

# Join the Bornay experience

Bornay 



Seguimos  
evolucionando  
contigo.

**Bornay** 

**Bornay**

*On a human level, it is deeply satisfying for me to have dedicated my life to bringing power and water to people struggling for access to electricity and drinking from puddles. Looking back and recalling such contrived folk pills me with the enthusiasm to carry on innovating.*

*duan Bornay*

**Since 1970**, we have been pioneers in harnessing the power of the wind. In getting electricity to places where there is none. And there is a lot you can do in four decades. We have applied our technology in 50 countries: the *United States of America, Japan, Angola, Antarctica...* We have developed the most reliable small-scale windturbines in terms of performance and sturdiness. More than 4000 facilities around the world have chosen a *Bornay*.

# Join the Bornay Experience.

Now is the time to contribute to distributed generation by making specific windturbines available for connection to grids.

We want to be with you on those long roads forward, sharing experience, knowledge, expertise.

We want to work with you, guaranteeing the quality of your facilities and bringing assurance to your customers. When you need small wind power, trust *Bornay*.

For joined-up energy,  
**join the Bornay experience.**

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# Moving Forw

# ard Since 1970.

*Every since my youth, I have been driven by the idea of generating electricity through the power of the wind.*

*David Boeray*

# 1970

➤ 06 07



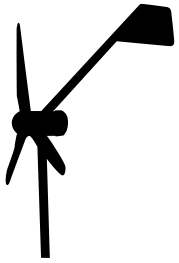
## The first Bornay.

**Man first set foot on the Moon** 40 years ago. What had seemed an impossible dream became reality thanks to the vision of a few pioneers. Who can forget that image of Neil Armstrong? As this was taking place, over in Europe in a small Spanish village near the Mediterranean, a young electrician called Juan Bornay was creating his first windturbine from some

automobile alternators, a few mechanical couplings, and wooden propellor blades. His dream: to produce energy by harnessing the wind. His motivation: to get electricity going in his grandparents' house. This is how Bornay ventured forth on what, four decades later, would make him one of the world's major producers of small-scale windturbines.



# 1978



## Fiberglass parts.

*I started my research in a small garage, experimenting with anything I could find that simulated wind.*

*Juan Borray*

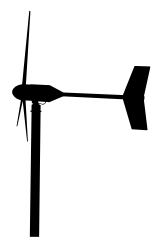


**Juan's continued research brings key improvements to the Borray.** Both the body and the yaw stabilizer of these windturbines are made of fiberglass. And right from the first moment, the Borray has an orientation system using slip rings and brushes, enabling risk-free energy transmission for the windturbine. With these improvements, the company can go global. Obtaining clean energy by harnessing the power of the wind is breaking through just as the planet is shaking off the hangover of the recent great oil crisis.

# 1982



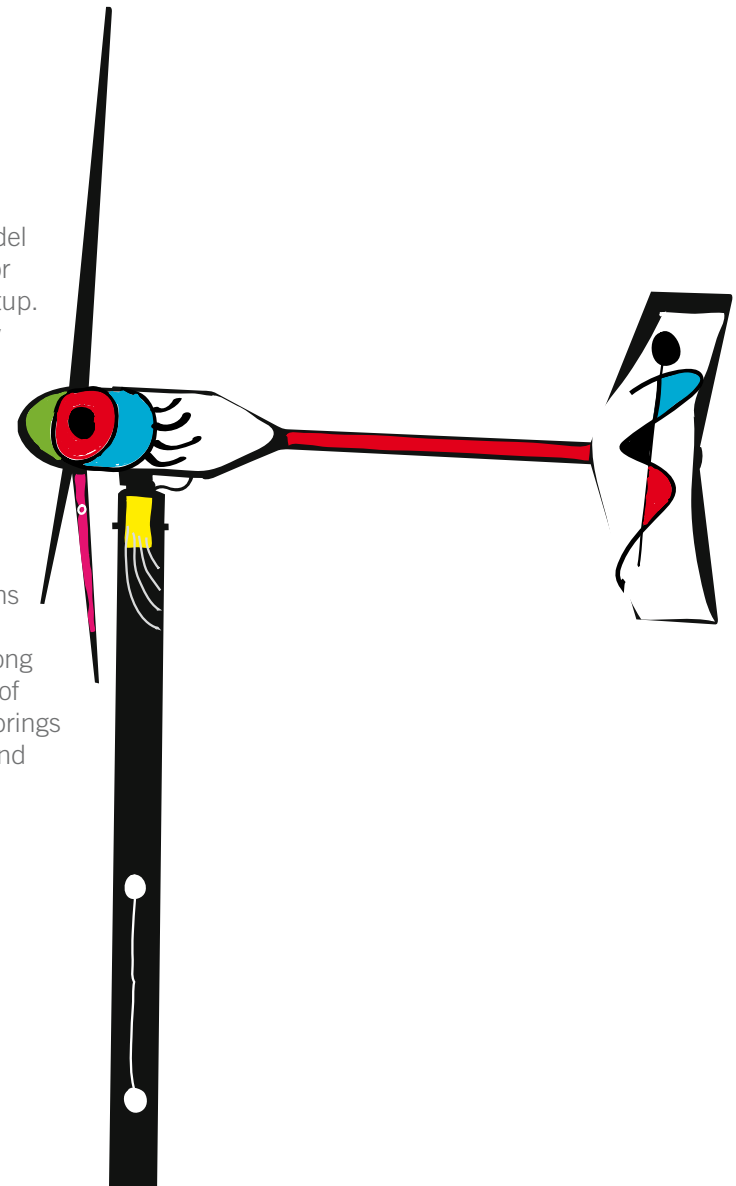
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In 1982, Bornay begins serial production, creating the G200W model equipped with an induction alternator which improves low wind speed startup. Numerous telecommunications relay stations and small, remote dwellings bring in a Bornay to ensure their

## Induction alternator.

electricity supplies. And Bornay opens up new markets: USA, Mexico, the Dominican Republic, Argentina, among others. Meanwhile, the combination of Bornay windturbines and windmills brings relief to dry, thirsty areas in Angola and Tanzania (Africa).



