



Cambridge Instruments
& Engg. Co.

EST. 1963 · HOWRAH, INDIA

TEST REPORT FORM

Cable Insulation Resistance Test

Core to earth and core to core · 1 minute readings, normalised per kilometre

01 Job and cable details

Customer / site

From (end A)

Cable type and size (e.g. 3C x 240 sq mm XLPE)

Installation

☐ Laid direct ☐ Duct / trench ☐ Tray ☐ Overhead

Test instrument, serial no.

Cable circuit / tag

To (end B)

Rated voltage (kV)

Conductor temperature (°C)

Test voltage (V DC)

Test date

Length L (m)

Humidity (%)

Calibration due

02 Readings

MΩ after 1 minute, other cores and the armour or screen earthed

Test core to ...	Reading at 1 min MΩ	Per km MΩ × L(km)	Minimum required MΩ	Result	Reading at 10 min optional, MΩ	PI 10 min / 1 min
R to earth				☐ Pass ☐ Fail		
Y to earth				☐ Pass ☐ Fail		
B to earth				☐ Pass ☐ Fail		
N to earth (if any)				☐ Pass ☐ Fail		
R to Y				☐ Pass ☐ Fail		
Y to B				☐ Pass ☐ Fail		
B to R				☐ Pass ☐ Fail		
R + Y + B to N				☐ Pass ☐ Fail		
Armour / sheath to earth				☐ Pass ☐ Fail		

Repeat each line on the cable at the temperature recorded. Insulation resistance falls as the conductor warms and as the cable gets longer, so compare lengths using the per-kilometre column.

03 Before and after

Continuity of conductors

Phase sequence / identification

Discharged and earthed after
test

☐ Yes

Terminations clean and dry

☐ Yes ☐ No

04 Result and sign-off

Overall result

☐ PASS ☐ FAIL

Ready to energise

☐ Yes ☐ No, retest

Remarks and recommended action

Signature and date: tester

Signature and date: reviewer





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WORKSHEET AND REFERENCE

Voltage, limits and method

What voltage to use, what to compare with, and how to normalise by length

01 Formulas

Resistance per kilometre
 $IR/km = IR \text{ measured} \times L(km)$

Predicted for a length
 $IR(L) = IR/km / L(km)$

Worked example
500 m, 8000 MΩ: 4000 MΩ·km

Leakage at 1 min
 $I (\mu A) = V / IR (M\Omega)$

Polarization index
 $PI = IR_{10min} / IR_{1min}$

Why per km
longer cable = more leakage paths
in parallel = lower IR

02 Test voltage

commonly used values as guides. Use your cable specification where it states one

Cable rated voltage	Test voltage (V DC)
Up to 500 V	500
1.1 kV (LV power cable)	1000
3.3 kV to 6.6 kV	2500
11 kV and above	5000

Minimum IR for LV circuits, BS 7671	MΩ
SELV and PELV circuits (250 V test)	0.5
Up to 500 V circuits (500 V test)	1.0
Above 500 V up to 1 kV (1000 V test)	1.0

For power cables the BS 7671 values above are an installation minimum, not a measure of a healthy cable. New cables usually read far higher, in the thousands of MΩ. Many sites use a guide of at least 1 MΩ per kV of rated voltage after 1 minute, and judge by comparison with the factory test, the previous test and the other cores. A reading far below its neighbours points to damage, moisture ingress or a poor termination.

03 Reading the result

What you see	Likely cause
One core far below the others	Local insulation damage or termination tracking
All cores low and falling with humidity	Moisture in joints or end boxes
Reading rises slowly then settles	Normal dielectric absorption
Reading wanders or steps down	Surface leakage, bad contact or partial breakdown

Do before testing
Isolate both ends and disconnect all loads, surge arresters and VTs
Clean terminations, keep leads away from earth
Short and earth cores to discharge, for as long as the test ran
Record conductor temperature, not only air temperature

04 Notes

- This form is for DC insulation resistance. It does not replace very low frequency or DC high-voltage withstand tests, or partial discharge tests on MV and HV cables.
- Take limits from the cable specification, the standard for your cable (for example IEC 60502 for 1 to 30 kV) and your site procedure.

CIE INSTRUMENTS FOR THIS TEST

CIE/444

Hand-driven, 100, 250, 500, 1000, 2500 and 5000 V, anti-magnetic aluminium body

DIT-2500

Digital, 100, 250, 500, 1000 and 2500 V, with DAR and PI

DIT-5000

Digital, up to 5000 V and 200 GΩ



Pick the voltage

Scan for the free test voltage selector.
cieinstruments.in/tools



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Page 2 of 2 · Calculation aid, not a substitute for the standard or your site procedure

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