

## Electrometer Box 1000569

### Instruction sheet

11/15 Hh



#### 1. Safety instructions

The electrometer box has an extremely high resistance at its voltage input, and can be damaged if an excessive voltage is applied.

- Do not exceed the maximum input voltage of  $\pm 8$  V!
- If necessary connect voltage-limiting components to the input!

#### 2. Description

The electrometer box is an impedance converter with an extremely high input resistance for measuring very small charges or currents.

It can be used in conjunction with the 3B NET/log™ unit for single manual measurements or with 3B NET/lab™ for recording and analysing measurements.

The electrometer box is recognised automatically by the 3B NET/log™ unit..

#### 3. Equipment supplied

- 1 Electrometer box
- 1 miniDIN 8-pin connecting lead, 600 mm long
- 1 Instruction sheet

#### 4. Technical data

- Input resistance:  $\geq 10^{11}$  ohms
- Input capacitance:  $\leq 50$  pF
- Measurement error:  $\leq 1.5\%$
- Overvoltage tolerance for non-hazardous contact voltages:
  - 1 kV (for low-resistance sources)
  - 10 kV (for high-resistance sources)
- Connectors: 4-mm safety sockets

#### 5. Operation

- Connect the electrometer box to an analog input of the 3B NET/log™ unit (input A or B).
- Short-circuit the input and calibrate the offset so that the output reading is zero.
- Carry out the chosen experiment without delay so that there is not time for stray charge to collect on the input terminals.
- Before starting a new experiment short-circuit the input again.

## 6. Examples of use

Suitable for quasi-static measurement of voltages up to  $\pm 8$  V, for high-resistance measurement of voltages greater than  $\pm 8$  V with the aid of a resistive voltage divider, for quasi-static measurement of voltages greater than  $\pm 8$  V with the aid of a capacitive voltage divider, for measuring very small currents with the aid of a high-resistance shunt and for measuring very small charges.

## 7. Sample experiment

### Measuring charges in electrostatics

Apparatus required:

1 3B NET/log™ @ 230 V	1000540
or	
1 3B NET/log™ @ 115 V	1000539
1 Electrometer box	1000569
1 Faraday cup	1000972
1 Capacitor 1 nF, 160 V	1642411
2 Friction rods	1002709
1 Experiment lead, black, 75 cm	1002840
1 Crocodile clip 4 mm	1002844
1 Cloth for rubbing rods	

- Set up the experiment as shown in Fig. 1.
- Plug the Faraday cup and the 1 nF capacitor into the 4 mm sockets provided.
- Plug the experiment lead into the green-and-yellow 4 mm socket on the side of the box.
- Attach the crocodile clip to the free end of the experiment lead.
- Switch on the 3B NET/log™ unit and wait for it to detect the electrometer box.
- Hold the crocodile clip in one hand and, without releasing it, discharge the Faraday cup.
- With the other hand lower the test object (e.g., a friction rod that has been rubbed) into the Faraday cup.
- Observe the effects of the charge transfer as shown by the changes in the voltage reading on the 3B NET/log™ unit.



Fig. 1 Experiment set-up for measuring charges in electrostatics