

Energy Monitor 3000

Introduction

With the Energy Monitor 3000, you are now able to determine power costs of your power loads in the easiest way.

Proper use

The measurement range of the Energy Monitor 3000 extends from 1.5 to 3000W. If values fall below or exceed these limit values, exact measurements are no longer possible. Also the device could be overloaded and thereby destroyed.

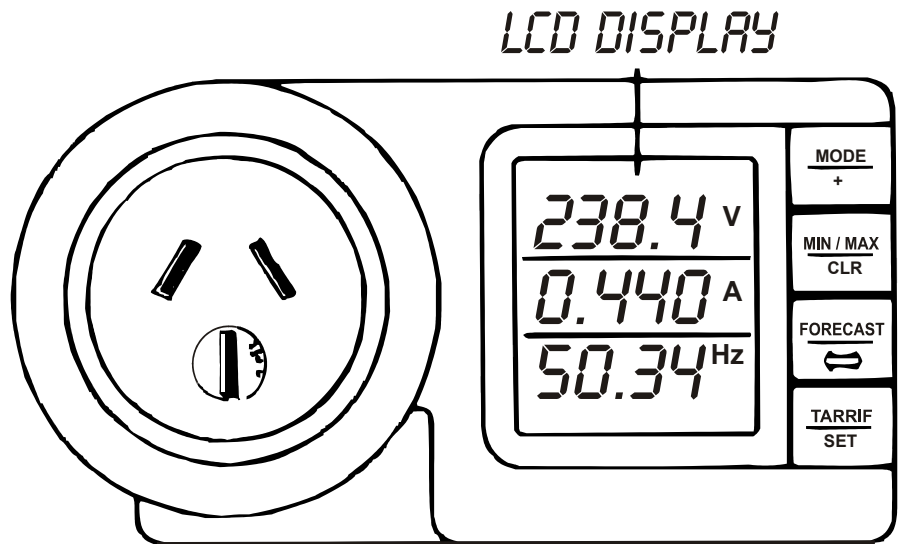
The Energy Monitor 3000 has been developed for monitoring and measuring electrical loads. Although the Energy Monitor 3000 is very accurate, it is not officially certified for usage by power companies and users for measuring power expenditures.

- The Energy Monitor 3000 is only certified for operation at 240V AC.
- Only power loads with a power supply of 240V AC 50Hz may be connected.
- The maximum power of any connected load may not exceed 3000W (max. current 13A).
- Operation of the Energy Monitor 3000 is only permitted in interior spaces and dry environments. Usage in the open air is strictly forbidden!
- Always observe the declarations on the identification labels of connected power loads.

Another use than the one described above may lead to damage to the product and may be associated with dangers like short circuit, fire, electric shock, etc. The entire product may not be converted or modified! The safety instructions must be strictly observed.

Safety Instructions

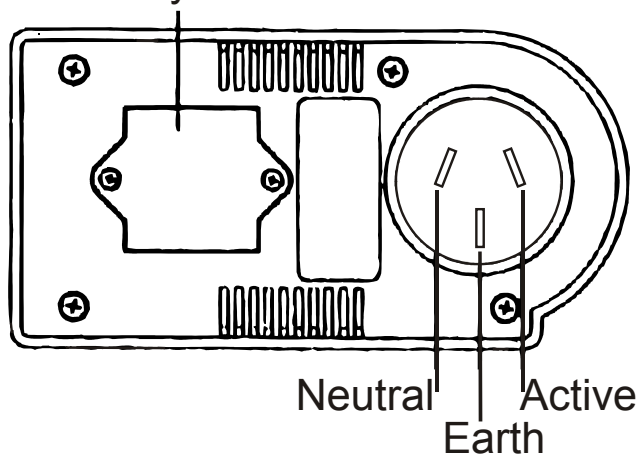
- The manufacturers will not assume any liability for damages to items or persons caused by improper handling or non-compliance with the safety notices! Any warranty claim will become null and void in such cases.
- It must be observed that the conductive ground wire is not broken as this can pose lethal danger in the event of a malfunction.
- This device is not a toy and does not belong in the hands of children.
- Only connect the Energy Monitor 3000 to certified protected contact outlets 230V AC 150 Hz $\pm 10\%$ (10/1 6A) with a ground wire.
- The connected load may not exceed 3000W (13A).
- The recommended operating temperature is between +10 and +40°C. High temperatures, especially during measurement of large power loads, lead to danger of overheating and can thereby permanently destroy the Energy Monitor 3000.
- Avoid operating under adverse environmental temperatures and near flammable gases, vapours and dust.
- For reasons of safety, never allow the device to be operated when wet or in a damp environment.
- When cleaning or servicing, the device must be disconnected from every source of operation voltage. Condensers in the device may still be charged, even if the device was disconnected from all voltage sources.
- In schools, training facilities, hobby and self-help workshops, qualified personnel must supervise the operation of measurement units.
- In commercial institutions, make sure you observe the accident prevention regulations of the commercial trade organization for electric installations.
- Do not insert needles, metals or any other objects into the device.
- If it has been ascertained that safe operation is no longer possible, take the device out of operation and secure it against accidental reactivation. It can be ascertained that safe operation is no longer possible if the device shows visible damage, no longer works correctly, has been stored for a long period under unfavourable conditions or has been placed under heavy stresses in transport.



