



MWI -5200-48

Multimode Wind Charger-Inverter for Eoltec's Scirocco wind turbine

- MANUAL -

Version 1.0



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1 **General Information**

1.1 ***Cautions and Warnings***

WARNING

THE MWI-5200-48 CHARGER/INVERTER GENERATES HIGH VOLTAGES AND CURRENTS. INCORRECT USE MAY CAUSE ELECTRICAL SHOCK AND DEATH.

- This manual is only for use with the MWI-5200-48 Charger/Inverter.
- The MWI-5200-48 Charger/Inverter 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 MWI-5200-48 Charger/Inverter and the installation of the MWI-5200-48 Charger/Inverter 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 MWI-5200-48 Charger/Inverter. This includes considerations to insulation of cabling, access to bare conductors, grounding, protection from moisture etc.
- Do not operate the MWI-5200-48 Charger/Inverter with any panels or covers removed. Do not operate the MWI-5200-48 Charger/Inverter if it is not properly installed.
- After being disconnected, the MWI-5200-48 Charger/Inverter may still contain high voltages in the capacitors. Ensure that these have been fully discharged before working on the MWI-5200-48 Charger/Inverter.
- Do not use the MWI-5200-48 Charger/Inverter outside the permissible ambient conditions.
- Do not short the inputs or outputs of the MWI-5200-48 Charger/Inverter while the MWI-5200-48 Charger/Inverter is running, as this can cause damage to the MWI-5200-48 Charger/Inverter.

1.2 ***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 grid-voltage (any voltage other than 230VAC 50/60Hz)
 - 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 battery DC voltage, lightning, etc)

2 Introduction

2.1 Welcome

Thank you for purchasing the state-of-the-art multi-modes MWI-5200-48 Wind Charger/Inverter. This device will provide you with a simple and powerful installation.

2.2 Features

The MWI-5200-48 Charger/Inverter 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 grid / batteries / wind turbine
- Automatic Slave (Grid-tied) or Master (stand-alone) modes
- Integrated anti-islanding fixtures (Enel – VDE0126 – UL 1741)
- Over-voltage protection
- DC- AC Galvanic isolation
- Silent operation
- Maintenance free

2.3 Method of Operation

The MWI-5200-48 wind charger/inverter can be used for stand alone, grid feeding, or UPS applications.

