

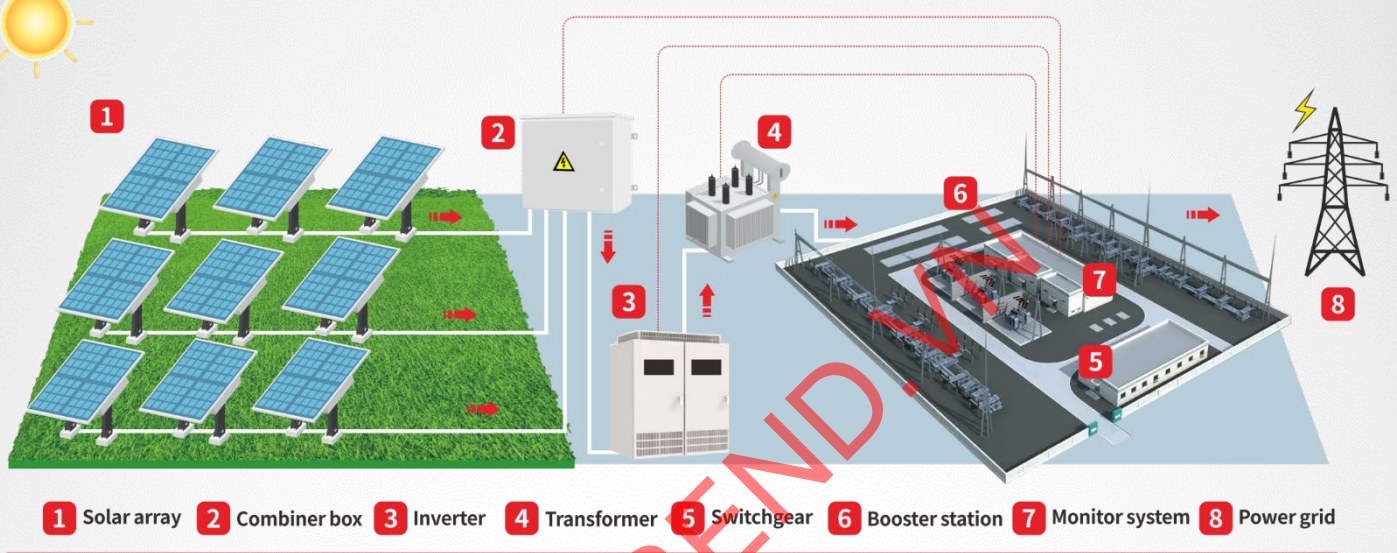


UNI-T®

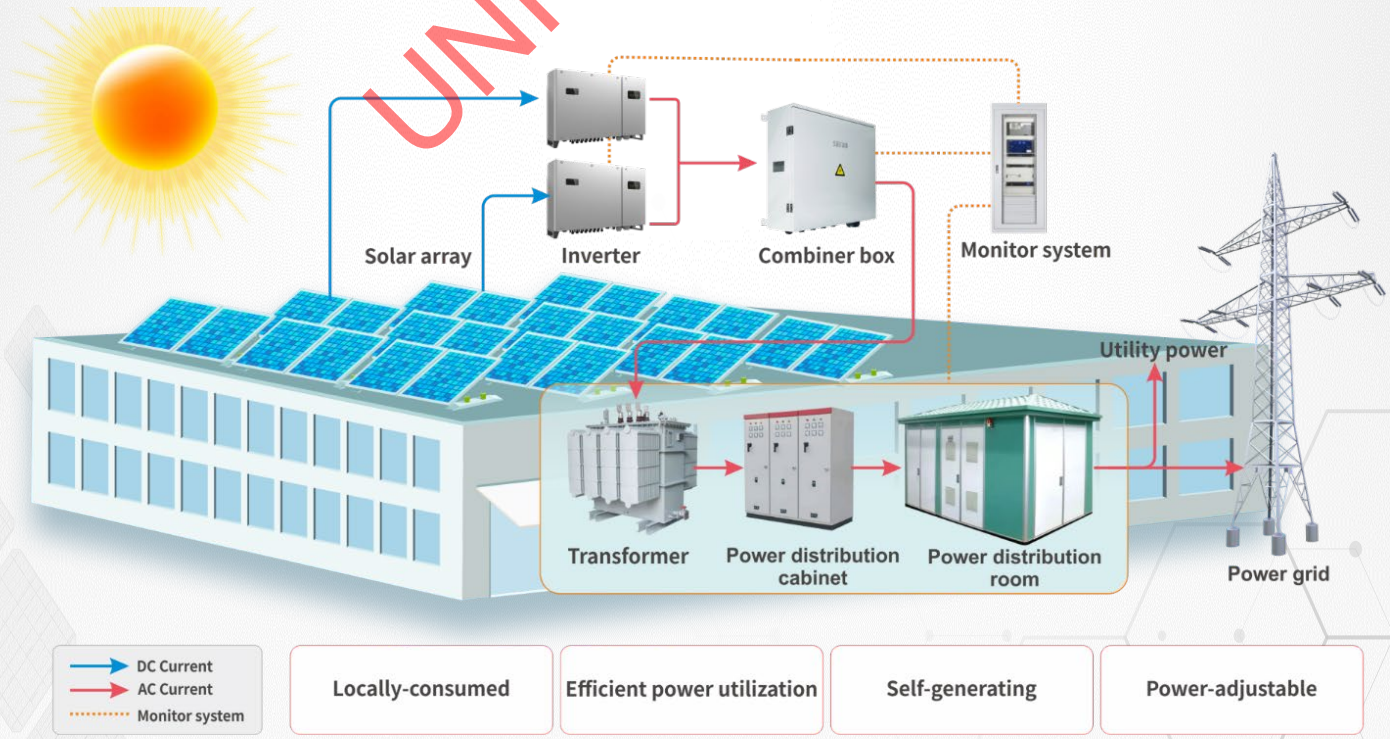
Solar Power Facility Solutions

Structure of Photovoltaic Power Station

Concentrated Photovoltaic Power Station



Decentralized Solar Power Plant

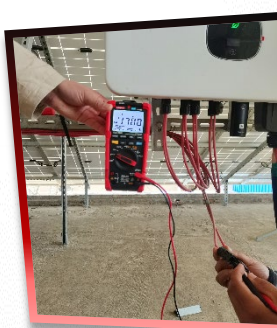
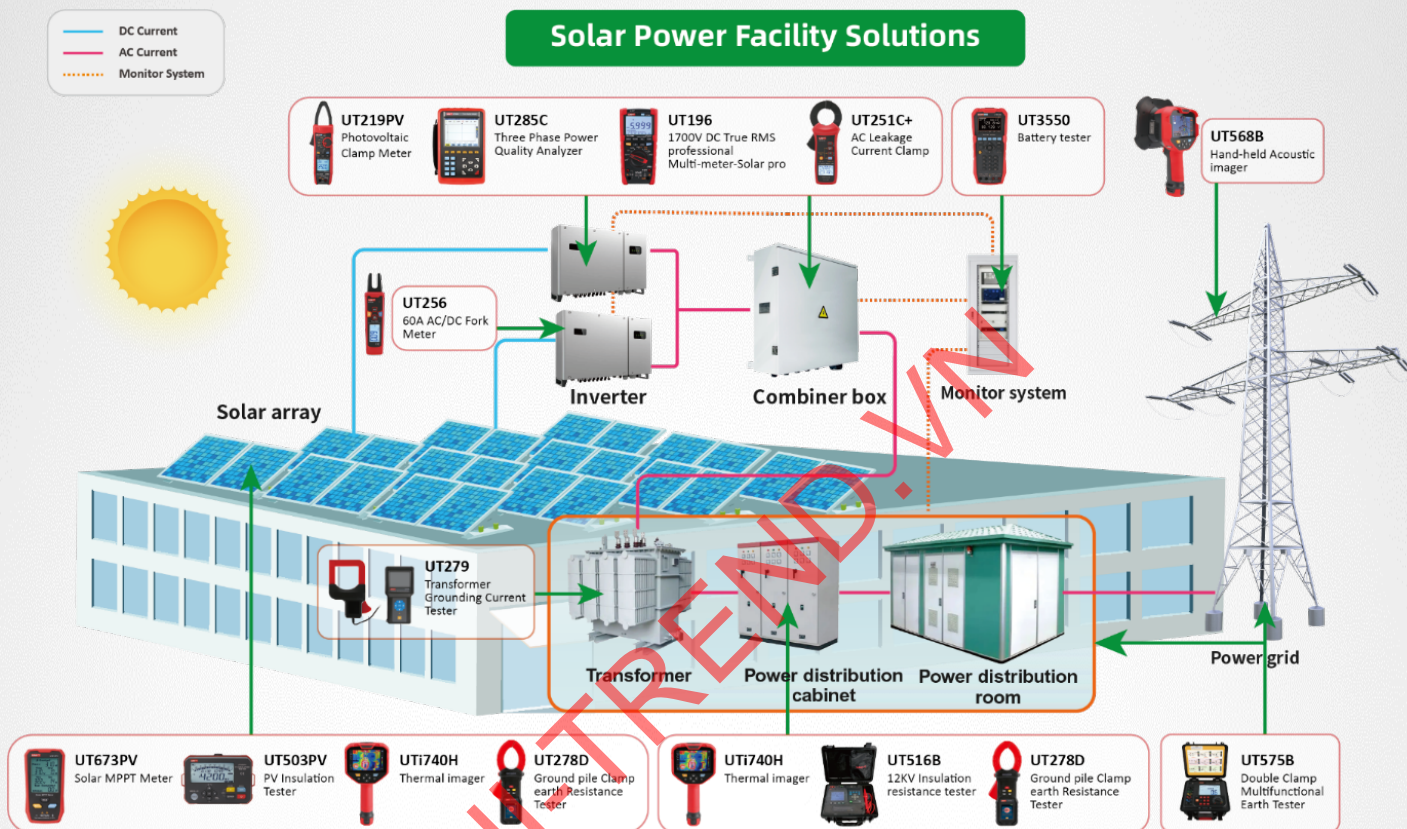


Main inspection items for operation & maintenance

Main equipment	Inspection items	Inspection Content	Recommended models
Photovoltaic Modules	Component appearance inspection	Inspect each component carefully under good lighting conditions. No cracks, bends, damage, poor sealing, bubbles or delamination, broken junction boxes, exposed connecting wires, and any other conditions that may affect component performance. Record or take photos of any cracks, bubbles or delamination	
	Module volt-ampere characteristic test	Test the component T-V performance curve, and detect parameters such as open circuit voltage, short circuit current, peak current, peak voltage, and peak power. The L-V and P-V curves of the module should be smooth, without mutations or abnormalities	UT673PV
	Module insulation resistance test	Determine whether the absolute performance of the current-carrying part and the frame (external environment) of the module is qualified. The test insulation resistance should be no less than 40MΩ/m² for the acreage	UT503PV
	Module grounding continuity test	Test whether there is a conduction channel between the exposed conductive surfaces of the module, and whether the test resistance meets the requirements. The test resistance should be less than 0.4Ω	UT278B UT278C UT278D
	Module hot spot test	Use thermal infrared to find the module hot spot and determine the cause of the hot spot. If it is a problem with the module itself, record the serial number and take a photo	UTi384G UTi740H
	Module EL test	Test whether the module has defects such as hidden cracks, bright pieces, dark pieces, black spots, and broken grids to evaluate the quality of the module during operation	
	Series mismatch loss test	Test the current consistency of the module in the string and detect whether there is a mismatch phenomenon in the string during operation	UT256
