

VUDU

insight<sup>TM</sup>  
SERIES

The best lithium battery designed specifically for golf



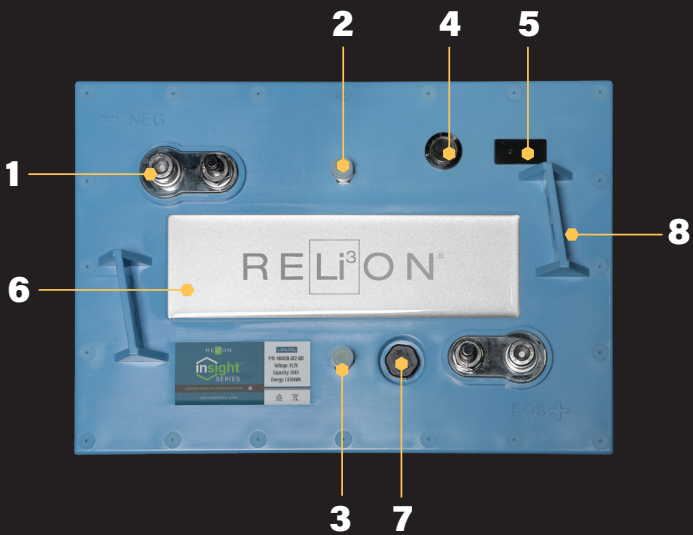
VUDU

# DESIGNED TO FIT. ENGINEERED TO PERFORM.

Designed and engineered from the ground up by a team of battery experts, InSight Series™ is the only lithium battery built to meet the power and energy requirements in golf cars, utility vehicles, AGVs and LSVs.

InSight features all the benefits of lithium batteries – longer life, no maintenance, faster charging – with even more intelligent features built-in. From its superior battery design to its one-of-a-kind BMS and intuitive software, InSight batteries offers exclusive advantages you won't find in competitive products. Making it an exceptional return on investment for years to come.

## INTELLIGENT DESIGN



- 1. Dual M8 Terminals (insert & stud)
- 2. CANbus Input
- 3. CANbus Output
- 4. Wake-Up Button
- 5. SOC/Status LEDs
- 6. Heatsink
- 7. Vent
- 8. Lifting Brackets

## WHY CHOOSE VUDU'S INSIGHT LITHIUM BATTERY?

### EASY INSTALLATION

InSight is a true drop-in solution for 48V vehicles. It's a 48V, 30Ah GC2 battery so there are no tray modifications needed. The most challenging part will be removing the heavy lead-acid batteries from the vehicle!

### SUPERSMART BMS™

InSight batteries have numerous advantages over competitors, starting with its SuperSmart BMS and intuitive Software - the most crucial components in a lithium battery. Learning algorithms make InSight the only lithium battery capable of calculating state of charge and state of health that gets even more accurate over time.

### INTELLIGENT COOLING

Unlike other lithium batteries that can trap heat, the InSight Series uses a carefully engineered cooling management system to quickly remove heat from inside the battery during conditions of high discharge and recharge currents. This prevents over-heating of critical components, which also extends the life of the battery.

### SCALABLE SYSTEM

InSight batteries offer freedom and flexibility. They are connected in parallel (up to 10) which means you can scale your system to provide increased power and energy (up to 300Ah) as needed.

### MANAGES REGENERATIVE CURRENTS

Other lithium batteries can't manage regenerative currents, mainly because the battery can't tell the difference between a charge current and a regen current. InSight batteries feature proprietary software that determines and safely manages regen currents - avoiding unnecessary battery disconnects.

### EXPERT ENGINEERING

InSight was designed by a team of engineers with over 100 years combined experience in the Golf/ Utility Vehicle-type segments. The result is a lithium battery that solves the challenges of power, capacity, ease of use and reliability – unlike any other lithium battery.

