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Operation

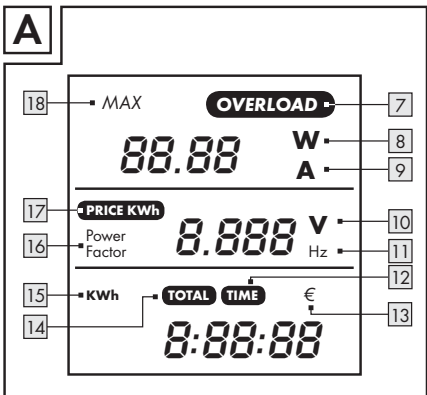
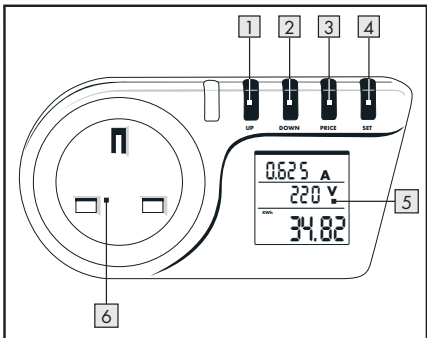
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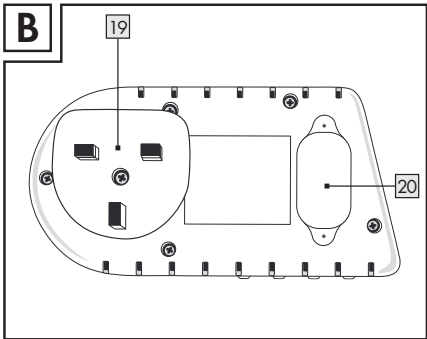
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The following pictograms are used in these operating instructions / on the device:

	Read instruction manual!
	Observe caution and safety notes!
	Caution - electric shock! Danger to life!
	Protect electrical devices from moisture!
	Risk of explosion!
	Keep children away from electrical devices!
V~	Volt (AC)
W	Watts (Effective power)
Hz	Hertz (mains frequency)
A	Amp
kWh	Kilowatt hour
	Direct current (Type of current and voltage)
	Proper procedure and handling.
	Dispose packaging and appliance in an environmentally-friendly way!

Energy monitor

● Introduction



Familiarise yourself with the product before using it for the first time. Please read the following operating manual and safety instructions carefully. Always use the instrument only as described and for the stated areas of use. Keep this manual in a safe place. Make sure that all documents accompany the instrument if you pass it on to anyone else.

○ Proper Use

The appliance is designed to measure the power consumption of electrical appliances and to calculate electricity and operating costs. Any other use or modification of the instrument constitute improper use and carry a serious risk of accident. The manufacturer is not liable for damage caused by improper use. The instrument is not intended for commercial use.

○ Supply Scope

1 wattmeter

2 round cell batteries (Alkaline LR44, 1.5 V)

1 operating manual

Warning label for the battery compartment cover in various languages are enclosed.

○ Description of Parts

- 1 UP button
- 2 DOWN button
- 3 PRICE button
- 4 SET button
- 5 Liquid crystal display (LCD)
- 6 Socket
- 7 OVERLOAD symbol
- 8 Watt symbol / Overload warning value for power consumption (W)
- 9 Ampere symbol / Overload warning value for current (A)
- 10 Volt symbol
- 11 Hz / Mains frequency symbol
- 12 TIME symbol
- 13 € / Cost symbol

- 14 Total symbol
- 15 Kilowatt Hours symbol
- 16 Power Factor symbol
- 17 PRICE KWh / price per kWh symbol
- 18 Max symbol
- 19 Connector plug
- 20 Battery compartment cover

○ Technical Data

Input voltage:	240V~, 50Hz
Max. permissible load:	10A, 2400W
Type of battery:	2xLR.44 (Alkaline) 1.5V ---
Lower limit range	
for current measurements:	0.005A
Ampere indicating range:	0.00 - 16A
Volt indicating range:	190 - 276V~
Watt indicating range:	0 - 4416W
Kilowatt hour indicating range:	0.0001 - 9999kWh
Mains frequency indicating range:	40 - 70Hz
Resolution:	1W
Enviromental conditions:	
Altitude:	max. 2000 m

Temperature: +5 °C - +40 °C

Relative humidity: max. 90%

Tolerance range

in volts: $\pm 3\%$

in amperes: $\pm 3\%$, $\pm 0.01\text{ A}$

in watts: $\pm 3\%$, $\pm 2\text{ A}$

Dimensions of LCD: 3.2 x 3.2 cm (W x H)



Safety Instructions

⚠ WARNING! Please read all the safety information and instructions. Failure to observe the safety information and instructions can result in electric shock, fire and/or serious injury.

