

Introduction

You decided to buy a cyclon wind generator, a professional construction of industrial production.

Now the cyclon wind generator lies in front of you, best wishes!

We present you, in the area of economic and alternative energy, pure innovation. The worldwide one and only mobile wind generator with a gear unit in the 9 till 24 kg category.

Our philosophy consists of to bring the world and our descendants usefull and simply favourable products in perfect quality and development. Please take the safety advices so seriously and please note them exactly!

Every cyclon has a serial number, which is mentioned on the label. In case of this serial number you can trace back all technical dates and manufactural numbers of the single components (generator, rotor membrane, polwheel, rectifier, gear unit and so on).

You can find the serial number also at delivery on its correctness and note these numbers, so that they are available for further inquiry.

The information in this direction have been drawn up with maximum care.

However , **ALGATEC** won` t take any responsibility for inexactness or possible missing information.

The user of this direction or this one who assembles the construction and puts it into operation, takes the whole responsibility and the risk.

We reserve to carry out, every time without announcement. There can ´ t be derive the right about later changes of already delivered products.

3. *Something general of wind energy*

3.1 For what do we need wind energy?

Our present prosperity is based on the consumption of much energy.

In the future our demand on energy will grow worldwide. But we can't afford to produce energy in the circumference as before.

It turns out that we have to make accessible also other sources of energy. In the following the main arguments should be shown.

Shortage of resources

3.2 Scarceness of resources

Its well - known that our fossil and atomic energy supplies are limited.

This table shows the forecast radius of the single sources of energy.

Sources of energy	radius of the sources
Hard coal	185 years
Petroleum	40 years
Natural gas	60 years
Uranium	LIGHT-WATER REACTORS 80 years
	With reprocessing 120 years
	Brooding reactor 5000 years

Since many centuries the human being makes good use of the power of wind.

But just in the last century we learned to change this power in electricity.

The development conforms to the demand of human being.

In the last centuries grows the demand of energy through development and techniques.

Innovative solutions were and are searched to stop this demand.

Not even in favour of nature.

We, **ALGATEC** made the solution of this problem to our business.

3.3 Wind power

Table for the division of the wind classes

Wind power	wind speed m/s	wind speed km/h	Description effect
0	0 - 0,5	0 - 1	calm rises vertical
1	0.6 - 1.7	2 - 6	low draught smoke softly moves
2	1.8 - 3.3	7 - 12	light wind for that emotionally noticeable
3	3.4 - 5.2	13 - 18	low wind, leafs softly move
4	5.3 - 7.4	19 - 26	strong wind, picks up dust Paper
5	7.5 - 9.8	27 - 35	fresh wind, small trees sway
6	9.9 - 12.4	36 - 44	strong wind howls on houses
7	12.5 - 15.2	45 - 54	stiff wind moves big trees
8	15.3 - 18.2	55 - 65	stormy wind prevents walking
9	18.3 - 21.5	66 - 77	storm uncovers bricks
10	21.6 - 25.1	78 - 90	heavy storm knocks down trees
11	25.2 - 29.0	90 - 104	violent storm
12	over 29	105 hurricane	heavy devastation

3.4 wind speed

1 m/s = 3.6 km/h = 2,237 mph = 1,944 knots

1 knot = 1 seamile per hour = 0,5144 m/s = 1,852 km/h = 1.125 mph

4. Advantages of the Cyclon wind generator

- very high energy profit
- very low movement
- aerodynamic and high-quality plastic wing nuts (optional carbon) removable
- revolution regulations through wing nut shifting
- gear unit with gear ratio from 1:3 till 1:7
- gear unit removable
- gear unit changeable without any effort (optic stays the same)
- gear unit and bearing are running in an oil bath
- 14 - 24 pol synchron generator
- high performance neodymmagnets
- thermo overheat protection
- high performance ball bearing
- stop gap (wind pressure switch)
- mechanical Windguide (electrical windguide in preparation)
- timeless noble design
- high quality
- high precised components
- 3 years guarantee
- multiple available in many areas
- private households, mobile homes, camping, allotment gardens, at the army, ships or expeditions
- it depends on the operational area, which one of the single components you choose
- for example for calm areas: longer and wider wing nuts to improve the starting behaviour
- for the land operation the generator consists of high-grade steel components and aluminium components
- for maritime areas we deliver all components consist of high-grade steel or bronze
- we also would like to work out special requests

THE CYCLON WIND TURBINES CAN BE CONVERTED TO WATER TURBINES EVERY TIME. OUR QUALIFIED PERSONNL CAN ADVISE YOU.

