

Prüfbericht-Nr.: <i>Test Report No.:</i>	CN224DKW 001	Auftrags-Nr.: <i>Order No.:</i>	168385936	Seite 1 von 9 <i>Page 1 of 9</i>
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	1282992	Auftragsdatum: <i>Order date:</i>	2022.08.10	
Auftraggeber: <i>Client:</i>	HUAWEI TECHNOLOGIES CO., LTD. Administration Building, Headquarters of Huawei Technologies Co., Ltd. Bantian, Longgang District, Shenzhen, 518129 Guangdong, P.R. China			
Prüfgegenstand: <i>Test item:</i>	SOLAR INVERTER			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	SUN2000-100KTL-M2, SUN2000-115KTL-M2			
Auftrags-Inhalt: <i>Order content:</i>	A3 certificate			
Prüfgrundlage: <i>Test specification:</i>	VDE-AR-N 4105/11.18 <i>Generators connected to the low-voltage distribution network – Technical requirements for the connection to and parallel operation with low-voltage distribution networks</i> DIN VDE V 0124-100/06.20 <i>Grid integration of generator plants – Low-voltage – Test requirements for generator units to be connected to and operated in parallel with low-voltage distribution networks</i>			
Wareneingangsdatum: <i>Date of receipt:</i>	2022.08.10			
Prüfmuster-Nr.: <i>Test sample No.:</i>	Engineering samples			
Prüfzeitraum: <i>Testing period:</i>	2022.08.10 – 2022.10.19			
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland (Shanghai) Co., Ltd.			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shanghai) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
erstellt von: / created by:		genehmigt von: / authorized by:		
2022.11.01 Edward Li / PE <i>Datum Name / Stellung Unterschrift</i> <i>Date Name / Position Signature</i>		2022.11.01 Zhiwei Yan / Reviewer <i>Datum Name / Stellung Unterschrift</i> <i>Date Name / Position Signature</i>		
Sonstiges / Other: Test procedure complied with DIN VDE V 0124-100/06.20, see report CN224DKW 001 attachment 1 for detail.				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet * Legend: P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested				
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

Prüfbericht-Nr.: CN224DKW 001
Test Report No.:

Seite 2 von 9
 Page 2 of 9

Liste der verwendeten Prüfmittel
List of used test equipment

Equip.	Description	Model	Manufacturer
9017073	Power Analyser(DEWETRON)	DEWE2-PA7	Austria, DEWETRON
9017074	Current Sensor(For WT3000)	IT 200-S	LEM
9017075	Current Sensor(For WT3000)	IT 200-S	LEM
9017076	Current Sensor(For WT3000)	IT 200-S	LEM
9017077	Current Sensor(For WT3000)	IT 200-S	LEM
9017078	Programmable AC Source(61860)	61860	Chroma ATE INC.
9017080	Oscilloscope	MDO3024	Tektronix
G1819265	ScopeCoder	DL850	JAPAN, Yokogawa
G1819266	Power Analyser(WT3000)	WT3000	JAPAN, Yokogawa
G1819267	T-Power Software	TP100-P-LVHA/STP	JAPAN, Yokogawa
G1819268	Anti-islanding test detection devices	ACLT-4830H	QUNLING Energy Resources
G1819269	Harmonic impedance analog flicker system	ACLT-6150	QUNLING Energy Resources
G1819277	PV array simulator	62150H-1000S	Chroma Co.
G1819278	PV array simulator	62150H-1000S	Chroma Co.
G1819279	PV array simulator	62150H-1000S	Chroma Co.
G1819280	PV array simulator	62150H-1000S	Chroma Co.

Prüfbericht-Nr.: CN224DKW 001
Test Report No.:

Seite 3 von 9
Page 3 of 9

Produktbeschreibung Product description

1 Produktdetails Product details

See below.

Copy of marking plate:



型号 Model: SUN2000-100KTL-M2
名称 Name: 太阳能光伏逆变器
SOLAR INVERTER

最大输入电压 d.c.Max.Input Voltage: 1100 Vd.c.
最大输入电流 d.c.Max.Input Current: 10x30 A
输入短路电流 Isc: 10x40 A
MPPT电压范围 d.c. MPPT Range: 200 ~ 1000 Vd.c.
输出电压 a.c. Output Nominal Voltage: 380/400 Va.c., 3(N)~ +⊕
480 Va.c., 3~ +⊕
输出频率 a.c. Nominal Operating Frequency: 50/60 Hz
额定输出功率 a.c. Output Rated Power: 100 kW
最大视在功率 a.c. Max.Output Apparent Power: 110 kVA
最大输出电流 a.c. Max.Output Current: 168.8 A; 380 Va.c.
160.4 A; 400 Va.c.
133.7 A; 480 Va.c.
功率因数 Power Factor: 0.8(lagging) ~ 0.8(leading)
温度范围 Operating Temperature Range: - 25 ~ + 60 °C
逆变器拓扑 Inverter Topology: Non - Isolation
防护等级 Enclosure: IP66
保护等级 Protection Class: I
过电压类别 Overvoltage Category: II(DC)/III(AC)
污染等级 Pollution Degree: III
海拔 Altitude: 4000 m
通讯方式 Communication: RS485
电弧故障保护 AFCI: TYPE I



华为技术有限公司 HUAWEI TECHNOLOGIES CO., LTD. 中国制造 MADE IN CHINA
HQ of Huawei, Bantian, Longgang District, Shenzhen, 518129, P.R.C



型号 Model: SUN2000-115KTL-M2
名称 Name: 太阳能光伏逆变器
SOLAR INVERTER

最大输入电压 d.c.Max.Input Voltage: 1100 Vd.c.
最大输入电流 d.c.Max.Input Current: 10x30 A
输入短路电流 Isc: 10x40 A
MPPT电压范围 d.c. MPPT Range: 200 ~ 1000 Vd.c.
输出电压 a.c. Output Nominal Voltage: 400 Va.c., 3(N)~ +⊕
480 Va.c., 3~ +⊕
输出频率 a.c. Nominal Operating Frequency: 50/60 Hz
额定输出功率 a.c. Output Rated Power: 115 kW
最大视在功率 a.c. Max.Output Apparent Power: 125 kVA
最大输出电流 a.c. Max.Output Current: 182.3 A; 400 Va.c.
151.9 A; 480 Va.c.
功率因数 Power Factor: 0.8(lagging) ~ 0.8(leading)
温度范围 Operating Temperature Range: - 25 ~ + 60 °C
逆变器拓扑 Inverter Topology: Non - Isolation
防护等级 Enclosure: IP66
保护等级 Protection Class: I
过电压类别 Overvoltage Category: II(DC)/III(AC)
污染等级 Pollution Degree: III
海拔 Altitude: 4000 m
通讯方式 Communication: RS485



华为技术有限公司 HUAWEI TECHNOLOGIES CO., LTD. 中国制造 MADE IN CHINA
HQ of Huawei, Bantian, Longgang District, Shenzhen, 518129, P.R.C

Prüfbericht-Nr.: CN224DKW 001
Test Report No.:

Seite 4 von 9
Page 4 of 9

Produktbeschreibung Product description

Product description:

The equipment with model name SUN2000-100KTL-M2 and SUN2000-115KTL-M2 are three phase non-isolated type Solar Inverter which will be installed and connected to the grid network.

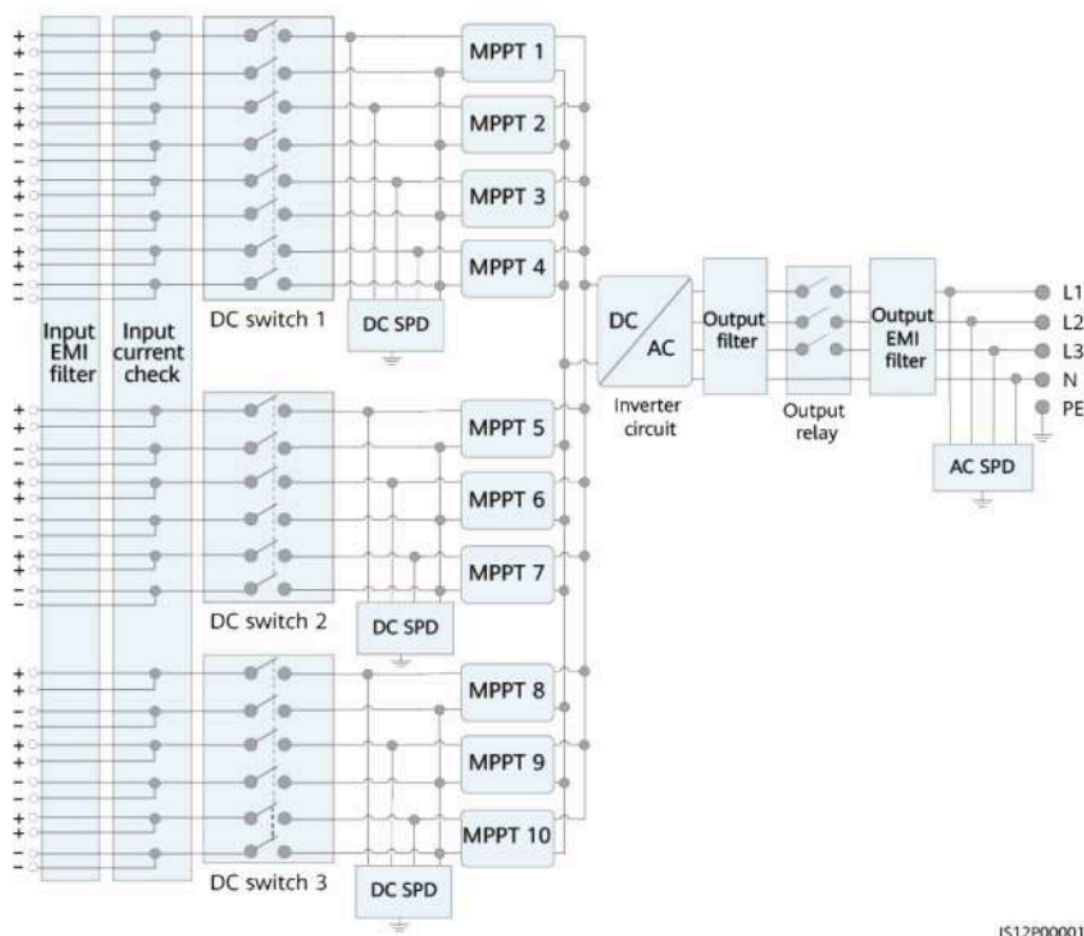
The equipment shall be fixed to suitable manner as specified in the installation instruction.

The EUTs contains filters for smoothing the output voltage and for EMC, switching and control circuits. Electronic circuits are mounted on a number of PCBs interconnected by appropriate connectors and wires. Power board including electronics components is mounted on the heat sink to earthing by metal screw and spring washer.

For all models the PV input combiner 10 string MPPT tracers, each MPPT tracer including 2 pair of PV input terminals. DC battery terminals connected to Battery. AC output direct connected to grid or load and protective Earthing are provided by dedicated earthing terminals. Grid is protected combination with a two series of relays as redundant build for ensure the inverter can independent disconnected from grid while a relay was fault.

During fault condition defined in this standard, after the DSP receives the abnormal signal from the relevant protective detection circuit, the relays will operate to disconnect the DC active lines from grid automatically.

The master DSP and slaver MCU have capacity independently to disconnect from grid, when any grid fault had happened.



IS12P00001

Block Diagram

Model Difference:

The models SUN2000-100KTL-M2 and SUN2000-115KTL-M2 are same as the construction, hardware and software, except the output power is different due to be adjusted by software.

Prüfbericht-Nr.: CN224DKW 001
Test Report No.:

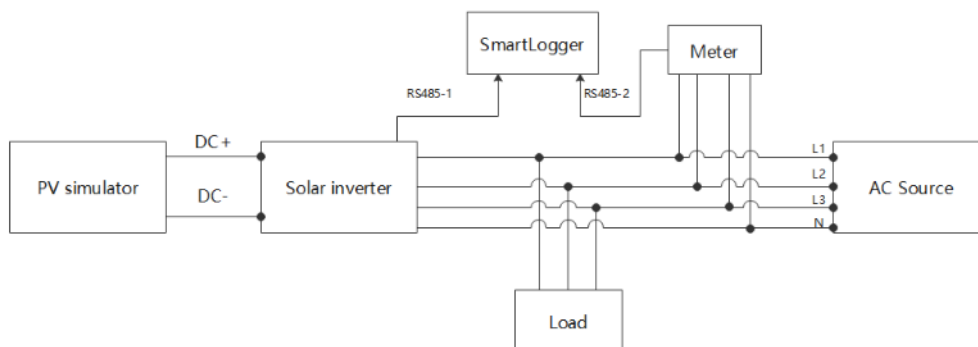
Seite 5 von 9
Page 5 of 9

Produktbeschreibung Product description

Remote control and logical interface:

Remote control and logical interface is through RS485/USB.

PAVE monitoring device and scheme:



The user can set the export limit(SmartLogger and Meter) through the monitoring platform of the PV inverter to control the power output from the inverter to the grid.

Export Restriction Control Procedures:

- 1.Select Export limitation setting
- 2.Enter password: XXX
- 3.Select setup type and enter the export limit value

SmartLogger and Meter:

Meter Model: DTSU666-HW

SmartLogger Model: SmartLogger3000

Model list:

MODELS LIST		SUN2000-100KTLM2	SUN2000-115KTLM2
PV INPUT	V _{MAX} PV [Vdc]	1100	
	I _{SC} PV [A]	40*10	
	MPPT Voltage Range V _{MPP} [Vdc]	200-1000	
	Max. Input Current I _{MAX} [A] (A/B) (each MPPT if more than 1)	30*10	
	MPPT Full Power Voltage Range [Vdc]	540-800	
	Number of MPPT	10	
	String per MPPT(+/-)	2/2	
	Backfeed Current [A]	0	
	Overvoltage Category (OVC)	II	

Prüfbericht-Nr.: CN224DKW 001
Test Report No.:

Seite 6 von 9
Page 6 of 9

Produktbeschreibung
Product description

AC Side(ON-Grid)	Rated Output Voltage Ur [Vac]	3L/N/PE, 230/400	
	Rated Output Frequency F _{NETZ} [Hz]	50/60	
	Rated Output Power P _E [kW]	100	115
	Max. Output Power P _E [kW]	110	125
	Max. Apparent power S _E max [kVA]	110	125
	Rated Output Current I _r [A]	144.4	166.0
	Max. Output Current I _{max} [A]	160.4	182.3
	Power Factor cosφ [λ]	0.8 leading ~0.8lagging	
	THD [V / I] (100% full power)	<3%	
	Overvoltage Category (OVC)	III	
System parameters	Type of inverter	Non-isolated	
	Firmware [Version]	V500R023	
	Software [Version]	V500R023C00SPC010	
	Type of NS Protection	Integrated	
	Separated by	Transformerless	
	Protective Class	Class I	
	Enclosure Protection (IP)	IP66	
	Operating Temperature Range [°C]	-25°C to +60°C	
	Pollution degree (PD)	PD3	
	Altitude [m]	4000m	
	Size(W*H*D) [mm]	1035*700*365	
	Weight [kg]	93	
Note:			

Prüfbericht-Nr.: CN224DKW 001
Test Report No.:

Seite 7 von 9
Page 7 of 9

Produktbeschreibung
Product description

2	Maße / Gewicht <i>Dimensions / Weight</i>	See models list
3	Bedienelemente <i>Operating elements</i>	N/A
4	Ausstattung / Zubehör <i>Equipment / Accessories</i>	N/A
5	Verwendete Materialien <i>Used materials</i>	N/A
6	Sonstiges <i>Other</i>	N/A

Prüfbericht-Nr.: CN224DKW 001
Test Report No.:

Seite 8 von 9
Page 8 of 9

Absatz	Anforderungen - Prüfungen	Messergebnisse - Bemerkungen	Bewertung
Clause	Requirements - Tests	Measuring results - Remarks	Evaluation

1	Anwendungsbereich Scope Details zur Ausgestaltung der messtechnischen Nachweise und zur Dokumentation der Messergebnisse sind in DIN VDE-V 0124-100 (VDE V 0124-100):2020-06 beschrieben. <i>Details on the design of the measuring certificates and the documentation of the measurement results are described in DIN VDE-V 0124-100 (VDE V 0124-100):2020-06.</i>		
---	---	--	--

ANLAGE zum Prüfbericht-Nr.: CN224DKW 001
APPENDIX to Test Report No.:

Seite 9 von 9
Page 9 of 9

ZUSATZ-DOKUMENTATION
ADDITIONAL DOCUMENTATION

List of Appendix :

- CN224DKW 001 attachment 1–VDE V 0124-100: 2020 Test report
- CN224DKW 001 attachment 2– Photo documentation

-End of test report-

Prüfbericht-Nr.: <i>Test Report No.:</i>	See test report CN224DKW 001	Auftrags-Nr.: <i>Order No.:</i>	See test report CN224DKW 001	Seite 1 von 153 <i>Page 1 of 153</i>	
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	See test report CN224DKW 001	Auftragsdatum: <i>Order date:</i>	See test report CN224DKW 001		
Auftraggeber: <i>Client:</i>	See test report CN224DKW 001				
Prüfgegenstand: <i>Test item:</i>	See test report CN224DKW 001				
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	See test report CN224DKW 001				
Auftrags-Inhalt: <i>Order content:</i>	A3 certificate				
Prüfgrundlage: <i>Test specification:</i>	DIN VDE V 0124-100/06.20 <i>Netzintegration von Erzeugungsanlagen –Niederspannung –Prüfanforderungen an Erzeugungseinheiten vorgesehen zum Anschluss und Parallelbetrieb am Niederspannungsnetz</i> <i>Grid integration of generator plants – Low-voltage – Test requirements for generator units to be connected to and operated in parallel with low-voltage distribution networks</i>				
Wareneingangsdatum: <i>Date of receipt:</i>	See test report CN224DKW 001	See test report CN224DKW 001			
Prüfmuster-Nr.: <i>Test sample No.:</i>	See test report CN224DKW 001				
Prüfzeitraum: <i>Testing period:</i>	See test report CN224DKW 001				
Ort der Prüfung: <i>Place of testing:</i>	See test report CN224DKW 001				
Prüflaboratorium: <i>Testing laboratory:</i>	See test report CN224DKW 001				
Prüfergebnis*: <i>Test result*:</i>	Pass				
erstellt von: / created by:		genehmigt von: / authorized by:			
See test report CN224DKW 001		See test report CN224DKW 001			
Datum <i>Date</i>	Name / Stellung <i>Name / Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name / Stellung <i>Name / Position</i>	Unterschrift <i>Signature</i>
Sonstiges / Other:					
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>			Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet * Legend: P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested					
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>					

V05

Prüfbericht-Nr.: CN224DKW 001 Attachment 1
Test Report No.:

Seite 2 von 153
Page 2 of 153

Liste der verwendeten Prüfmittel
List of used test equipment

See test report CN224DKW 001

Prüfbericht-Nr.: CN224DKW 001 Attachment 1
Test Report No.:

Seite 3 von 153
Page 3 of 153

Produktbeschreibung
Product description

See test report CN224DKW 001

Prüfbericht-Nr.: CN224DKW 001 Attachment 1
Test Report No.:

Seite 4 von 153
Page 4 of 153

Absatz	Anforderungen-Prüfungen	Messergebnisse-Bemerkungen	Bewertung
Clause	Requirements-Tests	Measuring results-Remarks	Evaluation

1	Anwendungsbereich Scope Diese DIN-VDE-Vornorm dient dem Nachweis der elektrischen Eigenschaften von Erzeugungseinheiten (EZE) nach der VDE-AR N 4105:2018-11 und gegebenenfalls anderen Netzanschlussbedingungen. <i>This DIN VDE preliminary standard serves to verify the electrical properties of power generation units (PGU) in accordance with VDE-AR N 4105:2018-11 and, if applicable, other grid connection conditions.</i>		
5	Prüfungen Tests		
5.1	Allgemeines General information		P
5.2	Nachweis zulässiger Netzzrückwirkungen Verification of permitted network reaction		P
5.3	Nachweis des Symmetrieverhaltens von Umrichtern Verification of symmetry behaviour of inverter		P
5.4	Nachweis des Verhaltens der Erzeugungseinheit am Netz Verification of behaviours of PGU on grid		P
5.5	Nachweis des NA-Schutzes Verification of NS-protections		P
5.6	Zuschaltbedingungen und Synchronisierung Connection conditions and synchronisation		P
5.7	Nachweis der PAV,E-überwachung Verification of PAV,E-monitoring		P
5.8	Nachweis der dynamischen Netzstützung Verification of dynamic network support		P

Prüfbericht-Nr.: CN224DKW 001 Attachment 1
Test Report No.:

Seite 5 von 153
Page 5 of 153

ZUSATZ-DOKUMENTATION
ADDITIONAL DOCUMENTATION

See following pages for test data.

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 6 von 153
Page 6 of 153

Test Engineer:	See cover page	Reviewer:	See cover page
Signature:	See cover page	Signature:	See cover page

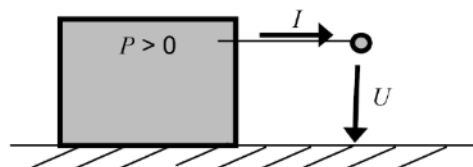
Testing Location: See cover page

Name:	See cover page
Address:	See cover page

Test Sample No.:	See cover page
------------------	----------------

Test Condition:

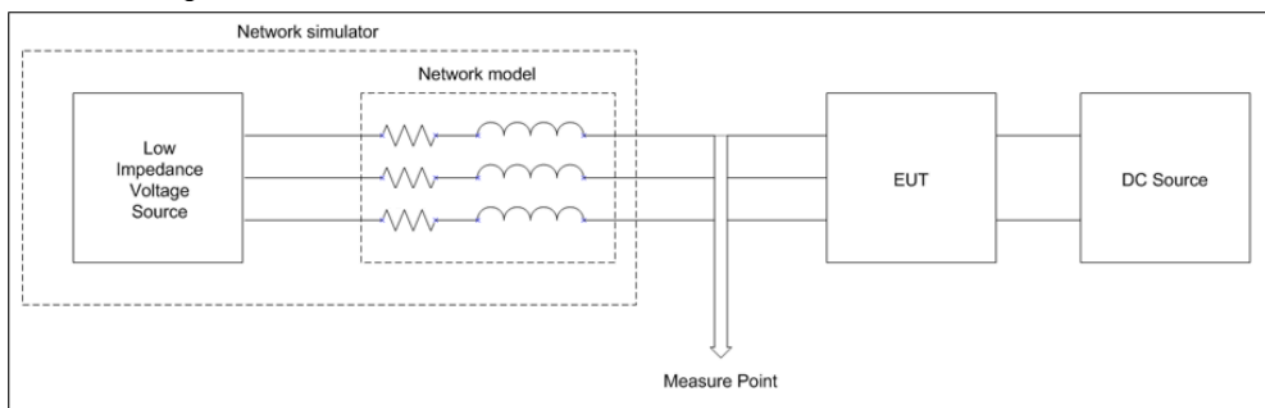
Generator reference system applied in test:



Test Date:

See cover page

Test bench diagram:



A network model (grid impedance simulator) only connected in test bench in flicker test (<75A condition), in the other tests the network model is bypassed.

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 7 von 153
Page 7 of 153

Test items	Remark
5.2 Verification of permitted network reaction	
5.2.2 Rapid voltage change (Kimax)	
5.2.3 Flicker	
5.2.4 Harmonics and Inter-harmonics (I inter, I higher)	
5.2.5 Commutation notches	
5.2.6 DC current feeding to network (Idc)	
5.3 Verification of symmetry behaviours of inverter	
5.3.2 Tests of three-phase inverter (Imbalance)	
5.3.3 Symmetry operation with a symmetry device	
5.4 Verification of behaviours of PGU on network	
5.4.2 Measurement of active- and reactive power ranges (P&Q range)	
5.4.3 Active power reduction through setting provision (P control)	
5.4.4 Active power output of PGU by over-frequency (LFSM-O)	
5.4.5 Active power output of ESS by over-frequency (LFSM-O)	
5.4.6 Active power output of PGU by under-frequency (LFSM-U)	
5.4.7 Active power output of ESS by under-frequency (LFSM-U)	
5.4.8.2 Tests of reactive power / displacement factor setting accuracy (Fixed $\cos\phi$)	
5.4.8.3 Tests of displacement factor- / active power character curve ($\cos\phi(P)$)	
5.4.8.4 Tests of reactive power-voltage character curve (Q(U))	
5.5 Verification of NS-protection	
5.5.2 NS-protection	
5.5.3 Central NS-protecton	
5.5.4 Integrated NS-protection	
5.5.6 Interface switch (Functional safety)	
5.5.7 Protection devices and protection settings (OV/UV, OF/UF)	
5.5.9 Constructional features of NS protection	
5.5.10 Islanding detection	
5.6 Connection conditions and synchronization (Reconnection)	
5.7 Verification of $P_{AV,E}$ monitoring	
5.8 Verification of dynamic network supporting (FVRT)	

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 8 von 153
Page 8 of 153

5.2.2	TABLE: Rapid voltage change (Kimax)			P
Test Conditions	Measurements			Limit
	U [V]	I [A]	Ki	Ki
Starting to 50%Pn	230.41	83.27	1.003	≤ 1.2
Starting to 100% Pn	231.01	183.77	1.106	≤ 1.2
Stopping at 100% Pn	231.01	175.12	1.054	≤ 1.2
Note(s):				

5.2.3	TABLE: Flicker							P	
SUN2000-115KTL-M2									
L1									
Test Condition	Measurement								
	30°		50°		70°		85°		
P/Pn [%]	Pst	C _{ψ_k}	Pst	C _{ψ_k}	Pst	C _{ψ_k}	Pst	C _{ψ_k}	
10	0.00057	0.00071	0.00053	0.00053	0.00050	0.00068	0.00049	0.00018	
20	0.01612	0.02004	0.01518	0.01503	0.01437	0.01949	0.01408	0.00511	
30	0.00058	0.00072	0.00055	0.00054	0.00052	0.00071	0.00051	0.00019	
40	0.00057	0.00071	0.00054	0.00054	0.00052	0.00071	0.00052	0.00019	
50	0.00058	0.00072	0.00056	0.00055	0.00054	0.00074	0.00053	0.00019	
60	0.00059	0.00073	0.00056	0.00055	0.00054	0.00073	0.00053	0.00019	
70	0.00058	0.00072	0.00056	0.00056	0.00055	0.00074	0.00054	0.00020	
80	0.00078	0.00097	0.00070	0.00069	0.00061	0.00083	0.00058	0.00021	
90	0.00076	0.00094	0.00069	0.00068	0.00062	0.00084	0.00060	0.00022	
100	0.00080	0.00099	0.00073	0.00073	0.00067	0.00091	0.00066	0.00024	
100	0.00075	0.00093	0.00070	0.00069	0.00065	0.00088	0.00064	0.00023	
100	0.00074	0.00091	0.00069	0.00068	0.00066	0.00089	0.00066	0.00024	
L2									
Test Condition	Measurement								
	30°		50°		70°		85°		
P/Pn [%]	Pst	C _{ψ_k}	Pst	C _{ψ_k}	Pst	C _{ψ_k}	Pst	C _{ψ_k}	
10	0.00058	0.00072	0.00054	0.00053	0.00051	0.00069	0.00050	0.00018	
20	0.01632	0.02029	0.01532	0.01518	0.01448	0.01964	0.01418	0.00514	
30	0.00058	0.00072	0.00055	0.00054	0.00052	0.00071	0.00051	0.00019	
40	0.00058	0.00072	0.00055	0.00055	0.00053	0.00072	0.00052	0.00019	
50	0.00057	0.00071	0.00056	0.00055	0.00054	0.00073	0.00053	0.00019	
60	0.00060	0.00074	0.00057	0.00056	0.00054	0.00074	0.00053	0.00019	
70	0.00059	0.00074	0.00057	0.00057	0.00056	0.00075	0.00055	0.00020	
80	0.00077	0.00096	0.00068	0.00068	0.00060	0.00081	0.00057	0.00021	
90	0.00077	0.00095	0.00070	0.00069	0.00063	0.00085	0.00061	0.00022	
100	0.00082	0.00102	0.00074	0.00073	0.00066	0.00089	0.00064	0.00023	
100	0.00071	0.00088	0.00066	0.00065	0.00063	0.00085	0.00062	0.00023	
100	0.00076	0.00095	0.00069	0.00069	0.00064	0.00087	0.00063	0.00023	
L3									
Test Condition	Measurement								

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 9 von 153
Page 9 of 153

	30°		50°		70°		85°	
P/Pn [%]	Pst	C _{ψ_k}	Pst	C _{ψ_k}	Pst	C _{ψ_k}	Pst	C _{ψ_k}
10	0.00058	0.00072	0.00054	0.00053	0.00051	0.00069	0.00050	0.00018
20	0.01608	0.01998	0.01504	0.01490	0.01421	0.01927	0.01394	0.00505
30	0.00057	0.00071	0.00054	0.00053	0.00051	0.00070	0.00050	0.00018
40	0.00057	0.00070	0.00054	0.00054	0.00052	0.00071	0.00052	0.00019
50	0.00057	0.00070	0.00055	0.00054	0.00053	0.00072	0.00053	0.00019
60	0.00059	0.00074	0.00057	0.00056	0.00054	0.00073	0.00053	0.00019
70	0.00059	0.00073	0.00057	0.00056	0.00055	0.00075	0.00055	0.00020
80	0.00078	0.00097	0.00069	0.00068	0.00061	0.00082	0.00058	0.00021
90	0.00076	0.00094	0.00069	0.00068	0.00062	0.00084	0.00060	0.00022
100	0.00083	0.00104	0.00076	0.00075	0.00068	0.00092	0.00065	0.00023
100	0.00076	0.00094	0.00068	0.00068	0.00063	0.00086	0.00062	0.00022
100	0.00080	0.00099	0.00074	0.00073	0.00067	0.00091	0.00065	0.00023
SUN2000-100KTL-M2								
L1								
Test Condition	Measurement							
	30°		50°		70°		85°	
P/Pn [%]	Pst	C _{ψ_k}	Pst	C _{ψ_k}	Pst	C _{ψ_k}	Pst	C _{ψ_k}
10	0.00057	0.00071	0.00053	0.00053	0.00050	0.00068	0.00049	0.00018
20	0.00058	0.00072	0.00054	0.00054	0.00051	0.00070	0.00050	0.00018
30	0.00058	0.00072	0.00055	0.00054	0.00052	0.00071	0.00051	0.00019
40	0.00057	0.00071	0.00054	0.00054	0.00052	0.00071	0.00052	0.00019
50	0.00058	0.00072	0.00056	0.00055	0.00054	0.00074	0.00053	0.00019
60	0.00059	0.00073	0.00056	0.00055	0.00054	0.00073	0.00053	0.00019
70	0.00058	0.00072	0.00056	0.00056	0.00055	0.00074	0.00054	0.00020
80	0.00078	0.00097	0.00070	0.00069	0.00061	0.00083	0.00058	0.00021
90	0.00076	0.00094	0.00069	0.00068	0.00062	0.00084	0.00060	0.00022
100	0.00077	0.00096	0.00071	0.00070	0.00066	0.00089	0.00064	0.00023
100	0.00077	0.00096	0.00071	0.00070	0.00066	0.00089	0.00064	0.00023
100	0.00077	0.00096	0.00071	0.00070	0.00066	0.00089	0.00064	0.00023
L2								
Test Condition	Measurement							
	30°		50°		70°		85°	
P/Pn [%]	Pst	C _{ψ_k}	Pst	C _{ψ_k}	Pst	C _{ψ_k}	Pst	C _{ψ_k}
10	0.00058	0.00072	0.00054	0.00053	0.00051	0.00069	0.00050	0.00018
20	0.00058	0.00072	0.00055	0.00054	0.00052	0.00070	0.00051	0.00018
30	0.00058	0.00072	0.00055	0.00054	0.00052	0.00071	0.00051	0.00019
40	0.00058	0.00072	0.00055	0.00055	0.00053	0.00072	0.00052	0.00019
50	0.00057	0.00071	0.00056	0.00055	0.00054	0.00073	0.00053	0.00019
60	0.00060	0.00074	0.00057	0.00056	0.00054	0.00074	0.00053	0.00019
70	0.00059	0.00074	0.00057	0.00057	0.00056	0.00075	0.00055	0.00020
80	0.00077	0.00096	0.00068	0.00068	0.00060	0.00081	0.00057	0.00021
90	0.00077	0.00095	0.00070	0.00069	0.00063	0.00085	0.00061	0.00022

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 10 von 153
Page 10 of 153

100	0.00079	0.00098	0.00072	0.00071	0.00066	0.00089	0.00064	0.00023
100	0.00079	0.00098	0.00072	0.00071	0.00066	0.00089	0.00064	0.00023
100	0.00079	0.00098	0.00072	0.00071	0.00066	0.00089	0.00064	0.00023
L3								
Test Condition	Measurement							
	30°		50°		70°		85°	
P/Pn [%]	Pst	C _{ψ_k}	Pst	C _{ψ_k}	Pst	C _{ψ_k}	Pst	C _{ψ_k}
10	0.00058	0.00072	0.00054	0.00053	0.00051	0.00069	0.00050	0.00018
20	0.00057	0.00071	0.00054	0.00053	0.00051	0.00069	0.00050	0.00018
30	0.00057	0.00071	0.00054	0.00053	0.00051	0.00070	0.00050	0.00018
40	0.00057	0.00070	0.00054	0.00054	0.00052	0.00071	0.00052	0.00019
50	0.00057	0.00070	0.00055	0.00054	0.00053	0.00072	0.00053	0.00019
60	0.00059	0.00074	0.00057	0.00056	0.00054	0.00073	0.00053	0.00019
70	0.00059	0.00073	0.00057	0.00056	0.00055	0.00075	0.00055	0.00020
80	0.00078	0.00097	0.00069	0.00068	0.00061	0.00082	0.00058	0.00021
90	0.00076	0.00094	0.00069	0.00068	0.00062	0.00084	0.00060	0.00022
100	0.00079	0.00098	0.00072	0.00071	0.00066	0.00089	0.00063	0.00023
100	0.00079	0.00098	0.00072	0.00071	0.00066	0.00089	0.00063	0.00023
100	0.00079	0.00098	0.00072	0.00071	0.00066	0.00089	0.00063	0.00023
Note(s):								

5.2.4		TABLE: Harmonics and inter-harmonics									P	
SUN2000-115KTL-M2												
Harmonics												
P/P _n [%]	0	10	20	30	40	50	60	70	80	90	100	
Order No.	I/I _n [%]											
2	0.560	0.186	0.109	0.121	0.145	0.139	0.120	0.114	0.115	0.126	0.124	
3	0.688	0.144	0.054	0.079	0.137	0.099	0.153	0.119	0.150	0.107	0.101	
4	1.328	0.290	0.138	0.101	0.084	0.077	0.063	0.070	0.051	0.032	0.029	
5	0.834	0.185	0.203	0.139	0.181	0.112	0.331	0.184	0.118	0.275	0.444	
6	1.194	0.290	0.134	0.086	0.078	0.069	0.053	0.068	0.060	0.046	0.048	
7	0.856	0.206	0.200	0.125	0.169	0.155	0.234	0.100	0.133	0.242	0.453	
8	0.796	0.185	0.086	0.056	0.046	0.036	0.028	0.019	0.025	0.026	0.021	
9	0.467	0.083	0.041	0.028	0.064	0.111	0.053	0.060	0.033	0.035	0.066	
10	0.258	0.067	0.035	0.022	0.018	0.022	0.016	0.015	0.014	0.015	0.023	
11	0.429	0.110	0.063	0.081	0.099	0.129	0.134	0.086	0.077	0.205	0.104	
12	0.249	0.071	0.028	0.020	0.015	0.016	0.017	0.017	0.017	0.019	0.013	
13	0.329	0.082	0.048	0.053	0.047	0.126	0.124	0.077	0.066	0.128	0.144	
14	0.398	0.083	0.041	0.027	0.025	0.026	0.020	0.022	0.014	0.016	0.020	
15	0.628	0.083	0.053	0.025	0.035	0.064	0.062	0.034	0.042	0.037	0.037	
16	0.288	0.064	0.033	0.019	0.015	0.016	0.013	0.011	0.010	0.012	0.015	
17	0.655	0.134	0.111	0.138	0.148	0.181	0.210	0.144	0.116	0.119	0.147	

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 11 von 153
Page 11 of 153

18	0.275	0.063	0.026	0.018	0.016	0.015	0.012	0.012	0.012	0.013	0.010
19	0.352	0.082	0.083	0.107	0.108	0.126	0.164	0.144	0.152	0.163	0.179
20	0.238	0.050	0.025	0.020	0.017	0.016	0.014	0.012	0.013	0.012	0.012
21	0.653	0.097	0.061	0.050	0.086	0.068	0.075	0.048	0.068	0.070	0.065
22	0.298	0.064	0.030	0.040	0.026	0.024	0.015	0.014	0.011	0.013	0.013
23	0.723	0.094	0.079	0.099	0.151	0.170	0.173	0.159	0.129	0.108	0.158
24	0.307	0.070	0.040	0.047	0.034	0.030	0.023	0.022	0.016	0.017	0.010
25	0.588	0.111	0.095	0.111	0.106	0.141	0.178	0.172	0.210	0.191	0.157
26	0.649	0.130	0.060	0.021	0.016	0.015	0.015	0.019	0.019	0.017	0.011
27	0.749	0.157	0.087	0.051	0.101	0.067	0.077	0.073	0.073	0.076	0.098
28	0.667	0.155	0.042	0.022	0.016	0.015	0.012	0.013	0.015	0.021	0.018
29	0.959	0.174	0.074	0.092	0.135	0.203	0.172	0.167	0.148	0.151	0.186
30	0.282	0.076	0.032	0.022	0.017	0.016	0.014	0.014	0.017	0.020	0.020
31	0.663	0.158	0.085	0.092	0.123	0.233	0.218	0.237	0.234	0.200	0.160
32	0.264	0.061	0.031	0.021	0.016	0.015	0.019	0.015	0.014	0.012	0.012
33	1.268	0.210	0.094	0.042	0.051	0.058	0.075	0.093	0.075	0.071	0.097
34	0.266	0.059	0.030	0.020	0.018	0.014	0.013	0.012	0.013	0.017	0.012
35	1.219	0.149	0.055	0.082	0.135	0.176	0.178	0.182	0.159	0.173	0.204
36	0.268	0.062	0.028	0.020	0.018	0.016	0.014	0.016	0.016	0.021	0.017
37	0.648	0.249	0.092	0.084	0.140	0.219	0.208	0.223	0.233	0.194	0.136
38	0.253	0.063	0.027	0.018	0.016	0.016	0.015	0.017	0.016	0.018	0.021
39	1.311	0.314	0.183	0.088	0.037	0.026	0.065	0.074	0.066	0.058	0.068
40	0.364	0.086	0.035	0.020	0.015	0.016	0.014	0.015	0.020	0.027	0.022

SUN2000-100KTL-M2

Harmonics

P/P _n [%]	0	10	20	30	40	50	60	70	80	90	100
Order No.	I/In [%]										
2	1.469	0.540	0.227	0.163	0.140	0.083	0.090	0.094	0.113	0.084	0.089
3	1.786	0.399	0.397	0.385	0.241	0.151	0.249	0.162	0.046	0.097	0.115
4	1.370	0.350	0.209	0.176	0.145	0.094	0.088	0.124	0.150	0.110	0.121
5	6.408	0.979	0.734	0.493	0.350	0.412	0.461	0.305	0.209	0.164	0.066
6	1.030	0.252	0.133	0.096	0.077	0.057	0.045	0.040	0.037	0.026	0.024
7	6.707	0.335	0.446	0.426	0.321	0.322	0.547	0.270	0.090	0.082	0.056
8	0.524	0.103	0.069	0.050	0.042	0.032	0.028	0.046	0.029	0.019	0.023
9	1.940	0.292	0.310	0.320	0.273	0.044	0.104	0.102	0.054	0.036	0.027
10	0.515	0.117	0.104	0.064	0.044	0.025	0.027	0.032	0.031	0.030	0.025
11	21.45	2.445	2.584	1.612	1.096	0.255	0.212	0.118	0.121	0.062	0.115
12	0.760	0.216	0.205	0.157	0.111	0.022	0.028	0.026	0.020	0.023	0.020
13	20.31	2.475	2.568	1.586	1.051	0.338	0.314	0.167	0.088	0.114	0.074
14	0.435	0.098	0.093	0.062	0.042	0.022	0.016	0.017	0.022	0.022	0.032
15	1.736	0.278	0.358	0.339	0.293	0.093	0.091	0.109	0.095	0.071	0.044
16	0.492	0.105	0.065	0.047	0.036	0.030	0.023	0.020	0.014	0.013	0.011

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 12 von 153
Page 12 of 153

17	3.173	0.387	0.160	0.192	0.199	0.207	0.179	0.199	0.198	0.185	0.222
18	0.444	0.088	0.069	0.048	0.035	0.020	0.017	0.017	0.013	0.016	0.019
19	2.126	0.163	0.319	0.244	0.290	0.159	0.151	0.220	0.202	0.171	0.158
20	0.468	0.086	0.063	0.041	0.029	0.017	0.018	0.021	0.025	0.023	0.016
21	1.073	0.290	0.207	0.202	0.157	0.064	0.091	0.100	0.096	0.075	0.069
22	0.463	0.097	0.070	0.043	0.030	0.027	0.023	0.026	0.026	0.040	0.034
23	1.779	0.378	0.487	0.320	0.240	0.158	0.131	0.114	0.161	0.179	0.178
24	0.692	0.121	0.123	0.083	0.053	0.019	0.017	0.022	0.022	0.016	0.015
25	2.288	0.406	0.490	0.344	0.273	0.191	0.129	0.202	0.197	0.188	0.202
26	0.684	0.169	0.094	0.051	0.033	0.029	0.023	0.022	0.027	0.029	0.023
27	1.660	0.215	0.252	0.226	0.165	0.066	0.078	0.063	0.083	0.079	0.073
28	0.500	0.167	0.085	0.060	0.045	0.039	0.035	0.033	0.032	0.033	0.027
29	3.021	0.364	0.154	0.107	0.134	0.126	0.131	0.108	0.175	0.181	0.183
30	0.515	0.098	0.060	0.040	0.043	0.024	0.019	0.030	0.034	0.026	0.026
31	2.109	0.186	0.167	0.143	0.153	0.135	0.150	0.196	0.224	0.205	0.209
32	0.489	0.102	0.055	0.039	0.029	0.021	0.019	0.022	0.023	0.029	0.024
33	1.638	0.294	0.152	0.140	0.110	0.072	0.047	0.052	0.069	0.075	0.070
34	0.357	0.098	0.055	0.035	0.029	0.026	0.030	0.030	0.033	0.032	0.028
35	4.039	0.633	0.307	0.159	0.123	0.127	0.152	0.152	0.165	0.181	0.170
36	0.450	0.097	0.055	0.038	0.029	0.024	0.020	0.020	0.023	0.023	0.024
37	2.682	0.409	0.260	0.169	0.128	0.123	0.114	0.176	0.221	0.207	0.202
38	0.450	0.085	0.049	0.037	0.035	0.023	0.022	0.029	0.023	0.023	0.021
39	1.210	0.358	0.203	0.153	0.124	0.098	0.053	0.049	0.068	0.067	0.060
40	0.421	0.120	0.062	0.039	0.035	0.031	0.029	0.031	0.029	0.025	0.024

Note(s): The max. value of three phases were chosen.

SUN2000-115KTL-M2

Inter-harmonics

P/Pn [%]	0	10	20	30	40	50	60	70	80	90	100	Limit
f [Hz]	I/In [%]											
75	1.566	0.355	0.154	0.147	0.110	0.113	0.093	0.096	0.113	0.090	0.078	--
125	1.691	0.372	0.158	0.144	0.110	0.082	0.087	0.091	0.093	0.082	0.071	--
175	0.864	0.200	0.098	0.153	0.122	0.127	0.107	0.110	0.115	0.109	0.092	--
225	0.754	0.153	0.074	0.116	0.092	0.089	0.091	0.124	0.129	0.089	0.067	--
275	0.807	0.169	0.094	0.134	0.147	0.104	0.201	0.173	0.142	0.156	0.193	--
325	0.683	0.146	0.077	0.121	0.105	0.063	0.100	0.128	0.128	0.125	0.133	--
375	0.734	0.152	0.085	0.099	0.122	0.041	0.155	0.141	0.109	0.142	0.185	--
425	0.695	0.155	0.078	0.101	0.081	0.037	0.075	0.053	0.047	0.106	0.125	--
475	0.679	0.158	0.073	0.062	0.048	0.060	0.039	0.035	0.032	0.036	0.041	--
525	0.734	0.163	0.073	0.058	0.044	0.050	0.033	0.033	0.029	0.030	0.030	--
575	0.774	0.164	0.079	0.079	0.068	0.059	0.067	0.061	0.056	0.063	0.064	--
625	0.736	0.173	0.085	0.094	0.064	0.050	0.055	0.043	0.040	0.063	0.072	--

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 13 von 153
Page 13 of 153

675	0.743	0.170	0.081	0.079	0.067	0.041	0.063	0.058	0.054	0.064	0.062	--
725	0.814	0.187	0.090	0.099	0.067	0.040	0.054	0.041	0.038	0.064	0.076	--
775	0.812	0.192	0.089	0.061	0.051	0.043	0.034	0.031	0.029	0.030	0.030	--
825	0.847	0.200	0.091	0.060	0.051	0.044	0.033	0.030	0.028	0.028	0.027	--
875	0.884	0.206	0.094	0.063	0.054	0.046	0.036	0.031	0.029	0.030	0.030	--
925	0.881	0.207	0.097	0.066	0.055	0.046	0.036	0.032	0.030	0.030	0.027	--
975	0.884	0.207	0.100	0.064	0.056	0.051	0.038	0.034	0.030	0.030	0.028	--
1025	0.905	0.212	0.103	0.067	0.058	0.077	0.038	0.035	0.031	0.030	0.027	--
1075	0.938	0.217	0.107	0.076	0.061	0.128	0.038	0.035	0.031	0.029	0.026	--
1125	1.005	0.235	0.110	0.131	0.092	0.131	0.047	0.036	0.032	0.030	0.027	--
1175	1.036	0.243	0.113	0.217	0.157	0.122	0.080	0.048	0.035	0.033	0.030	--
1225	1.026	0.238	0.133	0.213	0.162	0.067	0.106	0.084	0.045	0.035	0.030	--
1275	1.171	0.255	0.231	0.194	0.152	0.055	0.109	0.095	0.070	0.045	0.030	--
1325	1.980	0.390	0.340	0.103	0.088	0.058	0.085	0.091	0.082	0.067	0.031	--
1375	2.516	0.602	0.312	0.085	0.058	0.060	0.049	0.057	0.077	0.075	0.037	--
1425	2.228	0.633	0.279	0.089	0.060	0.059	0.047	0.041	0.052	0.069	0.054	--
1475	1.840	0.570	0.144	0.093	0.062	0.059	0.049	0.043	0.041	0.049	0.070	--
1525	0.998	0.371	0.124	0.088	0.064	0.062	0.050	0.044	0.041	0.041	0.067	--
1575	0.890	0.245	0.124	0.082	0.066	0.058	0.051	0.045	0.043	0.041	0.055	--
1625	0.857	0.228	0.120	0.077	0.067	0.062	0.051	0.046	0.044	0.042	0.039	--
1675	0.783	0.202	0.110	0.073	0.066	0.061	0.051	0.047	0.043	0.041	0.038	--
1725	0.751	0.189	0.107	0.075	0.069	0.060	0.053	0.047	0.045	0.043	0.041	--
1775	0.746	0.185	0.098	0.071	0.066	0.058	0.054	0.049	0.048	0.048	0.043	--
1825	0.733	0.187	0.093	0.068	0.065	0.061	0.055	0.051	0.051	0.049	0.044	--
1875	0.704	0.175	0.092	0.066	0.061	0.055	0.058	0.055	0.052	0.051	0.046	--
1925	0.683	0.173	0.088	0.063	0.058	0.057	0.057	0.055	0.056	0.049	0.072	--
1975	0.675	0.190	0.081	0.061	0.054	0.052	0.058	0.059	0.051	0.052	0.073	--
SUN2000-100KTL-M2												
Inter-harmonics												
P/Pn [%]	0	10	20	30	40	50	60	70	80	90	100	Limit
f [Hz]	I/In [%]											
75	3.987	1.124	0.624	0.466	0.350	0.151	0.125	0.106	0.078	0.061	0.055	--
125	3.473	0.774	0.724	0.423	0.339	0.145	0.122	0.105	0.080	0.062	0.058	--
175	4.310	1.219	0.427	0.515	0.374	0.136	0.117	0.107	0.105	0.051	0.034	--
225	2.201	0.458	0.689	0.330	0.267	0.117	0.108	0.096	0.081	0.036	0.028	--
275	3.974	0.842	0.368	0.529	0.398	0.141	0.229	0.208	0.162	0.071	0.037	--
325	2.414	0.331	0.408	0.285	0.230	0.123	0.148	0.113	0.095	0.059	0.031	--
375	2.355	0.362	0.236	0.346	0.268	0.123	0.192	0.163	0.125	0.063	0.040	--
425	1.915	0.246	0.184	0.183	0.158	0.092	0.119	0.083	0.067	0.056	0.030	--
475	1.246	0.285	0.161	0.124	0.094	0.055	0.049	0.044	0.038	0.033	0.034	--
525	1.117	0.293	0.355	0.115	0.086	0.050	0.043	0.038	0.035	0.028	0.025	--
575	1.932	0.393	0.327	0.253	0.214	0.083	0.071	0.063	0.057	0.036	0.027	--

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 14 von 153
Page 14 of 153

625	1.871	0.402	0.363	0.253	0.187	0.103	0.081	0.062	0.048	0.039	0.027	--
675	1.987	0.488	0.320	0.262	0.217	0.081	0.070	0.062	0.057	0.037	0.028	--
725	1.790	0.400	0.163	0.248	0.180	0.114	0.081	0.062	0.048	0.040	0.031	--
775	1.122	0.401	0.158	0.121	0.087	0.054	0.045	0.040	0.038	0.033	0.029	--
825	1.133	0.312	0.164	0.113	0.086	0.053	0.044	0.039	0.036	0.032	0.030	--
875	1.231	0.303	0.158	0.119	0.089	0.054	0.047	0.041	0.038	0.033	0.030	--
925	1.243	0.302	0.151	0.113	0.089	0.055	0.048	0.041	0.038	0.033	0.030	--
975	1.272	0.319	0.156	0.110	0.085	0.055	0.048	0.042	0.039	0.034	0.031	--
1025	1.228	0.303	0.159	0.104	0.084	0.057	0.047	0.043	0.040	0.036	0.032	--
1075	1.237	0.326	0.168	0.108	0.082	0.057	0.046	0.043	0.040	0.035	0.032	--
1125	1.192	0.341	0.172	0.106	0.081	0.059	0.049	0.044	0.042	0.037	0.034	--
1175	1.297	0.346	0.177	0.118	0.093	0.060	0.053	0.047	0.043	0.037	0.034	--
1225	1.576	0.339	0.205	0.115	0.092	0.063	0.056	0.049	0.045	0.038	0.035	--
1275	2.102	0.417	0.329	0.122	0.097	0.066	0.056	0.050	0.047	0.040	0.036	--
1325	2.198	0.684	0.353	0.138	0.094	0.098	0.069	0.053	0.049	0.041	0.037	--
1375	1.969	0.726	0.338	0.215	0.106	0.158	0.116	0.061	0.051	0.042	0.038	--
1425	1.416	0.693	0.255	0.248	0.173	0.149	0.131	0.102	0.064	0.047	0.043	--
1475	1.281	0.502	0.182	0.232	0.195	0.137	0.124	0.122	0.104	0.070	0.067	--
1525	1.192	0.348	0.179	0.181	0.182	0.086	0.095	0.115	0.110	0.097	0.087	--
1575	1.161	0.343	0.177	0.123	0.138	0.073	0.067	0.094	0.108	0.094	0.084	--
1625	1.103	0.351	0.163	0.120	0.098	0.077	0.067	0.069	0.086	0.085	0.073	--
1675	1.072	0.320	0.157	0.120	0.093	0.075	0.066	0.068	0.069	0.063	0.057	--
1725	0.971	0.288	0.162	0.119	0.091	0.074	0.067	0.071	0.073	0.059	0.056	--
1775	0.981	0.286	0.153	0.115	0.091	0.073	0.070	0.072	0.073	0.063	0.059	--
1825	0.959	0.285	0.152	0.113	0.085	0.073	0.069	0.070	0.075	0.070	0.065	--
1875	0.967	0.279	0.145	0.106	0.086	0.068	0.065	0.074	0.097	0.106	0.096	--
1925	0.913	0.264	0.133	0.106	0.104	0.067	0.067	0.104	0.118	0.089	0.092	--
1975	0.793	0.247	0.153	0.128	0.115	0.075	0.088	0.109	0.092	0.090	0.084	--

Note(s): The max. value of three phases were chosen.

