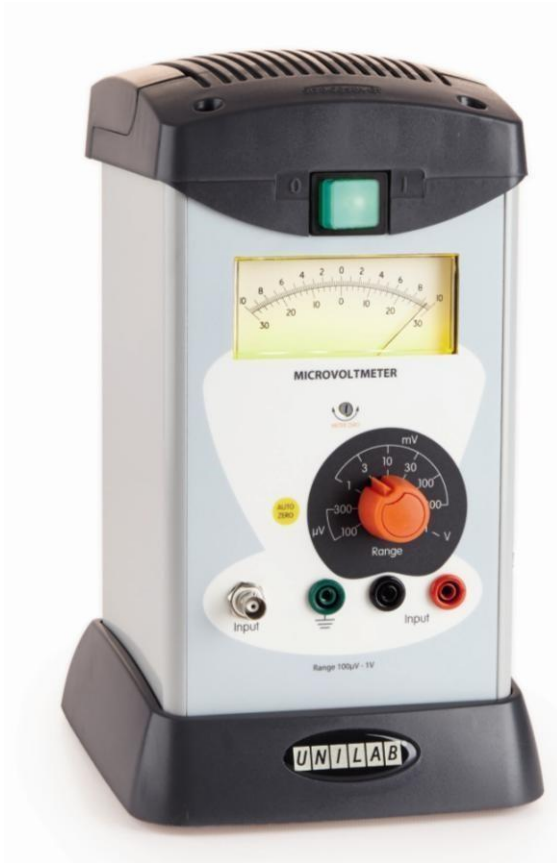


G85768 Spacesaver Microvoltmeter

NFU 603



Purpose:

The Microvoltmeter is an effective and robust replacement for a spot galvanometer, with 9 ranges from 100 μ V to 1V.

Suggested uses include: measurement of emf for thermocouples, strain gauges and Hall Effect devices, electromagnetic induction measurements etc.

Meter:

Analogue, illuminated centre-zero display of dc voltage.

Ratings:

230V ac \pm 10% 50Hz 12VA

Input impedance 1k Ω

Maximum input 1V 1mA

Fuse: F50mA

Temperature range: 10 to 40 $^{\circ}$ C

Humidity: 10 to 90% RH

Mass:2.7kg

EMC:

This equipment is Class A according to the EMC standard EN55011 and is intended for use in a non-domestic environment only. Interference from nearby sources of RFI (radio frequency interference) may affect the readings. High voltage sources, PCs, laptops, tablets and mobile phones may affect it.

Warnings:

For your safety, this product should be used in accordance with these instructions, otherwise the protection provided may be impaired.

Do not open or remove covers or panels. Repairs and service may only be carried out by our repair agent, otherwise the warranty may be void.

Use only the 3-core mains cable supplied with the unit. If the mains cable is replaced, the rating of the replacement must be the same or better than the original.

The unit must be earthed at all times. The unit is earthed/grounded through the 3-core mains lead, so no additional earth connection is required.

Always position the instrument so that it can be disconnected from the mains, if an emergency arises.

This unit is intended for use in DRY conditions. Avoid spillage of water and other liquids on to the unit. If spillage occurs, disconnect the mains supply.

There is no specific requirement for insulation of external circuits as they cannot become hazardous live, as a result of connection to this unit. Limit the length of any connecting leads to 3 metres.

Features

- An effective and robust replacement for a centre-zero galvanometer
- Large illuminated centre-zero meter
- Input resistance of $10\text{M}\Omega/\text{V}$ on the $100\mu\text{V}$ range - considerably better than a spot galvanometer
- Input via 4mm shrouded sockets or BNC connector, for screened leads
- Auto-zero facility

Outputs None.

Basic operation

An electronic amplifier is used to measure the potential difference across the input resistance of $1\text{k}\Omega$. The gain of the amplifier is set by the range switch and used to drive the indicating meter.

The red and black input terminals 'float' i.e. they are not referenced to 0V . The green earth/ground socket is connected to the Microvoltmeter case, and provides a common ground. Connecting either the red or black socket to the green earth/ground socket references that socket to 0V . In this way, the readings on the Microvoltmeter can be made relative to true 0 volts.

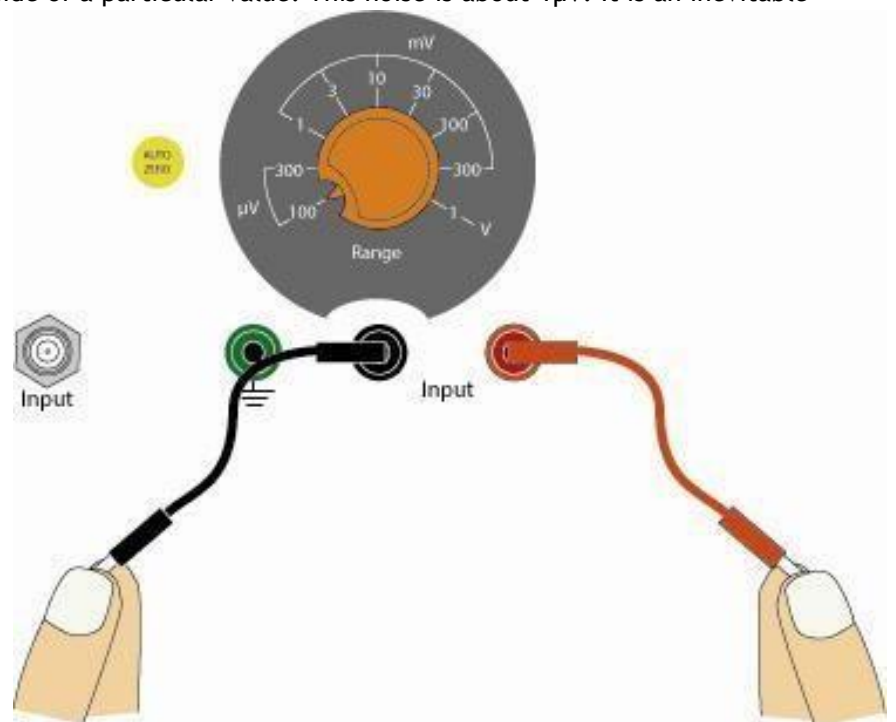
On the most sensitive ranges, ambient electrical noise on the input of the amplifier causes the needle to swing randomly a small amount either side of a particular value. This noise is about $1\mu\text{V}$. It is an inevitable consequence in the use of such a highly sensitive measuring instrument. Connection using a coaxial screened lead to the BNC socket, will reduce interference.

