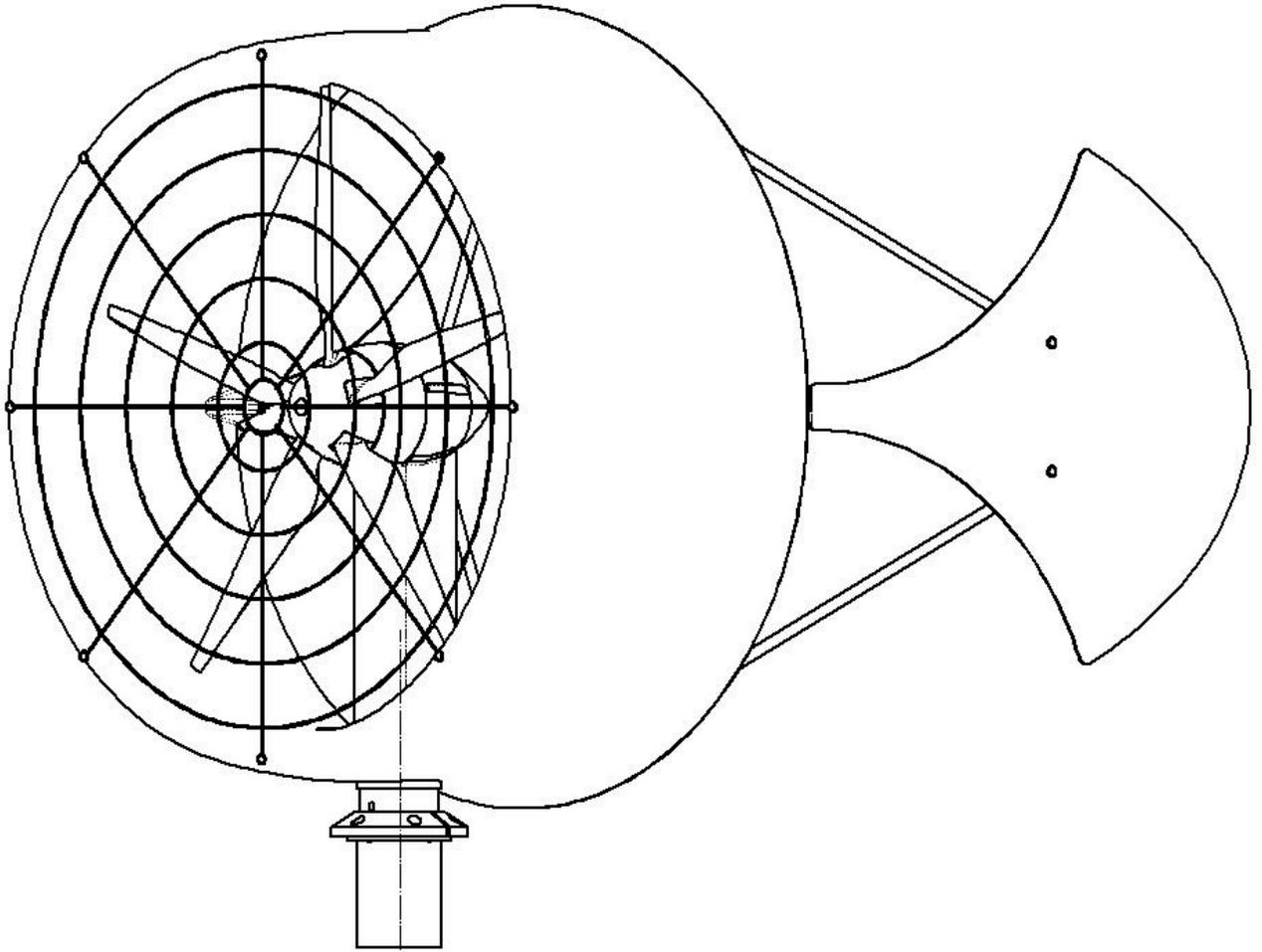


Installation Instructions



Wind power station

ENFLO 0071

Version from 01.04.2008

1. General Information

- 1.1 Safety guidelines
- 1.2 Hazards during the installation

2. Unpacking the ENFLO 0071 wind turbine

- 2.1 Checking the contents of the delivery
- 2.2 Hoisting the wind power station out of the shipping crate

3. Installation of the wind turbine

- 3.1 Assembling the wind vanes
- 3.2 Assembling the struts
- 3.3 Tightening the bolts/screws

4. Interfacing to the mast

- 4.1 Figures

5. Aligning the wind power station with the prevailing wind

1. General Information

Congratulations on purchasing an ENFLO 0071 wind power station (WPS) from WindTec Systems AG.

The ENFLO 0071 Wind Power Station (WPS) is constructed from corrosion-resistant components and is consequently almost maintenance-free and unaffected by daily and hourly influences of inclement weather.

Please be advised of all relevant legal requirements (including construction requirements) determined by your city or community before installing the wind turbine. WindTec Systems AG assumes no liability for the disposition and the operation of the WPS.

Important: Before beginning to assemble and install the wind turbine, it is absolutely necessary to carefully read through the complete manual and accompanying manuals and take note of all safety warnings. The safety and proper functioning of all equipment is highly dependent on correct and careful assembly and installation. Should you have any further questions after reading this manual, please contact your authorized dealer.

Please pay attention to the safety warnings in this manual!

1.1 Safety Guidelines

Please read this manual carefully before starting assembly and installation, or before conducting maintenance. This manual provides information that is critical to ensuring your safety during assembly, operation, and in case of trouble. If you have further questions, please don't hesitate to contact your dealer, a WindTec Systems AG service partner, or WindTec Systems AG itself.

All wind turbines are machines that operate both electrically and mechanically, and can result in multiple associated dangers during operation.

a.) Mechanical dangers

The rotor when in motion poses the most significant danger. The rotor blades possess sharp edges and can cause very serious injury even at a low rotation speed.

Important:

- Never touch the rotating blades of the turbine
- Never attempt to stop the rotation of the rotor by hand
- The WPS should only be operated in locations inaccessible to most persons

The turning wind turbine (turned by the wind vanes to align with the wind) poses a further danger. Make certain the turbine is installed with enough room for the necessary rotation and that this area is off-limits during operation of the station.

b.) Electrical dangers

If the generator runs in idle – that is, if the electrical connection to the load is broken – it can produce a very high no-load voltage, depending on wind speed.

Important:

- You must follow the safety guidelines according to VDE 0100 before beginning work on all electrical machines.
- Only authorized persons are allowed to work on electrical machines.
- Protect yourself from electrical shock: under no circumstances should you contact voltage-conducting, uninsulated, cable ends

Please be aware of suitable options for protection against lightning strike in the area of installation!

WPAs are considered very vulnerable to lightning strikes, especially when installed in an exposed location on a high mast.

Therefore, it is recommended to consult an authorized dealer to install lightning protection on the WPS and/or incorporate the WPS into an existing system of protection. Our authorized dealers are happy to advise you of possible options.

Neither WindTec Systems AG nor our authorized dealers assume any responsibility for damage incurred to the WPS by lightning strike.

1.2 Hazards during the installation

The following indications apply to installation and de-installation, as well as maintenance and all other work on the WPS:

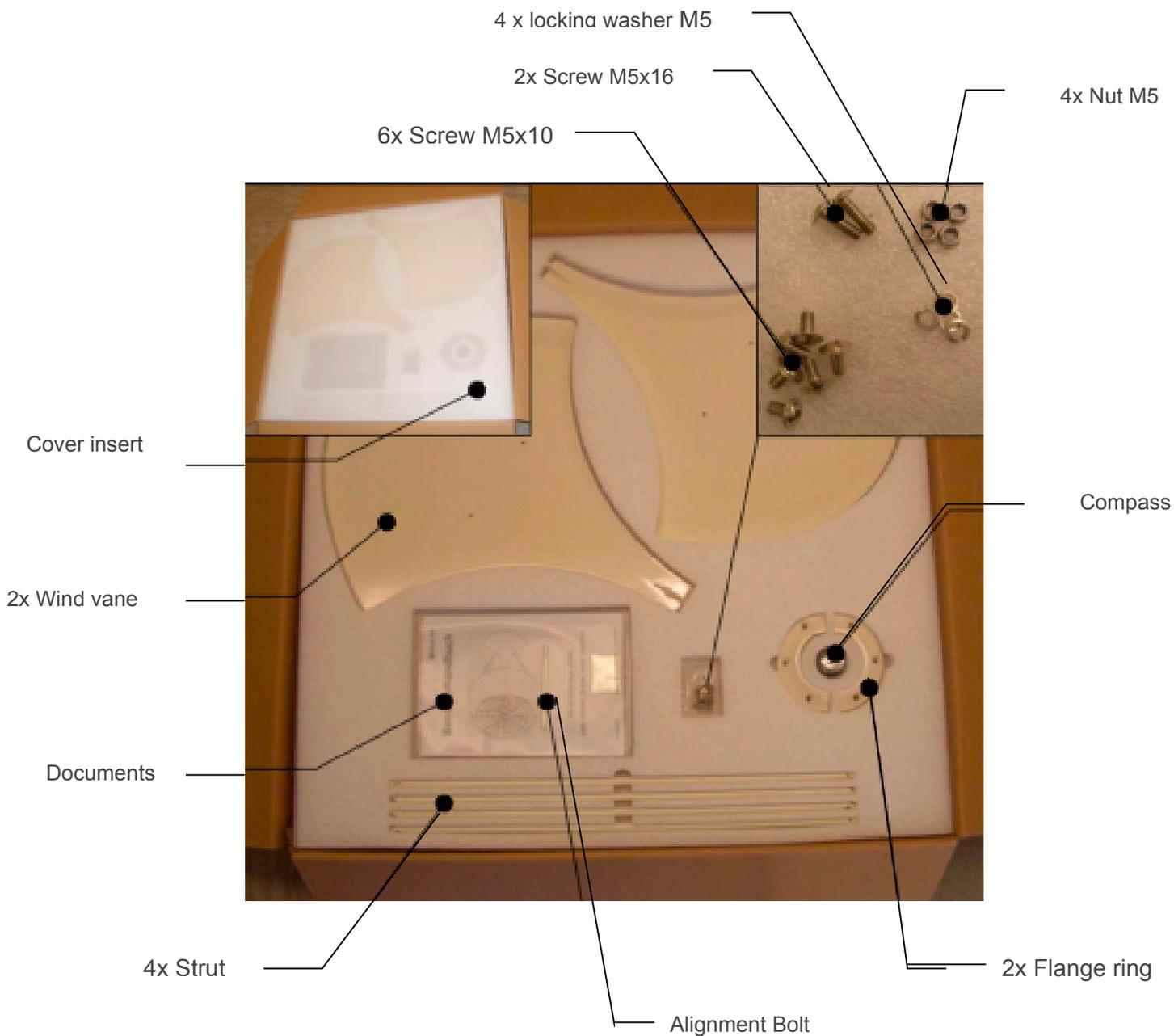
- The assembly and installation of the station require careful planning and execution to guarantee efficient operation.
- Safety must be the primary consideration when choosing the installation location, and installing and operating the station. Please take all necessary precautions for preventing personal injury or property damage.
- During the whole time of installation the presence of 2 persons is obligatory, so that at least one person can administer first aid in case of accident.
- It is important during set-up of the station to follow all relevant and applicable ordinances, regulations, and norms relating installation and safety.
- During any manner of work on the WPS, an unintentional start-up must be prevented.
- Only designated mast structures should be used (see section 4.2).
- As already mentioned, the rotating turbine blades present the greatest danger of the WPS. Although the blades are very well protected by the diffuser housing and the front protective grating, contact with the rotor blades can inflict severe injuries.

Important:

- Before installation, be aware of all warnings and indications for the assembly and installation of the ENFLO 0071 wind power station contained in this manual and the accompanying manuals and read them carefully.
- Only as such can a correct and trouble-free functioning of the safety and performance capabilities of the station be assured.
- Please contact your authorized dealer for WindTec Systems AG products with any questions.

2. Unpacking the turbine

2.1 Checking the contents of the delivery



2.2 Hoisting the WPS out of the shipping crate

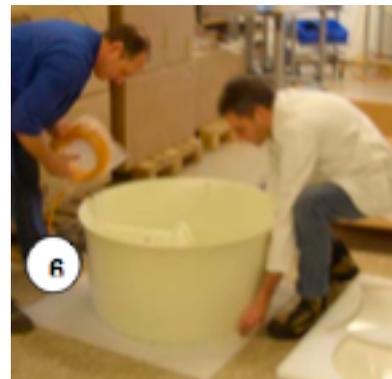
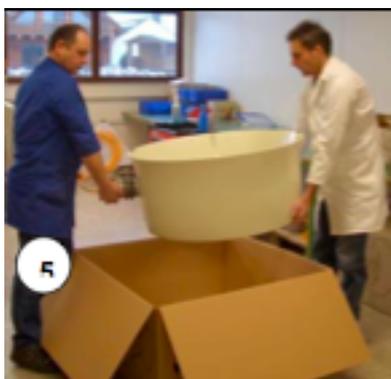
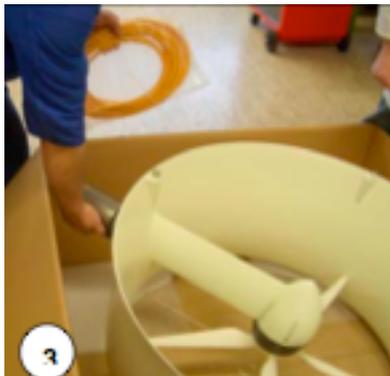
We recommend that you do not attempt to remove the turbine and its components by yourself, for the purpose of preventing accident or injury. In addition, any helpers with acute or potential back pains or back problems could be endangered, as the approximately 25kg weight of the WPS must be moved/shifted.

Do not use the cable, the rotor or the rotor blades, or the very thin edge of the upper end of the WPS housing when hoisting or moving the WPS. These components are not intended for this purpose and may be damaged through such misuse.

Please be aware that the mounting casing (picture 2) can be moved both axially and radially. This is entirely normal and absolutely necessary for proper functioning of the turbine. For this reason, and to avoid that your fingers or hand become lodged in the casing, grip the casing with both hands by the lower third. The following explanation of the removal of the WPS from the shipping crate is only a recommendation of the manufacturer.

It is advised to remove the edge protectors before taking the turbine out of the shipping crate.

Mounting Casing



3. Installation of the wind turbine

3.1 Assembling the wind vanes

For the installation of the wind vanes, you will need a torque wrench with an Allen wrench attachment (size 4), as well as a crescent wrench or a socket wrench attachment (size 8). We do not recommend that you assemble the wind vanes and the struts alone.

It is not important which wind vane is assembled first. Both vanes are identical in their shape and fittings, but can only be installed in one orientation. Grip one of the wind vanes so that the rear, higher part of the vane is in your right hand and you can read the imprint from left to right. This is the right wind vane.

Now mount this vane onto the turbine as indicated in the images below, followed by the left vane using the same procedure.

Bracket on the housing of the WPS

It is necessary to first tighten the nuts using only your fingers, so as to leave some play for the subsequent mounting of the struts. The screws can then be tightened to the required torque following assembly (see 3.3).



