



**Cambridge Instruments
& Engg. Co.**

EST. 1963 · HOWRAH, INDIA

TECHNICAL CATALOGUE · MOTOR-CUM-HAND DRIVEN

CIE/777 HM

Mains motor with hand-crank operation

Sustained-voltage insulation testing

A universal, multi-purpose instrument for checking insulation and conductance under simulated operating conditions in high-tension electrical and electronic fields. It is ideally suited to the electrical maintenance of rotating plant machinery and distribution networks, communication cables and insulators, and to the servicing of control and switching equipment, transformers and industrial installations. The dielectric absorption test needs the test voltage applied for several minutes, and operating the instrument under motor power makes this easy. Polarisation index is the resistance after 10 minutes divided by the resistance after 1 minute, and better results are obtained with longer test periods. The high sensitivity of the instrument gives sensible readings in these tests. The CIE/777 can save several hours in locating intermittent shorts, defective electrical connections, and insulation and conductor failure, and in preventing costly repairs and breakdowns. The CIE/777 HM can also be operated by hand cranking, with all other details as for the CIE/777.



CIE/777 HM · ILLUSTRATIVE IMAGE

01 HIGHLIGHTS

- | | |
|---|---|
| ✓ Operated from 230 V, 50 Hz A.C. mains, or by hand cranking | ✓ Collapsible generator handle |
| ✓ Centrifugal clutch (governor) for constant output voltage | ✓ Seasoned wooden cabinet with sunmica finish, detachable lid, carrying handle and lock |
| ✓ Anti-parallax mirror scale with knife-edge pointer (not provided on triple-range and above) | ✓ Highly sensitive cross-coil indicator |
| ✓ Guard ring around the line terminal, plus a guard terminal | ✓ Externally accessible infinity adjuster |
| ✓ ON-OFF switch, jewel lamp for mains ON and safety fuse | ✓ Terminals accept standard cable terminations, including 4 mm plug and spade |
| ✓ Accurate and quick response: 3 seconds | ✓ Conforms to IS 2992:1987 |

02 TYPICAL APPLICATIONS

- Field insulation testing where mains supply is uncertain or unavailable
- Sustained PI and dielectric absorption testing (motor-driven mode)
- Remote substation and railway traction equipment commissioning
- HV transformer and cable insulation assessment

03 PRINCIPLE AND CONSTRUCTION

PRINCIPLE

A built-in motor operated from 230 V, 50 Hz A.C. mains, a static rectifier and a cross-coil ohm meter. The instrument can also be operated by hand cranking.

CONSTRUCTION

Housed in a seasoned wooden cabinet with sunmica finish, complete with detachable lid, carrying handle and lock. Terminals are designed to accommodate standard cable terminations, including 4 mm plug and spade. The weight is 12 kg including top cover (CIE/777: 9 kg).

04 SALIENT FEATURES

Mains motor drive

A built-in motor operated from 230 V, 50 Hz A.C. mains, with a static rectifier and a cross-coil ohm meter.

Guard ring and guard terminal

A guard ring around the line terminal and a guard terminal eliminate errors due to surface leakage. An externally accessible infinity adjuster is also provided.

Controls and protection

A highly insulated panel carries an ON-OFF switch, a jewel lamp indicating mains ON and a safety fuse protecting the motor, with a 3-pin socket for the supply cord.

Hand-crank operation

The instrument operates on A.C. mains as well as by hand cranking. A centrifugal clutch (governor) holds the output voltage constant, and the generator handle is collapsible.