Fig. 1

- Typical stand alone wiring -

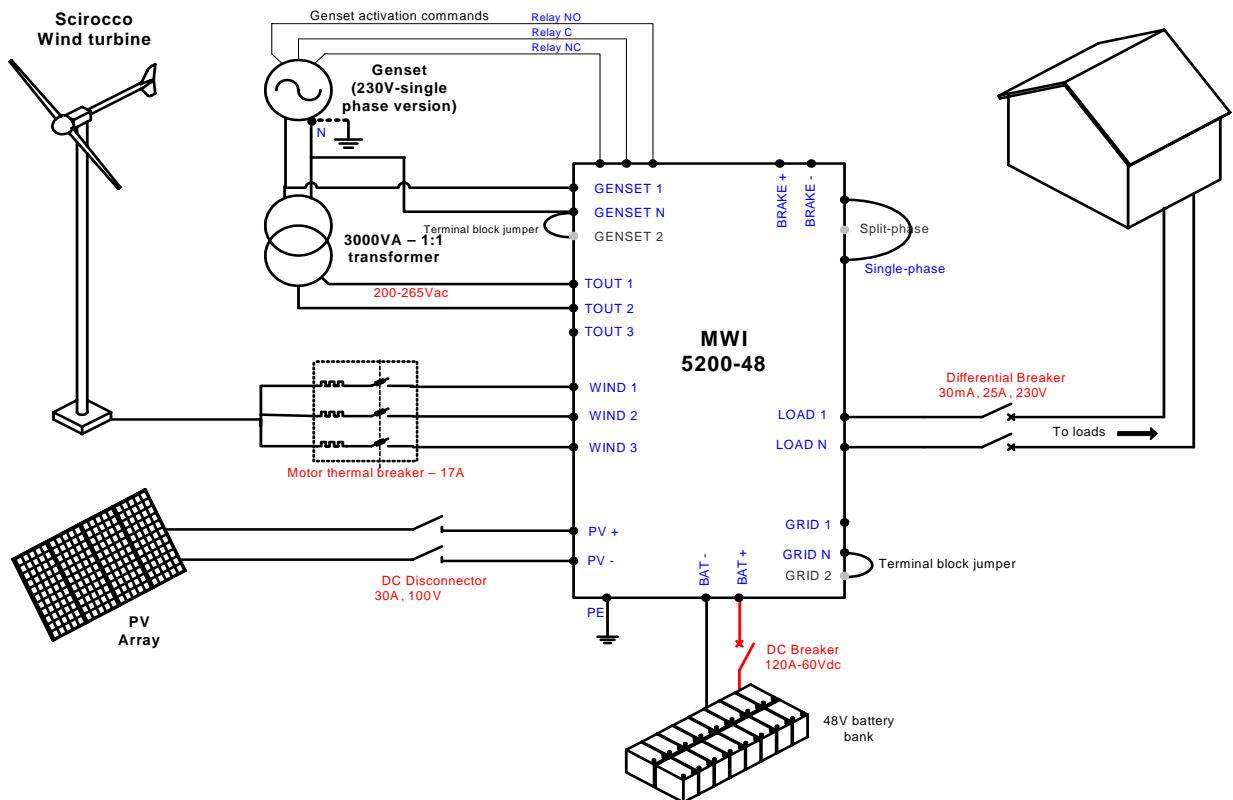


Fig. 2

