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Truck Energy Storage System

RoyPow®
Get powered. Get inspired

ONE-STOP SOLUTION

Energy independence for your ideal moving home



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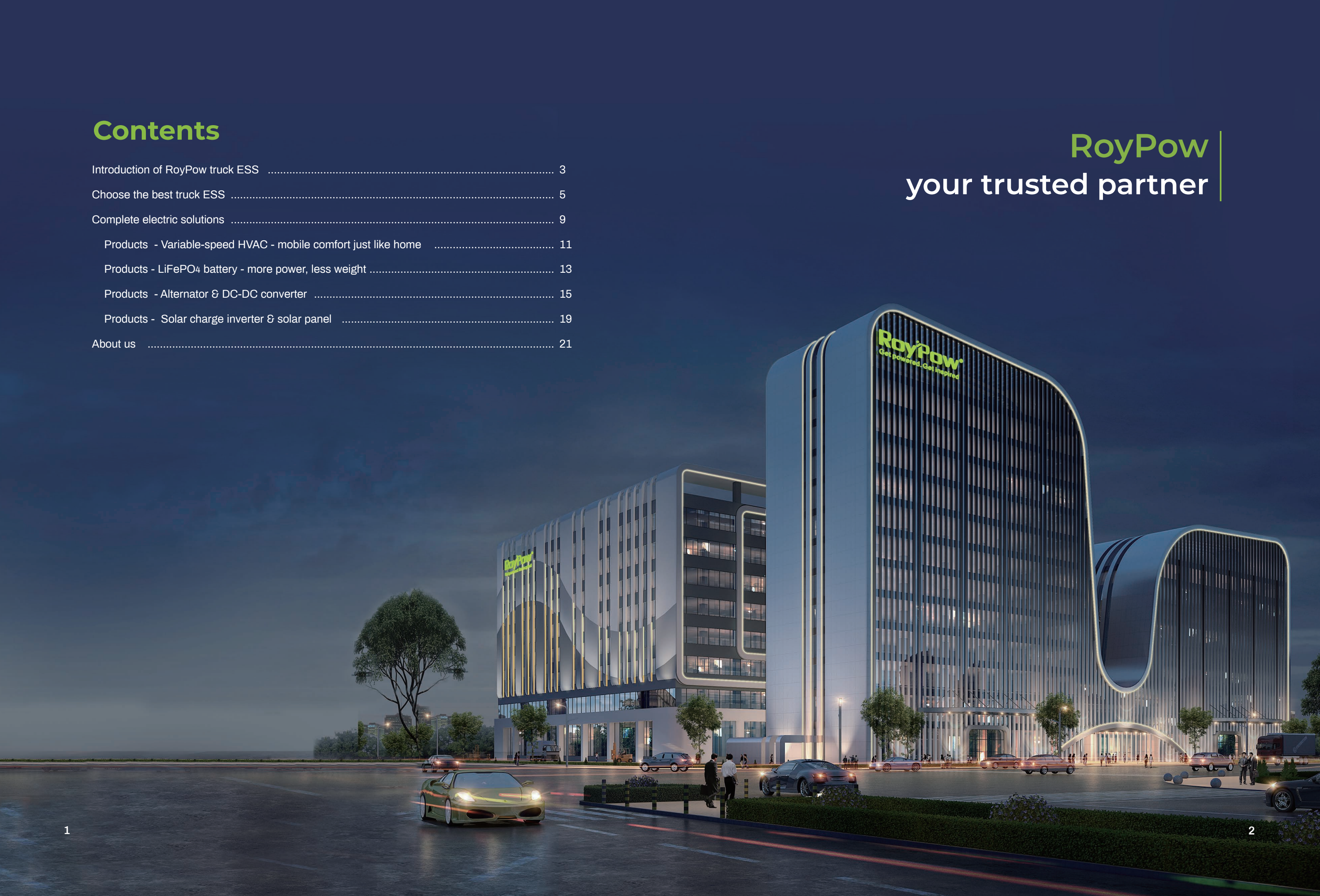
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RoyPow
your trusted partner



Introduction of RoyPow truck ESS



Freedom on the road

Say goodbye to power shortage!

Hefty fines associated with idling, increased fuel consumption and emissions as well as escalating maintenance costs have long plagued long-haul truck drivers who live in their truck for most time of the year.

Here is the solution! RoyPow truck ESS provides green, safe & reliable power to deliver basic home comforts without running into those issues anymore.

No worry of

- High fuel costs
- Noisy environment
- Frequent maintenance
- Air pollution
- Violation against the anti-idling law

Just enjoy the cool!



