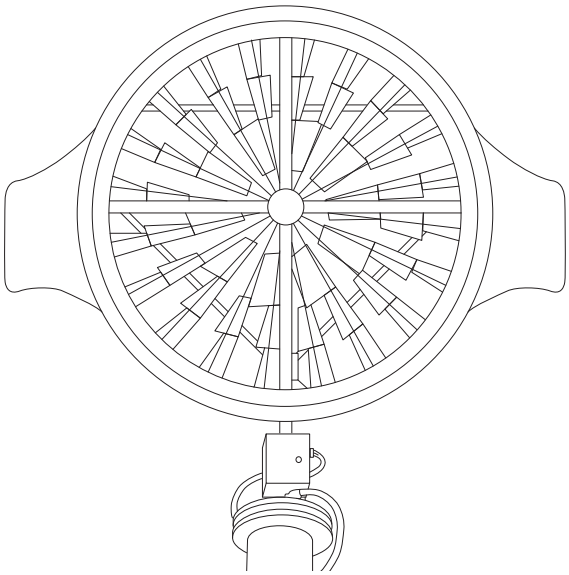
Honeywell



HONEYWELL™ Wind Turbine

Model WT6500

Owner's Manual

Thank You!

Thank you for your purchase of this award winning turbine, and welcome to the Age of Renewable Energy.

Popular Mechanics BREAKTHROUGH AWARDS 2009

2010 EDISON AWARDS INNOVATIONS & INNOVATORS

Thank you for your purchase of the **HONEYWELL**™ Wind Turbine. It is one of the most advanced wind turbine systems in the world. We are proud to offer a cost effective renewable energy technology that will provide you with many years of electric generation from an available and abundant resource; the wind. Our technology has received the prestigious Gold Edison Award in 2010 and the Breakthrough Technology Award for 2009 from Popular Mechanics. By purchasing and installing this product you have demonstrated your desire to reduce carbon dioxide emission and play a role in energy conservation.

Please take a moment to complete and return to us the Warranty Registration Card.

Serial Number _____

Model Number _____

Please note that the Warranty depends on the proper installation of the **HONEYWELL**™ Wind Turbine. Please read this Owner's Manual carefully and always use licensed and trained personnel for its proper installation.

The **HONEYWELL**™ Wind Turbine is manufactured by WindTronics. Please contact WindTronics at:

621 Sprucewood Avenue
Windsor, Ontario
N9C 0B3

877-946-3898

Safety Information

PLEASE READ THESE INSTRUCTIONS AND THE ENTIRE MANUAL PRIOR TO INSTALLATION. INSTALLATION OF THIS WIND TURBINE CAN ONLY BE PERFORMED BY A LICENSED AND TRAINED PROFESSIONAL.

Safety Icons

The following symbols identify dangers associated with the installation, use or ownership of the **HONEYWELL**™ Wind Turbine. When you see the symbols be aware of the protocol for personal injury or property damage.

WARNING	WARNING indicates a hazard that could result in death, personal injury or property damage.
CAUTION	CAUTION indicates a hazard that could result in property damage.

IMPORTANT: PLEASE TAKE NOTE

PROFESSIONAL INSTALLATION: REQUIRED

TIP: Helpful information to ease the installation

Important Safety Instructions

1. This Owner's Manual contains important instructions for the **HONEYWELL**™ Wind Turbine installation and maintenance. Please save it.

2. Read the entire Owner's Manual prior to installation and follow all warnings and cautions included in the Owner's Manual and/or attached to the **HONEYWELL**™ Wind Turbine.

3. Improper installation, adjustment, alteration, service maintenance, or use can cause fire, electrical shock, or other conditions which may cause death, personal injury or property damage.

4. The use of a licensed and trained professional for the installation and maintenance of the **HONEYWELL**™ Wind Turbine is required.

⚠ WARNING

DO NOT CONNECT THE HONEYWELL WIND TURBINE TO ANY CONTROLLER OTHER THAN THE SMARTBOX™ Controller OR OTHER CONTROLLER PRE-APPROVED, IN WRITING, BY WINDTRONICS. Failure to follow this warning will void the **HONEYWELL**™ Wind Turbine warranty and may result in death, personal injury or property damage (including damage to the **HONEYWELL**™ Wind Turbine).

5. Choose a very calm, nearly no wind, day for the installation.

6. Follow the installation procedures contained within this Owner's Manual and all safety codes. Follow the National Electric Code (NEC) and your local building zoning and zoning codes. In Canada, follow the Canadian Electrical Code (CEC).

7. Only licensed and trained personnel should move and lift the **HONEYWELL**™ Wind Turbine. The **HONEYWELL**™ Wind Turbine should only be moved using standard hoists and hydraulic lifts.

8. Appropriate protective personal equipment such as hard hat, work gloves, safety glasses, and closed toe work shoes should be worn when installing the **HONEYWELL**™ Wind Turbine.

9. Only licensed and trained personnel can perform the following maintenance functions on this **HONEYWELL**™ Wind Turbine:

    - Open and work on the **SMARTBOX**™ Control Equipment.
    - Open and work on the Junction Box at the turbine
    - Apply any torque to any of the turbine's fasteners

10. The installation directions include recommendations of a variety of options. Installation must be approved and certified by your local Professional Engineer (PE) and the installer must acquire all the necessary permits from the local authorities prior to installation.

11. Your installer must use only proper grounding methods as stipulated by the NEC or CEC if in Canada.

12. The **HONEYWELL**™ Wind Turbine is an electric generator. Therefore high voltage is generated within the system. Be sure to only use installers and maintenance professionals to perform work on this turbine.

13. Failure to complete and mail in the registration card will affect the Warranty.

14. Failure to use a licensed and trained installer or follow local codes will adversely affect the warranty coverage and possibly void your warranty.

NOTE TO INSTALLER: This Owner's Manual should be left with the owner of the **HONEYWELL**™ Wind Turbine.

Table of Contents

3. Specifications

4. Warranty Information

5. Appendix

1 Introduction

Chapter 1 describes the **HONEYWELL**™ Wind Turbine.

Product Description

The **HONEYWELL**™ Wind Turbine is a novel electric generator (Worldwide patents pending). It consists, as shown in the product detailed schematic, of a central wheel made of aluminum rim, stainless steel spokes, and aluminum hub. Two ceramic bearings are used to attach this wheel to the center shaft of the turbine. Custom-shaped glass-filled nylon blades are attached to the spokes of this wheel. Permanent magnets are affixed to the tips of these blades at the rim of the wheel.

The wind flows through this wheel with ease and it interacts with the aerodynamically designed blades to induce a rotational motion in the wheel around its center hub. This rotational motion is THE indication that wind energy is being extracted from the flowing wind stream. The magnets travel at a much higher speed for any given wheel rotation because they are located at the rim of the wheel. This placement of the permanent magnets at the blade tips produces the needed high speed motion without the need of any gearing mechanism. The elimination of gears in this wind turbine technology enhances wind energy extraction efficiency and prolongs its operating life.

The permanent magnets at the blade tips and wheel rim travel at high speed within a novel and custom-built stator system. This stator system converts the motion of these magnets into electricity. A glass-filled nylon aerodynamically shaped shroud covers the stator system.

An anemometer is attached to the **HONEYWELL**™ Wind Turbine that produces near instantaneous readings of wind speed and direction at the point of installation.

The electric output of the stator system is a variable direct current (DC) and is connected together with the anemometer wind speed and direction outputs to the **HONEYWELL**™ Wind Turbine **SMARTBOX**™ Control Equipment.

The **SMARTBOX**™ Control Equipment contains custom electronic battery charging circuits, an inverter, and a transfer switch. The **SMARTBOX**™ Control Equipment also employs a microprocessor which is programmed for optimal electric energy extraction from the wind, battery charge management, and automatically controls the transmission of electricity via the transfer switch from the Grid (switch board) or the attached battery (Not included).

Shipping Contents

1. One **HONEYWELL**™ Wind Turbine
2. Two (2) Wind Deflectors with four (4) brackets attached and eight (8) ¼”-20 S.S. locknuts
3. One (1) Deflector installation instruction manual
4. One (1) Wind Turbine inspection certificate Tag
5. One (1) Junction Box assembly including:
    - Wire harness connected to Wind Turbine which includes two (2) 14 AWG Black wire and one (1) 12 AWG Green wire
    - Davis instrument anemometer model 7911

Before Installing the **HONEYWELL™** Wind Turbine:

IMPORTANT

Please take note that the **HONEYWELL™** Wind Turbine is a proprietary wind driven electric generator. It is designed to displace annual electric consumption by connecting it to the electric switch board in the proper procedures described in this Owner's Manual. It may also be used on a stand-alone installation where connecting to a local electric grid is not possible. Its unique and high efficiency design enable it to work in very low wind areas starting at 2 miles per hour (mph) and much higher (to 38 mph). Please follow the Site Selection guidelines for optimal installation.

The **HONEYWELL™** Wind Turbine is an electric generator. Only licensed and trained personnel can perform the following installation and maintenance functions:

- Open and work on the **SMARTBOX™** Control Equipment.
- Open and work on the Junction Box at the turbine
- Apply any torque to any of the turbine's fasteners

The installation directions include recommendations of a variety of options. Installation must be approved and certified by your local Professional Engineer (PE) and the installer must acquire all the necessary permits from the local authorities prior to installation.

Your installer must use only proper grounding methods as stipulated by the NEC or CEC if in Canada.

The **HONEYWELL™** Wind Turbine is an electric generator. Therefore high voltage is generated within the system. Be sure to only use installers and maintenance professionals to perform work on this turbine.

Failure to complete and mail in the registration card will affect the Warranty.

Failure to use a licensed and trained installer or follow local codes will adversely affect the warranty coverage and possibly void your warranty.

Please contact WindTronics if there is any doubt or concern regarding this electric generator or its installation.

1-877-946-3898

Lift Point

The recommended lift point is shown in the photograph below:

2 Turbine Mounting and Wiring

Chapter 2 describes turbine installation, mounting options and electrical wiring.

Turbine Mounting

Introduction

⚠ WARNING

Hazardous voltages, currents, or other conditions that could cause serious bodily injury or death exist in this equipment or may be associated with its use.

⚠ WARNING

Personal Injury and Property Damage Hazard
STOP! If you plan to connect the **HONEYWELL**™ Wind Turbine to any controller other than the **SMARTBOX**™ Controller, immediately cease the installation of the **HONEYWELL**™ Wind Turbine. The **HONEYWELL**™ Wind Turbine can only be connected to the **SMARTBOX**™ Controller or other controller pre-approved, in writing, by WindTronics. Failure to follow this warning will void the **HONEYWELL**™ Wind Turbine warranty and may result in death, personal injury or property damage (including damage to the **HONEYWELL**™ Wind Turbine).

PROFESSIONAL INSTALLATION required

After following the unpacking procedures included in the wind turbine package, it is required that only licensed and trained personnel perform the installation and maintenance of the wind turbine.

In general the installation consists of mounting the turbine on suitable and approved mounting hardware. The installation procedure include recommendations for the mounting options. They must be approved and certified by your local Professional Engineer (PE) and a licensed and trained installer must acquire all the necessary permits from the local authorities prior to installation.

The following illustration shows the **HONEYWELL**™ Wind Turbine installation on a **ROOFBOX**™ Mount (see details on page 14). The turbine is mounted to the **ROOFBOX**™ Mount using a **QUADPOD**™ Mount (see details on page 14). The anemometer and the Junction Box are mounted by a certified and trained electrician to one of the support legs of the **QUADPOD**™ Mount. Please be aware of the warning label on the **HONEYWELL**™ Wind Turbine shroud that states the following: WARNING: TURBINE BLADES ARE NECESSARY FOR THE PROPER OPERATION. THEY ARE EXPOSED MOVING PARTS: ACCIDENT HAZARD.

⚠ CAUTION

WHEN MOUNTING ON OR OVER A COMBUSTIBLE SURFACE, A FLOOR PLATE OF AT LEAST 1.43 mm GALVANIZED OR 1.6 mm UNCOATED STEEL EXTENDED AT LEAST 150 mm BEYOND THE EQUIPMENT ON ALL SIDES MUST BE INSTALLED.

