

UNITED STATES DISTRICT COURT  
EASTERN DISTRICT OF WISCONSIN  
MILWAUKEE DIVISION

PSLC LLC,

Plaintiff,

v.

GENERAC POWER SYSTEMS, INC.,

Defendant.

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CIVIL ACTION NO. 2:24-cv-1270-PP

**JURY TRIAL DEMANDED**

**PLAINTIFF’S PRELIMINARY INFRINGEMENT CONTENTIONS**

**AND ACCOMPANYING DOCUMENT PRODUCTION**

Plaintiff PSLC LLC (“Plaintiff”) hereby provides its preliminary infringement contentions concerning Defendant GENERAC POWER SYSTEMS, INC. (“Defendant” of “Generac”) and accompanying document production.

Plaintiff undertook reasonable efforts to prepare these preliminary infringement contentions based on publicly available information. The period for discovery has just begun, and as such, Plaintiff reserves the right to amend its infringement contentions based on material identified and/or produced during discovery and as the litigation progresses. Plaintiff expressly reserves the right to supplement and/or amend its contentions after a full review of Defendant’s initial technical document production. In addition, the evidence cited in support of the disclosures herein is necessarily exemplary and is therefore illustrative and not exhaustive. For example, Plaintiff anticipates that relevant facts and evidence are uniquely within the possession, custody, or control of Defendant. Plaintiff reserves the right to supplement, amend, or modify the information contained herein and to use and introduce at trial such information and any subsequently identified or discovered information.

These preliminary infringement contentions are based at least in part upon Plaintiff's present understanding of United States Patent Nos. 10,879,727 ("the '727 Patent"), 10,892,618 ("the '618 Patent"), and 11,967,857 ("the '857 Patent"), (collectively, "the Asserted Patents" or "the Patents-in-Suit"). and the accused products in the absence of additional claim construction proceedings and limited discovery. The Asserted Patents are entitled to a priority date at least as early as 05/26/2011 based on the initial provisional patent application. The Asserted Patents issued on 12/29/2020 ('727 Patent), 01/12/2021 ('618 Patent), and 04/23/2024 ('857 Patent), respectively. Plaintiff reserves the right to amend its preliminary infringement contentions in response to claim construction proceedings and this Court's claim construction rulings. Plaintiff further reserves the right to amend its preliminary infringement contentions and asserted claims based on any proceedings before the United States Patent and Trademark Office regarding the Patents-in-Suit.

#### **A. IDENTIFICATION OF INFRINGED CLAIMS**

The currently asserted claims of the Patents-in-Suit are as follows:

| <b>Patent</b> | <b>Asserted Claims</b>                                                                                     |
|---------------|------------------------------------------------------------------------------------------------------------|
| '727 Patent   | Claims 13, 37                                                                                              |
| '618 Patent   | Claims 1, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30 |
| '857 Patent   | Claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 27, 66, 71                                                       |

Plaintiff identifies these asserted claims based on its current and preliminary understanding and reserves the right to supplement and/or change its identification as discovery proceeds, including identifying additional claims and withdrawing claims.

**B. IDENTIFICATION OF ACCUSED PRODUCTS, SYSTEMS, METHODS AND/OR SERVICES**

Defendant makes, uses, sells, offers for sale, and/or imports into the United States backup power sources and load management devices and/or systems. Defendant's online website may be accessed at <https://www.generac.com/>. The term "Accused Products" herein refers to all products (including components, devices, software, and/or applications) and/or systems manufactured, made, designed, used, tested, imported, offered for sale or sold by or on behalf of Defendant practicing one or more of the Asserted Claims of the Patents-in-Suit, and all methods, processes and/or services employed by Defendants that practice one or more of the Asserted Claims of the Patents-in-Suit.

The Accused Products include Defendant's backup power sources and load management devices and/or systems. As such, the Accused Products include, but are not limited to, the PWRmanager, PWRcell Batteries, PWRcell Inverter, PV Link Substring Optimizer, Automatic Transfer Switches, PWRcell Automatic Transfer Switch (PWRcell ATS), PWRGenerator, Generac AC Generators, Smart Management Modules (SMMs), Load Managers, Current Transformer Kits, and PWRView App. Oftentimes, when used together, as Defendant suggests, the Accused Products make up what Defendant refers to as its PWRcell Energy Storage Systems. The following list of Accused Products form Defendant's PWRcell Energy Storage Systems:

- All models and versions of Generac's PWRmanager product including but not limited to Generac's PWRmanager A0001426546, A0002198364, and G00080090.

- All models and versions of Generac’s PWRcell Battery products including but not limited to models or versions A0001515563, APKE00028, APKE00042, 3.0 kWh DCB Battery Module - G0080041, 3.0 kWh EX Battery Module - G0080001/G0080003/G0080005, PWRcell Battery 2 compatible with PWRmanager and PWRcell 2 Battery Cabinet - APKE00076.
- All models and versions of Generac’s PWRcell Inverter products including but not limited to models or versions XVT076A03, X7602, X11402, PWRcell 2 Inverter - APKE00075.
- All models and versions of Generac’s PV Substring Optimizers including but not limited to PV Link 2500W MPPT Optimizer – S2502.
- All models and versions of Generac’s Automatic Transfer Switch products including but not limited to A0001501151, CXSW100A301, CXSW200A301, and PWRcell ATS Controller Upgrade Kit (G00800060). By way of example, the PWRcell ATS Controller Upgrade Kit is depicted in Defendant’s line diagrams and described in its literature, such as at p. 24 of its Generac PWRcell Inverters Installation and Owner’s Manual (copies of which are being produced concurrently herewith).
- All models and versions of Generac’s PWRgenerator. According to Defendant’s literature, its PWRgenerator may be used for home backup and is capable of pairing with the PWRcell solar and battery storage system for “flexible configuration options” and to provide a “comprehensive load management solution.” See, e.g., a0001501151-rev-d-pwrcell-ats—01-spec-sheet2.pdf, produced concurrently herewith. This is also depicted in Defendant’s line diagrams and such customizable configuration infringes the Asserted Claims.
- All models and versions of Generac’s Rebus DC Nanogrid Coupled PV including but not limited to PV Link S2502. The use of Generac’s DC Coupled PV is depicted in

Defendant's line diagrams and such customizable configuration infringes the Asserted Claims.

- All models and versions of Generac's AC Generators which are compatible with and capable of providing backup AC power for Generac's Solar Battery Solutions systems. These Generac Generators include but are not limited to liquid diesel and propane as well as gaseous LP and natural gas fuel types; Standby, Whole House, Home Backup and GP series Portable Emergency Generators; including but not limited to the Guardian, protector, EcoGen, 72XX and 73XX families. The use of Generac's AC Generators are depicted in Defendant's line diagrams and such customizable configurations infringe the Asserted Claims. And Generac's DC output PWRgenerator.
- All models and versions of Generac's Smart Management Modules (SMMs) product including but not limited to G006873, G000700-0, G0070000, G007006-0 and G0070060. Note that, according to Defendant's literature, the Load Manager is functionally the same as the SMMs. See, e.g., What is Generac Load Management.pdf produced concurrently herewith.
- All models and versions of Generac's Current Transformers and Current Transformer Kits, including but not limited to Model APKE00006, CT601, 0J0481C, and 0J0481E.
- All models and versions of Generac's PWR View Application.
- All models and versions of Generac's PWRmicro including but not limited to the PM-820. The PWRmicro was only recently announced in September 2025. See <https://www.generac.com/about/news/generac-introduces-pwrmicro-an-innovative-microinverter-designed-to-provide-greater-homeowner-savings-through-higher-energy->

[yield/](#) . The PWRmicro is described by Defendant as integrating with its PWRcell 2 and home standby generators.

- All models and versions of Generac's Rebus 380 VDC Nanogrid.
- All models and versions of Generac's HVAC Energy Manager including but not limited to G0070250. This product appears to be a relatively new offering from Generac. The module operates with the 24 VAC control wiring used for HVAC systems. It senses the frequency of the 24 VAC and switches the HVAC compressor's existing 240 V contactor off to turn that load off whenever the frequency of the 24 VAC drops. For example, when the grid power is out and a Generac backup generator is providing the house power. With respect to overloads, the output power frequency drops and because that output power is used to provide the 24 VAC power via a transformer the 24 VAC frequency also drops. This new Energy Management Module works similarly to the SMMS identified above but operates with 24 volts input and utilizes the power contactor in the Air Conditioner system's outside compressor. The attached claims charts thus apply to this customizable product offering.
- All models and versions of Generac's Smart Air Conditioning Module (SACM) including but not limited to A0004499959.
- All models and versions of Generac's PWRcell 2 system, and system devices and components. The PWRcell 2 appears to be a new, recently unveiled system by Defendant, with limited publicly available literature to date. Defendant states the PWRcell 2 includes a PWRcell 2 Inverter Model APKE00075, a Battery Cabinet Model APKE00076, 3.0 kWh DCB Battery module Model G0080041, and Smart Disconnect Switch (SDS) Model APKE00067. See also <https://www.generac.com/solar-batter-solutions/pwrcell-product-overview/> That being said, the PWRcell 2 offers similar functionality to the above

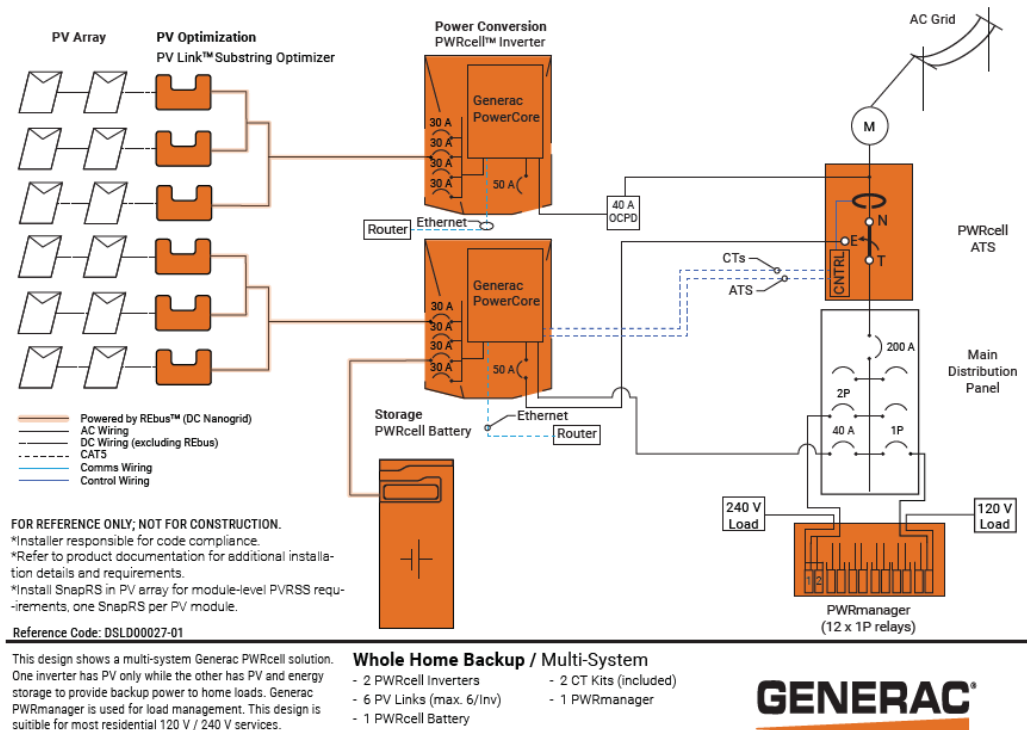
described systems and touts its ability to provide backup power solutions that are capable of handling power outages, similar to the systems listed above. See, e.g., <https://www.generac.com/solar-battery-solutions/pwrcell-2/> . Defendant states “PWRcell 2 is a battery storage system that harnesses power from the sun or the electric grid to help you reduce energy costs, minimize your reliance on the electric grid, and be prepared for unexpected power outages. Every PWRcell 2 system consists of one Generac Smart Disconnect Switch (SDS), one inverter, one battery cabinet, at least three lithium-ion battery modules, and an Ecobee Smart Thermostat Enhanced.” Thus the inverter, an existing Generac product, the generator if one is installed and the solar array, all still need to be protected from overloads. Given the similarities in functionality set forth by Defendant, and the limited amount of publicly available information on the PWRcell 2, Plaintiff will be seeking discovery on the PWRcell 2 and reserves the right to amend and/or supplement its infringement contentions with respect to the PWRcell 2.

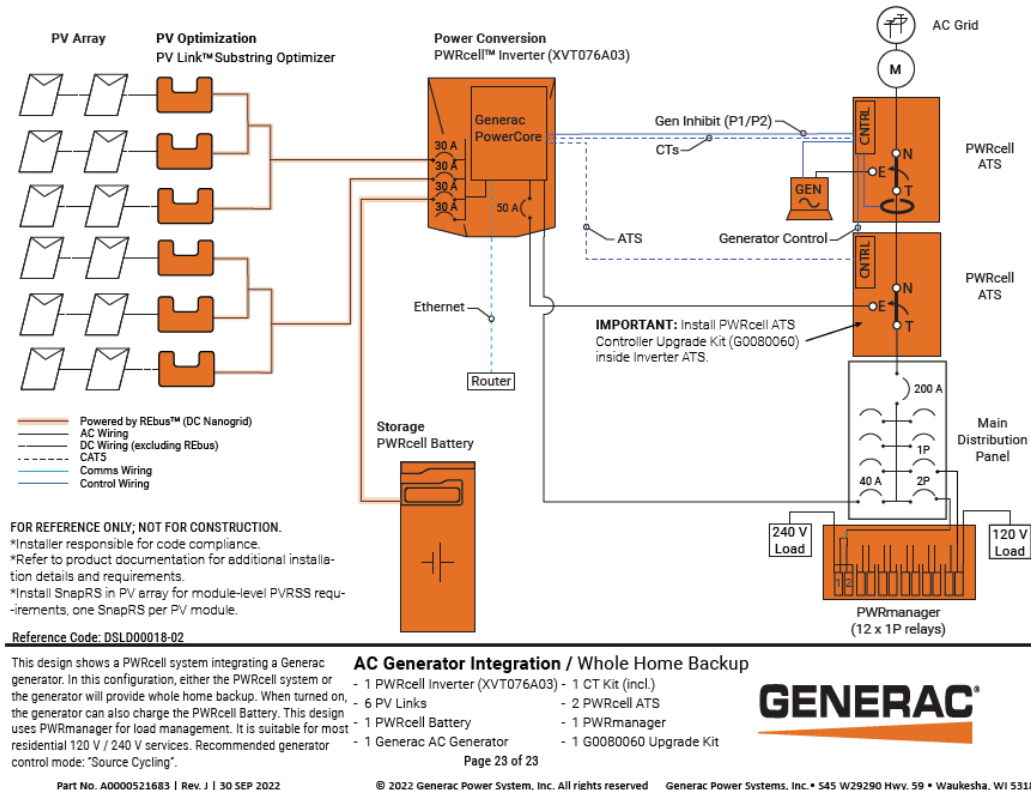
The Accused Products include all other products made, used, imported, sold or offered for sale by Defendant that includes the same or similar infringing functionality and all past, present, and future generations of the infringing design, as well as any successor products or later-released products that utilize the same or similar infringing design.

### **C. CHARTS SETTING FORTH WHERE IN THE ACCUSED PRODUCT(S) EACH ELEMENT OF THE ASSERTED CLAIM(S) ARE FOUND**

Subject to ongoing discovery and investigation, Plaintiff provides preliminary claim charts pertaining to the Patents-in-Suit and Defendant’s Accused Products attached hereto as Exhibits A through C. These preliminary infringement contentions serve as a notice function and are not required to—and therefore do not—present every possible permutation or theory of Plaintiff’s case.

Defendant's PWRcell Energy Storage Systems have a variety of components as displayed by the following diagrams depicted in Defendant's publicly available literature. *See e.g.* A0000521683-4\_Line\_Diag.pdf; Single Line Diags for PWRcell inverters w-SMMs.pdf; PWRcell\_Line\_Diagrams.pdf. Copies of these materials, along with the materials referenced in the attached claim charts, are being produced concurrently herewith for ease of reference.





For purposes of these Preliminary Infringement Contentions, Plaintiff will primarily refer to Defendant's following Figure 8-1. That being said, Defendant specifically describes that its PWRcell Energy Storage Systems are highly customizable and can be tailored to consumer's needs and therefore can contain more Accused Products that may or may not be pictured in this Figure.

## New PWRcell Installation Including Load Management

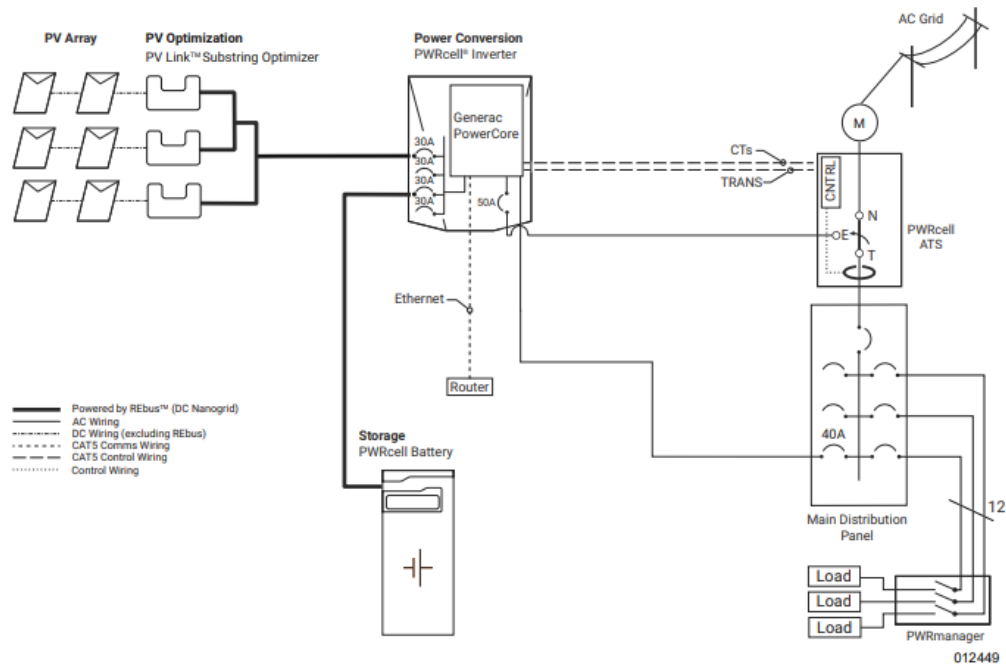


**Figure 8-1. New PWRcell Installation Including Load Management**

### D. LITERAL INFRINGEMENT AND INFRINGEMENT UNDER THE DOCTRINE OF EQUIVALENTS

Plaintiff contends that the Accused Products literally infringe the Asserted Claims of the Patents-in-Suit as more specifically explained in the claim charts attached hereto as Exhibits A through C. Plaintiff also asserts infringement under the doctrine of equivalents, and reserves the right to argue infringement under the doctrine of equivalents to the extent that the difference between any claim element and any component of any product or system, and any step of any service, method, and/or process, is insubstantial. Plaintiff incorporates by reference its Complaint, and any future amendments thereto.

### E. DIRECT AND INDIRECT INFRINGEMENT

Plaintiff incorporates by reference the statements and allegations made in its Complaint, and any amendments thereto. Plaintiff alleges that Defendant, without authority, consent, right or license, and in direct infringement of the Asserted Claims of the Patents-in-Suit, makes, has

made, uses, imports, sells, offers for sale, and/or distributes the Accused Products, which comprise the components and functionality described herein. Plaintiff alleges that Defendant's actions constitute direct infringement, either literally or under the doctrine of equivalents, of the Asserted Claims of the Patents-in-Suit. Defendant had notice of the Patents-in-Suit at least as early as February 14, 2012 based on prior written communication. Additional written communication occurred on March 15, 2012 and again on January 24, 2021. A copy of those communications are being produced concurrently herewith.

In addition, Defendant has and continues to actively induce infringement of the Asserted Claims of the Patents-in-Suit by its customers, resellers, distributors, and/or end users and is thus liable for indirect infringement under 35 U.S.C. § 271(b). The use, sale, offer for sale, and/or distribution of any of the Accused Products by Defendant's customers, resellers, distributors and/or end users constitutes a direct infringement as described herein. Defendant knows that the Accused Products are especially designed for and marketed toward infringing use by others. Defendant has induced, caused, urged, encouraged, aided and abetted its direct and indirect customers, resellers, distributors and end users to make, use, sell, offer for sale and/or import one or more of the Accused Products. Defendant had notice of the Patents-in-Suit at least as early as February 14, 2012 based on prior written communication. Additional written communication occurred on March 15, 2012 and again on January 24, 2021. Additionally, Defendant provides step-by-step instructions for installation, setup, and use of Accused Products to operate in a manner that directly infringes, either literally or under the doctrine of equivalents, the Asserted Claims. Copies of exemplar publicly available documentation are being produced concurrently herewith. These instructions are provided by Defendant as user manuals and online content (including via Defendant's online website) made available by Defendant or on behalf of Defendant for its

customers and distributors. Such conduct by Defendant was intended to and actually did result in direct infringement by Defendant's direct and indirect customers, including the making, using, selling, offering for sale, and/or importation of the Accused Products in the United States. On information and belief, Defendant provides and will continue to provide encouragement and/or instructions, such as its website literature and instructions on its software application, that encourage and/or instruct its customers to use, and use in the future, the Accused Products in an infringing manner, specifically intending such customers will operate the Accused Products in such a manner, and knowing of such actions, which constitutes infringement of one or more claims as set forth herein. Defendant engages in such inducement knowingly based on the actual and written notice of the Patents-in-Suit.

In addition, Defendant contributes to the infringement of the Asserted Claims by its customers, resellers, distributors and end users of at least the Accused Products and is therefore liable for indirect infringement under 35 U.S.C. § 271(c). The Accused Products are especially designed to provide backup power sources and load management devices in the manners described herein which infringe the Asserted Claims. The Accused Products have no substantial non-infringing use, as they are specifically designed and marketed for use in the installation and operation of backup power sources and load management devices as described in these preliminary infringement contentions. Sales, offers for sale, installation, setup and use of the Accused Products by Defendant's distributors, resellers, customers and end users constitutes direct infringement, either literally or under the doctrine of equivalents, of the Asserted Claims. Defendant had notice of the Patents-in-Suit at least as early as February 14, 2012 based on prior written communication. Additional written communication occurred on March 15, 2012 and again on January 24, 2021, as discussed above.

Date: 10/17/2025

Respectfully submitted,

/s/ Dave R. Gunter

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**ATTORNEYS FOR PLAINTIFF  
PSLC LLC**

**CERTIFICATE OF SERVICE**

The undersigned hereby certifies that on October 17, 2025, a true copy of the foregoing Plaintiff's Preliminary Infringement Contentions and Accompanying Document Production was served via electronic mail on counsel of record for Defendant.

/s/ Dave R. Gunter

# **EXHIBIT A**

**Plaintiff's Preliminary Infringement Contentions**  
**Exhibit A**

**U.S. Pat. No. 10,879,727**  
**Power Source Load Control**

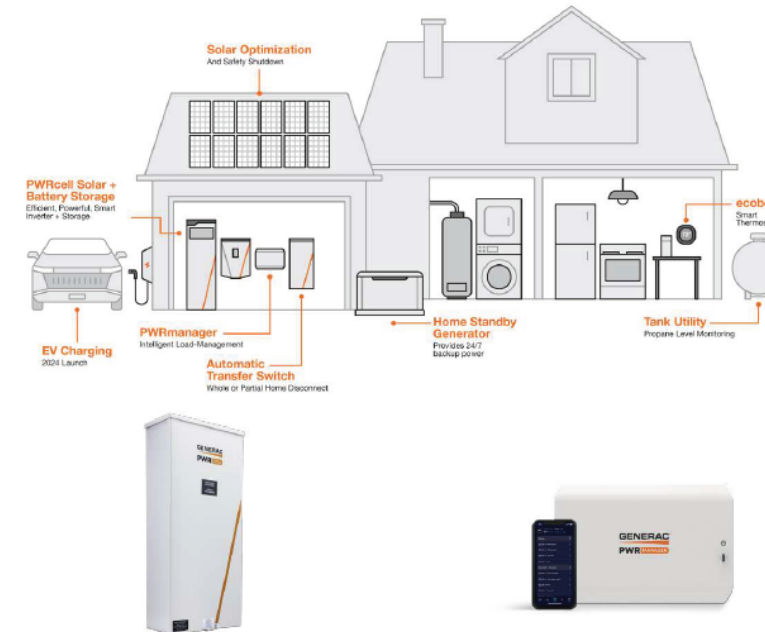
13. An apparatus for controlling power provided from a plurality of power sources to a group of loads, the apparatus including:

- Generac offers apparatuses for controlling power provided from a plurality of power sources to groups of loads.
- Defendant advertises its PWRcell Energy Storage Systems as systems which can encompass multiple different configurations and system architectures that are designed to work with multiple different types of power sources including, PWRcell Batteries, PV Arrays, back up generators, and other types of power sources.
- Different embodiments of Defendant's apparatuses contain a wide range of Defendant's products. See list of "Accused Products" in Plaintiff's Preliminary Infringement Contentions.
- Defendant refers publicly to its Integrated Home Energy Ecosystem, as the components are designed to work together.
- Defendant's PWRcell Energy Storage Systems implement advanced load management to prevent the overloading of power sources while providing backup power.

## Integrated Home Energy Ecosystem

PWRcell isn't just a powerful battery, but it's also the most flexible and scalable home energy system on the market. With a range of supplementary products and features, PWRcell can be configured to meet just about any budget or lifestyle so you get a solution tailored to your unique needs.

Each component has also been designed to work better together. The PWRmanager advanced load management device and features like Outage Guard integrate seamlessly with PWRcell, helping provide additional protection from outages and invaluable peace of mind.



### Automatic Transfer Switch

An integrated solar + battery storage system is made easy with the PWRcell Automatic Transfer Switch (ATS). Power your home and manage up to four individual HVAC (24 VAC controlled) loads with the PWRcell ATS.

6 | Generac Power Systems

### PWRmanager

The PWRmanager advanced load management device enhances whole home backup power and provides simplified control of up to twelve 120 V circuits or six 240 V circuits plus two thermostats. PWRmanager will automatically manage those loads during an outage to extend backup duration and prevent inverter overload.

## Advanced Load Management

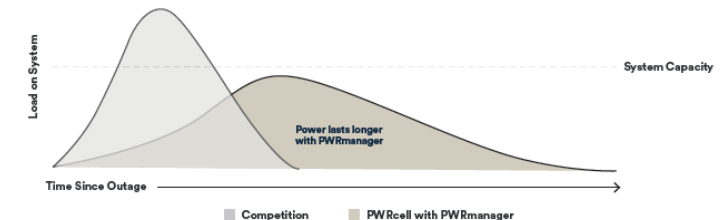
Load management systems are designed to prevent a standby power source, such as an energy storage system, from being overloaded while providing backup power during an outage. The PWRmanager advanced load management system also provides an in-hand ability to turn circuits on or off during an outage, or even while on grid.

PWRmanager provides a richly integrated load management functionality when used with the PWRcell system.

### Advanced Load Management with PWRmanager

#### Cost-effective Solution to Whole Home Power

The PWRmanager advanced load management device adds unbeatable flexibility and value to the PWRcell System. Controlled via the user-friendly PWRview app, PWRmanager enables batteries to work smarter, so a smaller system can power the home for longer.



During an outage, PWRmanager extends backup duration and prevents the PWRcell system from being overloaded by too many large loads being turned on at once.

PWRcell Consumer Brochure | 5

13. An apparatus for controlling power provided from a plurality of power sources to a group of loads, the apparatus including:

- Defendant's Energy Storage Systems can encompass multiple different configurations and system architectures and are designed to work with multiple different types of power sources including, PWRcell Batteries, PV Arrays, back up generators, and other types of power sources.
- For example, the diagram shown on this slide is an exemplary diagram of one of Defendant's PWRcell Energy Storage Systems comprising components including Defendant's PWRcell Inverter, PV Substring Optimizer, PWRcell Battery, PWRmanager, PWRcell ATS, Rebus DC nanogrid, and Current Transformer Kits.

### New PWRcell Installation Including Load Management

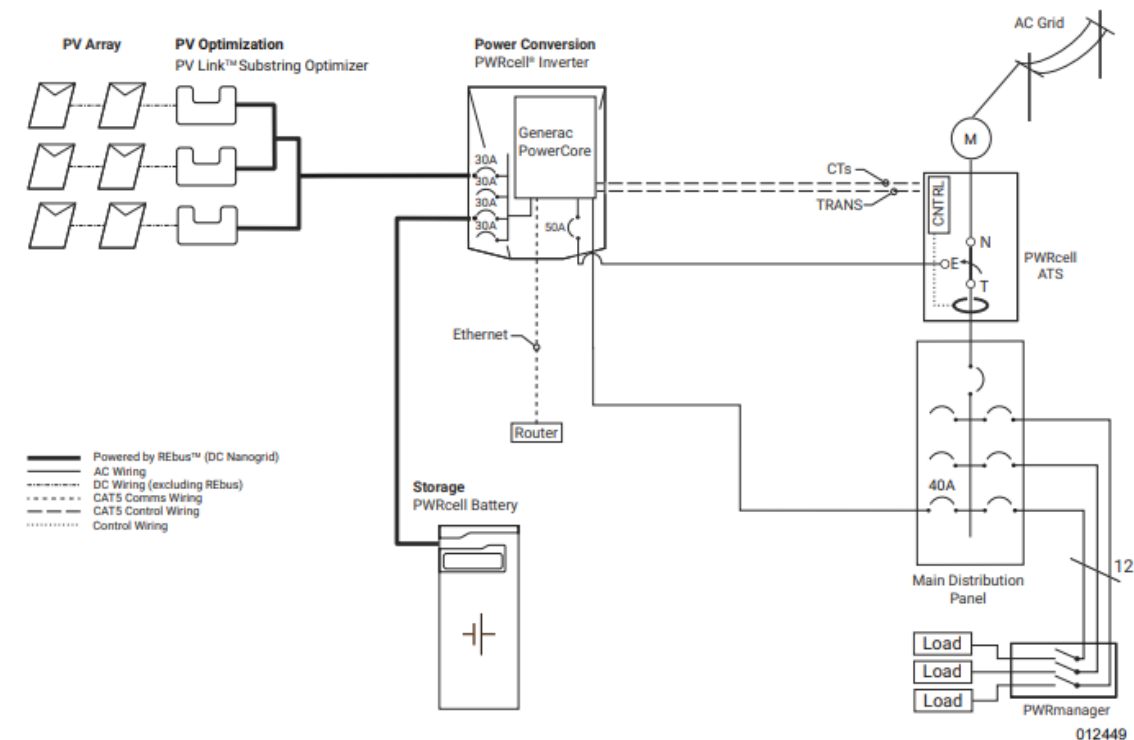
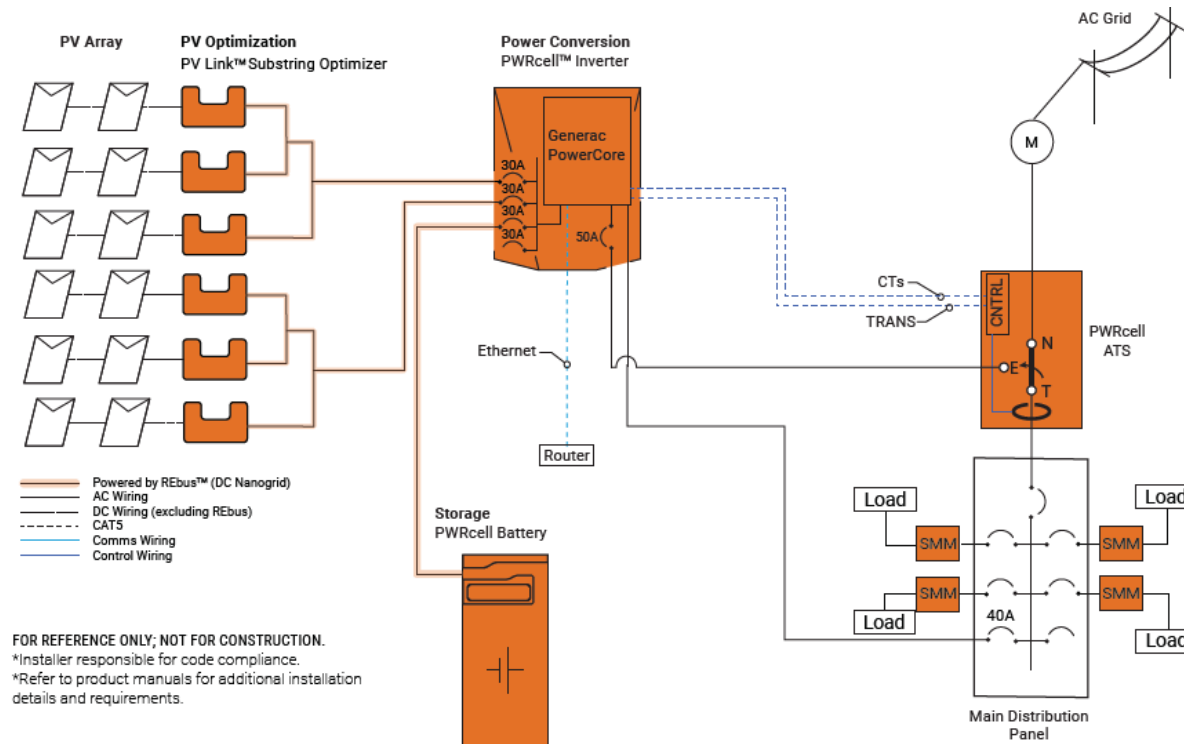


Figure 8-1. New PWRcell Installation Including Load Management

13. An apparatus for controlling power provided from a plurality of power sources to a group of loads, the apparatus including:

- The diagram shown on this slide is another exemplary diagram provided by Defendant illustrating one of its PWRcell Energy Storage Systems.
- This figure demonstrates how SMM's can be used in place of the PWRmanager to accomplish individual load management.
- Defendant's literature confirms that the functionality present in SMM's is equivalent to that provided by the PWRmanager.



Reference Code: 2315-01

This design shows a Generac PWRcell system with a PWRcell ATS in a whole home backup configuration. Use this system configuration to provide backup power to the main service panel loads using Generac Smart Management Modules (SMMs) for load shedding in accordance with NEC 702.4(B) and Article 220.

This configuration is acceptable with 200A or larger utility services.

Part No. A0000521883 | Rev. F | 25 FEB 2021

#### Whole Home Backup / Solar + Storage

- 1 PWRcell Inverter
- 6 PV Links
- 1 PWRcell Battery
- 1 CT Kit (incl.)
- 1 PWRcell ATS
- 4 Generac SMMs

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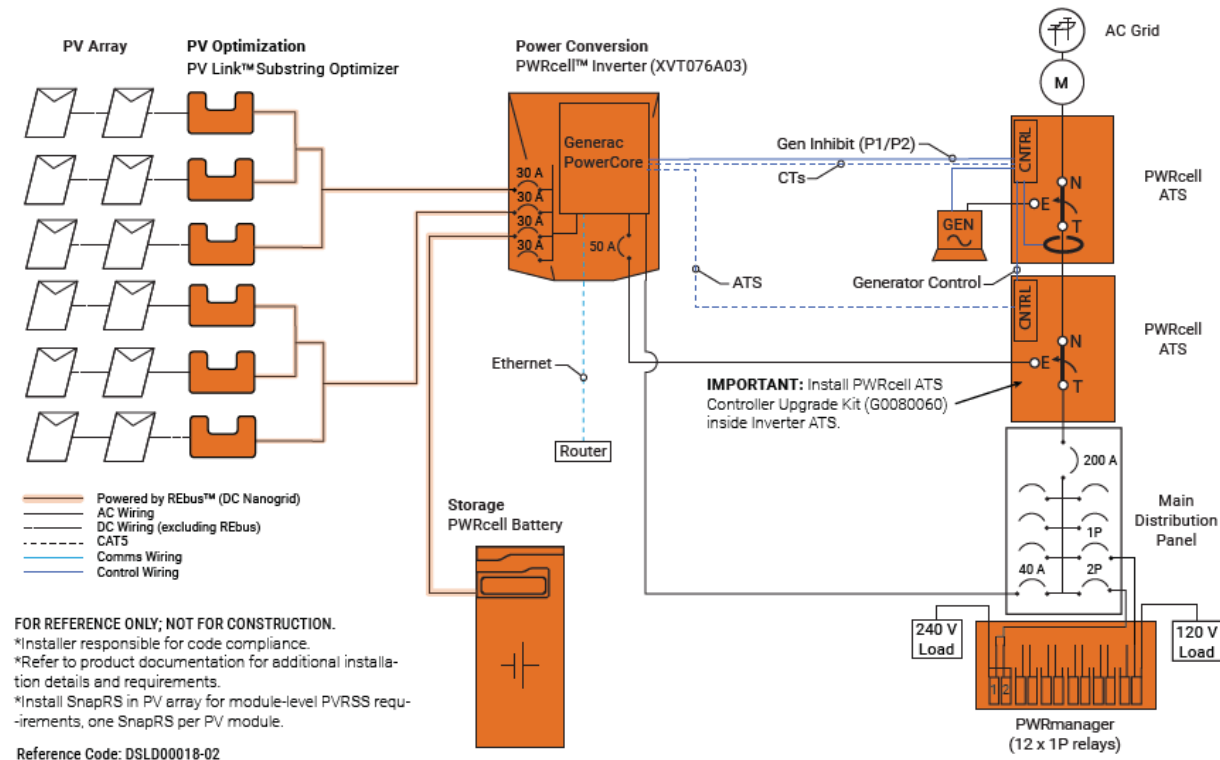
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**GENERAC**

Generac Power Systems, Inc.  
545 W28280 Hwy. 59  
Waukesha, WI 53189

13. An apparatus for controlling power provided from a plurality of power sources to a group of loads, the apparatus including:

- The diagram shown on this slide is another exemplary diagram provided by Defendant illustrating one of its PWRcell Energy Storage Systems.
- This figure demonstrates how Defendant's AC Generators can be integrated into the PWRcell Energy Storage System and provide further backup power.



a) a transfer switch which is controllable to select a power grid service circuit or a generator to power various loads of a group of loads, the power grid service circuit and the generator each having a maximum output current capability;

- Defendant's apparatus comprises a transfer switch which is controllable to select a power grid service circuit or a generator to power various loads of a group of loads, the power grid service circuit and the generator each having a maximum output current capability
- Defendant's apparatus comprises a transfer switch shown as Defendant's PWRcell Automatic Transfer Switch (ATS).
- Defendant's ATS has a power grid connection at N, a PWRCell DC to AC Inverter connection at E and is controllable to select one or the other to provide power to a group of loads. Representative loads can be seen connected to the PWRmanager.

### New PWRcell Installation Including Load Management

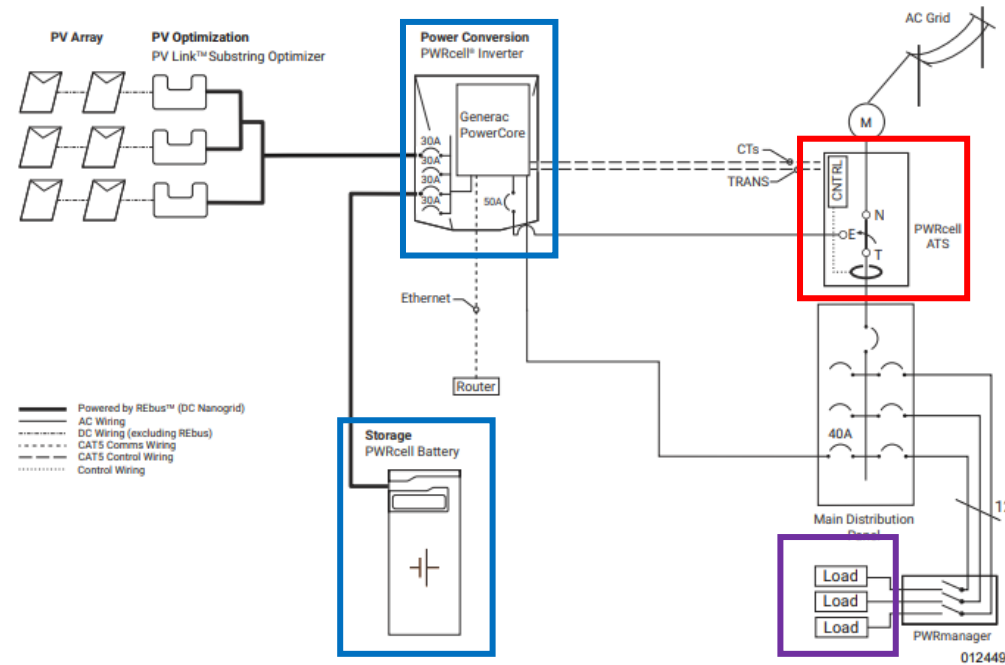


Figure 8-1. New PWRcell Installation Including Load Management

b) a processor circuit programmed to control the transfer switch and the generator to power the group of loads from the power grid when the power grid operates at an acceptable voltage and to cause one or more loads of the group of loads to be powered by the generator when the power grid does not operate at the acceptable voltage;

- Defendant's apparatus includes a processor circuit programmed to control the transfer switch and the generator to power the group of loads from the power grid when the power grid operates at an acceptable voltage and to cause one or more loads of the group of loads to be powered by the generator when the power grid does not operate at the acceptable voltage.
- Defendant's literature explains that when a service interruption occurs, relays inside the inverter isolate the PWRcell Inverter's AC grid connection and the PWRcell ATS transfers to the inverter as a power source to power the loads when the power grid is unavailable or unable to provide requisite power to the group of loads.
- Figure 8-1 shows that the inverter grid connection, which supplies power to the battery charger, is disconnected via the transfer switch. When the grid operates at an acceptable voltage, the battery may be charged via the DC power through the PWRcell Inverter and Rebus Nanogrid. When the grid does not operate at an acceptable voltage, power from the backup battery can be sent through the inverter can power the group of loads.

See **Figure 5-8**. When configured to operate with a PWRcell ATS installed between a main panel and subpanel, a PWRcell system can provide backup power to the subpanel, referred to below as a protected loads subpanel, during a utility service interruption.

When a service interruption occurs, relays inside the inverter isolate the inverter's AC grid connection, the transfer switch transfers to the inverter as a power source, and the inverter powers protected loads, using PV and battery power. The ATS transfer typically takes a fraction of a second but may take up to a few seconds depending on how the grid service is interrupted.

In this configuration, the PWRcell Inverter will control the PWRcell ATS upon loss of utility voltage.

Source: Inverter Install and Owners Manual

#### New PWRcell Installation Including Load Management

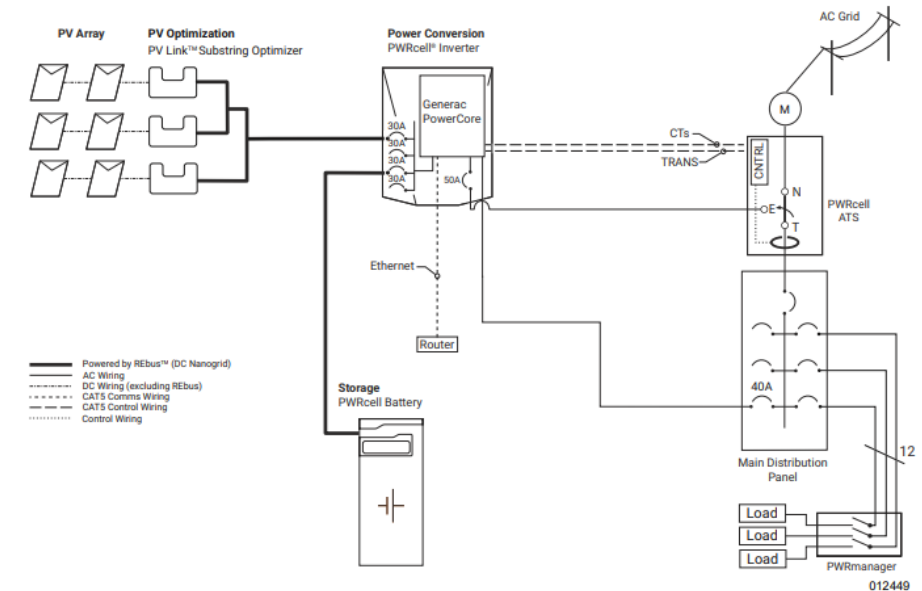


Figure 8-1. New PWRcell Installation Including Load Management

c) the processor circuit being programmed to timely monitor the current provided to the one or more loads of the group of loads when they are powered by the generator and to timely monitor the group of loads when they are powered by the power grid operating in advance and when necessary to communicate with one or more loads or corresponding load modules of the group of loads to control the current consumed thereby to prevent exceeding the maximum output current capacity of the power source selected by the transfer switch.

- Defendant's apparatus contains a processor circuit being programmed to timely monitor the current provided to the one or more loads of the group of loads when they are powered by the generator and to timely monitor the group of loads when they are powered by the power grid operating in advance and when necessary to communicate with one or more loads or corresponding load modules of the group of loads to control the current consumed thereby to prevent exceeding the maximum output current capacity of the power source selected by the transfer switch.
- In the table to the right, the control of the AC output power by the inverter is described. When load demand on the Inverter is too high, the inverter will control the output power voltage to drop causing PWRmanager to control the current consumed by loads or corresponding load modules of the group of loads in response to the processor circuit.
- If the demand continues, the inverter will drop its output power frequency and the PWRmanager will shed loads.

## Overload Behavior

Table 9-2. Overload Behavior

| Island Overload Event                                                                               | Cause                                                                                          | Behavior                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Solution            |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Overload on Voltage<br><br>(vulnerable when battery has low SoC)                                    | Load demand is too high and the inverter has dropped it's voltage in an attempt to compensate. | <ul style="list-style-type: none"> <li>– If inverter output voltage drops below 114 V, inverter will attempt to shed any loads connected to load management devices by dropping frequency.</li> <li>– If the inverter drops below 96 V for more than 6 sec (loads will brown out during this time), the system will blackout all loads.</li> </ul>                                                                                                                      | – Reduce house load |
| Overload on Current<br><br>(vulnerable to this condition when system does not have an external ATS) | There is too much load on the protected loads panel.                                           | <ul style="list-style-type: none"> <li>– If inverter experiences current greater than 35 amps L-N, the inverter will prevent transfer back to the grid and system will stay islanded.</li> <li>– If inverter experiences current greater than 35 amps for more than 15 seconds it will blackout and attempt to power loads at an increasing interval, starting at 20 seconds and increasing by 20 seconds between each attempt, up to a maximum of one hour.</li> </ul> | – Reduce house load |

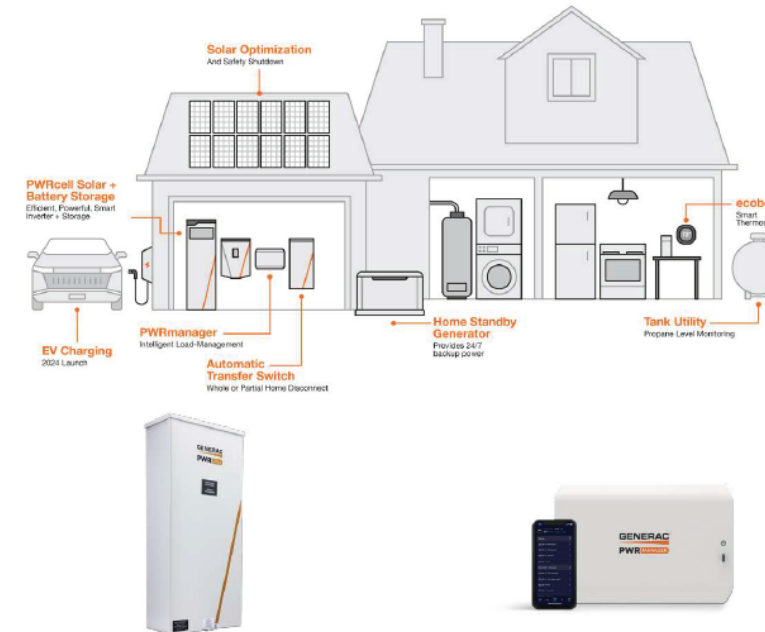
37. An apparatus for controlling power provided from a plurality of power sources to a group of loads, the apparatus including:

- Generac offers apparatuses for controlling power provided from a plurality of power sources to groups of loads.
- Defendant advertises its PWRcell Energy Storage Systems as systems which can encompass multiple different configurations and system architectures that are designed to work with multiple different types of power sources including, PWRcell Batteries, PV Arrays, back up generators, and other types of power sources.
- Different embodiments of Defendant's apparatuses contain a wide range of Defendant's products. See list of "Accused Products" in Plaintiff's Preliminary Infringement Contentions.
- Defendant refers publicly to its Integrated Home Energy Ecosystem, as the components are designed to work together.
- Defendant's PWRcell Energy Storage Systems implement advanced load management to prevent the overloading of power sources while providing backup power.

## Integrated Home Energy Ecosystem

PWRcell isn't just a powerful battery, but it's also the most flexible and scalable home energy system on the market. With a range of supplementary products and features, PWRcell can be configured to meet just about any budget or lifestyle so you get a solution tailored to your unique needs.

Each component has also been designed to work better together. The PWRmanager advanced load management device and features like Outage Guard integrate seamlessly with PWRcell, helping provide additional protection from outages and invaluable peace of mind.



### Automatic Transfer Switch

An integrated solar + battery storage system is made easy with the PWRcell Automatic Transfer Switch (ATS). Power your home and manage up to four individual HVAC (24 VAC controlled) loads with the PWRcell ATS.

6 | Generac Power Systems

### PWRmanager

The PWRmanager advanced load management device enhances whole home backup power and provides simplified control of up to twelve 120 V circuits or six 240 V circuits plus two thermostats. PWRmanager will automatically manage those loads during an outage to extend backup duration and prevent inverter overload.

