



Fox ESS Inverter Testing Procedure



1. Pre-Test Inspection

Step 1: Safety Check

Wear PPE: Insulated gloves, safety goggles.

Isolators OFF: Ensure both AC and DC isolators are OFF.

Step 2: Visual Inspection

Inspect the Inverter: Check for damage, loose wires, or corrosion.

Check Environment: Verify ventilation and clearance.

Secure Connections: Tighten any loose connections.

Photo Example:

Example: Visual inspection of inverter wiring and environment.

2. AC Voltage Testing

Preparation:

Set the Multimeter: Set the multimeter to AC voltage (~).

Step 3: AC Voltage Testing

Disconnect AC Cables: From the inverter's AC output terminals.

Measure Grid Voltage: Place multimeter probes on Line (L) and Neutral (N) terminals.

Record the voltage (should be ~230V or 110V).

Reconnect and Secure: Reconnect AC cables and ensure secure connections.

Photo Example:



3. DC Testing

Preparation:

Set the Multimeter: Use the DC voltage setting for measuring open circuit voltage (Voc) and the DC current setting for measuring short circuit current (Isc).

Measure Open Circuit Voltage (Voc):

Disconnect Strings: Ensure the DC isolator is OFF. Disconnect each PV string from the inverter one at a time.

String 1: Place the multimeter probes on the positive and negative terminals of String 1. Record the Voc. Repeat for each string (e.g., String 2, String 3).

String 2: Place the multimeter probes on the positive and negative terminals of String 2. Record the Voc.

String 3: Repeat the same for String 3, if applicable.

Measure Short Circuit Current (Isc):

String 1: Set the multimeter to the DC current setting. Disconnect String 1, then connect the multimeter in series with the positive and negative terminals. Measure and record the Isc.

String 2: Repeat the process for String 2, measuring and recording the Isc.

String 3: Repeat the same for String 3, if applicable.



Reconnect Strings:

Reconnect: After all measurements are taken, reconnect all strings to the inverter, ensuring correct polarity and secure connections.

Document Results:

Record the Voc and Isc values for each string in the installation report.

Photo Example:

Example: Multimeter connected to the terminals of multiple PV strings for measuring Voc and Isc.

String 1 Voc Measurement:



4. Insulation Resistance Testing (Optional)

Setup:

Prepare the Tester: Set the insulation resistance tester to 500V or 1000V DC, as recommended by the manufacturer.

Testing String 1:

Positive to Ground: Connect the tester's positive lead to the positive terminal of String 1 and the negative lead to the ground. Measure and record the insulation resistance.

Negative to Ground: Connect the tester's positive lead to the negative terminal of String 1 and the negative lead to the ground. Measure and record the insulation resistance.

Testing String 2:

Positive to Ground: Connect the tester's positive lead to the positive terminal of String 2 and the negative lead to the ground. Measure and record the insulation resistance.

Negative to Ground: Connect the tester's positive lead to the negative terminal of String 2 and the negative lead to the ground. Measure and record the insulation resistance.

Record Results:

Ensure all readings are within the acceptable range specified by the manufacturer and document them in the installation report.

Photo Example:

Example: Insulation tester connected between positive terminal and ground for each string.



Example: Insulation tester connected between negative terminal and ground for each string.





5. Communication and Monitoring Check

Verify Modules: Check the functionality of the data logger: if blinking slowly, it means it's connected to wifi. If blinking rapidly, wifi is not connected.

Photo Example:

Example: Checking communication module connections.



6. Battery Voltage Testing (If Applicable)

Preparation:

Set the Multimeter: Set the multimeter to DC voltage.

Measure Battery Voltage:

Connect probes to battery terminals and record voltage.

Photo Example:

Example: Multimeter probes connected to battery terminals for voltage measurement.



7. Final Connections and Documentation

Final Connection Check:

Ensure all connections (AC, DC, communication, and battery if applicable) are secure and properly installed.

Take Photos:

Overall Connection Layout: Photograph all connections, showing how the inverter is wired.

Inverter Front Panel: Take a clear photo of the front panel, showing the display and any indicators.

Chint Meter or CT Connections: If a Chint meter or current transformers (CTs) are connected, take detailed photos of these connections.

Final Documentation:

Include all photos and testing results in the testing report for future reference.



Fox ESS Inverter Testing Checklist

1. AC Voltage Testing

Grid Voltage: _____ V

Measure between Line (L) and Neutral (N) terminals, should be ~230V or 110V

Connections Secure: Yes No

2. DC Testing

Open Circuit Voltage (Voc)

String 1 Voc: _____ V

String 2 Voc: _____ V

String 3 Voc: _____ V (if applicable)

Short Circuit Current (Isc)

String 1 Isc: _____ A

String 2 Isc: _____ A

String 3 Isc: _____ A (if applicable)

Connections Secure: Yes No

3. Insulation Resistance Testing (Optional)

String 1

Positive to Ground: _____ MΩ

Negative to Ground: _____ MΩ

String 2

Positive to Ground: _____ MΩ

Negative to Ground: _____ MΩ



String 3 (if applicable)

Positive to Ground: _____ MΩ

Negative to Ground: _____ MΩ

Connections Secure: Yes No

4. Battery Voltage Testing (If Applicable)

Battery Voltage: _____ V

5. Photos Checklist

1. DC Testing: Photos of both strings during DC testing.
2. AC Testing: Photo of AC testing setup.
3. Resistance Testing: Photos of resistance testing on both positive and negative terminals.
4. Inverter SN Number: Photo of the inverter's serial number (located on the right-hand side).
5. Data Logger Connection: Photo of data logger connections.
6. Inverter Front Panel: Photo showing the front panel of the inverter, including display and indicators.
7. Chint Meter or CT Connection: Photos of Chint meter or CT connections (if applicable).
8. Battery Connection: Photos of battery connections (if applicable).
9. Overall Connection Layout: Photo showing the complete layout of all connections.

Installer/Technician Signature: _____

Date: _____