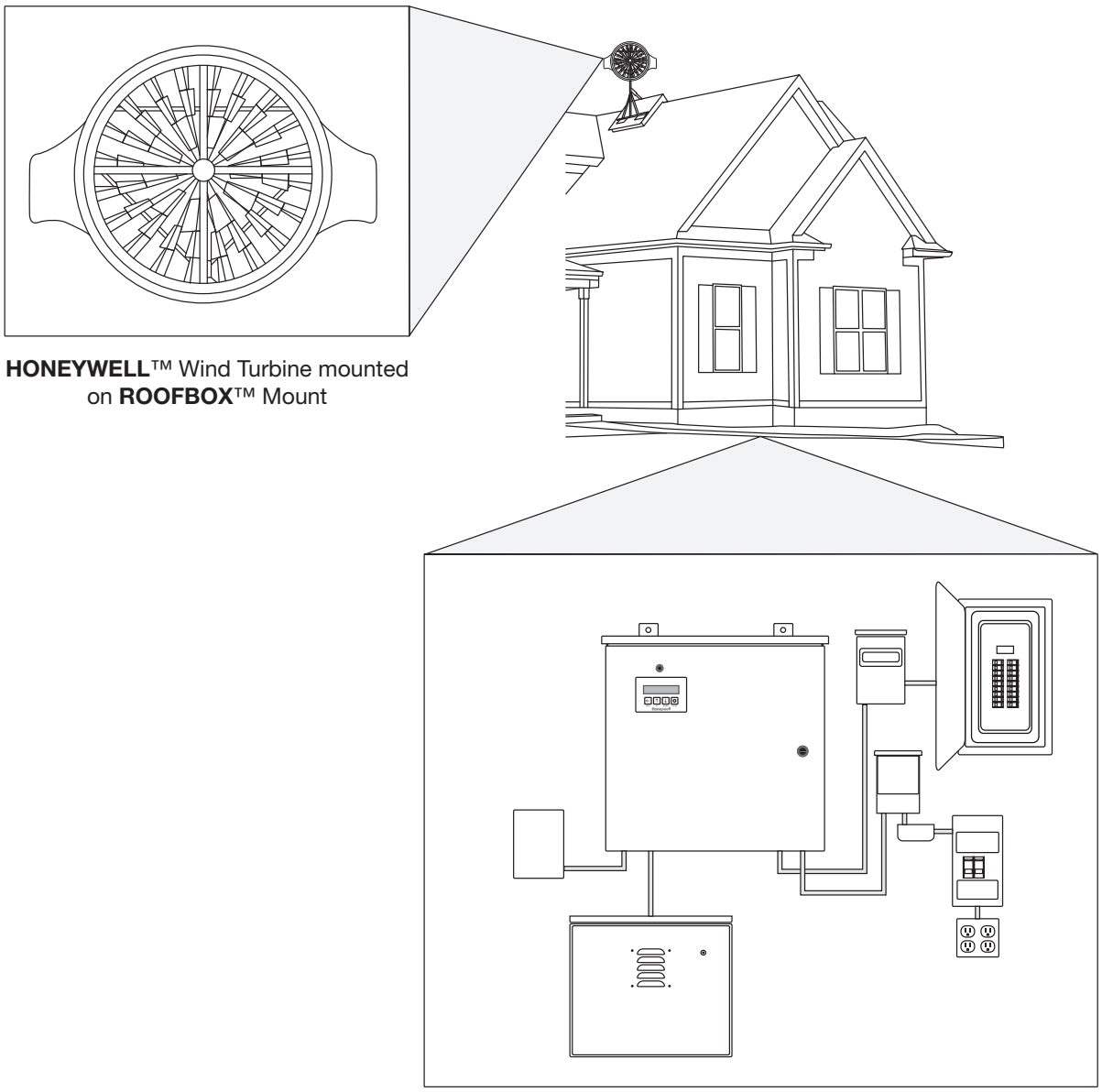
⚠ WARNING

Personal Injury and Property Damage Hazard
Do not touch revolving turbine blades or insert objects, including sticks and screwdrivers, into revolving turbine blades. Failure to follow this warning may result in death, personal injury or property damage.

The supplied **SMARTBOX**™ Control Equipment (Battery Box and batteries not included) are installed next to the home's electrical switch box by a certified and trained electrician in accordance to installation directions explained in this Owner's Manual. The certified and trained electrician will divert the grid from a pre-selected household circuit, such as lights, (see Electrical Manual recommendations) to the **SMARTBOX**™ Control Equipment AC input terminals. The **SMARTBOX**™ Control Equipment AC output terminals are connected to the circuit breaker on the home's electrical switch board.

The **HONEYWELL**™ Wind Turbine captures energy that the **SMARTBOX**™ Control Equipment stores in the batteries located in the battery box. The **SMARTBOX**™ Control Equipment then manages the supply of electricity to the selected circuit breaker on the home's switch board automatically switches between the grid power and the wind power.

Turbine with Electrical Systems



HONEYWELL™ Wind Turbine mounted on **ROOFBOX**™ Mount

Typical **SMARTBOX**™ Controller connection next to house circuit breakers.

Figure 2.1 Complete Turbine System

Site Selection

The key objective of a site evaluation or study is to place the **HONEYWELL**™ Wind Turbine so energy generated from the wind is maximized while meeting the local zoning requirements. Key elements to focused on during the site evaluation include:

1. High average wind speeds. The turbine delivers its best energy performance in areas of high wind speeds. This can best be determined by using simple anemometers at the installation site. It is recommended that such wind speed data is recorded for as long a period as possible and even better if several seasons are considered. When this is not possible, rely on published wind data as an estimate for the average local wind speeds. Published wind atlases can contain very useful

comparative data for a region or a specific location. However, be very careful when relying only on this information as such data quite often tends to be measured at very high altitudes and may not be useful at lower and more practical heights.

2. As a general rule it is best to install the turbine at the highest permissible position and far removed in proximity to trees and other adjacent buildings or structures.

3. Always take into consideration all possible safety consequences of the turbine installation at the local site.

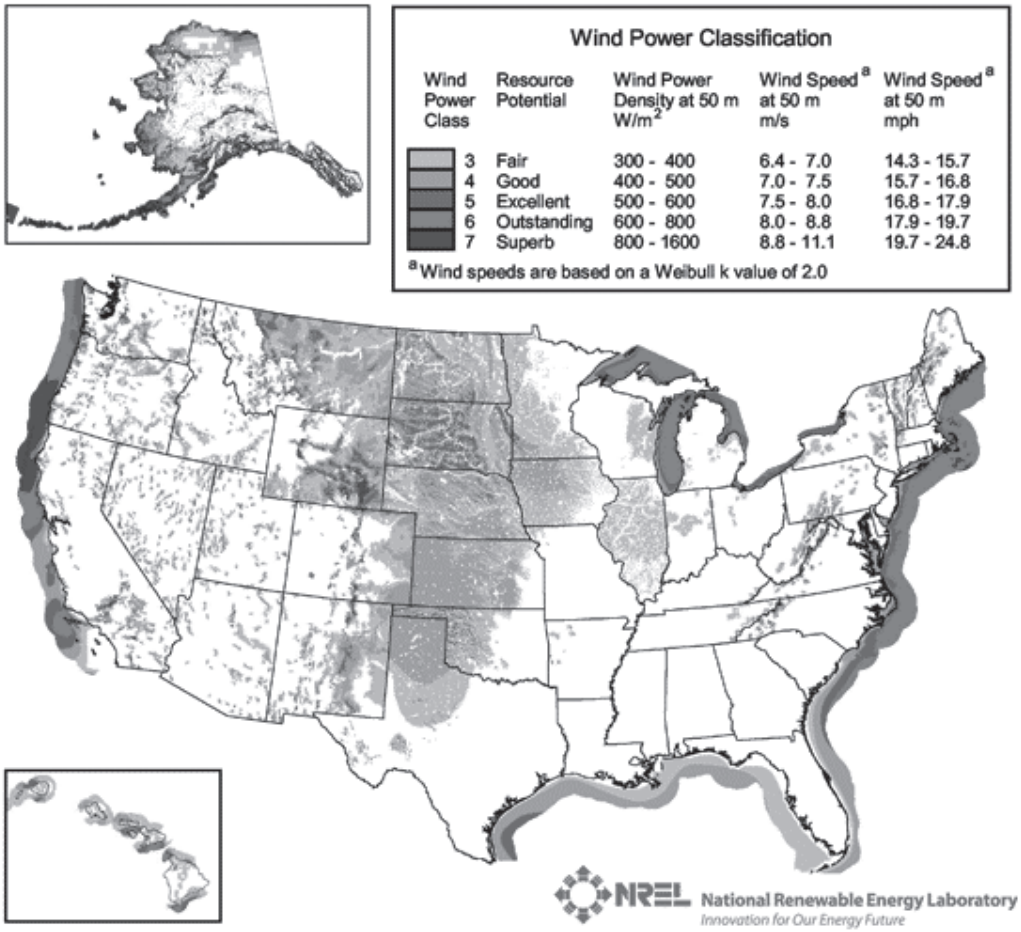


Figure 2.2 Wind Map for USA

There are several options for the installation of the **HONEYWELL**™ Wind Turbine. The turbine may be installed using a pole, a **QUADPOD**™ Mount on a flat roof with a ballast or a **QUADPOD**™ Mount on a pitched roof with a **ROOFBOX**™ Mount. These are described in the next section.

Building codes and installation requirements vary considerably between various townships, cities, states and countries. Make sure that all required local permits are obtained BEFORE beginning installation. In all cases installation must be conducted by a licensed and trained professional contractor and electrician. In some locations the local electric utility may have strict regulations about renewable energy technologies such as this wind turbine and other interconnect agreements and therefore it is highly recommended that they are also contacted BEFORE installation.

Mounting Options

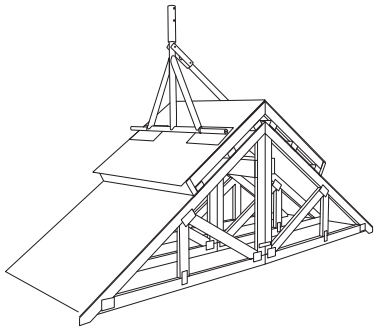
⚠ WARNING

Personal Injury and Property Damage Hazard
Do not install the **HONEYWELL**™ Wind Turbine in a location that is accessible to children or pets. Failure to follow this warning may result in death, personal injury or property damage.

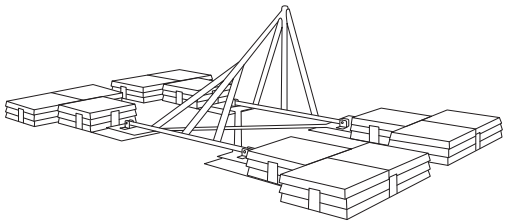
⚠ WARNING

Personal Injury and Property Damage Hazard
The **HONEYWELL**™ Wind Turbine must be mounted by licensed and trained personnel only, with the use of all appropriate hardware. Failure to follow this warning will void the **HONEYWELL**™ Wind Turbine warranty and may result in death, personal injury or property damage (including damage to the **HONEYWELL**™ Wind Turbine).

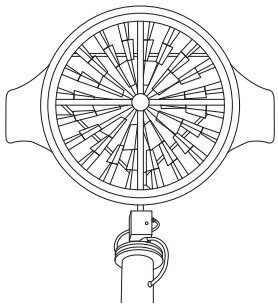
The schematic below shows the installation options available for the **HONEYWELL**™ Wind Turbine. Whichever mounting option is chosen should be approved by a local Professional Engineer (PE). All of the options listed have been rated by our Professional Engineer. Please refer to the following designs and their included specifications.



QUADPOD™ Mount
residential
small commercial
flat or pitched



Ballast
QUADPOD™ base
weighed down
commercial
flat roof



Poles

Material	*Height*
concrete	20 ft.
steel	30 ft.
wood	40 ft.