5. Scope of delivery

The CYCLON TURBINE is partly pre-installed and consists of the following essential components:

1. Transport box:

- 1 x pre-installed wind turbine with gearbox, cable junction,
- 1 x rectifier 360 volt 100 ampere – 200 ampere
- 1 x guarantee card
- 1 x mounting and instruction manual

2. Transport box:

- 6 x M 8 grub screw and screw-nuts for the mounting of the rotor wings
- 3 x M 6 slotted screw with screw-nuts for the wind-track-mounting
- 1 x wind-track-mounting
- 1 x wind-track-mounting pole
- 1 x rotor wings (3 rw,) GRP or optional made of carbon

Please check whether the above enumerated parts are in your transport box to ensure, that you have every part for the mounting.

Please check the condition of the parts to detect poss. damages in transit and reclaim them immediately.

6. General informations about assembly and mounting

The place to establish resp. the highness of the mast should be chosen so that adjacent houses and vegetation (trees, bushes, and so on) are overtowered, cause they can engender air turbulences. Thereby the wind turbine could not work optimal.

It is said, that the power in square rises up proportional to the wind speed.

If you pay attention to that point, you should search a place to establish, where is a high undistinguished and constant wind speed as possible.

Favourable setting ups for the mobile wind generator

If the wind generator will be installed near an object, it might be that this object will generate turbulences and due to that fact the construction won't work according to the rules.

To achieve high yield of wind power, the wind generator should be installed as far as possible from barriers.

If this isn't possible, the height of the mast should be choosed to be taller than this barriers.

If the wind construction shall be installed in mountainous land, it can either be installed in the valley or on a mountain.

Before we expand on, we prod to sources of danger by assembly or reperation.

7. Sources of danger

Wind turbines have sources of danger, like other machines, whereon it's important to pay attention. Here are the important informations.

7. 1. Mechanical dangers

The greatest source of danger is the revolving rotor. **Caution:** Never touch a revolving rotor. Don't try to stop the rotor by hand. Don't mount the wind turbine where other persons could reach the rotor.

The rotor wings are made of caol reinforced plastic. This material is very sturdy, so that your CYCLON can overcome very high wind speed. However the material can break, if articles come into the revolving rotor. Please pay attention, so that no articles can come into the revolving rotor.

7. 2. Electrical dangers

Please consult a technician for electrical installations, cause very high no-load tensions could be developed by an ongoing generator.

All conductions, electrical components and joinings need to sustain at least ampere (12 V - version) respectively 20 ampere (24 V - version).

Caution: Conductions with a cross section, that is not enough dimensioned can heat so intense, that a fire can flare.

For saveguarding you need to mount the supply pipes as near as possible to the battery fuses.

A short circuit must be avoided in any case, because a fire can flare or further on to a depletion of the battery (leakage of battery acid and gases).

Caution: Avoid a short circuit of the batteries. By the load of lead-acid-batteries inflammable hydrogen comes into being. At so called "open" lead-acid-batteries this acid leakage through the ventilation opening of the battery.

Caution: Never install the batteries where sparks can come into being. Always pay attention that there is enough ventilation.
The load resistor, that conducts as accessories kit could become very hot.

Caution: Don't install resistors on an inflammable underground, because a fire can come into being.

7. 3. Precautions:

For your security – please read it implicitly!

With the original wind turbine you received a technical high-grade product, that however needs a bit attention. We simplify the mounting with pre-assembly for you, however we demount the rotor wings and the wind-track mounting for the transport. Mounting and installation require thorough arrangement and execution, therefore the installation works faultless. Please preconceive that the installation is set out to wind and weather!

Please inform yourself about a lightning protection, that is appropriate for the position! Basically wind energy installations are graded as insecure for lightnings, particularly if they are mounted in an exposed position on a high mast. If a lightning batters in, it can progress to every connected components (battery, consumer).

>>> Fire hazard!

Therefore it is absolute to recommend to equip the original generator CYCLON with a lightning protection resp. to integrate it into a lightning protection concept. That can only be achieved competently by a technician on-site. For damages, which arose because of a lightning impact owing to a lightning protector, that doesn't exist or that is insufficient, we don't take over liability.

By the construction of these wind turbines top priority was given to the aspect of security-your security and that of your neighbours and relatives, after functionality and design. Every moving electric-mechanical device however includes some dangers. Think while everything that you do absolute on your security, please pay attention to the following delineated precautions, please use your common sense!

The most important thing you should preconceive by the arrangement of the site, the installation and the current operation is security.

The ultralarge danger is posed by the rotary rotor wings. The wind wings are produced of high-grade synthetic (GRP) and very sturdy. While a storm, the wings can reach a very high speed and are than nearly invisible.

Grievous bodily harm can be caused by touch.

Don't install the wind turbine so that persons can get into contact with the rotary wings. Pay attention while the installation, too. Choose a calm day for the mounting!

Don't let the wind turbine rotate unobstructed (without connection to the band of memory). That can destroy the loading automatic controller.

You need to pinch off the band of memory, so you can retard the wind turbine.

Don't let the wind turbine rotate unobstructed (without any connection).