	Module laboratory test	Mainly test and inspect the power generation performance indicators and safety performance indicators of the module. The required inspection items are the nominal power and photoelectric conversion efficiency of the components, and the optional inspection items are the insulation voltage performance, wet leakage current performance, and mechanical load performance	UT673PV UT503PV
Brackets	Structural parts	Rust inspection and repair of structural parts such as bridges, flat irons, brackets, ladders, and grounding	
Combine box	Grounding conductivity test	Check whether the grounding conductivity of the photovoltaic combiner box is intact and whether there is leakage. Pass current between each exposed wire part and the grounding end of the external grounding wire for 5s, and the measured resistance does not exceed 0.40Ω	UT278B UT278C UT278D
	Insulation resistance test	Check the insulation safety of the photovoltaic combiner box. When the system voltage is greater than 500V, the test voltage should be 1000V. Measure the insulation resistance between the incoming/outgoing terminals and the grounding terminal of the junction box to be no less than 20MΩ, and the insulation resistance of each branch to the ground to be no less than 1KQ/V	UT503PV
Inverter	Efficiency test	Test the efficiency of the power station inverter, and measure the conversion efficiency at the load points of 5%, 10%, 20%, 25%, 30%, 50%, 75%, 100% and the maximum output efficiency point to meet the standard requirements	UT285C
	Power quality test	Power quality tests should be carried out before the power station is put into operation, and the inverter Nobo and waveform distortion, power factor, three-phase voltage imbalance and DC component should be tested and evaluated. The power quality should meet the requirements of the power grid	
Transformer	Temperature screening	Quickly locate, diagnose and deal with problems such as abnormal transformer operation (such as abnormally high voltage), abnormal temperature rise, and damage.	UTi384G UTi740H
	Ground protection screening	Transformer grounding and neutral leakage abnormal detection	UT278B UT278C UT278D

Application in PV station's operation & maintenance

Solar Power Facility Solutions



What causes low efficiency of photovoltaic array power generation?

Hot spots, a common issue in PV arrays, significantly reduce power output and can even damage modules. Caused by factors such as string breakage, shading, and environmental conditions, hotspots can lead to reduced efficiency, power loss, and safety hazards.

