

# Fluke Commissioning and Troubleshooting Tools for Solar Installers

**FLUKE®**



## Wire Installation

- Check the integrity of insulation after wire installation
- Identify ground faults and potential insulation damage
- Detect issues early to prevent larger problems

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PRODUCTS

Insulation resistance tester: 1507, 1537, 1587 FC  
Multifunction tester: SMFT-1000



## Ground Resistance

- Measure equipment grounding system resistance to ground
- Prevent safety hazards from ungrounded parts in case of a ground fault

FLUKE  
PRODUCTS

Earth ground clamp: 1630-2 FC  
Earth ground tester: 1625-2 GEO



## Voltage and Polarity

- Identify mis-wired strings
- Ensure proper landing of module home run

FLUKE  
PRODUCTS

Clamp meter: 393 FC  
Multifunction tester: SMFT-1000



## Performance

- Compare expected vs. actual power measurements
- Verify inverter efficiency
- Ensure proper system operation
- Establish baseline data for future testing

FLUKE  
PRODUCTS

Clamp meter: 393 FC  
Multifunction tester: SMFT-1000



## I-V Curve

- Identify module/string issues before operation
- Establish a historical record for future comparisons
- Detect issues not visible with Voc testing

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PRODUCTS

I-V curve tester: PVA-1500HE2, PVA-1500T2  
Multifunction tester with I-V curve: SMFT-1000



## Thermal Imaging

- Identify hotspots indicating faults or inefficiencies
- Detect potential issues early, such as microcracks or defective cells
- Ensure uniform module performance
- Prevent overheating hazards

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PRODUCTS

Thermal imager: PTi120, TiS55+, Ti480 PRO



## Earth-Bond Continuity

- Measure resistance/continuity between two points (e.g., module frame to ground rod)
- Ensure bonding of non-current carrying metal parts

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PRODUCTS

Insulation resistance tester: 1507, 1537, 1587 FC  
Multifunction tester: SMFT-1000



## Harmonics

- Troubleshoot and prevent issues in power generation, transmission, and distribution systems
- Conduct load studies to reduce energy usage

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PRODUCTS

Power quality and energy analyzer: 1770 Series



Fluke™ Solar Tools

## What Should Solar Installers be Measuring?

### Inverters and Transformers



#### Inverters and Transformers

- DC voltage and current
- AC voltage and current
- Fuse continuity
- Thermal imaging
- Torque terminals
- Inverter efficiency
- AC power quality: voltage, frequency, harmonics

#### Maintenance on Inverters and Transformers

- Ensures equipment is operating properly
- Upholds OEM warranty
- Prevents future failures
- Maximizes system production

**FLUKE  
PRODUCTS**

**Digital multimeters  
Clamp meters  
Multifunction testers  
Thermal imagers**

### Modules



**Visual inspection on an array is needed to look for any obvious damage or accidental disconnections, including:**

- Damaged modules
- Compromised insulation
- Loose or damaged connectors

#### Thermal imaging inspection:

- Aerial or handheld
- Modules/cells not operating will be hot
- High resistance connections will be hot
- Identify equipment for further testing

#### Voltage and current:

- Vmp testing can identify closed bypass diodes
- Imp testing can identify strings that aren't producing
- Test circuits for current before disconnecting module connectors or opening fuses

Note: Fluke tool must be CAT III, with a voltage rating greater than the array voltage.

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PRODUCTS**

**Thermal imagers  
Digital multimeters  
Clamp meters  
I-V curve tracers**

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