faveo: Viridi Backup System

USER GUIDE

V2.1

Contents

LEGAL DISCLAIMER

As an express condition of Viridi's warranty and to encourage utilization of industry best practices, Viridi requires that the installation and operation of the faveo be only completed by, or at the direction of, a licensed electrical professional (as defined by the jurisdiction(s) within which the installation occurs). Specific installations can vary, so please direct specific questions to Viridi's attention (via telephone: 716-968-8658; or in writing to sales@viridiparente.com). Viridi expressly disclaims liability for installations made in a manner inconsistent with this guide and/or in non-compliance with local building and electrical codes. This user guide incorporates all terms and conditions of sale. All steps, details, and any other information is subject to change, from time to time, with or without notice.

faveo installation in Lancaster, NY

SAFETY GUIDELINES

SYMBOLS

	Warning		Quality
	Shock Hazard		Tip
	Minor Shock Hazard		Pull Test
	General Safety		Time
	Wear Gloves		

QUALIFIED PERSONNEL

This guide for the tasks and procedures described herein is intended for use by skilled staff only. A skilled staff is defined as a trained and qualified electrician or installer with all the following skills and experience:

- Knowledge of the functional principles and operation of on-grid and off-grid (backup) systems.
- Knowledge of the dangers and risks associated with installing and using electrical devices and acceptable mitigation methods.
- Knowledge of the installation of electrical devices.
- Knowledge of and adherence to this guide and all safety precautions and best practices.
- Knowledge of local installation standards and electrical licenses, if required by local municipality.

Repair or disassembly of the faveo is only possible by a specially authorized person separately from the installation qualification.

SAFETY INSTRUCTIONS

All faveo users and installers are responsible for familiarizing themselves with the contents of this document and all warnings before performing installation and servicing.

General Safety Precautions

(By example and without limitation)

- Over-voltages or wrong wiring can damage the inverter.
- Any type of product breakdown may lead to a leakage of electrolytes or flammable gas.
- Avoid installing the faveo in the same location where flammable materials are stored. Do not install in places where explosive gas or chemicals are present.
- During the installation of the faveo, the utility grid input must be deenergized. Wiring must be carried out by Qualified Personnel.
- The faveo should only be serviced by Qualified Personnel.
- The electronics inside the faveo are vulnerable to electrostatic discharge.
- Personnel should be grounded before handling the faveo.

faveo Handling Guide

- Do not expose the faveo to an open flame.
- Do not place or store the faveo near highly flammable materials.
- Do not expose or place near water sources such as downspouts or sprinklers.
- Do not install the faveo in an airtight enclosure or in an area without ventilation.
- The faveo is a commercial product and not designed for residential installation.
- Store the faveo in a cool, dry place prior to installation.
- Store the faveo on a flat, level service prior to installation.
- Store the faveo out of reach of children and animals.
- Do not disconnect, disassemble, or repair the faveo with unqualified personnel. Only Qualified Personnel should handle, install, and service the faveo.
- Do not damage the faveo by dropping, deforming, impacting, cutting, or penetrating with a sharp object. Doing so may cause a fire or leakage of the electrolytes.
- Do not step or stand on the faveo or its packaging.
- Do not place any foreign objects on top of the faveo.

- Do not connect any AC conductors directly to the faveo. These are only to be connected to the AC-In / AC-Out breaker.
- Do not charge or discharge the faveo if damaged.
- Install the faveo with proper clearance from vehicles.
- The faveo has been designed to NEMA 3R, which provides a degree of protection from falling rain, dirt, and sleet, and will be undamaged by the external formation of ice on the enclosure.

Lifting and unpacking guidelines will be dependent on the final consumer and local installation parameters. Follow established workplace safety guidelines and procedures when receiving, handling, transporting, unpacking, lifting, and installing the faveo.