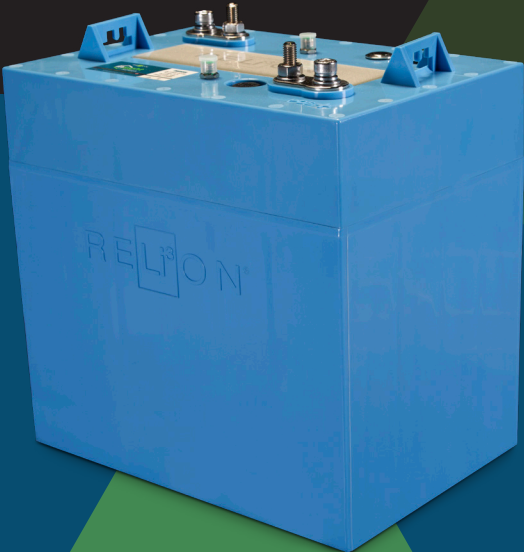
## AVAILABLE CURRENTS WHEN CONNECTED IN PARALLEL

CHARACTERISTIC	Li <sup>3</sup>	Li <sup>3</sup> Li <sup>3</sup>	Li <sup>3</sup> Li <sup>3</sup> Li <sup>3</sup>	Li <sup>3</sup> Li <sup>3</sup> Li <sup>3</sup> Li <sup>3</sup>
Voltage	51.2V	51.2V	51.2V	51.2V
Capacity	30Ah	60Ah	90Ah	120Ah
Charge Current	50A	100A	150A	200A
Continuous Discharge Current	100A	200A	300A	400A
Peak Discharge (30s)	125A	250A	375A	500A
Peak Discharge (10s)	150A	300A	450A	600A

## GO FURTHER WITH INSIGHT

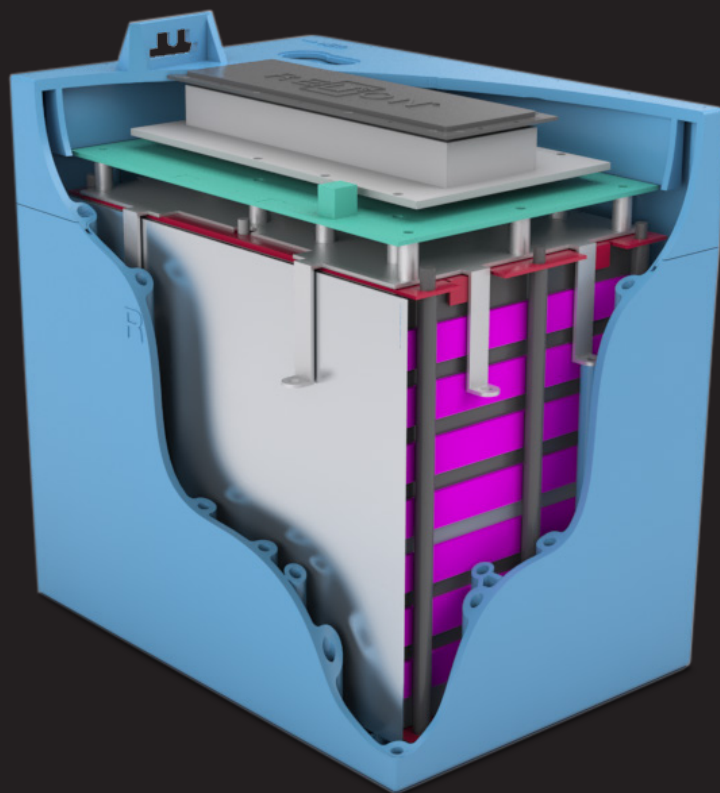
INSIGHT 48V 30AH BATTERIES	RANGE*
2 (60Ah)	40 - 50 miles per charge
3 (90 Ah)	60 - 75 miles per charge
4 (120Ah)	80 - 100 miles per charge
5 (150Ah)	100 - 125 miles per charge
6 (180Ah)	120 - 150 miles per charge

*\*Based on a standard, 2-seat, golf car.*



# SIMPLY SUPERIOR IN EVERY WAY.

Not only are InSight batteries smarter, they're built to the highest quality standards. State-of-the-art construction that includes an exclusive heat sink, IP67 rated enclosure, and UL certification. Assembled in an advanced manufacturing facility, InSight Series™ batteries undergo rigorous quality control checks and inspection at each stage of assembly to ensure a reliable, consistent, and high-quality product.



