ESPERTO
Engineers

ELECTRICAL INSPECTION

Performance & safety assessment



FOR INDUSTRIAL & COMMERCIAL SOLAR PLANTS

SOLAR PV AUDIT & INSPECTION

Assess. Identify. Optimize.

WHAT YOUR PLANT GAINS

Find hidden losses
Identify where your plant may be losing generation.

Spot costly faults early
Heating, wiring and earthing problems, caught in time.

Fix the right things first
Every issue ranked by risk and urgency.

espertopk.com

Why every solar plant needs a health check

A solar plant keeps generating even when something is wrong. Heat, dust and years of operation quietly reduce its output and its safety. An audit shows what is really happening.

WHERE PLANTS QUIETLY LOSE VALUE

01 Hotspots & loose connections

Loose terminals, damaged cells and worn connectors resist current and heat up. The fault grows quietly with every heating and cooling cycle.

Impact: **Fire risk, burnt equipment and forced shutdowns.**

02 Soiling & shading

Dust, bird droppings, new structures or vegetation block light from reaching the cells. In dusty conditions this builds up fast.

Impact: **Lost units every day, often blamed on weather.**

03 String mismatch & module damage

A cracked, delaminated or degraded module drags down the whole string it belongs to, even when the other modules are healthy.

Impact: **Lower output and faster ageing of the array.**

04 Inverter faults & derating

Repeated alarms, overheating or blocked ventilation make the inverter reduce its output while the plant still appears to be running.

Impact: **Capped generation that nobody notices on the display.**

05 Cable & insulation wear

UV, heat and mechanical stress crack cable insulation and loosen connectors over time, on both the DC and AC sides.

Impact: **Earth faults, arcing risk and unplanned downtime.**

06 Earthing & protection gaps

Corroded bonds, missing links or ageing surge protection leave the plant exposed to faults and lightning.

Impact: **Danger to people, damaged equipment and insurance exposure.**

7,500 kWh
lost every year

For every 1% of output lost on a 500 kWp plant. Small losses add up year after year.

*Illustrative: assumes ~1,500 kWh/kWp annual yield. Actual figures depend on site and tariff.

WHEN TO AUDIT

Every year, before the defects period ends, when output drops, or after storms and heavy dust.

WHICH PLANTS

Industrial, commercial and rooftop solar plants, whoever installed them.

What we inspect, area by area

Scope is agreed before the visit and tailored to your plant.

01 PV MODULES & STRUCTURE

- Cracks, damage, discoloration, soiling
- Shading, clamps, fasteners, frames
- Delamination, backsheet, junction boxes

02 DC SYSTEM & STRINGS

- String voltage and current, safely accessed
- Cables, connectors, polarity, insulation
- Combiner boxes, fuses, protection

03 INVERTERS & AC SYSTEM

- Alarms, fault history, parameters
- Breakers, isolators, terminations
- Ventilation, cooling, grid status

04 THERMAL INSPECTION

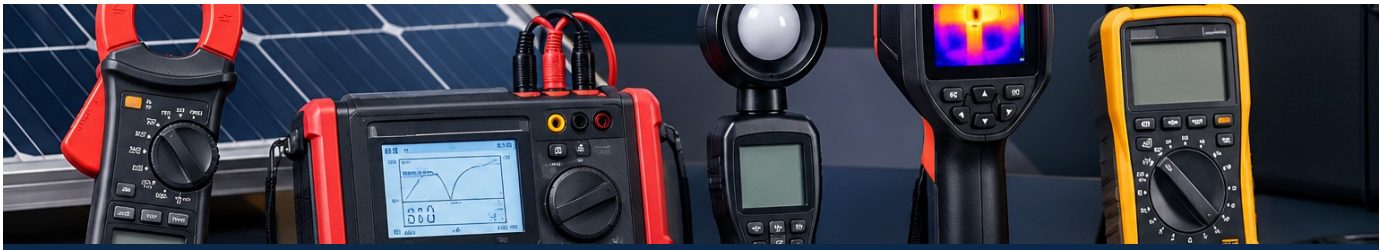
- Hotspots at modules and connections
- Panel and breaker terminations
- Compared with neighbours, photographed

05 EARTHING & PROTECTION

- Earthing conductors and bonding
- Structure and frame bonding
- Surge and lightning protection

06 PERFORMANCE REVIEW

- Irradiance and module temperature
- Reported vs. expected output
- Monitoring and data logging



PROFESSIONAL-GRADE INSTRUMENTS — Illustrative

SAFETY FIRST

PPE and insulated tools, lockout/tagout, and measurements only at safe, accessible points.

ADD-ON TESTS

I–V curve tracing, power-quality analysis, comprehensive earthing tests and lab module testing.

From site visit to a decision-ready report

HOW THE AUDIT WORKS

01

Review

Drawings, commissioning records and generation data, where available.

02

Inspect & test

Visual, thermal and instrument checks on site.

03

Analyse

Findings compared with design and operating data.

04

Report

Evidence, risks and recommended actions in one clear report.

WHAT YOUR REPORT CONTAINS

01 **Executive summary**
A clear one-page overview for management.

02 **Findings & loss analysis**
What was seen and measured, with photos and thermal images.

03 **Risk-ranked issues**
Every issue rated P1, P2 or P3.

04 **Corrective action plan**
What to fix, in what order, and why.

HOW WE RATE EVERY ISSUE

P1 **Act immediately**
Safety risk or serious fault. Do not delay.

P2 **Plan and schedule**
Real generation loss or a deteriorating condition. Fix in the next maintenance window.

P3 **Monitor**
Minor item. Recheck at the next visit.

SAMPLE REPORT AVAILABLE

Ask us for a sample audit report to see exactly how findings, photographs, priorities and actions are presented.

Reference frameworks: IEC 62446-1, IEC 61724, IEC 62548 (reference only; no certification implied). Conclusions reflect the conditions and access available during inspection. Energy savings are not guaranteed. Repairs, replacements, cleaning and add-on tests are excluded unless agreed in writing.

ESPERTO Engineers

SCHEDULE YOUR SOLAR AUDIT

Tell us your plant size and location. We will propose a scope and schedule.

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