

6 KW Heater Controller

With optimal power point tracking for Scirocco wind turbine



Description :

Our **6kW Heater Controller** provides a simple and economic way to realize direct heating applications with our 6kW Scirocco wind turbine.

It is intended to directly works with standard 230Vac heater resistors, and thus can easily adapt to existing installation.

Features :

- 6000W rated output with 5kW to 7.5kW (@ 230Vac) rated resistors.
- Possibility to connect 2kW to 9kW rated resistors (with derating).
- All working parameters and settings are displayed on a unique and large LCD display with keypad, and there is no need for any additional metering or display device.
- Total produced energy is internally recorded and can be displayed.
- Programmable maximum voltage-current-power allows to perfectly tune the installation in case of re-employ of existing heaters.
- Digital input for remote control (output ramp up/ ramp down).
- Internally self powered by the wind turbine generator. No need for any other power source.
- Noise free DC output (PWM converter, 20khz IGBT switch) doesn't generate any mechanical noise in the heater resistor.
- Specifically designed to work with Scirocco Wind Turbine, variable speed management and our unique DSP controlled Maximum Power Point Tracking system ensures maximized wind power extraction, even in low wind conditions, and low noise.

Eoltec's power electronics are manufactured and developed in exclusive cooperation with leading innovative inverter manufacturer, **MLT Drives CC** (South Africa – www.mltdrives.com - info@mltdrives.com)

– 6 kW Heater Controller Specification Sheet –

Model	HC- 6K-230V-M
--------------	----------------------

Connection 1 - WT generator input

Input voltage range (3 phases input)	60V to 270V AC
Input voltage frequency	15 to 55 hz
Maximum input current (continuous, per phase)	16 A
Maximum input power (continuous)	6300 W

Connection 2 – Heater resistor

Nominal output voltage	230V dc
Maximum output voltage (adjustable)	250V dc
Maximum output current (adjustable)	30A dc
Maximum output power (adjustable)	6000 W
Maximum heater resistance	30.0 Ω
Minimum heater resistance	5.5 Ω

Connection 3 – Remote control digital input

Input open voltage	5V dc
Input closed sink current (0V)	4 mA
Input logic	NO or NC (adjustable)
Power up-down ramp time	1 s

User interface

Main display	LCD, 2 lines of 16 characters
Alarm display	Main LCD display + Led
Parameters input and scrolling	Keypad
Displayed parameters	Output voltage/current/power Wind turbine rpm Totalized produced energy Error messages
Displayed user settings	Maximum current limit Maximum voltage limit Maximum power limit Remote control input logic (NO/NC) Firmware version

Housing

Dimensions (DxWxH) mm	300x468x215mm
Weight (kg)	16 kg
IP protection index	IP53
Input & output connections	Internal screw connectors
Fixing	Wall mount

Miscellaneous

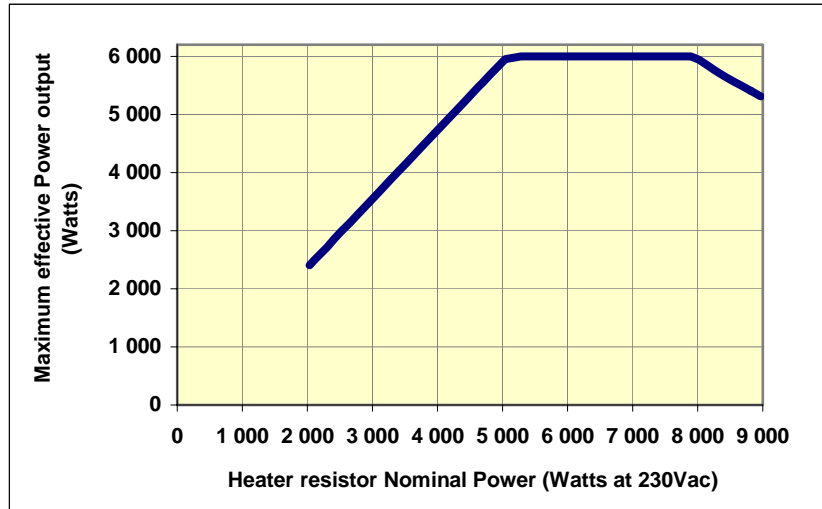
Operating temperature range	-10 to +45°C
Maximum efficiency	95%
Over voltage protection	Output voltage
Over temperature protection	yes
Over current protection	Electronic control and circuit breaker
Cooling	Natural cooling
Mean time between failure (MTBF)	>25000 hours (at 100% output power)
Warranty	2 years