Figure 2.3 Mounting Options

⚠ WARNING Failure to follow proper installation practices for any of the mounting options could result in death, personal injury and/or property damage.

⚠ WARNING The vertical axis of the turbine must be level when installed. Turbines installed with their vertical axis off-level will see significant impact on performance.

IMPORTANT: The **ROOFBOX™ QUADPOD™** system is designed for pitched or flat roof tops. As roof construction and roof lines vary, pole mounted installations are recommended for residential environments for optimal cost, flexibility and performance.

Pole Mount

PROFESSIONAL INSTALLATION required

The pole mount for the **HONEYWELL™** Wind Turbine can be fabricated out of concrete, steel, or wood. A detailed design is shown below of a direct burial pole that is certified for WindTronics. Whichever pole design option is chosen, it should be approved by a local Professional Engineer (PE). All of the options listed have been rated by our Professional Engineer. Please refer to the following designs and their included specifications.

See page 32 in the Appendix for design and specifications.

QUADPOD™ Mount

PROFESSIONAL INSTALLATION required

The **QUADPOD™** wind turbine mounting system is a novel design in that it can be used on a flat roof area or any roof angle due to its strong, hinged design. The **QUADPOD™** when mounted according to its installation procedure always ensures that the wind turbine is in a vertical stand at various roof angles. The **QUADPOD™** installation on a roof should be approved by a local Professional Engineer (PE). All of the options listed have been rated by our Professional Engineer. Please refer to the following designs and their included specifications.

See page 33 in the Appendix for design and specifications.

ROOFBOX™ Mount

PROFESSIONAL INSTALLATION required

The **HONEYWELL™** Wind Turbine may be mounted on the **QUADPOD™** which can be securely mounted onto a **ROOFBOX™**. The **ROOFBOX™** design is shown below and certified by our Professional Engineer. The **ROOFBOX™** installation on a roof when selected should be approved by a local Professional Engineer (PE). All of the options listed have been rated by our Professional Engineer. Please refer to the

following designs and their included specifications.

See page 34 in the Appendix for design and specifications.

Ballast Mount

See page 35 in the Appendix for design and specifications.

Turbine Wiring

⚠ WARNING

ELECTRIC SHOCK HAZARD
Disconnect turbine and battery circuits before wiring. Turn off all power before wiring. Failure to follow safety warning could result in serious injury and/or death.

⚠ WARNING

Personal Injury and Property Damage Hazard
STOP! If you plan to connect the **HONEYWELL**™ Wind Turbine to any controller other than the **SMARTBOX**™ Controller, immediately cease the installation of the **HONEYWELL**™ Wind Turbine. Failure to follow this warning will void the **HONEYWELL**™ Wind Turbine warranty and may result in death, personal injury or property damage (including damage to the **HONEYWELL**™ Wind Turbine).

PROFESSIONAL INSTALLATION required

Installations must meet all local electrical codes. Installations for the equipment should only be performed by a qualified electrician or a licensed and trained WindTronics installer.

The wiring connections between a mounted **HONEYWELL**™ Wind Turbine, Battery Box and **SMARTBOX**™ Controller is relatively simple. The following diagram details and specifies the wire gauges required in this installation. It is strongly recommended that a certified and trained electrician performs all the electrical connection. All electrical systems must be grounded in accordance to the National Electric Code (NEC) (or, in Canada, the Canadian Electric Code (CEC)) and local standards. Please refer to the **SMARTBOX**™ Controller Manual for full details on wiring, connecting and commissioning of the **HONEYWELL**™ Wind Turbine.

Turbine Component Diagram

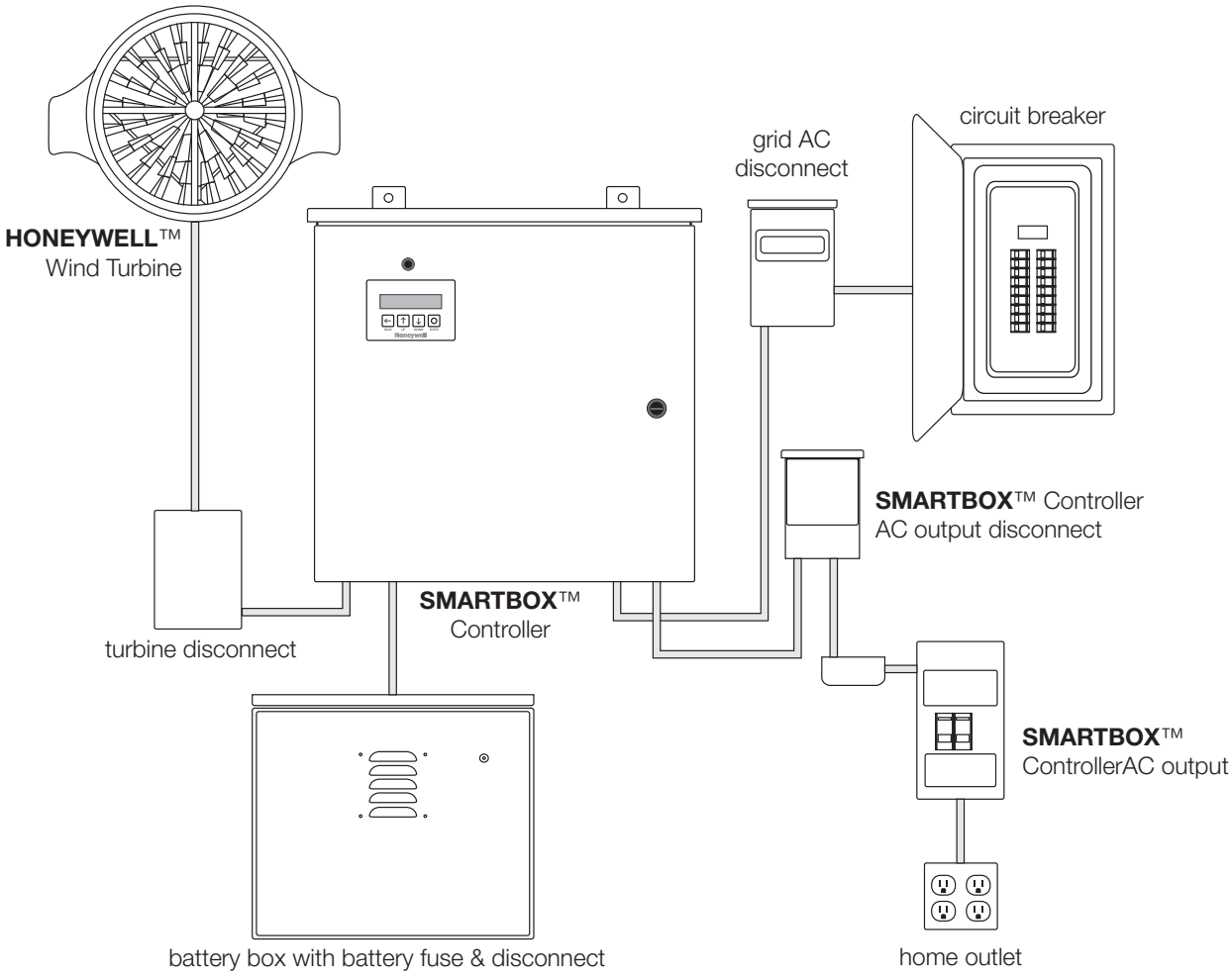


Figure 2.4 Turbine Components

The SMARTBOX™ Controller

The **SMARTBOX**™ Controller contains all the electronic controls needed to integrate to the home's electrical switch board circuits. The **SMARTBOX**™ Controller is housed in a NEMA 3R enclosure and must be mounted on the wall next to the home's electrical switch board. The **SMARTBOX**™ has an LCD display and four operational buttons. Details of the function of these buttons is listed in the **SMARTBOX**™ Controller Manual. Please read the **SMARTBOX**™ Controller Manual and always consult and use a certified and trained electrician for connections and service.

TIP: The instructions in this section apply to a typical installation. Installation procedures may vary according to your specific application. For special applications, consult a qualified electrician or your WindTronics certified dealer.

IMPORTANT: Installation must be compliant with all local electrical codes. Installation of this equipment should only be performed by a qualified electrician or by a Certified Renewable Energy System Installer.

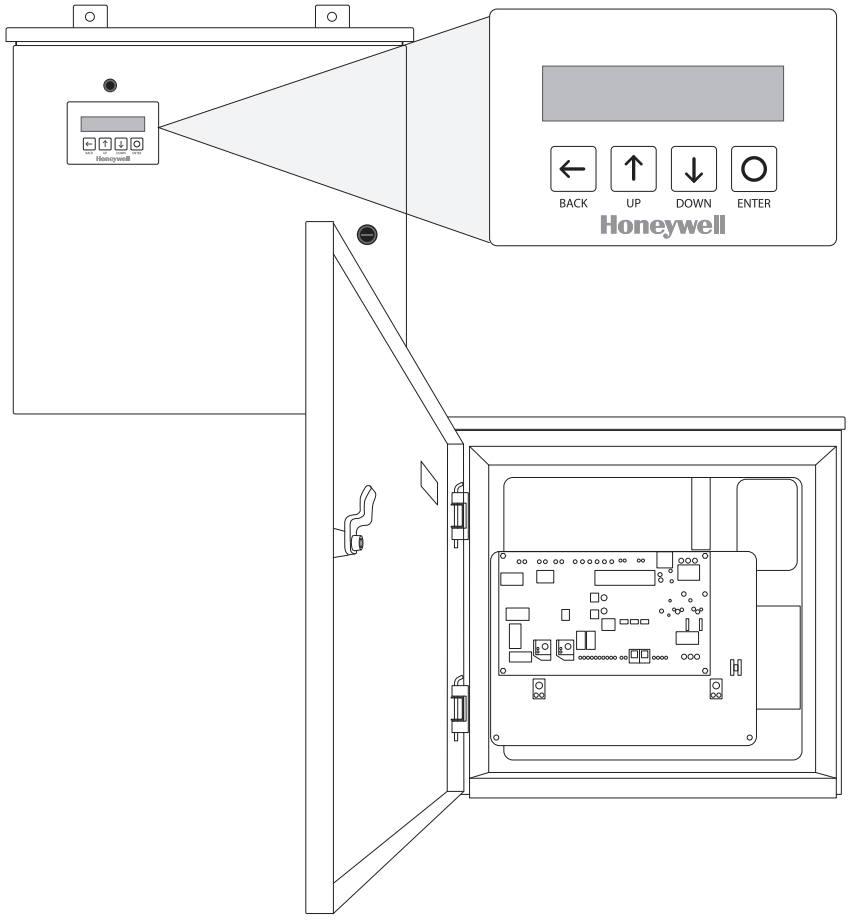


Figure 2.5 The **SMARTBOX**™ Controller

The Battery Box

The Battery Box is a NEMA 3R type and must be mounted on the wall near the **SMARTBOX**™ Controller. The Battery Box requires its own On/Off switch and a 100 amp fuse. Please refer to the **SMARTBOX**™ Controller Manual for connecting the Battery Box to the **SMARTBOX**™ Controller and also for maintenance and service.

IMPORTANT: Please read the **SMARTBOX**™ Controller Manual

TIP: Always consult and use a certified and trained electrician for connections and service.