## Advanced Load Management

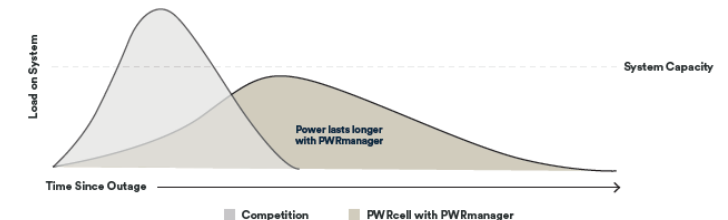
Load management systems are designed to prevent a standby power source, such as an energy storage system, from being overloaded while providing backup power during an outage. The PWRmanager advanced load management system also provides an in-hand ability to turn circuits on or off during an outage, or even while on grid.

PWRmanager provides a richly integrated load management functionality when used with the PWRcell system.

### Advanced Load Management with PWRmanager

#### Cost-effective Solution to Whole Home Power

The PWRmanager advanced load management device adds unbeatable flexibility and value to the PWRcell System. Controlled via the user-friendly PWRview app, PWRmanager enables batteries to work smarter, so a smaller system can power the home for longer.



During an outage, PWRmanager extends backup duration and prevents the PWRcell system from being overloaded by too many large loads being turned on at once.

PWRcell Consumer Brochure | 5

37. An apparatus for controlling power provided from a plurality of power sources to a group of loads, the apparatus including:

- Defendant's Energy Storage Systems can encompass multiple different configurations and system architectures and are designed to work with multiple different types of power sources including, PWRcell Batteries, PV Arrays, back up generators, and other types of power sources.
- For example, the diagram shown on this slide is an exemplary diagram of one of Defendant's PWRcell Energy Storage Systems comprising components including Defendant's PWRcell Inverter, PV Substring Optimizer, PWRcell Battery, PWRmanager, PWRcell ATS, Rebus DC nanogrid, and Current Transformer Kits.

New PWRcell Installation Including Load Management

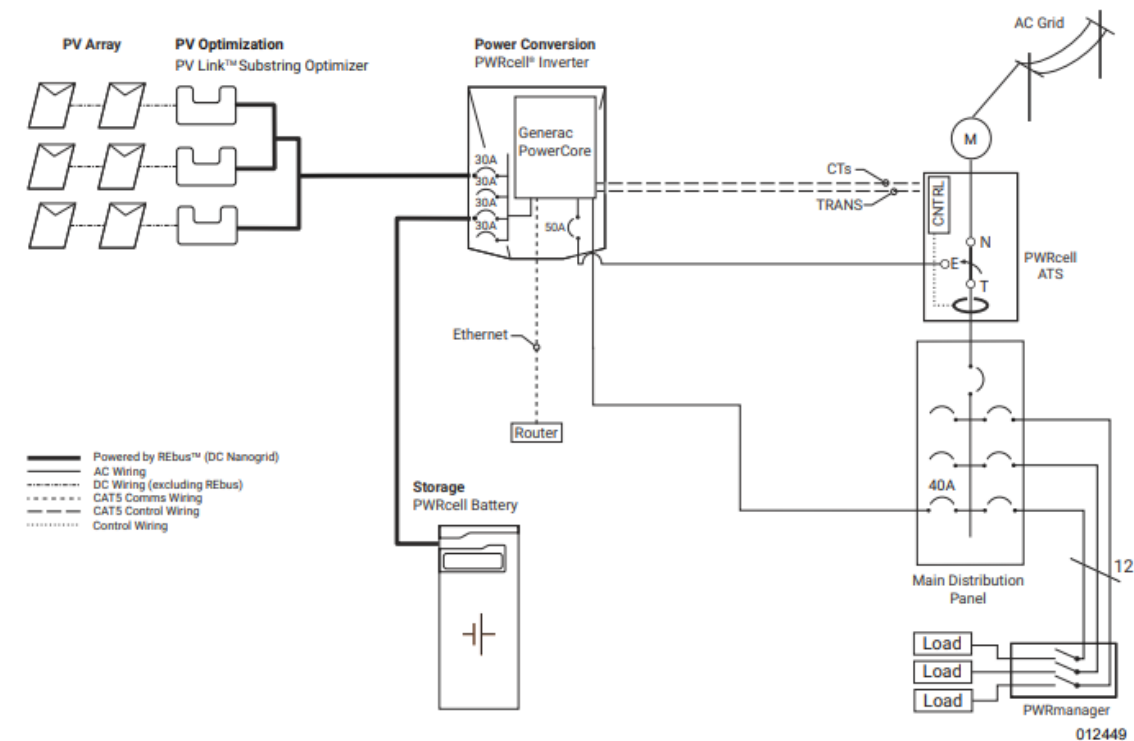
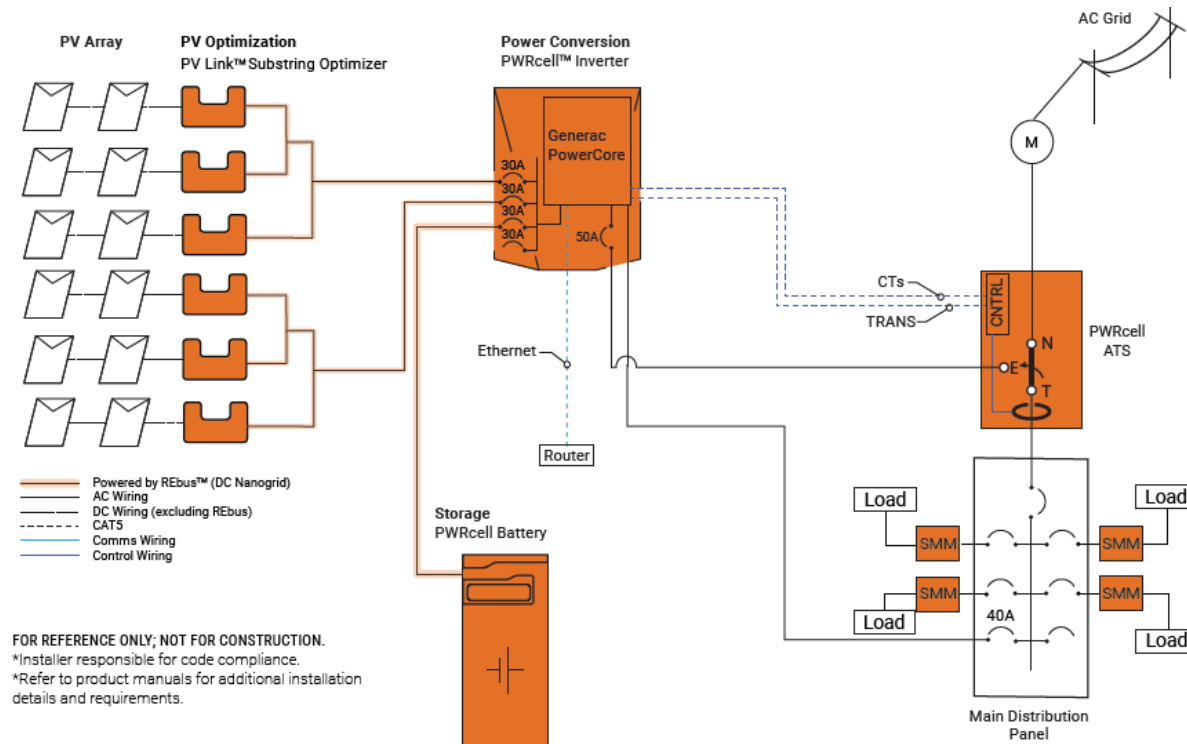


Figure 8-1. New PWRcell Installation Including Load Management

37. An apparatus for controlling power provided from a plurality of power sources to a group of loads, the apparatus including:

- The diagram shown on this slide is another exemplary diagram provided by Defendant illustrating one of its PWRcell Energy Storage Systems.
- This figure demonstrates how SMM's can be used in place of the PWRmanager to accomplish individual load management.
- Defendant's literature confirms that the functionality present in SMM's is equivalent to that provided by the PWRmanager.



Reference Code: 2315-01

This design shows a Generac PWRcell system with a PWRcell ATS in a whole home backup configuration. Use this system configuration to provide backup power to the main service panel loads using Generac Smart Management Modules (SMMs) for load shedding in accordance with NEC 702.4(B) and Article 220.

This configuration is acceptable with 200A or larger utility services.

Part No. A0000521883 | Rev. F | 25 FEB 2021

#### Whole Home Backup / Solar + Storage

- 1 PWRcell Inverter
- 6 PV Links
- 1 PWRcell Battery
- 1 CT Kit (incl.)
- 1 PWRcell ATS
- 4 Generac SMMs

Page 8 of 13

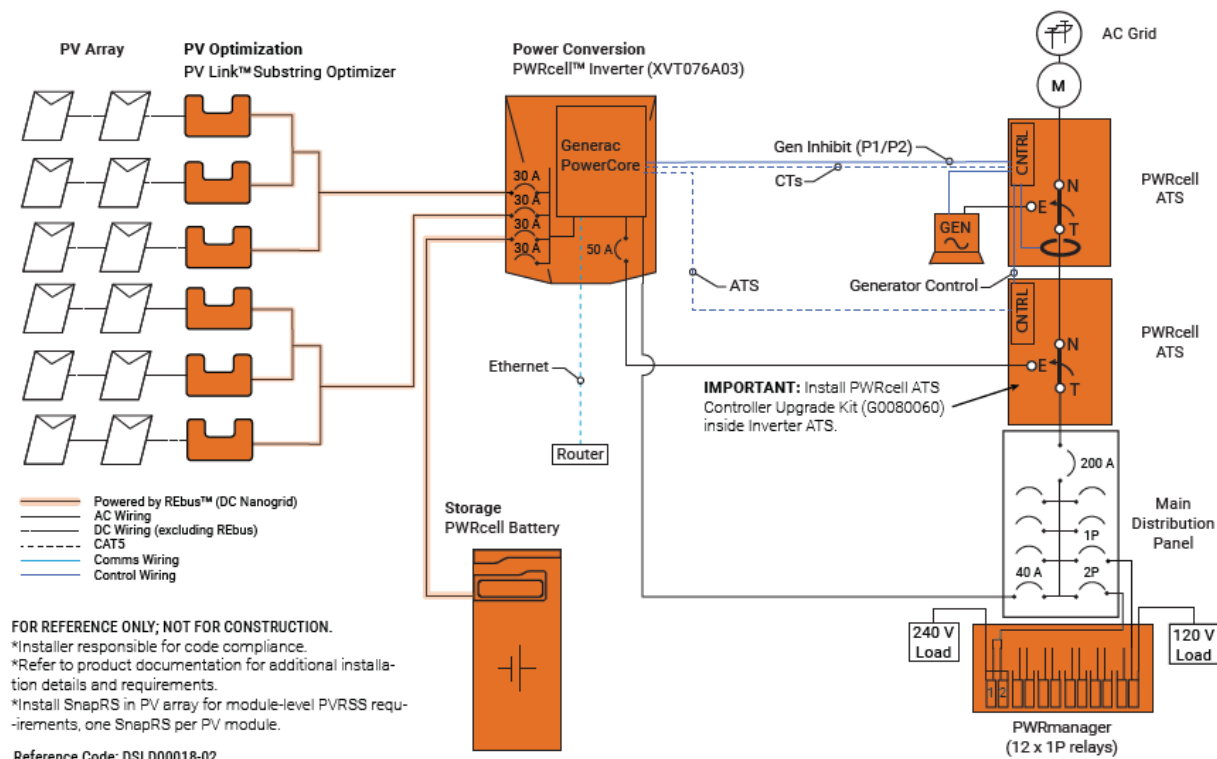
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**GENERAC**

Generac Power Systems, Inc.  
 545 W28280 Hwy. 59  
 Waukesha, WI 53189

37. An apparatus for controlling power provided from a plurality of power sources to a group of loads, the apparatus including:

- The diagram shown on this slide is another exemplary diagram provided by Defendant illustrating one of its PWRcell Energy Storage Systems.
- This figure demonstrates how Defendant's AC Generators can be integrated into the PWRcell Energy Storage System and provide further backup power.



This design shows a PWRcell system integrating a Generac generator. In this configuration, either the PWRcell system or the generator will provide whole home backup. When turned on, the generator can also charge the PWRcell Battery. This design uses PWRmanager for load management. It is suitable for most residential 120 V / 240 V services. Recommended generator control mode: "Source Cycling".

#### AC Generator Integration / Whole Home Backup

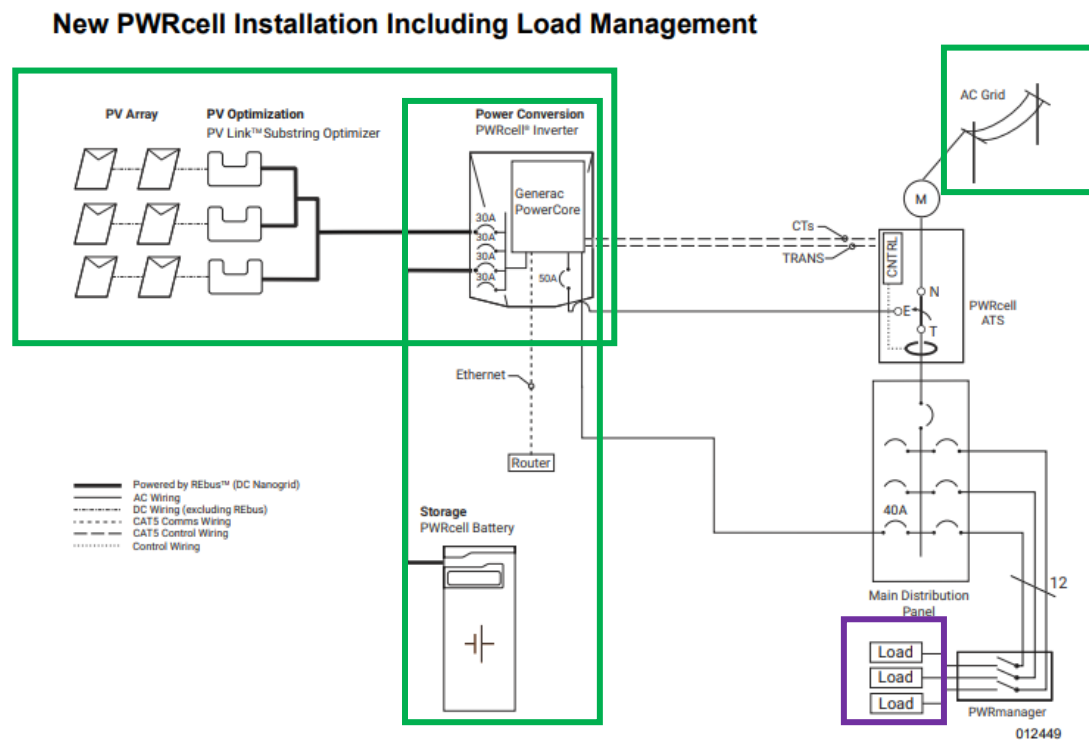
- |                                  |                          |
|----------------------------------|--------------------------|
| - 1 PWRcell Inverter (XVT076A03) | - 1 CT Kit (incl.)       |
| - 6 PV Links                     | - 2 PWRcell ATS          |
| - 1 PWRcell Battery              | - 1 PWRmanager           |
| - 1 Generac AC Generator         | - 1 G0080060 Upgrade Kit |

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**GENERAC®**

37. An apparatus for controlling power provided from a plurality of power sources to a group of loads, the apparatus including:

- Defendant offers apparatuses for controlling power provided from a plurality of power sources to a group of loads.



(a) a small backup power system transfer switch which is controllable to select a power grid service circuit or a DC to AC inverter to power a group of loads, the DC to AC inverter being powered by a battery with the battery being charged by a battery charger, the power grid service circuit and the DC to AC inverter each having a maximum output current capability;

- Defendant's apparatus comprises a small backup power system transfer switch which is controllable to select a power grid service circuit or a DC to AC inverter to power a group of loads the DC to AC inverter being powered by a battery with the battery being charged by a battery charger, the power grid service circuit and the DC to AC inverter each having a maximum output current capability.
- Defendant's apparatus comprises a small backup power system transfer switch shown as Defendant's PWRcell Automatic Transfer Switch (ATS).
- Defendant's ATS has a power grid connection at N, a PWRCell DC to AC Inverter connection at E and is controllable to select one or the other to provide power to a group of loads. Representative loads can be seen connected to the PWRmanager.

### New PWRcell Installation Including Load Management

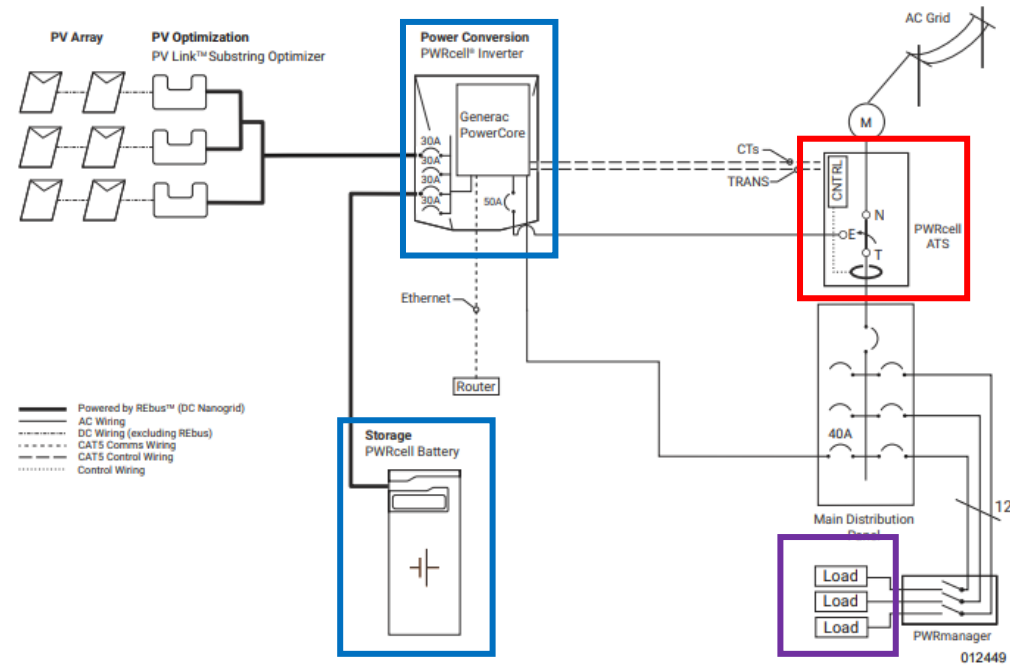


Figure 8-1. New PWRcell Installation Including Load Management

(a) a small backup power system transfer switch which is controllable to select a power grid service circuit or a DC to AC inverter to power a group of loads, the DC to AC inverter being powered by a battery with the battery being charged by a battery charger, the power grid service circuit and the DC to AC inverter each having a maximum output current capability;

## About PWRcell Battery

The PWRcell Battery is the storage component of the PWRcell system. The battery can be used for grid-connected solar applications, such as Self Supply, Rate Arbitrage, and Clean Backup power. The battery is designed to work seamlessly with PV Links and the PWRcell Inverter to form the PWRcell system for grid-tied solar-plus-storage.

The PWRcell Battery uses the REbus 380VDC nanogrid to connect the PWRcell Inverter. The REbus nanogrid automates the flow of power to enable plug-and-play setup and operation of PWRcell equipment.

[https://ressupply.com/documents/generac/PWRcell\\_Battery\\_Owners\\_Manual.pdf](https://ressupply.com/documents/generac/PWRcell_Battery_Owners_Manual.pdf)

## Section 2: General Information

### Specifications

| Description                                                                                                            | Units | XVT076A03 |
|------------------------------------------------------------------------------------------------------------------------|-------|-----------|
| Max. cont. grid-tied AC power @ 122°F (50°C)                                                                           | kW    | 7.6       |
| Max. cont. AC power in island mode w/ external transfer switch and single 6 module battery cabinet <sup>2</sup>        | kW    | 9.0       |
| Max. cont. AC power in island mode w/ external transfer switch and 2 battery cabinets (8 modules minimum) <sup>1</sup> | kW    | 11.0      |

[https://ressupply.com/documents/generac/XVT076A03\\_Installation\\_Manual.pdf](https://ressupply.com/documents/generac/XVT076A03_Installation_Manual.pdf)

(b) a processor circuit being programmed to control the transfer switch and the DC to AC inverter to power one or more loads of the group of loads including the battery charger from the power grid when the power grid operates at an acceptable voltage and to cause the one or more loads of the group of loads but not the battery charger to be powered by the DC to AC inverter when the power grid does not operate at the acceptable voltage;

- Defendant's apparatus includes a processor circuit programmed to control the ATS and the inverter to power one or more loads of the group of loads including the battery charger from the power grid when the power grid operates at an acceptable voltage and causes the one or more loads of the group of loads but not the battery charger to be powered by the DC to AC inverter when the power grid does not operate at the acceptable voltage.
- Defendant's literature explains that when a service interruption occurs, relays inside the inverter isolate the PWRcell Inverter's AC grid connection and the PWRcell ATS transfers to the inverter as a power source to power protected loads.
- Figure 8-1 shows that the inverter grid connection, which supplies power to the battery charger, is disconnected via the transfer switch. When the grid operates at an acceptable voltage, the battery may be charged via the DC power through the PWRcell Inverter and Rebus Nanogrid. When the grid does not operate at an acceptable voltage, power from the backup battery can be sent through the inverter can power the group of loads.

See **Figure 5-8**. When configured to operate with a PWRcell ATS installed between a main panel and subpanel, a PWRcell system can provide backup power to the subpanel, referred to below as a protected loads subpanel, during a utility service interruption.

When a service interruption occurs, relays inside the inverter isolate the inverter's AC grid connection, the transfer switch transfers to the inverter as a power source, and the inverter powers protected loads, using PV and battery power. The ATS transfer typically takes a fraction of a second but may take up to a few seconds depending on how the grid service is interrupted.

In this configuration, the PWRcell Inverter will control the PWRcell ATS upon loss of utility voltage.

Source: Inverter Install and Owners Manual

#### New PWRcell Installation Including Load Management

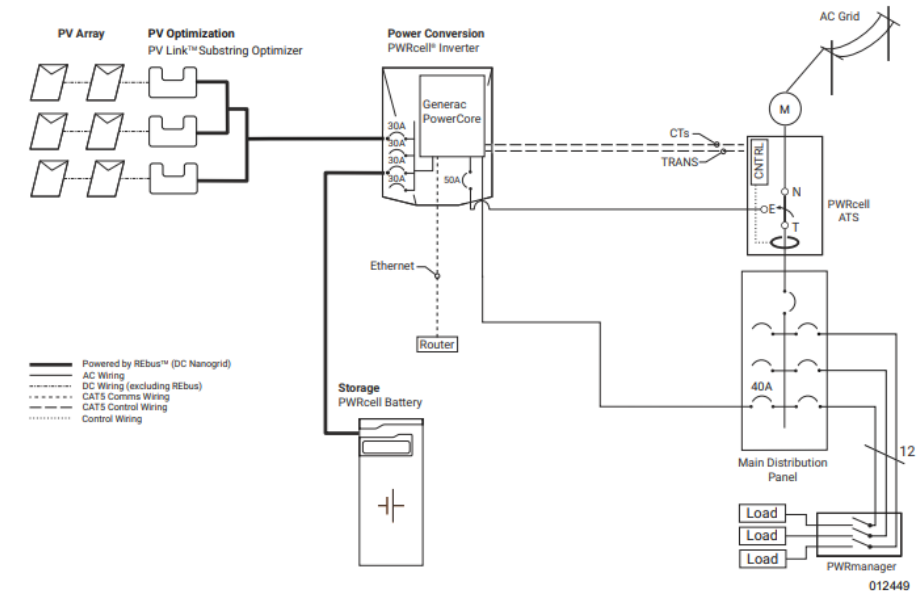


Figure 8-1. New PWRcell Installation Including Load Management

(c) the processor circuit being programmed to timely monitor the current provided to the loads by said DC to AC inverter and to prevent exceeding the maximum current capacity of the DC to AC inverter.

- Defendant's apparatus contains a processor circuit programmed to timely monitor the current provided to the loads by said DC to AC inverter that prevents exceeding the maximum current capacity of the DC to AC inverter.
- In the table to the right, the control of the AC output power by the inverter is described. The inverter will control the output power voltage to drop causing PWRmanager loads to reduce power consumption.
- If the demand continues, the inverter will drop its output power frequency and the PWRmanager will shed loads.

## Overload Behavior

Table 9-2. Overload Behavior

| Island Overload Event                                                                               | Cause                                                                                          | Behavior                                                                                                                                                                                                                                                                                                                                                                                                                   | Solution            |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Overload on Voltage<br><br>(vulnerable when battery has low SoC)                                    | Load demand is too high and the inverter has dropped it's voltage in an attempt to compensate. | <p>– If inverter output voltage drops below 114 V, inverter will attempt to shed any loads connected to load management devices by dropping frequency.</p> <p>– If the inverter drops below 96 V for more than 6 sec (loads will brown out during this time), the system will blackout all loads.</p>                                                                                                                      | – Reduce house load |
| Overload on Current<br><br>(vulnerable to this condition when system does not have an external ATS) | There is too much load on the protected loads panel.                                           | <p>– If inverter experiences current greater than 35 amps L-N, the inverter will prevent transfer back to the grid and system will stay islanded.</p> <p>– If inverter experiences current greater than 35 amps for more than 15 seconds it will blackout and attempt to power loads at an increasing interval, starting at 20 seconds and increasing by 20 seconds between each attempt, up to a maximum of one hour.</p> | – Reduce house load |

(c) the processor circuit being programmed to timely monitor the current provided to the loads by said DC to AC inverter and to prevent exceeding the maximum current capacity of the DC to AC inverter.

- Defendant's apparatus comprises current transformer (CTs) which provide timely power output parameters to the electronic processor in the PWRmanager via the CTs connection from the CNTRL, via the PWRcell and Ethernet connected network. The CT on the ATS measures the timely amount of power from the inverter's 50A output circuit breaker to the E input and the T output of the ATS when the inverter is selected.
- The CTs measure the current passing through the conductor within them and then the measurement signal passes through the dotted and dashed lines to the inverter.
- The inverter responds to the current information provided to it by the CTs and controls the frequency of its power in response to the level of the loads. In at least this way, the processor circuit timely monitors and controls the current provided to the loads.

### New PWRcell Installation Including Load Management

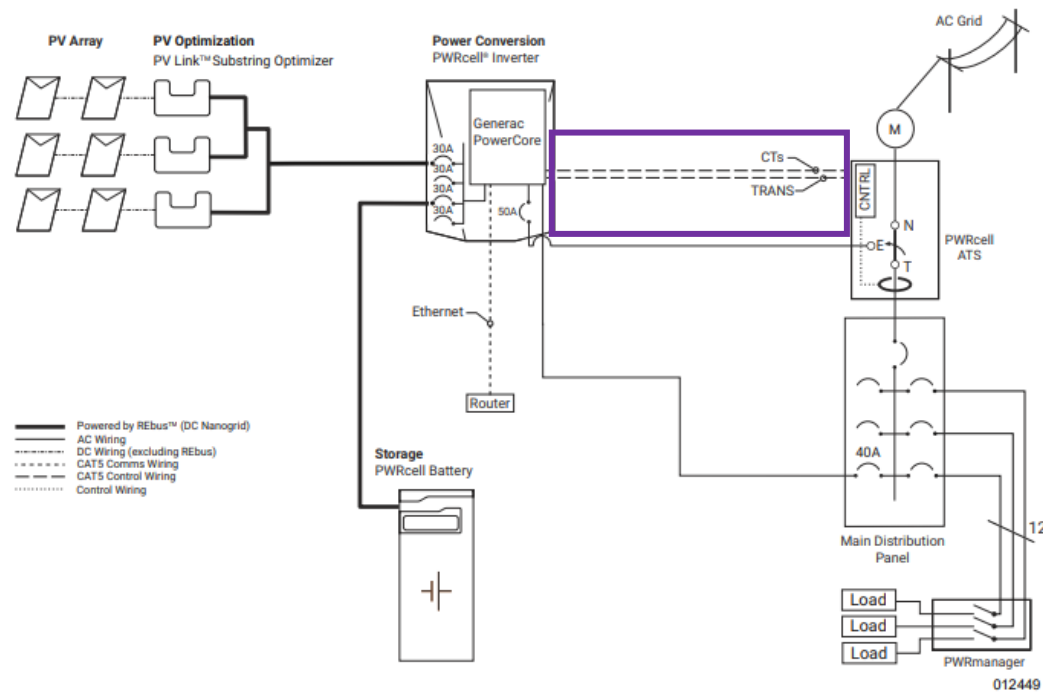


Figure 8-1. New PWRcell Installation Including Load Management

# **EXHIBIT B**

Plaintiff's Preliminary Infringement Contentions  
Exhibit B

U.S. Pat. No. 10,892,618  
Power Source Load Control

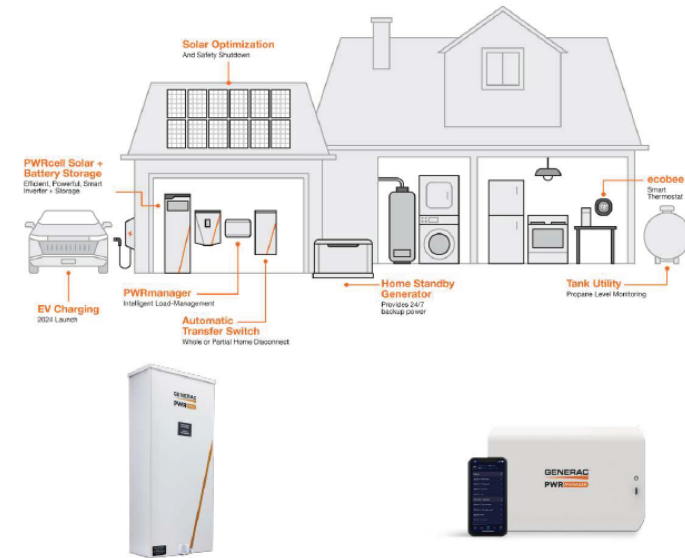
1. For use in a home or business which receives single or multiple phase A.C. electric power from at least a first power source, the A.C. electric power having a standard frequency and voltage and powering a group of loads in the home or business, a load coupler device operating to disconnect one or more loads to prevent or relieve an overload of the power source which is supplying power thereto, the load coupler device comprising:

- Generac offers load coupler devices operating to disconnect one or more loads to prevent or relieve an overload of a power source which is supplying power for use in a home or business.
- Defendant advertises its PWRcell Energy Storage Systems which can encompass multiple different configurations and system architectures and are designed to work with multiple different types of power sources including, PWRcell Batteries, PV Arrays, back up generators, and other types of power sources.
- Different embodiments of Defendant's systems contain a wide range of Defendant's products. See list of "Accused Products" in Plaintiff's Preliminary Infringement Contentions.
- Defendant refers publicly to its Integrated Home Energy Ecosystem, as the components are designed to work together.
- Defendant's PWRcell Energy Storage Systems comprise Defendant's load coupler device products including its PWRmanagers, Smart Management Modules, Smart Air Conditioning Modules, and HVAC Power Management Modules.

## Integrated Home Energy Ecosystem

PWRcell isn't just a powerful battery, but it's also the most flexible and scalable home energy system on the market. With a range of supplementary products and features, PWRcell can be configured to meet just about any budget or lifestyle so you get a solution tailored to your unique needs.

Each component has also been designed to work better together. The PWRmanager advanced load management device and features like Outage Guard integrate seamlessly with PWRcell, helping provide additional protection from outages and invaluable peace of mind.



### Automatic Transfer Switch

An integrated solar + battery storage system is made easy with the PWRcell Automatic Transfer Switch (ATS). Power your home and manage up to four individual HVAC (24 VAC controlled) loads with the PWRcell ATS.

6 | Generac Power Systems

### PWRmanager

The PWRmanager advanced load management device enhances whole home backup power and provides simplified control of up to twelve 120 V circuits or six 240 V circuits plus two thermostats. PWRmanager will automatically manage those loads during an outage to extend backup duration and prevent inverter overload.

## Advanced Load Management

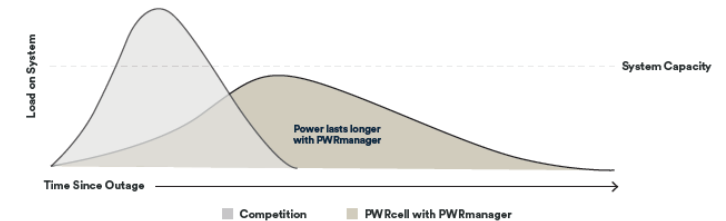
Load management systems are designed to prevent a standby power source, such as an energy storage system, from being overloaded while providing backup power during an outage. The PWRmanager advanced load management system also provides an in-hand ability to turn circuits on or off during an outage, or even while on grid.

PWRmanager provides a richly integrated load management functionality when used with the PWRcell system.

### Advanced Load Management with PWRmanager

#### Cost-effective Solution to Whole Home Power

The PWRmanager advanced load management device adds unbeatable flexibility and value to the PWRcell System. Controlled via the user-friendly PWRview app, PWRmanager enables batteries to work smarter, so a smaller system can power the home for longer.

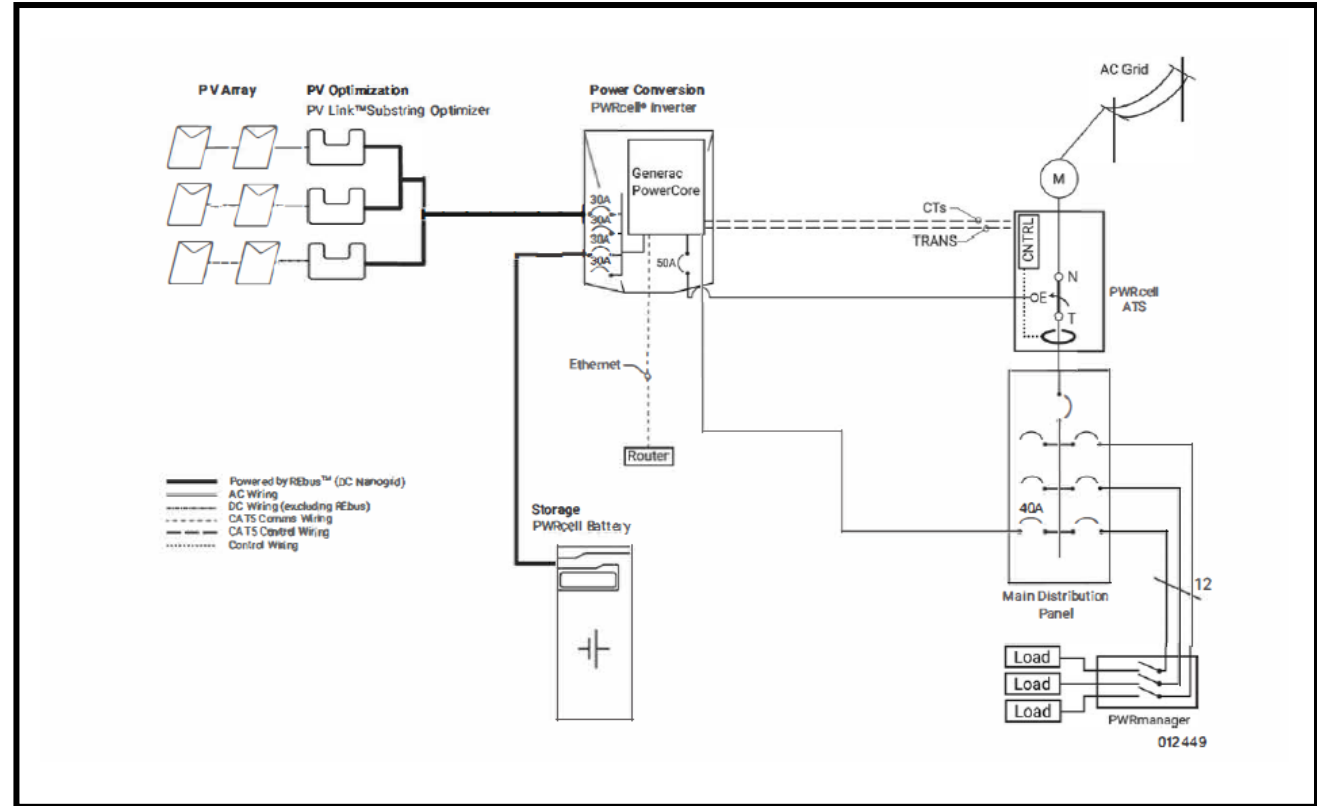


During an outage, PWRmanager extends backup duration and prevents the PWRcell system from being overloaded by too many large loads being turned on at once.

PWRcell Consumer Brochure | 6

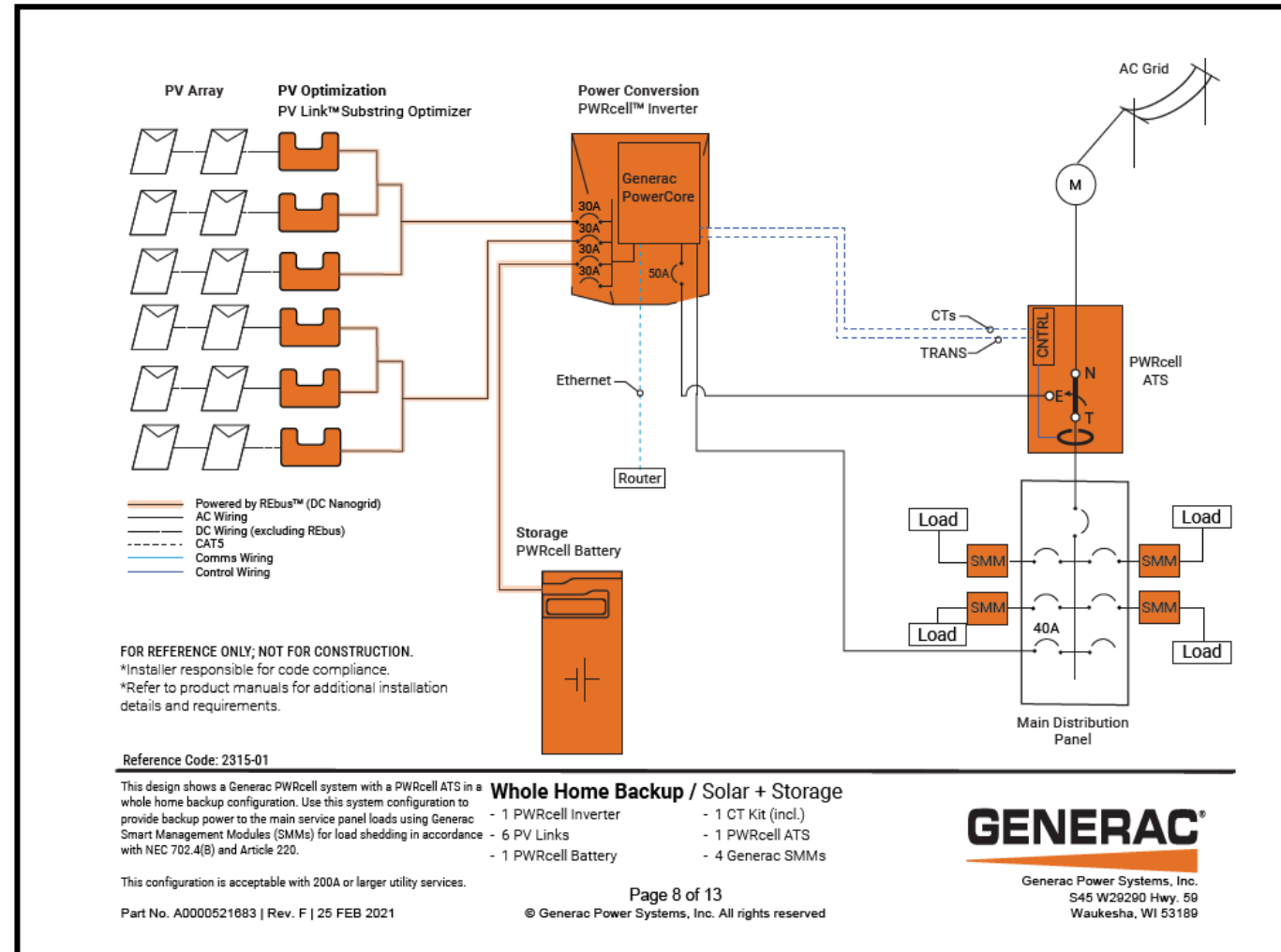
1. For use in a home or business which receives single or multiple phase A.C. electric power from at least a first power source, the A.C. electric power having a standard frequency and voltage and powering a group of loads in the home or business, a load coupler device operating to disconnect one or more loads to prevent or relieve an overload of the power source which is supplying power thereto, the load coupler device comprising:

- The diagram shown on this slide is one example of Defendant's backup power systems for providing power to a home or business.
- The PWRcell ATS shown is connected to the primary first power source, the power grid. The service connection cannot be any larger than a 200A, 240V grid because all the grid power must pass through the ATS, which rated at 200A, 240V. This ATS would be used in a home or business.
- In this particular configuration, Defendant's PWRmanager is shown and capable of disconnecting one or more loads to prevent or relieve an overload of the power source, the PWRcell Inverter.



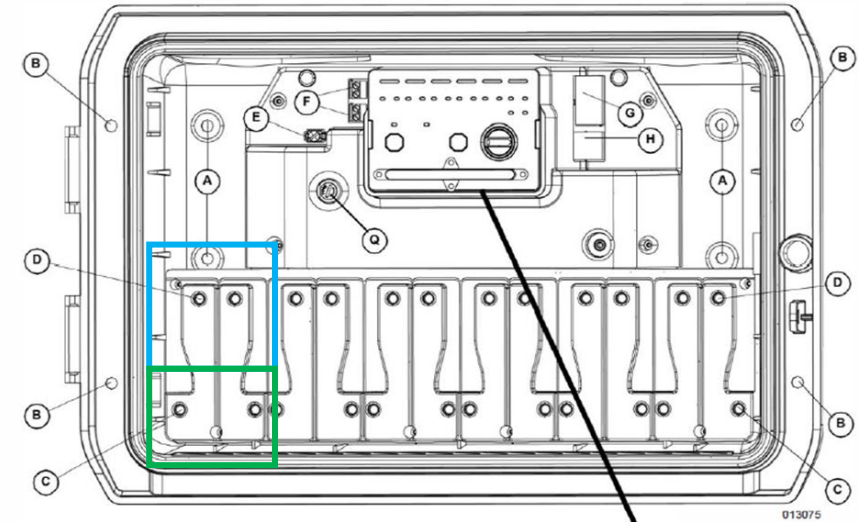
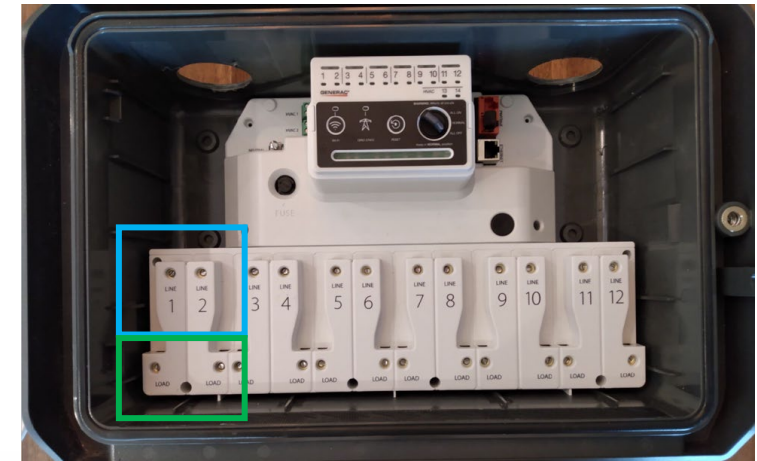
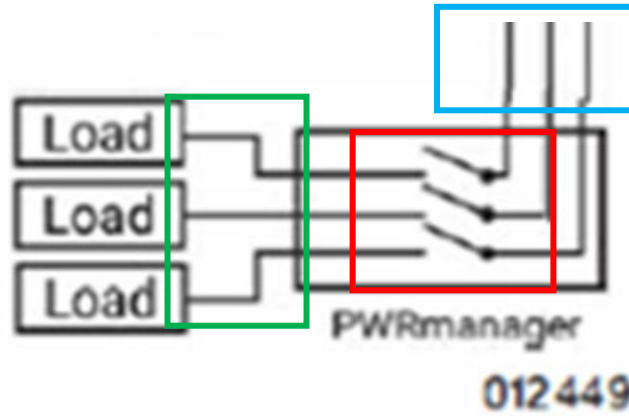
1. For use in a home or business which receives single or multiple phase A.C. electric power from at least a first power source, the A.C. electric power having a standard frequency and voltage and powering a group of loads in the home or business, a load coupler device operating to disconnect one or more loads to prevent or relieve an overload of the power source which is supplying power thereto, the load coupler device comprising:

- The diagram shown on this slide is another example of Defendant's backup power systems. In this configuration, Defendant uses Smart Management Modules (SMMs) for load shedding instead of Defendant's PWRmanager.
- Defendant's literature explains that the PWRmanager functions in the same way as its SMMs and that SMMs can be used to shed individual loads.



1. a) a contactor comprising one or more each of a control connection for opening and closing the contactor, a line connection for receiving A.C. electric power from a power source, and a load connection for supplying power to a corresponding first load when the contactor is closed,

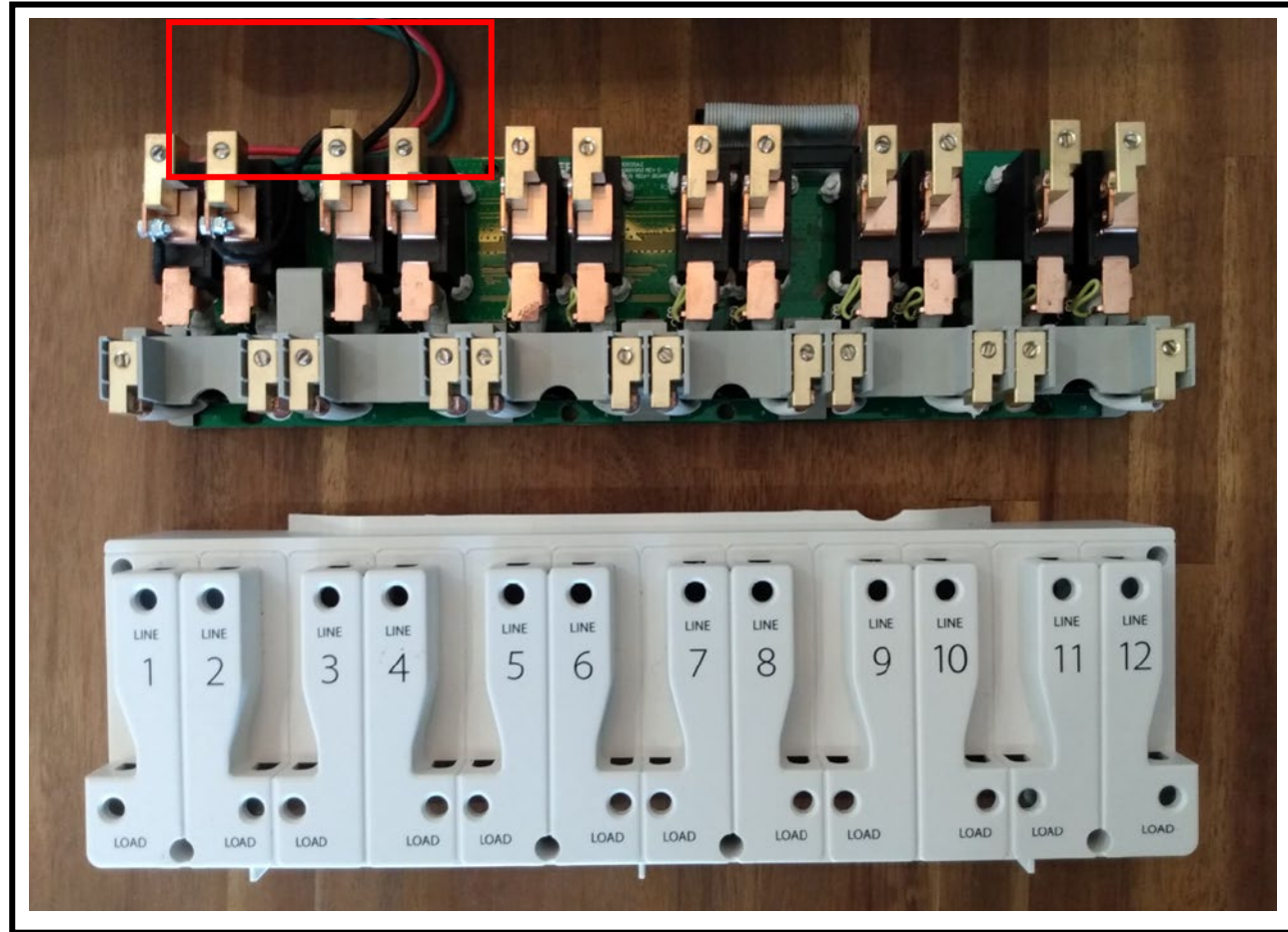
- Defendant's load coupler device comprises a contactor comprising one or more each of a control connection for opening and closing the contactor, a line connection for receiving A.C. electric power from a power source, and a load connection for supplying power to a corresponding first load when the contactor is closed.
- The PWRmanager has 12 contactors. When the contactors are closed, power from the line terminal connection flows to the load terminal connection to supply power to the load. When the contactors are open, as shown, no power flows.