# 1984



*My first export was to the United States. Over fifteen days, I learnt English. Later, I would travel to Angola, the Dominican Republic, Argentina, Cuba, Mexico, Japan, etc...even to Antarctica.*

*Juan Borray*

## Injected nylon blades.

**Bornay evolves.** From manually handcrafting blades, the company starts producing injected nylon blades able to withstand hurricane force without breaking. This innovation cuts production time and increases the durability of the Bornay. Its pioneering essence is enhanced by intense production and sales activity. America, Europe, and Africa now count on Bornay reliability.

# 1988

## Permanent magnet alternators. Adjustable blade pitch.



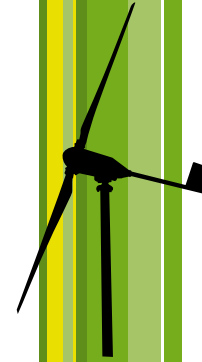
**The company has consolidated and matured.** Innovation and the urge to supply places in need of energy inspires Bornay to new heights as the company creates a new windturbine equipped with a 250W three-phase permanent magnet alternator complete with adjustable blade pitch. This boosts the features of the Bornay, especially in low and medium wind speeds. The introduction of an automatic brake system and mechanical blade pitch control means the attack angle of blades can be adjusted relative to the wind, bringing startup with low wind conditions and control at high speeds - a constant challenge for Bornay. In fact, in a few short years this innovation will be improved upon with the production of a windturbine incorporating an adjustable three-bladed rotor and 500W nominal power.

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# 1993

## Fiberglass/carbon fiber blades.

**Bornay heeds market requirements** and comes up with a smart answer, creating a new range of windturbines: Inclin range, with power options of 250W, 600W, 1000W and 2500W, robust machinery replacing the adjustable blade pitch with a tilting brake system, and using fiberglass/carbon fiber blades in place of injected nylon. Now the world starts admiring Bornay's greater sturdiness, durability, and reduced maintenance needs.



## Tilting brake.

*Perfection and fine-tuning our machine was achieved with great dedication and because we controlled the whole production process ourselves.*

*Juan Bornay*

# 1997

7 12 13



Bornay

**The 20th century draws to a close.** Information technology opens society to knowledge and globalisation. Humanity is forced to look ahead with greater balance, and the sustainability of the Earth is now a priority.

## Neodymium magnets.

Bornay seeks the fusion of state-of-the-art innovation and technology, bringing in neodymium magnets, effectively doubling power and reducing thickness threefold. The Bornay range is updated with windturbine options in 250W, 600W, 1500W and 3000W. A new 6000W nominal power model is launched.

*What I started as a hobby has now  
become a prestigious name  
branded worldwide.*  
duan Bornay

# 2000



## Fiberglass/carbon fiber blades by RTM.

**Three decades after** Juan Bornay's earliest prototypes and his wind simulation experiments, Bornay is now a prestigious name brand in the nascent renewable energy industry. Through constant innovation and productivity improvements, the firm has also secured a solid international distribution network. With serial production of 5 models ranging up to 6KW, Bornay takes a new step forward, developing a new RTM-based production system of fiberglass/carbon fiber blades, achieving a weight/resistance ratio that is unique in the marketplace. Bornay outlines its current strategic plan: Bring the world clean energy solutions as one of the key worldwide manufacturers in small-scale windturbine production.

# 2008

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**There is now no turning away** from the need to make efficient, clean energy production systems available. Bornay sees this challenge as an opportunity and is creating specific windturbines for connection to power grids that comply with each country's national norms regulating the flow from small wind power.

## Grid connection systems.

This transformation means Bornay is now moving towards the synergy of adding in energy from other renewable sources such as photovoltaics.

*With more than half the planet facing difficulties in accessing electricity and water, we want to continue offering solutions to the world.*

*Juan Bornay*





# Today We are still evolving with you.



**This planet will not now conceive** of any form of development which does not respect the environment. Resources are dwindling. But energy demands are greater than ever. What started as a dream is now a priority. Harnessing wind power and manufacturing reliable windturbines is a guarantee of commitment to the sustainability of the planet.

Against this backdrop, Bornay has a presence in 50 countries as a reputable firm backed by its history and the sturdiness of its machinery. And it wants to bring the world renewable energy solutions and invite industry's best professionals to carry on evolving and join the **Bornay** experience.

**Bornay** 

➤ 16 17 **Bornay, no doubt about it.**

**BORNAY**  
**600 1500 3000 6000**

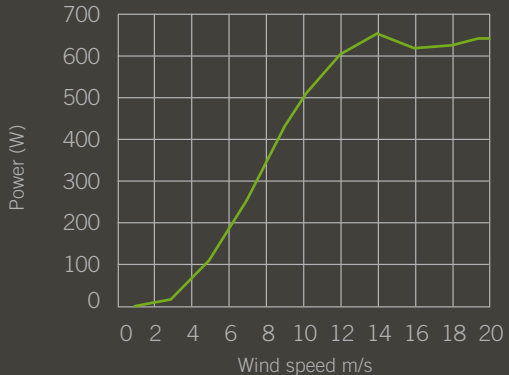
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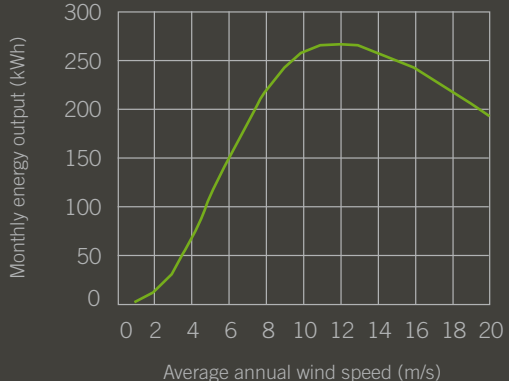