PLEASE RETAIN ALL SAFETY INFORMATION AND INSTRUCTIONS FOR FUTURE REFERENCE.






How to avoid fatal injury by electric shock!


- Inspect the wattmeter, additional equipment and the electrical appliances you wish to test before every use to ensure that they are intact. Damaged electrical appliances

es and buckled/kinked mains leads or bare wires increase the risk of an electric shock.

- Do not operate the wattmeter if mains leads or mains plugs on the electrical appliances you wish to test are damaged.



CAUTION! Damaged mains leads pose a risk of fatal injury by electric shock.

- The connector plug  of the wattmeter must fit into the outlet. The connector plug  must not be modified in any way. Do not use adapter plugs in conjunction with earthed electrical appliances. Using unmodified mains plugs and proper outlets reduces the risk of an electric shock.
- Avoid physical contact with earthed surfaces such as those of pipes, heaters, ovens and fridges. There is an increased risk of an electric shock if your body is earthed.
-  Keep the wattmeter away from rain and moisture. If water enters the wattmeter there is an increased risk of an electric shock.
- Only operate the wattmeter in dry clothing and preferably shoes with a rubber sole or standing on an insulating mat.
- Only measure voltages of over 25 V ~ in compliance with the relevant safety instructions for the electrical appliance you wish to test.
- Never under any circumstances open up the housing of the wattmeter. If the wattmeter does not work properly or is dam-

- aged, please have it repaired immediately by a specialist.
- Do not operate the wattmeter outdoors.
- Always remove the electrical appliances you are testing from the socket  directly by the mains plug and never using the mains lead.
- Remove the wattmeter from the outlet when you have finished using it.



How to avoid personal injury and damage to the product!


-  **RISK OF FATAL INJURY AND ACCIDENTS FOR INFANTS AND CHILDREN!** Never leave children unattended with the packaging materials or the product. The packaging material carries a risk of suffocation and there is a risk of fatal injury by electric shock. Children often underestimate dangers. Always keep children away from the product.
-  **CAUTION! DANGER OF EXPLOSION!** Never operate the wattmeter where there is any risk of explosion, i.e. close to inflammable liquids or gases.
- Never exceed the stated maximum input voltage.
- Avoid strong vibrations or shocks.
- Never expose the wattmeter to extreme temperatures,

extreme sunlight, humidity or moisture.

- Never expose the wattmeter to extreme temperature fluctuations. Do not use the wattmeter until it has become adjusted to the ambient temperature.
- Never operate the wattmeter close to strong magnetic fields such as motors, transformers or similar.
- Do not place the wattmeter face down on workbenches or working surfaces. This helps to prevent damage to the operating elements and the LCD **5**.
- Remove the batteries from the wattmeter if you do not intend to use it for any length of time.
- Do not connect after each other.
- The power meter shall be used only in installation category II (CAT II) according to IEC664, i. e. in which transient voltages do not exceed 2500V ~, the mains supply for residential area generally belongs to this category



Safety Instructions for Batteries!

- Remove batteries that have not been used for any length of time from the instrument.
-  **CAUTION! DANGER OF EXPLOSION!**
Never recharge batteries.