Source – Generac PWRManager Installation Manual

1. a) a contactor comprising one or more each of a control connection for opening and closing the contactor, a line connection for receiving A.C. electric power from a power source, and a load connection for supplying power to a corresponding first load when the contactor is closed,

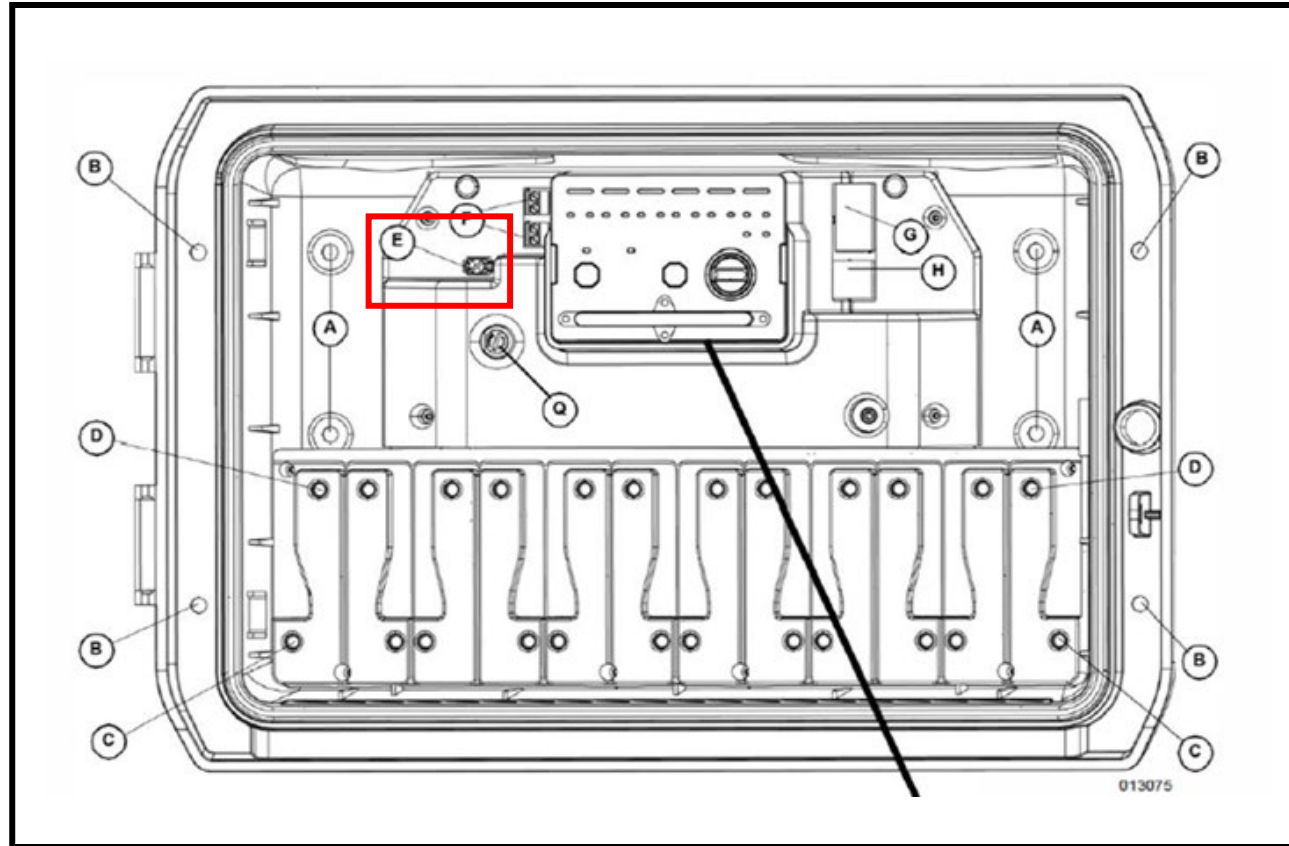
- In the photo, the red and black (power) and green (ground) **wires** connect the line side power from the inverter to the upper low voltage board (not shown). The neutral power wire is connected to the low voltage board so that voltage, frequency, and other parameters can be measured.



Source – Generac PWRManager Breakdown Photos

1. a) a contactor comprising one or more each of a control connection for opening and closing the contactor, a line connection for receiving A.C. electric power from a power source, and a load connection for supplying power to a corresponding first load when the contactor is closed,

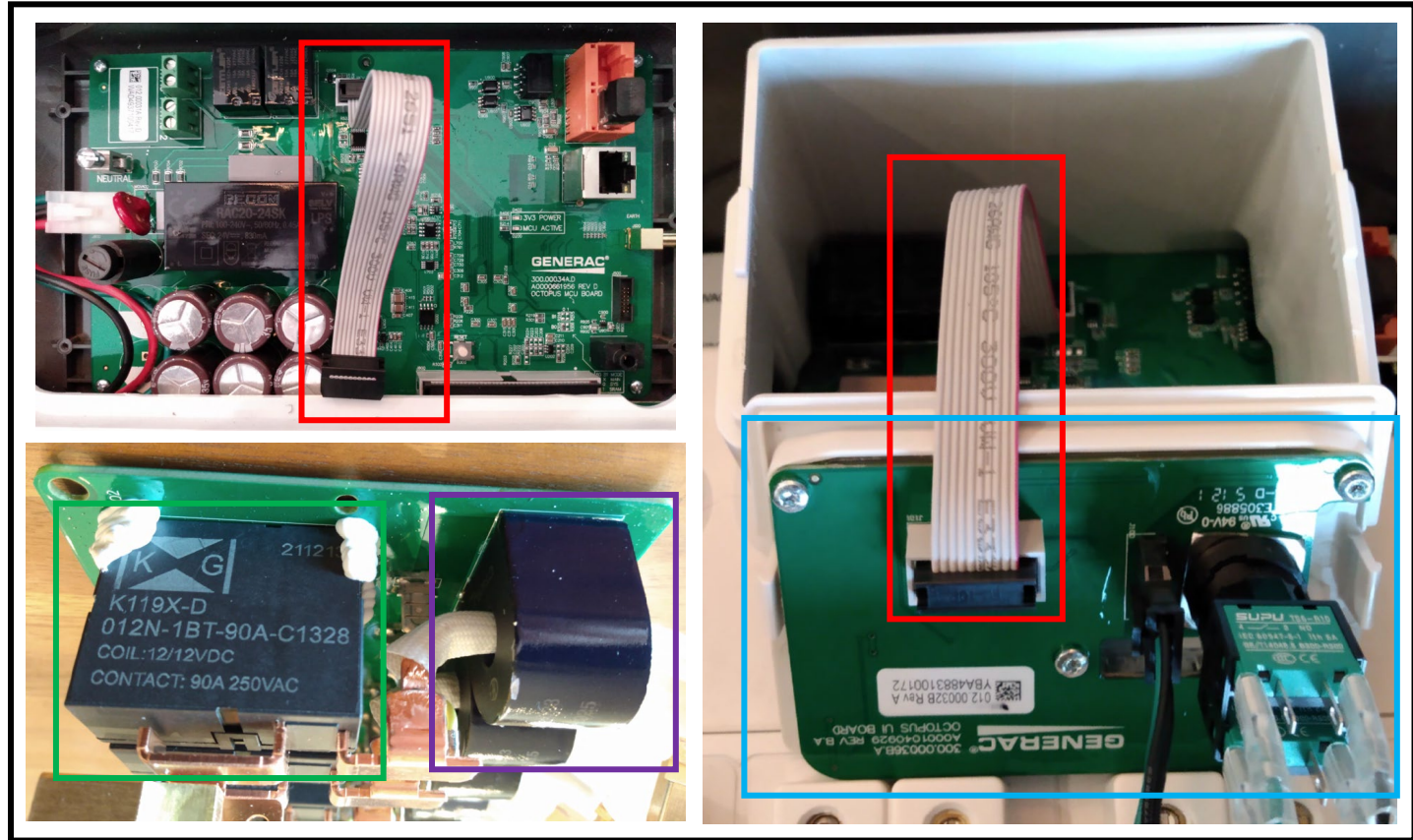
- The neutral power wire is connected to the low voltage board at **E**.



Source – Generac PWRManager Installation Manual

1. a) a contactor comprising one or more each of a control connection for opening and closing the contactor, a line connection for receiving A.C. electric power from a power source, and a load connection for supplying power to a corresponding first load when the contactor is closed,

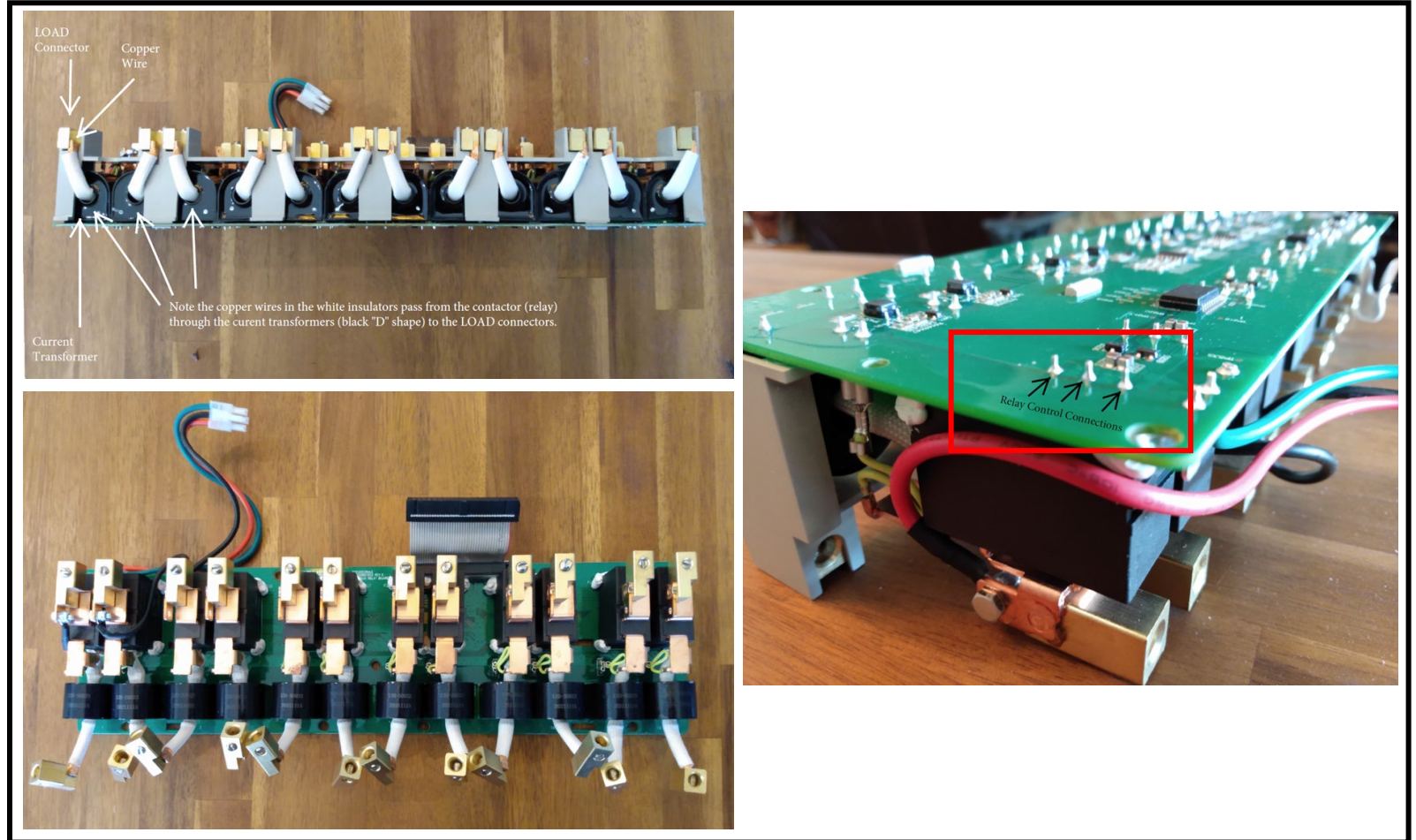
- The **grey ribbon cable** carries control signals for the relays from the upper to the lower PCBs. The cable plugs into the **low voltage board**, which provides the control signals. Those signals are carried from the ribbon cable via traces on the high voltage PCB to the row of relays. The **relay** shown is marked K119X-D. This is a custom design KG Technologies K119-90 High Power Latching Relay rated at 90A (i.e. a contactor). **Current transformers** are in the row on the right.



Source – Generac PWRManager Breakdown Photos

1. a) a contactor comprising one or more each of a control connection for opening and closing the contactor, a line connection for receiving A.C. electric power from a power source, and a load connection for supplying power to a corresponding first load when the contactor is closed,

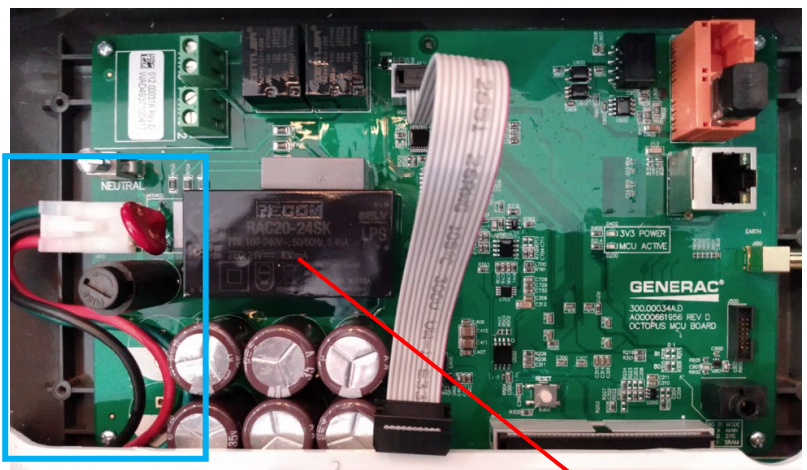
- These photos show alternate views of the relay PCB, one with the **LOAD connectors** removed from their supports.



Source – Generac PWRManager Breakdown Photos

1. b) a power supply circuit having an input coupled at the line connection to the electric power and an output providing lower voltage power to power a processor circuit,

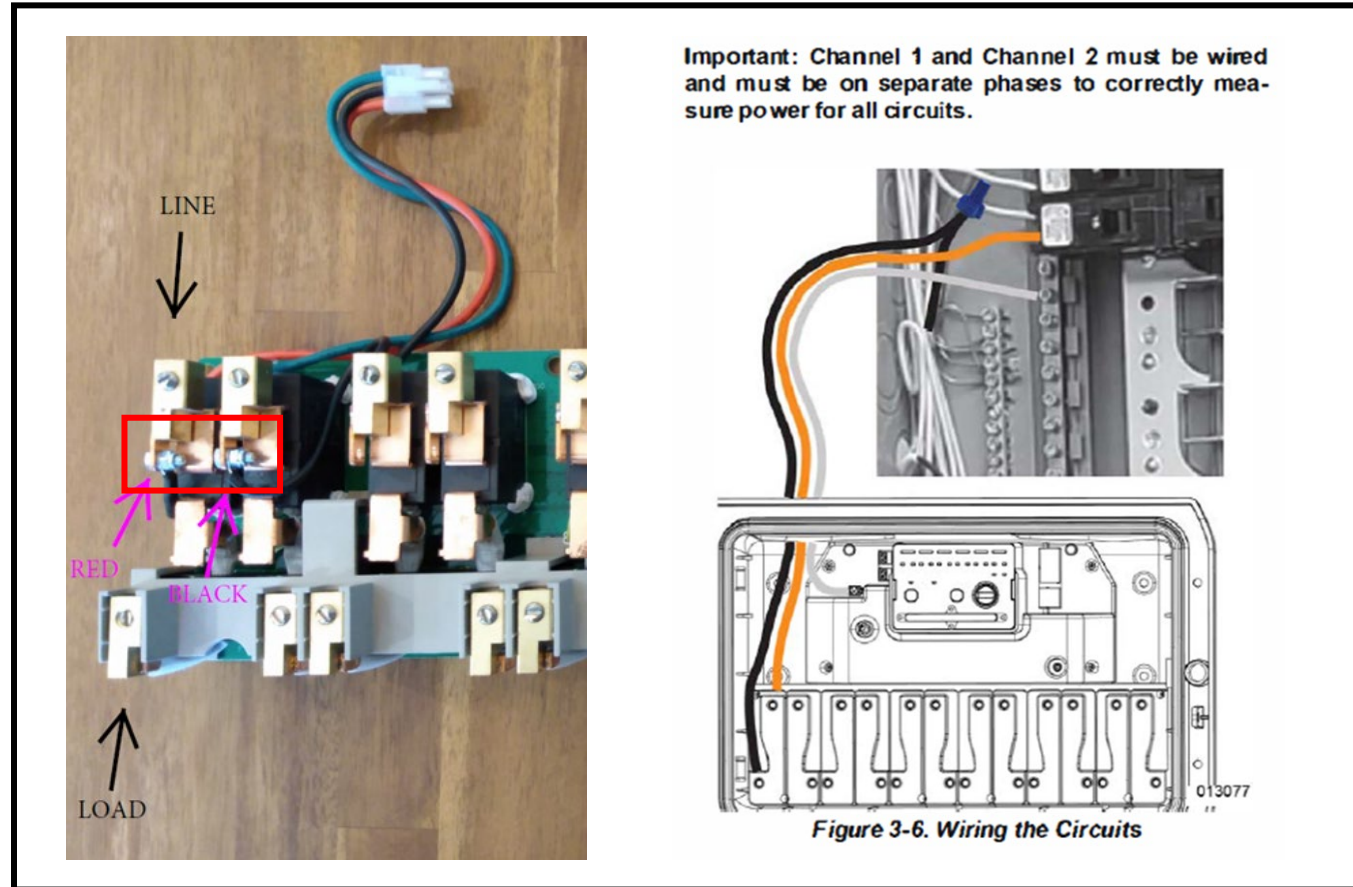
- Defendant's load coupler device comprises a power supply circuit having an input coupled at the line connection to the electric power and an output providing lower voltage power to power a processor circuit.
- The red and black wires carry 240-volt inverter power from the relay 1 & 2 line connections. These wires and the green ground wire are plugged into the low voltage PCB. The 100-240 Volt, 50/60Hz to 24VDC power supply is coupled to the 240-volt line connections via the red and black wires noted above, and a lower voltage 24VDC is supplied to provide power via a further included circuit reduction to 3.3V which powers the processor.



Source – Generac PWRManager Breakdown Photos

b) a power supply circuit having an input coupled at the line connection to the electric power and an output providing lower voltage power to power a processor circuit,

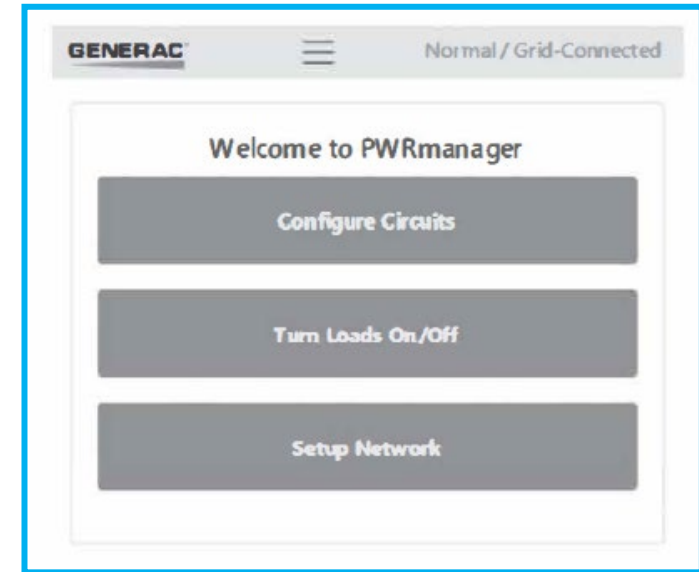
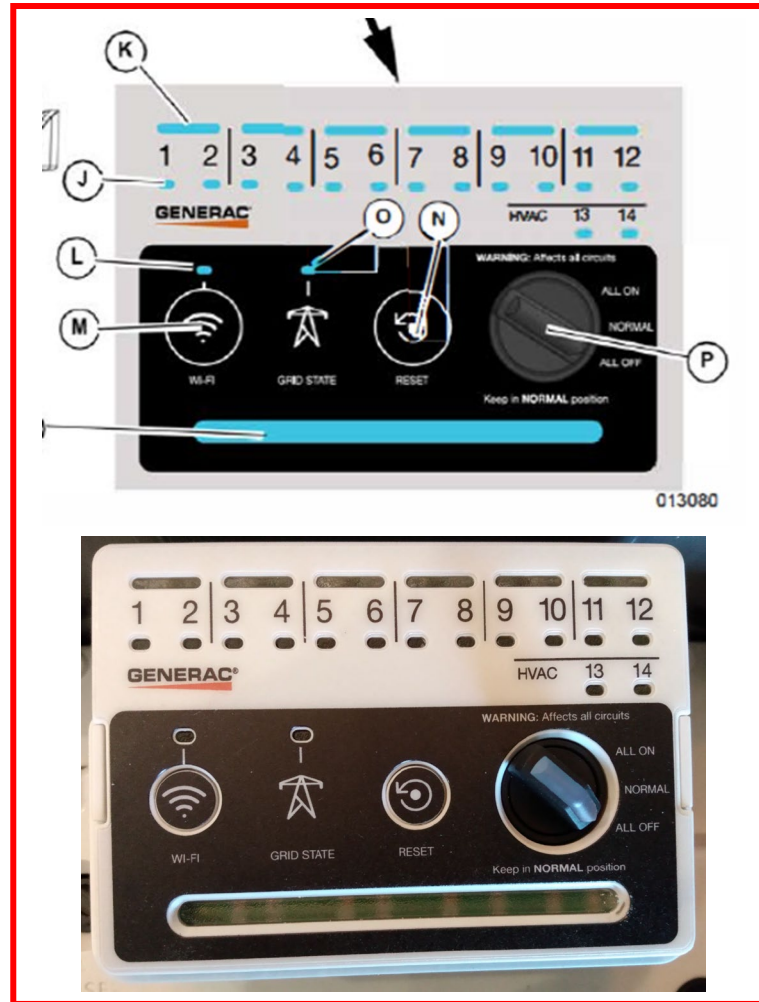
The red and black power wires connect to the line side of contactors 1 & 2 via the zinc plated screws. This carries the 240-volts power supplied by the inverter to the power supply on the upper low voltage board. The contactors 1 & 2 are configured and designed to receive 240-volts as instructed in Figure 3-6 on page 8 of the PWRManager Installation Manual. Note the bold font above the figure on the left stating that this 240-volt connection is required "... to correctly measure the power for all circuits." This voltage measurement is used with the current measurement from the various current transformers to determine power in watts or volt-amps, as well as to determine the voltage and frequency of the inverter supplied power.



Source – PWRManager Breakdown Photos and Installation Manual

1. c) a user input circuit coupled to the processor circuit, the user input circuit to receive inputs from an installer thereby allowing configuration of the load coupler device by the installer when it is installed to operate with the first load

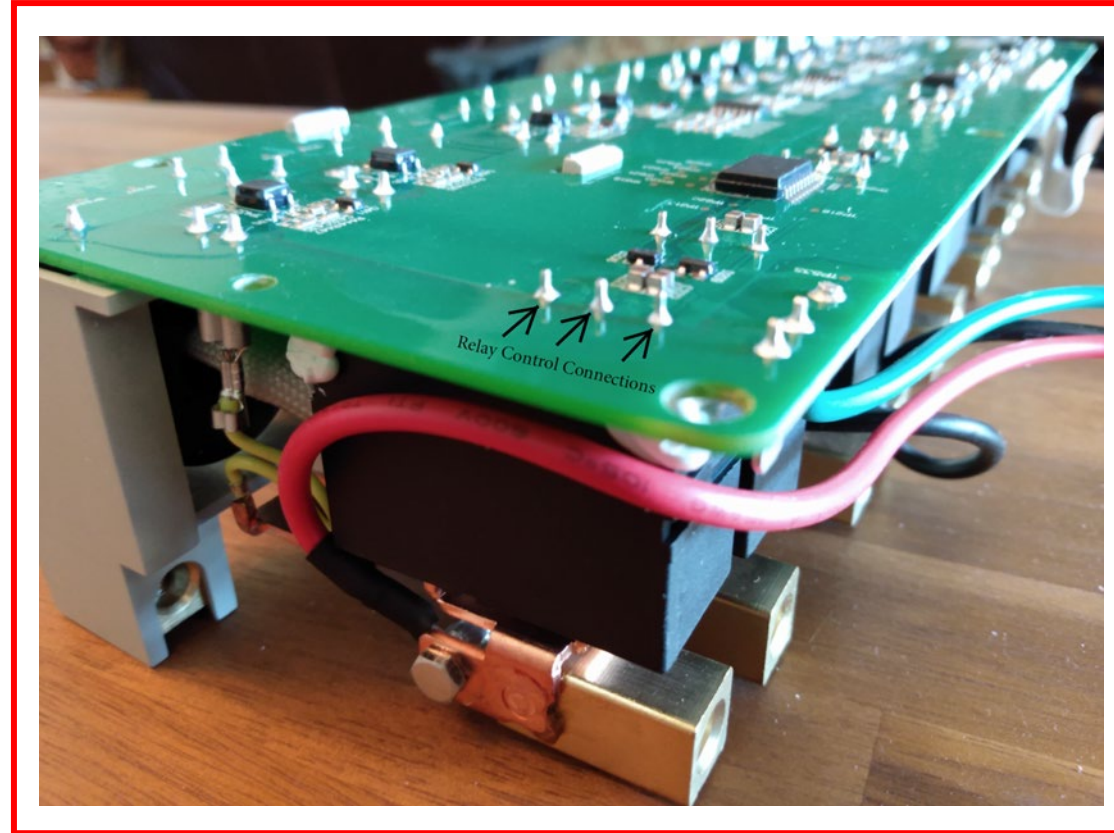
- Defendant's load coupler device further comprises a user input circuit coupled to the processor circuit, the user input circuit to receive inputs from an installer thereby allowing configuration of the load coupler device by the installer when it is installed to operate with the first load.
- The user input includes a rotary switch, P, with three positions: ALL ON; NORMAL, and ALL OFF. The three rotary switch functions can be considered as inputs to the processor circuit to allow configuration of the load coupler device by the installer via the WiFi Access Point, M.
- This facilitates a direct connection to the user input circuit via a mobile device (e.g. touchscreen smart phone or laptop), thus allowing an installer to provide inputs to the processor circuit. These inputs allow configuration of the load coupler by the installer when it is installed to operate with the first load.



Source – Generac PWRManager Breakdown Photos and Installation Manual

1. d) the processor circuit coupled to the line and control connections of the contactor and . . .

- Defendant's load coupler device further comprises the processor circuit coupled to line and control connections of the contactor.
- Relay control connections, line connection red wire and line connection black wire are examples shown to the right.



Source – Generac PWRManager Breakdown Photos

1. d) ... executing a program whereby via the connection or sensor coupled to the line connection the processor is responsive to the amount of total load on the power source and ...

- Defendant's load coupler device further comprises the processor circuit coupled to line and controls connections of the contactor and executing a program whereby via the connection or sensor coupled to the line connection the processor is responsive to the amount of total load on the power source.
- This portion of the claim is met in at least the following 3 ways:
- 1) The processor circuit executes a program whereby the connection to the line is used to correctly measure power for all circuits. The PWRmanager is described as "know[ing] how much power your inverter has available at any given time."



Source – <https://www.youtube.com/watch?v=WNqw8WCPwls>

1. d) ... executing a program whereby via the connection or sensor coupled to the line connection the processor is responsive to the amount of total load on the power source and ...

2) An overload is caused by the amount of total load on the power source exceeding the inverter's capability, thus the processor executes a program whereby it is responsive to that amount of total load on the power source as determined by the CT's in the ATS, or the inverter's internal load sensing, both of which are directly coupled to the line connection of the contactor.

### Application Considerations

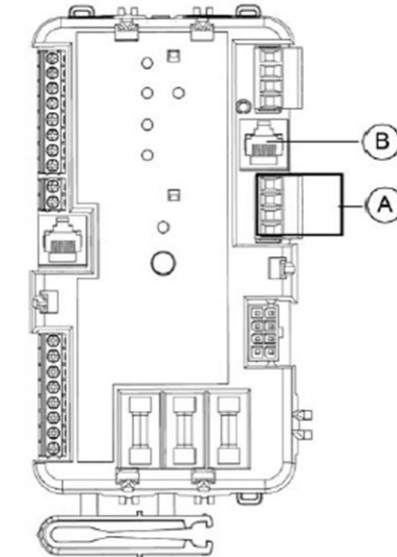
Overload on the power source is determined by AC power signal fluctuations.

The PWRmanager can control 12 AC single pole circuits and interrupt two HVAC thermostat low voltage circuits.

For digital thermostats where a 24 VAC thermostat wire is not available, interrupt the unit's power source by wiring through one of the 12 power relays in the PWRmanager.

### Current Transformers

Current Transformers are provided with the PWRcell Inverter and allow the inverter to measure the flow of power to and from the home. The PWRcell ATS Controller provides connections for these CTs (A), and for CT measurements to be sent back to the inverter (B).



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Figure 2-4. CT Input and CT Output (Inverter)

|   |                     |   |                         |
|---|---------------------|---|-------------------------|
| A | CT Input (From CTs) | B | CT Output (To Inverter) |
|---|---------------------|---|-------------------------|

Source – Generac PWRManager Installation Manual and PWRCell Automatic Switch Transfer Owner's Manual

1. d) ... executing a program whereby via the connection or sensor coupled to the line connection the processor is responsive to the amount of total load on the power source and ...

- 3) The frequency of the power output from the inverter is reduced to cause a load shed when the inverter is overloaded, thus representing a known amount of power (greater than the inverter's known maximum capability).

### Overload Behavior

Table 9-2. Overload Behavior

| Island Overload Event                                                                               | Cause                                                                                          | Behavior                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Solution            |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Overload on Voltage<br><br>(vulnerable when battery has low SoC)                                    | Load demand is too high and the inverter has dropped it's voltage in an attempt to compensate. | <ul style="list-style-type: none"> <li>– If inverter output voltage drops below 114 V, inverter will attempt to shed any loads connected to load management devices by dropping frequency.</li> <li>– If the inverter drops below 96 V for more than 6 sec (loads will brown out during this time), the system will blackout all loads.</li> </ul>                                                                                                                      | – Reduce house load |
| Overload on Current<br><br>(vulnerable to this condition when system does not have an external ATS) | There is too much load on the protected loads panel.                                           | <ul style="list-style-type: none"> <li>– If inverter experiences current greater than 35 amps L-N, the inverter will prevent transfer back to the grid and system will stay islanded.</li> <li>– If inverter experiences current greater than 35 amps for more than 15 seconds it will blackout and attempt to power loads at an increasing interval, starting at 20 seconds and increasing by 20 seconds between each attempt, up to a maximum of one hour.</li> </ul> | – Reduce house load |

### Application Considerations

An overload condition is determined by the PWRcell inverter frequency while the inverter is in island mode. Loads are managed and de-energized when frequency is less than 58 Hz for three seconds or less than 50 Hz for ½ second (for 60 Hz systems).

The controller can be used in conjunction with individual SMMs to manage a combined total of eight loads.

- The priority order determines the order in which managed loads are re-energized by the load management system after all of the managed loads have been de-energized due to an overload condition.
- Use Priorities A/C 1-4 on the controller as the top priorities, then up to four SMMs as Priorities 5-8.
- Use only select A/C priorities on the controller as the top priorities, then use additional SMMs as the remaining priorities.
- A SMM can share a priority with an A/C priority on the controller provided the standby power source is sized to handle the combined surge load from both appliances. Sharing priorities can allow up to 12 loads to be managed in a properly sized system.

In any combination of modules, the recovery times after a loss of utility power or shutdown due to overload are shown in Table 1: [Priority Settings](#).

Table 1. Priority Settings

| Priority | Recovery Time        | PWRcell<br>ATS<br>Controller | SMM |
|----------|----------------------|------------------------------|-----|
| 1        | 5 minutes            | Yes                          | Yes |
| 2        | 5 minutes 15 seconds | Yes                          | Yes |
| 3        | 5 minutes 30 seconds | Yes                          | Yes |
| 4        | 5 minutes 45 seconds | Yes                          | Yes |
| 5        | 6 minutes            | NA                           | Yes |
| 6        | 6 minutes 15 seconds | NA                           | Yes |
| 7        | 6 minutes 30 seconds | NA                           | Yes |
| 8        | 6 minutes 45 seconds | NA                           | Yes |

Source – Generac PWRCell Automatic Switch Transfer Owner's Manual and Installation and Owner's Manual for Generac PWRcell Inverter

1. d) ... one or more of voltage, current or frequency of the electric power supplied at the contactor line connection

- Defendant's load coupler device further comprises the processor circuit coupled to line and controls connections of the contactor and executing a program whereby via the connection or sensor coupled to the line connection the processor is responsive to the amount of total load on the power source and one or more of voltage, current or frequency of the electric power supplied at the contactor line connection.
- As shown to the right, the application provides information on real-time power over each of the connections (e.g., "interior lights" at "0.4 kW"). This is one example of "one or more voltage [and] current" because power is equal to voltage multiplied by current.

## Controlling Loads in PWRview

Loads wired through the PWRmanager can be controlled in the PWRview app. Tap on the "circuits" icon in the navigation bar to see the list of loads. Tap on a circuit bar to see more detail about it. When the circuit bar is expanded, the edit icon is exposed (see **Figure 3-5**) (A). Tap on that to make changes to the circuit.

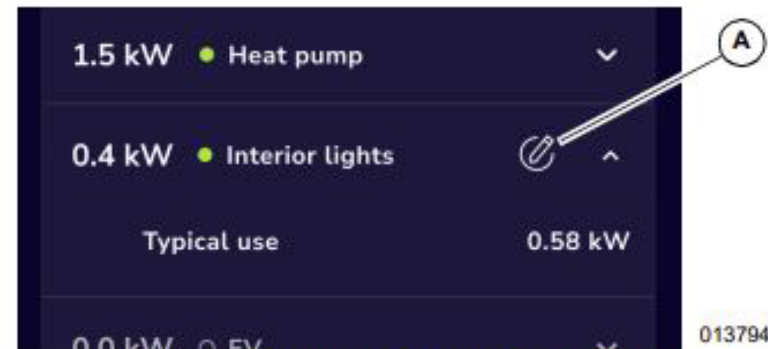


**Figure 3-5. Circuit Control Panel Edit Icon**

Tap on the edit icon and the circuit control panel will appear.

Source – Generac Owner's Manual PWRManager 12 Relay Load Controller at p. 6 [A0001426542 \(generac.com\)](https://www.generac.com/A0001426542)

1. d) ... one or more of voltage, current or frequency of the electric power supplied at the contactor line connection

In addition, the PWRmanager is described by Generac as operating like 6 SMMs (Smart Management Modules), and the processor executes a program whereby it is responsive to the frequency of the power provided to and sensed at the contactor line connection.

Additional discussion of SMM functionality will follow on the next slides.



#### Smart Management Module (SMM) (sold separately)

Any loads, including central air conditioners, can be managed using a Smart Management Module (SMM). The system can accommodate up to eight individual SMMs.

**NOTE:** SMMs are self-contained and have individual built-in controllers and are wired in series with the 240V branch circuit wiring between the circuit breaker and the managed load.

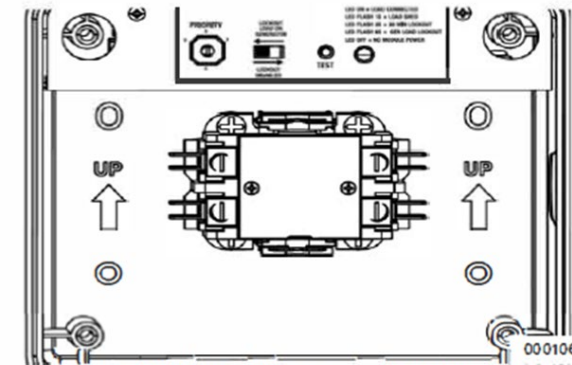
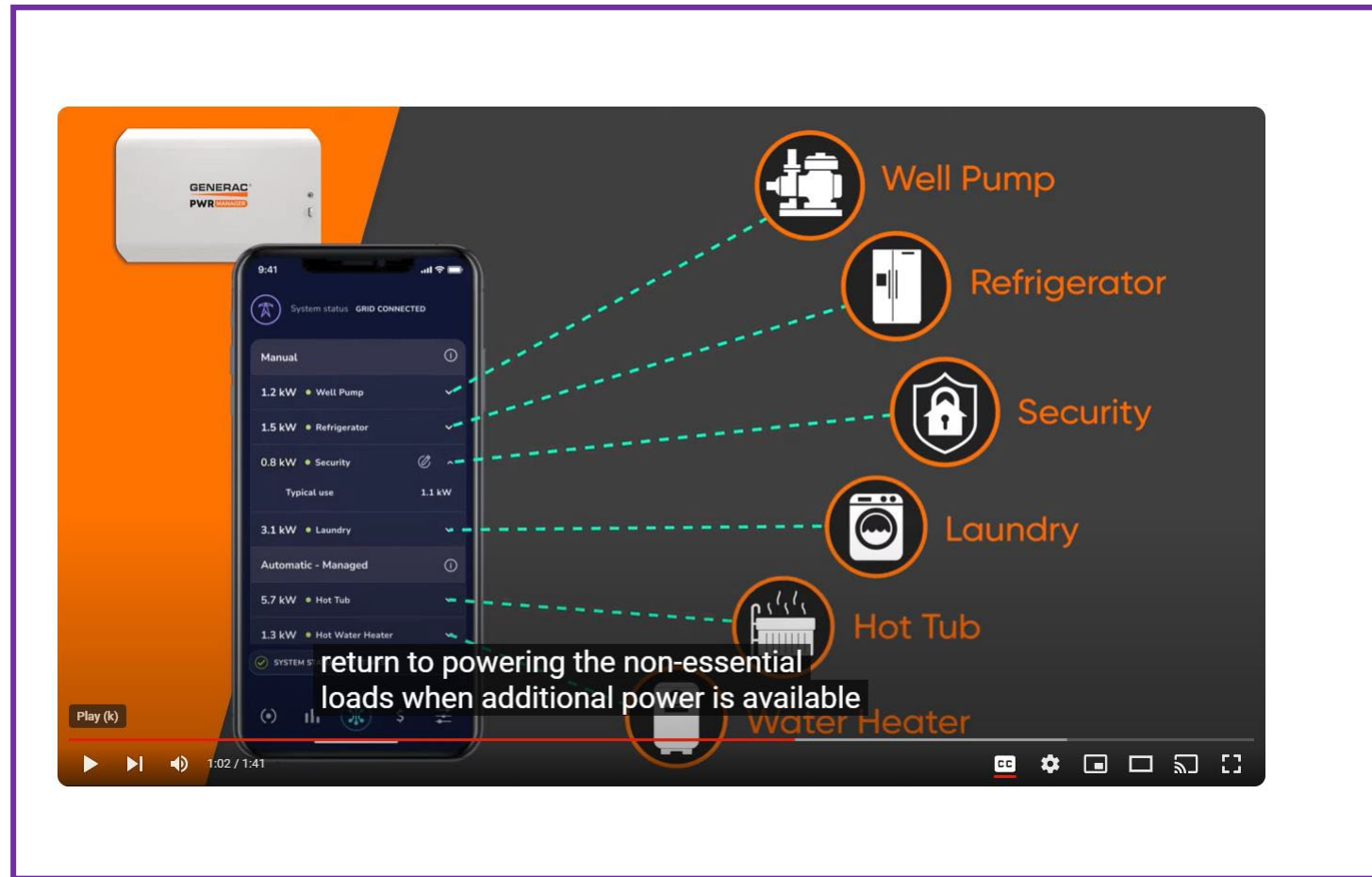


Figure 2-3. Smart Management Module (SMM)

Source – <https://www.youtube.com/watch?v=SV88fMln5hQ>  
and Generac PWRCell Automatic Switch Transfer Owner's Manual

1. d) ... to cause a load shed by opening the contactor to either relieve an actual overload or prevent a potential overload of the power source, or both,

- Defendant's load coupler device further comprises the processor circuit coupled to line and controls connections of the contactor and executing a program whereby via the connection or sensor coupled to the line connection the processor is responsive to the amount of total load on the power source to cause a load shed by opening the contactor to either relieve an actual overload or prevent a potential overload of the power source or both.
- As explained in the video to the right, "When necessary, power manager will divert electricity away from non-essential loads to ensure essential appliances like well pumps and refrigerators have uninterrupted power."



Source – Integrated Product Ecosystem at 0:40. [Integrated Product Ecosystem - YouTube](#)

1. d) ... to cause a load shed by opening the contactor to either relieve an actual overload or prevent a potential overload of the power source, or both,

- In addition, SMMs (that Generac likens to the functionality of PWRManager) use a voltage amount and a voltage frequency determination. Here the processor will use both because the inverter controls the PWRManager's frequency and voltage to indicate an overload. The processor senses the overload, which is caused by the amount of total load on the power source exceeding its capability, and responds to the amount of total load on the power source. Because the processor determines overload by AC power signal fluctuations, it must sense at least one of the voltage, current or frequency.

### Smart Management Module (SMM) (sold separately)

Any loads, including central air conditioners, can be managed using a Smart Management Module (SMM). The system can accommodate up to eight individual SMMs.

**NOTE:** SMMs are self-contained and have individual built-in controllers and are wired in series with the 240V branch circuit wiring between the circuit breaker and the managed load.

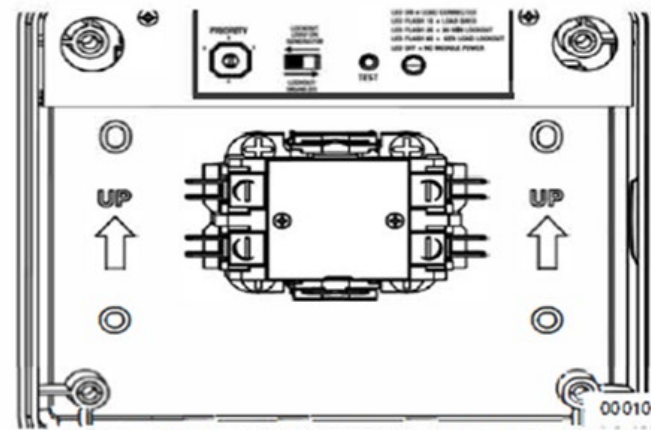


Figure 2-3. Smart Management Module (SMM)

Source – Generac PWRCell Automatic Switch Transfer Owner's Manual

1. d) ... and following the load shed after at least a known time period the processor closes the contactor to resupply power to the first load, the known time period responsive to the configuration of the load coupler.

- Defendant's load coupler device further comprises the processor circuit coupled to line and controls connections of the contactor and executing a program whereby via the connection or sensor coupled to the line connection the processor is responsive to the amount of total load on the power source to cause a load shed by opening the contactor to either relieve an actual overload or prevent a potential overload of the power source or both and following the load shed after at least a known time period the processor closes the contactor to resupply power to the first load, the known time period responsive to the configuration of the load coupler.
- The time periods for each of the load priorities are configured by the installer. The inverter is designed to shut down if an overload is not corrected within a short amount of time.

**Table 1. Priority Settings**

| Priority | Recovery Time        | PWRcell<br>ATS<br>Controller | SMM |
|----------|----------------------|------------------------------|-----|
| 1        | 5 minutes            | Yes                          | Yes |
| 2        | 5 minutes 15 seconds | Yes                          | Yes |
| 3        | 5 minutes 30 seconds | Yes                          | Yes |
| 4        | 5 minutes 45 seconds | Yes                          | Yes |
| 5        | 6 minutes            | NA                           | Yes |
| 6        | 6 minutes 15 seconds | NA                           | Yes |
| 7        | 6 minutes 30 seconds | NA                           | Yes |
| 8        | 6 minutes 45 seconds | NA                           | Yes |

### Load Management Options

Load management systems are designed to prevent a power source such as an inverter from being overloaded by large appliance loads. Options include:

- Smart Management Modules (SMMs)
- Smart A/C Module (SACM) (found in PWRview transfer switch)
- Advanced Load Controller: PWRmanager

When using the PWRmanager in a system, it will control 12 circuits and two HVAC thermostat channels. Additional circuits can be managed by adding SMMs and configuring for lockout.

Do not use SACM circuits when using PWRmanager; instead use the PWRmanager's HVAC thermostat circuits.

### Backup System Capacity

Under normal operation, the PWRmanager will manage the load on and off as needed to ensure that the back up system can supply enough power to the circuits remaining without shutting down. NEC Article 702.4 requires that the backup power supply be sized for the connected load. By using load management, a reduced size back up system can satisfy this need.

**IMPORTANT NOTE:** When operating the Override Switch in the All-ON position, the load management mechanism will not operate and the potential to overload the back up system exists. To meet the NEC Article 702.4 requirements, never operate the PWRmanager while in backup power mode with the switch in the All-ON position.

#### Minimum Off Time

- Some circuits require a minimum off time to allow them to return to ready state.
- For any equipment like this, set a minimum off time of 5 minutes.
- If the homeowner attempts to restart load too soon, the app will inform it is pending and display a warning icon. See [Figure 4-9](#). The load will start after the delay time expires.



**Figure 4-9. Minimum off Time Warning Icon**

#### Finish Circuit by Circuit Configuration

View the list of circuits to see if a circuit is incorrectly configured. A warning icon will appear in the bar to indicate more needs to be done for that circuit.

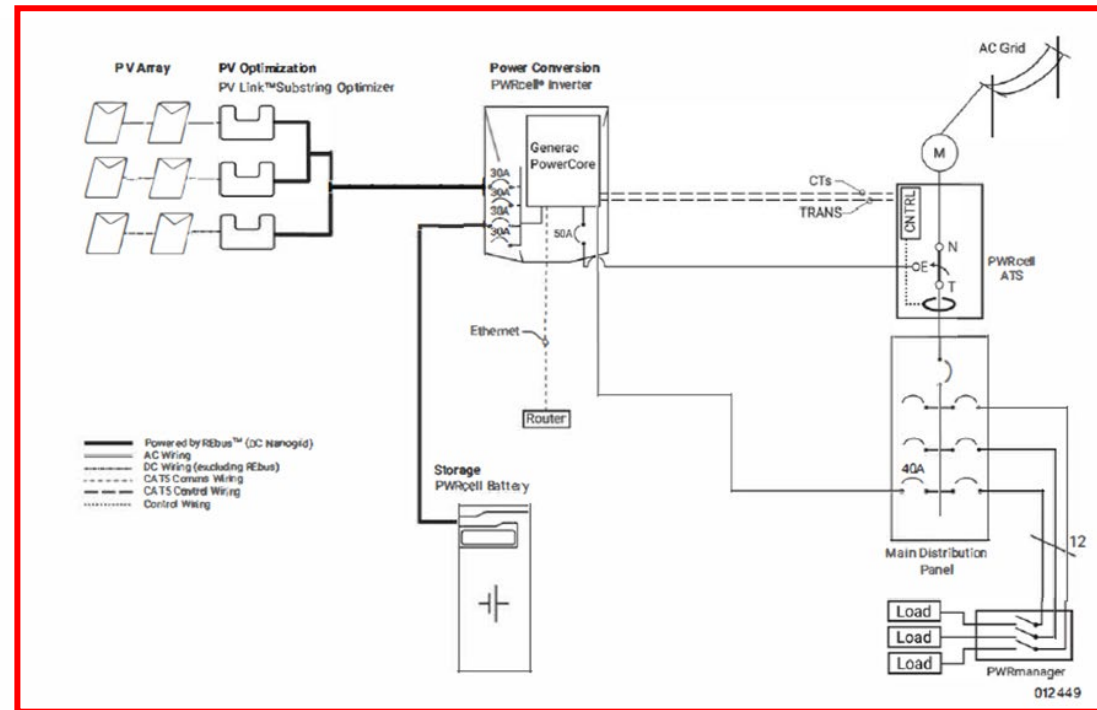
Source – Generac PWRCell Automatic Switch Transfer Owner's Manual and PWRManager Installation Manual

4. The load coupler device of claim 1 wherein the electric power is 240 volts A.C. and the contactor, power supply, processor and user input circuit are all contained within a UL approved enclosure.

- Defendant's load coupler device of claim 1 comprises electric power at 240 volts A.C. and comprises a contactor, power supply, processor and user input circuit, all contained within a UL approved enclosure.
- The Performance Specifications describe Per-Circuit Current Capacity operates at 120 and 240 volts. Thus, the grid, inverter, and PWRmanager operate with 240 volts A.C. electric power.

### Performance Specifications

| Description                                 | Value                                                                     |
|---------------------------------------------|---------------------------------------------------------------------------|
| Per-circuit Current Capacity                | 60 A Resistive / newline AC / 2HP motor load at 120 V, 4HP motor at 240 V |
| Number of Controllable Relays               | 12                                                                        |
| Number of HVAC-control Relays (no metering) | 2                                                                         |
| Power Consumption                           | <20 W                                                                     |
| Maximum Total Current                       | 450 A                                                                     |
| Warranty                                    | 10 Years                                                                  |



5. The load coupler device of claim 1 wherein a name or other identifier can be assigned thereto via the user input circuit at the time of installation of the load coupler device.

- Defendant's load coupler device of claim 1 comprises the ability to assign names or identifies that can be assigned thereto via the user input circuit at the time of installation of the load coupler device.
- The screenshot from the Installation Manual details how to name the load coupler device.

**Load Label**

Tap on the Circuit Name field and enter a text label up to 39 characters long. This will display for the homeowner when they are viewing their circuits in the PWRview app.

6. The load coupler device of claim 1 wherein the priority of the first load can be assigned to the load coupler via the user input circuit by the installer at the time of installation of the load coupler device.

- Defendant's load coupler device allows for the priority of the first load to be assigned to the load coupler via the user input circuit by the installer at the time of installation of the load coupler device.
- The images shown from the Installation Manual demonstrate how the user input can set the priority of the first load to the load coupler.

See [Figure 4-11](#) and [Figure 4-12](#). Review the priority sequence with the homeowner. Adjust the priorities by reordering loads in the list using the Up and Down arrows beside each load's label. Other circuits will be re-assigned priorities to accommodate the change made. The order the circuits display in the web interface tool will reflect the priority order. The highest priority loads (lowest priority number) will appear at the top, and lower priority loads toward the bottom.

