



## The Evolution of Vertical Wind Technology



**EOW-300**

**EOW-200**

**EOW-100**

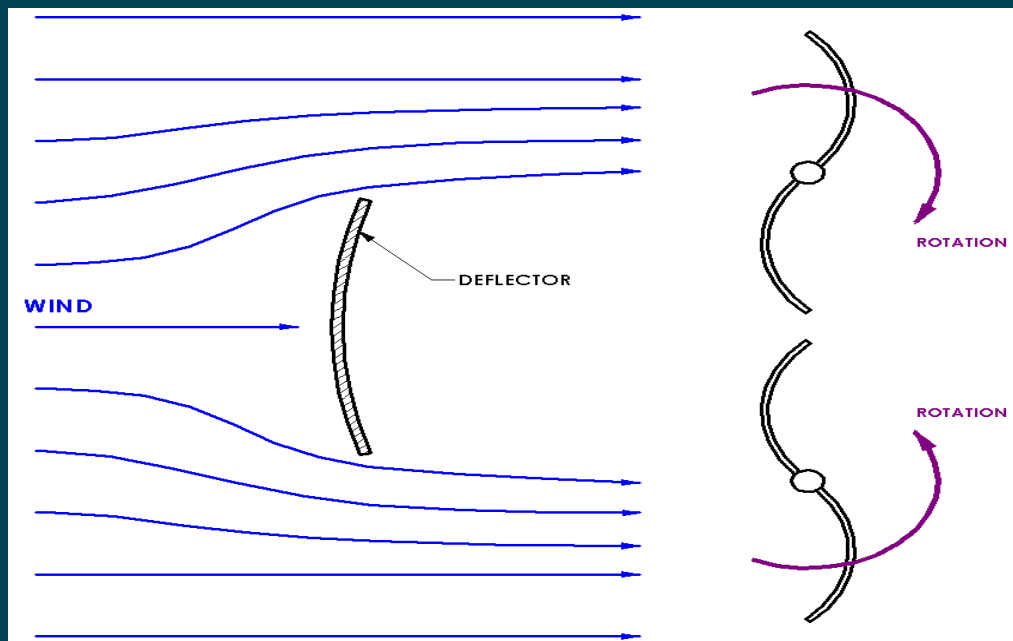
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**Manufacturing/Assembled in the USA**

**Offices in Texas / Florida / Nicaragua / Germany / UK**

## Introduction:

Thank you for requesting information on BE-WIND products.

The BE-WIND product line was founded and developed from the aerospace industry. Over 10 years in development and testing, using the state of art Design software and manufacturing process. We ourselves spent many years researching the requirements and concerns of invested people in the small wind market. Having set high goals to produce a product that was efficient and durable. The result was our patented Dual Axis Vertical turbine with a diversion and accelerator for a front shield. The forward shield not only prevents the wind force on the back side of the rotating blades, but also accelerates air flow to the production side of the blades. The second turbine gives us balance and redundancy, in the event of a malfunction to one of the power supplies.



Our focus is to supplement your power needs as best as possible. Trying to reduce dependency from the grid and increasing energy costs. We make no claims to remove 100% of your power consumption, but we hope to put a reasonable dent into it.

If Off grid is your requirement, we can support Storage systems and join with Solar to offer a Hybrid approach to maintain a 24-hour power source. We offer one of the best Warranties in the business and stand behind our US manufactured product.

Please review the current systems available and do not hesitate to contact us for questions and support.

# PRODUCT INFO:

# EOW -100

# 1-2kw System

NOTES:

- NOTES: EOW-100 1.0-2.0 KW OPTIONS
- 220-VOLT SYSTEM
- 112 VOLT SYSTEM

STRUCTURE: ALUMINUM 6061 T6  
BLADES TPO HIGH IMPACT PLASTIC  
POWDER-COATED (MULTIPLE COLORS)

OVERALL SIZE: 60" X 81" X 72"  
ESTIMATED WEIGHT 375 LBS.

OPTIONS: MULTIPLE COLOR OR WRAP SCHEEMS  
LIGHTING EFFECTS WITH SOLAR SYSTEM MOUNT

STANDARD COLOR: BLACK STRUCTURE, WHITE BLADES

LOGO OR WRAP

OPTIONAL SOLAR PANEL

GENERATORS

REV	APPROVALS	DATE	REV	APPROVALS	DATE

REV	DESCRIPTION	DATE

REV	DESCRIPTION	DATE

BE-WIND LLC

EOW-100

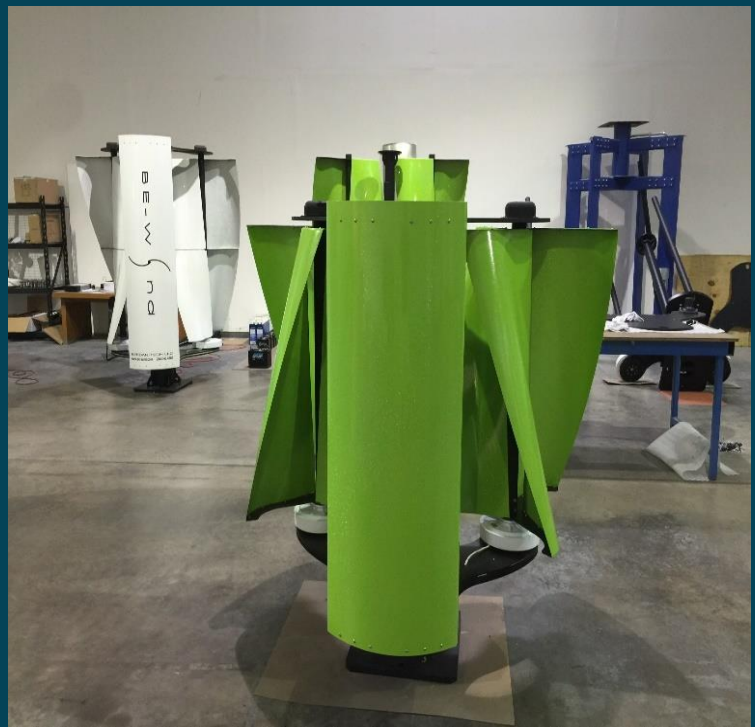
SCALE 1:1

THIRD ANGLE PROJECTION

**EOW-100 Supports 2 x .5-1.0 KW Axial Flux Generators. With High or Low Voltage output depending on application.**

**220-volt 3Phase VAC 3-Amp output Grid Tie application  
112-volt 3Phase VAC 6- Amp Battery Storage system**





**The EOW-100 is our smallest foot print. Design for light power outputs higher wind conditions, 1-2kw is available. Standard build is 2 x 1.0 Kw generators.**

This design has 3 x 48" helix blades per side, designed to capture 360 degrees of air flow, with a low wind speed kick in of only 3-4 mph (2/ms). Light weight of only 350 lbs. depending on generators, built from 6061 Aluminum that is processed the same as commercial aircraft structures. We anodize the aluminum when required by coastal locations and powder coat to prevent corrosion; all the fasteners are Stainless steel and blades are of composite or ABS plastic with UV protection to avoid any discoloration of the material over long periods of sun exposure. Multiple colors and designs are available.

This system was designed with portability and quick install in mind. This system is fully customizable for decals on front deflector and or night lighting with a solar panel and battery system for special lighting effects or Marketing applications.