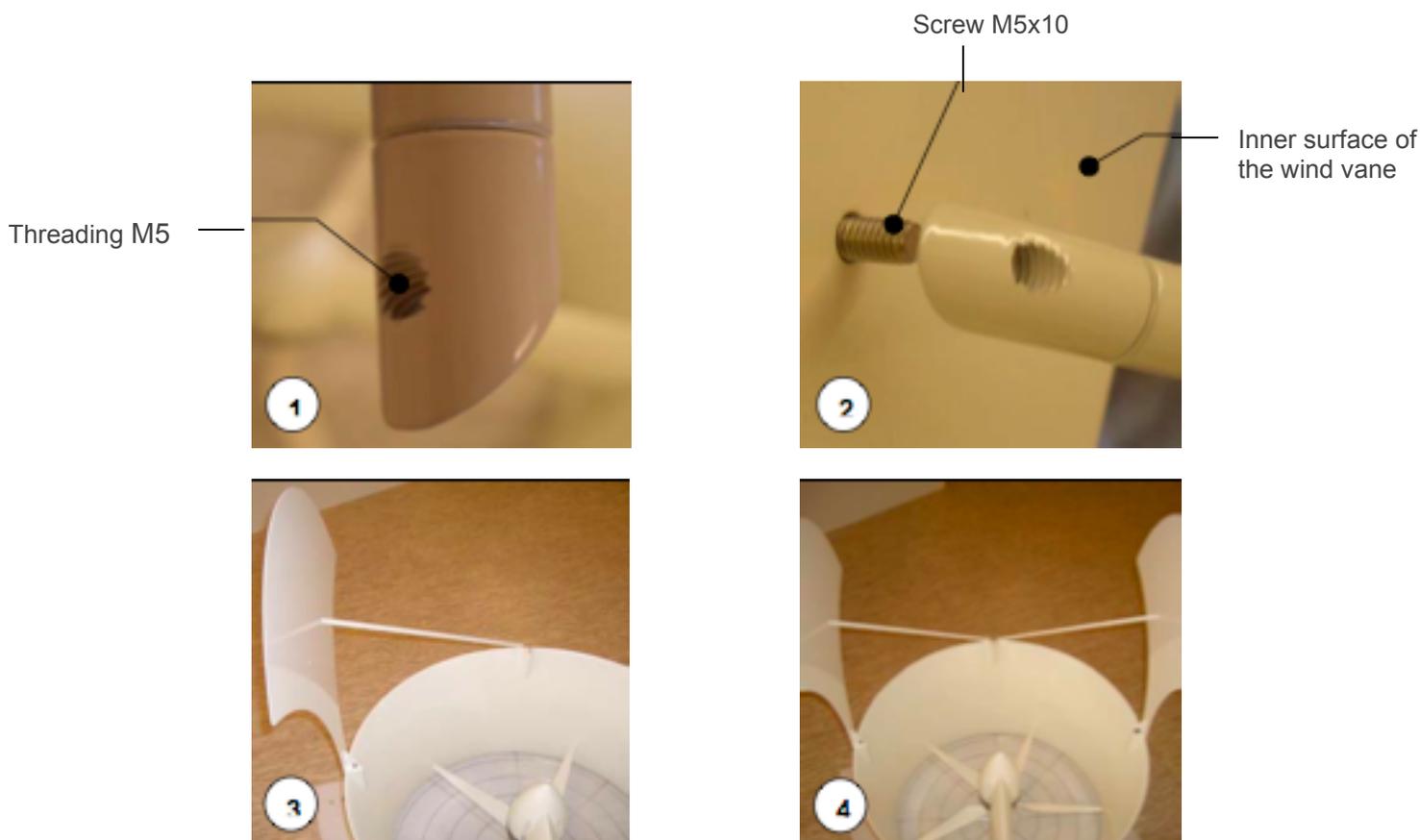
Make certain that the wind vanes, during and after installation, only lay on the turbine housing with their own weight. Turning the wind vanes beyond the rotation limit stop on the housing, regardless of which direction, will inevitably lead to a break or damage to the bracket attached to the housing of the WPS.

3.2 Assembling the struts

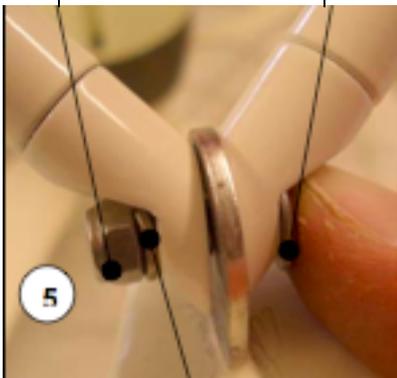
It is also not important which strut is mounted first. It is only necessary to notice that the ends of each strut are rotatable, and constructed differently. One end has an M5 threading, while the other end has a counter sunk drill hole. The end with the threading is mounted on the wind vane. We recommend that you first attach both struts to the brackets on the turbine housing, so that the wind vanes can then be fixed and anchored to the struts. Only tighten the screws for installation of the struts as well as the wind vanes by hand.

This allows the necessary orientation of the struts when screwed to the bracket on the turbine housing. The screws can then be tightened to the appropriate torque at the end of installation (see 3.3).

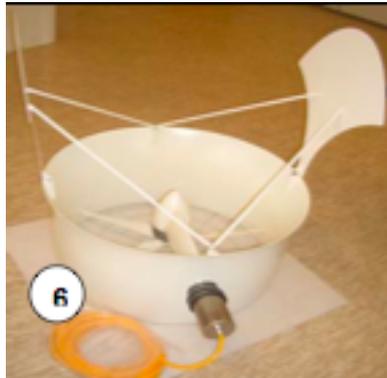
Install the struts as indicated in the images below.



Nut M5 Screw M5x16



Locking washer M5



3.3 Tightening the bolts/screws

Following installation of the struts, and using the torque wrench, tighten all 6 screws to a torque of 5Nm.

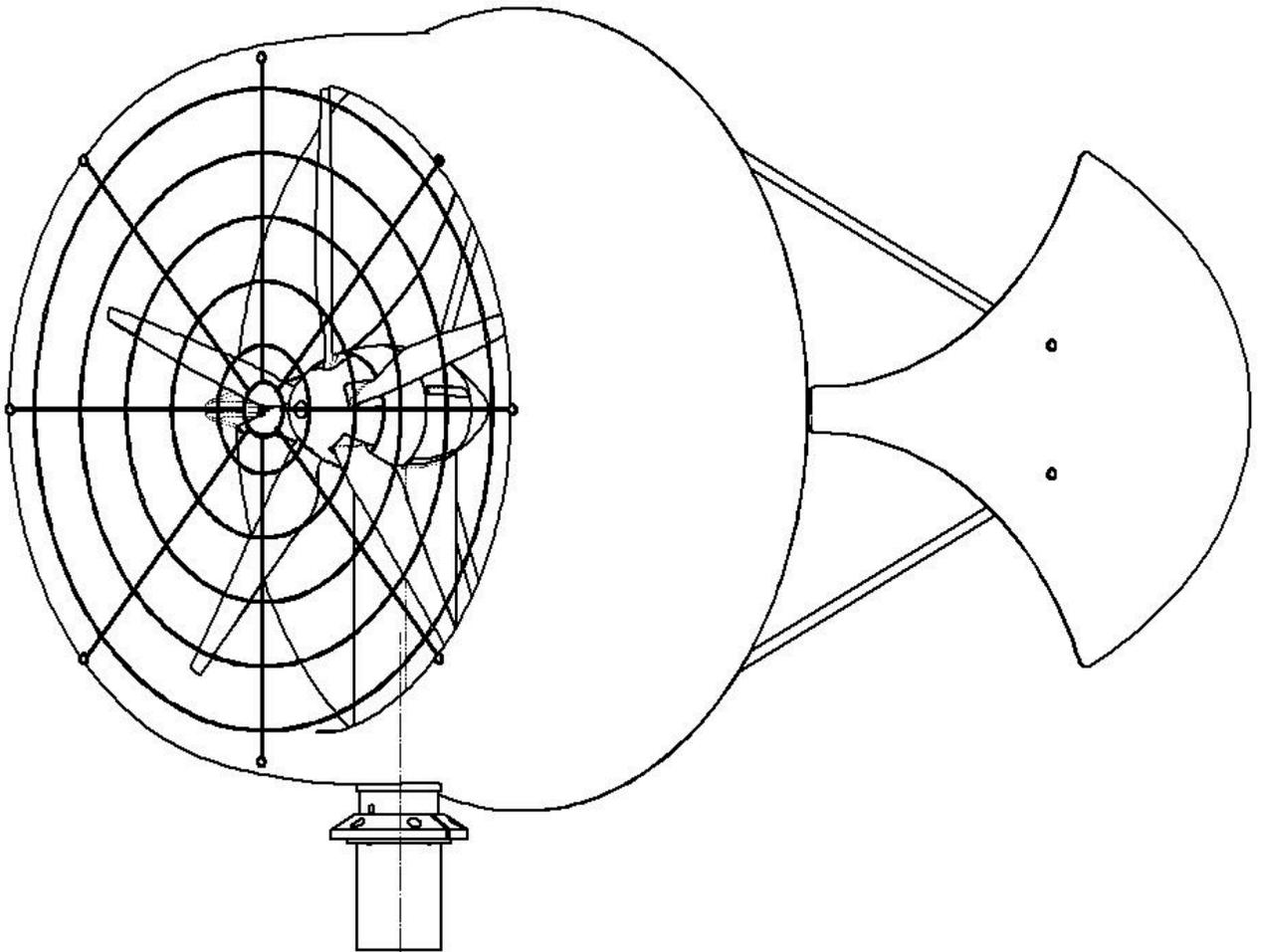
Congratulations – Assembly Complete

We expressly state that the WPS, assembled with the wind vanes, must not be transported using the wind vanes and/or struts. Only use the housing, in the area of the protective grating, for transporting the WPS. Only grip the WPS carefully through the grating, because despite very careful monitoring, some burrs may form here. To avoid getting any fingers stuck, we advise you to move your fingers slowly and carefully through the protective grating.

