# ENERGY METER(SK410)

## ⚠ SAFETY INFORMATION: Always read before proceeding.

**User's Manual**

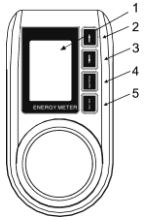
Congratulate with your purchasing of this energy meter. This product has been made with the best care, and the object has been of strict quality control. It is advised to read this guide before you can enjoy energy saving properties of this energy meter.

**Properties**

- Warning for overload
- Energy indicator
- Calculation of energy costs
- Usage duration

**Overview Of Functions**

1. LCD screen
2. **↑UP:** Selection of display mode in upper part of panel (V, A, Max. A, W, Max. W, Overload W/A，Cos Phi).
3. **↓DOWN:** Selection of display mode in central panel (KWh, Total costs, Price).
4. **OVERLOAD:** Allow to introduce parameters of overload.
5. **PRICE:** Allow to introduce energy price.

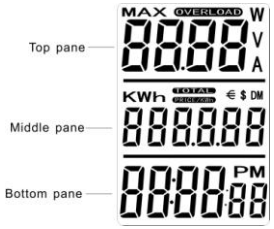



**Overview Of Reproduction On Screen**

**Top Panel:** The upper part displays the Voltage, Current, Max Current, Watt, Max Watt and the regulation for overload of Current /Watt, Power factor.

**Middle Panel:** The central part displays the consumed energies, the total costs and the institution of energy price.

**Bottom Panel:** The bottom part displays the accumulated usage duration of an apparatus.




**Installation Of Batteries**

The energy meter SK410 has been equipped with 2 LR44 1.5V batteries which insure that your program remains kept in case of a current discontinuance occur (during 30 days).To reduce discharge of the batteries, they are insulated by a cordon.

Before taking the apparatus in use you should pull out the battery compartment in the back and remove the cordon. Then you can go further with setting your SK410. If the apparatus is not used for a long time (+1 month), the batteries should be removed for conservation. If you want to replace the batteries, you must firstly unsheathe the apparatus from mains supply.

**Overview Of Different Measuring Forms**

**Upper Part**

To descend the different modes of the upper part of screen, you should press the **UP** key. The overview offered below gives examples of the window and function of each mode.

Volt → Ampere → Max Amp → Watt → Max Watt → Overload→ Cos Phi

**Order Of Window**

**Overview Of Different Forms Of Electricity Measuring**

**Central Part**

Press **↓DOWN** key for this part. The overview offered below gives examples of the window and function of each mode.

**Sequence In Screen**

KWh → Total costs → Price

**Bottom Part**

This part displays the accumulated time that an apparatus has been employed in sum. It is available in form of Hour/Minute/Seconds or Hour/Minute.

- When the total usage duration reaches 99:59: 59, the screen will proceed automatically in hour/minute mode.
- The maximum is 9999:59 (10000hour).
- The counting happens with seconds as long as the accumulated time totally smaller than 100 hours. Afterwards, minutes become the smallest units of time.
- The apparatus must be used under voltage to stand and work so that the SK410 functioning time would be counted.
- If the used apparatus consumes too little current (less than 0.04A), no data will appear on the screen (indication=0.00A), and the functioning time will not be counted.

**Energy Indicator**

Press the **↑UP** key for windows of following values: the voltage, the current, the maximum current, wattage, maximum wattage, the introduced value for overload, and the power factor. These values are always shown in the upper part of the LCD screen.

1. **Window Of Voltage(V)**
   The voltage is shown in V in the upper part
2. **Window Of Current(A)**
   The current is shown in A in this mode.
3. **Window Of Maximum Current**
   The maximum current is shown in this mode. This value is preserved to the highest one of those were detected.
4. **Window Of Wattage(W)**
   The wattage is shown in the upper part in this mode. The calculation of used energy in Watt is generated by multiplying the voltage, the current and the energy factor (energy=voltage × current).
5. **Window Of Maximum Wattage**
   The maximum consumed energy is shown in this mode. This value remains visible till it is exceeded.
6. **Power Factor (Cos Phi)**
   The power factor thus gives the phase displacement angle and thus the ratio of effective output to apparent power.

**Erase The Data Of Maximum Current And Maximum Wattage**

Press the **↑UP** key and **OVERLOAD** key at the same time to erase the data of maximum current and maximum wattage.

