

# UGE-4K™

## SILENTLY POWERFUL

The **UGE-4K** vertical axis wind turbine by **Urban Green Energy** is here to change the path of small wind. Quiet, yet powerful, it is the ultimate achievement in small wind, allowing our patented technologies to create a powerful system to offset your energy use, whatever the demand may be!

Whether you are eager to send energy to the grid or to charge a bank of batteries off the grid, the UGE-4K is an excellent solution for those looking to benefit from the untapped energy of the wind.

Visit [www.urbangreenenergy.com/products/uge-4k](http://www.urbangreenenergy.com/products/uge-4k) today to find out how the UGE-4K is saving the planet, one wind turbine at a time!



# SPECIFICATIONS

## General

Axis \_\_\_\_\_ Vertical  
 Height \_\_\_\_\_ 4.60 m (15.10 ft)  
 Width \_\_\_\_\_ 3.00 m (9.85 ft)  
 Weight \_\_\_\_\_ 461 kg (1016 lb)  
 Swept Area \_\_\_\_\_ 13.8 m<sup>2</sup> (149 ft<sup>2</sup>)  
 Blade Materials \_\_\_\_\_ Carbon Fiber and Fiberglass

## Performance

Rated Power \_\_\_\_\_ 4000 W  
 Cut-in Wind Speed \_\_\_\_\_ 3.5 m/s (7.8 mph)  
 Cut-out Wind Speed \_\_\_\_\_ 30 m/s (67 mph)  
 Rated RPM \_\_\_\_\_ 125 RPM  
 Survival Wind Speed \_\_\_\_\_ 55 m/s (123 mph)  
 Rated Wind Speed \_\_\_\_\_ 12 m/s (27 mph)  
 Noise Level at 12 m/s \_\_\_\_\_ 38 dB

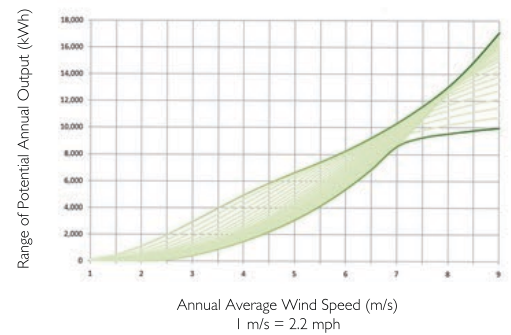
## Certifications

CE Certified \_\_\_\_\_ European Conformity  
 IEC-61400-2 \_\_\_\_\_ Wind Turbine Safety  
 IEC-61400-11 \_\_\_\_\_ Noise Level Certification  
 IEC-61400-12 \_\_\_\_\_ Power Performance Certification  
 ISO-2631 \_\_\_\_\_ Vibration Level Certification

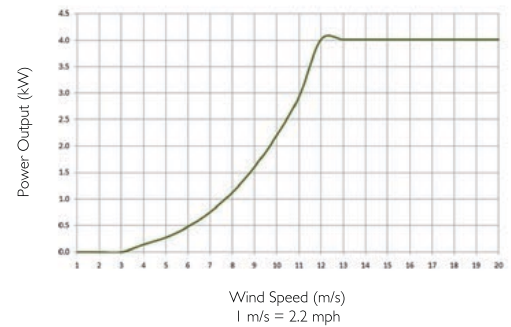
## Electric Generation

Generator Type \_\_\_\_\_ Three-Phase Permanent Magnet  
 Rated Output  
 Off-Grid \_\_\_\_\_ 48 V DC  
 Grid-Tie \_\_\_\_\_ 530 V DC

UGE-4K Annual Power Output

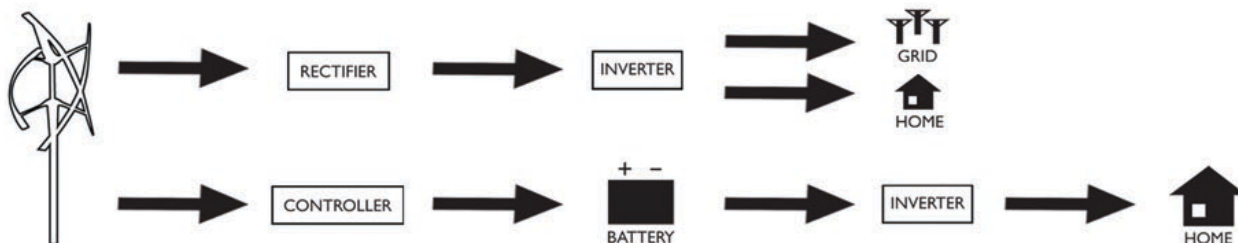


UGE-4K Power Curve



Inverters and Controllers available for all locations and regulations

## Grid-Tie and Battery Backup configuration



Gridtie

SOLAR READY

For more information, visit  
[www.urbangreenenergy.com](http://www.urbangreenenergy.com)  
[info@urbangreenenergy.com](mailto:info@urbangreenenergy.com)





## Technical Documentation

### Specifications for UGE-4K

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Completed by: MC

Checked by: YW

Please note that our documents are occasionally updated. You may verify the validity of this document by visiting: [www.urbangreenenergy.com/documents](http://www.urbangreenenergy.com/documents)



# Urban Green Energy

## 4kW Wind Turbine Specifications

### Physical Information

Axis	Vertical
Height	4.60 meters
Width	3.00 meters
Weight	461 kg
Swept Area	13.8 m <sup>2</sup>
Blade Materials	Carbon Fiber & Fiberglass

### Performance

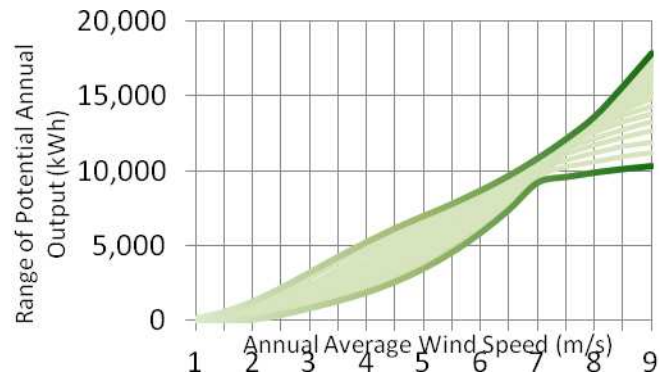
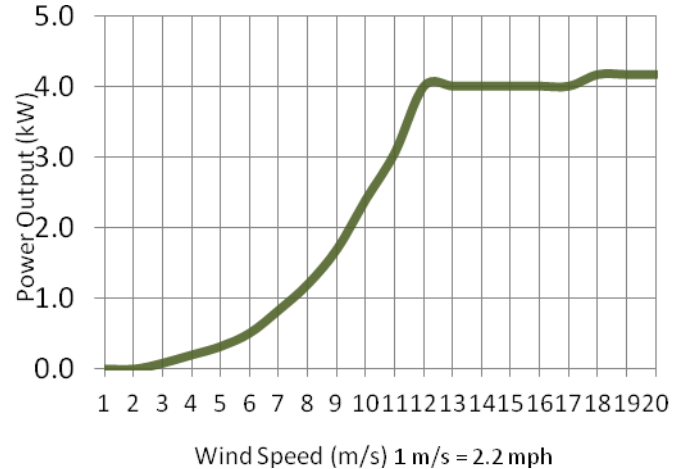
Rated Power	4000 W
Cut-in Wind Speed	3.5 m/s
Cut-out Wind Speed	30 m/s
Rated RPM	110 RPM
Survival Wind Speed	55 m/s
Rated Wind Speed	12 m/s
Annual Energy at 5 m/s	4560 kWh
Noise from IEC 61400-11 at 12 m/s	38 dB

### Certifications

CE Certified	European Conformity
IEC-61400-2	Wind Turbine Safety
IEC-61400-11	Noise Level Certification
IEC-61400-12	Power Performance Certification
ISO-2631	Vibration Level Certification

### Electric Generation

Generator Type	Three-Phase Permanent Magnet
Ambient Temperature	-25 C to 65 C (-13 F to 150 F)
Drive System	Direct Drive
Rated Output	
Off-Grid	48 Vdc
Grid-Tie	600 Vdc
Inverters and Controllers	Available for all locations and regulations



# OWNER'S MANUAL

UGE 4KW

INSTALLATION  
OPERATION  
MAINTENANCE



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# INTRODUCTION

Dear UGE-4K Owner,

Congratulations on purchasing your UGE 4kW rated Vertical Axis Wind Turbine (VAWT) and welcome to our family.

Enclosed in this manual is information regarding installation, operation and maintenance of your new turbine. Please read through it before installing and using your turbine.

These installation and maintenance instructions contain important information for the safe installation and maintenance of the UGE-4K vertical axis wind turbine. The turbine should only be installed by qualified personnel such as an employee of a UGE distributor, licensed contractor or certified electrician. Yearly maintenance checks should be performed by a person with similar qualifications. The owner should retain a copy of this manual for reference and to give to future maintenance personnel.

This manual should be used in conjunction with electronics installation manuals, tower installation manuals, and the UGE Electrical Supplement. These manuals can be found on the website of the tower and electronics suppliers respectively or can be provided by your UGE distributor.

In this manual you will see several checklists to guide you through the installation of the turbine. You will be able to follow these step-by-step instructions to insure your installation is completed correctly.

To activate your warranty, please go to [www.urbangreenenergy.com/warranty\\_form.php](http://www.urbangreenenergy.com/warranty_form.php). You must activate your warranty before allowing your turbine to spin.

We would like to hear from you with any questions or comments that you have. Please contact us during working hours (Monday-Friday 9:00am to 6:00 pm - US Eastern Time) at:

Telephone: +1 (917) 720-5685

Website: [www.urbangreenenergy.com](http://www.urbangreenenergy.com)

Email: [techsupport@urbangreenenergy.com](mailto:techsupport@urbangreenenergy.com)

Sincerely,



# SAFETY INSTRUCTIONS

## **CAUTION:**

### **PLEASE READ THESE INSTRUCTIONS CAREFULLY BEFORE INSTALLATION**

1. The conditions of your warranty are dependent upon proper installation.
2. If the wind turbine is allowed to spin at high speeds without electrical resistance, such as when the electronics are not completely and properly installed, the turbine may be “free-spinning” which can lead to extremely dangerous operation. **ALLOWING YOUR WIND TURBINE TO FREE SPIN WILL VOID YOUR WARRANTY.**

A turbine with no load on it may overspin even in very low wind conditions. Keep in mind that if you use an unauthorized controller or program a low MPPT table there may not be sufficient resistance on the turbine, allowing it to overspin and voiding your warranty. Always check with a UGE engineer before making such changes.

For grid tie systems, not using an inverter, or using an inverter that is not connected to the grid, will also allow the turbine to behave dangerously. Allowing the turbine to behave in such a way will also void your warranty. Please make sure that unless the turbine is fully operational, it is completely stopped either through electrical or mechanical means.

3. The UGE wind turbine system uses high voltage electricity and is potentially dangerous. The electronics associated with the UGE wind turbine must be installed by a certified electrician in accordance with the National Electric Code (NEC) and/or local electrical codes as applicable. Installation personnel shall employ safety precautions for high voltage equipment at all times. The turbine, tower, and electronics shall be properly grounded as established by the NEC and/or local electrical code.
4. This wind generator complies with international safety standards that must not be compromised. Opening the generator cover may compromise the safety and efficiency of the generator. Furthermore, opening the generator cover without manufacturer authorization will void the warranty.
5. During installation some components must be sealed to prevent water seepage. Failure to do so may lead to premature wear of your product and would compromise the warranty.
6. UGE turbine and tower shall be assembled and installed only by qualified personnel such as an employee of a UGE distributor, licensed contractor, or certified electrician.
7. Some components of the turbine are very heavy. Do not attempt to lift or move them without a proper hoist or suitable machine. Doing so may result in personal injury.
8. Register your warranty online at [http://www.urbangreenenergy.com/warranty\\_page.php](http://www.urbangreenenergy.com/warranty_page.php).