# BORNAY 600

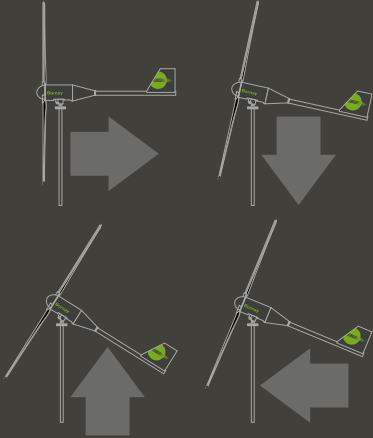
## Performance



## Energy



➤ 18 19



## Technical specifications

Number of blades	2
Diameter	2 mts
Material	Fiberglass and carbon fiber
Direction of rotation	Counterclockwise
Control systems	1. Electronic regulator 2. Passive by tilting

## Electrical specifications

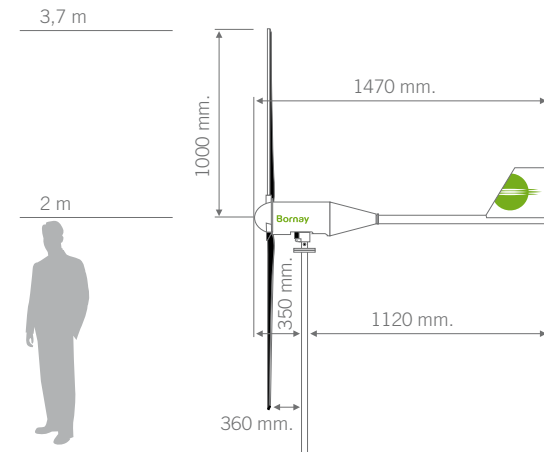
Alternator	Three phases permanent magnet
Magnets	Ferrite
Nominal power	600 w
Voltage	12, 24, 48 v
RPM	@ 1000
Regulator	12 v 60 Amp 24 v 30 Amp 48 v 15 Amp

## Performance, windspeed

For turn on	3,5 m/s
For nominal power	11 m/s
For automatic brake system	13 m/s
Survival	60 m/s

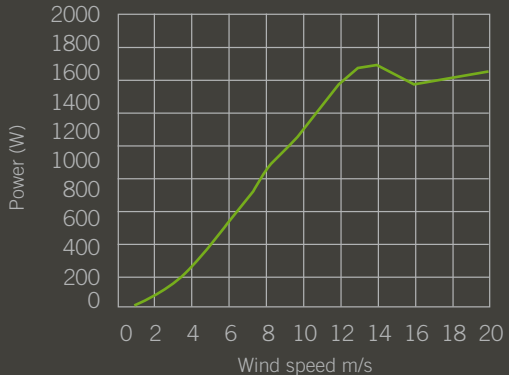
## Physical specifications

Windturbine weight	38 kg
Regulator weight	7 kg
Packaging	50 x 77 x 57 cm - 55 kg
Dimensions - weight	104 x 27 x 7 cm - 4,7 kg
Total	0,22 m <sup>3</sup> - 59,7 Kgr
Warranty	3 years

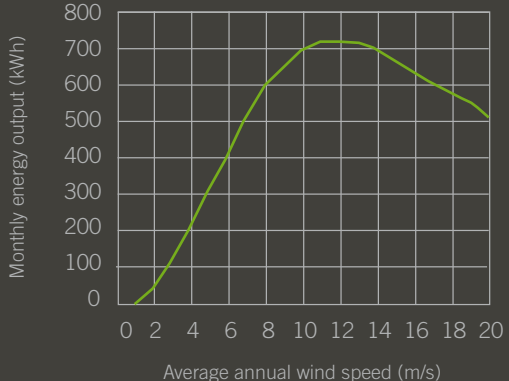


# BORNAY 1500

### Performance



### Energy



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## Technical specifications

Number of blades	2
Diameter	2,86 mts
Material	Fiberglass and carbon fiber
Direction of rotation	Counterclockwise
Control systems	1. Electronic regulator 2. Passive by tilting

## Electrical specifications

Alternator	Three phases permanent magnet
Magnets	Neodymium
Nominal power	1500 w
Voltage	24, 48, 120 v
RPM	@ 700
Regulator	24 v 80 Amp 48 v 40 Amp 120v. Grid connection

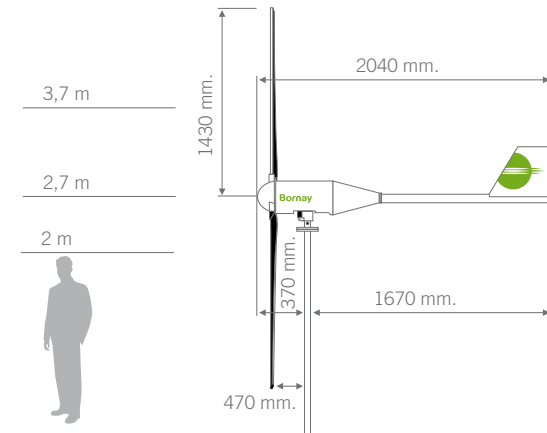
## Performance, windspeed

For turn on	3,5 m/s
For nominal power	12 m/s
For automatic brake system	14 m/s
Survival	60 m/s