**Indication Of Overload**

Overload alarm enables you to guard against the consumed energy exceeding the stipulate capacity. The OVERLOAD will blink to warn you in case of overload.

**Set Parameters Of Overload**

1. Press the ↑UP key to select the function of overload alarm.
2. The OVERLOAD symbol will appear. Press the **OVERLOAD** key.
3. Press the **↑UP** or **↓DOWN** key to choose between "**W**"(overload in Watt) and "**A**"(overload in Ampere).
4. Press the **OVERLOAD** key again, 4 digits appear of which the first digit blink.
5. Use the **↑UP** or **↓DOWN** key to set the value of the first digit.
6. Press the **OVERLOAD** key repeatedly to select the following digit. And further this way.
7. After all digits have been set this way, press the **OVERLOAD** key again to conclude.

If no key has been pushed for approximately 1 minute absolutely, the process will be ended automatically.

Note:

This energy meter do not protect against overpressure.

**Energy Consumption And Costs**

**A. Window Of Totally Consumed Energy In KWh**

The totally accumulated energy usage of the apparatus has been shown since the beginning of measuring in KWh.

**B. Window Of Total Usage Duration**

a) Here one sees the total time of energy usage of the connected apparatus. When the costs continuously increase to exceed 999.999 € that there is no more place for decimal place, the costs will be shown in 9999.99 €.The total costs has been based on the price which was introduced in the Price/KWh mode.

b) The total time that the meter runs is shown in hours/minutes/seconds mode in the bottom part of the LCD screen. The counting happens in seconds as long as the 100 hours are not exceeded. It proceeds in minutes afterwards. Both the energy meter and the connected apparatus must be in working order so that the functioning time could be counted. If the apparatus consumes too little current (<0.04A), any data and the duration being measured will not be indicated (0.00A).

**C. Price/KWh mode**

The price per KWh is set and shown in this mode. The tariff which is set here stipulates the "costs of consumed energy". Pass through the following steps to set the price of energy.

1. Press the **PRICE** key to blink the first digit.
2. Press the **↑UP** or **↓DOWN** key to set the first digit.
3. Press the **PRICE** key to let the second digit blink.
4. Press the **↑UP** or **↓DOWN** key to set the second digit.
5. Repeat step 3 and step 4 to set the third, fourth, fifth and sixth digit.
6. Press the **PRICE** key again to conclude.
7. The range of the price goes between 0.001 KWh and 9999.99KWh.

Press the **↓DOWN** and **PRICE** key at the same time to erase the total costs and the total usage duration for the KWh recording.

**Abnormalities On The Screen**

If the screen shows nothing or abnormal properties, please install the batteries again according to the manner described in this guide.

**Technical Properties**

- Battery: 2 LR44 1.5V, lifetime of the batteries: 30 days
- Functioning indicator
- For indoor use only
- Rated voltage: 230V ~ 50Hz
- Minimum measuring current: 0.03A
- Voltage measuring: 184-276V (accuracy: +/-3% of the value measured)
- Current measuring: 0.00 – 16.00A (accuracy: +/-3% of the value measured +/-0.03 A)
- Energy usage measuring: 0 –3680W
  (accuracy: +/-5% of the value measured +/-10 VA)
- KWh measuring: 0.0KWh – 9999.99KWh
  (accuracy: +/-5% of the value measured +/-0.1 KWh)
- Frequency measuring: 40 – 70Hz.

**Surroundings Condition For Use**

- Temperature: 5℃ to 40℃
- Max. humidity 90%
- Use only within house

·The guarantee expires in case of damage that caused by improper use or not observing the directives from the guide.

**Remarks**

The power meter shall be used only in installation category II (CAT II) according of IEC 664, i.e. in which transient voltages do not exceed 2500V. The mains supply for residential and commercial areas generally belongs to this category.

If the equipment is used in a manner not specified by the manufacture, the protection provided by the equipment may be impaired.

**Security And Maintenance Regulations**

- For Indoor use only
- Do not use it near children and animals
- Do not use it near water
- Follow the Instruction
- Do not disassembly the energy meter
- Maintenance services must be carried out by the manufacturer

**Cleaning Instruction**

- Plug off the apparatus from mains supply before cleaning
- Use a gentle and dry cloth for cleaning
- Never use water to clean the apparatus
- Never open the energy meter