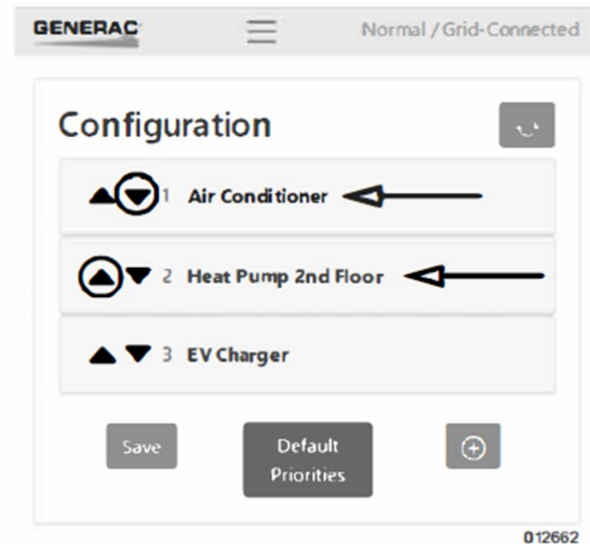
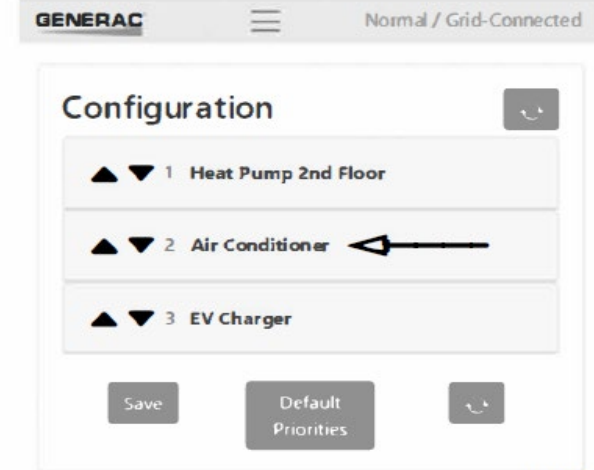


**Figure 4-11. Initial Priority Sequence**



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**Figure 4-12. Changed Priority Sequence**

#### Prioritized Loads

These loads are wired through the PWRmanager and are configured to run if they do not overload the inverter. If the total load exceeds the power capacity of the inverter, these will be shed in priority order to ensure the inverter continues to run. For best impact, the higher wattage loads should be used here:

- Stove, Oven
- Miscellaneous lighting and plug loads
- Heating and Air Conditioning equipment

7. The load coupler device of claim 1 wherein the processor circuit determines when to cause a load shed in response to a known and greater than an unavoidable electronic circuit propagation delay time duration of an overload.

- Defendant's load coupler device comprises the processor circuit determining when to cause a load shed in response to a known and greater than an unavoidable electronic circuit propagation delay time duration of an overload.
- The peak motor starting current (2 sec) is 50 Amps rms. Presumably, this is because the PWRmanager is designed specifically to operate with this inverter, so it will wait approximately 2 seconds before causing a load shed.

## Specifications

| Description                                                                                                            | Units   | XVT076A03           |
|------------------------------------------------------------------------------------------------------------------------|---------|---------------------|
| Max. cont. grid-tied AC power @ 122°F (50°C)                                                                           | kW      | 7.6                 |
| Max. cont. AC power in island mode w/ external transfer switch and single 6 module battery cabinet <sup>2</sup>        | kW      | 9.0                 |
| Max. cont. AC power in island mode w/ external transfer switch and 2 battery cabinets (8 modules minimum) <sup>1</sup> | kW      | 11.0                |
| Peak motor starting current (2 sec)                                                                                    | A rms   | 50                  |
| Normal output frequency AC                                                                                             | Hz      | 60                  |
| Grid Voltage Line to Neutral (L-N)                                                                                     | VAC     | 120                 |
| Grid Voltage Line to Line (L-L)                                                                                        | VAC     | 240                 |
| Peak efficiency                                                                                                        | %       | 97.3                |
| Optimal split phase imbalance for max. system performance                                                              | %       | ≤ 30                |
| CEC weighted efficiency                                                                                                | %       | 96.5                |
| AC terminals wire size                                                                                                 | AWG     | 8 to 6              |
| DC terminals wire size                                                                                                 | AWG     | 10 to 6             |
| STOP terminals wire size                                                                                               | AWG     | 20 to 14            |
| Normal Operating Performance Category                                                                                  | -       | Category B          |
| Abnormal Operating Performance Category                                                                                | -       | Category III        |
| Weight                                                                                                                 | lb (kg) | 70.9 (32.1)         |
| Thermal management                                                                                                     | -       | forced convection   |
| Weatherization rating                                                                                                  | -       | NEMA Type 3R        |
| Enclosure Material                                                                                                     | -       | powder-coated steel |

8. The load coupler device of claim 1 wherein the processor circuit determines when to cause a load shed in response to the amount of an overload and the time duration of the overload with the load shed occurring faster for large overloads as compared to small overloads.

- Defendant's load coupler device comprises a processor circuit which determines when to cause a load shed in response to the amount of an overload and the time duration of the overload with the load shed occurring faster for large overloads as compared to small overloads.
- Because the PWRmanager is designed to operate with the inverter, the inverter manages the loads while the SMM controls the load shedding in the case of an overload.

### Application Considerations

An overload condition is determined by the PWRcell inverter frequency while the inverter is in island mode. Loads are managed and de-energized when frequency is less than 58 Hz for three seconds or less than 50 Hz for ½ second (for 60 Hz systems).

The controller can be used in conjunction with individual SMMs to manage a combined total of eight loads.

- The priority order determines the order in which managed loads are re-energized by the load management system after all of the managed loads have been de-energized due to an overload condition.
- Use Priorities A/C 1-4 on the controller as the top priorities, then up to four SMMs as Priorities 5-8.
- Use only select A/C priorities on the controller as the top priorities, then use additional SMMs as the remaining priorities.
- A SMM can share a priority with an A/C priority on the controller provided the standby power source is sized to handle the combined surge load from both appliances. Sharing priorities can allow up to 12 loads to be managed in a properly sized system.

8. The load coupler device of claim 1 wherein the processor circuit determines when to cause a load shed in response to the amount of an overload and the time duration of the overload with the load shed occurring faster for large overloads as compared to small overloads.

- Defendant's load coupler device comprises processor circuit determining when to cause a load shed in response to the amount of an overload and the time duration of the overload with the load shed occurring faster for large overloads as compared to small overloads.
- The table shows that the fault duration for a 370A overload is 300μs and for a 32A overload is 6.23 seconds. The PWRmanager is designed specifically to operate with this inverter, so it will wait a period of time which corresponds to these overload times before causing a load shed.

**Table 7-3. Island Mode AC Short Circuit Current Contribution**

|                                                                 |            |
|-----------------------------------------------------------------|------------|
| Peak AC short-circuit current contribution                      | 370 A p-p  |
| Peak output fault current duration                              | 300 us     |
| Peak output RMS fault current                                   | 125 A rms  |
| Max 3-Cycle RMS output fault current                            | 47.7 A rms |
| Max fault current duration (Current limit in overload 32 A rms) | 6.23 s     |

9. The load coupler device of claim 1 wherein the processor circuit responds directly to power provided at the contactor line connection and causes a load shed in response to the duration and voltage of a lower than normal voltage of the power provided at the contactor line connection.

- Defendant's load coupler device comprises the processor circuit responding directly to power provided at the contactor line connection and causes a load shed in response to the duration and voltage of a lower than normal voltage of the power provided at the contactor line connection.
- The inverter is designed to initially lower its output voltage to cause a load shed on overload.
- Because the PWRmanager is designed specifically to operate with this inverter, it will respond to that voltage to initiate a load shed.

### Application Considerations

An overload condition is determined by the PWRcell inverter frequency while the inverter is in island mode. Loads are managed and de-energized when frequency is less than 58 Hz for three seconds or less than 50 Hz for ½ second (for 60 Hz systems).

The controller can be used in conjunction with individual SMMs to manage a combined total of eight loads.

- The priority order determines the order in which managed loads are re-energized by the load management system after all of the managed loads have been de-energized due to an overload condition.
- Use Priorities A/C 1-4 on the controller as the top priorities, then up to four SMMs as Priorities 5-8.
- Use only select A/C priorities on the controller as the top priorities, then use additional SMMs as the remaining priorities.
- A SMM can share a priority with an A/C priority on the controller provided the standby power source is sized to handle the combined surge load from both appliances. Sharing priorities can allow up to 12 loads to be managed in a properly sized system.

10. The load coupler device of claim 1 wherein the processor circuit causes a load shed in response to the amount of current the load draws from the power provided via, and sensed at the contactor line connection, such that a load which does not draw enough current to relieve an overload is not shed.

- Defendant's load coupler device comprises the processor circuit causing a load shed in response to the amount of current the load draws from the power provided via, and sensed at the contactor line connection, such that a load which does not draw enough current to relieve an overload is not shed.
- Defendant indicates that "It knows how much power your inverter has available at any given time" which would include during an overload.
- Furthermore, the PWRview app characterizes each load by power consumption, such that the lowest priority load or loads drawing enough current to alleviate the overload would be shed.



11. The load coupler device of claim 1 wherein the processor circuit causes a load shed in response to a lower than normal frequency, and the duration of lower than normal frequency, of the power provided to and sensed at the contactor line connection such that for lower than normal frequencies, a lower frequency will cause a load shed faster than a relatively higher frequency.

- Defendant's load coupler device comprises the processor circuit causing a load shed in response to a lower than normal frequency, and the duration of lower than normal frequency, of the power provided to and sensed at the contactor line connection such that for lower than normal frequencies, a lower frequency will cause a load shed faster than a relatively higher frequency.
- Because the PWRmanager is designed to operate with the inverter, the description of frequency vs. overload given for the inverter, and the corresponding load shedding response time given for an SMM apply to the PWRmanager as well.

### Application Considerations

An overload condition is determined by the PWRcell inverter frequency while the inverter is in island mode. Loads are managed and de-energized when frequency is less than 58 Hz for three seconds or less than 50 Hz for ½ second (for 60 Hz systems).

The controller can be used in conjunction with individual SMMs to manage a combined total of eight loads.

- The priority order determines the order in which managed loads are re-energized by the load management system after all of the managed loads have been de-energized due to an overload condition.
- Use Priorities A/C 1-4 on the controller as the top priorities, then up to four SMMs as Priorities 5-8.
- Use only select A/C priorities on the controller as the top priorities, then use additional SMMs as the remaining priorities.
- A SMM can share a priority with an A/C priority on the controller provided the standby power source is sized to handle the combined surge load from both appliances. Sharing priorities can allow up to 12 loads to be managed in a properly sized system.

12. The load coupler device of claim 1 wherein the processor circuit causes a load shed in response to the amount of total load on the power source, the amount of total load being determined by an electronic circuit which is part of a control system of the power source.

- Defendant's load coupler device comprises the processor circuit causing a load shed in response to the amount of total load on the power source, the amount of total load being determined by an electronic circuit which is part of a control system of the power source.
- In the table shown, the description under **Cause** for an **Overload on Voltage** describes how there is an electronic circuit which is part of a control system of the power source.
- Similarly, the description under **Cause** for an **Overload on Current** describes how the inverter determines an overload, and the PWRmanager performs a load shed. The load shed occurs first in response to the drop in voltage. If that shed is inadequate to alleviate the overload, then a load will be shed in response to the drop in frequency.

## Overload Behavior

Table 9-2. Overload Behavior

| Island Overload Event                                                                               | Cause                                                                                          | Behavior                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Solution            |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Overload on Voltage<br><br>(vulnerable when battery has low SoC)                                    | Load demand is too high and the inverter has dropped it's voltage in an attempt to compensate. | <ul style="list-style-type: none"> <li>– If inverter output voltage drops below 114 V, inverter will attempt to shed any loads connected to load management devices by dropping frequency.</li> <li>– If the inverter drops below 96 V for more than 6 sec (loads will brown out during this time), the system will blackout all loads.</li> </ul>                                                                                                                      | – Reduce house load |
| Overload on Current<br><br>(vulnerable to this condition when system does not have an external ATS) | There is too much load on the protected loads panel.                                           | <ul style="list-style-type: none"> <li>– If inverter experiences current greater than 35 amps L-N, the inverter will prevent transfer back to the grid and system will stay islanded.</li> <li>– If inverter experiences current greater than 35 amps for more than 15 seconds it will blackout and attempt to power loads at an increasing interval, starting at 20 seconds and increasing by 20 seconds between each attempt, up to a maximum of one hour.</li> </ul> | – Reduce house load |

Source – Generac PWRcell Inverter Installation and Owner's Manual

13. The load coupler device of claim 1 wherein when the processor circuit causes a load shed and further causes the load shed to end a known amount of time after the load shed wherein the known amount of time is responsive to the configuration which the installer provides when the load coupler device is installed.

- Defendant's load coupler device comprises the processor circuit causing a load shed and further causing the load shed to end a known amount of time after the load shed wherein the known amount of time is responsive to the configuration which the installer provides when the load coupler device is installed.
- There is a delay that can be set before the circuits will turn back on.

#### Minimum Off Time

- Some circuits require a minimum off time to allow them to return to ready state.
- For any equipment like this, set a minimum off time of 5 minutes.
- If the homeowner attempts to restart load too soon, the app will inform it is pending and display a warning icon. See [Figure 4-9](#). The load will start after the delay time expires.

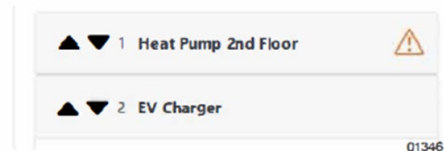


**Figure 4-9. Minimum off Time Warning Icon**

#### Finish Circuit by Circuit Configuration

View the list of circuits to see if a circuit is incorrectly configured. A warning icon will appear in the bar to indicate more needs to be done for that circuit.

14. The load coupler device of claim 1 wherein the processor circuit is responsive to the frequency of the power provided by the power source to cause the contactor to close the power circuit to the first load at a known amount of time after an overload of the power source ends wherein the known amount of time is responsive to the priority of the first load which the installer assigns to the load coupler device when the load coupler device is installed.

- Defendant's load coupler device comprises the processor circuit responding to the frequency of the power provided by the power source to cause the contactor to close the power circuit to the first load at a known amount of time after an overload of the power source ends wherein the known amount of time is responsive to the priority of the first load which the installer assigns to the load coupler device when the load coupler device is installed.
- As shown, when the installer sets a known minimum off time period, the load will start after that known time expires. Priorities may also be set as illustrated to the right.

#### Minimum Off Time

- Some circuits require a minimum off time to allow them to return to ready state.
- For any equipment like this, set a minimum off time of 5 minutes.
- If the homeowner attempts to restart load too soon, the app will inform it is pending and display a warning icon. See [Figure 4-9](#). The load will start after the delay time expires.

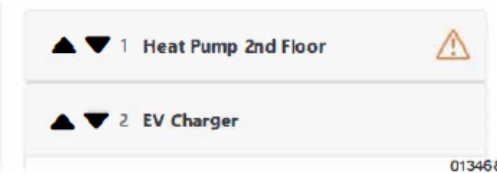


Figure 4-9. Minimum off Time Warning Icon

Table 1. Priority Settings

| Priority | Recovery Time        | PWRcell<br>ATS<br>Controller | SMM |
|----------|----------------------|------------------------------|-----|
| 1        | 5 minutes            | Yes                          | Yes |
| 2        | 5 minutes 15 seconds | Yes                          | Yes |
| 3        | 5 minutes 30 seconds | Yes                          | Yes |
| 4        | 5 minutes 45 seconds | Yes                          | Yes |
| 5        | 6 minutes            | NA                           | Yes |
| 6        | 6 minutes 15 seconds | NA                           | Yes |
| 7        | 6 minutes 30 seconds | NA                           | Yes |
| 8        | 6 minutes 45 seconds | NA                           | Yes |

15. The load coupler device of claim 1 wherein the processor circuit is responsive to an installer's inputs to the user input circuit such that the installer can open and close the contactor.

- Defendant's load coupler device comprises the processor circuit responsive to an installer's inputs to the user input circuit such that the installer can open and close the contactor.
- The rotary switch position ALL OFF opens the contactor, and the position ALL ON closes the contactor.
- Additionally, the PWRmanager Installation Manual includes instructions for the installer to "Show the ability to turn a load on and off." The load off opens the contactor and the load on closes the contactor.



### Hand over to Homeowner

Steps to follow in handing the system over to the homeowner:

1. Once the registration is complete, confirm that they can log in to the PWRview App and see the circuits page in the app.
2. Explain the loads which have been configured for Lockout and with priorities.
3. Show the ability to turn a load on and off. To download the PWRview App, please visit the link below.

16. The load coupler device of claim 1 wherein before the processor circuit would otherwise close the contactor to resupply power to the first load when the known time period elapses, in response to one or more of: ...

- Defendant's load coupler device wherein before the processor circuit would otherwise close the contactor to resupply power to the first load when the known time period elapses in response to one or more of:
- Because the PWRmanager is designed to operate with the inverter, the description of frequency vs. overload given for the inverter, and the corresponding load shedding response time given for an SMM apply to the PWRmanager as well.

### Application Considerations

An overload condition is determined by the PWRcell inverter frequency while the inverter is in island mode. Loads are managed and de-energized when frequency is less than 58 Hz for three seconds or less than 50 Hz for ½ second (for 60 Hz systems).

The controller can be used in conjunction with individual SMMs to manage a combined total of eight loads.

- The priority order determines the order in which managed loads are re-energized by the load management system after all of the managed loads have been de-energized due to an overload condition.
- Use Priorities A/C 1-4 on the controller as the top priorities, then up to four SMMs as Priorities 5-8.
- Use only select A/C priorities on the controller as the top priorities, then use additional SMMs as the remaining priorities.
- A SMM can share a priority with an A/C priority on the controller provided the standby power source is sized to handle the combined surge load from both appliances. Sharing priorities can allow up to 12 loads to be managed in a properly sized system.

...i) the voltage of the power provided to and sensed at the contactor line connection,  
ii) the frequency of the power provided to and sensed at the contactor line connection,  
iii) the total load on the power source,  
iv) or, via a current transformer, the total current being supplied by the power source, ...

Defendant's load coupler device wherein before the processor circuit would otherwise close the contactor to resupply power to the first load when the known time period elapses in response to one or more of: i) the voltage of the power provided to and sensed at the contactor line connection,  
ii) the frequency of the power provided to and sensed at the contactor line connection,  
iii) the total load on the power source,  
iv) or, via a current transformer, the total current being supplied by the power source

### Application Considerations

An overload condition is determined by the PWRcell inverter frequency while the inverter is in island mode. Loads are managed and de-energized when frequency is less than 58 Hz for three seconds or less than 50 Hz for ½ second (for 60 Hz systems).

The controller can be used in conjunction with individual SMMs to manage a combined total of eight loads.

- The priority order determines the order in which managed loads are re-energized by the load management system after all of the managed loads have been de-energized due to an overload condition.
- Use Priorities A/C 1-4 on the controller as the top priorities, then up to four SMMs as Priorities 5-8.
- Use only select A/C priorities on the controller as the top priorities, then use additional SMMs as the remaining priorities.
- A SMM can share a priority with an A/C priority on the controller provided the standby power source is sized to handle the combined surge load from both appliances. Sharing priorities can allow up to 12 loads to be managed in a properly sized system.

... the processor first determines at least one of whether the power source is already overloaded or if connecting the first load will cause the power source to become overloaded, and if one of these conditions exists, the processor does not close the contactor thus preventing the first load from being connected to the power source.

Defendant's load coupler device wherein before the processor circuit would otherwise close the contactor to resupply power to the first load when the known time period elapses in response to one or more of:

- i) the voltage of the power provided to and sensed at the contactor line connection,
- ii) the frequency of the power provided to and sensed at the contactor line connection,
- iii) the total load on the power source,
- iv) or, via a current transformer, the total current being supplied by the power source the processor first determines at least one of whether the power source is already overloaded or if connecting the first load will cause the power source to become overloaded, and if one of these conditions exists, the processor does not close the contactor thus preventing the first load from being connected to the power source.

- The language of this section describes how if the first load would cause an overload, it will be disconnected, meeting the claim language “if one of these conditions exists, the processor does not close the contactor thus preventing the first load from being connected to the power source.”

#### **Prioritized Loads**

These loads are wired through the PWRmanager and are configured to run if they do not overload the inverter. If the total load exceeds the power capacity of the inverter, these will be shed in priority order to ensure the inverter continues to run. For best impact, the higher wattage loads should be used here:

- Stove, Oven
- Miscellaneous lighting and plug loads
- Heating and Air Conditioning equipment

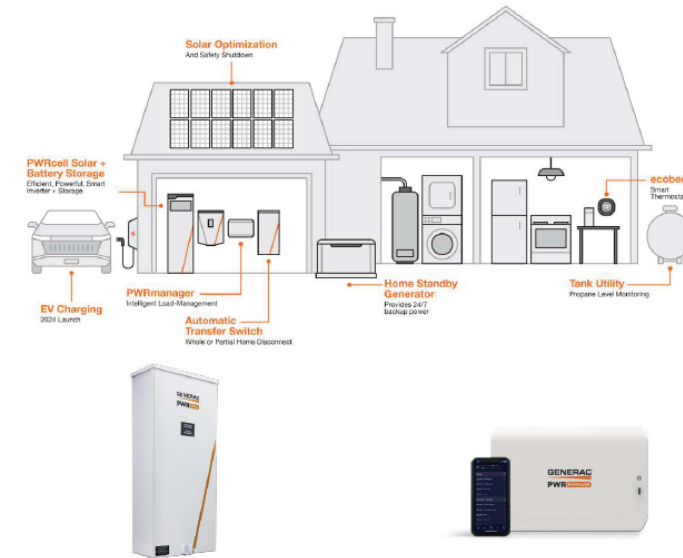
17. In a home or business which receives standard single or multiple phase voltage and frequency A.C. electric power for a group of loads from a primary first power source connected at a service connection in the home or business, a small backup power system comprising:

- Generac offers multiple backup power systems for controlling power provided from a plurality of power sources to groups of loads for homes or business which receive standard single or multiple phase voltage and frequency A.C. electric power.
- Defendant advertises its PWRcell Energy Storage Systems which can encompass multiple different configurations and system architectures and is designed to work with multiple different types of power sources including, PWRcell Batteries, PV Arrays, back up generators, and other types of power sources.
- Different embodiments of Defendant's systems contain a wide range of Defendant's products. See list of "Accused Products" in Plaintiff's Preliminary Infringement Contentions.
- Defendant refers publicly to its Integrated Home Energy Ecosystem, as the components are designed to work together.

## Integrated Home Energy Ecosystem

PWRcell isn't just a powerful battery, but it's also the most flexible and scalable home energy system on the market. With a range of supplementary products and features, PWRcell can be configured to meet just about any budget or lifestyle so you get a solution tailored to your unique needs.

Each component has also been designed to work better together. The PWRmanager advanced load management device and features like Outage Guard integrate seamlessly with PWRcell, helping provide additional protection from outages and invaluable peace of mind.



### Automatic Transfer Switch

An integrated solar + battery storage system is made easy with the PWRcell Automatic Transfer Switch (ATS). Power your home and manage up to four individual HVAC (24 VAC controlled) loads with the PWRcell ATS.

6 | Generac Power Systems

### PWRmanager

The PWRmanager advanced load management device enhances whole home backup power and provides simplified control of up to twelve 120 V circuits or six 240 V circuits plus two thermostats. PWRmanager will automatically manage those loads during an outage to extend backup duration and prevent inverter overload.

## Advanced Load Management

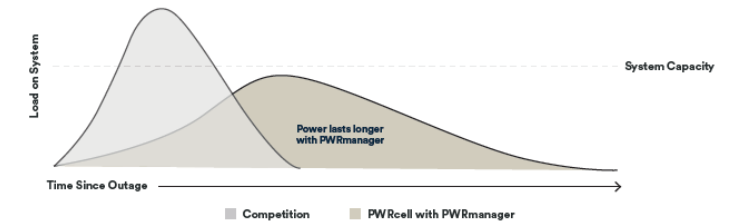
Load management systems are designed to prevent a standby power source, such as an energy storage system, from being overloaded while providing backup power during an outage. The PWRmanager advanced load management system also provides an in-hand ability to turn circuits on or off during an outage, or even while on grid.

PWRmanager provides a richly integrated load management functionality when used with the PWRcell system.

### Advanced Load Management with PWRmanager

#### Cost-effective Solution to Whole Home Power

The PWRmanager advanced load management device adds unbeatable flexibility and value to the PWRcell System. Controlled via the user-friendly PWRview app, PWRmanager enables batteries to work smarter, so a smaller system can power the home for longer.

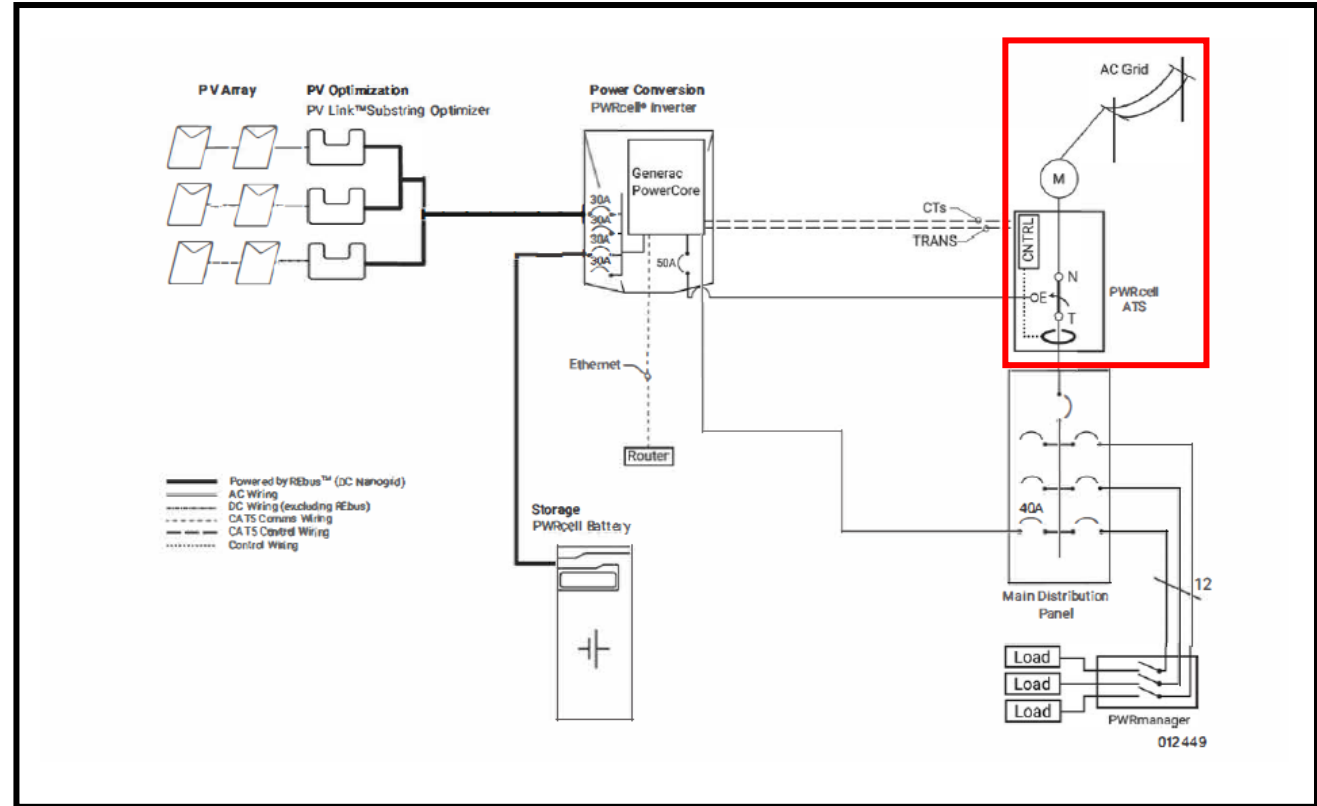


During an outage, PWRmanager extends backup duration and prevents the PWRcell system from being overloaded by too many large loads being turned on at once.

PWRcell Consumer Brochure | 6

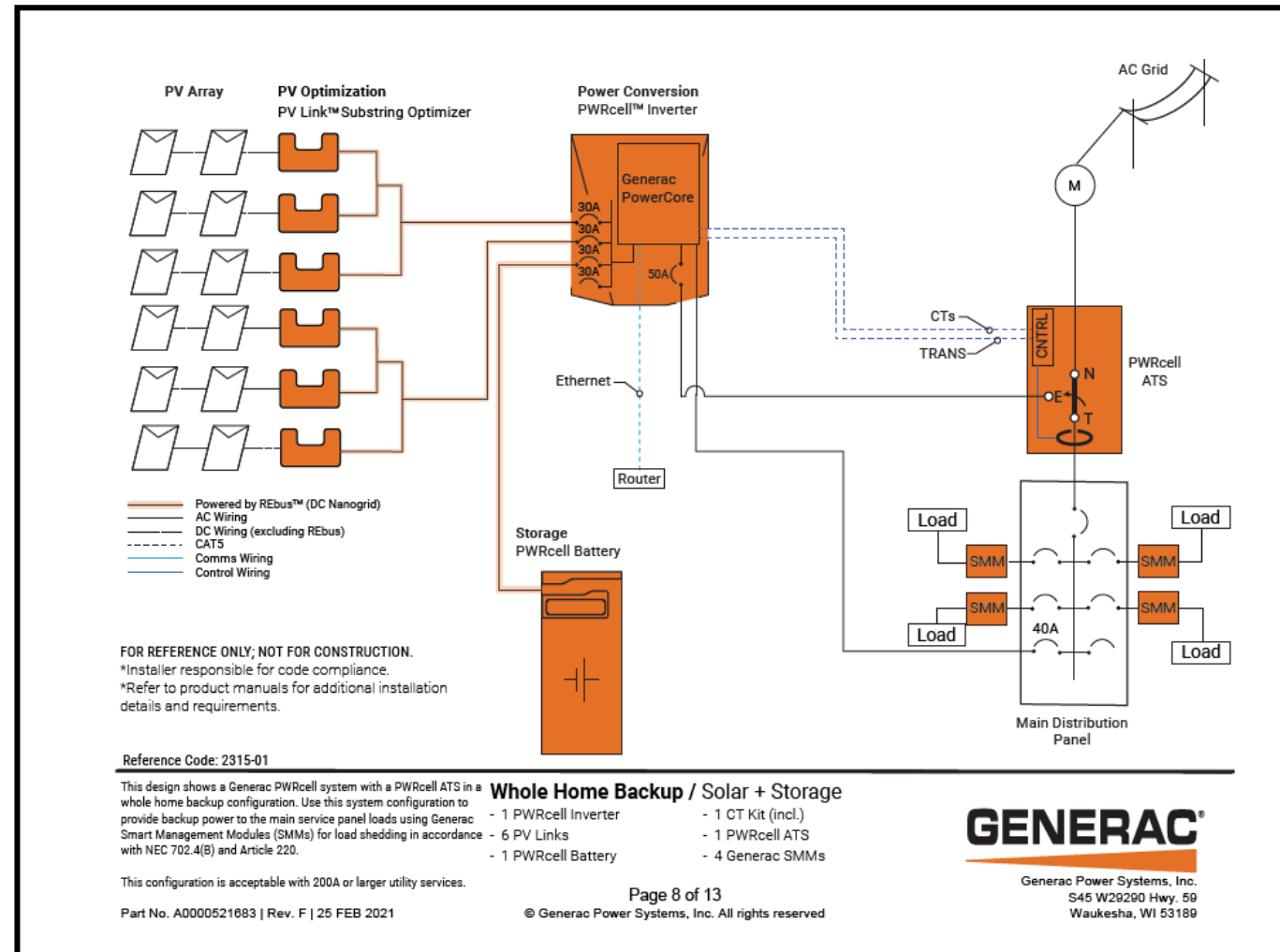
17. In a home or business which receives standard single or multiple phase voltage and frequency A.C. electric power for a group of loads from a primary first power source connected at a service connection in the home or business, a small backup power system comprising:

- The diagram shown on this slide is one example of Defendant's backup power systems for controlling power provided from a plurality of power sources to groups of loads for homes or business which receive standard single or multiple phase voltage and frequency A.C. electric power.
- The PWRcell ATS shown is connected to the primary first power source, the power grid. The service connection cannot be any larger than a 200A, 240V grid because all the grid power must pass through the ATS, which rated at 200A, 240V. This ATS would be used in a home or business.



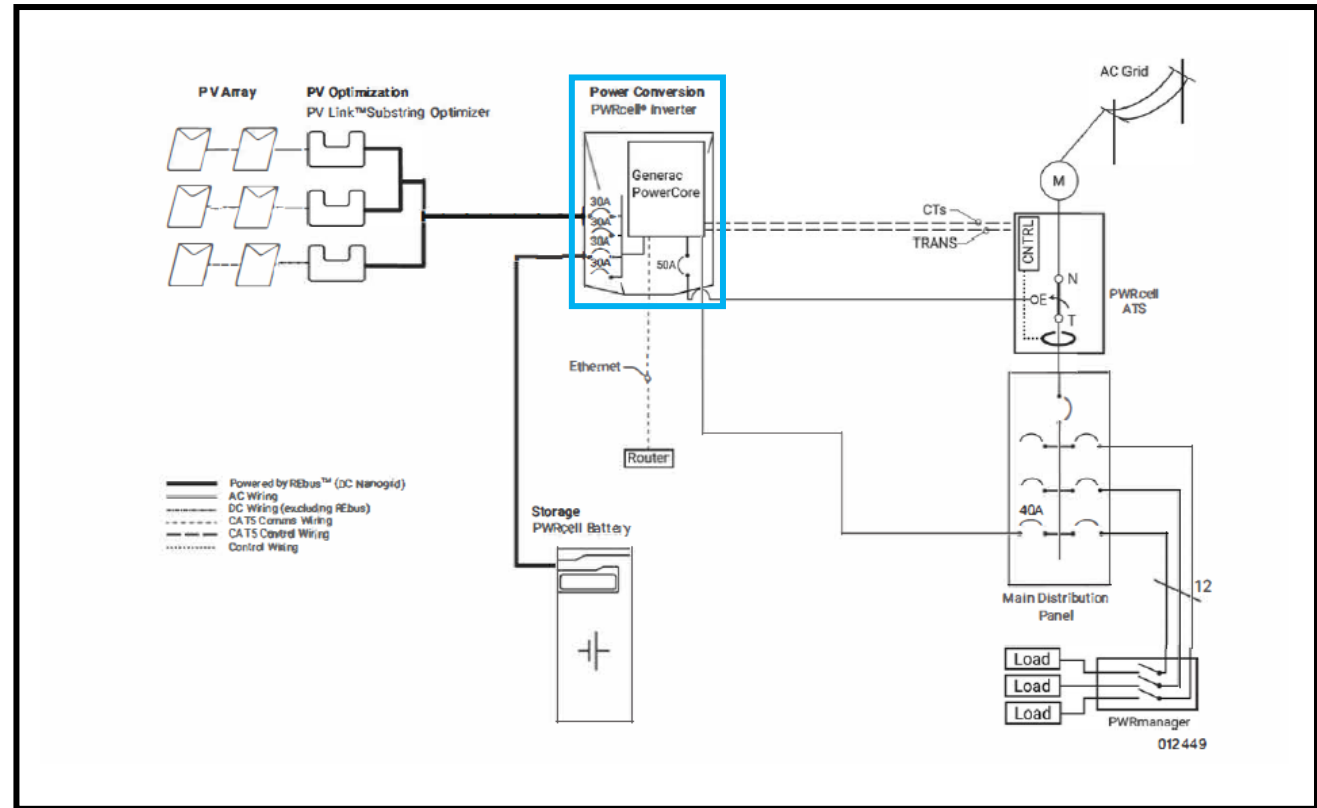
17. In a home or business which receives standard single or multiple phase voltage and frequency A.C. electric power for a group of loads from a primary first power source connected at a service connection in the home or business, a small backup power system comprising:

- The diagram shown on this slide is another example of Defendant's backup power systems for controlling power provided from a plurality of power sources to groups of loads for homes or business which receive standard single or multiple phase voltage and frequency A.C. electric power.
- For example, this configuration uses Smart Management Modules (SMMs) for load shedding rather than Defendant's PWRmanager.
- Defendant has multiple components that it uses to effectuate advanced load management including SMM's, load managers, PWRmanagers, and HVAC power management modules.



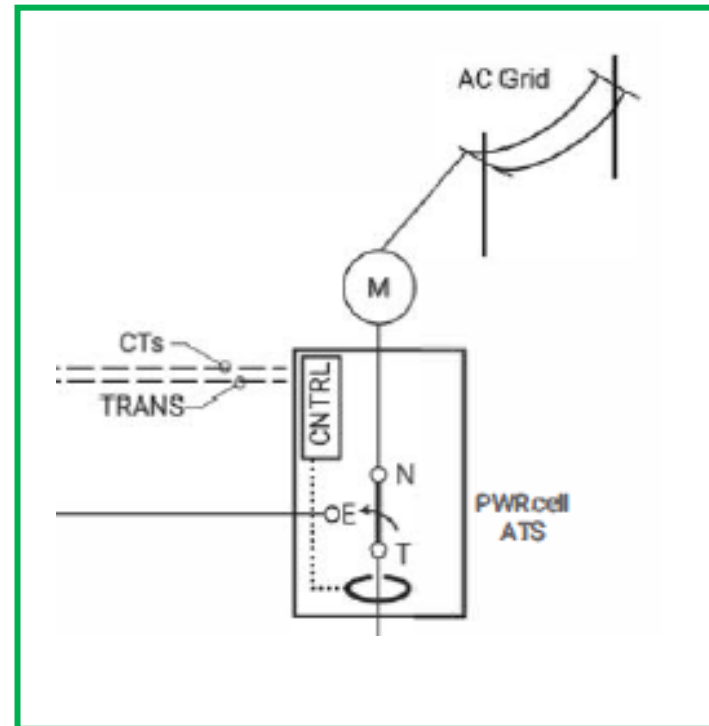
(a) a second power source providing A.C. electrical power at the same standard voltage and frequency as a first power source connected at a service connection to a home or business and providing power to a group of loads, the second power source not being capable of simultaneously powering all of the loads of the group of loads;

- Defendant's backup power system comprises a second power source providing A.C. electrical power at the same standard voltage and frequency as a first power source connected at a service connection to a home or business that provides power to a group of loads but is incapable of simultaneously powering all of the group of loads.
- In one embodiment, Defendant's PWRcell Inverter functions as said second power source because it parallels the grid power via the 40A circuit breaker and must be rated at 240 Volts, 60 Hz.
- The "group of loads" may be the entire 100A or 200A circuit breaker (as supported by the claim's preamble which states that the "primary first power source" powers the group of loads).
- The inverter cannot "simultaneously power all of the loads of the group of loads" because it only supplies 40A. The Inverter might be able to power all 12 loads of the PWRmanager, but not everything connected to a standard residential electrical service connection.
- The inverter can only supply its max power output for spec for grid parallel via the 40A breaker or island mode spec via the 50A breaker if grid power fails.



(b) a transfer switch having an output, a first input coupled to a first power source and a second input coupled to the second power source with the transfer switch operating to select the first or the second power source to provide power via the transfer switch output for at least some loads of the group of loads;

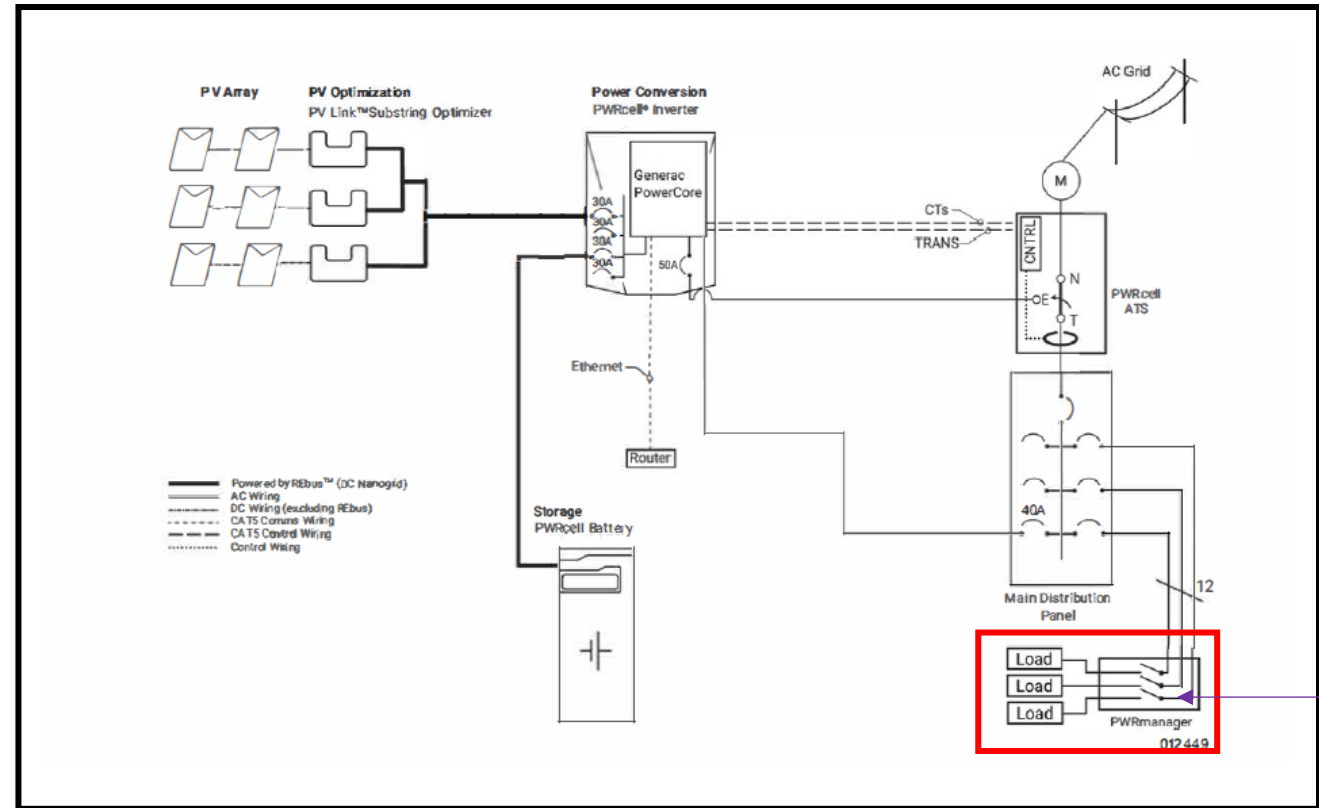
- Defendant's backup power system comprises a transfer switch having an output, a first input coupled to a first power source and a second input coupled to the second power source with the transfer switch operating to select the first or second power source to provide power via the transfer switch output for at least some loads of the group of loads.
- Defendant's backup power system comprises the PWRcell ATS, shown in the diagram on the right, which comprises an output, T, a first input coupled to the grid, N, and a second input coupled to the second power source, E. The PWRcell ATS operates to select the first or second power source to provide power via the transfer switch output for at least some loads of the group of loads.



(c) a first load coupler comprising:

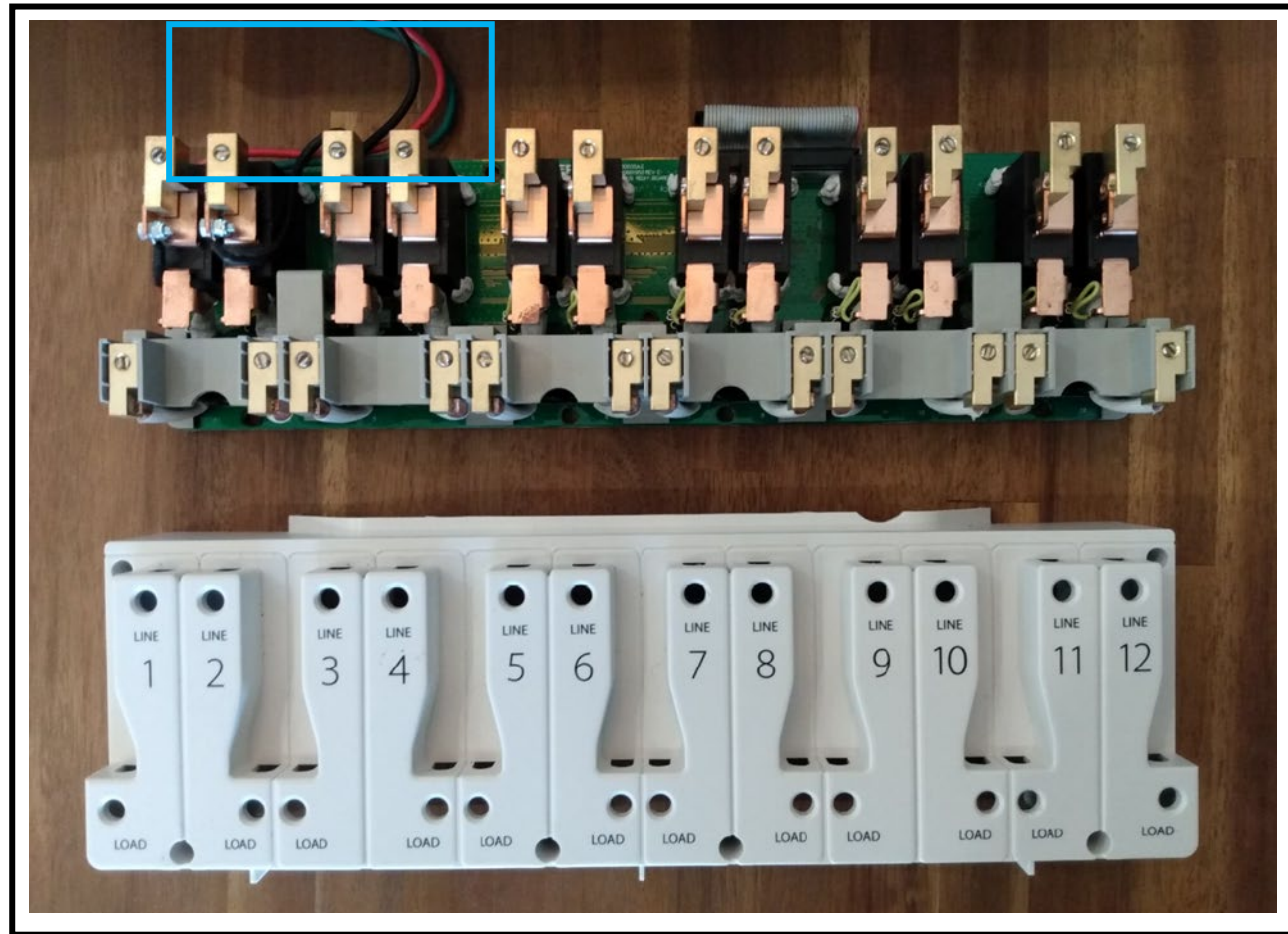
a) a contactor having one or more each of line and load terminals for wiring the contactor in series in the electric circuit from the transfer switch output to the power input of a corresponding first load, the line terminal receiving power from the transfer switch output and the load terminal providing that power to the first load when the contactor is closed, ...

- Defendant's backup power system comprises a first load coupler comprising a contactor having one or more each of line and load terminals for wiring the contactor in series in the electric circuit from the transfer switch output to the power input of a corresponding first load, the line terminal receiving power from the transfer switch output and the load terminal providing that power to the first load when the contactor is closed.
- Using the bottom relay in Figure 8-1 as relay 1, Defendant's PWRmanager has 1 line terminal (on the right) and 1 load terminal (on the left) as shown. It is wired in series with the electric circuit from the transfer switch output T via the panel, to the bottom load. The line terminal on the right of the drawing and the load terminal on the left terminal are connected as claimed, providing that power to the first load when the contactor is closed.



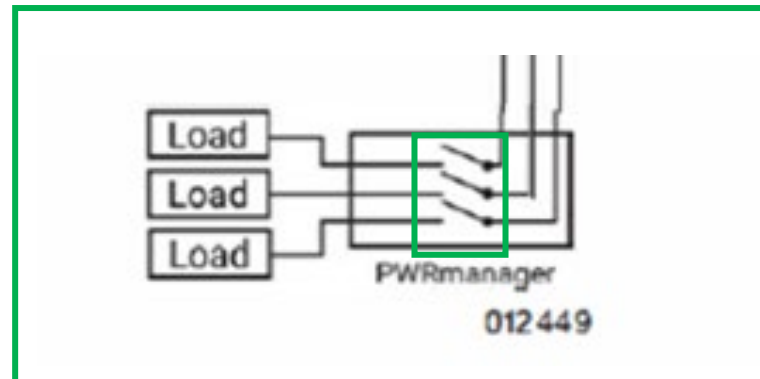
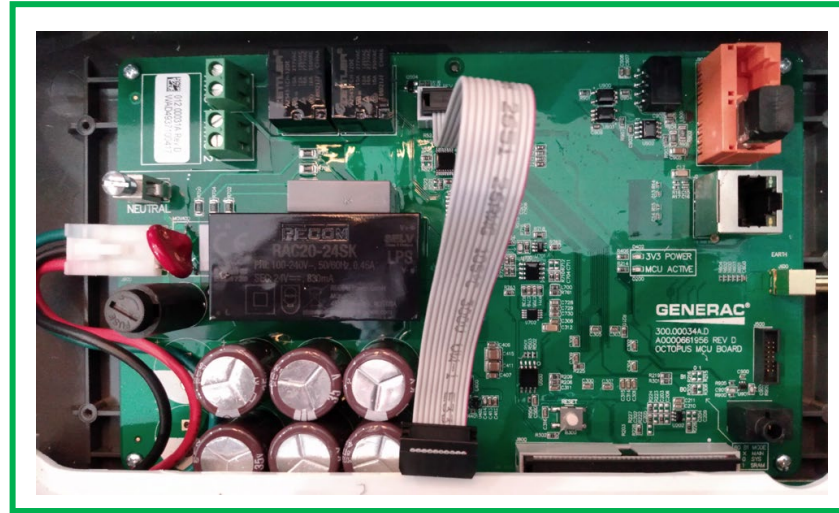
... b) a power supply having an input responsive to the power at the contactor line terminal and an output for providing power to a processor circuit, ...