9. Warning symbols to be used throughout this manual:



**CAUTION**



**ELECTRICAL  
DANGER**



**IMPORTANT  
NOTE**



# SPECIFICATIONS

## **PHYSICAL INFORMATION**

Axis	Vertical
Height	4.60 m (15.1 ft)
Width	3.00 m (9.84 ft)
Swept Area	13.8 m <sup>2</sup> (149 ft <sup>2</sup> )
Blade Materials	Carbon Fiber & Fiberglass

## **PERFORMANCE**

Rated Power	4000 W
Cut-in Wind Speed	3.5 m/s (7.83 mph)
Cut-out Wind Speed	30 m/s (67.1 mph)
Rated RPM	125 RPM
Survival Wind Speed	50 m/s (110 mph)
Rated Wind Speed	12 m/s (26.8 mph)
Annual Energy at 5 m/s (11.2 mph)	4560 kWh
Noise at 60 meters (197 ft) at 12 m/s	38 dB (A)

## **ELECTRIC GENERATION**

Generator Type	Three-Phase Permanent Magnet
Rated Output	
Off-Grid	48 Vdc
Grid-Tie	530 Vdc
Inverters and Controllers	Available for all locations and regulations

## **WEIGHT OF PARTS**

Blades	24 kg (52.9 lbs)
Generator	170 kg (375 lbs)
Axis	140 kg (309 lbs)
Connecting arm	13 kg (29 lbs)
Turbine	461 kg (1016 lbs)
Total shipment (2 boxes)	614 kg (1354 lbs)

## **CERTIFICATIONS**

CE Certified	European Conformity
IEC-61400-2	Wind Turbine Safety
IEC-61400-11	Noise Level Certification
IEC-61400-12	Power Performance Certification
ISO-2631	Vibration Level Certification

# PRE-INSTALLATION CHECKLIST

## **SHIPPING CONFIRMATION:**

- Turbine and tower delivery location and time confirmed.
- Equipment available on-site to unload towers and/or turbine from delivery truck.
- Open crate(s) and confirm all turbine components have arrived – see list page 6 - 9.
- Confirm no turbine components have been damaged during shipping.
- Open crate(s) and confirm all specialty electrical components have arrived – see page 10. for wiring diagrams.
- Confirm no specialty electrical components have been damaged during shipping.

## **PERMITTING:**

- Signed and sealed foundation and/or tower drawings obtained (if required, check with your local department of buildings).
- Building permit obtained for turbine, tower, and/or foundation (if required, check with your local department of buildings).
- Grid interconnect permit obtained from local utility (Grid-tie only).

## **PRE-INSTALLATION:**

- Wind Assessment performed (if required).
- Foundation installed per UGE sample foundation drawings or per a design approved by a licensed Professional Engineer.
- Verify all installation personnel have read through this installation manual.
- Verify project electrician has purchased off-the-shelf products (conduit, wires, switches, etc.). See the UGE Electrical supplement for more information on these items.
- Check weather for day of installation.

## **INSTALLATION EQUIPMENT:**

- Verify qualified personnel (minimum 2) are scheduled to be on site to assemble the turbine.
- Verify project electrician is scheduled to be on site to wire electronics and connect turbine system to grid.
- Reserve crane or boom truck (may not be required for tilt-up towers).
- Reserve man-lift, bucket truck or ladder (may not be required for tilt-up towers).
- Turbine working platform (stand) available.
- Verify all tools required for assembly and installation will be on site, see page 14.
- Bring Camera if desired.

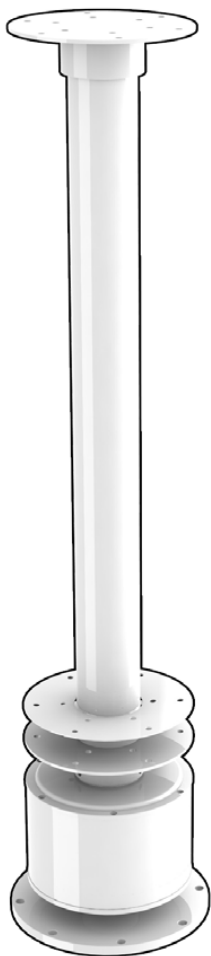
# PARTS LIST



**CAUTION:**  
**CHECK THAT ALL COMPONENTS ARE INCLUDED UPON RECEIVING THIS PRODUCT TO ENSURE SAFE AND EFFICIENT INSTALLATION.**



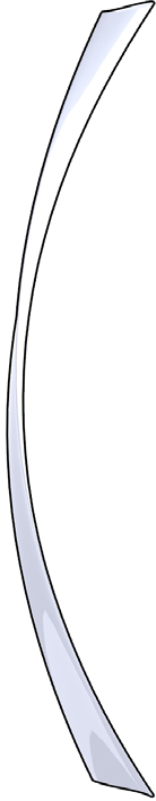
Axis Top Plate



Generator Axis



# PARTS LIST



Blade

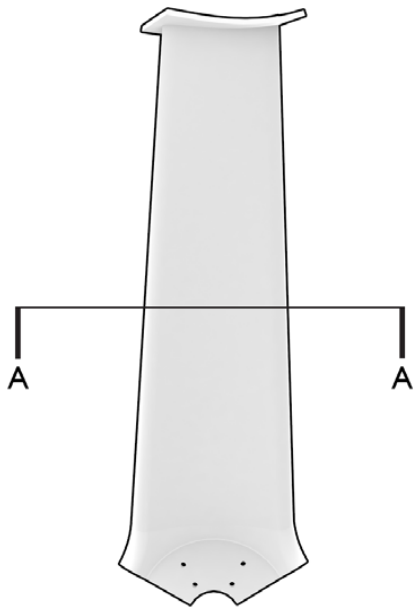
X 3



Loctite

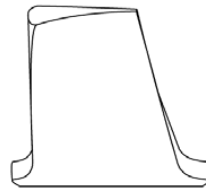
X 1

# PARTS LIST

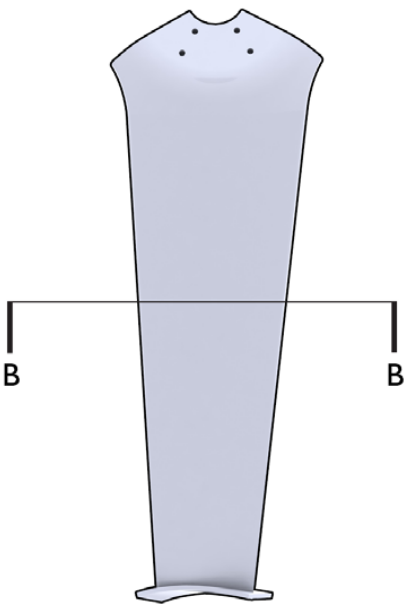


Upper Connecting Arm

X 3

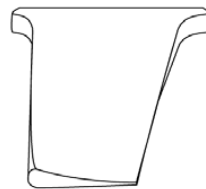


A - A Sectional View



Lower Connecting Arm

X 3



B - B Sectional View

# PARTS LIST



**NOTE: ALL BOLTS COME WITH A SET OF WASHER, LOCK WASHER AND NUT:**



PART	AMOUNT	NAME	LOCATION
------	--------	------	----------



8

M20X80

Generator Flange



24

M16X110

Connecting Arms



2

Round Eye Nut

Axis Top Plate



6

M12X60

Turbine Blades \*



6

M12X35

Turbine Blades \*

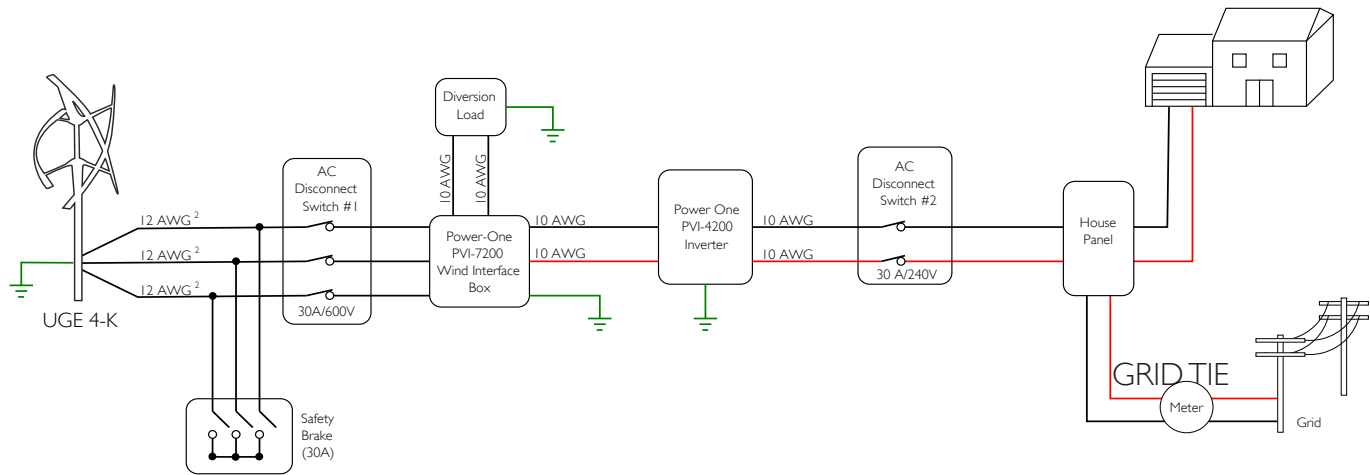
**\* INDICATES NO NUT NEEDED**

# WIRING DIAGRAMS

## ELECTRICAL SYSTEM OVERVIEW

Detailed wiring diagrams are available from the UGE website or your UGE distributor.

### GRID-TIE



### OFF-GRID

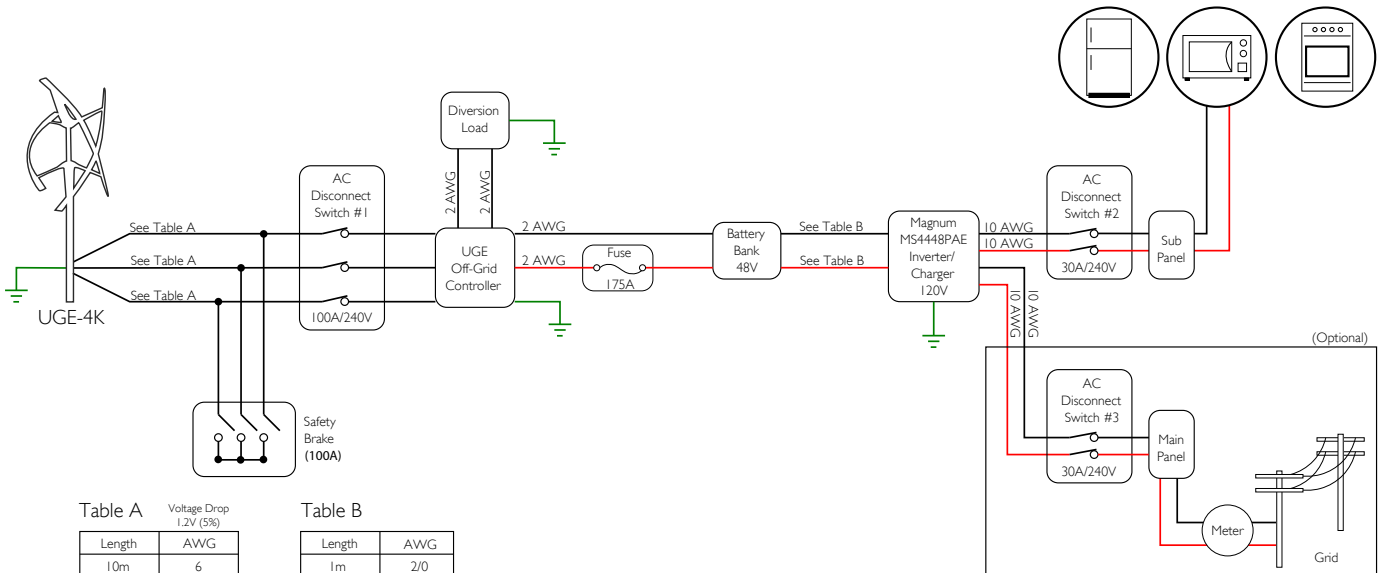


Table A Voltage Drop 1.2V (5%)

