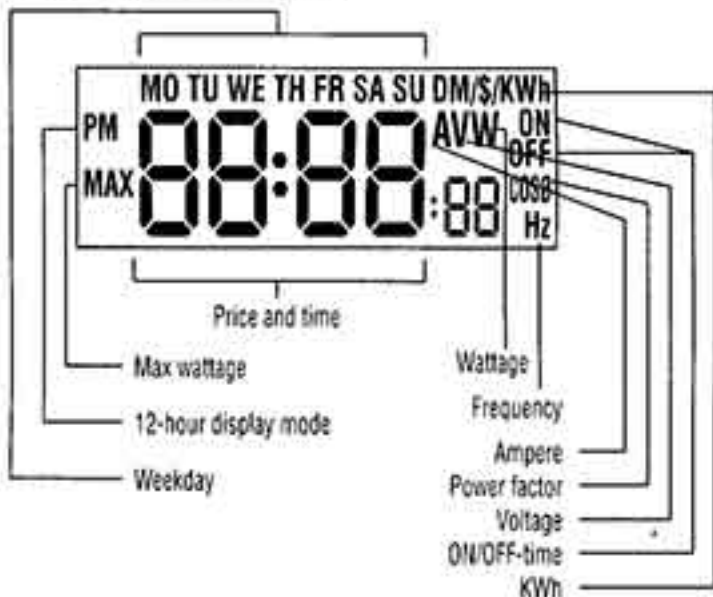


GB PM 230 electricity meter

LCD display elements



The PM 230 electricity meter is a monitoring and testing instrument with which it is possible to determine the power consumption of a connected appliance and the cost of the electricity consumed.

Installing the batteries

Before the instrument is used, two 1.5 V dry-cell batteries must be fitted, type LR 44, V 13 GA, RW 82 or similar. Remove the battery compartment from the back of the instrument and install the two batteries in accordance with the polarity symbols in the compartment. Installing the batteries the wrong way round may damage the instrument.

The purpose of the batteries is to store the metered amounts and programmes.

Resetting

If an abnormal display appears or the buttons produce no response, the instrument must be reset. To do this, press the RESET button with a round object, e.g. a ballpoint pen or straightened paper clip. This will delete all the programmes from the instrument memory.

Setting the clock

In the clock mode, the present time is displayed. To adjust the time, proceed as follows.

First, press the SET button once; this causes the *Day* sign to flash. Pressing the CHANGE button once raises the number in increments of 1. Confirm your input with the SET button.

Now the *Hour* value starts flashing. Pressing the CHANGE button once raises this value by increments of 1. Confirm your input with the SET button.

Now the *Minute* value starts flashing. Pressing the CHANGE button once raises this value by increments of 1. Confirm your input with the SET button.

Now the *Second* value starts flashing. Press the CHANGE button once to set this value to 0. Confirm your input with the SET button; this concludes the clock setting procedure.

The instrument will leave every setting mode if no key is pressed for one minute.

12- or 24-hour display mode

The instrument offers a choice of 12-hour (with PM) or 24-hour display (0-23). To transfer from one mode to the other, press the SET button in the clock mode and hold down for 5 seconds.

Summary of electricity meter modes

To call up displays of the following modes, press the FUNCTION button. The summary represents examples of the status of each individual mode and its function.

Mode	Status	Function displayed
Clock		Present time
Mode 1		Present voltage supply (V) and frequency (Hz)
Mode 2		Current strength (A) and power factor received by the appliance.
Mode 3	 	Power received by the appliance (W); press the 2-PRICE button to display the maximum wattage and active period.
Mode 4		Cumulative time (in hours:minutes) the appliance has been running.
Mode 5	 	Total electricity (kWh) consumed by the appliance. Press the 2-PRICE button to display the total electricity consumed (kWh) at the regular price (r) and reduced price (d).

Mode 6 Total cost of electricity consumed (\$). The \$ sign also represents all other currencies.

Mode 7

 Electricity price per kWh. Press the 2-PRICE button to activate the 2-price mode. The regular price, regular ON-time price, regular OFF-time and reduced price are displayed.

Clock

Pressing the CHANGE button between mode 1 and 7 causes the display to revert to the clock mode.

Mode 1: Voltage display

In this mode, the present voltage supply (V) and frequency (Hz) are displayed. The line frequency is measured at a resolution of 1 Hz and within the range of 40 Hz to 70 Hz.

Mode 2: Amps display

In this mode, the present current strength (A) and the power factor ($\cos \phi$) received by the appliance are displayed.

If the measured current strength is less than 4 A, a resolution of 0.01 A is selected. Other than this, it is 0.02 A. At a measured current strength under 0.02 A, only 0 A is displayed.

Mode 3: Wattage display

In this mode, the power is displayed in W. To calculate the power consumed by the appliance, multiply the voltage, current and power factors.

Pressing the 2-PRICE button in this mode calls up the maximum wattage display. Pressing this button again displays the time at which the maximum wattage occurred.

Mode 4: Operating duration

In this mode, the total time is displayed during which the connected appliance has been switched on. The time is shown in hours and minutes or, if the total exceeds 100 hours, in hours only. After 9999 hours, the display flashes.

To record the time, both the electricity meter and the connected appliance must be switched on. If the appliance uses too little current, the time is not registered.

For information on resetting the recorded total time, see »Resetting modes 4, 5 + 6«

Mode 5: kWh display

In this mode, the cumulative total electricity consumption by the connected appliances (in kWh) is displayed. Resolution is 0.01 kWh; the highest number displayed is 9999.99 kWh.