## Physical specifications

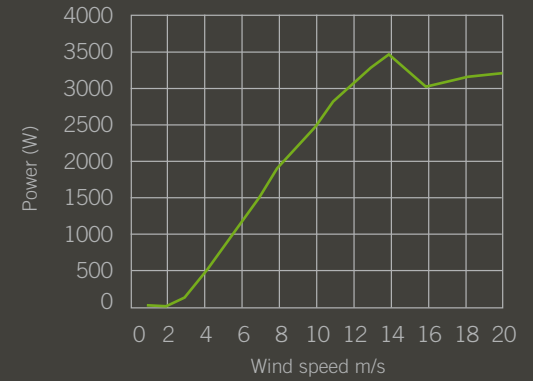
Windturbine weight	41 kg
Regulator weight	8 kg
Packaging	50 x 77 x 57 cm - 57 kg
Dimensions - weight	153 x 27 x 7 cm - 6,8 kg
Total	0,23 m <sup>3</sup> - 61,8 Kgr
Warranty	3 years

**Bornay** 

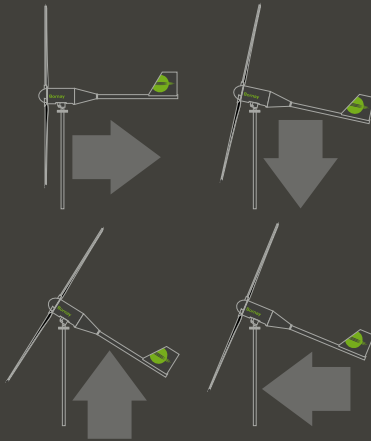
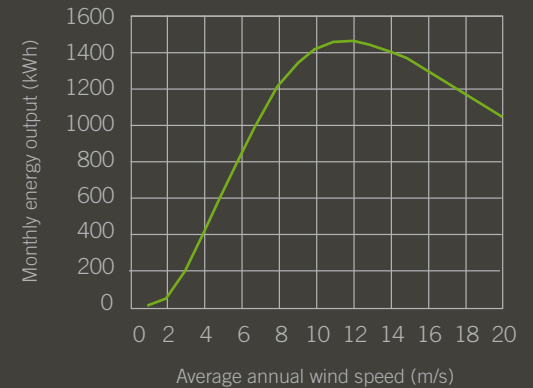


# BORNAY 3000

## Performance



## Energy



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## Technical specifications

Number of blades	2
Diameter	4 mts
Material	Fiberglass and carbon fiber
Direction of rotation	Counterclockwise
Control systems	1. Electronic regulator 2. Passive by tilting

## Electrical specifications

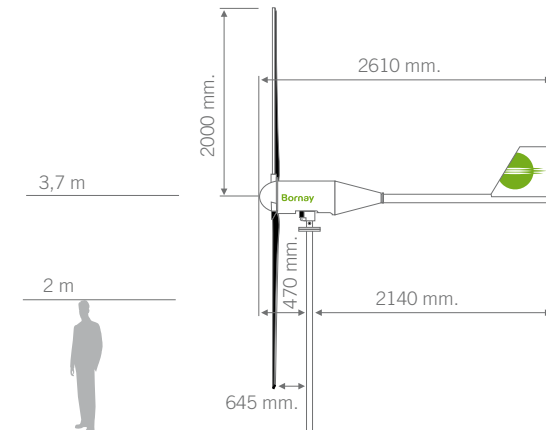
Alternator	Three phases permanent magnet
Magnets	Neodymium
Nominal power	3000 w
Voltage	24, 48, 120 v
RPM	@ 500
Regulator	24 v 150 Amp 48 v 75 Amp 120v. Grid connection

## Performance, windspeed

For turn on	3,5 m/s
For nominal power	12 m/s
For automatic brake system	14 m/s
Survival	60 m/s

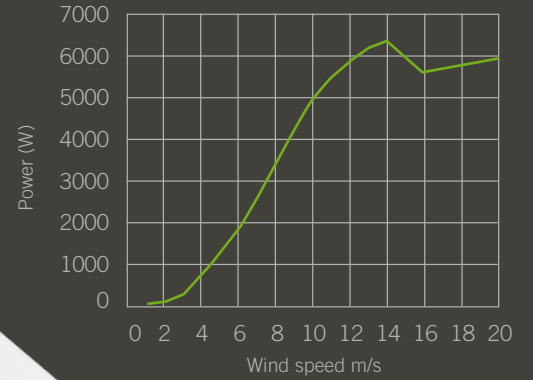
## Physical specifications

Windturbine weight	93 kg
Regulator weight	14 kg
Packaging	120 x 80 x 80 cm - 135 kg
Dimensions - weight	220 x 40 x 15 cm - 19 kg
Total	0,90 m <sup>3</sup> - 154 Kgr
Warranty	3 years

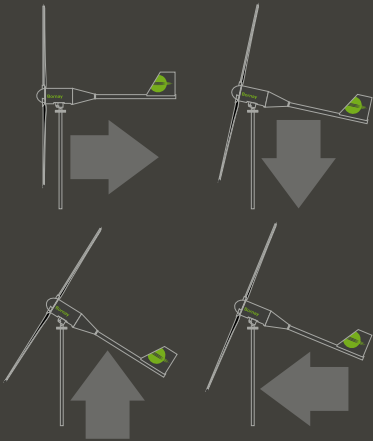
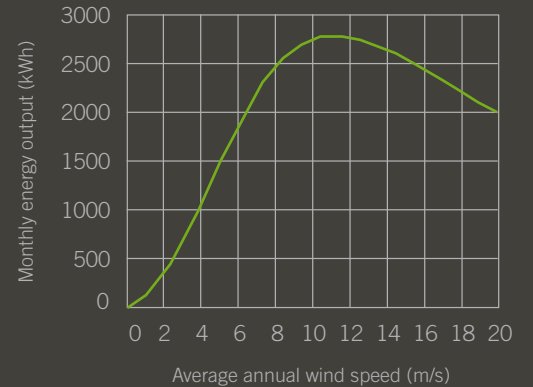