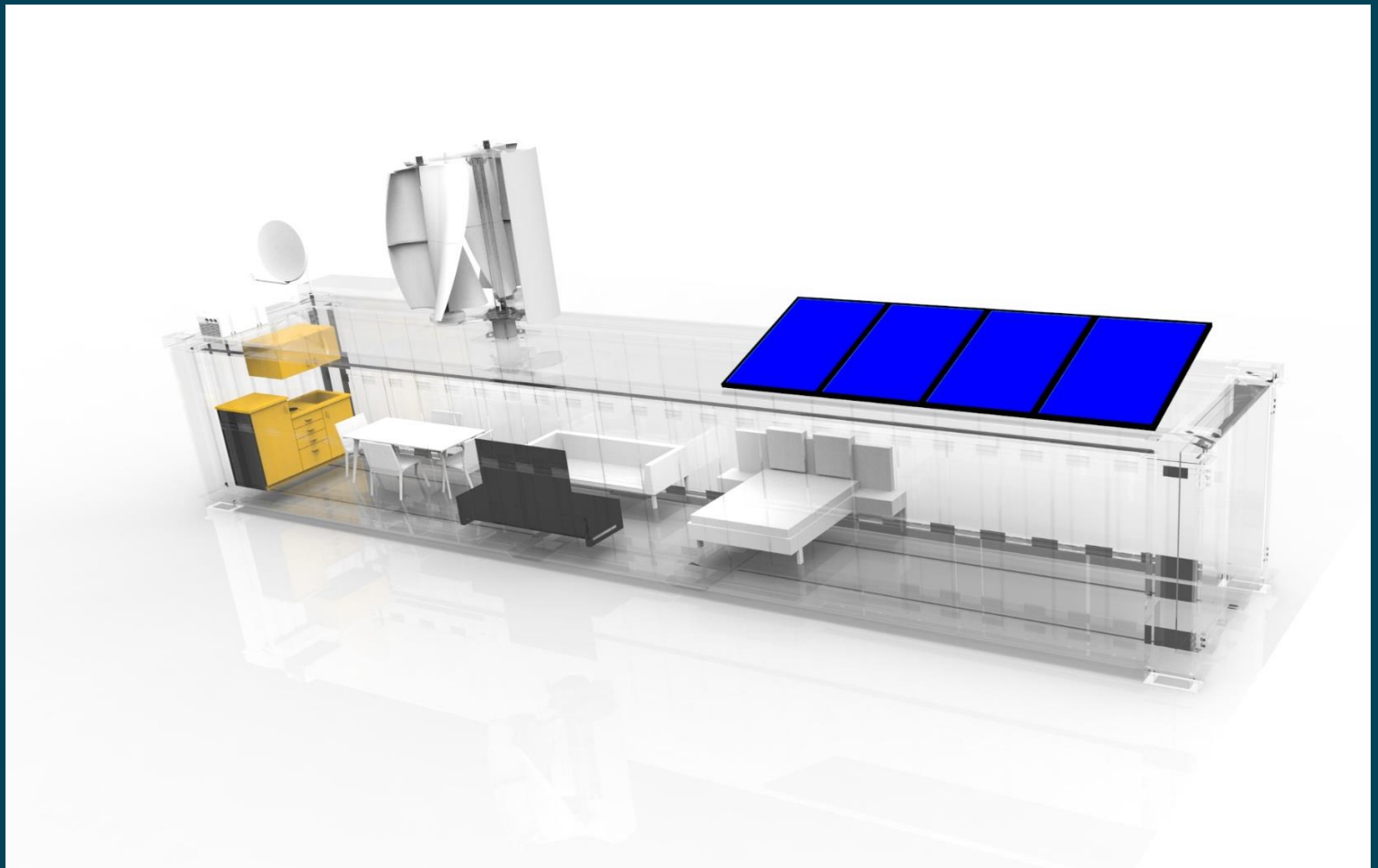
This system was designed to handle areas of higher winds, Coastal winds, Mountain and extreme weather areas with speeds as high as 120 mph. City Roof Tops and Skyscrapers Even with a low kick in speed. The smaller structure and blade surface allows for more intense weather locations. This system is fully customizable. The system will come fully assembled and ready to mount on multiple locations.

**Primary Applications:** Remote extreme weather locations, Cell tower, Tiny house construction, Container construction, City Buildings and roof top structures, Mountain locations and Extreme high wind locations. Offering, Battery support, smaller power requirements. Extreme remote locations or areas difficult to install any energy source of any kind.



EOW-100

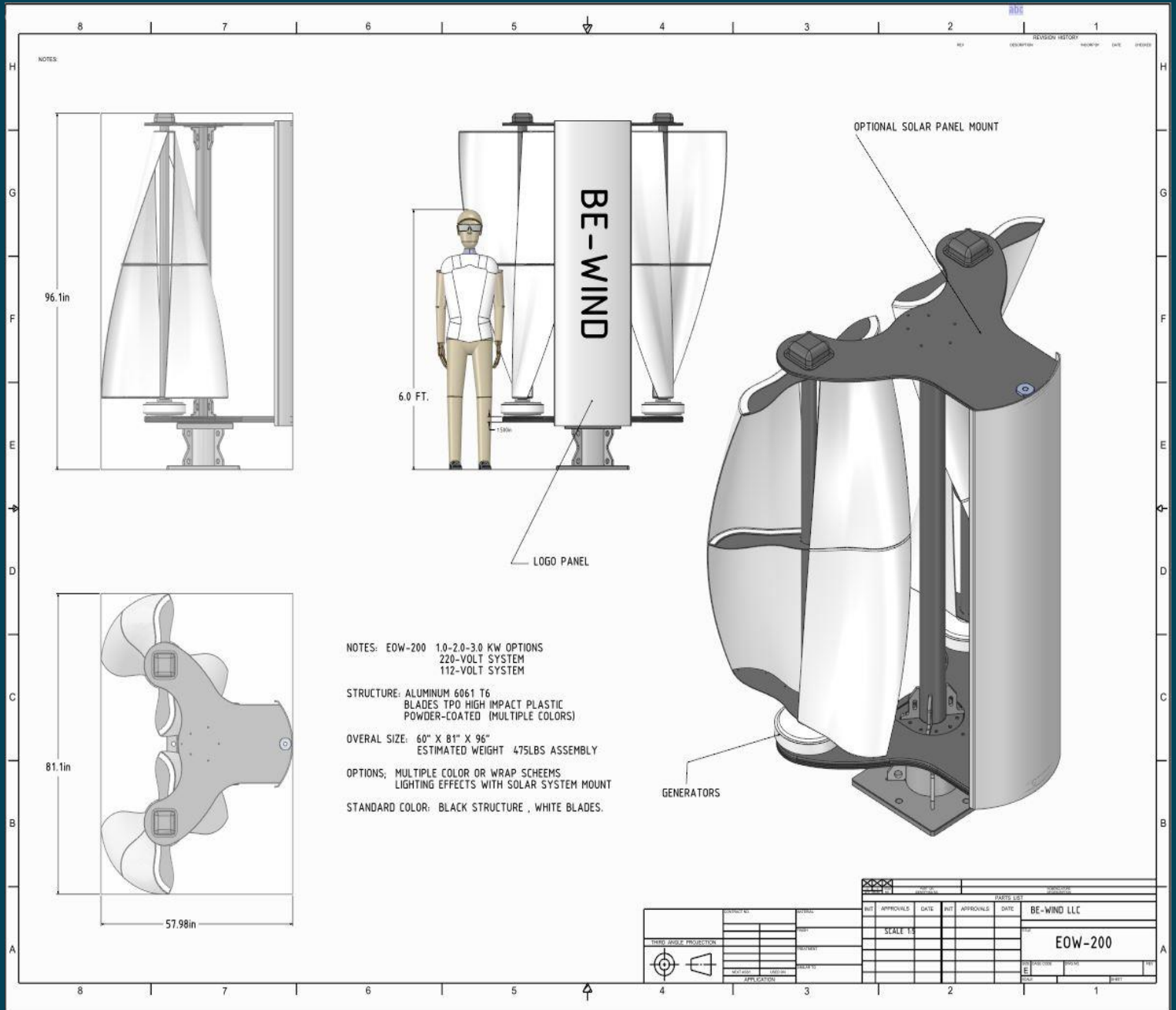
EOW-200



# PRODUCT INFO:

## EOW -200

## 1-2-3kw System



**EOW-200 Supports 2 x .5 -1.0-1.5 KW Axial Flux Generators  
With high or Low Voltage output depending on application.**

**220-volt 3Phase VAC 4 Amp output Grid Tie application  
112-volt 3Phase VAC 10 Amp Battery Storage system**





**The EOW-200** is our midrange foot print. The 200 has been our pilot system for more than 10 years. Designed for Medium Urban power applications 1,2,3 kw is available.