SUN2000-115KTL-M2

Higher frequency Harmonics

P/P _n [%]	0	10	20	30	40	50	60	70	80	90	100	Limit
f [kHz]	I/I _n [%]											
2.1	2.227	0.504	0.251	0.174	0.230	0.302	0.272	0.302	0.294	0.282	0.242	--
2.3	2.156	0.497	0.265	0.205	0.222	0.209	0.189	0.195	0.161	0.155	0.179	--
2.5	1.772	0.447	0.245	0.171	0.165	0.198	0.161	0.171	0.178	0.161	0.130	--
2.7	1.862	0.345	0.189	0.150	0.164	0.197	0.174	0.165	0.160	0.146	0.155	--
2.9	1.989	0.419	0.322	0.235	0.204	0.171	0.101	0.085	0.072	0.077	0.130	--
3.1	1.646	0.304	0.226	0.183	0.170	0.150	0.161	0.163	0.171	0.149	0.103	--
3.3	1.133	0.297	0.242	0.220	0.193	0.198	0.136	0.140	0.126	0.117	0.136	--
3.5	1.329	0.373	0.157	0.159	0.138	0.156	0.173	0.182	0.192	0.172	0.157	--
3.7	1.348	0.287	0.181	0.122	0.103	0.077	0.101	0.083	0.084	0.091	0.086	--

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 15 von 153
Page 15 of 153

3.9	1.211	0.183	0.085	0.095	0.117	0.124	0.151	0.131	0.124	0.114	0.121	--
4.1	1.375	0.261	0.147	0.110	0.117	0.112	0.136	0.126	0.130	0.128	0.117	--
4.3	0.925	0.221	0.127	0.106	0.091	0.091	0.075	0.071	0.079	0.081	0.083	--
4.5	1.241	0.196	0.095	0.084	0.087	0.097	0.124	0.120	0.136	0.134	0.120	--
4.7	1.144	0.193	0.127	0.124	0.117	0.098	0.105	0.112	0.117	0.132	0.125	--
4.9	0.747	0.176	0.091	0.102	0.103	0.106	0.088	0.084	0.094	0.095	0.095	--
5.1	0.978	0.196	0.088	0.072	0.091	0.086	0.128	0.131	0.133	0.131	0.115	--
5.3	0.775	0.182	0.096	0.093	0.091	0.106	0.091	0.101	0.091	0.110	0.123	--
5.5	0.645	0.170	0.098	0.073	0.084	0.100	0.096	0.099	0.101	0.096	0.104	--
5.7	0.759	0.169	0.088	0.058	0.057	0.053	0.080	0.083	0.095	0.096	0.090	--
5.9	0.734	0.175	0.077	0.069	0.072	0.069	0.065	0.064	0.069	0.078	0.108	--
6.1	0.859	0.187	0.065	0.054	0.046	0.037	0.045	0.052	0.064	0.066	0.075	--
6.3	0.584	0.148	0.075	0.049	0.053	0.051	0.040	0.041	0.041	0.044	0.051	--
6.5	0.804	0.196	0.079	0.055	0.051	0.055	0.042	0.044	0.047	0.047	0.043	--
6.7	0.923	0.238	0.102	0.059	0.049	0.037	0.027	0.031	0.032	0.032	0.026	--
6.9	0.512	0.178	0.080	0.043	0.039	0.041	0.032	0.030	0.029	0.031	0.025	--
7.1	0.892	0.243	0.120	0.073	0.050	0.040	0.025	0.029	0.028	0.030	0.027	--
7.3	0.913	0.252	0.145	0.087	0.058	0.036	0.025	0.025	0.022	0.021	0.018	--
7.5	0.519	0.167	0.068	0.042	0.030	0.026	0.022	0.021	0.022	0.022	0.019	--
7.7	0.864	0.239	0.149	0.096	0.064	0.040	0.023	0.023	0.018	0.018	0.017	--
7.9	0.850	0.227	0.144	0.103	0.071	0.044	0.023	0.020	0.016	0.014	0.015	--
8.1	0.501	0.158	0.074	0.040	0.033	0.026	0.021	0.019	0.016	0.014	0.015	--
8.3	0.788	0.217	0.136	0.102	0.076	0.053	0.028	0.023	0.015	0.013	0.014	--
8.5	0.735	0.214	0.128	0.098	0.079	0.058	0.028	0.023	0.016	0.012	0.014	--
8.7	0.450	0.163	0.081	0.041	0.030	0.025	0.024	0.019	0.016	0.013	0.012	--
8.9	0.643	0.200	0.126	0.096	0.081	0.063	0.038	0.030	0.020	0.014	0.012	--
SUN2000-100KTL-M2												
Higher frequency Harmonics												
P/P _n [%]	0	10	20	30	40	50	60	70	80	90	100	Limit
f [kHz]	I/In [%]											
2.1	5.022	0.875	0.469	0.320	0.223	0.244	0.273	0.279	0.287	0.267	0.266	--
2.3	3.437	0.968	0.481	0.337	0.240	0.223	0.206	0.170	0.176	0.168	0.166	--
2.5	2.147	0.647	0.309	0.241	0.201	0.196	0.200	0.202	0.207	0.190	0.190	--
2.7	3.046	0.827	0.411	0.296	0.224	0.203	0.197	0.202	0.203	0.207	0.217	--
2.9	2.721	0.852	0.447	0.346	0.289	0.207	0.175	0.157	0.165	0.160	0.147	--
3.1	1.990	0.491	0.263	0.215	0.177	0.201	0.208	0.186	0.151	0.142	0.138	--
3.3	1.932	0.514	0.366	0.285	0.258	0.244	0.199	0.199	0.189	0.167	0.148	--
3.5	1.776	0.556	0.381	0.351	0.318	0.310	0.295	0.246	0.194	0.163	0.156	--
3.7	1.578	0.279	0.223	0.198	0.164	0.160	0.167	0.148	0.132	0.122	0.118	--
3.9	1.732	0.374	0.229	0.216	0.190	0.177	0.144	0.168	0.187	0.179	0.167	--
4.1	1.621	0.272	0.214	0.203	0.177	0.184	0.175	0.170	0.157	0.148	0.137	--
4.3	1.526	0.299	0.170	0.166	0.120	0.103	0.121	0.109	0.110	0.102	0.103	--

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 16 von 153
Page 16 of 153

4.5	2.037	0.450	0.182	0.159	0.148	0.162	0.144	0.149	0.145	0.141	0.136	--
4.7	1.507	0.320	0.186	0.171	0.149	0.163	0.172	0.152	0.119	0.113	0.110	--
4.9	1.693	0.427	0.173	0.143	0.120	0.105	0.129	0.106	0.099	0.086	0.089	--
5.1	1.903	0.456	0.192	0.147	0.116	0.119	0.138	0.148	0.132	0.121	0.119	--
5.3	1.247	0.356	0.187	0.153	0.131	0.113	0.149	0.132	0.095	0.088	0.088	--
5.5	1.357	0.381	0.186	0.146	0.124	0.107	0.100	0.099	0.114	0.097	0.095	--
5.7	1.294	0.329	0.173	0.129	0.116	0.088	0.089	0.107	0.122	0.112	0.103	--
5.9	1.008	0.287	0.140	0.105	0.088	0.079	0.067	0.066	0.065	0.054	0.058	--
6.1	1.002	0.315	0.131	0.096	0.086	0.082	0.071	0.071	0.085	0.091	0.094	--
6.3	0.814	0.244	0.119	0.073	0.064	0.065	0.056	0.058	0.067	0.069	0.072	--
6.5	0.776	0.185	0.120	0.082	0.066	0.065	0.050	0.047	0.048	0.045	0.045	--
6.7	0.678	0.212	0.110	0.069	0.060	0.066	0.060	0.048	0.045	0.046	0.049	--
6.9	0.583	0.195	0.108	0.073	0.048	0.033	0.040	0.042	0.042	0.046	0.049	--
7.1	0.570	0.228	0.126	0.089	0.056	0.048	0.051	0.039	0.035	0.031	0.033	--
7.3	0.512	0.196	0.113	0.082	0.064	0.044	0.039	0.043	0.035	0.030	0.033	--
7.5	0.452	0.170	0.102	0.080	0.056	0.041	0.032	0.029	0.028	0.029	0.029	--
7.7	0.455	0.182	0.118	0.088	0.065	0.046	0.033	0.040	0.036	0.030	0.028	--
7.9	0.408	0.146	0.111	0.085	0.069	0.061	0.042	0.039	0.035	0.028	0.026	--
8.1	0.389	0.141	0.099	0.077	0.052	0.053	0.047	0.031	0.022	0.021	0.020	--
8.3	0.367	0.130	0.115	0.084	0.064	0.055	0.031	0.038	0.038	0.030	0.025	--
8.5	0.334	0.117	0.107	0.090	0.068	0.059	0.048	0.043	0.040	0.031	0.025	--
8.7	0.312	0.111	0.101	0.083	0.051	0.041	0.044	0.031	0.020	0.019	0.017	--
8.9	0.309	0.108	0.109	0.092	0.064	0.052	0.039	0.039	0.042	0.034	0.059	--

Note(s): The max. value of three phases were chosen.

5.2.5	TABLE: Commutation notches			P
Test Conditions P/ P _{E_{max}}	Measurements			
	I _{com} [A]			
	L1	L2	L3	
25% - 35%	54.32	54.26	53.98	
65% - 75%	126.69	126.53	126.00	
> 90%	182.06	182.42	181.88	
Note(s):				

5.2.6	TABLE: DC current feeding to network (Idc)			P
Test Conditions P/ P _{Emax}	Measurements			Limit
	Idc / In [%]			Idc/In
	L1	L2	L3	
SUN2000-115KTL-M2				
30% - 40%	0.060%	0.084%	0.090%	0.5%
60% - 70%	0.054%	0.133%	0.151%	0.5%
> 95%	0.042%	0.090%	0.133%	0.5%
SUN2000-100KTL-M2				
30% - 40%	0.021%	0.021%	0.028%	0.5%
60% - 70%	0.021%	0.069%	0.069%	0.5%

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 17 von 153
Page 17 of 153

> 95%	0.021%	0.062%	0.042%	0.5%
Note(s):				

5.3.2	TABLE: Tests of three-phase inverter (Imbalance)						P
Test Conditions		Measurements					Limit
$\cos\varphi$	$S/S_{E\max}$ [%]	$S_{asy}/S_{E\max}$ [%]					$S_{asy}/S_{E\max}$ [%]
1.0	100	0.20%	0.21%	0.21%	0.20%	0.21%	$\leq \pm 5$
1.0	50	0.04%	0.04%	0.03%	0.04%	0.04%	
Max. un	100	0.21%	0.22%	0.24%	0.22%	0.23%	
Max. un	50	0.06%	0.07%	0.06%	0.07%	0.06%	
Max. ov	100	0.22%	0.23%	0.22%	0.22%	0.22%	
Max. ov	50	0.04%	0.07%	0.06%	0.04%	0.07%	
Note(s): S_{asy} : Max. Asymmetry power among three phases.							

5.4.2		TABLE: Measurement of active- and reactive power ranges (P&Q range)				P			
Test Conditions		Measurements				Δ Limit			
U/Un	cosφ	U [V]	P _{max} [W]	S _{max} [VA]	cosφ	cosφ	P _{max} / P _{Emax}	S _{max} / S _{Emax}	
0.9	1.0	207.76	113886	113887	1.000	--	≤102%	≤102%	
1.0		230.76	126086	126086	1.000				
1.09		251.53	126123	126126	1.000				
0.9	Max.un	207.72	83181	103676	0.802	≤0.9(5)			
1.0		230.78	100414	124938	0.804				
1.09		251.50	100311	125046	0.802				
0.9	Max.ov	207.48	78307	98178	0.798				
1.0		230.59	99816	125258	0.797				
1.09		251.30	99632	125363	0.795				
Note(s):									

5.4.3(a)		TABLE: Active power reduction through setting provision (P control)			P
Test Conditions		Measurements			Limit
P/P _n [%]		P/P _n [%]		$\Delta P/P_n$ [%]	$\Delta P/P_n$ [%]
100		99.94		-0.06	$\leq 5\%$
90		90.27		0.27	
80		80.24		0.24	
70		70.20		0.2	
60		60.14		0.14	
50		50.12		0.12	
40		40.06		0.06	
30		30.02		0.02	
20		19.98		-0.02	
10		9.95		-0.05	
No disconnection occur					Y

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 18 von 153
Page 18 of 153

5.4.3(b)	TABLE: Active power reduction through setting provision (P control)		P
Test Conditions	Measurements		Limit
P/Pn [%]	$\Delta P/\Delta t$ [%Pn/s]		$\Delta P/\Delta t$ [%Pn/s]
100->5	0.502		0.33-0.66
5->100	0.503		

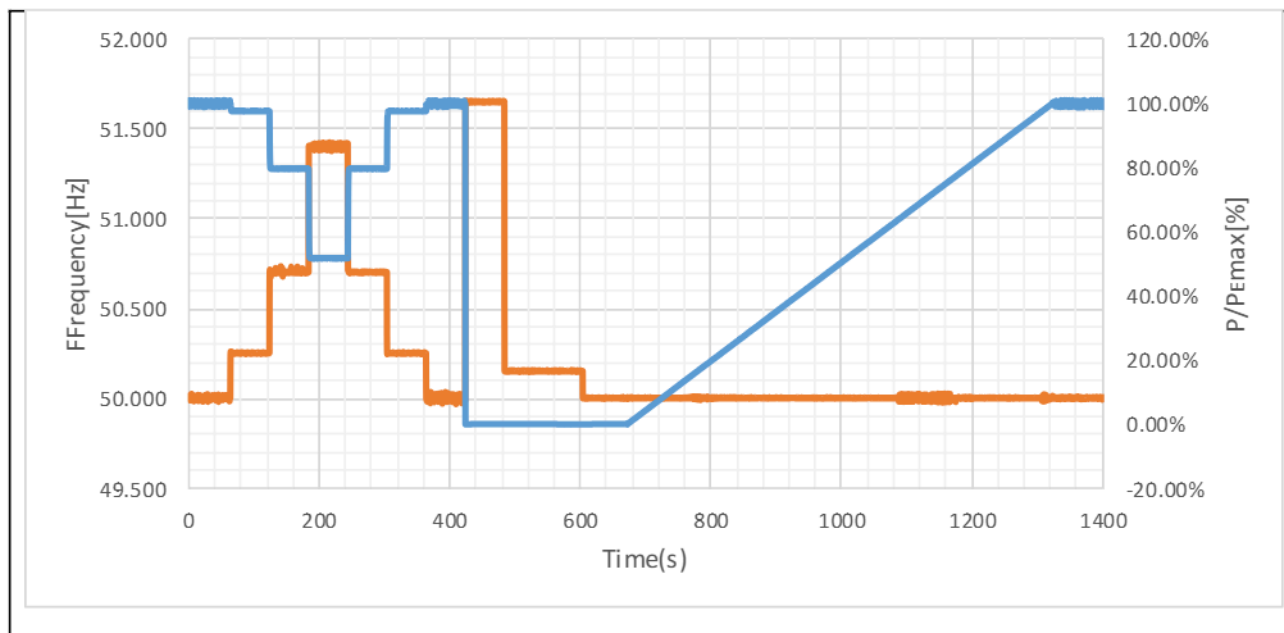
5.4.3(d)	TABLE: Active power reduction through setting provision (P control)		P
Test Conditions		Measurements	Limit
P/P _n [%]		T _{response} [s]	T _{response} [s]
100->0		1.2	≤ 5
Note(s):			

5.4.4(a)		TABLE: Active power output of PGU by over-frequency (LFISM-O)							P		
LFISM-O settings		f _{active}		f _{stop}		f _{deactive}		Droop			
		50.2		N/A		50.2		5%(40%P _M /Hz)			
Test Conditions		Measurements					Target	Tolerance	Limit		
f [Hz]	P _{prim} [%]	P/P _{E_{max}} [%]	f [Hz]	T _{rise} [s]	T _{set} [s]	T _v [s]	P/P _{E_{max}} [%]	ΔP/P _{E_{max}} [%]	ΔP [%]	T _{rise} [s]	T _{set} [s]
50.00	100	99.93	50.00	--	--	--	100	-0.07	≤±10	≤2	≤20
50.25	100	97.58	50.25	1	1	--	98	-0.42			
50.70	100	79.62	50.70	1	1	--	80	-0.38			
51.40	100	51.70	51.40	1	1	--	52	-0.30			
50.70	100	79.65	50.70	1	1	--	80	-0.35			
50.25	100	97.60	50.25	1	1	--	98	-0.40			
50.00	100	99.93	50.00	1	1	--	100	-0.07			
51.65	100	Disconnection					0	--			
50.15	100	No Reconnection					0	--			
Test Conditions		Measurements					Target	Tolerance	Limit		
f [Hz]	P _{prim} [%]	P/P _{E_{max}} [%]	f [Hz]	ΔP/Δt [%/min]		P/P _{E_{max}} [%]	ΔP/P _{E_{max}} [%]	ΔP [%]	ΔP/Δt [%/min]		
50.00	100	99.87	50.00	9.20		100	-0.13	≤±10	≤10		
Note(s):											
Plotting diagram:											

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 19 von 153
Page 19 of 153

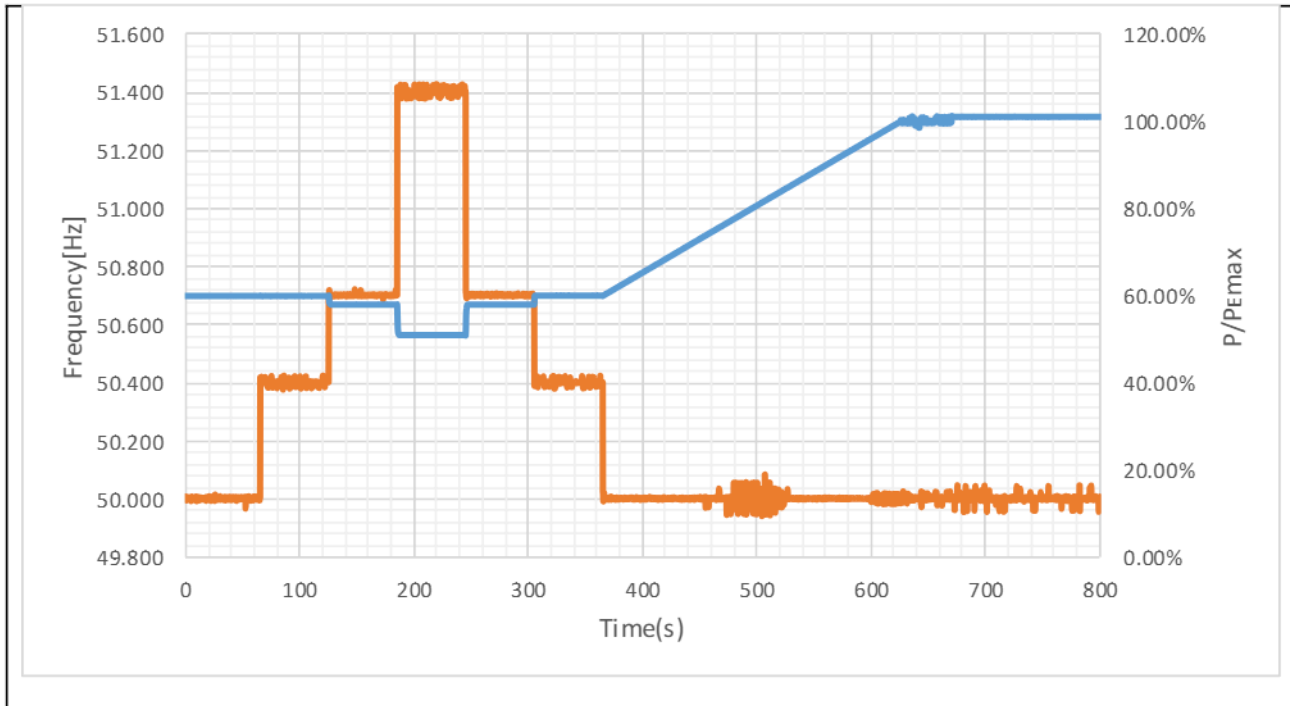


5.4.4(b)		TABLE: Active power output of PGU by over-frequency (LFSM-O)							P		
LFSM-O settings		f _{active}		f _{stop}		f _{deactive}		Droop			
		50.5		N/A		50.2		12%(16.67%P _M /Hz)			
Test Conditions		Measurements					Target	Tolerance	Limit		
f [Hz]	P _{rim} [%]	P/P _E max [%]	f [Hz]	T _{rise} [s]	T _{set} [s]	T _v [s]	P/P _E max [%]	ΔP/P _E max [%]	ΔP [%]	T _{rise} [s]	T _{set} [s]
50.00	60	60.00	50.00	--	--	--	60		≤±10	≤2	≤20
50.40	60	59.99	50.40	--	--	--	60				
50.70	60->100	58.00	50.70	1	1	--	58				
51.40	100	51.00	51.40	1	1	--	51				
50.70	100	58.01	50.70	1	1	--	58				
50.40	100	60.02	50.40	1	1	--	60				
Test Conditions		Measurements					Target	Tolerance	Limit		
f [Hz]	P _{rim} [%]	P/P _E max [%]	f [Hz]	ΔP/Δt [%/min]			P/P _E max [%]	ΔP/P _E max [%]	ΔP [%]	ΔP/Δt [%/min]	
50.00	100	101.09	50.00	9.21			100	1.09	≤±10	≤10	
Note(s):											
Plotting diagram:											

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 20 von 153
Page 20 of 153



5.4.5(a)		TABLE: Active power output of ESS by over-frequency (LFSSM-O)								N/A	
LFSSM-O settings		f _{active}		f _{stop}			f _{deactive}		Droop		
		50.2		N/A			50.2		5%(40%P _{E_{max}} /Hz)		
Test Conditions		Measurements					Target	Tolerance	Limit		
f [Hz]	P _{prim} [%]	P/P _{E_{max}} [%]	f [Hz]	T _{rise} [s]	T _{set} [s]	T _v [s]	P/P _{E_{max}} [%]	ΔP/P _{E_{max}} [%]	ΔP [%]	T _{rise} [s]	T _{set} [s]
50.00	100			--	--	--	100		≤±10	≤1	≤20
50.25	100					--	98				
50.70	100					--	80				
51.40	100					--	52				
50.70	100					--	80				
50.25	100					--	98				
50.00	100					--	100				
51.65	100	Disconnection					0	--			
50.15	100	No Reconnection					0	--			
Test Conditions		Measurements					Target	Tolerance	Limit		
f [Hz]	P _{prim} [%]	P/P _{E_{max}} [%]	f [Hz]	ΔP/Δt [%/min]			P/P _{E_{max}} [%]	ΔP/P _{E_{max}} [%]	ΔP [%]	ΔP/Δt [%/min]	
50.00	100						100		≤±10	≤10	
Note(s):											
Plotting diagram:											

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 21 von 153
Page 21 of 153

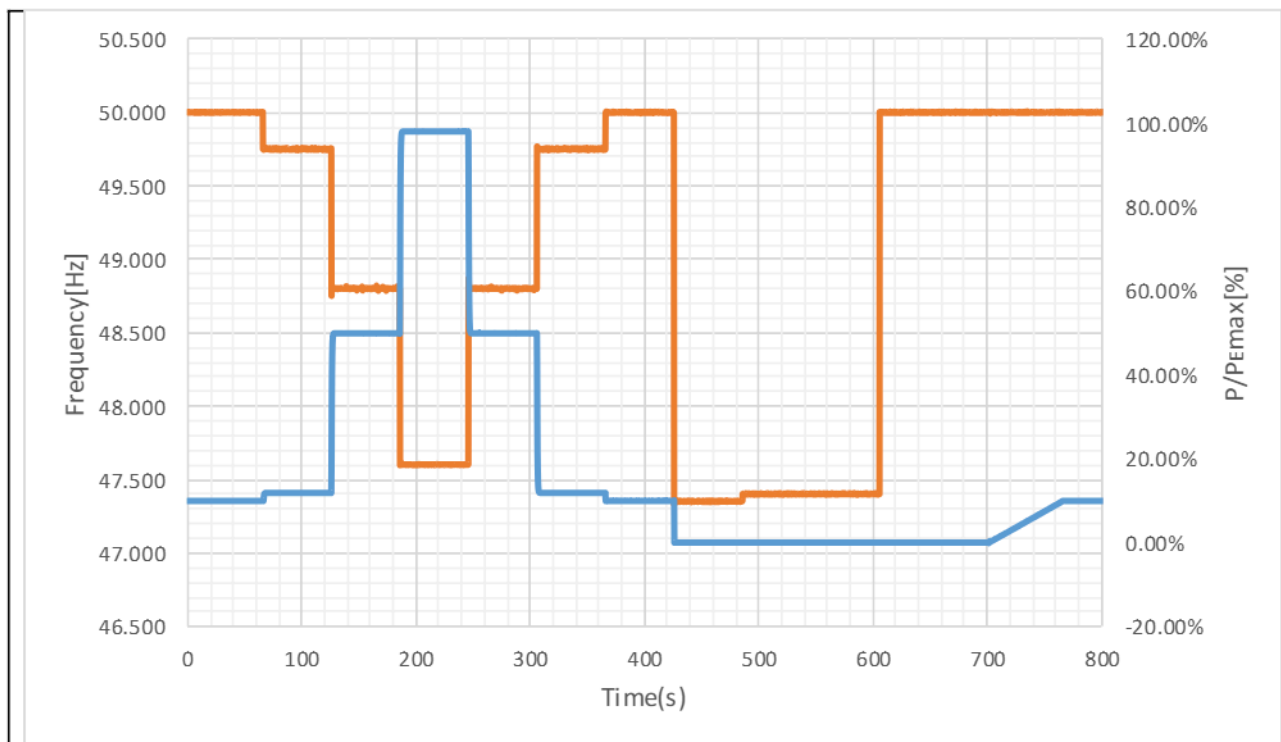
5.4.5(b)		TABLE: Active power output of ESS by over-frequency (LFSM-O)								N/A	
LFSM-O settings		f _{active}		f _{stop}			f _{deactive}		Droop		
		50.5		N/A			50.2		5%(40%P _{E_{max}} /Hz)		
Test Conditions		Measurements					Target	Tolerance	Limit		
f [Hz]	P _{prim} [%]	P/P _{E_{max}} [%]	f [Hz]	T _{rise} [s]	T _{set} [s]	T _v [s]	P/P _{E_{max}} [%]	ΔP/P _{E_{max}} [%]	ΔP [%]	T _{rise} [s]	T _{set} [s]
50.00	60			--	--	--	60		≤±10	≤1	≤20
50.40	60			--	--	--	60				
50.70	60->100					--	52				
51.40	100					--	24				
50.70	100					--	52				
Test Conditions		Measurements					Target	Tolerance	Limit		
f [Hz]	P _{prim} [%]	P/P _{E_{max}} [%]	f [Hz]	ΔP/Δt [%/min]			P/P _{E_{max}} [%]	ΔP/P _{E_{max}} [%]	ΔP [%]	ΔP/Δt [%/min]	
50.10	100						100		≤±10	≤10	
50.00	100			--			100		≤±10	--	
Note(s):											
Plotting diagram:											

5.4.6(a)		TABLE: Active power output of PGU by under-frequency (LFSM-U)							P		
LFSM-U settings		f _{active}		f _{stop}		f _{deactive}		Droop			
		49.8		N/A		49.8		5%(40%P _{E_{max}} /Hz)			
Test Conditions		Measurements					Target	Tolerance	Limit		
f [Hz]	P _{prim} [%]	P/P _{E_{max}} [%]	f [Hz]	T _{rise} [s]	T _{set} [s]	T _v [s]	P/P _{E_{max}} [%]	ΔP/P _{E_{max}} [%]	ΔP [%]	T _{rise} [s]	T _{set} [s]
50.00	100	9.92	50.00	--	--	--	10	-0.08	≤±10	≤2	≤20
49.75	100	11.85	49.75	1	1	--	12	-0.15			
48.80	100	49.92	48.80	1	1	--	50	-0.08			
47.60	100	98.06	47.60	1	1	--	98	0.06			
48.80	100	49.89	48.80	1	1	--	50	-0.11			
49.75	100	11.84	49.75	1	1	--	12	-0.16			
50.00	100	9.91	50.00	1	1	--	10	-0.09			
47.35	100	Disconnection					0	--			
47.40	100	No Reconnection					0	--			
Test Conditions		Measurements					Target	Tolerance	Limit		
f [Hz]	P _{prim} [%]	P/P _{E_{max}} [%]	f [Hz]	ΔP/Δt [%/min]			P/P _{E_{max}} [%]	ΔP/P _{E_{max}} [%]	ΔP [%]	ΔP/Δt [%/min]	
50.00	100	9.91	50.00	9.21			10	-0.09	≤±10	≤10	
Note(s): Product power was limited to 10% at the beginning of test by a lower priority command from user.											
Plotting diagram:											

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 22 von 153
Page 22 of 153

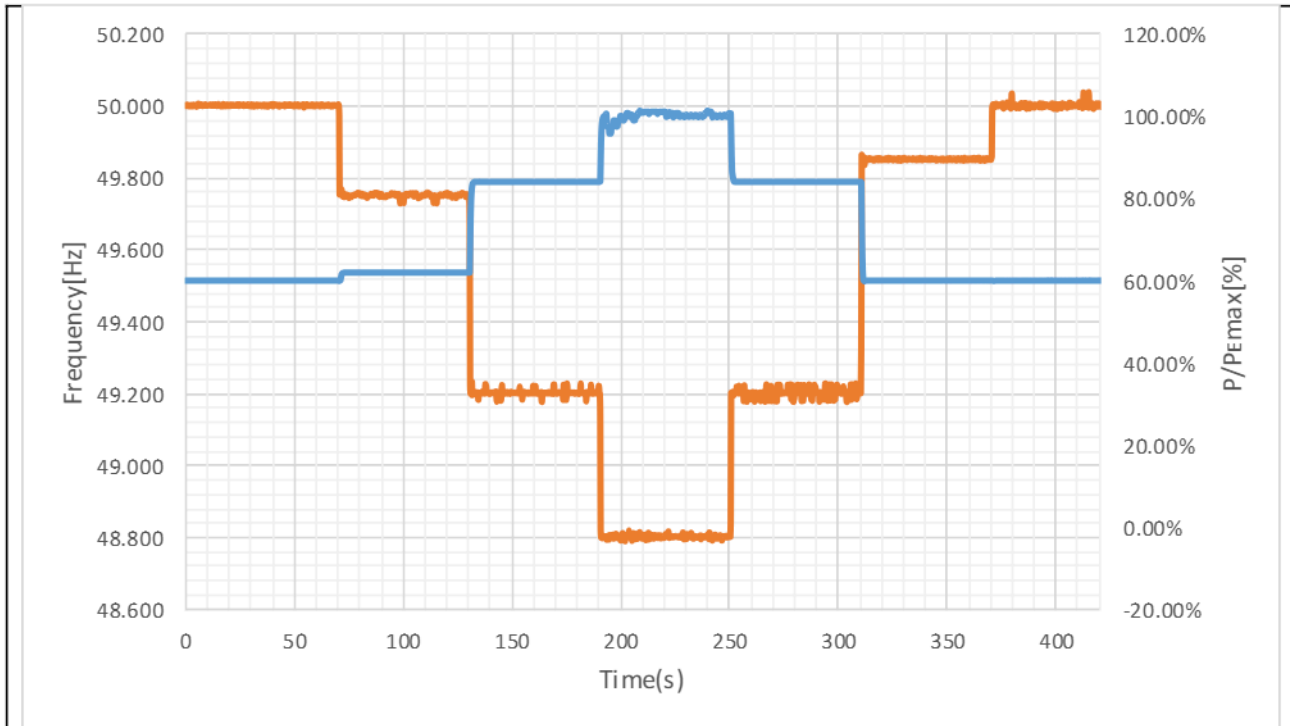


5.4.6(b)		TABLE: Active power output of PGU by under-frequency (LFSM-U)							P		
LFSM-U settings		f _{active}		f _{stop}		f _{deactive}		Droop			
		49.8		N/A		49.8		5%(40%P _{E_{max}} /Hz)			
Test Conditions		Measurements					Target	Tolerance	Limit		
f [Hz]	P _{rim} [%]	P/P _{E_{max}} [%]	f [Hz]	T _{rise} [s]	T _{set} [s]	T _v [s]	P/P _{E_{max}} [%]	ΔP/P _{E_{max}} [%]	ΔP [%]	T _{rise} [s]	T _{set} [s]
50.00	100	60.02	50.00	--	--	--	60	0.02	≤±10	≤2	≤20
49.75	100	62.01	49.75	1	1	--	62	0.01			
49.20	100	84.11	49.20	1	1	--	84	0.11			
48.80	100	100.80	48.80	1	1	--	100	0.80			
49.20	100	84.06	49.20	1	1	--	84	0.06			
49.85	100	60.07	49.85	1	1	--	60	0.07			
50.00	100	60.02	50.00	--	--	--	60	0.02			
Note(s):											
Product power was limited to 60% at the beginning of test by a lower priority command from user.											
Plotting diagram:											

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 23 von 153
Page 23 of 153



5.4.7(a)		TABLE: Active power output of ESS by under-frequency (LFSM-U)								N/A		
LFSM-U settings		f_{active}		f_{stop}			$f_{deactive}$		Droop			
		49.8		N/A			49.8		2%(100%P _{E_{max}} /Hz)			
Test Conditions		Measurements						Target	Tolerance	Limit		
f [Hz]	P _{rim} [%]	P/P _{E_{max}} [%]	f [Hz]	T _{rise} [s]	T _{set} [s]	T _v [s]	P/P _{E_{max}} [%]	ΔP/P _{E_{max}} [%]	ΔP [%]	T _{rise} [s]	T _{set} [s]	
50.00	100			--	--	--	-100		≤±10	≤1	≤20	
49.75	100					--	-95					
48.80	100					--	0					
47.60	100					--	100					
48.80	100					--	0					
49.85	100					--	-100					
50.00	100			--	--	--	-100					
47.35	100	Disconnection						0	--			
47.40	100	No Reconnection						0	--			
Test Conditions		Measurements						Target	Tolerance	Limit		
f [Hz]	P _{rim} [%]	P/P _{E_{max}} [%]	f [Hz]	ΔP/Δt [%/min]			P/P _{E_{max}} [%]	ΔP/P _{E_{max}} [%]	ΔP [%]	ΔP/Δt [%/min]		
50.00	100						-100		≤±10	≤10		
Note(s):												
Product was set in charging mode under rated power at the beginning of test.												
Plotting diagram:												

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 24 von 153
Page 24 of 153

5.4.7(b)		TABLE: Active power output of ESS by under-frequency (LFSM-U)								N/A	
LFSM-U settings		f _{active}		f _{stop}		f _{deactive}		Droop			
		49.8		N/A		49.8		2%(100%P _{E_{max}} /Hz)			
Test Conditions		Measurements					Target	Tolerance	Limit		
f [Hz]	P _{prim} [%]	P/P _{E_{max}} [%]	f [Hz]	T _{rise} [s]	T _{set} [s]	T _v [s]	P/P _{E_{max}} [%]	ΔP/P _{E_{max}} [%]	ΔP [%]	T _{rise} [s]	T _{set} [s]
50.00	100			--	--	--	10		≤±10	≤1	≤20
49.75	100					--	15				
48.80	100					--	100				
47.60	100					--	100				
48.80	100					--	100				
49.85	100					--	10				
50.00	100			--	--	--	10				
Note(s):											
Product power was limited to 10% at the beginning of test by a lower priority command from user.											
Plotting diagram:											

5.4.8.2		TABLE: Tests of reactive power / displacement factor setting accuracy (Fixed cosφ)							P		
Test Conditions			Measurements					Target	Tolerance	Limit	
U/Un [%]	P/P _{E_{max}} [%]	cosφ	P [W]	Q [Var]	S [VA]	U [V]	cosφ	Q [Var]	ΔQ/P _{E_{max}} [%]	ΔQ/P _{E_{max}} [%]	
90	50	0.90 under-excited	62501	-30554	69571	207.48	0.898	-30271	0.23	≤± 4	
90	S _{E_{max}}		94571	-46374	105328	207.61	0.898	-45803	0.46	≤± 4	
100	50		62549	-30610	69637	230.51	0.898	-30294	0.25	≤± 4	
100	S _{E_{max}}		112477	-55458	125406	230.70	0.897	-54475	0.79	≤± 4	
110	50		62510	-30622	69607	253.51	0.898	-30275	0.28	≤± 4	
110	S _{E_{max}}		112523	-55150	125310	253.68	0.898	-54497	0.52	≤± 4	
90	50	0.95 under-excited	62513	-20826	65892	207.51	0.949	-20547	0.22	≤± 4	
90	S _{E_{max}}		102578	-34446	108209	207.68	0.948	-33716	0.58	≤± 4	
100	50		62570	-20876	65960	230.52	0.949	-20566	0.25	≤± 4	
100	S _{E_{max}}		118636	-39872	125158	230.75	0.948	-38994	0.70	≤± 4	
110	50		62516	-20891	65914	253.53	0.948	-20548	0.27	≤± 4	
110	S _{E_{max}}		118850	-39670	125296	253.72	0.949	-39064	0.48	≤± 4	
90	50	0.90 over-excited	62540	29984	69358	207.57	0.902	30290	0.24	≤± 4	
90	S _{E_{max}}		97402	46518	107940	207.80	0.902	47174	0.52	≤± 4	
100	50		62630	30046	69466	230.61	0.902	30333	0.23	≤± 4	
100	S _{E_{max}}		112950	53873	125140	230.85	0.903	54704	0.66	≤± 4	
110	50		62624	30010	69445	253.60	0.902	30330	0.26	≤± 4	
110	S _{E_{max}}		112833	54061	125115	253.83	0.902	54648	0.47	≤± 4	
90	50	0.95 over-excited	62545	20270	65748	207.57	0.951	20558	0.23	≤± 4	
90	S _{E_{max}}		104416	33662	109707	207.82	0.952	34320	0.53	≤± 4	
100	50		62606	20268	65805	230.58	0.951	20578	0.25	≤± 4	

Prüfbericht-Nr.:
Test report no.:

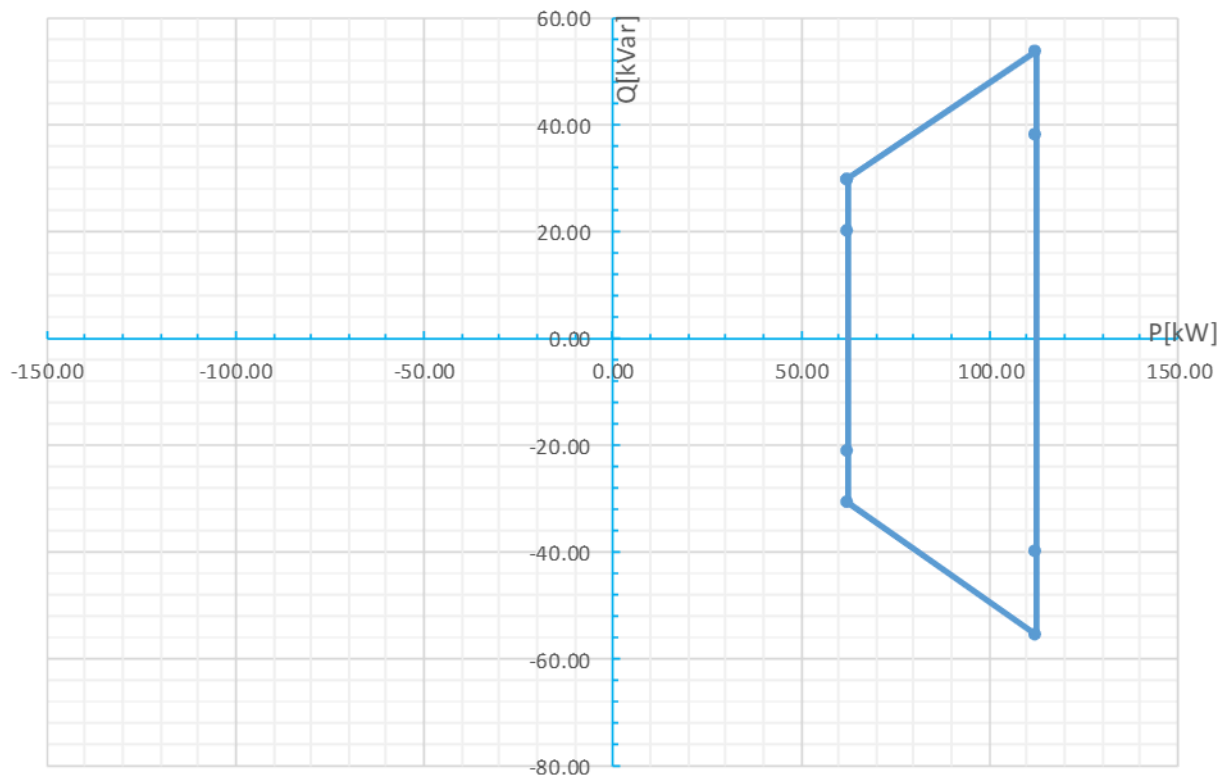
CN224DKW 001 Attachment 1

Seite 25 von 153
Page 25 of 153

100	$S_{E_{max}}$	119204	38348	125221	230.87	0.952	39180	0.67	$\leq \pm 4$
110	50	62600	20264	65798	253.58	0.951	20576	0.25	$\leq \pm 4$
110	$S_{E_{max}}$	119047	38569	125138	253.83	0.951	39129	0.45	$\leq \pm 4$

Note(s):

P-Q Diagram:

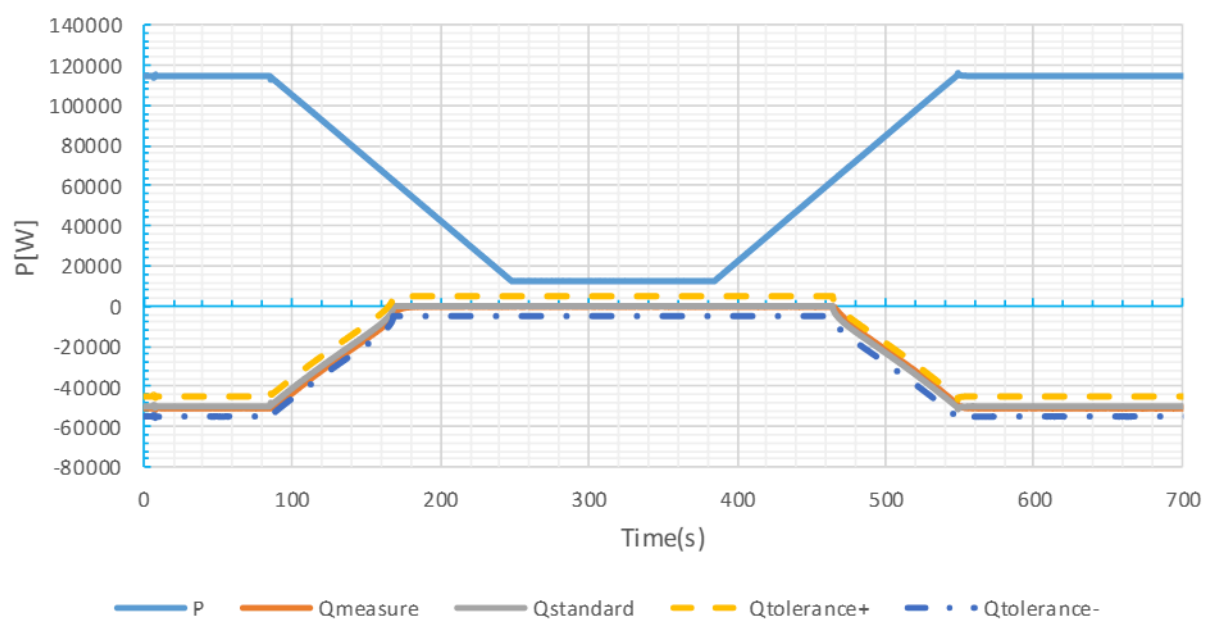


5.4.8.3(a)	TABLE: Tests of displacement factor- / active power character curve (cosφ(P))				P
cosφ (P) curve settings:	P/P _{Emax} [%]	10	50	100	
	cosφ	1.0	1.0	0.9	
	3Tau [s]	10			
Test Conditions			Limit		
P _{dc} /P _{dc,r} [%]			ΔQ/P _{Emax} [%]		
100->10->100 with ramp ≤30%P _{dc,r} /min			≤±4.0		
Plotting diagram:					
P _{AC} (t), Q _{measure} (t), Q _{standard} (t), Q _{tolerance} (t)					

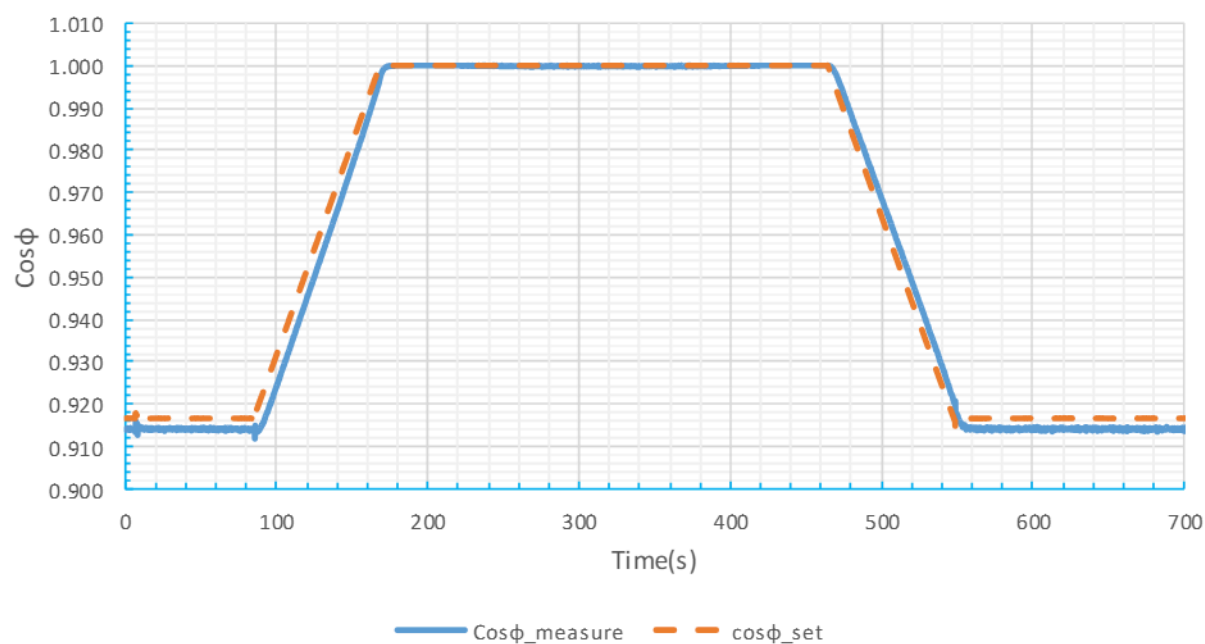
Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 26 von 153
Page 26 of 153



$\cos\phi(t)$



5.4.8.3(b)	TABLE: Tests of displacement factor- / active power character curve ($\cos\phi(P)$)		P
Test Conditions	Measurements	Limit	
$P_{rim}/P_{dc,r}$ [%]	Response time T [s]	Response time T [s]	
100->40	9.8	Complied with PT-1 curve	
40->100	8.0		
100->75	8.6		

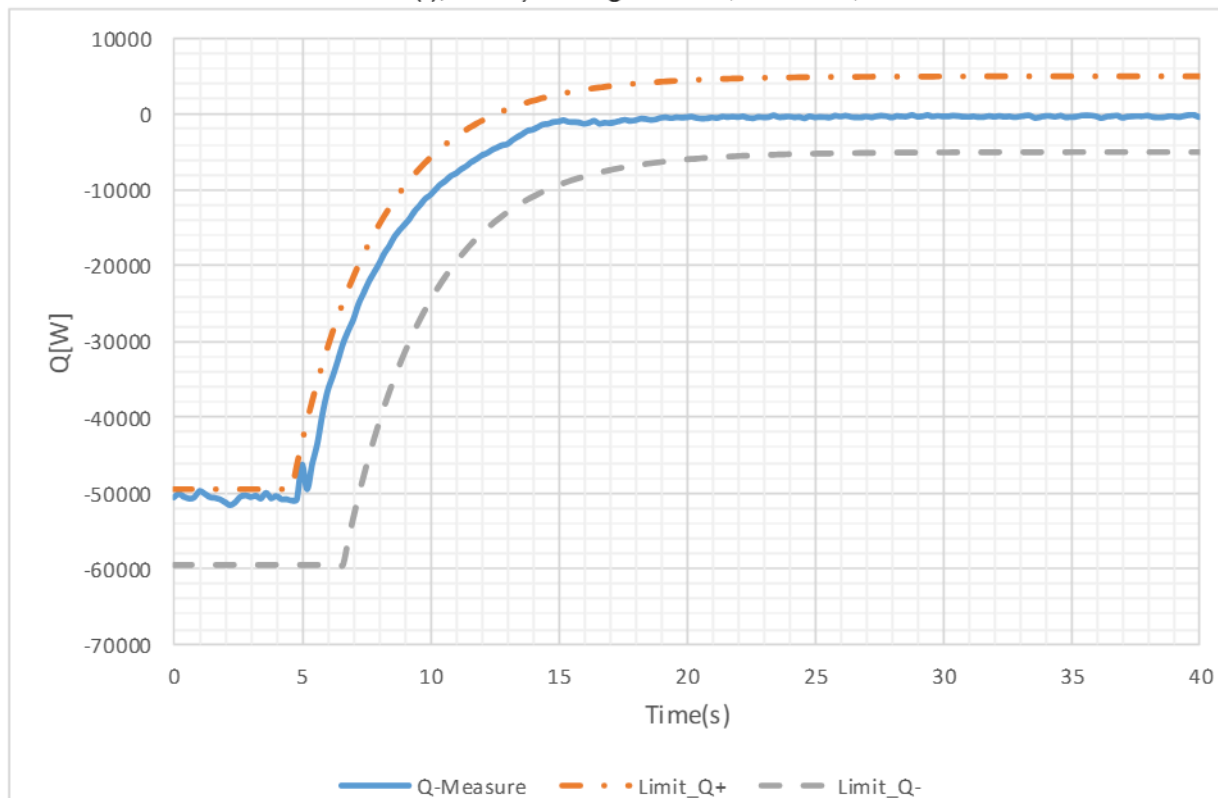
Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

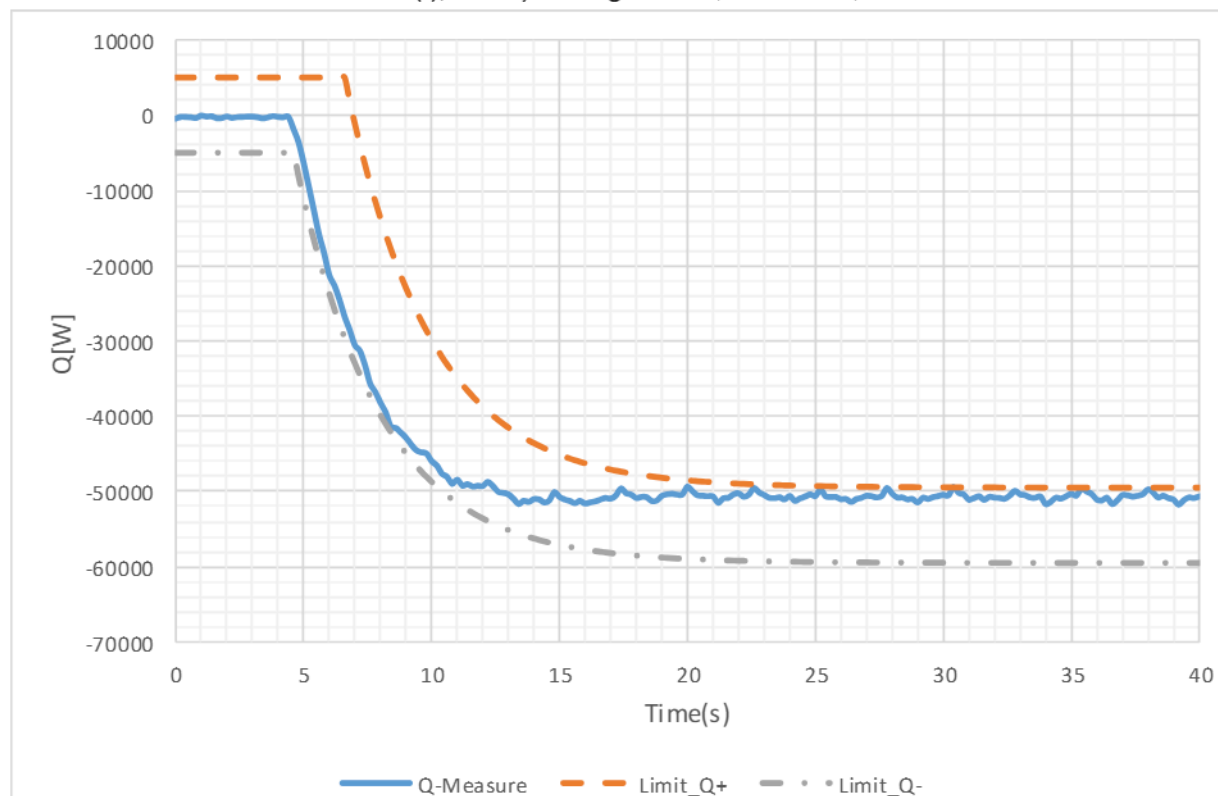
Seite 27 von 153
Page 27 of 153

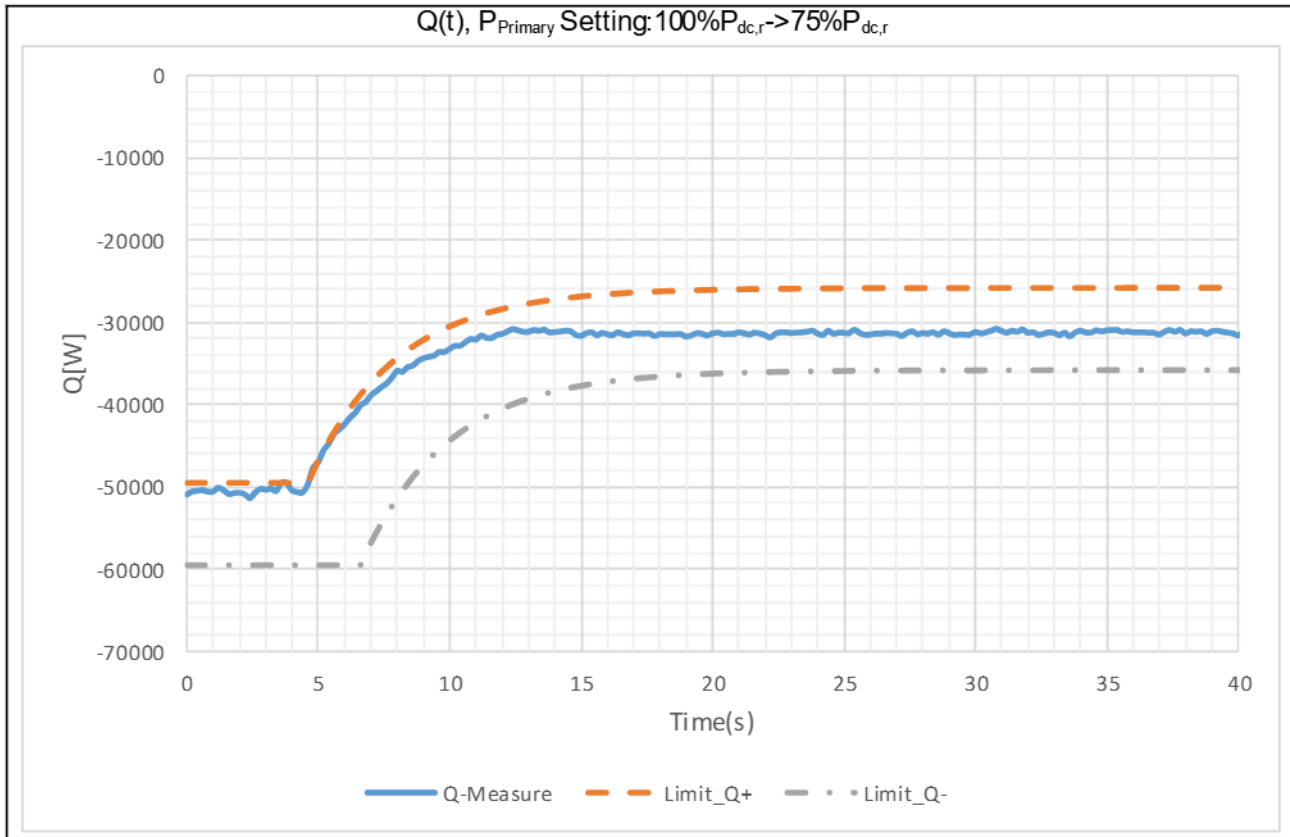
Plotting diagram:

$Q(t)$, P_{Primary} Setting: $100\%P_{\text{dc,r}} \rightarrow 40\%P_{\text{dc,r}}$



$Q(t)$, P_{Primary} Setting: $40\%P_{\text{dc,r}} \rightarrow 100\%P_{\text{dc,r}}$





5.4.8.4(a)	TABLE: Tests of reactive power-voltage character curve (Q(U))					P
Q (U) curve settings:	U/Un	0.93	0.97	1.03	1.07	
	Q/S _{E_{max}}	+0.436	0	0	-0.436	
	3Tau [s]	10				
Test Conditions		Measurements		Target	Tolerance	Limit
U/Un[%]		Q[Var]	U [V]	Q[Var]	$\Delta Q/P_{E_{max}}$ [%]	ΔQ [Var]
100		-1017	230.95	0	-0.81	$\pm(0.01*Un,Y*K_{QU}+0.04PE_{max}),$ $K_{QU}= Q_{max} /(0.04*Un,Y)$
99		-1021	228.65	0	-0.82	
98		-1052	226.32	0	-0.84	
97		-954	224.02	0	-0.76	
96		12717	221.73	13625	-0.73	
95		26235	219.46	27250	-0.81	
94		39759	217.16	40875	-0.89	
93		53643	214.85	54500	-0.69	
92		53654	212.55	54500	-0.68	
91		53688	210.23	54500	-0.65	
90		53698	207.93	54500	-0.64	
91		53681	210.25	54500	-0.66	
92		53666	212.56	54500	-0.67	
93		53637	214.85	54500	-0.69	
94		44474	217.13	40875	2.88	
95		28584	219.45	27250	1.07	
96		13784	221.75	13625	0.13	

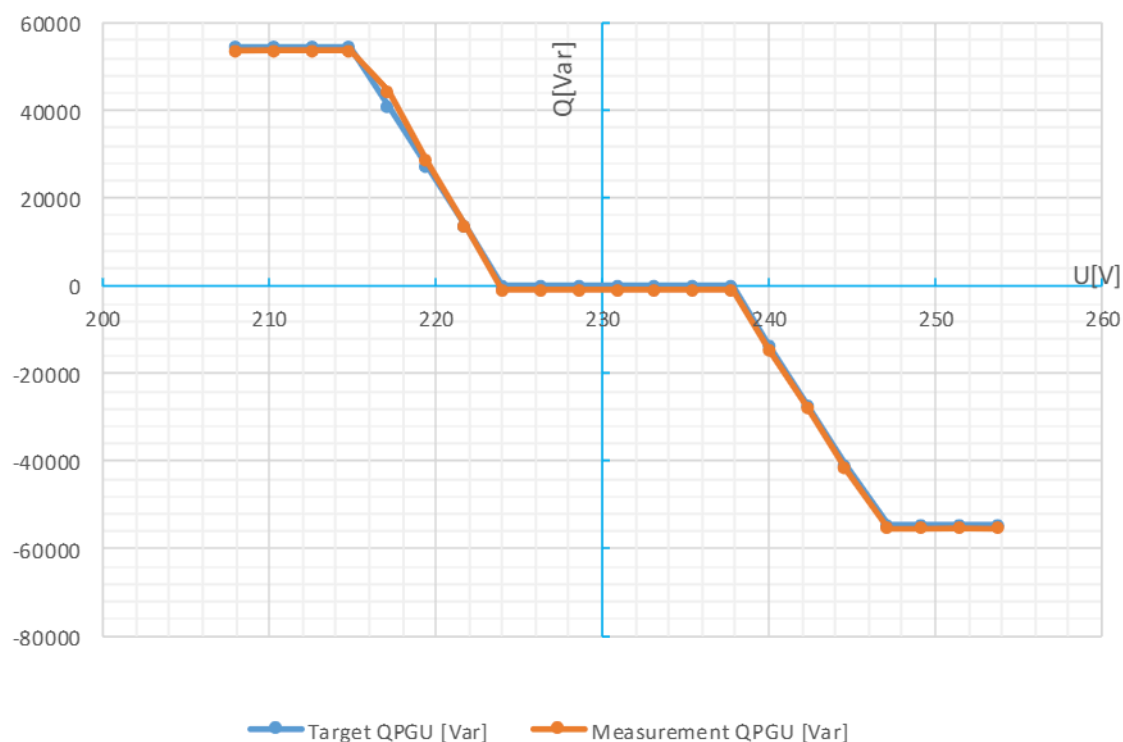
Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 29 von 153
Page 29 of 153

97	-1035	224.02	0	-0.83
98	-994	226.32	0	-0.80
99	-1003	228.63	0	-0.80
100	-1037	230.93	0	-0.83
101	-910	233.19	0	-0.36
102	-934	235.49	0	-0.37
103	-867	237.81	0	-0.35
104	-14569	240.06	-13625	-0.38
105	-27841	242.32	-27250	-0.24
106	-41588	244.59	-40875	-0.29
107	-55271	247.14	-54500	-0.31
108	-55201	249.13	-54500	-0.28
109	-55277	251.44	-54500	-0.31
110	-55167	253.74	-54500	-0.27
109	-55201	251.44	-54500	-0.28
108	-55141	249.14	-54500	-0.26
107	-55303	246.85	-54500	-0.32
106	-45316	244.57	-40875	-1.78
105	-30321	242.32	-27250	-1.23
104	-16682	240.08	-13625	-1.22
103	-879	237.80	0	-0.35
102	-955	235.51	0	-0.38
101	-1006	233.22	0	-0.40
100	-1070	230.92	0	-0.43

Diagram:



Prüfbericht-Nr.:
Test report no.:

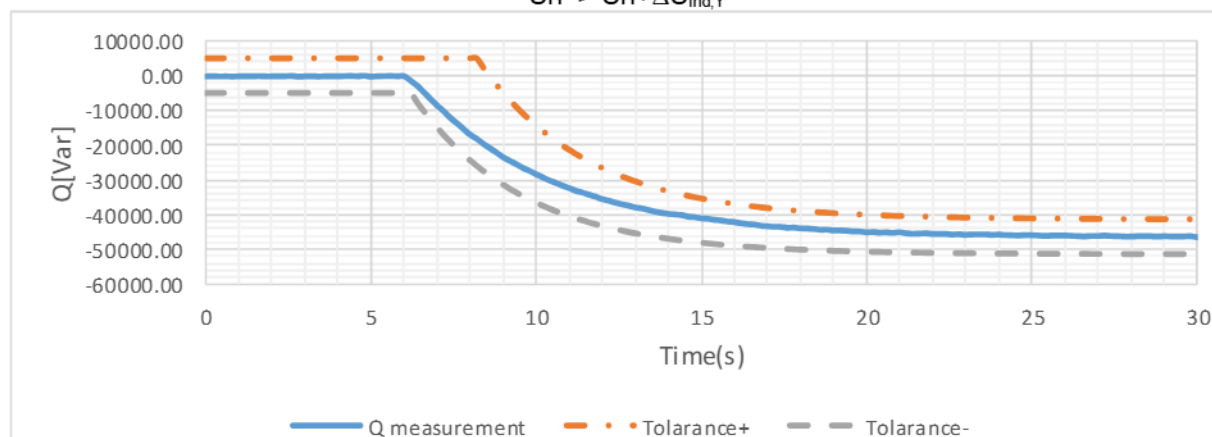
CN224DKW 001 Attachment 1

Seite 30 von 153
Page 30 of 153

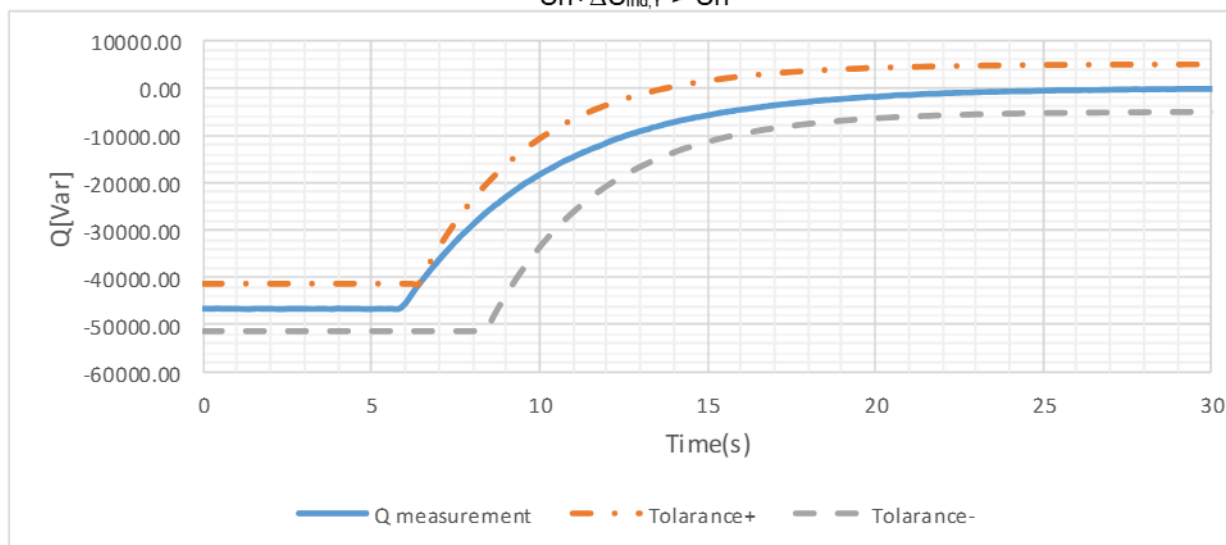
5.4.8.4(b)	TABLE: Tests of reactive power-voltage character curve (Q(U))					P
Test Conditions	Measurement			Target	Limit	
	Settling time T [s]	Q _{Start} [Var]	Q _{end} [Var]	Q _{end} /S _{Emax} [%]	Settling time T [s]	$\Delta Q_{end}/P_{E_{max}}$ [%]
Un -> Un+ $\Delta U_{ind,Y}$	12.4	-129	-44064	-0.85Q _{max}	PT1 complied, See attached curve for detail.	$\leq \pm 4$
Un+ $\Delta U_{ind,Y}$ -> Un	12.4	-46651	-35	0		$\leq \pm 4$
Un -> Un+ $\Delta U_{ind,Y}$	12.4	-139	-44061	-0.85Q _{max}		$\leq \pm 4$
Un+ $\Delta U_{ind,Y}$ -> Un	12.4	-46591	-282	0		$\leq \pm 4$
Un -> Un+ $\Delta U_{ind,Y}$	12.4	-239	-44059	-0.85Q _{max}		$\leq \pm 4$
Un+ $\Delta U_{ind,Y}$ -> Un	12.4	-46567	-280	0		$\leq \pm 4$
Un -> Un+ $\Delta U_{cap,Y}$	13	-213	44115	0.85Q _{max}		$\leq \pm 4$
Un+ $\Delta U_{cap,Y}$ -> Un	13	46536	37	0		$\leq \pm 4$
Un -> Un+ $\Delta U_{cap,Y}$	13	-93	44041	0.85Q _{max}		$\leq \pm 4$
Un+ $\Delta U_{cap,Y}$ -> Un	13	46555	11	0		$\leq \pm 4$
Un -> Un+ $\Delta U_{cap,Y}$	13.2	-156	44043	0.85Q _{max}		$\leq \pm 4$
Un+ $\Delta U_{cap,Y}$ -> Un	13	46566	-13	0		$\leq \pm 4$

Plotting Diagram

Un -> Un+ $\Delta U_{ind,Y}$



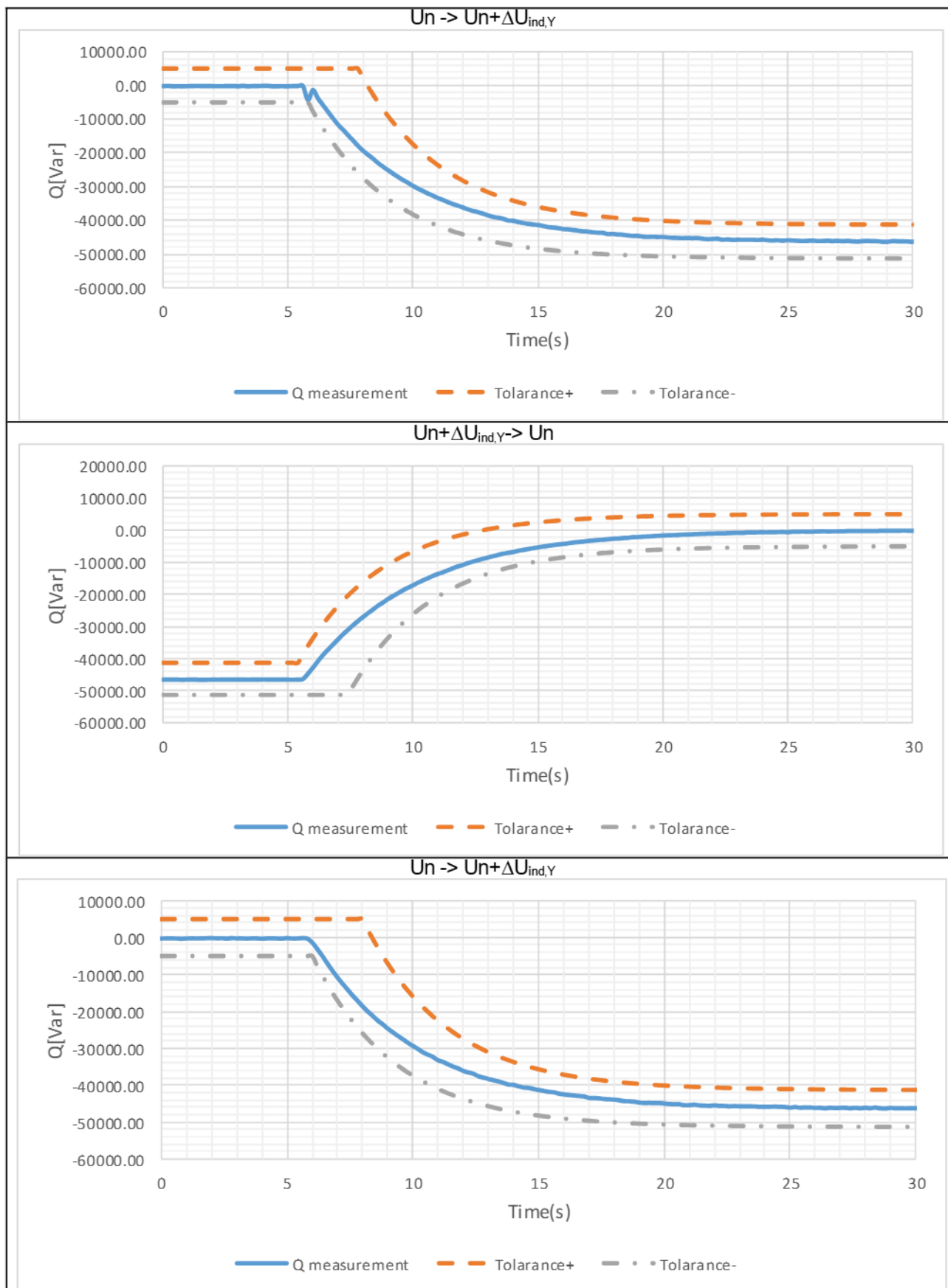
Un+ $\Delta U_{ind,Y}$ -> Un



Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

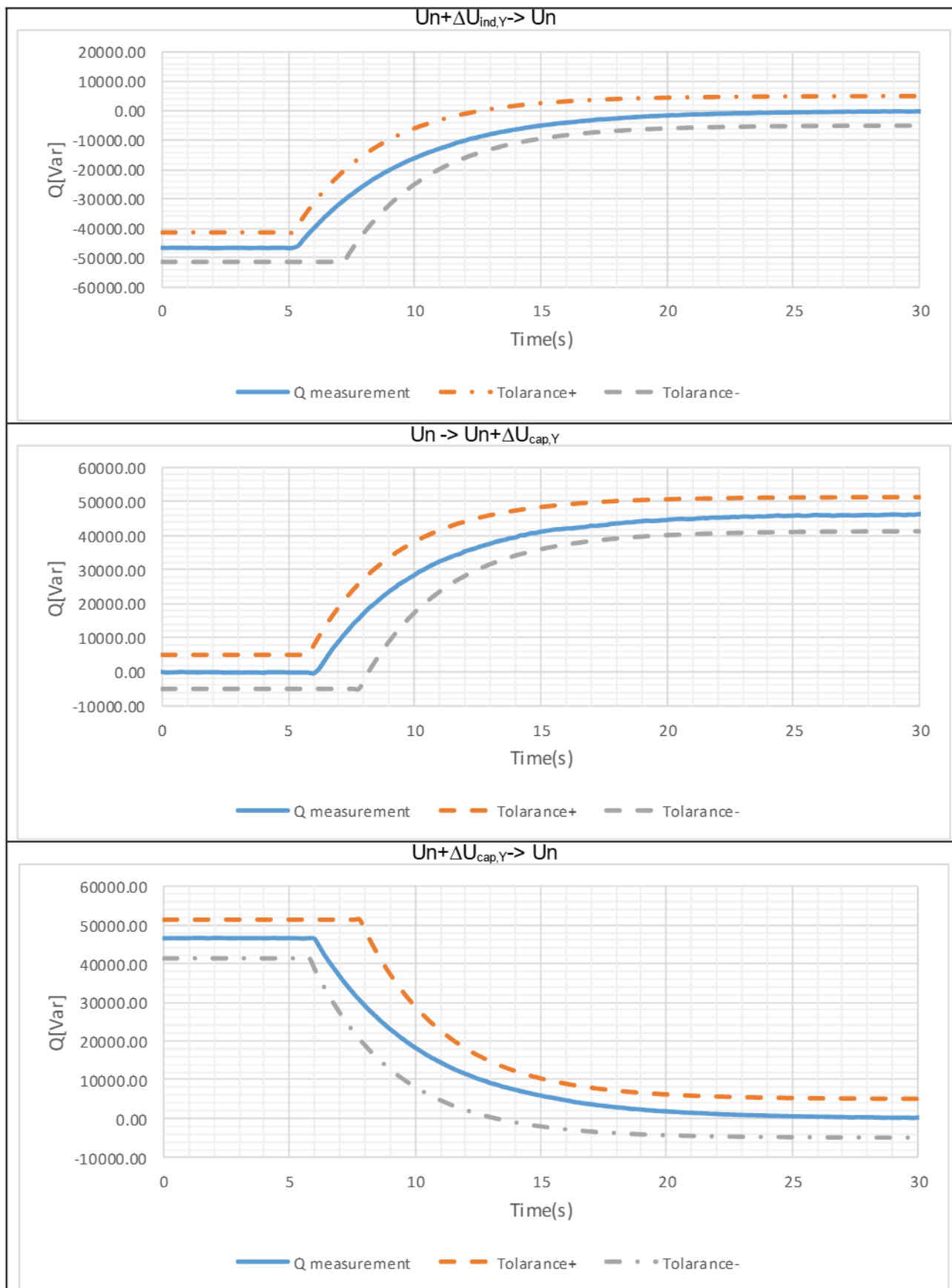
Seite 31 von 153
Page 31 of 153



Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

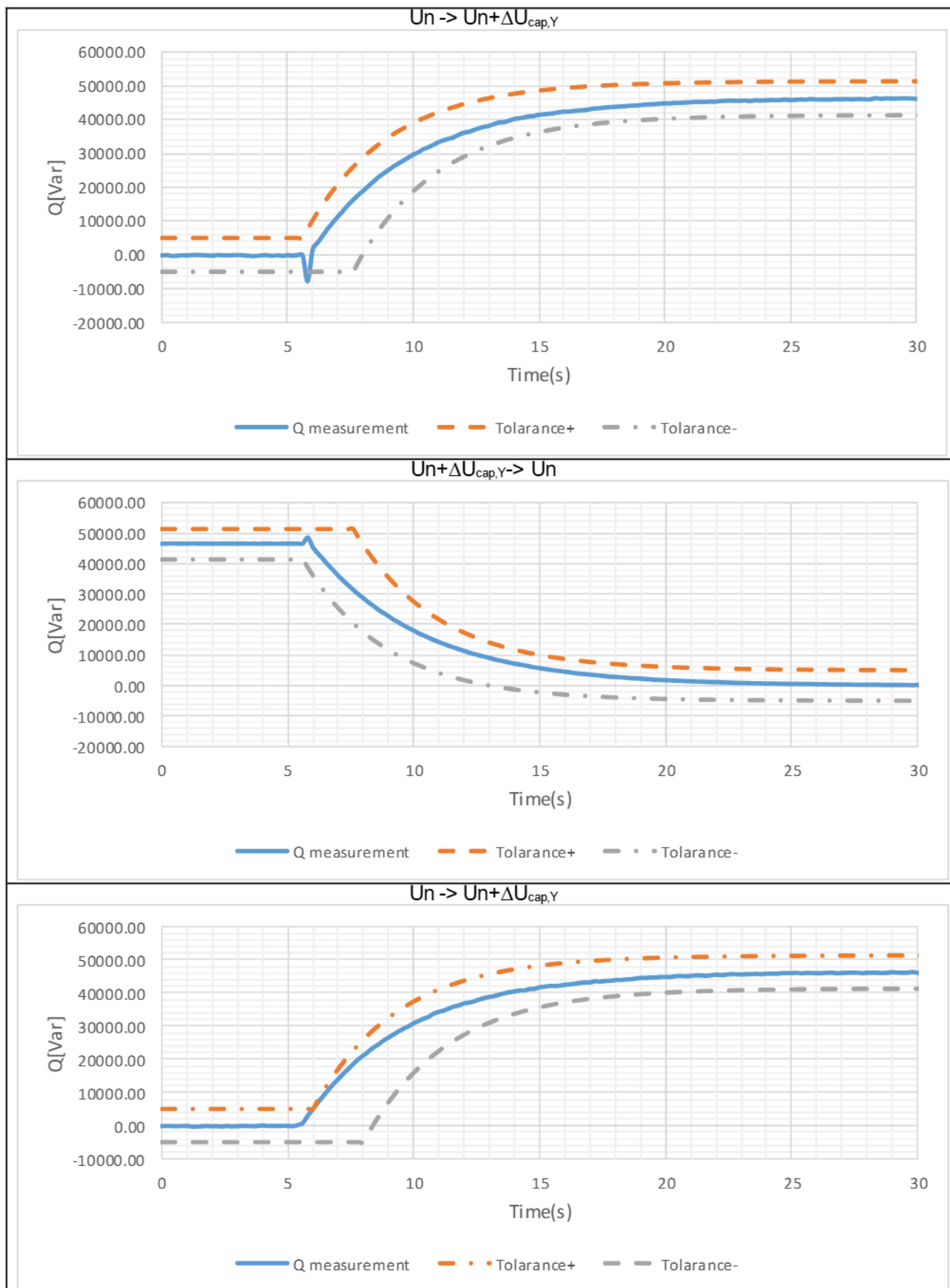
Seite 32 von 153
Page 32 of 153



Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

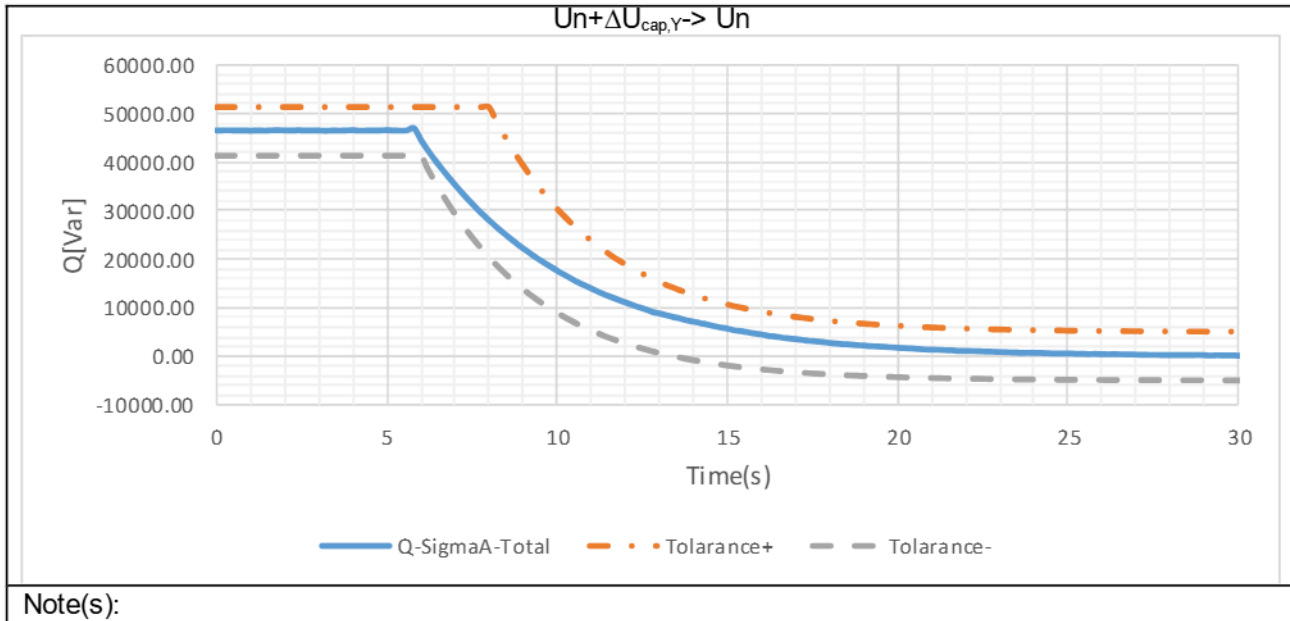
Seite 33 von 153
Page 33 of 153



Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 34 von 153
Page 34 of 153



5.5.2, 5.5.4, 5.5.6		TABLE: NS-protection, Integrated interface switch (Functional safety)					P
The max. initial short-circuited current I_k [A]:				182.3			
DIN EN 62109-1 cert/report No.:				N/A			
No.	component No.	fault	test voltage (V)	test time	fuse No.	Input current (A)	Result
1.	Relay defect K5 Pin 1-pin 2	Short before start-up	230Vac 600Vdc	10min	—	—	PCE can't start up. Error message: alarm grid relay abnormal No hazard, no damage, no reconnection.
2.	Relay defect K8 Pin 1-pin 2	Short before start-up	230Vac 600Vdc	10min	—	—	PCE can't start up. Error message: alarm grid relay abnormal No hazard, no damage, no reconnection.
3.	Relay defect C956	Short before start-up	230Vac 600Vdc	10min	—	—	PCE can't start up. Error message: alarm grid relay abnormal No hazard, no damage, no reconnection.
4.	Relay defect R144	Short before start-up	230Vac 600Vdc	10min	—	—	PCE can't start up. Error message: alarm grid relay abnormal No hazard, no damage, no reconnection.

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 35 von 153
Page 35 of 153

5.	Relay defect Q5	Short before start-up	230Vac 600Vdc	10min	--	--	PCE can't start up. Error message: alarm grid relay abnormal No hazard, no damage, no reconnection.
6.	Relay defect Q6	Short before start-up	230Vac 600Vdc	10min	--	--	PCE can't start up. Error message: Leakage current sensor hardware failure No hazard, no damage, no reconnection.
7.	Relay defect R144	Open before start-up	230Vac 600Vdc	10min	--	--	PCE can't start up. Error message: Leakage current sensor hardware failure No hazard, no damage, no reconnection.
8.	Relay defect C28	Short before start-up	230Vac 600Vdc	10min	--	--	PCE can't start up. Error message: alarm grid relay abnormal No hazard, no damage, no reconnection.
9.	PV insulation measurement defect Q7	Short before start-up	230Vac 600Vdc	10min	--	--	EUT can't start up. Error message: Unit can't power on, alarm, ISO fault. No hazard, no damage, no reconnection.
10.	PV insulation measurement defect D98	Short before start-up	230Vac 600Vdc	10min	--	--	PCE can't start up. Error message: Unit can't power on, alarm, ISO fault. No hazard, no damage, no reconnection.
11.	PV insulation measurement defect U35	Short before start-up	230Vac 600Vdc	10min	--	--	PCE can't start up. Error message: Unit can't power on, alarm, ISO fault. No hazard, no damage, no reconnection.
12.	RCMU measurement defect Q14	s-c	230Vac 600Vdc	10min	--	--	PCE shutdown immediately. Error message: alarm boost input over current No hazard, no damage, no reconnection.

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 36 von 153
Page 36 of 153

13.	RCMU measurement defect C747 +5V	s-c	230Vac 600Vdc	10min	--	--	PCE shutdown immediately. Error message: alarm boost input over current No hazard, no damage, no reconnection.
14.	RCMU measurement defect R126	o-c	230Vac 600Vdc	10min	--	--	PCE shutdown immediately. Error message: alarm boost input over current No hazard, no damage, no reconnection.
15.	RCMU measurement defect R461	o-c	230Vac 600Vdc	10min	--	--	PCE shutdown immediately. Error message: alarm boost input over current No hazard, no damage, no reconnection.
16.	RCMU measurement defect U34 pin1 to pin4	s-c	230Vac 600Vdc	10min	--	--	PCE shutdown immediately. Error message: alarm boost input over current No hazard, no damage, no reconnection.
17.	PV voltage detect D1502 PIN2- PIN3	s-c	230Vac 600Vdc	10min	--	--	PV inverter shut down. Error message "High String Input Voltage". No components damage, no hazard.
18.	PV voltage detect D1502 PIN1- PIN3	s-c	230Vac 600Vdc	10min	--	--	PV inverter shut down. Error message "High String Input Voltage". No components damage, no hazard.
19.	PV current detect C3201 SMP_BOOS T_A_CUR_D C-3V3	o-c	230Vac 600Vdc	10min	--	--	PV inverter shut down. Error message "Device Fault". No components damage, no hazard.
20.	PV current detect C3201 SMP_BOOS T_A_CUR_D C-AGND	o-c	230Vac 600Vdc	10min	--	--	PV inverter shut down. Error message "Device Fault". No components damage, no hazard.

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 37 von 153
 Page 37 of 153

21.	PV current detect D1501 PIN2-PIN3	s-c	230Vac 600Vdc	10min	--	--	PV inverter shut down. Error message "Device Fault". No components damage, no hazard.
22.	PV current detect D1501 PIN1-PIN3	s-c	230Vac 600Vdc	10min	--	--	PV inverter shut down. Error message "Device Fault". No components damage, no hazard.
23.	Grid voltage L2L3 line monitoring U59, PIN8-+5V	s-c	230Vac 600Vdc	10min	--	--	PV inverter shut down. Error message "Grid Overvoltage". No components damage, no hazard.
24.	Grid voltage L2L3 line monitoring U59, PIN8-AGND	s-c	230Vac 600Vdc	10min	--	--	PV inverter shut down. Error message "Grid Overvoltage". No components damage, no hazard.
25.	Grid voltage L3 phase monitoring U59, PIN8-+5V	s-c	230Vac 600Vdc	10min	--	--	PV inverter shut down. Error message "alarm grid relay abnormal". No components damage, no hazard.
26.	Grid voltage L3 phase monitoring U59, PIN8-AGND	s-c	230Vac 600Vdc	10min	--	--	PV inverter shut down. Error message "alarm grid relay abnormal". No components damage, no hazard.
27.	Grid frequency monitoring U50 PIN2-PIN3	s-c	230Vac 600Vdc	10min	--	--	PV inverter shut down. Error message "Grid Under frequency". No components damage, no hazard.
28.	Grid frequency monitoring U50 PIN2-PIN12	o-c	230Vac 600Vdc	10min	--	--	PV inverter shut down. Error message "Grid Under frequency". No components damage, no hazard.
29.	Main ARM pin 139 R1767	o-c	230Vac 600Vdc	10min	--	--	PV inverter shut down. Error message "Device Fault". No components damage, no hazard.

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 38 von 153
Page 38 of 153

30.	Main ARM pin 140 R1766	o-c	230Vac 600Vdc	10min	--	--	PV inverter shut down. Error message "Device Fault". No components damage, no hazard.
31.	Slave ARM pin 139 R1733	o-c	230Vac 600Vdc	10min	--	--	PV inverter shut down. Error message "Device Fault". No components damage, no hazard.
32.	Slave ARM pin 140 R1732	o-c	230Vac 600Vdc	10min	--	--	PV inverter shut down. Error message "Device Fault". No components damage, no hazard.
33.	Loss of control DSP failure CPU, C104	s-c +3.3V	230Vac 600Vdc	10min	--	--	PV inverter shut down. No components damage, no hazard. Inverter can be restarted and operated normally when the fault was removed, no alarm.

Note(s): The unit passed electric strength test after single fault test above.

5.5.7(a)	TABLE: Protection devices and protection settings (OV/UV)					P
Condition	Setting U/Un [%]	Measurement				Limitation $\Delta U/Un$ [%]
		Trip value [V]				
		L123	L1	L2	L3	
U>>	125	286.9	286.5	286.8	287.2	$\leq \pm 1.0$
U<	80	185.4	184.3	184.0	184.4	
U<<	45	104.9	101.6	103.8	103.8	
Condition	Setting U/Un [%]	Measurement				Limitation $\Delta U/Un$ [%]
		Trip value [V]				
		L123	L1-L2	L2-L3	L3-L1	
U>>	125	--	286.2	286.6	286.9	$\leq \pm 1.0$
U<	80	--	185.3	185.3	185.3	
U<<	45	--	104.8	104.8	103.8	
Condition	Setting [ms]	Measurement				Limitation [ms]
		Trip time [ms]				
		L123	L1	L2	L3	
U>>	100	138	139	138	137	≤ 200
U<	3000	3036	3035	3027	3027	3000-3100
U<<	300	338	338	345	345	300-400
Condition	Setting	Measurement				Limitation [ms]
		Trip time [ms]				
		L123	L1-L2	L2-L3	L3-L1	
U>>	100	--	125	125	125	≤ 200

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 39 von 153
Page 39 of 153

U<	3000	--	3030	3020	3020	3000-3100
U<<	300	--	340	330	340	300-400
Condition	Setting [s]	Measurement				Limitation [s]
		Trip time [s]				
		L123	L1	L2	L3	
U> 230->257.6	500	471	464	460	504	450-550
U> 230->248.4	No disconnect	No disconnect				No disconnect
U> 244->262.2	300	245	250	243	314	225-375
Note(s): Tests on L-L voltages are applicable to product over 30kVA.						

5.5.7(b)	TABLE: Protection devices and protection settings (OF/UF)		P
Condition	Setting f [Hz]	Measurement	Limitation Δf/fn [%]
		Trip value [Hz]	
f>	51.5	51.49	≤±0.1
f<	47.5	47.50	
Condition	Setting [ms]	Measurement	Limitation [ms]
		Trip time [ms]	
f>	100	120	≤200
f<	100	148	≤200
Note(s):			

5.5.7(c)	TABLE: Protection devices and protection settings		P
1.	The last 5 fault indication can be read	☒ Pass ☐ Failed	
	Fault 1: Grid Undervoltage	Interface equipment: Communication with PC.	
	Fault 2: Grid Underfrequency	Interface equipment: Communication with PC.	
	Fault 3: Grid Loss	Interface equipment: Communication with PC.	
	Fault 4: Grid Loss	Interface equipment: Communication with PC.	
	Fault 5: Grid Loss	Interface equipment: Communication with PC.	
2.	Fault indication can be read after a supply interruption $\leq 3s$	☒ Pass ☐ Failed	
	Fault 1: Grid Undervoltage	Interface equipment: Communication with PC.	
	Fault 2: Grid Underfrequency	Interface equipment: Communication with PC.	
	Fault 3: Grid Loss	Interface equipment: Communication with PC.	

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 40 von 153
Page 40 of 153

Fault 4: Grid Loss	Interface equipment: Communication with PC.
Fault 5: Grid Loss	Interface equipment: Communication with PC.

5.5.9	TABLE: Constructional features of NS protection	P
1.	The protection settings can be read on PGU or data interface equipment	☒ Pass ☐ Failed Interface equipment: Communication with PC.
2.	The NS protection settings shall be protected.	☒ Pass ☐ Failed Protection type: Password Protected
3.	If all protection settings are fixed	☒ Pass ☐ Failed Protection settings: Can be set but requires password authentication

5.5.10	TABLE: Islanding detection (per IEC 62116: 2014)					P
Power 100%						
Conditions	P _R [kW]	Q _L [kVar]	Q _C [kVar]	Q _f	Trip time [ms]	Limitation [ms]
P _R : -10% Q _C : +10%	L1: 37.54	L1: 45.84	L1: 41.64	1.16	216	
	L2: 37.58	L2: 45.86	L2: 41.62	1.16		9000
	L3: 37.61	L3: 45.88	L3: 41.63	1.16		
P _R : -10% Q _C : +5%	L1: 37.49	L1: 43.77	L1: 41.59	1.14	247	
	L2: 37.51	L2: 43.71	L2: 41.60	1.14		9000
	L3: 37.56	L3: 43.74	L3: 41.63	1.14		
P _R : -10% Q _C : 0%	L1: 37.66	L1: 41.67	L1: 41.58	1.11	304	
	L2: 37.61	L2: 41.65	L2: 41.62	1.11		9000
	L3: 37.68	L3: 41.61	L3: 41.64	1.11		
P _R : -10% Q _C : -5%	L1: 37.58	L1: 39.61	L1: 41.66	1.08	220	
	L2: 37.60	L2: 39.56	L2: 41.61	1.08		9000
	L3: 37.54	L3: 39.57	L3: 41.63	1.08		
P _R : -10% Q _C : -10%	L1: 37.48	L1: 37.53	L1: 41.67	1.06	203	
	L2: 37.52	L2: 37.58	L2: 41.59	1.06		9000
	L3: 37.54	L3: 37.52	L3: 41.62	1.06		
P _R : -5% Q _C : +10%	L1: 39.62	L1: 45.86	L1: 41.61	1.10	215	
	L2: 39.59	L2: 45.79	L2: 41.63	1.10		9000
	L3: 39.64	L3: 45.83	L3: 41.66	1.10		
P _R : -5% Q _C : -10%	L1: 39.64	L1: 37.56	L1: 41.68	0.99	199	
	L2: 39.61	L2: 37.55	L2: 41.56	1.00		9000

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 41 von 153
Page 41 of 153

	L3: 39.59	L3: 37.48	L3: 41.61	1.00		
P _R : 0% Q _C : +10%	L1: 41.58	L1: 45.88	L1: 41.64	1.05	227	9000
	L2: 41.62	L2: 45.81	L2: 41.62	1.04		
	L3: 41.65	L3: 45.86	L3: 41.65	1.05		
P _R : -5% Q _C : +5%	L1: 39.66	L1: 43.78	L1: 41.61	1.08	239	9000
	L2: 39.62	L2: 43.71	L2: 41.63	1.07		
	L3: 39.64	L3: 43.72	L3: 41.62	1.08		
P _R : -5% Q _C : 0%	L1: 39.64	L1: 41.71	L1: 41.65	1.05	275	9000
	L2: 39.62	L2: 41.66	L2: 41.68	1.05		
	L3: 39.61	L3: 41.64	L3: 41.62	1.05		
P _R : -5% Q _C : -5%	L1: 39.63	L1: 39.62	L1: 41.63	1.02	208	9000
	L2: 39.65	L2: 39.57	L2: 41.67	1.03		
	L3: 39.58	L3: 39.63	L3: 41.62	1.02		
P _R : 0% Q _C : +5%	L1: 41.66	L1: 43.71	L1: 41.62	1.02	332	9000
	L2: 41.57	L2: 43.77	L2: 41.58	1.02		
	L3: 41.63	L3: 43.69	L3: 41.63	1.02		
P _R : 0% Q _C : 0%	L1: 41.7	L1: 41.65	L1: 41.68	1.00	346	9000
	L2: 41.68	L2: 41.61	L2: 41.73	1.00		
	L3: 41.63	L3: 41.63	L3: 41.65	1.00		
P _R : 0% Q _C : -5%	L1: 41.69	L1: 39.64	L1: 41.66	0.97	213	9000
	L2: 41.71	L2: 39.59	L2: 41.59	0.97		
	L3: 41.66	L3: 39.55	L3: 41.61	0.97		
P _R : +5% Q _C : +5%	L1: 43.81	L1: 39.64	L1: 41.66	0.93	240	9000
	L2: 43.79	L2: 39.59	L2: 41.59	0.93		
	L3: 43.74	L3: 39.55	L3: 41.61	0.93		
P _R : +5% Q _C : 0%	L1: 41.65	L1: 37.56	L1: 41.68	0.95	322	9000
	L2: 41.64	L2: 37.55	L2: 41.56	0.95		
	L3: 41.61	L3: 37.48	L3: 41.61	0.95		
P _R : +5% Q _C : -5%	L1: 43.81	L1: 45.88	L1: 41.64	1.00	216	9000
	L2: 43.79	L2: 45.81	L2: 41.62	1.00		
	L3: 43.74	L3: 45.86	L3: 41.65	1.00		
P _R : 0% Q _C : -10%	L1: 43.81	L1: 37.56	L1: 41.68	0.9	193	9000
	L2: 43.79	L2: 37.55	L2: 41.56	0.9		
	L3: 43.74	L3: 37.48	L3: 41.61	0.9		
P _R : +5% Q _C : +10%	L1: 45.89	L1: 45.88	L1: 41.64	0.95	215	9000
	L2: 45.81	L2: 45.81	L2: 41.62	0.95		
	L3: 45.84	L3: 45.86	L3: 41.65	0.95		
P _R : +5% Q _C : -10%	L1: 45.89	L1: 43.71	L1: 41.62	0.93	323	9000
	L2: 45.81	L2: 43.77	L2: 41.58	0.93		

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 42 von 153
Page 42 of 153

	L3: 45.84	L3: 43.69	L3: 41.63	0.93		
P _R : +10% Q _C : +10%	L1: 45.89	L1: 41.65	L1: 41.68	0.91	225	
	L2: 45.81	L2: 41.61	L2: 41.73	0.91		9000
	L3: 45.84	L3: 41.63	L3: 41.65	0.91		
P _R : +10% Q _C : +5%	L1: 45.81	L1: 39.64	L1: 41.66	0.89	227	
	L2: 45.79	L2: 39.59	L2: 41.59	0.89		9000
	L3: 45.83	L3: 39.55	L3: 41.61	0.89		
P _R : +10% Q _C : 0%	L1: 45.81	L1: 37.56	L1: 41.68	0.86	338	
	L2: 45.79	L2: 37.55	L2: 41.56	0.86		9000
	L3: 45.83	L3: 37.48	L3: 41.61	0.86		
P _R : +10% Q _C : -5%	L1: 39.62	L1: 45.86	L1: 41.61	1.10	210	
	L2: 39.59	L2: 45.79	L2: 41.63	1.10		9000
	L3: 39.64	L3: 45.83	L3: 41.66	1.10		
P _R : +10% Q _C : -10%	L1: 39.64	L1: 37.56	L1: 41.68	0.99	192	
	L2: 39.61	L2: 37.55	L2: 41.56	1.00		9000
	L3: 39.59	L3: 37.48	L3: 41.61	1.00		
Power 66%						
Conditions	P _R [kW]	Q _L [kVar]	Q _C [kVar]	Q _f	Trip time [ms]	Limitation [ms]
P _R : 0% Q _C : -5%	L1: 27.42	L1: 25.56	L1: 27.58	0.97	195	
	L2: 27.48	L2: 25.51	L2: 27.53	0.97		9000
	L3: 27.51	L3: 25.49	L3: 27.55	0.97		
P _R : 0% Q _C : -4%	L1: 27.46	L1: 25.91	L1: 27.58	0.97	208	
	L2: 27.48	L2: 25.96	L2: 27.53	0.97		9000
	L3: 27.51	L3: 26.29	L3: 27.55	0.97		
P _R : 0% Q _C : -3%	L1: 27.45	L1: 26.45	L1: 27.61	0.98	214	
	L2: 27.50	L2: 26.38	L2: 27.63	0.98		9000
	L3: 27.46	L3: 26.29	L3: 27.59	0.98		
P _R : 0% Q _C : -2%	L1: 27.45	L1: 26.56	L1: 27.61	0.99	219	
	L2: 27.50	L2: 26.57	L2: 27.63	0.99		9000
	L3: 27.46	L3: 26.61	L3: 27.59	0.99		
P _R : 0% Q _C : -1%	L1: 27.45	L1: 26.98	L1: 27.61	0.99	264	
	L2: 27.50	L2: 26.87	L2: 27.63	0.99		9000
	L3: 27.46	L3: 26.91	L3: 27.59	0.99		
P _R : 0% Q _C : 0%	L1: 27.45	L1: 27.58	L1: 27.62	1.00	276	
	L2: 27.50	L2: 27.56	L2: 27.61	1.00		9000
	L3: 27.46	L3: 27.54	L3: 27.54	1.00		
P _R : 0% Q _C : +1%	L1: 27.45	L1: 28.14	L1: 27.62	1.02	276	
	L2: 27.50	L2: 28.17	L2: 27.61	1.02		9000

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 43 von 153
Page 43 of 153

	L3: 27.46	L3: 28.12	L3: 27.54	1.02		
P _R : 0% Q _C : +2%	L1: 27.45	L1: 28.58	L1: 27.58	1.02	252	
	L2: 27.50	L2: 28.62	L2: 27.61	1.02		9000
	L3: 27.46	L3: 28.51	L3: 27.57	1.02		
P _R : 0% Q _C : +3%	L1: 27.51	L1: 28.91	L1: 27.62	1.03	215	
	L2: 27.55	L2: 28.94	L2: 27.61	1.03		9000
	L3: 27.46	L3: 29.01	L3: 27.54	1.03		
P _R : 0% Q _C : +4%	L1: 27.47	L1: 29.32	L1: 27.64	1.04	212	
	L2: 27.50	L2: 29.27	L2: 27.63	1.04		9000
	L3: 27.46	L3: 29.28	L3: 27.57	1.04		
P _R : 0% Q _C : +5%	L1: 27.45	L1: 29.72	L1: 27.62	1.04	200	
	L2: 27.50	L2: 29.75	L2: 27.61	1.04		9000
	L3: 27.46	L3: 29.78	L3: 27.54	1.04		
Power 33%						
Conditions	P _R [kW]	Q _L [kVar]	Q _C [kVar]	Q _f	Trip time [ms]	Limitation [ms]
P _R : 0% Q _C : -5%	L1: 13.67	L1: 11.55	L1: 13.81	0.92	212	
	L2: 13.72	L2: 11.61	L2: 13.79	0.92		9000
	L3: 13.78	L3: 11.59	L3: 13.71	0.92		
P _R : 0% Q _C : -4%	L1: 13.78	L1: 12.12	L1: 13.89	0.94	213	
	L2: 13.74	L2: 12.18	L2: 13.72	0.94		9000
	L3: 13.72	L3: 12.21	L3: 13.69	0.94		
P _R : 0% Q _C : -3%	L1: 13.68	L1: 12.56	L1: 13.89	0.96	215	
	L2: 13.74	L2: 12.61	L2: 13.72	0.96		9000
	L3: 13.72	L3: 12.58	L3: 13.69	0.96		
P _R : 0% Q _C : -2%	L1: 13.79	L1: 12.94	L1: 13.89	0.97	248	
	L2: 13.74	L2: 12.97	L2: 13.72	0.97		9000
	L3: 13.72	L3: 13.01	L3: 13.69	0.97		
P _R : 0% Q _C : -1%	L1: 13.69	L1: 13.42	L1: 13.91	0.99	256	
	L2: 13.72	L2: 13.38	L2: 13.87	0.99		9000
	L3: 13.78	L3: 13.47	L3: 13.85	0.99		
P _R : 0% Q _C : 0%	L1: 13.77	L1: 13.76	L1: 13.84	1.00	280	
	L2: 13.65	L2: 13.81	L2: 13.81	1.00		9000
	L3: 13.72	L3: 13.86	L3: 13.77	1.00		
P _R : 0% Q _C : +1%	L1: 13.81	L1: 14.17	L1: 13.71	1.01	256	
	L2: 13.78	L2: 14.27	L2: 13.79	1.01		9000
	L3: 13.72	L3: 14.31	L3: 13.72	1.01		
P _R : 0% Q _C : +2%	L1: 13.86	L1: 14.62	L1: 13.75	1.02	222	
	L2: 13.77	L2: 14.78	L2: 13.84	1.02		9000

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 44 von 153
Page 44 of 153

	L3: 13.76	L3: 14.82	L3: 13.82	1.02		
P _R : 0% Q _c : +3%	L1: 13.74	L1: 15.24	L1: 13.75	1.05	214	9000
	L2: 13.78	L2: 15.34	L2: 13.79	1.05		
	L3: 13.72	L3: 15.24	L3: 13.72	1.05		
P _R : 0% Q _c : +4%	L1: 13.81	L1: 15.75	L1: 13.79	1.07	212	9000
	L2: 13.78	L2: 15.72	L2: 13.82	1.07		
	L3: 13.72	L3: 15.79	L3: 13.75	1.07		
P _R : 0% Q _c : +5%	L1: 13.81	L1: 16.21	L1: 13.71	1.08	202	9000
	L2: 13.78	L2: 16.18	L2: 13.79	1.08		
	L3: 13.72	L3: 16.31	L3: 13.72	1.08		

5.6	TABLE: Connection conditions and synchronization (Reconnection)				P
Condition	Measurement		Limitation		
	Reconnection	Delay time [s]	Reconnection	Delay time [s]	
f<47.45Hz	No	--	No	≥60	
f≥47.55Hz	Yes	69	Yes	≥60	
f>50.15Hz	No	--	No	≥60	
f≤50.05Hz	Yes	68	Yes	≥60	
U<0.84Un	No	--	No	≥60	
U≥0.86Un	Yes	68	Yes	≥60	
U>1.11Un	No	--	No	≥60	
U≤1.09Un	Yes	68	Yes	≥60	
Note(s):					