# BORNAY 6000

### Performance



### Energy



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## Technical specifications

Number of blades	3
Diameter	4 mts
Material	Fiberglass and carbon fiber
Direction of rotation	Counterclockwise
Control systems	1. Electronic regulator 2. Passive by tilting

## Electrical specifications

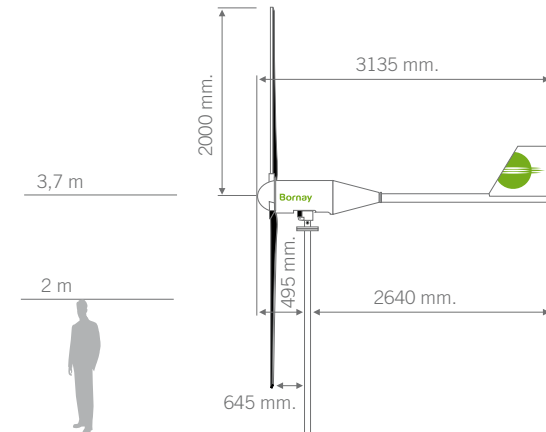
Alternator	Three phases permanent magnet
Magnets	Neodymium
Nominal power	6000 w
Voltage	48, 120 v
RPM	@ 600
Regulator	48 v 150 Amp 120v. Grid connection

## Performance, windspeed

For turn on	3,5 m/s
For nominal power	12 m/s
For automatic brake system	14 m/s
Survival	60 m/s

## Physical specifications

Windturbine weight	107 kg
Regulator weight	18 kg
Packaging	120 x 80 x 80 cm - 149 kg
Dimensions - weight	260 x 40 x 15 cm - 22 kg
Total	0,91 m <sup>3</sup> - 171 Kgr
Warranty	3 years



# Typical Installations

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# Off Grid Applications

Consumes	Quantity	Power	Hours	Daily consum
Lighting	8	13	2	208 Wh
Lighting	5	10	5	250 Wh
TV	1	250	4	1000 Wh
Video	1	150	1	150 Wh
Computer	1	180	4	720 Wh
Fridge	1	180	12	2160 Wh
Washing machine	1	750	1	750 Wh
Small consumes	1	500	2	1000 Wh

**Consumes**

6238 Wh

## Batteries

Battery voltage	24 volts
Days of autonomy	3 days
Battery capacity	897 Ah - C100

## Inverter

Input voltage	24 volts	Charger	Yes
Output voltage	220 volts	Trhee phases	No
Frequency	50 Hz	Sinewave	Pure
Maximum power	2164 W peak	Inverter	3000 W

Production	Quantity	Power	Isolation	Daily consum
Solar Modules	10	100	4	4000 Wh

	Windspeed	Power	Quantity	Daily consum
Windturbine 1500 neo 24 v.	5	245	1	2695 Wh

**Production**

6695 Wh



**A Wind Turbine**

Generates electricity from wind power, either during the day or at night. Its power varies relative to the needs of the installation.

**B Batteries**

Stores the energy produced by the wind turbine and solar panels, making it available for later use. It is recommended to have battery banks that last a minimum of three days.

# Off Grid Applications

## I Inverter

Transforms the stored continuous electricity into domestic electricity (alternating current at 220 V). A charger can be integrated to charge the batteries from an external source, like a diesel generator.

## R Controller

Controls the electricity generated by the wind turbine, the solar panels. It also controls the state of the battery. Prevents the overcharge and discharge of the battery bank.

## Ps Solar Panels

Generates electricity using solar radiation: therefore, its use is limited to daylight hours. Combined with a wind turbine, they guarantee a stable electricity production throughout the entire year. The number of solar panels and its power depends on the total energy required for the installation.

# Telecommunications

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## **A** Wind Turbine

Generates electricity from wind power, either during the day or at night. Its power varies relative to the needs of the installation.

## **B** Batteries

Stores the energy produced by the wind turbine and solar panels, making it available for later use. It is recommended to have battery banks that last a minimum of three days.