To accurately assess the performance of your PV modules and pinpoint the root cause of low efficiency, the [UT673PV](#) Solar MPPT Tester is indispensable. By measuring key parameters like P_{max} , V_{mp} , I_{mp} , V_{oc} , and I_{sc} , this advanced tool quickly identifies underperforming modules.

Unlike traditional multimeters that only measure open-circuit voltage, the UT673PV provides a comprehensive analysis of module health. This enables precise detection of subtle efficiency losses often overlooked by basic testing methods.

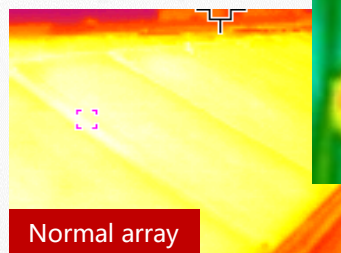
To determine if a module is operating optimally, compare its measured parameters to either standard conditions ($1000W/m^2$, $25^{\circ}C$) or the values of known healthy modules within the same array. Any significant deviations indicate potential problems.

Why do we utilize the thermal imager to detect hot spot?

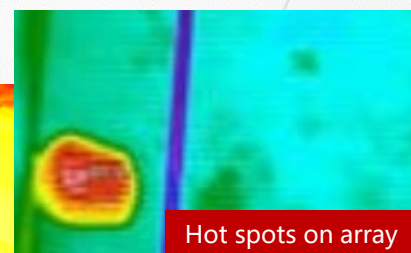
Identifying hot spots in photovoltaic arrays is crucial for maximizing energy output and preventing equipment damage. While visual inspections can sometimes detect obvious issues, thermal imaging offers a more accurate and efficient solution.

If the local temperature of the same component is significantly higher than the adjacent temperature, it considers to be a hot spot area.

Drones equipped with thermal cameras provide a broad overview of the entire array, while handheld models like the [UTi740H](#) and [UTi384G](#) allow for detailed inspections of specific areas. This combined approach ensures comprehensive monitoring and troubleshooting.



Normal array



Hot spots on array

Grounding Safety: Protect Your PV System with UT278D

Proper grounding is essential for the safety and performance of photovoltaic (PV) systems. Common grounding issues include:

- Increased resistance: Caused by poor connections between grounding wires or corrosion.
- Open circuits: Resulting from broken or disconnected grounding paths.
- Inadequate grounding: Earth resistance exceeding recommended levels (typically 4Ω or less).



Poor grounding

Earth resistance standard:

Optimal grounding is essential for the safety and performance of solar power systems. To ensure compliance, the lightning-proof earth resistance should be less than 4Ω , and the conduction resistance should not exceed 0.4Ω .



The [UT278D](#) grounding clamp meter simplifies this critical task. Its versatile measurement capabilities, including clamp grounding resistance, 3-wire/4-wire measurement, and voltage/current testing, make it an indispensable tool for maintaining electrical safety.

The Silent Threat: Insulation Degradation in PV Arrays

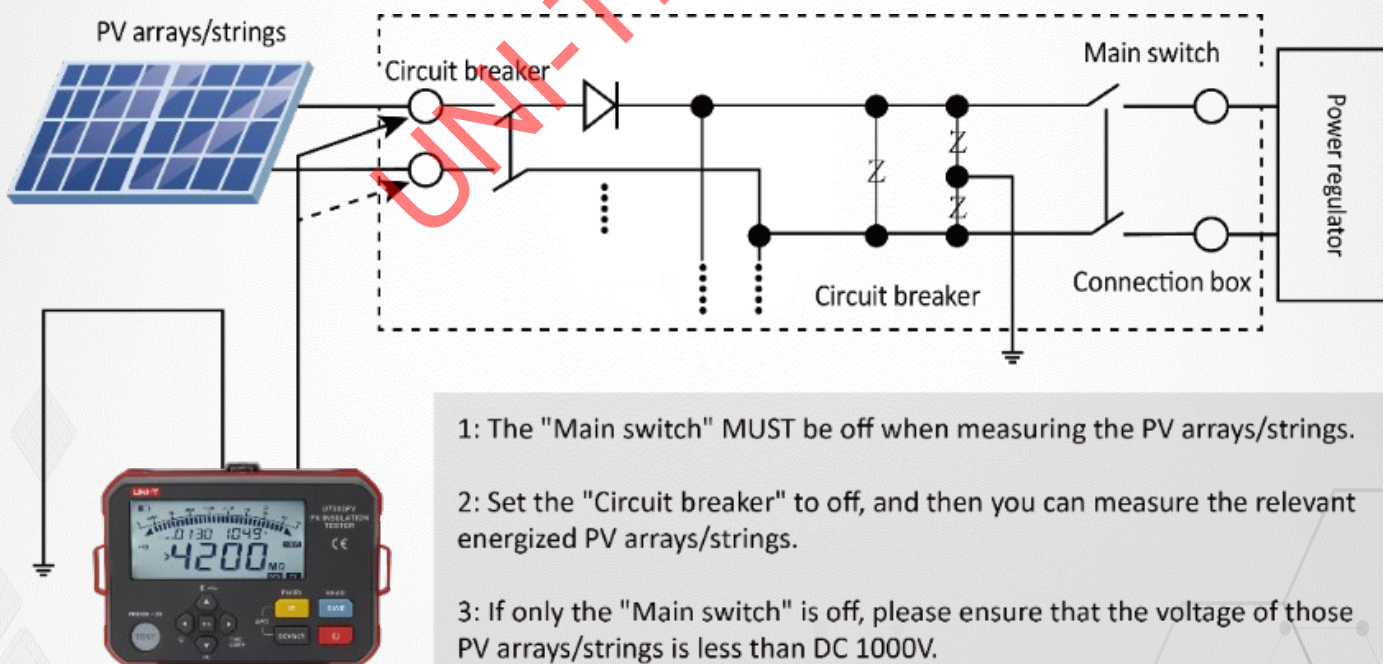
Insulation issues in PV arrays can arise from various factors including:

- Physical damage: Cracks or tears in module insulation.
- Material degradation: Aging of insulation materials over time.
- Improper connections: Poor insulation between array terminals and grounding.

These problems can lead to severe consequences such as electrical fires, equipment failure, and reduced system lifespan. Regular inspection and maintenance are essential to mitigate these risks.

Safely test your solar panels without interrupting power generation using the [UT503PV](#).

This versatile tool measures insulation resistance, automatically detects AC/DC voltage, and remote control test pen operation keep you safe during testing. Measures both live and non-live insulation resistance, automatically recognizes AC/DC voltage, and features stepping voltage, Bluetooth data transmission, and automatic discharge. Protect your investment and ensure optimal performance with the UT503PV.



Open-Circuit Voltage (Voc) Testing for PV Arrays

To assess the health and performance of a PV array, measuring the open-circuit voltage of each string or module is crucial. A deviation in Voc exceeding 5% under consistent light conditions indicates potential issues.