- Defendant's backup power system comprises a first load coupler comprising a power supply having an input responsive to the power at the contactor line terminal and an output for providing power to a processor circuit.
- The power supply and associated circuitry receives 240 volts from the relays 1 & 2 via the red and black wires and provides 3.3 volts for the processor on the octopus MCU board.



... c) the processor circuit executing steps of a program and being coupled to and controlling the contactor to open and close to thereby control coupling of power from the transfer switch output to the first load, the processor circuit normally causing the contactor to be closed to provide power to the first load, ...

- Defendant's backup power system comprises a first load coupler comprising a processor circuit executing steps of a program and being coupled to and controlling the contactor to open and close to thereby control coupling of power from the transfer switch output to the first load, the processor circuit normally causing the contactor to be closed to provide power to the first load.
- The Processor circuit is coupled to the contactor via the ribbon cable shown in the image to the right. The processor controls the opening and closing of the PWRmanager's contactor to control coupling of power from the PWRcell ATS's output T to the first load connected to the load connection of the contactor.
- The contactor is normally caused to be closed to power the first load.



#### SMM and Carton Contents

**Priority Dial (A)** – Sets module priority.

**NOTE: PRIORITY MUST BE DIFFERENT for each module in an installation.** Priority sets the order in which loads recover from a load shed event. Recovery time from a load shed event is five minutes for Priority 1. Each priority after Priority 1 waits an additional 15 seconds after the initial recovery time. See [Table 2-1](#).

**Lockout Switch (B)** – Enables or disables lockout function. Switch positions are LOCKOUT LOAD ON GENERATOR (enabled) and LOCKOUT DISABLED. See [Table 2-2](#).

**NOTE:** Recovery time is based on priority dial settings. See [Table 2-1](#).

**Test Button (C)** – Disables contactor output for a specified time.

**LED (D)** – Provides module status. See [Table 2-3](#).

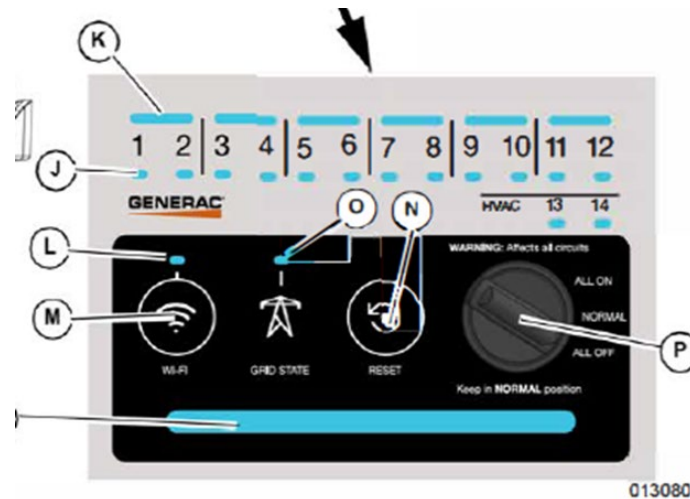
**Contactor (E)** – Normally CLOSED. If the generator begins to overload, the contactor opens to take the load off generator power. The contactor also opens to take the load off generator power. See [Connections](#).

**Mounting Holes (F)** – Internal enclosure mounting holes provide clean and sturdy mounting.

**Priority Decal (G)** – Provided for recording priority of each module in installation. Install on electrical panel.

... d) a user input circuit coupled to the processor circuit and enabling a user who is an installer to configure the first load coupler to operate with the first load, ...

- Defendant's backup power system comprises a first load coupler comprising a user input circuit coupled to the processor circuit and enabling a user who is an installer to configure the first load coupler to operate with the first load.
- The user input circuit is coupled to the processor. The WiFi Access Point allows an installer to configure the first load coupled to operate with the first load via a mobile device. This allows an installer to provide inputs to the processor circuit. These inputs provide for configuration of the load coupler by the installer when it is installed to operate with the loads.
- The user input may also include a rotary switch, P, with three positions: ALL ON; NORMAL, and ALL OFF. The three rotary switch functions can be considered as inputs to the processor circuit to allow configuration of the load coupler device by the installer via the WiFi Access Point, M.



Source – Generac PWRManager Breakdown Photos and Installation Manual

## Connection to PWRmanager

Connect directly to the PWRmanager's broadcast WiFi network from a mobile device or laptop following the steps below.

- See [Figure 4-1](#). Open the device's WiFi configuration tab, find a PWRmanager-xxxxxx WiFi Access Point (AP), and connect to it. Look on the label for the required password.
- Open a browser on your device and point at IP address: <http://10.10.10.10> to open the configuration web interface tool. In the prompt that appears, enter "admin" as the user name and the password from the label (see [Figure 4-1](#) and [Figure 4-2](#)) for the PWRmanager's Web Interface.

Source – Generac PWRmanager Installation Manual



... e) the processor circuit being programmed to cause a load shed in response to at least one of an actual or potential overload of the second power source and further operating to close the contactor to resupply power to the first load after at least a known time period after the load shed with the known time period being responsive to the first load coupler configuration by the installer.

- Defendant's backup power system comprises a first load coupler comprising a processor circuit programmed to cause a load shed in response to at least one of an actual or potential overload of the second power source and further operating to close the contactor to resupply power to the first load after at least a known time period after the load shed with the known time period being responsive to the first load coupler configuration by the installer.
- Defendant's processor circuit is programmed to cause a load shed in response to at least one of an actual or potential overload of the PWRcell Inverter. This is accomplished in part through the opening of a contactor to stop power supply to a given load.
- The inverter is designed to shut down if an overload is not corrected within a short amount of time, thus the PWRmanager causes a load shed for both an actual overload and a potential overload.

## Load Management Options

Load management systems are designed to prevent a power source such as an inverter from being overloaded by large appliance loads. Options include:

- Smart Management Modules (SMMs)
- Smart A/C Module (SACM) (found in PWRview transfer switch)
- Advanced Load Controller: PWRmanager

When using the PWRmanager in a system, it will control 12 circuits and two HVAC thermostat channels. Additional circuits can be managed by adding SMMs and configuring for lockout.

Do not use SACM circuits when using PWRmanager; instead use the PWRmanager's HVAC thermostat circuits.

### SMM and Carton Contents

**Priority Dial (A)** – Sets module priority.

**NOTE: PRIORITY MUST BE DIFFERENT for each module in an installation.** Priority sets the order in which loads recover from a load shed event. Recovery time from a load shed event is five minutes for Priority 1. Each priority after Priority 1 waits an additional 15 seconds after the initial recovery time. See [Table 2-1](#).

**Lockout Switch (B)** – Enables or disables lockout function. Switch positions are LOCKOUT LOAD ON GENERATOR (enabled) and LOCKOUT DISABLED. See [Table 2-2](#).

**NOTE:** Recovery time is based on priority dial settings. See [Table 2-1](#).

**Test Button (C)** – Disables contactor output for a specified time.

**LED (D)** – Provides module status. See [Table 2-3](#).

**Contactor (E)** – Normally CLOSED. If the generator begins to overload, the contactor opens to take the load off generator power. The contactor also opens to take the load off generator power. See [Connections](#).

**Mounting Holes (F)** – Internal enclosure mounting holes provide clean and sturdy mounting.

**Priority Decal (G)** – Provided for recording priority of each module in installation. Install on electrical panel.

... e) the processor circuit being programmed to cause a load shed in response to at least one of an actual or potential overload of the second power source and further operating to close the contactor to resupply power to the first load after at least a known time period after the load shed with the known time period being responsive to the first load coupler configuration by the installer.

- The Priority Settings table shows known time periods after the load shed when the contactor is closed. Each time period corresponds to a priority which is configured by the installer.
- The section on Minimum Off Time details how when the installer sets a known minimum off time period, the load will start after that time expires.

**Table 1. Priority Settings**

| Priority | Recovery Time        | PWRcell<br>ATS<br>Controller | SMM |
|----------|----------------------|------------------------------|-----|
| 1        | 5 minutes            | Yes                          | Yes |
| 2        | 5 minutes 15 seconds | Yes                          | Yes |
| 3        | 5 minutes 30 seconds | Yes                          | Yes |
| 4        | 5 minutes 45 seconds | Yes                          | Yes |
| 5        | 6 minutes            | NA                           | Yes |
| 6        | 6 minutes 15 seconds | NA                           | Yes |
| 7        | 6 minutes 30 seconds | NA                           | Yes |
| 8        | 6 minutes 45 seconds | NA                           | Yes |

#### Minimum Off Time

- Some circuits require a minimum off time to allow them to return to ready state.
- For any equipment like this, set a minimum off time of 5 minutes.
- If the homeowner attempts to restart load too soon, the app will inform it is pending and display a warning icon. See [Figure 4-9](#). The load will start after the delay time expires.

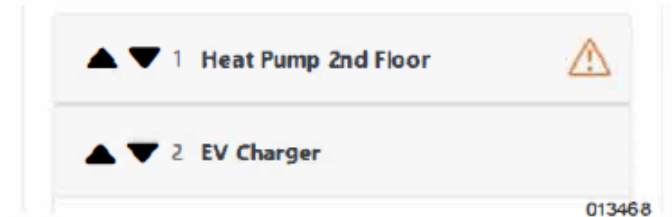


**Figure 4-9. Minimum off Time Warning Icon**

... e) the processor circuit being programmed to cause a load shed in response to at least one of an actual or potential overload of the second power source and further operating to close the contactor to resupply power to the first load after at least a known time period after the load shed with the known time period being responsive to the first load coupler configuration by the installer.

- The Priority Settings table shows known time periods after the load shed when the contactor is closed. Each time period corresponds to a priority which is configured by the installer.
- Defendant also uses different LED states to indicate power and loading conditions.

**Table 1. Priority Settings**

| Priority | Recovery Time        | PWRcell<br>ATS<br>Controller | SMM |
|----------|----------------------|------------------------------|-----|
| 1        | 5 minutes            | Yes                          | Yes |
| 2        | 5 minutes 15 seconds | Yes                          | Yes |
| 3        | 5 minutes 30 seconds | Yes                          | Yes |
| 4        | 5 minutes 45 seconds | Yes                          | Yes |
| 5        | 6 minutes            | NA                           | Yes |
| 6        | 6 minutes 15 seconds | NA                           | Yes |
| 7        | 6 minutes 30 seconds | NA                           | Yes |
| 8        | 6 minutes 45 seconds | NA                           | Yes |

**Table 2-3. LED States**

| State                    | LED State                        | Mode                    | Note                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------|----------------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Shed                     | 1 second flash<br>(1 On – 1 Off) | Generator               | Module detected an overload and shed its load. This state only occurs in generator mode, or during a first time utility power-up for five minutes of initial operation.                                                                                                                                                                                                                                  |
| Lockout<br>(30 minutes)  | 3 second flash<br>(3 On – 3 Off) | Generator               | Module detected an overload while trying to recover from a shed situation. Operation is disabled for 30 minutes. This state only occurs in generator mode.                                                                                                                                                                                                                                               |
| Lockout<br>Switch Active | 6 second flash<br>(6 On – 6 Off) | Generator               | Module output is disabled and there is no power to the appliance while in generator mode and generator is overloaded. Lockout switch must be ON. See <a href="#">Table 2-2</a> .                                                                                                                                                                                                                         |
| Lockout<br>Switch Active | ON                               | Utility                 | Lockout switch operates in generator mode only. It has no function in utility mode. LED is solid, indicating the load is connected. Lockout switch must be ON. See <a href="#">Table 2-2</a> .                                                                                                                                                                                                           |
| Normal                   | ON                               | Generator or<br>Utility | Indicates the appliance has power. This is the default in utility mode. It is the normal operating state in generator mode when an overload is not detected.                                                                                                                                                                                                                                             |
| Test                     | 1 second flash                   | Generator or<br>Utility | Test button triggers a typical shed condition and overrides all other states except generator lockout switch ACTIVE state.<br><br><b>NOTE:</b> Actual test time varies depending on SMM priority setting. Use the following formula to calculate test time:<br>Time = (P-1) x 15 seconds, where P represents priority setting.<br>Example: SMM Priority 6 test time = (6-1) x 15 seconds, or 75 seconds. |

19. The small backup power system of claim 17 wherein a name or other identifier can be assigned to the first load coupler via the user input circuit by an installer at the time of installation of the first load coupler.

- Defendant's power system comprises name or other identifiers that can be assigned to a first load coupler via the user input circuit by an installer at the time of installation of the first load coupler.
- This section from the PWRmanager Installation Manual details how a user can assign a name or identifier to the load coupler.

**Load Label**

Tap on the Circuit Name field and enter a text label up to 39 characters long. This will display for the homeowner when they are viewing their circuits in the PWRview app.

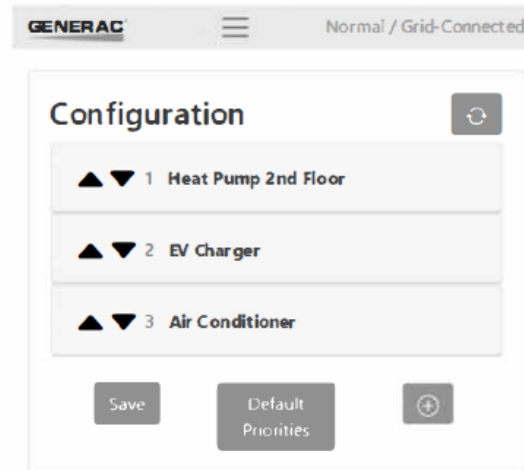
20. The small backup power system of claim 17 wherein the priority of the first load can be assigned to the first load coupler via the user input circuit by an installer at the time of installation of the first load coupler.

- Defendant's power system further comprises assigning priority of the first load to the first load coupler via the user input circuit by an installer at the time of installation of the load coupler.
- Defendant's literature details how a user can assign priorities to each of the load couplers and reorder them as necessary.

### Configure Load Priorities

See [Figure 4-10](#). If the categories have been set appropriately for all circuits, then tapping on the Default Priorities button will set the priorities.

**NOTE:** Tap Save to store the priorities configured. To abandon all changes, click the refresh button in the header of the page.



012661

**Figure 4-10. Configure Load Priorities**

See [Figure 4-11](#) and [Figure 4-12](#). Review the priority sequence with the homeowner. Adjust the priorities by reordering loads in the list using the Up and Down arrows beside each load's label. Other circuits will be re-assigned priorities to accommodate the change made. The order the circuits display in the web interface tool will reflect the priority order. The highest priority loads (lowest priority number) will appear at the top, and lower priority loads toward the bottom.

21. The small backup power system of claim 17 wherein in e) the processor circuit causes a load shed in response to sensing, at the line terminal of the contactor, a drop in the voltage of the power provided by the second power source.

- Defendant's power system comprises the processor circuit causing a load shed in response to sensing, at the line terminal of the contactor, a drop in the voltage of the power provided by the second power source.
- Defendant's PWRmanager senses the power provided by the PWRcell inverter at the line terminal of the contactor. The inverter is designed to initially lower its output voltage to cause a load shed on overload. Because the PWRmanager is designed to work with the inverter, the PWRmanager will also respond to that voltage to initiate a load shed.

## Overload Behavior

Table 9-2. Overload Behavior

| Island Overload Event                                                                               | Cause                                                                                          | Behavior                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Solution            |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Overload on Voltage<br><br>(vulnerable when battery has low SoC)                                    | Load demand is too high and the inverter has dropped it's voltage in an attempt to compensate. | <ul style="list-style-type: none"> <li>– If inverter output voltage drops below 114 V, inverter will attempt to shed any loads connected to load management devices by dropping frequency.</li> <li>– If the inverter drops below 96 V for more than 6 sec (loads will brown out during this time), the system will blackout all loads.</li> </ul>                                                                                                                      | – Reduce house load |
| Overload on Current<br><br>(vulnerable to this condition when system does not have an external ATS) | There is too much load on the protected loads panel.                                           | <ul style="list-style-type: none"> <li>– If inverter experiences current greater than 35 amps L-N, the inverter will prevent transfer back to the grid and system will stay islanded.</li> <li>– If inverter experiences current greater than 35 amps for more than 15 seconds it will blackout and attempt to power loads at an increasing interval, starting at 20 seconds and increasing by 20 seconds between each attempt, up to a maximum of one hour.</li> </ul> | – Reduce house load |

22. The small backup power system of claim 17 wherein in e) the processor circuit causes a load shed in response to sensing, at the line terminal of the contactor, the current of the power provided by the second power source and consumed by the first load.

- Defendant's power system's processor circuit causes a load shed in response to sensing, at the line terminal of the contactor, the current of the power provided by the second power source and consumed by the first load.
- The power output and frequency of the AC power of the PWRcell Inverter is sensed by Defendant's processor circuit which communicates to the PWRmanager to open the contactor to shed a load.

## Overload Behavior

Table 9-2. Overload Behavior

| Island Overload Event                                                                               | Cause                                                                                          | Behavior                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Solution            |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Overload on Voltage<br><br>(vulnerable when battery has low SoC)                                    | Load demand is too high and the inverter has dropped it's voltage in an attempt to compensate. | <ul style="list-style-type: none"> <li>If inverter output voltage drops below 114 V, inverter will attempt to shed any loads connected to load management devices by dropping frequency.</li> <li>If the inverter drops below 96 V for more than 6 sec (loads will brown out during this time), the system will blackout all loads.</li> </ul>                                                                                                                      | – Reduce house load |
| Overload on Current<br><br>(vulnerable to this condition when system does not have an external ATS) | There is too much load on the protected loads panel.                                           | <ul style="list-style-type: none"> <li>If inverter experiences current greater than 35 amps L-N, the inverter will prevent transfer back to the grid and system will stay islanded.</li> <li>If inverter experiences current greater than 35 amps for more than 15 seconds it will blackout and attempt to power loads at an increasing interval, starting at 20 seconds and increasing by 20 seconds between each attempt, up to a maximum of one hour.</li> </ul> | – Reduce house load |

## Load Management Options

Load management systems are designed to prevent a power source such as an inverter from being overloaded by large appliance loads. Options include:

- Smart Management Modules (SMMs)
- Smart A/C Module (SACM) (found in PWRview transfer switch)
- Advanced Load Controller: PWRmanager

When using the PWRmanager in a system, it will control 12 circuits and two HVAC thermostat channels. Additional circuits can be managed by adding SMMs and configuring for lockout.

Do not use SACM circuits when using PWRmanager; instead use the PWRmanager's HVAC thermostat circuits.

## SMM and Carton Contents

**Priority Dial (A)** – Sets module priority.

**NOTE: PRIORITY MUST BE DIFFERENT for each module in an installation.** Priority sets the order in which loads recover from a load shed event. Recovery time from a load shed event is five minutes for Priority 1. Each priority after Priority 1 waits an additional 15 seconds after the initial recovery time. See [Table 2-1](#).

**Lockout Switch (B)** – Enables or disables lockout function. Switch positions are LOCKOUT LOAD ON GENERATOR (enabled) and LOCKOUT DISABLED. See [Table 2-2](#).

**NOTE:** Recovery time is based on priority dial settings. See [Table 2-1](#).

**Test Button (C)** – Disables contactor output for a specified time.

**LED (D)** – Provides module status. See [Table 2-3](#).

**Contactor (E)** – Normally CLOSED. If the generator begins to overload, the contactor opens to take the load off generator power. The contactor also opens to take the load off generator power. See [Connections](#).

**Mounting Holes (F)** – Internal enclosure mounting holes provide clean and sturdy mounting.

**Priority Decal (G)** – Provided for recording priority of each module in installation. Install on electrical panel.

23. The small backup power system of claim 17 wherein in e) the processor circuit causes a load shed in response to sensing, at the line terminal of the contactor, a drop in the frequency of the power provided by the second power source the drop in frequency representing a known amount of power being supplied by the second power source.

- Defendant's processor circuit causes a load shed in response to sensing, at the line terminal of the contactor, a drop in frequency of the power provided by the second power source, the drop in frequency representing a known amount of power being supplied by the second power source.
- The frequency of the power output from Defendant's PWRcell Inverter is controlled and reduced to cause a load shed when the inverter is nearing its maximum output power capability.
- This is both true of systems using Defendant's SMM's, PWRmanagers, HVAC Energy Managers, and Load Managers.

#### Application Considerations

An overload condition is determined by the PWRcell inverter frequency while the inverter is in island mode. Loads are managed and de-energized when frequency is less than 58 Hz for three seconds or less than 50 Hz for ½ second (for 60 Hz systems).

The controller can be used in conjunction with individual SMMs to manage a combined total of eight loads.

- The priority order determines the order in which managed loads are re-energized by the load management system after all of the managed loads have been de-energized due to an overload condition.
- Use Priorities A/C 1-4 on the controller as the top priorities, then up to four SMMs as Priorities 5-8.
- Use only select A/C priorities on the controller as the top priorities, then use additional SMMs as the remaining priorities.
- A SMM can share a priority with an A/C priority on the controller provided the standby power source is sized to handle the combined surge load from both appliances. Sharing priorities can allow up to 12 loads to be managed in a properly sized system.

24. The small backup power system of claim 17 wherein the processor circuit causes a load shed at a known time after the start of an overload the known time responsive to the amount of overload and duration of overload as determined by sensing, at the contactor line terminal, the frequency of the power provided by the second power source.

- Defendant's processor circuit causes a load shed at a known time after the start of an overload the known time responsive to the amount of overload and duration of overload as determined by sensing, at the contactor line terminal, the frequency of the power provided by the second power source.
- As shown, the known time for an overload which causes a 58 Hz frequency is three seconds. The overload is determined by the processor sensing the frequency of the power provided by the inverter at the contactor line terminal.

### Application Considerations

An overload condition is determined by the PWRcell inverter frequency while the inverter is in island mode. Loads are managed and de-energized when frequency is less than 58 Hz for three seconds or less than 50 Hz for ½ second (for 60 Hz systems).

The controller can be used in conjunction with individual SMMs to manage a combined total of eight loads.

- The priority order determines the order in which managed loads are re-energized by the load management system after all of the managed loads have been de-energized due to an overload condition.
- Use Priorities A/C 1-4 on the controller as the top priorities, then up to four SMMs as Priorities 5-8.
- Use only select A/C priorities on the controller as the top priorities, then use additional SMMs as the remaining priorities.
- A SMM can share a priority with an A/C priority on the controller provided the standby power source is sized to handle the combined surge load from both appliances. Sharing priorities can allow up to 12 loads to be managed in a properly sized system.

25. The small backup power system of claim 17 where in response to sensing, at the contactor line terminal, a drop in the frequency of the power provided by the second power source, the processor circuit creates a load shed followed by causing the contactor to close the power circuit to the first load after at least a known amount of time after that overload ends.

- Defendant's processor circuit functions to close the contactor after creating a load shed in response to a drop in frequency, resupplying power to the load after at least a known amount of time.
- First, the processor circuit senses the drop in frequency of the power provided by the inverter at the contactor line terminal and sheds a load.
- Table 1 shows the known amounts of time after the overload ends when the loads of different priorities are reenergized.
- This is true of Defendant's systems using either SMM's or a PWRmanager.

#### Application Considerations

An overload condition is determined by the PWRcell inverter frequency while the inverter is in island mode. Loads are managed and de-energized when frequency is less than 58 Hz for three seconds or less than 50 Hz for ½ second (for 60 Hz systems).

The controller can be used in conjunction with individual SMMs to manage a combined total of eight loads.

- The priority order determines the order in which managed loads are re-energized by the load management system after all of the managed loads have been de-energized due to an overload condition.
- Use Priorities A/C 1-4 on the controller as the top priorities, then up to four SMMs as Priorities 5-8.
- Use only select A/C priorities on the controller as the top priorities, then use additional SMMs as the remaining priorities.
- A SMM can share a priority with an A/C priority on the controller provided the standby power source is sized to handle the combined surge load from both appliances. Sharing priorities can allow up to 12 loads to be managed in a properly sized system.

**Table 1. Priority Settings**

| Priority | Recovery Time        | PWRcell<br>ATS<br>Controller | SMM |
|----------|----------------------|------------------------------|-----|
| 1        | 5 minutes            | Yes                          | Yes |
| 2        | 5 minutes 15 seconds | Yes                          | Yes |
| 3        | 5 minutes 30 seconds | Yes                          | Yes |
| 4        | 5 minutes 45 seconds | Yes                          | Yes |
| 5        | 6 minutes            | NA                           | Yes |
| 6        | 6 minutes 15 seconds | NA                           | Yes |
| 7        | 6 minutes 30 seconds | NA                           | Yes |
| 8        | 6 minutes 45 seconds | NA                           | Yes |

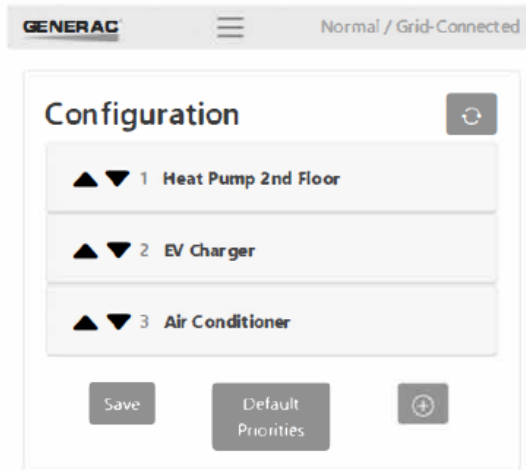
26. The small backup power system of claim 25 wherein the known amount of time is responsive to the configuration which the installer provides when the load coupler is installed.

- Defendant's power system's known amount of time to close the contactor subsequent to load shed is responsive to the configuration which the installer provides when the load coupler is installed.
- The PWRmanager system responds to the amount of time set when the installer sets the load priority installer when the load coupler is installed.

### Configure Load Priorities

See [Figure 4-10](#). If the categories have been set appropriately for all circuits, then tapping on the Default Priorities button will set the priorities.

**NOTE:** Tap Save to store the priorities configured. To abandon all changes, click the refresh button in the header of the page.



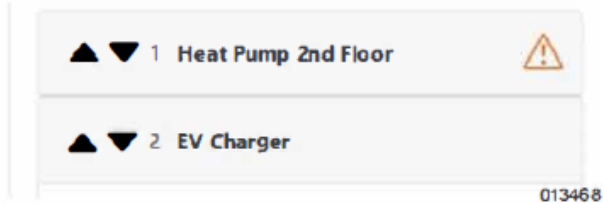
012661

**Figure 4-10. Configure Load Priorities**

See [Figure 4-11](#) and [Figure 4-12](#). Review the priority sequence with the homeowner. Adjust the priorities by reordering loads in the list using the Up and Down arrows beside each load's label. Other circuits will be re-assigned priorities to accommodate the change made. The order the circuits display in the web interface tool will reflect the priority order. The highest priority loads (lowest priority number) will appear at the top, and lower priority loads toward the bottom.

### Minimum Off Time

- Some circuits require a minimum off time to allow them to return to ready state.
- For any equipment like this, set a minimum off time of 5 minutes.
- If the homeowner attempts to restart load too soon, the app will inform it is pending and display a warning icon. See [Figure 4-9](#). The load will start after the delay time expires.



013468

**Figure 4-9. Minimum off Time Warning Icon**

27. The small backup power system of claim 25 wherein the known amount of time is responsive to the priority which the installer assigns to the load when the load coupler is installed.

- Defendant's power system's known amount of time to close the contactor subsequent to load shed is responsive to the priority the installer assigns to the load when the load coupler is installed.
- Table 1 shows the known amounts of time after the overload ends when the loads of different priorities are reenergized.
- This applies to systems using either SMMs or a PWRmanager.

**Table 1. Priority Settings**

| Priority | Recovery Time        | PWRcell<br>ATS<br>Controller | SMM |
|----------|----------------------|------------------------------|-----|
| 1        | 5 minutes            | Yes                          | Yes |
| 2        | 5 minutes 15 seconds | Yes                          | Yes |
| 3        | 5 minutes 30 seconds | Yes                          | Yes |
| 4        | 5 minutes 45 seconds | Yes                          | Yes |
| 5        | 6 minutes            | NA                           | Yes |
| 6        | 6 minutes 15 seconds | NA                           | Yes |
| 7        | 6 minutes 30 seconds | NA                           | Yes |
| 8        | 6 minutes 45 seconds | NA                           | Yes |

28. The small backup power system of claim 17 wherein the load coupler is responsive to an installer's input to the user input circuit such that the installer can cause opening or closing of the contactor.

- Defendant's power system comprises a load coupler responsive to an installer's input to the user input circuit such that the installer can cause opening or closing of the contactor.
- The instructions for turning the system over to the homeowner detail showing that the system can turn a load on and off. This functionality shows that "the installer can cause opening or closing of the contactor."

### Hand over to Homeowner

Steps to follow in handing the system over to the homeowner:

1. Once the registration is complete, confirm that they can log in to the PWRview App and see the circuits page in the app.
2. Explain the loads which have been configured for Lockout and with priorities.
3. Show the ability to turn a load on and off. To download the PWRview App, please visit the link below.

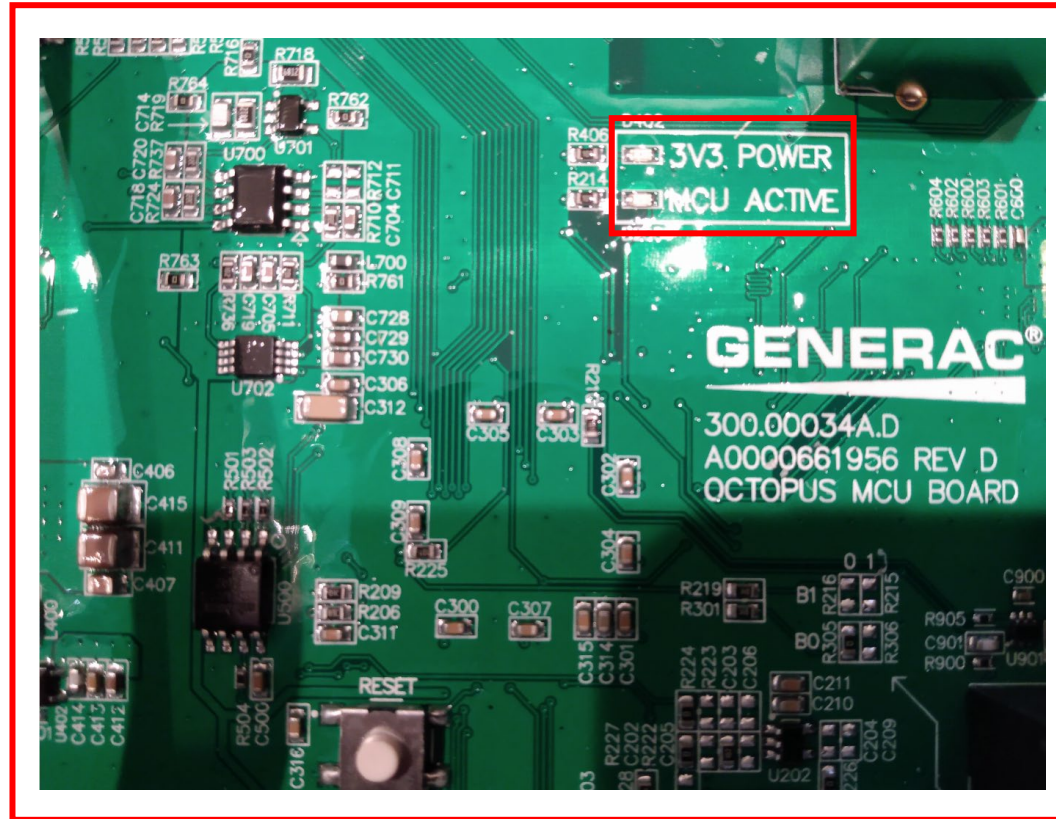


Source – Generac PWRmanager Installation Manual

Source – Generac PWRmanager Breakdown Photos and Instructions Manual

29. The small backup power system of claim 17 wherein the processor circuit is configured to include a microcontroller, the contactor receives at its line terminal 240 volt A.C. power from the transfer switch, the power supply is configured to receive the 240 volt A.C. power from the line terminal of the contactor and provide low voltage D.C. power required by the microcontroller.

- Defendant's power system's processor circuit is configured to include a microcontroller, the contactor receiving at its line terminal 240 volt A.C. power from the transfer switch, the power supply configured to receive the 240 volt A.C. power from the line terminal of the contactor and provide low voltage D.C. power required by the microcontroller.
- As shown by the label, the processor incorporates an MCU or a micro controller unit. The contactor (relay 1) may be configured as a 240 volt contactor by pairing it with relay 2 and thereby receive 240 volt A.C. from the ATS via the panel, at its line terminals. Low voltage 3.3 volts DC to power the microcontroller is provided as demonstrated by the 3.3 volt D402 3V3 Power indicator LED indicator shown.



30. The small backup power system of claim 17 wherein before the processor circuit would otherwise close the contactor to resupply power to the first load when the known time period elapses, in response to one or more of:

- The known time periods corresponding to the load priorities will allow the respective load to be resupplied with power after the known time period elapses.

**Table 1. Priority Settings**

| Priority | Recovery Time        | PWRcell<br>ATS<br>Controller | SMM |
|----------|----------------------|------------------------------|-----|
| 1        | 5 minutes            | Yes                          | Yes |
| 2        | 5 minutes 15 seconds | Yes                          | Yes |
| 3        | 5 minutes 30 seconds | Yes                          | Yes |
| 4        | 5 minutes 45 seconds | Yes                          | Yes |
| 5        | 6 minutes            | NA                           | Yes |
| 6        | 6 minutes 15 seconds | NA                           | Yes |
| 7        | 6 minutes 30 seconds | NA                           | Yes |
| 8        | 6 minutes 45 seconds | NA                           | Yes |

i) the voltage of the power sensed at the contactor line connection,  
ii) the frequency of the power sensed at the contactor line connection,  
iii) the amount of total load on the second power source which amount is provided to the processor circuit by a monitoring circuit incorporated into the control system of the power source,  
iv) the total current being supplied by the second power source, ...

By having the loads wired through the PWRmanager and configured to run if they do not overload the inverter, the processor is responsive to at least iii).

### Prioritized Loads

These loads are wired through the PWRmanager and are configured to run if they do not overload the inverter. If the total load exceeds the power capacity of the inverter, these will be shed in priority order to ensure the inverter continues to run. For best impact, the higher wattage loads should be used here:

- Stove, Oven
- Miscellaneous lighting and plug loads
- Heating and Air Conditioning equipment

the processor first determines at least one of whether the second power source is overloaded or if connecting the first load will cause the second power source to become overloaded, and if one of those conditions exists, the processor does not close the contactor to prevent the first load from being connected to the second power source and further waits at least a second time period before again attempting to close the contactor.

### Prioritized Loads

These loads are wired through the PWRmanager and are configured to run if they do not overload the inverter. If the total load exceeds the power capacity of the inverter, these will be shed in priority order to ensure the inverter continues to run. For best impact, the higher wattage loads should be used here:

- Stove, Oven
- Miscellaneous lighting and plug loads
- Heating and Air Conditioning equipment

**Table 1. Priority Settings**

| Priority | Recovery Time        | PWRcell<br>ATS<br>Controller | SMM |
|----------|----------------------|------------------------------|-----|
| 1        | 5 minutes            | Yes                          | Yes |
| 2        | 5 minutes 15 seconds | Yes                          | Yes |
| 3        | 5 minutes 30 seconds | Yes                          | Yes |
| 4        | 5 minutes 45 seconds | Yes                          | Yes |
| 5        | 6 minutes            | NA                           | Yes |
| 6        | 6 minutes 15 seconds | NA                           | Yes |
| 7        | 6 minutes 30 seconds | NA                           | Yes |
| 8        | 6 minutes 45 seconds | NA                           | Yes |

The processor determines if “the total load exceeds the power capacity of the inverter,” and if connecting the first load will cause the second power source to become overloaded. If either condition exists, the processor will not close the contactor. This prevents the first load from being connected to the power source. The processor can further wait at least a second time period before again attempting to close the contactor.

Source – Generac PWRmanager Installation Manual and PWRcell Automatic Transfer Switch Owner’s Manual

# **EXHIBIT C**

Plaintiff's Preliminary Infringement Contentions  
Exhibit C

U.S. Pat. No. 11,967,857  
Power Source Load Control

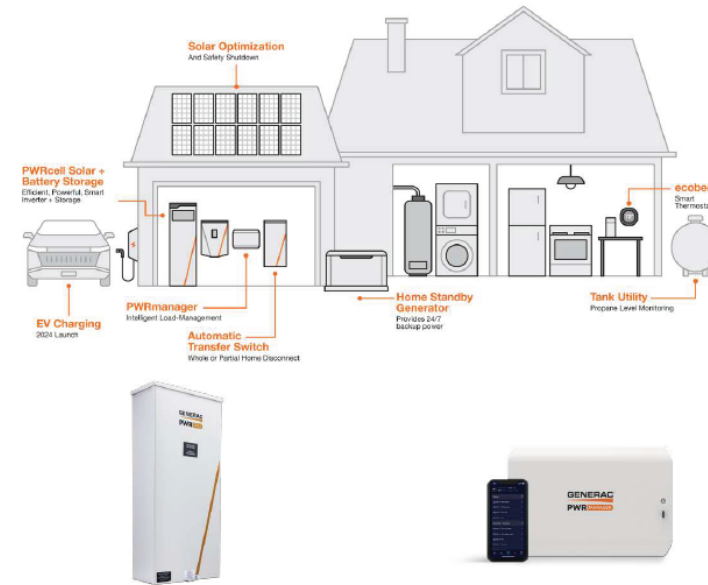
1. A power system which provides A.C. power with a controlled A.C. frequency to assist in managing the loading thereof, the power system comprising:

- Defendant offers multiple power systems providing AC power with a controlled AC frequency to assist in managing loading.
- Defendant advertises its power systems as PWRcell Energy Storage Systems which can encompass multiple different configurations and system architectures and are designed to work with multiple different types of power sources including, PWRcell Batteries, PV Arrays, back up generators, and other types of power sources.
- Different embodiments of Defendant's systems contain a wide range of Defendant's products. See list of "Accused Products" in Plaintiff's Preliminary Infringement Contentions.
- Defendant refers publicly to its Integrated Home Energy Ecosystem, as the components are designed to work together.

## Integrated Home Energy Ecosystem

PWRcell isn't just a powerful battery, but it's also the most flexible and scalable home energy system on the market. With a range of supplementary products and features, PWRcell can be configured to meet just about any budget or lifestyle so you get a solution tailored to your unique needs.

Each component has also been designed to work better together. The PWRmanager advanced load management device and features like Outage Guard integrate seamlessly with PWRcell, helping provide additional protection from outages and invaluable peace of mind.



### Automatic Transfer Switch

An integrated solar + battery storage system is made easy with the PWRcell Automatic Transfer Switch (ATS). Power your home and manage up to four individual HVAC (24 VAC controlled) loads with the PWRcell ATS.

6 | Generac Power Systems

### PWRmanager

The PWRmanager advanced load management device enhances whole home backup power and provides simplified control of up to twelve 120 V circuits or six 240 V circuits plus two thermostats. PWRmanager will automatically manage those loads during an outage to extend backup duration and prevent inverter overload.

## Advanced Load Management

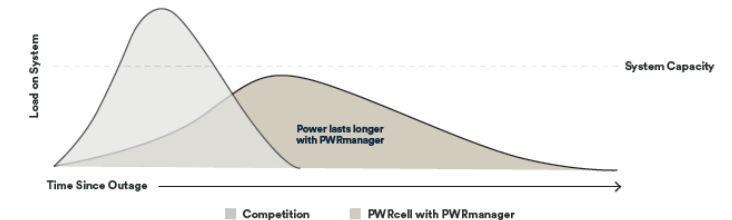
Load management systems are designed to prevent a standby power source, such as an energy storage system, from being overloaded while providing backup power during an outage. The PWRmanager advanced load management system also provides an in-hand ability to turn circuits on or off during an outage, or even while on grid.

PWRmanager provides a richly integrated load management functionality when used with the PWRcell system.

### Advanced Load Management with PWRmanager

#### Cost-effective Solution to Whole Home Power

The PWRmanager advanced load management device adds unbeatable flexibility and value to the PWRcell System. Controlled via the user-friendly PWRview app, PWRmanager enables batteries to work smarter, so a smaller system can power the home for longer.

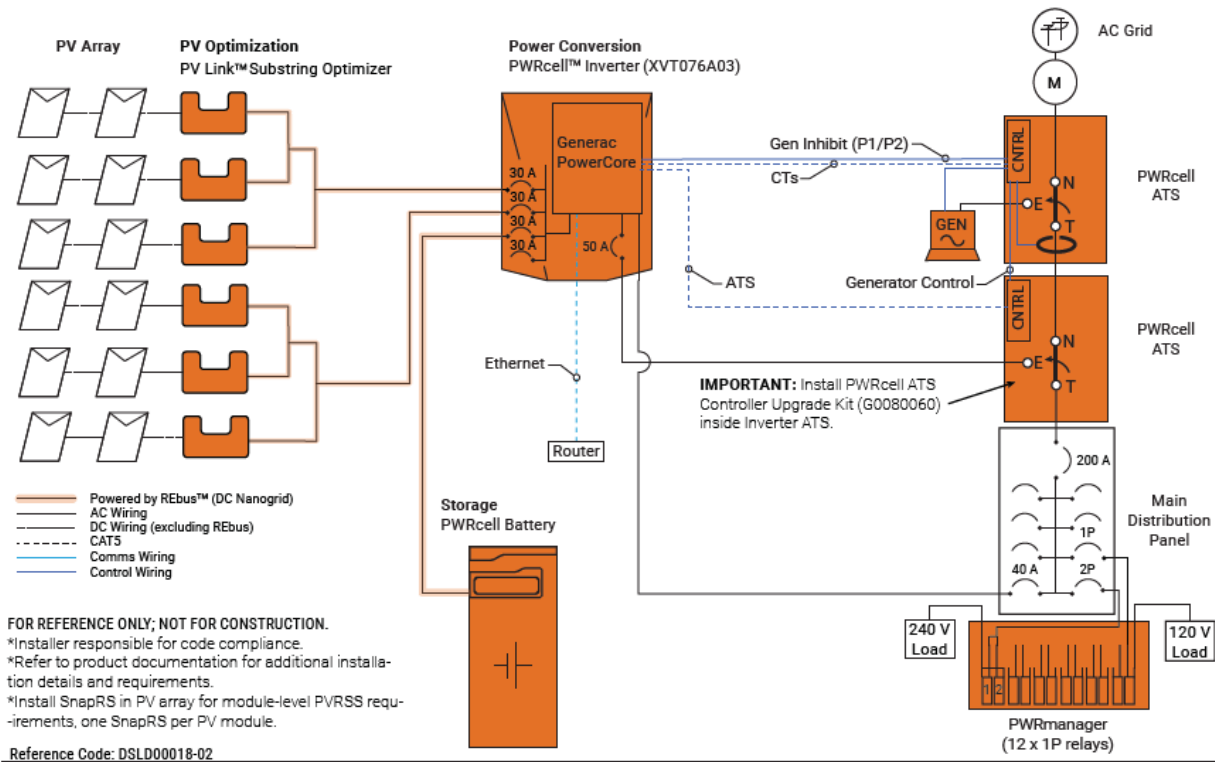


During an outage, PWRmanager extends backup duration and prevents the PWRcell system from being overloaded by too many large loads being turned on at once.

PWRcell Consumer Brochure | 5

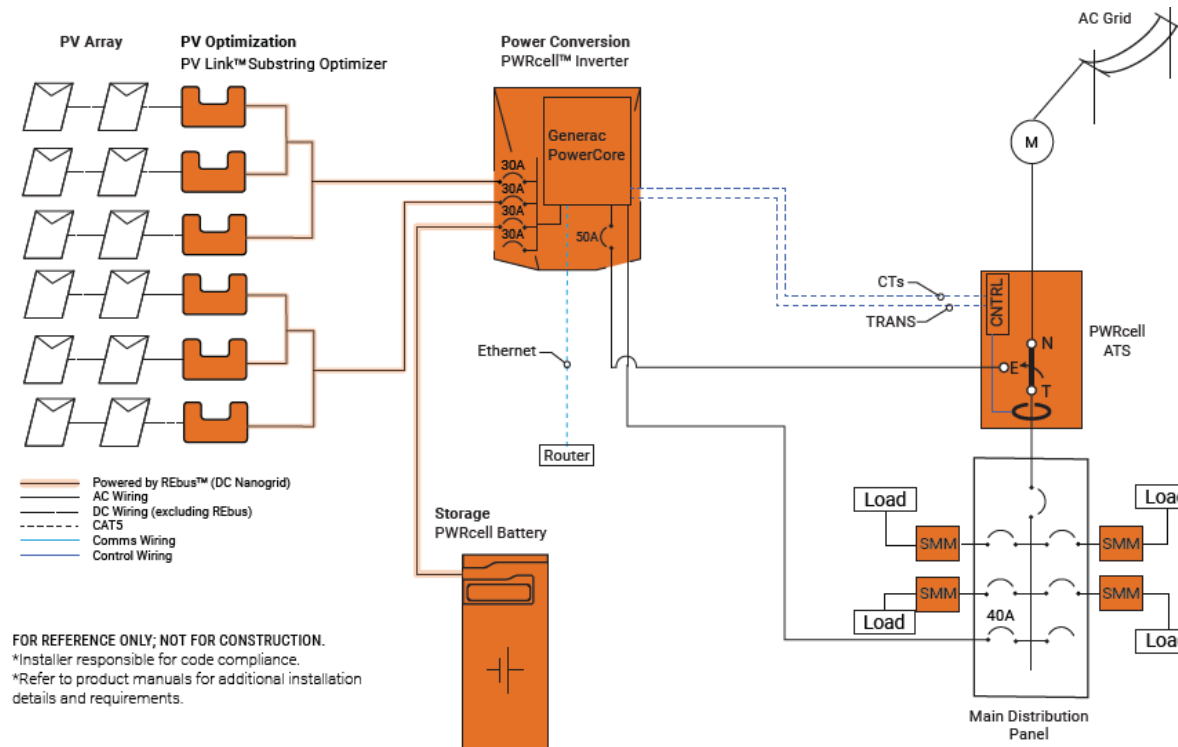
1. A power system which provides A.C. power with a controlled A.C. frequency to assist in managing the loading thereof, the power system comprising:

- For example, the diagram on this slide is an exemplary diagram modelling a PWRcell Energy Power Storage System provided by Defendant.
- This figure demonstrates how Defendant's AC Generators can be integrated into the PWRcell Energy Storage System and provide further backup power.
- Defendant's PWRcell Inverter controls its AC frequency to assist in managing loads to thereby cause the PWRmanager to disconnect loads. In this configuration, the PWRcell Inverter converts DC power from either the PWRcell Battery or PV array to controlled AC power to power loads.



1. A power system which provides A.C. power with a controlled A.C. frequency to assist in managing the loading thereof, the power system comprising:

- The diagram shown on this slide is another exemplary diagram provided by Defendant illustrating one of its PWRcell Energy Storage Systems.
- This figure demonstrates how SMM's can be used in place of the PWRmanager to accomplish load management.



Reference Code: 2315-01

This design shows a Generac PWRcell system with a PWRcell ATS in a whole home backup configuration. Use this system configuration to provide backup power to the main service panel loads using Generac Smart Management Modules (SMMs) for load shedding in accordance with NEC 702.4(B) and Article 220.

This configuration is acceptable with 200A or larger utility services.

Part No. A0000521683 | Rev. F | 25 FEB 2021

#### Whole Home Backup / Solar + Storage

- 1 PWRcell Inverter
- 6 PV Links
- 1 PWRcell Battery
- 1 CT Kit (incl.)
- 1 PWRcell ATS
- 4 Generac SMMs

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**GENERAC®**

Generac Power Systems, Inc.  
S45 W29290 Hwy. 59  
Waukesha, WI 53189

1. A power system which provides A.C. power with a controlled A.C. frequency to assist in managing the loading thereof, the power system comprising:

- The diagram on this slide is another exemplary diagram modelling a PWRcell Energy Power Storage Systems comprising components including Defendant's PWRcell Inverter, PV Substring Optimizer, PWRcell Battery, PWRmanager, PWRcell ATS, Rebus DC nanogrid wiring and Current Transformer Kits.
- Defendant's PWRcell Inverter can convert DC power from the PV Array and/or Storage Battery to AC power which flows into the Main Distribution Panel through the 40A Circuit Breaker to power loads.
- There are two main modes of operation that the inverter can operate in, grid-tied where the inverter output AC power frequency is controlled to be locked to the grid power frequency, and island (backup power) mode where the grid has failed and the inverter power output frequency is controlled to be substantially the same as the nominal power line frequency, (60 Hz in the U.S.), when the inverter is operating normally, and when the inverter is approaching or reaches overload the inverter frequency is controlled to drop to a lower frequency, e.g. 58 Hz or lower. Thus, the output power frequency is controlled.