The automatic break system then doesn't work correct and the wind turbine can be destroyed by a storm.

Don't manipulate the loading automatic controller.

Don't permute the polarities.

Use only enough dimensioned cable.

Caution!

Don't go in proximity to the wind turbine while a thunderstorm and don't touch any part of the installation.

7. 4 Dangers when assembling/mounting

The best place for the assembling of a wind turbine is on a free area with a high mast as possible.

Pay attention to that the rotor wings don't strike against the mast and rotate free.

A lightning protector constitution must be put on the mast step. Apply corresponding appliances therefore.

You need to work very thorough, therefore nobody can be hurt by the rotary rotor wings, resp. those come into contact with articles.

Pay attention to the observance of the minimum distance between the rotor wings and the mast. The fixture is depending on the type, that you apply.

The foundation for a freestanding resp. tighten mast must be done thorough. The underground must be in a good condition, so that a soak isn't possible.

8. Installation of a wind turbine on the mast

Before you begin with the installation, familiarize with the particularize parts and the sequence of the steps of a procedures, therefore every handle bar becomes clear. The more prepared you approach a task, the more confident you can work!

The correct order of the mounting

- 1. mast**
- 2. generator**
- 3. wind-track-mounting**
- 4. rotor wings**

Think of your security by everything you do-both above by the mast and below to the ground, too (precipitation parts)!

8. 1 Mounting of the mast

Mount the mast so that it stands sturdy tighten at three scores by courtesy of wire ropes. At installations, where it is not possible to tighten at three scores, please use a thicker pipe to be able to guarantee the stability of the wind turbine, or try to support it with more pipes at two points.

Important: Put an attenuator made of gummi under at the joining of the mast to the masonry, to avoid vibrations at the masonry while the wind turbine is in operation.

Important: The tightening of the wire ropes must begin 10 cm below the mounted wings lacy.

That means:

At CYCLON 1000 1, 10 meters below the end of the mast above,

At CYCLON 3000 1, 50 meters below the end of the mast above,

At CYCLON 5000 1, 70 meters below the end of the mast above.

The mast point is to be prepared in such a way that the aluminum admission can be installed.

The mast must to in any case with water-dares to be adjusted, so that the generator stands on straight mast.

Examine they "Sitz" before, without the weight of the wind wheels.

8.2 Generator installation

Before you mount the generator, plunge the plug-in connector of the generator at the mast admission with the connection cable together, which was leaded through the mast before.

Now mount the generator into the recording. The wind turbine has to have the possibilty to rotate free, but the mounting may not have too much place.

The wind turbine on the mast must be tighten with M 10 screws at three places on a level with the indent (Look at the picture).

8. 3 Wind adjusting mounting

At first you need to mount together the wind adjusting wing on the wind adjusting pole by courtesy of two supplied M 6 screws. Pay attention so that the screws not stripped the thread.

Thereafter you need to plunge thereupon the wind adjusting at the rear end of the generator on the oelfuellstutz up to the stop. In courtesy of one of the supplied M 6 screws the pole can be mounted.

8. 4 Mounting of the rotor wings

At least the rotor wings are mounted:

At first screw a M 6 safety bolt on the wing at let one without. Plunge the first wing thereupon. You will see on the wing a lowering groove at the bolt when you look through the threadhole. Now you need to thighten the first bolt.

Pay already attention to the properly wing position thereby.

Thereafter you can thighten the second safety bolt.

Tighten the both safety bolts thorough. Make sure of the sturdy seat of the screws.

Repeat those steps for the other rotor wings.

At least you tighten the cover caps of the safety bolts.

How to justify the wings optimal, you learn from the site "adjustment of the wings" please. There we tell you more about the types of adjustment.

Please check again whether you really properly mounted everything and fixed!

8. 5 Adjustment of the wings

Adjustment of wings

Pos. 1: weak wind. Adjustment 340 degrees

Pos. 2: middle to strong wind: Adjustment 325 degrees

9. Electrical connection

9. 1 Fuses

Please mount a fuse in every PLUS conduction between the generator-loading automatic controller and the loading automatic controller-battery. This prevents a short-circuit between the two components.

Use a fuse by 12 volt version of 65 ampere thereby, by 24 volt version of 100 ampere.

Mount the fuses with a minimum distance of two meters into the battery. Thereby you prevent fire hazards.

9. 2 Grounding of the system

To protect your installation of damages by an impact of a lightning, you should include a congruous dimensioned grounding. A technician can advise you particularly. He knows if necessary the to abide local regulations. By an exertion on yachts, use the grounding of the ship, please.