## INDUSTRY CERTIFICATIONS

UL2580 (Cell)

IEC 62133-2:2017

**UN38.3**

UL2271 (Battery Pack)

UN38.3 (Battery Pack)

CE (Battery Pack)



## WE STAND BEHIND OUR PRODUCT

# 10 YEAR WARRANTY



**VUDUENERGY.COM**

Call Toll-Free (US Only): 1 (800) 940-9894

All International Calls: +1 (727) 285-0878

VUDU provides our customers with the highest quality and safest lithium products, in compliance with all regulatory standards.

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YOUR ENERGY SUPERSTORE

**insight**  
SERIES



LiFePO4

## INTELLIGENT FEATURES

### Up to 128 Parallel Connections

- Intelligent battery-to-battery balancing
- Additive continuous and peak currents
- No additional hardware needed

### Heatsink Design

- Strategically located
- Unique passive cooling
- Prevents over-heating of critical components

### Dual M8 Terminals (insert and Stud)

- Ample space for connections

### LED Indicator

- Provides State of Charge (SOC)

### Unique BMS Design

- Microcontroller-based design
- Innovative protection algorithms
- MOSFET-based for ultra-fast response times
- High-resolution internal measurements
- Ultra-low self-consumption
- Non-volatile historical data
- CANbus communication



DATA SHEET

## MODEL

Part Number	48V030-GC2-001
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## FUNCTIONAL SPECIFICATIONS

Nominal Voltage	51.2V
Cell Chemistry	LiFePO4
Cell Type	Prismatic
Ampere-hour Capacity	30Ah
Watt-hour Capacity	1.536kWh
Specific Energy	128Wh/kg
Charge Efficiency	99%
Impedance (50% SOC, 1kHz)	<100mΩ
Cycles @ 80% DOD	>6000

## MECHANICAL SPECIFICATIONS

BCI Size	GC2
Dimensions (LxWxH)	260 x 180 x 276 mm
Weight	26.4 lbs (12 kg)
Case Material	ABS
Stud Terminal	M8 X 1.25 - 20
Insert Terminal	M8 X 1.25 - 20
Handles	Molded
Ingress Protection Marking	IP67
Case Flame Rating	UL94 V-0

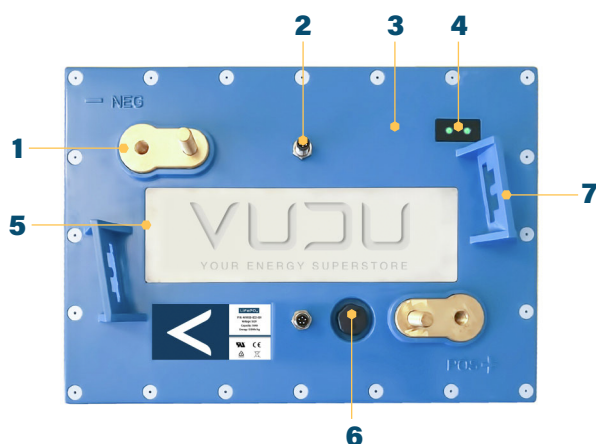
## DISCHARGE SPECIFICATIONS

Continuous Discharge Current	100A
Discharge Current (30-sec)	125A
Max Discharge Current (10-sec)	150A
Short Circuit Protection	500A
Low Voltage Disconnect	40V (5s)
Low Voltage Reconnect	Reset & Charge
Self-Discharge per Month @ 25°C	Idle 1.2%, Sleep 0.12%

## CHARGE SPECIFICATIONS

Continuous Charge Current	50A
Max Charge Voltage	58.4V
Recommended Charge Voltage	56V
Float Voltage	55.2V
High Voltage Disconnect	60.8V (4s)
High Voltage Reconnect	Automatic
Temperature Compensation	None





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### ENVIRONMENTAL SPECIFICATIONS

*Charge Temperature	-20°C to 45°C
Discharge Temperature	-20°C to +60°C
Operating Humidity	<90% RH
Storage Temperature	-40°C to +60°C
Storage Humidity	25 to 85% RH