Length	AWG
10m	6
50m	2
100m	2/0
100m	250 Kcmil

Table B

Length	AWG
1m	2/0
2m	2/0
3m	4/0
5m	4/0x2

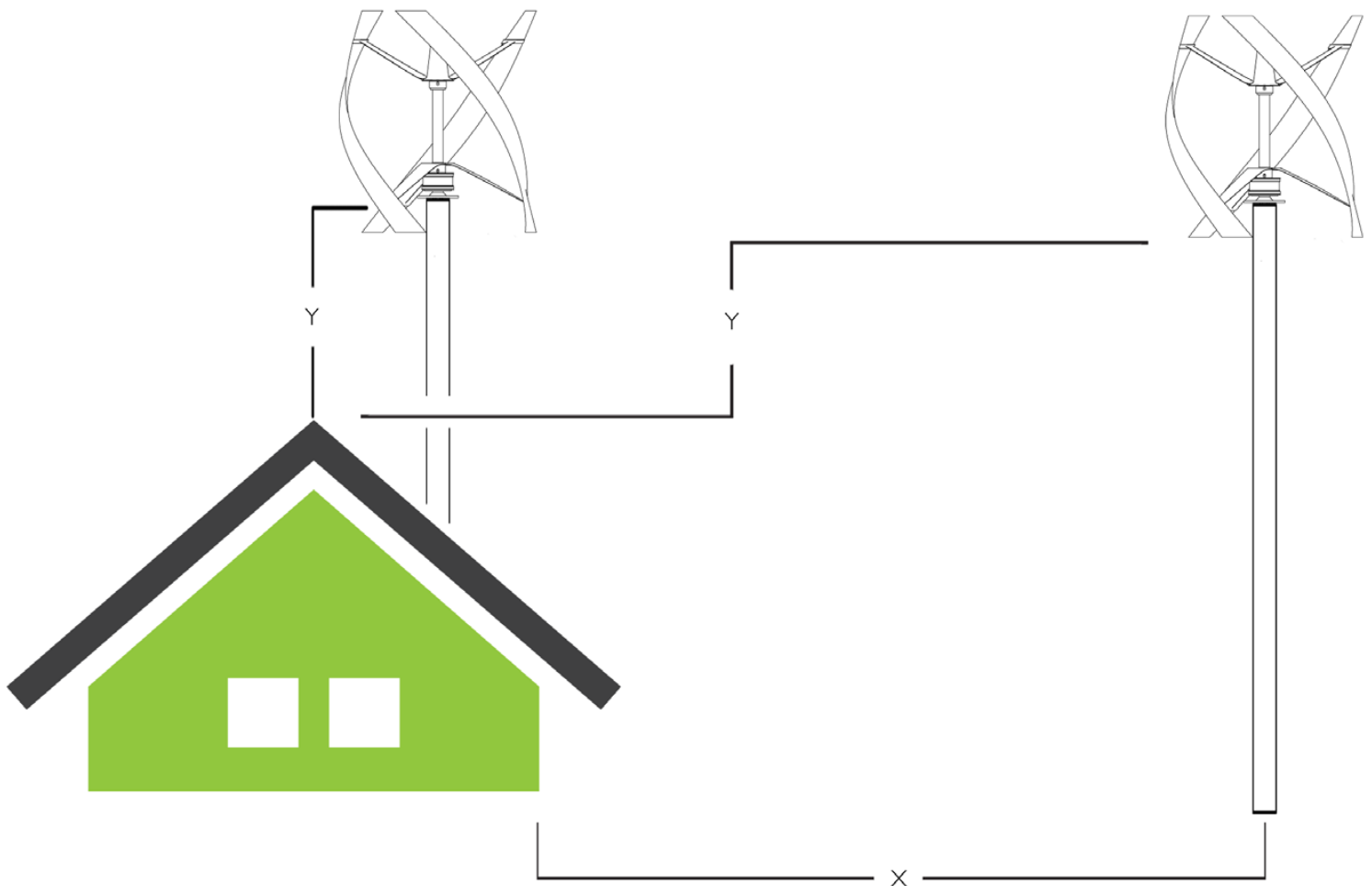
# GETTING STARTED

## **POSITIONING YOUR TURBINE**

Selecting the optimal location for your UGE-4K turbine is crucial to capturing the wind power required to generate electricity. Several factors must be taken into account while selecting your location:

- Surrounding structures and other obstacles
- Tower Height
- Available Space
- Zoning height restrictions

The taller the tower the higher quality the wind, however towers can be expensive so it is important to balance performance with cost to achieve the quickest payback. Ask UGE engineers for the minimum value of X and Y to have a good performance. It is also necessary to adhere to local building restrictions.





# GETTING STARTED

## **TOWER AND SUPPORTING STRUCTURE**

### **FOUNDATIONS:**

Properly installing the tower and supporting structure for the turbine is essential to proper operation of your wind turbine.

Urban Green Energy turbines can be roof mounted or be supported by a tower on a stand-alone foundation. Sample foundation drawings for reinforced concrete foundations are available from your UGE distributor. If required, Urban Green Energy can also provide copies of these drawings that have been signed and sealed by a professional engineer. For projects that opt for a different foundation, the foundation should be designed by a professional engineer. Contact Urban Green Energy technical support for foundation design criteria. Keep in mind that depending on local building code, concrete foundations can take up to 28 days to cure before the tower can be installed on it.

For projects that call for a roof mounted turbine, the interface between the tower and the building structure should be designed by a professional engineer. The loads going from the tower to the building are shown on the UGE load tables which are available through your UGE distributor. Contact UGE technical support if you or the engineer has any questions on this connection.

### **TOWERS:**

Towers can be purchased through Urban Green Energy or manufactured elsewhere.

Towers not purchased through Urban Green Energy shall be designed by a professional engineer. Contact Urban Green Energy technical support for tower design criteria.

For projects using towers purchased through UGE, please see the "Tower Assembly Instructions" manual published by American Resource and Energy and which is available from your UGE distributor. This document explains the proper tower installation procedure as well as safety precautions to be taken when erecting the tower. Also see the tower design drawings for minimum slip overlaps between tower sections. We recommend measuring and marking these distances directly onto the outside face of the tower prior to tower installation to confirm adequate overlap of tower sections.

The tower shall be leveled after installed. Towers purchased through Urban Green Energy are designed to be installed with a gap between the bottom plate of the tower and the top of the foundation or existing building. Leveling nuts placed in this gap allow for proper leveling of the tower during installation and during the annual maintenance check (see page 38). The tower shall be leveled such that the top plate of the tower is within 1 degree of horizontal.

# GETTING STARTED

## **WIRE SIZING**

The wire sizing directions listed in the ELECTRICAL SYSTEM OVERVIEW section are for SINGLE UGE-4K turbine installations. DO NOT attempt to use these wire sizing instructions for multiple UGE-4K turbines connected to a single controller or wind interface box. Please ensure all power is turned off before working on any electrical connections.

Wire gauge recommendations are based on NEC 310.16 for THHW copper wire below 100°F (A certified electrician shall verify wire gauge meets local electrical code). Wire length should not exceed 150m. Each electrical component shall have its own grounding wire and connect to a common earth ground. For projects where the turbine and tower are supported by a reinforced concrete foundation, the project electrician may opt to use the rebar in the foundation as the grounding electrode for the turbine and tower, per NEC article 694.40C.

## **USAGE**

The UGE-4K is a wind powered three phase electricity generator.

- It requires specialty electronics to convert the energy it creates into usable AC or DC. Please contact UGE technical support if you are interested in using specialty electronics not purchased through UGE.
- Do not modify the UGE-4K
- Do not attempt to use a power source other than the wind to rotate the UGE-4K

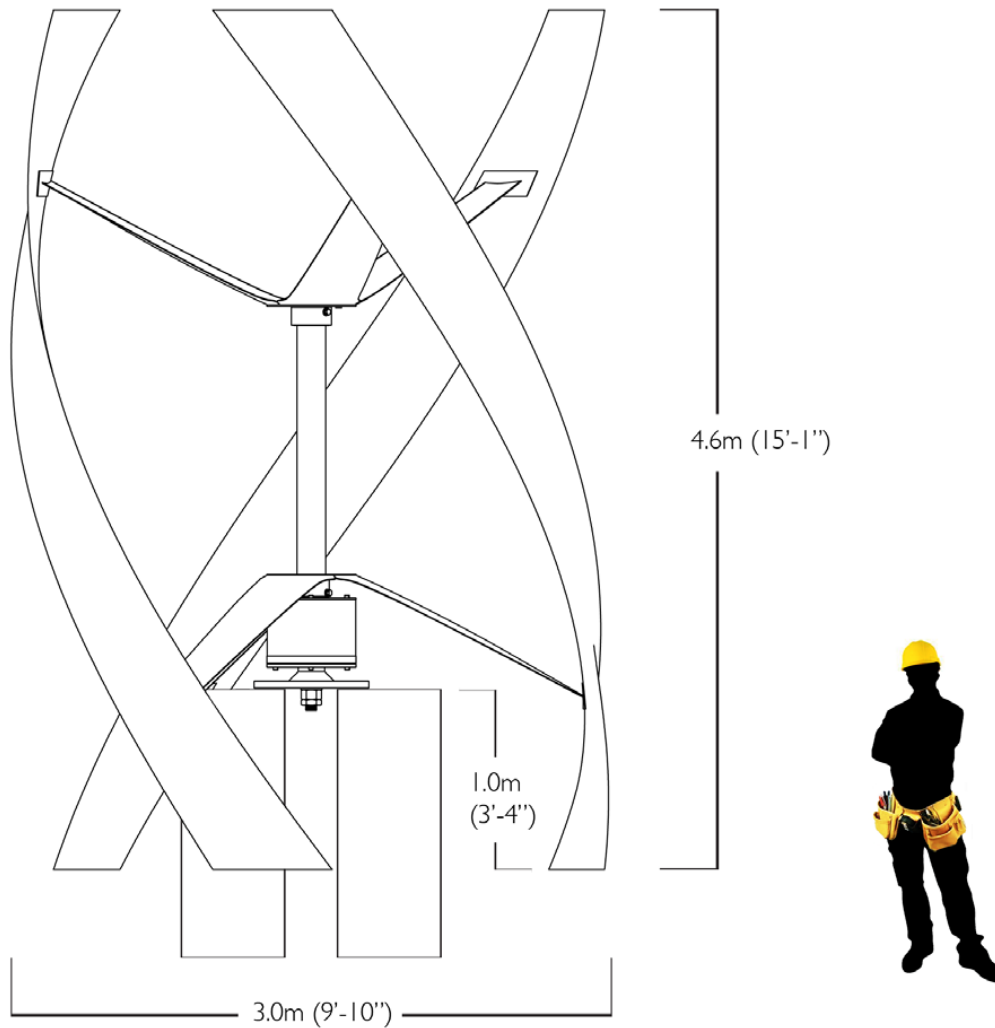
# GETTING STARTED

## **ASSEMBLY REQUIREMENTS**

Before proceeding to installation, the following tools will be needed to conduct safe and efficient assembly of the UGE-4KVAWT:

TOOL ID	AMOUNT	NAME
Wr1	1	Torque wrench with 30mm socket (M20 Bolt) & 24mm socket (M16 Bolt)
Hex1	1	10mm Hex key
Wr2	1	100mm Adjustable Wrench
Cr	1	Hydraulic lift or crane
Ss	1	Silicone Sealant
Ls	1	Lifting Straps
Wp	1	Working Platform (see next page)

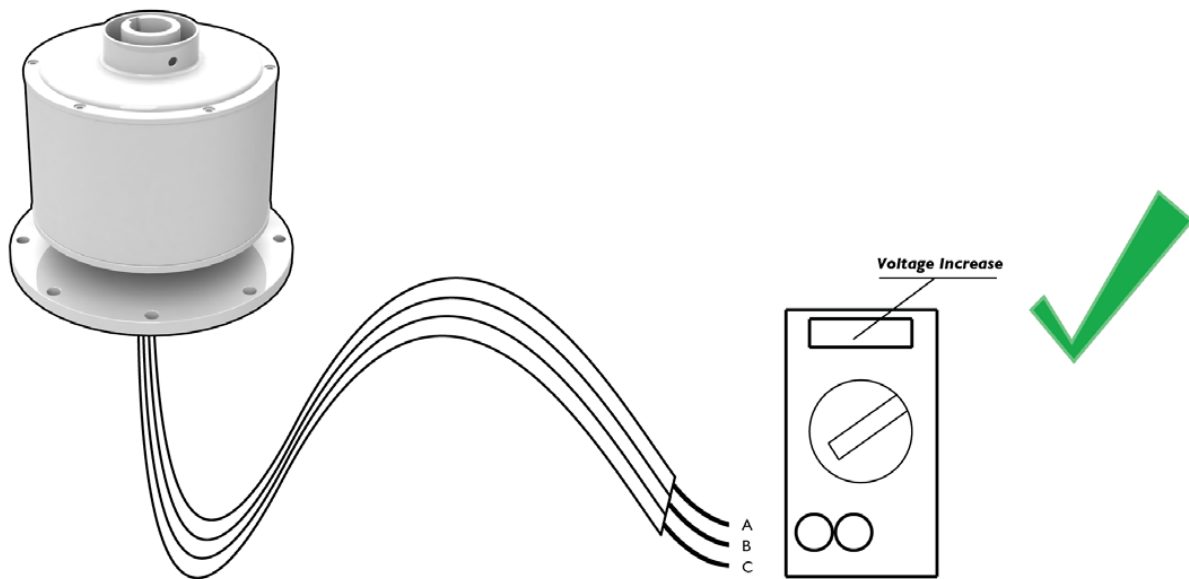
# GETTING STARTED



Assembly of the UGE-4K requires a working platform capable of withstanding 450 kg (1000 lbs) weight, with a 150mm (6") diameter opening for the bottom nut of the generator to rest in-; and approximately 5m x 5m x 10m (16'- 6" x 16'- 6" x 33') space for assembly.