This design has optional 2 x 60" or 3 x 60" helix blades per side, designed to capture 360 degrees of air flow, with a low wind speed kick in of only 3-4 mph. (2.0 m/s) and useable power production starting at 5mph (2.5 m/s)

Light weight of only 450 lbs. depending on generators, built from 6061 Aluminum that is processed the same as commercial aircraft structures.

We anodize the aluminum and powder coat when required by coastal locations to prevent corrosion; all the fasteners are Stainless steel and blades are of composite or TPO plastic with UV protection to avoid any discoloration of the material over long periods of sun exposure. This system was designed with portability and quick install in mind.

The system will come fully assembled and ready to mount on multiple locations.

In 2018 we hope to introduce the new Composite EOW-200 giving a more compatible pricing structure, with new maintenance free technology, never seen in the wind industry of this type.

### **Primary Applications:**

Developed for the Urban environment and small business applications. This our most popular system. Great for Homes, Cottages, Barns, Small business for specific applications and remote power source locations.

Excellent for either Grid tie or off grid applications using 110-220 voltage or 12/24/48 volt Battery systems and fully customizable with colors, Decals or special lighting effects.

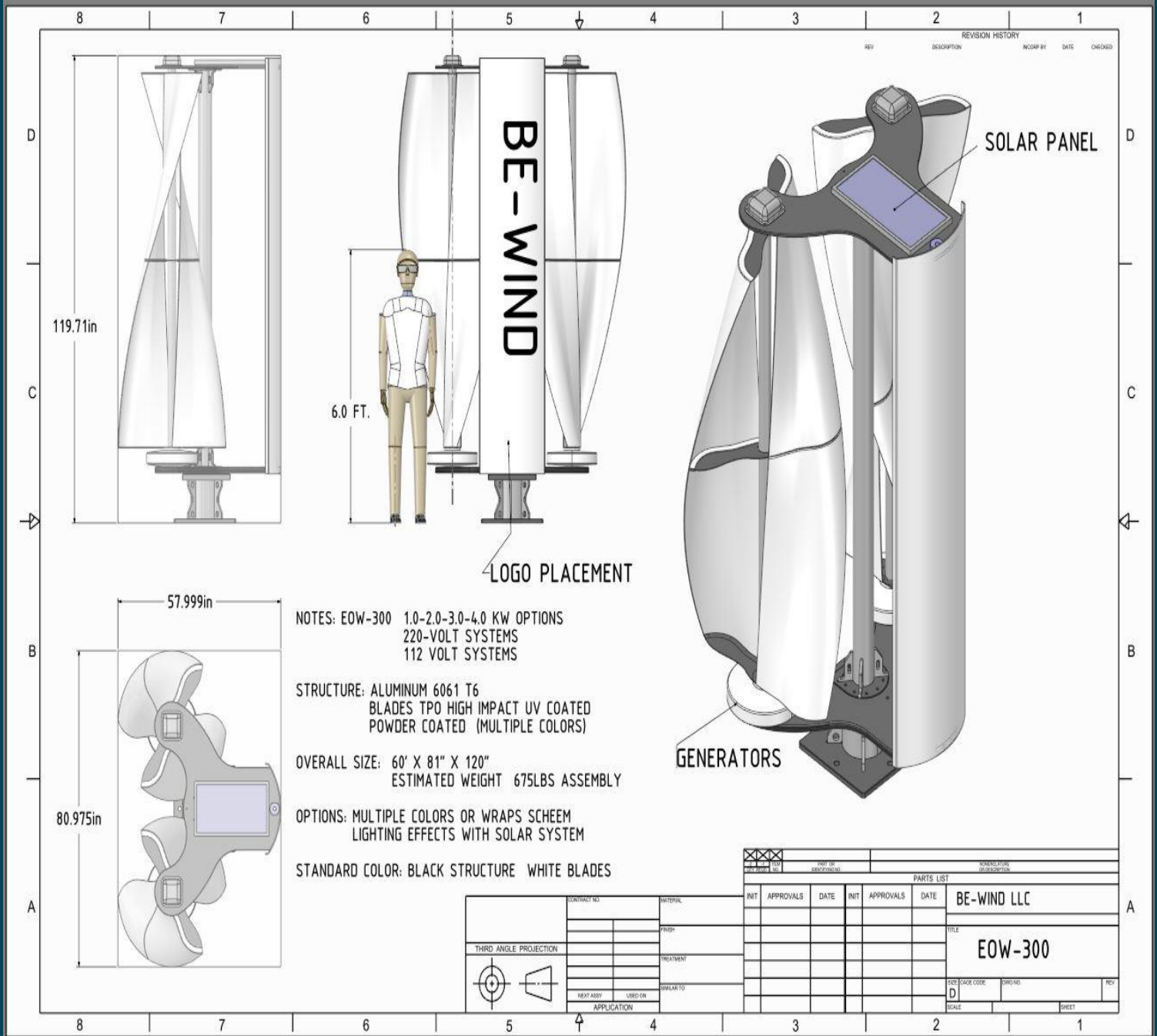






**PRODUCT INFO:**

**BE-WIND EOW -300 2-3-4 kw**



**EOW-300 2 x 1.5-2.0 KW system Axial Flux Generators  
With High or Low Voltage output depending on application.**

**220-volt 3phase 6 Amp output Grid Tie application  
112-volt VDC 10-15 Amps Battery Storage system**

**The EOW-300** is our largest foot print. Design for med-high power outputs 2,3,4kw is available. This design has 2 x 96” helix blades per side, designed to capture 360 degrees of air flow, with a low wind speed kick in of only 3-4 mph. (2.0 m/s)

Light weight of only 575 lbs. depending on generators, built from 6061 Aluminum that Is processed the same as commercial aircraft structures.

We anodize the aluminum and powder coat when required by coastal locations to prevent corrosion, all the fasteners are Stainless steel and blades are of composite or TPO plastic with UV protection to avoid any discoloration of the material over long periods of sun exposure.

This system was designed with portability and quick install in mind.

The system will come fully assembled and ready to mount on multiple locations.

With optional special effects, thru LED lighting or customized applications, this product is a sure attraction for any business or resort location.

### **Primary Applications:**

The EOW-300 was design for larger power applications, such as larger homes and large cottages.

Small to Medium Business requiring a steadier power source, micro grid technology where combining a small wind farm makes great sense. Able to operate in low winds as well as higher wind speeds.

This system can be customized to meet your operational needs as well as marketing needs. With Led lighting and front shield branding. Your advertisement will surely be noticed.

Excellent for Battery Storage or 208/220 voltage grid tie applications.



# POWER CONNECTION AND OUTPUT DATA:

## The EOW-100, 200, 300

Can be configured to be used in many power applications.

Battery storage for 12/24/48 Volt systems with pure sine wave inverters connecting directly to the power source.

Grid tie applications with Inverters from ABB, Tristar, Victron or Schneider as well as other Wind Grid tie inverters. 110/208/240 volt systems.