Simple experiment

Check that the unit is connected and working (switch is illuminated).

Switch the Microvoltmeter to the $100\mu\text{V}$ range.

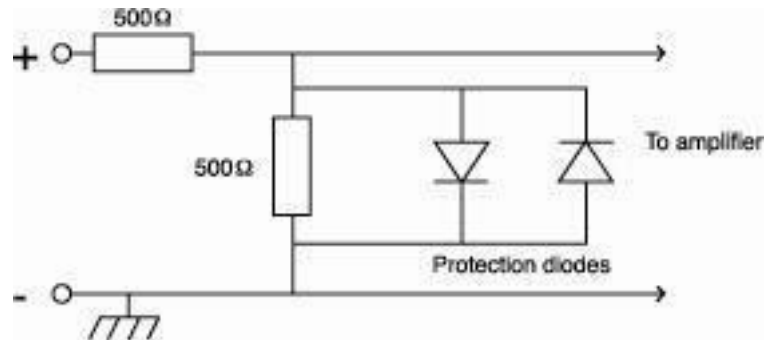
Connect a lead to each terminal. Hold the free ends of the leads, one in each hand (damp fingers are best), this should cause the meter needle to swing.



The emf generated by each half cell, formed by wet fingers and leads, usually vary because of slightly different conditions. This difference in emf, provides a measurable potential difference).

Input Protection

Protection diodes are fitted which start to conduct if an input greater than about 0.5V is applied, this limits the input to the amplifier. A 500Ω resistor on the input provides some protection against overload.



Accuracy

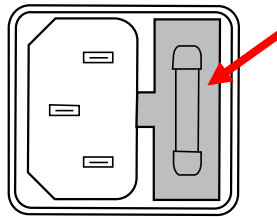
The meter accuracy on all ranges is $\pm 5\%$ of full scale deflection.

Mains lead and fuse replacement

The mains cable stows on the back of the unit with a wind and clip feature. The mains cable retainer can be removed to allow the cable to be stored separately. Simply remove the screw and retainer from the base of the unit. The IEC cable is now detachable. In the unlikely event of the fuse blowing, the retainer and mains cable must be removed to gain access to the fuse carrier.



The carrier can be removed with a fingernail or tip of a screwdriver. A spare fuse is provided in the carrier.



Replacement fuses must be 20mm cartridge time-delay fuses, of the correct rating: F50mA



Cleaning

The front panel membrane conceals and protects switches and LEDs. It may be wiped clean using a damp cloth. Be sure to disconnect the unit from the mains before cleaning, and do not use any abrasive cleaners or organic solvents.

Periodic testing:

Check the mains lead and plugs at both ends for any damage.

Periodically check the earth bonding and insulation, by performing a Portable Appliance Test (PAT). Most schools and local authorities have a regular schedule for such testing.

Check that the fuse in the mains plug (5A recommended) and the two fuses (F50mA active and spare) in the IEC socket on the back panel are all of the correct rating.

Warranty, repairs and spare parts:

The power supply is guaranteed for a period of one year from the date of delivery to the customer. This warranty does not apply to defects resulting from the action of a user such as misuse, improper wiring, any operations outside of its specification, improper maintenance or repair, or unauthorized modification.

Our liability is limited to repair or replacement of the product. Any failure during the warranty period should be referred to Customer Services.

In the event of a fault, apart from replacing the instrument fuse in the IEC socket, the power supply should be referred to the Philip Harris recommended repair agent.

Please contact Customer Services or techsupport@philipharris.co.uk for advice.

Instructions for authorized service technicians

Ensure that any replaceable mains cord is of the correct rating.

Ensure that all earth conductors and protective earth bonding is maintained after service work. Please refer to the detailed service procedures, safe servicing and continued safety - contact techsupport@philipharris.co.uk for advice.

For any manufacturer specific parts please refer to our recommended repairer.

Please refer to product specific risks that may affect service personnel, the protective measures and verification of the safe state after repair.

Disposal of Waste Electrical and Electronic Equipment (WEEE)



Do not dispose of this product with household waste

- For the proper treatment, recovery and recycling please take this product to an appropriate collection point.
- If you are unsure where this is, contact your Local Authority.
- By disposing of this product correctly you will be providing positive help to the environment.

Supplier details:

Customer Service Centre, Philip Harris & UNILAB, Hyde Buildings, Ashton Road, Hyde, Cheshire SK14 4RH UK

Orders and Information Tel: 0845 120 4521

Fax: 0800 138 8881

Repairs

Tel: 0845 120 3211

E-mail: techsupport@philipharris.co.uk

Website: www.philipharris.co.uk

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