

DATA SHEET

MODULAR TREE
18A, 24A, 30A
standard & hybrid

By



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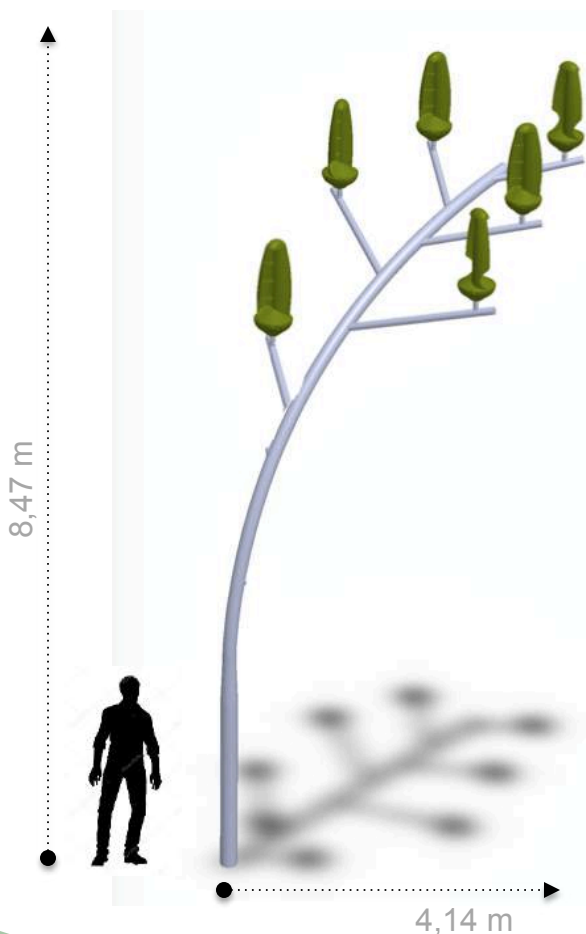
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THE MODULAR TREE

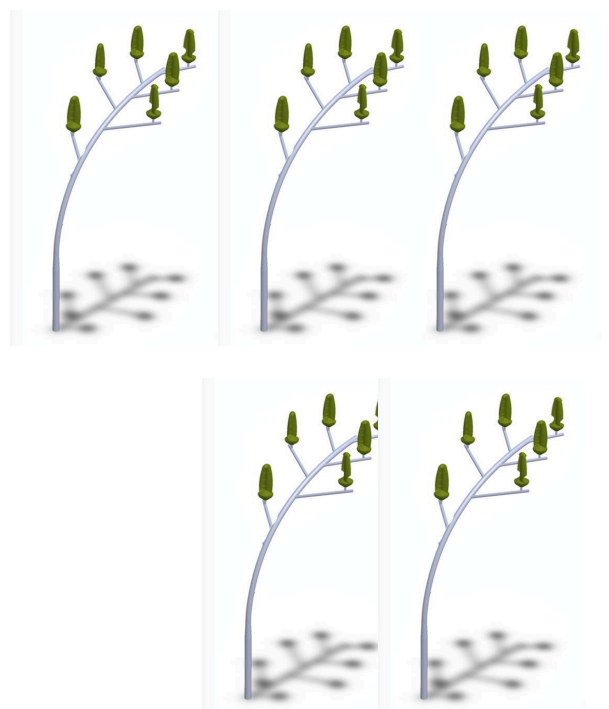
THE MODULAR TREE is a complementary electrical production platform, shaped like a Tree. This innovation captures all types of wind in urban or natural environments, whether turbulent or laminar, strong or light with a 360 degrees ability.

The MODULAR TREE is composed of 3 to 5 modules (or trunks). Each of them carrying 6 micro turbines dubbed Aeroleaves. The MODULAR TREE is an interesting alternative to the WindTree. Smaller, simpler, scalable keeping the same design and silent.



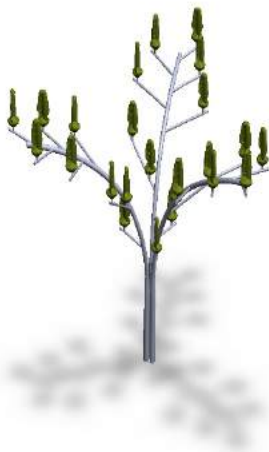
You can choose 3 sizes of MODULAR TREE with either 18, 24 or 30 Aeroleaves, producing between 5400 Watts and 9000 Watts

This allows you to vary the size according to your space and budget.