Urban Green Energy turbines are available with several different mounting options. A crane is required for installing the tower and turbine. Choose a crane which can safely lift 450 kg (1000 lbs) of weight at least 6m (20') above the height of your tower.

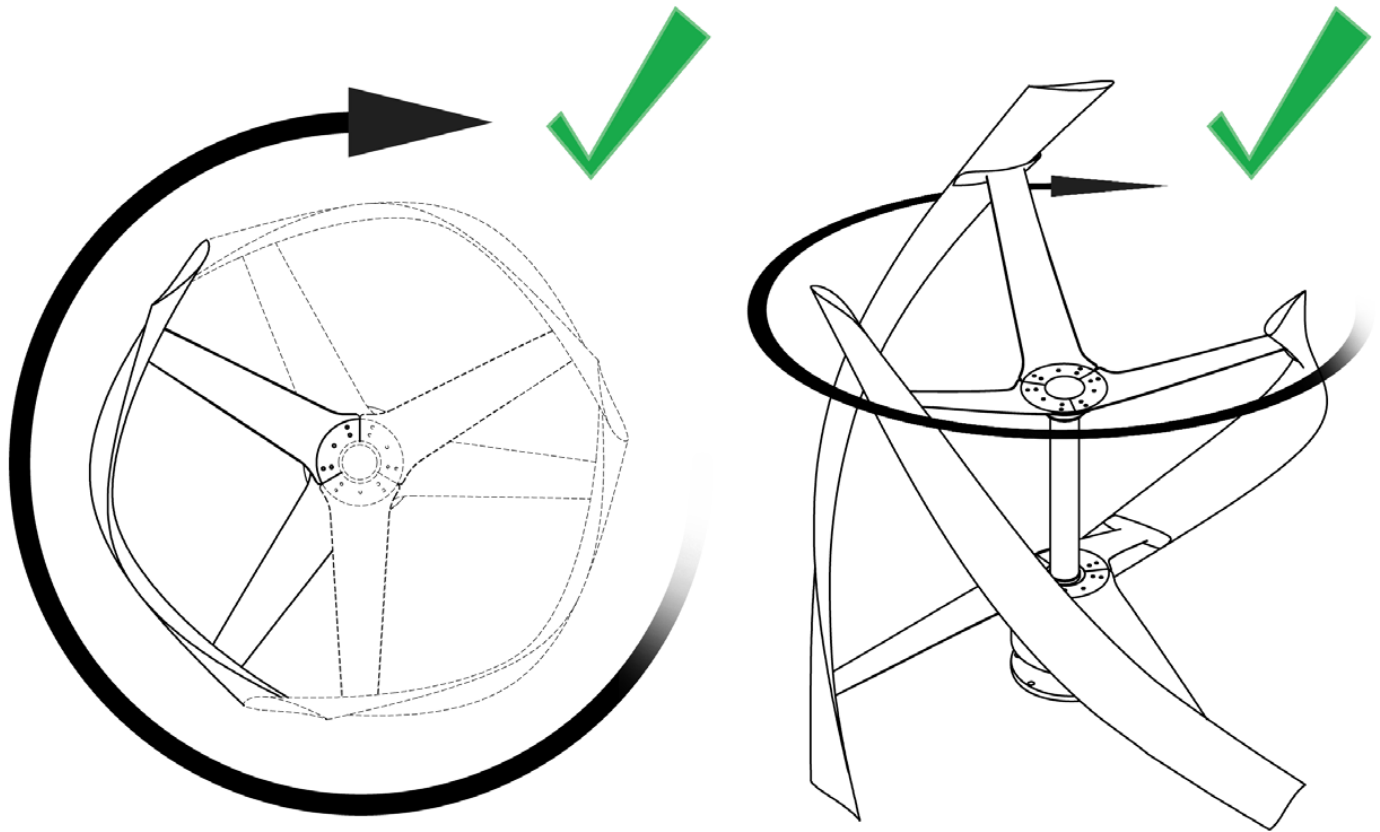
# GETTING STARTED



## **IMPORTANT CONSIDERATIONS**

To verify that the generator is working appropriately, connect a voltmeter to two of the generator terminals. Slowly spin the generator and watch the AC voltage being created. Spin the generator slightly faster and verify that the voltage generated increases.

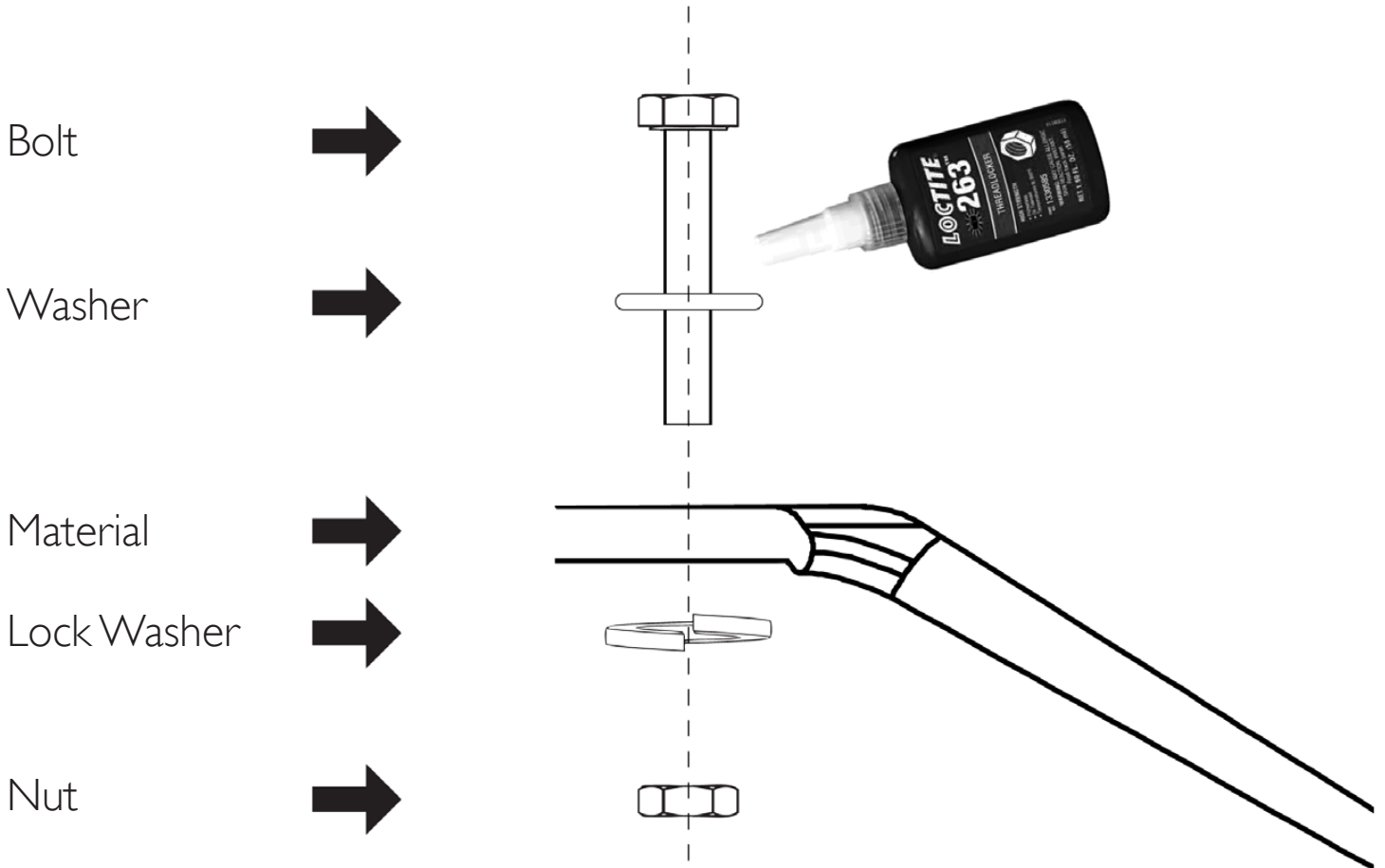
# GETTING STARTED



## ***SPIN DIRECTION***

When uncertain of the orientation of the blades, along with corresponding upper and lower connecting arms, check with the diagram above to confirm that all parts are oriented to have the leading edge rotate in clockwise direction upon final assembly. The leading edge is the thicker edge of the blade.

# GETTING STARTED



- The order of bolt, washer, material, lock washer, and nut should be observed during installation of every bolt.
- Loctite sealant should be applied on every bolt
- Torque values should be observed when tightening all bolts. See chart for torque values at each component.

## LOCATION

Connecting Arms

Blades

Generator

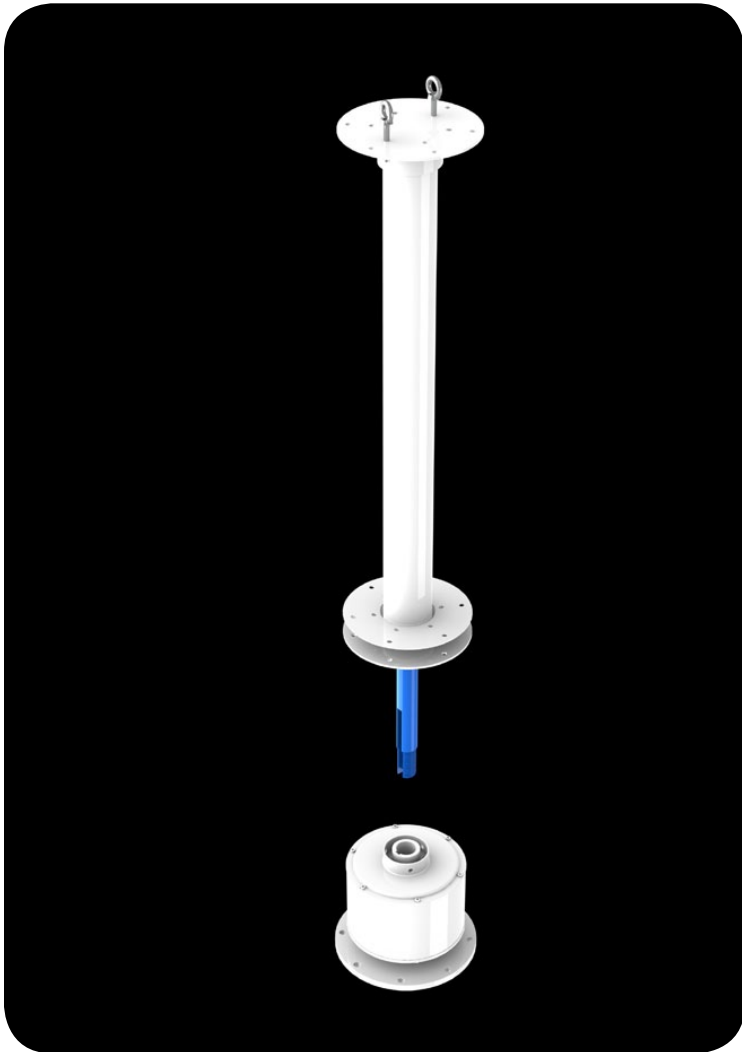
## TORQUE

35 Nm (26 ft\*lb)

20 Nm (15 ft\*lb)

305 Nm (225 ft\*lb)

# INSTALLATION



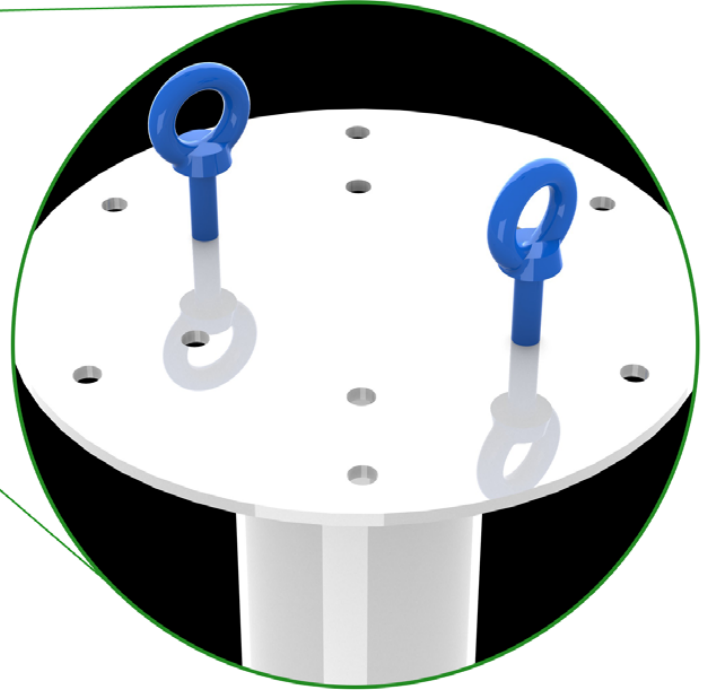
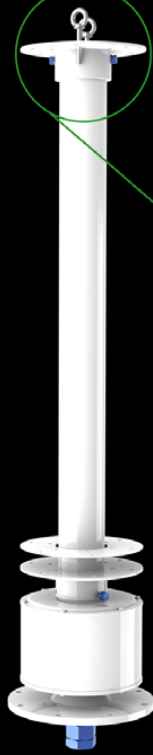
 **NOTE**

In earlier UGE-4K models, the axis and the generator did not come pre-assembled together. Please contact UGE technical support for installation instructions for this version turbine.