05 PERFORMANCE AND TEST SPECIFICATION

Standard	IS 2992:1987
Supply	230 V, 50 Hz A.C. mains, or hand cranking
Indicator	Highly sensitive cross-coil indicator; anti-parallax mirror scale with knife-edge pointer (not provided on triple-range and above instruments)
Scale length	100 mm (approx.)
Accuracy	As per IS 2992:1987
Response time	3 seconds
High voltage test	Withstands minimum 2 kV or (rated voltage + 1) kV A.C. (r.m.s.) for 1 minute between the electrical circuit and the containing case
Insulation resistance of the instrument	Better than 50 MΩ at 500 V D.C. between the electrical circuit and the containing case

06 CONSTRUCTION AND PHYSICAL SPECIFICATION

Hand operation	Collapsible generator handle; centrifugal clutch (governor) for constant output voltage
Guard and infinity adjuster	Guard ring around the line terminal and a guard terminal; externally accessible infinity adjuster
Panel	Highly insulated panel with ON-OFF switch, jewel lamp indicating mains ON and safety fuse protecting the motor; 3-pin socket for the supply cord
Supply cord	2 m, with 3-pin plug
Terminals	Designed to accommodate standard cable terminations, including 4 mm plug and spade
Body	Seasoned wooden cabinet with sunmica finish, detachable lid, carrying handle and lock
Weight (including top cover)	12 kg (approx.)
Dimensions (including top cover)	14 × 10 × 10 inch (approx.)

07 RANGE OPTIONS BY RATED VOLTAGE

Each instrument is built for **one rated voltage** and **one insulation range**. Choose a rated voltage, then **one** range from its row. Ranges are not combined in one instrument unless one of the dual voltage or dual insulation range options below is selected.

RATED VOLTAGE	INSULATION RESISTANCE RANGE (MΩ): ANY ONE OF			
500 v	0–1000			
1000 v	0–2000			
2500 v	0–5000	OR	0–10,000	OR 0–20,000
5000 v	0–5000	OR	0–10,000	OR 0–20,000
				OR 50–50,000
	100–100,000			
10,000 v	0–10,000	OR	0–20,000	OR 50–50,000
				OR 100–100,000

Any other range can be manufactured against specific requirements.

08 DUAL VOLTAGE AND DUAL INSULATION RANGE OPTIONS

Dual voltage and dual insulation range

Two rated voltages, each with its own insulation range. The selected range must be within the rated resistance listed for that voltage. Not available for the 10,000 V instrument.

Single voltage but dual insulation range

One rated voltage with two insulation ranges, within the rated resistance listed for that voltage. Not available for the 10,000 V instrument.

Dual voltage, single insulation range

Two rated voltages sharing one insulation range, within the rated resistance listed for that voltage. Not available for the 10,000 V instrument.

09 MULTIRANGE MOTOR-CUM-HAND DRIVEN INSULATION TESTER: CIE/777 HM/MR

SERIES	RATED VOLTAGE	INNER SCALE (MΩ)	OUTER SCALE (MΩ)
MR-A	5000 V	0–5000	50–100,000
	2500 V	0–2500	25–50,000
	1000 V	0–1000	10–20,000
MR-B	5000 V	0–2000	10–10,000
	2500 V	0–1000	5–5000
	1000 V	0–500	2–2000
MR-C	5000 V	100–100,000	Single scale
	2500 V	50–50,000	Single scale
MR-D	5000 V	0–5000	50–100,000
	2500 V	0–2500	25–50,000
MR-E	5000 V	50–50,000	Single scale
	2500 V	25–25,000	Single scale
	1000 V	10–10,000	Single scale

Multirange instruments are provided with a range selector switch, so one instrument covers every voltage and range listed in its series. Any other range can be manufactured against specific requirements.

10 STANDARD AND OPTIONAL ACCESSORIES

Supplied as standard

- ✓ Mains cord, 2 m
- ✓ 1 pair of H.V. testing leads

Optional, at extra cost

- Rexine carrying case
- 15-minute timer facility
- Testing leads, 1 m or 2 m
- Additional / special-grade H.V. testing leads, 2 m

11 HOW TO ORDER

To order, quote the **model**, the **rated voltage** and the **insulation range**, for example

CIE/777 HM, 500 V / 0–1000 MΩ. Any range not listed can be manufactured against specific requirements.