

Users Manual

DIGITAL NANOAMMETER Model: DNM-121

Manufactured by

SCIENTIFIC EQUIPMENT & SERVICES

New Adarsh Nagar

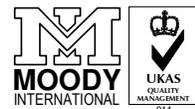
Roorkee - 247 667, UA, INDIA

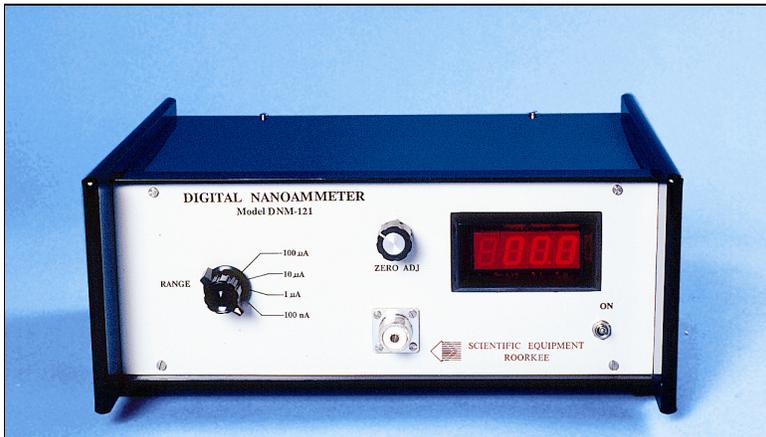
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- Measures current down to 100pA
- All solid state and IC design
- Accepts either polarity of input current.

Digital Nanoammeter, DNM-121, a rugged and low cost instrument, is a product of extensive R&D using high input impedance integrated circuits. It has 4 decade ranges with 100% over-ranging. The unit is suitable for current measurement in the range of 100pA to 200μA. For the ease, readings are directly obtained on a 3½ digit DPM. The instrument is capable of accepting either polarity of the input current.

The very low leakage current of the input stage combined with the high linearity fast response due to high negative feedback enables accurate and easily reproducible measurements. The instrument uses a FET input operational amplifier that offers the very low input bias current, low offset voltage, low drift and noise.

These characteristics have been fully utilized in the present Nanoammeter. This operational amplifier is used in low level current to voltage configuration.

Applications

To measure current from photomultiplier tubes, photometer etc.

Leakage currents in solid state devices. FET gate and tube grid voltages without loading errors.

Current through very high resistance in conjunction with a power supply.

Potentials across semiconductors, piezoelectric systems & pH electrodes.

Specifications

Range	:	100nA, 1μA, 10μA, 100μA with 100% over-ranging
Accuracy	:	0.2% for all ranges
Resolution	:	0.1nA
Input Resistance	:	25Ω, 2.5Ω, 0.25Ω, 0.025Ω
Display	:	3½ digit, 7 segment LED (12.5mm height) with auto polarity and decimal indication
Input	:	Through Amphenol connector
Power Supply	:	110V±10%, 60Hz
Weight	:	2.5Kg
Dimensions	:	240mm X 275mm X 120mm

OPERATING INSTRUCTIONS :

INSTALLATION :

When unpacking the instrument, inspect for any damage during transit. Any such damage should immediately be intimated to the factory for appropriate action.

The instrument is light weight and portable and does not require any permanent installation. Before connecting to the mains supply, it should be ensured that the mains voltage is between 200 to 240 volts a.c. and a *good earth connection is available in the power socket.*

OPERATING INSTRUCTIONS :

1. Ensure that the Main's switch is in 'OFF' position. Connect the instrument to a three pin *well earthed* main's point.
2. Switch 'ON' the instrument. Allow one minute for warm up, stabilisation of components and circuits.
3. Using 'Zero adj' adjust the panel meter reading to zero.
4. Connect the coaxial cable to the source and select appropriate range.

PRECAUTIONS :

1. The instrument should be placed as near to the source as possible. This will minimise current leakage paths, noise pick-ups and capacitive loading.
2. Use only the best quality coaxial cable with amphenol connectors at both ends. Cable system should be made as rigid and vibration free as possible, since cable movement can cause various noise signals, which are significant in the high impedance systems.
3. Many instrumentation situations, such as flame detectors in gas chromatographs, involve measurement of low level currents from high voltage sources. If the source is not current limited it requires input protection. All that is required is a resistor in series with the affected input terminal so that the maximum overload current is 0.5 mA (for example 200 K ohms for a 100 volt overload). The instrument is protected for 200 volts and a suitable series resistor should be added in the source circuit for additional voltage of the source. This will not cause any significant reduction in the performance.
4. Please note that the instrument is essentially designed for very low current measurement from high impedance source. Measurement of currents from comparative low impedance source may require zero adjustment even at higher ranges. This may be checked and corrected if necessary, for a particular load.

DIGITAL GAUSSMETER, MODEL DNM-121 SCHEMATIC DIAGRAM