Output power versus heater resistor characteristics :

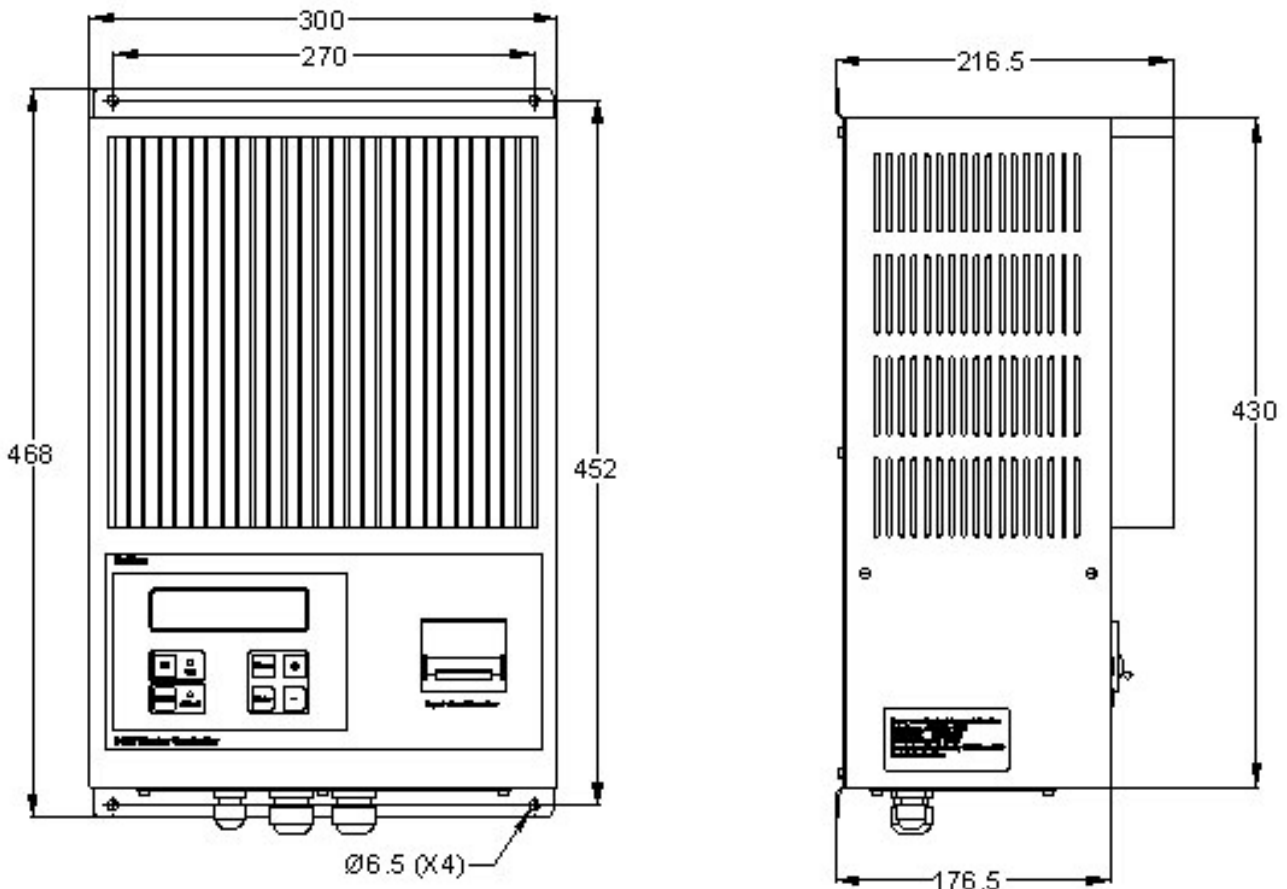
Different limits are implemented in the device (adjustable in user menu settings):