By measuring the voltage between the positive and negative poles of a PV string or module without any load, you can identify problems like damaged cells, shading, or other factors affecting the array's efficiency. For example, a string of 20 panels with 50V each would have a total Voc of 1000V.

UT196: Your Essential Tool for Open-Circuit Voltage Testing

Regular Voc testing is essential for maintaining optimal system performance and preventing costly repairs.

Designed with safety in mind, the [UT196](#) digital multimeter boasts an IP65 rating and a 1700V DC voltage measurement capability, making it ideal for solar array testing. Its LPF function ensures accurate readings by filtering out high-frequency noise.

Beyond voltage measurement, the UT196 also excels in high-current applications, thanks to its 3000A flexible current clamp.

With its robust construction, safety certifications (cETL/EMC), and advanced features, the UT196 is your reliable partner for efficient and accurate solar system maintenance.



Inverter Detection

Inverter Challenges & Their Impact

A photovoltaic (PV) inverter is designed to convert the direct current (DC) electricity produced by PV modules into sinusoidal alternating current (AC) electricity, which can then be connected to a load or integrated into the power grid.

Inverter malfunctions can significantly impact the performance and safety of a photovoltaic system. Common issues include:

- Voltage and current abnormalities: Fluctuations that can affect system efficiency and stability.
- Insulation degradation: Leading to electrical hazards and equipment failure.
- Overheating: Caused by various factors, resulting in reduced performance and potential damage.
- Power quality issues: Including harmonics, power factor, and unbalanced loads, impacting system efficiency and grid compatibility.

These problems can stem from factors like corrosion, poor connections, and substandard components. The consequences of inverter failure include reduced power generation, increased maintenance costs, and potential safety risks.

Essential Testing for PV System Health

To ensure optimal performance and safety, regular inspection, maintenance, and the use of advanced diagnostic tools are essential to prevent inverter issues and optimize system performance.

Key areas of focus include:

- Insulation integrity: Measuring insulation resistance to prevent electrical hazards and equipment damage.
- Grounding effectiveness: Verifying proper grounding to protect against electrical shocks and system instability.
- Circuit health: Assessing voltage and current levels to identify performance issues.
- Thermal management: Monitoring component temperatures to prevent overheating and equipment failure.
- Power quality: Evaluating harmonic distortion, voltage fluctuations, and other factors impacting system efficiency.

By adhering to industry standards and utilizing specialized testing equipment, you can proactively identify and address potential problems, maximizing system uptime and energy yield.

Inverter Detection

Circuit current (DC) detection



Accurately measuring DC current in PV arrays is crucial for identifying potential issues. The [UT256](#)'s clamp-on design simplifies this process, allowing for quick and easy current measurement without disrupting the circuit.

If a significant current deviation is detected, isolating specific arrays for individual testing allows for precise fault diagnosis. This non-invasive approach saves time and minimizes disruption to the system.

The UT256's user-friendly design and reliable performance make it an essential tool for maintaining optimal PV system efficiency.

Voltage/Current Measurement of Inverter

Measuring both DC and AC sides of an inverter provides a comprehensive assessment of system performance and helps identify potential issues.

DC side measurements (voltage and

current) evaluate the input power from the solar panels. This data reveals the health of the PV array and its ability to deliver optimal power to the inverter.

AC side measurements (voltage, current, power factor, and harmonics) assess the inverter's output quality and efficiency. By comparing input and output parameters, technicians can evaluate the inverter's performance and identify any conversion losses or anomalies.

Key benefits of measuring both sides:

- Enhanced troubleshooting: Pinpoint issues on either the DC or AC side.
- Optimized system performance: Identify bottlenecks and areas for improvement.
- Improved energy yield: Ensure maximum power transfer from solar panels to the grid.
- Safety: Detect potential hazards like overcurrent or voltage spikes.

By monitoring both DC and AC parameters, technicians can optimize system performance, prevent downtime, and ensure the safety of personnel and equipment.

Inverter Detection



■ UT219PV: Your Versatile Tool for Inverter Monitoring

The [UT219PV](#) clamp meter is not only ideal for solar panel assessment but also excels in inverter performance evaluation. Its ability to measure up to 2500V DC voltage and 3000A current (with external clamp) makes it suitable for accurately monitoring inverter input and output parameters.

By measuring voltage and current on both the DC and AC sides of the inverter, you can assess efficiency, detect anomalies, and troubleshoot potential issues. The UT219PV's advanced features, including Bluetooth connectivity and data logging, further enhance your ability to analyze inverter performance and optimize system output.

■ Cable Insulation Resistance Measurement for Inverters

Insulation testing is a critical component of inverter maintenance. By measuring the resistance between conductive parts and the inverter's enclosure, technicians can identify potential insulation breakdown.

Insulation failures can reduce inverter efficiency and output. Deteriorated insulation can lead to electrical shocks, fires, and other hazards. By conducting routine insulation tests, you can proactively address potential issues and ensure the safe and reliable operation of your PV system.

Always ensure the system is de-energized before performing insulation resistance tests. To assess cable insulation, perform a resistance test between:

- Phase-to-phase conductors: Measure the insulation resistance between each pair of phases.
- Phase-to-ground: Test the insulation between each phase and the grounding system.

Inverter Detection

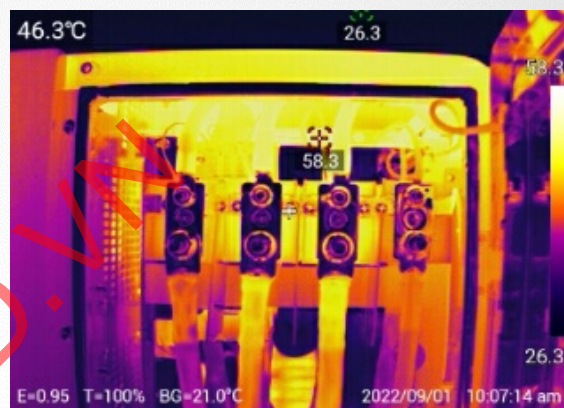
■ UT513C: Your Essential Tool for Inverter Insulation Testing

Safeguarding your PV system requires meticulous insulation testing. The [UT513C](#) insulation resistance tester offers unparalleled performance and user-friendliness. With its 5kV voltage output, automatic discharge, absorption ratio, and polarization index calculations, it provides accurate and efficient insulation testing. Its user-friendly interface, featuring one-button operation and USB data transfer, simplifies the testing process. Designed with safety in mind, the UT513C includes anti-misplug protection.

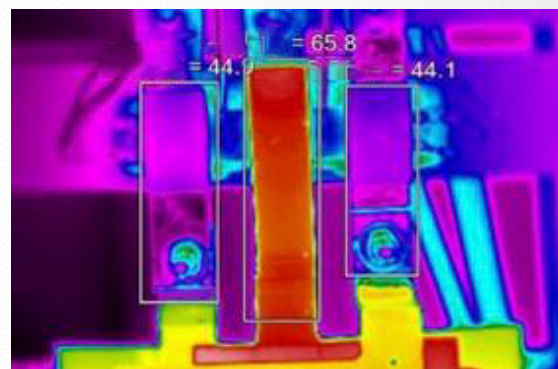
By incorporating the UT513C into your maintenance routine, you can effectively identify potential insulation issues, prevent costly breakdowns, and ensure the long-term reliability of your PV system.

for precise analysis. Generate detailed reports with the accompanying app to support maintenance decisions.