### New PWRcell Installation Including Load Management

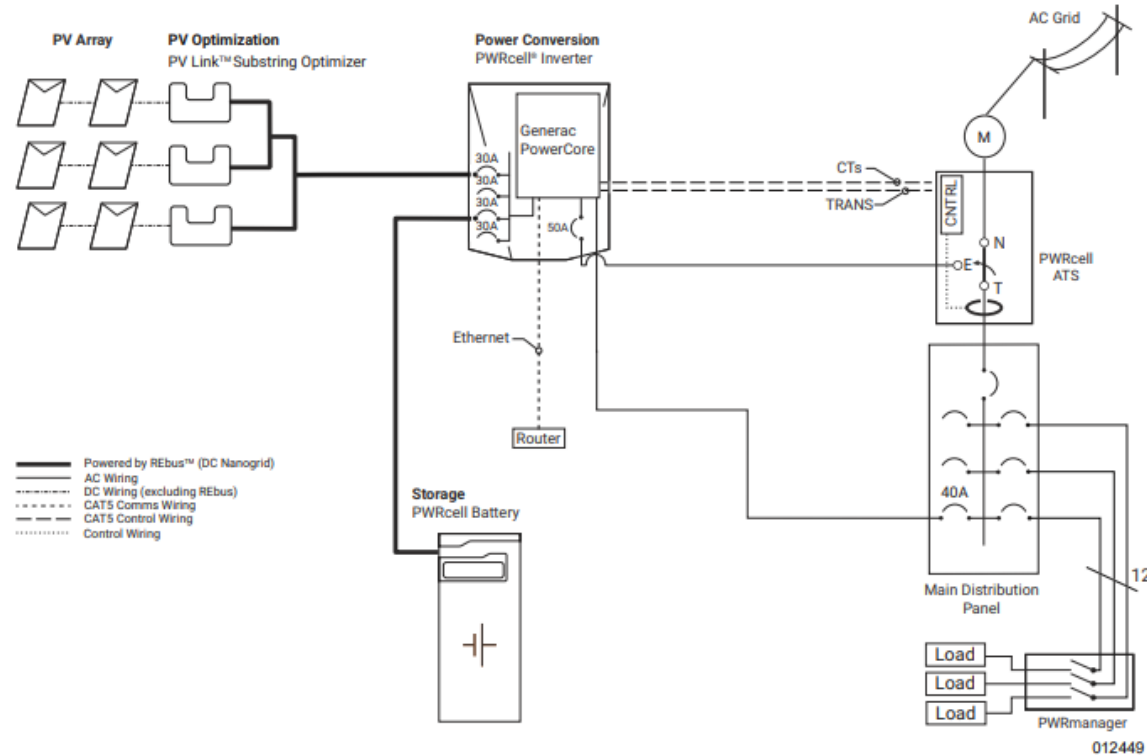
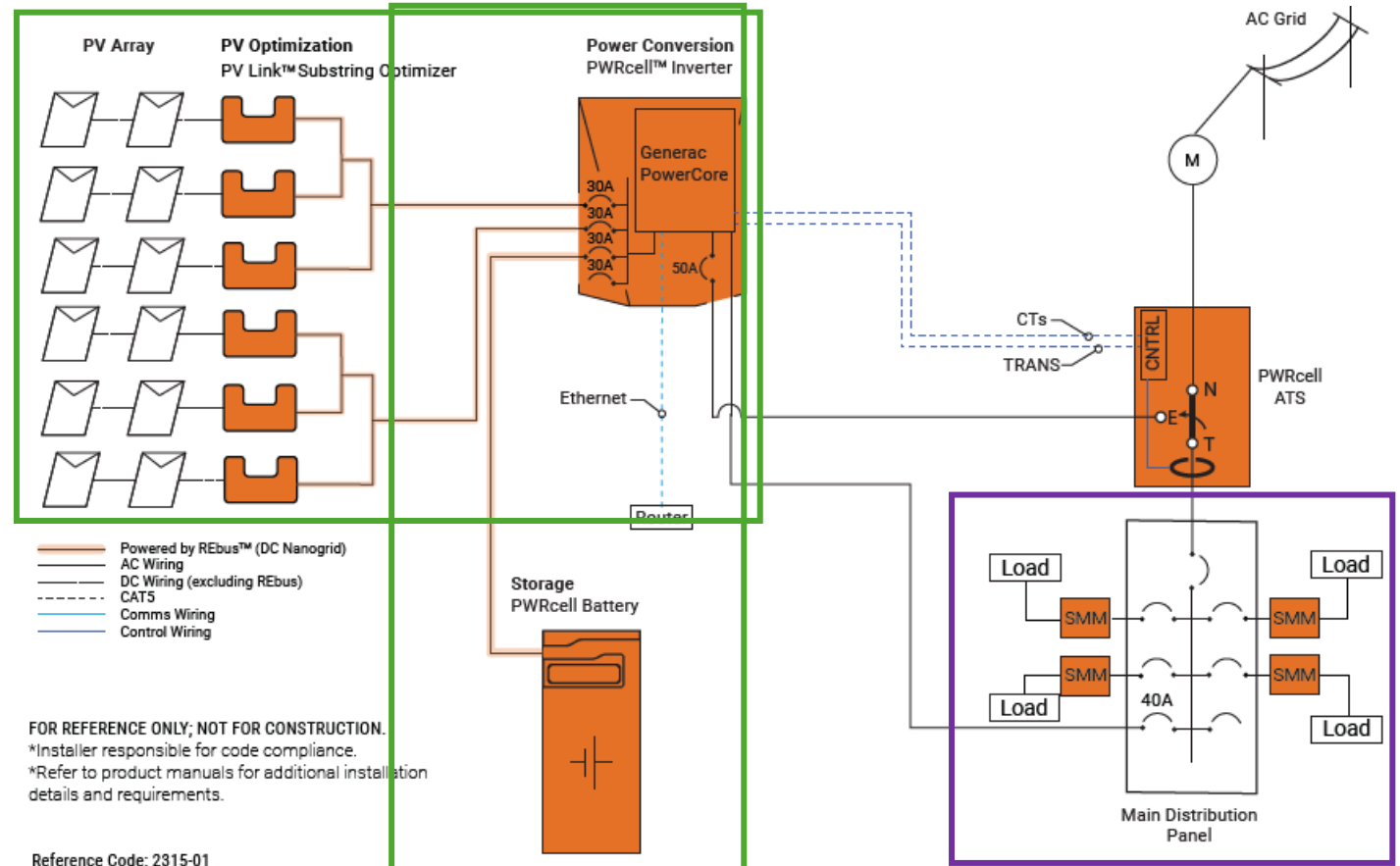


Figure 8-1. New PWRcell Installation Including Load Management

1. (a) a non-utility type power source comprising an inverter which provides single or multiple phase output A.C. power to one or more of a plurality of loads, the power source having at least one maximum output power parameter which if exceeded causes an overload of the power source, the output A.C. power having an A.C. frequency, which frequency is controlled in response to the timely amount of the output A.C. power;

- Defendant offers multiple power systems comprising non-utility type power sources comprising an inverter providing single or multiple phase output A.C. power to one or more of a plurality of loads where the power source has at least one maximum output power parameter which if exceeded causes an overload of the power source, the output A.C. power having an A.C. frequency which is controlled in response to the timely amount of the output A.C. power.
- The PWRcell inverter can convert DC power from DC power sources including PV Arrays and/or the PWRcell Battery to AC power which flows into the Main Distribution Panel through the 40A Circuit Breaker to power one or more of a plurality of loads.
- These loads can include but are not limited to the loads pictured attached to the main distribution panel in the bottom right of the diagram.



Reference Code: 2315-01

This design shows a Generac PWRcell system with a PWRcell ATS in a whole home backup configuration. Use this system configuration to provide backup power to the main service panel loads using Generac Smart Management Modules (SMMs) for load shedding in accordance with NEC 702.4(B) and Article 220.

This configuration is acceptable with 200A or larger utility services.

Part No. A0000521683 | Rev. F | 25 FEB 2021

**Whole Home Backup / Solar + Storage**

- |                      |                    |
|----------------------|--------------------|
| - 1 PWRcell Inverter | - 1 CT Kit (incl.) |
| - 6 PV Links         | - 1 PWRcell ATS    |
| - 1 PWRcell Battery  | - 4 Generac SMMs   |

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1. (a) a non-utility type power source comprising an inverter which provides single or multiple phase output A.C. power to one or more of a plurality of loads, the power source having at least one maximum output power parameter which if exceeded causes an overload of the power source, the output A.C. power having an A.C. frequency, which frequency is controlled in response to the timely amount of the output A.C. power;

- The specifications provided by Defendant describe the maximum output power parameter of the power source.
- The specifications also describe the output frequency of the A.C. power of the power source.
- This further relates to the power source's maximum output parameters.

## Section 2: General Information

### Specifications

| Description                                                                                                            | Units | XVT076A03 |
|------------------------------------------------------------------------------------------------------------------------|-------|-----------|
| Max. cont. grid-tied AC power @ 122°F (50°C)                                                                           | kW    | 7.6       |
| Max. cont. AC power in island mode w/ external transfer switch and single 6 module battery cabinet <sup>2</sup>        | kW    | 9.0       |
| Max. cont. AC power in island mode w/ external transfer switch and 2 battery cabinets (8 modules minimum) <sup>1</sup> | kW    | 11.0      |

[https://ressupply.com/documents/generac/XVT076A03\\_Installation\\_Manual.pdf](https://ressupply.com/documents/generac/XVT076A03_Installation_Manual.pdf)

### Application Considerations

An overload condition is determined by the PWRcell inverter frequency while the inverter is in island mode. Loads are managed and de-energized when frequency is less than 58 Hz for three seconds or less than 50 Hz for ½ second (for 60 Hz systems).

The controller can be used in conjunction with individual SMMS to manage a combined total of eight loads.

- The priority order determines the order in which managed loads are re-energized by the load management system after all of the managed loads have been de-energized due to an overload condition.
- Use Priorities A/C 1-4 on the controller as the top priorities, then up to four SMMS as Priorities 5-8.
- Use only select A/C priorities on the controller as the top priorities, then use additional SMMS as the remaining priorities.
- A SMM can share a priority with an A/C priority on the controller provided the standby power source is sized to handle the combined surge load from both appliances. Sharing priorities can allow up to 12 loads to be managed in a properly sized system.

### Ratings

| Description                                                      | Units  | Min  | Nominal             | Max  |
|------------------------------------------------------------------|--------|------|---------------------|------|
| Maximum Input Voltage (nanogrid)                                 | V      |      |                     | 420  |
| Range of Input Operating Voltage (nanogrid)                      | V      | 360  |                     | 400  |
| Maximum input current (nanogrid)                                 | A      |      |                     | 20   |
| Maximum input short circuit current (nanogrid)                   | A      |      |                     | 30   |
| Maximum input source backfeed current to input source (nanogrid) | A      |      |                     | 30   |
| Output power factor rating (ac)                                  | -      |      |                     | 1    |
| Operating Voltage range (ac) 2ph                                 | V, rms | 108  |                     | 130  |
| Operating Voltage range (ac) 3ph                                 | V, rms | 106  |                     | 132  |
| Operating frequency range or single frequency                    | Hz     | 59.6 |                     | 60.4 |
| Nominal output voltage (ac)                                      | V, rms |      | 120/240 & 208, 3 ph |      |
| Normal output frequency (ac)                                     | Hz     |      | 60                  |      |

1. (b) a power sensing circuit which may be part of the power source or otherwise and is responsive to the timely amount of the output A.C. power, the power source operating in response to the power sensing circuit to control the frequency of the output A.C. power to have a first frequency when the power source is not overloaded and a second frequency when the power source is overloaded or is near to being overloaded;

- Defendant offers multiple power systems comprising a power sensing circuit that is responsive to the timely amount of the output A.C. power, the power source operating in response to the power sensing circuit to control the frequency of the output A.C. power to have a first frequency when the power source is not overloaded and a second frequency when the power sourced is overloaded or is near to being overloaded.
- Defendant's power sensing circuit comprises electrical current sensors shown as current transformers (CTs) which provide timely power output parameters to the electronic processor in the PWRmanager via the CTs connection from the CNTRL, via the PWRcell and Ethernet connected network. The CT on the ATS measures the timely amount of power from the inverter's 50A output circuit breaker to the E input and the T output of the ATS when the inverter is selected.
- The CTs measure the current passing through the conductor within them and then the measurement signal passes through the dotted and dashed lines to the inverter.
- The inverter also has an internal power sensing circuit that is responsive to the timely amount of the output A.C. power and responds to the current information provided to it by the CTs and controls the frequency of its power in response to the level of the loads.
- In at least this way, the power sensing circuit timely monitors A.C. power such that the system may control the current provided to the loads.

### New PWRcell Installation Including Load Management

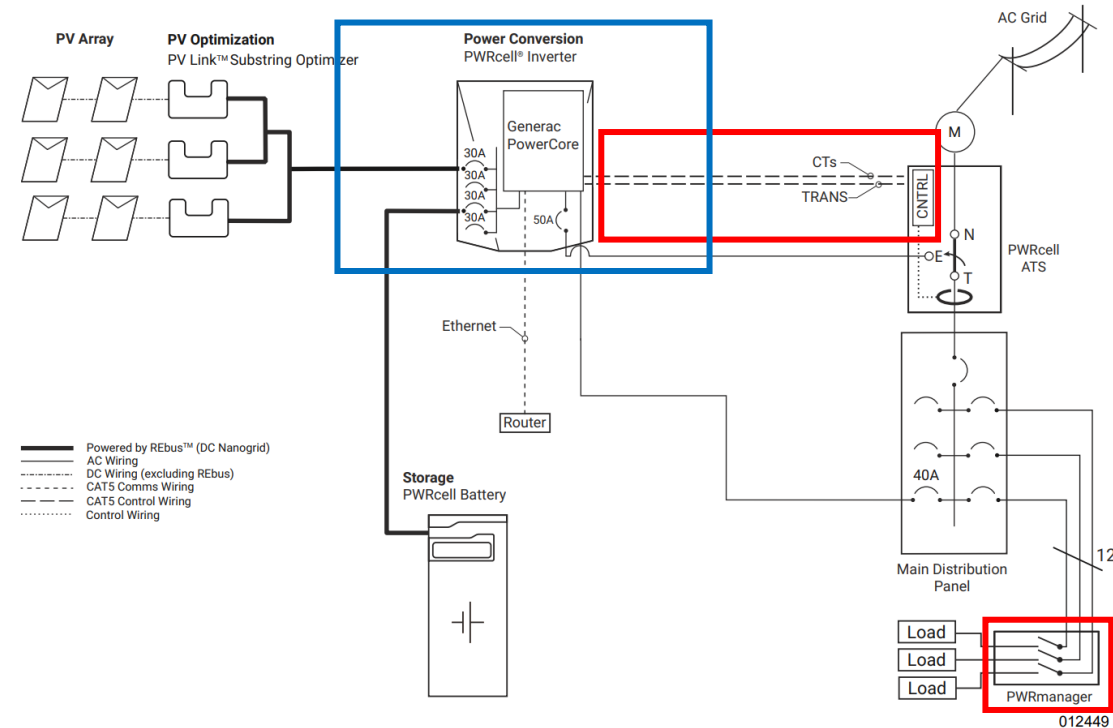


Figure 8-1. New PWRcell Installation Including Load Management

1. (b) a power sensing circuit which may be part of the power source or otherwise and is responsive to the timely amount of the output A.C. power, the power source operating in response to the power sensing circuit to control the frequency of the output A.C. power to have a first frequency when the power source is not over-loaded and a second frequency when the power source is overloaded or is near to being overloaded;

- Defendant's PWRcell Inverter responds to the current information provided to it by the CTs and controls the frequency of its power in response to the level of the loads.

#### Application Considerations

An overload condition is determined by the PWRcell inverter frequency while the inverter is in island mode. Loads are managed and de-energized when frequency is less than 58 Hz for three seconds or less than 50 Hz for ½ second (for 60 Hz systems).

The controller can be used in conjunction with individual SMMs to manage a combined total of eight loads.

- The priority order determines the order in which managed loads are re-energized by the load management system after all of the managed loads have been de-energized due to an overload condition.
- Use Priorities A/C 1-4 on the controller as the top priorities, then up to four SMMs as Priorities 5-8.
- Use only select A/C priorities on the controller as the top priorities, then use additional SMMs as the remaining priorities.
- A SMM can share a priority with an A/C priority on the controller provided the standby power source is sized to handle the combined surge load from both appliances. Sharing priorities can allow up to 12 loads to be managed in a properly sized system.

#### Overload Behavior

Table 9-2. Overload Behavior

| Island Overload Event                                                                               | Cause                                                                                          | Behavior                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Solution            |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Overload on Voltage<br><br>(vulnerable when battery has low SoC)                                    | Load demand is too high and the inverter has dropped it's voltage in an attempt to compensate. | <ul style="list-style-type: none"> <li>– If inverter output voltage drops below 114 V, inverter will attempt to shed any loads connected to load management devices by dropping frequency.</li> <li>– If the inverter drops below 96 V for more than 6 sec (loads will brown out during this time), the system will blackout all loads.</li> </ul>                                                                                                                      | – Reduce house load |
| Overload on Current<br><br>(vulnerable to this condition when system does not have an external ATS) | There is too much load on the protected loads panel.                                           | <ul style="list-style-type: none"> <li>– If inverter experiences current greater than 35 amps L-N, the inverter will prevent transfer back to the grid and system will stay islanded.</li> <li>– If inverter experiences current greater than 35 amps for more than 15 seconds it will blackout and attempt to power loads at an increasing interval, starting at 20 seconds and increasing by 20 seconds between each attempt, up to a maximum of one hour.</li> </ul> | – Reduce house load |

1. (c) a processor circuit comprising one or more processors responsive to the output A.C. power, the processor circuit operating in response to the occurrence of the second frequency to control the output A.C. power consumed by at least one load of the one or more loads thereby helping to prevent or alleviate an overload of the power source.

- Defendant offers multiple power systems comprising a processor circuit comprising one or more processors responsive to the output A.C. power, the processor circuit operating in response to the occurrence of the second frequency to control the output A.C. power consumed by at least one load of the one or more loads thereby helping to prevent or alleviate an overload of the power source.
- Defendant's PWRmanager responds to Defendant's PWRcell Inverter's previously described controlled frequency to control output power and receives updates from the inverter on how much power capacity it has and will prevent loads from starting up that would potentially brown out the system.
- This allows the PWRmanager to prevent a load from being connected to the inverter if that load can draw more power (the first load power parameter) than the generator is capable of providing at the time.

### New PWRcell Installation Including Load Management

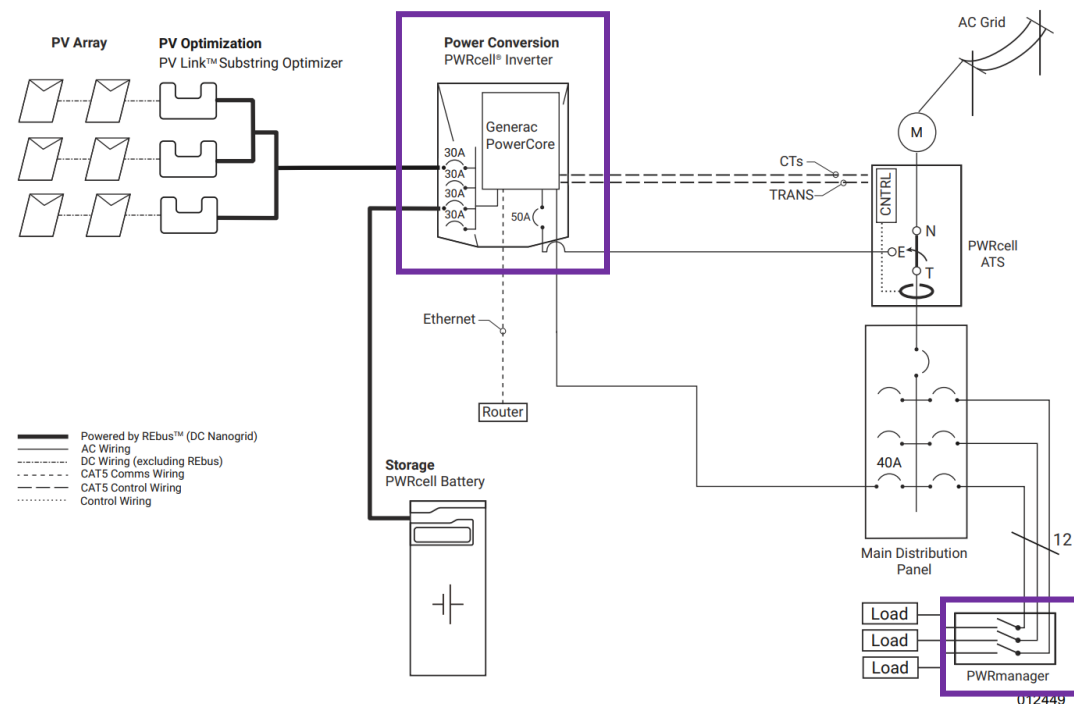


Figure 8-1. New PWRcell Installation Including Load Management

1. (c) a processor circuit comprising one or more processors responsive to the output A.C. power, the processor circuit operating in response to the occurrence of the second frequency to control the output A.C. power consumed by at least one load of the one or more loads thereby helping to prevent or alleviate an overload of the power source.

- A processor in the PWRcell Inverter monitors the output AC power via the CTs or internal sensor in the inverter and controls the output frequency to be 60 Hz when the inverter is not overloaded and below 58 Hz for at least three seconds if the Inverter is overloaded. If the overload continues, then the frequency is dropped below 50 Hz and stays there until the overload is cured. If the overload is not cured by the frequency drop (like a short circuit) the Inverter shuts down.
- A processor in the PWRmanager which both monitors Ethernet communications from the inverter and the voltage and frequency of the Inverter's output A.C. power and can disconnect loads in response to the ethernet communication and in response to the power frequency.
- Thus, if the inverter changes the frequency to 58 Hz PWR, the PWRmanager's processor (or the SMMs of slide 3's processor) can disconnect one or more loads.

### New PWRcell Installation Including Load Management

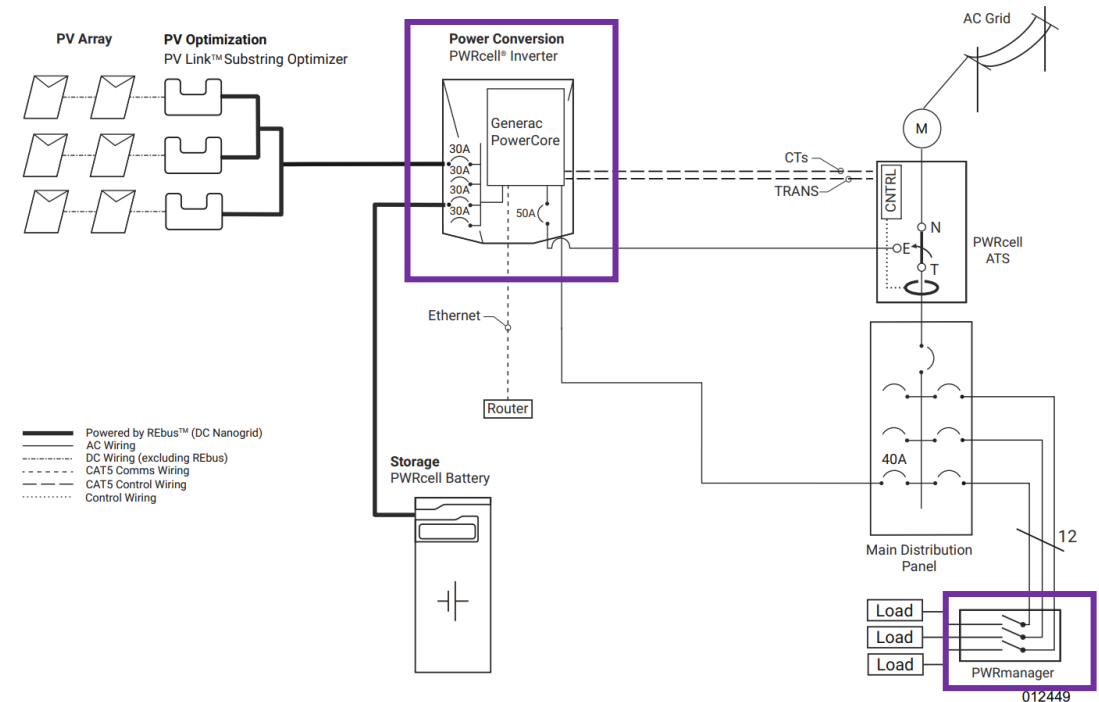
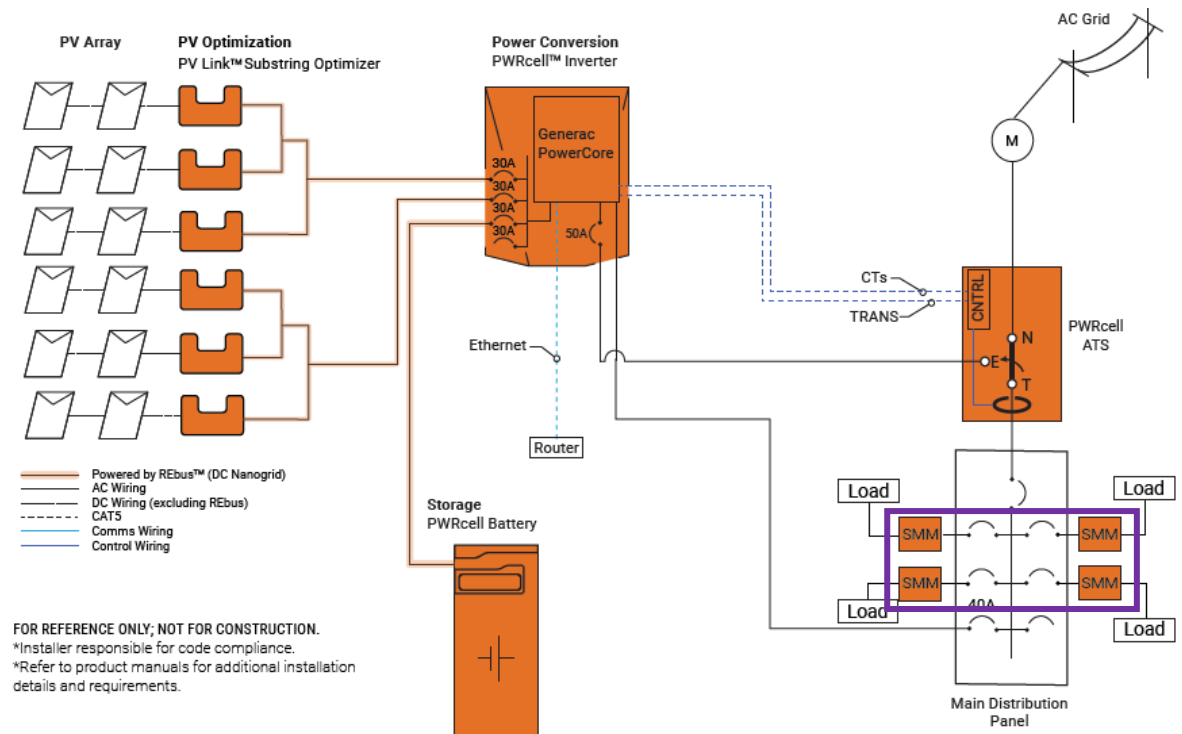


Figure 8-1. New PWRcell Installation Including Load Management

1. (c) a processor circuit comprising one or more processors responsive to the output A.C. power, the processor circuit operating in response to the occurrence of the second frequency to control the output A.C. power consumed by at least one load of the one or more loads thereby helping to prevent or alleviate an overload of the power source.

- SMMs can be used in the same system with or without a PWR manager, and vice versa. SMMs do not receive Ethernet and thus must use frequency. The PWRmanager can receive Ethernet but if the Ethernet goes down during a grid failure, such as by the router dropping out because of a brownout, the frequency based load shedding is still there.



Reference Code: 2315-01

This design shows a Generac PWRcell system with a PWRcell ATS in a whole home backup configuration. Use this system configuration to provide backup power to the main service panel loads using Generac Smart Management Modules (SMMs) for load shedding in accordance with NEC 702.4(B) and Article 220.

This configuration is acceptable with 200A or larger utility services.

Part No. A0000521683 | Rev. F | 25 FEB 2021

#### Whole Home Backup / Solar + Storage

- 1 PWRcell Inverter
- 6 PV Links
- 1 PWRcell Battery
- 1 CT Kit (incl.)
- 1 PWRcell ATS
- 4 Generac SMMs

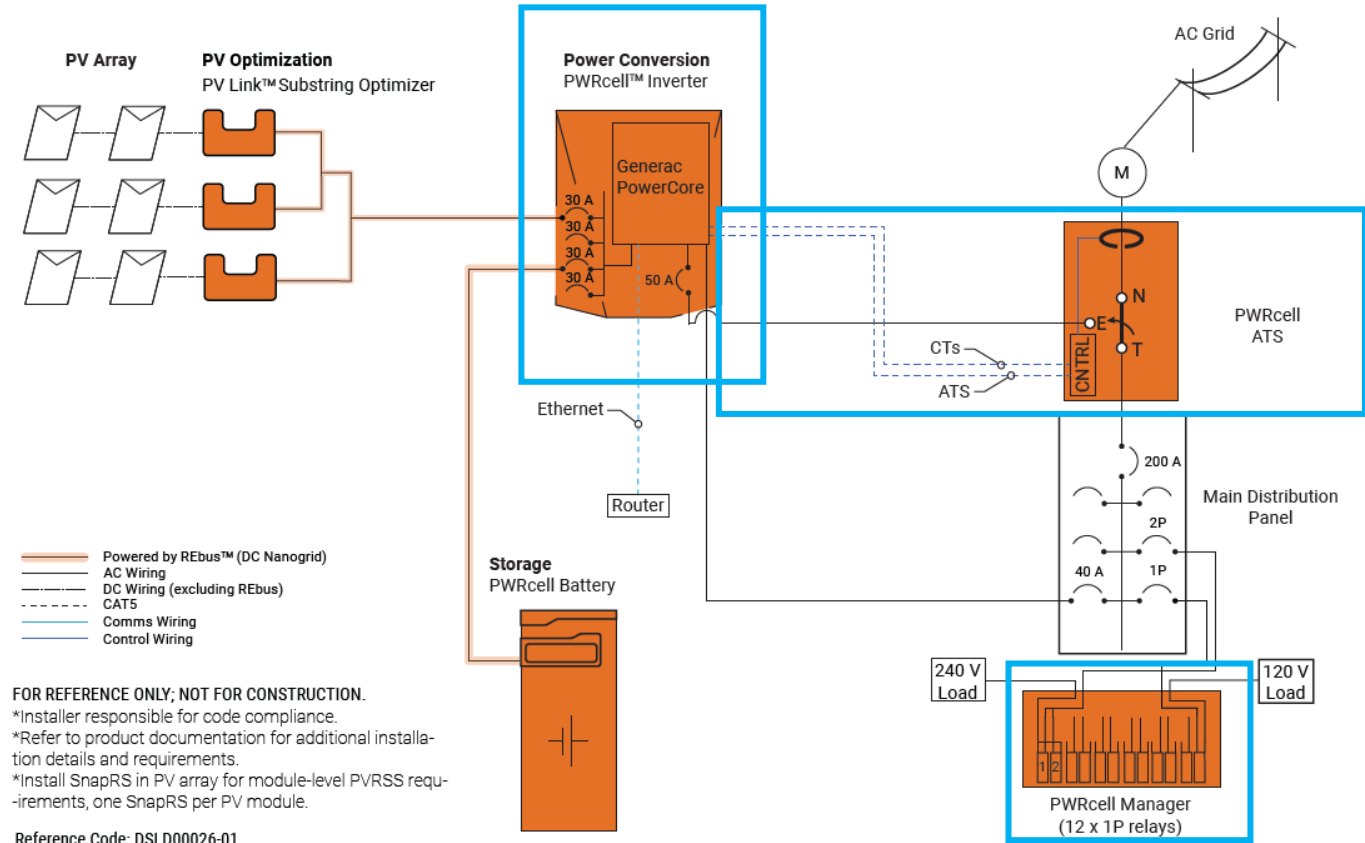
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2. A power system claimed in claim 1 wherein when the one or more loads demand more power than the inverter can produce, the power source changes to the A.C. power output frequency from the first frequency to the second frequency to signal the processor circuit to shed one or more of the plurality of loads to help the power source to recover from an overload.

- Defendant's power system further comprises a power source (PWRcell Inverter) which changes its AC power output frequency from a first frequency to a second frequency to signal the processor circuit to shed one or more of the plurality of loads to help the power source to recover from an overload when one or more loads demand more power than the inverter can produce.
- Loads can be effectively shed via the relays found in the PWRManager to recover from an overload.
- This process is signaled by the PWRcell Inverter's AC power output frequency sensed by the current transformers which provide the information to the inverter in advance to recover from an overload.



This design shows a Generac PWRcell system with a PWRcell ATS for whole home backup. Use this system design to provide backup power to home loads. Use a Generac PWRmanager for load management of up to twelve 120 V loads or six 240 V loads. This design is suitable for most residential 120 V / 240 V services.

**Whole Home Backup / PWRmanager**

|                      |                    |
|----------------------|--------------------|
| - 1 PWRcell Inverter | - 1 CT Kit (incl.) |
| - 3 PV Links         | - 1 PWRcell ATS    |
| - 1 PWRcell Battery  | - 1 PWRmanager     |

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2. A power system claimed in claim 1 wherein when the one or more loads demand more power than the inverter can produce, the power source changes to the A.C. power output frequency from the first frequency to the second frequency to signal the processor circuit to shed one or more of the plurality of loads to help the power source to recover from an overload.

- Defendant's power system further comprises a power source (PWRcell Inverter) which changes its AC power output frequency from a first frequency to a second frequency to signal the processor circuit to shed one or more of the plurality of loads to help the power source to recover from an overload when one or more loads demand more power than the inverter can produce.
- Loads can be effectively shed via the relays found in the PWRManager to recover from an overload.
- This process is signaled by the PWRcell Inverter's AC power output frequency sensed by the current transformers which provide the information to the inverter in advance to recover from an overload.

### Application Considerations

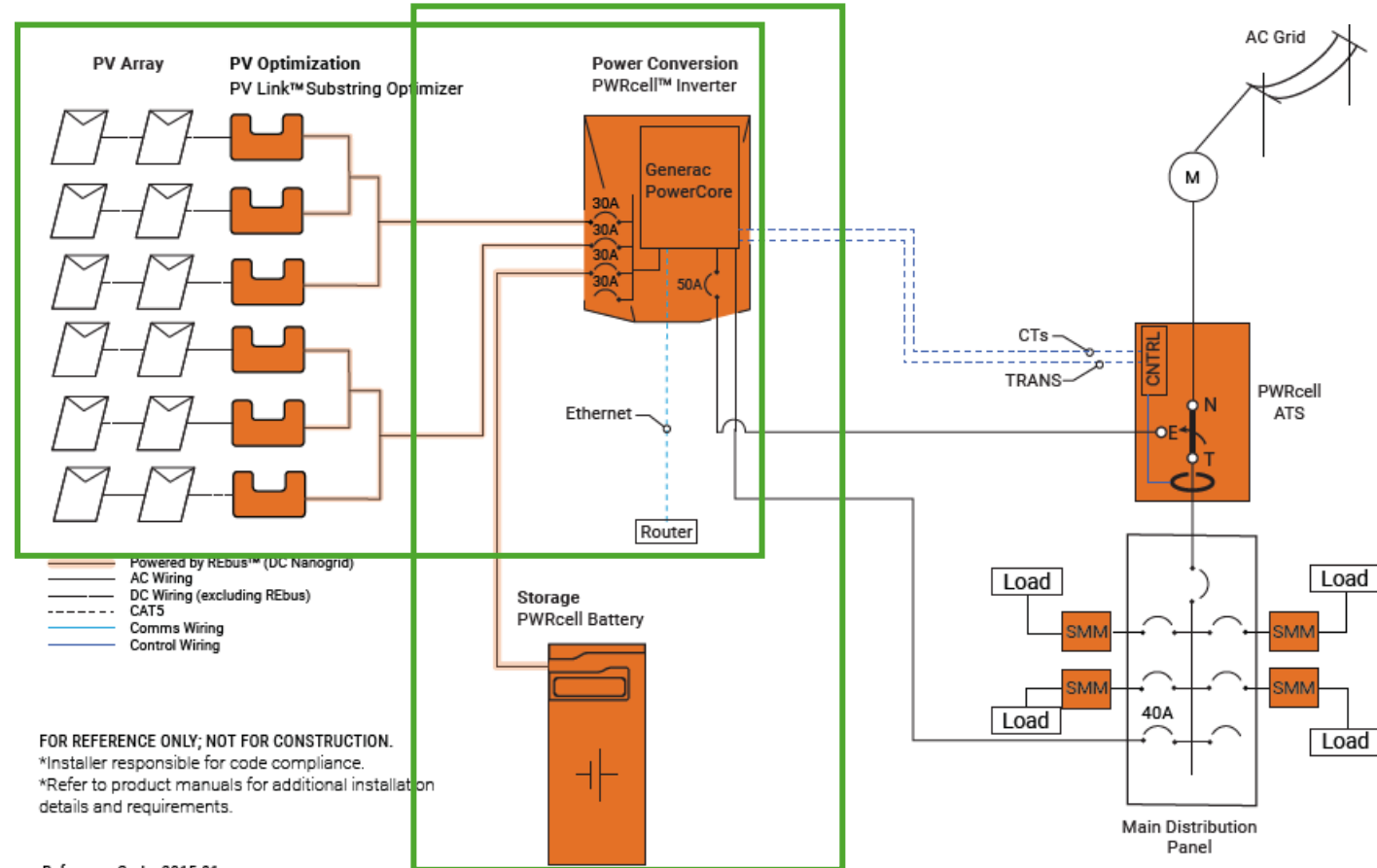
An overload condition is determined by the PWRcell inverter frequency while the inverter is in island mode. Loads are managed and de-energized when frequency is less than 58 Hz for three seconds or less than 50 Hz for ½ second (for 60 Hz systems).

The controller can be used in conjunction with individual SMMs to manage a combined total of eight loads.

- The priority order determines the order in which managed loads are re-energized by the load management system after all of the managed loads have been de-energized due to an overload condition.
- Use Priorities A/C 1-4 on the controller as the top priorities, then up to four SMMs as Priorities 5-8.
- Use only select A/C priorities on the controller as the top priorities, then use additional SMMs as the remaining priorities.
- A SMM can share a priority with an A/C priority on the controller provided the standby power source is sized to handle the combined surge load from both appliances. Sharing priorities can allow up to 12 loads to be managed in a properly sized system.

3. A power system as claimed in claim 1 wherein the power source is used as a backup power source when utility power fails.

- Defendant's power system further comprises a power source used as a backup power source when utility power fails.
- In this configuration, the PWRcell Inverter can provide AC power from either the PV array or the PWRcell Battery when the AC grid fails.



Reference Code: 2315-01

This design shows a Generac PWRcell system with a PWRcell ATS in a whole home backup configuration. Use this system configuration to provide backup power to the main service panel loads using Generac Smart Management Modules (SMMs) for load shedding in accordance with NEC 702.4(B) and Article 220.

This configuration is acceptable with 200A or larger utility services.

Part No. A0000521683 | Rev. F | 25 FEB 2021

#### Whole Home Backup / Solar + Storage

- 1 PWRcell Inverter
- 1 CT Kit (incl.)
- 6 PV Links
- 1 PWRcell ATS
- 1 PWRcell Battery
- 4 Generac SMMs

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4. A power system as claimed in claim 1 wherein the inverter is responsive to power provided by a generator comprising an internal combustion engine to provide the output A.C. power.

- Defendant's power system further comprises an inverter responsive to power provided by a generator comprising an internal combustion engine to provide the output AC power.
- The PWRGenerator's 400 V DC output is designed to connect to a PWRcell inverter via REbus DC input.
- When there is insufficient PV Array and Battery power, the PWRcell Inverter can start the generator and use that DC power to provide the output A.C. power. It can also use the generator DC power to charge the battery.

PWRcell System

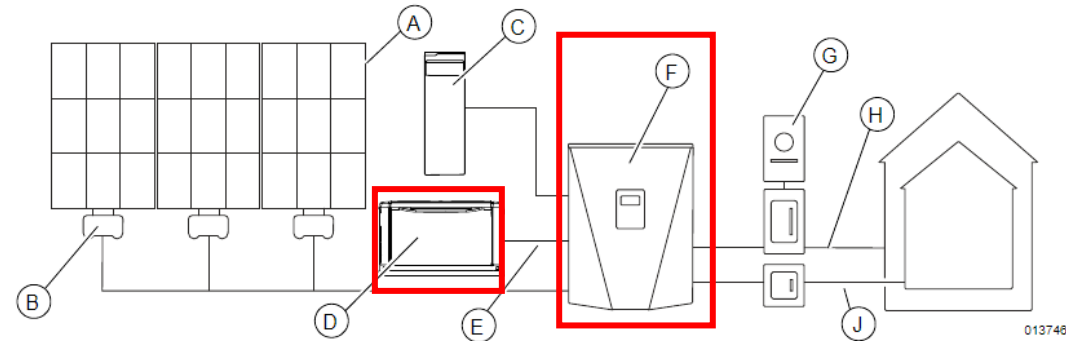
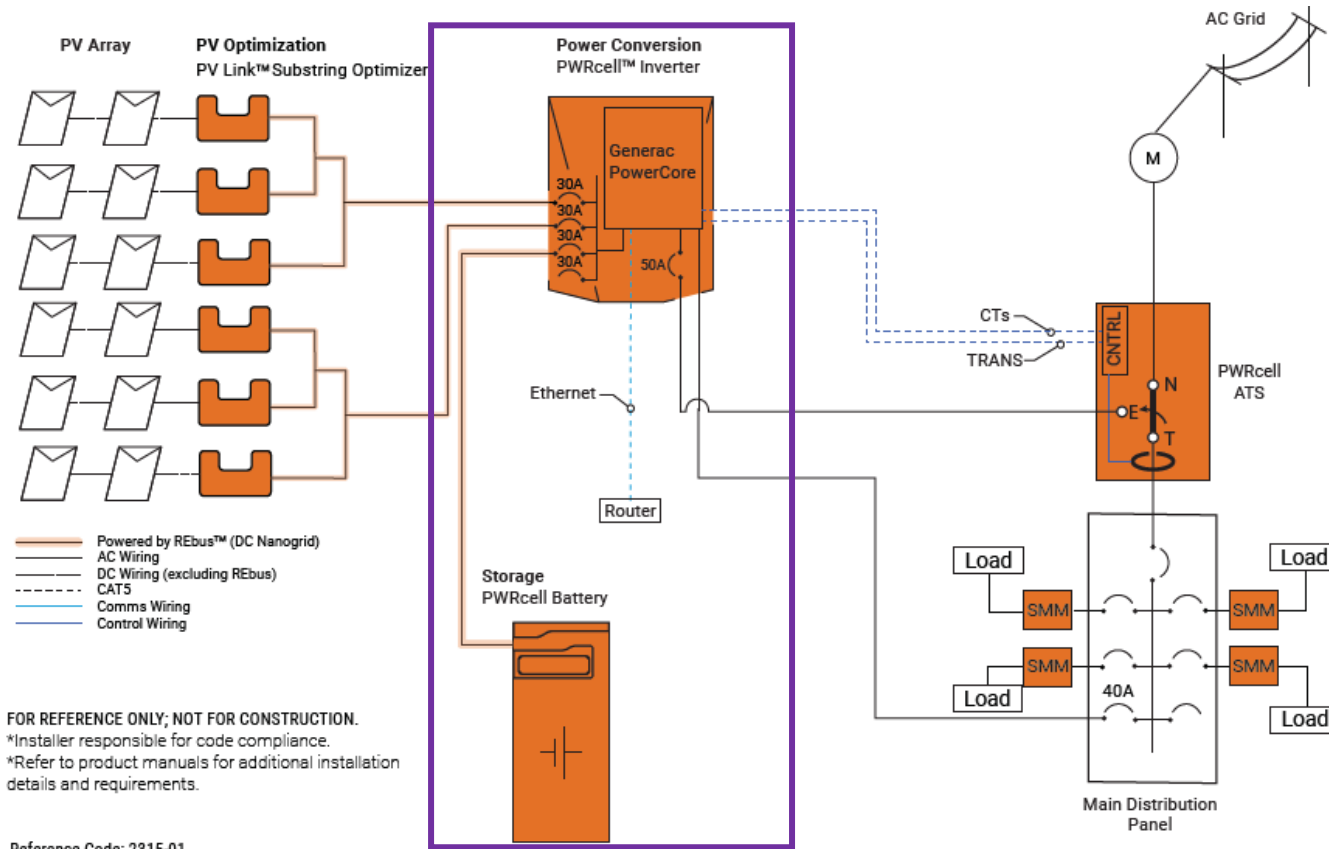


Figure 3-11. PWRcell System Example

|   |                 |   |                  |
|---|-----------------|---|------------------|
| A | Solar panels    | F | PWRcell Inverter |
| B | PV link         | G | Grid             |
| C | PWRcell Battery | H | Loads            |
| D | PWRgenerator    | J | Protected loads  |
| E | REbus           |   |                  |

5. A power system as claimed in claim 1 wherein the inverter is responsive to at least one rechargeable battery to provide the output A.C. power.

- Defendant's power system further comprises an inverter responsive to at least one rechargeable battery to provide the output AC power.
- Defendant's PWRCell Inverter can respond to stored power in the charged PWRcell Battery to provide output AC power.
- This is most common in instances where the grid fails.



This design shows a Generac PWRcell system with a PWRcell ATS in a whole home backup configuration. Use this system configuration to provide backup power to the main service panel loads using Generac Smart Management Modules (SMMs) for load shedding in accordance with NEC 702.4(B) and Article 220.

This configuration is acceptable with 200A or larger utility services.

Part No. A0000521683 | Rev. F | 25 FEB 2021

#### Whole Home Backup / Solar + Storage

- |                      |                    |
|----------------------|--------------------|
| - 1 PWRcell Inverter | - 1 CT Kit (incl.) |
| - 6 PV Links         | - 1 PWRcell ATS    |
| - 1 PWRcell Battery  | - 4 Generac SMMs   |

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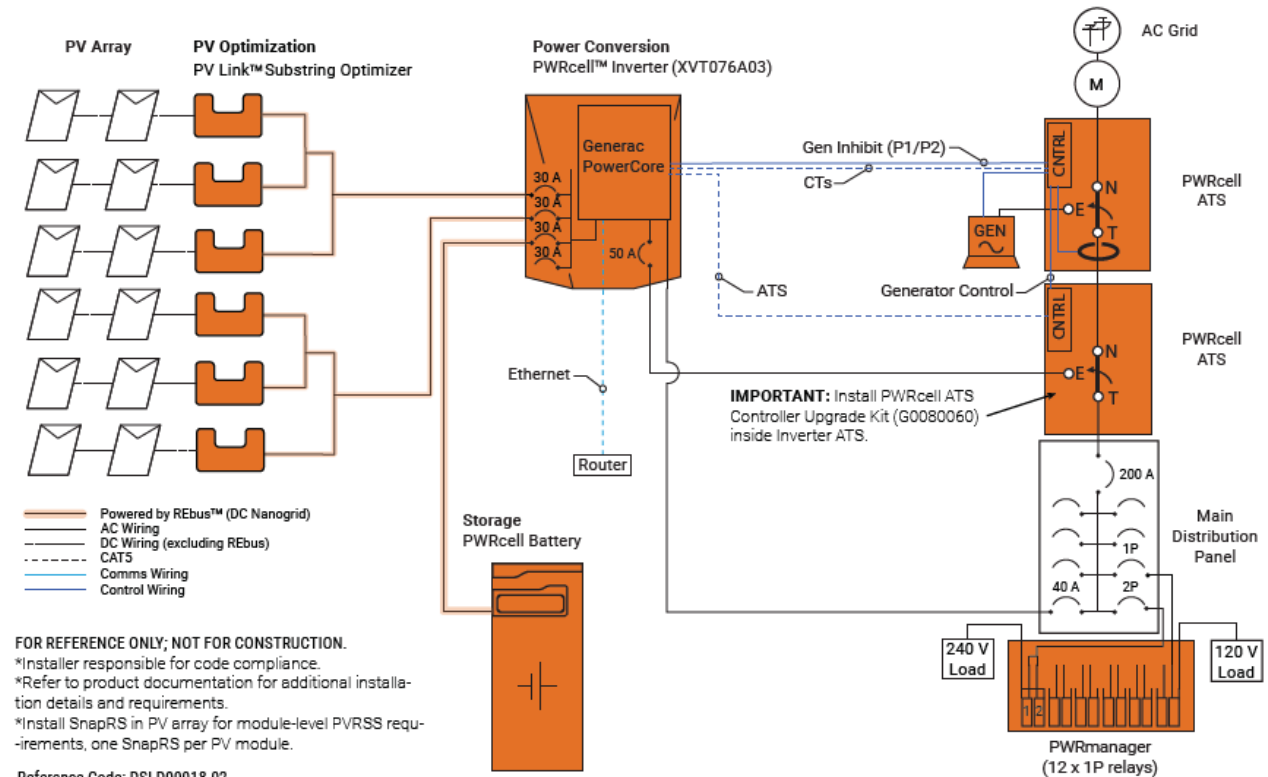
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6. A power system as claimed in claim 5 wherein the power system controls the charging of the at least one rechargeable battery.

- Defendant's power system further comprises the control of the charged of the rechargeable battery.
- Defendant's power system is capable of charging the PWRcell Battery using multiple power options, the PWRcell Inverter, and the REbus DC Nanogrid.



This design shows a PWRcell system integrating a Generac generator. In this configuration, either the PWRcell system or the generator will provide whole home backup. When turned on, the generator can also charge the PWRcell Battery. This design uses PWRmanager for load management. It is suitable for most residential 120 V / 240 V services. Recommended generator control mode: "Source Cycling".