Noise



High temperature



High operating cost



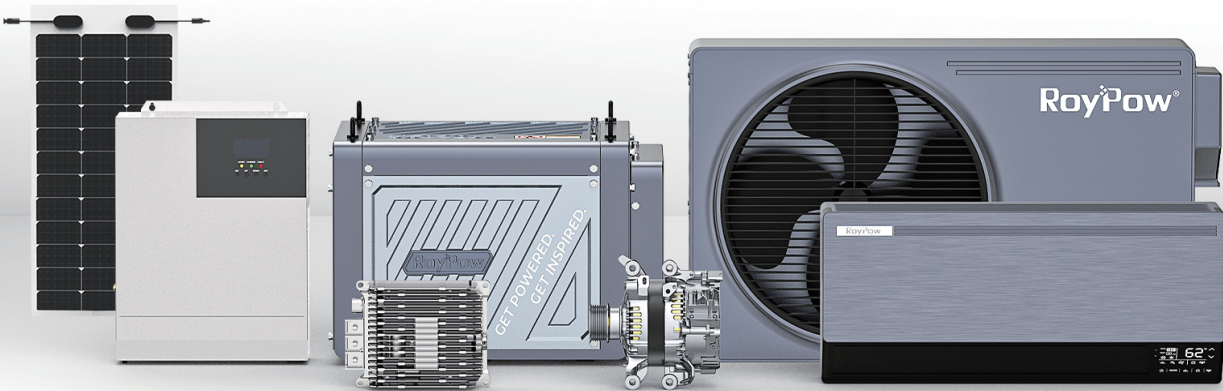
Engine idling



Pollution

Enjoy exceptional value with RoyPow truck ESS

RoyPow truck ESS can provide both DC and AC power to run sleeper cab hotel loads – including HVAC – without need for auto-start or extended engine operation.



Traditional APU VS RoyPow truck ESS



Energy storage system for trucks	Diesel / lead-acid battery-driven	RoyPow LiFePO4 battery-driven
Operation costs	Expensive fuel costs, frequent maintenance on engine wear and battery swapping	Eliminates your exposure to fluctuating fuel costs, less maintenance
Eco-friendly	Large quantities of fume emission and high corrosion	Emission free
Noise	Loud	Low noise, runs quieter
Maintenance	Need belt, oil, filter changes and frequent replacements	Minimal
Truck idling	Lots of idling, rely on the engine	No idling time, engine-free

Choose the best truck ESS

New-generation ESS

Cleaner & greener alternative to diesel APUs!

Up to
6,000
life cycles

Safe
LFP (LiFePO₄)
chemistry

-4°F - 131°F
Operating temperature



**Zero
emission**

**Virtually
maintenance
free**



Appropriate temperature
control & quiet operation
for a sound sleep



No noise & pollution
from generator or engine
idling



Customizable options
with additional solar panels or
solar charger inverter



Fast charging
increases the runtime
of HVAC and other
electronics



Multiple charging sources
when plugged into shore power,
through optional solar panel or
alternator



01 Remote monitoring & control

- ✓ Monitor and manage truck energy storage system from mobile phones anytime and anywhere
- ✓ Remotely turn on / off the HVAC system in advance for unrivaled comfort and convenience

WiFi connection everywhere 02

- ✓ Automatically switch to available network operators globally with built-in wireless data terminal
- ✓ Reliable WiFi hotspots are available to deliver the best internet experience for truck drivers

ALL-ELECTRIC SYSTEM FOR LONG-HAUL DRIVERS

Best-in-class performance,
uncompromised safety,
and total freedom to roam.

RoyPow
Get powered. Get inspired.

