dcbel™ FAQ

1 Availability

1.1 When will dcbel™ be available in my location?

dcbel™ will be available in California beginning with the Bay area as soon as this fall and will expand to the Greater Los Angeles and San Diego areas at the beginning of 2021. We will expand to additional markets based on demand! Should you wish to see dcbel™ in your area feel free to pre-order dcbel™ so you can be added to the waitlist and receive updates on when it will become available in your region.

1.2 How much does dcbel™ cost?

dcbel™ starts at $4,999 and varies based on the number and type of EV connectors you select and whether you wish to benefit from Blackout Power.

1.3 How can I become a dcbel™ reseller or installer?

dcbel™ is always interested in partnering with qualified partners.

For further information on becoming a dcbel™ partner, please complete the Partner Form on the dcbel™ website and someone from our Partnerships team will get back to you.

2 Features & Compatibility

2.1 Where can I find more information about dcbel™'s compatibility?

We're glad you asked! You can start off with the following resources:

- Full dcbel™ Specifications
- dcbel™ Solar Guide

2.2 How is dcbel™'s bidirectionality unique?

dcbel™'s bidirectional power flow feature called Blackout Power is built upon an award-winning power electronics innovation called the PUC5 which is short for 5 Level Packed U Cell Inverter Topology. It is recognized by the prestigious Institute of Electrical and Electronics Engineers (IEEE) professional association as the Best New Approach to Electrical Engineering.

To find out more about what makes our technology unique we encourage you to visit Our Technology page on the dcbel™ website.

2.3 What EVs are compatible with dcbel™ charging?

All EVs that have either an SAE J1772, CHAdeMO or CCS1 charging port can be charged by dcbel™. However, the SAE J1772 cannot benefit from dcbel™'s Power Boost functionality as the protocol only allows for AC charging which is limited by the EV onboard converter. Any other protocols such as Tesla can charge with a dcbel™ using a SAE J1772, CHAdeMO or CCS1 to Tesla adapter.

2.4 What EVs are compatible with Blackout Power?

Blackout Power is the beloved dcbel™ feature that uses the energy stored in your EV's massive battery to power your home in a utility grid blackout. This is otherwise known as bidirectional charging, two-way power flow, V2H (vehicle-to-home) or power discharge.

Compatibility with dcbel™'s Blackout Power feature requires a multi-part response:

1. **Does the technical standard that the EV is built to allow for bidirectional power flow and communication?**

There are two major global DC EV charging standards: CHAdeMO and CCS. All EVs built to the CHAdeMO standard like the Nissan Leaf and Mitsubishi Outlander are currently compatible with Blackout Power while, as a rule of thumb, pre-2021 CCS vehicles like the Chevrolet Bolt are not currently supported. The CCS standards are currently being revised to allow EV's built to CCS standards to support bidirectional power flows. The revised standards are scheduled to be published this year (2020) and dcbel™ was designed to be ready for the CCS protocol update and will be able to support Blackout Power via CCS with a small over the air upgrade shortly after the updated protocol is published.

2. **Does the EV manufacturer support bidirectionality?**

There is a second important consideration and that is the manufacturer's warranty on the EV battery and their willingness to support bidirectionality. At this time, there are only a few EV manufacturers that will allow an EV owner to discharge their EV battery for purposes other than powering the EV without voiding the battery warranty. And even those that do may specify very specific conditions or equipment certifications that must be observed. dcbel™ is currently

working with EV manufacturers who provide Blackout Power as a standard feature of their products.

2.5 Is dcbel™ compatible with my Tesla?

A Tesla EV equipped with the corresponding Tesla-J1772 and Tesla/CHAdeMO connector adapters is compatible with dcbel™ J1772 AC Level 2 and CHAdeMO DC Level 3 charging and "solar charging" capabilities (assuming that the owner has a residential solar array). A Tesla is not compatible with the "Blackout Power" feature of dcbel™. Such usage will void the Tesla battery warranty and may cause technical problems with the EV.

2.6 Does power flow back into the grid when Blackout Power is enabled?

No. An automatic transfer switch (ATS) opens to prevent any power flowing back to the grid. This is to ensure the safety of any utility personnel that may be working on the grid during an outage.

2.7 Why should I use my EV as a backup power source instead of a stationary battery?

What most people don't realize is how huge the EV battery is! The average EV can provide 5 to 10 times the power compared to a separate stationary battery which equates to about 2-4 days[1] of powering an entire North American single-family home … and it doubles as a car too! If you don't have an EV or want the extra back up for when your EV isn't there, dcbel™ also has the capacity to integrate a stationary battery which can communicate with your solar setup to store the power produced during the day to be used later at night when electricity rates can be more expensive.