We expressly state that the turbine must not be used or loaded during mounting of the WPS to the mast. The force necessary to set up the mast and to mount the turbine on the mast must only be applied to the mast, and not to the turbine.

Furthermore, we expressly state that the insulation (tubing) of the conductor cable must only be removed when properly and safely wiring (see operation manual) to the appliance and/or regulator. Uncovered or unwired leads may pose a serious electrocution danger on account of the current generated by the freely rotating turbine.

Aligning the turbine in the prevailing wind direction



Windkraftanlage (WKA)

ENFLO 0071

Version from 01.04.2008

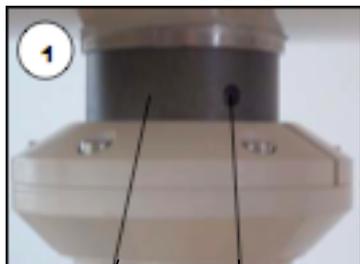
The wind power station (WPS) must be aligned with the prevailing wind (the main wind direction), because the WPS is equipped with a rotation limit stop. The limit stop prevents twisting of the power supply cable in the WPS. However, the WPS is designed to freely rotate 360 degrees. You can find out the direction of the prevailing wind in your location by consulting either an authorized dealer or a local weather service.

In order to align the wind power station with the prevailing wind, the WPS must be mounted on the mast or mounting system and the mast or mounting system must be fully raised/set-up. For the alignment of the WPS, please use the compass and alignment bolt included in the packaging materials.

Be advised that the WPS can only be configured when already mounted on the mast system. Make certain that all precautions have been taken and all required tools are available and functioning properly. The safety of all persons present must be given first priority. Only set-up the WPS on a windless days. Make certain that the rotor is not able to start on its own.

The alignment of the WPS is performed by turning the bearing case (see diagram 1) to the previously determined wind direction. It is necessary to loosen the bolts of the flange ring in order to turn the bearing case. Follow these steps:

- 1) Unscrew all 6 bolts in the flange ring each 1 full revolution, so that the bolts still secure the WPS but do not tighten the WPS to the mast.
- 2) Insert the alignment bolt into the pre-drilled hole in the bearing case by screwing the bolt in a clockwise direction.
- 3) Turn the bearing case to the direction of the prevailing wind by pushing the alignment bolt (diagrams 1 and 2). The alignment bolt should be used to turn the WPS until the bolt faces in the direction of the prevailing wind.



Drill hole for the alignment bolt

Flange ring



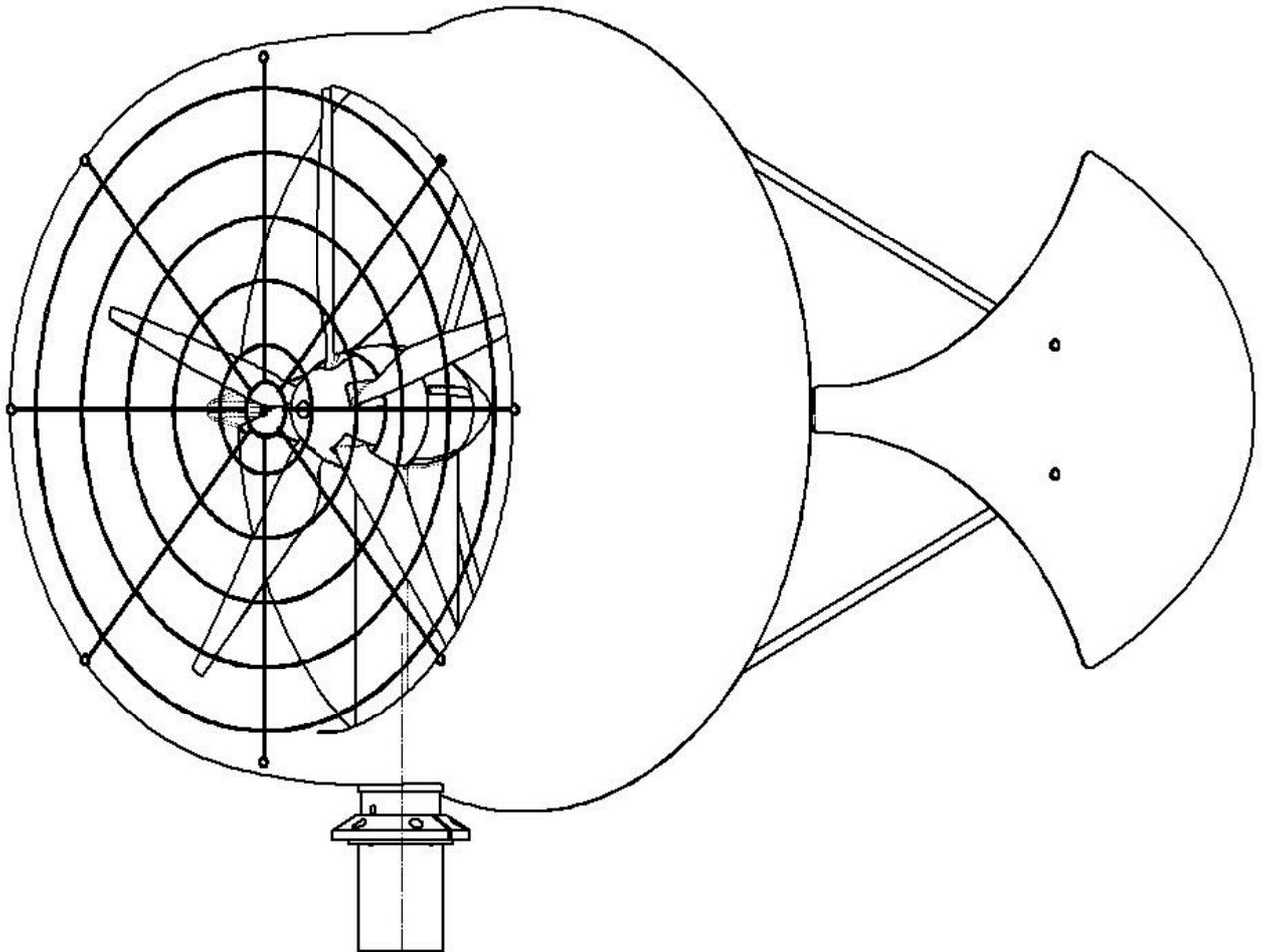
Alignment bolt

In the example in Diagram 3, the prevailing wind comes from the east. In the case that the wind comes mainly from the west, the WPS would need to be turned 180 degrees so that the alignment bolt faces in the opposite direction. Please consult your dealer with any further questions.



- 4) Remove the alignment bolt
- 5) Re-tighten the screws of the flange ring to a torque of 25 Nm (using screws with a strength of 8.8)

User manual



Wind power station (WPS)

ENFLO 0071

Version from: 13.03.2008

1. General guidelines

- 1.1 Safety guidelines
- 1.2 Hazards during the installation
- 1.3 Labeling

2. Description of the wind power station (WPS) ENFLO 0071

- 2.1 Dimensions and technical specifications

3. Installation of the wind power station (WPS) ENFLO 0071

- 2.2 Delivery Contents
- 2.3 Optional accessories

3. Position and mounting of the wind power station

- 3.1 Basics considerations about wind
- 3.2 Rooftop installation or tower installation
- 3.3 Aligning the turbine in the prevailing wind direction

4. Electrical components and connection diagram

- 4.1 Principle schematic
- 4.2 Configuration of cables

5. Start up

6. Maintenance

- 6.1 Bolt positions
- 6.2 Positions of bearings
- 6.3 Rotation limit stop
- 6.4 Housing
- 6.5 Electronic system

7. + 9. Trouble shooting

- 9.1-wind generator does not run
- 9.2-wind generator does not deliver power
- 9.3-wind generator delivers insufficient power
- 9.4 batteries does not fully charge

10. Servicing / spare parts

11. Declaration of conformity

1. General Information

Congratulations on purchasing an ENFLO 0071 wind power station (WPS) from WindTec Systems AG.