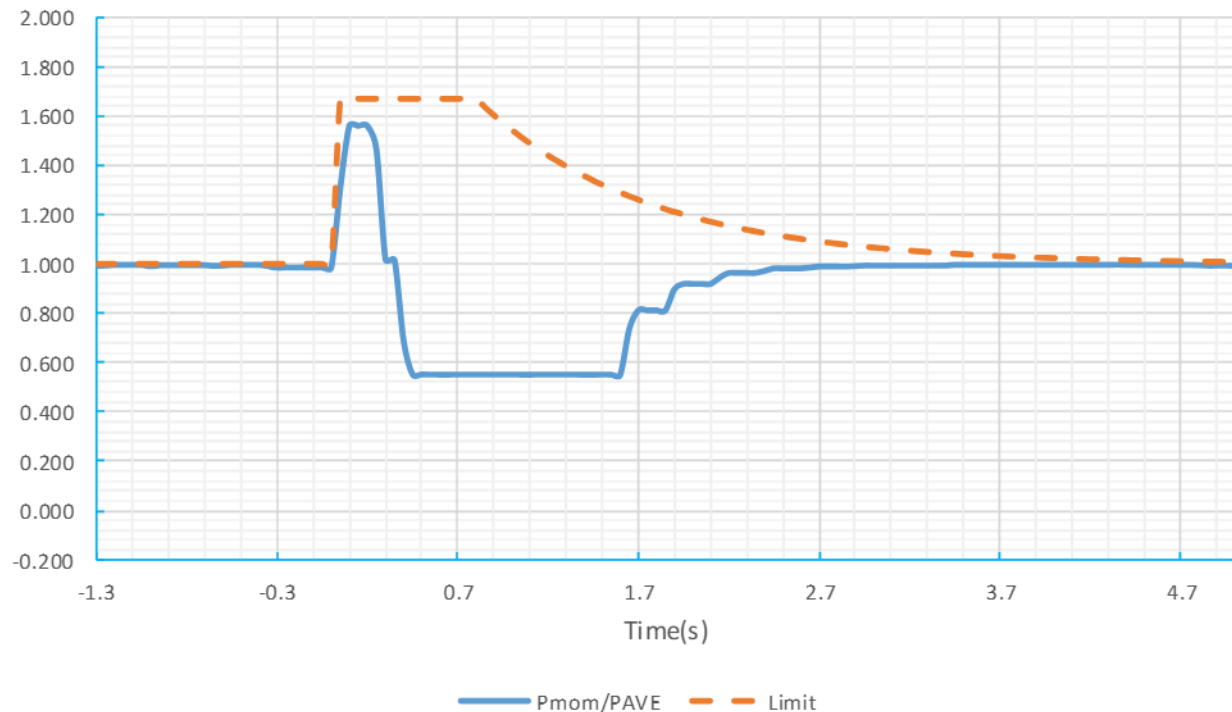
5.7	TABLE: P _{AV,E} monitoring		P
P _{AV,E} value setting: 60% P _n			
Power limit method			
Test method		Condition	
Jump of primary energy		P _{rim} / P _{dc,r} : 60%->100%	
Cut of load		P _{load} /P _n : 40%->0%	

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 45 von 153
Page 45 of 153

Power curve:



Disconnection method

Condition	Trip time [ms]	
	Measurement	Limitation
$0.98 \cdot P_{AV,E}$	N/A	No disconnect
$1.02 P_{AV,E} - 1.067 \cdot P_{AV,E}$	N/A	$< 10000 + 200$
$1.067 P_{AV,E} - 1.670 \cdot P_{AV,E}$	N/A	$< 3000 + 200$
$1.690 \cdot P_{AV,E}$	N/A	< 200

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

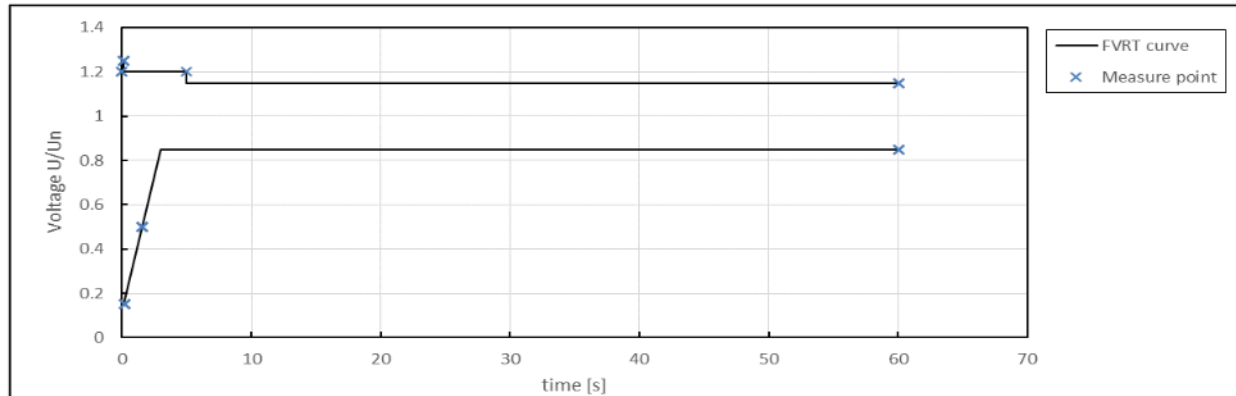
Seite 46 von 153
Page 46 of 153

5.8

TABLE: Verification of dynamic network supporting (FVRT)

P

FVRT curve settings:



Fault Type	3-phase fault and 2-phase fault
Transformer Type	Dy5
NS protection settings	See table 5.5.7 for detail.
Any auxilliary power supply in fault ride through?	Yes/No
Terminal sequence	For D1: U-L1, V-L2, W-L3 For D2: U-L3, V-L1, W-L2

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 47 von 153
Page 47 of 153

5.8		Verification of dynamic network support				P
Test	Voltage depth U/Un [p.u.]	Fault type	Fault duration [ms]	Power P/Pn [p.u.]	Reactive power Q/Pn [p.u.]	Test No.
1	0.15.....0.25	A	For 0.15pu ≥150 For 0.25pu ≥500	1.0	0...±0.1	1.1
				0.2...0.6		1.2
		D1		1.0		1.3
				0.2...0.6		1.4
		D2		1.0		1.3 (D2)
2	0.50....0.60	A	For 0.5pu ≥1500 For 0.60pu ≥ 2000	1.0	Max. over- excited	2.1
				0.2...0.6		2.2
		D1		1.0		2.3
				0.2...0.6		2.4
3	0.50....0.60	A	For 0.5pu ≥1500 For 0.60pu ≥ 2000	1.0	Max. under- excited	3.1
				0.2...0.6		3.2
		D1		1.0		3.3
				0.2...0.6		3.4
4	0.85....0.90	A	≥ 60000	1.0	0...±0.1	4.1
				0.2...0.6		4.2
		D1		1.0		4.3
				0.2...0.6		4.4
5	1.2....1.25	A	≥ 100	1.0	0...±0.1	5.1
				0.2...0.6		5.2
		D1		1.0		5.3
				0.2...0.6		5.4
		D2		1.0		5.3 (D2)
6	1.15...1.20	A	≥ 5000	1.0	0...±0.1	6.1
				0.2...0.6		6.2
		D1		1.0		6.3
				0.2...0.6		6.4
7	1.10...1.15	A	≥ 60000	1.0	0...±0.1	7.1
				0.2...0.6		7.2
		D1		1.0		7.3
				0.2...0.6		7.4

Prüfbericht-Nr.:
Test report no.:

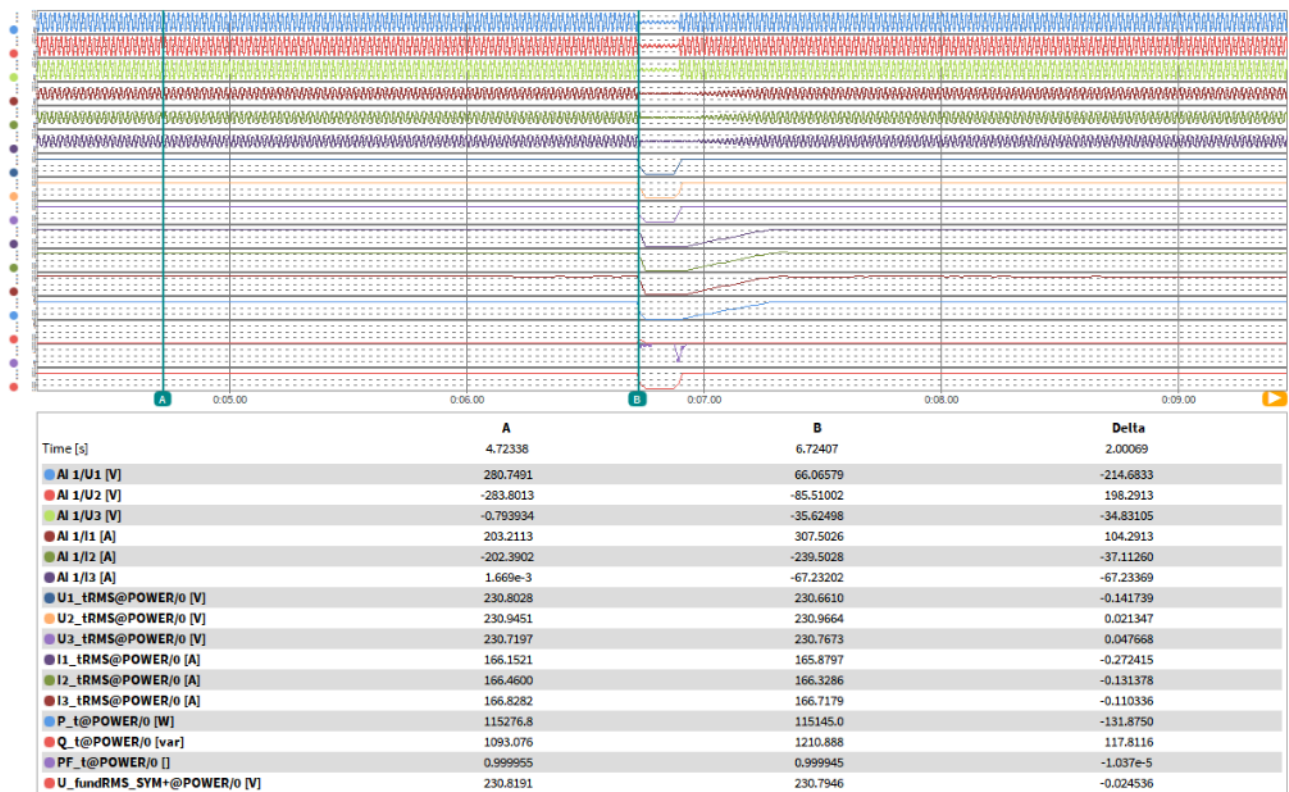
CN224DKW 001 Attachment 1

Seite 48 von 153
Page 48 of 153

Test No. 1.1 idle test



Test No. 1.1 with PGU Before dip

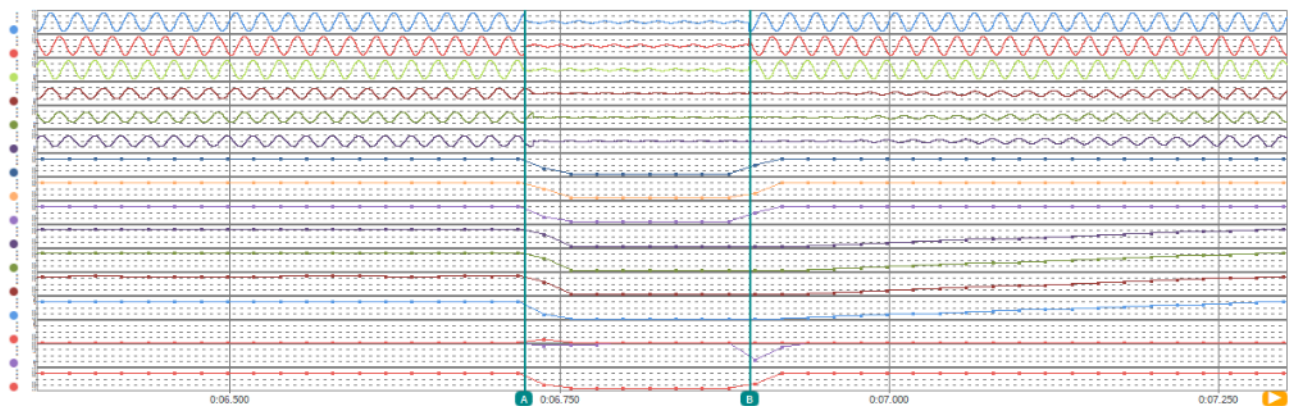


Prüfbericht-Nr.:
Test report no.:

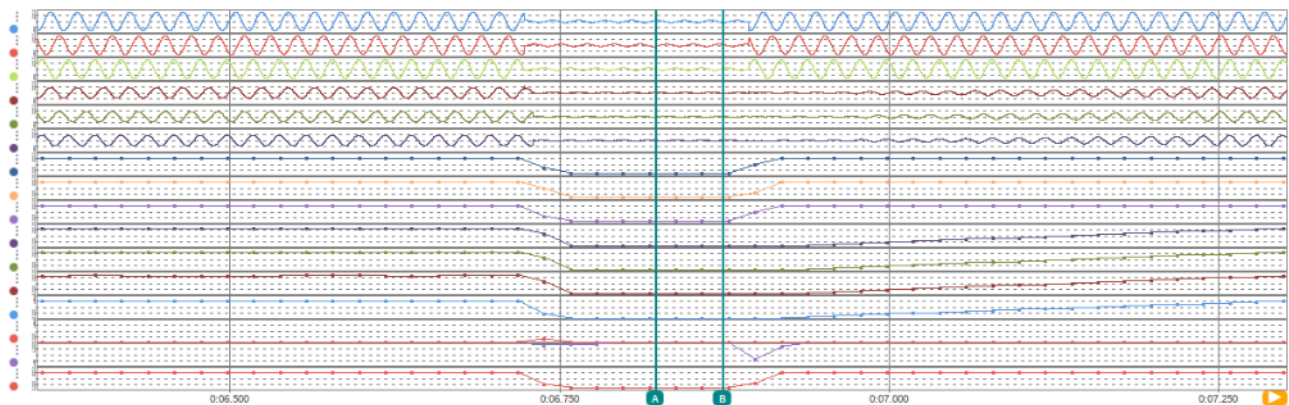
CN224DKW 001 Attachment 1

Seite 49 von 153
Page 49 of 153

During dip



Time [s]	A	B	Delta
	6.72368	6.89480	0.17112
AI 1/U1 [V]	299.3405	-322.5806	-621.9211
AI 1/U2 [V]	-262.0976	175.9324	438.0300
AI 1/U3 [V]	-40.74407	147.3188	188.0629
AI 1/I1 [A]	215.9245	22.04955	-193.8750
AI 1/I2 [A]	-185.9217	-7.794857	178.1268
AI 1/I3 [A]	-30.31361	-14.19246	16.12115
U1_tRMS@POWER/0 [V]	230.6610	30.01526	-200.6458
U2_tRMS@POWER/0 [V]	230.9664	30.17792	-200.7885
U3_tRMS@POWER/0 [V]	230.7673	30.06332	-200.7040
I1_tRMS@POWER/0 [A]	165.8797	8.420364	-157.4593
I2_tRMS@POWER/0 [A]	166.3286	8.468319	-157.8603
I3_tRMS@POWER/0 [A]	166.7179	8.544556	-158.1734
P_t@POWER/0 [W]	115145.0	741.8311	-114403.1
Q_t@POWER/0 [var]	1210.888	187.5549	-1023.333
PF_t@POWER/0 []	0.999945	0.969494	-0.030450
U_fundRMS_SYM+@POWER/0 [V]	230.7946	30.06460	-200.7300

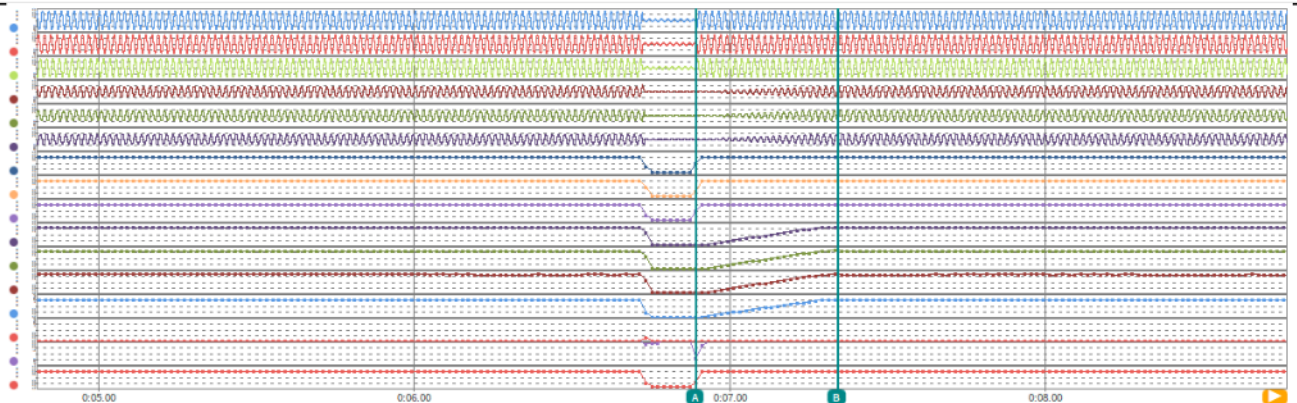


Time [s]	A	B	Delta
	6.82301	6.87389	0.05088
AI 1/U1 [V]	34.88612	-39.40344	-74.28956
AI 1/U2 [V]	-38.79452	32.83143	71.62595
AI 1/U3 [V]	3.725529	6.903649	3.178120
AI 1/I1 [A]	13.36801	-11.01601	-24.38402
AI 1/I2 [A]	-13.29911	11.35445	24.65356
AI 1/I3 [A]	-0.044823	-0.413537	-0.368714
U1_tRMS@POWER/0 [V]	30.02924	30.02027	-8.976e-3
U2_tRMS@POWER/0 [V]	30.16854	30.16704	-1.503e-3
U3_tRMS@POWER/0 [V]	30.05279	30.04761	-5.177e-3
I1_tRMS@POWER/0 [A]	8.429290	8.461449	0.032159
I2_tRMS@POWER/0 [A]	8.412232	8.473787	0.061555
I3_tRMS@POWER/0 [A]	8.690016	8.571336	-0.118680
P_t@POWER/0 [W]	736.3004	741.8449	5.544495
Q_t@POWER/0 [var]	218.6139	195.5763	-23.03767
PF_t@POWER/0 []	0.958638	0.966961	8.323e-3
U_fundRMS_SYM+@POWER/0 [V]	30.06162	30.05766	-3.954e-3

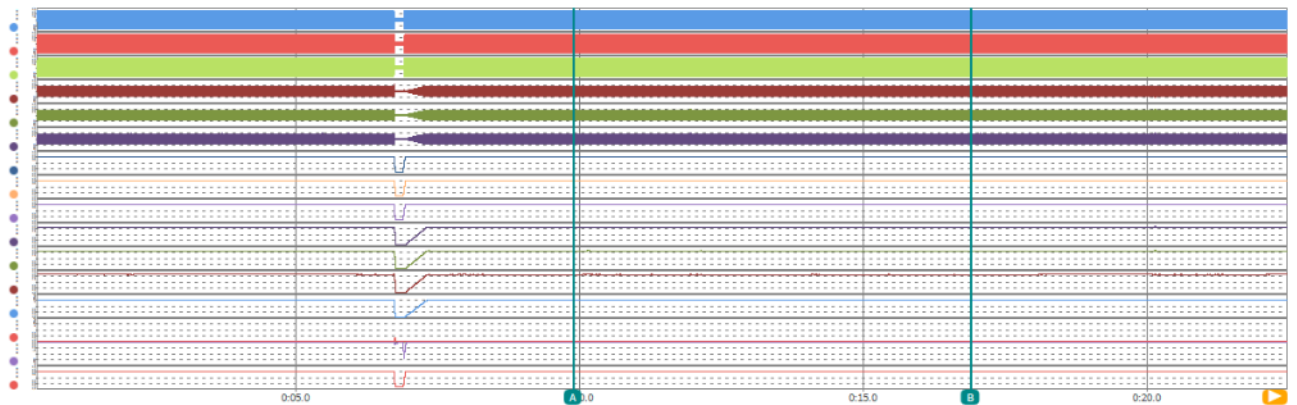
After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 50 von 153
Page 50 of 153

Time [s]	A	B	Delta
AI 1/U1 [V]	6.89277	7.34166	0.44889
AI 1/U2 [V]	-32.66239	166.6479	199.3103
AI 1/U3 [V]	40.26413	-326.5031	-366.7672
AI 1/I1 [A]	-6.234646	159.2772	165.5119
AI 1/I2 [A]	-11.46746	119.0929	130.5604
AI 1/I3 [A]	11.71410	-234.4648	-246.1789
U1_tRMS@POWER/0 [V]	-0.392914	115.2468	115.6397
U2_tRMS@POWER/0 [V]	30.01526	230.9190	200.9037
U3_tRMS@POWER/0 [V]	30.17792	231.1433	200.9654
I1_tRMS@POWER/0 [A]	30.06332	230.9517	200.8883
I2_tRMS@POWER/0 [A]	8.420364	166.3642	157.9438
I3_tRMS@POWER/0 [A]	8.468319	166.8405	158.3722
P_t@POWER/0 [W]	8.544556	166.9703	158.4257
Q_t@POWER/0 [var]	741.8311	115536.6	114794.8
PF_t@POWER/0 []	187.5549	1196.546	1008.991
U_fundRMS_SYM+@POWER/0 [V]	0.969494	0.999946	0.030452
	30.06460	231.0015	200.9369



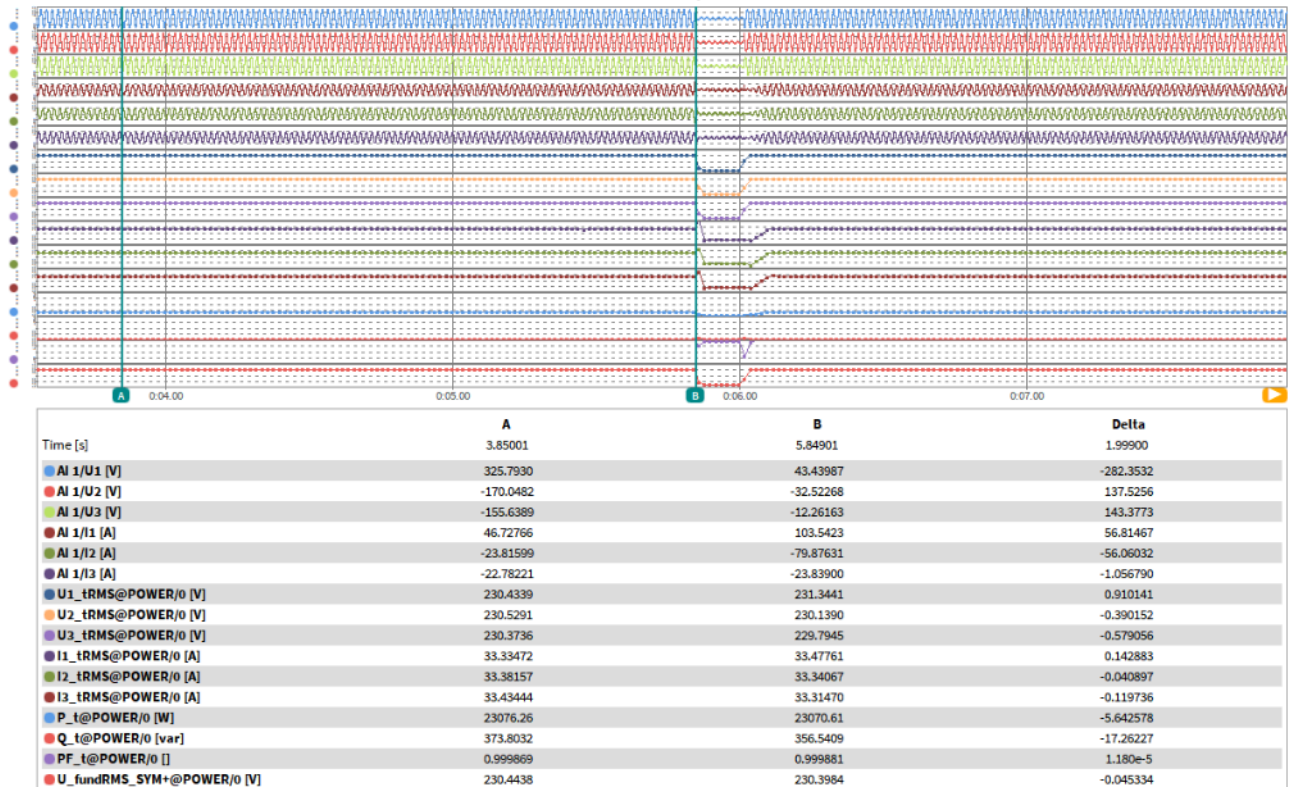
Time [s]	A	B	Delta
AI 1/U1 [V]	9.89202	0:16.88710	6.99508
AI 1/U2 [V]	-207.8328	227.0436	434.8765
AI 1/U3 [V]	322.2528	91.11476	-231.1380
AI 1/I1 [A]	-113.5931	-316.6683	-203.0752
AI 1/I2 [A]	-151.8550	163.1179	314.9729
AI 1/I3 [A]	233.6034	65.90128	-167.7021
U1_tRMS@POWER/0 [V]	-81.70498	-229.0677	-147.3627
U2_tRMS@POWER/0 [V]	230.7919	230.7896	-2.289e-3
U3_tRMS@POWER/0 [V]	230.9109	230.9084	-2.426e-3
I1_tRMS@POWER/0 [A]	230.7478	230.7363	-0.011551
I2_tRMS@POWER/0 [A]	165.9398	165.9621	0.022339
I3_tRMS@POWER/0 [A]	166.2484	166.2187	-0.029770
P_t@POWER/0 [W]	166.5496	166.5923	0.042694
Q_t@POWER/0 [var]	115108.3	115117.6	9.375000
PF_t@POWER/0 []	1423.735	1057.428	-366.3071
U_fundRMS_SYM+@POWER/0 [V]	0.999924	0.999958	3.427e-5
	230.8138	230.8080	-5.722e-3

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 51 von 153
Page 51 of 153

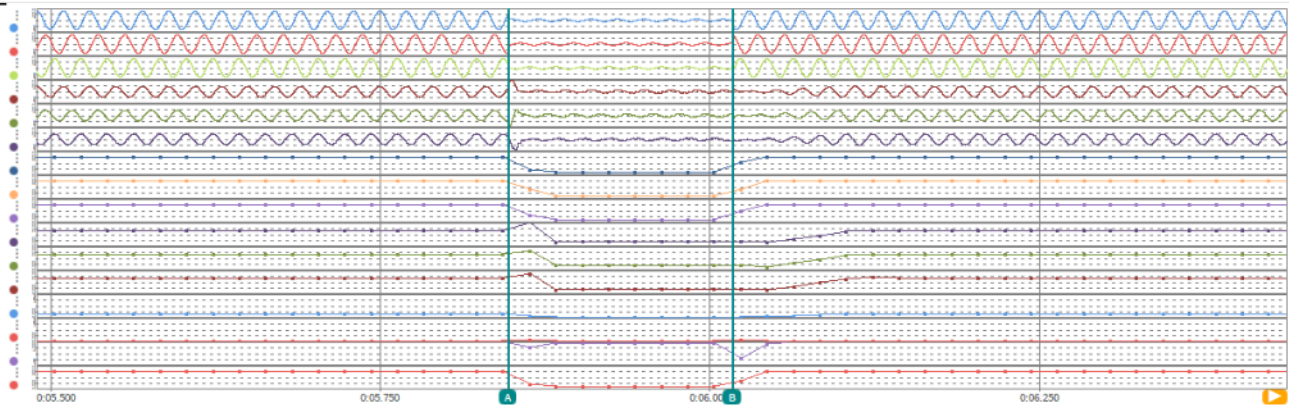
Test No. 1.2 idle test

Test No. 1.2 with PGU
Before dip

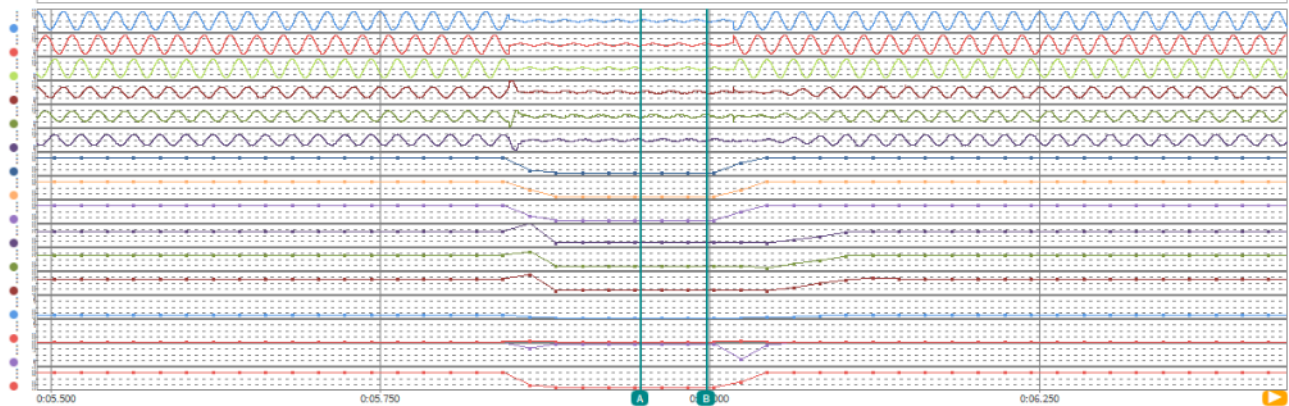
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 52 von 153
Page 52 of 153

Time [s]	A	B	Delta
AI 1/U1 [V]	214.5696	-31.31366	-245.8832
AI 1/U2 [V]	-319.6454	41.36420	361.0096
AI 1/U3 [V]	104.7280	-9.456635	-114.1846
AI 1/I1 [A]	31.57997	-7.348061	-38.92803
AI 1/I2 [A]	-46.36312	7.889271	54.25239
AI 1/I3 [A]	14.67490	-0.546932	-15.22184
U1_trMS@POWER/0 [V]	231.3441	30.28657	-201.0575
U2_trMS@POWER/0 [V]	230.1390	30.32703	-199.8119
U3_trMS@POWER/0 [V]	229.7945	30.18974	-199.6048
I1_trMS@POWER/0 [A]	33.47761	8.535676	-24.94193
I2_trMS@POWER/0 [A]	33.34067	8.536753	-24.80392
I3_trMS@POWER/0 [A]	33.31470	8.515320	-24.79938
P_t@POWER/0 [W]	23070.61	731.6088	-22339.00
Q_t@POWER/0 [var]	356.5409	254.1205	-102.4204
PF_t@POWER/0 []	0.999881	0.944638	-0.055243
U_fundRMS_SYM+@POWER/0 [V]	230.3984	30.24769	-200.1507

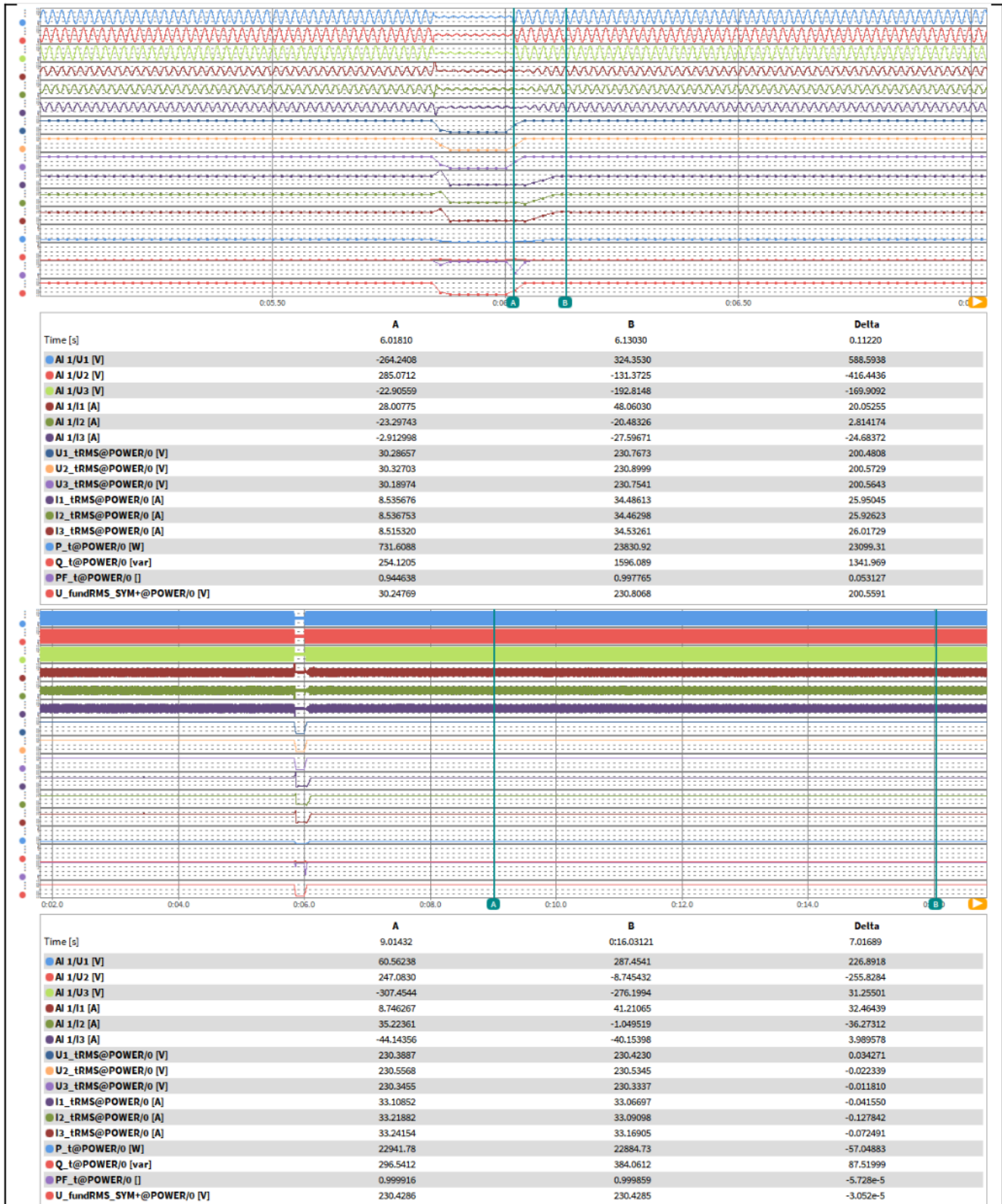


Time [s]	A	B	Delta
AI 1/U1 [V]	31.06451	-31.56066	-62.62517
AI 1/U2 [V]	-41.46528	41.08095	82.54624
AI 1/U3 [V]	8.682251	-7.991791	-16.67404
AI 1/I1 [A]	9.450436	-8.272529	-17.72297
AI 1/I2 [A]	-9.037972	7.966400	17.00437
AI 1/I3 [A]	-0.309229	0.180006	0.489235
U1_trMS@POWER/0 [V]	30.20931	30.21927	9.958e-3
U2_trMS@POWER/0 [V]	30.35569	30.35752	1.831e-3
U3_trMS@POWER/0 [V]	30.23981	30.24085	1.045e-3
I1_trMS@POWER/0 [A]	8.641465	8.584927	-0.056539
I2_trMS@POWER/0 [A]	8.590402	8.544263	-0.046139
I3_trMS@POWER/0 [A]	8.636983	8.627543	-9.439e-3
P_t@POWER/0 [W]	734.6583	734.9861	0.327820
Q_t@POWER/0 [var]	270.8648	260.2962	-10.56854
PF_t@POWER/0 []	0.938260	0.942632	4.372e-3
U_fundRMS_SYM+@POWER/0 [V]	30.24800	30.25327	5.264e-3

After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 53 von 153
Page 53 of 153

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 54 von 153
Page 54 of 153

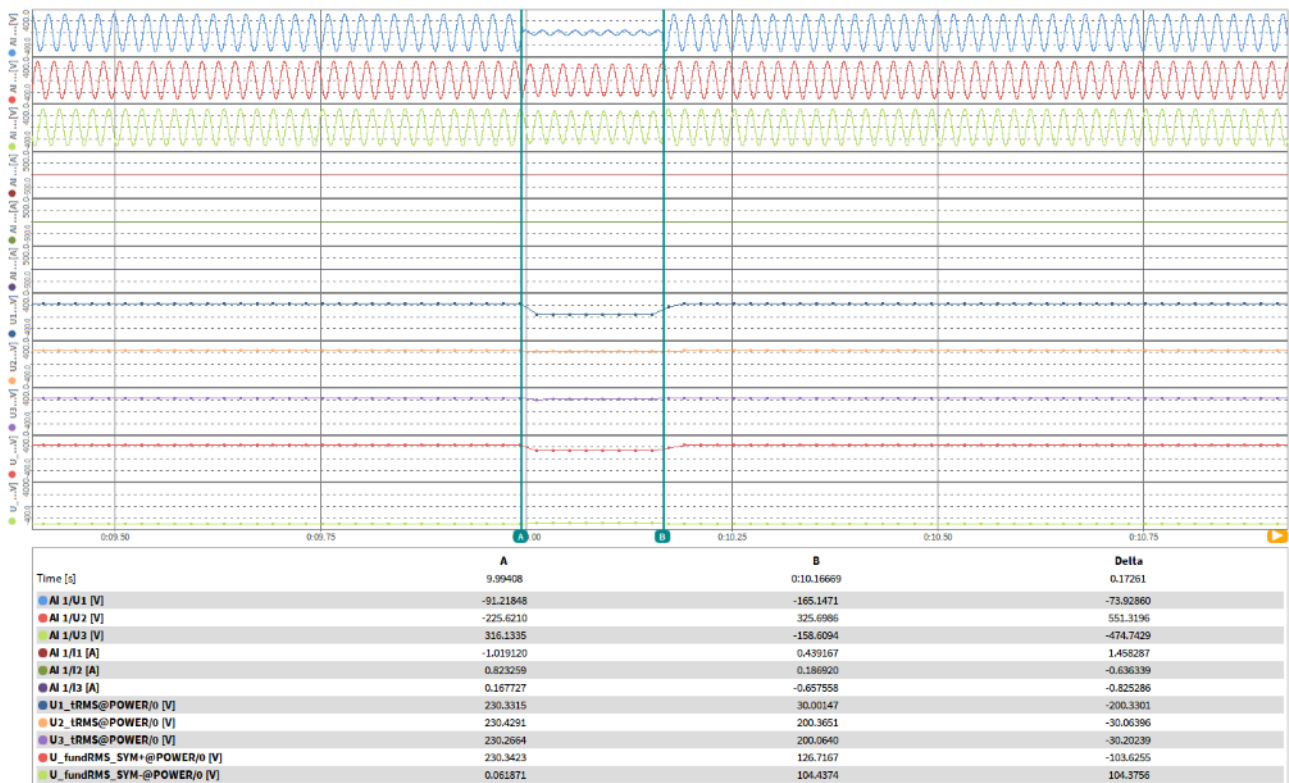
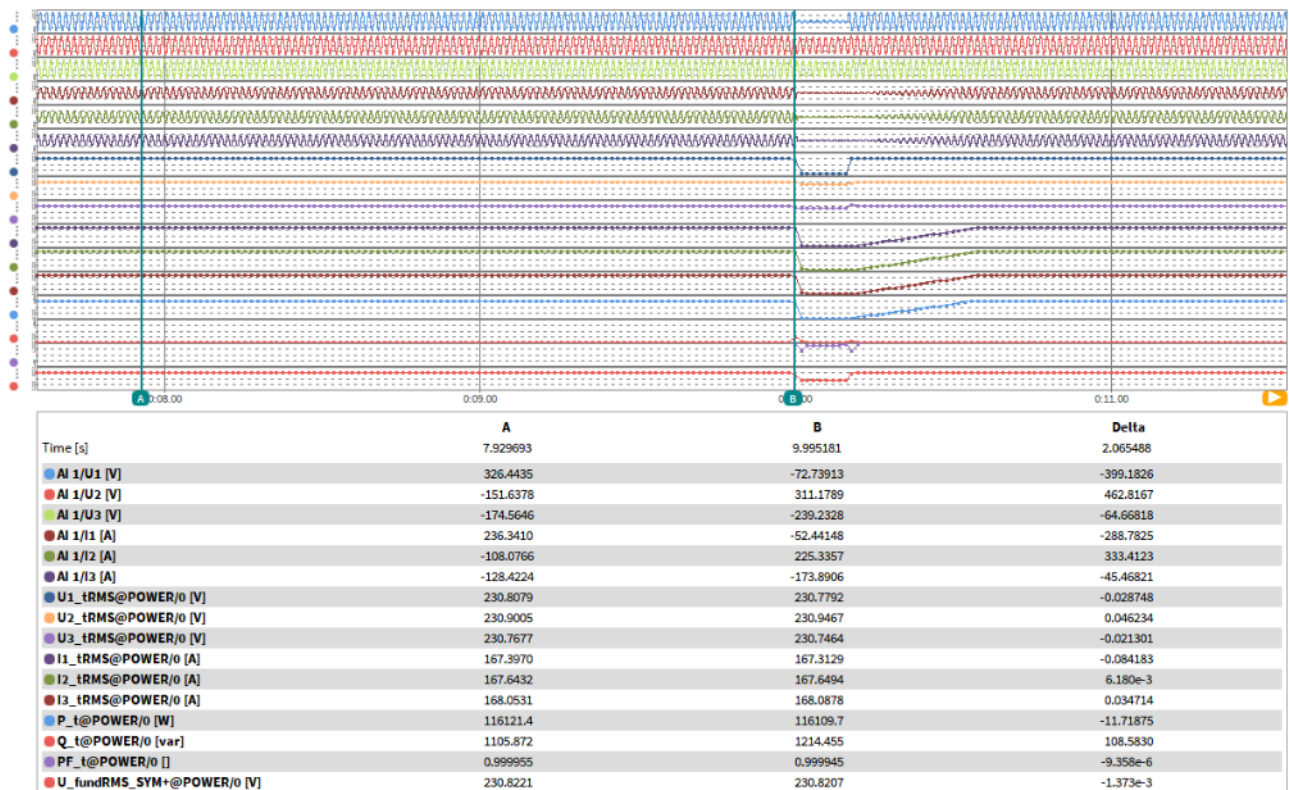
Condition						Measurement	
	No.	Parameter	Phase ref.	Time ref.	unit		
General Info.	0	Test number	--	--	--	1.1	1.2
	1	Date	--	--	yyyy.mm.dd	2022.08.15	2022.08.15
	2	Time (start of test)	--	--	hh:mm:ss	13:15:14	13:15:14
	3	Fault type (phase)	--	--		3 phase	3 phase
	4	Setting voltage depth	Line to neutral	--	p.u.	0.15	0.15
	5	Setting dip duration		--	ms	170	170
	6	Point of fault entry	Total	--	s	9.99369	9.99369
	7	Point of fault clearance	Total	--	s	10.16454	10.16454
	8	Fault duration in empty load test	Total	--	ms	170.85	170.85
	9	Voltage depth/height in empty load test	Total	t1+100ms to t2 and t1-10s to t1	p.u.	0.131	0.1306
	10		Pos.		p.u.	1.001	1.0015
Before dip <t1	11	Voltage	Line to neutral	t1-100s to t1	p.u.	1.004	1.002
	12	Current	Pos.	t1-500ms to t1-100ms	p.u.	1.002	0.201
	13	Active power	Total	t1-10s to t1	p.u.	1.002	0.201
	14		Pos.			1.001	0.201
	15	Reactive power	Total	t1-10s to t1	p.u.	0.009	0.003
	16		Pos.			0.009	0.003
	17	Cos φ	--	t1-10s to t1	--	0.999	0.999
During dip t1 to t2	18	Voltage	Line to neutral	t1+100ms to t2-20ms	p.u.	0.131	0.132
	19	Line current	Phase 1	t1+60ms	p.u.	0.053	0.053
	20		Phase 2			0.050	0.055
	21		Phase 3			0.055	0.051
	22	Line current	Phase 1	t1+100ms	p.u.	0.051	0.052
	23		Phase 2			0.051	0.052
	24		Phase 3			0.052	0.052
	25	Active power	Total	t1+100ms to t2-20ms	p.u.	0.006	0.006
	26		Pos.			0.006	0.006
After dip > t2	27	Voltage	Line to neutral	t2+3s to t2+10s	p.u.	1.004	1.002
	28	Active power	Total	t2+3s to t2+10s	p.u.	1.001	0.199
	29		Pos.			1.001	0.199
	30	Active power rising time	Pos.	--	s	0.449	0.112
	31	Reactive power	Total	t2+3s to t2+10s	p.u.	N/A	N/A
	32		Pos.			N/A	N/A
	33	Reactive power rising time	Pos.	--	s	N/A	N/A
	34	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	Yes	Yes

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 55 von 153
Page 55 of 153

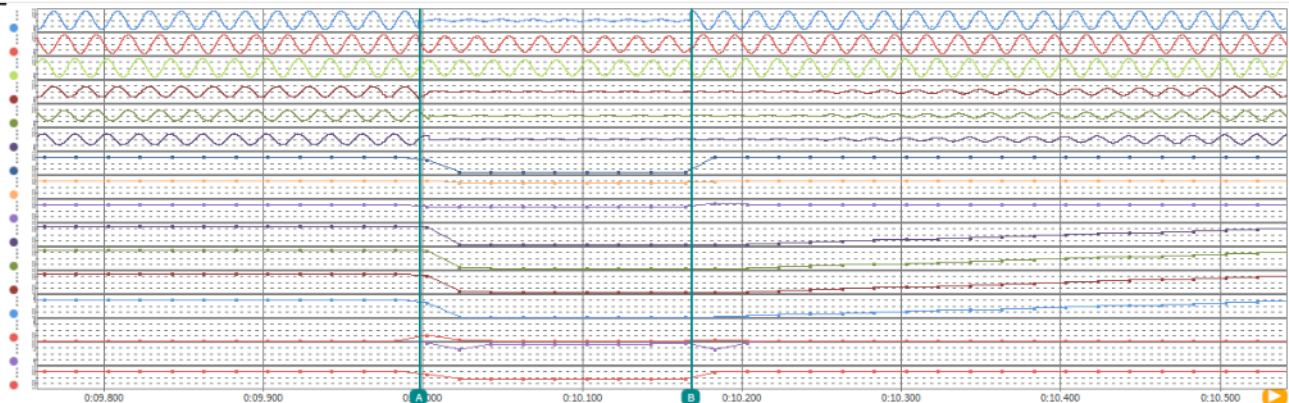
Test No. 1.3 idle test

Test No. 1.3 with PGU
Before dip

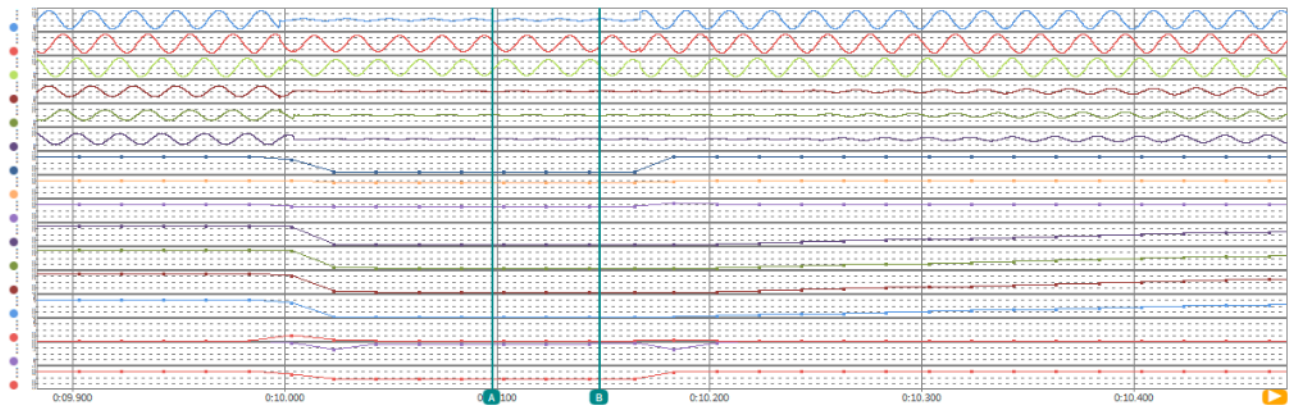
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 56 von 153
Page 56 of 153

Time [s]	A	B	Delta
AI 1/U1 [V]	9.998027	0:10.168539	0.170512
AI 1/U2 [V]	-23.38672	298.4126	321.7993
AI 1/U3 [V]	111.2204	-230.8879	-342.1083
AI 1/I1 [A]	-112.6535	-65.75561	46.89789
AI 1/I2 [A]	-265.1210	-24.02222	241.0988
AI 1/I3 [A]	228.4585	4.782439	-223.6761
U1_tRMS@POWER/0 [V]	39.70361	17.51983	-22.18378
U2_tRMS@POWER/0 [V]	230.7792	29.08387	-201.6953
U3_tRMS@POWER/0 [V]	230.9467	206.3722	-24.57445
I1_tRMS@POWER/0 [A]	230.7464	205.1960	-25.55038
I2_tRMS@POWER/0 [A]	167.3129	8.076260	-159.2366
I3_tRMS@POWER/0 [A]	167.6494	9.196913	-158.4525
P_t@POWER/0 [W]	168.0878	7.926978	-160.1609
Q_t@POWER/0 [var]	116109.7	3286.866	-112822.8
PF_t@POWER/0 []	1214.455	1824.844	610.3892
U_fundRMS_SYM+@POWER/0 [V]	0.999945	0.874292	-0.125653
	230.8207	128.7171	-102.1036

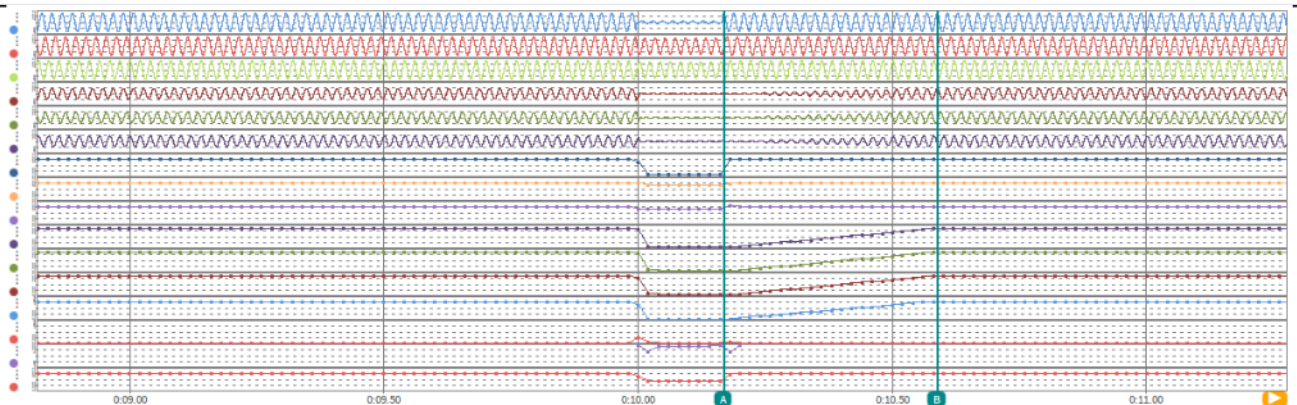


Time [s]	A	B	Delta
AI 1/U1 [V]	0:10.097968	0:10.148416	0.050448
AI 1/U2 [V]	-37.74262	40.07936	77.82197
AI 1/U3 [V]	136.4472	-95.37244	-231.8196
AI 1/I1 [A]	-126.4343	85.53148	211.9658
AI 1/I2 [A]	-11.00218	12.66956	23.67175
AI 1/I3 [A]	10.81669	-10.94616	-21.76285
U1_tRMS@POWER/0 [V]	0.161052	-1.752496	-1.913548
U2_tRMS@POWER/0 [V]	30.05396	30.01887	-0.035093
U3_tRMS@POWER/0 [V]	200.1550	200.2960	0.141006
I1_tRMS@POWER/0 [A]	199.1012	199.2309	0.129684
I2_tRMS@POWER/0 [A]	8.715985	8.425449	-0.290536
I3_tRMS@POWER/0 [A]	9.184925	8.898936	-0.285989
P_t@POWER/0 [W]	7.691195	7.624022	-0.067173
Q_t@POWER/0 [var]	3079.887	3036.649	-43.23828
PF_t@POWER/0 []	1924.428	1847.078	-77.34998
U_fundRMS_SYM+@POWER/0 [V]	0.848060	0.854363	6.303e-3
	126.3812	126.4479	0.066658

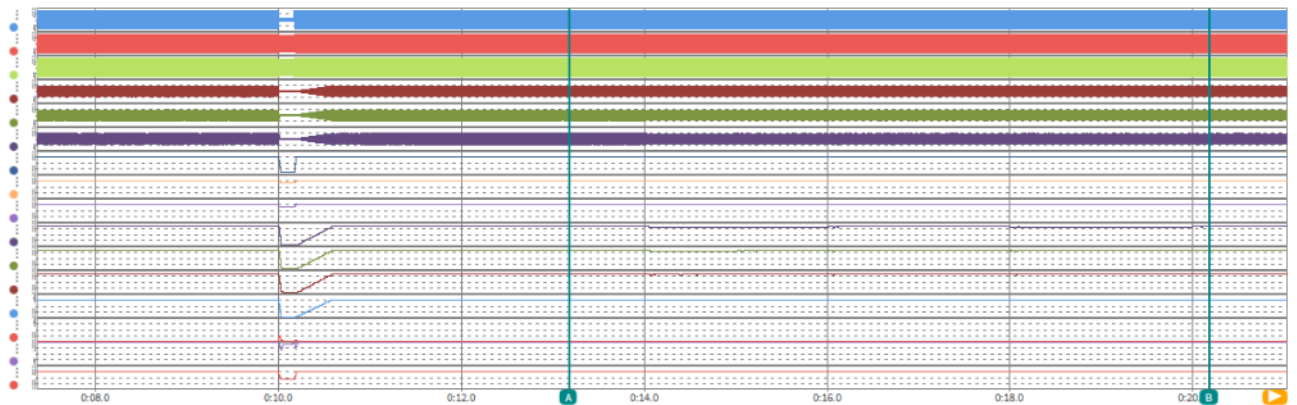
After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 57 von 153
Page 57 of 153