2.8 Is dcbel™ a back up power system?

dcbel™ uses your EV's battery and/or separate stationary battery as a back up power source by acting as a battery charger/inverter. However, you still need to provide the stationary battery and EV - dcbel™ does not come with one.

2.9 Will PG&E allow your system to be used?

dcbel™ was designed to work with utilities like PG&E and a California utility listing of dcbel™ as an approved product are planned and will be approved shortly. Preliminary discussions with the utilities have already taken place and since dcbel™ will be UL 1741 SA and Rule 21 compliant we do not anticipate problems with local utilities.

2.10 What stationary batteries is dcbel™ compatible with?

dcbel™ is compatible with all batteries that have a 400V DC nominal voltage like the LG Chem RESU.

[1] Based on the annual electricity use of 6,570 kwh for the average Californian home which extrapolates to 18 kWh / day.

2.11 Can dcbel™ use a Tesla Powerwall as stationary battery?

dcbel™ does not currently support a Tesla Powerwall as it has its own inverter and logic that is not designed to be compatible with other inverters.

2.12 Do I need to have an EV for dcbel™ to benefit from dcbel™?

Absolutely not! While there are certainly beneficial EV specific features, dcbel™ is also a powerful 15.2 kW MPPT solar inverter with two separate 7.6 kW solar array inputs and a stationary battery charger. Many of our customers purchase it as a solar + storage system and know that when it is time to get a new car, their home will be EV ready!

2.13 Can I generate and consume power generated from my solar panels during a utility grid blackout?

This requires a charged EV or stationary battery in addition to the solar panels. The EV or battery will provide the necessary voltage and frequency references for the solar inverter (to be validated with David H. and Peter I.).

2.14 What noise level does dcbel™ operate at?

When operating, dcbel™ has a low hum of around **50** db which is similar to a regular home appliance like a well insulated dishwasher**.** Since dcbel™ is typically in the garage or on an outside wall of the house, this level of noise should be hardly noticeable.

Most of the noise comes from the fans in the cooling system which means that the sound of moving air would, on average, be louder in regions with hotter ambient temperatures. In more temperate and cool regions, the fans do not need to run continuously.

It is relevant to know that the average EV hums at around 90 db while charging at high power. The EV, in most circumstances, is likely to drown out the noise from dcbel™.

2.15 How much energy does dcbel™ use when idle?

When idle, dcbel™ is in monitoring mood and only data collection and the display is active. Monitoring mode uses about 35-40 watts of power which is equivalent to a single incandescent lightbulb.

3 Installation

3.1 Can I install dcbel™ in a multi-unit dwelling or in series?

No. dcbel™ was designed for a single-family home with a single electrical service entrance. It should not be installed in a multi-unit dwelling or in series.

3.2 If we want to benefit from the Blackout Power feature how many breakers are required?

One 125A/2P and one 40A/2P breakers are to be installed in the main panel. A 15A/1P must be installed in the sub panel and can be dedicated to a wall socket. The 125A breaker is in fact the addition of the breaker capacity dedicated to AC1 (40A), AC2 (40A) and the backup load (40A).

Please view the 'AC Connection: Breaker Size Recommendation' of the full dcbel™ specifications.

3.3 What is the maximum load that dcbel™ can backup?

The present maximum load in backup is 7.6kW (32A at 240V).

3.4 Is it possible to operate dcbel™ in an offgrid capacity?

No. The first version of dcbel™ was designed to work with grid-connected homes.

3.5 I already have solar panels and want to install a dcbel™. Will it be compatible with my system?

Your solar panels have been sized to work with your existing inverters which may have specifications that are materially different from dcbel™'s. In retrofit situations, we must review your unique installation to determine if the panel array configuration and wiring is compatible with dcbel™.

- We encourage you to read the dcbel™ Solar Guide for more information on dcbel™'s solar inverter functionalities.

3.6 Is dcbel™ compatible with my existing solar inverter?

dcbel™ itself is a solar inverter and thus not compatible with other solar inverters. It can, however, run in parallel to your existing solar inverter and be installed to benefit solely from the dual EV charging and blackout power functionality, and be connected to your solar panels once your current system fails. In that case, you would not be able to benefit from solar charging or take full advantage of the optimization and energy management benefits provided by Orchestrate.

We encourage you to read the dcbel™ Solar Guide for more information on dcbel™'s solar inverter functionalities.

3.7 What size does my breaker panel need to be?

Breaker panels should be sized as a function of your current or expected house load. As a general rule, a 200A panel the majority of North American single-family home.

3.8 How much dcbel™ cost to install?

We highly suggest you contact a local installer to evaluate the cost of installation as it varies based on your home's unique energy needs, rooftop surface area and current electrical setup.