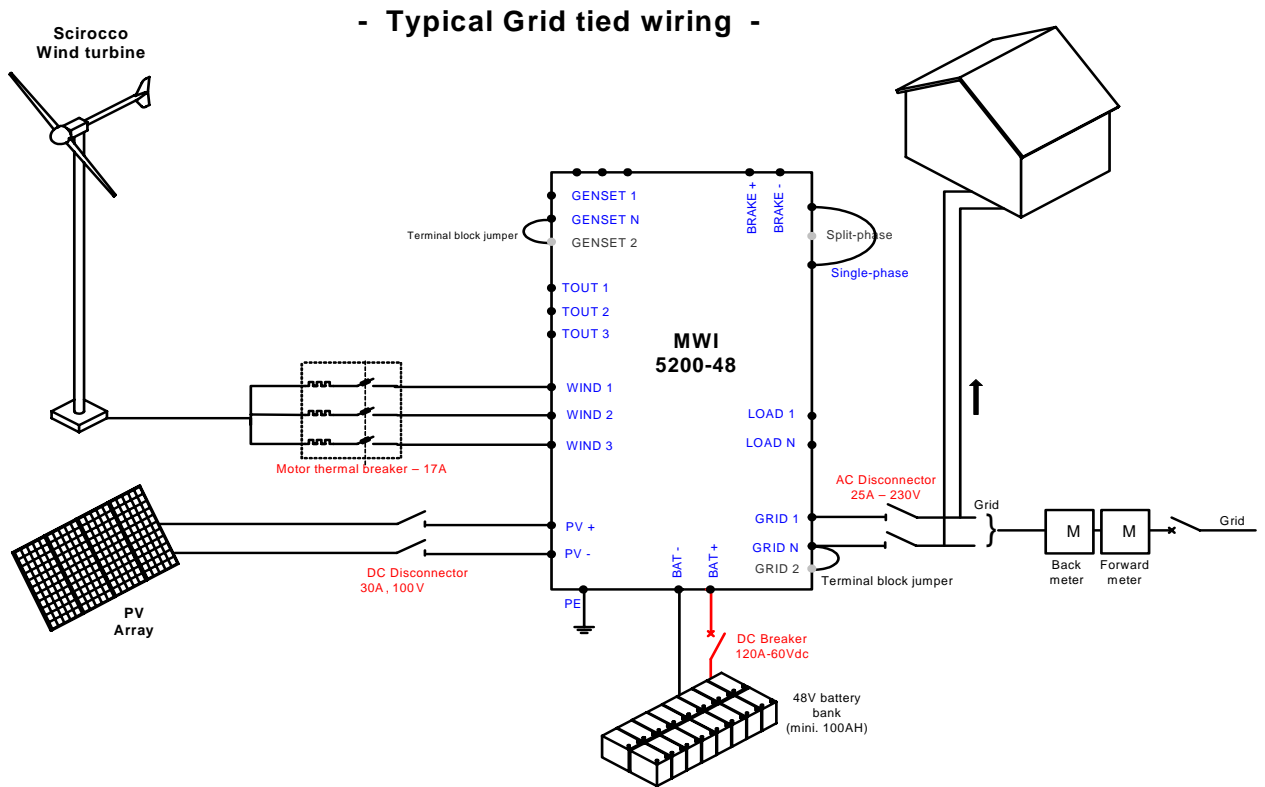
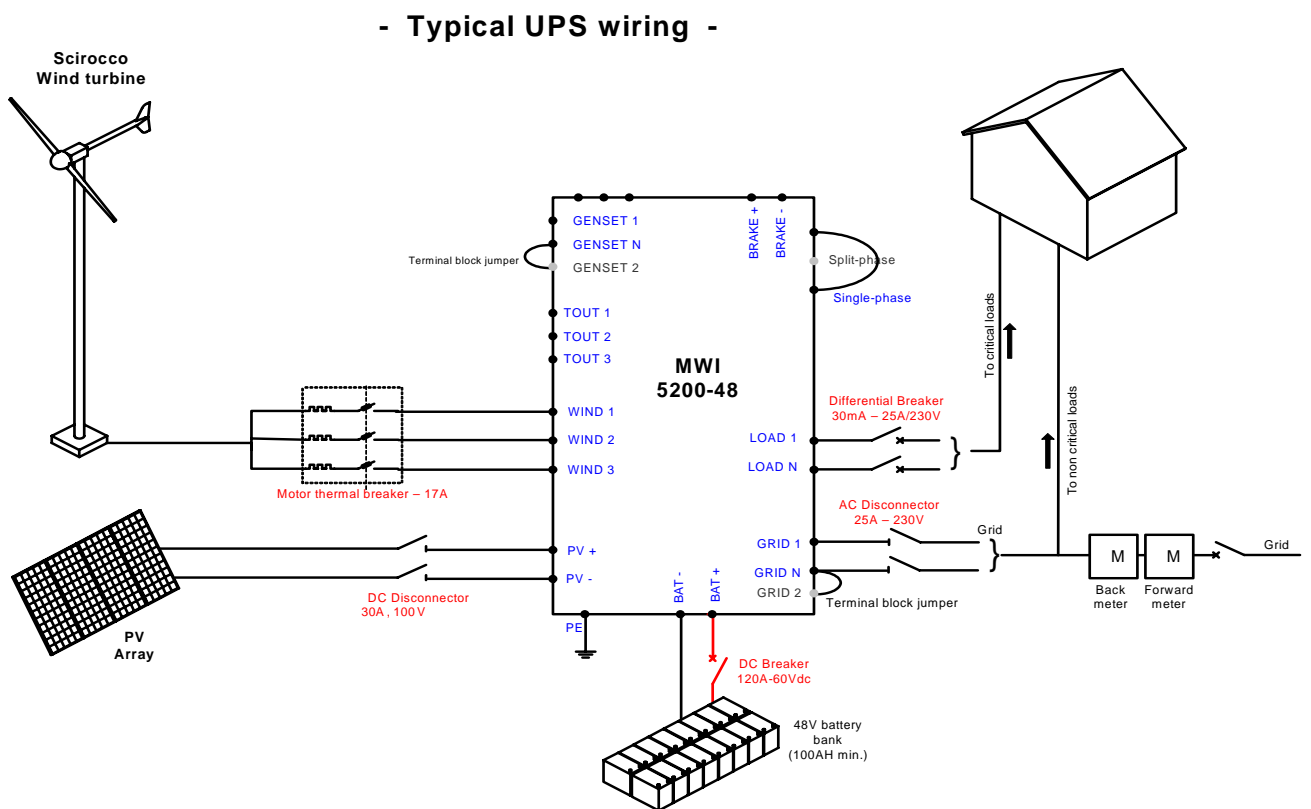