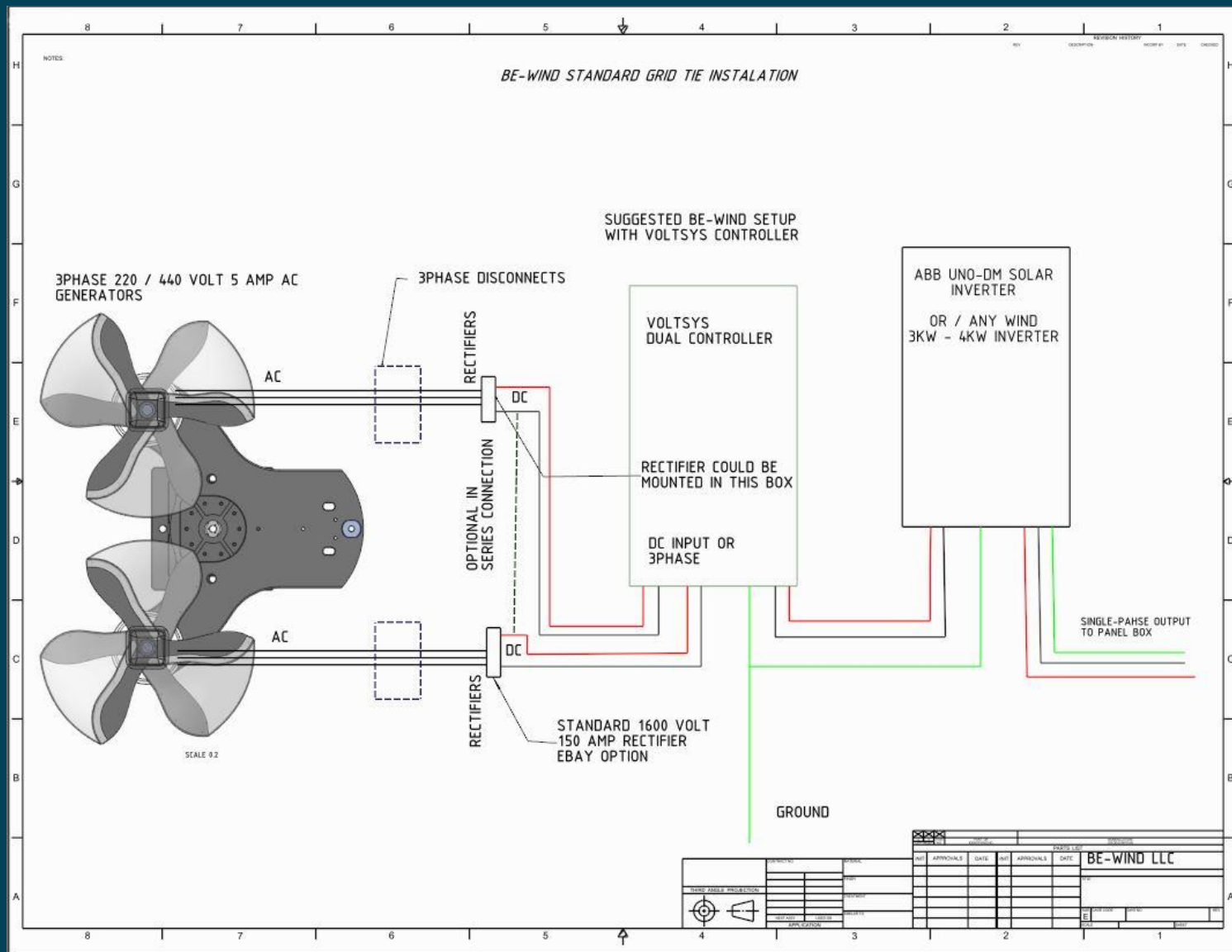
We are currently testing new systems all the time.

Perfect with existing Solar systems and Hybrid installations both on grid and off grid.

## POWER PRODUCTION:

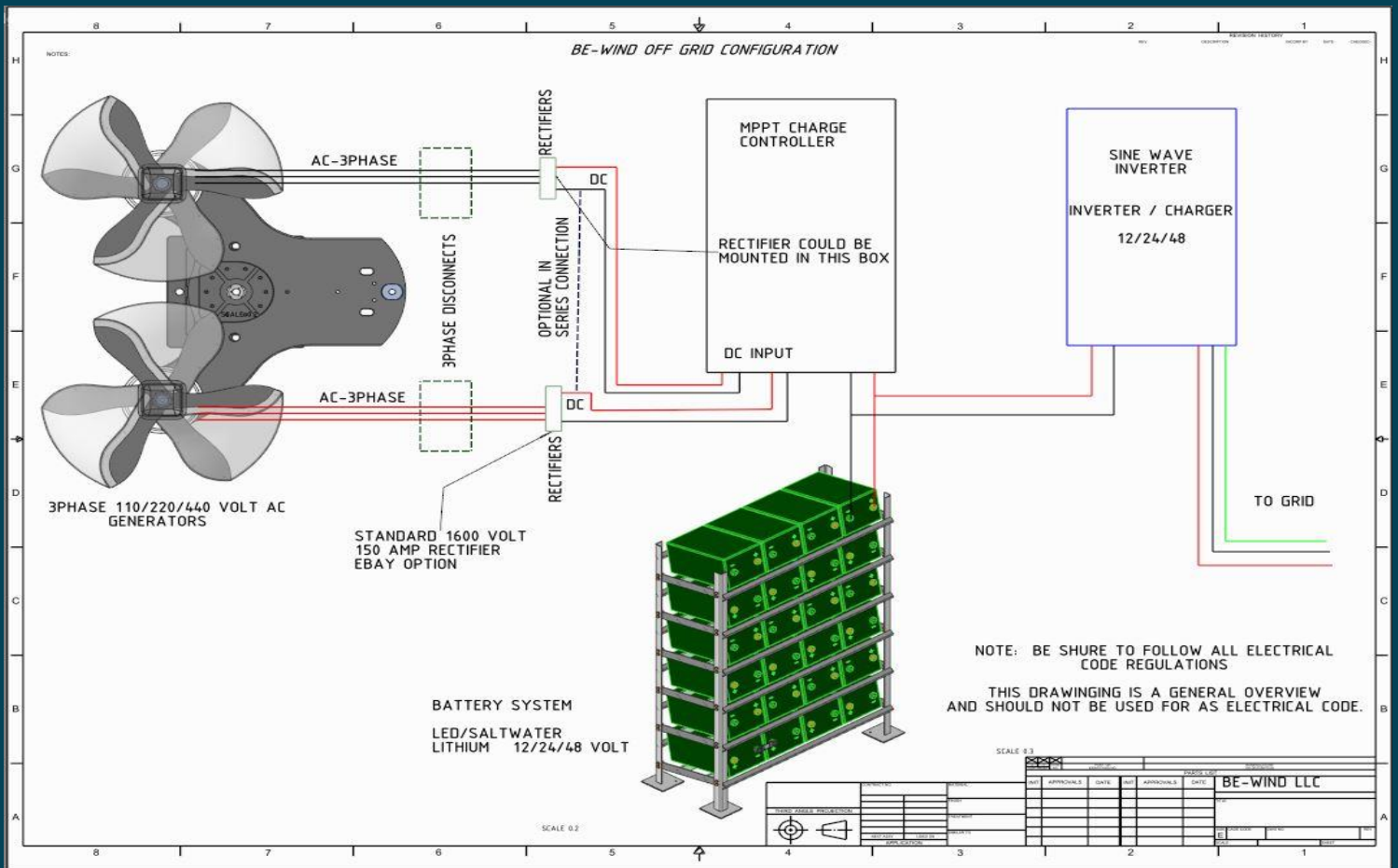
The BE-WIND systems can be configured in the same manner as many Solar system. We offer both Grid tie and off grid applications. Single phase connections available, with unlimited storage capacity, using the Aquion Clean battery systems or the latest in Lithium technology, or standard Gel or Led acid.