#### AC Generator Integration / Whole Home Backup

- |                                  |                          |
|----------------------------------|--------------------------|
| - 1 PWRcell Inverter (XVT076A03) | - 1 CT Kit (incl.)       |
| - 6 PV Links                     | - 2 PWRcell ATS          |
| - 1 PWRcell Battery              | - 1 PWRmanager           |
| - 1 Generac AC Generator         | - 1 G0080060 Upgrade Kit |

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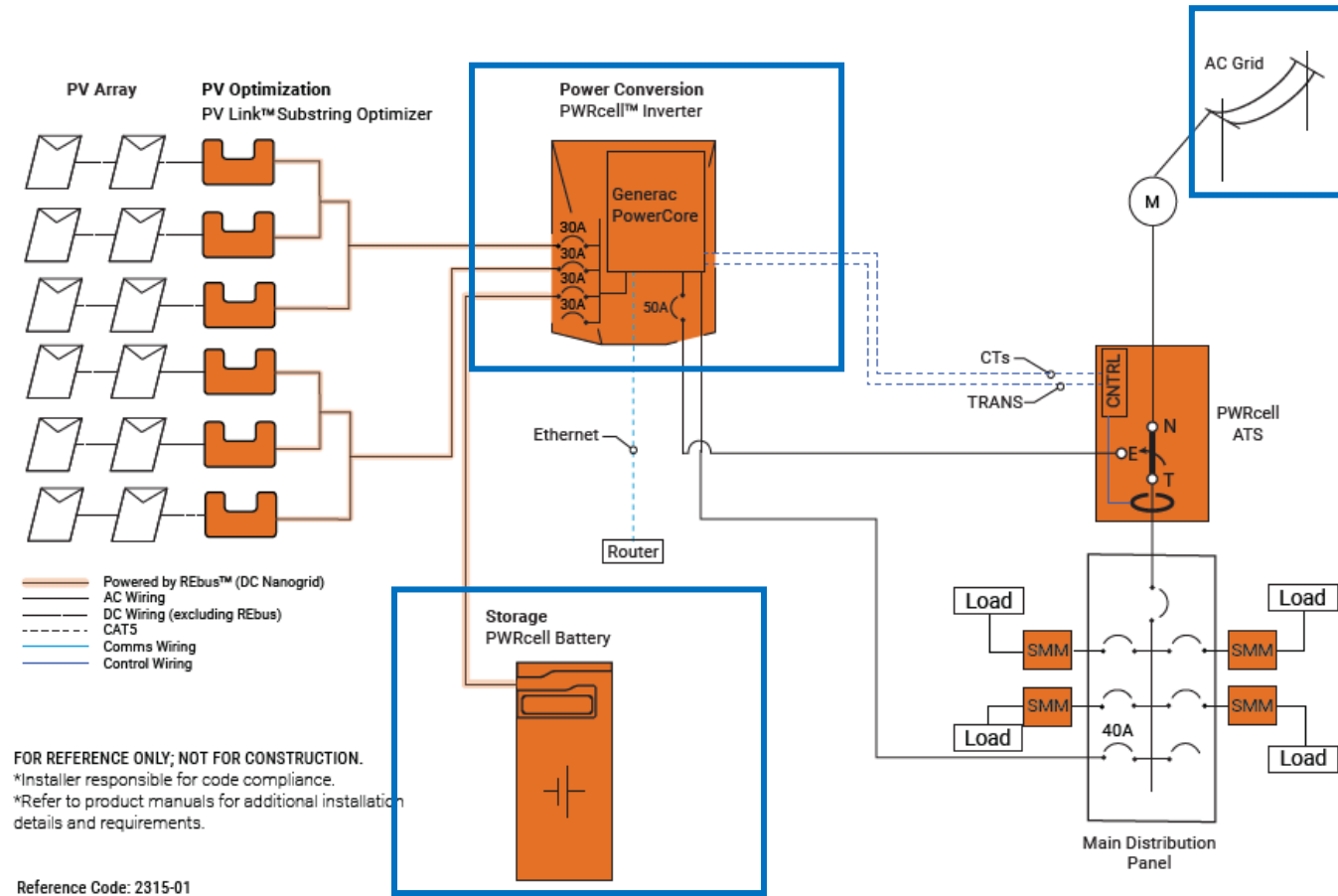
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7. A power system as claimed in claim 6 wherein the power system controls the charging of the at least one rechargeable battery from a power grid.

- Defendant's power system also allows for the charging of the rechargeable battery from the power grid.
- Defendant's power system facilitates the charging of PWRcell battery with power from the AC grid which is converted to DC power by the PWRcell Inverter.



Reference Code: 2315-01

This design shows a Generac PWRcell system with a PWRcell ATS in a whole home backup configuration. Use this system configuration to provide backup power to the main service panel loads using Generac Smart Management Modules (SMMs) for load shedding in accordance with NEC 702.4(B) and Article 220.

This configuration is acceptable with 200A or larger utility services.

Part No. A0000521683 | Rev. F | 25 FEB 2021

#### Whole Home Backup / Solar + Storage

- 1 PWRcell Inverter
- 6 PV Links
- 1 PWRcell Battery
- 1 CT Kit (incl.)
- 1 PWRcell ATS
- 4 Generac SMMs

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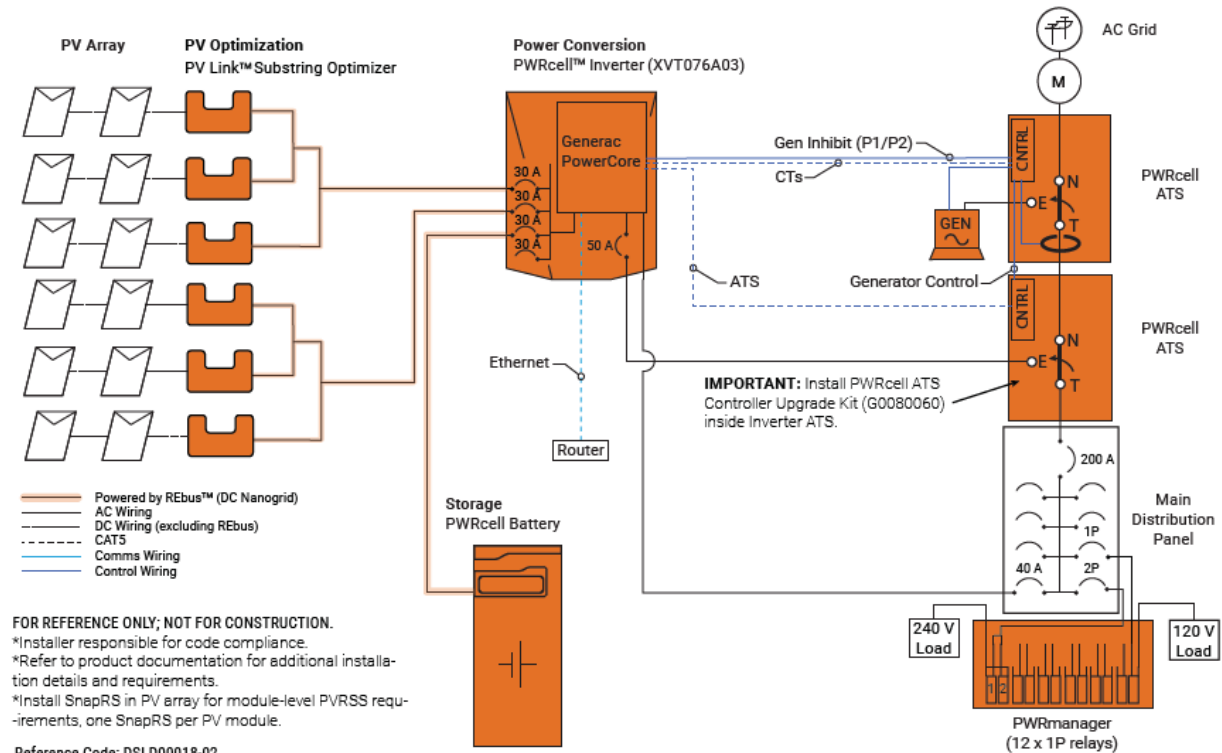
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9. A power system as claimed in claim 6 wherein the power system controls the charging of the at least one rechargeable battery from a non-grid internal combustion powered electrical power source.

- Defendant's power system also comprises controlling the charging of the rechargeable battery from a non-grid internal combustion powered electrical power source.
- As shown in this configuration which demonstrates how Defendant's AC generators can be integrated into back up power systems, Defendant states that the generator is able to charge the PWRcell Battery.
- This is accomplished by the AC generator providing AC power to the PWRcell Inverter which is converted to DC power to charge the PWRcell Battery.

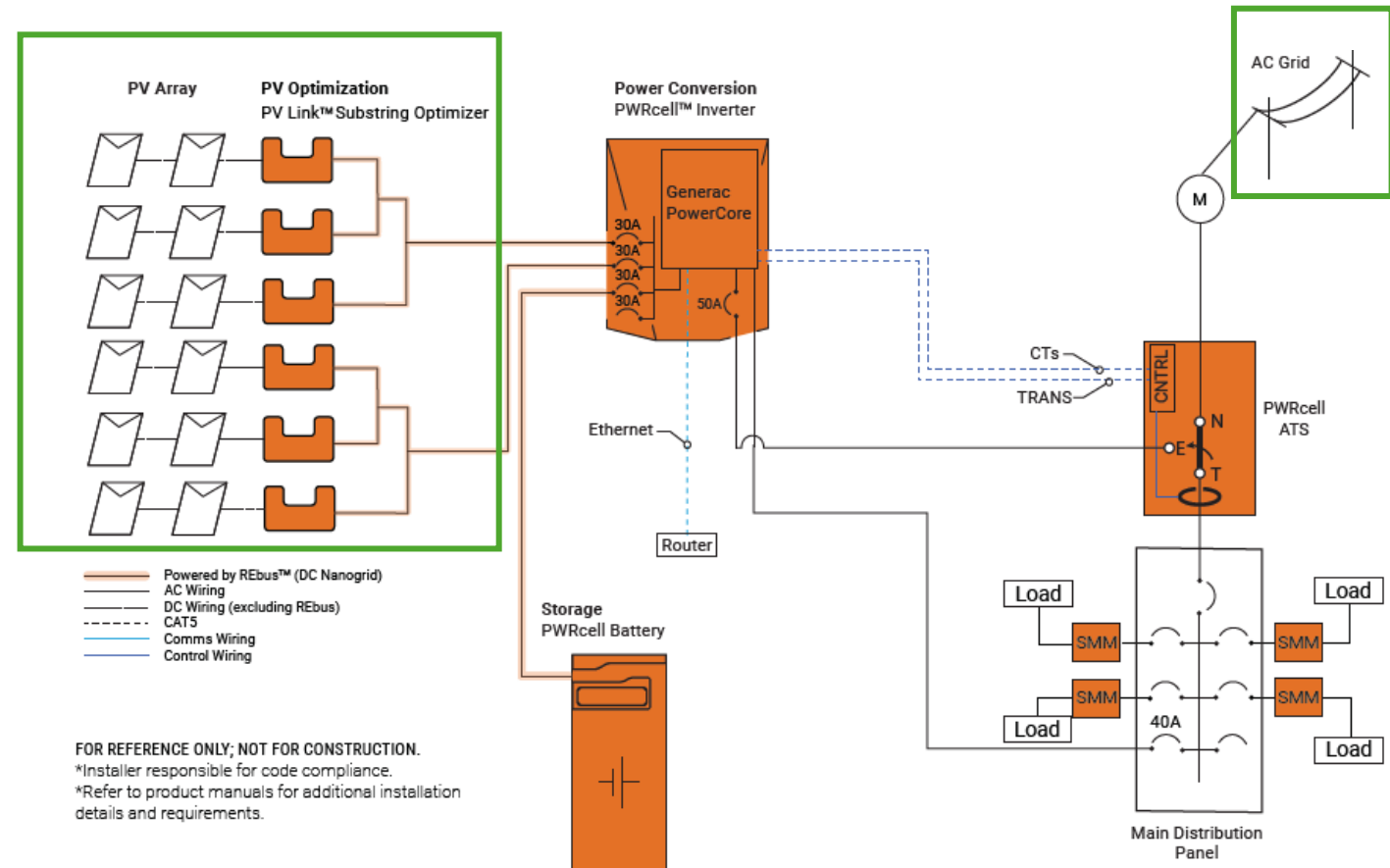


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10. A power system as claimed in claim 6 wherein a power grid and at least one solar panel are available to charge the battery and the power system controls the selection of at least one of the power grid and the at least one solar panel to charge the at least one rechargeable battery.

- Defendant's power system comprises configurations wherein a power grid and at least one solar panel are both available to charge the battery wherein the power system controls the selection of the power grid and at least one solar panel to charge the at least one rechargeable battery.
- Defendant's power system is capable of charging the PWRcell Battery using multiple distinct power sources including the PV array or AC grid through its configuration focused around the PWRcell Inverter.
- The PV array is able to charge the battery when the AC grid is not operating at an acceptable voltage while the AC grid is able to provide AC power to the PWRcell Inverter which converts the power to DC power to charge the PWRcell Battery.



FOR REFERENCE ONLY; NOT FOR CONSTRUCTION.  
 \*Installer responsible for code compliance.  
 \*Refer to product manuals for additional installation details and requirements.

Reference Code: 2315-01

This design shows a Generac PWRcell system with a PWRcell ATS in a whole home backup configuration. Use this system configuration to provide backup power to the main service panel loads using Generac Smart Management Modules (SMMs) for load shedding in accordance with NEC 702.4(B) and Article 220.

This configuration is acceptable with 200A or larger utility services.

Part No. A0000521683 | Rev. F | 25 FEB 2021

#### Whole Home Backup / Solar + Storage

- |                      |                    |
|----------------------|--------------------|
| - 1 PWRcell Inverter | - 1 CT Kit (incl.) |
| - 6 PV Links         | - 1 PWRcell ATS    |
| - 1 PWRcell Battery  | - 4 Generac SMMs   |

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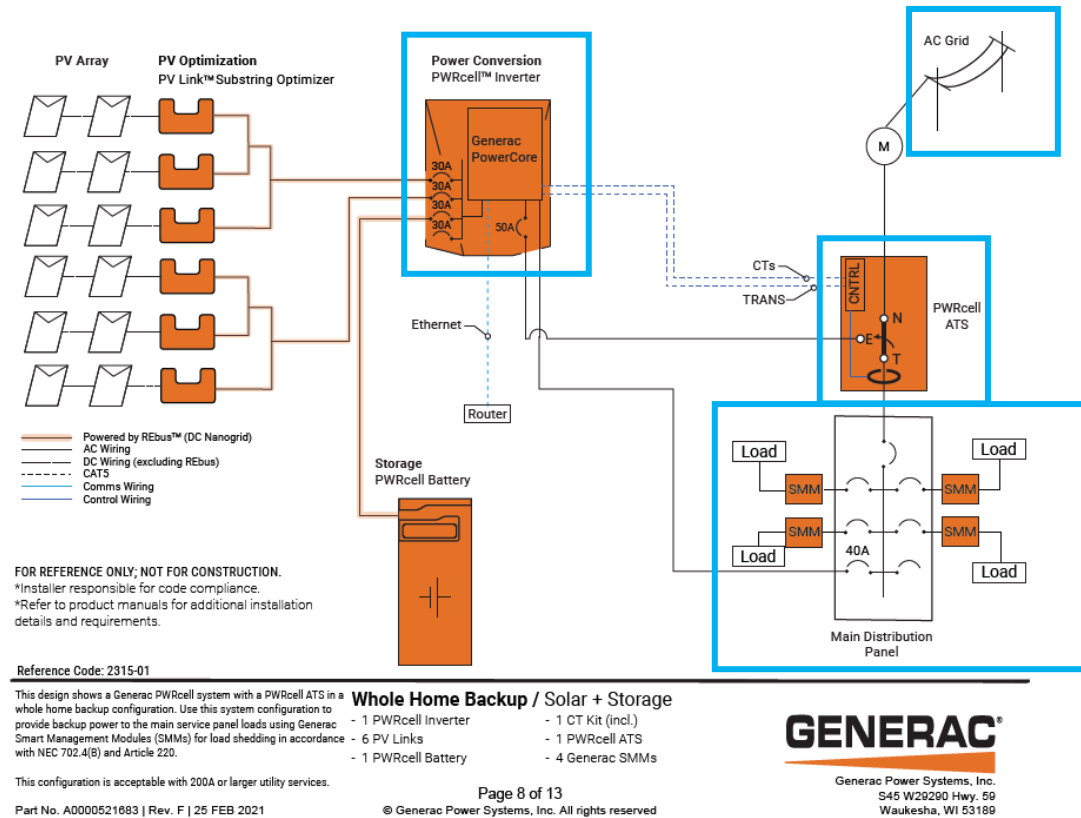
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13. A power system as claimed in claim 1 further including a transfer switch which may select a power grid or the power source to provide power to the one or more of a plurality of loads, the transfer switch outputting power from the grid power meets acceptable parameters and to output power from the power source when the grid power does not meet acceptable standards.

- Defendant's power system comprises a transfer switch capable of selecting a power grid or other power source to provide power to the one or more of a plurality of loads, the transfer switch outputting power from the grid wherein the power meets acceptable parameters and the output power from the power source when the grid power does not meet acceptable standards.
- Defendant's system includes the PWRcell ATS which selects the power source which will power a plurality of loads including the loads on the main distribution panel.
- As shown in the diagram, in normal circumstances, the T connection of the ATS will be connected to the N connection of the ATS when grid power is sufficient. However, the T connection of the ATS will connect to the E connection for instances when the grid power does not meet requirements or the grid has failed.



### PWRcell ATS

A Generac PWRcell ATS can be integrated into the PWRcell installation to facilitate alternate backup power configurations. Refer to the PWRcell ATS manual for additional information regarding configurations and installation instructions.

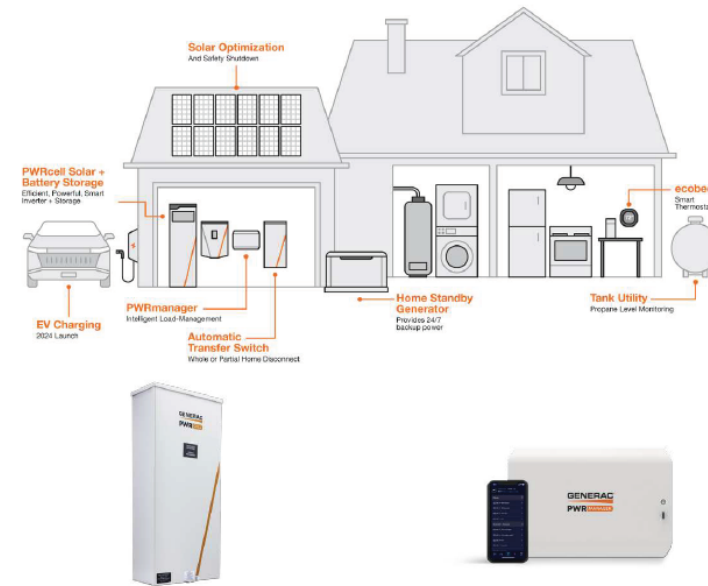
27. An electronic power system which provides AC power, the power system comprising at least:

- Defendant offers multiple electronic power systems providing AC power.
- Defendant advertises its power systems as PWRcell Energy Storage Systems which can encompass multiple different configurations and system architectures and are designed to work with multiple different types of power sources including, PWRcell Batteries, PV Arrays, back up generators, and other types of power sources.
- Different embodiments of Defendant's systems contain a wide range of Defendant's products. See list of "Accused Products" in Plaintiff's Preliminary Infringement Contentions.
- Defendant refers publicly to its Integrated Home Energy Ecosystem, as the components are designed to work together.

## Integrated Home Energy Ecosystem

PWRcell isn't just a powerful battery, but it's also the most flexible and scalable home energy system on the market. With a range of supplementary products and features, PWRcell can be configured to meet just about any budget or lifestyle so you get a solution tailored to your unique needs.

Each component has also been designed to work better together. The PWRmanager advanced load management device and features like Outage Guard integrate seamlessly with PWRcell, helping provide additional protection from outages and invaluable peace of mind.



### Automatic Transfer Switch

An integrated solar + battery storage system is made easy with the PWRcell Automatic Transfer Switch (ATS). Power your home and manage up to four individual HVAC (24 VAC controlled) loads with the PWRcell ATS.

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### PWRmanager

The PWRmanager advanced load management device enhances whole home backup power and provides simplified control of up to twelve 120 V circuits or six 240 V circuits plus two thermostats. PWRmanager will automatically manage those loads during an outage to extend backup duration and prevent inverter overload.

## Advanced Load Management

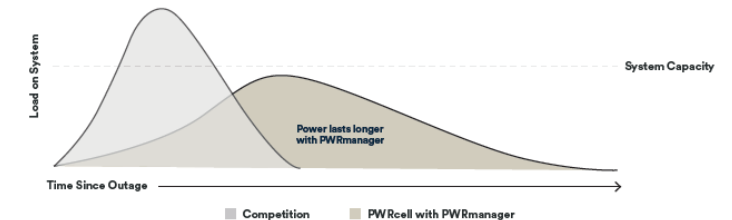
Load management systems are designed to prevent a standby power source, such as an energy storage system, from being overloaded while providing backup power during an outage. The PWRmanager advanced load management system also provides an in-hand ability to turn circuits on or off during an outage, or even while on grid.

PWRmanager provides a richly integrated load management functionality when used with the PWRcell system.

### Advanced Load Management with PWRmanager

#### Cost-effective Solution to Whole Home Power

The PWRmanager advanced load management device adds unbeatable flexibility and value to the PWRcell System. Controlled via the user-friendly PWRview app, PWRmanager enables batteries to work smarter, so a smaller system can power the home for longer.

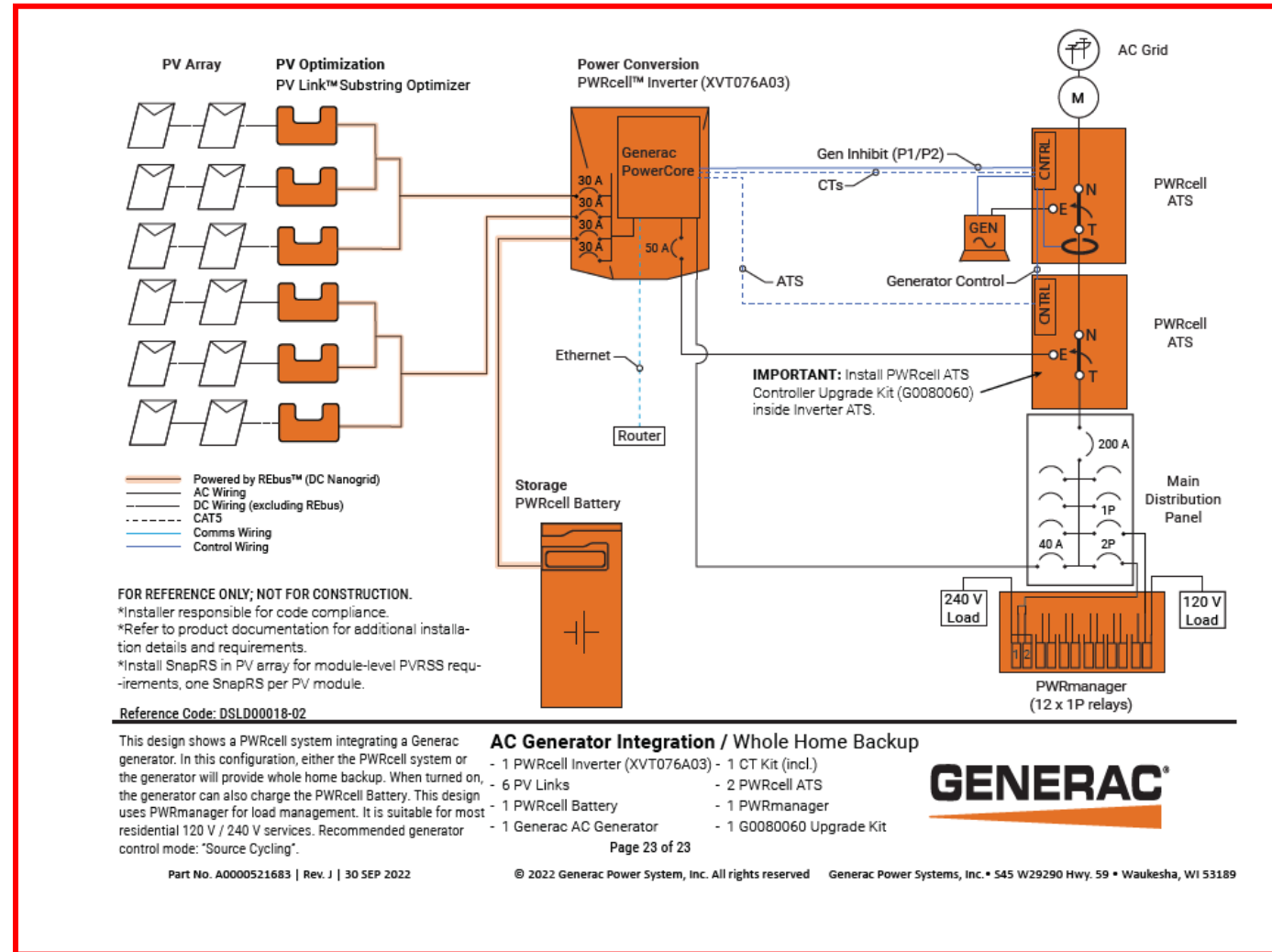


During an outage, PWRmanager extends backup duration and prevents the PWRcell system from being overloaded by too many large loads being turned on at once.

PWRcell Consumer Brochure | 5

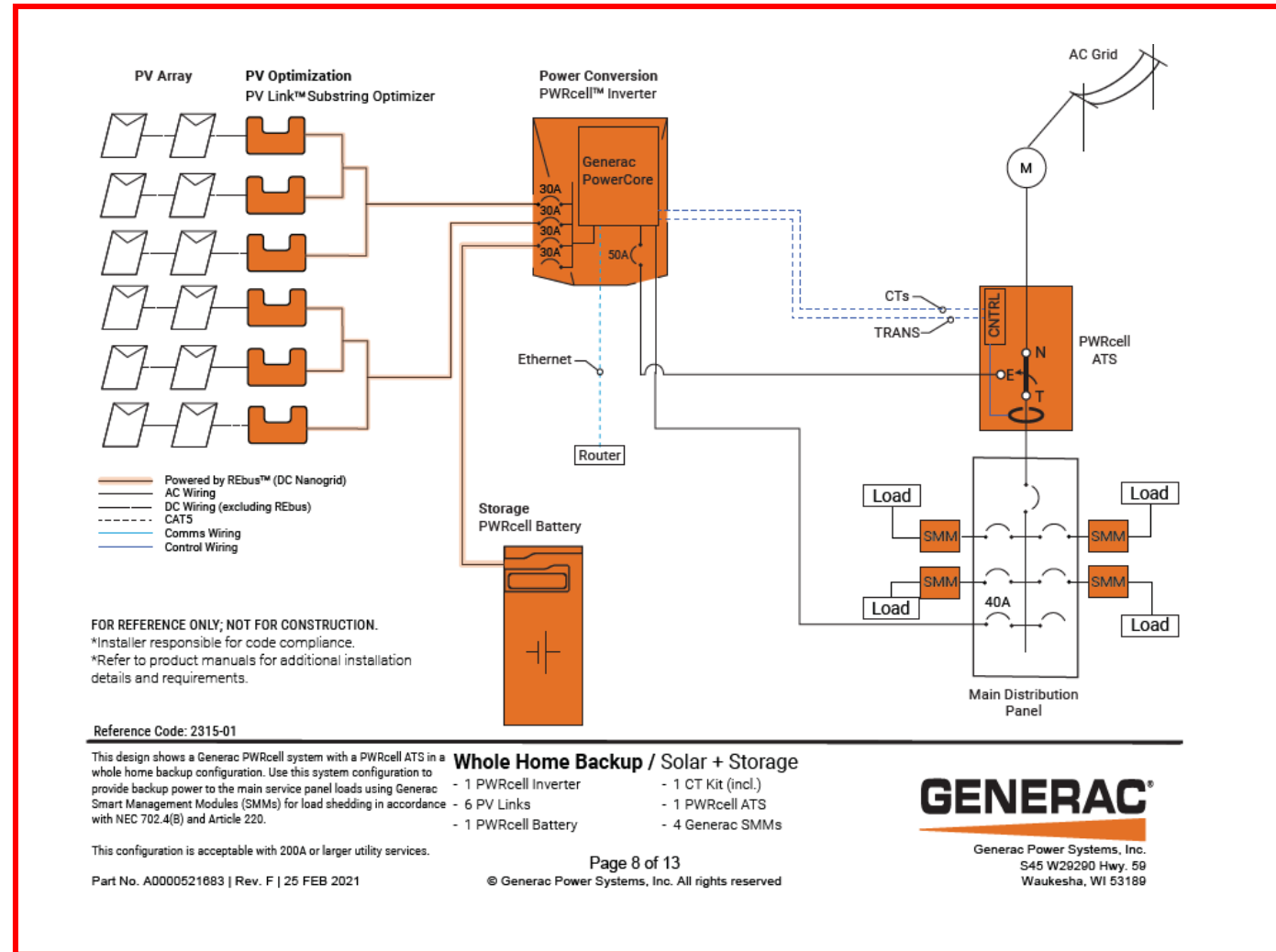
27. An electronic power system which provides AC power, the power system comprising at least:

- For example, the diagram on this slide is an exemplary diagram modelling a PWRcell Energy Storage System provided by Defendant.
- This figure demonstrates how Defendant's AC Generators can be integrated into the PWRcell Energy Storage System and provide further backup power.
- Defendant's PWRcell Inverter controls its AC frequency to assist in managing loads to thereby cause the PWRmanager to disconnect loads. In this configuration, the PWRcell Inverter converts DC power from either the PWRcell Battery or PV array to controlled AC power to power loads.



27. An electronic power system which provides AC power, the power system comprising at least:

- The diagram shown on this slide is another exemplary diagram provided by Defendant illustrating one of its PWRcell Energy Storage Systems.
- This figure demonstrates how SMM's can be used in place of the PWRmanager to accomplish load management.



27. An electronic power system which provides AC power, the power system comprising at least:

- The diagram on this slide is another exemplary diagram modelling a PWRcell Energy Power Storage Systems comprising components including Defendant's PWRcell Inverter, PV Substring Optimizer, PWRcell Battery, PWRmanager, PWRcell ATS, Rebus DC nanogrid wiring and Current Transformer Kits.
- Defendant's PWRcell Inverter can convert DC power from the PV Array and/or Storage Battery to AC power which flows into the Main Distribution Panel through the 40A Circuit Breaker to power loads.
- There are two main modes of operation that the inverter can operate in, grid-tied where the inverter output AC power frequency is controlled to be locked to the grid power frequency, and island (backup power) mode where the grid has failed and the inverter power output frequency is controlled to be substantially the same as the nominal power line frequency, (60 Hz in the U.S.), when the inverter is operating normally, and when the inverter is approaching or reaches overload the inverter frequency is controlled to drop to a lower frequency, e.g. 58 Hz or lower. Thus, the output power frequency is controlled.

### New PWRcell Installation Including Load Management

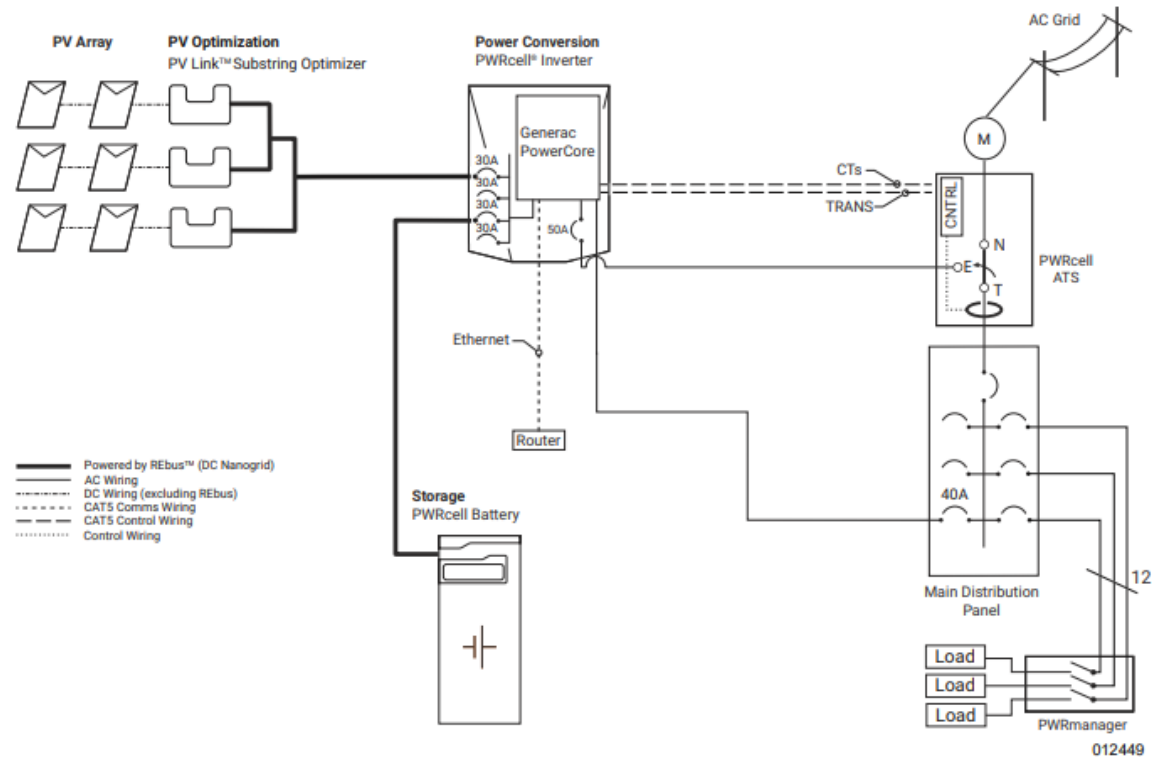
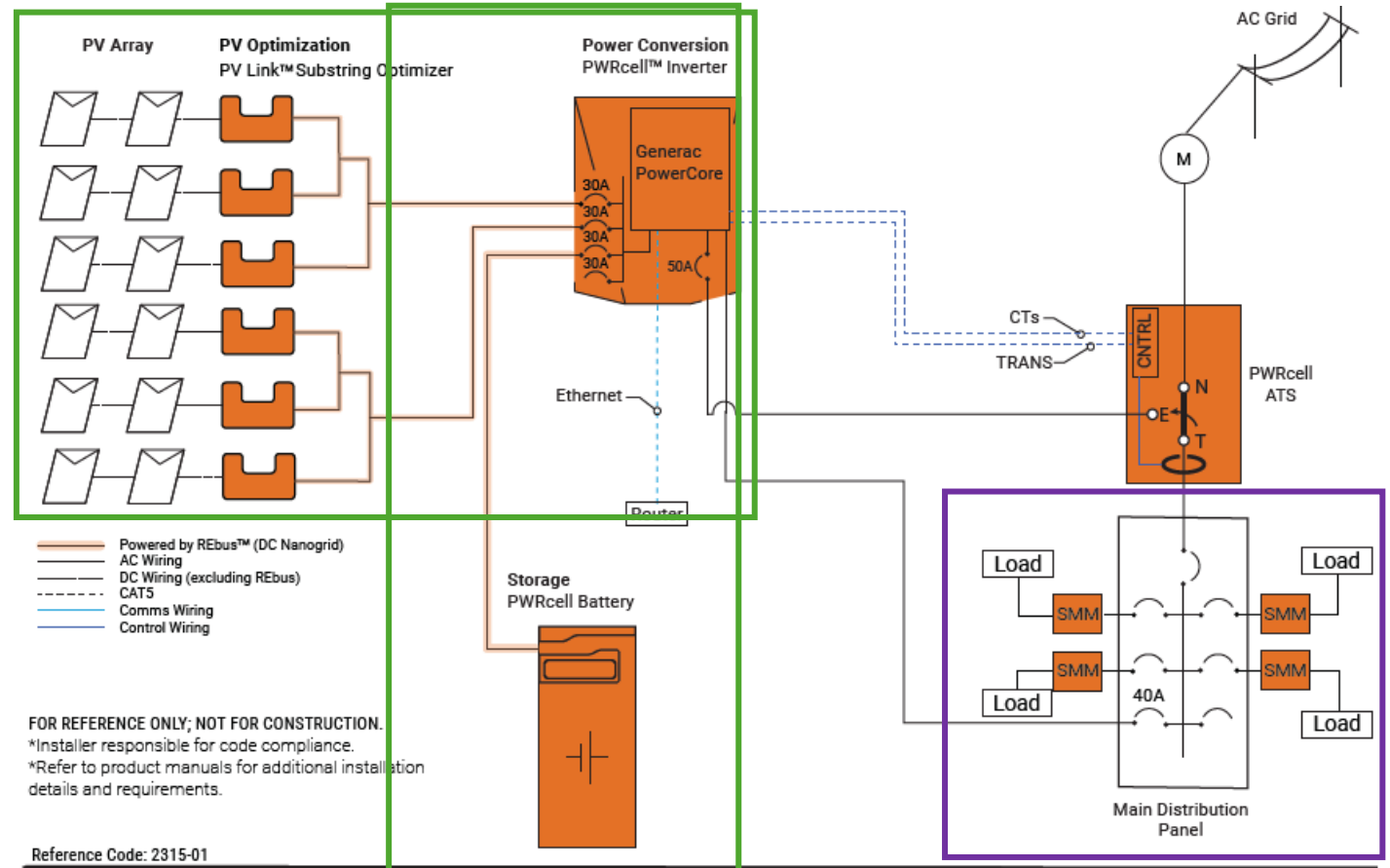


Figure 8-1. New PWRcell Installation Including Load Management

(a) an AC power source having one or more DC to AC inverter which converts DC power to AC power having a changeably controlled frequency, the AC power source having at least one timely operating parameter from which an overload of the AC power source may be determined;

- Defendant offers multiple power systems comprising power sources having one or more DC to AC inverter which converts DC power to AC power having a changeably controlled frequency, the AC power source having at least one timely operating parameter from which an overload of the AC power source may be determined.
- The PWRcell inverter can convert DC power from DC power sources including PV Arrays and/or the PWRcell Battery to AC power which flows into the Main Distribution Panel through the 40A Circuit Breaker to power one or more of a plurality of loads.
- These loads can include but are not limited to the loads pictured attached to the main distribution panel in the bottom right of the diagram.



Reference Code: 2315-01

This design shows a Generac PWRcell system with a PWRcell ATS in a whole home backup configuration. Use this system configuration to provide backup power to the main service panel loads using Generac Smart Management Modules (SMMs) for load shedding in accordance with NEC 702.4(B) and Article 220.

This configuration is acceptable with 200A or larger utility services.

Part No. A0000521683 | Rev. F | 25 FEB 2021

#### Whole Home Backup / Solar + Storage

- |                      |                    |
|----------------------|--------------------|
| - 1 PWRcell Inverter | - 1 CT Kit (incl.) |
| - 6 PV Links         | - 1 PWRcell ATS    |
| - 1 PWRcell Battery  | - 4 Generac SMMs   |

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(a) an AC power source having one or more DC to AC inverter which converts DC power to AC power having a changeably controlled frequency, the AC power source having at least one timely operating parameter from which an overload of the AC power source may be determined;

- The specifications provided by Defendant describe the maximum output power parameters of the power source.
- The specifications also describe the output frequency of the A.C. power of the power source.
- This further relates to the power source's maximum output parameters.

## Section 2: General Information

### Specifications

| Description                                                                                                            | Units | XVT076A03 |
|------------------------------------------------------------------------------------------------------------------------|-------|-----------|
| Max. cont. grid-tied AC power @ 122°F (50°C)                                                                           | kW    | 7.6       |
| Max. cont. AC power in island mode w/ external transfer switch and single 6 module battery cabinet <sup>2</sup>        | kW    | 9.0       |
| Max. cont. AC power in island mode w/ external transfer switch and 2 battery cabinets (8 modules minimum) <sup>1</sup> | kW    | 11.0      |

[https://ressupply.com/documents/generac/XVT076A03\\_Installation\\_Manual.pdf](https://ressupply.com/documents/generac/XVT076A03_Installation_Manual.pdf)

### Application Considerations

An overload condition is determined by the PWRcell inverter frequency while the inverter is in island mode. Loads are managed and de-energized when frequency is less than 58 Hz for three seconds or less than 50 Hz for ½ second (for 60 Hz systems).

The controller can be used in conjunction with individual SMMS to manage a combined total of eight loads.

- The priority order determines the order in which managed loads are re-energized by the load management system after all of the managed loads have been de-energized due to an overload condition.
- Use Priorities A/C 1-4 on the controller as the top priorities, then up to four SMMS as Priorities 5-8.
- Use only select A/C priorities on the controller as the top priorities, then use additional SMMS as the remaining priorities.
- A SMM can share a priority with an A/C priority on the controller provided the standby power source is sized to handle the combined surge load from both appliances. Sharing priorities can allow up to 12 loads to be managed in a properly sized system.

### Ratings

| Description                                                      | Units  | Min  | Nominal             | Max  |
|------------------------------------------------------------------|--------|------|---------------------|------|
| Maximum Input Voltage (nanogrid)                                 | V      |      |                     | 420  |
| Range of Input Operating Voltage (nanogrid)                      | V      | 360  |                     | 400  |
| Maximum input current (nanogrid)                                 | A      |      |                     | 20   |
| Maximum input short circuit current (nanogrid)                   | A      |      |                     | 30   |
| Maximum input source backfeed current to input source (nanogrid) | A      |      |                     | 30   |
| Output power factor rating (ac)                                  | -      |      |                     | 1    |
| Operating Voltage range (ac) 2ph                                 | V, rms | 108  |                     | 130  |
| Operating Voltage range (ac) 3ph                                 | V, rms | 106  |                     | 132  |
| Operating frequency range or single frequency                    | Hz     | 59.6 |                     | 60.4 |
| Nominal output voltage (ac)                                      | V, rms |      | 120/240 & 208, 3 ph |      |
| Normal output frequency (ac)                                     | Hz     |      | 60                  |      |

b) a power source monitor, which may be part of the power source or otherwise, operating in response to the at least one timely operating parameter to control the AC power frequency to have a timely one of a plurality of frequencies including least a first frequency when there is no overload and a second frequency when there is an overload;

- Defendant offers multiple power systems comprising a power source monitor, which may be part of the power source or otherwise, operating in response to the at least one timely operating parameter to control the AC power frequency to have a timely one of a plurality of frequencies including least a first frequency when there is no overload and a second frequency when there is an overload.
- Defendant's power source monitor comprises electrical current sensors shown as current transformers (CTs) which provide timely power output parameters to the electronic processor in the PWRmanager via the CTs connection from the CNTRL, via the PWRcell and Ethernet connected network. The CT on the ATS measures the timely amount of power from the inverter's 50A output circuit breaker to the E input and the T output of the ATS when the inverter is selected.
- The CTs measure the current passing through the conductor within them and then the measurement signal passes through the dotted and dashed lines to the inverter.
- The inverter also has an internal power source monitor that is responsive to the timely amount of the output A.C. power and responds to the current information provided to it by the CTs and controls the frequency of its power in response to the level of the loads.
- In at least this way, the power source monitor timely monitors operating parameters such that the system can control the A.C. power frequency.

### New PWRcell Installation Including Load Management

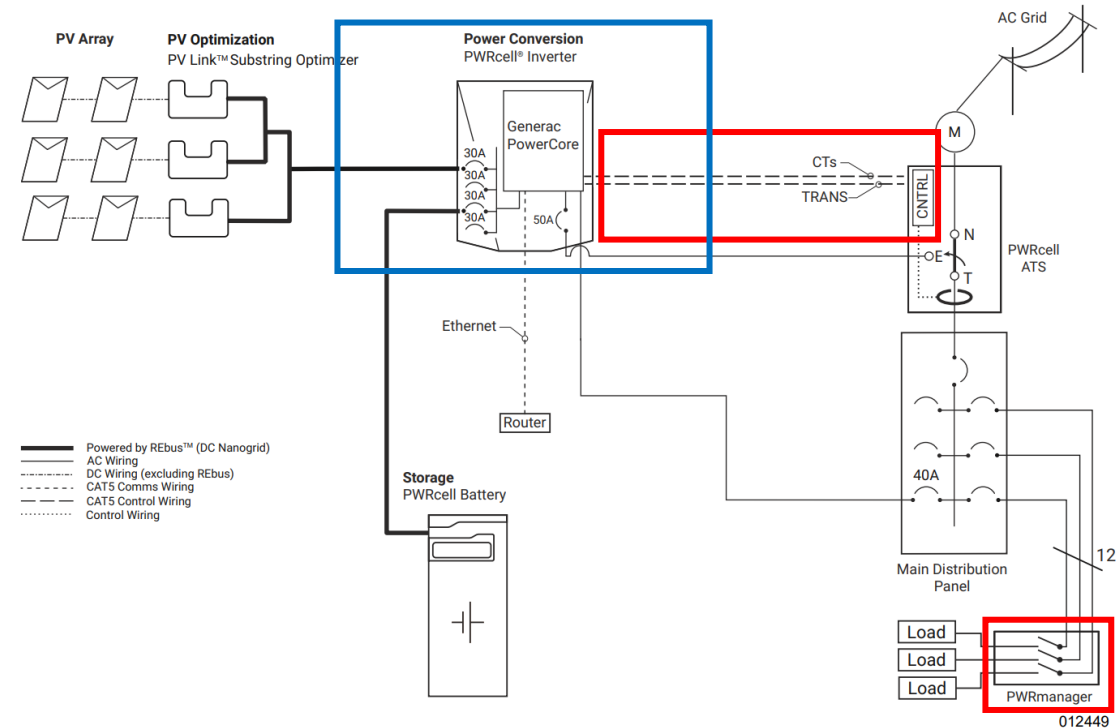


Figure 8-1. New PWRcell Installation Including Load Management

b) a power source monitor, which may be part of the power source or otherwise, operating in response to the at least one timely operating parameter to control the AC power frequency to have a timely one of a plurality of frequencies including least a first frequency when there is no overload and a second frequency when there is an overload;

- Defendant's PWRcell Inverter responds to the current information provided to it by the CTs and controls the frequency of its power in response to the level of the loads.

#### Application Considerations

An overload condition is determined by the PWRcell inverter frequency while the inverter is in island mode. Loads are managed and de-energized when frequency is less than 58 Hz for three seconds or less than 50 Hz for ½ second (for 60 Hz systems).

The controller can be used in conjunction with individual SMMs to manage a combined total of eight loads.

- The priority order determines the order in which managed loads are re-energized by the load management system after all of the managed loads have been de-energized due to an overload condition.
- Use Priorities A/C 1-4 on the controller as the top priorities, then up to four SMMs as Priorities 5-8.
- Use only select A/C priorities on the controller as the top priorities, then use additional SMMs as the remaining priorities.
- A SMM can share a priority with an A/C priority on the controller provided the standby power source is sized to handle the combined surge load from both appliances. Sharing priorities can allow up to 12 loads to be managed in a properly sized system.

#### Overload Behavior

Table 9-2. Overload Behavior

| Island Overload Event                                                                               | Cause                                                                                          | Behavior                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Solution            |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Overload on Voltage<br><br>(vulnerable when battery has low SoC)                                    | Load demand is too high and the inverter has dropped it's voltage in an attempt to compensate. | <ul style="list-style-type: none"> <li>If inverter output voltage drops below 114 V, inverter will attempt to shed any loads connected to load management devices by dropping frequency.</li> <li>If the inverter drops below 96 V for more than 6 sec (loads will brown out during this time), the system will blackout all loads.</li> </ul>                                                                                                                      | – Reduce house load |
| Overload on Current<br><br>(vulnerable to this condition when system does not have an external ATS) | There is too much load on the protected loads panel.                                           | <ul style="list-style-type: none"> <li>If inverter experiences current greater than 35 amps L-N, the inverter will prevent transfer back to the grid and system will stay islanded.</li> <li>If inverter experiences current greater than 35 amps for more than 15 seconds it will blackout and attempt to power loads at an increasing interval, starting at 20 seconds and increasing by 20 seconds between each attempt, up to a maximum of one hour.</li> </ul> | – Reduce house load |

c) the power system further comprising a coupling circuit for controllably coupling the AC power to at least a first load of the one or more loads, the first coupling being responsive to the loading of the AC power source in a manner that it performs at least one of helping to prevent, or helping to mitigate, overloading of the power source.

- Defendant offers multiple power systems comprising a coupling circuit for controllably coupling the AC power to at least a first load of the one or more loads, the first coupling being responsive to the loading of the AC power source in a manner that it performs at least one of helping to prevent, or helping to mitigate, overloading of the power source.
- Defendant's PWRmanager responds to Defendant's PWRcell Inverter's previously described controlled frequency to control output power and receives updates from the inverter on how much power capacity it has and will prevent loads from starting up that would potentially brown out the system.
- This allows the PWRmanager to prevent a load from being connected to the inverter if that load can draw more power (the first load power parameter) than the generator is capable of providing at the time.
- This allows the power system to help prevent or help mitigate overloading of the power source.

