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*"WIND POWER NOW AT
YOUR DOORSTEP."*

ATLAS7

ATLAS7
Vertical Axis Wind Turbine

TESUP

TESUP

USER MANUAL

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2.1 GENERAL INSTRUCTIONS

Before you begin installing, read this entire owner's manual. Following the instruction and recommendations in this manual will help assure safe and enjoyable use of your new renewable energy system. Please take the time to read through this manual prior to assembly.

- Place this instruction manual in a safe place for reference.
- TESUP Wind Turbines can only be used with TESUP Charge Controllers and TESUP selling Inverters.
- There has to be constant load consumption for the wind turbine system (wind turbine, charge controller and inverter) to work smoothly without stopping and heating. That's why we recommend grid connected systems only.
- Wind turbines, charge controllers and inverters have to be installed outdoors.
- Wait until a calm day to install or perform maintenance on your Turbine with activation of brake.
- Listen to your Turbine, if you hear any mechanical noise, maintenance may be required, please contact your Turbine dealer.
- After installation re-adjust and tighten the screws and bolts.
- Adhere to proper grounding techniques as established by the National Electrical Code.
- Your Wind Turbine must be installed in accordance with this manual and local and national building code. Incorrect installation may void your warranty.
- Wind Turbine blades spin at a potentially dangerous speed, this must be respected. Never approach a Turbine in motion.
- Note wire size prior to wiring. Any under sizing of wire can be potentially dangerous.
- Check the manual brake periodically.
- Check the battery health periodically. The low battery voltage and improper connection can cause over-spin issues.

2.2 OPERATING & INSTALLING CONDITIONS

Please make sure that:

- The wind turbine system has been erected correctly by a suitably trained person.
- All operating personnel have read and fully understood this translation of the original instructions
- The wind turbine system is properly maintained and repaired.

2.3 SYMBOLS USED

IN THIS MANUAL:



IMPORTANT: Please take a note.



DANGER: Immediate danger can cause serious injury.



WARNING: Potential Danger, can cause Serious injury.



CAUTION: Potential Danger, can cause moderate injury.



NOTE: Useful Tips

OTHER SIGNS USED:



GENERAL WARNING



HIGH VOLTAGE



MAY START WITHOUT WARNING



ENVIORNMENTAL HAZARD

2.4 WARRANTY DETAILS

The “General Terms of Sale and Delivery” of the manufacturer or his authorized representative apply.

2.5 PRODUCT FEEDBACK

Please notify the manufacturer or his authorized representative about any of the following:

- Accidents
- Potential safety hazards associated with the wind turbine system
- Ambiguities in this translation of the original instructions
- Description of the wind turbine system

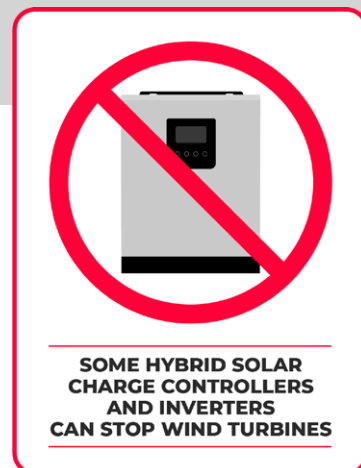
3.1 INTENDED USE

- The wind turbine system may only be used as a “small wind turbine system” (SWTS) to generate power in accordance with EN 61400-2.
- The wind turbine system may only be operated in accordance with the ratings and in the approved wind class (refer to the technical data).
- Observance of the original instructions and compliance with the maintenance and repair instructions are essential preconditions of use for the intended purpose.

3.2 REASONABLY FORSEEABLE MISUSE

- All forms of use which deviate from or exceed the limits of use described above are contrary to the intended purpose. The manufacturer is not liable for any damage resulting from such use.
- No liability will be accepted by the manufacturer if the equipment has been altered as well as in the event of improper assembly, installation, start-up, operation, maintenance, or repair.
- Only original parts supplied by the manufacturer are approved as spare parts or accessories. Any spare parts or accessories not supplied by the manufacturer have not been tested for operation and could be detrimental to reliability. No liability will be accepted by the manufacturer for any damages which result from the use of non-approved spare parts or accessories.
- Reasonably foreseeable misuse includes:
 - Operation outside the manufacturer’s specification.
 - All modifications or changes to the wind turbine system without the manufacturer’s written approval.
 - Use of parts other than ATLAS 7 original parts.
 - Operation in non-approved SWTS classes.
 - Operation in strong winds or hurricanes.

