

Auszug aus dem Prüfbericht zum Einheitszertifikat: 28111587 018

(Verbindung mit Prüfbericht N. 28111587 029)

“Bestimmung der elektrischen Eigenschaften”

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 Auszug Nr.: 1 _ **Annex F.3** (VDE-AR-N 4105)

Anlagentyp:	Netzgekoppelte Photovoltaik Wechselrichter						
Hersteller:	Power-One Italy S.p.A. Via S. Giorgio 642, 52028 Terranuova Bracciolini (AR) - Italy						
Referenzreport:	28111587 029						
Messzeitraum:	Vom 25. Juni 2018 bis 10. Oktober 2018						
Wirkleistung [$P_{E_{max}}$]: (Nominale Leistung unter Referenzkonditionen)	<table border="1"> <thead> <tr> <th>Models</th> <th>$P_{E_{max}}$</th> </tr> </thead> <tbody> <tr> <td>REACT2-UNO-5.0-TL</td> <td>4.6KW</td> </tr> <tr> <td>REACT2-UNO-3.6-TL</td> <td>3.6KW</td> </tr> </tbody> </table>	Models	$P_{E_{max}}$	REACT2-UNO-5.0-TL	4.6KW	REACT2-UNO-3.6-TL	3.6KW
Models	$P_{E_{max}}$						
REACT2-UNO-5.0-TL	4.6KW						
REACT2-UNO-3.6-TL	3.6KW						
Nominale Ausgangsspannung:	230 V (Phase/ Neutral)						
Note : Aktualisieren Hinweis **: Test nach Modell REACT2-UNO-5.0-TL durchgeführt. Das Testergebnis kann auf alle Modelle von der gleichen Produktfamilie erweitert werden. Die Familie Produkt-Modell wird durch die folgenden Produkte hergestellt: <i>REACT2-UNO-5.0-TL, REACT2-UNO-3.6-TL</i>							

Blindleistungsbezug										
Wirkleistung P/S_n [%]	10	20	30	40	50	60	70	80	90	100
Max. $\cos \varphi$ untererregt	0.895	0.897	0.898	0.898	0.898	0.898	0.899	0.899	0.900	0.899
Max. $\cos \varphi$ übererregt	0.895	0.897	0.898	0.898	0.898	0.898	0.898	0.898	0.897	0.897

Einhaltung eines fest vorgegebenen Verschiebungsfaktors $\cos \varphi$											
Vorgabewert	0,900 _{OV}	0,920 _{OV}	0,940 _{OV}	0,960 _{OV}	0,980 _{OV}	1	0,980 _{UN}	0,960 _{UN}	0,940 _{UN}	0,920 _{UN}	0,900
Messwert an den Klemmen	0,9020	0,9217	0,9407	0,9600	0,9792	1,0000	0,9800	0,9600	0,9400	0,9199	0,9002