Response to Emergency Situations

The faveo includes internal fault mechanisms designed to prevent failures and subsequent risk hazards. However, Viridi cannot guarantee safety performance of the faveo if ever exposed to abuse, damage, or negligence.

If an installer or user happens to be exposed to the internal materials of the battery cell due to damage on the outer casing, the following actions are recommended:

- *In Case of Inhalation:* Leave the contaminated area immediately and seek medical attention.
- *In Case of Skin Contact:* Wash the contacted area with soap thoroughly and seek medical attention.
- *In Case of Ingestion:* Induce vomiting and seek medical attention.

If a fire breaks out at the location where the faveo is installed, perform the following counter measures:

- Utilize fire-extinguishing media as appropriate. Use an FM-200 or CO2 extinguisher for battery fires. Use an ABC fire extinguisher if the fire is not from the battery and has not yet spread to it.
- Follow the proper fire-fighting instructions. If a fire occurs when charging the faveo, provided it is safe to do so, disconnect the battery pack circuit breaker to shut off the power charge. If the batter pack is not on fire yet, extinguish the fire before the battery pack catches fire, preferably with water. If the battery pack within the faveo is on fire, do not try to extinguish it, and evacuate people from the premises immediately.

WARNING: Explosion is possible when the battery pack within the faveo is heated above 150°C. When a battery pack is burning, it will leak poisonous gases. Do not approach it.

To deal with an accident with the faveo on land, place the damaged faveo into a segregated place and call your local fire department or service engineer.

To deal with an accident with the faveo in the water, stay out of the water and do not touch anything if any part of the battery, inverter, or wiring is submerged. Do not use the submerged battery again and contact your Viridi service engineer for assistance.

PRODUCT OVERVIEW

KEY BENEFITS

- Instantaneous backup in less than 20 milliseconds.
- Improves public safety and security.
- Reduces labor costs of controlling or resetting intersection.
- Remote monitoring and full telematics to support data sharing and alerts.
- Built to operate in extreme temperatures.
- Sophisticated BMS with CAN (2.0b).
- Battery management system performs cell balancing, prevents over/under voltage, current, and pack temperature.
- Maintenance-free; 3-year warranty on all components.

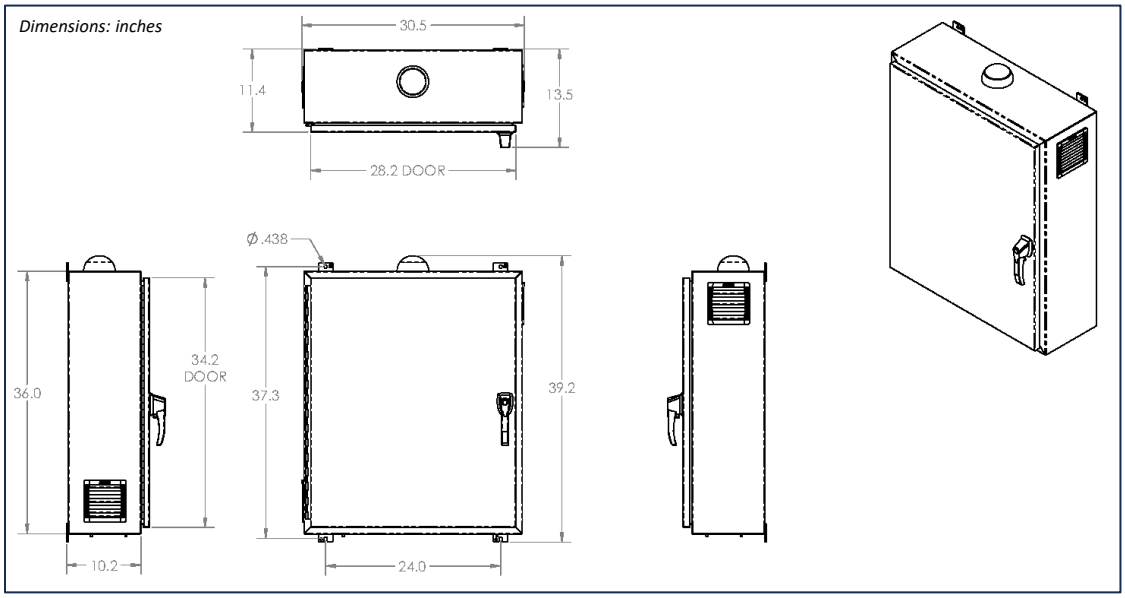
SPECIFICATIONS

Physical Specs

Weight: 275 lbs (124.74 kg)