3.3 SYSTEM COMPONENTS

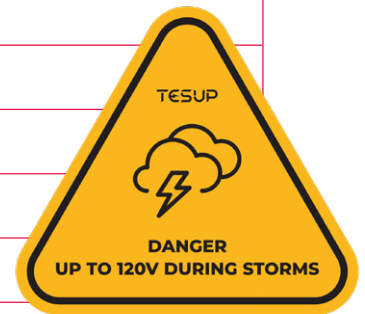


3.4 WIND TURBINE COMPONENTS



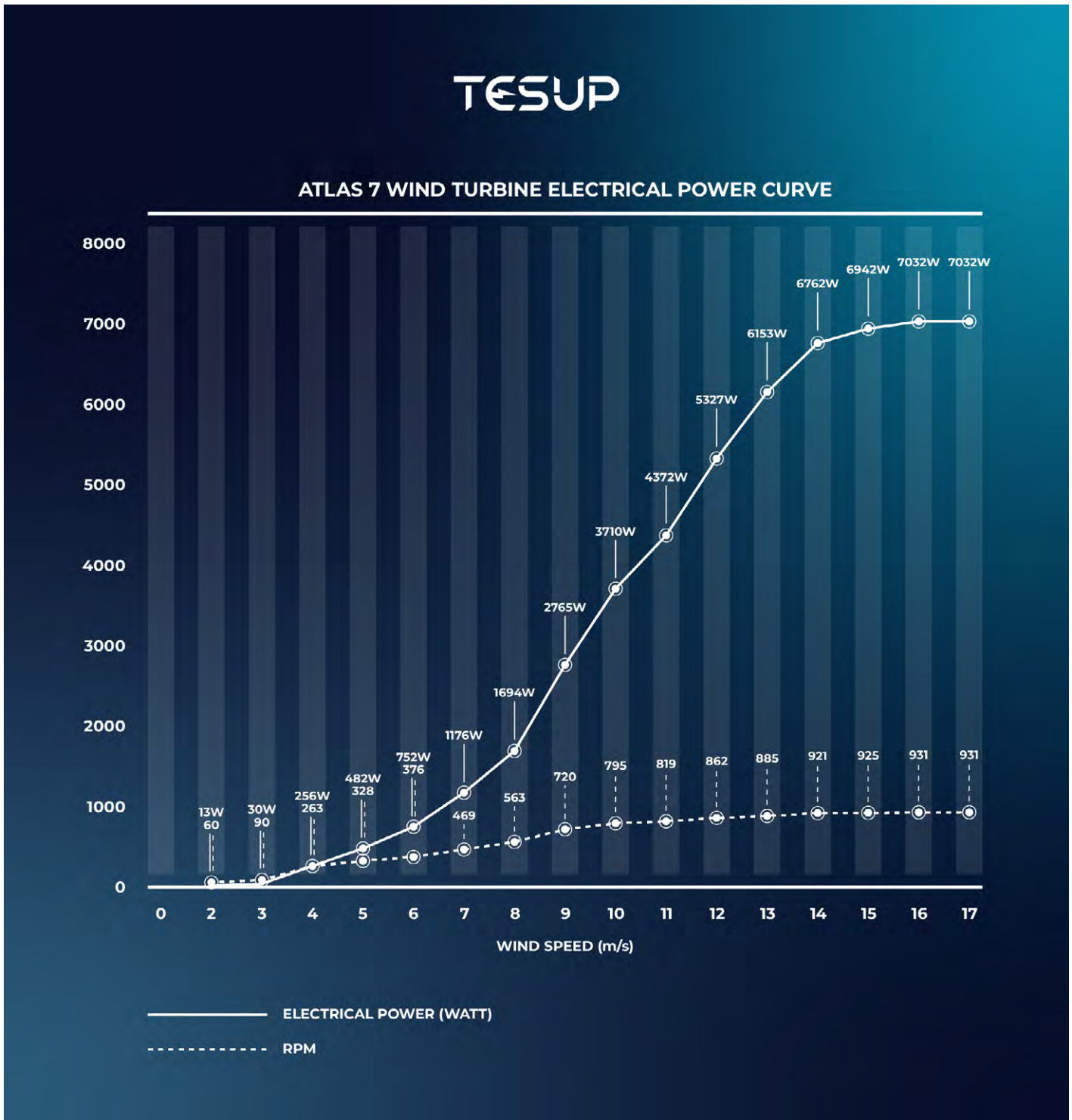
4.1 PARAMETER & DIMENSIONAL DETAILS

SPECIFICATIONS	
Designation	24V to 48V (Regulated by the Charge Controller)
GENERATOR	
Type	7KW vertical axis wind permanent magnet generator
Weight	24.5kg (54lbs)
Max. Power	7kW
Operating Circuit Voltage	0-220V
Current	3-Phase
Start Of Charging	3m/s
Base Plate Material	Sheetmetal
Direction Of Rotation	Clockwise
Test Standards	EN 61000-6-1 (electromagnetic compatibility – immunity) EN 61000-6-3 (electromagnetic compatibility – emissions)
ROTOR BLADES	
Material	Aluminum
Diameter	1200 mm (3.93 Feet)
Weight Per Rotor Blades	750 g (1.65 lbs)
Direction Of Rotation	Clockwise
Starting Wind Speed	4m/s (3m/s afterwards)
No. Of Blades	3
Max Rpm	950
Max Speed	50m/s
Noise	30 dB



WARNING: a hurricane scale III (50-58 m/s) or above occurs, please cover wind turbine blades.

4.2 POWER CURVE



4.3 GENERAL ARRANGEMENT



5.1 TECHNICAL DETAILS

The Wind Turbine Charge Controller from TESUP is an intelligent controller which controls the wind turbine. It safely and efficiently charges and control your battery with the wind generator combination.

With its discreet appearance and simple operation with integrated protection functions, this device has high efficiency and no-load losses. The version of the controller will significantly increase the life and sustainability of all the component of the system.