- Maximum output power : 6000W
- Maximum output voltage : 250Vdc
- Maximum output current : 30 Amp. dc
- load impedance : 5 to 30Ω

Due to these limits, the maximum achievable output power is depending of the resistance of the load connected to the output :



Dimensions and fixing :



Note : The device must be vertical for correct cooling

- Installation and operation -

Cautions and Warnings

WARNING
**THE HC- 6K HEATER CONTROLER GENERATES
HIGH VOLTAGES AND CURRENTS.
INCORRECT USE MAY CAUSE ELECTRICAL SHOCK AND DEATH.**

- This manual is only for use with the HC- 6K Heater controller.
- The HC- 6K Heater controller contains sophisticated electronic equipment and must be installed by a qualified electrical technician. Any queries must be referred to the appropriate service provider.
- Any work performed on the HC- 6K Heater controller and the installation of the HC- 6K Heater controller must comply with local and national electrical regulations.
- All precautions relating to the installation and operation of mains voltage equipment must be observed when installing the HC- 6K Heater controller. This includes considerations to insulation of cabling, access to bare conductors, grounding, protection from moisture etc.
- Do not operate the HC- 6K Heater controller with any panels or covers removed. Do not operate the HC- 6K Heater controller if it is not properly installed.
- After being disconnected, the HC- 6K Heater controller may still contain high voltages in the capacitors. Ensure that these have been fully discharged before working on the HC- 6K Heater controller.
- Do not use the HC- 6K Heater controller outside the permissible ambient conditions.
- Do not short the inputs or outputs of the HC- 6K Heater controller while the HC- 6K Heater controller is running, as this can cause damage to the HC- 6K Heater controller.

Warranty

- Warranty is for two years from date of purchase.
- No liability is accepted for any damages occurring through use, manipulation, working situations and handling which are not explicitly mentioned in these operating instructions.
- The following cases are not covered by the warranty:
 - Reverse polarity on Battery connections (+/- reversed)
 - Connection to incorrect load
 - Damage due to condensation in the appliance
 - Defects caused by transport damage, force, physical or mechanical means
 - Any unauthorised changes to the system
 - Damage from any over-voltages (over input voltage, lightning, etc)

Features

The HC- 6K Heater controller has numerous advanced features, including.

- Simple installation and configuration
- Fully dedicated and tuned for use with Eoltec's Scirocco wind turbine
- State-of-the-art Digital Signal processor system
- Easy connection to heater resistor / wind turbine
- Output enable/disable remote control with programmable NO/NC logic
- Silent operation
- Maintenance free

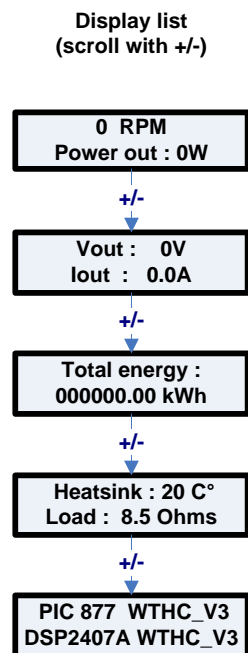
Operator interface



- Enable/disable output with **ON** key
- Scroll the displayed parameter (+ and - key)
- accessing and modifying the adjustable setup parameters (**Menu** , **Enter** , + / - keys).

Parameters display :