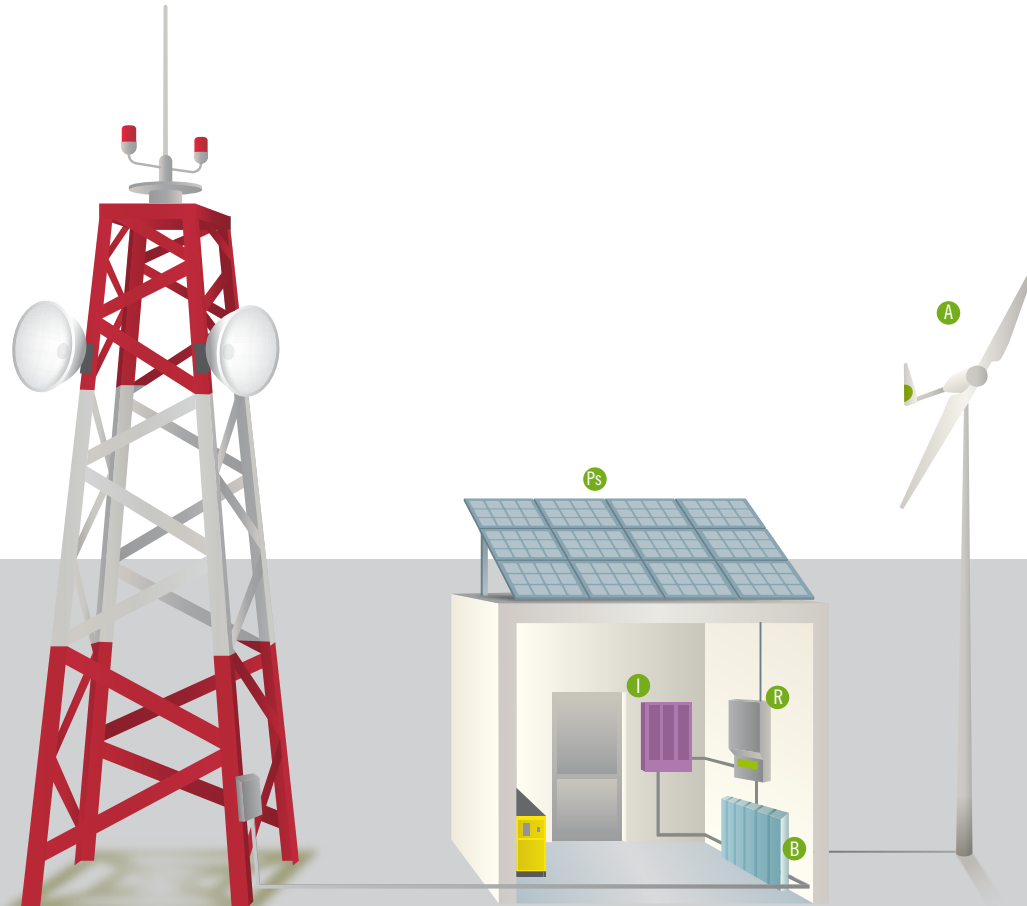
## **I** Inverter

Transforms the stored continuous electricity into domestic electricity (alternating current at 220 V). A charger can be integrated to charge the batteries from an external source, like a diesel generator.

## **R** Controller

Controls the electricity generated by the wind turbine, the solar panels. It also controls the state of the battery. Prevents the overcharge and discharge of the battery bank.





**Ps Solar Panels**

Generates electricity using solar radiation: therefore, its use is limited to daylight hours. Combined with a wind turbine, they guarantee a stable electricity production throughout the entire year. The number of solar panels and its power depends on the total energy required for the installation.

# Water pumping

## A Wind Turbine

Generates electricity from wind power, either during the day or at night. Its power varies relative to the needs of the installation.

## B Batteries

Almacena la energía generada por el aerogenerador y paneles solares, suministrándola posteriormente para su consumo. La autonomía mínima recomendada es de tres días.

## I Inverter

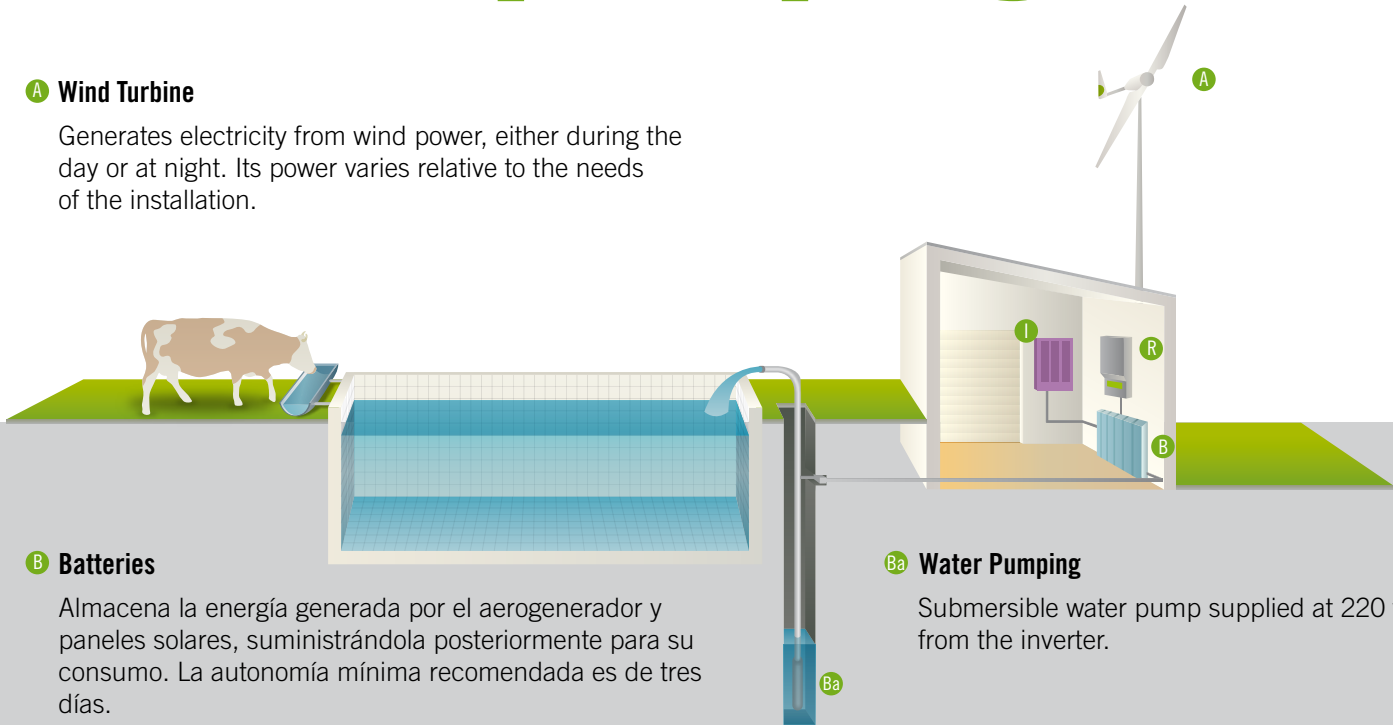
Transforms the stored continuous electricity into domestic electricity (alternating current at 220 V). A charger can be integrated to charge the batteries from an external source, like a diesel generator.

