

INSTRUCTION MANUAL: WIND CONTROL PANEL-DIGITAL (WCP-D)

The AIR wind generator digital control panel is fully calibrated and ready for installation. Please follow the instructions below for proper indoor installation. This manual covers the 5 amp to 40 amp rated WCP-D options, which are designed to operate with 12-48 VDC nominal battery banks. Critical to note, each WCP-D are both product and voltage specific per the breaker size.

Please see table below

WIND CONTROL PANEL PART NUMBERS

P/N	BREAKER SIZE	TURBINE TYPE
2-ARAC-D-5	5 A	AIR 40/ AIR BREEZE 48 V
2-ARAC-D-10	10 A	AIR 40/ AIR BREEZE 24 V
2-ARAC-D-20	20 A	AIR 30/ AIR MaX/ AIR X MARINE/ SILENT X MARINE 48 V
2-ARAC-D-20	20 A	AIR 40/ AIR BREEZE 12 V
2-ARAC-D-25	25 A	AIR 30/ AIR MaX/ AIR X MARINE/ SILENT X MARINE 24 V
2-ARAC-D-40	40 A	AIR 30/ AIR MaX/ AIR X MARINE/ SILENT X MARINE 12 V

OVERVIEW: This control panel is designed to be installed indoors protected from weather. Installation requires drilling holes into the base of the plastic enclosure to allow for mounting and wiring. The Circuit Breaker switch is used to turn on and off the wind turbine control panel as well as provide protection in case of a major fault. The RUN-STOP toggle switch controls the operation of the wind turbine. In the RUN position, it allows the wind turbine to operate and produce power while in the STOP position it will electrically break the wind turbine stopping or stalling the rotation (in this mode some rotation may occur in windy conditions). The center position is the OPEN position (OPEN CIRCUIT), disconnecting the wind turbine from the battery bank but not braking the wind turbine.

WARNING – the turbine should not be left in the Open Circuit/Center position on the stop switch except during trouble shooting for short periods of time. The Digital display meter provides information on current (A), battery voltage (V), power (W) and wind generator energy production (W - hrs.) over the recorded time period.

The WCP-D is designed to the AIR product specifications and should be used only with the (RE) Ryse Energy AIR family of wind turbines. The WCP-D has 5 option with a from a 5-40 amp rating. The AIR models: Air Breeze, Air 40, Air-X Marine, Air 30, AIR MaX and AIR Silent X, have built-in regulators allowing protection of the batteries from overcharging.

!! WARNING !!

Disconnect battery(s) prior to making any connections! Secure the rotor blades of the wind turbine mechanically so that they are unable to rotate.

MECHANICAL INSTALLATION

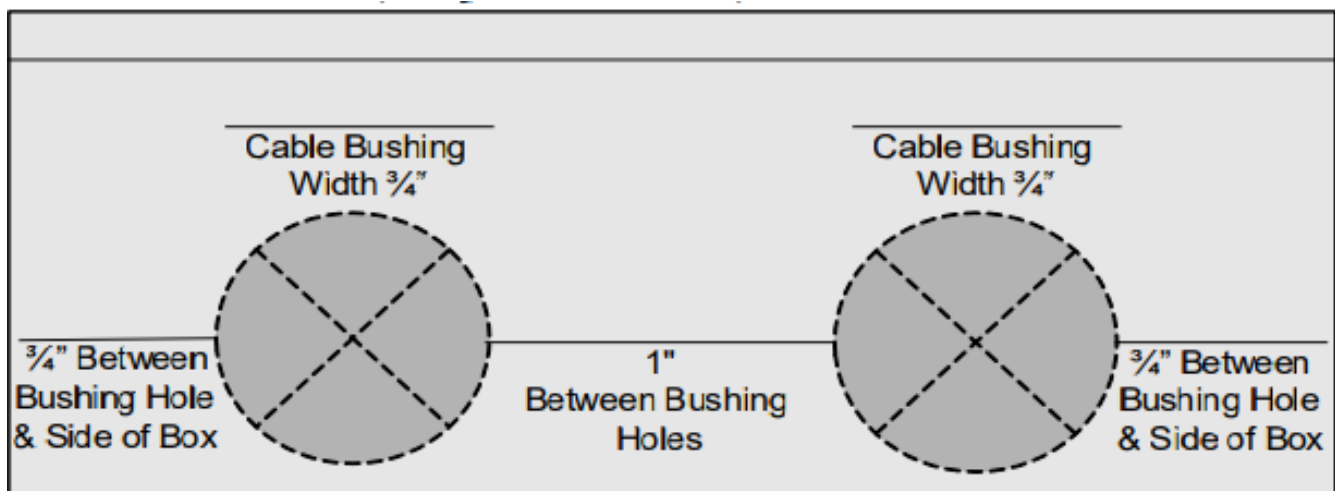
Locate a suitable mounting area for the WCP-D, preferably as close to the battery bank as possible where it will be interconnected yet where there is still easy access to view the meter and operate the controls.