The ENFLO 0071 Wind Power Station (WPS) is constructed from corrosion-resistant components and is consequently almost maintenance-free and unaffected by daily and hourly influences of inclement weather.

Please be advised of all relevant legal requirements (including construction requirements) determined by your city or community before installing the wind turbine. WindTec Systems AG assumes no liability for the disposition and the operation of the WPS.

Important: Before beginning to assemble and install the wind turbine, it is absolutely necessary to carefully read through the complete manual and accompanying manuals and take note of all safety warnings. The safety and proper functioning of all equipment is highly dependent on correct and careful assembly and installation. Should you have any further questions after reading this manual, please contact your authorized dealer.

Please pay attention to the safety warnings in this manual!

1.1 Safety Guidelines

Please read this manual carefully before starting assembly and installation, or before conducting maintenance. This manual provides information that is critical to ensuring your safety during assembly, operation, and in case of trouble. If you have further questions, please don't hesitate to contact your dealer, a WindTec Systems AG service partner, or WindTec Systems AG itself.

All wind turbines are machines that operate both electrically and mechanically, and can result in multiple associated dangers during operation.

a.) Mechanical dangers

The rotor when in motion poses the most significant danger. The rotor blades possess sharp edges and can cause very serious injury even at a low rotation speed.

Important:

- Never touch the rotating blades of the turbine
- Never attempt to stop the rotation of the rotor by hand
- The WPS should only be operated in locations inaccessible to most persons

The turning wind turbine (turned by the wind vanes to align with the wind) poses a further danger. Make certain the turbine is installed with enough room for the necessary rotation and that this area is off-limits during operation of the station.

b.) Electrical dangers

If the generator runs in idle – that is, if the electrical connection to the load is broken – it can produce a very high no-load voltage, depending on wind speed.

Important:

- You must follow the safety guidelines according to VDE 0100 before beginning work on all electrical machines.
- Only authorized persons are allowed to work on electrical machines.
- Protect yourself from electrical shock: under no circumstances should you contact voltage-conducting, uninsulated, cable ends

Please be aware of suitable options for protection against lightning strike in the area of installation!

WPAs are considered very vulnerable to lightning strikes, especially when installed in an exposed location on a high mast.

Therefore, it is recommended to consult an authorized dealer to install lightning protection on the WPS and/or incorporate the WPS into an existing system of protection. Our authorized dealers are happy to advise you of possible options.

Neither WindTec Systems AG nor our authorized dealers assume any responsibility for damage incurred to the WPS by lightning strike.

1.2 Hazards during the installation

The following indications apply to installation and de-installation, as well as maintenance and all other work on the WPS:

- The assembly and installation of the station require careful planning and execution to guarantee efficient operation.
- Safety must be the primary consideration when choosing the installation location, and installing and operating the station. Please take all necessary precautions for preventing personal injury or property damage.
- During the whole time of installation the presence of 2 persons is obligatory, so that at least one person can administer first aid in case of accident.
- It is important during set-up of the station to follow all relevant and applicable ordinances, regulations, and norms relating installation and safety.
- During any manner of work on the WPS, an unintentional start-up must be prevented.
- Only designated mast structures should be used (see section 4.2).
- As already mentioned, the rotating turbine blades present the greatest danger of the WPS. Although the blades are very well protected by the diffuser housing and the front protective grating, contact with the rotor blades can inflict severe injuries.

Important:

- Before installation, be aware of all warnings and indications for the assembly and installation of the ENFLO 0071 wind power station contained in this manual and the accompanying manuals and read them carefully.
- Only as such can a correct and trouble-free functioning of the safety and performance capabilities of the station be assured.
- Please contact your authorized dealer for WindTec Systems AG products with any questions.

1.3 Labeling

This manual applies to the ENFLO 0071.

Manufacturer: **WindTec Systems AG**
Löwenstrasse 16
CH-8280, Kreuzlingen
Switzerland
Tel. +41 (0) 71 677 90 50
Fax. +41 (0) 71 677 90 55
Internet: www.enflo-windtec.ch
E-Mail: info@enflo-windtec.ch

The serial number and the nominal voltage for the generator are stamped on the specification plate below the turbine (on the mount casing). The specifications are also included in the packaging of the delivery.

Type:	ENFLO 0071
Nominal Voltage:	230 VDC
Nominal Power:	500 Watt
Serien – Nr.:	0xxxxxx
Baujahr:	xxxx
WindTec Systems AG Löwenstrasse 16 CH – 8280 Kreuzlingen	

Figure 1

Advice: The inverter included in the accessories has its own serial number.

2. Description of the wind power station (WPS) ENFLO 0071

The **ENFLO 0071** wind power station is designed as a small wind power station with a diffuser housing enclosing the rotor blades, and with a nominal voltage of 0.5 kW. As with all wind turbines, the basic functioning principle is the generation of electricity from the conversion of kinetic power in moving air currents into mechanical energy in the rotating turbine blades – and finally into electrical energy.

The diffuser housing is constructed as a ring-shaped aerofoil, which accelerates the air current passing through the turbine and results in a yield of **2.5 times** more energy compared with conventional, free-blade systems. The efficiency of the turbine is further increased by the very minimal clearance between the rotor blade tips and the diffuser.

Further advantages of the diffuser design are:

- Minimization of noise production
- No stroboscope effect
- Protection against falling ice
- No hazards for birds

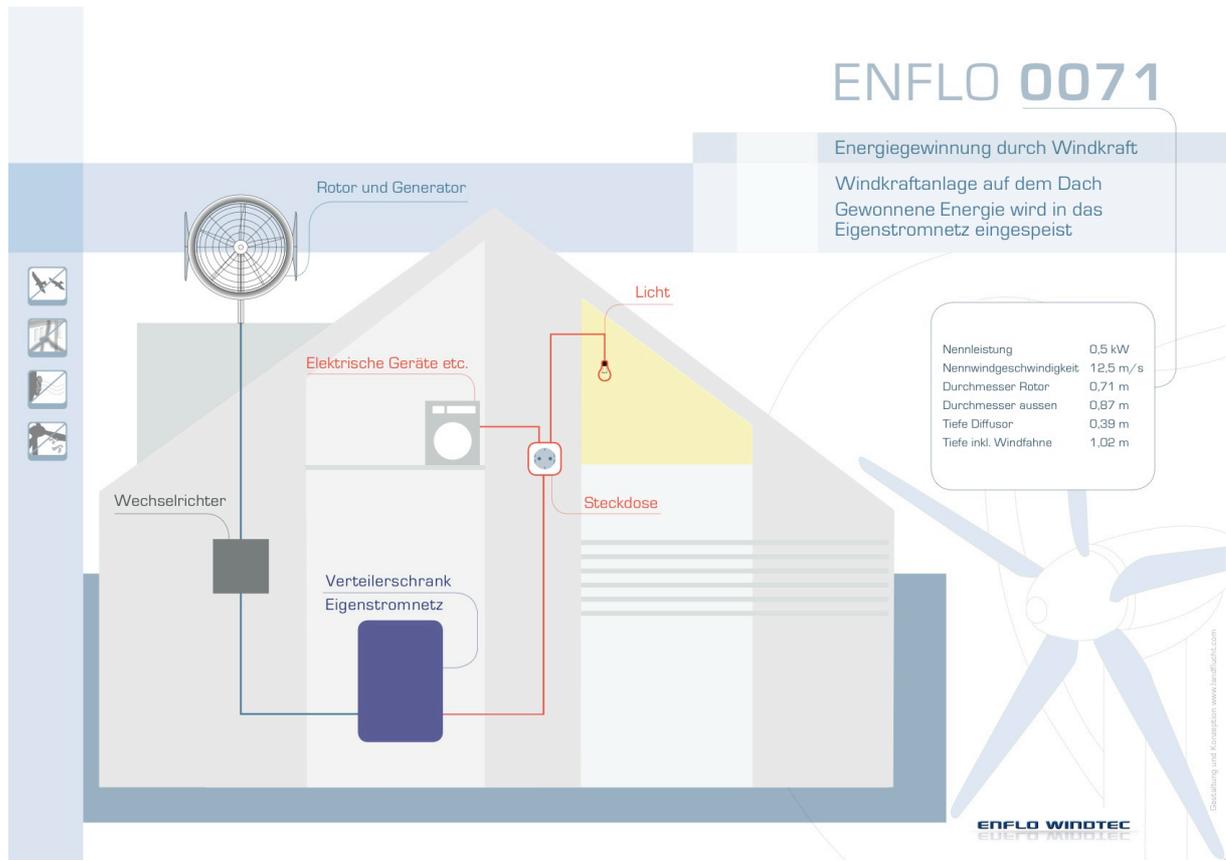
The design of the ENFLO 0071 intentionally avoids the use of a gear assembly or slip ring contacts for the transfer of power. This design increases the efficiency and reduces the maintenance requirements of the WPS.