# INSTALLATION

## STEP 1



Round Eye Nut  
X 2



M16X110  
X 2

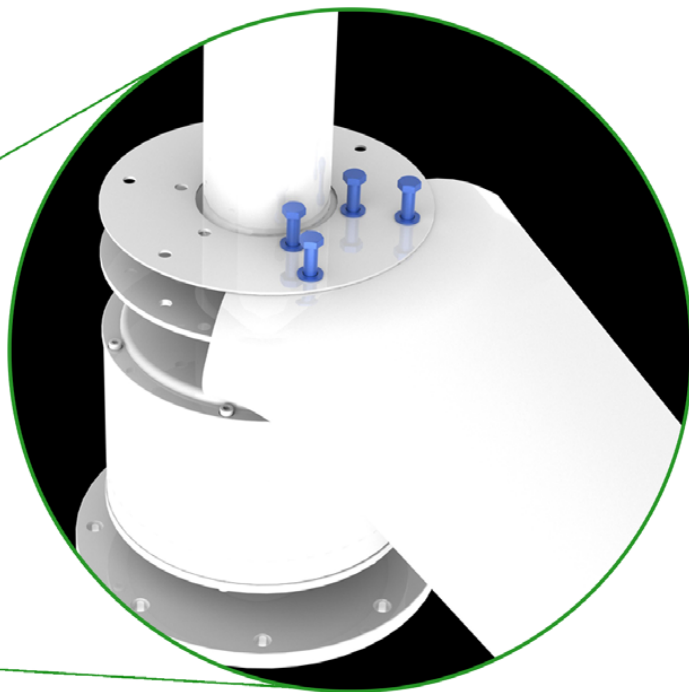
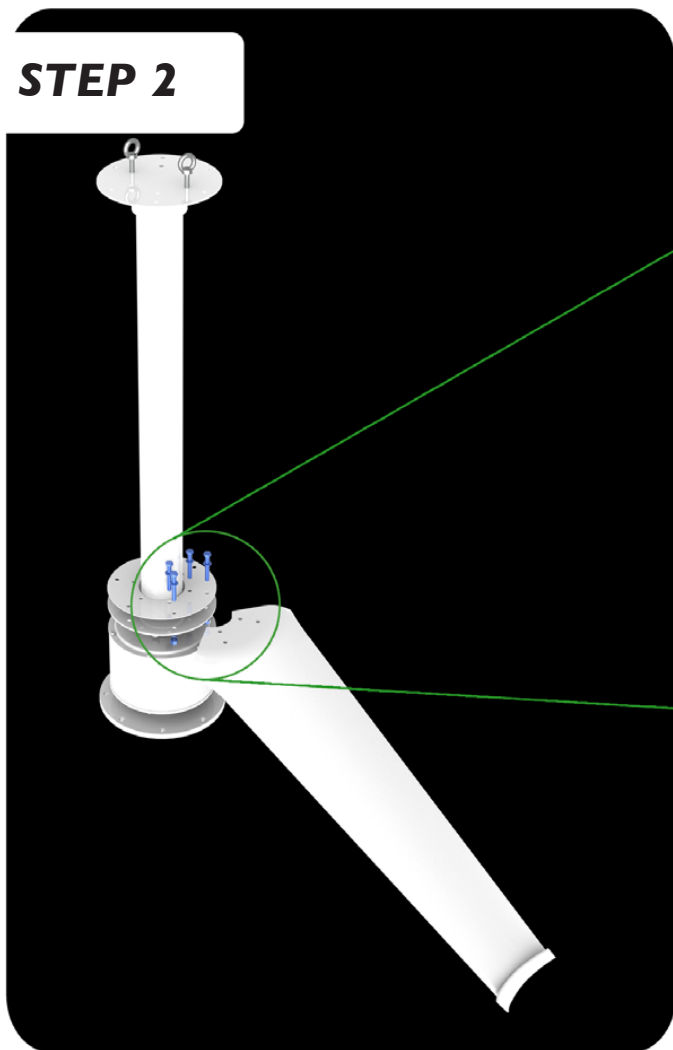
## AXIS PREPARATION

Tool needed: Wrl

Screw the M16X110 bolts through the top flange of the generator axis and the top axis plate, and into the round eye nuts. Tighten the bolts onto the round eye nuts with two nuts to form an eyehook. This allows the crane to operate and lift the axis without damaging the shaft. These two eyehooks will remain in these locations until the end of assembly. When connecting the upper connecting arms (**STEP 4, STEP 5**), the eyehooks take the place of two M16X110 bolts. Use strap to connect eyehooks to crane and lift generator and axis onto assembly stand.

# INSTALLATION

## STEP 2



Bolt M16X110  
X 4

### **ATTACH LOWER CONNECTING ARM**

Tool needed: Wrl

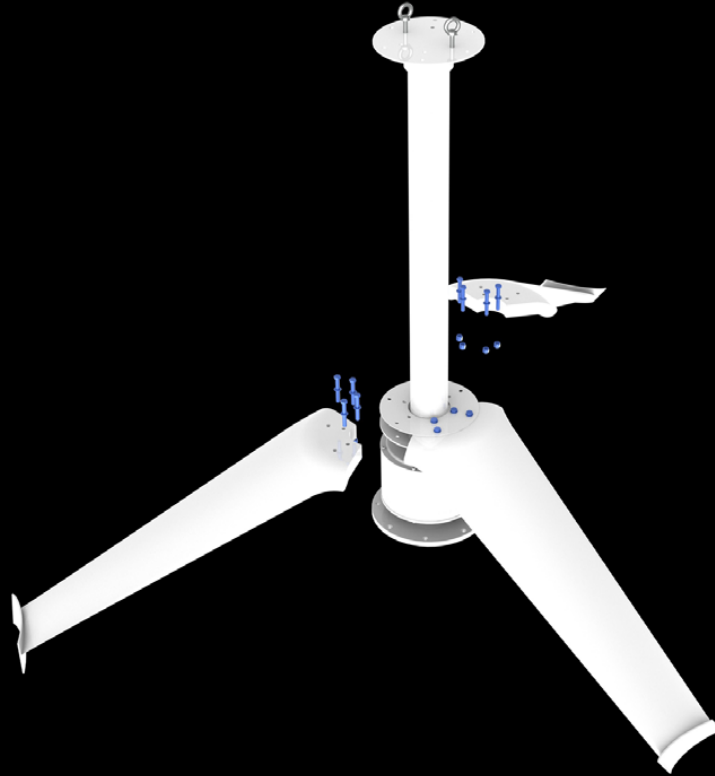
Place the lower connecting arm between the two lower connection plate flanges. Secure in place with bolts M16X110. Tighten M16X110 bolts with washers and nuts.

#### **NOTE:**

**DIFFERENTIATE THE UPPER CONNECTING ARMS WITH THE LOWER CONNECTING ARMS. CORRECT SETUP IS INDICATED BY THE LEADING EDGE OF BOTH TYPES OF CONNECTING ARMS ROTATING TOWARDS THE CLOCKWISE DIRECTION. (SEE ITEM 2 IN THE GETTING STARTED SECTION)**

# INSTALLATION

## STEP 3



Bolt M16X110  
X 8

### **COMPLETE LOWER CONNECTING ARM ASSEMBLY**

Tool needed: Wrtl

Repeat **STEP 2** for the 2 remaining lower connecting arms.

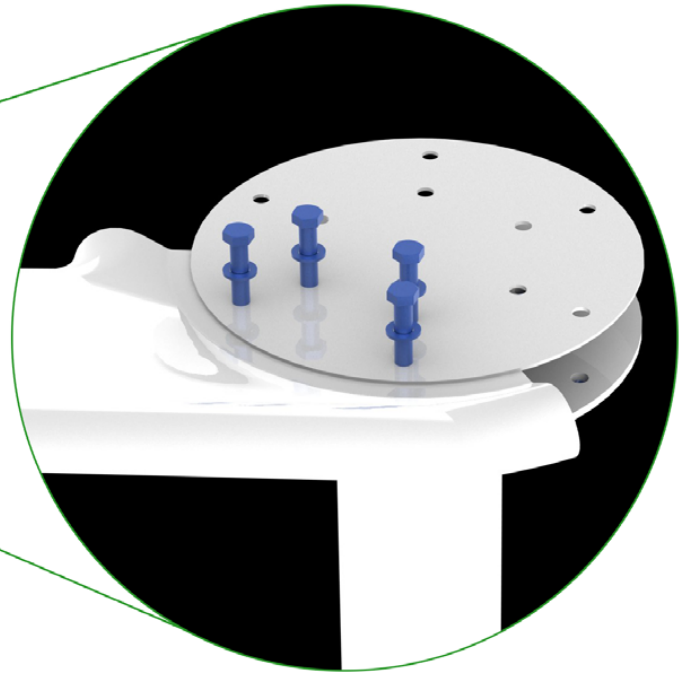
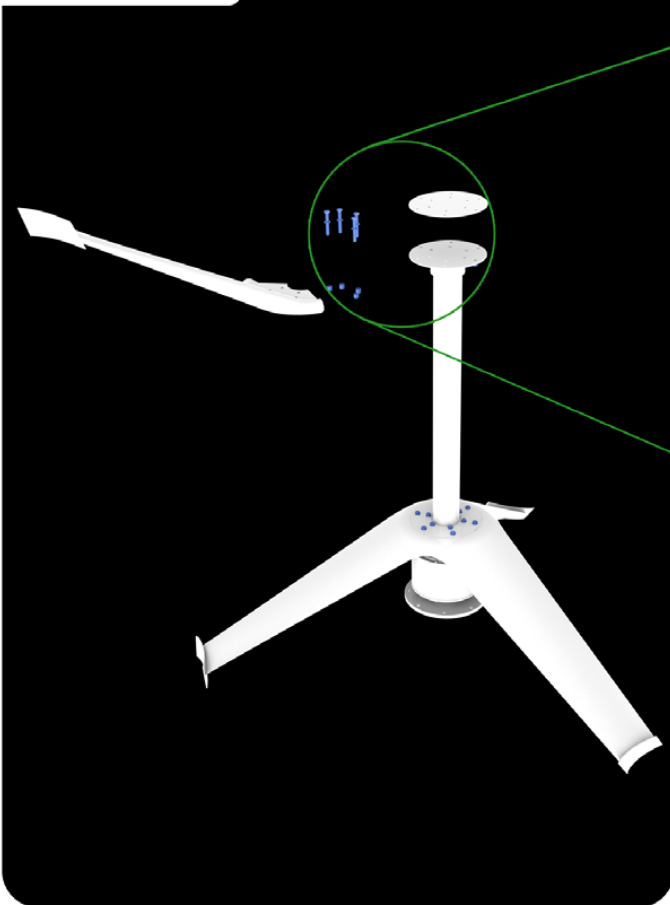


#### **NOTE:**

**ENSURE BOLTS ARE ONLY HAND TIGHT UNTIL ALL BLADES ARE INSTALLED. THE BOLTS SHOULD THEN BE GRADUALLY TIGHTENED FOR EACH BLADE AND CORRESPONDING CONNECTING ARM IN TURN. THIS PROCESS SHOULD BE REPEATED UNTIL BOLTS ARE TIGHT TO ENSURE GOOD FIT-UP OF BLADES AND CONNECTING ARMS. WHEN BLADES ARE FULLY ASSEMBLED, RETURN TO THE BOLTS TO ENSURE THAT THEY ARE TIGHTENED TO THE CORRECT TORQUE REQUIREMENT.**

# INSTALLATION

## STEP 4



Bolt M16X110  
X 4

### **ATTACH UPPER CONNECTING ARM**

Tool needed: Wrtl

Position the upper connecting arms between the two upper connection plate flanges. Secure in place with bolts M16X110. In this step, all bolts used are the same.

NOTE: Eyehooks need to be removed in order to install the top connecting arms. Eyenuts may be reconnected to bolts after connecting arms are installed if needed to lift the turbine into place.