ENCLOSURE MOUNTING INSTRUCTIONS

Enclosure Mounting: The enclosure of the control panel is designed to be mounted on a surface in the vertical position only. Additional holes are required to be drilled in the enclosure for mounting and wiring (enclosure is rated for indoor use only).

- 1) Remove the cover off the enclosure base during the four corner screws.
- 2) Identify a mounting location for the enclosure base. It is recommended the control panel be located as close to the battery bank as possible (7' or less) for a more accurate reading of battery voltage. Mark and drill the enclosure back with holes adequate enough to mount the enclosure back to the mounting area surface (hardware not included) for your specific location.
- 3) Determine optimum location to bring wires in and out of the enclosure. A 3/4" clear hole is required to secure the included wire bushings. Typically, the wind generator input wire and battery wires are fed through the top, top one third sides of the enclosure or sometimes through bottom of the enclosure (see attached typical mechanical drawing locate the holes). When locating wire bushing holes try to position them so they are as close to the bottom of the enclosure as possible allowing for easy wiring passage internally while not interfering with the internal circuits

NOTE: Recommend placing Holes on either Top or Bottom Ends of Enclosure



ENCLOSURE MOUNTING INSTRUCTIONS

- 4) Mount the now predrilled enclosure base into place. Insert wire bushings and pre-stripped wires accordingly.
- 5) Make the connections as described in the section below, being sure that wires are routed internally in the box to avoid interference with the internal components. The WCP terminal blocks, which will accept an 8 AWG or smaller wire size, provides for easy interconnect of the two turbine wires and two battery power wires.
- 6) Insert cover onto enclosure (it should easily fit in place, be cautious that the wires are not interfering with the internal components or the cover) and secure with 4 original mounting screws after wiring is complete.

ELECTRICAL INSTALLATION

Wind Generator Connection: Mechanically tie off the wind turbine blade so that it cannot operate while making your connections. Connect the wires of the 12-48V wind turbine feed wires to the terminals marked wind. Negative to -2 and Positive to 1+ of the Control Panel using the appropriate wire size (8 AWG or smaller) which the blocks will accept, see Figure 2. If a larger gauge wire is required, use a few inches of 8 AWG wire to transition to the terminal blocks. The green grounding wire of the wind generator is connected to the grounding system.

!! WARNING !!

ABYC STANDARDS AND PRACTICES should be followed during the installation along with the manufacturer's recommendation. This manual is made available to assist during installation and start up and is not intended to supersede the ABYC Standards or the Manufacturers requirements and recommendations.

CAUTION

Wire size of the interconnect to both input (wind generator) and output (battery bank) of the control panel is critical to the proper operation of the wind generator. Please consult a Wire Sizing Table (Ryse Energy AIR Owners Manual) to be sure you have the minimum wire size recommended so that the voltage drop is less than 3%.

WIND CONTROL PANEL CONNECTION POINTS

- 1) **Battery Connections:** Be sure battery feed wires are not connected to the battery at this time. Connect the battery feed wires to terminals marked Battery with Negative to -4 and Positive to 3+ of the control panel using the appropriate wire size (see Figure 2).