9. 3 Needed tools

Please lay out the additionally following tools:

- Screwdriver-set
- Open-end wrench-set
- Wire cutter
- Vein end sleeve pliers
- Crimping pliers
- Shrinkdown plastic tubing or insulating tape
- Multimeter
- Allen wrench-set

9. 4 General informations/regulations

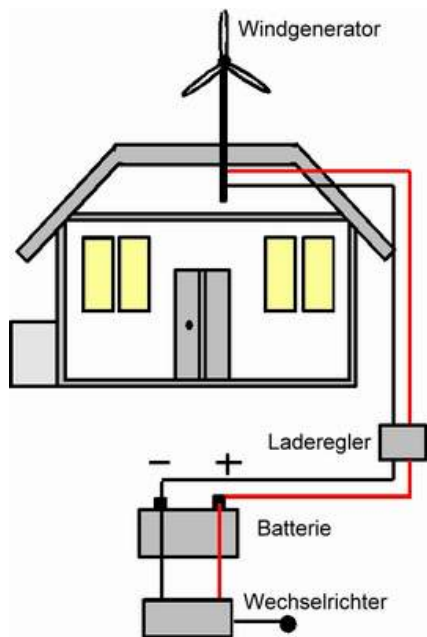
For the installations are to heed the general recognized regulates and standardizes for the electrical-installations, particularly for the direct current installations, as well as the prevention of accidents regulation.

Please pay attention for that every installation-, maintenance- and repair works at the electrical installation are only implemented by according to qualified persons. They need to read the informations, which are given in this manual, too.

Information: After all the electrical components have been installed connect the connections!!!

Information: Please connect the batteries at least!!!

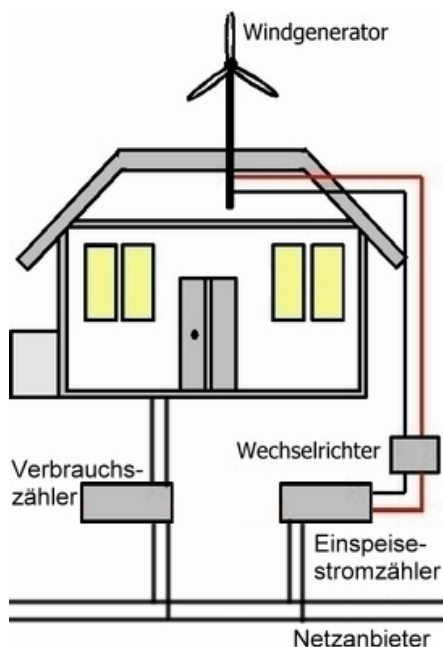
9.5 Connection diagrams for storage in battery



If no netzeinspeisung is possible or desired, in principle in batteries one stores.

With an offer in excess at energy also a water storage water heater can serve as memory.

9.6 Connection diagrams for feed-in



The state generally supports renewable energy. The network carriers have different in each case agreements, which meet you with the Contracting Parties.

Therefore it is to be taken up advisable with the responsible network carrier contact.

9.7 Battery

Information!!! Please pay attention to that the batteries are enough ventilated. By the use of not maintained free batteries (lead acid batteries), extremely gases could come into being.

To elongate the working life of the batteries, use an appropriate loading automatic controller. Those regulate the loading cycles of the batteries, so that an ornateness or an unloading danger can never come into being.

The amount of the batteries, that you need conform to your average power requirement. Therefore detect your power requirement, please. Our service center or the responsible seller can give you a hand.

9.8 Load automatic controller

The different accumulators need also different load procedures, which are reached by power electronics.

To be prevented the task of the load automatic controller is a possible overloading the charge and unloading to be supervised.

In order to avoid too high or to deep tension, it is to be used necessarily a load automatic controller.

Because the output voltage of a generator depends strongly on the attached load and the driving speed.

A correct installation and use of a load automatic controller are important for the reason, since it ensures so the life span of the memory module as well as a problem-free use.

10. Check list

settled	Text	Control of ok?
	Mast:	
	Mast stands stably	
	Mast is aligned with spirit level	
	Anchoring wires are firmly removed and have sturdy seat	
	Rubber absorber at the points of contact to the brick-work put underneath	
	Mast does not wobble with inserted generator back and forth	
	Grounding/ lightning protection:	
	Mast geerdet	
	Connection examined for correctness	
	Electrical installation:	
	Battery duly set up and attached	
	Load automatic controller duly fastens and attached	
	Load resistance duly fastens and attached	
	sufficient heat dissipation intended	
	Fuse holder fastens and attached	
	Inverter pole correctly attached	
	All cables, and/or lines in accordance with connection diagram lays and attached	
	Polarity of the lines at all connection points controls	
	Wind generator:	
	Mast admission duly bolts and examined for tightness	
	Wind adjusting aligned and firmly installs	
	Wing correctly adjusted and firmly installs	
	Wings turn in the clockwise direction problem-free	
	From generator outgoing cables do not hang around freely	

After all assembly works were duly implemented and controlled again, you can take the generator in enterprise.