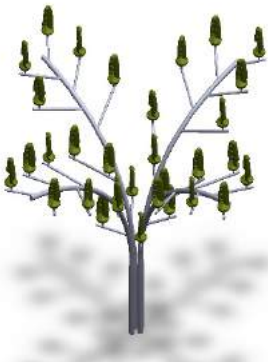
18, 24, or 30 Aeroleaf

3 possible configurations
with 3, 4, or 5 trunks



MODULAR TREE 18 A

Max Power	5400 W
Nominal Power	2934 W
Number of Aeroleaves	18
Power per Aeroleaf	300 W
Weight	1450 Kg



MODULAR TREE 24 A

Max Power	7200 W
Nominal Power	3912 W
Number of Aeroleaves	24
Power per Aeroleaf	300 W
Weight	1930 Kg



MODULAR TREE 30 A

Max Power	9000 W
Nominal Power	4890 W
Number of Aeroleaves	30
Power per Aeroleaf	300 W
Weight	2410 Kg

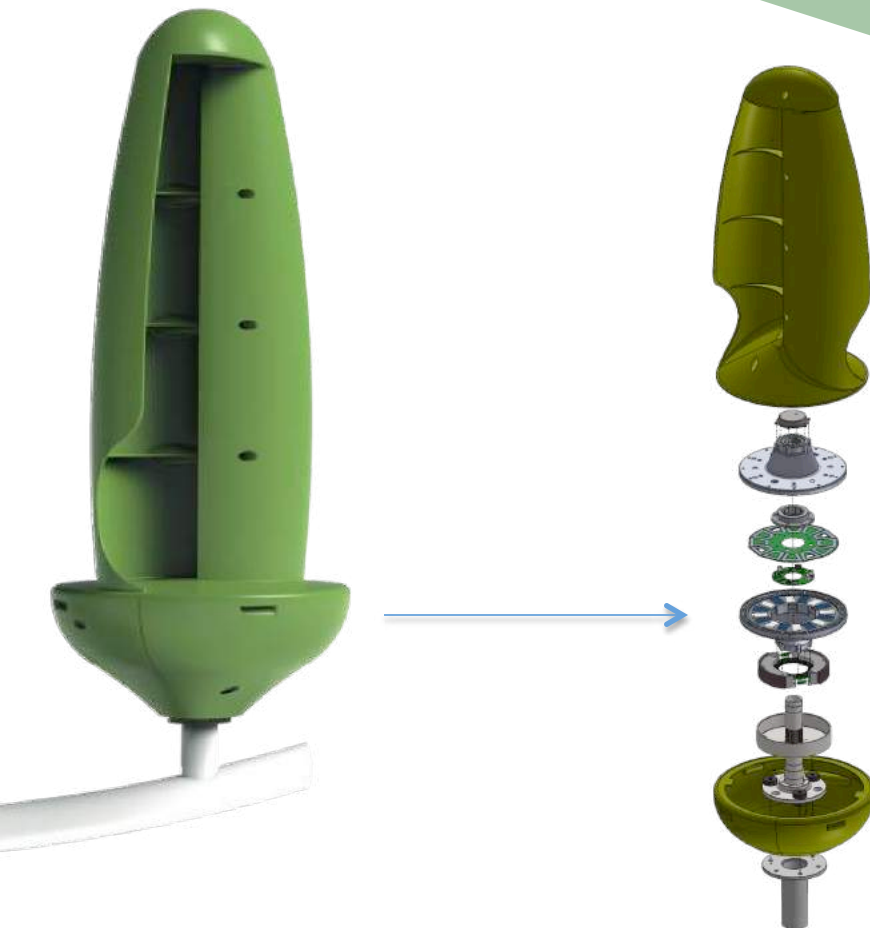
Each Aeroleaf is made of a synchronous generator with permanent magnets. The generators developed by New World Wind have a stator (copper winding linked to an electronic card) and a rotor made of two plates supporting the magnets.