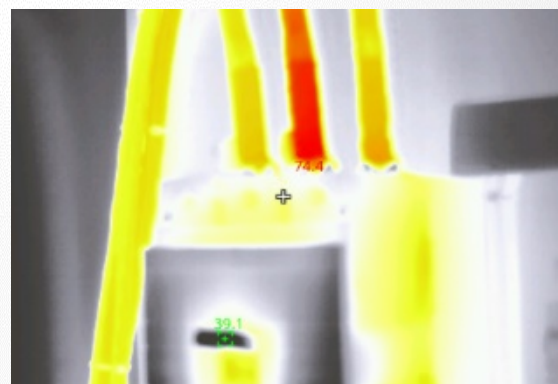
By incorporating thermal imaging into your inspection routine, you can significantly improve inverter reliability and extend its lifespan.



Over-high connector temperature



Unbalanced three phases



Over-high cable temperature

■ Inverter Temperature Measurement

Early detection of inverter overheating is crucial for preventing costly repairs and downtime. The [UTi740H](#) thermal camera excels at identifying temperature anomalies, enabling you to proactively address potential issues.

Key features include a 4.3" display, 384x288 resolution, focus adjustment, auto-tracking of high-temperature areas, and manual isotherm function

Importance of Power Quality Measurement for Inverters

Power quality measurement is crucial for ensuring optimal inverter performance, system reliability, and grid compatibility.

- Identify and mitigate power quality issues: Early detection of problems like harmonics, voltage fluctuations, and unbalanced loads prevents equipment damage and system downtime.
- Optimize inverter efficiency: By analyzing power quality parameters, you can fine-tune inverter settings for maximum energy output.
- Comply with grid standards: Adherence to power quality regulations is essential for grid-connected systems.
- Protect equipment: Poor power quality can damage sensitive electronic components and reduce equipment lifespan.

Key power quality parameters to measure:

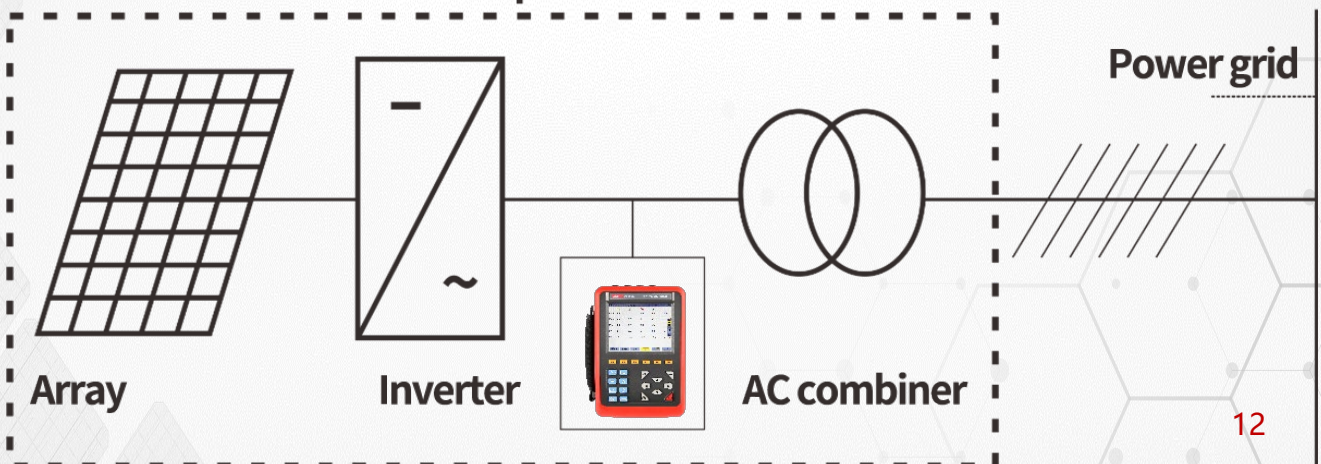
- Voltage sags and swells
- Harmonics
- Power factor
- Unbalanced loads
- Frequency variations

By regularly monitoring these parameters, you can proactively address power quality issues, improve system efficiency, and extend the lifespan of your inverter and other connected equipment.

It's crucial to consult the specific power quality standards applicable to your location to ensure compliance. Some common international standards include:

- * IEC 61000-3-2: Limits for harmonic current emission
- * IEEE 519-2014: Recommended practices and requirements for harmonic control in electric power systems.

Photovoltaic power station



■ UT285C: Your Comprehensive Power Quality Analyzer



UT285C Power Quality Analyzer can analyze harmonic and power factor for power operation and perform data acquisition and monitoring for power grid for a long time. The equipped PC software can analyze the measurement data uploaded to computer and generates test report, facilitating determining if the power quality meets requirements, achieving grid connection and improving operation efficiency.

Key features:

- Real-time waveform analysis: Visualize voltage and current patterns to detect anomalies.

- In-depth harmonic evaluation: Assess up to the 50th harmonic to identify potential equipment damage.
 - Power factor measurement: Optimize system efficiency and reduce energy consumption.
 - Unbalanced phase detection: Identify load imbalances that can impact system performance.
 - Data logging and analysis: Capture and analyze power quality data for trend analysis and troubleshooting.
- Empower your maintenance team with the UT285C to enhance system reliability, prevent equipment failures, and ensure compliance with grid standards.

Combiner Box Detection

The Role of Combiner Boxes in PV Systems

Combiner boxes serve as crucial components in photovoltaic (PV) systems, consolidating power from multiple solar modules before it's fed into the inverter. They protect the system from overcurrent, short circuits, and reverse polarity.

■ Essential Test Items for Combiner Boxes

To ensure optimal performance and safety, regular inspections and tests of combiner boxes are essential. Key test items include:

- **Current & voltage measurement:** Verify voltage levels of input and output circuits.
- **Insulation resistance testing:** Assess the condition of internal components.
- **Temperature monitoring:** Check for overheating, indicating potential issues.
- **Grounding resistance measurement:** Verify proper grounding to prevent electrical shocks.
- **Circuit continuity testing:** Confirm proper connections between modules and the inverter.
- **Overcurrent protection functionality:** Test the performance of fuses or circuit breakers.

By conducting these tests, you can identify potential problems early on, preventing system failures and ensuring the longevity of your PV installation.

■ Temperature Measurement of Connectors and Cables

Overheating within a combiner box can indicate potential electrical issues and compromise system performance. Thermal imaging provides a non-invasive method to identify hotspots and assess overall thermal conditions.