## Ba Water Pumping

Submersible water pump supplied at 220 vac from the inverter.

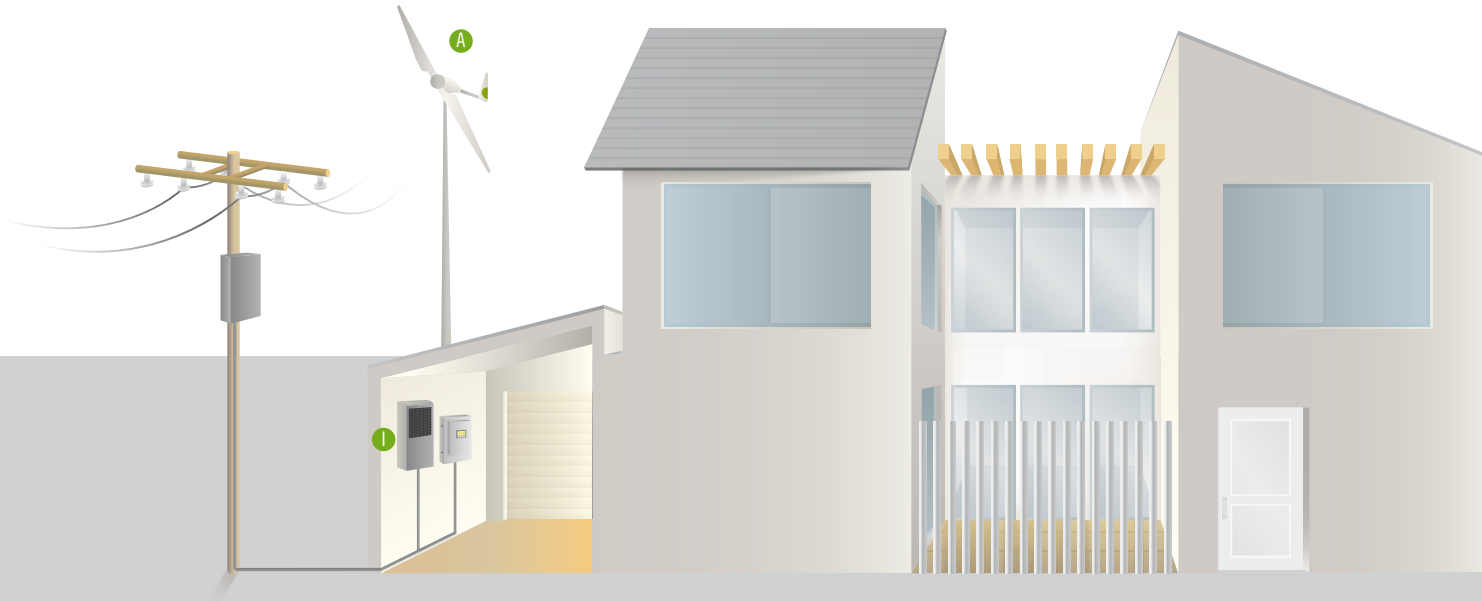
## R Controller

Controls the electricity generated by the wind turbine, the solar panels. It also controls the state of the battery. Prevents the overcharge and discharge of the battery bank.



# Grid connection

Bornay 



## **A** Wind Turbine

Generates electricity from wind power, either during the day or at night.

## **I** Inverter

Synchronizes the energy generated by the wind turbine and/or solar modules with the electrical grid and produces the input into the grid.

**Strict compliance** with international standard ISO 9001 and an integrated production process control guarantee the reliability of Bornay. Our bioclimatic facilities and autosufficiency optimise the energy resources of our facilities,

# Lineage of Professional Quality.

where Bornay windturbines are made and from where they are distributed to any point on the planet in 24-48 hours.

However, the true foundation of Bornay's quality is found in its people. It is a firmly committed and involved professional team, working to maintain the sturdiness of Bornay machinery.

Such painstaking care of details and the actual manufacturing process is what makes the difference.

*Goals are never truly reached.  
Challenges are renewed  
daily. You must always be  
ready to learn and undertake  
initiatives all your life.  
Juan Bornay*

## RAW MATERIALS.



**The raw materials** used in the manufacture of our windturbines have been rigorously selected to guarantee the reliability and durability of our machinery. Stainless steel, bronze, and carbon fiber are some of the materials we use.

## MECHANICS.



**In the Mechanics area**, raw materials are transformed into intermediate products. Plans are poured over to control the tolerance and quality of the finished product.

## ELECTRICS.



**In the Electrics area**, coils are wound and control panels made, while stringent checks confirm insulation and continuity in alternators and regulators undergo functionality testing.

## COMPOSITES.



**The use** of fiberglass/carbon fiber through RTM methods obtains blades with a unique resistance/weight ratio. Before they can be sent for assembly, they have to go through a proper catalyzing process.

*I have many years of experience in this, ensuring that all mechanical parts produced at Banway are of top quality and maximum guarantees.*

*Ramón Cerdá  
At Banway since 1993*

## ELECTRICAL TRANSMISSION. ASSEMBLY.



**The transmission** of energy between the windturbine and the tower depends on the use of 3 slip rings around the orientation axis, as well as three sets of brushes.



**Starting with the yaw**, the alternator is then assembled, plus the blades and the other elements that make up the windturbine.

## BLADE COMPENSATING AND BALANCING.



**Blades** are compensated using similar weights and balances. These are later balanced on the rotor in order to avoid vibrations and extend the Bornay's useful life.

## FINAL CONTROL.



8

**After assembly**, all elements are checked again: yaw control, casing, blades, nose cone, screws...The real power of the alternator is bench checked.