Simply initiated by the rotation of the blade, without any belts or gears, the magnets create a magnetic field, generating tension and alternating current (AC). To allow for the addition of each Aeroleaf power, it is switched to direct current prior to the final AC generation

Thanks to the electronic card developed by New World Wind, the production of the current is optimized with respect to wind speed. The microcontroller on each Aeroleaf guarantees a fine regulation of the system. Every ten milliseconds a computation is performed to sent a voltage/current instruction to Aeroleaf rotational speed in order to generate the maximum power

Each Aeroleaf is silent thanks to their shape and the level of air fanned. Besides, The Aeroleaf does not use any clog, which allows it to remain silent.

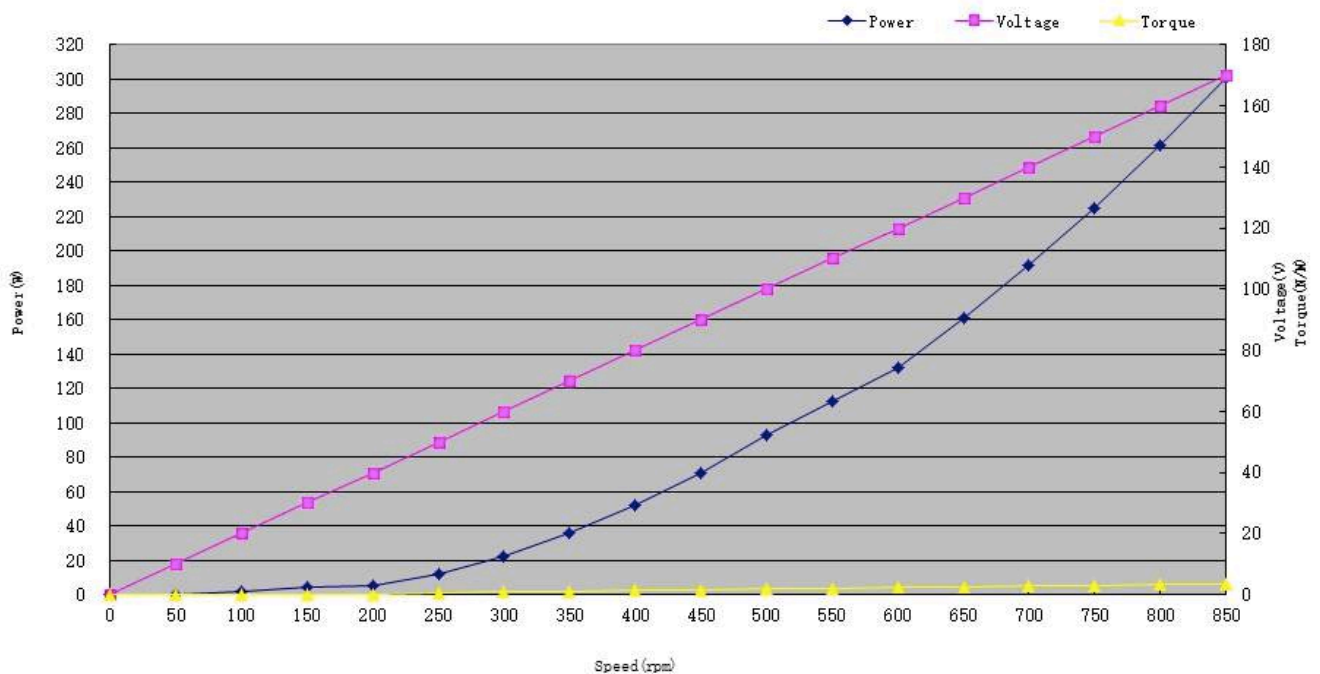
The Aeroleaf has an optimized aerodynamic shape to gather the smallest wind and air movement. The threshold is 2.5m/s. Conversely, if the wind is too strong, an electromagnetic brake will be triggered to maintain the spin of the Aeroleaf in its confort zone and avoid any damage.