Properties

- Monitoring of voltage, current and frequency
- Display of active power, apparent power and cos phi
- Min/Max value recording of voltage, current, frequency, active power, apparent power and cos phi
- Determination of "On" time for devices that run constantly (i.e. refrigerator)
- Display of used energy and accrued power costs
- Cost forecast
- Dual programmable power tariffs

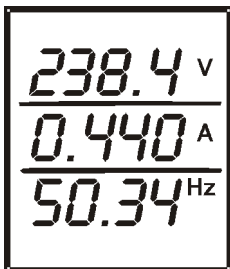
Battery Cover



Connection, operation settings

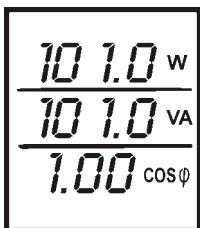
Before you connect the Energy Monitor 3000 to an outlet or power load, the desired power tariff must be set. The procedure for entering the power tariff is described under point C.

A Display of supply voltage, frequency and load current



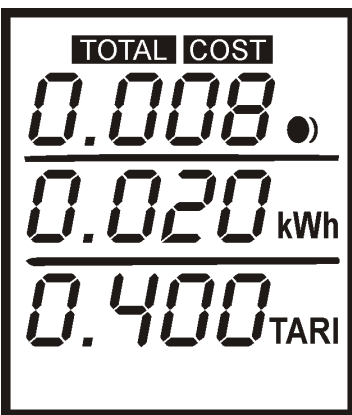
1. Immediately after the Energy Monitor 3000 is plugged into an outlet, the supply voltage, frequency of the supply voltage and present current consumption of the connected loads are displayed in the LCD.
2. Press the "MIN/MAX CLR" button to switch between the minimum, maximum and present values.
3. Press the "MIN/MAX CLR" button for longer than 4 seconds to remove the minimum and maximum values and return to the present values.
4. Pressing the "MODE" button switches the display to active power, apparent power and cos phi.

B Display of active power, apparent power, cos phi and type of load



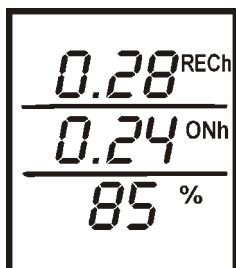
1. Press the "MIN/MAX CLR" button to switch between the minimum, maximum and present values.
2. Press the "MIN/MAX CLR" button for longer than 4 seconds to remove the minimum and maximum values and return to the present values. Note; Min/Max power records are in integral form.
3. Pressing the "MODE" button switches the display to used energy in kWh (kilowatt hours), the tariff setting and the display of accrued energy costs.

C Display of used energy, energy tariff setting and energy costs



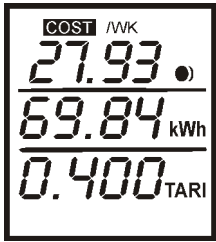
1. Press and hold the "MIN/MAX CLR" button for longer than 4 seconds to set the "total energy costs", the "cost projection", "kWh", "rech" and "on h" to "0".
2. With the "Tariff (Set)" button, you can switch between Tariff 1 and Tariff 2, display the "total accrued costs" for every tariff or change the displayed tariff.
3. To change the displayed tariff, press and hold the "Tariff (Set)" button for 4 seconds until the right position begins to blink.
4. With the "Mode" button, increase the value of the blinking position from 0 to 9; reset to 0 with the "MIN/MAX CLR" button. After entering the desired values, you can select the next position with the "Forecast" button.
5. After entering all values, confirm the adjusted tariff with the "Tariff (Set)" button.
6. Change to the second tariff with the "Tariff (Set)" button and repeat the entry as in steps 3 to 5.
7. Press the "Mode" button to change to "Recording mode".

D Display of recorded data



1. By pressing the "MINI/MAX CLR" button for more than 4 seconds, you can set the data for "rec h" (recording time), "on h" ("on" time of selected power loads, eg refrigerator, that don't always run and the percent value to "0". Note: "Total Energy Costs", the "Cost Projection" and "kWh" will also be reset to zero.
2. Press the "Mode" button to change to "Cost Forecast Mode".

E Display of cost forecast. The cost forecast calculates the projected energy costs from the momentary power recording of the connected power loads using the set energy tariff.



1. Press the "Forecast" button to switch between displaying "Cost 1 WK" (weekly cost), "Cost / Month" , (monthly cost) and "Cost 1 YR" (annual cost).
2. By pressing the "Tariff (Set)" button, you can switch between displaying the costs forecasts based on Tariff 1 and Tariff 2.
3. The procedure for setting the tariff is described under point C.
4. Press the "Mode" button to display the momentary supply voltage, the frequency of the supply voltage and the momentary current have recording of the connected power loads.