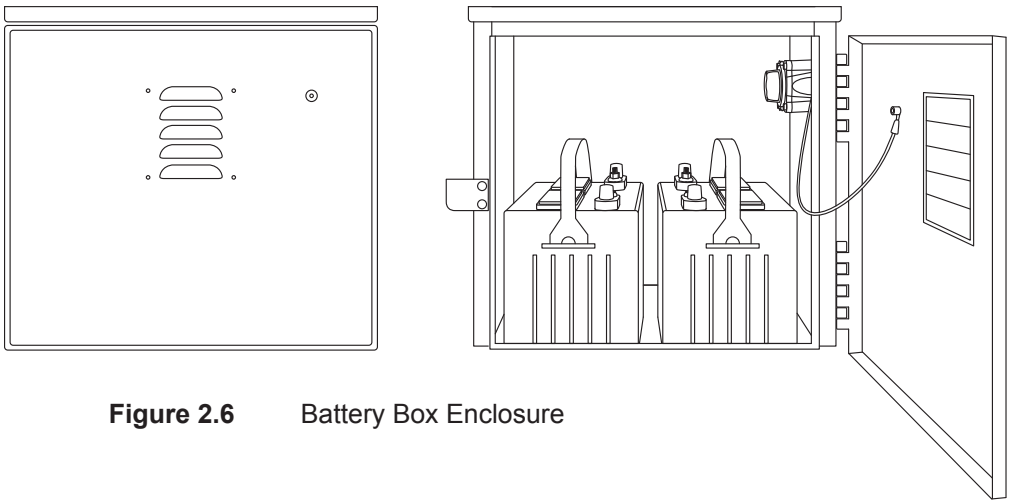


Figure 2.6 Battery Box Enclosure

Recommended Battery Type

We only recommend using TWO-12V, 100Ah, flooded, deep cycle, marine grade batteries.

The Junction Box

The **HONEYWELL**™ Wind Turbine is an electric generator. As discussed in the technology description the electricity is generated at the stators due to the high speed traversing of the permanent magnets at the blade tip and wheel rim. The electrical output of each stator is bused to the Junction Box that is mechanically attached to the mount section nearest the turbine. The Junction Box contains the interface electronics of the stators to which all the wire connections are made in the field by a certified and trained electrician to the **SMARTBOX**™ Controller located near the home's electrical switch board.

The Junction Box is a NEMA 4X enclosure to which a steel enclosure that houses an 1900 W stainless steel resistor is attached. The resistor is named the Dump Load and is used in various operating and safety regimes as defined by the controlling software of the **HONEYWELL**™ Wind Turbine. An anemometer that measures the wind speed and direction is also attached to the Junction Box. Please refer to the **SMARTBOX**™ Controller Manual for full details. Only a certified and trained electrician should install and maintain the Junction Box, the attached Dump Load resistor housing and anemometer.

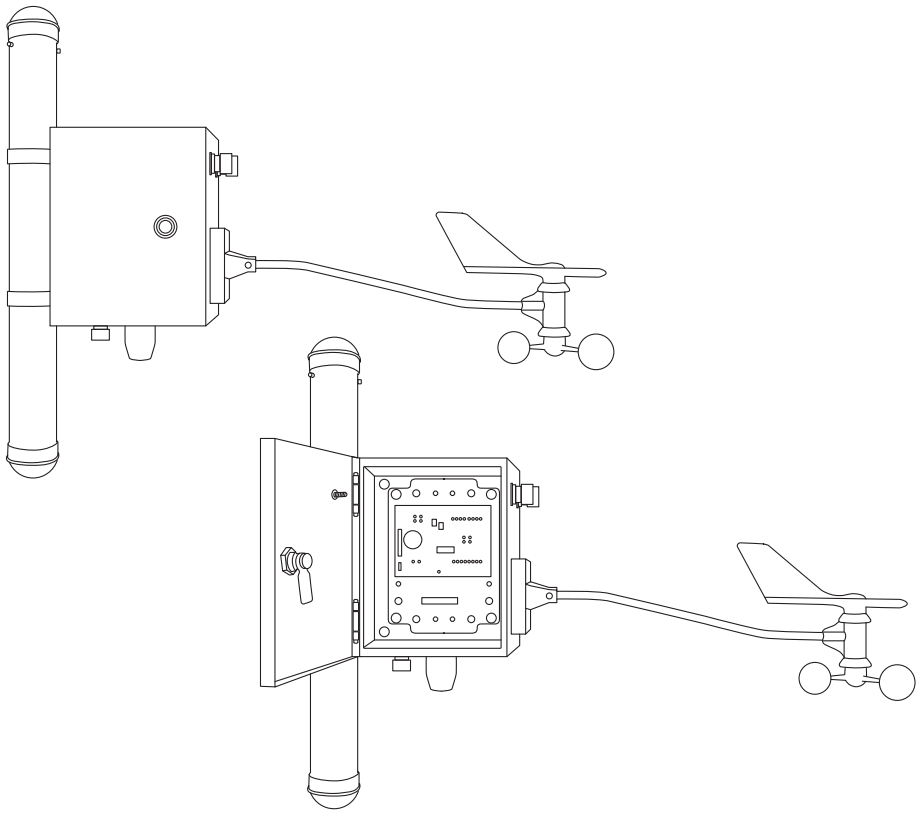


Figure 2.7 Junction Box Enclosure

Junction Box Block Diagram

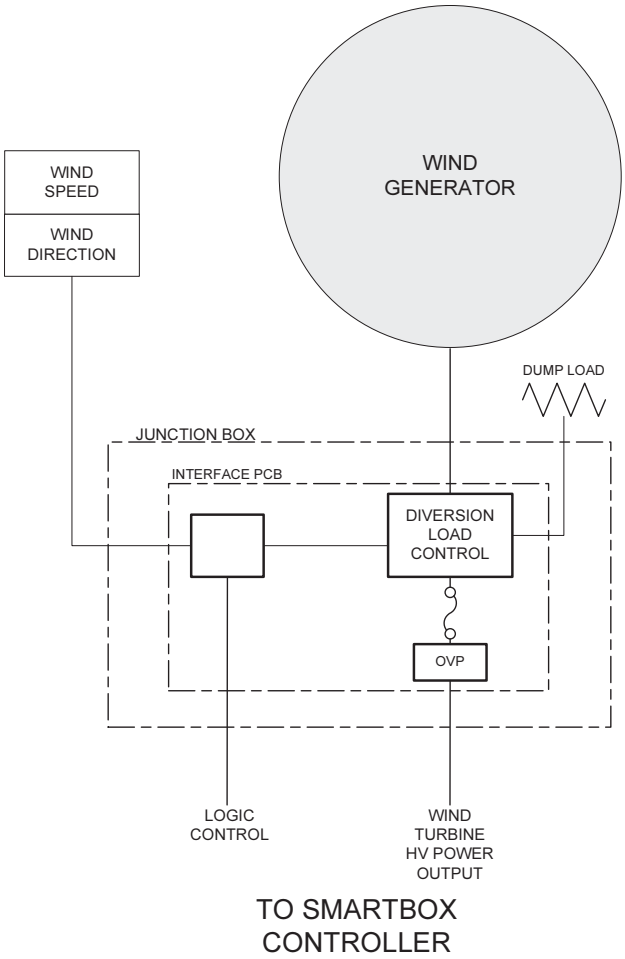


Figure 2.8 Junction Box Block Diagram

Turbine Wiring Overview

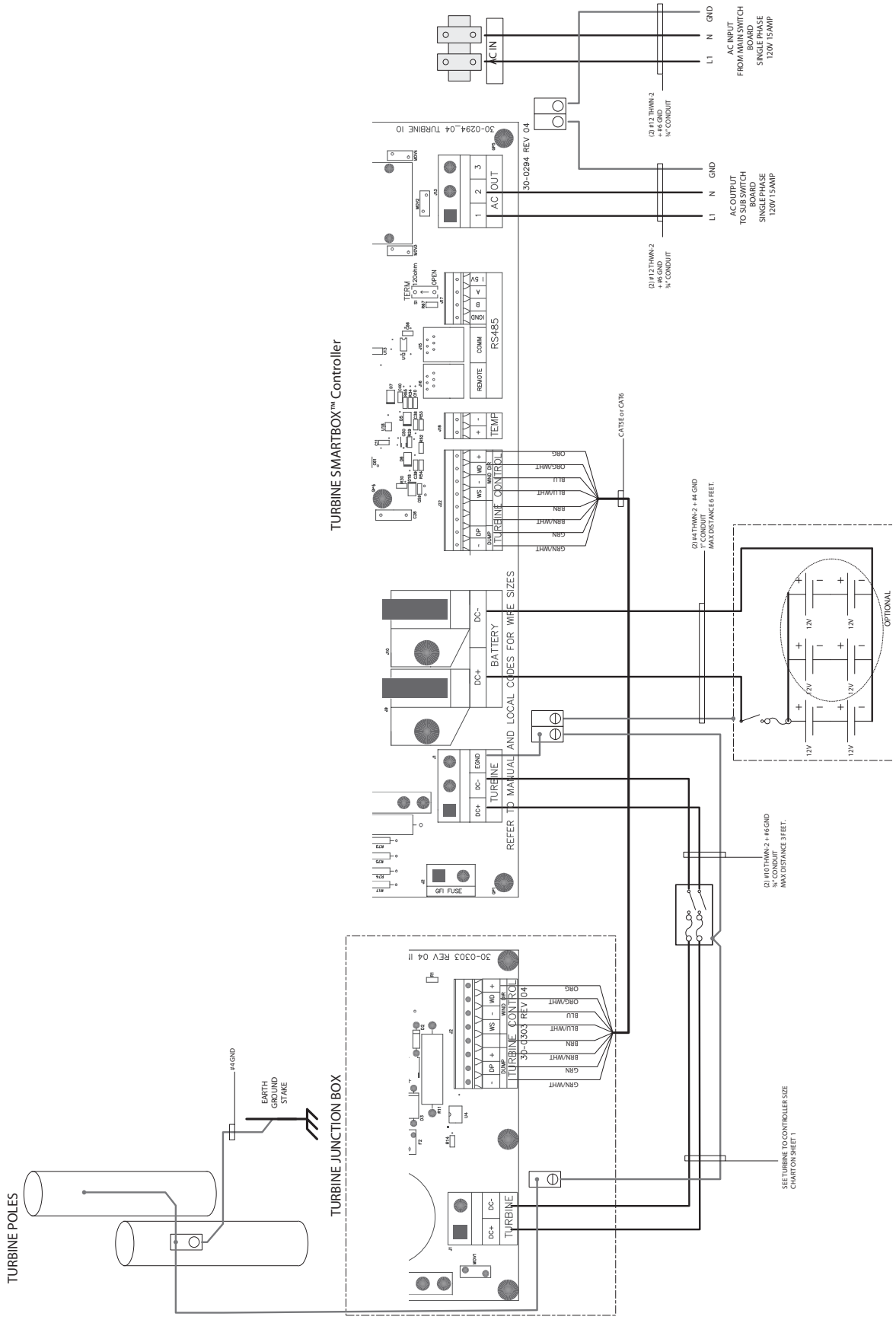


Figure 2.9 Wiring Overview See Appendix for one-line electrical drawing pages 36-37.