Dimensions: 30.5 in wide x 39.2 in tall x 11.4 in deep (without handle)

Enclosure: Steel NEMA 3R



Certifications

UL 458 (Inverter)

Operating Temperature Range

Discharge: -20°C to 50°C (-4°F to 122°F)

Charge: -20°C to 45°C (-4°F to 113°F)

NOTE: Operating temperature range mirrors battery cell specifications. faveo does not require externally supported thermal management. The Battery Management System is programmed to manage pack utilization rate to control internal pack thermal conditions to prevent operation outside of pack interior temperature limits.

Battery Specs

- Capacity: 196 Ah/5 kWh.
- Integrated pack fuse: 50kA interrupt rating
- Integrated contactor: 2000A breaking capacity
- 250W (2.1A/120V) run time: 20hr
- 500W (4.6A/120V) run time: 10hr
- Pack service life: 20-year (~3,000 full cycles)

Recycling Partner

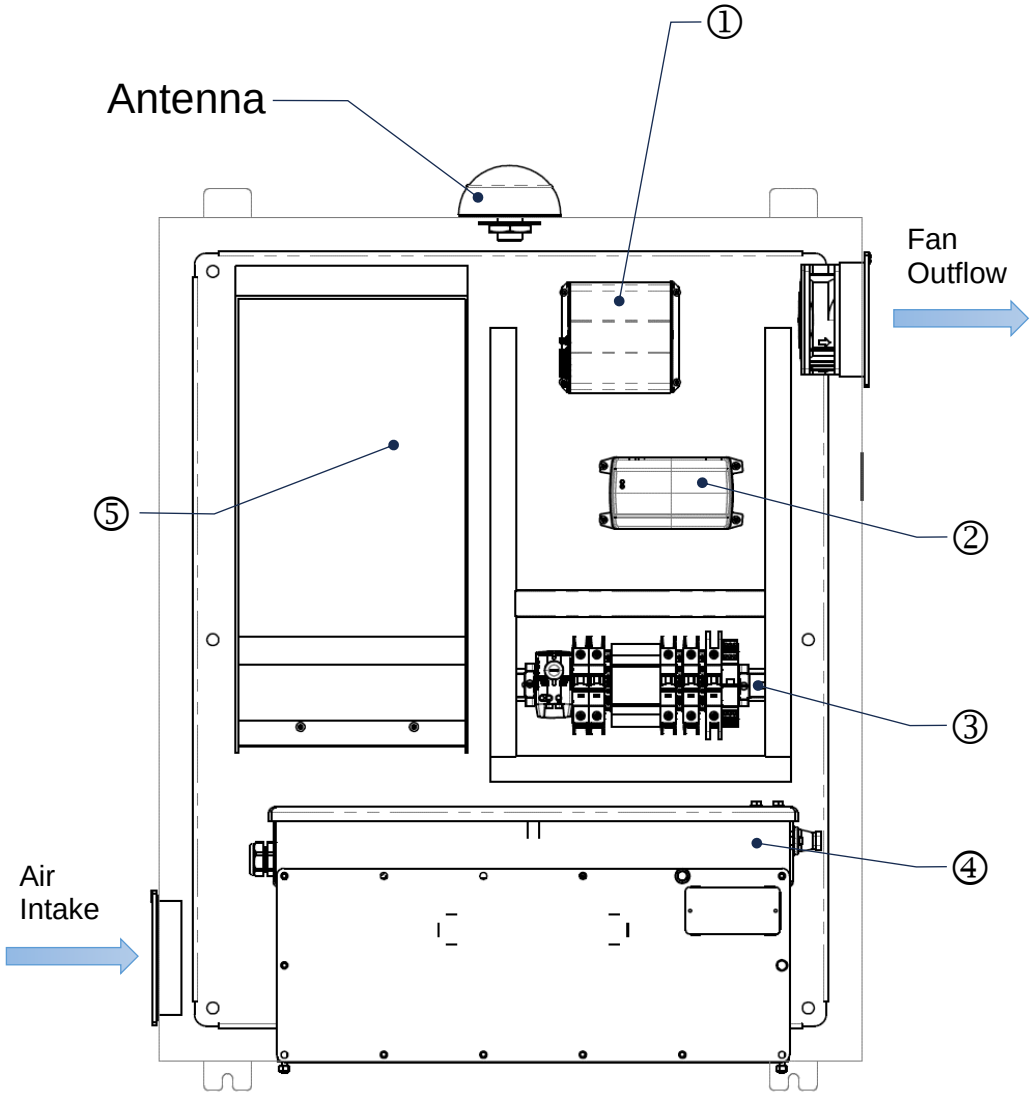
Li-Cycle recovers 95% of the valuable elements in lithium-ion batteries.