The ENFLO 0071 wind turbine starts working at 2.5 m/sec, and at 12.5 m/sec. wind speed the system reaches the nominal power of approximately 500 watts.

The overall arrangement of the ENFLO 0071 comprises the components diffuser, rotor, damping/insulation, bearings, wind airfoil, and electrical system. The individual components are made primarily of corrosion-resistant metals and plastics. Two wind vanes allow the turbine to passively align with the direction of the wind. As already mentioned, the housing of the rotor is built as a diffuser which accelerates the air current passing through the rotor blades and thereby increases the energy yield. The rotor comprises a rotor hub, five rotor blades, and a metallic reinforcing plate. The rotor diameter is 710mm with a functional surface of 0.40m². The generator shaft connected to the rotor hub and rotor blades leads directly to the generator, which is designed as a 3-phase, permanently excited synchronous generator, which reaches a nominal power output of 500 watts at a nominal rotation frequency of 1200 rpm. The power limiter works via a stall regulator (current break) and a chopper regulator (braking resistor).

The station is particularly suited for use in residential areas, mobile homes, vacation homes, etc.

Network power inverter/ grid supply:



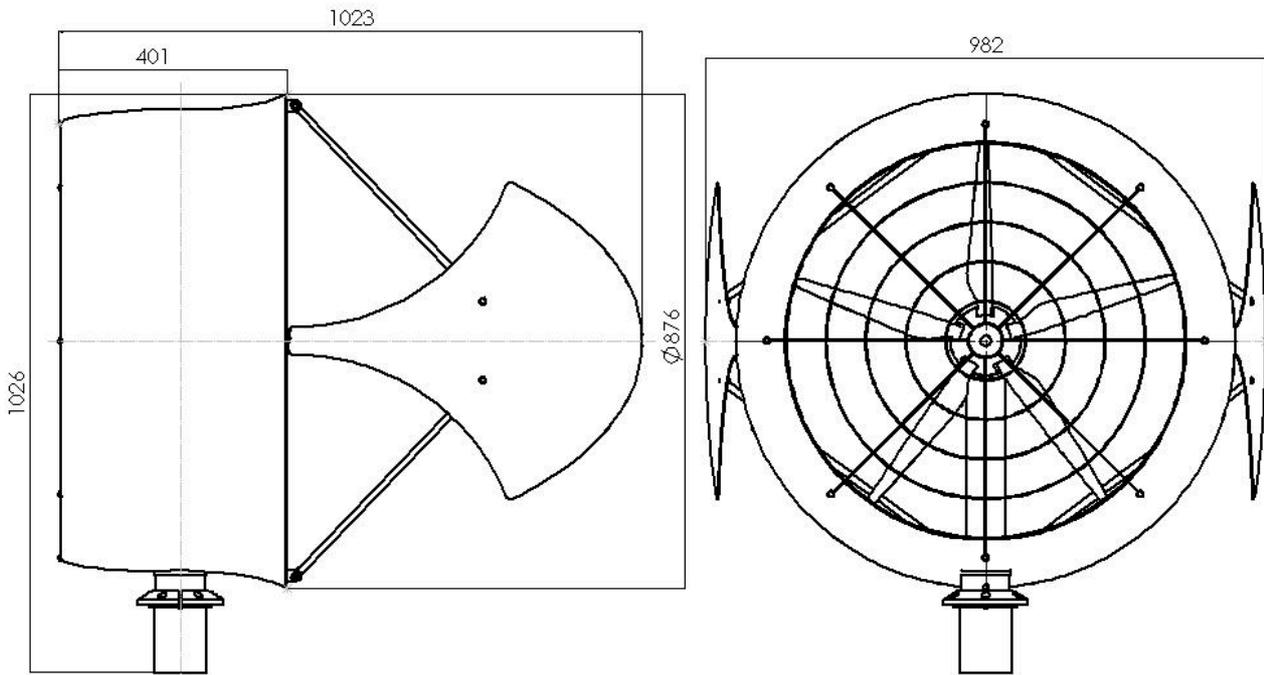
The inverter must be connected to the existing housing supply system in order to receive electrical power from the generator. The inverter is part of the WPS. As such, the electrical current will indirectly feed to the housing grid via the inverter without intermediate storage.

The electrical current generated by the WPS will be adjusted to the existing housing power supply system.

Important:

Please read through the enclosed manual for the inverter as well as the corresponding safety warnings.

2.1 Dimensions and Technical Specifications



Power

Nominal Power	0.5 kW
Nominal wind velocity	12.5 m/s
Start-up wind speed, minimum	2.5 m/s
Operation break wind speed	25 m/s
Maximum operation wind speed	55 m/s

Rotor

Diameter	0.71 m
Effective surface	0.40 m ²
Blades, number of	5
Nominal speed	1200 rpm
Material	PA / GFK

Diffuser

Outside diameter	0.87 m
Depth (diffuser)	0.39 m
Depth (incl. wind airfoil)	1.02 m
Material	PU / foam /Aluminium

Wind direction tracker

Passive follow-up	self-adjusting with wind airfoil
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Gearbox

Type	gearless
------	----------

Generator

Generator	disc synchronous generator, permanently energized, high numbers of poles
Nominal speed	1200 rpm
Nominal voltage	130V, AC 3-phase
Degree of protection	IP 55
Power cabling	generator to converter via cable

Converter

Power system	acc. VDE 126.1.1
Output voltage	230 V
Frequency	50 Hz
conformity	according to EN 50178
Net filter device	network filter + network throttling
Degree of protection	IP 33
Type	processor controlled power supply
Output regulator	optimal adjustment to the generator
Safety shutdown	via free programmable RISC processor
Emergency cut off	Stall regulation Chopper regulation (Break-resistor)

Total weight

Without converter and mast; including packaging	about 30 kg
---	-------------

Specific features

The rotor is housed in a diffuser, resulting in a power increase of more than 2.5 times, in comparison to systems equipped with free running wind turbines.

3. Installation of the wind power station

With your purchase of the ENFLO 0071, you have received a high-quality product, which will provide you with years of valuable service. The assembly of the wind airfoils and the struts can be performed using the attached assembly instructions. As already mentioned, assembly and installation of the station requires careful planning and execution to ensure efficient operation.

3.1 Contents of the delivery / packing list

The wind turbine is mostly pre-assembled at the factory to allow a simple completion upon delivery. The main components are included in the delivery are:

1	Pcs.	Wind turbine with vibration damper (elastic-collar, pre-assembled)	
1	Pcs.	Flange ring	
1	Pcs.	Wind vane	
1	Pcs.	Struts (for the wind vanes)	
2	Pcs.	Lens-head screw with flange	M5 x 16
6	Pcs.	Lens-head screw with flange	M5 x 10
4	Pcs.	Self-locking nut	DIN 934 – M5
4	Pcs.	Spring ring	DIN 128 – M5
1	Pcs.	Aligning pin	
1	Pcs.	Compass	
1	Pcs.	User manual, assembly instruction	
1	Pcs.	Packing	

Required tools, which are not supplied:

1	Pcs.	Allen wrench	Size 3
1	Pcs.	Crescent wrench	Size 8
1	Pcs.	Torque wrench (from 5 Nm up to 25 Nm)	

Please check your order for completeness in order to be sure that all components were included in the packaging before beginning assembly, and that no components were damaged during shipping. Any damages incurred during shipping or any missing components should be reported immediately to the shipping company and/or dealer/manufacturer.

3.2 Optional accessories

Aluminum mast – Rooftop Installation set
 Aluminum mast – Wall installation set
 Aluminum mast – Ground/ freestanding installation set

Power regulator using a power inverter for network supply (230V, 50 Hz).

