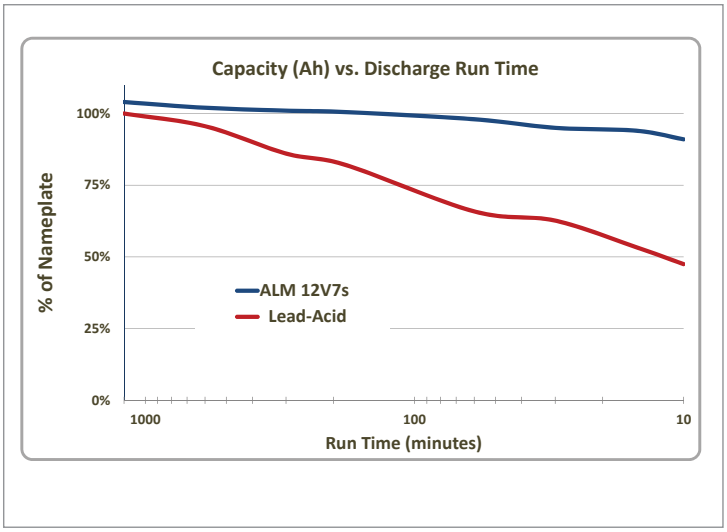
- Autonomous robots, Industrial machinery
- Security systems, Emergency lighting

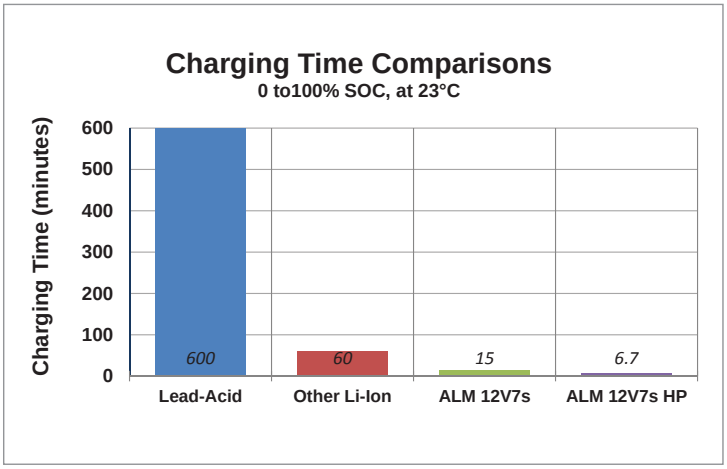
MEDICAL EQUIPMENT

Medical equipment increasingly relies on advanced batteries for operational portability. However, sidelining equipment for hours to accommodate battery charging or frequent servicing directly impacts the cost and quality of patient care. The fast recharging and long operating life of the ALM® 12V7s maximizes the value for:

- Mobile Carts, Diagnostic Equipment



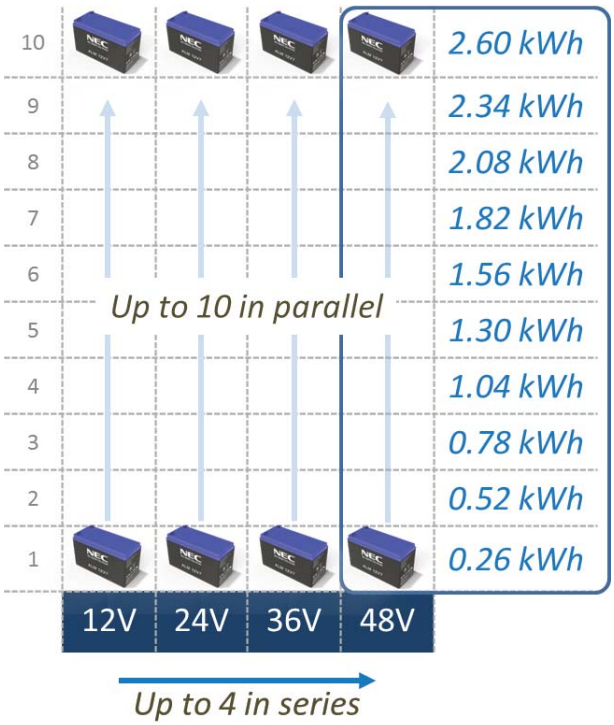




ALM® 12V7s SCALABILITY

- Simple systems up to 2.6 kWh*
  - Up to four ALMs in series
  - Up to ten ALMs in parallel
- Enables 12V, 24V, 36V and 48V systems
- No external BMS required
  - Protection functions of each battery cooperate in scaled configurations
  - Automatic balancing between batteries in series and/or parallel

** Based on Beginning of Life (BOL) available energy, 1C discharge.*



PHYSICAL AND MECHANICAL SPECIFICATIONS

Specification	Description
Dimensions (excluding terminals)	151 x 64.5 x 99.7 mm (5.9 x 2.5 x 3.9 in)
Weight (approximate)	ALM 12V7s 914 g (2.01 lbs)
	ALM 12V7s HP 932 g (2.05 lbs)
Case Material	ABS Plastic, UL 94 5VA Flame Rating
Terminal Requirements	6.35 mm (0.25 in) Quick Connect FASTON or equivalent

ORDERING INFORMATION

Product Model	Description	Regulatory Model Number	Order Number
ALM® 12V7s	ALM 12V7s, Single Unit	PSL000004	ALM000007-01
ALM® 12V7s HP	ALM 12V7s High Power, Single Unit	PSL000005	ALM000008-01

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