Pressing the 2-PRICE button displays how much electricity has been consumed in total at the regular price. Pressing the button again displays how much electricity in total has been consumed at the reduced price.

For information on resetting the recorded total electricity consumption, see »Resetting modes 4, 5 + 6«.

Mode 6: Display of cost

In this mode, the total cost of the electricity consumed by the appliance connected to the unit is displayed. The cost is based on the price input in mode 7.

The cost is shown in the display from \$ 0.00 to \$ 9999.

For information on resetting the recorded total cost, see »Resetting modes 4, 5 + 6«.

Mode 7: Electricity price display/setting

In this mode, the electricity price per kWh is displayed and set. The price input here affects the »cost of electricity consumed« displayed in mode 6. Input the electricity price as follows:

1. Press the SET button, causing the first digit to flash.
2. Pressing the CHANGE button once raises this value in increments of 1.
3. Press the SET button, causing the second digit to flash.
4. Repeat steps 2. and 3. to input the remaining digits making up the price.
5. Press the SET button, causing the decimal point to flash.
6. By means of the CHANGE button, move the decimal point to the correct position in the price display.
7. Confirm your input with the SET button.

Example: Setting a price of \$ 0.38 per kwh

Call up the display for Mode 7 and press the SET button. While the first digit is flashing, press the

SET button twice, leaving the first and second digits unchanged at 0. Press the CHANGE button and set the third digit to 3, then press SET again. Press the CHANGE button and set the fourth digit to 8, then press SET again. Now position the decimal point in front of the 3 with the CHANGE button and confirm your input by pressing the SET button. Alternatively, the second digit can be set to 3 and the third digit to 8 and the first and fourth digits left at 0. This method will achieve the same result as that described above.

For information on inputting different electricity prices for other times of the day, see »Two-price operation«.

Resetting modes 4, 5 + 6

To reset the cumulative measured values, press and hold the SET button for 5 seconds in modes 4, 5 and 6. The cumulative measured values for ON-time, kWh and total costs will then be reset to 0.

Two-price operation

The electricity meter permits two electricity prices to be set for different times of day, namely the 'regular price' and the 'reduced price' (or a price which usually applies in off-peak hours). If the connected appliance is switched on within the period input under 'ON-time regular price' and 'regular price OFF-time', the costs of the electricity consumed will be calculated at the 'regular' price. The 'reduced price' will apply to the other times when the meter is in use.

Both prices are then added up, the result being the total cost of the electricity consumed.

Engaging the two-price operating mode takes place in mode 7. Press the 2-PRICE button until the letter 'r' appears in the bottom right-hand corner of

the LCD display; this stands for 'regular price'. By means of the FUNCTION button, it is possible to go through the different modes, whereupon mode 7 is replaced by four new modes, i.e.

- A. Regular price
- B. Regular price ON-time
- C. Regular price OFF-time
- D. Reduced price

Pressing the 2-PRICE button again until the 'r' letter goes out resets the 2-price operating mode.

Regular price

The 'regular price' can be displayed and adjusted in this mode. To adjust the price, carry out the steps described for setting the 'regular price' (mode 7).

Regular price ON-time

The ON-time at the 'regular price' can be adjusted in this mode. First, set the operating time for the 'regular price' to continuous operation. To set the operating time for operation within the periods of the 'regular price' for electricity, first set the period of ON-time, followed by the period of OFF-time. Pressing the FUNCTION button once in the ON-time mode displays the 'regular price' mode. At first (i.e. before any adjustment), the display will show '-:--'. To set the day and time for the ON-time, proceed as follows:

Press the SET button, causing the day to flash. Press the CHANGE button to change the day to every day, Mo-Fr, Mo-Sa, Sa-Su, Mo-Su.

Confirm the input with the SET button. Now the number of hours should flash. Pressing the CHANGE button raises the value by 1. Confirm the input with the SET button.

Now the number of minutes should flash. Pressing the CHANGE button raises the value by 1. To conclude the input, press the SET button.

Regular price OFF-time

Pressing the FUNCTION button once in the ON-time mode displays the OFF-time mode. Now carry out the steps described above to set the OFF-time. In this case, the weekdays are the same as for the ON-time and cannot be changed at this point.

Reduced price

Pressing the FUNCTION button once in the OFF-time mode displays the 'reduced price' mode with the letter 'd' in the bottom right-hand corner of the LCD display. To set the reduced price, carry out the same steps as for setting the regular price. Please note that the decimal point will be in the same position as for the regular price and cannot be changed here.

Abnormal display

If the display on the meter is abnormal or non-existent, carry out the resetting process described above, otherwise the meter may not function faultlessly.

Technical specification

Operating voltage:	230 V ~, 50 Hz
Operating current:	Max 13 A
Lowest measurable current:	0.02 A
Voltage display (V AC):	190 V - 276 V
Current display (amps):	0.00 A - 16.00 A
Wattage display (watts):	0 W - 4416 W
KWh display (in kWh):	0.00 - 999.99 kWh
Frequency display (Hz):	40 - 70 Hz
Power factor display:	0.20 - 1.00

Accuracy

Voltage:	+/- 3% of measured value
Current:	+/- 3% of measured value +/- 0.04 A
Wattage:	+/- 5% of measured value +/- 10 W
kWh:	+/- 5% of measured value +/- 0.1 kWh