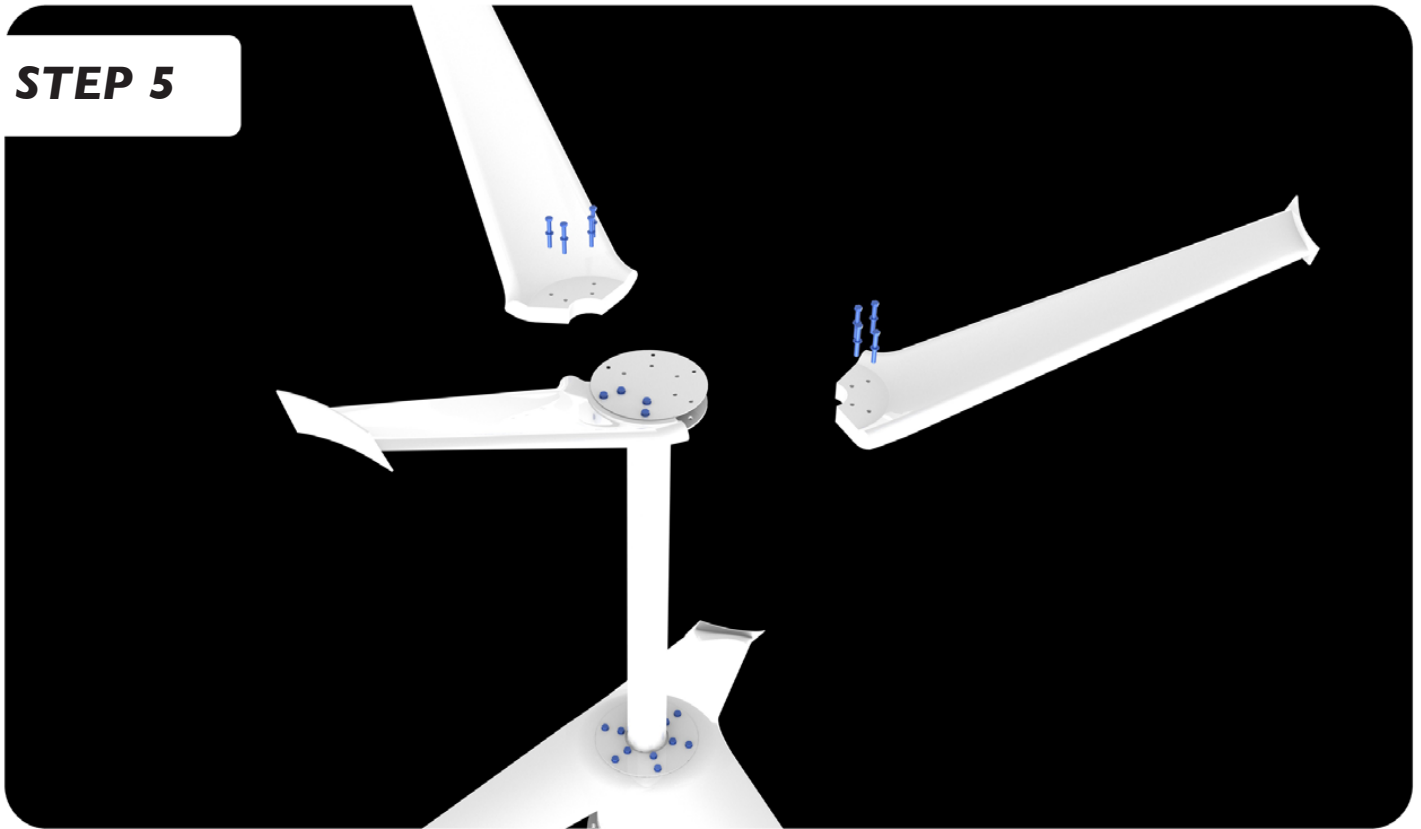


#### **NOTE:**

**DIFFERENTIATE THE UPPER CONNECTING ARMS WITH THE LOWER CONNECTING ARMS. CORRECT SETUP IS INDICATED BY THE LEADING EDGE ROTATING TOWARDS THE CLOCKWISE DIRECTION. (SEE ITEM 2 IN THE GETTING STARTED SECTION)**

# INSTALLATION

## STEP 5



Bolt M16X110  
X 8

### COMPLETE UPPER CONNECTING ARM ASSEMBLY

Tool needed: Wrl

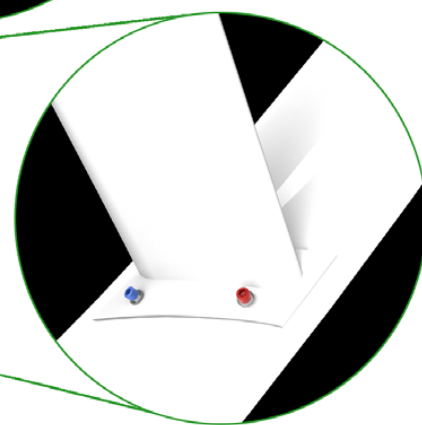
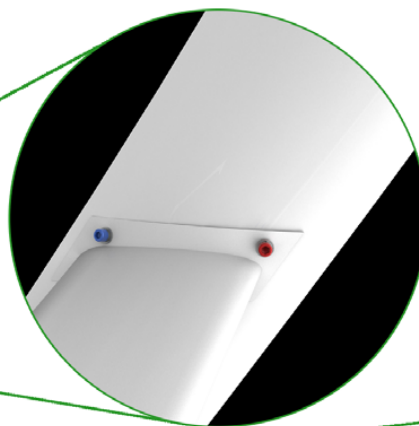
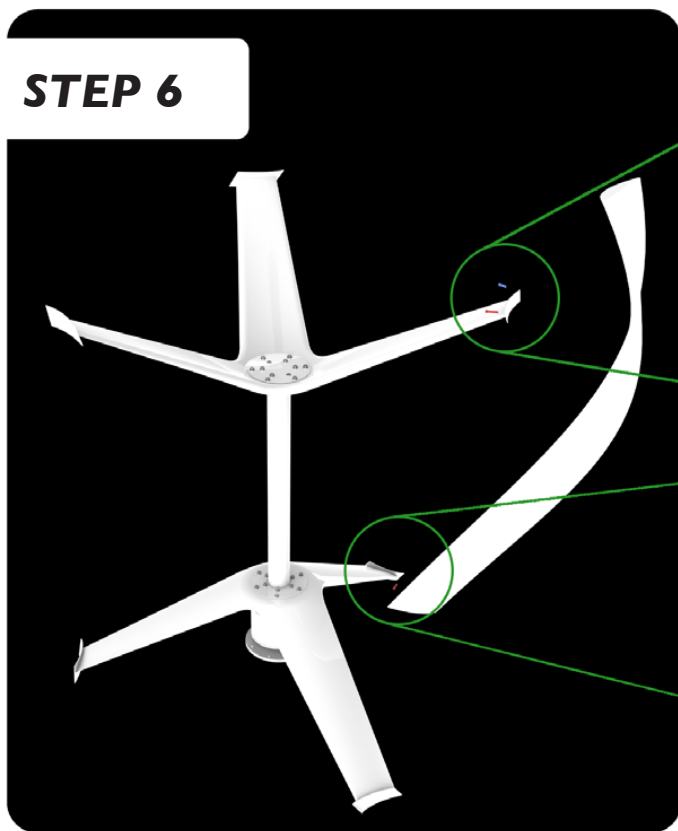
Repeat **STEP 4** for the 2 remaining upper connecting arms. The eyehooks will be replaced with two M16X110 bolts at the end of assembly.

#### **NOTE:**

**RECALL IN STEP 2 THE EYEHOOKS ARE USED AS BOLT M16X95 WITH THE UPPER CONNECTION ARMS, AND WILL REMAIN IN POSITION UNTIL INSTALLATION IS COMPLETE.**

# INSTALLATION

## STEP 6



Bolt M12X60  
X 2



Bolt M12X35  
X 2

### **BLADE ASSEMBLY**

Tools needed: Hex I

Position Turbine Blade adjacent to corresponding upper connecting arm and lower connecting arm. Place rubber gaskets between connecting arm and blade. Use bolts M12X60 and M12X35 to fasten the blade to the connecting arms. Bolts M12X60 are used for the leading edge, and bolts M12X35 for the trailing edge of the blade.

#### **NOTE:**

**MANY INSTALLERS FIND IT EASIEST TO CONNECT THE BLADES TO THE CONNECTING ARMS WHEN FASTENING THE BOLTS IN THIS ORDER: TRAILING EDGE TOP, LEADING EDGE TOP, TRAILING EDGE BOTTOM, LEADING EDGE BOTTOM.**

# INSTALLATION

## STEP 7



Bolt M12X60  
× 4



Bolt M12X35  
× 4

### COMPLETE BLADE ASSEMBLY

Tools needed: Hex I

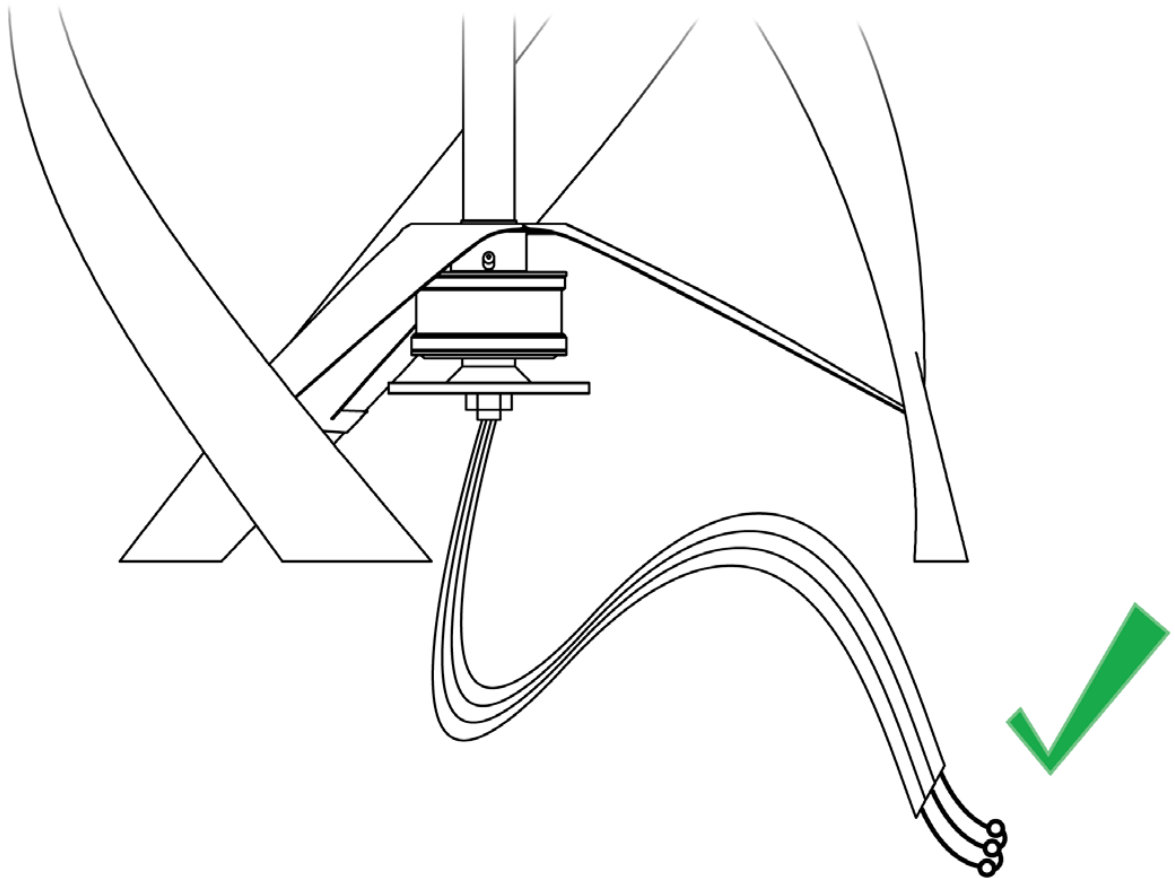
Repeat **STEP 6** for remaining 2 blades. With all blades installed, the turbine can now rotate freely without any resistance. This confirms that the turbine is good for operation.



**CAUTION:**  
**BEFORE PROCEEDING, RETURN TO ALL BOLTS AND ENSURE THAT THEY HAVE NOW BEEN TIGHTENED TO THE NECESSARY TORQUE REQUIREMENTS. SEALANT SHOULD BE APPLIED TO GAPS BETWEEN BLADES AND CONNECTING ARMS.**

# INSTALLATION

## STEP 8



### SHORT CIRCUIT GENERATOR



**CAUTION:** BEFORE INSTALLING THE TURBINE ON THE TOWER, THE GENERATOR WIRES MUST BE SHORT CIRCUITED TO PREVENT THE TURBINE FROM FREE SPINNING. THIS CAN BE DONE BY TYING THE STRIPPED ENDS OF THE GENERATOR WIRES TOGETHER.