!! WARNING !!

It is strongly recommended to recheck the tightness of the screws on the terminal block where the connections are made. Initially, tight screw connections will loosen as the wire compresses and therefore going back to recheck the tightness of the screws after a period of time will help assure a good connection.

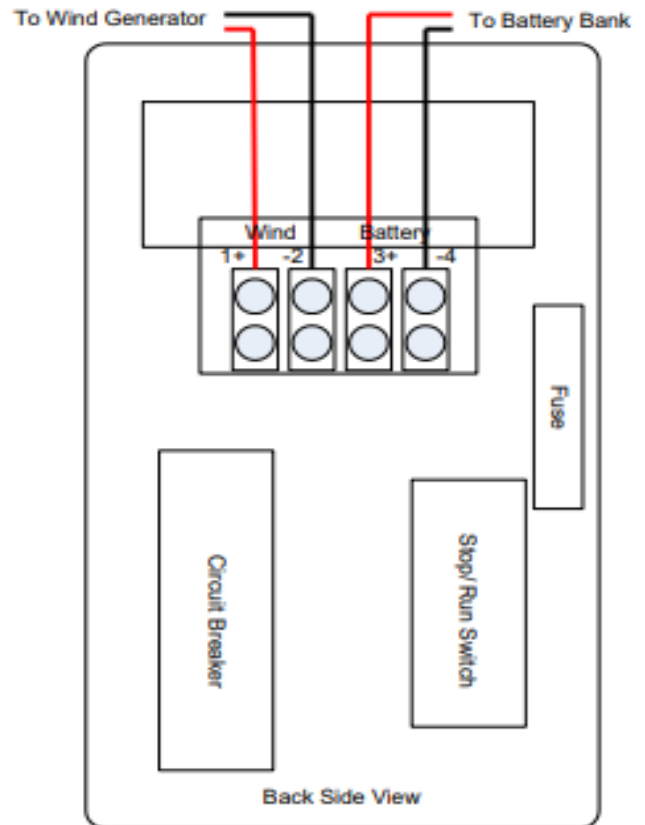


Figure 2

- 2) **Mounting:** Mechanically install the panel into the enclosure base using all 4 cover screws.
- 3) **Battery Connection:** Verify the Circuit Breaker on the Control Panel is in the "OFF" position. Set the RUN-STOP switch in the "STOP" position. Connect the battery feed wires from the Control Panel to the battery bank terminals. Make sure all connections are tight and the wires are of proper size and are mechanically secured.

!! WARNING !!

IMPORTANT: Please be sure polarity (negative/positive) is correct, if not it will damage the control panel and the wind turbine, voiding the warranty.

START UP:

Remove the mechanical tie off of the wind turbine so that it can spin freely. It should rotate at this point (if wind present) but have some resistance (Run-Stop switch is in the “STOP” position). Turn Circuit Breaker to the “ON” position. The digital meter should illuminate and indicate battery system voltage. No current or wattage would be displayed at this time. If there is an energy value displayed, reset to zero by following procedure in section marked “Energy Display/Reset” Switch the RUN-STOP switch to the “RUN” position. The wind turbine should begin turning and current should be displayed provided the battery bank is at 85% or less – not in regulation (please refer to Ryse Energy owners manual for battery regulation set points).

If the battery bank is “topped off” or fully charged, the AIR wind turbine will be in regulation mode and will no longer push current, blades may still rotate if “wind” is present. The wind turbine LED should blink and if there is sufficient wind it should begin spinning and current should be displayed provided the battery bank is at 85% or less. Please see the Ryse Energy AIR instruction manual that came with the wind generator for more information.

!! WARNING !!

Set the wind generator RUN-STOP switch in the “STOP” position prior to turning off or on the power circuit breaker.

In order for the Hybrid energy systems to be operational, the circuit breaker must be left in the “On” position which allows the wind generator to be applying energy to the battery bank when wind is available. Leaving the circuit breaker “on” and wind circuits active will deplete only a minor amount of energy from the battery during non-energy producing periods and should not be of concern. The wind system typically works in harmony together with other energy producing systems on board such as solar PV, alternator, or AC powered battery charger and therefore it is not necessary to turn “off” the wind circuit breaker when these are active (refer to Ryse Energy instruction manual for more information).