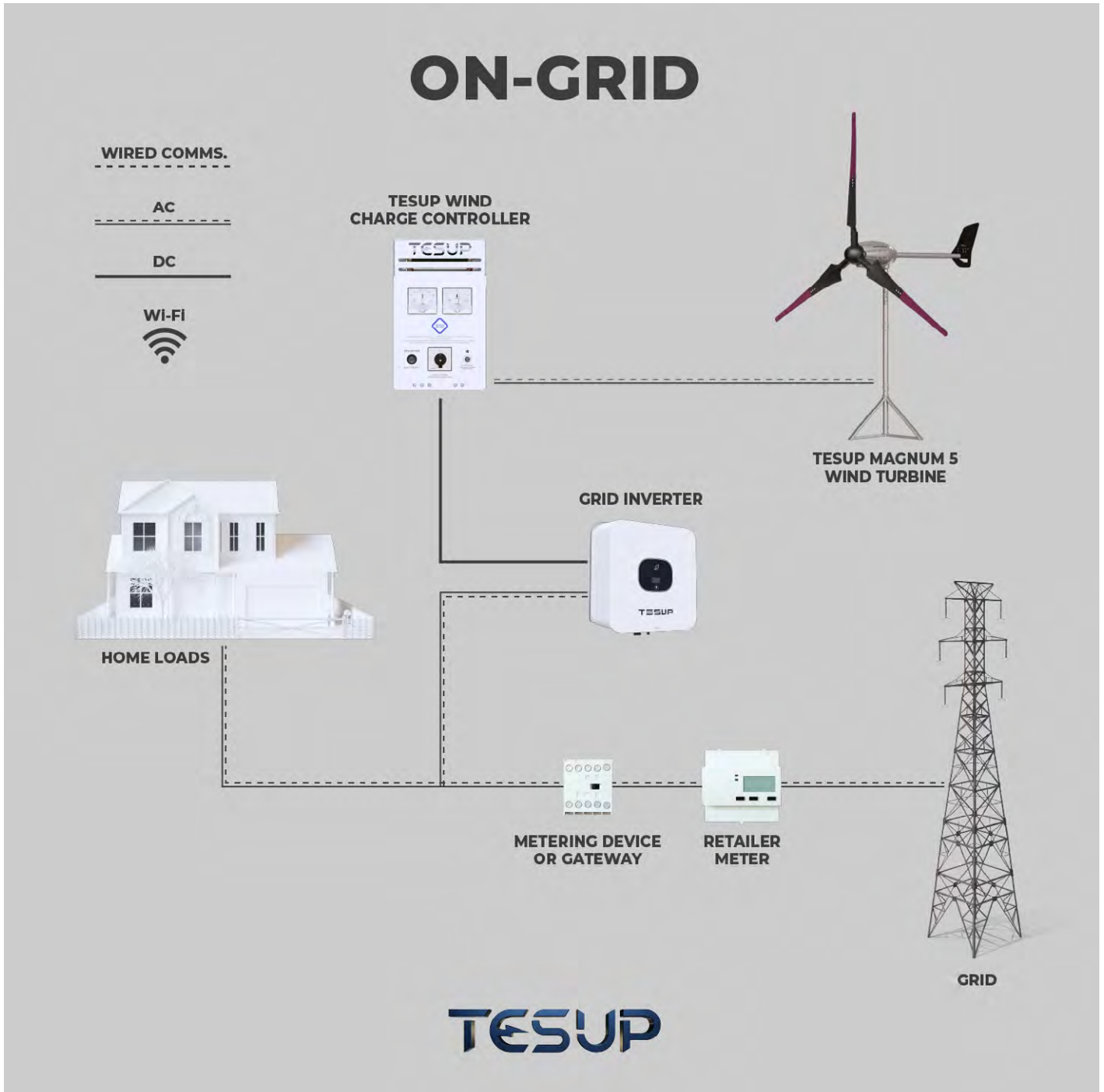
The special features and product information are listed below:

- Use of solid-state components.
- Manual brake function.
- Increasing the life of the controller. Microprocessor controlled charge with integrated voltage and current limiting.
- Dump-load is included. Modern Load dissipation system in three steps to avoid immediate blockage of turbine.
- Resistors might be used for heating.