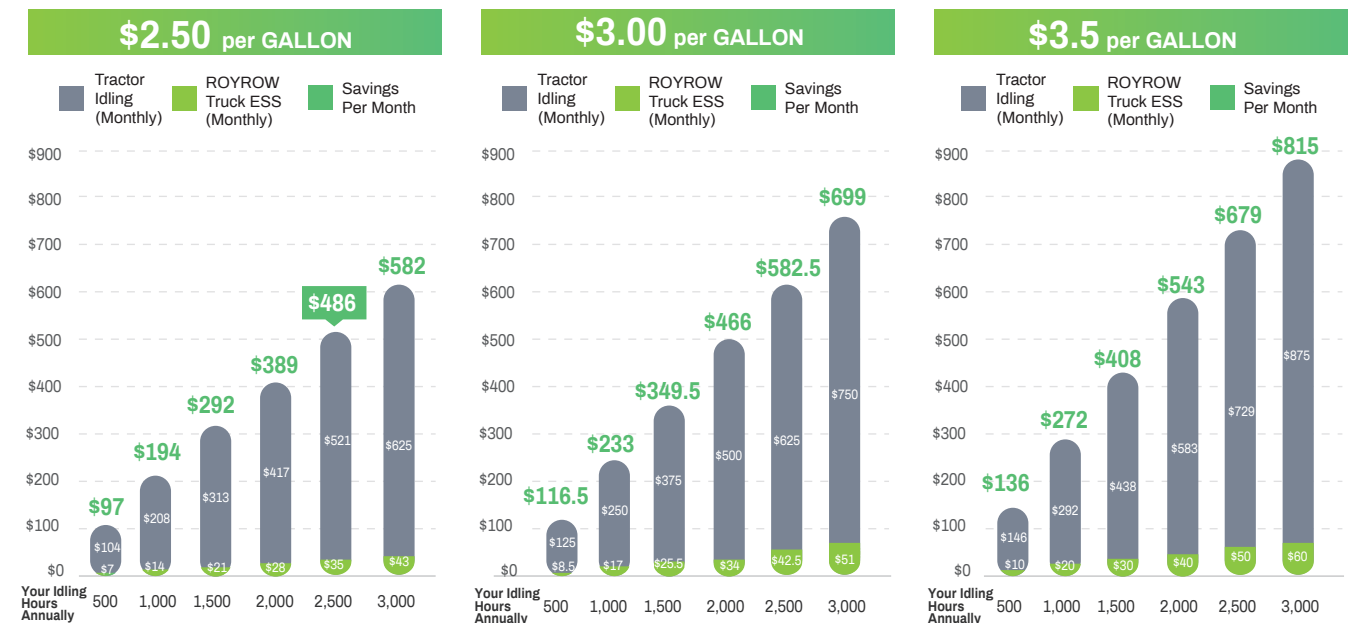
Maximum cost savings

✓ Lowered operating costs
by minimizing fuel consumption

✓ Reduced operation
of the tractor engine also delivers great cost savings on maintenance



How RoyPow truck ESS saves on fuel bills



Example:

If you idle 2,500 hours per year with a fuel price of \$2.50 per gallon, you can save up to \$486 per month on fuel alone with RoyPow truck ESS!

Tractor idling assumptions

Annual miles.....100,000 MI. Idling fuel cost1.0 gph

Save your cost per month with RoyPow truck ESS

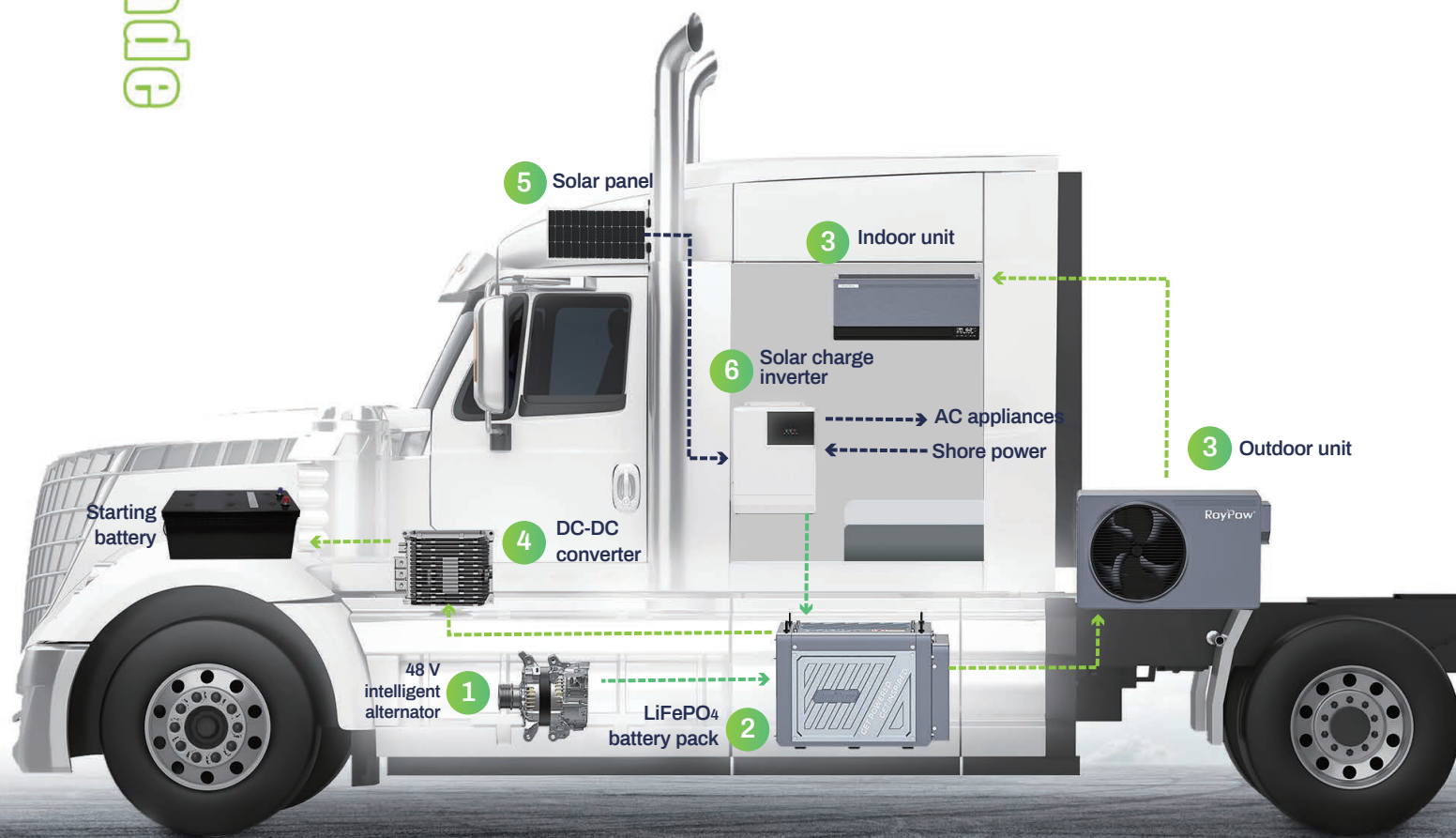
(Based on fuel consumption only). Fuel savings from start / stop off time is not included.