Time [s]	A	B	Delta
0:10.168475	0:10.588429	0.419954	
AI 1/U1 [V]	299.8226	311.7829	11.96027
AI 1/U2 [V]	-243.6514	-241.0877	2.563715
AI 1/U3 [V]	-57.78742	-72.36934	-14.58192
AI 1/I1 [A]	-20.83671	227.5865	248.4232
AI 1/I2 [A]	5.447984	-175.7882	-181.2362
AI 1/I3 [A]	17.05694	-52.92142	-69.97836
U1_tRMS@POWER/0 [V]	29.08387	231.0921	202.0083
U2_tRMS@POWER/0 [V]	206.3722	231.1156	24.74339
U3_tRMS@POWER/0 [V]	205.1960	231.0028	25.80675
I1_tRMS@POWER/0 [A]	8.076260	167.1194	159.0431
I2_tRMS@POWER/0 [A]	9.196913	167.1686	157.9717
I3_tRMS@POWER/0 [A]	7.926978	168.1665	160.2395
P_t@POWER/0 [W]	3286.866	116092.6	112805.7
Q_t@POWER/0 [var]	1824.844	1492.406	-332.4377
PF_t@POWER/0 []	0.874292	0.999917	0.125625
U_fundRMS_SYM+@POWER/0 [V]	128.7171	231.0669	102.3499



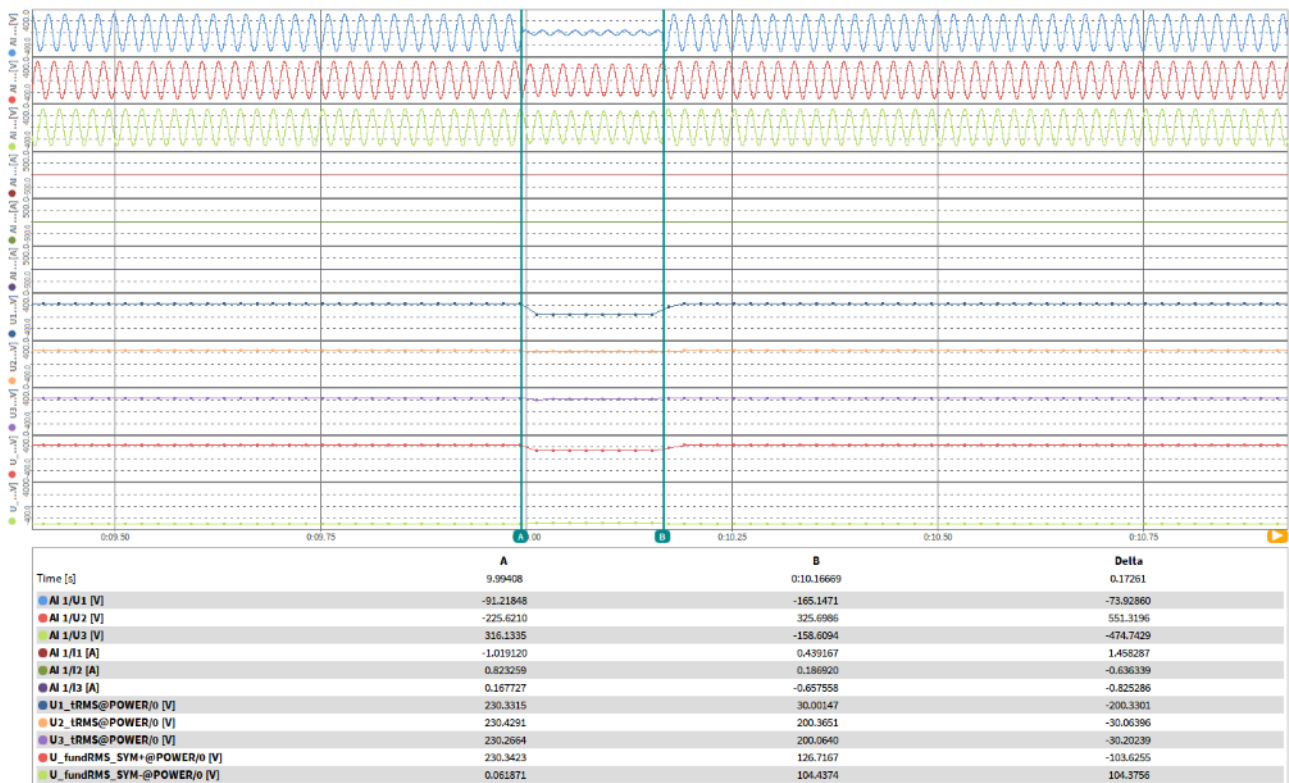
Time [s]	A	B	Delta
0:13.178617	0:20.180483	7.001867	
AI 1/U1 [V]	-319.1233	-296.1679	22.95542
AI 1/U2 [V]	219.3411	28.36657	-190.9745
AI 1/U3 [V]	100.6992	266.6793	165.9801
AI 1/I1 [A]	-232.0695	-213.4105	18.65900
AI 1/I2 [A]	158.8835	16.85262	-142.0308
AI 1/I3 [A]	73.37201	196.3431	122.9711
U1_tRMS@POWER/0 [V]	230.7993	230.7922	-7.172e-3
U2_tRMS@POWER/0 [V]	230.9462	230.9094	-0.036804
U3_tRMS@POWER/0 [V]	230.7464	230.7317	-0.014709
I1_tRMS@POWER/0 [A]	167.4674	166.8004	-0.667053
I2_tRMS@POWER/0 [A]	167.8210	167.0763	-0.744766
I3_tRMS@POWER/0 [A]	168.1217	167.4361	-0.685638
P_t@POWER/0 [W]	116193.4	115700.0	-493.3672
Q_t@POWER/0 [var]	1455.675	1403.485	-52.19019
PF_t@POWER/0 []	0.999922	0.999926	4.888e-6
U_fundRMS_SYM+@POWER/0 [V]	230.8277	230.8076	-0.020081

Prüfbericht-Nr.:
Test report no.:

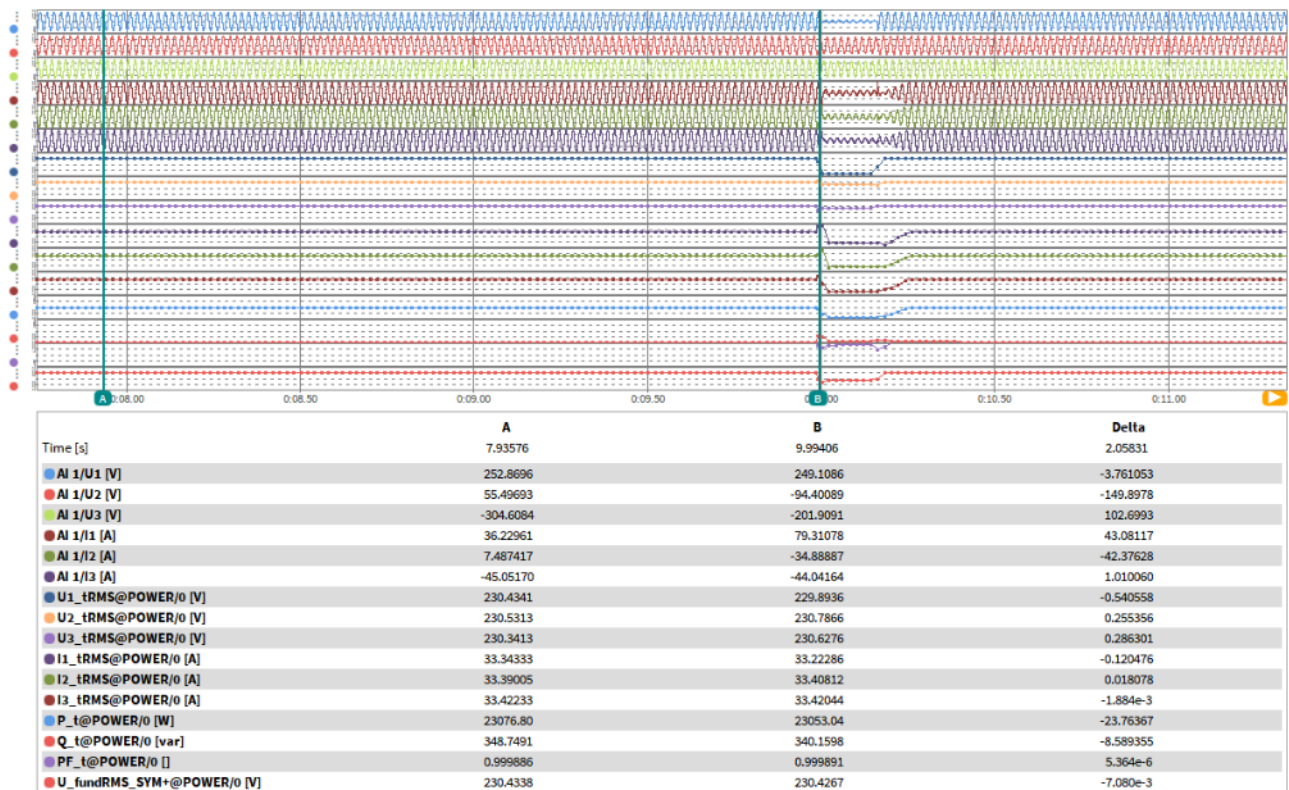
CN224DKW 001 Attachment 1

Seite 58 von 153
Page 58 of 153

Test No. 1.4 idle test



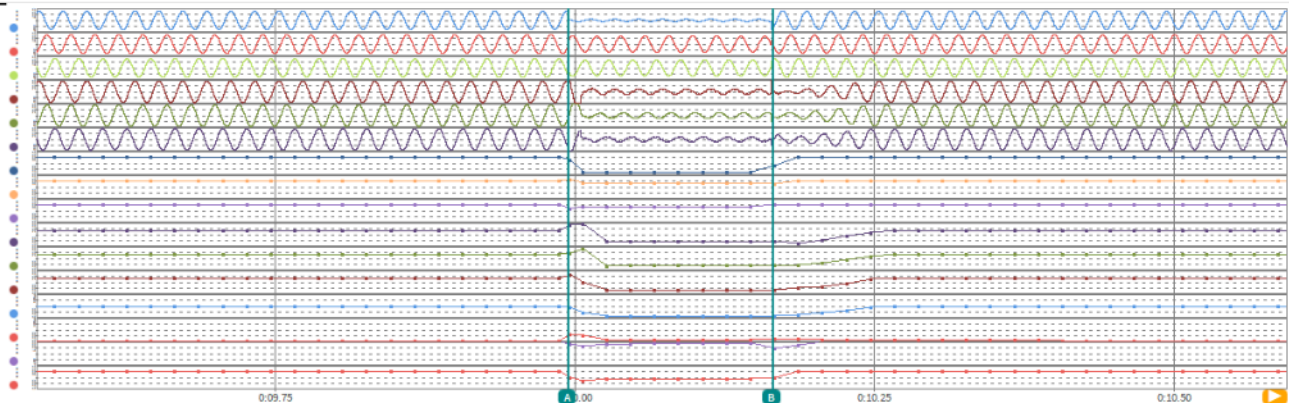
Test No. 1.4 with PGU Before dip



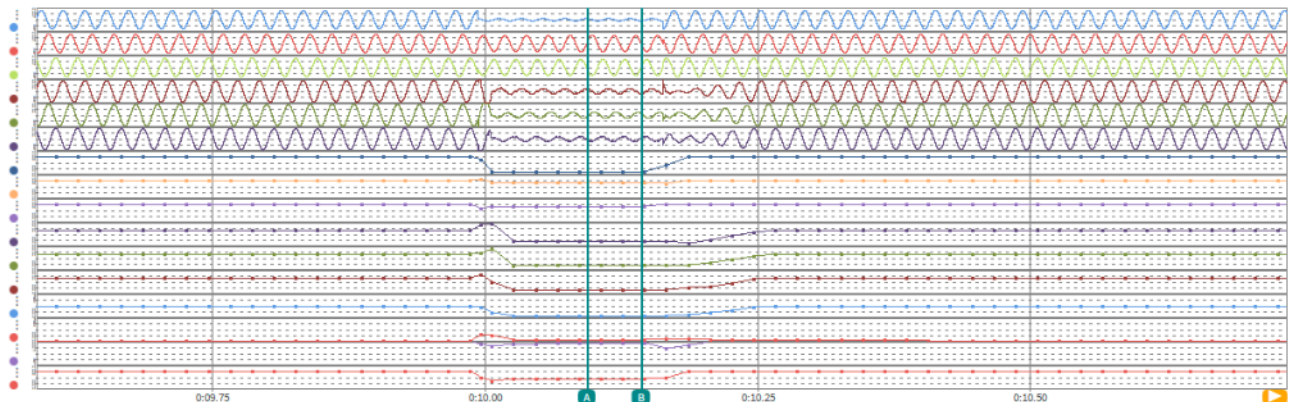
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 59 von 153
Page 59 of 153

Time [s]	A	B	Delta
9.99434	0:10.16483	0.17048	
AI 1/U1 [V]	60.54569	-293.5357	-354.0814
AI 1/U2 [V]	68.25185	29.92535	-38.32650
AI 1/U3 [V]	-81.66433	262.8861	344.5504
AI 1/I1 [A]	91.74967	17.58921	-74.16046
AI 1/I2 [A]	-29.32108	-11.53243	17.78865
AI 1/I3 [A]	-66.08713	-6.110549	59.97658
U1_trMS@POWER/0 [V]	229.8936	30.05604	-199.8375
U2_trMS@POWER/0 [V]	230.7866	201.0770	-29.70966
U3_trMS@POWER/0 [V]	230.6276	200.0980	-30.52962
I1_trMS@POWER/0 [A]	33.22286	8.336529	-24.88633
I2_trMS@POWER/0 [A]	33.40812	8.960395	-24.44773
I3_trMS@POWER/0 [A]	33.42044	7.523364	-25.89708
P_t@POWER/0 [W]	23053.04	3058.665	-19994.37
Q_t@POWER/0 [var]	340.1598	1817.088	1476.928
PF_t@POWER/0 []	0.999891	0.859731	-0.140160
U_fundRMS_SYM+@POWER/0 [V]	230.4267	126.9408	-103.4859

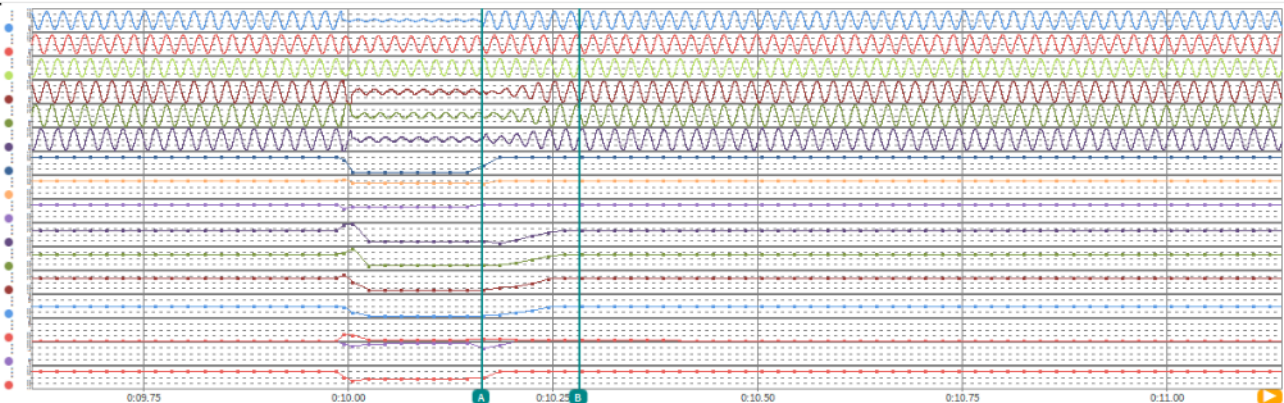


Time [s]	A	B	Delta
0:10.09394	0:10.14359	0.04965	
AI 1/U1 [V]	42.39083	-41.28075	-83.67157
AI 1/U2 [V]	35.51531	-0.505209	-36.02052
AI 1/U3 [V]	-46.44585	7.012129	53.45798
AI 1/I1 [A]	9.512306	-7.861376	-17.37368
AI 1/I2 [A]	-5.189300	6.954909	12.14421
AI 1/I3 [A]	-4.362107	0.794888	5.156994
U1_trMS@POWER/0 [V]	30.10540	30.10785	2.447e-3
U2_trMS@POWER/0 [V]	200.7814	200.7786	-2.838e-3
U3_trMS@POWER/0 [V]	199.7932	199.7956	2.350e-3
I1_trMS@POWER/0 [A]	8.364895	8.368990	4.095e-3
I2_trMS@POWER/0 [A]	8.951420	8.984138	0.032719
I3_trMS@POWER/0 [A]	7.598106	7.615536	0.017430
P_t@POWER/0 [W]	3067.918	3080.319	12.40015
Q_t@POWER/0 [var]	1820.024	1819.076	-0.948608
PF_t@POWER/0 []	0.860046	0.861063	1.017e-3
U_fundRMS_SYM+@POWER/0 [V]	126.7887	126.7886	-9.918e-5

After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 60 von 153
Page 60 of 153

Time [s]	A	B	Delta
AI 1/U1 [V]	-283.7551	-320.6990	-36.94391
AI 1/U2 [V]	90.21640	212.7092	122.4928
AI 1/U3 [V]	137.4283	108.5086	-28.91970
AI 1/I1 [A]	54.41046	-45.14575	-99.55621
AI 1/I2 [A]	-27.86660	32.69077	60.55737
AI 1/I3 [A]	-26.23701	12.48074	38.71775
U1_trMS@POWER/0 [V]	30.05604	230.7927	200.7367
U2_trMS@POWER/0 [V]	201.0770	230.8336	29.75668
U3_trMS@POWER/0 [V]	200.0980	230.4144	30.31642
I1_trMS@POWER/0 [A]	8.336529	32.93968	24.60315
I2_trMS@POWER/0 [A]	8.960395	33.04688	24.08648
I3_trMS@POWER/0 [A]	7.523364	33.05202	25.52866
P_t@POWER/0 [W]	3058.665	22786.19	19727.52
Q_t@POWER/0 [var]	1817.088	1655.261	-161.8267
PF_t@POWER/0 []	0.859731	0.997372	0.137641
U_fundRMS_SYM+@POWER/0 [V]	126.9408	230.6780	103.7372



Time [s]	A	B	Delta
AI 1/U1 [V]	-241.9982	-268.4944	-26.49617
AI 1/U2 [V]	309.9811	-31.20423	-341.1854
AI 1/U3 [V]	-67.50298	294.0653	361.5682
AI 1/I1 [A]	-35.04157	-38.78713	-3.745556
AI 1/I2 [A]	44.77012	-4.157186	-48.92731
AI 1/I3 [A]	-9.652973	42.58108	52.23406
U1_trMS@POWER/0 [V]	230.3990	230.3949	-4.166e-3
U2_trMS@POWER/0 [V]	230.5376	230.5267	-0.010956
U3_trMS@POWER/0 [V]	230.3475	230.3453	-2.197e-3
I1_trMS@POWER/0 [A]	33.25268	33.09172	-0.160961
I2_trMS@POWER/0 [A]	33.29212	33.13503	-0.157089
I3_trMS@POWER/0 [A]	33.35420	33.22194	-0.132259
P_t@POWER/0 [W]	23017.42	22912.11	-105.3086
Q_t@POWER/0 [var]	311.7473	375.7052	63.95792
PF_t@POWER/0 []	0.999908	0.999866	-4.268e-5
U_fundRMS_SYM+@POWER/0 [V]	230.4264	230.4205	-5.829e-3

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 61 von 153
Page 61 of 153

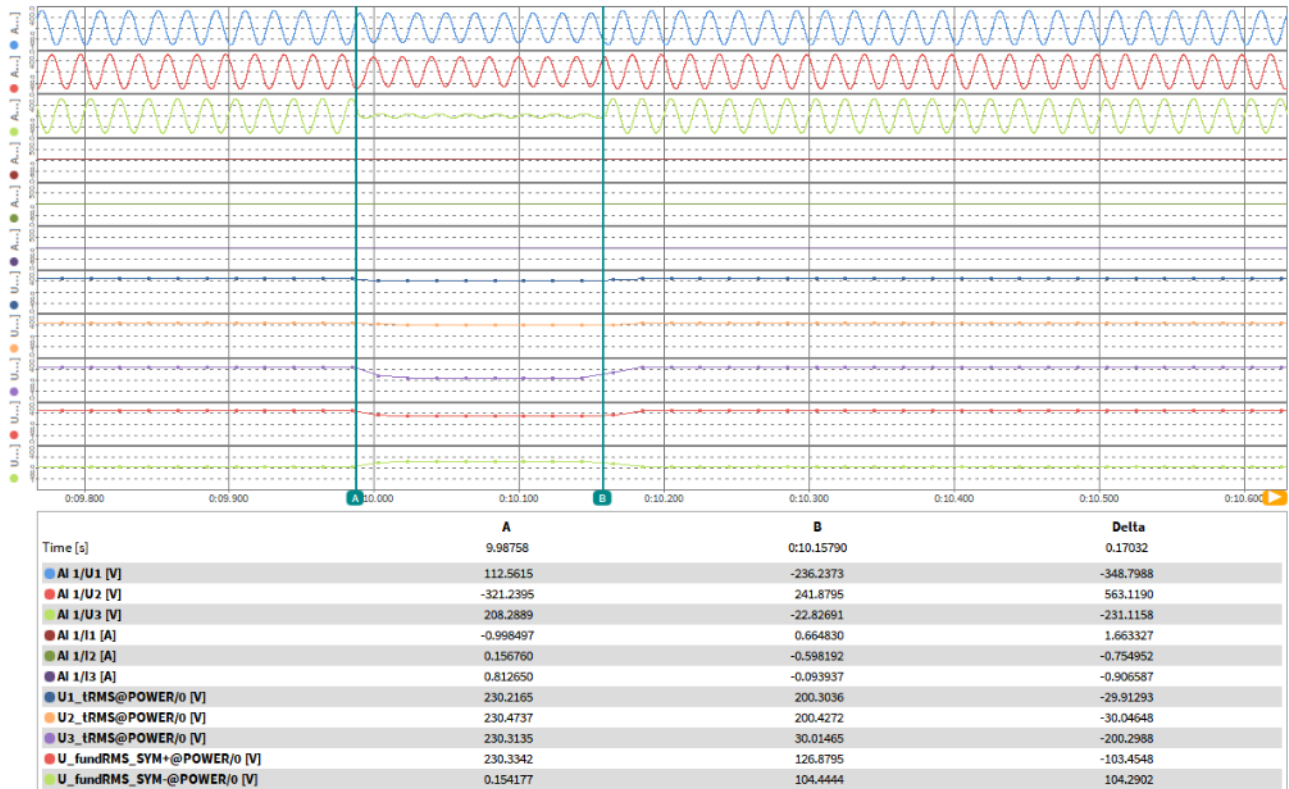
Condition						Measurement	
	No.	Parameter	Phase ref.	Time ref.	unit		
General Info.	0	Test number	--	--	--	1.3	1.4
	1	Date	--	--	yyyy.mm.dd	2022.08.15	2022.08.15
	2	Time (start of test)	--	--	hh:mm:ss	15:52:19	15:52:19
	3	Fault type (phase)	--	--		2 phase	2 phase
	4	Setting voltage depth	Line to neutral	--	p.u.	0.15	0.15
	5	Setting dip duration		--	ms	170	170
	6	Point of fault entry	Total	--	s	9.99408	9.99408
	7	Point of fault clearance	Total	--	s	10.16669	10.16669
	8	Fault duration in empty load test	Total	--	ms	172.61	172.61
	9	Voltage depth/height in empty load test	Total	t1+100ms to t2 and t1-10s to t1	p.u.	0.130	0.130
	10		Pos.		p.u.	1.001	1.001
Before dip <t1	11	Voltage	Line to neutral	t1-100s to t1	p.u.	1.004	1.002
	12	Current	Pos.	t1-500ms to t1-100ms	p.u.	1.011	0.201
	13	Active power	Total	t1-10s to t1	p.u.	1.010	0.201
	14		Pos.			1.010	0.200
	15	Reactive power	Total	t1-10s to t1	p.u.	0.009	0.003
	16		Pos.			0.009	0.003
	17	Cos φ	--	t1-10s to t1	--	0.999	0.999
During dip t1 to t2	18	Voltage	Line to neutral	t1+100ms to t2-20ms	p.u.	0.131	0.131
	19	Line current	Phase 1	t1+60ms	p.u.	0.056	0.051
	20		Phase 2			0.043	0.051
	21		Phase 3			0.051	0.047
	22	Line current	Phase 1	t1+100ms	p.u.	0.053	0.050
	23		Phase 2			0.055	0.054
	24		Phase 3			0.046	0.046
	25	Active power	Total	t1+100ms to t2-20ms	p.u.	0.017	0.027
	26		Pos.			0.016	0.027
After dip > t2	27	Voltage	Line to neutral	t2+3s to t2+10s	p.u.	1.004	1.002
	28	Active power	Total	t2+3s to t2+10s	p.u.	1.010	0.200
	29		Pos.			1.006	0.199
	30	Active power rising time	Pos.	--	s	0.420	0.119
	31	Reactive power	Total	t2+3s to t2+10s	p.u.	N/A	N/A
	32		Pos.			N/A	N/A
	33	Reactive power rising time	Pos.	--	s	N/A	N/A
	34	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	Yes	Yes

Prüfbericht-Nr.:
Test report no.:

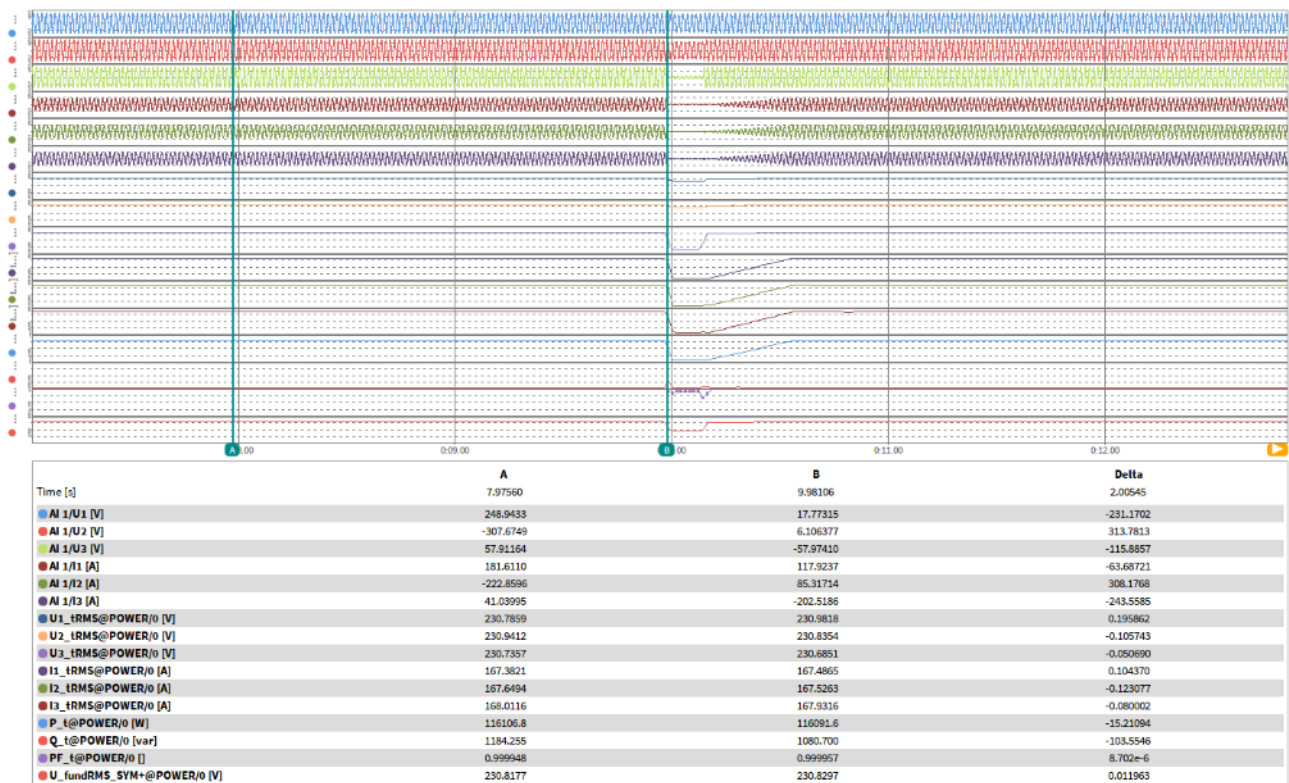
CN224DKW 001 Attachment 1

Seite 62 von 153
Page 62 of 153

Test No. 1.3(D2) idle test



**Test No. 1.3(D2) with PGU
Before dip**

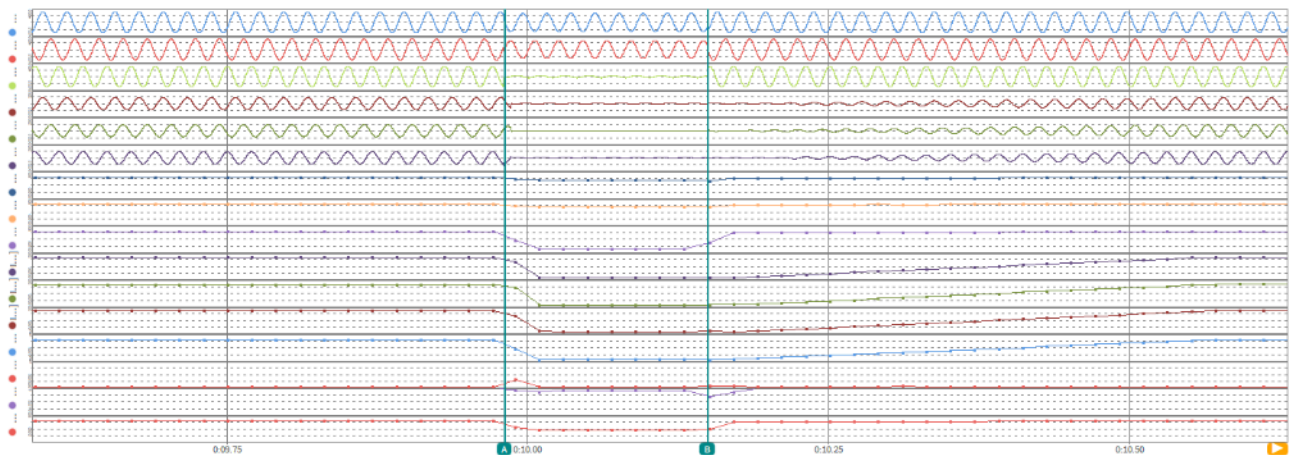


Prüfbericht-Nr.:
Test report no.:

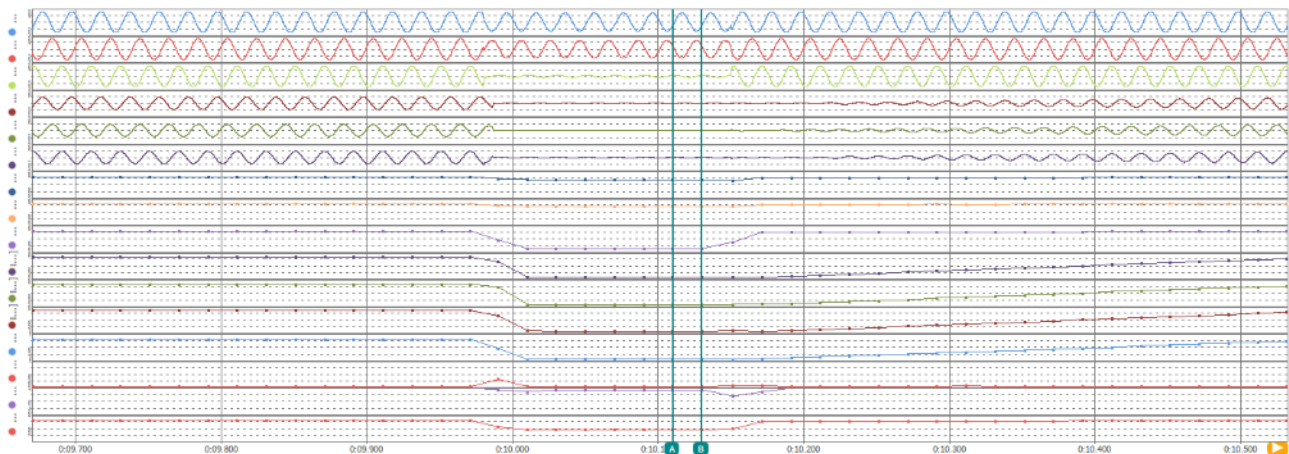
CN224DKW 001 Attachment 1

Seite 63 von 153
Page 63 of 153

During dip



Time [s]	A	B	Delta
	9.98117	0:10.14970	0.16853
AI 1/U1 [V]	4.254818	-128.4101	-132.6649
AI 1/U2 [V]	12.70938	116.5681	103.8587
AI 1/U3 [V]	-53.19262	38.57780	91.77042
AI 1/I1 [A]	108.3900	-12.76589	-121.1559
AI 1/I2 [A]	110.6639	0.123262	-110.5406
AI 1/I3 [A]	-218.5465	12.61735	231.1639
U1_IRMS@POWER/0 [V]	230.9818	200.1271	-30.85474
U2_IRMS@POWER/0 [V]	230.8354	199.5444	-31.29108
U3_IRMS@POWER/0 [V]	230.6851	30.05199	-200.6331
I1_IRMS@POWER/0 [A]	167.4865	8.923440	-158.5631
I2_IRMS@POWER/0 [A]	167.5263	7.614997	-159.9113
I3_IRMS@POWER/0 [A]	167.9316	8.370033	-159.5616
P_t@POWER/0 [W]	116091.6	3061.342	-113030.3
Q_t@POWER/0 [var]	1080.700	1810.977	730.2765
PF_t@POWER/0 []	0.999957	0.860680	-0.139277
U_fundRMS_SYM+@POWER/0 [V]	230.8297	126.6065	-104.2231

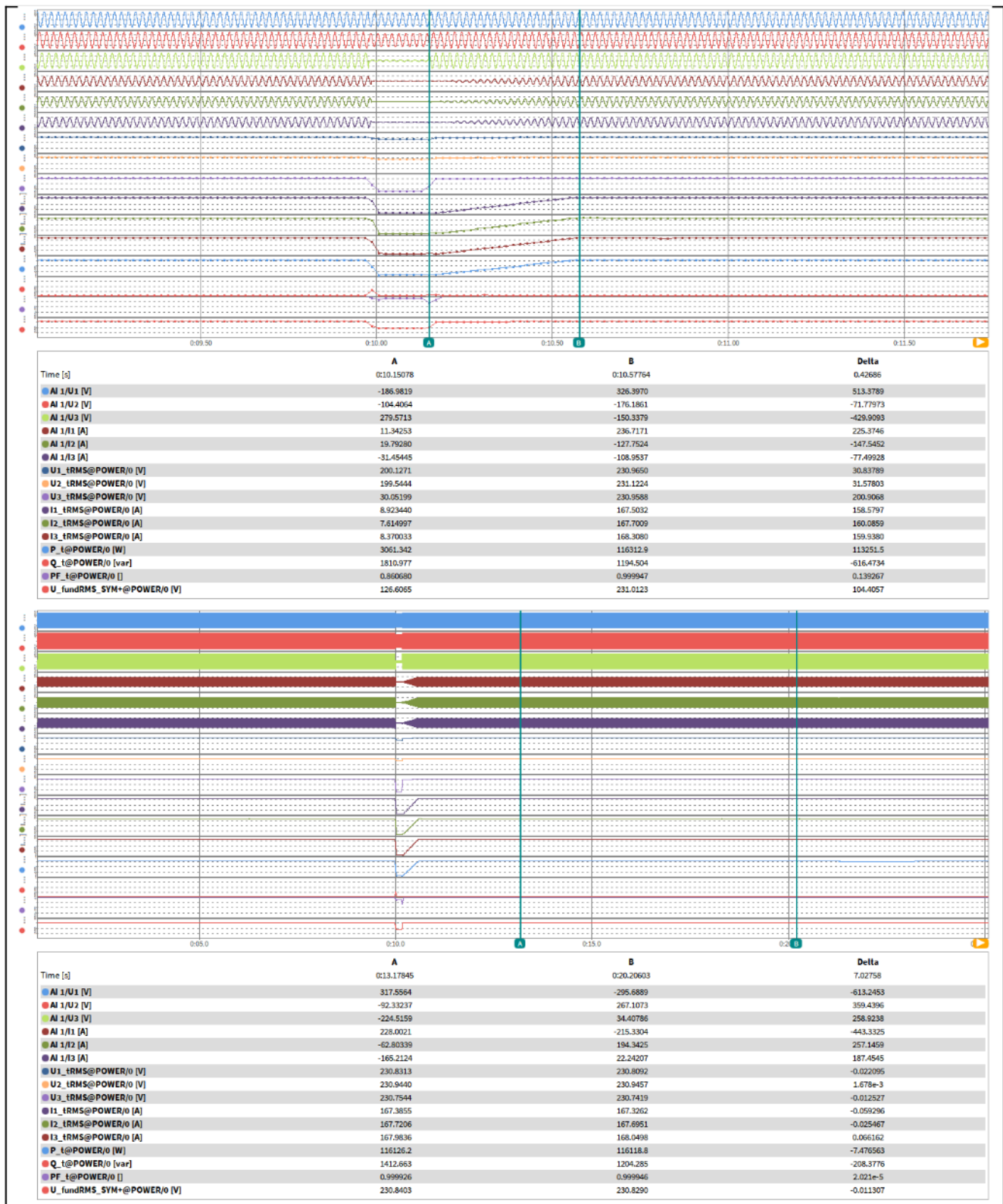


Time [s]	A	B	Delta
	0:10.10986	0:10.12990	0.02004
AI 1/U1 [V]	-120.9638	-112.5844	8.379460
AI 1/U2 [V]	110.0779	101.8014	-8.276463
AI 1/U3 [V]	39.09603	39.41131	0.313282
AI 1/I1 [A]	-11.31153	-11.50143	-0.189900
AI 1/I2 [A]	-1.052022	-1.404882	-0.352860
AI 1/I3 [A]	12.36093	12.84802	0.487089
U1_IRMS@POWER/0 [V]	200.1217	200.1255	3.754e-3
U2_IRMS@POWER/0 [V]	199.5491	199.5442	-4.868e-3
U3_IRMS@POWER/0 [V]	30.05639	30.04866	-7.729e-3
I1_IRMS@POWER/0 [A]	8.939065	8.918580	-0.020485
I2_IRMS@POWER/0 [A]	7.694782	7.651060	-0.043722
I3_IRMS@POWER/0 [A]	8.367007	8.358994	-8.013e-3
P_t@POWER/0 [W]	3078.463	3070.462	-8.001221
Q_t@POWER/0 [var]	1819.316	1807.029	-12.28674
PF_t@POWER/0 []	0.860899	0.861827	9.277e-4
U_fundRMS_SYM+@POWER/0 [V]	126.6085	126.6050	-3.479e-3

After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 64 von 153
Page 64 of 153

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 65 von 153
Page 65 of 153

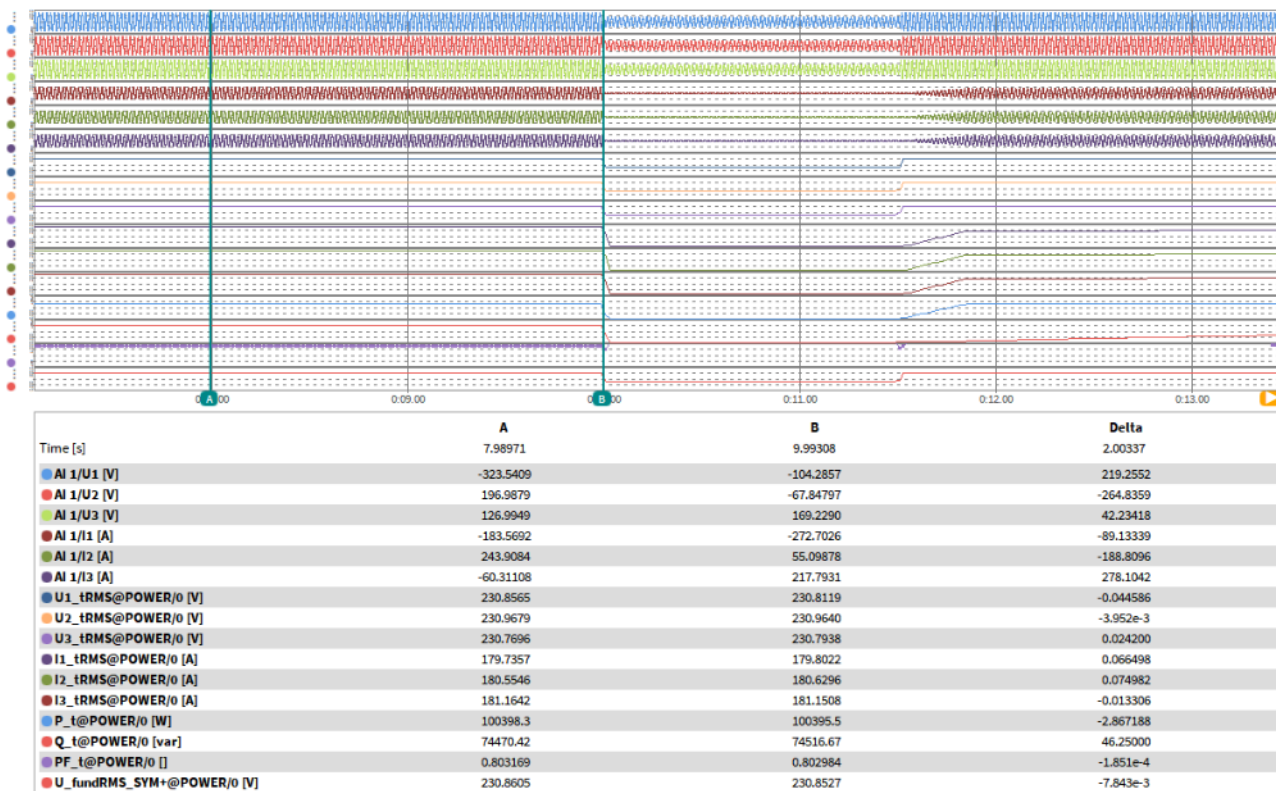
Condition						Measurement
	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	1.3(D2)
	1	Date	--	--	yyyy.mm.dd	2022.08.15
	2	Time (start of test)	--	--	hh:mm:ss	16:42:00
	3	Fault type (phase)	--	--		2 phase
	4	Setting voltage depth	Line to neutral	--	p.u.	0.15
	5	Setting dip duration		--	ms	170
	6	Point of fault entry	Total	--	s	9.98758
	7	Point of fault clearance	Total	--	s	10.15790
	8	Fault duration in empty load test	Total	--	ms	170.32
	9	Voltage depth/height in empty load test	Total	t1+100ms to t2 and t1-10s to t1	p.u.	0.130
	10		Pos.		p.u.	1.004
Before dip <t1	11	Voltage	Line to neutral	t1-100s to t1	p.u.	1.004
	12	Current	Pos.	t1-500ms to t1-100ms	p.u.	1.010
	13	Active power	Total	t1-10s to t1	p.u.	1.010
	14		Pos.			1.009
	15	Reactive power	Total	t1-10s to t1	p.u.	0.009
	16		Pos.			0.009
	17	Cos φ	--	t1-10s to t1	--	0.999
During dip t1 to t2	18	Voltage	Line to neutral	t1+100ms to t2-20ms	p.u.	0.131
	19	Line current	Phase 1	t1+60ms	p.u.	0.050
	20		Phase 2			0.048
	21		Phase 3			0.054
	22	Line current	Phase 1	t1+100ms	p.u.	0.054
	23		Phase 2			0.047
	24		Phase 3			0.051
	25	Active power	Total	t1+100ms to t2-20ms	p.u.	0.016
	26		Pos.			0.016
After dip > t2	27	Voltage	Line to neutral	t2+3s to t2+10s	p.u.	1.004
	28	Active power	Total	t2+3s to t2+10s	p.u.	1.010
	29		Pos.			1.010
	30	Active power rising time	Pos.	--	s	0.427
	31	Reactive power	Total	t2+3s to t2+10s	p.u.	N/A
	32		Pos.			N/A
	33	Reactive power rising time	Pos.	--	s	N/A
	34	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	Yes

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 66 von 153
Page 66 of 153

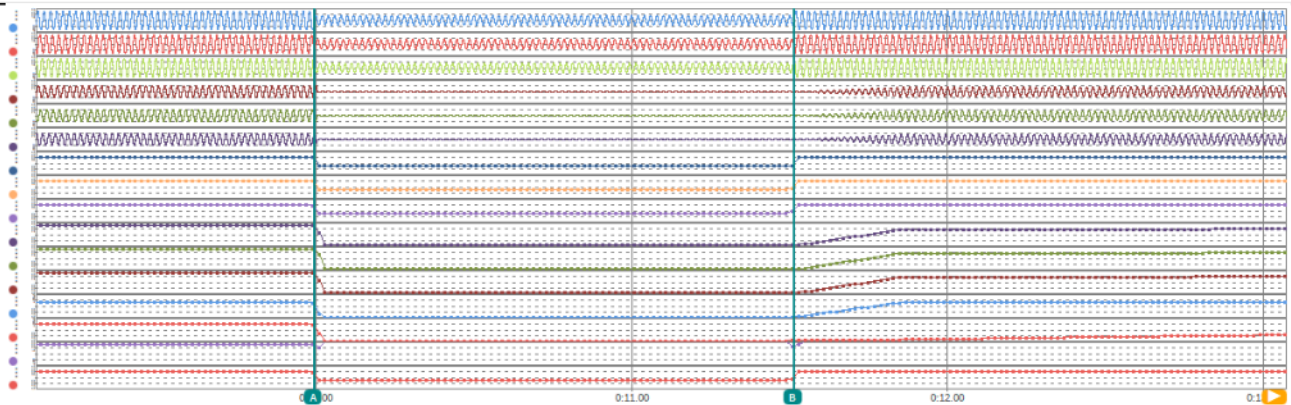
Test No. 2.1 idle test

Test No. 2.1 with PGU
Before dip

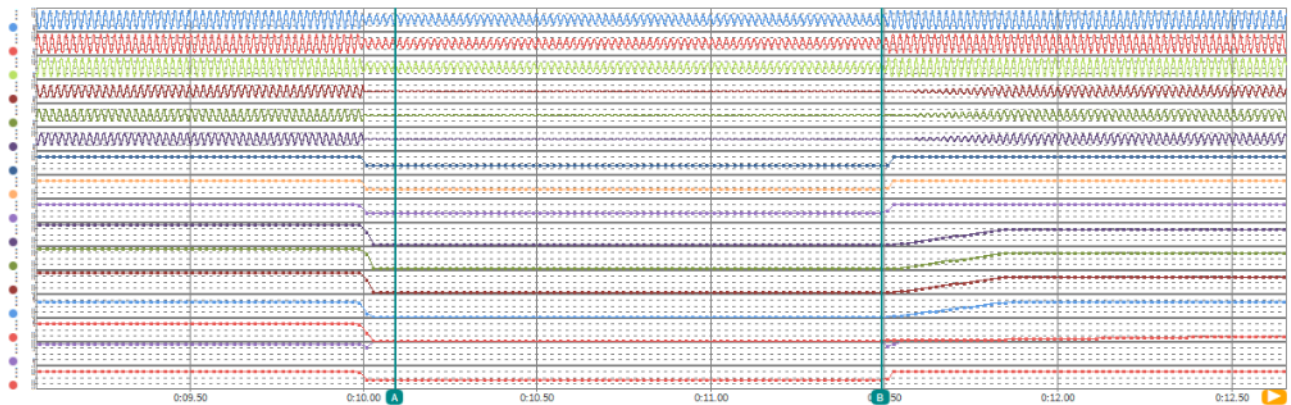
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 67 von 153
Page 67 of 153

Time [s]	A	B	Delta
	9.99292	0:11.51242	1.51950
AI 1/U1 [V]	-109.8483	-213.6781	-103.8299
AI 1/U2 [V]	-58.87032	-61.48267	-2.612353
AI 1/U3 [V]	172.9550	223.1755	50.22049
AI 1/I1 [A]	-248.8405	18.21923	267.0597
AI 1/I2 [A]	63.10213	6.509185	-56.59294
AI 1/I3 [A]	184.9806	-24.56737	-209.5480
U1_tRMS@POWER/0 [V]	230.8119	112.1751	-118.6368
U2_tRMS@POWER/0 [V]	230.9640	112.2249	-118.7391
U3_tRMS@POWER/0 [V]	230.7938	112.1175	-118.6764
I1_tRMS@POWER/0 [A]	179.8022	8.307678	-171.4946
I2_tRMS@POWER/0 [A]	180.6296	8.329228	-172.3004
I3_tRMS@POWER/0 [A]	181.1508	8.267489	-172.8834
P_t@POWER/0 [W]	100395.5	2768.030	-97627.43
Q_t@POWER/0 [var]	74516.67	377.0446	-74139.63
PF_t@POWER/0 []	0.802984	0.990850	0.187866
U_fundRMS_SYM+@POWER/0 [V]	230.8527	112.1723	-118.6804

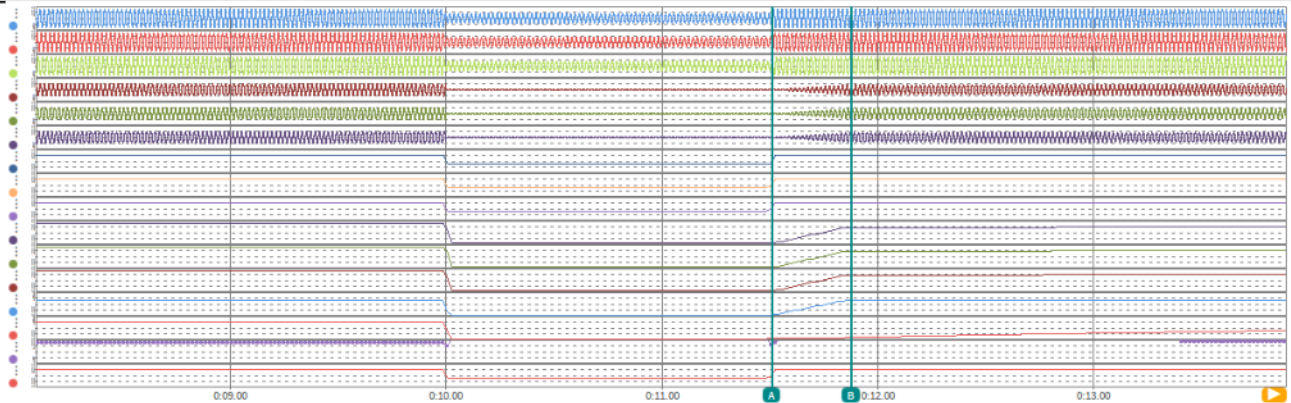


Time [s]	A	B	Delta
	0:10.09245	0:11.49100	1.39856
AI 1/U1 [V]	-115.6147	-150.1570	-34.54232
AI 1/U2 [V]	-34.99437	30.47180	65.46617
AI 1/U3 [V]	148.6697	119.4429	-29.22678
AI 1/I1 [A]	-9.604097	-11.09612	-1.492024
AI 1/I2 [A]	-0.626087	2.526999	3.153086
AI 1/I3 [A]	10.21349	8.546830	-1.666665
U1_tRMS@POWER/0 [V]	110.6473	112.1690	1.521706
U2_tRMS@POWER/0 [V]	110.9085	112.2311	1.322556
U3_tRMS@POWER/0 [V]	110.4090	112.1237	1.714630
I1_tRMS@POWER/0 [A]	8.221786	8.403695	0.181910
I2_tRMS@POWER/0 [A]	8.259031	8.445786	0.186755
I3_tRMS@POWER/0 [A]	8.201781	8.270570	0.068789
P_t@POWER/0 [W]	2702.568	2787.240	84.67188
Q_t@POWER/0 [var]	394.8920	414.1476	19.25565
PF_t@POWER/0 []	0.989493	0.989140	-3.524e-4
U_fundRMS_SYM+@POWER/0 [V]	110.6535	112.1743	1.520813

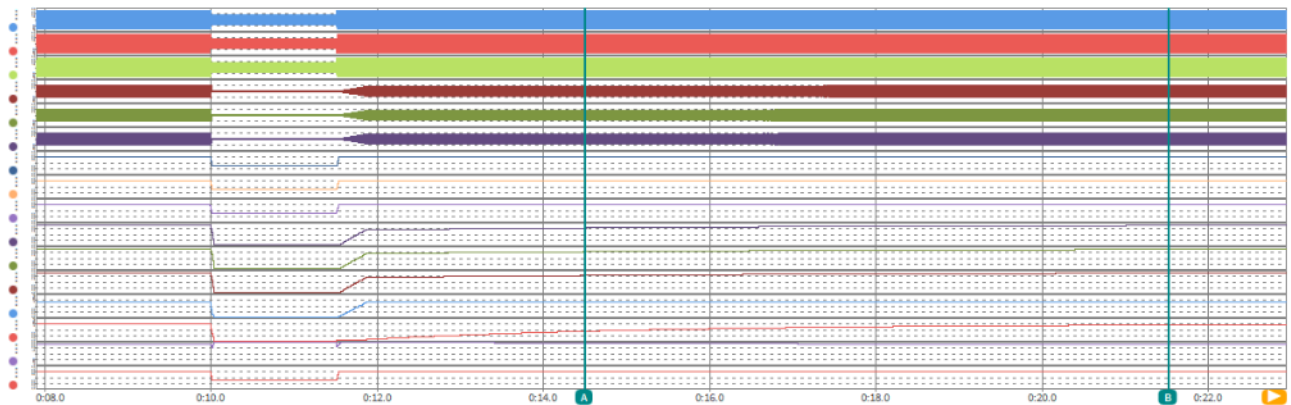
After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 68 von 153
Page 68 of 153