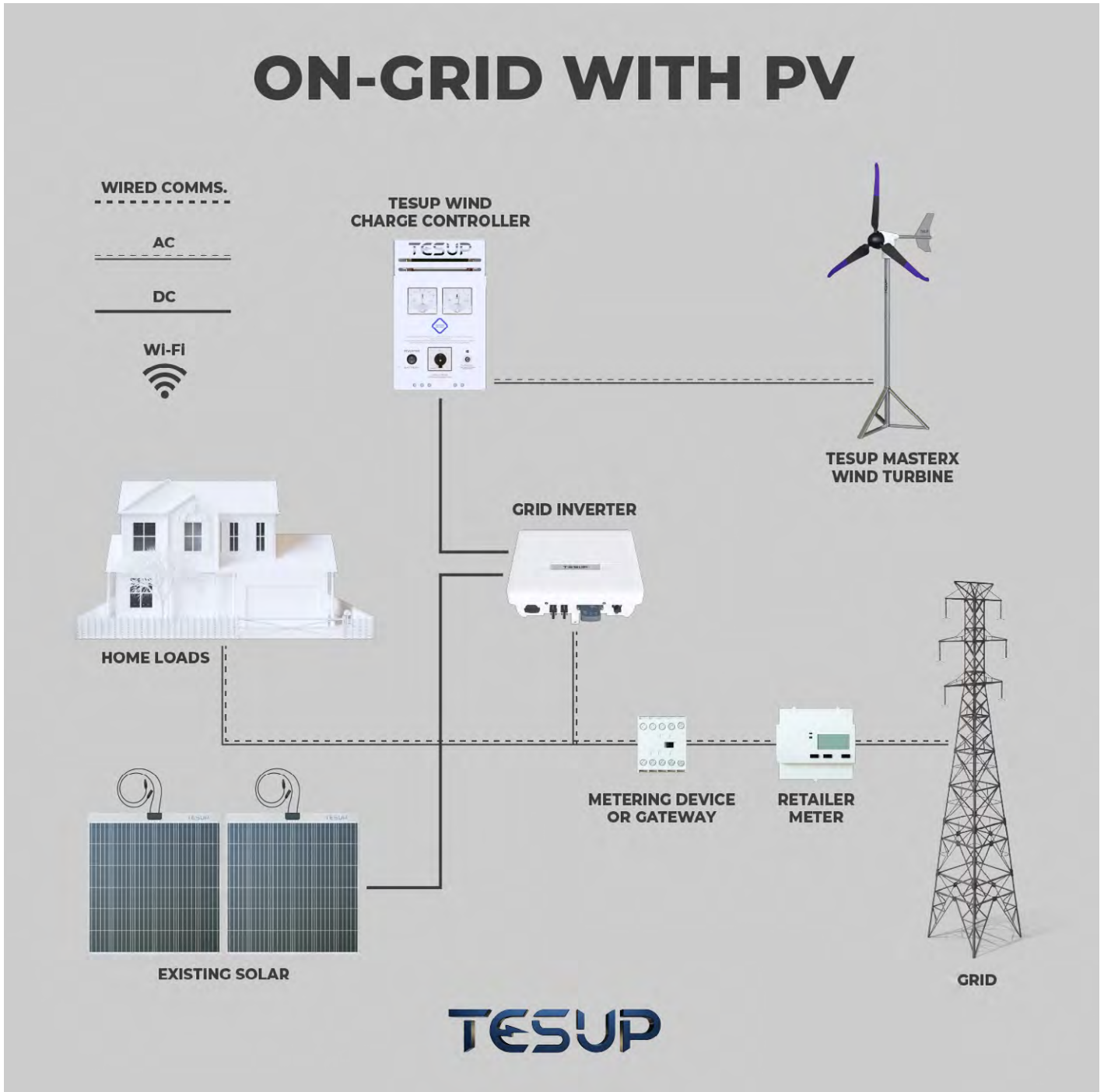
5.2 WIRING DIAGRAM

Wiring Diagram: ON GRID SYSTEMS



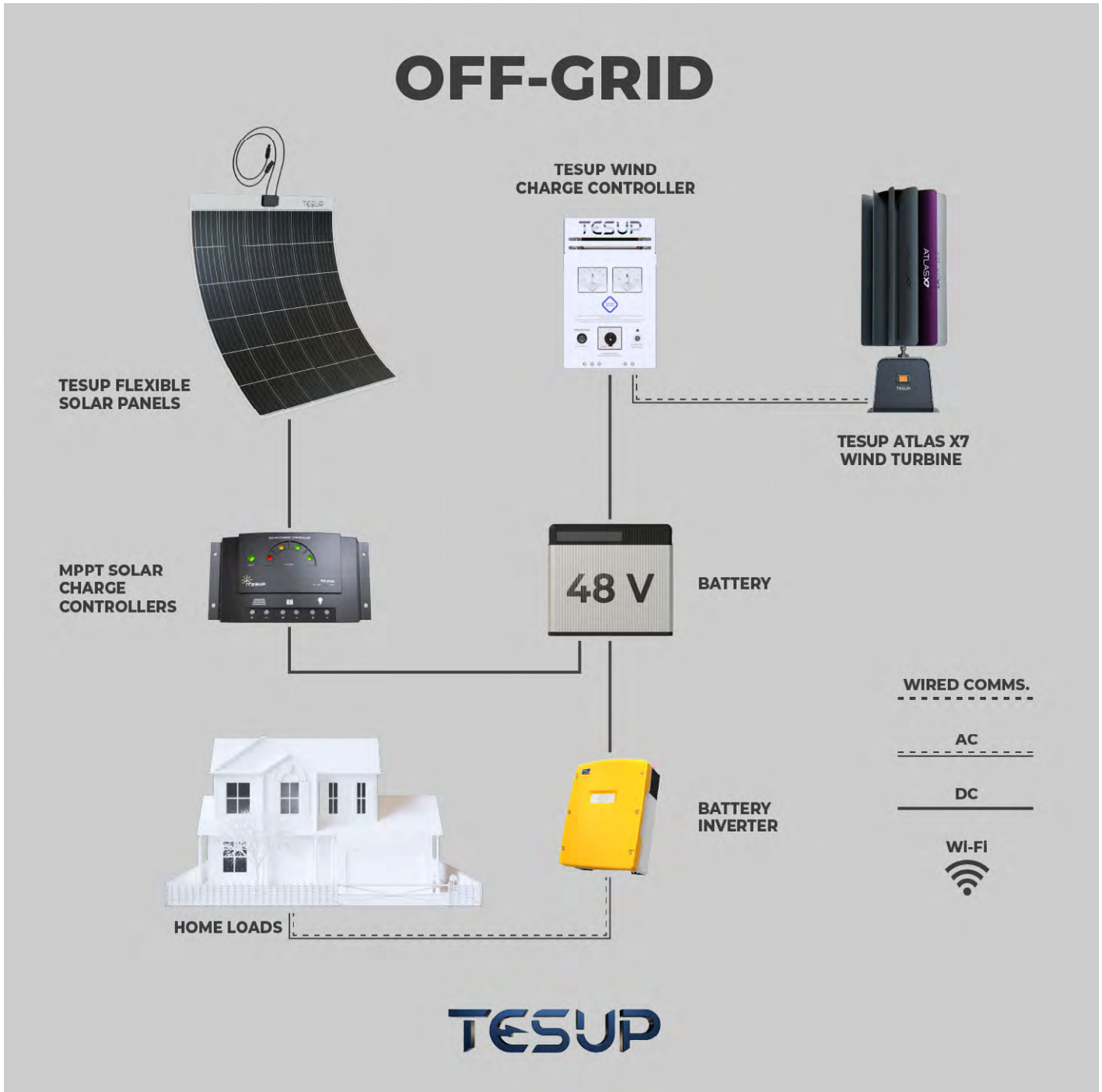
5.2 WIRING DIAGRAM

Wiring Diagram: ON GRID SYSTEMS WITH PV



5.2 WIRING DIAGRAM

Wiring Diagram: OFF - GRID SYSTEMS



5.3 STORAGE & OPERATION

STORAGE:

- Ambient temperature: -15 to +40°C.
- Storage location: Dry, frost-free

• OPERATION:

- Ambient temperature: -25 to +40°C.
- Place of use: Max. SWTS Class III acc. to EN 61400-2.

Our wind turbine systems can only be used as a 'Small Wind Turbine System' (SWTS) to generate power in accordance with EN 61400-2. Our products can be used for low voltage generation purposes; voltage can be maximised to 75V with a TESUP Charge Controller. Our wind turbines should operate with a charge controller at all times. We are constantly improving our technology; our latest wind turbines can generate more than 100 volts during high winds, some products even at 10 m/s wind speed.

The TESUP Charge Controller can adjust and limit the output voltage level between 0 to 75 volts. If the inverter option is selected using the button on the TESUP charge controller, there is no maximum voltage limitation. Stickers warning of electrical danger are on our products. We do not take any responsibility for health risks associated with the use of electricity.

An inverter is an important component in on-grid systems that converts the DC power transferred by the charge controller into AC power for use in the home or electrical grid. For the best product performance, we recommend using your wind turbine within an on-grid system with a Tesup selling inverter. For more information about the inverters, please click the button.

The Company (TESUP) is not responsible for modifications and external damages that may inhibit voltage generation. While we take utmost care to ensure that product descriptions, pictures, information and prices are correct, we do not accept any liability for any inaccuracies, errors or omissions. We do not accept any liability for any inaccuracies for incorrect usage of TESUP products. We do not take any responsibility for installation and modifications mistakes for the products which are delivered disassembled. Colours may differ slightly from those shown on the website due to limitations of internet, software and computer hardware technologies. In line with our policy of continuous product improvement, TESUP reserves the right to change, vary or make different the product specification without prior notification.

6.1 MODIFICATIONS BY THE USER