Full product sheet and other details can be found at https://viridiparente.com/products-services/. The faveo is maintenance-free with a three-year warranty on all components. Failure to adhere to the guidelines set forth in the faveo: Viridi Backup System USER GUIDE will void the warranty as provided in the terms and conditions of sale.

COMPONENTS

COMPONENT LIST

1. Viridi VCom telematics
2. Inverter Controller (Cerbo GX)
3. DIN Rail Stack (see step 4 of installation guidelines)
4. Viridi RPS5 Battery
5. Inverter/Charger (MultiPlus 2kVA 120 V)



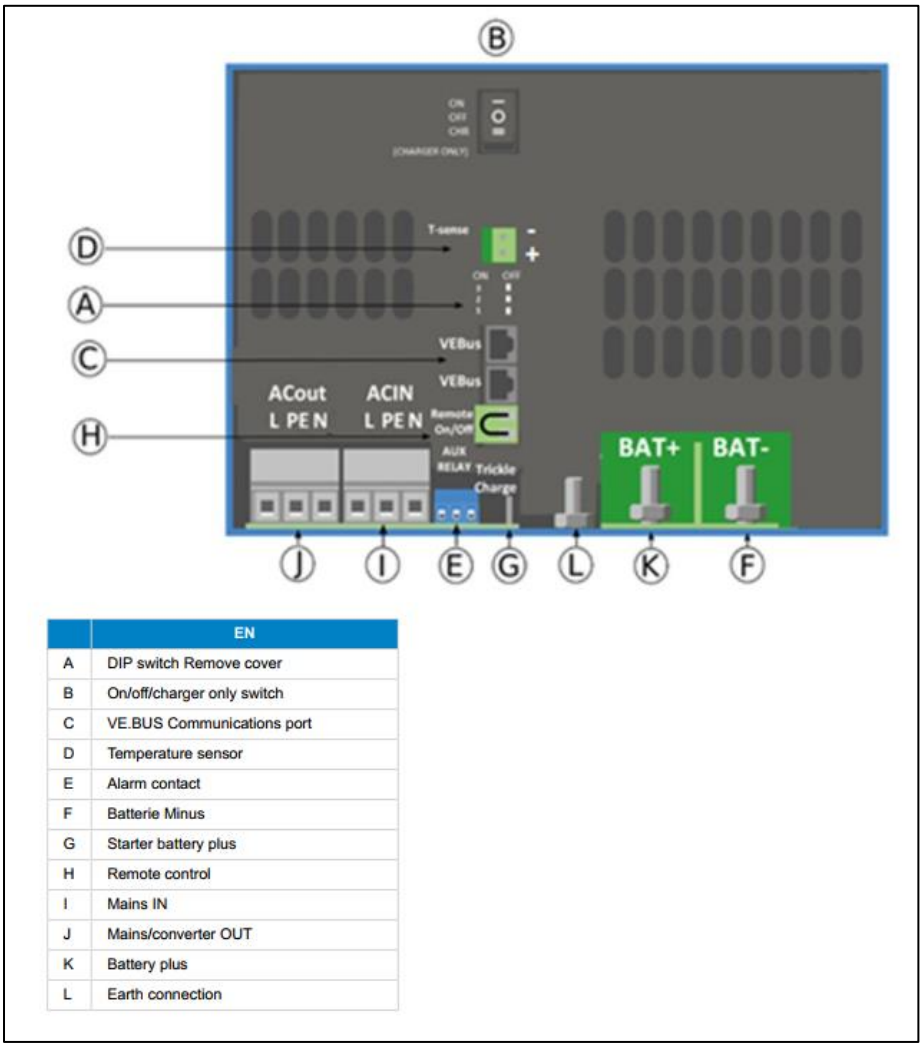
VIRIDI TELEMATICS

The Viridi VCom telematics unit provides cloud-based monitoring of faveo data. Access to a data dashboard is customized based on customer needs and can be accessed via the web with a username and password provided upon system installation.

More information on the Viridi VCom is available upon request.

MULTIPLUS 2KVA 120 V INVERTER

The MultiPlus 2kVA 120 V Inverter is an automatic transfer switch and DC to AC inverter to provide an uninterrupted power supply (UPS) to the location where the faveo is installed.



	EN
A	DIP switch Remove cover
B	On/off/charger only switch
C	VE.BUS Communications port
D	Temperature sensor
E	Alarm contact
F	Batterie Minus
G	Starter battery plus
H	Remote control
I	Mains IN
J	Mains/converter OUT
K	Battery plus
L	Earth connection

More information on the MultiPlus 2kVA 120V can be found at:
https://www.victronenergy.com/upload/documents/MultiPlus_2kVA_120V/24547-MultiPlus_2kVA-pdf-en.pdf