### STANDARD GRID CONNECTION

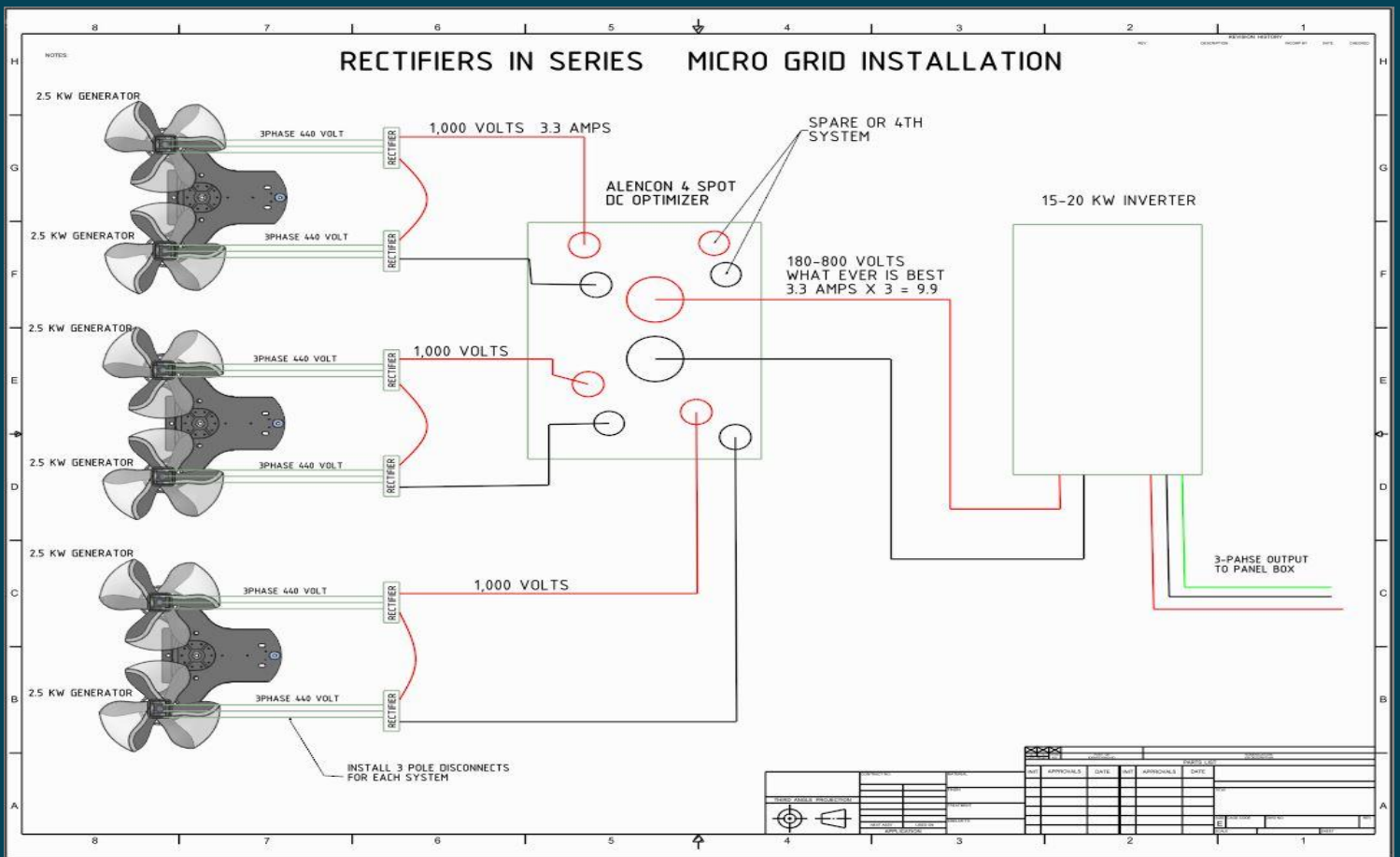




# STANDARD BATTERY APPLICATION



# MICRO GRID APPLICATION



## **POWER DATA UNLOADED SUPPLIED BY GENERATOR MANUFACTURE:**

Below is power production data in an unloaded condition. Since every location will be different, we have calculated the data to show power generation based on Wind speed, torque and Blade RPM, we recommend a survey of the average winds at your location to determine average power generation. Our current collected data shows lower power production than shared by the direct generator manufacture, while under loads, so please assume less production when loaded to grid connection or battery storage.

The key aspect to our data, is redundancy. Since we are the only solution with two generators, you are sure to have power, even if one of the units goes down for any reason.

Continuous power in extreme conditions is our main goal. All green energy is subject to the environment, solar (Sun, clouds, Sand, water), Wind (Amount and speed, Height from the ground). Understanding the need to secure constant energy, we are strong believers in Hybrid Wind/Solar applications. We have been working with solar teams worldwide, to support this program.

### **THE DATA.**

This data represents the power curve of an individual generator as we need to convert 3phase AC to DC. As mostly all inverters convert the DC to single phase AC or stay as DC for Battery charging. Then multiply the data below by 2 for dual generators.

Since every installation is different and loads are variable, this gives you an estimated wind generator Output as represented by the manufacture.

**Note: Understanding the data.**

**By: Ian Woofenden.**

**“To understand power curves, it is important to not look at the top end, as this will only happen occasionally on any wind system. Trying to compare one wind generator to another using power curves is another common mistake. While there is some useful comparative information in the curves, it’s not a simple comparison, and people too often scrutinize turbines poorly, looking primarily at the peak.**

**For example, I’ve lived with two turbines that shared about the same peak on their power curves—yet one produced 2.3 times more energy than the other in similar conditions.”**

## Why Unloaded Data?

We have come to realize that every load is slightly different as well as wind locations, Power draw and applications involved with our small systems. These are not large systems and operate slightly different. We recommend storage as first option as this is a fixed load and grid tie as an alternative connection.

## VOLTS, WATTS UNLOADED CONDITIONS AS SUPPLIED BY THE MANUFACTURES TESTED DATA

Data below represents the manufactures power output

Based on **3phase generators.**

**1.0 kw Generator High voltage**

### Testing Data

Speed (RPM)	Load voltage (VAC )	Load current (A )	Load power (W)	Torque (N.m)	Efficiency (%)
250	215.5	2.7	1008	44.9	85.8
225	194	2.4	817	40.4	85.8
200	172.4	2.2	643	35.9	85.5
175	150.9	1.9	493	31.4	85.5
150	129.3	1.6	364	27	85.5
125	107.8	1.3	252	22.5	85.3
100	86.2	1.1	163	18.1	85.3
75	64.7	0.8	91	13.6	85
50	43.1	0.5	41	9.2	84.9

**1.0 kw Generator Low voltage**

### Testing Data

Speed (RPM)	Load voltage (VAC )	Load current (A )	Load power (W)	Torque (N.m)	Efficiency (%)	Frequency (Hz)
360	132.0	6.30	1440.3	43.3	88.3	60
300	110.0	5.25	1000.2	36.2	87.9	50
240	88.0	4.20	640.1	29.2	87.3	40
180	66.0	3.15	360.1	22.2	85.9	30
120	44.0	2.10	160.0	15.5	82.2	20
60	22.0	1.05	40.0	9.5	66.8	10



## 3-phase AC power

### 1.5 kw Generator high voltage

#### Testing Data

Speed (RPM)	Load voltage (VAC )	Load current (A)	Load power (W)	Torque (N.m)	Efficiency (%)
300	222	3.9	1500	54.3	87.9
270	199	3.5	1205	48.9	87.2
240	175	3.1	932	42.8	86.6
210	153	2.7	712	37.6	86.2
180	131	2.3	522	32.4	85.5
150	112	2.0	382	28.6	85.0
120	90	1.6	247	23.2	84.6
90	67	1.2	137	17.3	83.8

### 1.5 kw Generator Low voltage

#### Testing Data

Speed (RPM)	Load voltage (VAC )	Load current (A)	Load power (W)	Torque (N.m)	Efficiency (%)	Frequency (Hz)
300	111	7.90	1519	53.1	91.1	50.0
250	92.5	6.58	1044	46.3	86.1	41.7
200	74.0	5.27	668	37.3	85.6	33.3
150	55.5	3.95	376	28.3	84.6	25.0
100	37.0	2.63	167	19.5	81.7	16.7

## 3-phase AC power

### 2.0 kw Generator high voltage

#### Testing Data

Speed (RPM)	Load voltage (VAC )	Load current (A)	Load power (W)	Torque (N.m)	Efficiency (%)	Frequency (Hz)
420	265.0	6.30	2891.6	73.0	90.0	70.0
350	221	5.3	2008.0	61.2	89.5	58.3
280	177	4.2	1285.1	49.5	88.5	46.7
210	133	3.2	722.9	38.0	86.4	35.0
140	88	2.1	321.3	27.1	81.0	23.3
70	44	1.1	80.3	18.1	60.4	11.7