11. Enterprise of the plant

11.1 Safety references

The Cyclon wind generator may not be operated in the case of full-loaded battery without load automatic controllers.

No persons may be in the danger area.

The turning wings may not be touched up to the complete stop.

The Cyclon wind generator may not be operated without clamped generator inlet without electrical load.

11.2 Yearly energy yield

The Cyclon wind generator produces different achievements depending upon wind velocity and number of revolutions of the generator.

The yearly energy yield is different therefore in each location.

In the lower diagram they can compute an average value at energy yield after their location.

These values can vary depending upon wind conditions.

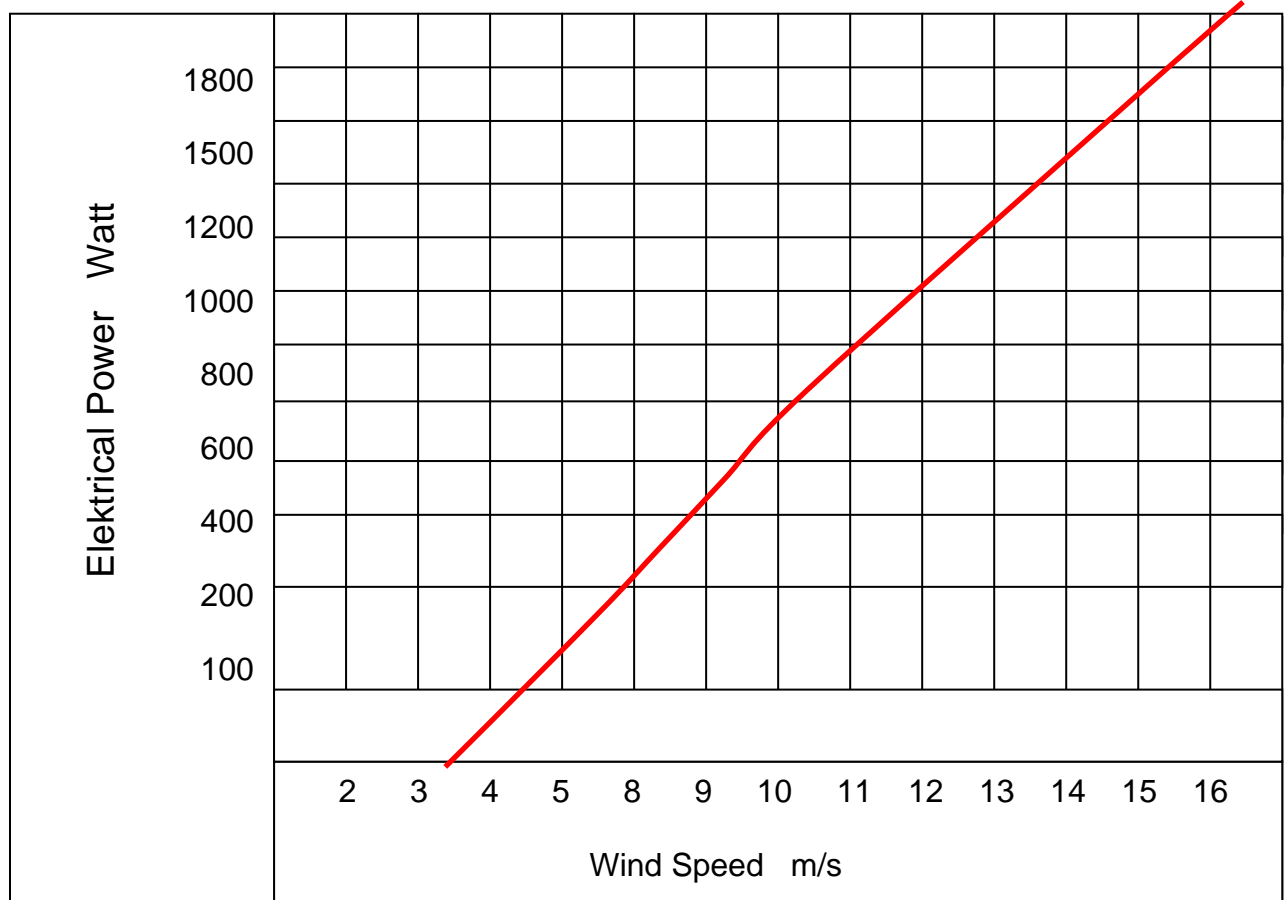
11.3 Performance curves CYCLON 1000 / CYCLON 3000 / CYCLON 5000

Performance curves CYCLON 1000

Reference: Note they please that this value can be achieved only after a certain break-in period of the ball bearings and their sealing rings.