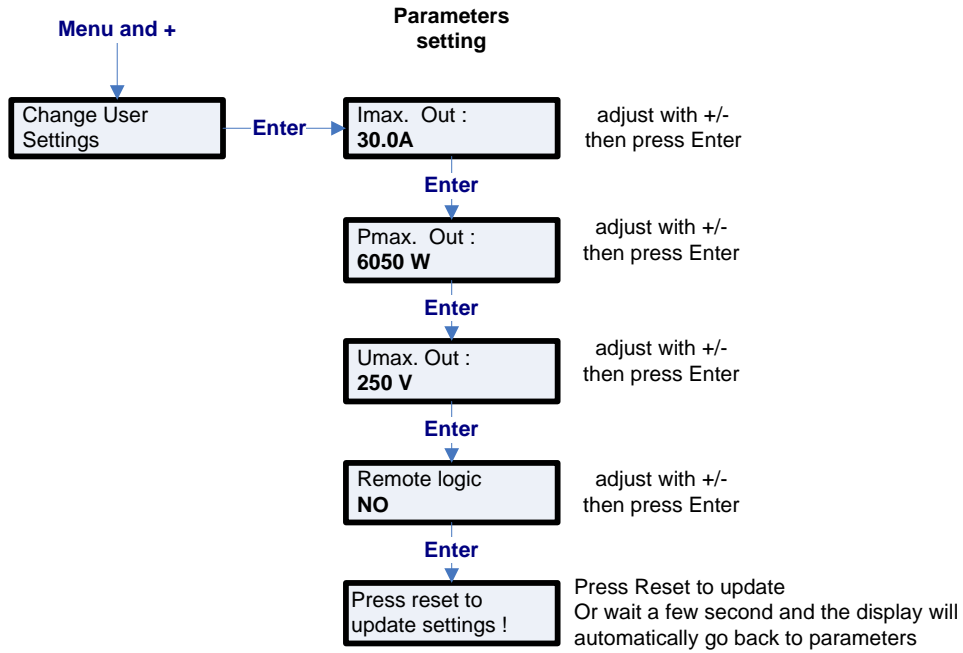
- Once the WT is running, the display is enabled.
- Scroll the displayed parameters with + and - keys.



Parameters setting :

4 parameters can be set :

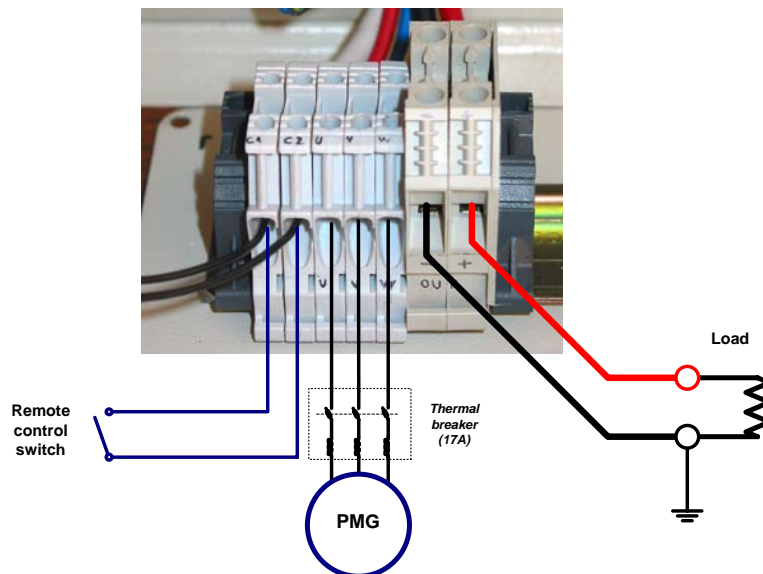
- Maximum output current (10.0 to 30.0A, default 30.0A)
- Maximum output voltage (200 to 250Vdc, default 250Vdc)
- Maximum output power (2000 to 6050W, default 6050W)
- Remote input logic (NO or NC, default is NO with output enabled)



Site selection

The heater controller must be installed indoors, in a dry, shady, clean environment. Easy access to the cabling terminals must be available.
At least 150mm clearance must be provided with sides and top box for correct cooling.

Wiring :



Connection to Load output :

Ensure that all breakers are "OFF".

Connect the single-phase cabling from the load to **Gnd** and **V+** terminals.

Connect ground wire to ground terminal.

Cabling should be of at least 6mm² core cable (for 6kW heater resistor).

Connection to Scirocco generator :

Ensure that all breakers are "OFF".

A 3 phases motor thermal breaker must be used to protect the wind turbine generator. Thermal current threshold must be set to 17A.

Connect the three-phases cabling from the wind turbine generator to the breaker, then from the breaker to the **U / V / W** terminals.

Cabling should be of at least 4mm² core cable.

Connection to remote control switch :

You can connect a normally open or normally close switch to the remote control input.

Set the "remote logic" to NO or NC according to your need.

Input open voltage is +5V, short circuit current is 4mA. tect the wind turbine generator.