



Technical Bulletin

FROM: Primus Wind Power Engineering Department

DATE: July 22nd, 2020

RE: Potentiometer Adjustment of the Regulation Voltage for all AIR Wind Turbines and all Battery Types (including Lithium Ion batteries)

The AIR turbine continually monitors battery voltage (as a bulk charging source) and compares it to the voltage regulation set point. The voltage regulation settings are preset at the factory to the values illustrated within the table in this document. These values are adjustable for individual applications. The AIR factory preset point is generally acceptable for most sealed and flooded lead acid battery types. Most lithium ion (LI) batteries are designed to be “drop in” replacements for lead acid batteries. However, some LI batteries have a lower recommended charge voltage. Refer to your battery manual for the recommended bulk charge voltage. Using the AIR manual or information below, please make the necessary adjustments to the regulation voltage set point per the battery manual utilized. The AIR turbines will function properly using all battery types if the above considerations are taken into account. Adjustments to the regulation voltage set point may be avoided considering the following - the larger the battery bank and more consistent voltage load, the less likely the need for any adjustments to the regulation voltage set point. All LI Batteries have a battery management system and should disconnect if the charging voltage is too high to protect the battery. If the LI battery is disconnecting during use, please refer to steps below to adjust the regulation voltage set point. It is also strongly recommended with LI batteries as well as all battery types that when the turbine is left unattended and incurs no load for extended periods of time, the stop switch should be toggled to the STOP/OFF position for safety.

In 2020, Primus Wind Power released an updated Lithium Ion (LI) control circuit card designed to improve the AIR turbine functionality with LI battery types. It is strongly recommended when using LI batteries that the AIR turbine is also upgraded to this new power electronic circuit card. Primus Wind Power offers the AIR Loyalty program with discounted pricing specifically for this purpose. Please contact us at info@primuswindpower.com or 303.242.5820 to learn more.

Adjusting Regulation Voltage

The AIR turbine enters a regulation mode when the voltage set point is reached and remains in place until the battery voltage drops to the “cut-in” voltage (which is slightly lower than voltage set point). The difference between these two (2) values is called “hysteresis” which prevents the turbine from “bouncing” in and out regulation. The hysteresis is approximately 0.6V for 12V turbines, 1.2V for 24V turbines, and 2.4V for 48V turbines. The voltage regulation set point is adjustable using the potentiometer on the side of the AIR turbine body. To accurately set the regulation voltage, disconnect the turbine from the batteries and use an adjustable voltage source (or power supply, if available) and a multi-meter to apply the desired voltage across the positive and negative turbine leads. With the power supply off, turn the potentiometer



screw fully clockwise. Then turn on the power supply, verify two (2) blinks of the LED on the turbine, and then turn the potentiometer screw counterclockwise very slowly until the LED begins blinking. The regulation set point is now fixed to the voltage applied across the turbine leads. Alternatively, the regulation set point voltage may be adjusted using a trial and error method. Use the accompanying chart as a guide to increase or decrease the voltage regulation set point using the potentiometer screw on the side of AIR turbine body. Monitor the battery voltage over a period of time and make only small adjustments until the regulation set point voltage has reached the desired level.

Please refer to our AIR Owner’s Manual for more information or contact Technical Support at info@primuswindpower.com or 303.242.5820 to learn more.

System Voltage	Factory Set Point	Voltage Regulation Set-Point Adjustment Range*	Voltage Change per 1/8 Turn of Potentiometer Screw**
12 Volt	14.1 Volts	13 – 17 Volts	0.56 Volts
24 Volt	28.2 Volts	26 – 34 Volts	1.12 Volts
48 Volt	56.4Volts	52– 68 Volts	2.24 Volts

*Adjustment ranges are approximate and actual ranges may vary.

** Turn clockwise to increase voltage and/or counterclockwise to decrease voltage