Fig. 3



2.4 User Interface

2.4.1 Overall view



2.4.2 Power switch

Note that the unit is internally powered by the battery input. Then whatever is the position of the main switch, if the battery is connected to the unit the display will be enabled.

To completely disable the unit, disconnect the battery from the unit (with the DC breaker).

The Main switch has two functions :

- Activate the unit when it is in "ON" position
- Connect the inverter to the output

2.4.3 LED's

The five LED on the front panel give an indication of the status of the MWI-5200-48 Charger/Inverter.

- **POWER** : Indicates that the charger/inverter is operational (DC breaker and main switch must be in "ON" position)
- **FAULT** : Indicates that the charger/inverter is in faulty state
- **FAN FAIL** : Indicates a fan failure
- **GRID FAIL** : Indicates that the grid fail or is out of range
- **O.T.** : Indicates that the unit internal temperature is too high

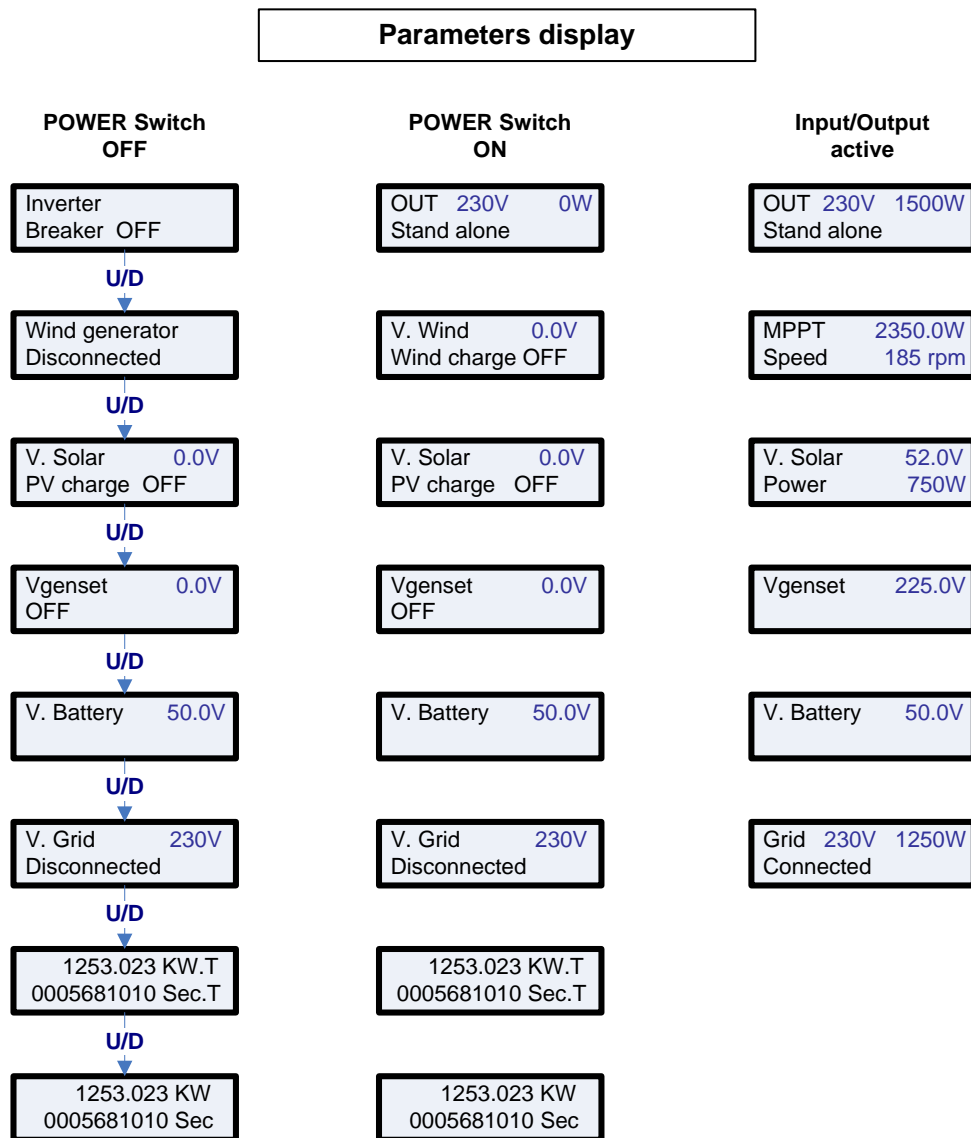
2.4.4 Keypad

The Keypad is used for :

- Scroll the displayed parameter (**UP** and **DOWN** key)