NWW Micro Generator

Proprietary technology with electronic regulation card embedded in each leaf for a maximum efficiency

300W-850RPM-170 VAC



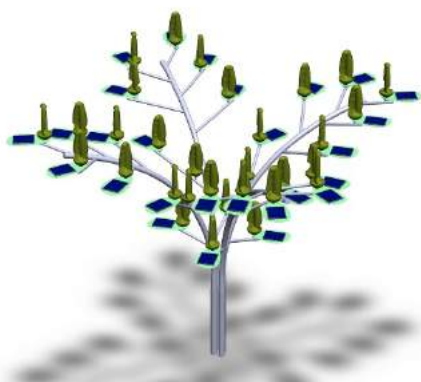
Power curve per Aeroleaf
Relation Voltage/Power/SpeedRPM

New World Wind has also developed a high performance photovoltaic petal in order to add a second source of power to the Aeroleaves.
The Solar petal is optional and can equip modular Trees 18A, 24A, 30A.
The Solar panel is positioned at the bottom of each Aeroleaf.



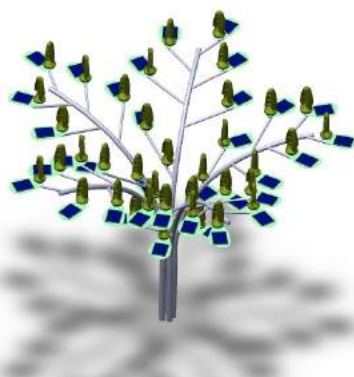
MODULAR TREE 18 A Hybrid

Max Power	5940 W
Number of solar petals	12
Number of Aeroleaf	18
Power per Aeroleaf	300 W
Power per petal	36 Wc
Weight	1600 Kg



MODULAR TREE 24 A Hybrid

Max Power	7920 W
Number of solar petals	16
Number of Aeroleaf	24
Power per Aeroleaf	300 W
Power per petal	36 Wc
Weight	2130 Kg



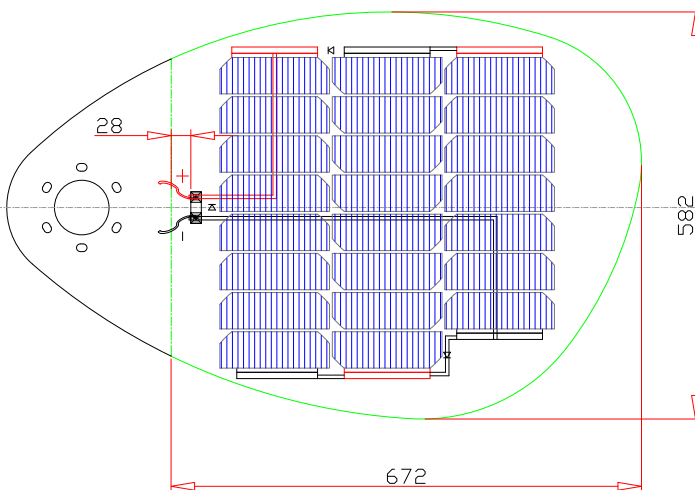
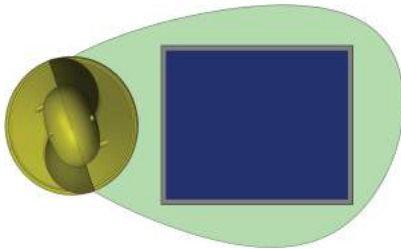
MODULAR TREE 30 A Hybrid

Max Power	9900 W
Number of solar petals	20
Number of Aeroleaf	30
Power per Aeroleaf	300 W
Power per petal	36 Wc
Weight	2660 Kg



THE PHOTOVOLTAÏC PETAL

The Photovoltaic petal is light and thin (less than 800g and 3mm). Besides, it is waterproof and robust. Given its gradient of 5° from horizontal, The solar petal enables an increase of speed of wind when getting close to the edge of the Aeroleaf, improving the efficiency by 5%,
This hybrid system increases the Modular Tree performance while keeping it organic.



Monocrystalline semi-flexible film
mounted on the petal

SOLBIAN
FREEDOM POWERED BY THE SUN

Each petal has 23 cells for an area of 0.3 m². The solar Petal is light and thin (800g and 3mm). Besides, it is waterproof and robust.

