Industrie Service
Energie und Umwelt

TÜVRheinland®
Precisely Right.

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Köln, 04.02.2011

Declaration
- 21215510 -

Manufacturer:	TRITEC Logistics GmbH Boschstraße 2 - 4 71287 Weissach Germany
Product:	IV-curve tracer for poly and mono crystalline PV modules **Type:** „TRI-KA Kennlinienmessgerät“

Basis of testing:

EN IEC 61215:2005 „Crystalline silicon terrestrial photovoltaic (PV) modules – Design qualification and type approval" - 10.6.3.1 Performance at STC (Standard test conditions: 25°C / 1000 W/m² / AM 1.5).

Test requirements:

Steady state solar simulator, classification: BBB

Test item:

Comparative IV-curve measurement between the product „TRI-KA Kennlinienmessgerät“ and the TÜV Rheinland measurement engineering (measurement uncertainty P_{mpp}: ± 3.5 %)

Measured PV modules (3 different PV module manufacturers):

Module 1:	Solar module 6“ poly cell, 54 cells, P_{mpp}: 205Wp, U_{oc}: 33,2V, I_{sc}: 8,36A
Module 2:	Solar module 6“ poly cell, 60 cells, P_{mpp}: 230Wp, U_{oc}: 36,9V, I_{sc}: 8,33A
Module 3:	Solar module 6“ poly cell, 60 cells, P_{mpp}: 225Wp, U_{oc}: 36,8V, I_{sc}: 8,17A

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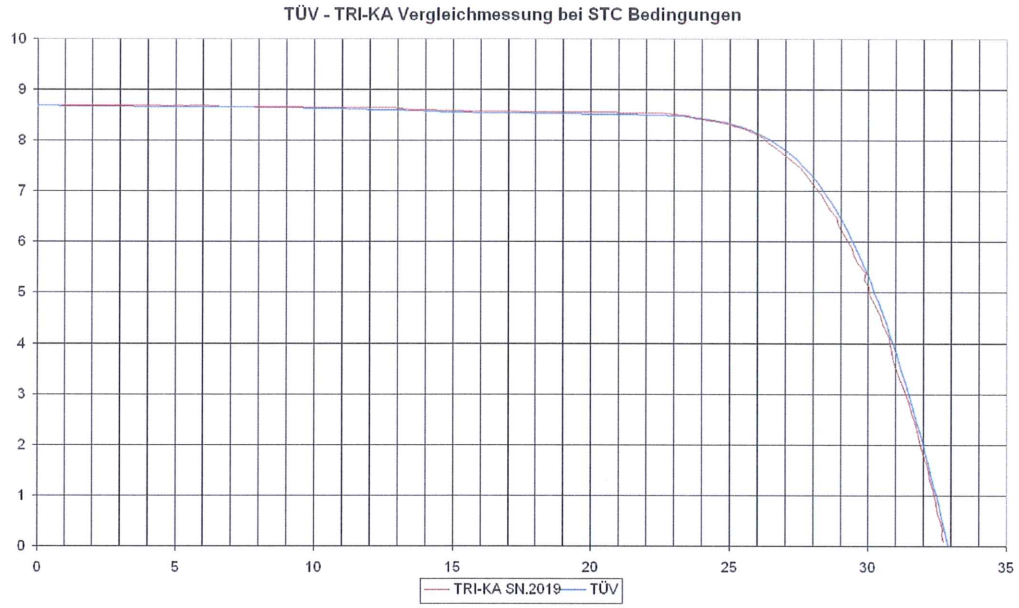
Geschäftsführung
Eckhard Lippold

Amtsgericht Köln HRB 56171

Test results:

The three PV modules were measured acc. to IEC 61215 clause 10.6.3.1 with TÜV Rheinland measurement equipment in comparison with the "TRI-KA Kennlinienmess-gerät".



Without correction to STC conditions

	module 1			module 2			module 3		
	TRI-KA	TÜV	deviance	TRI-KA	TÜV	deviance	TRI-KA	TÜV	deviance
Uoc [V]	32.63	32.87	-0.74 %	36.7	36.71	-0.03 %	36.89	37.102	-0.57
Isc [A]	8.65	8.69	-0.44 %	8.545	8.48	0.80 %	8.449	8.423	0.31
Umpp [V]	26.11	26.49	-1.45 %	29.09	29.50	-1.38 %	29.13	29.77	-2.16
Impp [A]	7.97	7.99	-0.28 %	7.928	7.83	1.29 %	8.025	7.91	1.44
Pmpp [W]	208.10	211.76	-1.73 %	230.63	230.87	-0.11 %	233.77	235.54	-0.75

With correction to STC conditions

	module 1			module 2			module 3		
	TRI-KA	TÜV	deviance	TRI-KA	TÜV	deviance	TRI-KA	TÜV	deviance
Uoc [V]	32.63	32.87	-0.74 %	36.98	36.71	0.73 %	37.23	37.102	0.34 %
Isc [A]	8.65	8.69	-0.44 %	8.63	8.48	1.80 %	8.49	8.423	0.80 %
Umpp [V]	26.11	26.49	-1.45 %	29.38	29.50	-0.39 %	29.47	29.77	-1.02 %
Impp [A]	7.97	7.99	-0.28 %	8	7.83	2.21 %	8.06	7.91	1.89 %
Pmpp [W]	208.10	211.76	-1.73 %	235.04	230.87	1.80 %	237.53	235.54	0.84 %

TRI-SEN – measured irradiance and module temperature

	module 1	module 2	module 3
Irradiance [W/m²]	1000	990	996
Temperature [°C]	25.0	26.8	27.2

The product was measured voluntarily for the manufacturer according to the valid technical standards. The results are valid in combination with the tested modules only. This declaration will lose its validity with any change in design, material, components or manufacturing process of the "TRI-KA Kennlinienmessgerät".

TÜV Rheinland Energie und Umwelt GmbH

Renewable Energies

i. V. i. A.

Dipl.-Ing. J. Althaus Dipl.-Ing. L. Jakisch