- accessing and modifying the adjustable setup parameters (**ESC** and **ENTER** keys).

2.4.5 Parameters display

- Once the battery is connected to the unit, the display is enabled.
- Scroll the displayed parameters with **UP** and **DOWN** keys.
- If Display Scroll is set to "automatic" the list will scroll automatically.
- Some screens are depending of Power switch position, or input/output actual state.
- Push **ESC** key to go to the Menu.
- If you are on a sub-menu, push **ESC** key several times until you are back to the parameters display.

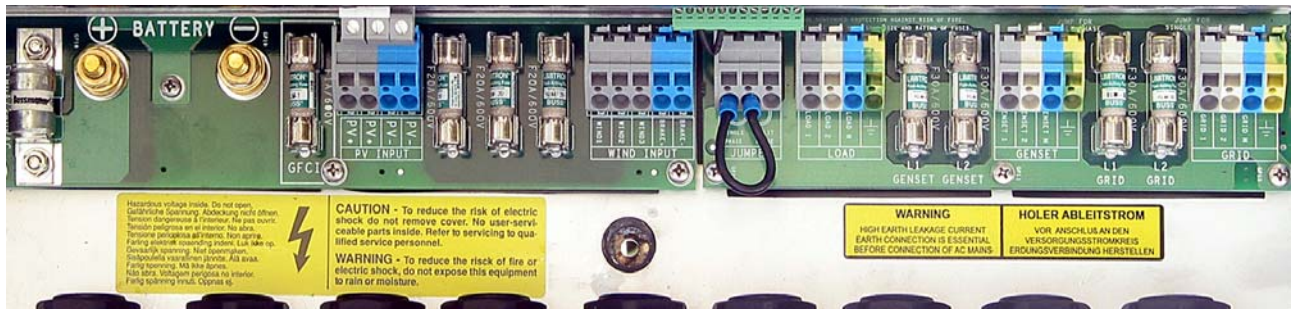


3 Installation

3.1 **Site selection**

The charger/inverter must be installed indoors, in a dry, shady, clean environment. Easy access to the cabling terminals must be available.

3.2 **Terminals map**



3.3 **Connection to Load output (non Grid AC Output)**

Ensure that all breakers are "OFF".

Connect the single-phase cabling from the load to **Load1** and **LoadN** terminals.

Connect ground wire to ground terminal.

Cabling should be of at least 4mm² core cable.

3.4 **Connection to Grid output**

Ensure that all breakers are "OFF".