*Fuel consumption will vary based on ambient temperature and tractor cab insulation characteristics.

Note: All data are based on RoyPow standard test procedures. Actual performance may vary according to local conditions
The fuel prices above are based on US dollars. Fuel cost will vary from countries and regions

Complete electric solutions

Designed to install quickly and easily. The system can be easily customized for different driving conditions and budgets.



RoyPow
Get powered. Get inspired.

Truck energy storage packs included

1 48 V intelligent alternator

48 V intelligent alternator's overall popularity is attributed to its high safety and efficiency, which offers the best life experience for truck drivers.



Up to
5kW
continuous generated output

Up to
85%
conversion efficiency

2 LiFePO₄ battery

RoyPow LiFePO₄ battery pack provides high power capacity for your truck to run appliances such as microwave, HVAC system, and more without the need to idle or run the generator.



Up to
10
years battery life

0
maintenance

>6,000
life cycles

3 9,000 BTU HVAC

Designed for sleeper cab, this HVAC with variable speed expels the heat out of the cab effectively and runs quiet, creating a cozy resting environment.



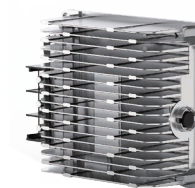
Up to
12 hours running

9,000 BTU
cooling capacity

As low as
35 dB noise

4 DC-DC converter

Designed specifically for truck-use, the bidirectional DC - DC converter is vibration-tested to ensure it can withstand the rigid road conditions with high performances retained.



✓ Automotive-grade

✓ Max. efficiency at **95%**

5 Solar panel (optional)

RoyPow solar panel is designed to provide long-lasting durability and performance in the extreme trucking conditions.



✓ Foldable

✓ Lightweight

✓ Ultra-thin

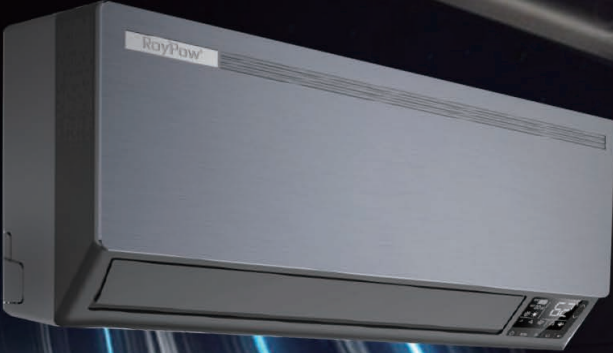
6 Solar charge inverter (optional)

The all-in-one solar charge inverter is a combination of an inverter, a battery charger and an MPPT solar charge controller into one complete system to reduce component and simplify installation.