IMPORTANT

It is strongly recommended the installer/user read the Ryse Energy “AIR” instruction/start up manuals prior to powering up the WCP-D and related equipment. Adjustments may be necessary based on the type of batteries in the system and other optional features which may be needed for your particular installation.

DISPLAY OPERATION:

Backlight Control: short press the small button located on the right side of the display to turn on or off the backlight. The backlight has a memory function and therefore it will keep your setting even after it powered off.

Energy Display/Reset: The energy information on the display represents a cumulative amount of energy production from its prior reset. To reset it back to zero complete the following steps:

1. Long press the button on display until the power display area reads “CLR” and then release the button.
2. The energy display will begin flashing indicating it in the reset mode. Short press the button again and the energy value should be cleared and it should automatically exit the flashing reset mode.
3. If there is no activity within 5 seconds, it means the energy value has not been clear and the meter will automatically exit the energy reset mode.
4. If the value has not cleared to zero then repeat step #1 to make a second attempt to clear the reset of the energy value.

The Energy value is accumulated number (Energy = Power x Time). It will be maintained in the memory of the meter even if circuit breaker is turned off. A manual Energy value reset of the display will be necessary if you want to have a new Energy value.

Set Voltage Alarm: The display meter has built in high and low-voltage alarms. If you wish to adjust them from the default, follow the below instructions:

1. Long press the button to the right of the display until the power display area reads “SET” then release the button.
2. The Voltage display will show the high voltage alarm value, the Current display will show the low voltage alarm value and the last digit begins to flash. Short press the button to advance the setting. When there is no button activity over 3 seconds the meter will switch to the next digit automatically from the High voltage alarm value to the Low voltage alarm., There are a total of 6 digits the range of voltage alarm can be set from 6.5 to 99.9 V
3. Fewer completing your adjustments for the alarm setting, long press the button until the screen displays pass which means you set the successfully the voltage alarm and it will automatically exit the setting state.

!! WARNING !!

The meter is set up from the factory to work with a 50A shunt which is built into the controller. If the button is held to long the power area may begin displaying CURR which can allow accidental adjustment of the shunt setting. Do not change the setting of 50A as it will put the meter out of calibration. To exit this mode, long press the button to exit back to normal display.

TROUBLESHOOTING:

1. **Wind Turbine is Cycling On/Off:** When your battery bank is approaching top off (full charge), you may see the wind turbine starting and stopping very frequently. This is caused by the wind turbine attempting to do the final top off on to your battery bank. It may be necessary to lower the voltage set point for the wind generator regulator to eliminate this problem. See the Ryse Energy instruction manual for more information.
2. **Wind Turbine Not Operating Properly:** Primus Wind Power AIR wind turbines contain a microcontroller for operating/regulation. From time to time transients or electrical noise (i.e. lightning strikes, keying the SSB microphone, etc.) may cause these microprocessors to go unstable. To correct the problem, turn the WCP – D Stop/Run switch to Stop, wait approximately 5 minutes and then set it back to Run. If this does not resolve the problem, please refer to the Ryse Energy user manual for additional troubleshooting advice or contact Ryse Energy LLC Tech support 303-242-5820.
3. **Display Blank:** Complete the following steps:
 - 3.1. Check that the DC circuit breaker is in the ON position.
 - 3.2. Confirm that the correct DC voltage is applied to the controller by checking the battery terminals inside the controller (use a voltmeter) after you have removed it from its enclosure base.
 - 3.3. If the display is still blank after you confirm voltage is applied to the controller and the DC breaker on the controller has been turned ON then check the fuse.
 - 3.4. Fuse check. Remove power from the controller, unscrew the fuse holder and check the fuse for continuity. If the fuse has failed the continuity check replace the fuse and repower the controller.
 - 3.5. If the controller display is still blank, controller requires servicing.

WIND CONTROL PANEL CONNECTION DIAGRAM