- The wind turbine system is in conformity with the European Machinery Directive 2006/42/EC provided only original ATLAS 7 components are used and subject to proper erection. The use of components from other manufacturers as well as modifications or changes to the wind turbine system by the user are prohibited and could render the declaration of conformity invalid.

6.2 RESIDUAL RISKS

- Any residual risks which arise because of operation or maintenance are described in the relevant sections of these instructions.

6.3 PERSONNEL REQUIREMENTS

- All work on the wind turbine system must be carried out by authorized persons. Such persons must be familiar with the safety devices and regulations prior to carrying out the work. Authorized persons are defined as follows:

Operating mode	Necessary qualifications
Erection	Suitably trained persons
Normal operation	Trained personnel
Cleaning	Trained personnel
Maintenance	Suitably trained persons
Repair	Manufacturer

6.4 IMPORTANT SAFETY INSTRUCTIONS

- **OUTDOOR USE ONLY**

- Tighten all fasteners properly.
- Use grounding techniques as established by the NEC.
- Install turbine in accordance with this manual and local and national building codes. Failure to comply may affect and possibly void your warranty.
- Properly complete the Warranty Registration Card.
- Observe wire size and fuse recommendations listed in the Wiring Section of this manual.
- To make the system operational, wind turbine, charge controller and grid inverter are all required.



WARNING: Rotating blades are a serious mechanical hazard. Install wind turbines so no one can come in contact with blades.



WARNING:

- Danger to life due to operation in non-approved wind classes! The wind turbine system may only be operated up to Class III wind sites.
- High Wind Speed - High Voltages - High Temperatures
- Fire Resistant Cables Only
- **OUTDOOR USE ONLY**



IMPORTANT: To make the system operational TESUP Wind Turbine, TESUP Charge Controller and TESUP selling grid inverter are all required. All to be installed outdoors.

7.1 SHIPPING CONDITIONS

- The wind turbine system is shipped disassembled.
- Refer to the contract documentation for the scope of supply.

7.2 PRE-REQS AT THE PLACE OF USE

- Certain prerequisites are to be followed at the place of use.
- Specifications related to footprint, minimum clearances and installation conditions are provided, which needs to be taken care of.

7.3 PERMISSIBLE WIND CLASS AND MINIMUM CLEARANCES

- For information on local wind classes, please contact the responsible authorities or your nearest meteorological office.
- The place of use must be free of obstacles; alternatively, the wind turbine must be erected with a sufficient height. As this is specifically for home use, the location on top of the house or terrace should be good for proper functioning of the turbine.