ALL IN ONE

Inverter
+
Battery
charger
+
MPPT solar
charge controller



Up to
12 hours running

9,000 BTU / h
cooling capacity

As low as
35 dB noise

50%
power saving

Stay cool
in the harshest
of climate!

Mobile comfort
just like home



Technical specifications



Model	48V-9.5K FR
Rated input voltage	DC 48 V
Inverter / Non-inverter	Inverter
Mode	Cooling / Heating
Refrigerating capacity	2,500 ~ 10,000 BTU / h (750 ~ 3,000 W)
Refrigerating power	150 ~ 900 W
Rated cooling capacity	9,000 BTU / h (2,650 W)
Rated cooling power	750 W
Energy efficiency ratio (EER)	3.5 (W / W)
Max. rated input current	25 A
Heating capacity	2,700 BTU / h (800 W)
Input power of heating	800 W
Temperature range	61°F - 86 °F (16°C - 30°C)
Refrigerant	R410A
Outdoor unit waterproof level	IPX4
Indoor unit noise level	35 dB
Outdoor unit noise level	52 dB
Indoor unit dimension (L x W x H)	26.1 x 7.7 x 11.7 inch (663 x 197 x 296 mm)
Outdoor unit dimension (L x W x H)	35.5 x 9.4 x 20.4 inch (902 x 240 x 519 mm)
Indoor / outdoor unit weight	13.2 lbs (6.0 kg) 66.1 lbs (30.0 kg)

Note: All data are based on RoyPow standard test procedures. Actual performance may vary according to local conditions

LiFePO₄ battery - more power, less weight

High energy storage capacity of RoyPow LiFePO₄ battery meets the power requirements for sleeper cabs without needing to idle, greatly saving the fuel, money and time.



Long-lasting, long runtime

- ✓ Up to **10** years battery life
- ✓ **>6,000** life cycles
- ✓ Withstand the rigors and abuse of a deep discharge



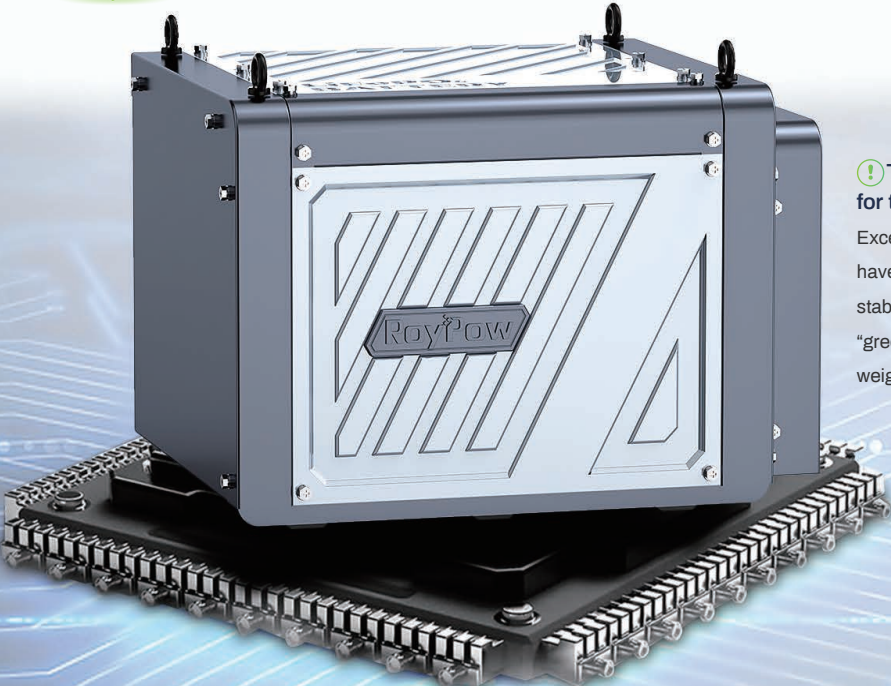
Zero maintenance

- ✓ No regular filling of distilled water
- ✓ Saving costs on labor and maintenance
- ✓ No frequent battery replacements



Ultra safe, ensures peace of mind

- ✓ Automotive grade lithium iron phosphate cells (LiFePO₄ cells)
- ✓ More thermal & chemical stability
- ✓ Engineered to resist vibration & shock



! Tips: Why choose LiFePO₄ batteries for trucks?

Except providing longer life, LiFePO₄ batteries have higher energy density and are more stable and reliable. They are environmentally "green" and lightweight to reduce the overall weight on the truck.