- Make sure when inserting the batteries that the polarity is correct. This is indicated in the battery compartment.
- If necessary, clean the battery and instrument contacts before inserting the batteries.
- Remove spent batteries from the instrument immediately on account of the increased risk of leakage.
- Batteries must not be disposed of in household waste.
- Consumers are under a legal obligation to dispose of batteries properly.
- Keep batteries out of the reach of children, do not dispose of them in fire, do not short-circuit them, and do not take them apart.
- Failure to observe these instructions may result in the batteries discharging beyond their end voltage, which carries a risk of leakage. If the batteries in your instrument have leaked, remove them immediately to prevent damage to the instrument.
- Avoid contact with skin, eyes and mucous membrane. In the event of contact with battery acid, rinse the affected area with plenty of water and/or consult a doctor.
- Unplug the appliance before changing the batteries.
- The battery compartment cover **20** must be completely inserted before bring into operation.

● Before you start

Note: first stick the enclosed label in the language of your particular country on the battery compartment cover **20**.

Note: two round cell batteries (Alkaline LR44, 1.5 V⁻⁻⁻) are already inserted in the wattmeter on delivery.

- Remove the battery compartment cover **20** by unscrewing the two screws with a suitable screwdriver.
- Remove the isolating strip between the two round cell batteries (Alkaline LR44, 1.5 V⁻⁻⁻) on the back of the battery compartment cover **20**.
- Close the battery compartment by replacing the battery compartment cover **20**. Please make sure that you retighten the two screws firmly.

Note: Make sure that you replace the battery compartment cover **20** the right way round. The rounded corners of the battery compartment cover **20** must fit into the rounded recesses in the battery compartment.

- The wattmeter is now ready for operation.

● Operation

○ Connecting the electrical appliance to be tested

⚠ CAUTION! RISK OF FATAL INJURY BY ELECTRIC SHOCK! Only measure voltages of over 25V ~ in compliance with the relevant safety instructions for the electrical appliance you wish to test.

⚠ CAUTION! RISK OF INJURY! Never exceed the stated maximum input voltage.

- Plug the wattmeter into a suitable outlet.
- Now plug the mains plug of the electrical appliance you wish to test into the socket **6** of the wattmeter.

○ Current measurement

- Press the UP button **1** until the Ampere symbol **9** appears in the top third of the LCD display **5**.

Note: the "Current measurement" function is the standard setting for the wattmeter. As soon as the isolating strip between the two round cell batteries is removed, the wattmeter is automatically in this mode.

- The LCD **5** now indicates the present current in A (Ampere) required for use of the electrical appliance.
Note: you can also call up the current reading when the wattmeter has been removed from the outlet or when the electrical appliance you are testing is no longer connected to the wattmeter. As soon as you take a new measurement, the old current is overwritten.

○ **Maximum current**

- Press the UP button **1** until the Max symbol **18** and the Ampere symbol **9** appear in the top third of the LCD display **5**.
- The LCD **5** now indicates the maximum required current in A (Ampere) measured with the wattmeter so far.
Note: you can also call up the maximum current reading when the wattmeter has been removed from the outlet or when the electrical appliance you are testing is no longer connected to the wattmeter.
Note: the maximum current value is saved until a higher value is measured. The old value is then overwritten by the new measurement.

○ Measure power consumption

- Press the UP button **1** until the Watt symbol **8** appears in the top third of the LCD display **5**.
- The LCD display **5** now indicates the current power consumption in W (Watt) required for the load.

Note: the power consumption is calculated according to the following formula: $\text{power} = \text{voltage} \times \text{current} \times \text{power factor}$.

○ Maximum power consumption

- Press the UP button **1** until the Max symbol **18** and the Watt symbol **8** appear in the top third of the LCD display **5**.
- The LCD **5** now indicates the maximum power consumption in W (Watt) measured by the wattmeter so far.

Note: you can also call up the maximum power consumption reading when the wattmeter has been removed from the outlet or when the electrical appliance you are testing is no longer connected to the wattmeter.

Note: the maximum power consumption is saved until a higher value is measured. The old value is then overwritten by the new measurement.

○ Delete maximum values

- Use the UP button **1** to select one of the two maximum values (see “Maximum current”, “Maximum power consumption”).
- Keep the SET button **4** pressed for approx. 3 seconds to reset the maximum value to 0.

○ Set the overload warning value

Note: in this mode you have a choice between two overload warning values. You can set an overload warning value for the current (A) and an overload warning value for the power consumption (W).

Note: the overload warning value for power consumption (W) **8** is set by default to 0000 W on delivery.