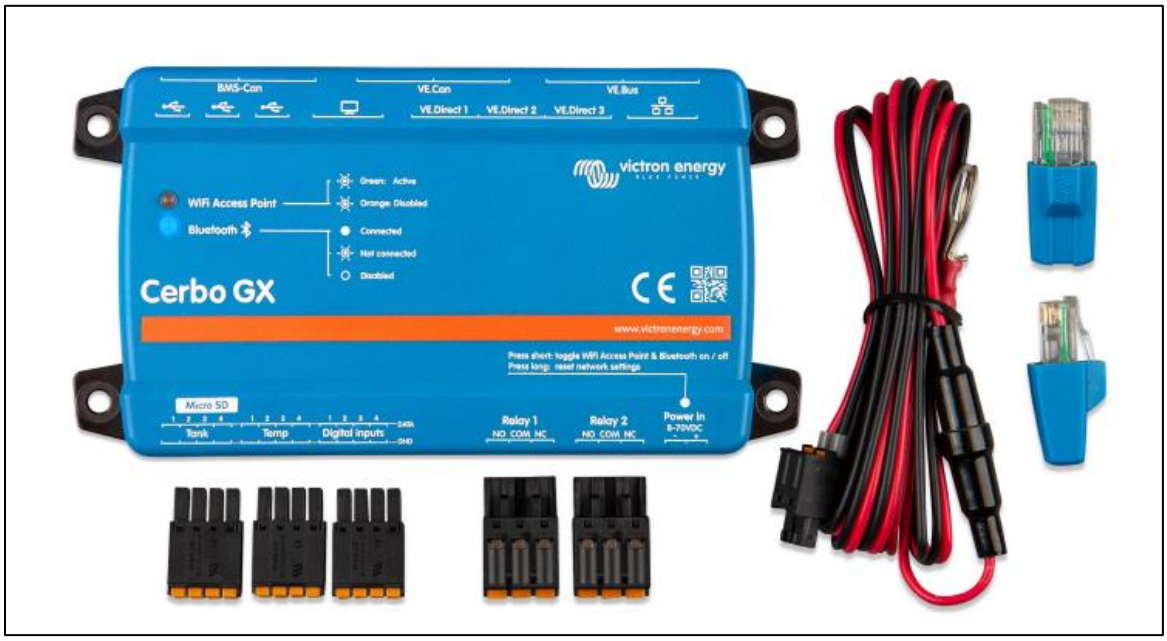
SCAN ME

Inverter Specifications

faveo: Viridi Backup System	
MultiPlus 24/2000/50	
Power Control/Power Assist	Yes
Transfer Switch	50A
INVERTER	
Input Voltage Range	19-33V
Output	Output Voltage: 120VAC +/- 2% Frequency: 60Hz +/- .01% (1)
Cont. Output Power at 25 (degree symbol)C (3)	2000VA
Cont. Output Power at 25 (degree symbol)C	1600W
Cont. Output Power at 40 (degree symbol)C	1400W
Cont. Output Power at 65 (degree symbol)C	1000W
Peak Power	3500W
Maximum Efficiency in %	94
Zero Load Power	11
Zero Load Power in Search Mode	4
CHARGER	
AC Input	Input Voltage Range: 95-140VAC Input Frequency: 45-65Hz
Battery Temperature Sensor	Yes
GENERAL	
Protection (2)	a-g* (listed below)
Common Characteristics	Operating Temp. Ranges: -40° to 65°C (fan assisted) Humidity (non-condensing): max 95%
ENCLOSURE	
Common Characteristics	Material & Color: Steel/ABS (blue RAL 5012) Protection Category: IP21