Key features of [UTi740H](#) include a 4.3" display, 384x288 resolution, focus adjustment, auto-tracking of high-temperature areas, and manual isotherm function for precise analysis. Generate detailed reports with the accompanying app to support maintenance decisions.

By regularly inspecting your combiner box with the UTi740H, you can proactively address thermal issues, preventing equipment failure and optimizing system efficiency.

Combiner Box Detection

■ Detecting Leakage Current with UT251C+



Early detection of leakage current is crucial for preventing electrical hazards and maintaining optimal system performance. The [UT251C+](#) clamp meter simplifies this process by enabling quick and accurate measurements.

Key benefits of using the UT251C+:

- **Rapid detection:** Quickly identify abnormal leakage currents by clamping around output cables.
- **High sensitivity:** Detect even minor leakage with 0.001mA resolution.
- **Efficient workflow:** 40mm large clamp opening accommodates various cable sizes.
- **Data management:** Bluetooth connectivity and data storage for analysis and record-keeping.

By incorporating the UT251C+ into your maintenance routine, you can safeguard your PV system and prevent costly downtime.

The Role of Transformer Detection in PV Systems

Transformers are essential components in photovoltaic (PV) power systems, primarily for voltage transformation.

In large-scale PV plants, transformers increase the voltage of the generated electricity to match grid requirements for efficient transmission, provide electrical isolation between the PV system and the grid, enhancing safety. And optimizes power transfer between the inverter and the grid.

- Temperature monitoring: Checks for overheating of windings and core.
- Partial discharge testing: Detects early signs of insulation breakdown.
- Dielectric loss measurement (tan delta): Evaluates the insulation quality and detects moisture ingress.
- Short-circuit test: Determines the transformer's impedance and short-circuit current capability.
- No-load test: Measures core losses and magnetizing current.
- Load test: Verifies the transformer's ability to carry rated load without excessive temperature rise.

Testing Items for Transformers

Regular testing of transformers in PV stations is crucial for ensuring their optimal performance and reliability. Here are some key testing items:

Routine Tests:

- Insulation resistance measurement: Assesses the condition of the insulation system.
- Winding resistance measurement: Checks for any increase in winding resistance due to overheating or damage.
- Turns ratio test: Verifies the accuracy of the voltage transformation.
- Oil analysis: Monitors the condition of the transformer oil for contaminants and degradation.



■ UT279: Your Essential Tool for Transformer Grounding Current Detection

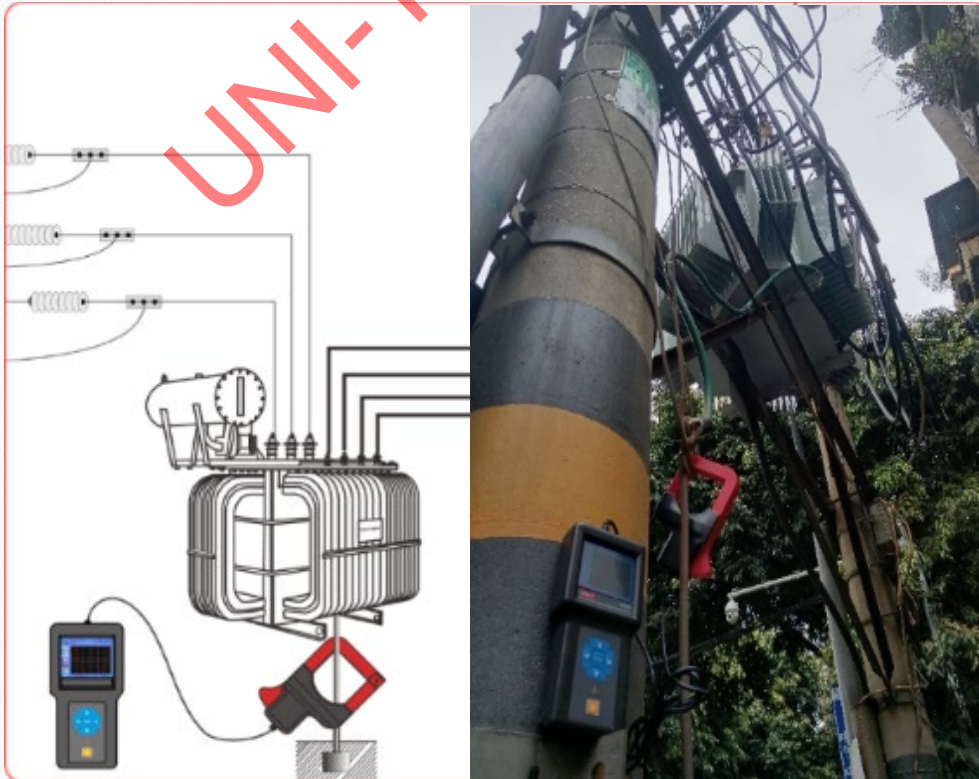
The UT279 Transformer Grounding Current Tester is designed to simplify and enhance the monitoring of transformer grounding currents. With its large clamp size, real-time waveform display, and advanced data analysis capabilities, the UT279 empowers maintenance teams to identify potential issues before they escalate.

Key features:

- Non-invasive measurement: Accurately measure grounding current without interrupting system operation.

- Real-time monitoring: Track grounding current trends and detect anomalies.
- Data analysis: Utilize PC software for in-depth analysis and report generation.
- User-friendly design: Large color display and intuitive interface for easy operation.

By incorporating the UT279 into your maintenance routine, you can significantly improve transformer reliability and safety while reducing downtime.



Transformer Detection



Temperature Monitoring

The level of heat radiated by radiators of transform during normal operation shall be same approximately, the temperature rises when one of the radiators fail, oil way clogs or radiator powers off. Thermal imager displays temperature variation visibly, facilitating troubleshooting fault safely and efficiently.

The UTi740H thermal camera is an invaluable tool for identifying potential issues. Its high-resolution display, coupled with features like focus adjustment, auto-tracking, and isotherm analysis, enables precise temperature measurement and hotspot detection.

By regularly inspecting transformers with the UTi740H, you can:

- Identify overheating components: Detect hot spots that may indicate insulation breakdown or other problems.
- Prevent equipment failure: Address issues before they lead to catastrophic failures.
- Optimize system efficiency: Ensure optimal transformer performance by maintaining optimal operating temperatures.
- Support predictive maintenance: Use thermal imaging data to plan maintenance schedules.

By incorporating thermal imaging into your maintenance routine, you can significantly enhance the reliability and lifespan of your transformers.