DC Power Wiring

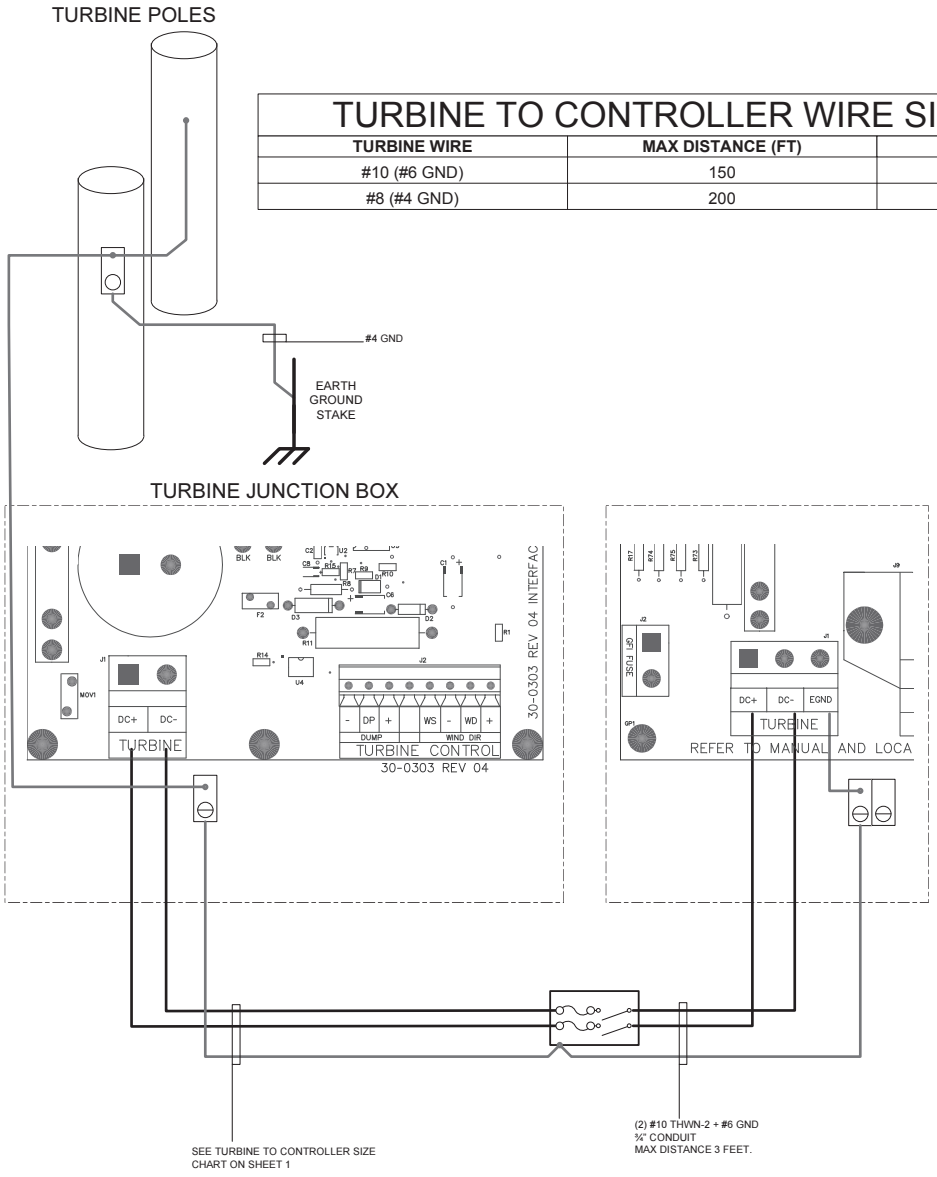


Figure 2.10 Power Wiring Diagram

Turbine Wiring and Distances

The **HONEYWELL**™ Wind Turbine and **SMARTBOX**™ Controller can be installed at a maximum distance of 200 feet apart. The **SMARTBOX**™ Controller and battery enclosure can be installed at a maximum distance of 10 feet apart.

Turbine Current Rating and Wiring

The turbine input is rated for 20 amps maximum Isc (short circuit). The recommended wire type is #10 AWG USE-2/RHW-2 or THWN-2, 90 degrees C wire for a turbine-to-Smart-Box distance of up to 150 feet. The wire gauge should be increased to #8 AWG for a distance of 150-200 feet. Due to the outside location of the turbine, a 70 degree C ambient temperature correction is recommended.

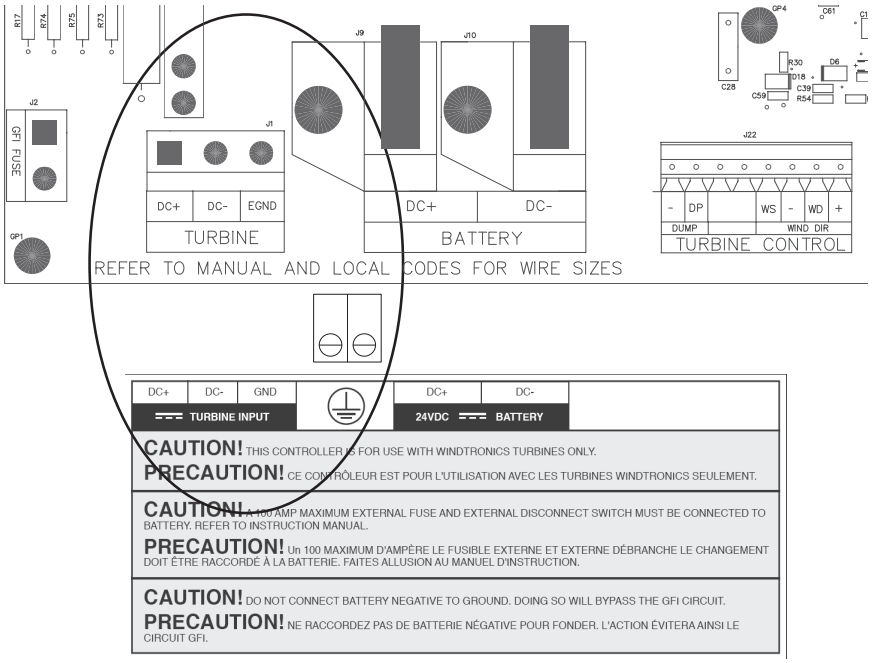


Figure 2.11 Turbine Connection Location in **SMARTBOX™** Controller

Turbine Over-Current Protection

The NEC/CEC requires the turbine circuit to be protected with a device rated for 125% of the rating of the circuit. The DC-rated fuse or circuit breaker between the turbine and the **SMARTBOX™** Controller must have a maximum size of 15 (the maximum current rating of the Smart Box).

⚠ WARNING

SHOCK OR FIRE HAZARD
Over-current protection must be installed to protect the Smart Box from short circuits and to provide a means of disconnecting the it.

⚠ WARNING

REVERSE POLARITY DAMAGE
Before making the final DC connection or closing the DC breaker or disconnect, check cable polarity at both the battery and the Smart Box. Positive (+) must be connected to positive (+). Negative(-) must be connected to negative (-).

Control Wiring

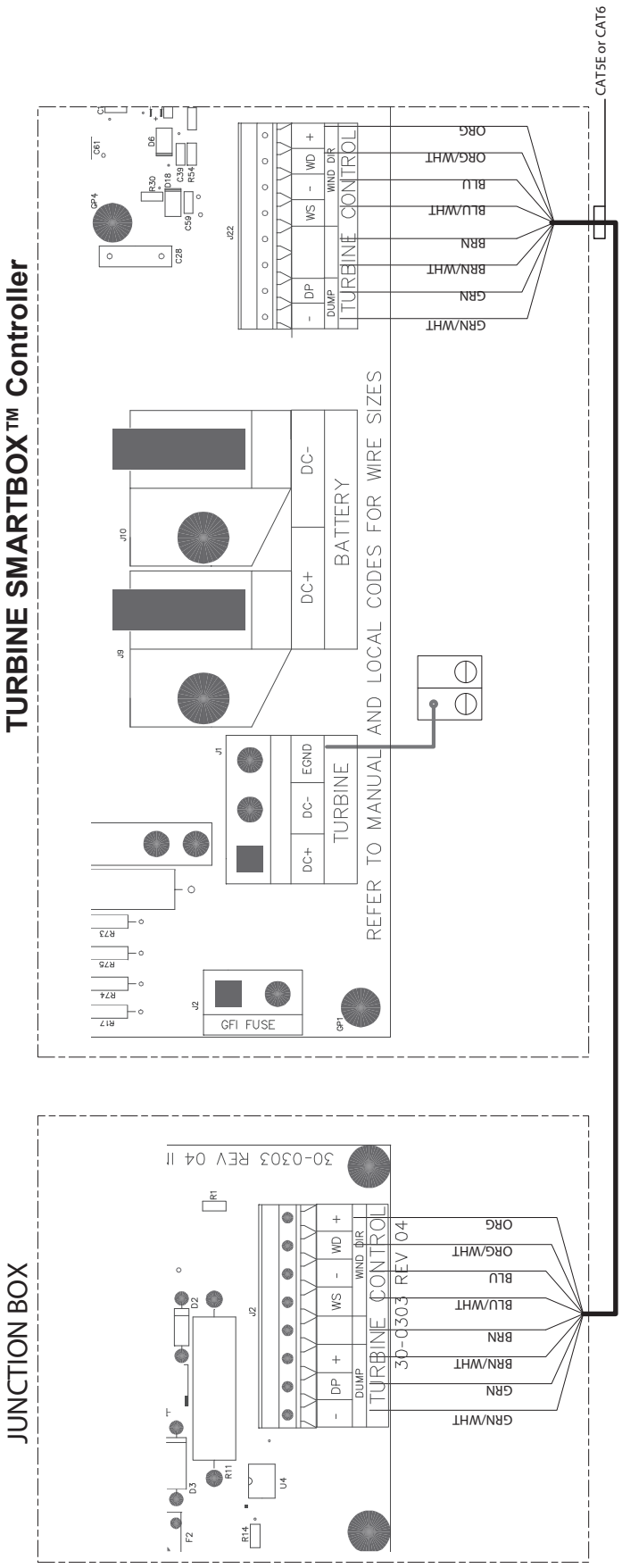


Figure 2.12 Turbine Control Wiring

Grounding

PROFESSIONAL INSTALLATION A certified and trained electrician must install and commission this turbine using the National Electric Code (NEC) (or, if in Canada, the Canadian Electric Code (CEC)) and in compliance to the local permitting and zoning codes.

The **SMARTBOX**™ Controller is designed to work only with the **HONEYWELL**™ Wind Turbine. The turbine uses a negative-grounded electrical system. Grounding for the turbine, battery and AC circuits are provided inside the wiring compartment. Each ground connection can accommodate up to #6 AWG wire size. GFI: A fuse rated at .5A 250V, accessible from the bottom of the wiring compartment, grounds the negative conductor of the turbine and provides turbine ground-fault protection. Only a Littelfuse 0312.500HXP or equivalent fuse should be used as a replacement.

⚠ WARNING

SHOCK HAZARD
DO NOT connect the battery negative to ground. NEC requirements specify that the battery negative ground must be done only through the 1A fuse. Bonding the battery negative to ground will disable the turbine's ground fault protection and will result in improper operation. The battery compartment should be grounded if made of metal.

⚠ WARNING

SHOCK AND FIRE HAZARD
Fuses must only be replaced by qualified service personnel, such as a certified electrician or technician. For continued protection again risk of fire, replace only with the same type and rating of fuse. Failure to follow this warning may result in death, personal injury or property damage.

⚠ WARNING

SHOCK HAZARD
Disconnect wind and battery circuits before removing the grounding connections or before removing or installing the fuse. Wait at least 5 minutes for the internal circuitry to discharge before servicing the unit. Failure to follow this warning may result in death, personal injury or property damage.

Even though the wind turbine is grounded at the service manual, it must also be grounded at the base of the mounting pole, **QUADPOD**™ Mount, or TriPod. Grounding at these mounts may prevent electric shock and voltage surges. Proper mount grounding may also minimize damage due to lightning strikes.

Grounding information is available from the National Electric Code (NEC) USA 2005 as well as the International Electrotechnical Commission (IEC) standard 60364-5-54 section Erection of Electrical Equipment: Earthing Arrangements, Protective Conductors and Protective Bonding Conductors. Please reference the NEC and IEC standards regarding full details of grounding this wind turbine. Please also refer to 205 NEC article 250.53 (G) regarding the grounding electrode installation. Also refer to 2005 NEC article 250.66 (A) regarding conductor size where it stipulates that where a grounding electrode conductor is connected to a rod, pipe or plate electrode, that portion of the conductor that is the sole connection to the grounding electrode shall be a minimum of 6AWG copper wire or 4AWG aluminum wire.

Operation

⚠ WARNING

Personal Injury and Property Damage Hazard
Do not touch revolving turbine blades or insert objects, including sticks and screwdrivers, into revolving turbine blades. Failure to follow this may result in death, personal injury or property damage.

PROFESSIONAL INSTALLATION A certified and trained electrician must install and commission this turbine using the National Electric Code (NEC) (or, if in Canada, the Canadian Electric Code (CEC)) and in compliance to the local permitting and zoning codes.

Follow the electrical connections and commissioning procedures in the **SMARTBOX™** Controller Manual for the wind turbine start up, operations, and maintenance. The label below is provided to indicate the location of the AC POWER disconnect switch. Please cut out and place near the **SMARTBOX™** Controller where an electrician and service personnel can easily see it.