### 2.0 kw Generators Low voltage

#### Testing Data

Speed (RPM)	Load voltage (VAC )	Load current (A)	Load power (W)	Torque (N.m)	Efficiency (%)	Frequency (Hz)
350	83.5	14.0	2004	60.5	90.5	58.3
280	66.8	11.2	1283	48.8	89.7	46.7
210	50.1	8.4	722	37.3	88.0	35.0
140	33.4	5.6	321	25.2	86.9	23.3
70	16.7	2.8	80	13.3	82.5	11.7

# BE-WIND Generators:

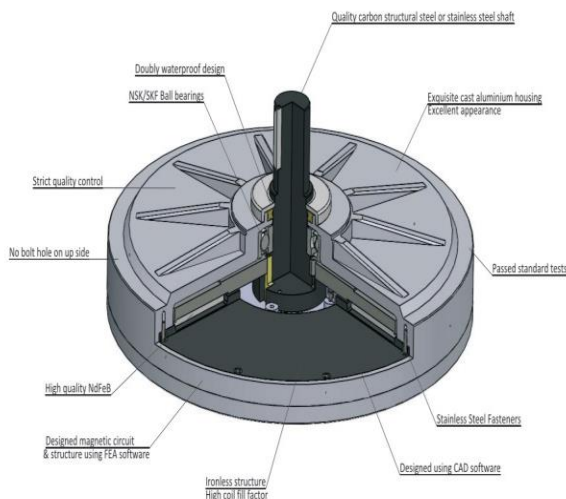
The BE-WIND systems use the latest's technology in Axial flux generators providing Low torque mid RPM and scalable options. The generators are slim line maintenance free Closed case technology.

## AFPMG for Small Wind Turbines & Hydro Power

QM manufactures a series of new energy high-efficient, disc-shaped, inner (outer) rotor, three-phase, **Axial Flux Permanent Magnet Generator (AFPMG)** with a coreless (ironless) stator. **AFPMG** ensures unsurpassed performance that will be highly appreciated by direct-drive small wind turbine (SWT) and Hydro Power manufacturers.

**AFPMG** provide advantages in terms of size and appearance. The mechanical structure of an **AFPMG** is simple, and the winding concept with a stator structure gives the generator a good performance and high efficiency.

### Constructions and Materials



### Advantageous Features

- **High efficiency at low speed**

No mechanical drive losses, no rotor copper losses due to the permanent magnet excitation and no stator eddy current losses in the ironless (coreless) stator  
The efficiency of **AFPMG**, depending on the model, is up to 90%.

- **Small dimension and weight**

**AFPMG** is uniquely lightweight and compact, construction is simple. The generators use much less metal in their construction, while also being highly durable and having a long life.

The generator's small weight and dimensions make it possible to reduce the size and price of the whole wind turbines.

The high specific capacity (output capacity per unit weight) significantly outperforms those from competing producers. This means that with similar dimensions and weight

- **Very small maintenance costs**

**AFPMG** is direct drive, no gearbox, oil-free system, low temperature rise

The highest energy efficiency at low speeds in the industry means that the generators can support any type of wind turbine with the widest range of wind speed.

The use of air-cooling reduces maintenance costs and also significantly strengthens the autonomy of power units

- **Very low starting torque**

**AFPMG** have no cogging torque and torque ripple, so the starting torque is very low, for direct-drive small wind turbine (SWT), the starting wind speed is less 1m/s.

- **Superior reliability**

Very low noise, less vibration, no mechanical belt, gear or lubrication unit, long life

- **Environmentally friendly**

The 100% environmentally clean technology and materials used in production during its long service life and the future recycling are absolutely harmless for the environment.

### Main Applications

- Small wind generators(SWT)

- Small electrical generators driven by gasoline or diesel engines,

- Electric vehicle drive machines, as motor and generator.

- Hydro Power

Application of **AFPMG** offers an alternative solution in the sphere of electrical generators or electrical machines in general. Their disc-shaped construction and advantageous electromechanical characteristics represent the main features in alternative electrical energy production and in high efficient electric drive systems.



## Customization:

For individuals and business, we can configure the system to meet just about every aspect, you need. Color, Lighting, Marketing or just plain cool visual effects.