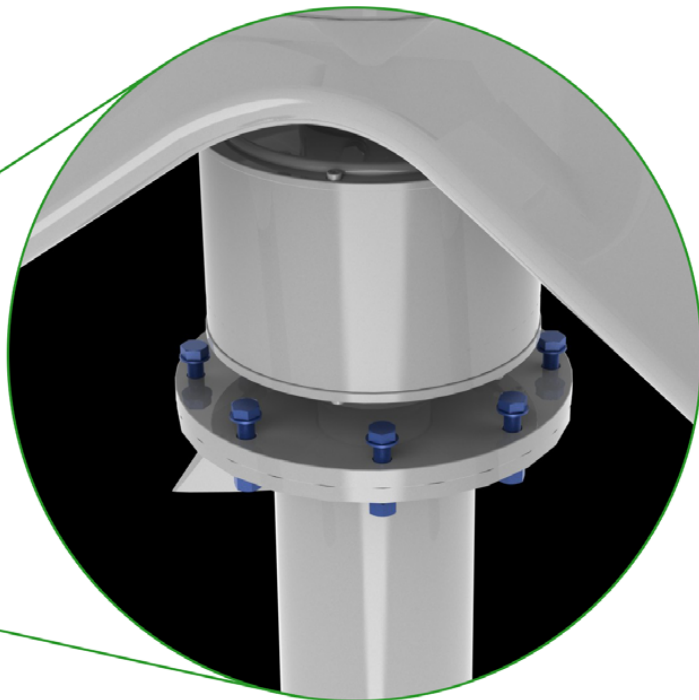
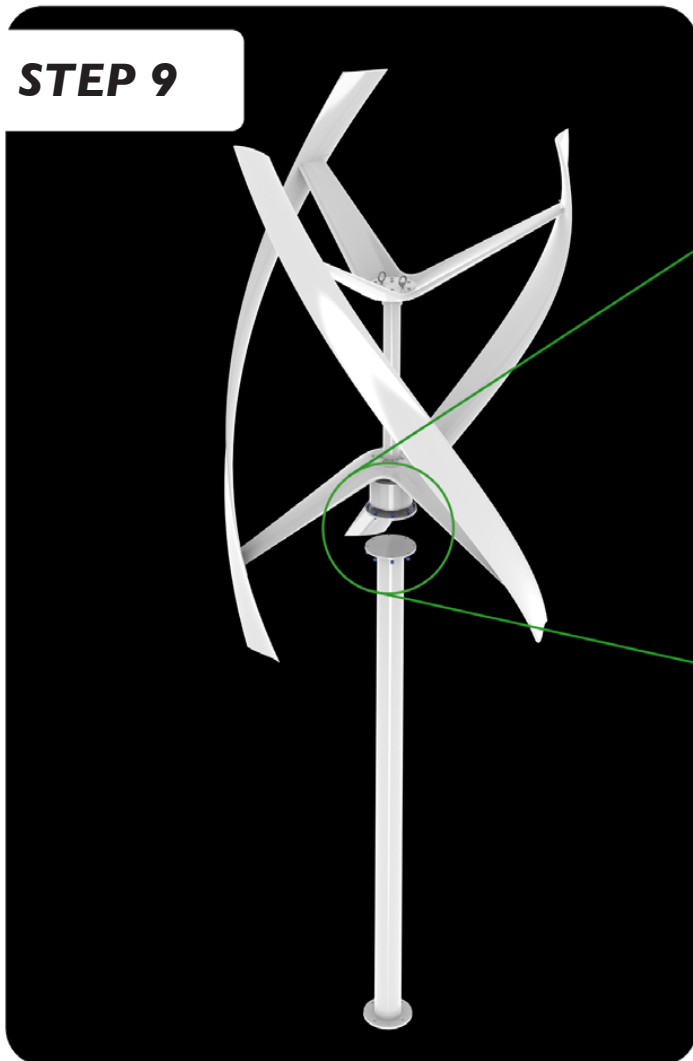


**NOTE:** MAKE SURE YOU WRITE DOWN THE SERIAL NUMBER LISTED ON THE GENERATOR FOR THE WARRANTY BEFORE LIFTING IT UP ON THE TOWER.



# INSTALLATION

## STEP 9



Bolt M20X80  
X 8

### **TURBINE INSTALLATION**

Tool needed: Cr, Ls, Wr1, Wr2

Lift the wind turbine onto tower, and mount onto supporting tower upper flange with bolts M20X80

**⚠ CAUTION:** **TURBINE BLADES SHOULD BE PHYSICALLY TIED DOWN TO PREVENT FREE SPINNING WHEN MOUNTING ON SUPPORTING TOWER.**

Congratulations! You have completed the assembly of the UGE-4K Vertical Axis Wind Turbine unit. For the next steps of installation on how to connect your turbine to the Grid or your Battery Backup system, refer to the electronics installation manual.

# COMMISSIONING CHECKLIST

## GRID-TIE

WITH THE SYSTEM PROPERLY WIRED PER THE SUPPLIED WIRING DIAGRAM, ENGAGE THE SAFETY BRAKE AND OPEN THE AC DISCONNECT SWITCHES #1 AND #2 BEFORE RUNNING THE FOLLOWING TESTS

### **Safety Brake Switch**

- Confirm the resistance between each phase is  $0\ \Omega$

### **AC Disconnect Switch #1**

- Confirm a switch is present between the turbine and PVI-7200
- Confirm the switch rating meets or exceeds the recommended values as shown in the supplied wiring diagram

### **Wind Interface Box**

- Confirm model - PVI-7200
- Confirm continuity across all three fuses inside the PVI-7200

### **Diversion Load**

- Confirm the resistance of the diversion load is appropriate for the specific turbine:
- $35 - 65\ \Omega$  for UGE-4K

### **Inverter**

- Confirm model
- PVI-4200 for UGE-4K
- Using the Aurora Installer software, confirm the correct MPPT is programmed to the inverter AND that the "Vin Start" input is set appropriately.
- Confirm on the LCD screen that the nominal grid voltage is correct, and that the inverter to grid connection is wired per the inverter manual.

### **AC Disconnect #2**

- Confirm a switch is present between the PVI-4200 inverter and the main panel
- Confirm the switch rating meets or exceeds the recommended value

### **Grounding**

- Confirm the resistance between all grounding conductors is  $0\ \Omega$

WITH THE SYSTEM PROPERLY WIRED PER THE SUPPLIED WIRING DIAGRAM, CLOSE THE AC DISCONNECTS #1 AND #2 AND DISENGAGE THE SAFETY BRAKE

### **Safety Brake Switch & AC Disconnect #1**

- Confirm a voltage exists between each phase with turbine spinning at the input terminals. (If there is no wind present, the turbine can be manually spun by hand to confirm voltage presence).

### **PVI-7200 Wind Interface Box**

- Measure the voltage at the turbine input terminals. This value will vary based on turbine RPM. (If there is no wind present, the turbine can be manually spun by hand to confirm voltage presence)

### **PVI-4200 Inverter**

- Confirm the inverter turns on at 50VDC, shows no errors and successfully connects to the grid.

# COMMISSIONING CHECKLIST

## OFF-GRID

WITH THE SYSTEM PROPERLY WIRED PER THE SUPPLIED WIRING DIAGRAM, ENGAGE THE SAFETY BRAKE AND OPEN ALL AC DISCONNECT SWITCHES BEFORE RUNNING THE FOLLOWING TESTS

### **Safety Brake Switch**

- Confirm the resistance between each phase is 0  $\Omega$

### **AC Disconnect Switch #1**

- Confirm a switch is present between the turbine and off-grid controller
- Confirm the switch rating meets or exceeds the recommended value

### **Controller**

- Confirm model - UGE-4K-OGC
- Confirm diversion load is present and connected to controller.

### **Batteries**

- Confirm battery voltage matches system voltage - 48V

### **Inverter (if applicable)**

- Confirm model according to local requirements and system voltage

### **AC Disconnect #2 (if applicable)**

- Confirm a switch is present between the inverter and the electric panel
- Confirm the switch rating meets or exceeds the recommended value

### **AC Disconnect #3 (if applicable)**

- Confirm a switch is present between the inverter and the main panel
- Confirm the switch rating meets or exceeds the recommended value

### **Grounding**

- Confirm the resistance between all grounding conductors is 0  $\Omega$

WITH THE SYSTEM PROPERLY WIRED PER THE SUPPLIED WIRING DIAGRAM, CLOSE THE AC DISCONNECTS SWITCHES AND DISENGAGE THE SAFETY BRAKE

### **Safety Brake Switch & AC Disconnect #1**

- Confirm a voltage exists between each phase with turbine spinning at the input terminals (If there is no wind present, the turbine can be manually spun by hand to confirm voltage presence)

### **Controller**

- Measure the voltage at the turbine input terminals and verify that the turbine light is flashing, indicating charging. (If there is no wind present, the turbine can be manually spun by hand to confirm voltage presence)

### **Inverter (if applicable)**

- Confirm that the inverter is creating the appropriate voltage and frequency desired and powering the appropriate devices

# OPERATION

Your UGE turbine is designed to operate with minimum action required on the part of the owner. If wired correctly, the controller or wind interface box / inverter combination will keep the turbine spinning at an optimum and safe RPM regardless of the wind speed. Please see the installation and/or owner's manuals for the turbine's electronics for more information on the proper operation of that equipment.

***Please follow the instructions below to ensure proper function of your wind turbine:***

- Unless the safety break is engaged, AC disconnect switch #1, the switch between the turbine and the controller or wind interface box, must be in the closed (on or engaged) position. This switch should be locked in the closed position with a combination lock, key lock, or zip tie. Locking this switch is a requirement for the activation of the warranty. Leaving this switch in the open position with the safety break not engaged can lead to a free-spinning situation, potentially damaging the turbine, and voiding the turbine's warranty.
- The covers of all electronic components shall remain on those components unless maintenance is being performed on the turbine or electronics. These covers shall only be removed by qualified personnel such as a UGE distributor, licensed contractor, or certified electrician, or by an individual under the direct supervision of UGE technical staff.
- The safety break may be engaged and disengaged at the owner's discretion. During times of high wind, the turbine may spin slowly even with the safety break engaged. This is normal. If the turbine is rotating when the safety break is engaged, the turbine should coast to a stop or very low RPM within 5 seconds. It is not recommended that the owner regularly engage the safety break when the turbine is rotating quickly.
- If the tower was purchased with a hinge and manual or motorized raising system, the owner may raise and lower the tower at their discretion. The safety break shall be engaged before raising or lowering the tower to prevent the turbine from spinning during the transition. It is recommended that the tower not be raised or lowered at times with wind speeds above 5 m/s [11 mph]
- If the turbine appears to be spinning off balance or begins to emit a noticeable sound, engage the safety break and contact UGE technical support at (917) 720-5685 ext. 6 or at [techsupport@urbangreenenergy.com](mailto:techsupport@urbangreenenergy.com)

# FAQ

1. **Does the UGE-4K need lightning protection?**

Lightning protection can be introduced to minimize the likelihood of high voltage and high current damage to the turbine and the control electronics. An ideal lightning protection solution is for any lightning strike to pass directly to ground without interfering with either the turbine control systems or entering into the building.

2. **What happens if I lose power from my utility company?**

Any inverter supplied by Urban Green Energy will have anti-islanding protection, meaning that the turbine will not be able to deliver current to the grid. This is a requirement to ensure the power lines can be repaired safely in the event of a fault.

3. **When should I contact the service center?**

Contact your merchant if the turbine is making loud and unusual sounds and if the turbine is not spinning in response to strong persistent wind. Your distributor may contact the UGE service center, or recommend you contact us directly.

4. **What should I do if I'm expecting a severe storm?**

The UGE-4k is capable of lasting a severe storm, however if you have the opportunity it is advisable to turn on the safety brake and anchor the turbine with a rope or other physical anchor.

5. **How do I shut down UGE-4K?**

Engage the safety break to stop the turbine from spinning

6. **Can I leave the UGE-4K unattended?**

Yes, your turbine is able to operate without user feedback.

7. **Can I mount UGE-4K to my roof?**

Structural considerations must be taken into account for your safety and the integrity of your building. It is also recommended a tower be installed to elevate the turbine above the level of the roof and where there is better quality wind.

8. **Can I recycle my turbine?**

When the turbine has reached the end of its usable life it should be brought to a proper recycling center since the metal in the turbine and electronics can be reused. The tower has a design life much longer than 20 years and may be reused to support a future small wind turbine.

# WARRANTY INFO

## **URBAN GREEN ENERGY, INC. THREE YEAR LIMITED WARRANTY AGREEMENT**

This Agreement (“Agreement”) is between you and Urban Green Energy, Inc. (“UGE”) and applies to UGE branded products (“Product”) and services purchased by you from UGE or any of its subsidiaries or affiliates or a UGE authorized reseller (“Reseller”), unless you enter into a separate written agreement with UGE. BY PURCHASING A UGE PRODUCT YOU AGREE THAT THIS AGREEMENT APPLIES TO YOU.