Connect the single-phase cabling from the AC supply grid to **Grid1** and **GridN** terminals.

Connect ground wire to ground terminal

Cabling should be of at least 4mm² core cable.

3.5 **Connection of Batteries**

Ensure that all breakers are "OFF".

Ensure that the **Batt+** terminal of the charger is connected to the positive terminal of the batteries, and the **Batt-** terminal of the charger to the negative terminal of the batteries.

Cabling from the inverter/charger to the batteries should be kept as short as possible.

Cabling should be of at least 16mm² core cable.

3.6 **Connection of Scirocco wind turbine**

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 **Wind1** / **Wind2** / **Wind3** connectors.

Cabling should be of at least 4mm² core cable.

3.7 **Connection of solar panel**

Ensure that all breakers are "OFF".

Ensure that the **Batt+** terminal of the charger is connected to the positive terminal of the Solar Panel, and the **Batt-** terminal of the charger to the negative terminal of the Solar Panel.

Cabling should be of at least 6mm² core cable.

3.8 **Initial Turn-on**

Ensure that all cables are properly connected and tightened.

Ensure that all the breakers and the MWI's power switch are in "OFF" position.

-1- Turn the battery DC breaker to the "ON" position

- In this position, the unit is internally powered from the battery, the display is active, but all the power inputs and outputs are inactive.

- Parameter settings should preferably be done in this mode

- Some parameter settings are only available in this mode

- 2- Switch the unit Power Switch (front panel) "ON"
 - *In this position, the unit is internally powered from the battery, the display is active, all the power inputs and outputs are active.*
 - *Some parameter settings are not available in this mode*
 - *Grid fail led will be active (if the unit is set for Grid feeding)*
 - *"Wind turbine not connected" will be displayed*

- 3- Switch the other breakers ON (grid, load, WT, SP)
 - *In this position, the unit is fully operational.*
 - *Use UP and DOWN keys to scroll parameters to check the inputs and output status.*

4 **Modes of operation**

4.1 **Stand alone mode**

In stand alone mode the charger/inverter will operate as the AC supply to the load. Power will be taken from the batteries to supply the load.

If the battery voltage goes below 46V, the Genset activation relay will be energized and if adequate voltage is detected on the Genset input the load will be internally transferred from the inverter to the Genset.

If the battery goes below 44V, the inverter is stopped.

4.2 **Grid tied mode**

In grid tied mode and when power is present at wind input or solar input, the charger/inverter will synchronise to the grid and feed power *.

Grid management (anti islanding) can be set to comply with the following standards : **ENEL**
VDE0126
UL1741

* assuming that battery is charged and that grid is present

4.3 **UPS mode**

UPS mode works like grid feeding mode but some critical loads are connected to the Load1/LoadN terminals.

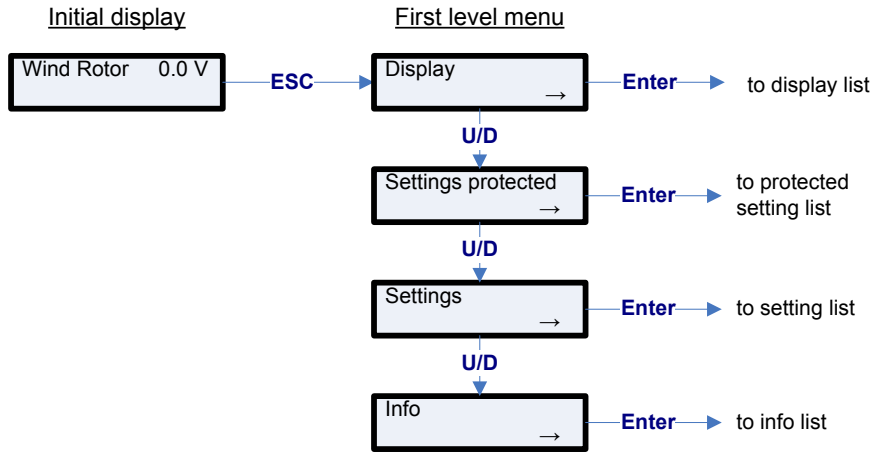
If the grid disappears, then the inverter disconnects from grid output, but load output is still connected to the inverter.