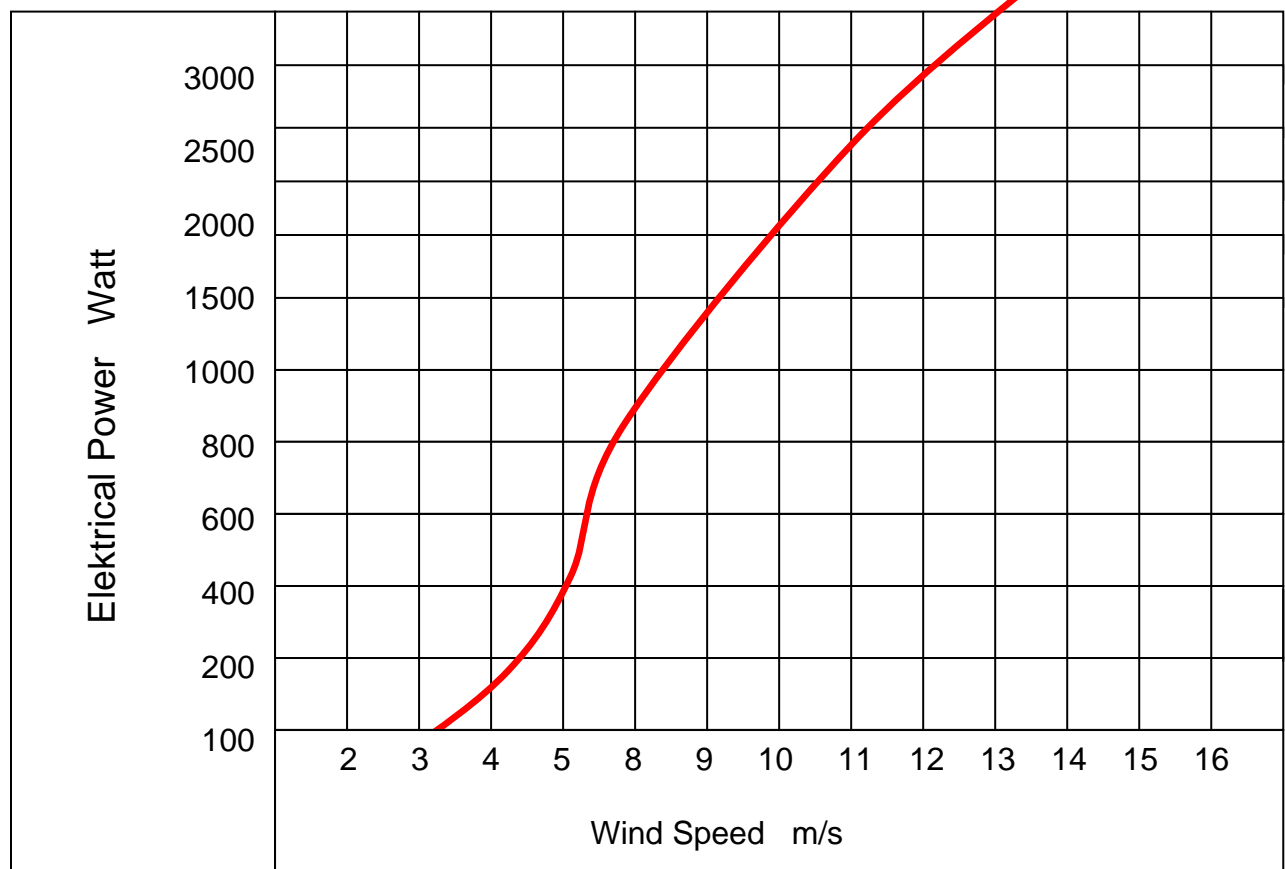
Technical data CYCLON 1000

Maximum achievement: 1800 Watts



Rated output	ca. 1000 Watts
Nominal speed	12 m/s
Switching on speed	3 m/s
Turn-off speed	20 m/s
Rotor diameter	1,80 m
Sheet number	3
Rotor blade material	GRP
Wing number of revolutions	50 – 800 Upm
Generator permanent magnet	3 Phases
Neodymium of magnets	24 poles
Rated voltage	12 V, 24 V, 48 V DC
Speed regulation	Rotor blade adjustment
Power adjustment	Rotor blade adjustment
Power adjustment	Generator short-circuit
Mass generator	6 kg