Time [s]	A	B	Delta
AI 1/U1 [V]	0:11.51252	0:11.88056	0.36803
AI 1/U2 [V]	-240.3853	321.8291	562.2144
AI 1/U3 [V]	-89.36501	-111.5079	-22.14289
AI 1/I1 [A]	317.1985	-209.7180	-526.9165
AI 1/I2 [A]	12.10582	202.0279	189.9221
AI 1/I3 [A]	12.77351	-82.76463	-95.53815
U1_rms@POWER/0 [V]	-24.89090	-119.2381	-94.34724
U2_rms@POWER/0 [V]	112.1751	231.1305	118.9554
U3_rms@POWER/0 [V]	112.2249	231.1040	118.8791
I1_rms@POWER/0 [A]	112.1175	231.0961	118.9786
I2_rms@POWER/0 [A]	8.307678	144.0594	135.7517
I3_rms@POWER/0 [A]	8.329228	144.0765	135.7473
P_t@POWER/0 [W]	8.267489	144.3320	136.0645
Q_t@POWER/0 [var]	2768.030	99689.90	96921.87
PF_t@POWER/0 []	377.0446	7174.917	6797.873
U_fundRMS_SYM+@POWER/0 [V]	0.990850	0.997420	6.570e-3
	112.1723	231.1070	118.9347



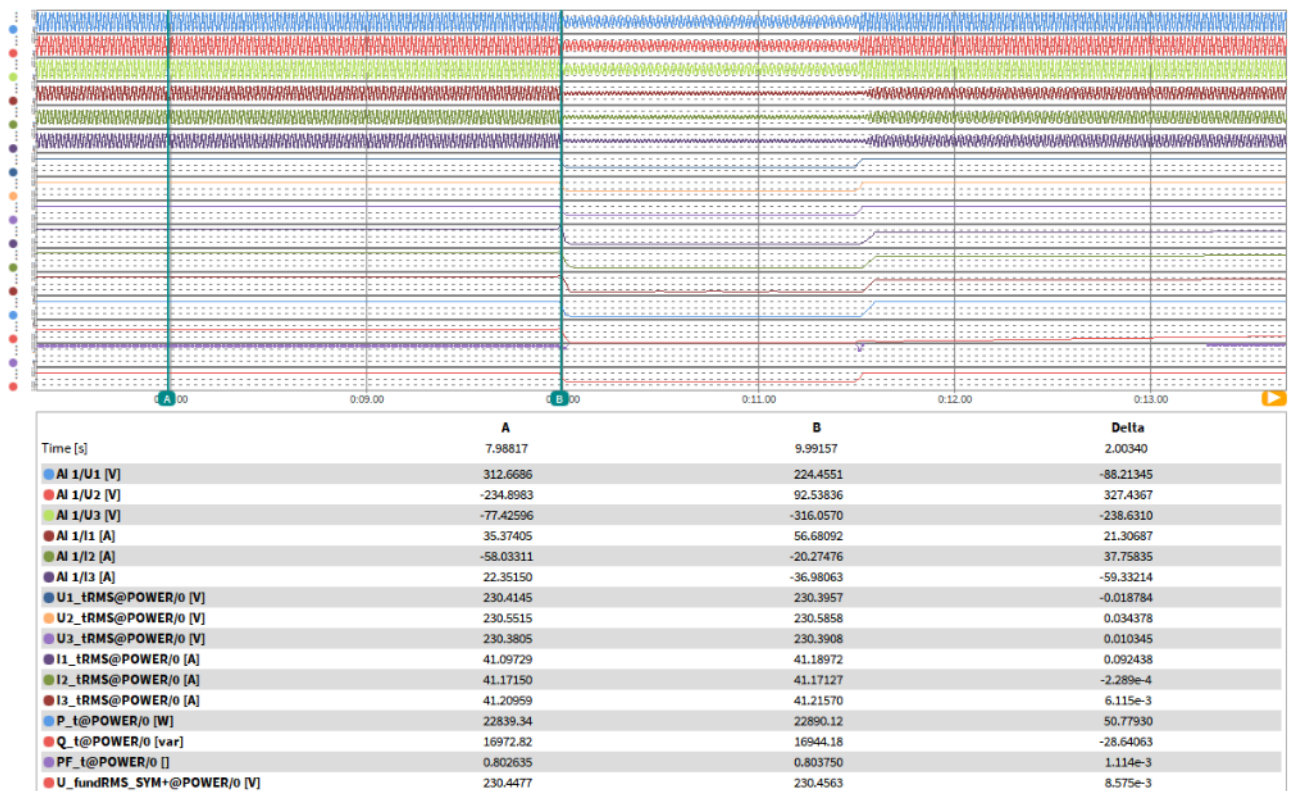
Time [s]	A	B	Delta
AI 1/U1 [V]	0:14.49793	0:21.51482	7.01689
AI 1/U2 [V]	266.8574	23.40102	-243.4564
AI 1/U3 [V]	-295.7871	-294.1704	1.616716
AI 1/I1 [A]	28.62477	270.4685	241.8437
AI 1/I2 [A]	116.1197	-119.7205	-235.8402
AI 1/I3 [A]	-220.7991	-121.3696	99.42949
U1_rms@POWER/0 [V]	104.3741	242.1246	137.7505
U2_rms@POWER/0 [V]	230.8453	230.8154	-0.029968
U3_rms@POWER/0 [V]	231.0143	230.9771	-0.037292
I1_rms@POWER/0 [A]	230.8491	230.7682	-0.080933
I2_rms@POWER/0 [A]	157.0523	176.7307	19.67836
I3_rms@POWER/0 [A]	157.3123	177.4922	20.17986
P_t@POWER/0 [W]	157.5296	177.8573	20.32764
Q_t@POWER/0 [var]	99814.20	100476.3	662.1250
PF_t@POWER/0 []	43701.16	70656.53	26955.38
U_fundRMS_SYM+@POWER/0 [V]	0.916048	0.817994	-0.098054
	230.8999	230.8503	-0.049683

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 69 von 153
Page 69 of 153

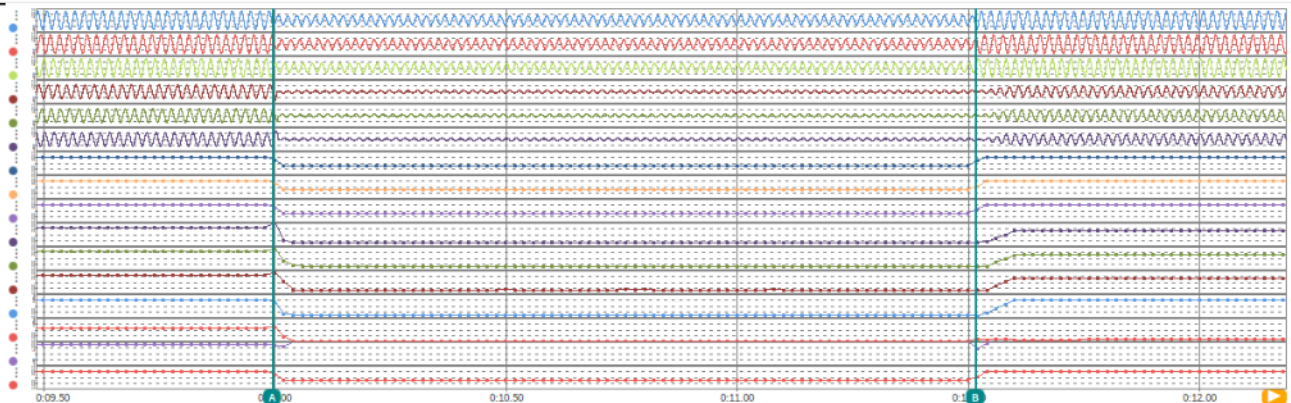
Test No. 2.2 idle test

Test No. 2.2 with PGU
Before dip

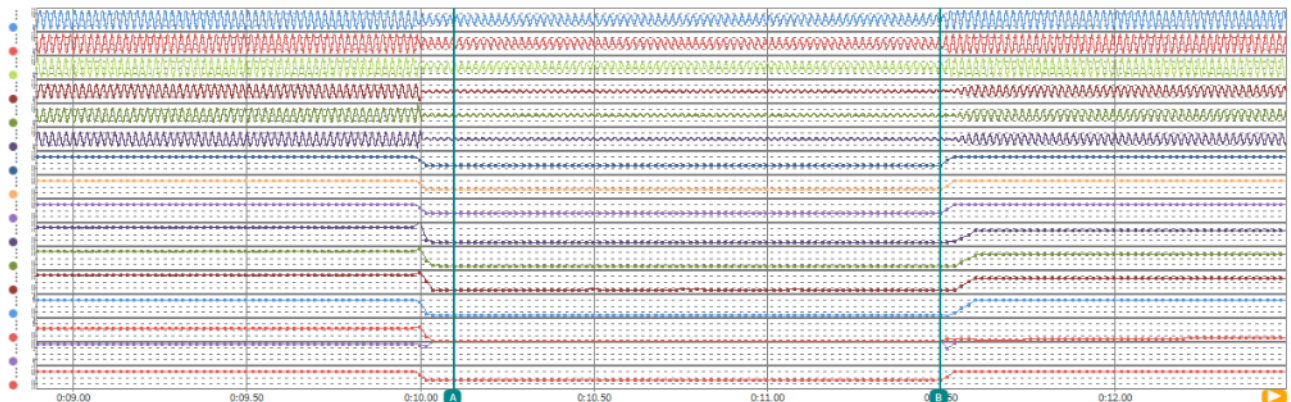
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 70 von 153
Page 70 of 153

Time [s]	A	B	Delta
AI 1/U1 [V]	-96.49277	-235.9710	-139.4782
AI 1/U2 [V]	170.9414	313.4916	142.5502
AI 1/U3 [V]	-72.62898	-77.64554	-5.016566
AI 1/I1 [A]	-6.790758	6.673098	13.46386
AI 1/I2 [A]	69.29028	-5.326987	-74.61727
AI 1/I3 [A]	-67.16502	-1.355648	65.80937
U1_tRMS@POWER/0 [V]	230.3957	112.1946	-118.2011
U2_tRMS@POWER/0 [V]	230.5858	112.2023	-118.3835
U3_tRMS@POWER/0 [V]	230.3908	112.1198	-118.2710
I1_tRMS@POWER/0 [A]	41.18972	8.225066	-32.96466
I2_tRMS@POWER/0 [A]	41.17127	8.281811	-32.88946
I3_tRMS@POWER/0 [A]	41.21570	8.306753	-32.90895
P_t@POWER/0 [W]	22890.12	2759.952	-20130.17
Q_t@POWER/0 [var]	16944.18	360.5042	-16583.68
PF_t@POWER/0 []	0.803750	0.991577	0.187827
U_fundRMS_SYM+@POWER/0 [V]	230.4563	112.1720	-118.2843

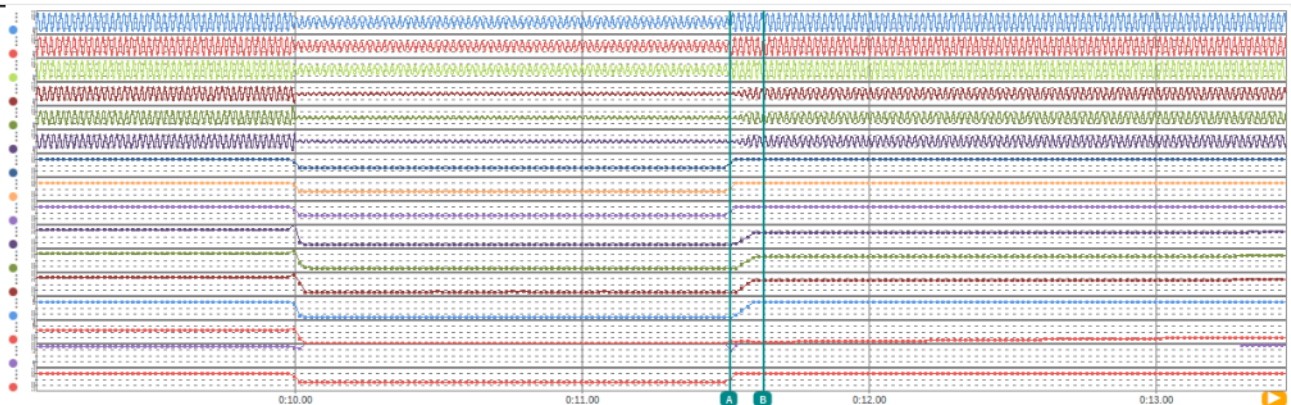


Time [s]	A	B	Delta
AI 1/U1 [V]	-96.26842	-88.19342	8.074999
AI 1/U2 [V]	156.9097	158.2339	1.324177
AI 1/U3 [V]	-60.36878	-70.00828	-9.639502
AI 1/I1 [A]	-6.995202	-5.666733	1.328468
AI 1/I2 [A]	11.96051	11.45697	-0.503540
AI 1/I3 [A]	-4.961729	-5.827666	-0.865936
U1_tRMS@POWER/0 [V]	111.8262	112.1612	0.334953
U2_tRMS@POWER/0 [V]	112.0621	112.2136	0.151543
U3_tRMS@POWER/0 [V]	111.6353	112.1379	0.502533
I1_tRMS@POWER/0 [A]	8.152849	8.217999	0.065150
I2_tRMS@POWER/0 [A]	8.254631	8.268262	0.013631
I3_tRMS@POWER/0 [A]	8.200034	8.250005	0.049971
P_t@POWER/0 [W]	2723.398	2750.369	26.97119
Q_t@POWER/0 [var]	396.7577	366.5723	-30.18546
PF_t@POWER/0 []	0.989554	0.991235	1.681e-3
U_fundRMS_SYM+@POWER/0 [V]	111.8400	112.1707	0.330711

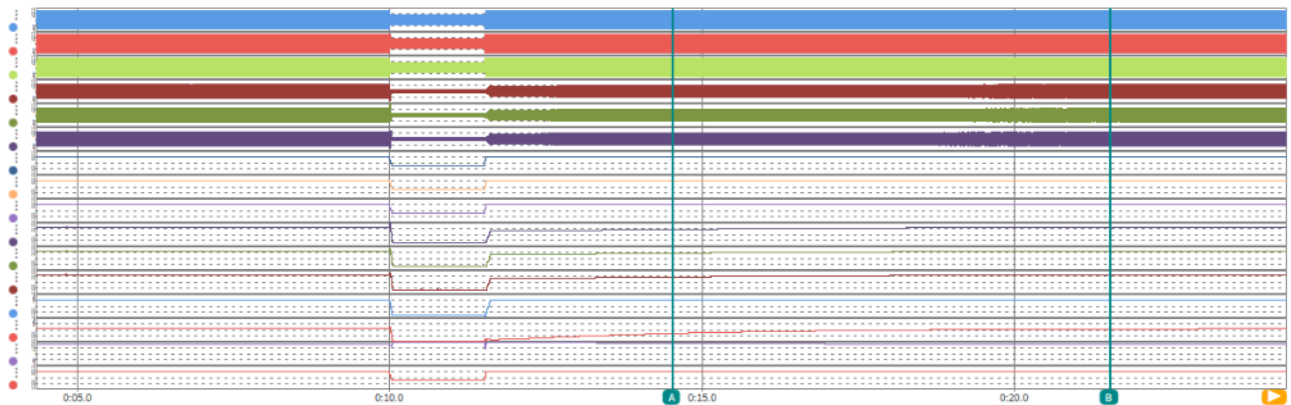
After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 71 von 153
Page 71 of 153

Time [s]	A	B	Delta
	0:11.51462	0:11.63251	0.11788
AI 1/U1 [V]	-38.46026	131.1092	169.5695
AI 1/U2 [V]	152.4122	192.9698	40.55763
AI 1/U3 [V]	-114.0401	-324.3623	-210.3222
AI 1/I1 [A]	-0.781655	21.92700	22.70866
AI 1/I2 [A]	10.84292	25.69056	14.84764
AI 1/I3 [A]	-10.09619	-47.65082	-37.55462
U1_tRMS@POWER/0 [V]	112.1946	230.4399	118.2453
U2_tRMS@POWER/0 [V]	112.2023	230.2278	118.0255
U3_tRMS@POWER/0 [V]	112.1198	230.7117	118.5919
I1_tRMS@POWER/0 [A]	8.225066	33.02239	24.79732
I2_tRMS@POWER/0 [A]	8.281811	33.21028	24.92847
I3_tRMS@POWER/0 [A]	8.306753	33.09782	24.79107
P_t@POWER/0 [W]	2759.952	22801.36	20041.41
Q_t@POWER/0 [var]	360.5042	2031.307	1670.802
PF_t@POWER/0 []	0.991577	0.996055	4.478e-3
U_fundRMS_SYM+@POWER/0 [V]	112.1720	230.4593	118.2873



Time [s]	A	B	Delta
	0:14.52360	0:21.52712	7.00352
AI 1/U1 [V]	-26.38936	294.3206	320.7100
AI 1/U2 [V]	-268.3988	-267.8270	0.571728
AI 1/U3 [V]	294.2779	-26.38340	-320.6613
AI 1/I1 [A]	-24.67656	28.86176	53.53833
AI 1/I2 [A]	-26.71659	-55.81951	-29.10292
AI 1/I3 [A]	51.53311	25.73729	-25.79582
U1_tRMS@POWER/0 [V]	230.4318	230.4574	0.025574
U2_tRMS@POWER/0 [V]	230.5809	230.5660	-0.014893
U3_tRMS@POWER/0 [V]	230.4057	230.3608	-0.044907
I1_tRMS@POWER/0 [A]	36.03171	40.28246	4.250744
I2_tRMS@POWER/0 [A]	36.13643	40.46002	4.323589
I3_tRMS@POWER/0 [A]	36.13575	40.48960	4.353855
P_t@POWER/0 [W]	22785.90	22794.99	9.093750
Q_t@POWER/0 [var]	10191.16	16155.29	5964.137
PF_t@POWER/0 []	0.912856	0.815875	-0.096981
U_fundRMS_SYM+@POWER/0 [V]	230.4715	230.4603	-0.011261

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 72 von 153
Page 72 of 153

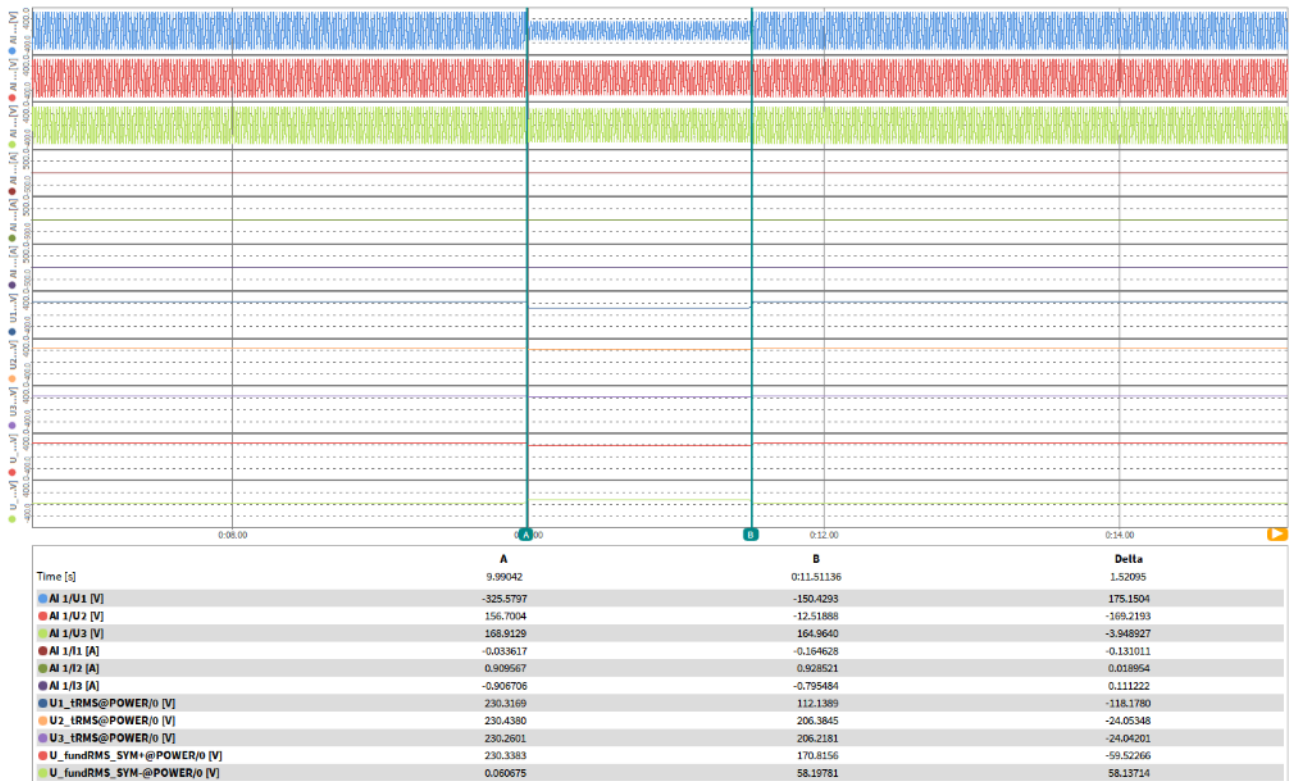
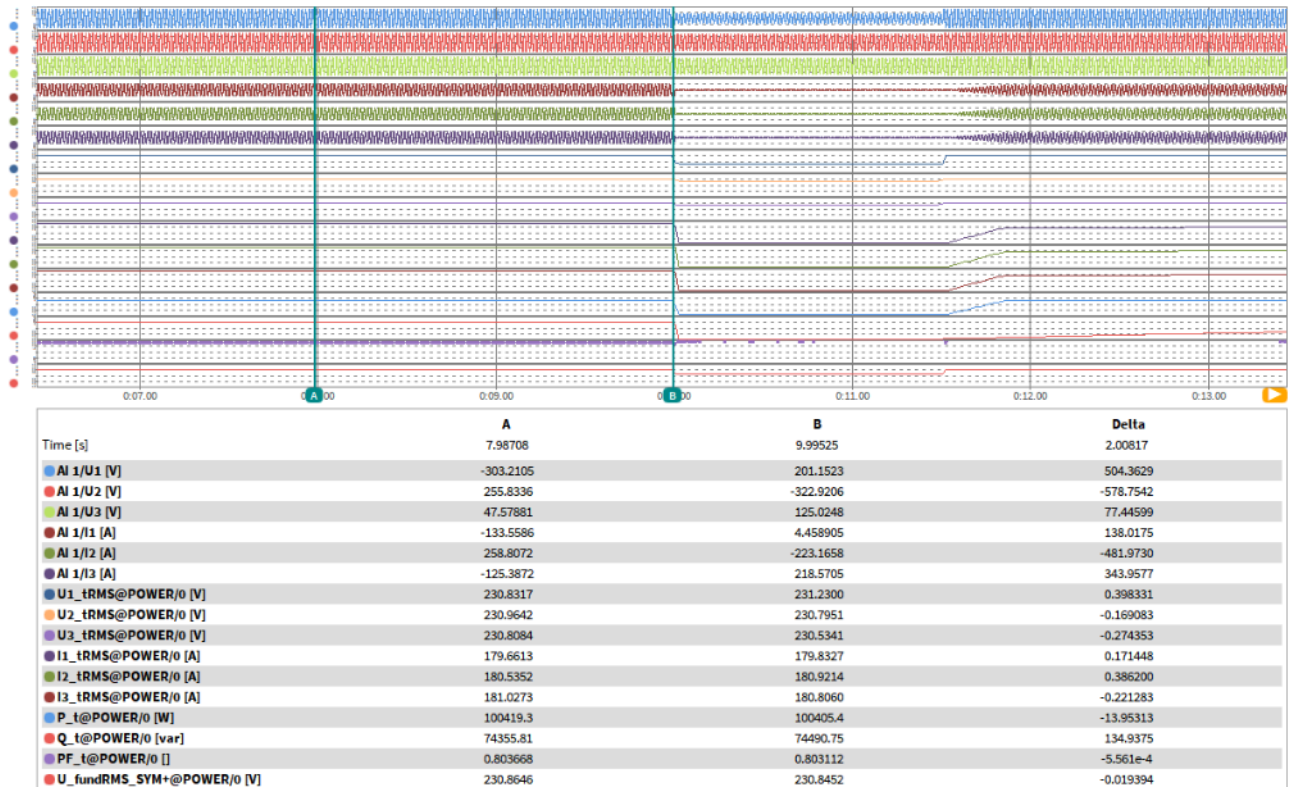
Condition						Measurement	
	No.	Parameter	Phase ref.	Time ref.	unit		
General Info.	0	Test number	--	--	--	2.1	2.2
	1	Date	--	--	yyyy.mm.dd	2022.08.15	2022.08.15
	2	Time (start of test)	--	--	hh:mm:ss	17:01:10	17:01:10
	3	Fault type (phase)	--	--		3 phase	3 phase
	4	Setting voltage depth	Line to neutral	--	p.u.	0.5	0.5
	5	Setting dip duration		--	ms	1518	1518
	6	Point of fault entry	Total	--	s	9.99644	9.99644
	7	Point of fault clearance	Total	--	s	11.51463	11.51463
	8	Fault duration in empty load test	Total	--	ms	1518.20	1518.20
	9	Voltage depth/height in empty load test	Total	t1+100ms to t2 and t1-10s to t1	p.u.	0.488	0.488
	10		Pos.		p.u.	1.001	1.001
Before dip <t1	11	Voltage	Line to neutral	t1-100s to t1	p.u.	1.004	1.002
	12	Current	Pos.	t1-500ms to t1-100ms	p.u.	1.088	0.248
	13	Active power	Total	t1-10s to t1	p.u.	0.873	0.199
	14		Pos.			0.873	0.199
	15	Reactive power	Total	t1-10s to t1	p.u.	0.648	0.148
	16		Pos.			0.648	0.147
	17	Cos ϕ	--	t1-10s to t1	--	0.803	0.803
During dip t1 to t2	18	Voltage	Line to neutral	t1+100ms to t2-20ms	p.u.	0.481	0.488
	19	Line current	Phase 1	t1+60ms	p.u.	0.049	0.049
	20		Phase 2			0.053	0.051
	21		Phase 3			0.049	0.048
	22	Line current	Phase 1	t1+100ms	p.u.	0.049	0.049
	23		Phase 2			0.050	0.050
	24		Phase 3			0.049	0.049
	25	Active power	Total	t1+100ms to t2-20ms	p.u.	0.024	0.024
	26		Pos.			0.024	0.024
After dip > t2	27	Voltage	Line to neutral	t2+3s to t2+10s	p.u.	1.004	1.002
	28	Active power	Total	t2+3s to t2+10s	p.u.	0.868	0.198
	29		Pos.			0.874	0.198
	30	Active power rising time	Pos.	--	s	0.368	0.118
	31	Reactive power	Total	t2+3s to t2+10s	p.u.	0.380	0.089
	32		Pos.			0.614	0.140
	33	Reactive power rising time	Pos.	--	s	10	10
	34	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	Yes	Yes

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 73 von 153
Page 73 of 153

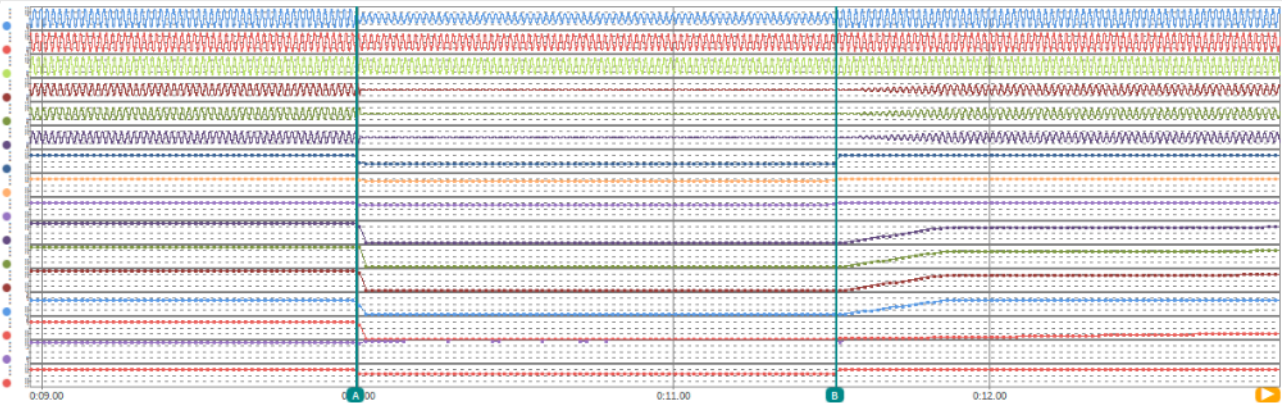
Test No. 2.3 idle test

Test No. 2.3 with PGU
Before dip

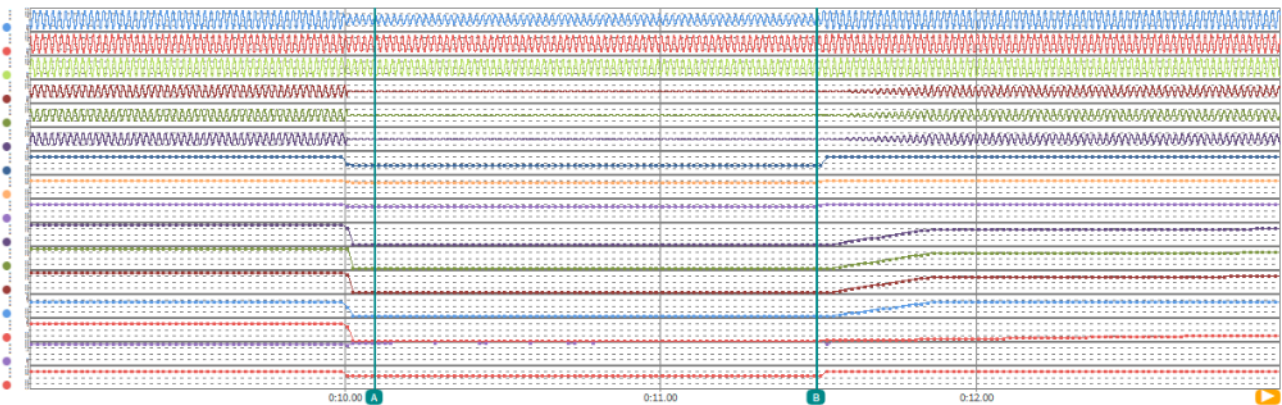
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 74 von 153
Page 74 of 153

Time [s]	A	B	Delta
	9.99655	0:11.51451	1.51796
AI 1/U1 [V]	146.5974	70.18304	-76.41435
AI 1/U2 [V]	-207.3486	-287.5009	-80.15228
AI 1/U3 [V]	65.51814	216.5542	151.0360
AI 1/I1 [A]	120.4454	3.791929	-116.6534
AI 1/I2 [A]	-253.7244	-12.41505	241.3093
AI 1/I3 [A]	133.2027	8.647204	-124.5555
U1_trMS@POWER/0 [V]	231.2300	111.5622	-119.6678
U2_trMS@POWER/0 [V]	230.7951	207.3622	-23.43294
U3_trMS@POWER/0 [V]	230.5341	207.1490	-23.38507
I1_trMS@POWER/0 [A]	179.8327	8.249948	-171.5828
I2_trMS@POWER/0 [A]	180.9214	8.654881	-172.2666
I3_trMS@POWER/0 [A]	180.8060	7.924991	-172.8810
P_t@POWER/0 [W]	100405.4	4158.699	-96246.68
Q_t@POWER/0 [var]	74490.75	1298.586	-73192.16
PF_t@POWER/0 []	0.803112	0.954546	0.151434
U_fundRMS_SYM+@POWER/0 [V]	230.8452	171.1230	-59.72226

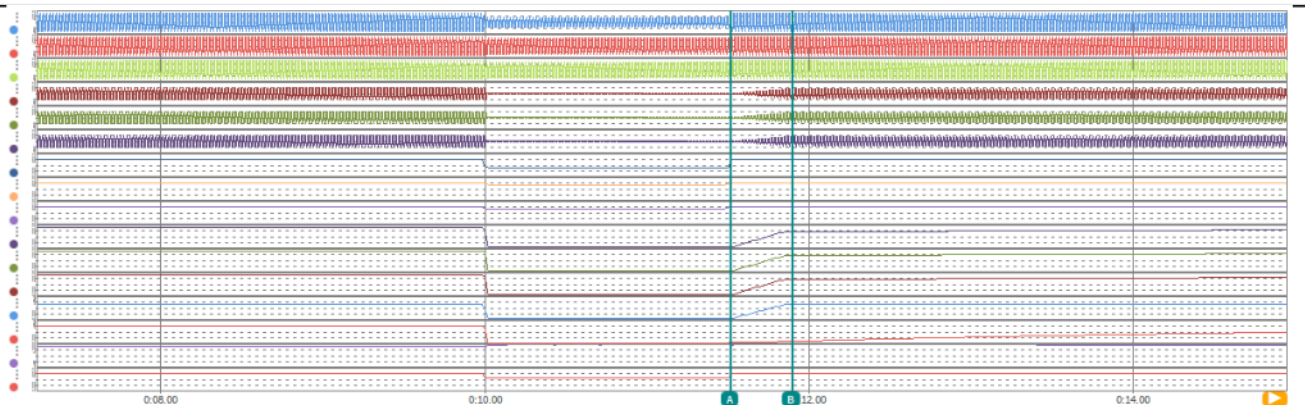


Time [s]	A	B	Delta
	0:10.09580	0:11.49408	1.39828
AI 1/U1 [V]	115.9926	47.04452	-68.94803
AI 1/U2 [V]	-244.9050	-291.8866	-46.98158
AI 1/U3 [V]	126.7417	244.4403	117.6987
AI 1/I1 [A]	8.302093	1.600385	-6.701708
AI 1/I2 [A]	-11.75630	-11.12437	0.631928
AI 1/I3 [A]	3.392577	9.485007	6.092430
U1_trMS@POWER/0 [V]	110.6578	112.1678	1.510056
U2_trMS@POWER/0 [V]	203.8569	206.4067	2.549774
U3_trMS@POWER/0 [V]	202.9696	206.2341	3.264481
I1_trMS@POWER/0 [A]	8.388457	8.224748	-0.163710
I2_trMS@POWER/0 [A]	8.709339	8.687604	-0.021735
I3_trMS@POWER/0 [A]	7.902981	7.877448	-0.025534
P_t@POWER/0 [W]	4066.062	4137.599	71.53638
Q_t@POWER/0 [var]	1422.688	1311.009	-111.6788
PF_t@POWER/0 []	0.943890	0.953291	9.401e-3
U_fundRMS_SYM+@POWER/0 [V]	168.4467	170.8443	2.397598

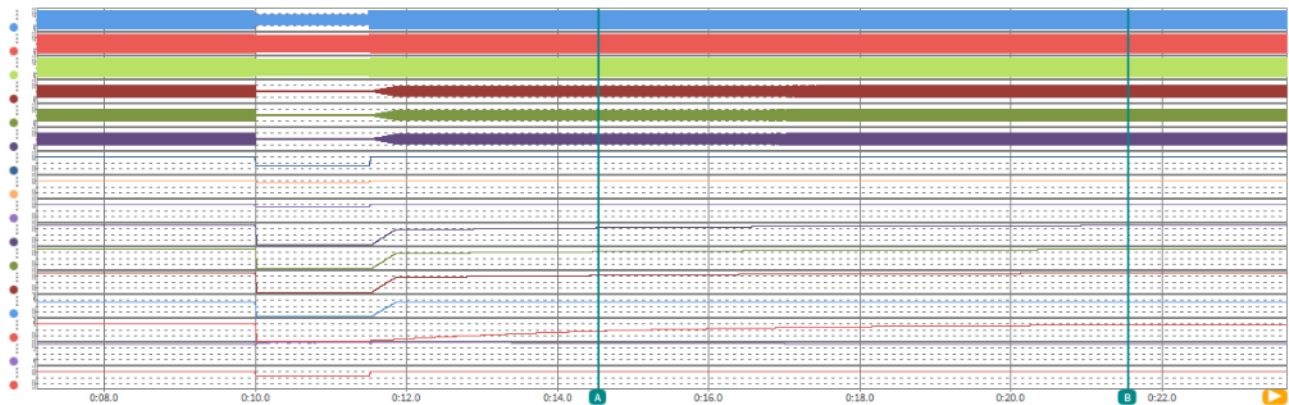
After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 75 von 153
Page 75 of 153

Time [s]	A	B	Delta
AI 1/U1 [V]	284.0564	272.9006	-11.15584
AI 1/U2 [V]	-286.5496	-291.3532	-4.803658
AI 1/U3 [V]	-10.35547	18.17942	28.53489
AI 1/I1 [A]	-3.855348	160.9739	164.8293
AI 1/I2 [A]	-5.231977	-186.0459	-180.8139
AI 1/I3 [A]	9.198666	25.37668	16.17801
U1_tRMS@POWER/0 [V]	111.5622	231.1477	119.5855
U2_tRMS@POWER/0 [V]	207.3622	231.2203	23.85817
U3_tRMS@POWER/0 [V]	207.1490	231.2478	24.09885
I1_tRMS@POWER/0 [A]	8.249948	143.3559	135.1059
I2_tRMS@POWER/0 [A]	8.654881	143.5371	134.8822
I3_tRMS@POWER/0 [A]	7.924991	143.6967	135.7717
P_t@POWER/0 [W]	4158.699	99236.16	95077.46
Q_t@POWER/0 [var]	1298.586	7956.736	6658.150
PF_t@POWER/0 []	0.954546	0.996801	0.042255
U_fundRMS_SYM+@POWER/0 [V]	171.1230	231.2022	60.07919



Time [s]	A	B	Delta
AI 1/U1 [V]	105.8273	-174.9125	-280.7398
AI 1/U2 [V]	215.0488	325.7389	110.6901
AI 1/U3 [V]	-319.8831	-151.2504	168.6328
AI 1/I1 [A]	153.5277	11.52873	-141.9990
AI 1/I2 [A]	64.65555	211.7669	147.1113
AI 1/I3 [A]	-218.3210	-223.3423	-5.021334
U1_tRMS@POWER/0 [V]	230.8313	230.8213	-0.010010
U2_tRMS@POWER/0 [V]	230.9601	230.9819	0.021790
U3_tRMS@POWER/0 [V]	230.8192	230.7802	-0.038940
I1_tRMS@POWER/0 [A]	157.2463	176.8231	19.57686
I2_tRMS@POWER/0 [A]	157.5255	177.5613	20.03587
I3_tRMS@POWER/0 [A]	157.7604	177.9321	20.17172
P_t@POWER/0 [W]	99763.60	100451.4	687.7734
Q_t@POWER/0 [var]	44143.33	70793.88	26650.54
PF_t@POWER/0 []	0.914477	0.817401	-0.097076
U_fundRMS_SYM+@POWER/0 [V]	230.8674	230.8582	-9.109e-3

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 76 von 153
Page 76 of 153

Test No. 2.4 idle test



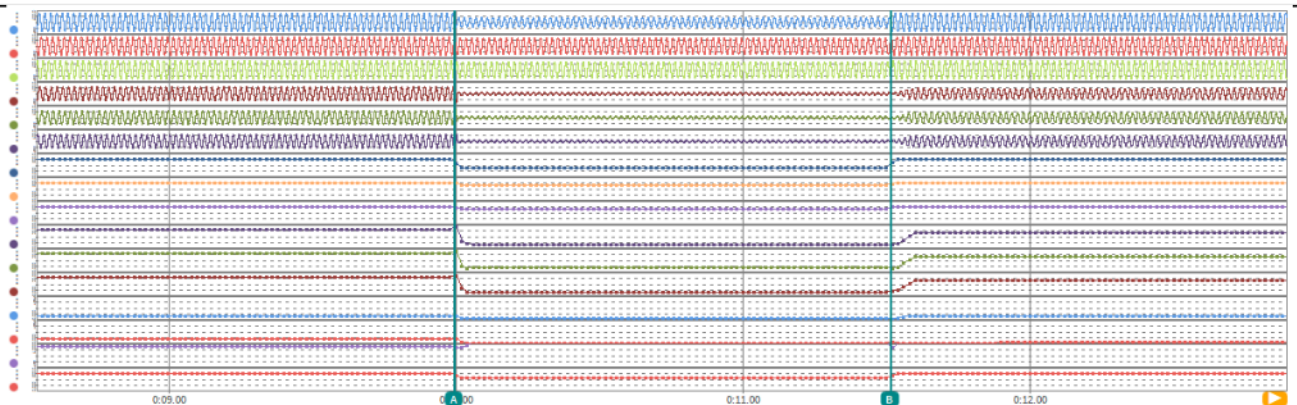
Test No. 2.4 with PGU
Before dip



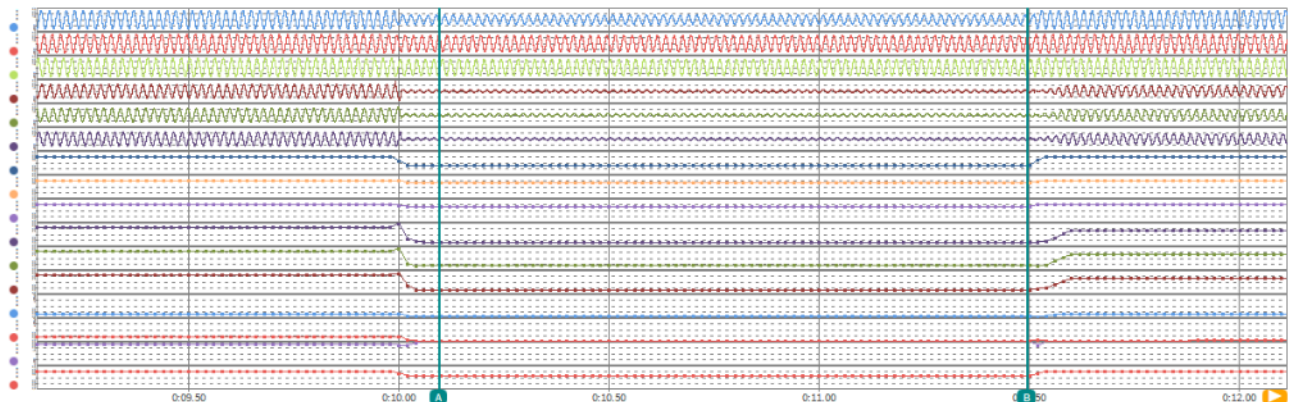
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 77 von 153
Page 77 of 153

Time [s]	A	B	Delta
	9.99444	0:11.51326	1.51881
AI 1/U1 [V]	42.57965	183.0156	140.4359
AI 1/U2 [V]	251.9932	133.9951	-117.9981
AI 1/U3 [V]	-291.0767	-326.0358	-34.95908
AI 1/I1 [A]	45.94744	-0.180244	-46.12768
AI 1/I2 [A]	10.40018	4.766226	-5.633951
AI 1/I3 [A]	-56.43666	-4.405737	52.03092
U1_tRMS@POWER/0 [V]	230.5723	112.0279	-118.5444
U2_tRMS@POWER/0 [V]	230.5058	206.6220	-23.88385
U3_tRMS@POWER/0 [V]	230.3216	206.4571	-23.86446
I1_tRMS@POWER/0 [A]	41.08278	8.275843	-32.80694
I2_tRMS@POWER/0 [A]	41.19530	8.641236	-32.55407
I3_tRMS@POWER/0 [A]	41.12214	7.903700	-33.21843
P_t@POWER/0 [W]	22828.36	4144.248	-18684.11
Q_t@POWER/0 [var]	16961.08	1303.365	-15657.72
PF_t@POWER/0 []	0.802696	0.953935	0.151240
U_fundRMS_SYM+@POWER/0 [V]	230.4651	170.9172	-59.54794

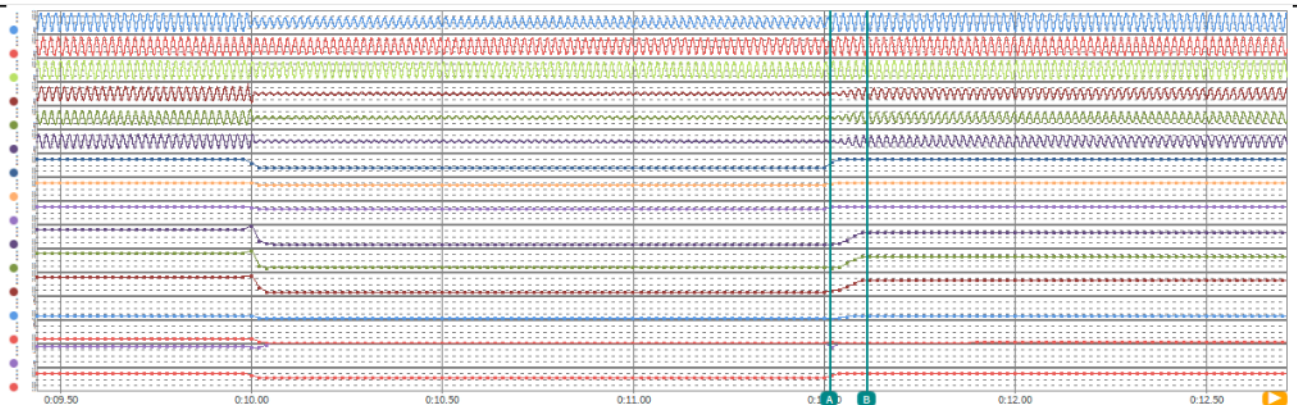


Time [s]	A	B	Delta
	0:10.09640	0:11.49496	1.39856
AI 1/U1 [V]	-56.14114	13.93437	70.07552
AI 1/U2 [V]	290.3738	272.2063	-18.16750
AI 1/U3 [V]	-234.4849	-286.3898	-51.90492
AI 1/I1 [A]	-2.480030	0.604868	3.084898
AI 1/I2 [A]	11.05201	7.655383	-3.396630
AI 1/I3 [A]	-8.650542	-8.282304	0.368238
U1_tRMS@POWER/0 [V]	111.8384	112.1630	0.324600
U2_tRMS@POWER/0 [V]	205.9623	206.4139	0.451553
U3_tRMS@POWER/0 [V]	205.2779	206.2462	0.968353
I1_tRMS@POWER/0 [A]	8.181339	8.291390	0.110051
I2_tRMS@POWER/0 [A]	8.584079	8.704296	0.120217
I3_tRMS@POWER/0 [A]	7.943722	7.958221	0.014500
P_t@POWER/0 [W]	4123.437	4172.357	48.91992
Q_t@POWER/0 [var]	1266.840	1292.712	25.87146
PF_t@POWER/0 []	0.955903	0.955204	-6.995e-4
U_fundRMS_SYM+@POWER/0 [V]	170.2702	170.8495	0.579285

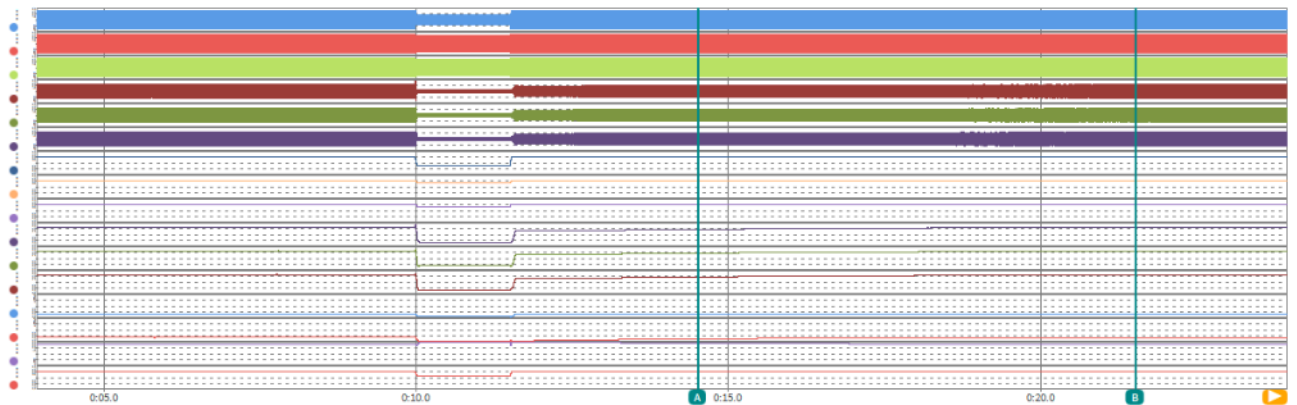
After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 78 von 153
Page 78 of 153

Time [s]	A	B	Delta
	0:11.51459	0:11.61268	0.09809
AI 1/U1 [V]	70.74905	236.2278	165.4787
AI 1/U2 [V]	240.5775	77.26932	-163.3082
AI 1/U3 [V]	-310.7991	-312.7072	-1.908064
AI 1/I1 [A]	3.505469	37.36222	33.85675
AI 1/I2 [A]	6.035328	6.587267	0.551939
AI 1/I3 [A]	-9.434105	-43.92326	-34.48916
U1_trMS@POWER/0 [V]	112.0279	230.4339	118.4061
U2_trMS@POWER/0 [V]	206.6220	230.4409	23.81891
U3_trMS@POWER/0 [V]	206.4571	230.5798	24.12268
I1_trMS@POWER/0 [A]	8.275843	33.55193	25.27609
I2_trMS@POWER/0 [A]	8.641236	33.52642	24.88518
I3_trMS@POWER/0 [A]	7.903700	33.93224	26.02854
P_t@POWER/0 [W]	4144.248	23232.56	19088.31
Q_t@POWER/0 [var]	1303.365	1507.963	204.5975
PF_t@POWER/0 []	0.953935	0.997900	0.043965
U_fundRMS_SYM+@POWER/0 [V]	170.9172	230.4845	59.56734



Time [s]	A	B	Delta
	0:14.51557	0:21.51585	7.00028
AI 1/U1 [V]	-38.09810	-94.33795	-56.23985
AI 1/U2 [V]	299.7644	317.0786	17.31420
AI 1/U3 [V]	-261.1275	-222.7199	38.40757
AI 1/I1 [A]	15.70904	17.97342	2.264381
AI 1/I2 [A]	35.38716	37.99558	2.608419
AI 1/I3 [A]	-48.91908	-56.21267	-7.293582
U1_trMS@POWER/0 [V]	230.4722	230.4418	-0.030426
U2_trMS@POWER/0 [V]	230.5704	230.5623	-8.067e-3
U3_trMS@POWER/0 [V]	230.3787	230.4031	0.024399
I1_trMS@POWER/0 [A]	36.03270	40.41880	4.386101
I2_trMS@POWER/0 [A]	36.12035	40.52032	4.399971
I3_trMS@POWER/0 [A]	36.12546	40.50506	4.379597
P_t@POWER/0 [W]	22762.57	22849.84	87.27148
Q_t@POWER/0 [var]	10229.14	16164.04	5934.901
PF_t@POWER/0 []	0.912131	0.816383	-0.095749
U_fundRMS_SYM+@POWER/0 [V]	230.4725	230.4680	-4.532e-3

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 79 von 153
Page 79 of 153

Condition						Measurement	
	No.	Parameter	Phase ref.	Time ref.	unit		
General Info.	0	Test number	--	--	--	2.3	2.4
	1	Date	--	--	yyyy.mm.dd	2022.08.15	2022.08.15
	2	Time (start of test)	--	--	hh:mm:ss	17:58:00	17:58:00
	3	Fault type (phase)	--	--		2 phase	2 phase
	4	Setting voltage depth	Line to neutral	--	p.u.	0.5	0.5
	5	Setting dip duration		--	ms	1518	1518
	6	Point of fault entry	Total	--	s	9.99042	9.99042
	7	Point of fault clearance	Total	--	s	11.51136	11.51136
	8	Fault duration in empty load test	Total	--	ms	1520.95	1520.95
	9	Voltage depth/height in empty load test	Total	t1+100ms to t2 and t1-10s to t1	p.u.	0.488	0.488
	10		Pos.		p.u.	1.001	1.001
Before dip <t1	11	Voltage	Line to neutral	t1-100s to t1	p.u.	1.004	1.002
	12	Current	Pos.	t1-500ms to t1-100ms	p.u.	1.088	0.248
	13	Active power	Total	t1-10s to t1	p.u.	0.873	0.198
	14		Pos.			0.873	0.199
	15	Reactive power	Total	t1-10s to t1	p.u.	0.647	0.148
	16		Pos.			0.648	0.147
	17	Cos ϕ	--	t1-10s to t1	--	0.804	0.802
During dip t1 to t2	18	Voltage	Line to neutral	t1+100ms to t2-20ms	p.u.	0.487	0.488
	19	Line current	Phase 1	t1+60ms	p.u.	0.051	0.051
	20		Phase 2			0.052	0.049
	21		Phase 3			0.048	0.048
	22	Line current	Phase 1	t1+100ms	p.u.	0.051	0.049
	23		Phase 2			0.052	0.052
	24		Phase 3			0.048	0.048
	25	Active power	Total	t1+100ms to t2-20ms	p.u.	0.035	0.036
	26		Pos.			0.036	0.036
After dip > t2	27	Voltage	Line to neutral	t2+3s to t2+10s	p.u.	1.004	1.002
	28	Active power	Total	t2+3s to t2+10s	p.u.	0.868	0.198
	29		Pos.			0.873	0.199
	30	Active power rising time	Pos.	--	s	0.380	0.099
	31	Reactive power	Total	t2+3s to t2+10s	p.u.	0.384	0.089
	32		Pos.			0.616	0.141
	33	Reactive power rising time	Pos.	--	s	10	10
	34	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	Yes	Yes