## BELIZE PROJECT

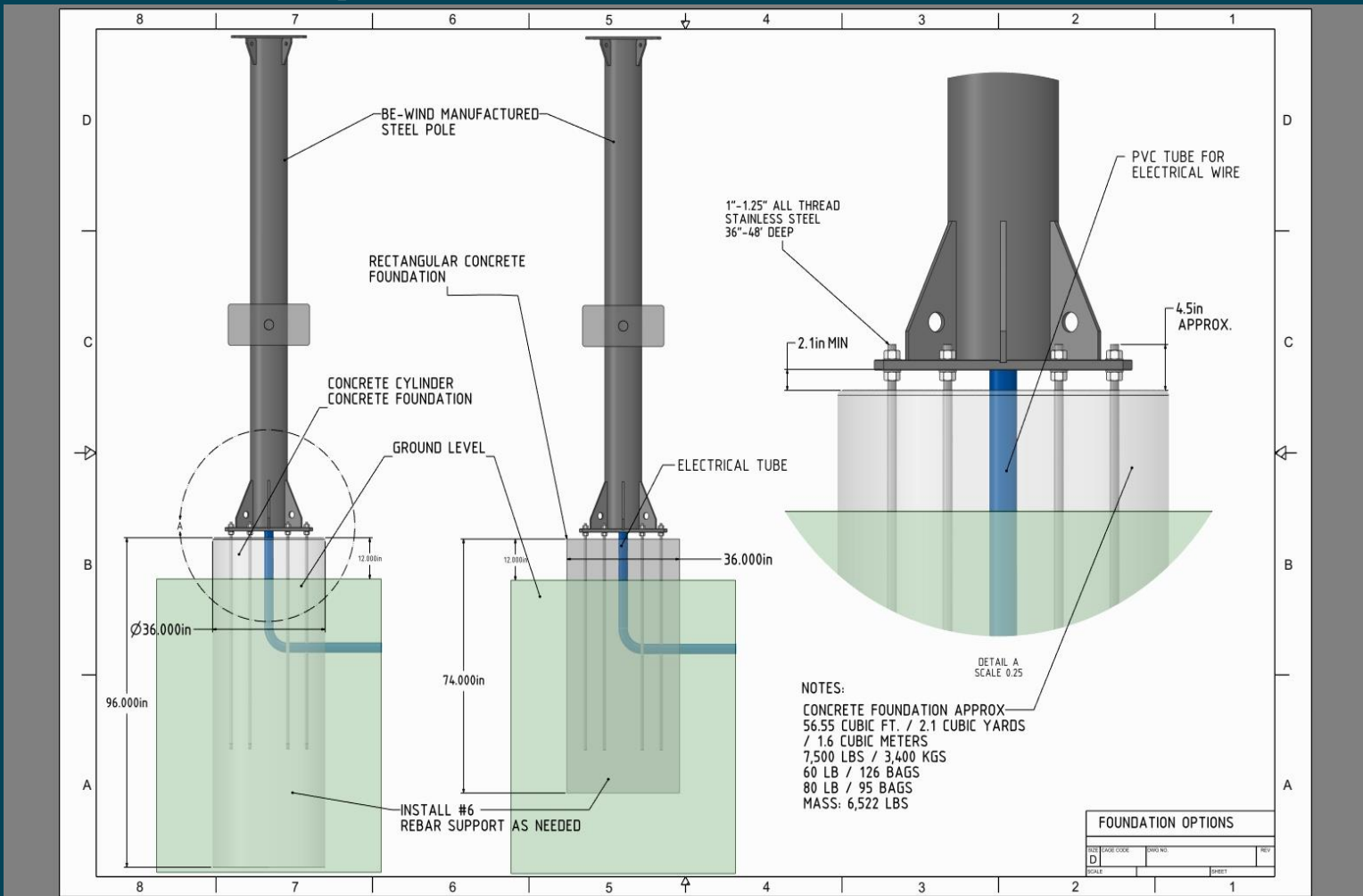


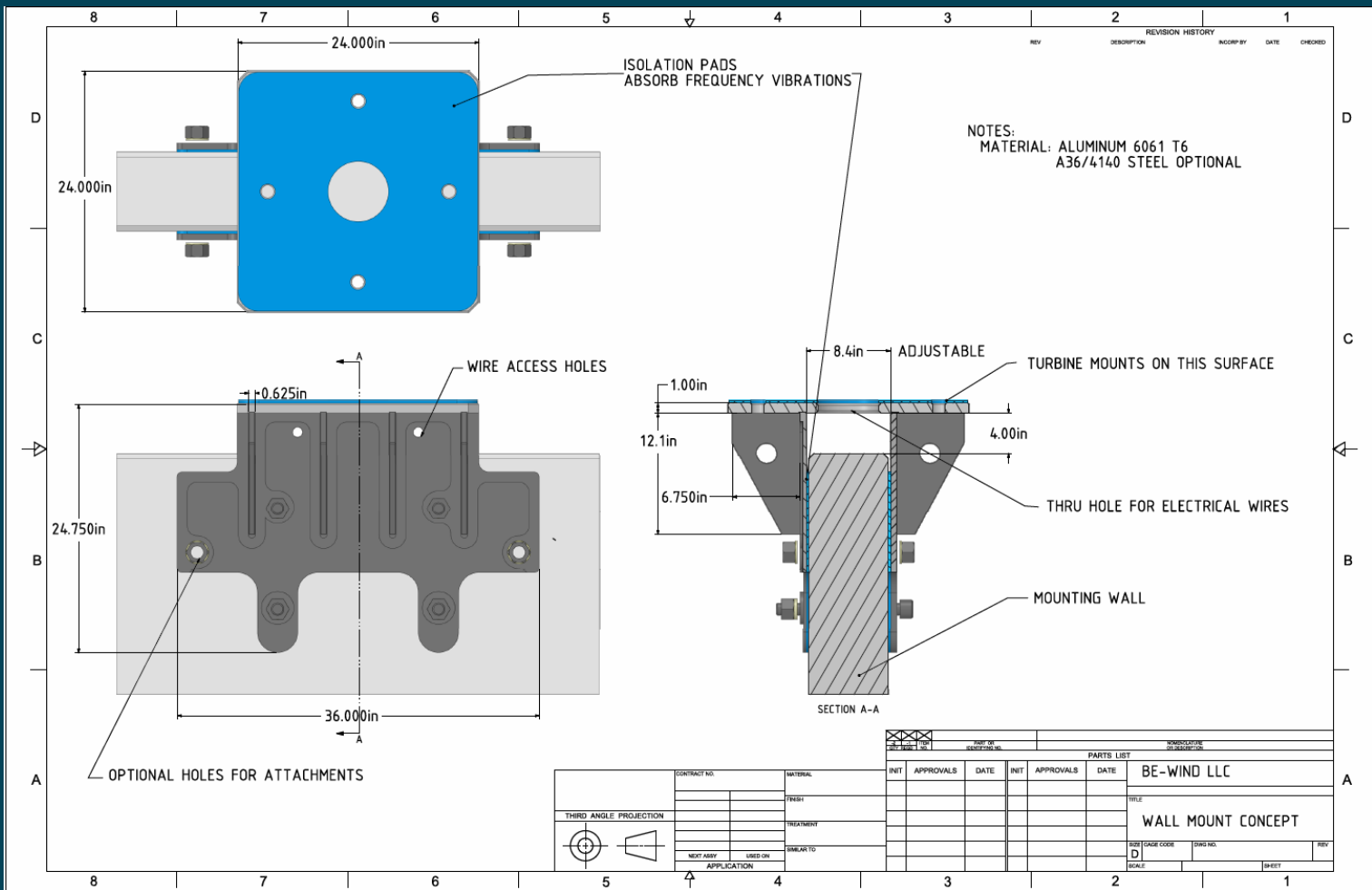
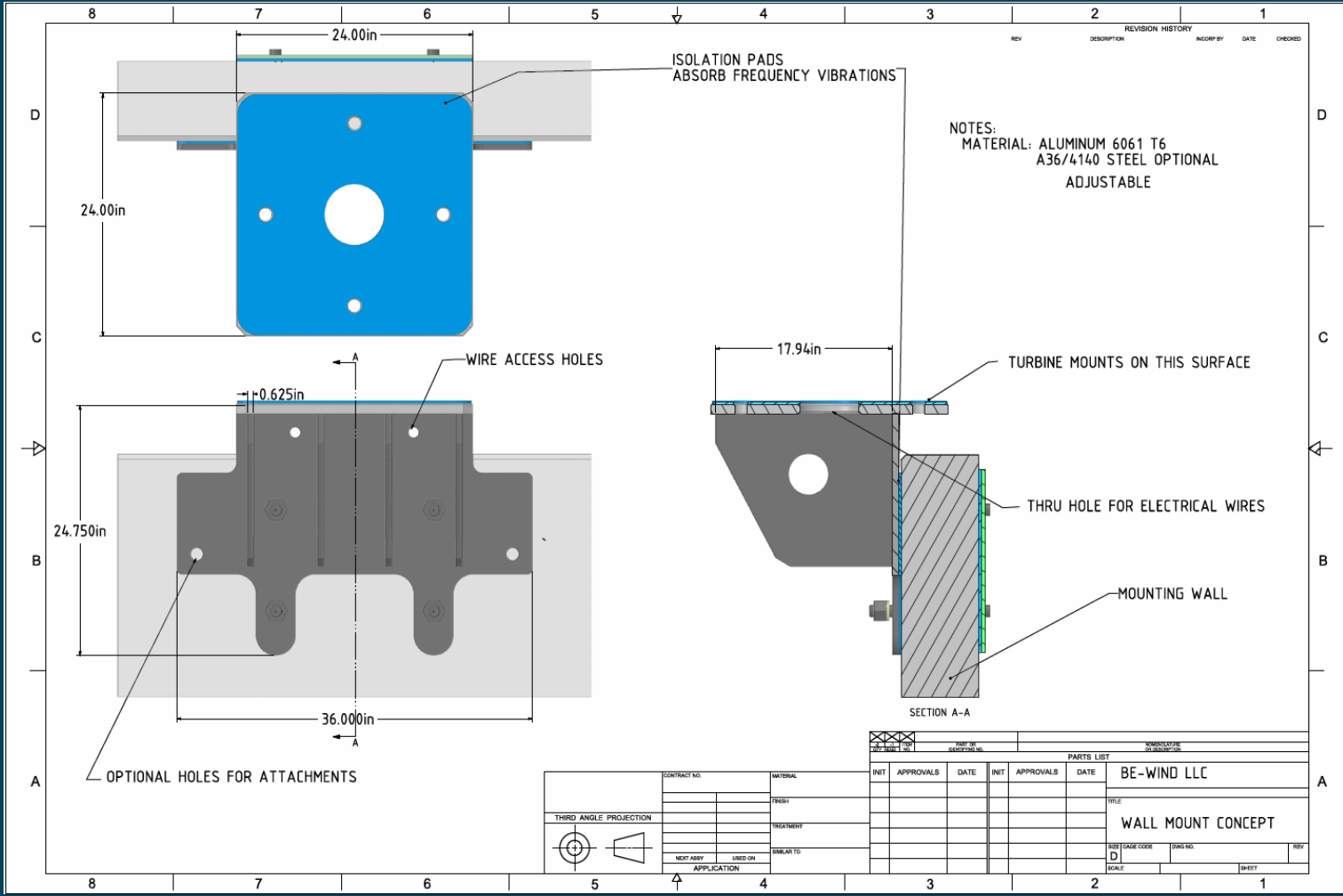




### Standard Mounting:

BE-WIND can support multiple mounting applications and with a strong engineering background in developing unique solutions, we can ensure a solution to support all aspects of our technology. We currently use a standard 15-20ft. pole design, Specialized building mounts as shown below. Offered in Steel and composite Solutions.







# NEW PRODUCTS AND ACCESSORIES:

In 2018 BE-WIND is working to expand its products and Configurations.

With the introduction of a new lightweight composite system and a zero-maintenance offering.