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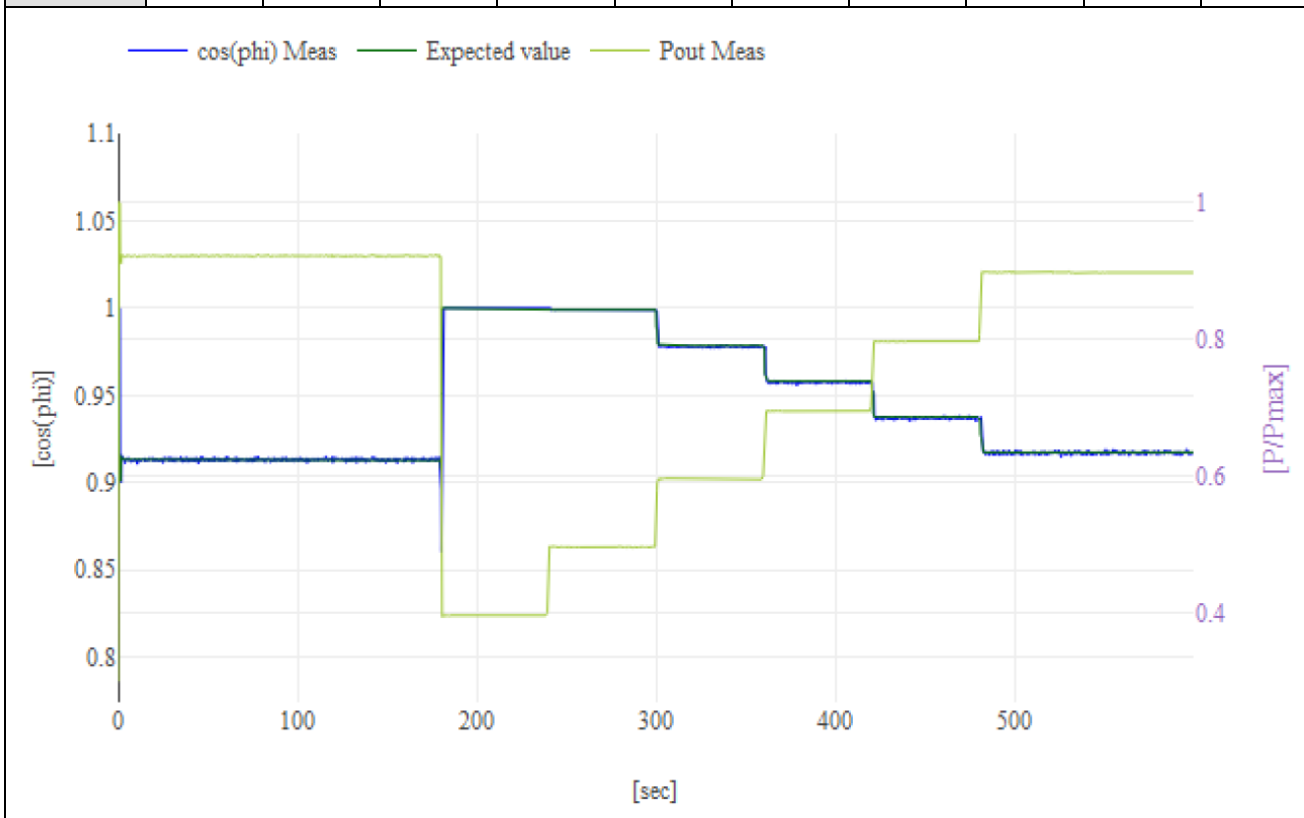
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Blindleistungsübergangsfunktion – Standard $\cos \varphi$ (P) - Kurve

Wirkleistung P/S _n [%]	10	20	30	40	50	60	70	80	90	100
$\cos \varphi$	-	1.000	1.000	1.000	0.998	0.977	0.957	0.936	0.916	-



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Schalthandlungen				
Einschalten ohne Vorgabe	k _i : -			
Ungünstigster Fall beim Umschalten der Generatorstufen	k _i : 1,004			
Einschalten bei Nennbedingungen	k _i : 1,013			
Schaltvorgang bei Nennleistung	k _i : 0,999			
Schlechtester Wert aller Schaltvorgänge	k _{i max} : 1,013			
Flickers:				
Netzimpedanzwinkel Ψ_k <i>Im schlechtesten Fall</i>	30°	50°	70°	85°
Coefficient of system flicker c_Ψ	1,74	-	-	-