Peak power - P _{max}	34 W ±5%
Rated Voltage - V _{mp}	17,8 V
Rated Current - I _{mp}	3, A
Open Circuit Voltage - V _{oc}	21,7 V
Short Circuit Current - I _{sc}	3,13 A
Temp. Coeff. P _{max}	-0.40 %/°C
Temp. Coeff. V _{oc}	-0.32 %/°C
Temp. Coeff. I _{sc}	0.05 %/°C
Operating Temp.	-40 + 85
Standard Test Conditions	(1000 W/m ² irradiance, AM1.5, 25°C)
Number of cells	23
Strings of cells	2x8 cells + 1x7 cells
Length	672 mm
Width	582 mm
Thickness	2 mm
Weight	0,8 kg
Output	0,3 m length – 4mm ² section
Maximum system voltage	1000V
Over current protection rating	12A
Application class (IEC 61730)	A
A/B/C	

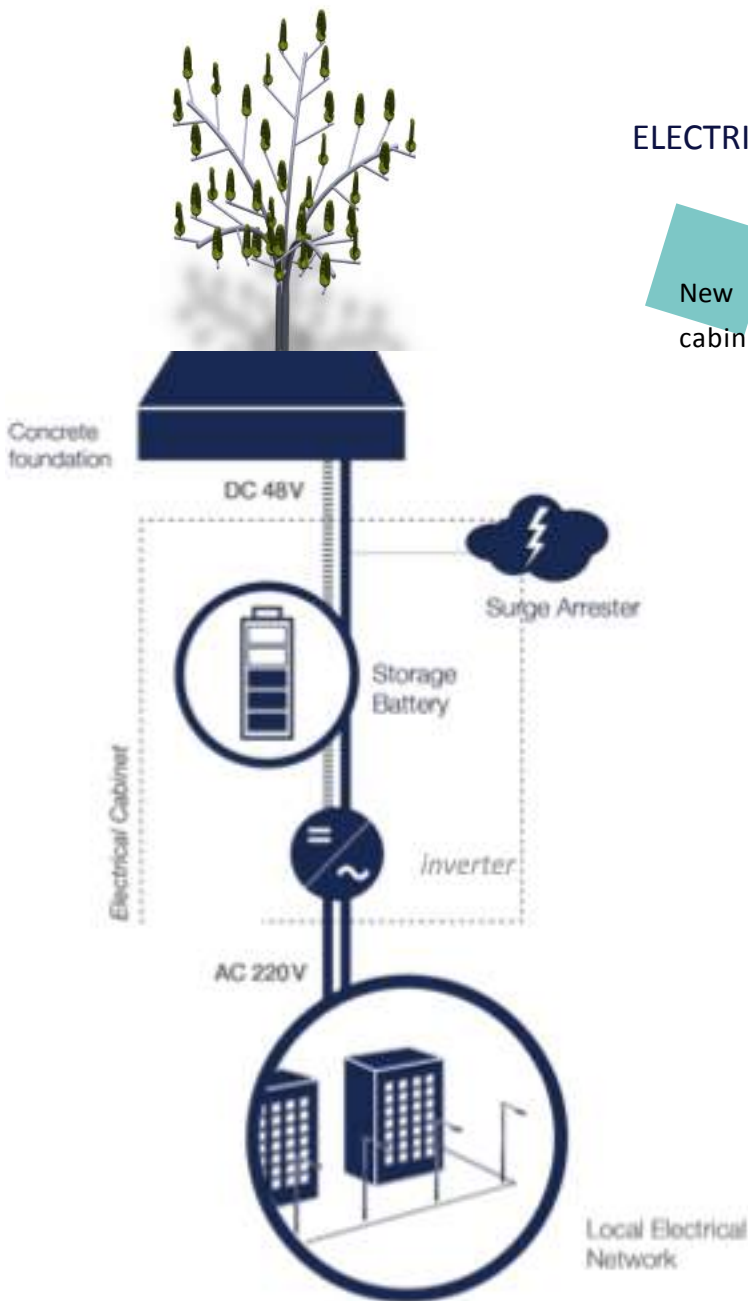
ELECTRICAL INSTALLATION SCHEMATICS

New World Wind provides an electrical cabinet compliant with the electrical standards in France/Europe. We will comply with country requirements.

The Electrical cabinet is made of:

- A battery, allowing to temporarily regulate the electricity production to limit peaks and solely for short time needs. It is not for storage.
- A specific inverter dedicated to self-consumption that connects directly to the customer's main switchboard (TGBT).
- All the security systems required for commissioning (fuse wire, switchgears, lightning conductor and isolation switch).

As such, the electrical cabinet is readily available for connection to local network.



The Modular Trees can be installed in various environments.