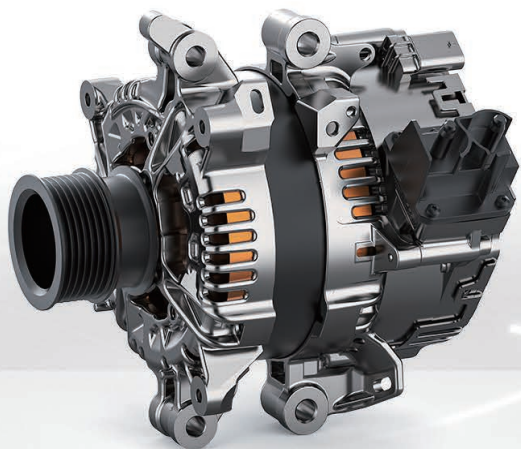
Technical specifications

Battery system specifications		
Configuration	14S1P	
Rated capacity (@ 0.5C, 77°F/ 25°C)	230 Ah	
Rated voltage (cell 3.2 V)	44.8 V	
Maximum voltage (cell 3.65 V)	51.1 V	
Minimum voltage (cell 2.5 V)	35 V	
Standard capacity (@ 0.5C, 77°F/ 25°C)	≥ 10.3 kWh	
SOC status before shipment	SOC 30% ± 3%	
Self-discharge rate (@SOC 100%, 77°F/ 25°C, Loss/Month, @BOL)	Max. 3%	
Safe reliability (Cell)	GBT Certified	
Insulation resistance (@77°F/ 25°C ± 41°F/ 5°C, RH 50%)	Min 20 MΩ / 1,000Vdc	
Cooling mode	Natural (passive) convection	
Heating function (Heating by charging mode)	Temperature rises by 59°F (15°C) in one hour On: Minimum temperature ≤ 43°F (6°C) Off: Minimum temperature ≥ 59°F (15°C)	
Working range of SOC	5% - 100%	
Protection rating	IP65	
Life cycle (@77°F/ 25°C, 0.5C charge, 1C discharge, DoD 70% (SOC 30 ~ 100%))	> 3,500	
Remaining capacity at the end of life (according to warranty period, driving pattern, temp. profile, etc)	EOL 70%	
Operating temperature	Charging working temperature	-4°F ~131°F (-20°C ~ 55°C) (under heating state)
	Discharge working temperature	-4°F ~131°F (-20°C ~ 55°C)
Storage temperature	Short-term (within one month)	-4°F ~ 113°F (-20°C ~ 45°C)
	Long-term (within one year)	32°F ~ 95°F (0°C ~ 35°C)
Weight	253.5 lbs (115 kg)	
Dimension	21.9 x 17.7 x 14.8 inch (555 x 450 x 376 mm)	


Note: 1. Only authorized personnel are allowed to operate or make adjustments to the batteries
2. All data are based on RoyPow standard test procedures. Actual performance may vary according to local conditions
3. All information provided is subject to change without prior notice.
*6,000 cycles achievable if the battery is not discharged below 50% DoD. 3,500 cycles at 70% DoD.


48 V intelligent alternator


48 V intelligent alternator's overall popularity is attributed to its high safety and efficiency, which can fully meet the electricity demand of living and working situations, greatly improving the life quality on / off the road.





It can achieve

- 

Automotive-grade, safe and reliable
- 

Wide working temperature range:
-4°F ~ 221°F (-20°C ~ 105°C)
- 

Smooth start-stop, torque boosting during vehicle acceleration
- 

Power generation efficiency management and rate optimization prevent lithium battery's over-heating / over-charging damages, etc
- 

Energy saving and emission reduction

Technical specifications

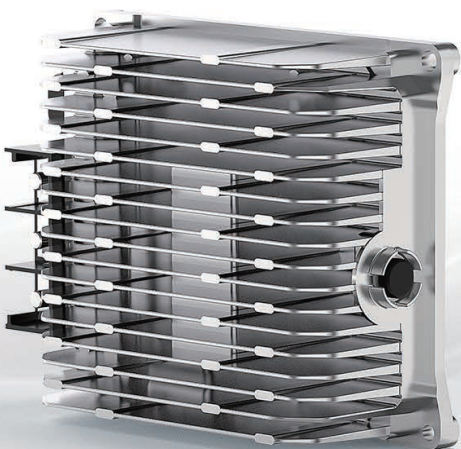


Model	48 V intelligent alternator
Peak power	10 kW, 20 s @ 221°F (105°C)
Peak generated output	11.5 kW, 20 s @ 221°F (105°C)
Peak torque	55 Nm
Peak efficiency	> 85%
Continuous power	> 5 kW @ 5,000 rpm, 221°F (105°C)
Maximum speed	18,000 rpm
Size	Φ150 X L154 mm, belt pulley is not included
Weight	9.6 kg, belt pulley and mounting arm are not included
Cooling type	Air cooling, motor working temperature range: -4°F ~ 221°F (-20°C ~ 105°C)
Protection rating	IP25 (motor); IP6K9K (inverter)
Insulation grade	Grade H
Safety grade	Support ASIL B development; support OBDII development

Note: All data are based on RoyPow standard test procedures. Actual performance may vary according to local conditions

Bidirectional DC-DC converter

Designed specifically for truck-use, the bidirectional DC - DC converter is vibration-tested to ensure it can withstand the rigid road conditions with high performances retained.