With the built-in battery, you can set saved data, recordings, and tariff setting even if the Energy Monitor 3000 is not connected to a power outlet. To save battery power, the LCD switches to sleep mode 60 seconds after the unit is disconnected from power outlet. To leave sleep mode, press the "Mode" button or plug the Energy Monitor 3000 into a powered outlet. After leaving sleep mode, the Energy Monitor 3000 returns to the display of supply voltage, frequency and load current. Rec h timer will start counting if the Energy Monitor 3000 is connected to power supply. On timer will start counting if the connected power load is "active", i.e. uses more than 2.6W.

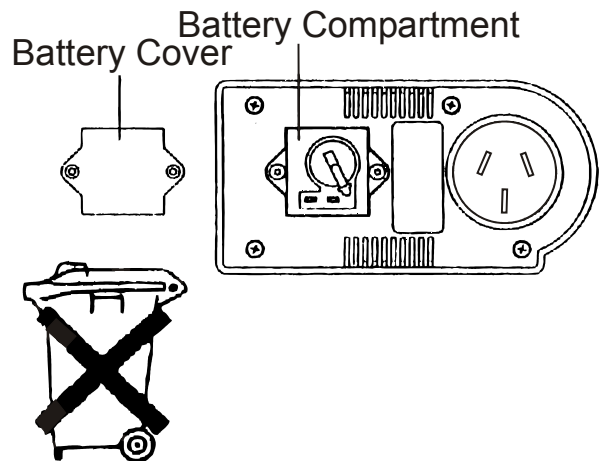
Replacing the battery

With a weak battery, the LCD loses contrast. If the "Low Bat" (empty battery) symbol appears, immediately replace the battery of the device. The Energy Monitor 3000 requires a cell battery of type CR 1620 3U, which has a lifespan of about 3 years.

For replacing the battery, proceed as follows:

1. Turn the screw of the battery compartment and remove the battery compartment cover (see diagram).
2. Remove the used battery from the Energy Monitor 3000 and replace it with a new one of the same type. Observe correct polarity when inserting the battery.
3. Replace the battery compartment cover and refasten the screw.

The end user is morally obligated to correctly dispose of all used batteries (button cells to lead batteries).
Make your contribution for environmental protection!



Additional notes

The connected loads should be operated as normal when producing the cost forecast. If an exact cost forecast is to be made per week/month/year for a power load, we recommend leaving the Energy Monitor 3000 connected to the load for at least one day. The Energy Monitor 3000 can thereby calculate an average power/load and accrued costs more accurately. The longer the Energy Monitor 3000 is connected, the more accurate is the cost forecast.

The power supply on a power net is never constant and varies from place to place. For example, a voltage fluctuation of 1% per second for a calculated cost forecast over 5 minutes will never be as accurate as a cost forecast taken over 3 hours.

Some devices use more current than others immediately after switching on. The current usage decreases the longer the device is in use (warm-up phase).

Maintenance

- Regularly inspect the Energy Monitor 3000 for damages.
- For cleaning the device and LCD, only use a dry, soft cloth. Do not use any cleaning solutions.
- Never immerse the device in water.
- Maintenance or repairs may only be performed by a technician familiar with associated regulations.

Technical data

Operating voltage:	230V AC / 50Hz alternating voltage (AC)
Max. connected power	3000W (3kW)
Max. current	13A
Input/Output	via protected contact plug/outlet
Overrun display	blinking display at approx. 3072W Caution! More than 3000W will destroy the device.
Tolerance	$\pm 1\% \pm 1\text{ W}$ typical (max. $\pm 2\%$ and $\pm 2\text{ W}$ for measurements up to 2500W; max. $\pm 4\%$ for measurements over 2500W)
Working temperature	+10 to +40°C
Battery type	CR 1620, 3V (or same build) ,
Tariff setting range	0.001 to 9.999
Power load display	0.001 to 15000 kWh (OFL= range exceeded)
Dimensions (L × W × H)	approx. 135 × 70 × 82 mm
Parameter resolution	
Voltage measurement	0.1V
Current measurement	0.001 A
Frequency	0.01 Hz
Active and apparent power	0.1 W/0,1 VA (for 1.5 to 1000) 1 W/1 VA (for over 1000)
Cos phi	0.01
Energy and costs	0.001 (for values under 10) 0.01 (for values between 10 and 100) 0.1 (for values between 100 and 1000) 1 (for values over 1000)
Rec h and On h	0.01 (for values up to 100) 0.1 (for values between 100 and 1000) 1 (for values over 1000)

Liability exclusion

- Manufacturers and distributors take no responsibility for incorrect measurement values or the results of such values.
- This product may not be used for medical purposes or published information.
- This device has been developed as an indicator for current usage and energy costs. Despite the high accuracy of the device, it is not to be used for official calculation between power providers and users.
- The technical data of the device can be changed without prior notice.
- The product is not a toy – keep it away from children.



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