YOU MUST REGISTER THIS LIMITED WARRANTY AGREEMENT AND RECEIVE ACCEPTANCE BEFORE YOU TURN ON YOUR WIND TURBINE.

The term of this Limited Warranty is three (3) years (the “Limited Warranty Period”). For the UGE-600, UGE-1K, UGE-4K vertical axis wind turbine;

Serial number\_\_\_\_\_

Vertical axis wind turbine model type\_\_\_\_\_

Vertical axis wind turbine is grid tie or off grid?\_\_\_\_\_

Customer Name\_\_\_\_\_

Customer Phone Number\_\_\_\_\_

Customer Email\_\_\_\_\_

Turbine Installation Site Address\_\_\_\_\_

The Limited Warranty Period begins on the date of product installation. The installation must be performed by qualified personnel, such as a certified electrician, an employee of a licensed contractor or an employee of an UGE distributor; this list is exemplary and by no means limiting. The date of installation may occur in the 12 month period following the delivery date of the product to the distributor. The warranty must be registered within ten (10) business days from the date of installation. The unit should be installed but not turned on prior to registering the warranty. The warranty registration period will expire at midnight (local time of installation location) on the tenth (10th) day following the installation date. The expiration of the warranty registration period terminates all rights covered in this Limited Warranty Agreement.

Date of delivery to Distributor (if applicable) \_\_\_\_\_

Date of installation\_\_\_\_\_

# WARRANTY INFO

## I. Registration of Limited Warranty.

- i. Complete the online warranty registration form at [http://www.urbangreenenergy.com/warranty\\_form.php](http://www.urbangreenenergy.com/warranty_form.php) with the serial number, unit type, date of delivery to distributor, date of installation, customer information and installation location.
- ii. Submit End-Users Agreement Statement signed and dated by the End-User.
- iii. Take the following photographs:-

### Grid Tie Units

- Wind Interface Box wiring
- Inverter wiring
- Diversion Load wiring
- Safety break and Disconnect switch wiring (3x)
- Locked AC disconnect switch #1
- Overall electrical assembly picture showing all components and conduits in between the electrical boxes and showing a zip tie or other means of ensuring the AC disconnect switch between the generator and the wind interface box cannot be opened accidentally.

### Off Grid Units

- Controller wiring
- Diversion load wiring
- Safety break and Disconnect switch wiring (3x)
- Locked AC disconnect switch #1
- Overall electrical assembly picture showing all components and conduits in between the electrical boxes and showing a zip tie or other means of ensuring the AC disconnect switch between the generator and the controller cannot be opened accidentally.

iv. In the event the product is not installed using a tower supplied by UGE, you must submit professional technical design drawings of the tower and calculations of strength, deflection and vibrations. For non-UGE supplied towers not installed with a standard foundation, you must submit drawings and strength, deflection and vibration calculations of any mounting provisions. For installations using UGE supplied towers but not our foundations, you must submit drawings of any mounting provisions. Please note that it is not the responsibility of UGE to review these drawings and/or calculations and they will only be kept on record if needed for future troubleshooting.

UGE does not accept responsibility for damage to UGE manufactured products resulting from the use of non-UGE supplied towers, roof mounts or electronics. Please note that if you choose to use non-UGE supplied parts you should ensure that the towers are designed adequately for the loads the turbine will experience and that all other parts are suitable for the installation.

v. Email the photographs and tower design, as applicable per iv. above, to [warranty@urbangreenenergy.com](mailto:warranty@urbangreenenergy.com).

vi. You will receive confirmation within two (2) business days of submitting the required images via email.

vii. Once you have received approval by way of a UGE Warranty Certificate you will not invalidate the warranty by turning your installed turbine on.

# WARRANTY INFO

2. Maintenance. To qualify for the full Limited Warranty period, the product must undergo full maintenance once within the first month of installation and following the first full maintenance, once every 12 months. Product maintenance should be registered by downloading the maintenance form from the UGE website. The form should be filled in and submitted to [techsupport@urbangreenenergy.com](mailto:techsupport@urbangreenenergy.com). The form should be submitted not more than 2 months from the date of installation and within ten (10) days from the date maintenance is performed. Then annually thereafter maintenance should be performed in no more than 13 month increments. All maintenance forms must be submitted in not more than ten (10) days following the date the maintenance is performed. Annual maintenance must be performed until the life of the general or extended warranty has terminated. Please note that failure to submit annual maintenance reports will invalidate the warranty.

3. Product Limited Warranty. UGE warrants that its Products will be free from defects in materials and workmanship, under normal use for which it is intended, for the Limited Warranty Period. During the Limited Warranty Period, UGE may, at its option: (i) provide replacement parts necessary to repair the Product, (ii) repair the Product or replace it with a comparable product, or (iii) refund the amount you paid for the Product, less depreciation of ten percent (10%), upon its return, provided that UGE may, at its sole option, attempt to remediate any defects via technical support through telephone or electronic communication prior to taking any actions outlined in items (i) through (iii) listed above. It is hereby agreed and understood that UGE shall not be responsible for the installation of replacement parts or replacement products. Replacement parts and products shall be shipped at no cost to you and shall be new or serviceably used, comparable in function and performance to the original part and warranted for the remainder of the Limited Warranty Period.

4. Warranty Limitations. This limited warranty does not cover misuse or minor imperfections in units that meet design specifications or imperfections that do not materially alter functionality. This limited warranty does not cover and UGE is not responsible for (1) damages caused by misuse, abuse, accidents, fire, acts of God, theft, disappearance, misplacement, power surges, viruses, reckless, willful, or intentional conduct, including, without limitation, damages caused by tampering with or dismantling any portion of the Product including its generator; (2) damages caused by servicing not authorized by UGE; (3) damages caused by usage that is not in accordance with Product instructions; (4) damages caused by failure to follow the Product instructions; (5) damages caused by the combination of Products with other non-UGE branded products, accessories, parts or components; (6) any equipment or components that were not included in your Product as originally sold to you; (7) normal wear and tear; (8) cosmetic damage that does not affect functionality or (9) damages or loss of function sustained as a result of wind speeds exceeding 55 m/s, lightning or hail or any other insurable loss under standard fire and extended coverage policies generally available for endorsement to you; (10) re-configuration or re-connection of the electronics by a non-UGE authorized distributor; (11) units which have been turned on with out approval, wherein approval is granted by way of a UGE Warranty Certificate corresponding to the unit serial number; (12) units which have been allowed to free spin. Note that if the turbine is installed first and not tied down or short circuited while the electronics are being installed and the warranty approved, the unit can still free spin and damage the blades, bearings and other parts. **DAMAGE INCURRED DUE TO FREE SPINNING IS NOT COVERED BY THIS OR ANY OTHER WARRANTY.** (13) If a non-UGE authorized distributor configures, re-configures or re-connects the electronics for any UGE product this will automatically void the warranty on all components of the product; this includes the turbine.

5. Services and Service Limited Warranty. Any services provided to you by UGE that are not within the scope of the Limited Warranty also are governed by this Agreement. For a period of ninety (90) days after services are



# WARRANTY INFO

performed, UGE warrants that services provided by it were performed in a professional and workmanlike manner. If your problem recurs within the 90 day service warranty period, UGE will, at its option, (1) re-perform the services, (2) replace the Product pursuant to the terms of this Agreement, or (3) permit you to return the Product and issue a refund pursuant to the terms of this Agreement. If you purchased an extended warranty, such as the UGE Extended Warranty Plan, please refer to the service plan for the coverage, duration and terms of service.

6. Instructions for Warranty Service. To obtain warranty service you must (1) notify UGE within ten (10) days of knowledge of any defect in Product, or any failure of the Product to function properly, (2) assist UGE in diagnosing issues with your Product and follow UGE's warranty processes and (3) obtain warranty service from UGE or an authorized service provider specified by UGE. UGE will not reimburse you for service performed by others.

7. Implied Warranties. EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS LIMITED IN DURATION TO THE DURATION OF THIS WARRANTY.

8. Limitation of Liability. UGE SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY. UGE'S MAXIMUM LIABILITY TO YOU IS LIMITED TO PURCHASE PRICE YOU PAID FOR PRODUCTS OR SERVICES PLUS INTEREST ALLOWED BY LAW. UGE IS NOT LIABLE TO YOU IF IT IS UNABLE TO PERFORM DUE TO EVENTS IT IS NOT ABLE TO CONTROL, SUCH AS ACTS OF GOD, PROPERTY DAMAGE, LOSS OF USE, INTERRUPTION OF BUSINESS, LOST PROFITS, LOST DATA OR OTHER CONSEQUENTIAL, PUNITIVE OR SPECIAL DAMAGES, HOWSOEVER CAUSED, WHETHER FOR BREACH OF WARRANTY, CONTRACT, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY OR OTHERWISE.

9. Dispute Resolution. If a dispute or claim is not resolved by you and UGE, then it shall be finally settled by arbitration in accordance with the then current rules of arbitration of the American Arbitration Association by three (3) arbitrators, one selected by each party and the third selected in accordance with such rules. Such arbitration shall be held in New York, New York, and the proceedings and all pleadings, filings, written evidence, decisions and other relevant documents shall be in English. Any final decision issued in the arbitration shall be in writing, and binding and conclusive upon the parties to this Agreement and may be entered as a final judgment by any court of competent jurisdiction. Each Party shall bear its own costs in connection with the foregoing arbitration. This agreement shall be governed by the laws of the state of New York, without regard to conflicts of laws rules.

10. General. UGE may assign this Agreement and/or any associated service plan without your consent and without notice to you. If UGE does assign this Agreement and/or any associated service plan, the assignee will assume all obligations to you, UGE will be released of all obligations, and you agree to look solely to the assignee for the performance of all obligations under this Agreement and/or any associated service plan. UGE and its subsidiaries and affiliates are intended beneficiaries of this Agreement. If there is any inconsistency between this Agreement and any other agreement included with or relating to Products or services purchased from UGE, this Agreement shall govern. This Agreement may not be modified, altered or amended without the written agreement of UGE. Any additional or altered terms shall be null and void, unless expressly agreed to in writing by UGE. If any term of this Agreement is illegal or unenforceable, the legality and enforceability of the remaining provisions shall not be affected or impaired.

# WARRANTY INFO

11. Modifications. UGE reserves the right to change the terms of this Limited Warranty in the future. UGE reserves the right to make design changes, improvements and/or additions to its products without obligation to install such in products previously manufactured.

# MAINTENANCE

After 1 month, and every year on the anniversary of the turbine's installation, it is required that your UGE-4K undergo a checkup. Although there is no routine or service requirement beyond this you should be aware of any unusual behavior or sounds. If this occurs it is best to utilize the safety brake to stop the turbine and then contact your distributor or the service center.



## **CAUTION:**

**THE MAINTENANCE CHECK SHOULD BE PERFORMED ON A DAY WITH CALM WINDS, 5M/S [11MPH] OR LESS. PRIOR TO PERFORMING ANY MAINTENANCE ON THE TURBINE, ENGAGE THE SAFETY BREAK TO PREVENT THE TURBINE FROM SPINNING.**

Equipment that you will need for the maintenance check includes:

- Ohm meteter
- Volt meter
- Digital level
- A bucket truck or other man lifting device may be needed to clean the turbine.

The routine checkup of your turbine should include:

- Clean the blades so that they are free of dust or bug matter
- All bolts tightened to required torque values
- Blades are free of defects
- Connecting arms are free of defects
- No abnormal noises from spinning turbine
- Tower is free of rust or other visible defects
- WIB/Controller functional
- 3 Fuses in WIB show continuity (if applicable)
- Inverter functional and displays no error messages (if present)
- Verifying the resistance of the diversion load
- Voltage produced when spinning turbine
- All wires securely attached to ports
- No rust exists on electrical connection points or inside enclosures
- Turbine, tower, and all electrical components are still properly grounded
- Batteries are within operable life
- Top plate of tower is plumb within 1 degree of horizontal

Release the safety break after the maintenance check is complete.

# NOTES

# NOTES

# TECHNICAL SUPPORT

If your product requires troubleshooting or warranty service, contact your merchant. If you are unable to contact your merchant, or the merchant is unable to provide service, contact Urban Green Energy directly at:

## Urban Green Energy

330 West 38th Street  
Suite 1103  
New York, NY 10018

Tech. Support Phone: +1 (917) 720-5685  
Email: [techsupport@urbangreenenergy.com](mailto:techsupport@urbangreenenergy.com)

February 2012  
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This equipment complies with all the fundamental requirements of the relevant standards and guidelines. All associated documents and the original Declaration of Conformity are available from the manufacturer.