Performance curve CYCLON 3000

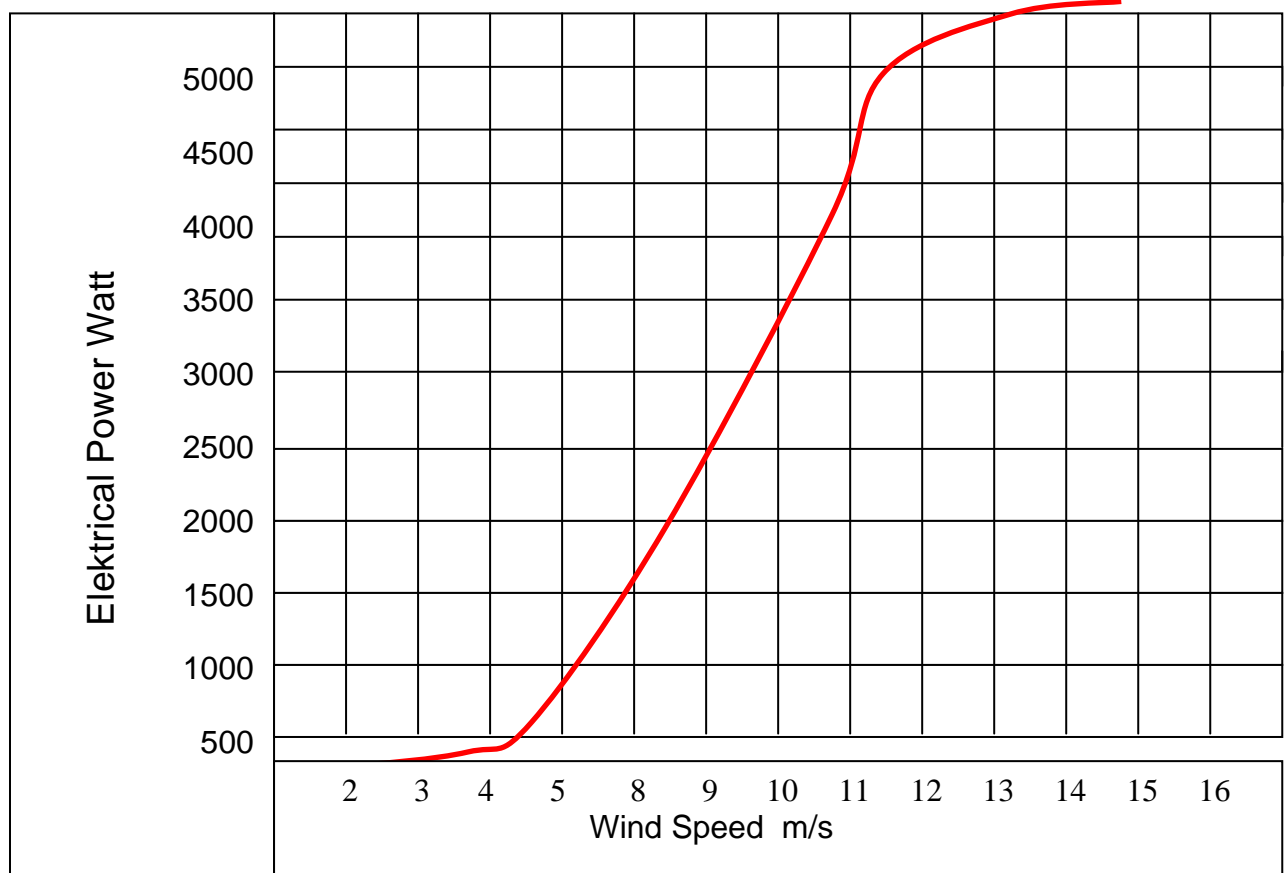


Reference: Note they please that this value can be achieved only after a certain break-in period of the ball bearings and their sealing rings.

Technical data CYCLON 3000

Rated output	ca. 3000 Watts
Nominal speed	12 m/s
Switching on speed	3 m/s
Turn-off speed	20 m/s
Rotor diameter	2,60 m
Sheet number	3
Rotor blade material	GRP
Wing number of revolutions	50- 800 Upm
Generator permanent magnet	3 Phases
Neodymium of magnets	24 poles
Rated voltage	24 V, 48 V, 120 V, 220 V DC
Speed regulation	Rotor blade adjustment
Power adjustment	Rotor blade adjustment
Power adjustment	Generator short-circuit
Mass generator	15 kg

Performance curve CYCLON 5000



Reference: Note they please that this value can be achieved only after a certain break-in period of the ball bearings and their sealing rings.

Technical data CYCLON 5000

Rated output	ca. 5000 Watts
Nominal speed	12 m/s
Switching on speed	3 m/s
Turn-off speed	20 m/s
Rotor diameter	3,10 m
Sheet number	3
Rotor blade material	GRP
Wing number of revolutions	50- 800 Upm
Generator permanent magnet	3 Phases
Neodymium of magnets	24 poles
Rated voltage	24 V, 48 V, 120 V, 220 V DC
Speed regulation	Rotor blade adjustment
Power adjustment	Rotor blade adjustment
Power adjustment	Generator short-circuit
Mass generator	19 kg

Caution: With weak wind areas they should select a longer rotor.
Please they ask their technical adviser.

12.Controls, maintenance works

12.1 Regularly controls

Maintenance after the installation

They should control one month after the installation again all screws for tightness.

Recurring maintenance

For the guarantee of a long life span of the plant we recommend the following maintenance work.