\*For charging below 0°C see Charging Instructions

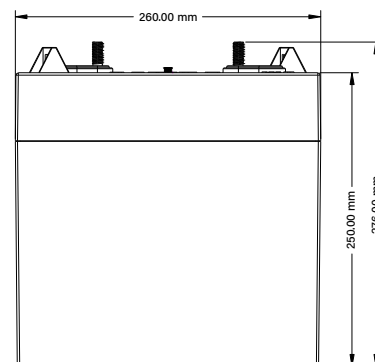
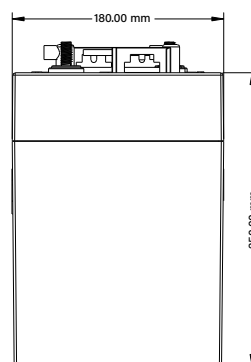
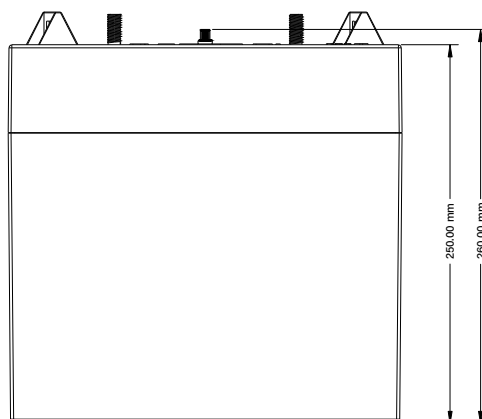
### CERTIFICATIONS

UL2580 (Cell)
UL2271 (Battery Pack)
CE (Battery Pack)
UN 38.3 (Battery Pack)

### APPLICATIONS

#### Traction and Stationary Including:

Golf & Utility Vehicles  
Floor Machines  
AWP  
Marine  
RV  
Solar  
Back-Up



### SHIPPING CERTIFICATIONS

UN 3480, Class 9





ADVANCED ENERGY TECHNOLOGIES



## QUICK INSTALLATION GUIDE



**INSIGHT 48V030-GC2** **LiFePO4**

### THANK YOU FOR CHOOSING VUDU!

This Quick Installation Guide contains important information regarding the proper installation of your InSight Series lithium battery. This QIG only applies to InSight Series 48V030-GC2 lithium battery.

#### INSTALLATION INSTRUCTIONS

##### 1. USE PARALLEL CONNECTIONS

The InSight 48V030-GC2 is a 48V, 30Ah battery that is only to be connected in parallel to meet your energy requirements. To get 60Ah connect two 48V InSight batteries in parallel, if you want 90Ah connect three in parallel and so on. You may connect up to ten 48V InSight batteries in parallel. They are only to be used in a 48V system and cannot be connected in series.

##### 2. INSTALL THE BATTERIES CLOSE TOGETHER

If you are replacing your existing batteries with fewer than the original batteries, install the new InSight batteries close to each other in the battery compartment.

##### 3. USE INSIGHT BATTERY SPACERS

We recommend using our Battery Spacers to fill the empty battery spots so you can use the existing battery hold-downs that come in your vehicle. If you do not use our Battery Spacers, please ensure your InSight batteries are securely held down.

##### 4. CABLE SIZE

Be sure to use cables of equal lengths to connect your InSight batteries.

##### 5. TORQUE

Use the proper torque.