It can achieve

- 

High efficiency & reduced switching losses
- 

Rugged design for mobile environments
- 

Wide operating temperature range

Technical specifications



Model	2.5 kW DC-DC converter
48 V Voltage range	24 V - 36 / 48 / 54 V - 60 V
12 V Voltage range	8 V - 14 V - 16 V
Max. power	Buck: 2.5 kW (178 A); Boost: 2 kW (41 A)
Communication type	CAN communication
Activation type	KL15
Over-temperature protection range	248°F (120°C)
Precharge time	Once pre-charge instruction is received, the 48 V side busbar capacitor voltage is expanded from 12 V to 48 V in 150 ms.
Working temperature range	1. At temperature below -4°F (-20°C), the output is turned off. 2. At temperature between 104°F - 140°F (40°C - 60°C), full power output is reached. 3. At temperature between 140°F - 185°F (60°C - 85°C), it provides a linearly reduced output of 2,500 W-0 W. 4. At temperature above 185°F (85°C), output is turned off.
Protection rating	IP67
Weight	< 6.6 lbs (3 kg)
Dimension	9.4 x 6.9 x 3.0 inch (238 x 175 x 75 mm)

Note: All data are based on RoyPow standard test procedures. Actual performance may vary according to local conditions

All-in-one solar charge inverter

Featuring higher response speed, reliability and industrial standard, this all-in-one solar charge inverter integrates an inverter, a battery charger and an MPPT solar charge controller into one complete system, largely simplifying off-grid solar installation and ideal for mobile applications!

Features

Around **30%** MPPT energy efficiency improvement

94% Maximum inverter efficiency

All-in-one design

- ✓ Seamless switching of uninterrupted power supply to meet electricity demand in versatile scenarios

Power saving

- ✓ Power saving mode automatically reduces power consumption at zero-load

Instant viewing of operation

- ✓ The LCD panel displays data and settings, which can also be viewed using the app and webpage

Multiple safety protections

- ✓ Short circuit protection, overload protection, reverse polarity protection, and so on

ALL IN ONE



Inverter



Battery charger



MPPT solar charge controller

Technical specifications

Battery input

Battery type	Lithium Ferro-Phosphate (LFP)
Rated battery input voltage	48 V (minimum startup voltage 44 V)
Hybrid charging maximum charging current	120 A
Battery voltage range [1]	40 Vdc - 60 Vdc ± 0.6 Vdc

Solar input

Maximum PV open-circuit voltage	145 Vdc	Maximum PV input current	50 A
PV working voltage range	60 - 145 Vdc	Maximum PV input power	4,400 W
MPPT voltage range	60 - 115 Vdc	Maximum PV charging current	80 A

AC input (generator/grid)

Mains maximum charging current	40 A	Mains charging efficiency	> 95%
Rated input voltage	110 / 120 Vac	Switching time	10 ms (typical value)
Maximum bypass overload current	40 A	Frequency	50 Hz / 60 Hz (automatic detection)
Input voltage range	(90 Vac - 140 Vac) ± 2%		

AC output

Output voltage waveform	Pure sine wave	On-load motor capacity	2 HP
Peak power	3,500 VA	Maximum efficiency	> 91 %
Output frequency range (Hz)	50 Hz ± 0.3 Hz / 60 Hz ± 0.3 Hz		
Rated output voltage (Vac)	120 Vac (180 / 185 / 110 Vac)		
Rated output power (VA)	3,500 VA (2,900 / 2,050 / 3,200 VA)		
Rated output power (W)	3,500 W (2,900 / 2,050 / 3,200 W)		
No-load loss	Non energy-saving mode: ≤ 50 W Energy-saving mode: ≤ 25 W (manual setup)		

