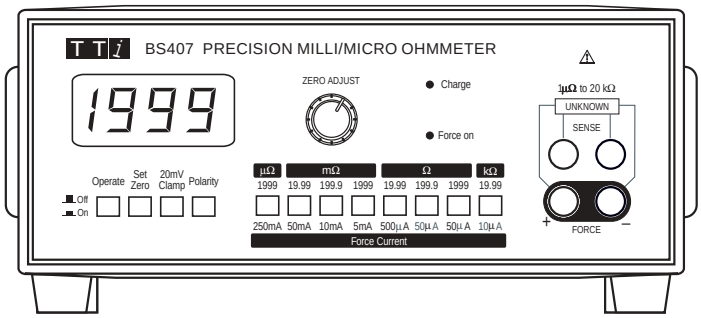
THURLBY THANDAR INSTRUMENTS

BS407 Wide range precision micro-ohmmeter



- High basic accuracy of 0.1%
- Wide measurement range of 1 micro Ω to 20k Ω
- Current reversal switch for detecting thermal emf effects
- Current diversion switch for easy zero setting
- Four terminal measurement using Kelvin clip leads
- Battery operation with built-in charger
- Switchable 20mV clamp for 'dry circuit' testing

A dedicated but versatile instrument

The BS407 is an instrument which is fully optimised for the task of accurate measurement of low resistances with a best resolution of 1µΩ.

Most multimeters offer a best resolution which is at least one thousand poorer than this. A very high resolution multimeter may attempt to resolve fairly low resistances, but it does so by resolving extremely low voltages (typically one nano-volt per micro-ohm), making it subject to severe errors from thermal emf effects and noise.

In contrast, the BS407 generates sufficient test voltage across the unknown resistance to combat noise and reduce thermal emf effects to manageable levels. Current reversal can then be used to eliminate any remaining thermal offset.

Rapid 4-terminal measurement

The BS407 uses a four terminal measurent system via high quality Kelvin Clip leads (supplied).

For speed and convenience front panel switches are provided for current diversion (allowing in-situ zero adjustment) and current reversal (for identifying thermal emf errors). An LED indicator warns of open circuit leads thus preventing spurious results from being recorded.

Battery operation with built-in charger

The BS407 is a fully portable instrument which operates from NiMh rechargeable batteries. The battery charger is built into the instrument and can be operated continuously during bench use.

Wide measurement range

The BS407 has eight push-button selected decade measurement ranges from 1.999mΩ up to 19.99kΩ.

This unusually wide range makes it suitable for a greater variety of applications than other micro-ohmmeters.

A front panel operated 'clamp' switch is available to limit the maximum voltage across the unknown to 20mV. This is a requirement for the measurement of switch contact resistances to international standards.

High resolution and accuracy

With a lowest range of 1999µΩ the BS407 can resolve one micro-ohm.

Precision analogue circuitry ensures a high measurement accuracy of up to 0.1% of reading ± 1 digit.

Designed and built in the EEC by:

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RANGES AND ACCURACY

Accuracies apply over a temperature range of 18°C to 28°C after a warm-up period of 30 minutes, and with the test connections in thermal equalibrium. Specificied accuracy applies for a period of one year.

Range	Resolution	Test Current	F.S. Voltage	Accuracy
1999 µΩ	1 µΩ	250 mA	500 µV	± 0.1% r ± 0.4% scale
19.99 mΩ	10 µΩ	50 mA	1 mV	± 0.1% r ± 0.2% scale
199.9 mΩ	100 µΩ	10 mA	2 mV	± 0.1% r ± 0.1% scale
1999 mΩ	1 mΩ	5 mA	10 mV	± 0.1% r ± 0.1% scale
19.99 Ω	10 mΩ	500 µA	10 mV	± 0.1% r ± 0.1% scale
199.9 Ω	100 mΩ	50 µA	10 mV	± 0.1% r ± 0.1% scale
1999 Ω	1 Ω	50 µA	100 mV	± 0.1% r ± 0.1% scale
19.99 kΩ	10 Ω	10 µA	200 mV	± 0.1% r ± 0.2% scale

FACILITIES

20mV Clamp

Operated by front panel switch. Limits the open circuit voltage across the unknown to 20mV (+0mV, -4mV) for "dry circuit" testing of switch and relay contacts. Not available on the 2000Ω and 20kΩ ranges.

Reverse Polarity

Operated by front panel switch. Reverses the polarity of the test current, enabling thermal emf effects to be detected and quantified.

Set Zero

Operated by non-latching front panel switch and rotary offset control. Diverts the test current way from the unknown allowing zero adjustment to be undertaken with the test leads in place.

MEASUREMENT SOURCE

Source EMF	18 mV ± 2mV with 20mV Clamp Active < 6V with 20mV Clamp Inactive
Compliance	> 1V (> 0.5V on 1999µΩ range).

Compliance is the maximum voltage that can be tolerated from additional resistance in series with the force connections

PROTECTION

The instrument is protected against the back-emf of its own test current from any inductance.

The instrument is protected against external voltage sources delivering up to one amp. Protection against greater abuse is provided by non-flamable fusible resistors.

POWER SOURCE

Battery

Four internal Ni-MH cells (non removable). Operating time depends upon the test current flowing - >150 hours with no test current, > 8 hours with maximum test current (1999µΩ range). Low battery indication in display.

AC Line

Built-in battery charger allows instrument operation while re-charging. Nominal re-charge time 16 hours.

GENERAL

Display:	3.5 digit LCD with 12.5mm characters.
Casing:	ABS casing with metal tilt stand giving 15° angle.
Power:	230V or 115V ±14% 50/60Hz, adjustable internally; 20VA max. Installation Category II.
Operating Range:	+5°C to + 40°C, 20% to 80% RH.
Storage Range:	-10°C to +65°C
Environmental:	Indoor use at altitudes to 2000m, Pollution Degree 2.
Electrical Safety:	Complies with EN61010-1.
EMC:	Complies with EN61326.
Size:	220(W) x 82(H) x 230(D) mm, (10.3 x 3.4 x 9.2") excluding feet and tilt stand.
Weight:	1.3 kg (3lb).

ACCESSORIES

SUPPLIED

Kelvin Test Clip Leads, Operating Manual, IEC Mains Lead

OPTIONAL

Carrying Case