79.7 – 88.5 in-lbs • 9 – 10 N-m

##### 6. UTILIZE CAN CABLES

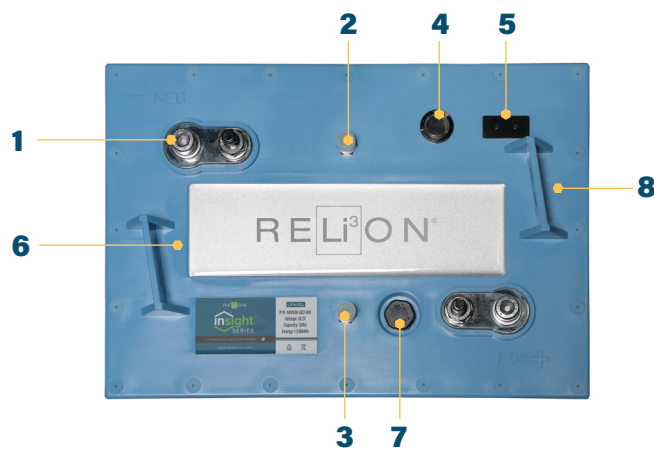
CAN cables are provided with your InSight battery. Starting with the first battery connect the CAN cable from the Output (on positive side of battery) to the Input (on negative side of battery) of the 2nd battery and so on. See image below for Input and Output CAN ports. The CAN port on the negative side of the 1st battery and on the positive side of the last battery will remain unused.

##### 7. WAKE UP THE BATTERY

Once connected, press and hold the Wake-Up button on one of the batteries until you see the first LED flash green. It will continue to flash green every 5 seconds. You will notice that once you wake up one battery the remaining batteries will automatically wake up. Once the batteries are awake, you can tap the Wake-Up button to see the state-of-charge (SOC) of each battery. Refer to our LED de-coder to determine the SOC. If the batteries are not at an equal SOC, they will balance upon being used.

##### 8. CHARGING

Wait 2 full minutes after using your battery before connecting your charger.



- 1.** Dual M8 Terminals  
(insert & stud)
- 2.** CANbus Input  
(on negative side of battery)
- 3.** CANbus Output  
(on positive side of battery)
- 4.** Wake-Up Button
- 5.** SOC/Status LEDs
- 6.** Heatsink
- 7.** Vent
- 8.** Lifting Brackets

## BATTERY INTERFACE:

The battery cover has two tri-color (green, orange, and red) that are used to communicate the status of the battery, the SOC of the battery, as well as protection modes and errors. LED1 is on the left side and LED2 is on the right side of the LED display when facing the battery from the positive post side.

## LEDS - STATE INDICATORS:

STATE	LED 1	LED 2
OFF	OFF	OFF
Active	Flashing Green (every 5 sec)	OFF
Battery Under Protection	Flashing Red (every 5 sec)	OFF
Charging	Off	Flashing Green (every 2 sec)
FW Update	Solid Green	Solid Green

## LEDS - SOC STATUS:

SOC	LED 1	LED 2
0 - 10%	Solid Green	Flashing Red
10% - 30%	Solid Green	Solid Red
30% - 50%	Solid Green	Flashing Orange
50% - 75%	Solid Green	Solid Orange
75% - 98%	Solid Green	Flashing Green
100%	Solid Green	Solid Green

## LEDS - ERROR INDICATORS:

STATE	LED 1	LED 2
Temperature Protection	Flashing Green	Flashing Red
Over Load Protection	Solid Green	Solid Orange
Battery Under Voltage Protection	Solid Green	Flashing Red

## PRECAUTIONS:

Lithium Iron Phosphate (LiFePO<sub>4</sub>) batteries are an inherently safe chemistry. Please reference VUDU's Lithium Iron Phosphate Safety Document (available on our website at [vuduenergy.com](http://vuduenergy.com)) for more details. However, as with any electronics, safety measures should always be taken. Please adhere to the instructions for safe handling and operation.

- Wear safety glasses when installing batteries
- Use a wrench with a rubber coated handle
- Do not place any objects on top of batteries
- Make sure all cable connections are properly tightened
- Refer to VUDU's LiFePO<sub>4</sub> SDS for additional information

## DEALER PRICING PACKAGES:

MAP - \$1,331.95

DEALER - \$1,055.00

DISTRIBUTOR (Minimum Required) - \$893.62



## TECHNICAL SUPPORT:

If you have technical questions about your battery, please contact the original place of purchase or VUDU Energy directly:



[sales@vuduenergy.com](mailto:sales@vuduenergy.com)



+1 (800) 940-9894



[VuDuEnergy.com](http://VuDuEnergy.com)

Challenge  
Your **Li<sup>3</sup>**mits<sup>®</sup>

ISO 9001:2015

UN38.3