## DELIVERY.



9

**The product** is in stock and ready for delivery to customers. Through the most reliable transport firms, 24-48 deliveries are guaranteed.

## R&D&I.



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**Bornay** is an example of constant innovation since 1970, and boasts the qualified technical staff for commitment to improvements, evolution, and new product design.

*It is a privilege to work at Bornay. There is a great atmosphere, camaraderie, and a good relationship with the management.*

*Lucia Berbegal  
At Bornay since 2007*

*The dependability of our professional team is one of the features of quality that sets Bornay apart.*

*Lino Bañuls  
At Bornay since 2001.*



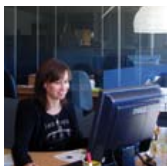
**Bornay's headquarters** are in *Spain* (Europe), in *Castalla*, very close to the *Mediterranean Sea*. Its facilities comprise a 1500m<sup>2</sup> bioclimatic building on 6500m<sup>2</sup> of land. Facing south, it combines enough small wind turbine and photovoltaic power

# Bioclimatic building.

for self-sufficiency, making the most of natural resources.







**Customer service** and total quality. Bornay offers telephone support and personalised service for its distributors and authorised installers. Its ISO 9001 certificate is a guarantee.



**Social responsibility.** Through the intense involvement of its personnel and maximum respect for the environment, Bornay is a socially responsible company.



**Business recognition.** Bornay was awarded the *Premio Nova* by the *Generalitat Valenciana*, as well as the *Sol y Paz Award* by the *Terra Foundation* for its company record.



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**f.** +34 965 560 752

*While at Bornay, I have realised that switching a light on for many people is an impossibility we have made feasible. And we are also co-operating to create a better world for our children.*

*Juan M. Pedro. At Bornay since 2006*

## Technical specifications

Number of blades	2
Diameter	2 mts
Material	Fiberglass and carbon fiber
Direction of rotation	Counterclockwise
Control systems	1. Electronic regulator 2. Passive by tilting

## BORNAY 600

Number of blades	2
Diameter	2 mts
Material	Fiberglass and carbon fiber
Direction of rotation	Counterclockwise
Control systems	1. Electronic regulator 2. Passive by tilting

## BORNAY 1500

Number of blades	2
Diameter	2,86 mts
Material	Fiberglass and carbon fiber
Direction of rotation	Counterclockwise
Control systems	1. Electronic regulator 2. Passive by tilting

## BORNAY 3000

Number of blades	2
Diameter	4 mts
Material	Fiberglass and carbon fiber
Direction of rotation	Counterclockwise
Control systems	1. Electronic regulator 2. Passive by tilting

## BORNAY 6000

Number of blades	3
Diameter	4 mts
Material	Fiberglass and carbon fiber
Direction of rotation	Counterclockwise
Control systems	1. Electronic regulator 2. Passive by tilting

## Electrical specifications

Alternator	Three phases permanent magnet
Magnets	Ferrite
Nominal power	600 w
Voltage	12, 24, 48 v
RPM	@ 1000
Regulator	12 v 60 Amp 24 v 30 Amp 48 v 15 Amp

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Nominal power	600 w
Voltage	12, 24, 48 v
RPM	@ 1000
Regulator	12 v 60 Amp 24 v 30 Amp 48 v 15 Amp

Alternator	Three phases permanent magnet
Magnets	Neodymium
Nominal power	1500 w
Voltage	24, 48, 120 v
RPM	@ 700
Regulator	24 v 80 Amp 48 v 40 Amp 120v. Grid connection

Alternator	Three phases permanent magnet
Magnets	Neodymium
Nominal power	3000 w
Voltage	24, 48, 120 v
RPM	@ 500
Regulator	24 v 150 Amp 48 v 75 Amp 120v. Grid connection

Alternator	Three phases permanent magnet
Magnets	Neodymium
Nominal power	6000 w
Voltage	48, 120 v
RPM	@ 600
Regulator	48 v 150 Amp 120v. Grid connection

## Performance, windspeed

For turn on	3,5 m/s
For nominal power	11 m/s
For automatic brake system	13 m/s
Survival	60 m/s

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Survival	60 m/s

For turn on	3,5 m/s
For nominal power	12 m/s
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For turn on	3,5 m/s
For nominal power	12 m/s
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Survival	60 m/s

## Physical specifications

Windturbine weight	38 kg
Regulator weight	7 kg
Packaging	50 x 77 x 57 cm - 55 kg
Dimensions - weight	104 x 27 x 7 cm - 4,7 kg
Total	0,22 m <sup>3</sup> - 59,7 Kgr
Warranty	3 years

Windturbine weight	38 kg
Regulator weight	7 kg
Packaging	50 x 77 x 57 cm - 55 kg
Dimensions - weight	104 x 27 x 7 cm - 4,7 kg
Total	0,22 m <sup>3</sup> - 59,7 Kgr
Warranty	3 years

Windturbine weight	41 kg
Regulator weight	8 kg
Packaging	50 x 77 x 57 cm - 57 kg
Dimensions - weight	153 x 27 x 7 cm - 6,8 kg
Total	0,23 m <sup>3</sup> - 61,8 Kgr
Warranty	3 years

Windturbine weight	93 kg
Regulator weight	14 kg
Packaging	120 x 80 x 80 cm - 135 kg
Dimensions - weight	220 x 40 x 15 cm - 19 kg
Total	0,90 m <sup>3</sup> - 154 Kgr
Warranty	3 years

Windturbine weight	107 kg
Regulator weight	18 kg
Packaging	120 x 80 x 80 cm - 149 kg
Dimensions - weight	260 x 40 x 15 cm - 22 kg
Total	0,91 m <sup>3</sup> - 171 Kgr
Warranty	3 years

BORNAY 600



BORNAY 1500



BORNAY 3000



BORNAY 6000





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