ATTENTION
To Disable Wind Turbine
Disconnect AC Power

Note: AC Power Disconnect Box is located at:

_____

Disconnect & Lock - Out AC Power per NFPA 70E and OSHA Requirements before servicing and/or maintance.

Windtronics, Inc
621 Sprucewood Avenue
Windsor, ON N9C0B3
Canada

There are no parts in the **HONEYWELL™** Wind Turbine that require lubrication or scheduled maintenance. Please follow the manufacturer of the battery for its installation, operation and maintenance. Please contact WindTronics Service with any questions:

1-877-946-3898

The **SMARTBOX™** Controller has built in automatic software fail safe procedures that serve as automatic safety turbine shut down modes. However the AC Power MUST be disconnected at the Disconnect AC Power Box as noted in the above label. Furthermore, the E-Stop on this AC Power Disconnect must be in the OFF position whenever maintenance and any other mechanical or electrical work is to be performed on this turbine.

The **HONEYWELL™** Wind Turbine is grounded to meet lightning surges. If noise or vibration is detected and if the turbine's blades rotate very slowly under extremely windy conditions turn turbine off and please contact WindTronics Service at:

1-877-946-3898

3 Specifications

For Information on:	See:
Technical Specification	25

Technical Specifications

Model WT-6500	Specification
Rated Power Output	1500 W at 13.9 m/s (31 mph)
Weight	79.5 Kg (175 pounds)
Rotor Diameter	1.82 m (6 feet)
Type	Blade Tip Power System
Constantly Facing Wind	Dynamic Aerodynamic Deflectors
Blades	20 Glass Filled Nylon (10 short and 10 long)
Rate Rotation	150 RPM
Shut Down Speed	165 Vdc or 38 mph
Tip Speed at 160 RPM	14m/s (32 m/s)
Generator	Perimeter Tip Permanent Magnet/Stator System
Yaw Control	Dynamic
Grid Feeding	Hybrid
Braking System	Electromagnetic
Cut-In Wind Speed	0.9 m/s (2 mph)
Rated Wind Speed	13.9 m/s (31 mph)
Survival Wind Speed	63 m/s (140 mph)
Sound Power Lever	Less Than 35 dB Added at 13.5 m/s (30 mph)

DATA SUBJECT TO CHANGE WITHOUT NOTICE

4 Warranty Information

5-Year Limited Warranty

LIMITED WARRANTY:

Subject to the terms below, WindTronics, Inc. (“WindTronics”) warrants its products against defects in materials or workmanship under normal use consistent with product instructions for a period of five (5) years from the date the original purchaser (the “Purchaser”) purchases the product. This warranty extends only to the Purchaser and cannot be assigned to any other party. If warranted products contain defects covered under this warranty, WindTronics’ obligation shall be limited to, in WindTronics’ sole and absolute discretion, repairing or replacing the defective parts. Repaired or replaced parts are warranted for the remainder of the original warranty period.

WARRANTY CLAIMS:

No rights may be exercised under this warranty unless the Purchaser registers the product for warranty coverage within sixty (60) days after purchase or provides proof of purchase. Purchaser can register the product for warranty coverage online at www.windtronics.com or by completing and returning the warranty registration card included with the product, in which case the product will be considered registered as of the postmark date on the warranty registration card. Notice of any defect covered under this warranty must be given within thirty (30) days of the date the defect is discovered. Notice shall be in writing or by telephone. Notices by telephone shall be made by calling (877) 946-3898 and written notices shall be sent to:

WindTronics, Inc.

621 Sprucewood Avenue

Windsor, Ontario N9C 0B3

Attn.: Customer Service – Warranties

The Purchaser must provide WindTronics the following: (1) the date the defect was discovered; (2) evidence of the defect, including, without limitation, photographs and a verbal/written description of the defect; (3) the serial number of the product; (4) the original purchase date of the product; (5) the location of the product; and (6) the name, address, and phone number of the party making the warranty claim.

We reserve the right to an on-site inspection by an authorized service representative. The Purchaser is required to provide adequate access to the product for any such repair or inspection. Subject to the terms and conditions contained in this document, a Factory Authorized Dealer/Service Center will repair the product. For the first two (2) years there will be no charge for parts, labor or the freight costs for parts necessary to repair the product. After the second year the warranties will only cover replacement parts. If it becomes necessary for the product to be shipped to the Factory Authorized Dealer/Service Center, the Purchaser shall be responsible for transporting the product to and from the Factory Authorized Dealer/Service Center. Additionally, reasonable travel charges of the repair person may be assessed in cases where the product is in a remote location. In the event the Purchaser is unable to obtain satisfactory service from a Factory Authorized Dealer/Service Center, the Purchaser should notify the WindTronics Customer Service Department.

If we determine that repairs are not feasible due to functional defect, we reserve the right to provide a replacement part or product in lieu of repair. We will replace with

a part of value equal to the original purchase. In such event, reasonable costs for removal of the defective product and delivery and installation of the replacement product will be the responsibility of the Purchaser. All replaced parts and products shall become the property of WindTronics on the date the part or product is replaced.

LIMITATIONS AND EXCLUSIONS ON LIMITED WARRANTY:

This limited warranty will not apply under any of the following circumstances:

1. If any part of the product has been altered or modified by anyone other than an authorized representative of WindTronics;
2. If any part of the product has not been installed, operated, repaired, or maintained in accordance with the product's instructions;
3. If any part of the product has been the subject of misuse, misapplication, improper maintenance or repair, damage caused by the fault or negligence of anyone other than an authorized representative of WindTronics, damage caused by severe weather or acts of God, or any other act or event beyond the control of WindTronics; and
4. If the product has been exposed to winds exceeding 100 mph/160 km per hour or has been subjected to abnormal physical, thermal or electrical stress.

WARRANTY REGISTRATION:

The Purchaser must maintain proof of purchase or register the product for warranty coverage within sixty (60) days after purchase. Purchaser can register the product for warranty coverage online at www.windtronics.com or by completing and returning the warranty registration card located in the back of the owner's manual. All warranty claims made on a product that has not been registered will be denied unless proof of purchase can be provided.

DISCLAIMERS APPLICABLE TO ALL WARRANTIES:

EXCEPT FOR THE EXPRESS LIMITED WARRANTY SET FORTH ABOVE, WINDTRONICS EXPRESSLY DISCLAIMS AND EXCLUDES ALL OTHER EXPRESS WARRANTIES. ADDITIONALLY, TO THE EXTENT PERMITTED BY APPLICABLE LAW, EACH AND EVERY IMPLIED WARRANTY THAT MAY APPLY TO THE PRODUCT (INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND FREEDOM FROM ENCUMBRANCES) ARE LIMITED IN DURATION TO THE FIVE-YEAR LIMITED WARRANTY PERIOD. WINDTRONICS EXPRESSLY DISCLAIMS ALL LIABILITY FOR BODILY INJURY OR DEATH THAT MAY OCCUR, DIRECTLY OR INDIRECTLY, BY USE OF THE PRODUCT.

LIMITATION OF LIABILITY

IN NO EVENT SHALL WINDTRONICS BE LIABLE FOR ANY DAMAGES RESULTING FROM LOSS OF CONFIDENTIAL OR OTHER INFORMATION OR BUSINESS INTERRUPTION OR ANY SPECIAL, INCIDENTAL, INDIRECT, OR CONSEQUENTIAL DAMAGES WHATSOEVER (INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFITS), REGARDLESS OF THE FORM OF ACTION, WHETHER IN TORT, STRICT LIABILITY, CONTRACT OR OTHERWISE, ARISING OUT OF OR IN ANY WAY RELATED TO THE DEFECT, REPAIR, REPLACEMENT OR SHIPMENT OF THE PRODUCT, EVEN IF WINDTRONICS KNOWS OF, OR SHOULD HAVE KNOWN OF, THE POSSIBILITY OF SUCH DAMAGES. THE FOREGOING LIMITATIONS, EXCLUSIONS AND DISCLAIMERS SHALL APPLY TO

THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW. IN NO EVENT SHALL WINDTRONICS' AGGREGATE LIABILITY EXCEED THE AMOUNT ACTUALLY RECEIVED BY WINDTRONICS FROM THE PURCHASER FOR THE PURCHASE OF THE PRODUCT.

Some states and provinces do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations may not apply to you. No agent, dealer, Service Company, or other party is authorized to change, modify, or extend the terms of this warranty in any manner whatsoever.

LEGAL REMEDIES:

This warranty gives you specific legal rights, and you may have other rights which vary from state to state or province to province.

CHANGES TO THIS LIMITED WARRANTY:

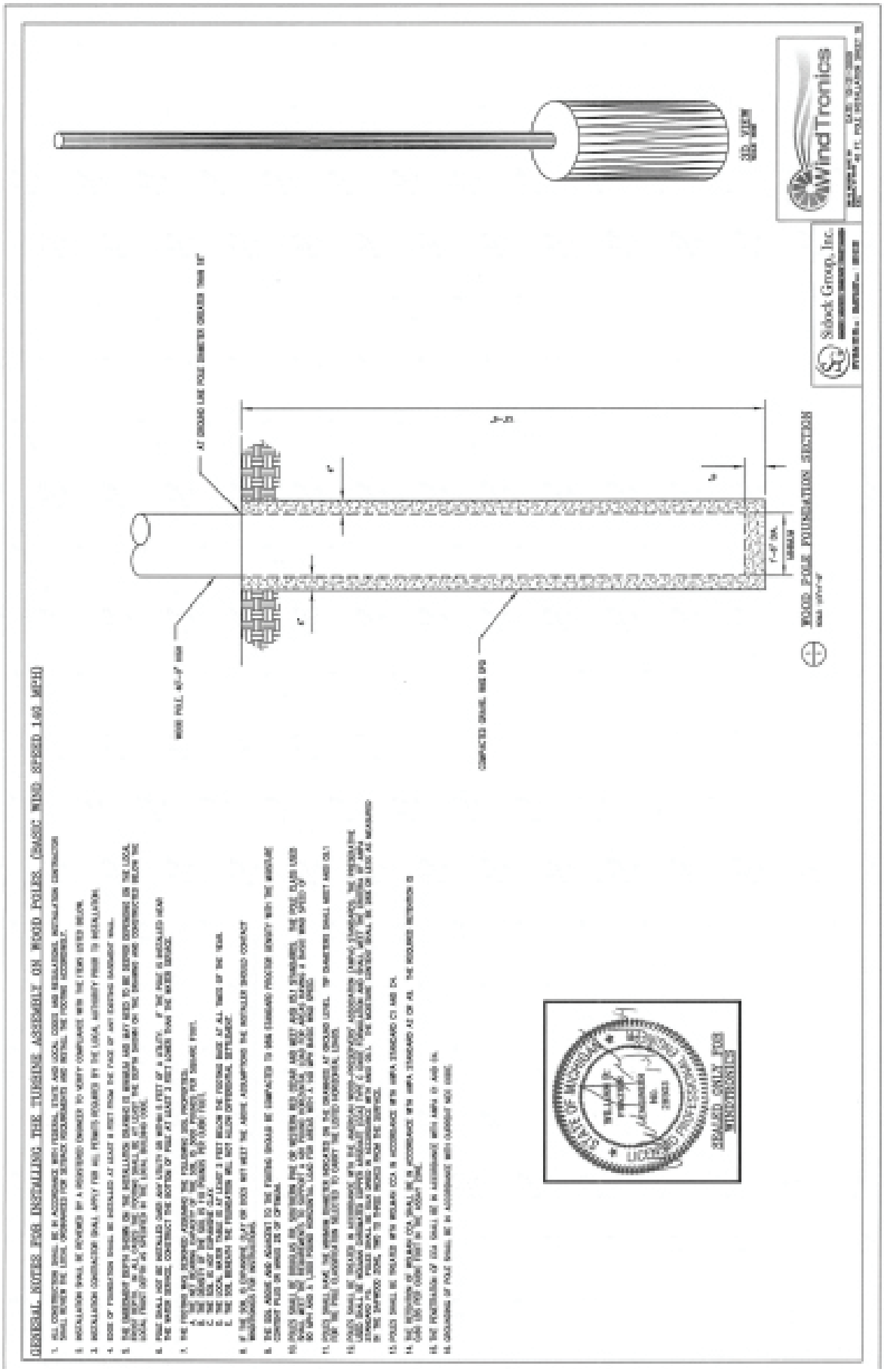
WindTronics may change this warranty from time to time. When WindTronics makes changes to the warranty, it will post them at www.windtronics.com. The warranty that shall apply to a product shall be the warranty posted at the Website at the time the product is purchased. It is the Purchaser's responsibility to check the Website to see if the warranty posted there is different than the warranty stated herein.