Proceed as follows:

1. Press the UP button **1** until the OVERLOAD symbol **7** appears in the top third of the LCD display **5**

Note: the wattmeter is programmed so that the overload warning value for power consumption (W) **8** automatically flashes first.

2. Now press the SET button **4**. The Watt symbol **8** begins to flash.
3. Press the UP **1** or DOWN button **2** to select either the overload warning value for power consumption (W) **8** or the overload warning value for current (A) **9**.
4. Press the SET button **4**. The first digit flashes.
5. Press the UP **1** or DOWN button **2** to set the required value.
6. Press the SET button **4** to move to the next digit.
7. Repeat steps 5 and 6 until you have set the required overload warning value.
8. When you have set the value for the last digit, press the PRICE button **3** to confirm your entry.

Note: as soon as the entered overload warning values are exceeded by any connected electrical appliance you are testing, the overload symbol **7** flashes and a warning signal sounds.

○ Measure mains voltage

- Press the DOWN button **2** until the Volt symbol **10** appears in the centre of the LCD display **5**.

Note: the “Measure mains voltage” function is the standard setting for the wattmeter. As soon as the isolating strip

between the two round cell batteries is removed, the wattmeter is automatically in this mode.

- The LCD **5** now indicates the present mains voltage in V (volts).

○ Measure mains frequency

- Press the DOWN button **2** until the mains frequency symbol **11** (Hz) appears in the centre of the LCD display **5**.
- The LCD **5** now indicates the present mains frequency in Hz (Hertz).

Note: the wattmeter indicates mains frequencies in a range of 40 to 70 Hz. In Europe a frequency of 50 Hz is used for the general power supply system.

○ Show power factor

- Press the DOWN button **2** until the Power Factor symbol **16** appears in the centre of the LCD display **5**.
- The LCD **5** now indicates the power factor.

Note: the power factor indicates the ratio between the actual and theoretical power consumption of an electrical

appliance. The power factor can be between 0 and 1. Ideally, the power factor is 1.

○ Set the price per kWh

Note: On delivery the price per kWh is set to 0.

Proceed as follows:

1. Press the DOWN button **2** until the PRICE kWh symbol **17** appears in the centre of the LCD display **5**.
 2. Now press the SET button **4**. The first digit flashes.
 3. Press the UP **1** or DOWN button **2** to set the units digit of the current price per kWh in Euro (€). Example: 1,00.
 4. Press the SET button **4** to move to the next digit.
 5. Press the UP **1** or DOWN button **2** to set the tens digit of the current price per kWh in Euro cents (€). Example: 1,10
 6. Press the SET button **4** to move to the next digit.
 7. Repeat step 5 to set the value for the units digit. Example: 1,11
- ! Tip:** details of the current price per kWh can be obtained from your electricity provider.
8. When you have set the value for the last digit, press the PRICE button **3** to confirm your entry.

Note: the value set here affects the “Display energy costs” function.

○ Total power consumption

Note: this mode indicates the cumulative total power in kWh consumed by connected electrical appliances since measurement began.

- Press the PRICE button **3** until the Kilowatt hour symbol **15** appears in the bottom third of the LCD display **5**.

Note: the “Total power consumption” function is the standard setting for the wattmeter. As soon as the isolating strip between the two round cell batteries is removed, the wattmeter is automatically in this mode.

- The LCD **5** now indicates the total amount of energy consumed in kWh (kilowatt hours).

Note: the measuring range of the wattmeter is between 0.00 and 9999.99 kWh.

○ Time measurement function

Note: this mode shows the amount of time in hours/minutes/seconds or hours/minutes format in which all connected electrical appliances consumed power. The wattmeter and the appliances you wish to test must be switched on in order for the time to be counted.

- Press the PRICE button **3** until the TIME symbol **12** appears in the bottom third of the LCD display **5**.
- The LCD **5** now indicates the amount of time in which connected electrical appliances consumed energy.

Note: as soon as the counter reaches 99:59:59, the display switches to hours/minutes format. The maximum time is 9999:59.

Note: you can also call up the total time when the wattmeter has been removed from the outlet or when the electrical appliance you are testing is no longer connected to the wattmeter.