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

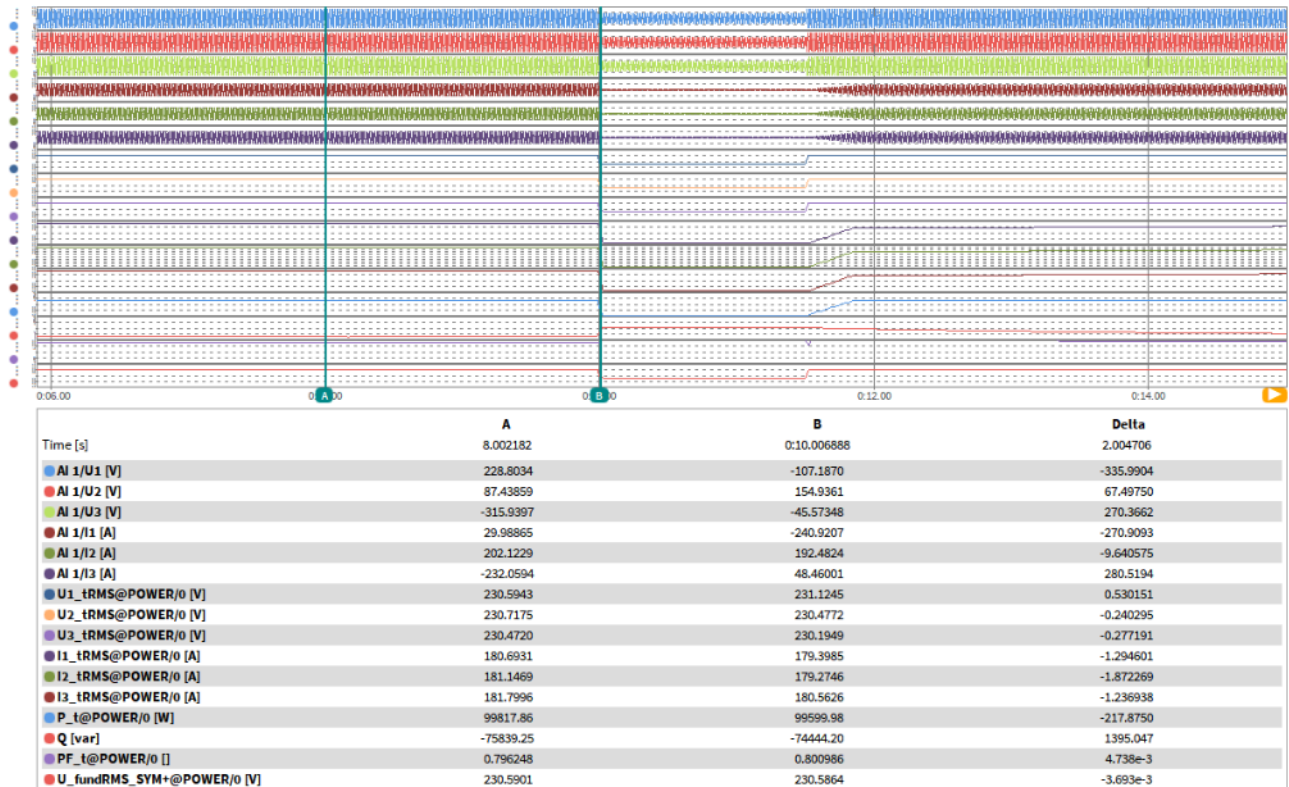
Seite 80 von 153
Page 80 of 153

Test No. 3.1 idle test



Test No. 3.1 with PGU

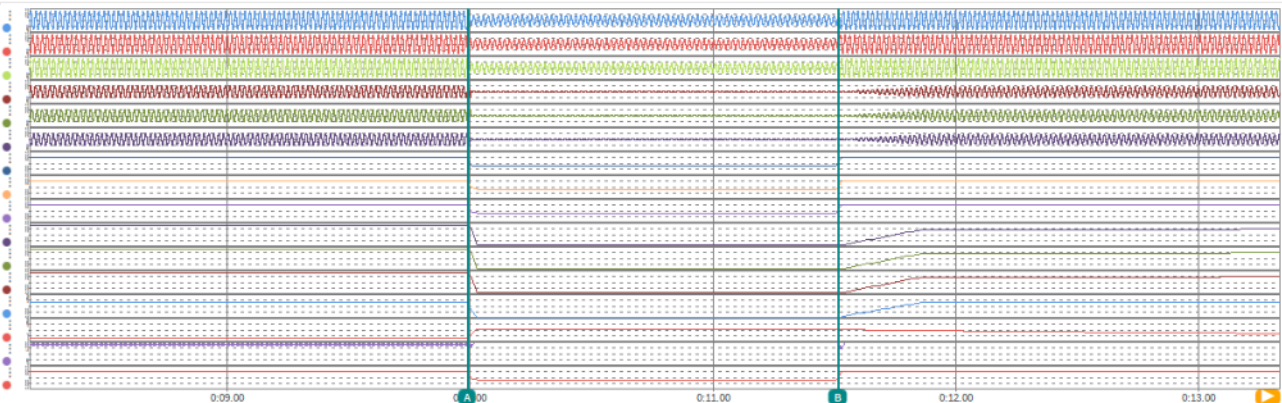
Before dip



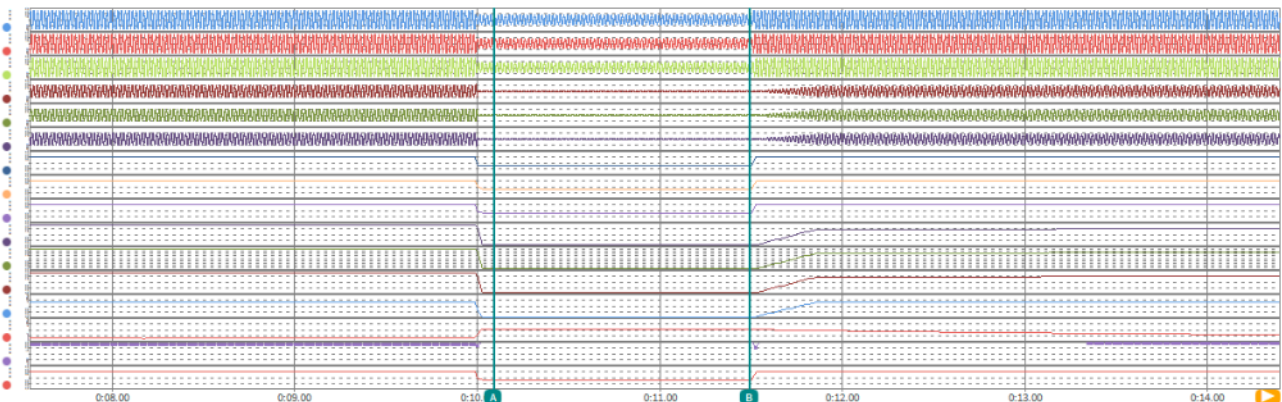
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 81 von 153
Page 81 of 153

Time [s]	A	B	Delta
AI 1/U1 [V]	-196.7707	83.01712	279.7878
AI 1/U2 [V]	-123.4093	-158.6320	-35.22277
AI 1/U3 [V]	323.6220	75.64736	-247.9746
AI 1/I1 [A]	-4.280567	5.154014	9.434581
AI 1/I2 [A]	-217.9462	-11.67762	206.2686
AI 1/I3 [A]	222.2828	6.468773	-215.8140
U1_trMS@POWER/0 [V]	230.5743	111.7261	-118.8482
U2_trMS@POWER/0 [V]	230.7340	112.4309	-118.3031
U3_trMS@POWER/0 [V]	230.5148	112.3414	-118.1734
I1_trMS@POWER/0 [A]	179.0592	8.276845	-170.7824
I2_trMS@POWER/0 [A]	179.5441	8.278330	-171.2658
I3_trMS@POWER/0 [A]	180.0775	8.321141	-171.7564
P_t@POWER/0 [W]	99566.00	2763.355	-96802.65
Q [var]	-74284.58	386.7560	74671.33
PF_t@POWER/0 []	0.801504	0.990347	0.188843
U_fundRMS_SYM+@POWER/0 [V]	230.6035	112.1547	-118.4487

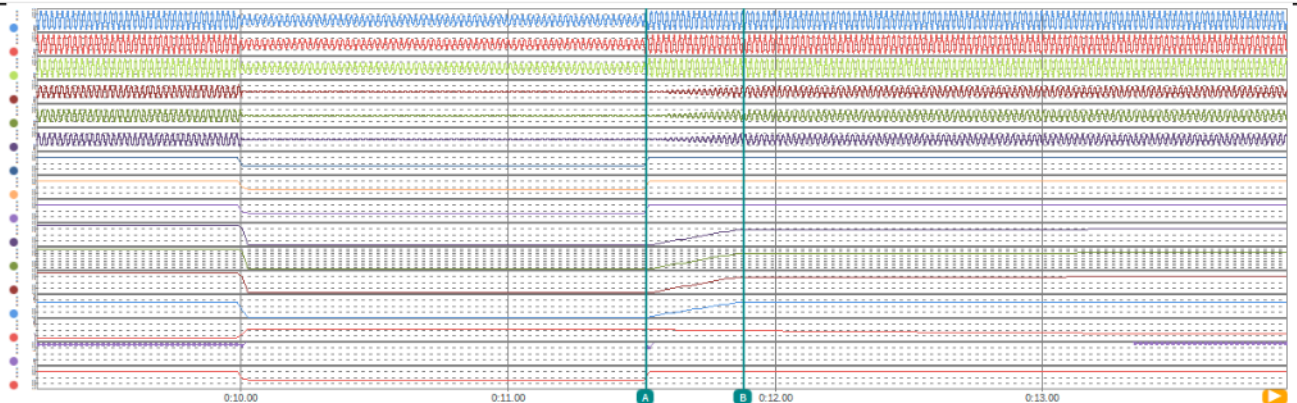


Time [s]	A	B	Delta
AI 1/U1 [V]	-143.7919	-51.49412	92.29780
AI 1/U2 [V]	9.684802	-104.4400	-114.1248
AI 1/U3 [V]	132.8323	155.5905	22.75825
AI 1/I1 [A]	-9.992719	-4.445792	5.546928
AI 1/I2 [A]	0.679255	-7.375479	-8.054734
AI 1/I3 [A]	9.306789	11.78348	2.476692
U1_trMS@POWER/0 [V]	113.2834	112.1679	-1.115440
U2_trMS@POWER/0 [V]	113.5173	112.2185	-1.298782
U3_trMS@POWER/0 [V]	113.1298	112.1307	-0.999123
I1_trMS@POWER/0 [A]	8.231988	8.306574	0.074586
I2_trMS@POWER/0 [A]	8.358849	8.257217	-0.101631
I3_trMS@POWER/0 [A]	8.341057	8.261410	-0.079647
P_t@POWER/0 [W]	2794.805	2756.037	-38.76807
Q [var]	412.2274	398.5208	-13.70663
PF_t@POWER/0 []	0.989297	0.989707	4.101e-4
U_fundRMS_SYM+@POWER/0 [V]	113.3087	112.1721	-1.136574

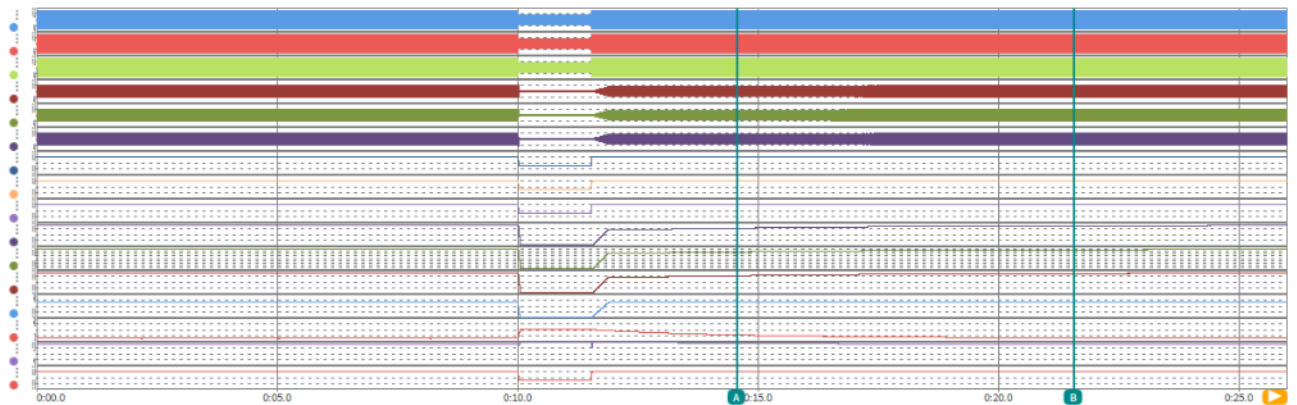
After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 82 von 153
Page 82 of 153

Time [s]	A	B	Delta
	0:11.517507	0:11.881962	0.364455
AI 1/U1 [V]	265.7566	234.1612	-31.59547
AI 1/U2 [V]	-294.2805	80.80864	375.0892
AI 1/U3 [V]	29.77801	-314.1191	-343.8971
AI 1/I1 [A]	-5.584002	135.9966	141.5806
AI 1/I2 [A]	2.985001	62.28865	59.30364
AI 1/I3 [A]	2.532959	-198.3708	-200.9038
U1_trMS@POWER/0 [V]	111.7261	230.6738	118.9477
U2_trMS@POWER/0 [V]	112.4309	230.6393	118.2084
U3_trMS@POWER/0 [V]	112.3414	230.8776	118.5362
I1_trMS@POWER/0 [A]	8.276845	142.0610	133.7842
I2_trMS@POWER/0 [A]	8.278330	142.0212	133.7428
I3_trMS@POWER/0 [A]	8.321141	142.4643	134.1432
P_t@POWER/0 [W]	2763.355	98201.66	95438.30
Q [var]	386.7560	-6510.677	-6897.433
PF_t@POWER/0 []	0.990347	0.997809	7.462e-3
U_fundRMS_SYM+@POWER/0 [V]	112.1547	230.7275	118.5727



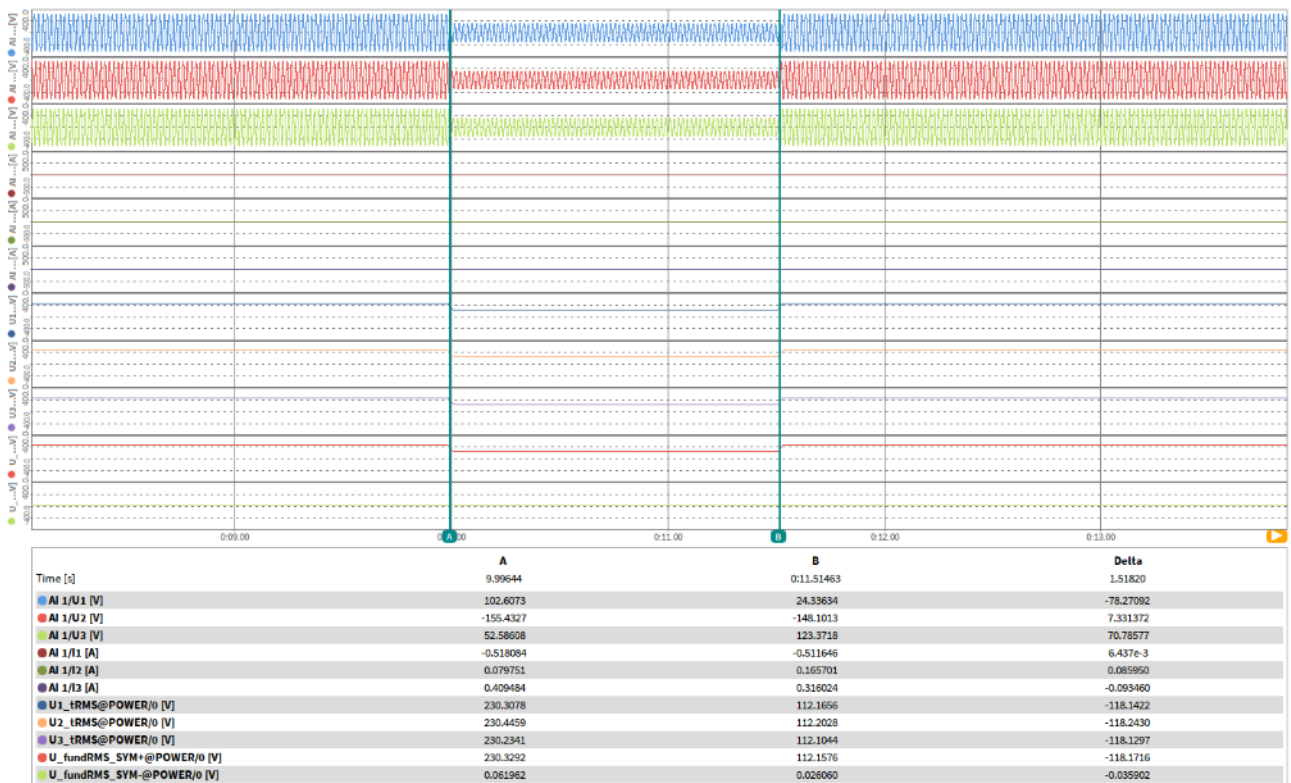
Time [s]	A	B	Delta
	0:14.552207	0:21.550686	6.998479
AI 1/U1 [V]	-203.1343	-289.5849	-86.45058
AI 1/U2 [V]	-119.6778	14.71949	134.3973
AI 1/U3 [V]	322.5794	274.4351	-48.14434
AI 1/I1 [A]	-53.23959	-107.0023	-53.76268
AI 1/I2 [A]	-158.7200	-140.0806	18.63945
AI 1/I3 [A]	211.9432	248.0111	36.06796
U1_trMS@POWER/0 [V]	230.5643	230.5680	3.677e-3
U2_trMS@POWER/0 [V]	230.6596	230.7030	0.043381
U3_trMS@POWER/0 [V]	230.4800	230.5001	0.020081
I1_trMS@POWER/0 [A]	155.1430	174.4166	19.27365
I2_trMS@POWER/0 [A]	155.5141	175.0147	19.50066
I3_trMS@POWER/0 [A]	155.6177	175.2424	19.62471
P_t@POWER/0 [W]	97886.21	97781.15	-105.0625
Q [var]	-44455.15	-71247.05	-26791.90
PF_t@POWER/0 []	0.910502	0.808211	-0.102291
U_fundRMS_SYM+@POWER/0 [V]	230.5640	230.5862	0.022110

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 83 von 153
Page 83 of 153

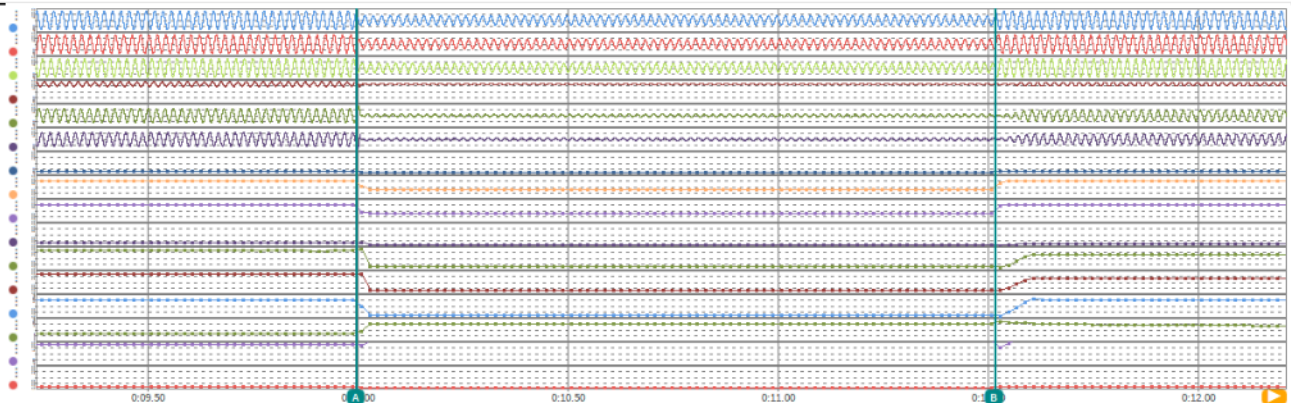
Test No. 3.2 idle test

Test No. 3.2 with PGU
Before dip

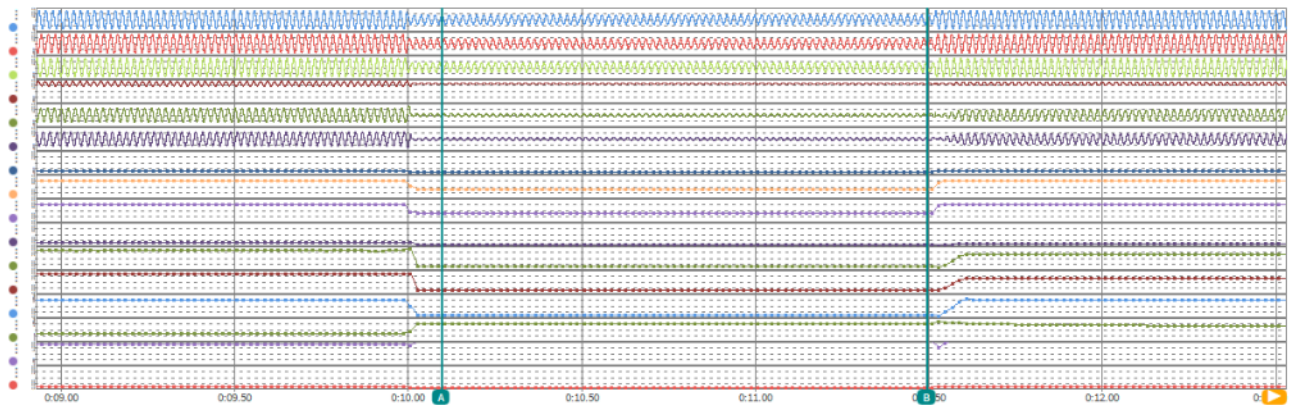
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 84 von 153
Page 84 of 153

Time [s]	A	B	Delta
	9.99784	0:11.51614	1.51830
AI 1/U1 [V]	162.7488	129.5631	-33.18572
AI 1/U2 [V]	-98.65952	-144.2053	-45.54582
AI 1/U3 [V]	-65.27090	14.32014	79.59104
AI 1/I1 [A]	65.83298	9.869815	-55.96316
AI 1/I2 [A]	-6.372810	-10.68592	-4.313112
AI 1/I3 [A]	-57.66261	0.778675	58.44128
U1_tRMS@POWER/0 [V]	230.3986	112.1626	-118.2361
U2_tRMS@POWER/0 [V]	230.4892	112.2314	-118.2578
U3_tRMS@POWER/0 [V]	230.3150	112.1226	-118.1924
I1_tRMS@POWER/0 [A]	41.69176	8.208763	-33.48300
I2_tRMS@POWER/0 [A]	41.72783	8.294829	-33.43300
I3_tRMS@POWER/0 [A]	41.76194	8.239311	-33.52263
P_t@POWER/0 [W]	22953.43	2749.918	-20203.51
Q [var]	-17464.18	375.7422	17839.92
PF_t@POWER/0 []	0.795835	0.990794	0.194959
U_fundRMS_SYM+@POWER/0 [V]	230.3996	112.1720	-118.2277

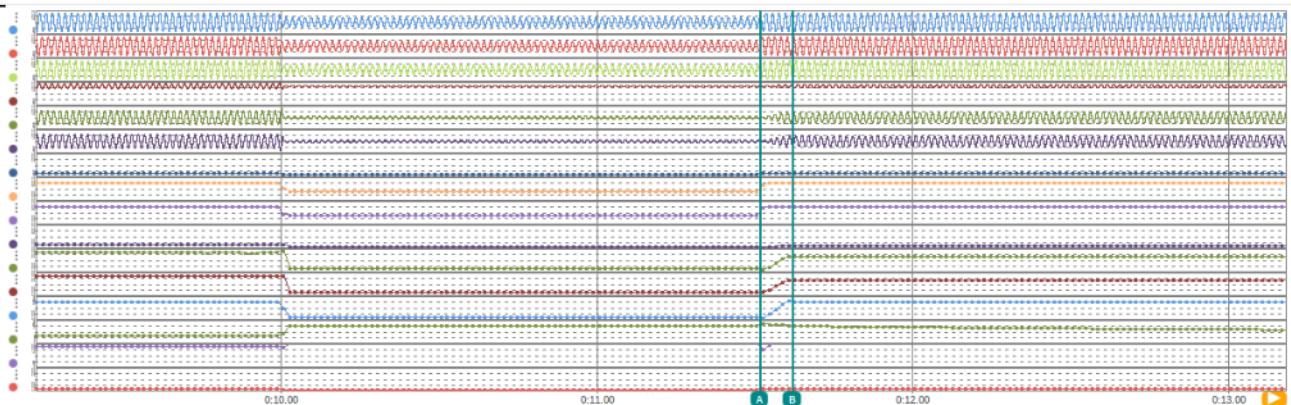


Time [s]	A	B	Delta
	0:10.09723	0:11.49470	1.39747
AI 1/U1 [V]	152.2110	78.38941	-73.82155
AI 1/U2 [V]	-116.9374	-158.8359	-41.89849
AI 1/U3 [V]	-36.43966	80.37186	116.8115
AI 1/I1 [A]	10.39112	4.824996	-5.566120
AI 1/I2 [A]	-9.103656	-11.88076	-2.777100
AI 1/I3 [A]	-1.313329	7.011652	8.324981
U1_tRMS@POWER/0 [V]	112.7206	112.1634	-0.557236
U2_tRMS@POWER/0 [V]	112.9312	112.2310	-0.700172
U3_tRMS@POWER/0 [V]	112.5158	112.1184	-0.397400
I1_tRMS@POWER/0 [A]	8.238027	8.262645	0.024618
I2_tRMS@POWER/0 [A]	8.207569	8.260685	0.053116
I3_tRMS@POWER/0 [A]	8.277748	8.274929	-2.819e-3
P_t@POWER/0 [W]	2754.136	2757.078	2.941162
Q [var]	425.8393	368.8626	-56.97665
PF_t@POWER/0 []	0.988257	0.991169	2.912e-3
U_fundRMS_SYM+@POWER/0 [V]	112.7212	112.1707	-0.550461

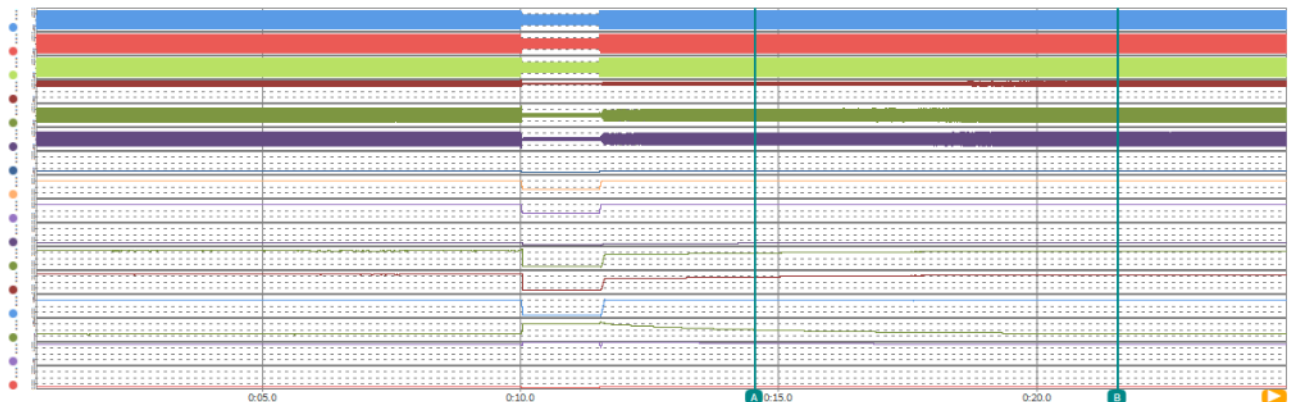
After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 85 von 153
Page 85 of 153

Time [s]	A	B	Delta
	0:11.51638	0:11.61978	0.10340
AI 1/U1 [V]	134.9161	283.1621	148.2461
AI 1/U2 [V]	-139.8711	-2.469063	137.4021
AI 1/U3 [V]	4.926205	-281.0590	-285.9852
AI 1/I1 [A]	10.18858	42.80222	32.61364
AI 1/I2 [A]	-11.12068	-5.831361	5.289316
AI 1/I3 [A]	0.937700	-38.21194	-39.14964
U1_tRMS@POWER/0 [V]	112.1626	230.4075	118.2450
U2_tRMS@POWER/0 [V]	112.2314	230.2030	117.9716
U3_tRMS@POWER/0 [V]	112.1226	230.6469	118.5243
I1_tRMS@POWER/0 [A]	8.208763	34.41064	26.20188
I2_tRMS@POWER/0 [A]	8.294829	34.25594	25.96111
I3_tRMS@POWER/0 [A]	8.239311	34.48195	26.24264
P_t@POWER/0 [W]	2749.918	23746.82	20996.91
Q [var]	375.7422	989.8982	614.1560
PF_t@POWER/0 []	0.990794	0.999132	8.339e-3
U_fundRMS_SYM+@POWER/0 [V]	112.1720	230.4184	118.2465



Time [s]	A	B	Delta
	0:14.54123	0:21.56490	7.02367
AI 1/U1 [V]	173.1277	-196.7602	-369.8879
AI 1/U2 [V]	152.1897	323.7472	171.5574
AI 1/U3 [V]	-325.5890	-125.5949	199.9941
AI 1/I1 [A]	6.809712	-55.29702	-62.10673
AI 1/I2 [A]	40.24029	42.30833	2.068043
AI 1/I3 [A]	-47.25719	13.02409	60.28128
U1_tRMS@POWER/0 [V]	230.3720	230.4069	0.034912
U2_tRMS@POWER/0 [V]	230.4755	230.5210	0.045547
U3_tRMS@POWER/0 [V]	230.3314	230.3262	-5.127e-3
I1_tRMS@POWER/0 [A]	36.17057	40.72757	4.557003
I2_tRMS@POWER/0 [A]	36.31139	40.86963	4.558239
I3_tRMS@POWER/0 [A]	36.31513	40.85624	4.541111
P_t@POWER/0 [W]	22941.45	22841.40	-100.0508
Q [var]	-10099.43	-16564.54	-6465.115
PF_t@POWER/0 []	0.915239	0.809534	-0.105705
U_fundRMS_SYM+@POWER/0 [V]	230.3914	230.4167	0.025269

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 86 von 153
Page 86 of 153

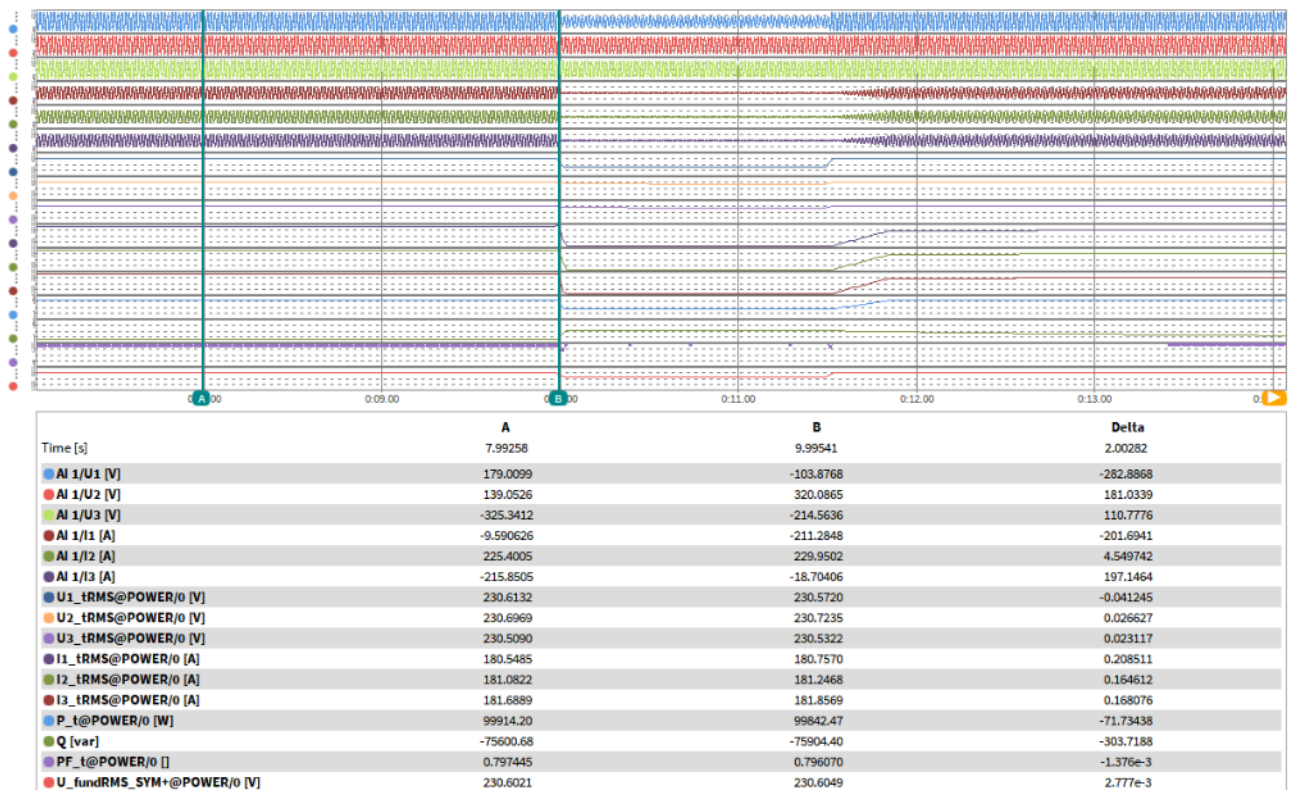
Condition						Measurement	
	No.	Parameter	Phase ref.	Time ref.	unit		
General Info.	0	Test number	--	--	--	3.1	3.2
	1	Date	--	--	yyyy.mm.dd	2022.08.15	2022.08.15
	2	Time (start of test)	--	--	hh:mm:ss	17:01:10	17:01:10
	3	Fault type (phase)	--	--		3 phase	3 phase
	4	Setting voltage depth	Line to neutral	--	p.u.	0.5	0.5
	5	Setting dip duration		--	ms	1518	1518
	6	Point of fault entry	Total	--	s	9.99644	9.99644
	7	Point of fault clearance	Total	--	s	11.51463	11.51463
	8	Fault duration in empty load test	Total	--	ms	1518.20	1518.20
	9	Voltage depth/height in empty load test	Total	t1+100ms to t2 and t1-10s to t1	p.u.	0.488	0.488
	10		Pos.		p.u.	1.001	1.001
Before dip <t1	11	Voltage	Line to neutral	t1-100s to t1	p.u.	1.003	1.002
	12	Current	Pos.	t1-500ms to t1-100ms	p.u.	1.091	0.251
	13	Active power	Total	t1-10s to t1	p.u.	0.868	0.199
	14		Pos.			0.866	0.200
	15	Reactive power	Total	t1-10s to t1	p.u.	-0.659	-0.152
	16		Pos.			-0.647	-0.152
	17	Cos ϕ	--	t1-10s to t1	--	0.796	0.802
During dip t1 to t2	18	Voltage	Line to neutral	t1+100ms to t2-20ms	p.u.	0.488	0.488
	19	Line current	Phase 1	t1+60ms	p.u.	0.051	0.051
	20		Phase 2			0.052	0.049
	21		Phase 3			0.048	0.050
	22	Line current	Phase 1	t1+100ms	p.u.	0.051	0.049
	23		Phase 2			0.052	0.049
	24		Phase 3			0.048	0.050
	25	Active power	Total	t1+100ms to t2-20ms	p.u.	0.024	0.024
	26		Pos.			0.024	0.024
After dip > t2	27	Voltage	Line to neutral	t2+3s to t2+10s	p.u.	1.003	1.002
	28	Active power	Total	t2+3s to t2+10s	p.u.	0.851	0.199
	29		Pos.			0.850	0.199
	30	Active power rising time	Pos.	--	s	0.365	0.103
	31	Reactive power	Total	t2+3s to t2+10s	p.u.	-0.387	-0.088
	32		Pos.			-0.620	-0.144
	33	Reactive power rising time	Pos.	--	s	10	10
	34	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	Yes	Yes

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 87 von 153
Page 87 of 153

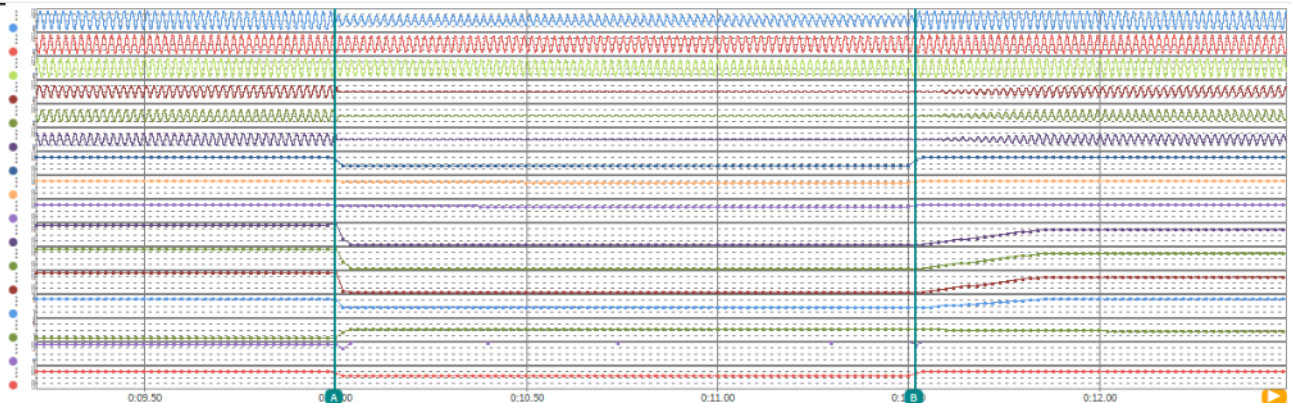
Test No. 3.3 idle test

Test No. 3.3 with PGU
Before dip

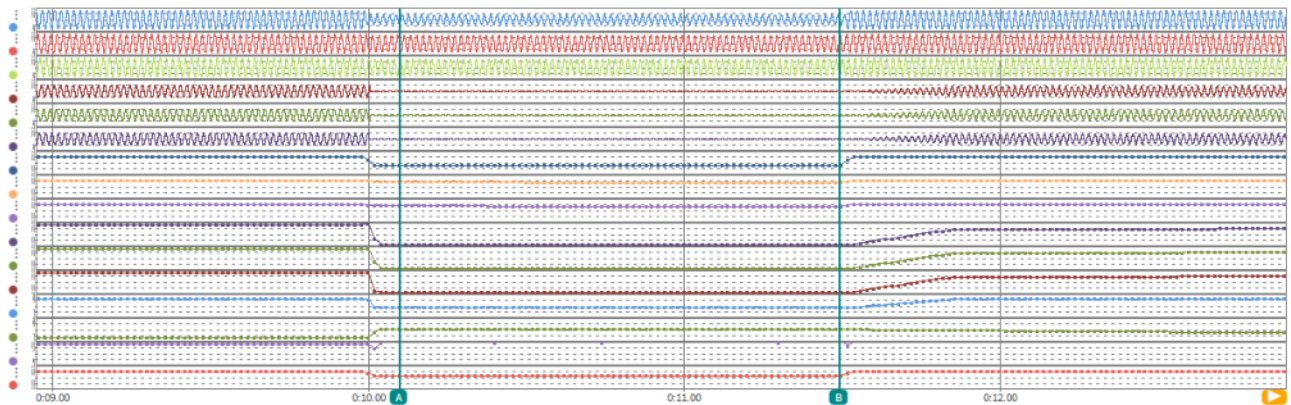
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 88 von 153
Page 88 of 153

Time [s]	A	B	Delta
AI 1/U1 [V]	9.99878	0:11.51614	1.51736
AI 1/U2 [V]	-160.8989	-122.0794	38.81955
AI 1/U3 [V]	134.9540	292.6626	157.7087
AI 1/I1 [A]	27.77434	-189.0772	-216.8515
AI 1/I2 [A]	-271.5480	10.22899	281.7770
AI 1/I3 [A]	38.09619	4.323244	-33.77295
U1_tRMS@POWER/0 [V]	235.2370	-14.49311	-249.7301
U2_tRMS@POWER/0 [V]	230.5720	112.2173	-118.3547
U3_tRMS@POWER/0 [V]	230.7235	206.3581	-24.36546
I1_tRMS@POWER/0 [A]	230.5322	206.1922	-24.33998
I2_tRMS@POWER/0 [A]	180.7570	8.392798	-172.3642
I3_tRMS@POWER/0 [A]	181.2468	8.803678	-172.4431
P_t@POWER/0 [W]	181.8569	8.084840	-173.7721
Q [var]	99842.47	4231.979	-95610.49
PF_t@POWER/0 []	-75904.40	1294.574	77198.97
U_fundRMS_SYM+@POWER/0 [V]	0.796070	0.956259	0.160189
	230.6049	170.8379	-59.76701

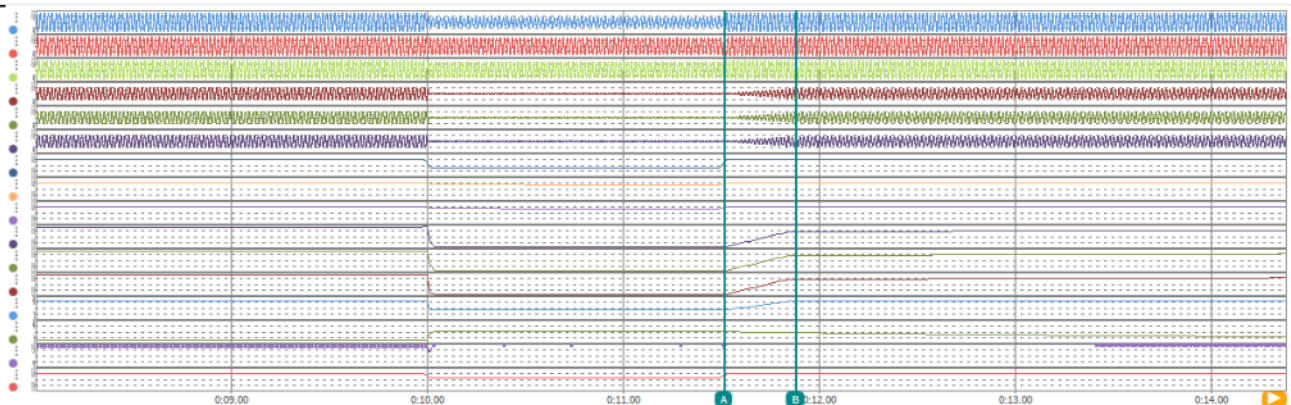


Time [s]	A	B	Delta
AI 1/U1 [V]	0:10.09819	0:11.49103	1.39284
AI 1/U2 [V]	-146.6713	136.9834	283.6547
AI 1/U3 [V]	188.3965	72.37769	-116.0188
AI 1/I1 [A]	-38.95331	-210.7229	-171.7696
AI 1/I2 [A]	-11.61599	11.96754	23.58353
AI 1/I3 [A]	11.54602	-3.783703	-15.32972
U1_tRMS@POWER/0 [V]	0.081778	-8.177042	-8.258820
U2_tRMS@POWER/0 [V]	113.3641	112.1814	-1.182671
U3_tRMS@POWER/0 [V]	208.7018	206.4138	-2.288010
I1_tRMS@POWER/0 [A]	208.0589	206.2445	-1.814377
I2_tRMS@POWER/0 [A]	8.386936	8.425336	0.038400
I3_tRMS@POWER/0 [A]	8.762168	8.814753	0.052585
P_t@POWER/0 [W]	8.104587	8.075561	-0.029026
Q [var]	4263.709	4235.103	-28.60693
PF_t@POWER/0 []	1327.839	1300.199	-27.64001
U_fundRMS_SYM+@POWER/0 [V]	0.954771	0.955963	1.193e-3
	172.5656	170.8556	-1.709930

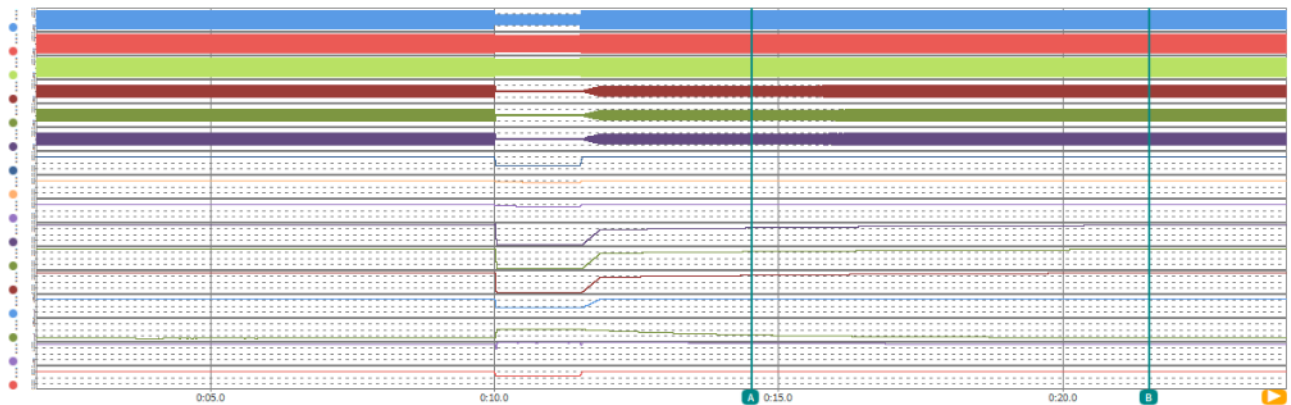
After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 89 von 153
Page 89 of 153

Time [s]	A	B	Delta
	0:11.51608	0:11.88137	0.36528
AI 1/U1 [V]	-85.12641	-264.2799	-179.1535
AI 1/U2 [V]	283.1903	-35.95519	-319.1455
AI 1/U3 [V]	-202.0066	297.4007	499.4073
AI 1/I1 [A]	-2.027750	-157.8957	-155.8679
AI 1/I2 [A]	11.54947	-35.25377	-46.80324
AI 1/I3 [A]	-9.511829	193.1261	202.6379
U1_tRMS@POWER/0 [V]	112.2173	230.7453	118.5280
U2_tRMS@POWER/0 [V]	206.3581	230.7404	24.38229
U3_tRMS@POWER/0 [V]	206.1922	230.8692	24.67703
I1_tRMS@POWER/0 [A]	8.392798	144.6109	136.2181
I2_tRMS@POWER/0 [A]	8.803678	144.5814	135.7777
I3_tRMS@POWER/0 [A]	8.084840	145.3890	137.3042
P_t@POWER/0 [W]	4231.979	100081.4	95849.44
Q [var]	1294.574	-6540.242	-7834.816
PF_t@POWER/0 []	0.956259	0.997872	0.041613
U_fundRMS_SYM+@POWER/0 [V]	170.8379	230.7820	59.94408



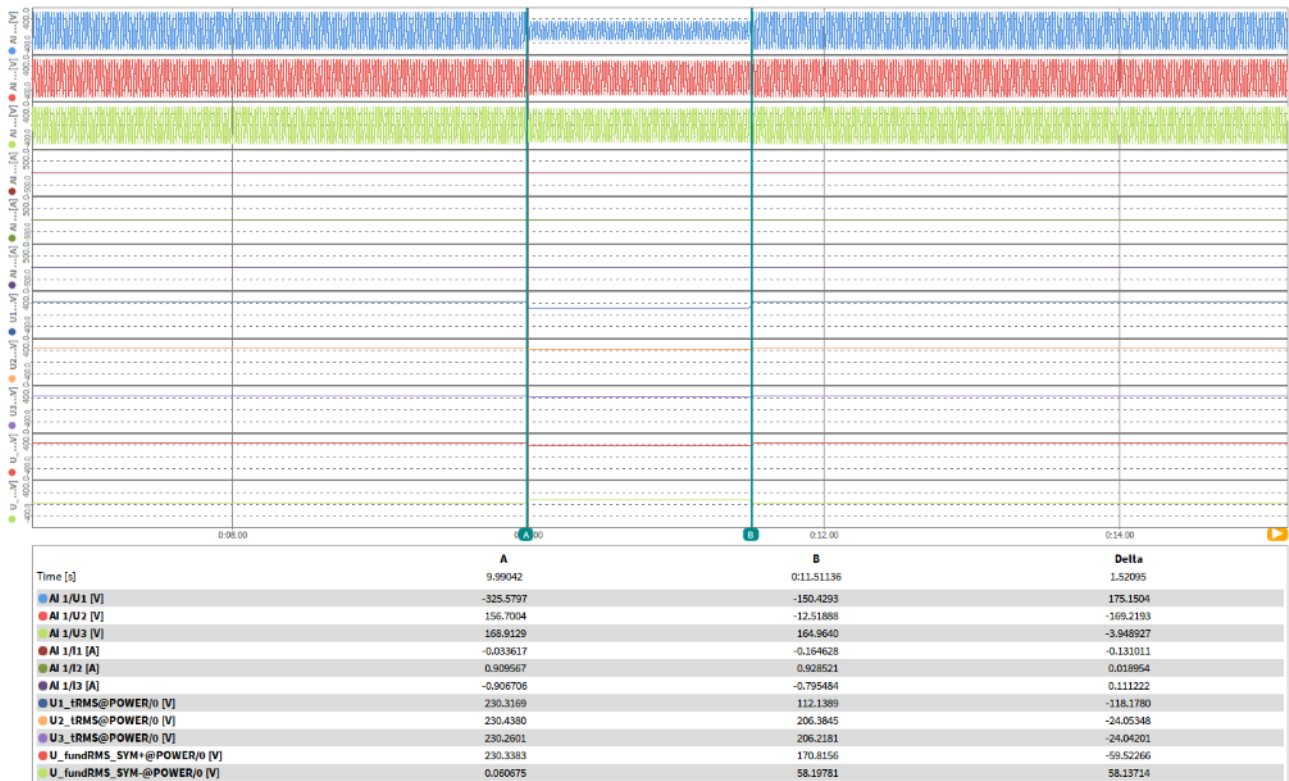
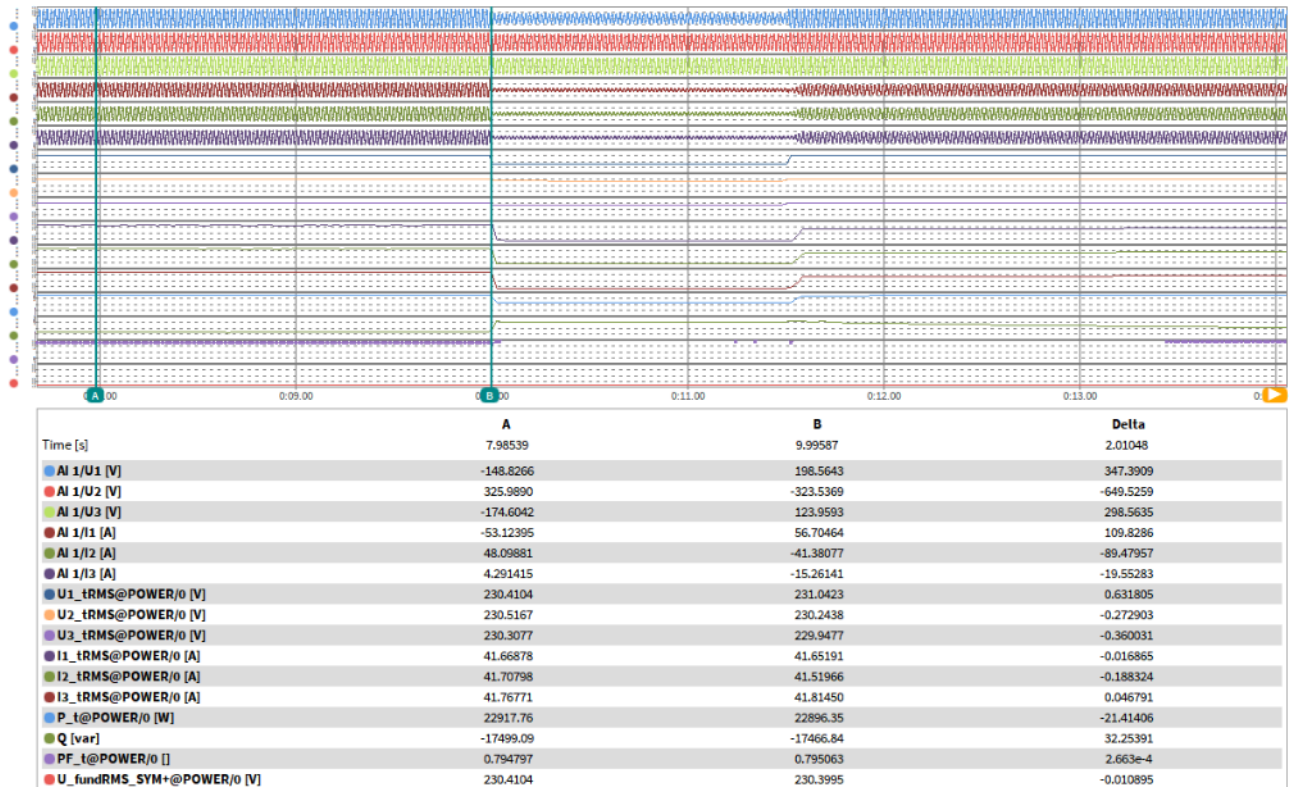
Time [s]	A	B	Delta
	0:14.51636	0:21.52609	7.00973
AI 1/U1 [V]	-199.0888	196.3842	395.4730
AI 1/U2 [V]	323.8490	-324.3509	-648.1998
AI 1/U3 [V]	-117.3644	125.9632	243.3276
AI 1/I1 [A]	-194.5971	239.3735	433.9706
AI 1/I2 [A]	190.5136	-184.4725	-374.9861
AI 1/I3 [A]	4.116535	-55.04752	-59.16405
U1_tRMS@POWER/0 [V]	230.5866	230.5909	4.288e-3
U2_tRMS@POWER/0 [V]	230.7482	230.7013	-0.046860
U3_tRMS@POWER/0 [V]	230.5029	230.4618	-0.041092
I1_tRMS@POWER/0 [A]	157.6984	177.5367	19.83826
I2_tRMS@POWER/0 [A]	157.8919	177.9140	20.02203
I3_tRMS@POWER/0 [A]	158.2162	178.5366	20.32045
P_t@POWER/0 [W]	99955.16	100054.6	99.47656
Q [var]	-44135.73	-71762.62	-27626.89
PF_t@POWER/0 []	0.914790	0.812599	-0.102191
U_fundRMS_SYM+@POWER/0 [V]	230.6086	230.5803	-0.028290