4. Position and mounting of the wind power station

Safety must be the primary consideration when planning the installation location, installing the station, and operating the turbine. Please observe all safety warnings and indications included in the first section of this manual very closely.

The electrical output of a wind power station increases as the third-power (³) of an increase in wind velocity. Where and how to mount a wind turbine is critical. The consequences of poor location can be unsafe operation, poor performance, and low power output – or all three.

For these reasons, it is important that the owner of the wind power station determines wind velocity for the installation location, in order to be able to identify the optimal location as well as determine the energy yield that can be expected.

4.1 Basics considerations about wind

The power available from wind is related to the turbine speed by a power of 3 (³). In practice, this means that 20 % increases in wind strength will almost double the power available. It is therefore very important to maximize the incident wind on the turbine blades. Wind speed increases with height and even small increases in turbine height can produce significant improvements in performance.

Some local or regional governments have modeled annual average wind speeds for areas in their jurisdiction. However, a large number of factors influence the actual effective strength of the wind at any particular site, including seasonal variations, low-altitude terrain, trees, and buildings. In altitudes lower than about 100m, air currents are strongly influenced by the characteristics, barriers, and roughness of the ground surface.

Because the actual performance of the wind turbine changes exponentially with wind speed, the annual average wind speed cannot be utilized to predict the potential power output of a specific location, and two locations with identical average wind speeds may result in largely different energy yields. Wind strength varies with the season, from day to day, and even with time of day. As such, a location with many peaks of high-speed winds will likely perform better than a location with consistent moderate winds over time.

The WPS should be installed in a location where the wind – at least from the main wind direction – flows unobstructed and without turbulence. As a **general rule** for allowing such 'planar' current, barriers to wind flow should be located 20-times farther away from the front of the turbine than their height, and barriers behind the turbine should be located 5 times farther away from the turbine than their height. Turbulences caused by buildings, trees, and shrubs, etc. reduce the yield of the WPS considerably and shorten the service life of the station.

Most importantly: the higher and farther away from disruptive objects (trees, shrubs, rooftops, etc.) the turbine is installed, the better.

Near to the ground surface, the roughness of the terrain significantly affects the speed of the wind. In a location with high roughness at the ground level (residential areas, allotments, open forest, hedges, etc.), it is necessary to install the WPS as high as possible.

In locations with a relatively smooth ground surface (e.g., open sea, broad meadows or rangeland, or smooth mountain clearings), the station can be installed in a lower position. An exception to the rule is location of the turbine to take advantage of so-called 'tunnel currents' that flow at an increased speed between two high barriers, such as mountain peaks, high-rise buildings, etc.

Please contact our authorized dealers with any questions concerning wind speeds and expected yearly energy yield.

4.2 Rooftop installation or tower installation

Regardless of whether the wind power station is installed on a freestanding mast, on a rooftop, or on the side of a house, consideration of safety assumes priority. Every moving part poses a safety risk.

Please observe the warnings and indications in the first section of this manual when setting-up the wind power station.

Only mast structures should be utilized which are capable of withstanding the loads created by the wind generator (both the wind load and the weight of the WPS) at all potential wind velocities.

The WindTec Systems mast systems are specially developed for the wind power station and meet all necessary requirements with respect to stability.

We assume no responsibility for all other mast systems apart from recommended WindTec Systems mast systems.

The location of the WPS should be determined with consideration of the statics and possibly under consultation from a skilled technician.

The WPS must be mounted exactly perpendicularly on the tower, and the tower must be built perfectly perpendicular to the level. A WPS not so arranged may deliver compromised performance because the station cannot appropriately orient itself in the wind.

We expressly indicate that the WPS must not be subjected to any loads during the installation or setup of the mast. The owner must be certain that the force necessary to construct and install the mast are only applied to the mast, and the WPS is not subjected to pressure or pulling forces.

Please be advised that the installation of the WPS requires that approx. 30 kg be moved and hoisted to the appropriate height. Please utilize technically sound tools and equipment, and ensure both an effective safeguard for the station and also for workers, passers-by, and surrounding property.

WindTec Systems AG assumes no responsibility for damage caused by negligence of these warnings.

4.3 Setting up the wind turbine in the prevailing wind on a standing mast, rooftop, etc.

Because your WPS is equipped with a rotation limit stop, this limit stop must be adjusted during installation according to the prevailing wind determined for the installation location. The rotation limit stop serves to limit the rotation of the turbine and consequently avoid twisting the conductor cables. However, despite the rotation limit stop, the station can rotate 360° about its axis. The WPS should be installed in the final location utilizing the installation manual enclosed with the delivery packaging.

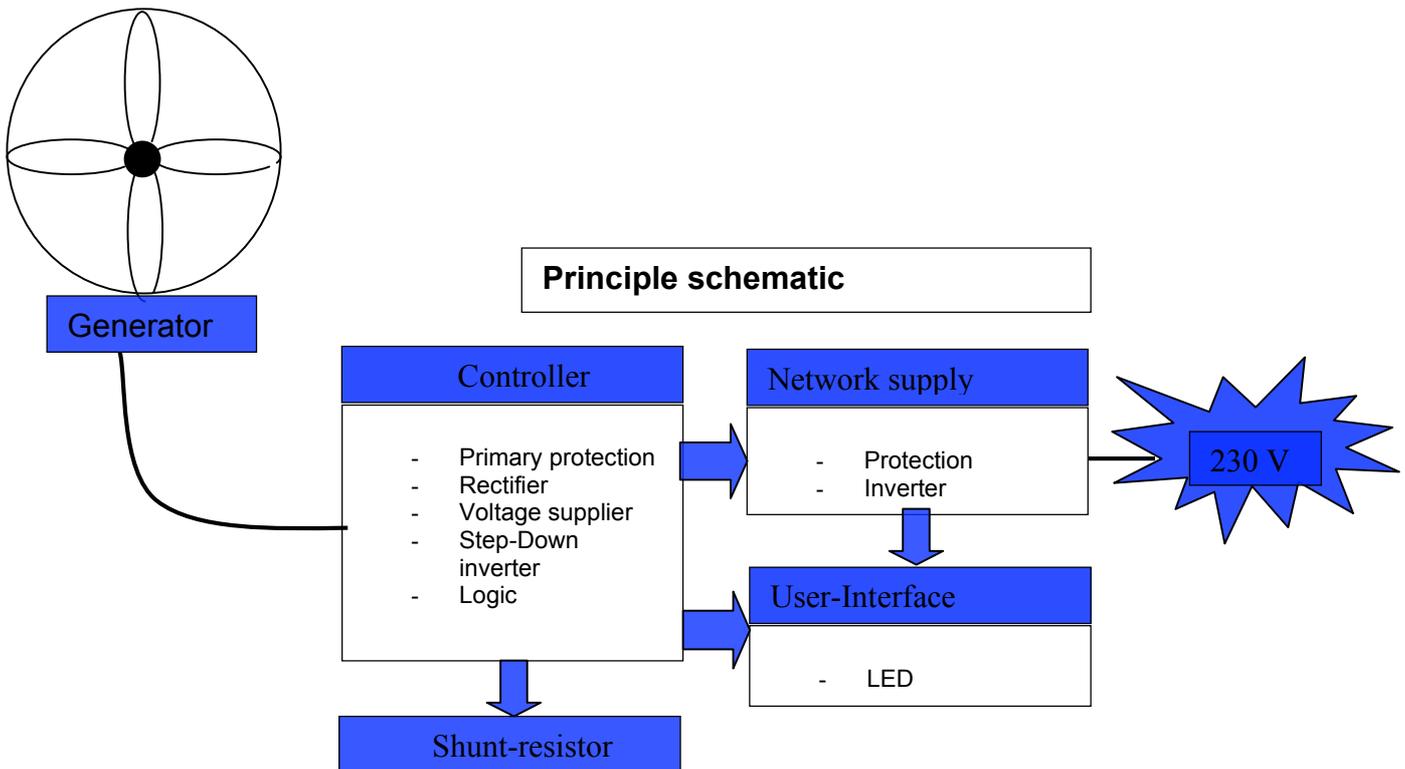
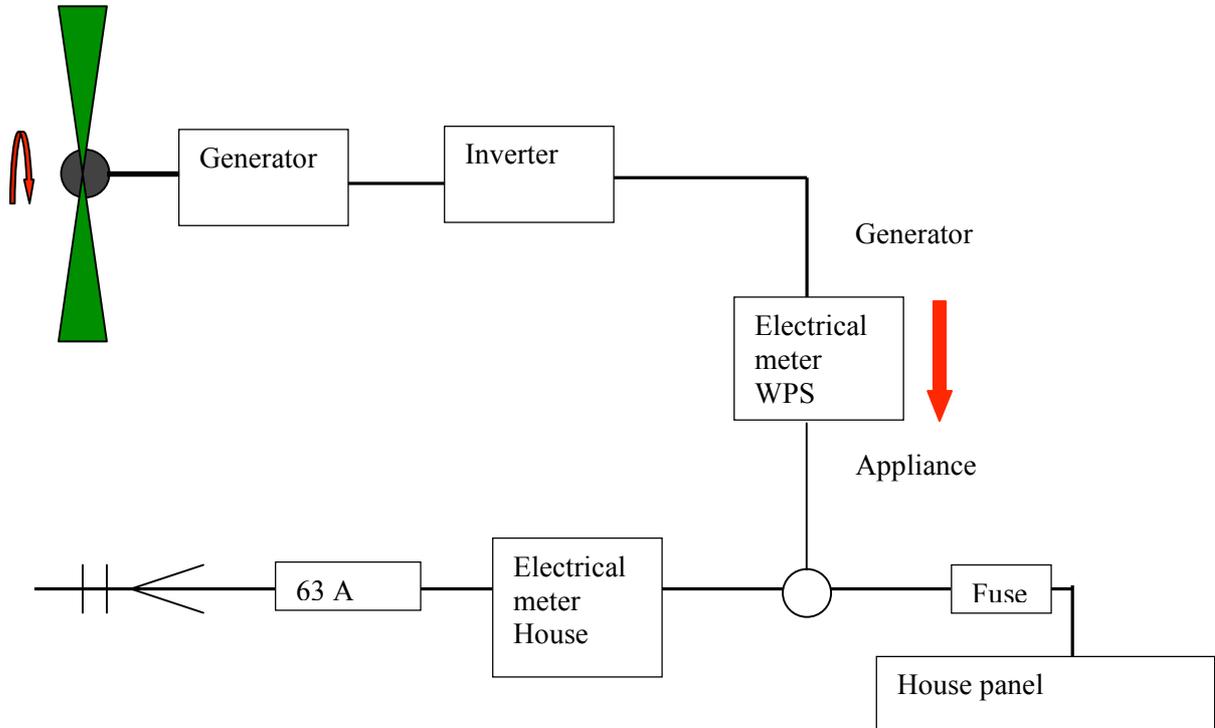
5 Electrical components and connection diagram