Battery-connection	M8 Bolts
Weight	15.5kg
Dimensions (h x w x d)	506 x 236 x147mm
STANDARDS	
Safety	EN-IEC 60335-1, EN-IEC 60335-2-29, EN 62109-1
Emmisions/Immunity	EN 55014-1, EN 55014-2, EN-IEC 61000-3-2, EN-IEC 61000-3-3, IEC 61000-6-1, IEC 61000-6-2, IEC 61000-6-3
** a.) Output Short Circuit, b.) Overload, c.) Battery Voltage too High, d.) Battery Voltage too Low, e.) Temperature too High, f.) 230VAC on Inverter Output, g.) Input Voltage Ripple too High*	

CERBO GX INVERTER CONTROLLER

The Cerbo GX Inverter Controller interfaces between the BMS (battery management system) and the inverter to control the settings of the faveo.



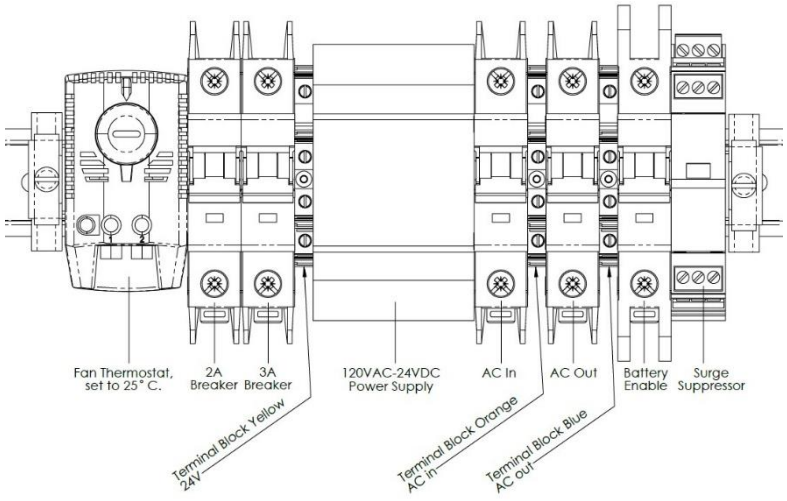
More information on the Cerbo GX can be found at:

https://www.victronenergy.com/upload/documents/Cerbo_GX/140558-CCGX__Venus_GX__Cerbo_GX__Cerbo-S_GX_Manual-pdf-en.pdf