5 Parameters settings

- To set the device parameters the unit must be powered by the battery.
- Some settings are only accessible if the power switch is "OFF"

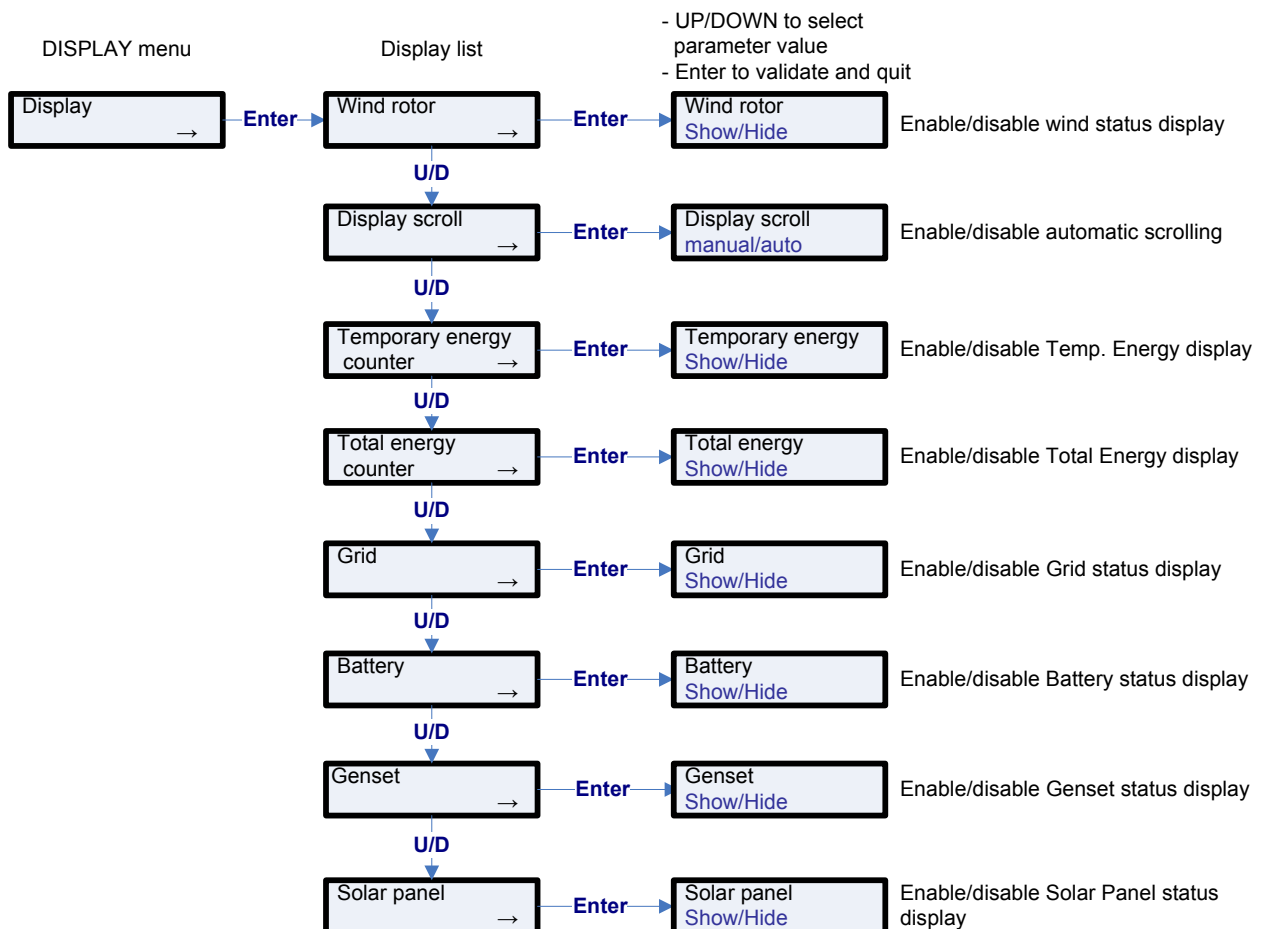
5.1 First level menu

- Press **ESC** to enter configuration mode. Four sub-menu are available, scroll the list with **UP** and **DOWN** keys.
- When the adequate sub-menu is selected, press **ENTER**.



5.2 DISPLAY menu

- Scroll the display parameter list with **UP** and **DOWN** keys. When the adequate parameter is selected, press **ENTER**.
- Use **UP** and **DOWN** keys to set the parameter to the adequate value, press **Enter** to validate and exit.
- Press **Esc** to exit to main menu



5.3 SETTINGS PROTECTED menu

SETTINGS PROTECTED menu

Settings protected →

Enter

Password ****

Initial password is set to 0000

Enter x 4

SETTINGS list

- UP/DOWN to select parameter value
- Enter to validate and quit

Set Vout →

Enter

Vout = 230 VAC

U/D

Grid standard →

Enter

Grid standard
ENEL

ENEL
VDE 0126
UL 1741

U/D

Restore E2 →

Enter

Confirm
E2 restore NO

U/D

Configuration system →

Enter

Set operating mode →

Enter

Stand alone
single phase 0

Grid connected 1
Stand alone split phase 2

U/D

Service →

Enter

Service Password

Factory reserved

U/D

Set frequency →

Enter

F = 50.00 Hz

Set to 50 or 60Hz

U/D

Set brake ON/OFF →

Enter

Function
disabled

Configuration system sub-menu

brake resistance value →

Enter

resistance
brake SHORT

NO brake
10 to 2500 ohms

U/D

Wind rotor type →

Enter

WRE 0.6.0

U/D

Genset charge mode →

Enter

Genset chg mode
single phase

Single phase
Three phases

U/D

Genset charge max power →

Enter

Genset chg power