WARNING: Danger to life due to operation in non-approved wind classes! The wind turbine system may only be operated up to Class III wind sites.



IMPORTANT: When choosing the place of use, make sure adequate room is available to tilt the tower and blades

7.4 MOUNTING DETAILS

The mounting surface and the bearer of your choice must have a sufficient load-bearing capacity. The size and structure of the foundation depend on the ground/ surface characteristics.



NOTE: Use of M10 hex bolts or Anchor Fasteners recommended.



WARNING: The mounting base must be fixed to the mounting surface and checked that it is fully stable before moving on to the next steps with wind turbine installation.

7.5 UNPACKING THE COMPONENTS

- Carefully open the packaging.
- Check the shipment for completeness (refer to the shipping documents).
- Separate the packaging material and dispose of it in an environmentally responsible way.

7.6 ASSEMBLING THE WIND TURBINE

TURBINE BODY:

- Carefully take all the components out of the box.
- Fix the turbine body (base) to the turbine's final location.
- Now insert the shaft on the rotor shaft (Double holes of the shaft should face down, single hole upside).
- Fix the shaft to the rotor shaft through the bottom holes on the shaft using the grub screws provided.
- Mount the bottom flange to the shaft.
- Mount the top flange to the shaft.
- Take a long profile set and mount the profile to the designated housings on the lower blade as shown in the diagram on the next page.
- Take a short profile set and mount the profile to the designated housings on the upper blade as shown in the diagram on the next page.
- Take a purple belt and mount the upper and lower blades together via the belt. The belt must be fixed to the blades from the outer surface. Repeat these three steps for all three blade sets.
- Mount complete blade sets to the top and bottom flange with the bolts and nuts provided.

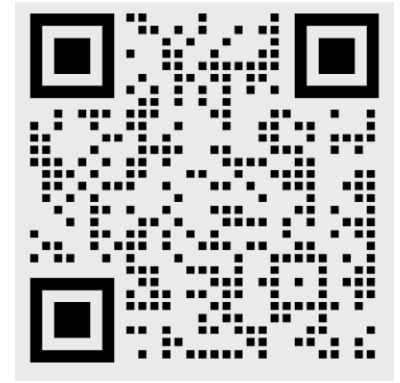


IMPORTANT: If you are using a charge control unit, you must install a battery-inverter in your charge control unit before proceeding.



IMPORTANT: Make sure the 3-phase AC cable at the wind turbine output is not short-circuited. If there is a short circuit, the turbine will brake itself and the blades will be prevented from turning.

- Connect the 3-phase AC output terminals located at the wind turbine output to the charge control unit with battery-inverter input and make sure to screw the terminals tightly.
- If you are using your charge control unit in 'Battery' mode, you should adjust the maximum voltage with the help of the potentiometer on it. (The maximum voltage setting is made to protect the system and to activate the automatic braking system when the wind speed reaches the capacity to produce the voltage value we have determined. Maximum voltage value should not exceed 18V for a 12V system, 30V for a 24V system, and 58V for a 48V system.)



Scan to watch ATLAS 7
turbine assembly



WARNING:

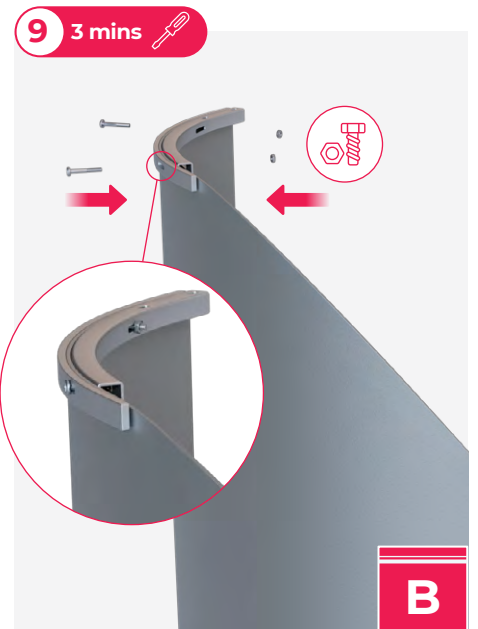
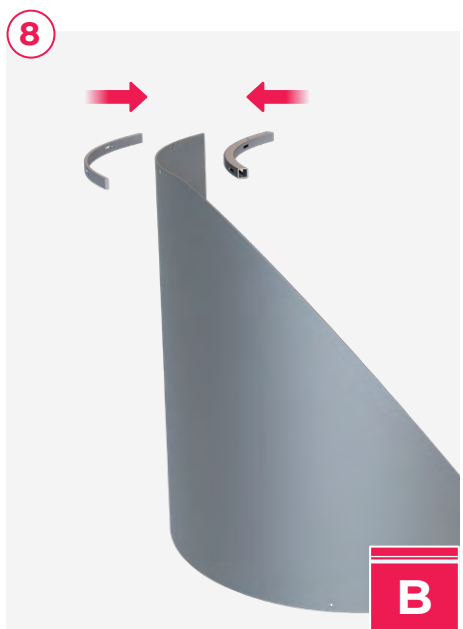
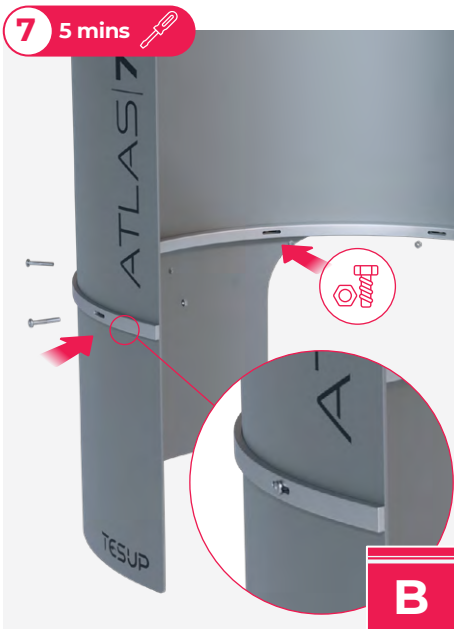
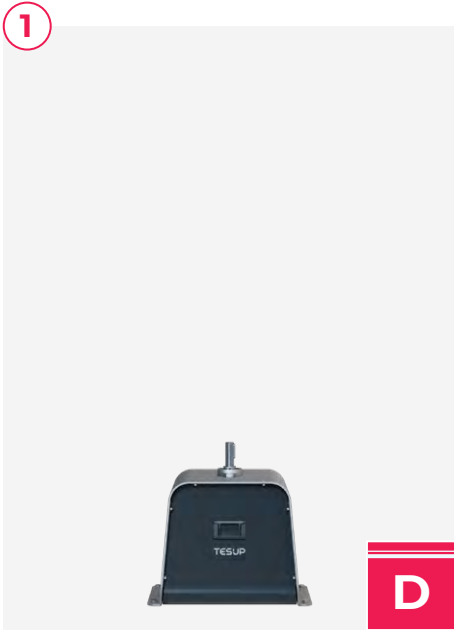
- Danger to life due to operation in non-approved wind classes! The wind turbine system may only be operated up to Class III wind sites.
- High Wind Speed - High Voltages - High Temperatures
- Fire Resistant Cables Only
- OUTDOOR USE ONLY