New World Wind can help you choose the most suitable configuration for your needs and services, by proportioning the number of leaves and petals according to your budget.

The customer is responsible for the realization of the tree anchorage.

The data necessary for the construction of the concrete block are provided by NewWorldWind upstream of the civil works.

The interface between the anchor and the tree is via a reservation template provided by NewWorldWind



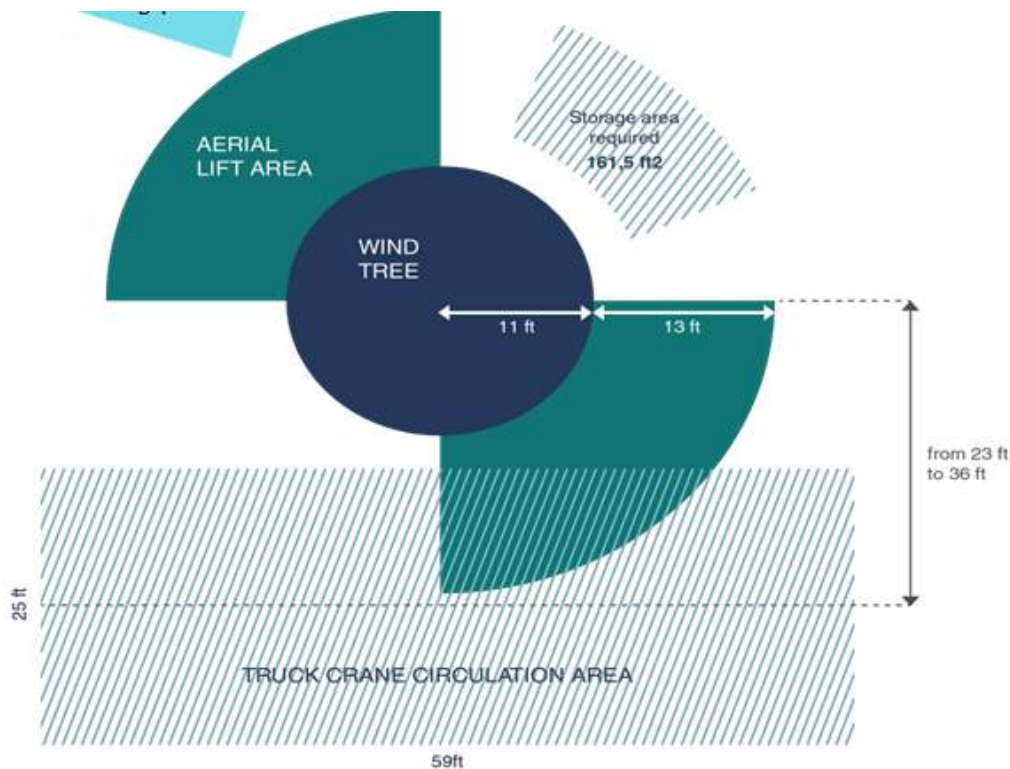
The following responsibilities are excluded from NewWorldWind scope and shall be managed by the Customer:

- Civil work of the Windtree foundation (solid concrete, including a junction box) based on the specifications provided by NewWorldWind
- Installation of the cable sleeve between the Windtree and the electrical panel,
- Preparation of the area allocated to the electrical cabinet (if needed),
- Electrical connection to the Customer Low Voltage panel,
- Provision of a secured site and storage area during the installation

The WindTree doesn't require any administrative approval prior to conduct the work (French requirements, other countries to confirm), because it's a wind system of less 12 meters.

The site works will start upon confirmation the site readiness as per a document to be signed-off by the project owner.

The metallic structure and the Aeroleaves will be delivered and temporary stored on site. the site must be accessible to a crane truck 12 t and 2 telescopic platforms required for handling parts