### New PWRcell Installation Including Load Management

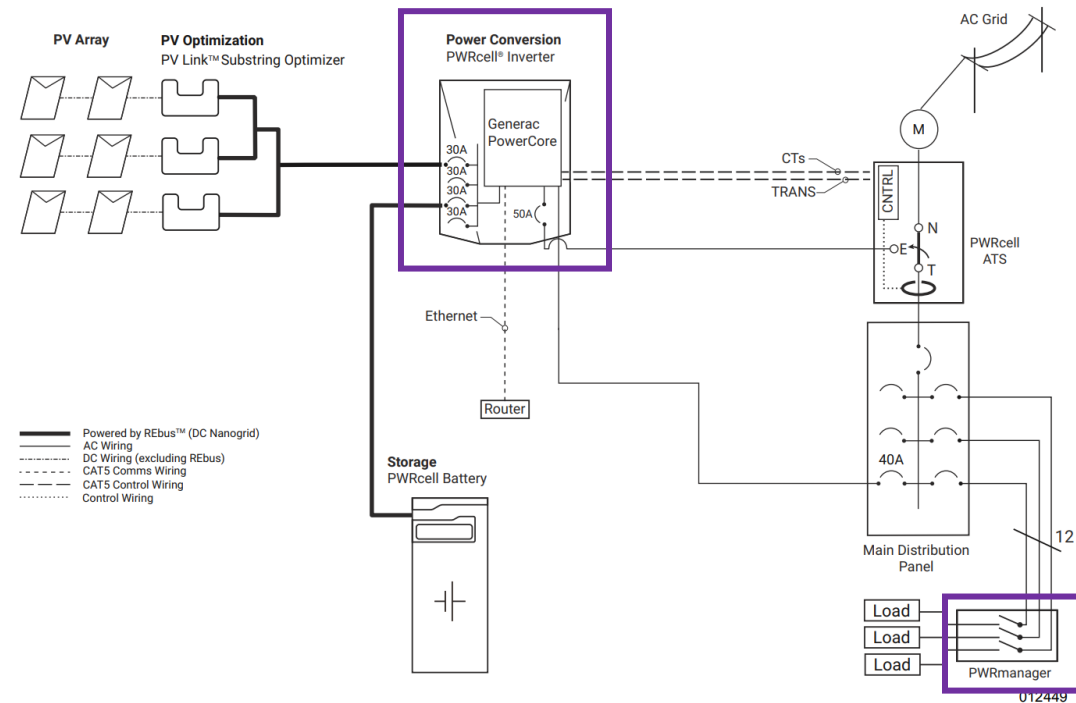


Figure 8-1. New PWRcell Installation Including Load Management

c) the power system further comprising a coupling circuit for controllably coupling the AC power to at least a first load of the one or more loads, the first coupling being responsive to the loading of the AC power source in a manner that it performs at least one of helping to prevent, or helping to mitigate, overloading of the power source.

- A processor in the PWRcell Inverter monitors the output AC power via the CTs or internal sensor in the inverter and controls the output frequency to be 60 Hz when the inverter is not overloaded and below 58 Hz for at least three seconds if the Inverter is overloaded. If the overload continues, then the frequency is dropped below 50 Hz and stays there until the overload is cured. If the overload is not cured by the frequency drop (like a short circuit) the Inverter shuts down.
- A processor in the PWRmanager which both monitors Ethernet communications from the inverter and the voltage and frequency of the Inverter's output A.C. power and can disconnect loads in response to the ethernet communication and in response to the power frequency.
- Thus, if the inverter changes the frequency to 58 Hz PWR, the PWRmanager's processor (or the SMMs of slide 3's processor) can disconnect one or more loads.
- This allows the power system to help prevent or help mitigate overloading of the power source.

### New PWRcell Installation Including Load Management

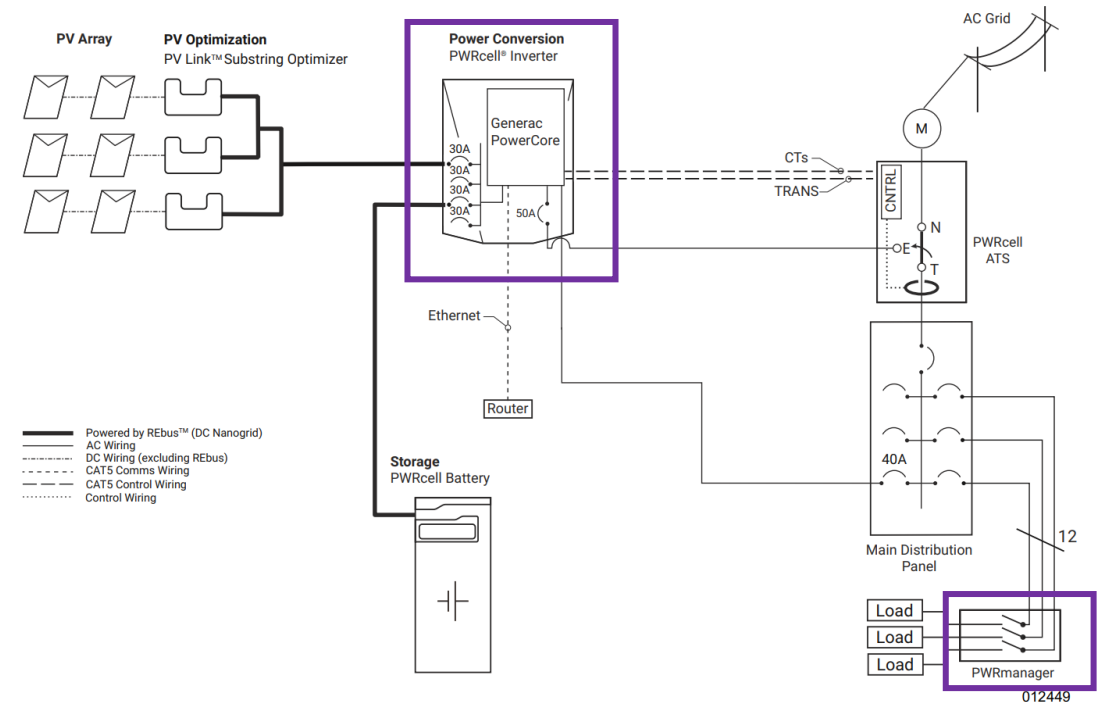
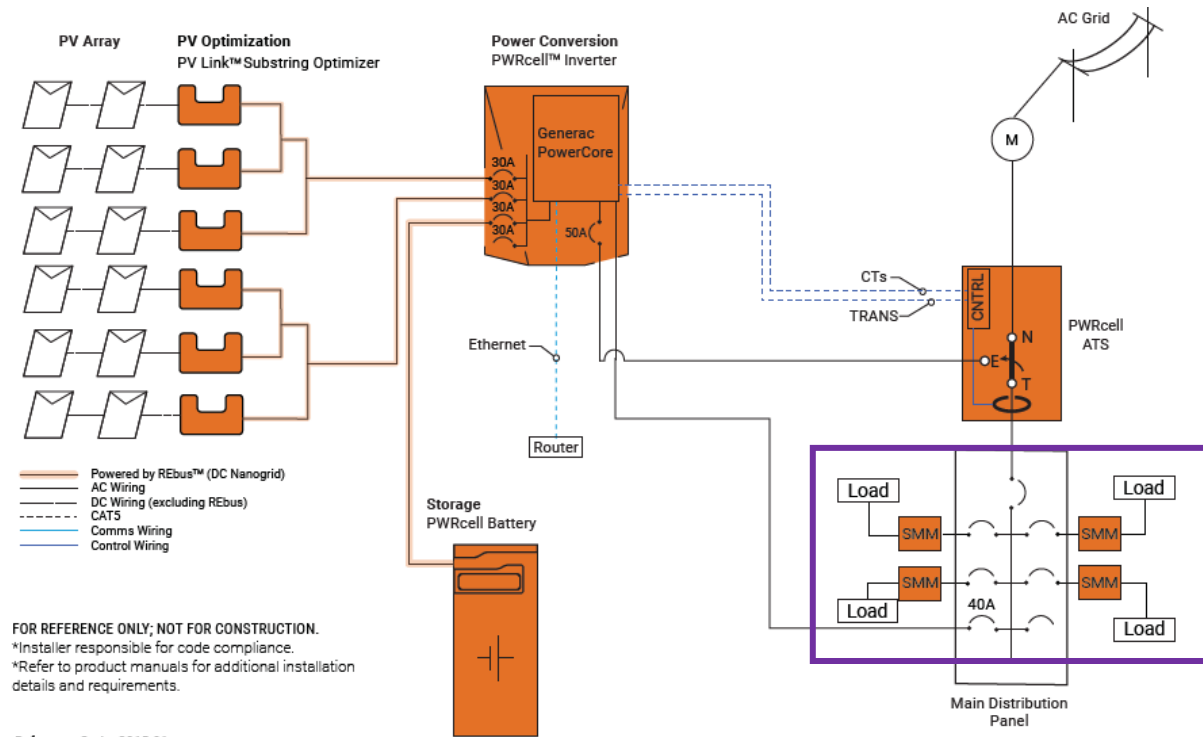


Figure 8-1. New PWRcell Installation Including Load Management

c) the power system further comprising a coupling circuit for controllably coupling the AC power to at least a first load of the one or more loads, the first coupling being responsive to the loading of the AC power source in a manner that it performs at least one of helping to prevent, or helping to mitigate, overloading of the power source.

- SMMs can be used in the same system with or without a PWR manager, and vice versa. SMMs do not receive Ethernet and thus must use frequency. The PWRmanager can receive Ethernet but if the Ethernet goes down during a grid failure, such as by the router dropping out because of a brownout, the frequency based load shedding is still there.
- This allows the power system to help prevent or mitigate overloading of the power source.



Reference Code: 2315-01

This design shows a Generac PWRcell system with a PWRcell ATS in a whole home backup configuration. Use this system configuration to provide backup power to the main service panel loads using Generac Smart Management Modules (SMMs) for load shedding in accordance with NEC 702.4(B) and Article 220.

This configuration is acceptable with 200A or larger utility services.

Part No. A0000521683 | Rev. F | 25 FEB 2021

#### Whole Home Backup / Solar + Storage

- |                      |                    |
|----------------------|--------------------|
| - 1 PWRcell Inverter | - 1 CT Kit (incl.) |
| - 6 PV Links         | - 1 PWRcell ATS    |
| - 1 PWRcell Battery  | - 4 Generac SMMs   |

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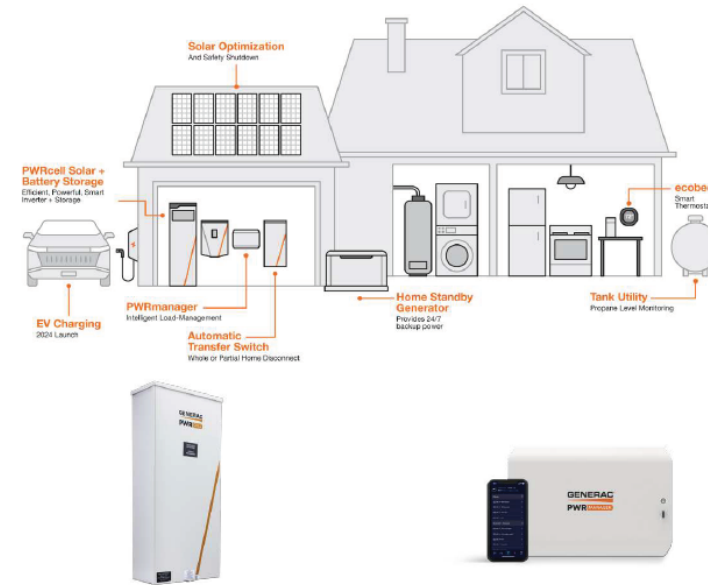
66. A power system which manages the loading of at least one A.C. power sources which provides AC power with a controlled AC frequency, the power system comprising:

- Defendant provides multiple power systems which manage the loading of at least one AC power source which provides AC power with a controlled AC frequency.
- Defendant advertises its power systems as PWRcell Energy Storage Systems which can encompass multiple different configurations and system architectures and are designed to work with multiple different types of power sources including, PWRcell Batteries, PV Arrays, back up generators, and other types of power sources.
- Different embodiments of Defendant's systems contain a wide range of Defendant's products. See list of "Accused Products" in Plaintiff's Preliminary Infringement Contentions.
- Defendant refers publicly to its Integrated Home Energy Ecosystem, as the components are designed to work together.

## Integrated Home Energy Ecosystem

PWRcell isn't just a powerful battery, but it's also the most flexible and scalable home energy system on the market. With a range of supplementary products and features, PWRcell can be configured to meet just about any budget or lifestyle so you get a solution tailored to your unique needs.

Each component has also been designed to work better together. The PWRmanager advanced load management device and features like Outage Guard integrate seamlessly with PWRcell, helping provide additional protection from outages and invaluable peace of mind.



### Automatic Transfer Switch

An integrated solar + battery storage system is made easy with the PWRcell Automatic Transfer Switch (ATS). Power your home and manage up to four individual HVAC (24 VAC controlled) loads with the PWRcell ATS.

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### PWRmanager

The PWRmanager advanced load management device enhances whole home backup power and provides simplified control of up to twelve 120 V circuits or six 240 V circuits plus two thermostats. PWRmanager will automatically manage those loads during an outage to extend backup duration and prevent inverter overload.

## Advanced Load Management

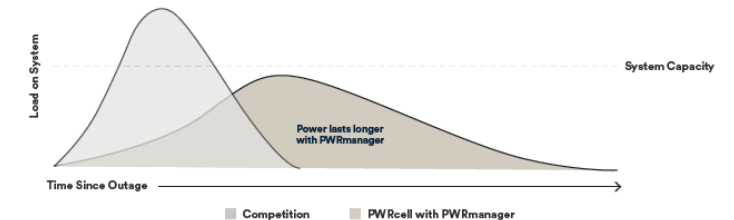
Load management systems are designed to prevent a standby power source, such as an energy storage system, from being overloaded while providing backup power during an outage. The PWRmanager advanced load management system also provides an in-hand ability to turn circuits on or off during an outage, or even while on grid.

PWRmanager provides a richly integrated load management functionality when used with the PWRcell system.

### Advanced Load Management with PWRmanager

#### Cost-effective Solution to Whole Home Power

The PWRmanager advanced load management device adds unbeatable flexibility and value to the PWRcell System. Controlled via the user-friendly PWRview app, PWRmanager enables batteries to work smarter, so a smaller system can power the home for longer.

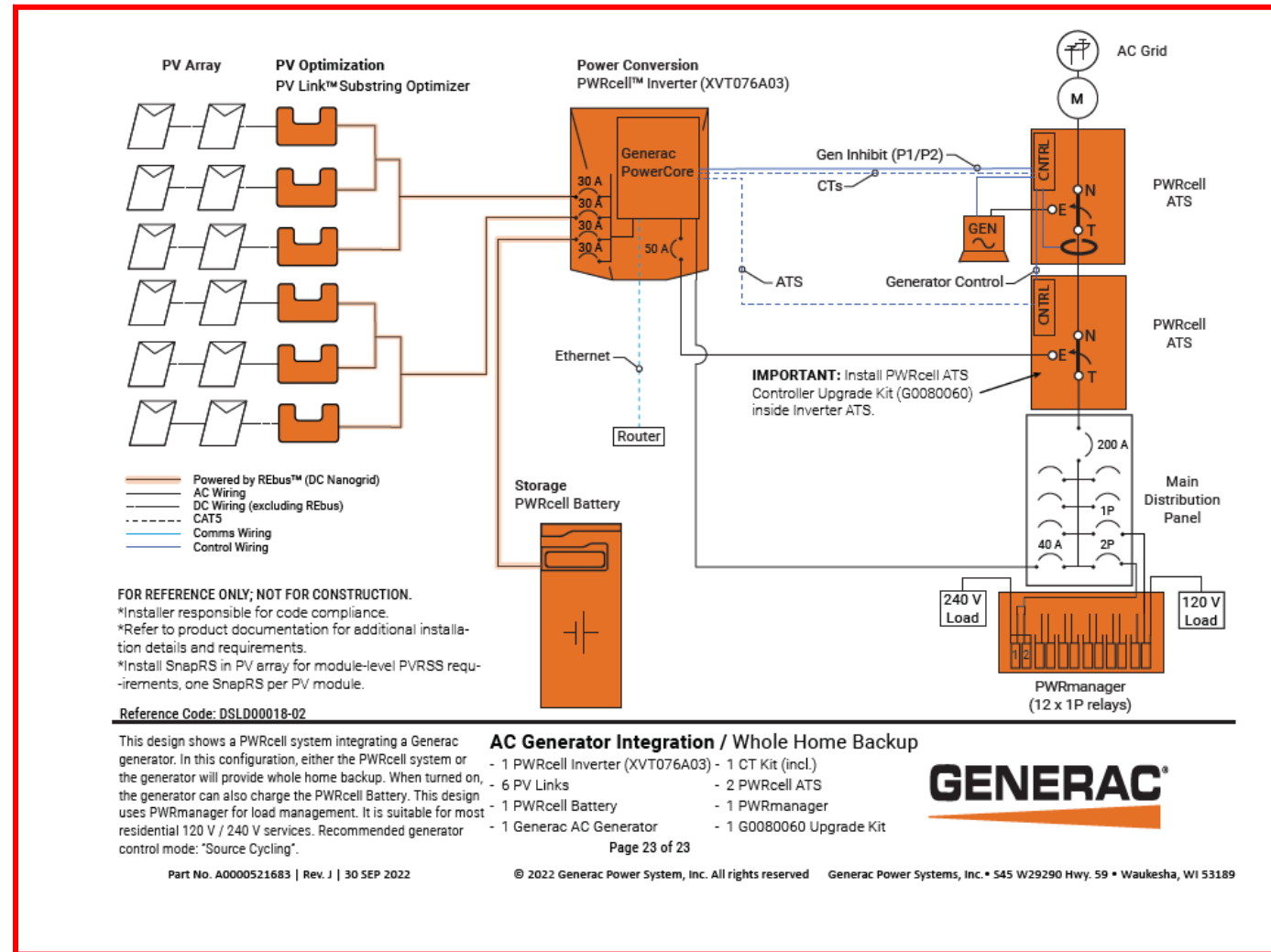


During an outage, PWRmanager extends backup duration and prevents the PWRcell system from being overloaded by too many large loads being turned on at once.

PWRcell Consumer Brochure | 5

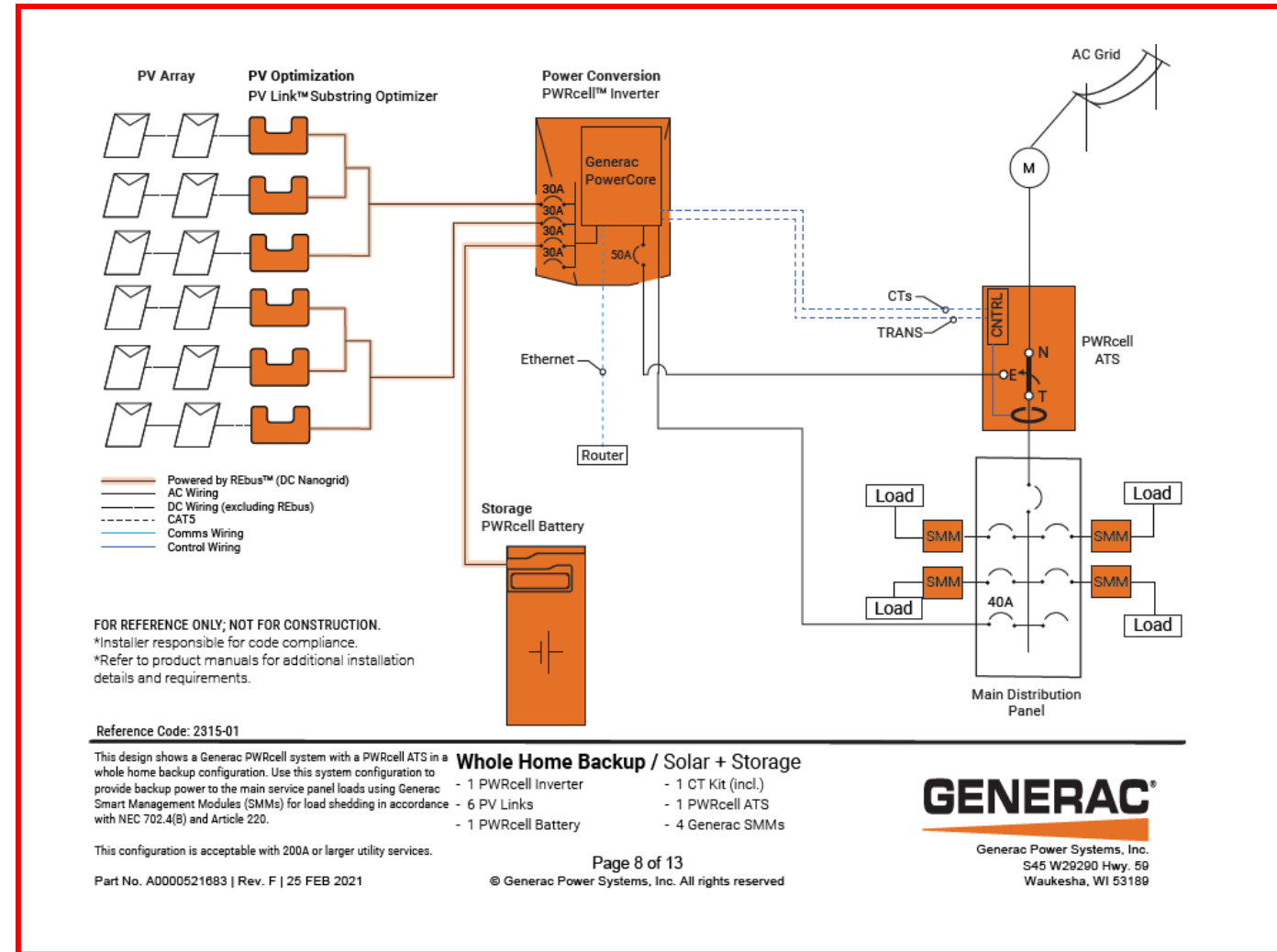
66. A power system which manages the loading of at least one A.C. power sources which provides AC power with a controlled AC frequency, the power system comprising:

- For example, the diagram on this slide is an exemplary diagram modelling a PWRcell Energy Power Storage System provided by Defendant.
- This figure demonstrates how Defendant's AC Generators can be integrated into the PWRcell Energy Storage System and provide further backup power.
- Defendant's PWRcell Inverter controls its AC frequency to assist in managing loads to thereby cause the PWRmanager to disconnect loads. In this configuration, the PWRcell Inverter converts DC power from either the PWRcell Battery or PV array to controlled AC power to power loads.



66. A power system which manages the loading of at least one A.C. power sources which provides AC power with a controlled AC frequency, the power system comprising:

- The diagram shown on this slide is another exemplary diagram provided by Defendant illustrating one of its PWRcell Energy Storage Systems.
- This figure demonstrates how SMM's can be used in place of the PWRmanager to accomplish load management.



66. A power system which manages the loading of at least one A.C. power sources which provides AC power with a controlled AC frequency, the power system comprising:

- The diagram on this slide is another exemplary diagram modelling a PWRcell Energy Power Storage Systems comprising components including Defendant's PWRcell Inverter, PV Substring Optimizer, PWRcell Battery, PWRmanager, PWRcell ATS, Rebus DC nanogrid wiring and Current Transformer Kits.
- Defendant's PWRcell Inverter can convert DC power from the PV Array and/or Storage Battery to AC power which flows into the Main Distribution Panel through the 40A Circuit Breaker to power loads.
- There are two main modes of operation that the inverter can operate in, grid-tied where the inverter output AC power frequency is controlled to be locked to the grid power frequency, and island (backup power) mode where the grid has failed and the inverter power output frequency is controlled to be substantially the same as the nominal power line frequency, (60 Hz in the U.S.), when the inverter is operating normally, and when the inverter is approaching or reaches overload the inverter frequency is controlled to drop to a lower frequency, e.g. 58 Hz or lower. Thus, the output power frequency is always being controlled.

### New PWRcell Installation Including Load Management

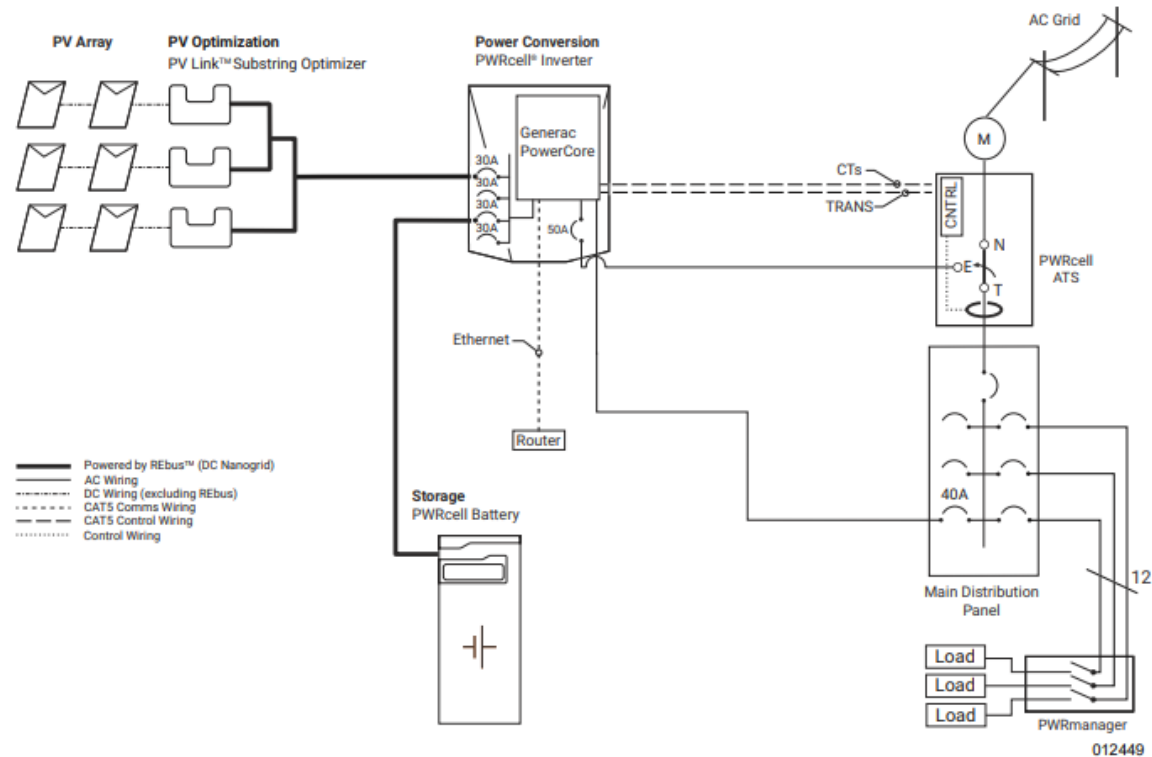
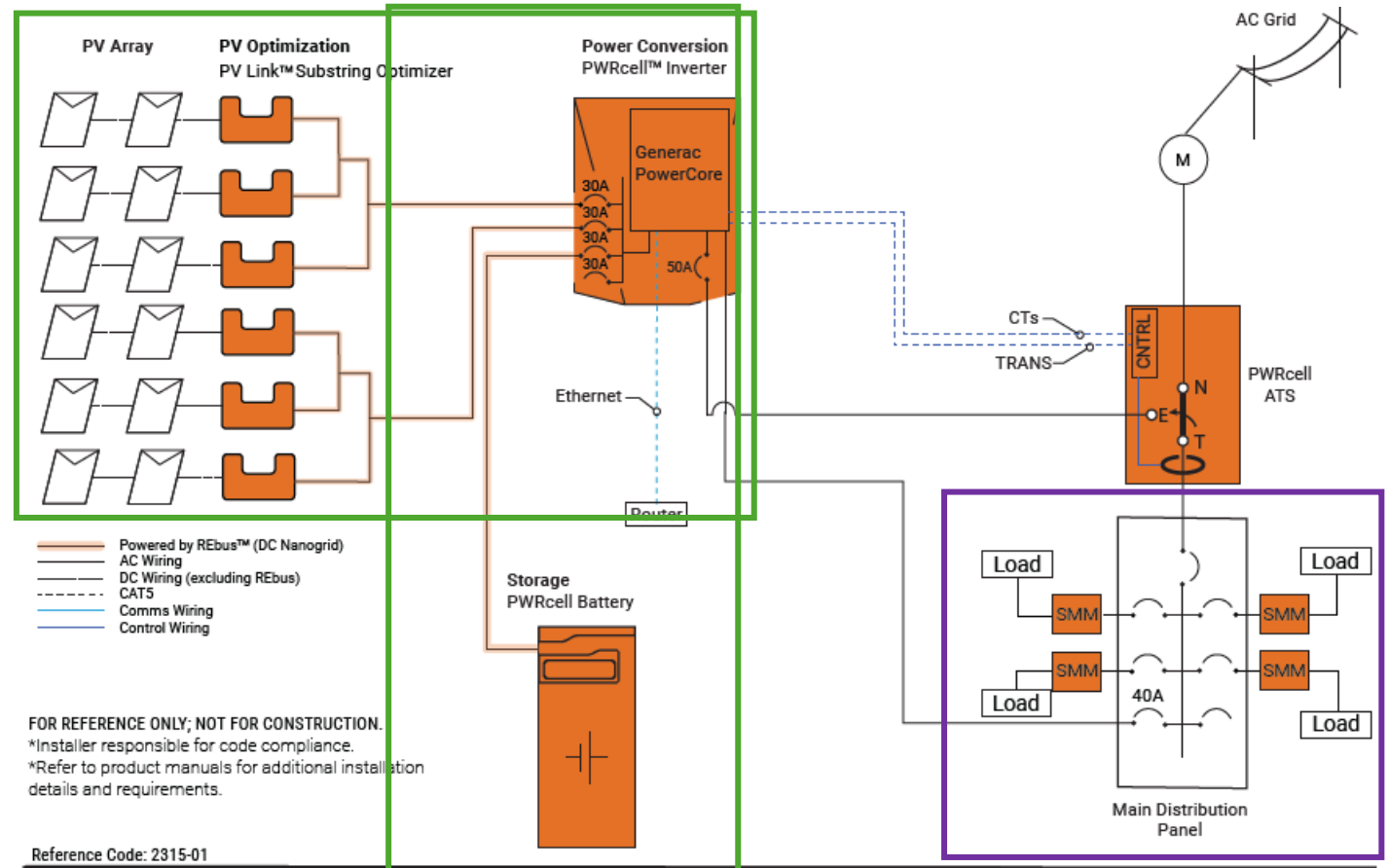


Figure 8-1. New PWRcell Installation Including Load Management

a) one or more non-utility type power source comprising at least an AC power generating circuit which outputs sinusoidal single or multiple phase AC power which may be controllably coupled to one or more of a plurality of loads, the AC power having a plurality of parameters including at least a frequency, a voltage, sine wave distortion and a current which may range from zero to a maximum amount depending on the loading of the power source;

- Defendant offers multiple power systems comprising one or more non-utility type power source comprising at least an AC power generating circuit which outputs sinusoidal single or multiple phase AC power which may be controllably coupled to one or more of a plurality of loads, the AC power having a plurality of parameters including at least a frequency, a voltage, sine wave distortion and a current which may range from zero to a maximum amount depending on the loading of the power source.
- The PWRcell inverter can convert DC power from DC power sources including PV Arrays and/or the PWRcell Battery to AC power which flows into the Main Distribution Panel through the 40A Circuit Breaker to power one or more of a plurality of loads.
- These loads can include but are not limited to the loads pictured attached to the main distribution panel in the bottom right of the diagram.



Reference Code: 2315-01

This design shows a Generac PWRcell system with a PWRcell ATS in a whole home backup configuration. Use this system configuration to provide backup power to the main service panel loads using Generac Smart Management Modules (SMMs) for load shedding in accordance with NEC 702.4(B) and Article 220.

This configuration is acceptable with 200A or larger utility services.

Part No. A0000521683 | Rev. F | 25 FEB 2021

**Whole Home Backup / Solar + Storage**

- |                      |                    |
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| - 1 PWRcell Inverter | - 1 CT Kit (incl.) |
| - 6 PV Links         | - 1 PWRcell ATS    |
| - 1 PWRcell Battery  | - 4 Generac SMMs   |

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a) one or more non-utility type power source comprising at least an AC power generating circuit which outputs sinusoidal single or multiple phase AC power which may be controllably coupled to one or more of a plurality of loads, the AC power having a plurality of parameters including at least a frequency, a voltage, sine wave distortion and a current which may range from zero to a maximum amount depending on the loading of the power source;

- The specifications provided by Defendant describe the plurality of parameters of the AC power of the non-utility type power source.
- Further, sine wave distortion can be on a given power source.
- See e.g.:  
<https://support.generac.com/s/article/What-Is-Total-Harmonic-Distortion-THD>;  
<https://support.generac.com/s/article/Does-My-Unit-Produce-a-Pure-True-Sine-Wave-or-a-Modified-Sine-Wave>.

## Section 2: General Information

### Specifications

| Description                                                                                                            | Units | XVT076A03 |
|------------------------------------------------------------------------------------------------------------------------|-------|-----------|
| Max. cont. grid-tied AC power @ 122°F (50°C)                                                                           | kW    | 7.6       |
| Max. cont. AC power in island mode w/ external transfer switch and single 6 module battery cabinet <sup>2</sup>        | kW    | 9.0       |
| Max. cont. AC power in island mode w/ external transfer switch and 2 battery cabinets (8 modules minimum) <sup>1</sup> | kW    | 11.0      |

[https://ressupply.com/documents/generac/XVT076A03\\_Installation\\_Manual.pdf](https://ressupply.com/documents/generac/XVT076A03_Installation_Manual.pdf)

### Application Considerations

An overload condition is determined by the PWRcell inverter frequency while the inverter is in island mode. Loads are managed and de-energized when frequency is less than 58 Hz for three seconds or less than 50 Hz for ½ second (for 60 Hz systems).

The controller can be used in conjunction with individual SMMS to manage a combined total of eight loads.

- The priority order determines the order in which managed loads are re-energized by the load management system after all of the managed loads have been de-energized due to an overload condition.
- Use Priorities A/C 1-4 on the controller as the top priorities, then up to four SMMS as Priorities 5-8.
- Use only select A/C priorities on the controller as the top priorities, then use additional SMMS as the remaining priorities.
- A SMM can share a priority with an A/C priority on the controller provided the standby power source is sized to handle the combined surge load from both appliances. Sharing priorities can allow up to 12 loads to be managed in a properly sized system.

### Ratings

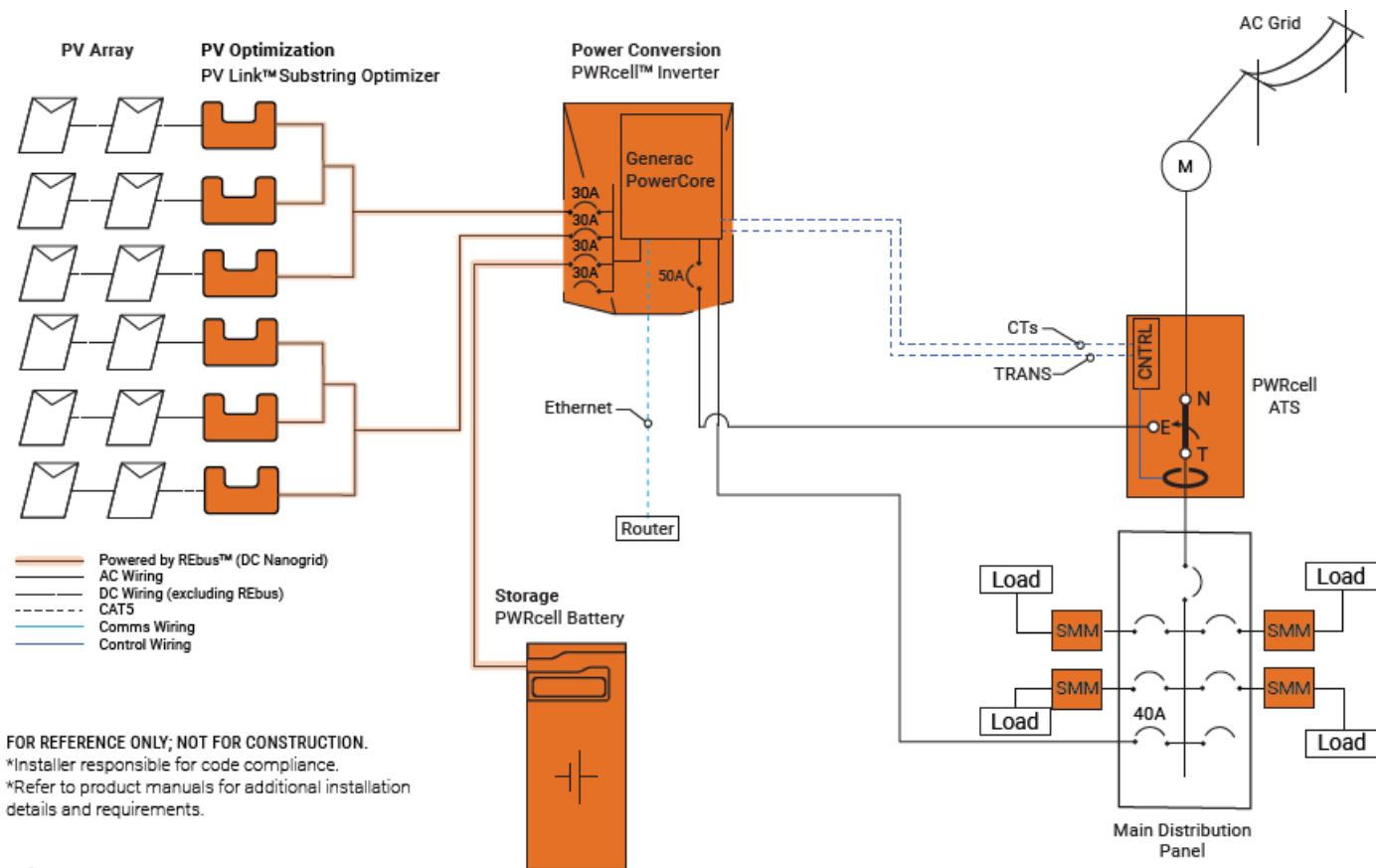
| Description                                                      | Units  | Min  | Nominal             | Max  |
|------------------------------------------------------------------|--------|------|---------------------|------|
| Maximum Input Voltage (nanogrid)                                 | V      |      |                     | 420  |
| Range of Input Operating Voltage (nanogrid)                      | V      | 360  |                     | 400  |
| Maximum input current (nanogrid)                                 | A      |      |                     | 20   |
| Maximum input short circuit current (nanogrid)                   | A      |      |                     | 30   |
| Maximum input source backfeed current to input source (nanogrid) | A      |      |                     | 30   |
| Output power factor rating (ac)                                  | -      |      |                     | 1    |
| Operating Voltage range (ac) 2ph                                 | V, rms | 108  |                     | 130  |
| Operating Voltage range (ac) 3ph                                 | V, rms | 106  |                     | 132  |
| Operating frequency range or single frequency                    | Hz     | 59.6 |                     | 60.4 |
| Nominal output voltage (ac)                                      | V, rms |      | 120/240 & 208, 3 ph |      |
| Normal output frequency (ac)                                     | Hz     |      | 60                  |      |

b) one or more contactor and/or transfer switch whereby the AC power may be electrically paralleled with, or connected in place of or as a backup replacement for the grid power and the power source controls the AC power such that;

- i. the frequency of the AC power is responsive to the grid power frequency when the AC power is provided in parallel with grid power so that connected loads receive power from one or both of the power source and grid; and
- ii. when the AC power is not paralleled with the grid, its frequency is responsive in a manner that the frequency represents the loading of the power source;

- Defendant offers power systems comprising one or more contactor and/or transfer switch whereby the AC power may be electrically paralleled with, or connected in place of or as a backup replacement for the grid power and the power source controls the AC power such that the frequency of the AC power is responsive to the grid power frequency when the AC power is provided in parallel with grid power so that connected loads receive power from one or both of the power source and grid; and when the AC power is not paralleled with the grid, its frequency is responsive in a manner that the frequency represents the loading of the power source.

- There are two main modes of operation that the inverter can operate in, grid-tied where the inverter output AC power frequency is controlled to be locked to the grid power frequency, and island (backup power) mode where the grid has failed and the inverter power output frequency is controlled to be substantially the same as the nominal power line frequency, (60 Hz in the U.S.), when the inverter is operating normally, and when the inverter is approaching or reaches overload the inverter frequency is controlled to drop to a lower frequency, e.g. 58 Hz or lower. Thus, the output power frequency is controlled. The switching between modes is accomplished by the PWRcell ATS.



FOR REFERENCE ONLY; NOT FOR CONSTRUCTION.

\*Installer responsible for code compliance.

\*Refer to product manuals for additional installation details and requirements.

Reference Code: 2315-01

This design shows a Generac PWRcell system with a PWRcell ATS in a whole home backup configuration. Use this system configuration to provide backup power to the main service panel loads using Generac Smart Management Modules (SMMs) for load shedding in accordance with NEC 702.4(B) and Article 220.

This configuration is acceptable with 200A or larger utility services.

Part No. A0000521683 | Rev. F | 25 FEB 2021

#### Whole Home Backup / Solar + Storage

- 1 PWRcell Inverter
- 6 PV Links
- 1 PWRcell Battery
- 1 CT Kit (incl.)
- 1 PWRcell ATS
- 4 Generac SMMs

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c) a load manager circuit comprising one or more processor, which load manager circuit may or may not be part of the power source, the load manager circuit responsive to the frequency of the AC power to provide AC power to at least one of the one or more of a plurality of loads when the power source is not overloaded and not provide AC power when the power source is overloaded.

- Defendant's power system comprises a load manager circuit comprising one or more processor, which load manager circuit may or may not be part of the power source, the load manager circuit responsive to the frequency of the AC power to provide AC power to at least one of the one or more of a plurality of loads when the power source is not overloaded and not provide AC power when the power source is overloaded.
- A processor in the PWRcell Inverter monitors the output AC power via the CTs or internal sensor in the PWRcell inverter and controls the output frequency to be 60 Hz when the inverter is not overloaded and below 58 Hz for at least three seconds if the Inverter is overloaded. If the overload continues, then the frequency is dropped below 50 Hz and stays there until the overload is cured. If the overload is not cured by the frequency drop (like a short circuit) the Inverter shuts down.
- A processor in the PWRmanager which both monitors Ethernet communications from the inverter and the voltage and frequency of the Inverter's output A.C. power and can disconnect loads in response to the ethernet communication and in response to the power frequency.
- Thus, if the inverter changes the frequency to 58 Hz PWR, the PWRmanager or SMMs can disconnect one or more loads.

### New PWRcell Installation Including Load Management

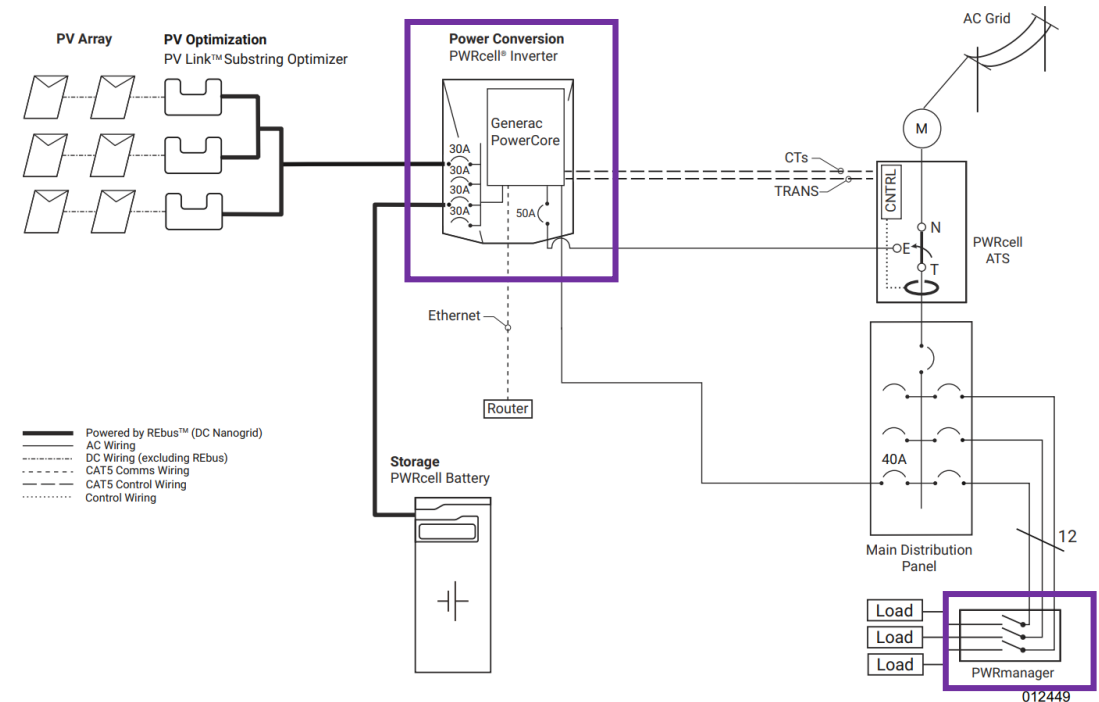


Figure 8-1. New PWRcell Installation Including Load Management

c) a load manager circuit comprising one or more processor, which load manager circuit may or may not be part of the power source, the load manager circuit responsive to the frequency of the AC power to provide AC power to at least one of the one or more of a plurality of loads when the power source is not overloaded and not provide AC power when the power source is overloaded.

- As one example, certain loads may be shed at 58Hz, and the rest shed at 50 Hz.

## Load Management Options

Load management systems are designed to prevent a power source such as an inverter from being overloaded by large appliance loads. Options include:

- Smart Management Modules (SMMs)
- Smart A/C Module (SACM) (found in PWRview transfer switch)
- Advanced Load Controller: PWRmanager

When using the PWRmanager in a system, it will control 12 circuits and two HVAC thermostat channels. Additional circuits can be managed by adding SMMs and configuring for lockout.

Do not use SACM circuits when using PWRmanager; instead use the PWRmanager's HVAC thermostat circuits.

### SMM and Carton Contents

**Priority Dial (A)** – Sets module priority.

**NOTE: PRIORITY MUST BE DIFFERENT for each module in an installation.** Priority sets the order in which loads recover from a load shed event. Recovery time from a load shed event is five minutes for Priority 1. Each priority after Priority 1 waits an additional 15 seconds after the initial recovery time. See [Table 2-1](#).

**Lockout Switch (B)** – Enables or disables lockout function. Switch positions are LOCKOUT LOAD ON GENERATOR (enabled) and LOCKOUT DISABLED. See [Table 2-2](#).

**NOTE:** Recovery time is based on priority dial settings. See [Table 2-1](#).

**Test Button (C)** – Disables contactor output for a specified time.

**LED (D)** – Provides module status. See [Table 2-3](#).

**Contactor (E)** – Normally CLOSED. If the generator begins to overload, the contactor opens to take the load off generator power. The contactor also opens to take the load off generator power. See [Connections](#).

**Mounting Holes (F)** – Internal enclosure mounting holes provide clean and sturdy mounting.

**Priority Decal (G)** – Provided for recording priority of each module in installation. Install on electrical panel.

71. The power system of claim 66 wherein in c) the load manager circuit is responsive to the AC power frequency and to at least the sine distortion of the AC power to provide or not provide AC power to the at least one of the one or more of a plurality of loads.

- Defendant's power system comprises a load manager circuit responsive to the AC power frequency and to at least the sine distortion of the AC power to provide or not provide AC power to the at least one of the one or more of a plurality of loads.
- A processor in the PWRcell Inverter monitors the output AC power via the CTs or internal sensor in the inverter and controls the output frequency to be 60 Hz when the inverter is not overloaded and below 58 Hz for at least three seconds if the Inverter is overloaded. If the overload continues, then the frequency is dropped below 50 Hz and stays there until the overload is cured. If the overload is not cured by the frequency drop (like a short circuit) the Inverter shuts down.
- A processor in the PWRmanager which both monitors Ethernet communications from the inverter and the voltage and frequency of the Inverter's output A.C. power and can disconnect loads in response to the ethernet communication and in response to the power frequency.
- Thus, if the inverter changes the frequency to 58 Hz PWR, the PWRmanager's processor (or the SMMs of slide 3's processor) can disconnect one or more loads.

### New PWRcell Installation Including Load Management

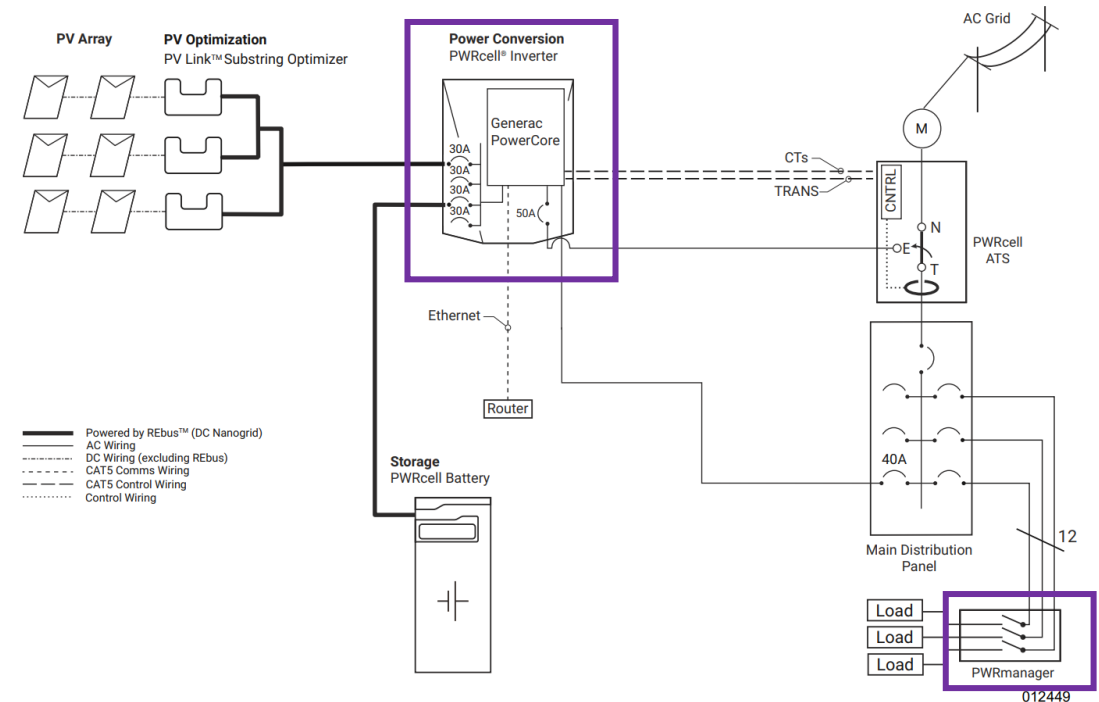


Figure 8-1. New PWRcell Installation Including Load Management