Transformer Detection

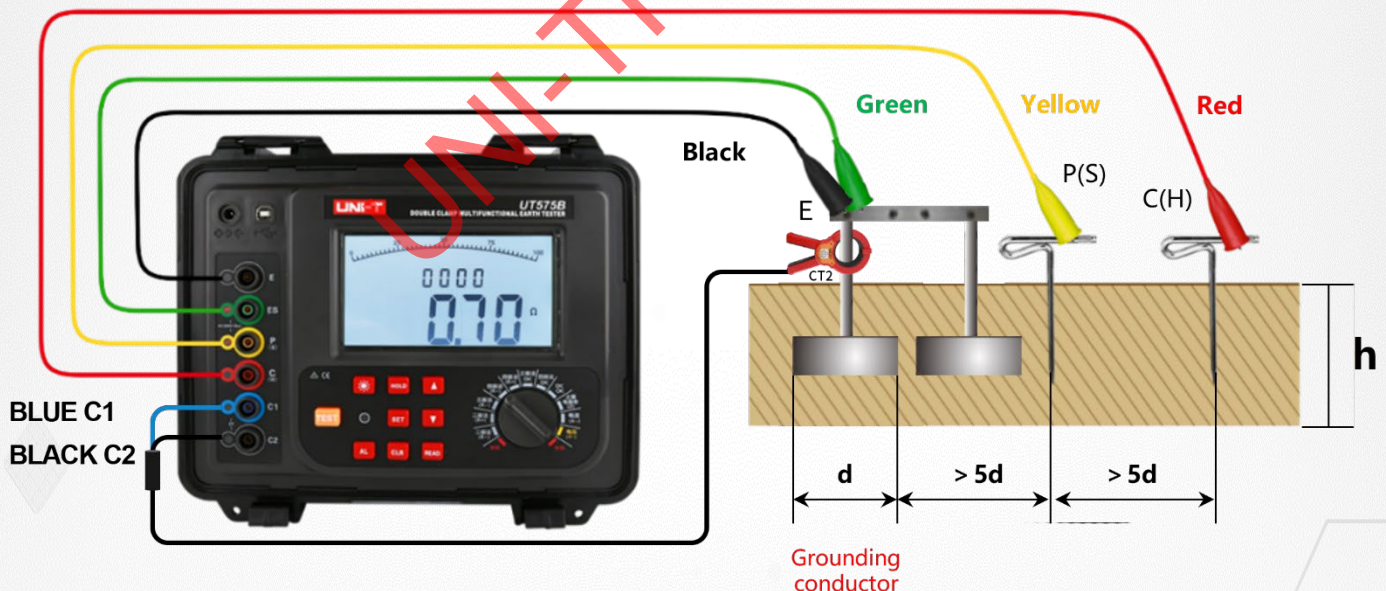
Grounding Resistance of the Transformer

Accurate grounding is essential for the safety and performance of transformers. The [UT575B](#) Ground Resistance Tester offers advanced features to ensure precise and reliable measurements.

Key benefits:

- Versatile measurement capabilities: Determine grounding resistance in various configurations, including single-point and mesh grounding systems.
- Enhanced accuracy: Four-wire testing method minimizes the impact of contact resistance for precise results.
- User-friendly design: Plug indication prevents errors, and Bluetooth connectivity enables data transfer and analysis.
- Strong anti-interference ability: 128Hz/111Hz/105Hz/94Hz (Automatic frequency selection measurement)

By incorporating the UT575B into your maintenance routine, you can effectively assess grounding system integrity, protect your equipment, and comply with safety standards.



Note: Perform grounding resistance tests in dry weather with a driven pile tester. Attach green/black wires to the transformer's ground, and yellow/red to stakes 5-10 meters apart. Press the meter's test button for direct readings.

Transformer Detection

Insulation resistance measurement

Insulation resistance testing is crucial for assessing the condition of transformer windings and preventing electrical failures. By measuring the resistance between windings and between windings and ground, technicians can identify potential insulation breakdown.

Measurement method: Measure insulation resistance of transformer under condition that the transformer powers off.

- Insulation resistances between high-voltage coil and casing,
- Low-voltage coil and casing;
- High-voltage and low-voltage coil are measured.

The UT516B insulation resistance tester is designed to safeguard your transformer investment. With a 12kV output voltage and advanced features like automatic discharge, absorption ratio, and polarization index calculations, it provides comprehensive insulation assessment. Its user-friendly interface, featuring one-button operation and USB data transfer, streamlines testing and analysis. Trust the UT516B to protect your transformer and ensure optimal performance.



Power Distribution Cabinet Detection

■ The Role of Power Distribution Cabinet/Room

Power distribution cabinets/rooms serve as the central control and distribution points for electrical power within a facility. By effectively managing power distribution, these cabinets ensure reliable and safe electrical supply to all components within a facility.

Power distribution cabinets/rooms are critical infrastructure, and their malfunction can lead to severe consequences. Common issues and their potential impacts include:

- Cable deterioration: Aging or damaged cables can result in short circuits, fires, and equipment failure.
- Poor grounding: Inadequate grounding can lead to electrical shocks, equipment damage, and system instability.
- Overheating components: Excessive heat caused by overcurrent or other factors can damage equipment and create fire hazards.
- Loose connections: Can lead to arcing, overheating, and potential fires.

■ Temperature Monitoring

Early detection of overheating components within power distribution cabinets is crucial for preventing equipment failure and ensuring system reliability.

The [UTi740H](#) thermal camera excels at identifying potential hotspots, enabling you to proactively address issues before they escalate. By quickly pinpointing areas of elevated temperature, you can pinpoint faulty components, optimize system performance, and reduce downtime.



Key features include a 4.3" display, 384x288 resolution, focus adjustment, auto-tracking of high-temperature areas, and manual isotherm function for precise analysis. Generate detailed reports with the accompanying app to support maintenance decisions.

Incorporate thermal imaging into your regular inspection routine to safeguard your power distribution system and minimize downtime.

Photovoltaic Monitoring System Detection

The Role of Transformer Detection in PV Systems

The photovoltaic monitoring system perform real-time monitor and control on array, inverter, combiner box, power distribution cabinet and other equipment in solar power station. The system displays data through data acquisition software, facilitating better control on the station operation.

Battery Aging and Failure in PV Monitoring Systems

Battery aging and failures can significantly disrupt the operation of a PV monitoring system. Symptoms of battery problems include:

- Low voltage: Reduced system performance and potential equipment damage.
- Communication errors: Disrupted data transfer and system control.
- Data acquisition failures: Loss of critical performance data.

These issues can lead to decreased system efficiency, downtime, and increased maintenance costs.

The UT3550 Solution

The [UT3550](#) Battery Tester offers a reliable solution for maintaining battery health and preventing system failures. By enabling real-time, automatic battery monitoring, the UT3550 helps identify issues early, such as:

- Voltage and resistance are shown on the same display: Facilitating viewing voltage and resistance rapidly.
- Data transfer: Exporting measurement data via PC software
- Auxiliary display: Facilitate data reading and match with hanging/shoulder strap, satisfying more testing requirements.
- Interface/protocol support: Supporting custom development, remote control and data acquisition.

With its versatility to test various battery types, including lithium, lead-acid, and hydrogen fuel cells, the UT3550 is a valuable tool for optimizing the performance and lifespan of your PV monitoring system.