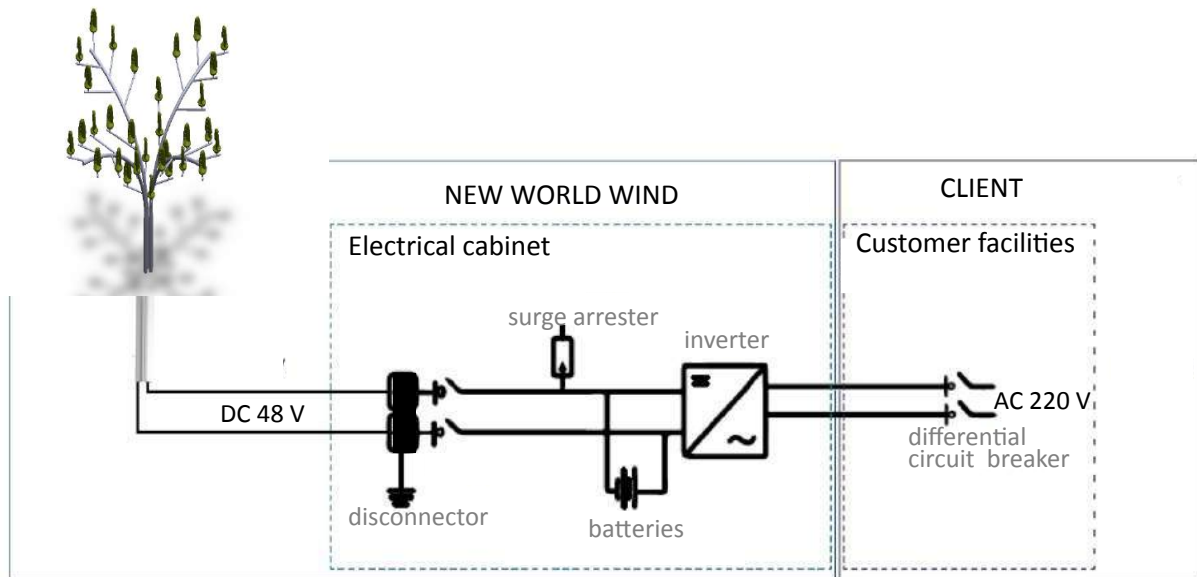


The client becomes responsible for the Modular Tree at delivery. The client becomes the owner of the Modular Tree at production start.

D1	D2	D3	D4
Delivery	Installation		Electrical Connection

ELECTRICAL CONNECTION

The Modular Tree is based on the concept of on-site generation and selfconsumption of the electricity in the connected building/area.



SCHEMATIC OF ELECTRIC INSTALLATION

The Modular Tree is connected to the local grid through the New World Wind electrical cabinet. A dedicated space should be prepared for the cabinet, within a maximum distance of 20 meters. In addition to the Modular Tree and its electrical cabinet, NewWorldWind is also providing the electrical wires between the Modular Tree and the Cabinet.

The overall installation is compliant with the current European standards.

In case of specific difficulties, New World Wind can propose adaptations to make the installation possible (on estimate)

The electrical cables sleeves between the Modular Tree and the Electrical cabinet is explained in the civil engineering specifications. Similarly, any specific protection and wiring until the Electrical cabinet shall be prepared by the Customer to allow for the connection between the Electrical cabinet and the customer facilities.

MECANICAL SPECIFICATIONS

Height	8,0 m
Diameter Modular/Modular hybrid	8,20 m - 9,60 m
Aeroleaf height	0,97 m
Weight	1450 to 2460 kg
Number of Aeroleaves	18-24-36
Number de solar petals	12-16-20

TURBINES SPECIFICATIONS

Starting speed	2,5 m/s (9 km/h)
nominal wind speed	18 m/s (65 km/h)
Maximum wind	43 m/s continuously, 50 m/s in gusts (180 km/h)

PETAL SPECIFICATIONS

Power per solar petal	36 Wc
Total photovoltaic Power	432-576-720 W
Weight per petal	800 g

ELECTRICAL SPECIFICATIONS

Installed capacity	5400 W to 9900 W
Maximum power per Aeroleaf	300 W
Output voltage of the Inverter	110 V - 230 V

SITE INSTALLATION

Installation Timeframe	2 to 3 Days
Storage Area	15 m ²
Max distance between Modular Tree and the electrical Cabinet	20 m

RESPONSIBILITIES

Civil Engineering	Client
Anchoring	Client
Electric sleeves	Client
Modular Tree and Aeroleaves installation	New World Wind
Control cabinet installation	New World Wind
Connection of the Modular tree to the electrical cabinet	New World Wind
Connection of the NWW cabinet to the customer facility	Client



Key notes

- The Client is in charge of doing the civil engineering
- The Modular Tree doesn't require a declaration of site works under the French standards, other local regulations would have to be respected.