## CONSTRUCTION:

The new super structure will be composed of “FRP” (**Fiber reinforced Plastic**) and “HDPE” (**High-Density Polyethylene**)

Both these materials are used in high construction environments, with high strength to density ratio. The FRP used in marine and building structures and can be bonded with a high strength resin, eliminating any welding and after machining. Availability is almost anywhere and can be machined thru a simple process of water jetting and small CNC machines for accurate hole and mounting locations.

The Blades and blade support will remain the same. Currently the front shield will remain the same product but under new design review. The Universal base structure will be fully constructed from “FRP” and will also be bonded with resin.

The main base and Top support have been reduced in thickness to offer lower cost and ease of shipping.

New to the system will be the first maintenance free wind turbine with Iglide technology, Self-Lubricating and Maintenance free, eliminating all bearings as we know them. The material is noncorrosive and can survive in salt water conditions for many decades. No lubrication required on any portion of the turbine.

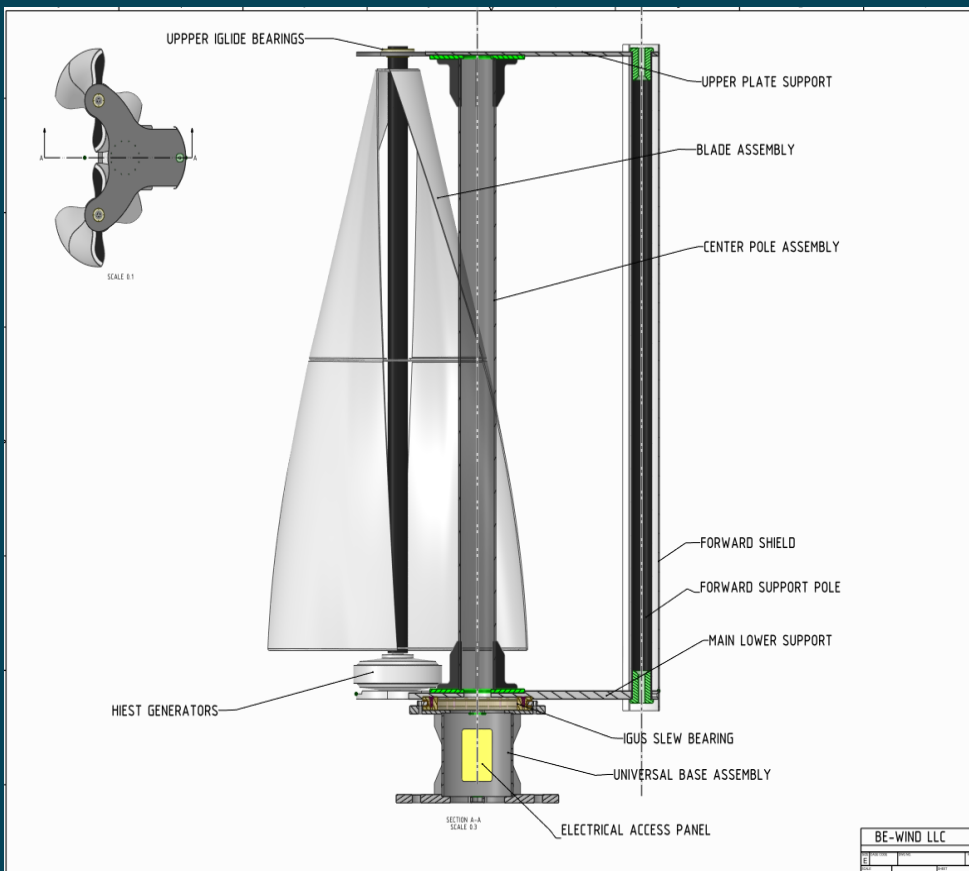
## General features of iglide® plain bearings

**Self-lubricating, Corrosion resistance, Maintenance-free, Media resistant**

**High compressive strengths, Low coefficients of friction, High mechanical dampening**

**High dirt resistance, Lightweight, Best wear-resistance, Excellent price/performance ratio**

This New system currently will come in one configuration. EOW-200-C exact specification as the Original EOW-200 But composed of different materials. 2.0 KW low voltage 112 VAC designed for Battery Storage system. Only option available would be the LED lighting package.



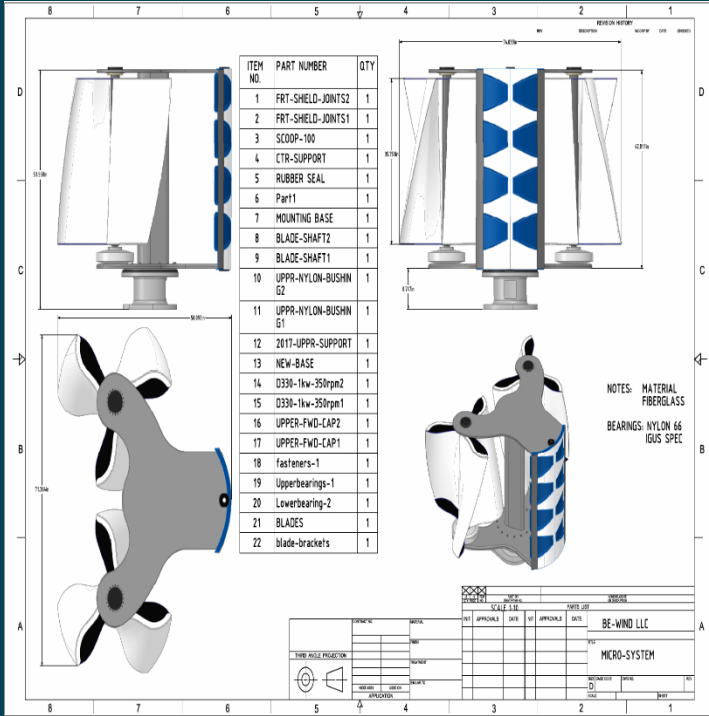
This system will carry 5-year structural warranty with 2 years on Generators and electronics. The standard color will be an all-Black color design.

Included will be a simple Rectifier solution to convert 3phase AC to DC With an MPPT Charge controller Designed for 12/24/48 volt systems.

**For more details request the specific product overview**

BE-WIND LLC

Also Available Soon for the market will be our Micro system. In 2018 we hope to continue to build wind systems That offer solutions for multiple applications. The Micro system is designed to be the smallest but yet most efficient wind system on the market. With only a 4 ft total height, this unit is designed for the most severe locations and And smallest power requirements. With a 1 kw output 2x .5 kw generators. This EOW-Micro can be used for Tiny home constructions, Tree House constructions, Telecom tower locations, Mountain top and areas of extreme weather, such as remote Polar application. It is also possible to mount this unit on Vehicles or trailers while in motion.



Constructed from composite materials such as the EOW-200 composite. This unit also includes the Iglide bearing technology. Please contact BE-WIND for further information.

## Electronics:

At BE-WIND we are constantly trying to find the next generation technology. With the enhancements of Solar technology, Wind systems can also take advantage of new devices. A Wind DC optimizer has been developed in partnership with a UK electronics firm to support the dual frequency input and the option to have a single inverter solution. The other key aspect is to allow wind systems to take advantage of Solar Inverters that have far more Monitoring and expandability as well reduced cost. Currently our Optimizer is approved to work with ABB UNO-DM Solar inverters. UL certified for North American, this is BE-WINDs choice of Grid tie application.

For MPPT controllers, there are hundreds of options and our Low voltage systems should work with just about Any of them. With high voltage systems we are focused on MorningStar V600-TS-MPPT. This allows us to use high Voltage 220 3phase generators and rectify to DC for Voltages 220 and above.



Thank you for the inquiry and please don't hesitate to let any of us at BE-WIND know how you feel about us and our technology. The product was developed from years of input from consumers and engineers. We are trying to make a difference in this world and We give you our promise that we will do more than our best to make things as lasting as possible. We strive to make the most robust system available anywhere in the world and will continue to improve and stand behind our systems.

The Evolution of wind Distribution began. January 1<sup>st</sup>, 2016

BE-WIND LLC

<http://www.be-wind.com>

**Michael Berdan**  
CEO/ Designer