disabled

disabled/enabled

U/D

Battery capacity →

Enter

Battery
> 500 A.H

200 to > 500 A.H

U/D

Brake resistance power →

Enter

Resistance power
1000 W

100 to 5000 W

6 Specifications

Model:	MWI-5200-48
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Wind Input specification

Operational input voltage range (3 phases input)	85 to 300VAC
Operational input voltage frequency	18 to 52 Hz
Maximum continuous input current	17 A
Maximum continuous input power	5600 W

Battery Input specification

Nominal battery voltage	48V
Output voltage range	40 to 58.6 VDC
Maximum output power (continuous)	5600 W
Maximum charging current (continuous)	100 A

Photovoltaic Input specification

Nominal input voltage	48V
Maximum continuous input power	1000 W
Maximum continuous input current	20 A
Over current protection	23 A

Inverter output specification

Nominal input voltage	230V
Maximum continuous output power	5200 VA
Maximum continuous output current	23 A
Surge power (5s)	8000 VA

User interface

Main display	LCD, 2 lines of 16 characters
Alarm display	Main LCD display + Led
Parameters input and scrolling	Keypad
Displayed parameters	Battery voltage, power, grid voltage, wind turbine rpm

Housing

Dimensions (DxWxH) mm	100 x 515 x 690mm
Weight (kg)	24 kg
IP protection index	IP53
Input & output connection	self clipping terminals Ø8 mm thread studs for battery
Fixing	Wall fixation

Miscellaneous

Operating temperature range	-10 to +40°C
Over voltage protection	Input and output
Over temperature protection	yes
Over current protection	Electronic control and circuit breaker
Cooling	Fans
Mean time between failure (MTBF)	>25000 hours (at 100% output power)
Warranty	2 years