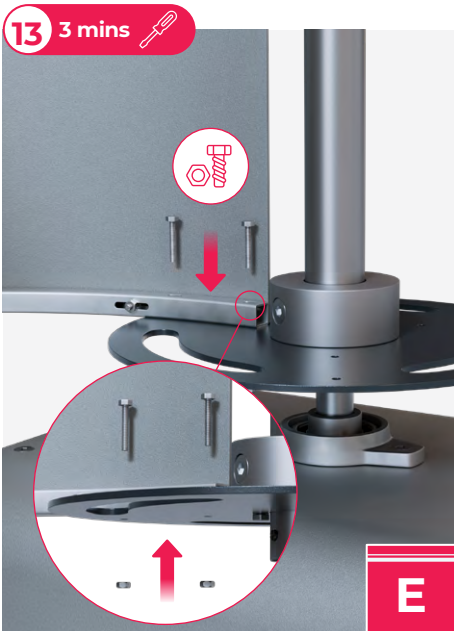
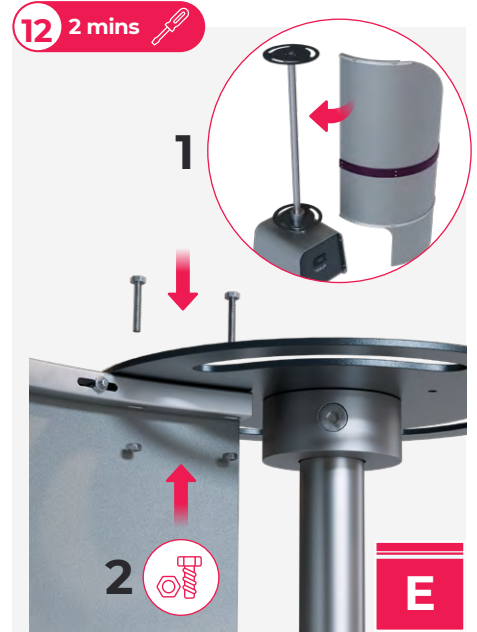
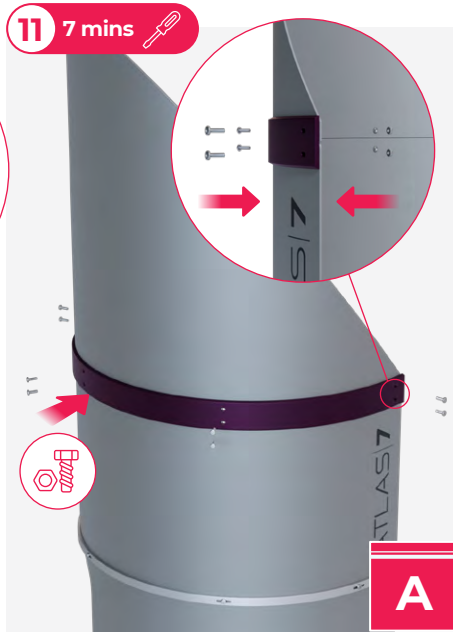
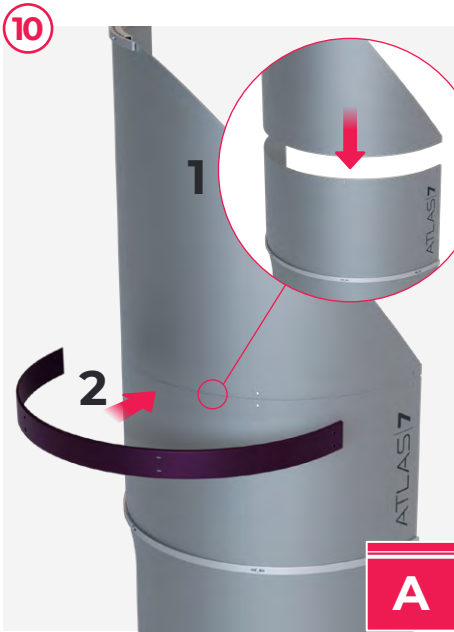


IMPORTANT: To make the system operational TESUP Wind Turbine, TESUP Charge Controller and TESUP selling grid inverter are all required. All to be installed outdoors.