Every 12 months or outside of "Windsaison" a short examination of the plant should take place:

- Examination of the bolt connection
- Examination of the electrical connections and the cable
- Visual inspection of the rotor blades

Attention do not take when possible damages the wings the generator to no more in enterprise.

They need new wings set for further start-up.

The disassembly of the damaged parts should of an expert personnel made to become.

12.2 The following parts of the wind generator are to be examined mainly

Camp

The wind generators are equipped with high-quality camps, which do not require a special maintenance.

Screws

For the wind generator only high-grade steel screws are used. If a screw was lost or if one is defective, then it should be replaced immediately.

Interwirings

All cables should be examined for tightness, in order to avoid short-circuits or contact problems.

13. Error tracing

13.1 Wind generator does not start

A cause: It is too little wind.

Elimination of errors: The generator runs only with 3 m/sek. Wind velocity on. With Anometer they can measure the wind velocity. The wing attitude still times with stood still the wing controls.

Importantly!!! The wings could begin with a gust of wind to turn. Make sure they that in the case they are not hurt.

A cause: Short-circuit in the system.

Elimination of errors: Please they have all lines examined by an expert personnel still times whether everything was attached correctly according to regulation.

13.2 Wind generator does not deliver an achievement

A cause: Little wind.

Elimination of errors: For wind wait. In order to go surely, measure with Anometer.

A cause: Defective electrical connection does not function.

Elimination of errors: Defective lines or devices replace.

A cause: Safety device burned through

Elimination of errors: Safety device replace with the correct safety device. Note!! No so-called temporary solution as safety device insert, since cable fires can develop.

13.3 Wind generator delivers to small achievement

A cause: Bad interwiring.

Elimination of errors: Thicker cable diameters use. Cables for length check. To long cables can lead to power loss.

14. Terms of the warranty

It was a good and correct decision that they decided to the purchase of a **ALGATEC** of wind generator. **ALGATEC** wind generators are constantly developed further and improved. If it should result however the fact that their

equipment exhibits one within the guarantee period defectively turns it please to their specialist dealer, with which they bought our wind energy plant. **ALGATEC** ensures that this equipment does not exhibit material and processing errors within the first 36 months starting from the time of the acquisition. If lack of the equipment should turn out during the guarantee period, which are based on material and/or processing errors, in accordance with the following conditions the company **ALGATEC** without computation of the work and material costs will repair the equipment or will exchange the equipment and/or defective parts. Guaranteeings are furnished only if the indemnity bond is duly filled out and is submitted the original invoice of the dealer.

The warranty does not take off:

- Regular inspections, maintenance and/or repair or exchange of parts causes by normal wear.
- Transport -, freight charges and risks, which are connected directly or indirectly with this equipment warranty.
- Damage, which arose by abuse and false use of the equipment, in particular with installation on a suitable mast. In the case of loss the proof is to be led by the buyer that the installation on a suitable mast was implemented (if no Point.of.com mast was used)
- Accidents, higher force or other one of ALGATEC not causes, in particular thunderbolt, which can be answered for, water, fire, disturbances of the public order

If the delivery article must be diminished in the context of the adhesion for lack due to past use and be developed after repair or replacement again, off and reconstruction are accomplished by the client without costs of **ALGATEC**.

Whether repair or new supply is attached or necessary, decides alone **ALGATEC**. Neither if repair nor new supply are possible, the client is only entitled to the resignation.

As far as compelling right plans nothing different one, the requirements of the buyer/operator are limited against Point.of.com to this warranty, and neither Point.of.com nor the ejector of the products take over beyond that an adhesion for direct or indirect damage out any express or one possibly conclusions permitting "practice" Warranty for this equipment.

Otherwise the "Generally terms of delivery apply to products and achievements of the Elektroindustrie".

Thus, now we wish them much wind and likewise much joy with its CYCLON WIND GENERATOR.

If they have improvement suggestions and further practice tips for this operating instructions, we would be very grateful, if they communicate us their ideas and practical experiences, so that they can be used in the future.

15. Konfirmitätserklärung

The signing company explains under own responsibility that the product:

Mobile wind generators

- CYCLON 1000
- CYCLON 3000
- CYCLON 5000

in agreement is with the standards and test confirmations, which are below specified:

EG-EMV- Guideline 89/336 EWG Drives ...61 000-4-5 EG- Low-voltage guideline 73/23 EWG 2/1995 A14/2000	EN 61 800-3, EMV- Norm Product standard for number of revolutions- changeable EN 50 081-2 ... 50 082-2, EN 61 000-4-2 EN 55014-1/1993 A2/1999 EN 61000-3-
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EG - Guideline electromagnetic compatibility 89/336EWG EN 55014-2/1997 EN 61000-3-3/1995 EN 5011-2-4/1999

EG- Machine guideline 98/37 EG