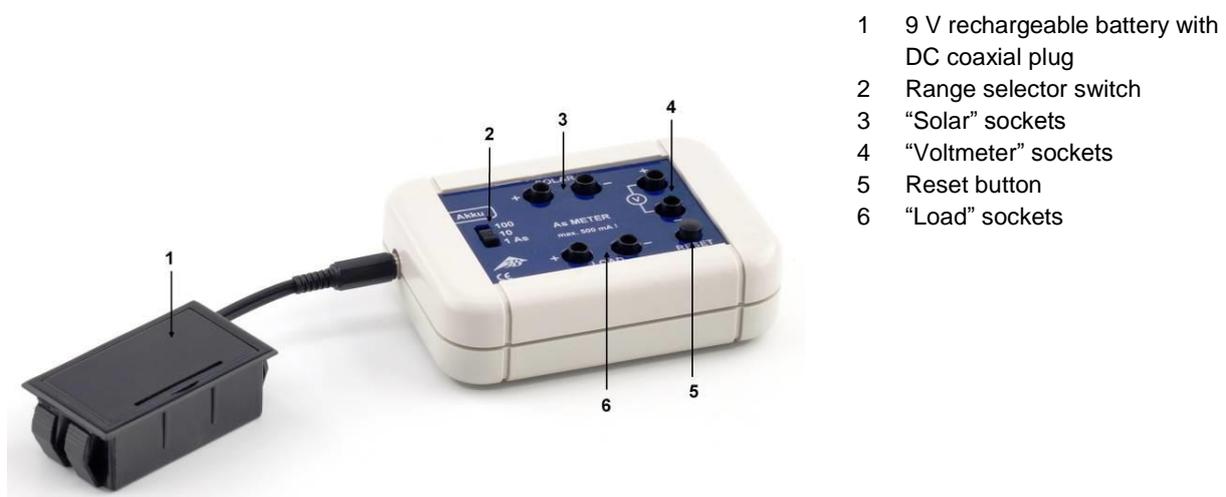


## Charge Meter with Rechargeable Battery 1017734

### Instruction manual

10/15 MH



- 1 9 V rechargeable battery with DC coaxial plug
- 2 Range selector switch
- 3 "Solar" sockets
- 4 "Voltmeter" sockets
- 5 Reset button
- 6 "Load" sockets

### 1. Safety instructions

The safety of this equipment is guaranteed when used as stipulated. Safety cannot, however, be assured if it is operated incorrectly or handled carelessly.

If there is a suspicion that it can no longer be used without hazard (e.g. if there is visible damage), the equipment must immediately be taken out of use

- Use the equipment in dry rooms only.
- Do not apply an external voltage to the output sockets.
- Only use the equipment with the rechargeable battery supplied. Do not connect it to any other batteries.
- The rechargeable battery can be permanently damaged if it is overcharged. The maximum charging current is 50 mA. If the battery should become perceptibly warm, stop the charging process immediately.
- If the charge meter is operated in conjunction with an external voltage source (e.g. a solar panel), it is necessary to include current limiting ( $I_{\max.} = 50 \text{ mA}$ ).

### 2. Description

The charge meter is for measuring the flow of current as a function of time. The range selector switch can be used to set one of three ranges for determining electrical charge. It should only be powered by a rechargeable battery supplying a voltage of 7...20 V, since when a voltage is applied across the "Solar" socket via a solar panel or other voltage source, then energy will be fed back to charge the battery. It is recommended that the load be a universally variable load resistor connected across the "Load" sockets. A voltmeter connected across the "Voltmeter" can be used so that you can read off the electrical charge detected. The reset button sets the voltage output across the "Voltmeter" sockets back to 0 V.

The apparatus is supplied as a charge meter, a 9 V rechargeable battery and case and an instruction manual.

### 3. Technical data

Connectors:	4-mm safety sockets
Power supply:	9 V rechargeable battery with DC co-axial connector (5.5x2.1 mm <sup>2</sup> )
Load current:	max. 500 mA
Battery charging current:	max. 50 mA
External voltage source:	Solar panel or DC power supply (max. 12 V DC) with current limiting of 50 mA in the absence of a load on the charge meter
Measuring range:	Selectable between 1/10/100 As (max. measurable charge $\pm 499$ As)
Dimensions:	105x75x35 mm approx.
Weight:	200 g approx. including rechargeable battery and case

### 4. Operation

#### 4.1 Resetting charge meter

- Connect the rechargeable battery to the charge meter and connect a voltmeter across the "Voltmeter" sockets. Select a measuring range of max. 5 V and hold down the reset button for a minimum of 2 seconds.

The charge meter will now be reset to 0 As.

#### 4.2 Determining the current consumption of the meter itself

- After resetting, calculate the current consumed by the meter itself using the equation  $I = Q / t$ . Use a stopwatch to measure the time taken for the voltmeter to indicate 1 As  $\pm 1$  V on its display. This value should then be subtracted from all the measurement results in the forthcoming experiments.

#### 4.3 Operating mode involving load and solar panel

- Connect a load across the "Load" sockets (max. 500 mA). Once the device is reset, the charge can now be measured.
- If an external voltage source is also connected (e.g. solar panel), the device will also have to be reset following that.

**Caution:** The 3B Scientific solar panel outputs a charging current of over 70mA. The maximum charging current for the battery, however, is only 50 mA. Either current limiting needs to be implemented or a load should be connected.

### 5. Storage, cleaning and disposal

- Store the equipment in a clean, dry and dust-free location.
- Do not use any aggressive cleaning agents or solvents to clean the equipment.
- Use a soft, damp cloth for cleaning.
- The packaging is to be disposed of at a local recycling facility.
- If it is necessary to dispose of the equipment itself, it should not be put into normal household waste. Local regulations for the disposal of electrical equipment should be observed.
- Do not dispose of batteries in normal household waste. Local regulations for their disposal should be observed (e.g. Germany: BattG, EU: 2006/66/EC).