GOVERNING LAW:

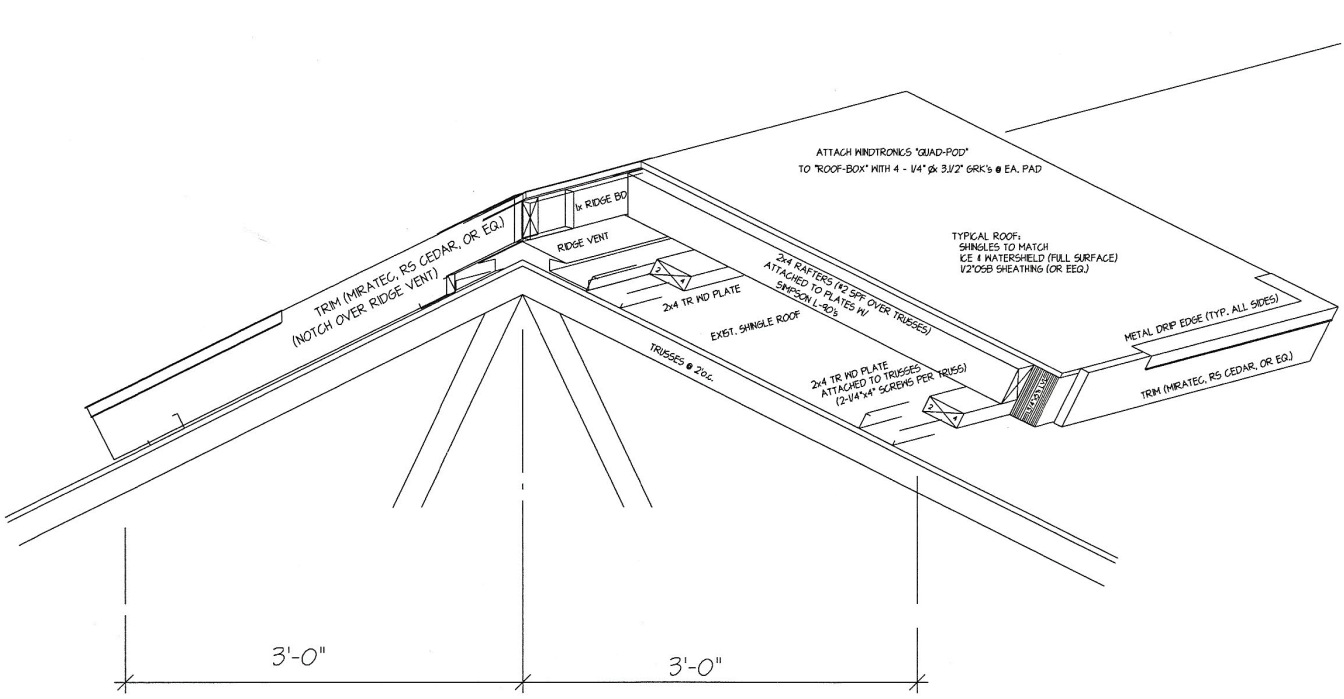
If the Purchaser purchases the product in the United States of America, this warranty is governed by the laws of the State of Michigan and the applicable federal laws of the United States. If the Purchaser purchases the product in Canada, this warranty is governed by the laws of the Province of Ontario and the federal laws of Canada applicable therein. In either case, the application of the United Nations Convention on Contracts for the International Sale of Goods is expressly excluded.

5 Appendix
Turbine Installation Drawings

Pole Mount


WindTronics
Stock Group, Inc.
ROOF POLE FOUNDATION SECTION
SEALED ONLY FOR STRUCTURE

ROOFBOX™ Mounting



ROOF BOX ISOMETRIC
6:12 PITCH ROOF SHOWN

ROOF BOX SIZE:
6'-4"l (OVER 4 TRUSSES)
3'-0" (HORIZ.) FROM PEAK TO LVL

"ROOF BOX" MATERIALS:

SHINGLES TO MATCH EXISTING
ICE & WATERSHIELD (FULL COVERAGE)
1/2" OSB SHEATHNG
2x4 RAFTERS (SPF) 2'o.c.
2x4 TREATED WD FURRING
1.3/4" x 5"h LVL
1x4 RIDGE BD.
L-90's ATTACHING RAFTERS TO FURRING
ATTACH FURRING TO TRUSSES w/ 2 - 1/4"x4" GRK's PER TRUSS
L-90's ATTACHING RAFTERS TO LVL's

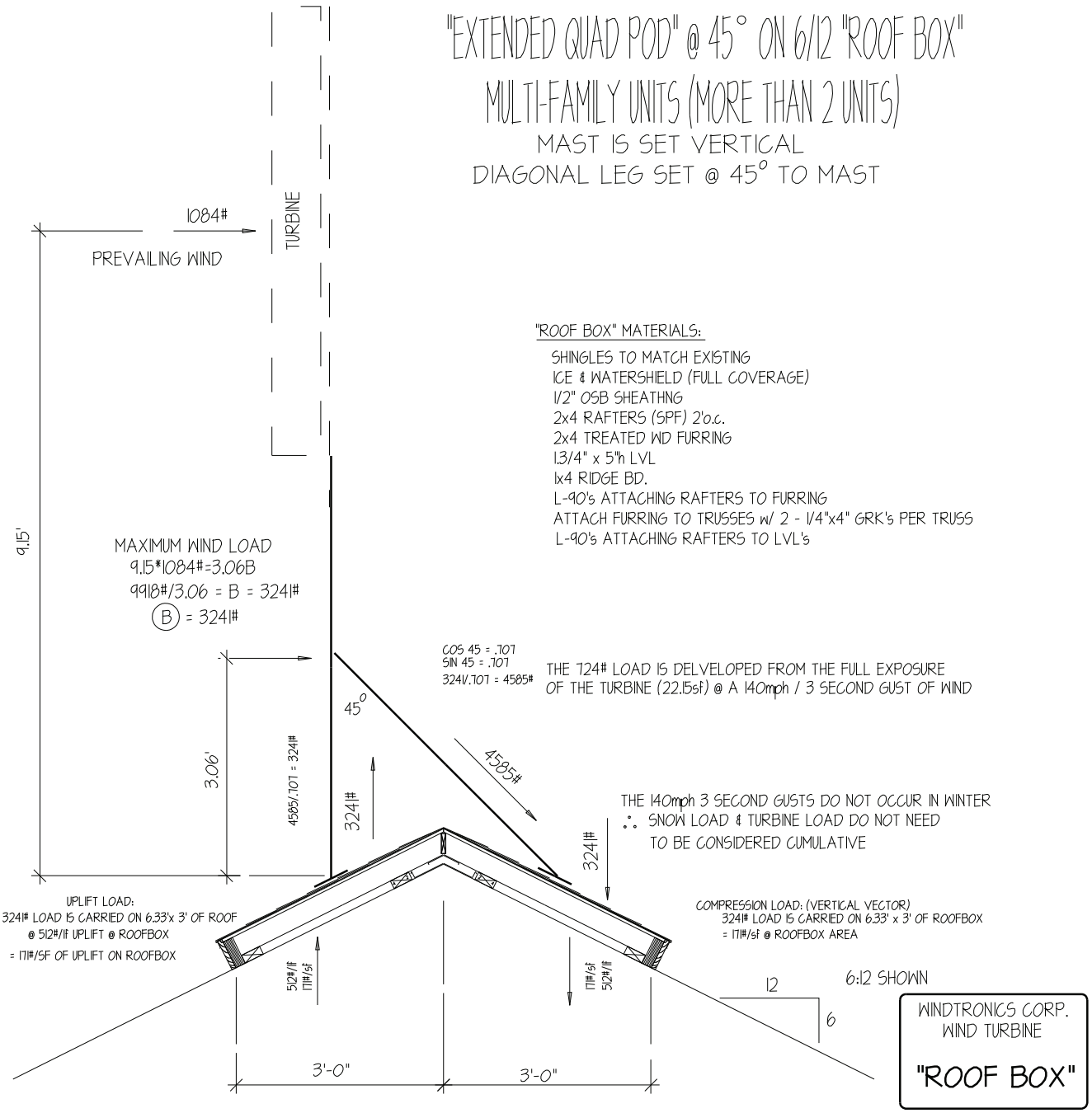
WINDTRONICS CORP.
WIND TURBINE
"ROOF BOX"

dryer architectural group
architecture/interiors/design consultants
220.1/2 washington
grand haven, michigan 49417
616/846-5400
dryerarch@azulstar.com

DRAWING INFORMATION			
Drawn:	ddd	Checked:	ddd
Date:	12-14-09	PROJ. No.	09-591

REVISIONS			Sheet:
#	Date	By	ROOF BOX ISOMETRIC
FILE No.: RB-ISO			

ROOFBOX™ with QUADPOD™ Mounting



ROOF BOX TO BE 6'-4"l.± (PLACED OVER 4 TRUSSES)
LOAD:
324I# LOAD IS VERTICAL @ TOP CHORD
LOADED ONTO 4 TRUSSES =
810# LOAD TO EACH TRUSS
512#/LF VERTICAL LOAD TO ROOF @ ROOF BOX

WINDTRONICS CORP.
WIND TURBINE
"ROOF BOX"

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architecture/interiors/design consultants
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dryerarch@azulstar.com

DRAWING INFORMATION			
Drawn: ddd		Checked: ddd	
Date: 11-29-10		PROJ. No. 10-655	
REVISIONS #	Date	By	Sheet: RB-MF2
FILE No.: RB-MF2			

