PV string test report (IEC 62446-1)

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Site / plant	Report number	Revision	Date of test

Inverter	Combiner box	Block / array	Tested by

Irradiance in plane (W/m²)	Module temperature (°C)	Ambient temperature (°C)	Sky conditions
850	*45*	*24*	*Clear, steady (example)*

INSTRUMENTS

Instrument	Make and model	Serial number	Calibration due	Certificate no.
PV tester (Voc and Isc)				
Insulation resistance tester				
Irradiance meter and probe				

MODULE DATA (FROM THE MODULE DATASHEET)

Module type	Voc at STC (V)	Isc at STC (A)	Temp. coefficient of Voc (%/°C)	Notes
Type A	*49.5*	*13.9*	*-0.26*	*Example: overwrite with your module data*

INSULATION TEST VOLTAGE AND MINIMUM RESISTANCE (IEC 62446-1)

System voltage: Voc at STC × 1.25 (V)	**1485**	Upper estimate: most modules in series × highest module Voc at STC × 1.25
Test voltage for this system voltage (V)	**1000**	Below 120 V: 250 V. 120 to 500 V: 500 V. Above 500 V: 1000 V
Minimum insulation resistance (MΩ)	**1.0**	Below 120 V: 0.5 MΩ. 120 V and above: 1 MΩ
Minimum used in this report (MΩ)		Blank: the value above is used. Enter a higher value if your specification sets one
Voc tolerance (± %)	5.0	Strings outside this deviation from the expected Voc are flagged

OTHER CATEGORY 1 CHECKS FOR THIS COMBINER BOX

No.	Check	Status	Remarks
1	Continuity of protective earthing and equipotential bonding		
2	Combiner box test: fuses, terminals, surge protection and labels		
3	DC isolators and switches operate; inverter functional test done		
4	Cables and connectors installed and labelled as the design		

Results

Strings: 2 Pass: 1 Fail: 1 Voc outside ±5 %: 0 IR below minimum: 1 Reversed polarity: 0

No.	String ID	Module type	Modules in series	Expected Voc (V)	Measured Voc (V)	Voc deviation	Expected Isc (A)	Measured Isc (A)	Isc deviation	Polarity	IR + to earth (MΩ)	IR − to earth (MΩ)	IR result	Result	Remarks
1	INV01-CB03-S01	Type A	24	1126.2	1131.0	0.4%	11.82	11.60	-1.9%	Correct	40.0	38.0	Pass	Pass	
2	INV01-CB03-S02	Type A	24	1126.2	1121.0	-0.5%	11.82	11.50	-2.7%	Correct	35.0	0.6	Fail	Fail	
3															
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16															
17															

No.	String ID	Module type	Modules in series	Expected Voc (V)	Measured Voc (V)	Voc deviation	Expected Isc (A)	Measured Isc (A)	Isc deviation	Polarity	IR + to earth (MΩ)	IR − to earth (MΩ)	IR result	Result	Remarks
18															
19															
20															
21															
22															
23															
24															

Expected Voc = modules in series × Voc at STC × (1 + coefficient / 100 × (module temperature − 25 °C)). Cell temperature runs a little above the back-of-module reading. One missing or bypassed module lowers Voc by 1/n (about 4 % in a 24-module string), inside a 5 % tolerance: compare each string with its neighbours as well. Expected Isc = Isc at STC × irradiance / 1000, meaningful only under steady, clear-sky irradiance; a string well below its neighbours points to shading, damage or a poor connection. Test insulation with the array isolated, and never disconnect a DC connector under load.

Sign-off	Name	Signature	Date
Tested by			
Witnessed by			