WARNING: The mounting base of the wind turbine must be fixed to the mounting surface and checked that it is fully stable, before moving on to the next steps with wind turbine installation.





7.7 ELECTRICAL CONNECTIONS

Wind Turbine has 3 phase AC connection. These connections are to be connected with TESUP Charge Controller.

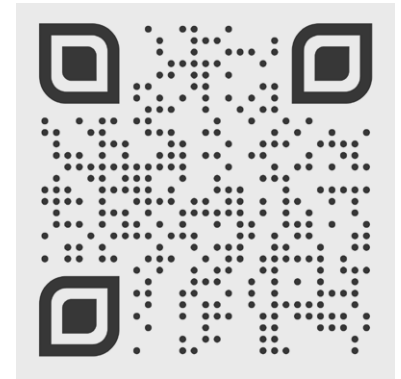
The output of the charge controller can be then connected in two ways:

- The Output of the charge controller can be connected to the battery.
- The Output of the charge controller can be connected to the power grid using the inverter.

The cables from charge controller to the battery or the power grid will be DC connection.

Cable lengths and cross sections should be as follows.

Length	<11 m	<18 m	<29 m	<44 m	<68 m	<110 m
Cross-section	2.5 sq. mm	4 sq. mm	6 sq. mm	10 sq. mm	16 sq. mm	25 sq. mm



Scan to watch electrical connections



WARNING: All work on electrical equipment must be carried out by a qualified electrician with the power switched off!



NOTE: To ensure proper operation, you must use an original TESUP charge controller.

8.1 SWITCHING ON THE WIND TURBINE SYSTEM

- Unlock the emergency stop button or release the brake button on the TESUP charge controller.
- The brake is released.
- The fast-blinking red LED on the TESUP charge controller goes out.
- The wind turbine system supplies power.



NOTE: For Information on operating the charge controller, refer to the separate instructions.

8.2 RESTART AFTER EMERGENCY

- Make sure the risk has been removed.
- Switch on the wind turbine system (section 8.1).

9.1 EMERGENCY SHUTDOWN

- Switch on the brake.
- The wind turbine is short-circuited via the TESUP charge controller.

9.2 TEMPORARY SHUTDOWN

- Switch on the brake.
- The wind turbine is short-circuited via the TESUP charge controller.
- This type of shutdown can occur during the stormy weather when the wind speed is higher than 27 m/s.

9.3 PROLONGED SHUTDOWN

- Switch on the brake.
- The wind turbine is short-circuited via the TESUP charge controller.

10.1 SAFETY PRECAUTIONS DURING MAINTENANCE

- Shut down the wind turbine system (Section 9).



WARNING: Risk of injury when carrying out maintenance work!

- Shut down the wind turbine system prior to all maintenance work.
- Take steps to prevent the wind turbine system from being switched on again by unauthorized persons.

10.2 INSPECTION & MAINTENANCE SCHEDULE

Interval	Component	Activity
Daily	Wind turbine	Check for abnormal noises
	Rotor blades	Check that the blades turn freely
	Tower	Inspect for damage
Yearly twice/ at the end of winter or after extreme weather events	Rotor blade	Inspect for cracks / damage and if necessary, replace
		Treat with underbody protection wax
		Are the rotor blades balanced?
	Mounting Base	Check for vibration
		Check the guy wires
		Is the Base mounted properly?
		Inspect for damage
	Wind Turbine	Check the bolts
	Electrical Wiring	Inspect the cables for damage



WARNING: Shut down the wind turbine system immediately if the rotor blades or the electrical wiring are damaged.

- Refer to the supplementary documents for information on maintaining supplier components.

10.3 MAINTENANCE & CLEANING BY THE USER

- Coat the wind turbine and the rotor blades regularly with commercially available wax.



WARNING: A wax film protects the surfaces of the wind turbine and the rotor blades from the weather and increases the efficiency of the blades.

11.1 FINAL DECOMMISSIONING OF WIND TURBINE



WARNING: Risk of injury and possible breakage due to unqualified dismantling, e.g. persons without suitable training. The system must be dismantled in the proper way by a suitably qualified person.



CAUTION: Stored energy

- Shut down the wind turbine system (Section 9).
- Have the electrical systems and equipment removed from service by a qualified electrician.
- Make sure all rotors are braked.
- Detach the rotor blades from the generator.
- Disconnect the electrical wiring.

11.2 DISPOSAL OF THE SYSTEM & COMPONENTS

Where necessary, dispose of the individual components in consultation with the responsible local authorities.

Wind Turbine System	
Wiring, electrical components	Dispose of as electronic scrap
Mechanical components	Segregate prior to disposal

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