Note: as soon as the wattmeter indicates that the current is too weak (0.00 A in "Measure current" mode), the time measurement function stops.

Note: the time measurement function stops as soon as you unplug the electrical appliance you are testing from the

socket **6** of the wattmeter. As soon as you plug another electrical appliance into the wattmeter, the time measurement function resumes.

○ Show energy costs

Note: the total cost of the consumed energy is shown in € (Euro).

Note: the total cost of the consumed energy is calculated on the basis of the set price per kWh (see “Set the kilowatt hour price”)

- Press the SET button **4** until the cost symbol **13** (€) appears in the bottom third of the LCD display **5**.
- The LCD **5** now indicates the energy costs incurred for use of the electrical appliance.

Note: you can also call up the total cost when the wattmeter has been removed from the outlet or when the electrical appliance you are testing is no longer connected to the wattmeter.

Note: the energy cost calculator stops as soon as you unplug the electrical appliance you are testing from the socket **6** of the wattmeter. As soon as you plug another

electrical appliance into the wattmeter, the energy cost calculator resumes.

○ **Reset power consumption/timer function/total cost display to 0**

- Press the DOWN **2** and PRICE **3** buttons simultaneously and hold them down for 3 seconds to reset the counter to 0.


○ **Changing the batteries**



Note: as soon as you remove the round cell batteries from the wattmeter, all the saved values are automatically deleted.

Proceed as follows:


- Remove the battery compartment cover **20** by unscrewing the two screws with a suitable screwdriver.
- Remove the two round cell batteries from the holder on the back of the battery compartment cover **20**.
- Insert two new batteries (Alkaline LR44, 1.5 V $\frac{+}{-}$) in the holder on the back of the battery compartment cover **20**.


Note: make sure when inserting the batteries that the polarity is correct. This is indicated in the battery compartment.

- Close the battery compartment by replacing the battery compartment cover . Please make sure that you retighten the two screws firmly.

Note: make sure that you replace the battery compartment cover  the right way round. The rounded corners of the battery compartment cover  must fit into the rounded recesses in the battery compartment.

● Cleaning and Care

 **WARNING! RISK OF FATAL INJURY BY ELECTRIC SHOCK!** Keep the wattmeter away from rain and moisture. If water enters the wattmeter there is an increased risk of an electric shock.

 **WARNING! RISK OF FATAL INJURY BY ELECTRIC SHOCK!** Before carrying out any work on the product or on an electrical appliance connected to it, remove the wattmeter from the outlet.

- Clean the wattmeter with a dry, non-fluffing cloth.

● Disposal

The packaging is made entirely of recyclable materials, which you may dispose of at your local recycling facilities.



Never dispose of electrical appliances in the household waste!

In accordance with European Directive 2002/96/EC on used electrical and electronic appliances and its implementation in national law, used electrical appliances must be collected separately and recycled in an ecologically compatible manner.

Details of current options for disposing of electrical appliances after their useful life can be obtained from your local or city council.



Please return the batteries and/or the appliance to the available collection points.

● **Warranty and Service**

○ **Warranty Declaration**

This instrument has a 2-year warranty from the date of purchase; the warranty is only valid for the original purchaser and is not transferable. Please retain your receipt as proof of purchase. The warranty applies to material or manufacturing defects only. It does not cover wear parts or damage caused by improper use. The warranty shall expire in the event of third-party intervention. This warranty shall not affect your statutory rights. Please contact the service centre by telephone in the event of any claims under the warranty. This is the only way to ensure that your instrument can be returned free of charge.

○ **Service Address**

Hugo Brennenstuhl GmbH & Co. KG

D-72074 Tübingen

www.brennenstuhl.com

Service tel.: +49 (0) 18 05 - 72 07 4-1

(14 Cent/min. from the German telephone network)

○ **Declaration of Conformity CE**

The CE symbol was applied in compliance with the following European Directives:

2006/95/EC Low Voltage Directive

2004/108/EC Electromagnetic Compatibility Directive

The Declaration of Conformity is held by the manufacturer.

○ **Manufacturer**

Hugo Brennenstuhl GmbH & Co. KG
D-72074 Tübingen