Transmission Line Detection

The Critical Role of Transmission Lines in PV Systems

Transmission lines are the vital conduits that carry electricity from the power generation source (e.g., solar panels, wind turbines) to the distribution network or end-users. Their role is indispensable in ensuring a reliable and efficient power supply.

Common Issues and Their Impacts

Transmission lines are subject to various challenges that can impact system performance and safety:

- Insulator degradation: Caused by factors like pollution, aging, and environmental conditions, leading to flashovers and system outages.
- Conductor damage: Physical damage, corrosion, or overheating can compromise conductor integrity and result in power losses.
- Hardware failures: Issues with connectors, clamps, and tower components can disrupt power flow.
- Vegetation interference: Overgrown vegetation can cause arcing and short circuits.

These problems can lead to power outages, equipment damage, safety hazards, and reduced system efficiency.

Preventive Maintenance and Inspection

Regular inspection and maintenance of transmission lines are crucial to prevent issues and ensure optimal performance. Key inspection items include:

- Insulator condition: Checking for cracks, damage, and contamination.
- Conductor integrity: Assessing for wear, corrosion, or breaks.
- Hardware condition: Inspecting clamps, connectors, and tower components for tightness and damage.
- Vegetation control: Removing any vegetation that could interfere with the lines.

By addressing these areas, you can significantly enhance the reliability and lifespan of your transmission lines.

Transmission Line Detection

Discharge of Transmission Line Insulators

The UT568B is a Hand-held acoustic imager designed for gas leakage and partial discharge detection. It is extensively utilized in multiple industries. In the power sector, it enables remote, non-contact detection of partial discharge in electrical equipment.

Additionally, it finds applications in the gas, chemical, metallurgy, and manufacturing fields for visual gas leak detection, and intelligent calculation of leakage levels and losses.

By enhancing maintenance and repair efficiency, the UT568B significantly benefits the power and petrochemical industries.

Key features:

- Air leaks & partial discharge detection
- Auto calculate the leakage volume and resulting losses
- High quality image: 138-channel MEMS digital microphone;
- Wide imaging range: FOV $60^{\circ} \times 40^{\circ} (V)$;
- 13MP camera & 25FPS
- Frequency(imaging): 2kHz - 100kHz
- None-contact detection: 0.3m~150m distance



Electrical discharge occurs at the tip of insulator

Transmission Line Detection

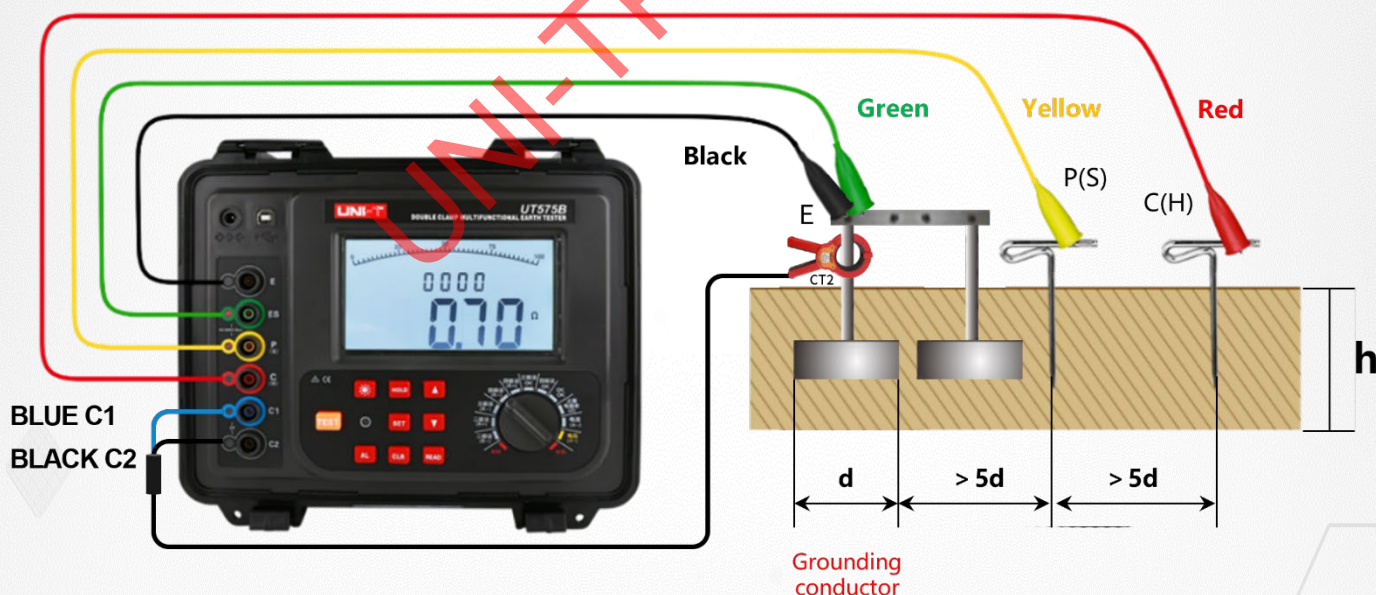
Grounding Resistance of the Transmission Line

Accurate grounding is essential for the safety and performance of Transmission Line. The [UT575B](#) Ground Resistance Tester offers advanced features to ensure precise and reliable measurements.

Key benefits:

- Versatile measurement capabilities: Determine grounding resistance in various configurations, including single-point and mesh grounding systems.
- Enhanced accuracy: Four-wire testing method minimizes the impact of contact resistance for precise results.
- User-friendly design: Plug indication prevents errors, and Bluetooth connectivity enables data transfer and analysis.
- Strong anti-interference ability: 128Hz/111Hz/105Hz/94Hz (Automatic frequency selection measurement)

By incorporating the UT575B into your maintenance routine, you can safeguard your transmission lines, prevent equipment damage, and minimize downtime.



Note: Perform grounding resistance tests in dry weather with a driven pile tester. Attach green/black wires to the transformer's ground, and yellow/red to stakes 5-10 meters apart. Press the meter's test button for direct readings.

Transmission Line Detection

Insulation resistance measurement

Insulation resistance testing is a critical component of transmission line maintenance. It helps identify potential insulation breakdown, preventing electrical hazards, equipment damage, and system outages.

By measuring the insulation resistance between conductors and between conductors and ground, technicians can assess the condition of insulators, cables, and other components.

The UT516B insulation resistance tester, with its high voltage output and advanced features, is well-suited for this task. With a 12kV output voltage and advanced features like automatic discharge, absorption ratio, and polarization index calculations, it provides comprehensive insulation assessment. Its user-friendly interface, featuring one-button operation and USB data transfer, streamlines testing and analysis. By regularly testing transmission line insulation, you can significantly improve system reliability and safety.





UNI-T®

UNI-TREND.VN

www.uni-trend.com

Solar Power Facility Solutions

©2024 Uni-T Corporation.

Specifications subject to change without notice.