All commonly recognized rules and norms for electronic appliance installation as well as accident-prevention regulations for low-voltage installation should be observed during installation.

Please ensure that all installation, maintenance, and repair work on the electrical components of the station is carried out only by the authorized dealer.

- **Attention: connection to the inverter/power grid should always be carried out before connecting the wind generator. Only as such can a correct and trouble-free functioning be assured.**
- **Attention: our power inverter displays its recognition of the power grid only after start-up of the wind turbine. As such, no energy is necessary for the inverter during standby of the wind turbine.**

5.1 Principle schematic (Grid-connected-system)



5.2 Configuration of the cables



Yellow-Green	= PE = Ground
Black	= U
Gray	= V
Brown	= W

6. Operation of the wind power station

Do not operate the WPS without electrical load, e.g. with the generator wires unconnected or with the control unit unconnected.

7. Maintenance

Your WPS is designed for long-term service, however we recommend that you perform some simple, regular maintenance checkups to ensure necessary operation safety. Before you begin with the checkup, be sure that you observe all safety advisories printed above.

We recommend that you perform the following checkup every 12 months.

7.1 Bolt and screw connections

Check to make sure that all bolts/screw, which are accessible externally, are tightly fastened and/or tightened to the proper torque. Especially important are the bolt connections of the wind vanes and the WPS with the mast.

7.2 Bearings

The bearings for the wind alignment components and the generator are lubricated with long-term lubricant. Check to make sure these bearings can move freely and smoothly.

7.3 Rotation limit stop

Your WPS is equipped with a rotation limit stop, which prevents twisting of the generator cable. However, the rotation range of the WPS is larger than 360°. Check the rotation range of the wind alignment components by turning the WPS until you feel resistance. The WPS is now turned fully to contact the limit stop. Now turn the WPS in the same direction with slightly increased force, about 10° further than before until it is no longer possible to turn the WPS. This way you activate the damper of the limit stop. Upon release of the turning force, the turbine should rotate by itself back in the opposite direction. Finally, check the same capability in the opposite direction.

7.4 Housing

All housing components as well as the wind vanes are built from corrosion-resistance materials.

7.5 Electrical System

Examination of the electrical system should only be carried out by qualified technicians. Make certain before any work that all conductors are transmitting no voltage and the wind generator is not able to start running unintentionally.

8. Troubleshooting

If, following installation and start-up of your WPS, unexpected problems occur, it is possible to check the following lists for possible causes and in most cases solve the problem directly.

Please consider your safety as the primary concern when working on the WPS.

Warning: Never touch the rotating turbine blades. Never attempt to stop the rotor by hand.

Warning: Use utmost caution when working on the electrical system, since all conductors usually transmit current.

We recommend the use of a multi-meter (voltage, current, resistance meter) and possibly anemometer (wind velocity)

9.1 The wind generator will not start up

Possible Cause	Investigate	Solution
Too little wind	Measure wind speed with an anemometer Note: Minimum wind speed of 2.5 m/s is required	Wait for more wind
A foreign body is lodged between the rotor and generator		Remove the foreign body Note: only perform on days with no wind
Generator has short-circuited	Test the throughput of the conductors (from the WPS interface to the tower)	Exchange the damaged component(s)
WPS is improperly set-up with respect to the prevailing wind, and/or has reached the limit stop	Measure wind speed with an anemometer Note: Minimum wind speed of 2.5 m/s is required	Check the current configuration of the WPS against the previously determined location analysis The direction of the wind causes the WPS to get stuck against the limit stop. Wait for the direction of the wind to change.
	Rotate the WPS by hand Note: only perform on days with no wind	
The generator shaft is stiff or locked	Turn the rotor by hand Note: only perform on days with no wind	Change generator, Only by authorized dealers

9.2 The wind generator does not supply power

Possible Cause	Investigate	Solution
Too little wind	Measure the wind with an anemometer	Wait for more wind
The electrical connection is broken	Check the throughput of the conductors and devices	Exchange the defective conductors and/or devices
Fuse defect	Check the throughput of the fuse	Replace defective fuse
Regulator unit defect	No increased torque can be detected during a manual short circuit of the connecting conductors	Only by authorized dealer

9.3 The wind generator produces too little power

Possible Cause	Investigate	Solution
Bad electrical connection	Check the resistance of all electrical conductors and devices	Replace the defective conductor section and/or device
Too high conductor resistance	Check the diameter/gauge and length of the conductors	Use thicker wires
WPS is located in a draft/lee	Check the surroundings for disturbances to wind flow, e.g., trees, turbulences caused by the roof structure, etc.	Choose another location for the WPS

10. Repair and parts replacement

In the case of a defect on your wind power station, please contact your nearest authorized dealer or authorized service location.

Warning: If the WPS is damaged, it must not be operated. Please contact an authorized dealer immediately.

Under no circumstances should you de-install the mechanical parts of the rotation limit stop. The pre-tensioning of the spring can cause serious injury both to you and to objects nearby. Repairs on the limit stop equipment as well as on the generator must only be carried out by authorized service locations.

10.1 Replacement Parts

Rotor, protective grating, wind vanes, struts

11. Declaration of Conformity

The products of WindTec systems AG can be combined with one another in different system variations. WindTec Systems AG declares, with reference to the declaration of conformity which accompanies this user manual, that the system variations conform to the relevant EU safety and health regulations in design, construction, and the embodiments here placed into circulation by WindTec Systems AG. These systems particularly conform to EU regulation 98/37/EC "machines", amended by RL 2006/42/EC. The technical documentation is available. In case of a modification to the machine not agreed by WindTec Systems AG, this declaration is invalid.

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Further questions regarding the ENFLO 0071 Wind Power Station? Please visit our website at www.enflo-windtec.ch.