Table: Harmonics according to IEC61000-4-30										
	10%P/Pn	20%P/Pn	30%P/Pn	40%P/Pn	50%P/Pn	60%P/Pn	70%P/Pn	80%P/Pn	90%P/Pn	Full Power
	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]
1	1.768	3.912	6.067	8.185	10.330	12.456	14.584	16.672	19.856	21.842
2	0.030	0.031	0.031	0.031	0.066	0.034	0.036	0.035	0.037	0.038
3	0.023	0.032	0.038	0.042	0.054	0.049	0.052	0.055	0.054	0.054
4	0.012	0.012	0.012	0.013	0.015	0.013	0.015	0.014	0.014	0.014
5	0.014	0.016	0.019	0.017	0.018	0.013	0.012	0.009	0.011	0.011
6	0.006	0.006	0.006	0.006	0.009	0.006	0.006	0.006	0.006	0.006
7	0.011	0.007	0.011	0.013	0.014	0.011	0.009	0.008	0.007	0.007
8	0.005	0.005	0.005	0.005	0.007	0.005	0.005	0.005	0.005	0.005
9	0.012	0.014	0.015	0.018	0.019	0.019	0.017	0.015	0.010	0.010
10	0.007	0.007	0.007	0.007	0.008	0.007	0.007	0.007	0.006	0.006
11	0.005	0.006	0.005	0.008	0.010	0.010	0.008	0.007	0.007	0.007
12	0.004	0.004	0.004	0.004	0.005	0.004	0.005	0.005	0.005	0.005
13	0.014	0.014	0.014	0.014	0.015	0.015	0.014	0.013	0.011	0.011
14	0.005	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005
15	0.006	0.003	0.003	0.004	0.006	0.006	0.006	0.006	0.010	0.010
16	0.003	0.003	0.003	0.003	0.004	0.003	0.004	0.004	0.004	0.004
17	0.010	0.005	0.005	0.003	0.005	0.005	0.005	0.004	0.006	0.006
18	0.003	0.003	0.003	0.003	0.004	0.003	0.003	0.004	0.004	0.004
19	0.009	0.004	0.003	0.004	0.005	0.004	0.005	0.005	0.010	0.010
20	0.003	0.003	0.003	0.003	0.004	0.003	0.004	0.004	0.005	0.004
21	0.009	0.004	0.004	0.004	0.005	0.005	0.005	0.006	0.009	0.009
22	0.004	0.004	0.003	0.004	0.004	0.004	0.005	0.005	0.006	0.006
23	0.010	0.007	0.005	0.006	0.009	0.009	0.011	0.012	0.018	0.018
24	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.006	0.009	0.009
25	0.026	0.023	0.019	0.016	0.016	0.016	0.014	0.013	0.014	0.014
26	0.009	0.007	0.008	0.009	0.009	0.009	0.011	0.012	0.018	0.017
27	0.035	0.033	0.035	0.043	0.048	0.048	0.059	0.064	0.099	0.099
28	0.012	0.011	0.011	0.011	0.016	0.013	0.017	0.015	0.029	0.028
29	0.035	0.035	0.032	0.039	0.048	0.045	0.057	0.059	0.096	0.097
30	0.009	0.007	0.009	0.011	0.011	0.012	0.015	0.017	0.027	0.027
31	0.025	0.023	0.022	0.020	0.018	0.019	0.017	0.018	0.018	0.018
32	0.007	0.006	0.006	0.006	0.006	0.008	0.007	0.008	0.010	0.009
33	0.006	0.005	0.005	0.006	0.009	0.009	0.011	0.011	0.015	0.016
34	0.003	0.003	0.004	0.006	0.005	0.007	0.006	0.007	0.007	0.007
35	0.008	0.008	0.007	0.006	0.008	0.006	0.008	0.007	0.009	0.009
36	0.003	0.003	0.004	0.007	0.004	0.006	0.005	0.006	0.005	0.005
37	0.007	0.007	0.006	0.005	0.007	0.004	0.004	0.004	0.005	0.005
38	0.002	0.002	0.003	0.006	0.003	0.003	0.003	0.004	0.004	0.004
39	0.007	0.007	0.006	0.004	0.004	0.003	0.004	0.004	0.006	0.005
40	0.003	0.003	0.003	0.004	0.004	0.003	0.004	0.004	0.004	0.004
41	0.004	0.004	0.004	0.004	0.004	0.003	0.004	0.004	0.005	0.005
42	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004
43	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.006	0.006
44	0.005	0.005	0.006	0.005	0.006	0.006	0.006	0.006	0.006	0.006
45	0.004	0.004	0.003	0.003	0.004	0.003	0.004	0.004	0.005	0.005
46	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.005	0.005	0.005
47	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.005	0.005
48	0.004	0.005	0.004	0.005	0.005	0.005	0.005	0.005	0.005	0.005

Auszug Nr.: 1 _ Annex F.3 (VDE-AR-N 4105)

Table: Harmonics according to IEC61000-4-30

	10%P/Pn	20%P/Pn	30%P/Pn	40%P/Pn	50%P/Pn	60%P/Pn	70%P/Pn	80%P/Pn	90%P/Pn	Full Power
	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]
49	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.006
50	0.004	0.004	0.004	0.005	0.005	0.005	0.005	0.005	0.005	0.005
THD	0.392%	0.391%	0.398%	0.438%	0.568%	0.481%	0.540%	0.560%	0.769%	0.771%