General

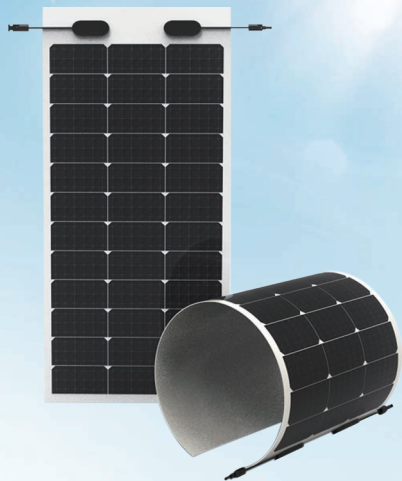
Certificate	CE (IEC 62109-1) / CETLCUL1741 / CSA C22.2 NO.107.1		
EMC certification level	EN61000, C2	Storage temperature range	-13°F - 140°F (-25°C - 60°C)
Working temperature range	5°F - 131°F (-15°C - 55°C)	Humidity range	5% - 95%
Weight	23.8 lbs (10.8 kg)	Dimension	16.8 x 12.7 x 4.9 inch (426 x 322 x 124 mm)

Note: All data are based on RoyPow standard test procedures. Actual performance may vary according to local conditions

Solar panel available option

Solar panel

Maximize your savings and enjoy the peace of mind that comes with solar panel's top durability, reliability and efficiency. Ideally suited for trucks!



Features

Flexible & foldable

Durable & weather-resistant

High conversion efficiency

Compact & lightweight

Ultra thin & easy installation



Technical specifications

Electrical performance

Model	ASP100NH36S
Maximum power	100 W
Power tolerance	+5 W
Optimum operating voltage	20.12 V
Optimum operating current	5.01 A
Open circuit voltage	24.45 V
Short circuit current	5.31 A
Module efficiency	20.74%

STC: AM=1.5, Irradiance 1.000W / m², Module temperature 77°F (25°C).

Temperature coefficient

Nominal module operating temperature	109°F ± 36°F (43°C ± 2°C)
Power temperature coefficient	- 0.36% / °C
Voltage temperature coefficient	- 0.28% / °C
Current temperature coefficient	- 0.06% / °C

Mechanical behavior

Backplane color	White
Solar cell	36 (3 x 12) / monocrystalline - PERC / 162.75 mm
Encapsulating materials	EVA / POE
Frame	Frameless
Protection grade of junction box	IP68
Cable (length / sectional area)	90 mm / 4 mm ²
Connector	MC4
Module actual size (L * W)	39.0 x 19.3 inch (990 x 491 mm)
Module assembly size (L *W *H)	1,070 mm x 520 mm x 1.7 mm (excluding junction box)
Module weight	3.1 lbs (1.4 kg)

Note: All data are based on RoyPow standard test procedures. Actual performance may vary according to local conditions

RoyPow, Your Trusted Partner For One-stop Energy Solutions

RoyPow is founded in Huizhou City, Guangdong Province, China, with manufacturing center in China and subsidiaries in the USA, Europe, Japan, the UK, Australia, South Africa, etc., to settle global sales and service network. Dedicated to renewable energy solutions for years, we have developed a portfolio of intellectual property and an integrated design and manufacturing capability that spans all aspects of the business from electronics and software design to module and battery assembly and testing. We are vertically integrated, and this ensures us to provide a wide range of application specific solutions to our customers.



R&D and manufacturing highlights

By virtue of all this, RoyPow is capable of “end-to-end” integrated delivery, and makes our products out-performing industry norms.

- Persistent technology innovation.
- All-round testing.
- Integrated design.
- Advanced MES system.
- Fully automatic production line.
- IATF16949 system.
- QC system.



Global sales and service network system

- Timely delivery.
- Hassle-free after-sales service.
- Fast response technical support.

RoyPow has comprehensively unfolded its overseas market layout to realize the localization of R&D, manufacturing, marketing and service, then become your most reliable partner.



Upgrading to new technology, with our turnkey solutions.

Years of dedication on new energy solutions, we are proud to offer customers professional solutions for:

- ✓ **Low speed vehicle batteries** including golf carts and sightseeing cars;
- ✓ **Industrial batteries** including forklifts, aerial work platforms and floor cleaning machines;
- ✓ **Residential energy storage systems & portable power units** including home storage and portable energy storage products, as well as off-grid energy storage (for forest cabin, island villa without electricity, etc.);
- ✓ **Vehicle-mounted batteries & HVAC systems** including RV and truck energy storage and air conditioning system, as well as off-grid solar system for RV;
- ✓ **Marine & boat power systems** including trolling motors, fish finders, other off-grid energy storage systems for marine, and marine power system;
- ✓ **Chargers** for forklifts, aerial work platforms, floor cleaning machines, golf carts and various marine batteries.