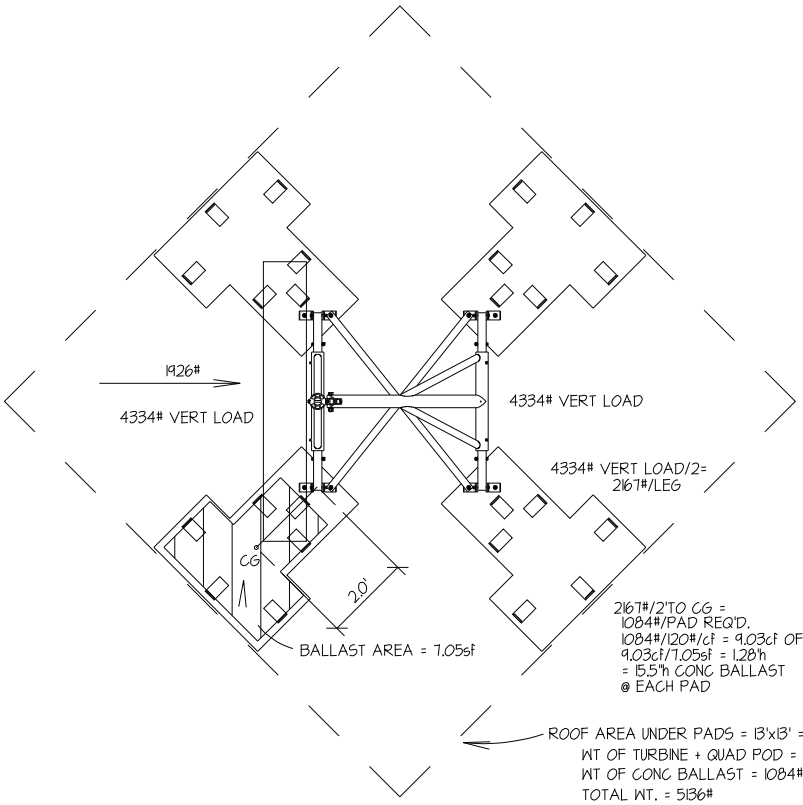
Ballast Mounting

WINDTRONICS CORP.
EXT. QUAD-POD
CALCULATIONS
140 DODD CT.
AMERICAN CANYON, CA 94503

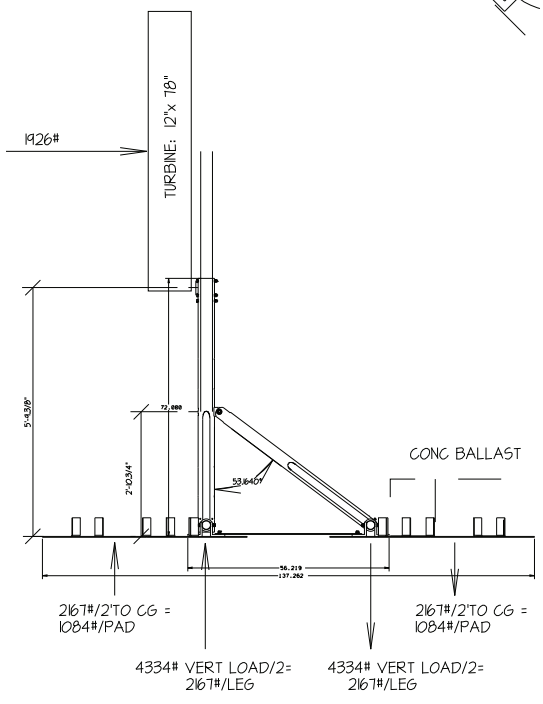
dryer architectural group
architecture/interiors/design consultants
220.1/2 washington
grand haven, michigan 49417
616/846-5400
dryerarch@azulstar.com

DRAWING INFORMATION			
Drawn:	ddd	Checked:	ddd
Date:	11-29-10	PROJ. No.	10-655
#	REVISIONS Date	By	Sheet: ROOF LOAD CALC'S
FILE No.: ROOF LOADS			

EXTENDED QUADPOD
ROOF LOAD CALCULATIONS
@ 140mph WIND & 60'HT.



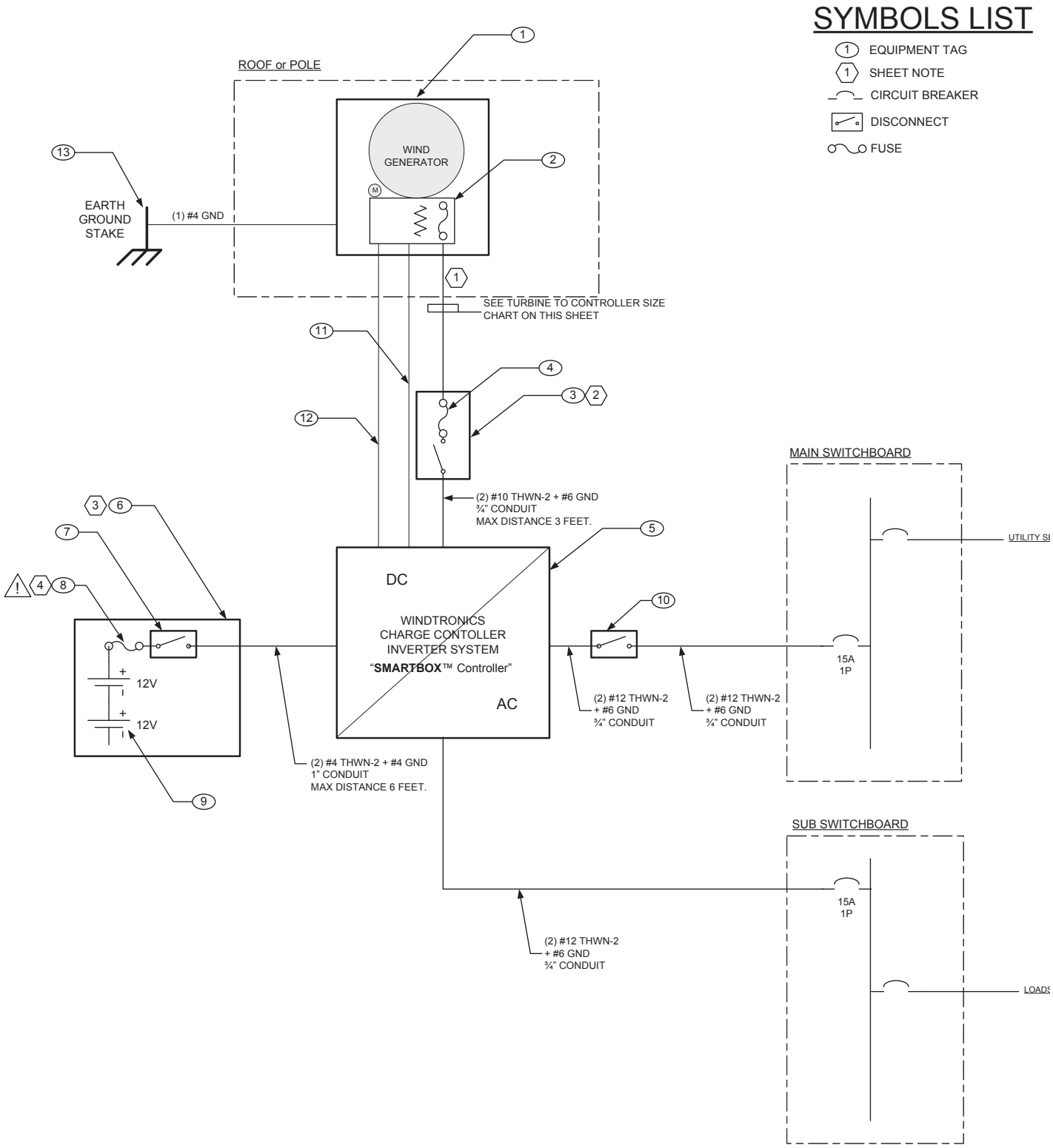
PLAN
SCALE: 1/4" = 1'-0"



ELEV
SCALE: 1/4" = 1'-0"

EXTENDED QUAD-POD REQUIRES APPROXIMATELY 30#/sf LOADING @ ROOF

Electrical One-Line Drawing Part 1



TURBINE TO CONTROLLER WIRE SIZE CHART		
TURBINE WIRE	**MAX DISTANCE (FT)**	**EMT CONDUIT (INCH)**
#10 (#6 GND)	150	3/4
#8 (#4 GND)	200	1

Electrical One-Line Drawing Part 2

SHEET NOTES

1. FOR ROOF MOUNT TURBINE, LOCAL FIRE DEPARTMENTS MAY REQUIRE DC DISCONNECTS AT THIS LOACTION. IF REQUIRED, PROVIDE SQUARE D H221NRB
2. LOCATE BESIDE OR BENEATH CONTROLLER
3. LOCATE OUTSIDE OR IN WELL VENTILATED AREA
4. LOCATE AND BOLT FUSE ON BATTERY POSITIVE TERMINAL

EQUIPMENT SCHEDULE

TAG	EQUIPMENT MANUFACTURE	EQUIPMENT DESCRIPTION	MODEL / PART NO
1	WINDTRONICS	WIND TURBINE	NA
2	WINDTRONICS	TURBINE INTERCONNECT ENCLOSURE	NA
3	Square D	H.D. 30AMP 250VDC FUSED DISCONNECT	H221NRB
4	ANY	15A 250VDC FAST ACTING FUSE CLASS RK1	NA
5	WINDTRONICS	TURBINE CONTROLLER	NA
6	NA	BATTERY ENCLOSURE	NA
7	NA	BATTERY DISCONNECT	NA
8	LITTELFUSE	100AMP 24V BATTERY FUSE	0298100
9	NA	2- 12V DEEP CYCLE BATTERIES	NA
10	SQUARE D	G.D. 30AMP 240VAC UNFUSED DISCONNECT	DU221RB
11	ANY	14AWG 1-PAIR UNSHIELDED	NA
12	ANY	CAT5E COMMUNICATION CABLE	CAT5E
13	ANY	GROUND STAKE AND CLAMP	ANY

NEC CALCULATIONS

ALL AMPACITIES CALCULATED AT 75DEG C FOR TERMINATIONS

DC VOLTAGE
TURBINE Voc = 170VDC
MAXIMUM DC VOLTAGE = 170VDC

TURBINE SOURCE CIRCUIT
TURBINE Isc = 20A (Short Circuit)
TURBINE Imp = 12.9 A (at Max Power)

SOURCE CIRCUIT OUTDOOR WIRING TO INVERTER = #10AWG USE-2/RHW-2 OR THWN-2, 90DEG RATED
TEMPERATURE CORRECTION FACTOR FOR 70DEG C AMBIENT = 0.58
TOTAL CURRENT CARRYING CONDUCTORS = 3, FACTOR = 1
CORRECTED AMPACITY = 40A X 0.58 X 1 = 23.2 A > 20 A

OUTPUT CIRCUIT OVERCURRENT PROTECTION = 15A
90% OF OVER CURRENT PROTECTION RATING = 15 X 0.90 = 13.5A
OUTPUT CIRCUIT CONTINUOUS CURRENT = 12.9A < 13.5A

AC OUTPUT CIRCUIT
MAX CONTINUOUS CURRENT = 12.5A
MAX INSTANTANEOUS CURRENT = 14.37A (3 MIN)

CONTROLLER OUTPUT CIRCUIT OVERCURRENT PROTECTION = 15 A BREAKER
90% OF OVERCURRENT PROTECTION RATING = 20 X 0.90 = 13.5A
OUTPUT CIRCUIT CONTINUOUS CURRENT = 13.5A < 15A

CONTROLLER OUTPUT WIRING TO POINT OF INTERCONNECTION = #12 THWN-2 90DEG C RATED
TEMPERATURE CORRECTION FACTOR FOR 40DEG C AMBIENT = 0.88
TOTAL CURRENT CARRYING CONDUCTORS = 3, FACTOR = 1
TOTAL INVERTER INSTANTANEOUS CURRENT = 14.37A
CORRECTED AMPACITY = 25A X 0.88 X 1 = 22A >14.37A

AC INPUT CIRCUIT
MAX CONTINUOUS CURRENT = 12.5A

CONTROLLER OUTPUT CIRCUIT OVERCURRENT PROTECTION = 15 A BREAKER
90% OF OVERCURRENT PROTECTION RATING = 15 X 0.90 = 13.5A
OUTPUT CIRCUIT CONTINUOUS CURRENT = 12.5A < 13.5A

CONTROLLER OUTPUT WIRING TO POINT OF INTERCONNECTION = #12 THWN-2 90DEG C RATED
TEMPERATURE CORRECTION FACTOR FOR 40DEG C AMBIENT = 0.88
TOTAL CURRENT CARRYING CONDUCTORS = 3 FACTOR = 1
TOTAL INVERTER INSTANTANEOUS CURRENT = 12.5A
CORRECTED AMPACITY = 25A X 0.88 X 1 = 22A >12.5A

BATTERY INPUT\CHARGE CIRCUIT
MAX CONTINUOUS SOURCE INVERTER CURRENT = 72A
MAX CONTINUOUS CHARGER CURRENT = 50A; 60A PEAK 5 minuets

BATTERY CIRCUIT OVERCURRENT PROTECTION = 100 A FUSE
80% OF OVERCURRENT PROTECTION RATING = 100 X 0.80 = 80A
BATTERY CIRCUIT CONTINUOUS CURRENT = 72A < 80A

BATTERY CIRCUIT TO CONTROLLER = #4 THWN-2 90DEG C RATED
TEMPERATURE CORRECTION FACTOR FOR 40DEG C AMBIENT = 0.88
TOTAL CURRENT CARRYING CONDUCTORS = 2 FACTOR = 1

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www.honeywell.com

Honeywell