Table: Inter-Harmonics according to IEC61000-4-30

	10%P/Pn	20%P/Pn	30%P/Pn	40%P/Pn	50%P/Pn	60%P/Pn	70%P/Pn	80%P/Pn	90%P/Pn	Full Power
	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]
1,5	0.0047696	0.005597	0.006361	0.008864	0.087516	0.013934	0.022456	0.011908	0.310078	0.277578
2,5	0.002798035	0.002862	0.002769	0.003138	0.016738	0.00408	0.00609	0.004009	0.087696	0.084515
3,5	0.01885762	0.019038	0.019488	0.019311	0.023549	0.018394	0.018103	0.018225	0.057991	0.05588
4,5	0.0023203	0.002377	0.00227	0.002427	0.005559	0.002941	0.003029	0.003139	0.041005	0.039791
5,5	0.002032525	0.001973	0.002069	0.002304	0.003549	0.002819	0.003387	0.003424	0.033084	0.032007
6,5	0.001896899	0.001846	0.001872	0.002005	0.002491	0.00208	0.002332	0.002348	0.027437	0.02663
7,5	0.001868056	0.001778	0.001868	0.002044	0.002631	0.002303	0.002635	0.002787	0.02375	0.023022
8,5	0.001786912	0.001724	0.001749	0.00186	0.002413	0.001974	0.002302	0.00227	0.02079	0.020151
9,5	0.01164531	0.011691	0.011741	0.011576	0.011471	0.011122	0.010785	0.010551	0.020635	0.02012
10,5	0.001731362	0.001638	0.001664	0.001796	0.002085	0.001906	0.002192	0.002255	0.016864	0.01636
11,5	0.00179991	0.001733	0.001832	0.002087	0.002455	0.002454	0.002775	0.002854	0.015641	0.015123
12,5	0.0018772	0.001802	0.001845	0.001932	0.002077	0.001988	0.002162	0.002195	0.014274	0.013837
13,5	0.01240791	0.01235	0.01233	0.012232	0.012129	0.01183	0.01174	0.011475	0.016022	0.01546
14,5	0.001772105	0.001578	0.001673	0.001698	0.001875	0.001818	0.002023	0.002086	0.012365	0.011916
15,5	0.001710002	0.001557	0.001671	0.001839	0.002047	0.002188	0.002481	0.00255	0.011788	0.011391
16,5	0.001675568	0.001451	0.001522	0.00164	0.001778	0.001745	0.001968	0.001968	0.010959	0.010612
17,5	0.001900202	0.001628	0.001728	0.001772	0.001904	0.001877	0.002047	0.002085	0.010431	0.010074
18,5	0.001684994	0.001469	0.001545	0.001636	0.001757	0.001712	0.001899	0.001983	0.009902	0.009525
19,5	0.001552074	0.001813	0.001995	0.002044	0.00204	0.001835	0.002047	0.002076	0.009486	0.009149
20,5	0.001477976	0.001788	0.001537	0.001638	0.001814	0.001718	0.001984	0.002079	0.009124	0.008793
21,5	0.001544733	0.002211	0.002757	0.003434	0.003804	0.003737	0.00393	0.004189	0.009402	0.009068
22,5	0.00151421	0.001923	0.001582	0.001671	0.001908	0.001793	0.002101	0.002319	0.008623	0.008271
23,5	0.003529882	0.002625	0.001917	0.003608	0.005402	0.006416	0.007649	0.008449	0.013337	0.012856
24,5	0.002324876	0.002493	0.002242	0.002108	0.002148	0.002304	0.002553	0.002594	0.008275	0.007988
25,5	0.02256204	0.020385	0.017833	0.01507	0.013632	0.013042	0.010925	0.011634	0.010409	0.009971
26,5	0.003117697	0.003292	0.002987	0.0035	0.004362	0.003755	0.004761	0.005524	0.011833	0.011668
27,5	0.03139297	0.03139	0.032025	0.037631	0.045314	0.043234	0.051251	0.054183	0.076225	0.073249
28,5	0.003511187	0.003506	0.003906	0.004349	0.004259	0.004987	0.006387	0.005758	0.012901	0.01273
29,5	0.03108657	0.029691	0.029279	0.035091	0.043273	0.041017	0.049312	0.053255	0.075505	0.07264
30,5	0.002650756	0.002653	0.002884	0.002735	0.003473	0.002597	0.003283	0.003752	0.008882	0.008494
31,5	0.02249658	0.021191	0.019384	0.016993	0.015488	0.015584	0.01346	0.013434	0.01028	0.009372
32,5	0.001808117	0.001843	0.002364	0.002538	0.003992	0.002201	0.00242	0.002456	0.006863	0.006531
33,5	0.003548396	0.002521	0.002211	0.004022	0.005181	0.007619	0.009134	0.009926	0.012212	0.011664
34,5	0.001662107	0.00172	0.004893	0.003921	0.004179	0.001869	0.002007	0.002194	0.00636	0.006015
35,5	0.001563867	0.001951	0.002593	0.004058	0.003853	0.005583	0.006232	0.006115	0.007007	0.006563
36,5	0.001660786	0.001781	0.005147	0.004171	0.004026	0.001785	0.001915	0.002048	0.006025	0.005698
37,5	0.001697029	0.001903	0.002076	0.003253	0.002526	0.002307	0.002604	0.002741	0.006013	0.005669