SCAN ME

INSTALLATION GUIDELINES

1. **Mount the faveo to the desired surface.**
    a. The unit is pole-mounted to the intersection infrastructure where grid power is located.
    b. Mounting options include, but are not limited to: strap-mounts, bolts, and Unistrut. This includes mounting against multiple surfaces, including light poles, traffic poles, or on a solid wall.
2. **Run conduit from the faveo to the power source provided.**
    a. 1" conduit is recommended to allow for additional equipment or systems such as cameras, data collection devices, etc. However, ½" conduit may also be used if there are no other power needs.
    b. The power source is often located in the pole where the faveo is mounted (1.a).
3. **Connect line (black), neutral (white), and ground (green) wires directly from the faveo to the provided power source into the surge suppressor corresponding to faveo wiring. Left to right should be Neutral (1), Ground (PE), Line (5).**
    a. Line, neutral, and ground wires are labeled inside the faveo.
    b. In some areas, line, neutral, and ground wires may be connected through a new or existing transfer or generator plug switch to bypass the faveo system. This allows for system servicing without interrupting power.



4. **Flip all the switches inside the faveo to the ON position. It takes about 30 seconds for all components to power up. Be sure the inverter switch is in the ON position.**
5. **Once the unit is powering the traffic light and traffic is safely controlled, test the system by turning the AC In breaker to the OFF position. Traffic lights should function without interruption. Turn the AC In breaker back to the ON position.**
6. **Finally, turn the Battery Enable breaker to the OFF position. Traffic lights should again remain on with no interruption. Turn the Battery Enable breaker back to the ON position.**

7. **Test data connection to Viridi and client monitoring (process varies based on location and client preference).**

DECOMMISSIONING

To decommission or uninstall the faveo please contact your Viridi service team. Decommissioning must be completed by Qualified Personnel. Disposal of components requires compliance with local laws, rules, and regulations. Viridi encourages recycling of all materials where possible, and works with LiCycle to recover valuable lithium-ion battery components.

Required equipment, tools, and other items depend on consumer requirements and installation location. Consult your service engineer and local installer for further instruction. Mounting hardware not included. The faveo is a commercial product and is not designed for residential installation.

POWERING THE FAVEO ON AND OFF

Powering ON

1. Open the enclosure door.
2. Ensure all breakers are off and wires are all securely connected.
3. Re-energize utility grid power.
4. Turn on the Battery Enable Breaker.
5. Turn on the AC In breaker.
6. Turn on the AC Out breaker.
7. Turn on remaining 2A and 3A breakers.
8. Indicator lights on the inverter, Cerbo GX, and AC-DC converter should illuminate.
1. After ~30 seconds, the Inverter light changes from Inverting to Charging.

Powering OFF

9. Open the enclosure door.
10. Turn off the AC Out breaker.
11. Turn off the AC In breaker.
12. Turn off the Battery Enable Breaker.
13. Turn off the remaining 2A and 3A breakers.
14. The System is off but be aware Utility Grid power is still present at AC In breaker input.

Customer Service and Contact Information

Address

Viridi Parente, Inc.
1001 East Delavan Avenue, Suite 02
Buffalo, NY 14215

Business Hours

Monday – Friday
8:30am – 4:30pm

Contact

P: 716.968.8658
E: sales@viridiparente.com

Website

www.viridiparente.com

Aerial View of Viridi at 1001 East Delavan Avenue