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Table: Inter-Harmonics according to IEC61000-4-30

	10%P/Pn	20%P/Pn	30%P/Pn	40%P/Pn	50%P/Pn	60%P/Pn	70%P/Pn	80%P/Pn	90%P/Pn	Full Power
	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]
38,5	0.001576973	0.001713	0.004781	0.003952	0.002002	0.001611	0.001849	0.00192	0.005816	0.005524
39,5	0.00170439	0.001829	0.001789	0.002027	0.001982	0.002024	0.002292	0.002404	0.005802	0.005472
40,5	0.001508436	0.00152	0.002168	0.002052	0.001972	0.001677	0.00193	0.002025	0.00569	0.005363
41,5	0.001635351	0.001615	0.001706	0.001925	0.002081	0.002087	0.002441	0.002431	0.005704	0.005371
42,5	0.001667171	0.001654	0.001879	0.002012	0.002288	0.001812	0.002139	0.002215	0.005598	0.00526
43,5	0.002244037	0.002139	0.002161	0.002406	0.002606	0.002278	0.002663	0.002557	0.005791	0.005461
44,5	0.002278323	0.002449	0.002586	0.002573	0.002683	0.00246	0.002695	0.002686	0.00571	0.005382
45,5	0.001870026	0.002119	0.002066	0.00214	0.002513	0.002296	0.002575	0.002498	0.005658	0.005331
46,5	0.002128238	0.002196	0.002297	0.002342	0.002549	0.002274	0.002602	0.002681	0.00566	0.005331
47,5	0.002018156	0.002083	0.00204	0.00237	0.00243	0.002206	0.002582	0.0026	0.005651	0.005289
48,5	0.002513842	0.002547	0.002653	0.002763	0.002753	0.002598	0.002825	0.002648	0.005696	0.005387
49,5	0.002312277	0.002412	0.002377	0.002593	0.002741	0.002654	0.002787	0.002764	0.005715	0.005346

Table: High Frequency Harmonics										
	10%P/Pn	20%P/Pn	30%P/Pn	40%P/Pn	50%P/Pn	60%P/Pn	70%P/Pn	80%P/Pn	90%P/Pn	Full Power
	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]
42	0.002896	0.002607	0.002685	0.003023	0.003127	0.002964	0.003183	0.003293	0.003618	0.003472
46	0.003698	0.003749	0.003839	0.003568	0.003938	0.003788	0.004053	0.004279	0.004251	0.004192
50	0.003723	0.003894	0.003916	0.004291	0.004234	0.004297	0.004627	0.004694	0.004641	0.004527
54	0.004112	0.004427	0.004253	0.004699	0.00448	0.004679	0.004734	0.004576	0.005425	0.005149
58	0.003589	0.003561	0.003469	0.00416	0.00368	0.003739	0.004278	0.003753	0.006045	0.006938
62	0.002969	0.002951	0.002981	0.003143	0.002925	0.002994	0.003239	0.003129	0.003058	0.003006
66	0.002179	0.002336	0.002258	0.002345	0.002382	0.002776	0.003799	0.002778	0.002459	0.002412
70	0.001835	0.001907	0.001901	0.002416	0.004726	0.002457	0.002275	0.002119	0.002242	0.002215
74	0.006928	0.006935	0.003934	0.002591	0.001782	0.001948	0.002318	0.001978	0.002112	0.002047
78	0.002363	0.002533	0.0024	0.002654	0.00271	0.002842	0.002896	0.002942	0.002675	0.002624
82	0.003719	0.003978	0.003767	0.004245	0.004058	0.004273	0.00446	0.00411	0.004092	0.004087
86	0.004982	0.004856	0.003905	0.004595	0.003509	0.006289	0.00469	0.003198	0.003803	0.004185
90	0.021258	0.019149	0.015445	0.007095	0.004108	0.015456	0.006254	0.002437	0.00245	0.002529
94	0.006032	0.005872	0.005215	0.005732	0.004115	0.006323	0.003145	0.001433	0.001775	0.001877
98	0.002868	0.002792	0.002295	0.003448	0.003351	0.002641	0.002206	0.001566	0.001882	0.002014
102	0.00222	0.002149	0.001941	0.002249	0.002386	0.002588	0.002217	0.001992	0.002051	0.002146
106	0.002026	0.00193	0.001697	0.001795	0.001893	0.001605	0.001563	0.00145	0.002225	0.002243
110	0.002243	0.002137	0.002982	0.00197	0.001826	0.001784	0.00161	0.001651	0.002324	0.002273
114	0.001844	0.001805	0.001744	0.001794	0.001768	0.001679	0.001632	0.001675	0.002642	0.002561
118	0.001427	0.001468	0.001416	0.001472	0.001423	0.001291	0.001253	0.001295	0.00217	0.001974
122	0.001193	0.001219	0.001207	0.001282	0.001241	0.001219	0.001264	0.001401	0.001632	0.001612
126	0.001098	0.001162	0.001183	0.001219	0.00114	0.001159	0.001246	0.001287	0.001602	0.001558
130	0.000989	0.001	0.001017	0.001124	0.001088	0.001116	0.001228	0.001273	0.001578	0.001539
134	0.00093	0.000947	0.000951	0.001088	0.001048	0.001412	0.001394	0.001608	0.001493	0.001473
138	0.000907	0.000916	0.000897	0.001091	0.001319	0.001058	0.001153	0.001199	0.001727	0.001692
142	0.000925	0.000945	0.00093	0.001176	0.001131	0.001118	0.00131	0.0014	0.001979	0.001981
146	0.00098	0.000963	0.001169	0.001234	0.001123	0.001152	0.001278	0.001369	0.001725	0.001715
150	0.001359	0.001791	0.001621	0.002154	0.001671	0.00131	0.001477	0.001356	0.00177	0.001789
154	0.001773	0.002093	0.002035	0.00228	0.002194	0.002042	0.002232	0.001985	0.002073	0.002112
158	0.001225	0.001286	0.00124	0.001323	0.001265	0.001341	0.001605	0.001489	0.001692	0.001775
162	0.000921	0.00102	0.000992	0.001066	0.001116	0.001238	0.001643	0.001284	0.001529	0.001577
166	0.00098	0.001091	0.00106	0.001077	0.00109	0.001211	0.001697	0.001676	0.001787	0.001805
170	0.000985	0.001117	0.00112	0.001128	0.001142	0.001276	0.001698	0.001933	0.002205	0.002209
174	0.002123	0.001679	0.001596	0.001659	0.001472	0.001742	0.001828	0.002114	0.002529	0.002515
178	0.003792	0.003165	0.002547	0.003387	0.002846	0.004072	0.003714	0.002952	0.007724	0.008574

Auszug aus dem Prüfbericht zum Einheitszertifikat: 28111587 018

(Verbindung mit Prüfbericht N. 28111587 029)

“Bestimmung der elektrischen Eigenschaften”

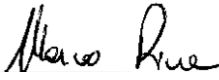
Auszug Nr.: 1 _ **Annex F.3** (VDE-AR-N 4105)

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Dieser Auszug aus dem Testreport ist nur gültig im Zusammenhang mit dem Testreport no.: **28111587 029**

Reviewed by:

12/10/2018	Marco Piva	
Datum	Name/Stellung	Unterschrift
<i>Date</i>	<i>Name/Position</i>	<i>Signature</i>

Ende der Auszug