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 90 von 153
Page 90 of 153

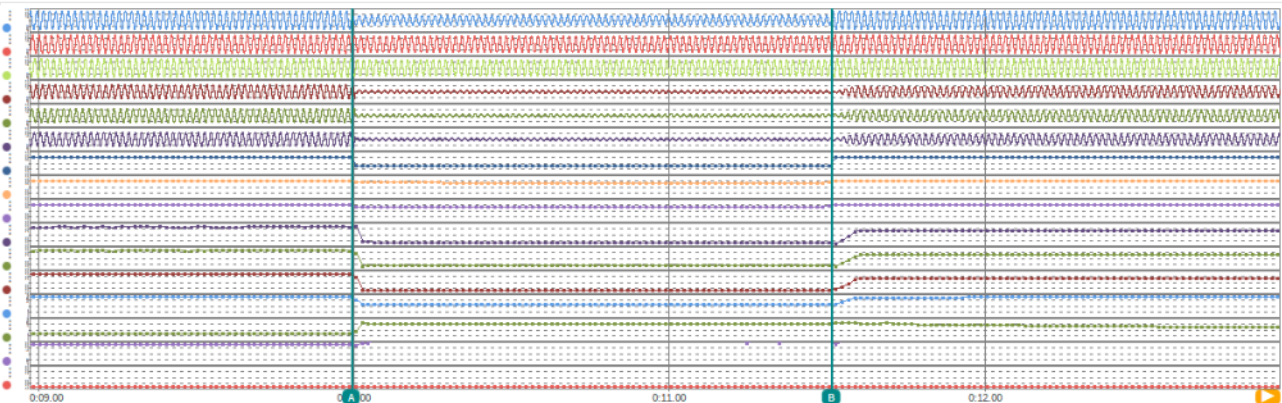
Test No. 3.4 idle test

Test No. 3.4 with PGU
Before dip

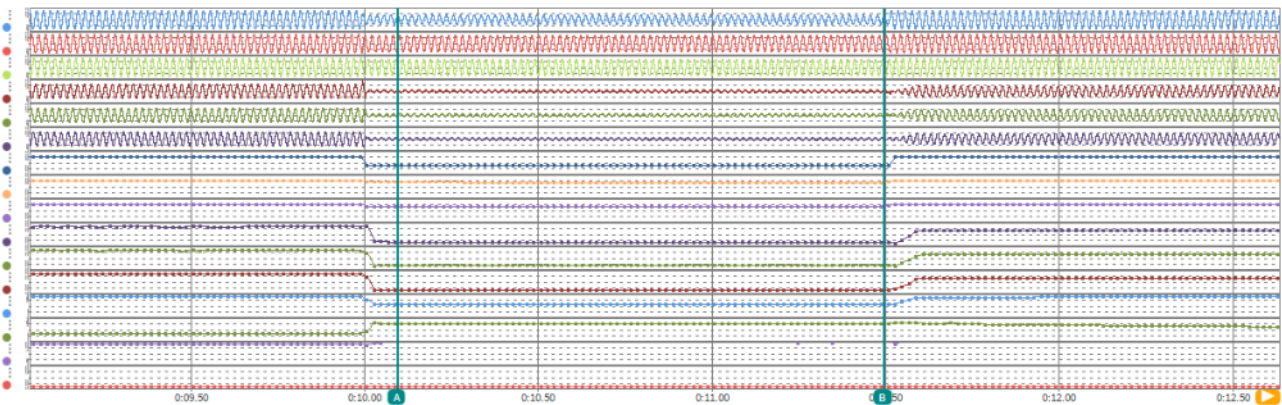
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 91 von 153
Page 91 of 153

Time [s]	A	B	Delta
9.99522	0:11.51516		1.51994
AI 1/U1 [V]	146.7049	71.34343	-75.36149
AI 1/U2 [V]	-326.0322	-287.0517	38.98049
AI 1/U3 [V]	177.0082	214.8352	37.82702
AI 1/I1 [A]	53.65026	3.903866	-49.74640
AI 1/I2 [A]	-49.05379	-12.20346	36.85034
AI 1/I3 [A]	-3.848315	8.278847	12.12716
U1_tRMS@POWER/0 [V]	231.0423	111.5286	-119.5136
U2_tRMS@POWER/0 [V]	230.2438	207.4749	-22.76894
U3_tRMS@POWER/0 [V]	229.9477	207.2243	-22.72342
I1_tRMS@POWER/0 [A]	41.65191	8.118587	-33.53333
I2_tRMS@POWER/0 [A]	41.51966	8.601213	-32.91844
I3_tRMS@POWER/0 [A]	41.81450	7.747000	-34.06750
P_t@POWER/0 [W]	22896.35	4091.165	-18805.18
Q [var]	-17466.84	1308.609	18775.45
PF_t@POWER/0 []	0.795063	0.952462	0.157399
U_fundRMS_SYM+@POWER/0 [V]	230.3995	171.1610	-59.23849

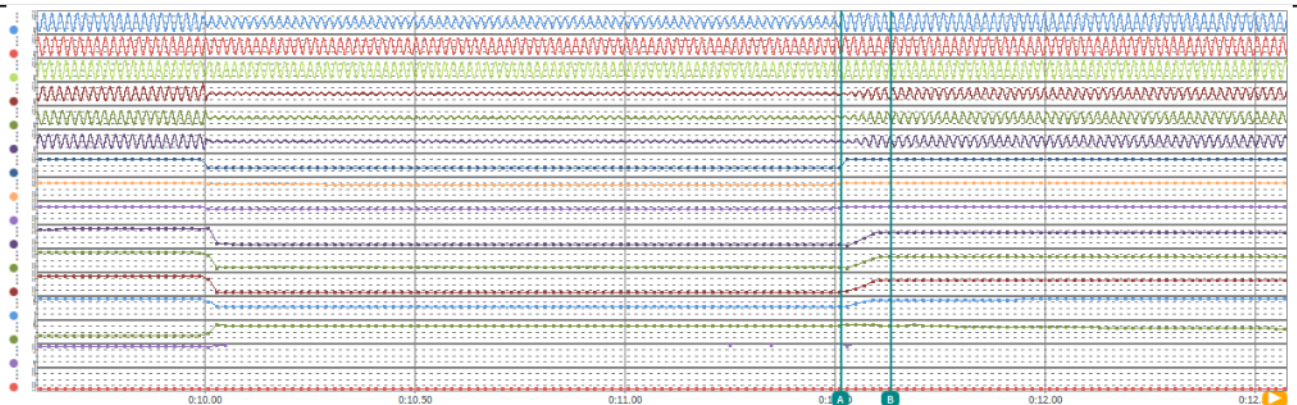


Time [s]	A	B	Delta
0:10.09436	0:11.49456		1.40020
AI 1/U1 [V]	30.67398	43.41936	12.74538
AI 1/U2 [V]	-291.8937	-291.8749	0.018835
AI 1/U3 [V]	261.5910	247.9675	-13.62348
AI 1/I1 [A]	0.763893	1.290083	0.526190
AI 1/I2 [A]	-10.63836	-10.43451	0.203848
AI 1/I3 [A]	9.976149	9.061575	-0.914574
U1_tRMS@POWER/0 [V]	112.7309	112.1736	-0.557281
U2_tRMS@POWER/0 [V]	207.5848	206.4333	-1.151520
U3_tRMS@POWER/0 [V]	206.8618	206.2347	-0.627121
I1_tRMS@POWER/0 [A]	8.175544	8.165303	-0.010241
I2_tRMS@POWER/0 [A]	8.666278	8.655733	-0.010545
I3_tRMS@POWER/0 [A]	7.829175	7.752389	-0.076786
P_t@POWER/0 [W]	4135.282	4101.161	-34.12158
Q [var]	1317.805	1297.699	-20.10669
PF_t@POWER/0 []	0.952790	0.953409	6.189e-4
U_fundRMS_SYM+@POWER/0 [V]	171.6035	170.8550	-0.748459

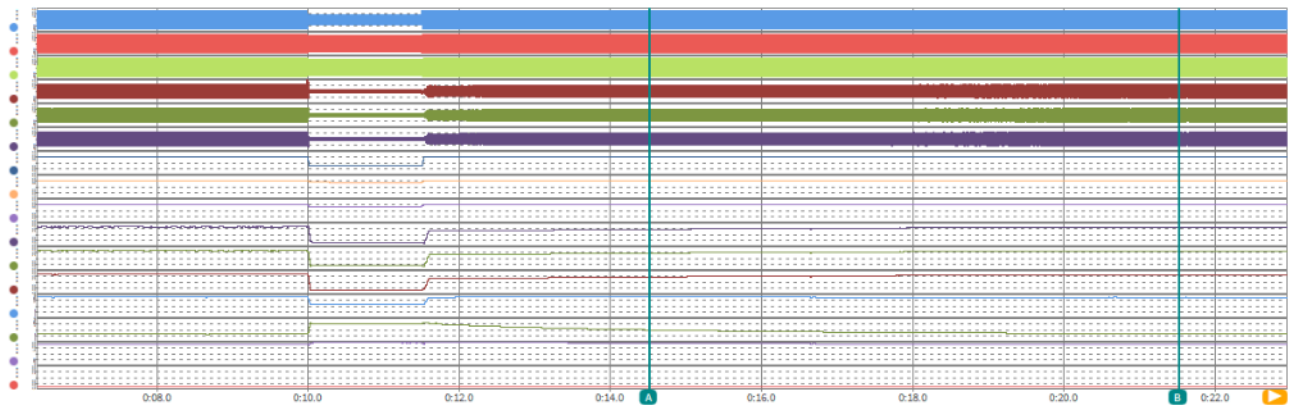
After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 92 von 153
Page 92 of 153

Time [s]	A	B	Delta
	0:11.51443	0:11.63291	0.11848
AI 1/U1 [V]	38.78284	-72.21795	-111.0008
AI 1/U2 [V]	-291.7938	-239.2206	52.57321
AI 1/U3 [V]	252.6391	311.4212	58.78210
AI 1/I1 [A]	1.059294	-11.39128	-12.45058
AI 1/I2 [A]	-10.51414	-33.89693	-23.38278
AI 1/I3 [A]	9.389520	45.51995	36.13043
U1_tRMS@POWER/0 [V]	111.5286	230.4469	118.9182
U2_tRMS@POWER/0 [V]	207.4749	230.4635	22.98868
U3_tRMS@POWER/0 [V]	207.2243	230.5583	23.33405
I1_tRMS@POWER/0 [A]	8.118587	33.01830	24.89971
I2_tRMS@POWER/0 [A]	8.601213	33.22156	24.62035
I3_tRMS@POWER/0 [A]	7.747000	32.94956	25.20256
P_t@POWER/0 [W]	4091.165	22818.32	18727.15
Q [var]	1308.609	1414.487	105.8776
PF_t@POWER/0 []	0.952462	0.998084	0.045622
U_fundRMS_SYM+@POWER/0 [V]	171.1610	230.4891	59.32811



Time [s]	A	B	Delta
	0:14.51288	0:21.51545	7.00257
AI 1/U1 [V]	-75.04869	199.8410	274.8897
AI 1/U2 [V]	-236.6984	-323.3156	-86.61724
AI 1/U3 [V]	312.7992	122.3328	-190.4664
AI 1/I1 [A]	9.173751	55.22323	46.04948
AI 1/I2 [A]	-48.60974	-41.02063	7.589102
AI 1/I3 [A]	39.47616	-14.08482	-53.56098
U1_tRMS@POWER/0 [V]	230.3853	230.3842	-1.114e-3
U2_tRMS@POWER/0 [V]	230.4747	230.5252	0.050491
U3_tRMS@POWER/0 [V]	230.3120	230.3323	0.020279
I1_tRMS@POWER/0 [A]	36.17421	40.59988	4.425674
I2_tRMS@POWER/0 [A]	36.21788	40.57192	4.354038
I3_tRMS@POWER/0 [A]	36.28209	40.65791	4.375824
P_t@POWER/0 [W]	22922.58	22631.56	-291.0137
Q [var]	-10071.37	-16607.45	-6536.079
PF_t@POWER/0 []	0.915529	0.806219	-0.109311
U_fundRMS_SYM+@POWER/0 [V]	230.3892	230.4126	0.023407

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 93 von 153
Page 93 of 153

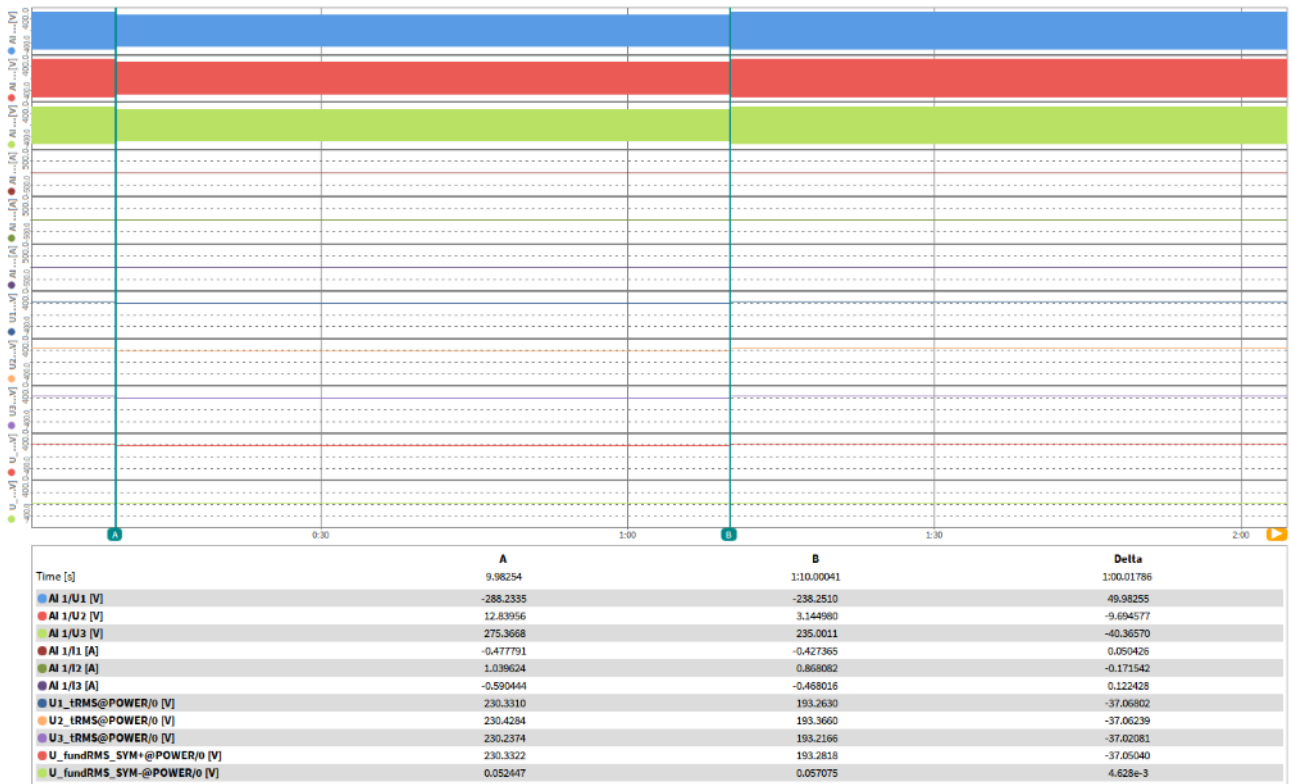
Condition						Measurement	
	No.	Parameter	Phase ref.	Time ref.	unit		
General Info.	0	Test number	--	--	--	3.3	3.4
	1	Date	--	--	yyyy.mm.dd	2022.08.15	2022.08.15
	2	Time (start of test)	--	--	hh:mm:ss	17:58:00	17:58:00
	3	Fault type (phase)	--	--		2 phase	2 phase
	4	Setting voltage depth	Line to neutral	--	p.u.	0.5	0.5
	5	Setting dip duration		--	ms	1518	1518
	6	Point of fault entry	Total	--	s	9.99042	9.99042
	7	Point of fault clearance	Total	--	s	11.51136	11.51136
	8	Fault duration in empty load test	Total	--	ms	1520.95	1520.95
	9	Voltage depth/height in empty load test	Total	t1+100ms to t2 and t1-10s to t1	p.u.	0.488	0.488
	10		Pos.		p.u.	1.001	1.001
Before dip <t1	11	Voltage	Line to neutral	t1-100s to t1	p.u.	1.003	1.002
	12	Current	Pos.	t1-500ms to t1-100ms	p.u.	1.091	0.251
	13	Active power	Total	t1-10s to t1	p.u.	0.869	0.199
	14		Pos.			0.868	0.199
	15	Reactive power	Total	t1-10s to t1	p.u.	-0.657	-0.152
	16		Pos.			-0.660	-0.152
	17	Cos φ	--	t1-10s to t1	--	0.797	0.795
During dip t1 to t2	18	Voltage	Line to neutral	t1+100ms to t2-20ms	p.u.	0.488	0.488
	19	Line current	Phase 1	t1+60ms	p.u.	0.052	0.051
	20		Phase 2			0.048	0.051
	21		Phase 3			0.049	0.048
	22	Line current	Phase 1	t1+100ms	p.u.	0.051	0.049
	23		Phase 2			0.053	0.052
	24		Phase 3			0.049	0.047
	25	Active power	Total	t1+100ms to t2-20ms	p.u.	0.037	0.036
	26		Pos.			0.037	0.036
After dip > t2	27	Voltage	Line to neutral	t2+3s to t2+10s	p.u.	1.003	1.002
	28	Active power	Total	t2+3s to t2+10s	p.u.	0.869	0.199
	29		Pos.			0.870	0.197
	30	Active power rising time	Pos.	--	s	0.365	0.118
	31	Reactive power	Total	t2+3s to t2+10s	p.u.	-0.384	-0.088
	32		Pos.			-0.624	-0.144
	33	Reactive power rising time	Pos.	--	s	10	10
	34	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	Yes	Yes

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 94 von 153
Page 94 of 153

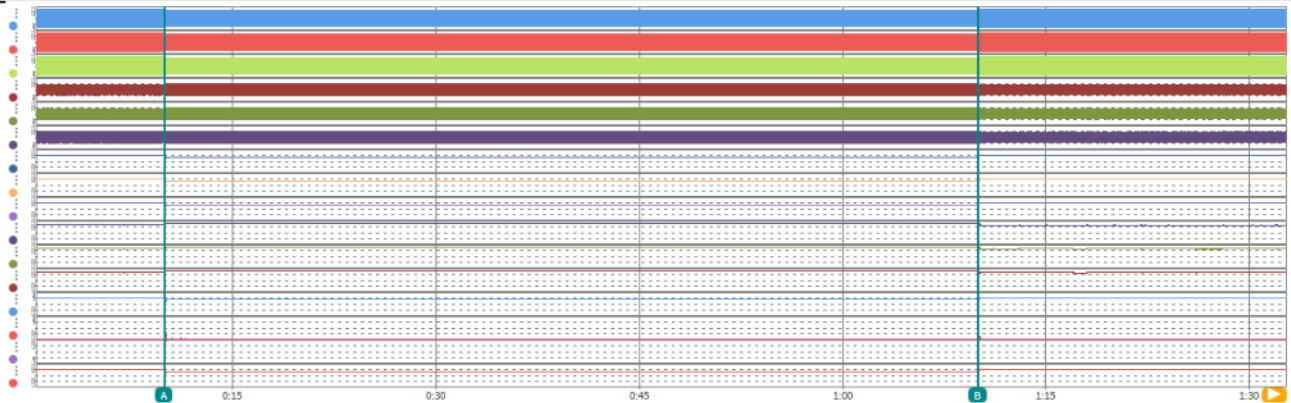
Test No. 4.1 idle test

Test No. 4.1 with PGU
Before dip

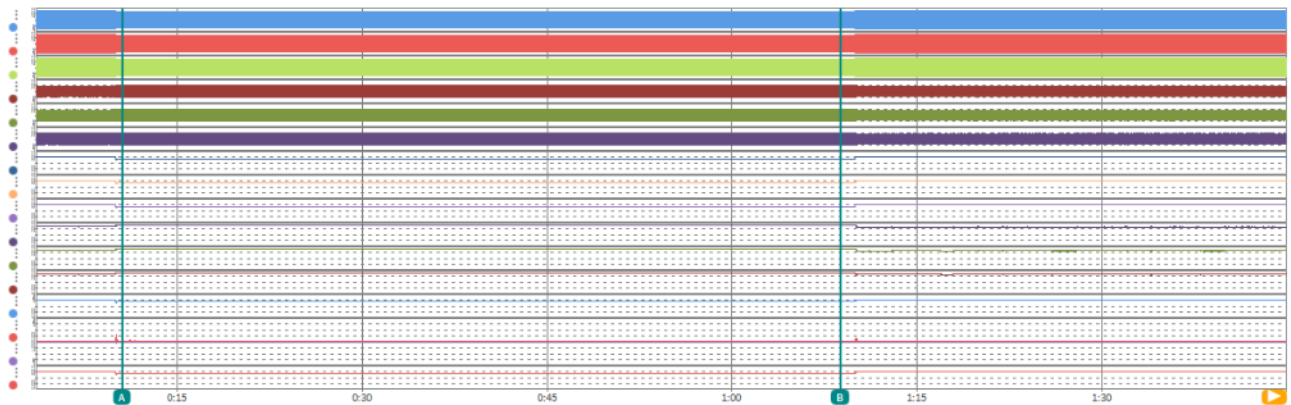
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 95 von 153
Page 95 of 153

Time [s]	A	B	Delta
	0:10.0017	1:09.9987	0:59.9970
AI 1/U1 [V]	-88.31358	-144.3102	-55.99666
AI 1/U2 [V]	-180.7890	-129.5948	51.19419
AI 1/U3 [V]	268.8201	273.5644	4.744292
AI 1/I1 [A]	-86.21800	-133.7645	-47.54651
AI 1/I2 [A]	-166.9498	-124.8489	42.10091
AI 1/I3 [A]	253.2762	258.6686	5.392313
U1_tRMS@POWER/0 [V]	230.7215	193.7454	-36.97609
U2_tRMS@POWER/0 [V]	230.9872	193.8746	-37.11267
U3_tRMS@POWER/0 [V]	230.8215	193.7096	-37.11195
I1_tRMS@POWER/0 [A]	167.2387	182.0051	14.76643
I2_tRMS@POWER/0 [A]	167.6576	182.7706	15.11299
I3_tRMS@POWER/0 [A]	168.0655	183.2934	15.22792
P_t@POWER/0 [W]	116100.5	106196.4	-9904.008
Q_t@POWER/0 [var]	1078.839	1172.858	94.01831
PF_t@POWER/0 []	0.999957	0.999939	-1.782e-5
U_fundRMS_SYM+@POWER/0 [V]	230.8399	193.7720	-37.06789

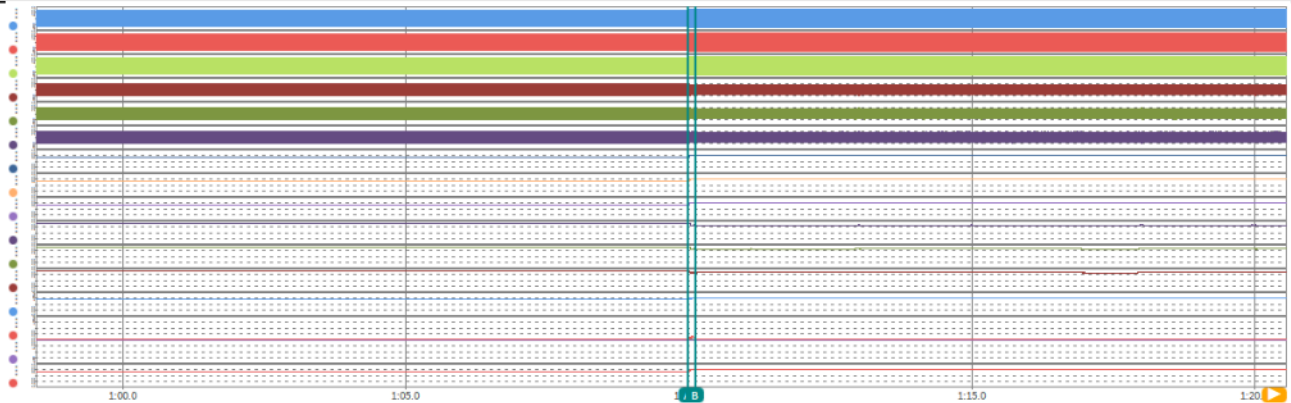


Time [s]	A	B	Delta
	0:10.6158	1:08.8449	0:58.2290
AI 1/U1 [V]	-230.0141	267.3097	497.3238
AI 1/U2 [V]	243.6018	-186.0426	-429.6444
AI 1/U3 [V]	-10.43272	-82.11017	-71.67745
AI 1/I1 [A]	-219.1503	252.0627	471.2130
AI 1/I2 [A]	222.3477	-172.0798	-394.4276
AI 1/I3 [A]	-3.381849	-80.36197	-76.98012
U1_tRMS@POWER/0 [V]	193.7624	193.7757	0.013290
U2_tRMS@POWER/0 [V]	193.8586	193.8793	0.020691
U3_tRMS@POWER/0 [V]	193.6920	193.7204	0.028397
I1_tRMS@POWER/0 [A]	180.1044	182.0259	1.921448
I2_tRMS@POWER/0 [A]	180.7382	182.7774	2.039154
I3_tRMS@POWER/0 [A]	181.2538	183.2889	2.035126
P_t@POWER/0 [W]	104984.5	106210.0	1225.438
Q_t@POWER/0 [var]	3490.495	1107.818	-2382.677
PF_t@POWER/0 []	0.999448	0.999946	4.978e-4
U_fundRMS_SYM+@POWER/0 [V]	193.7664	193.7872	0.020752

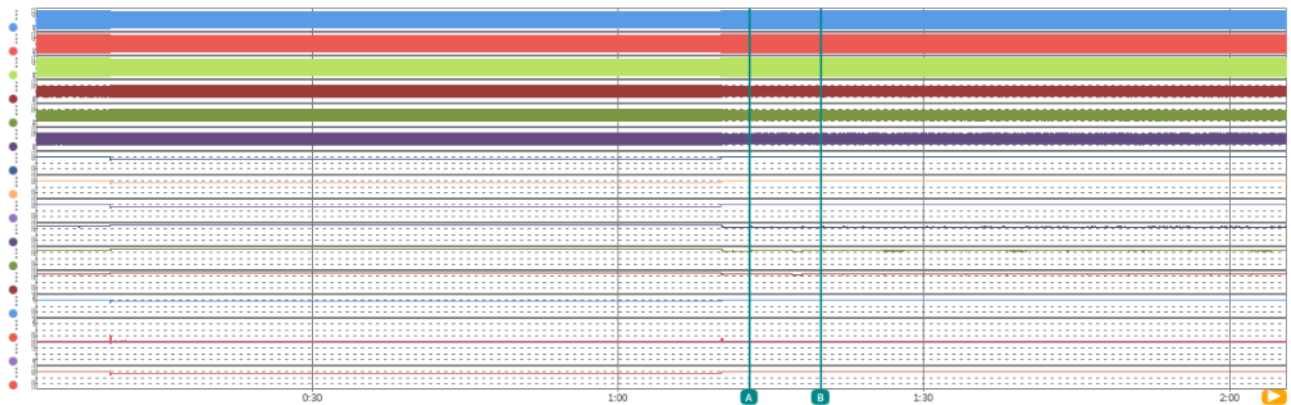
After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 96 von 153
Page 96 of 153

Time [s]	A	B	Delta
	1:09.9907	1:10.1236	0.1329
AI 1/U1 [V]	-25.99502	265.1162	291.1112
AI 1/U2 [V]	247.3171	-297.1676	-544.4846
AI 1/U3 [V]	-226.7437	30.97916	257.7229
AI 1/I1 [A]	-20.88905	197.9170	218.8060
AI 1/I2 [A]	232.2006	-209.7615	-441.9621
AI 1/I3 [A]	-211.3680	11.70170	223.0697
U1_tRMS@POWER/0 [V]	193.7454	229.9651	36.21971
U2_tRMS@POWER/0 [V]	193.8746	230.1199	36.24536
U3_tRMS@POWER/0 [V]	193.7096	230.1118	36.40216
I1_tRMS@POWER/0 [A]	182.0051	168.9523	-13.05284
I2_tRMS@POWER/0 [A]	182.7706	166.9500	-15.82062
I3_tRMS@POWER/0 [A]	183.2934	167.9392	-15.35420
P_t@POWER/0 [W]	106196.4	115069.2	8872.758
Q_t@POWER/0 [var]	1172.858	13989.18	12816.32
PF_t@POWER/0 []	0.999939	0.992691	-7.248e-3
U_fundRMS_SYM+@POWER/0 [V]	193.7720	230.0618	36.28979



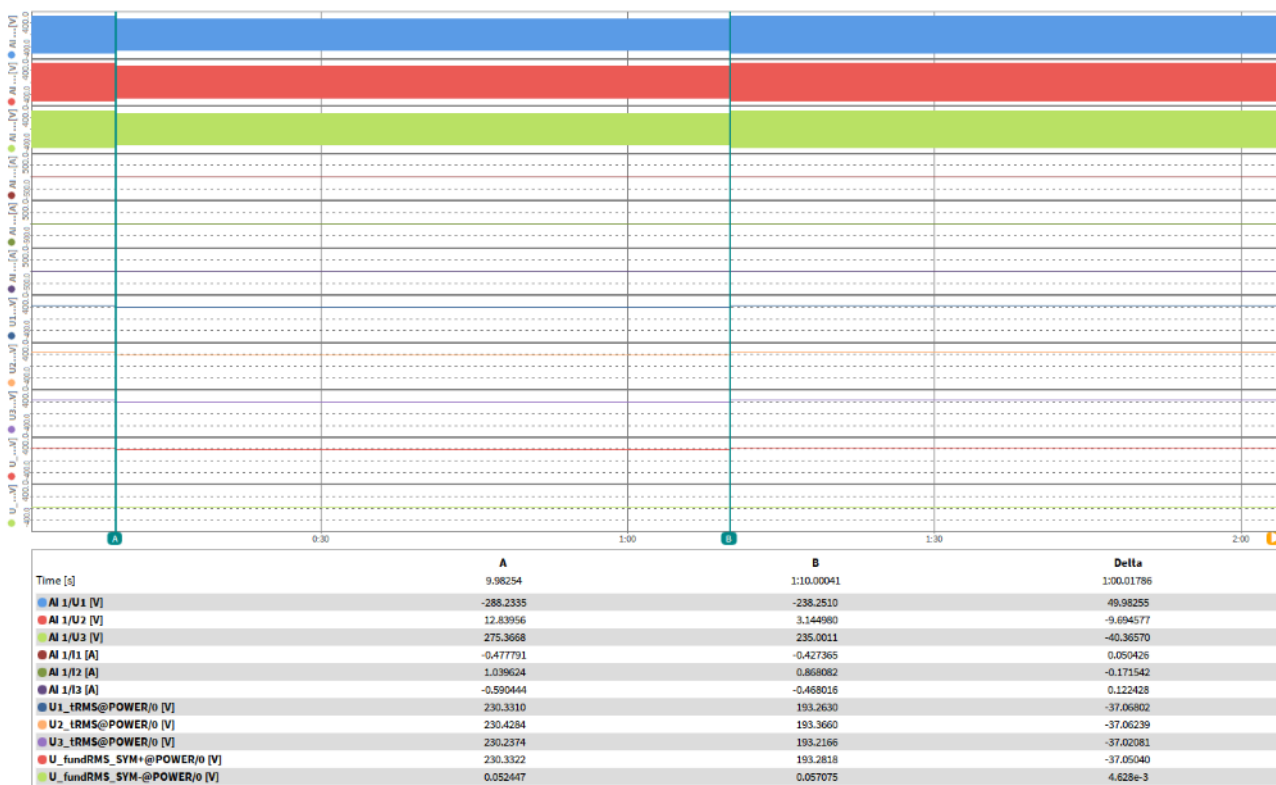
Time [s]	A	B	Delta
	1:12.9228	1:19.9180	6.9952
AI 1/U1 [V]	217.4318	-209.9822	-427.4140
AI 1/U2 [V]	-319.5875	-112.3567	207.2308
AI 1/U3 [V]	101.5210	321.4917	219.9707
AI 1/I1 [A]	156.0733	-153.0247	-309.0980
AI 1/I2 [A]	-231.4317	-81.00522	150.4265
AI 1/I3 [A]	75.20259	234.1110	158.9084
U1_tRMS@POWER/0 [V]	230.8080	230.8186	0.010605
U2_tRMS@POWER/0 [V]	230.9383	230.9163	-0.022034
U3_tRMS@POWER/0 [V]	230.7931	230.7097	-0.083450
I1_tRMS@POWER/0 [A]	166.0893	166.6292	0.539841
I2_tRMS@POWER/0 [A]	166.4604	166.8860	0.425613
I3_tRMS@POWER/0 [A]	166.8372	167.2291	0.391953
P_t@POWER/0 [W]	115274.5	115572.1	297.6641
Q_t@POWER/0 [var]	1293.093	1277.888	-15.20483
PF_t@POWER/0 []	0.999937	0.999939	1.788e-6
U_fundRMS_SYM+@POWER/0 [V]	230.8429	230.8114	-0.031555

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 97 von 153
Page 97 of 153

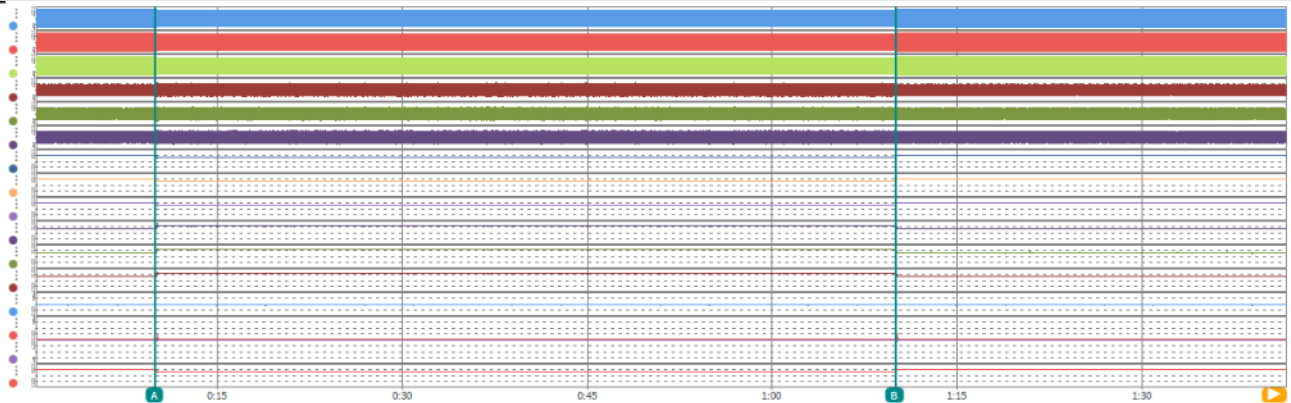
Test No. 4.2 idle test

Test No. 4.2 with PGU
Before dip

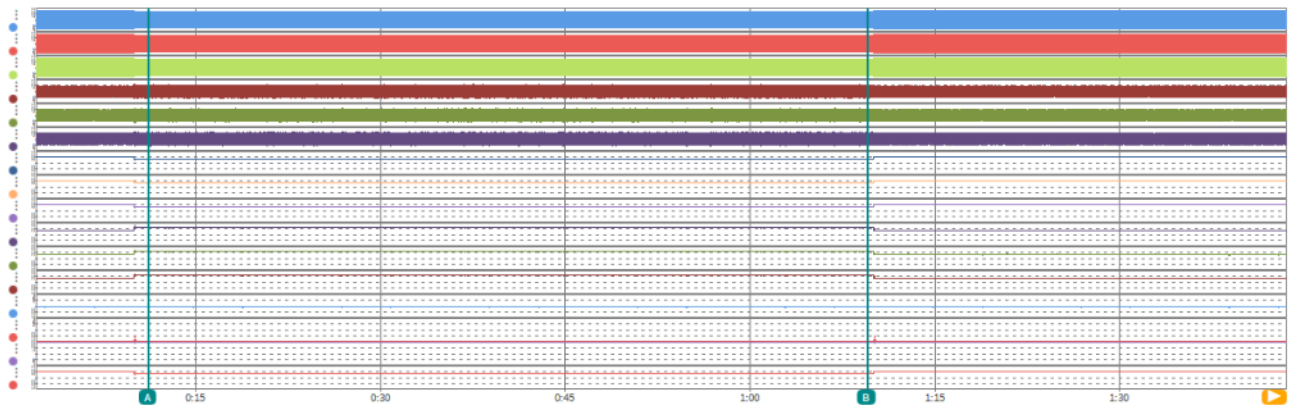
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 98 von 153
Page 98 of 153

Time [s]	A	B	Delta
	9.9750	1:09.9942	1:00.0192
AI 1/U1 [V]	199.2724	246.6984	47.42599
AI 1/U2 [V]	-323.0858	-225.8320	97.25381
AI 1/U3 [V]	123.5328	-24.92452	-148.4573
AI 1/I1 [A]	29.45066	51.21541	21.76476
AI 1/I2 [A]	-46.46671	-45.53378	0.932932
AI 1/I3 [A]	16.94989	-4.921675	-21.87157
U1_tRMS@POWER/0 [V]	230.4449	193.3756	-37.06931
U2_tRMS@POWER/0 [V]	230.5611	193.5025	-37.05859
U3_tRMS@POWER/0 [V]	230.3557	193.3248	-37.03081
I1_tRMS@POWER/0 [A]	33.31846	39.60799	6.289536
I2_tRMS@POWER/0 [A]	33.38300	39.64545	6.262444
I3_tRMS@POWER/0 [A]	33.36890	39.70418	6.335274
P_t@POWER/0 [W]	23057.33	23004.03	-53.30273
Q_t@POWER/0 [var]	444.1763	338.6569	-105.5194
PF_t@POWER/0 []	0.999815	0.999892	7.713e-5
U_fundRMS_SYM+@POWER/0 [V]	230.4521	193.3987	-37.05344



Time [s]	A	B	Delta
	0:11.2127	1:09.5067	0:58.2940
AI 1/U1 [V]	-11.21163	-261.4460	-250.2344
AI 1/U2 [V]	-230.0632	60.06718	290.1304
AI 1/U3 [V]	243.0039	200.7413	-42.26256
AI 1/I1 [A]	-1.478434	-54.49200	-53.01357
AI 1/I2 [A]	-47.93275	12.07542	60.00817
AI 1/I3 [A]	47.99021	42.33027	-5.659938
U1_tRMS@POWER/0 [V]	193.3783	193.3958	0.017502
U2_tRMS@POWER/0 [V]	193.4795	193.4928	0.013245
U3_tRMS@POWER/0 [V]	193.3088	193.3507	0.041901
I1_tRMS@POWER/0 [A]	39.56332	39.54719	-0.016129
I2_tRMS@POWER/0 [A]	39.65802	39.60833	-0.049698
I3_tRMS@POWER/0 [A]	39.62736	39.65178	0.024426
P_t@POWER/0 [W]	22977.30	22976.47	-0.830078
Q_t@POWER/0 [var]	555.9703	333.5486	-222.4217
PF_t@POWER/0 []	0.999707	0.999895	1.872e-4
U_fundRMS_SYM+@POWER/0 [V]	193.3866	193.4108	0.024200

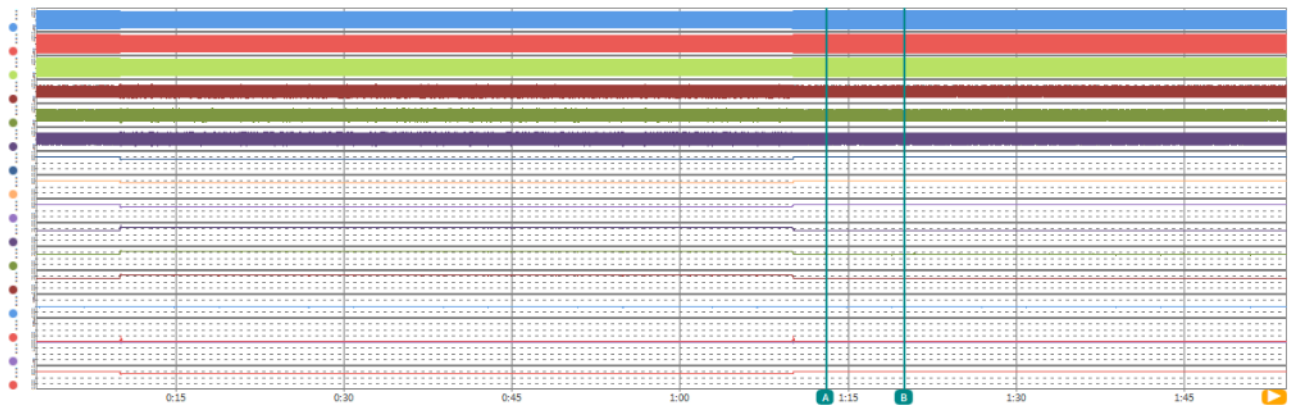
After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 99 von 153
Page 99 of 153

Time [s]	A	B	Delta
	1:10.0111	1:10.1116	0.1006
AI 1/U1 [V]	39.54387	98.53459	58.99072
AI 1/U2 [V]	-298.5738	-318.2507	-19.67692
AI 1/U3 [V]	261.0719	220.4304	-40.64155
AI 1/I1 [A]	3.575444	15.51545	11.94000
AI 1/I2 [A]	-42.18436	-47.61148	-5.427122
AI 1/I3 [A]	40.34746	31.99470	-8.352757
U1_tRMS@POWER/0 [V]	203.7026	230.1008	26.39821
U2_tRMS@POWER/0 [V]	197.7849	230.1849	32.40002
U3_tRMS@POWER/0 [V]	208.2303	230.1895	21.95917
I1_tRMS@POWER/0 [A]	38.43408	34.83622	-3.597858
I2_tRMS@POWER/0 [A]	39.07581	33.59397	-5.481838
I3_tRMS@POWER/0 [A]	37.83091	33.66340	-4.167515
P_t@POWER/0 [W]	23243.30	23077.20	-166.1074
Q_t@POWER/0 [var]	2993.454	4425.102	1431.648
PF_t@POWER/0 []	0.991809	0.982107	-9.701e-3
U_fundRMS_SYM+@POWER/0 [V]	202.6603	230.1570	27.49670



Time [s]	A	B	Delta
	1:12.9976	1:20.0229	7.0253
AI 1/U1 [V]	258.6243	-239.3787	-498.0030
AI 1/U2 [V]	47.78862	310.7703	262.9817
AI 1/U3 [V]	-301.0655	-70.96649	230.0990
AI 1/I1 [A]	36.29899	-34.16205	-70.46104
AI 1/I2 [A]	7.069827	44.07740	37.00757
AI 1/I3 [A]	-43.86342	-9.798885	34.06453
U1_tRMS@POWER/0 [V]	230.4304	230.4454	0.014938
U2_tRMS@POWER/0 [V]	230.5466	230.5336	-0.012939
U3_tRMS@POWER/0 [V]	230.3812	230.3826	1.404e-3
I1_tRMS@POWER/0 [A]	33.29224	33.28710	-5.135e-3
I2_tRMS@POWER/0 [A]	33.39824	33.32639	-0.071854
I3_tRMS@POWER/0 [A]	33.45265	33.39730	-0.055351
P_t@POWER/0 [W]	23075.52	23045.76	-29.76758
Q_t@POWER/0 [var]	355.1540	312.1062	-43.04782
PF_t@POWER/0 []	0.999882	0.999908	2.676e-5
U_fundRMS_SYM+@POWER/0 [V]	230.4510	230.4521	1.099e-3

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 100 von 153
Page 100 of 153

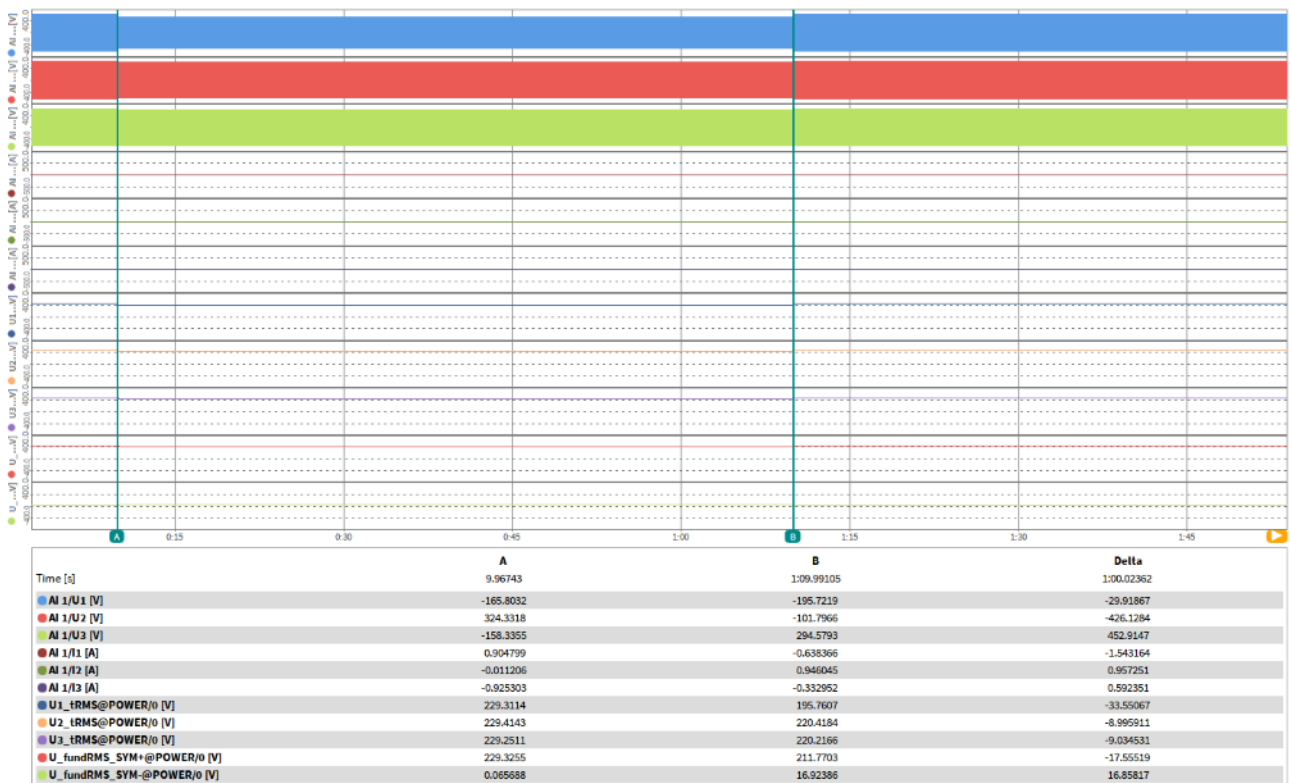
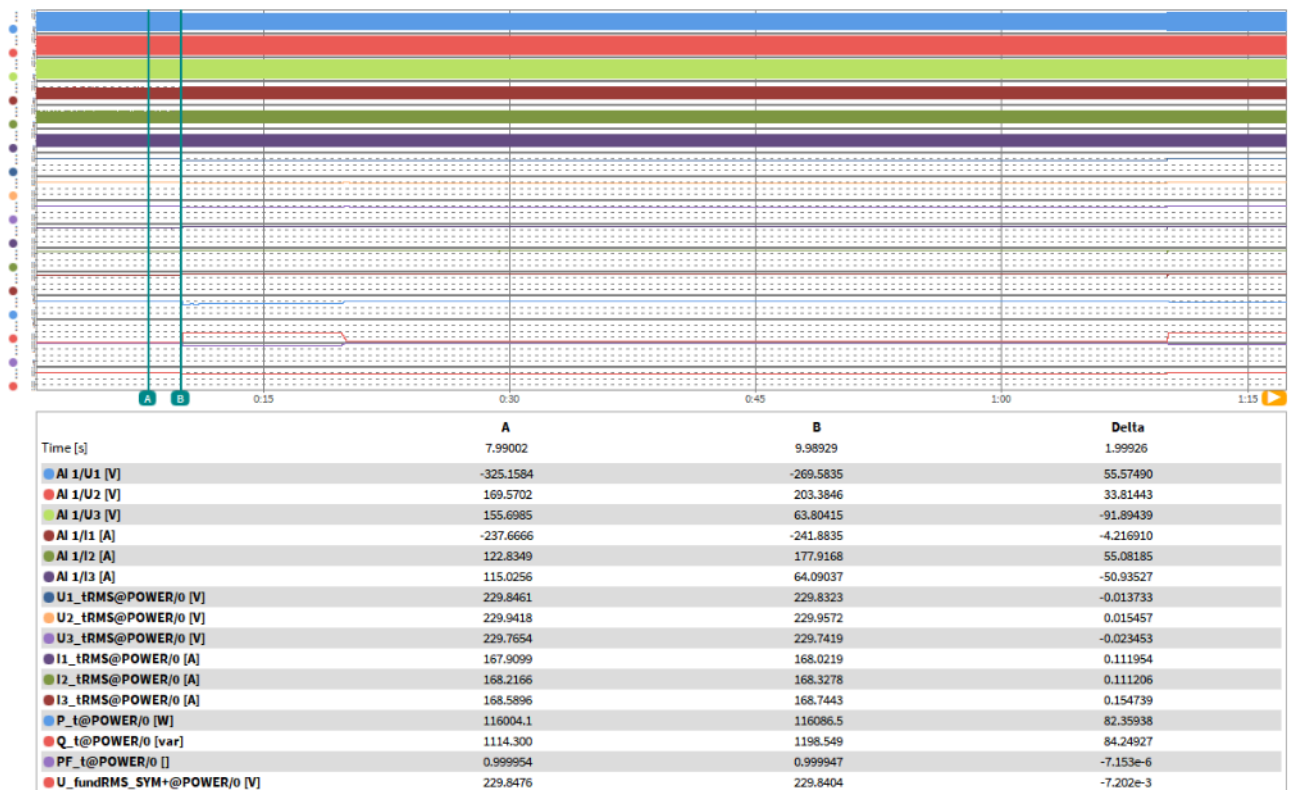
Condition						Measurement	
	No.	Parameter	Phase ref.	Time ref.	unit		
General Info.	0	Test number	--	--	--	4.1	4.2
	1	Date	--	--	yyyy.mm.dd	2022.08.15	2022.08.15
	2	Time (start of test)	--	--	hh:mm:ss	18:29:00	18:29:00
	3	Fault type (phase)	--	--		3 phase	3 phase
	4	Setting voltage depth	Line to neutral	--	p.u.	0.85	0.85
	5	Setting dip duration		--	s	60000	60000
	6	Point of fault entry	Total	--	s	9.98254	9.98254
	7	Point of fault clearance	Total	--	s	70.00041	70.00041
	8	Fault duration in empty load test	Total	--	ms	60000	60000
	9	Voltage depth/height in empty load test	Total	t1+100ms to t2 and t1-10s to t1	p.u.	0.840	0.840
	10		Pos.		p.u.	1.001	1.001
Before dip <t1	11	Voltage	Line to neutral	t1-100s to t1	p.u.	1.003	1.002
	12	Current	Pos.	t1-500ms to t1-100ms	p.u.	1.010	0.201
	13	Active power	Total	t1-10s to t1	p.u.	1.010	0.200
	14		Pos.			1.010	0.199
	15	Reactive power	Total	t1-10s to t1	p.u.	0.010	0.003
	16		Pos.			0.009	0.026
	17	Cos φ	--	t1-10s to t1	--	0.999	0.991
During dip t1 to t2	18	Voltage	Line to neutral	t1+100ms to t2-20ms	p.u.	0.842	0.841
	19	Line current	Phase 1	t1+60ms	p.u.	1.054	0.242
	20		Phase 2			1.114	0.243
	21		Phase 3			1.096	0.241
	22	Line current	Phase 1	t1+100ms	p.u.	1.102	0.252
	23		Phase 2			1.054	0.261
	24		Phase 3			1.090	0.259
	25	Active power	Total	t1+100ms to t2-20ms	p.u.	0.913	0.200
	26		Pos.			0.924	0.200
After dip > t2	27	Voltage	Line to neutral	t2+3s to t2+10s	p.u.	1.003	1.002
	28	Active power	Total	t2+3s to t2+10s	p.u.	1.002	0.201
	29		Pos.			1.005	0.200
	30	Active power rising time	Pos.	--	s	0.133	0.101
	31	Reactive power	Total	t2+3s to t2+10s	p.u.	N/A	N/A
	32		Pos.			N/A	N/A
	33	Reactive power rising time	Pos.	--	s	N/A	N/A
	34	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	Yes	Yes

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 101 von 153
Page 101 of 153

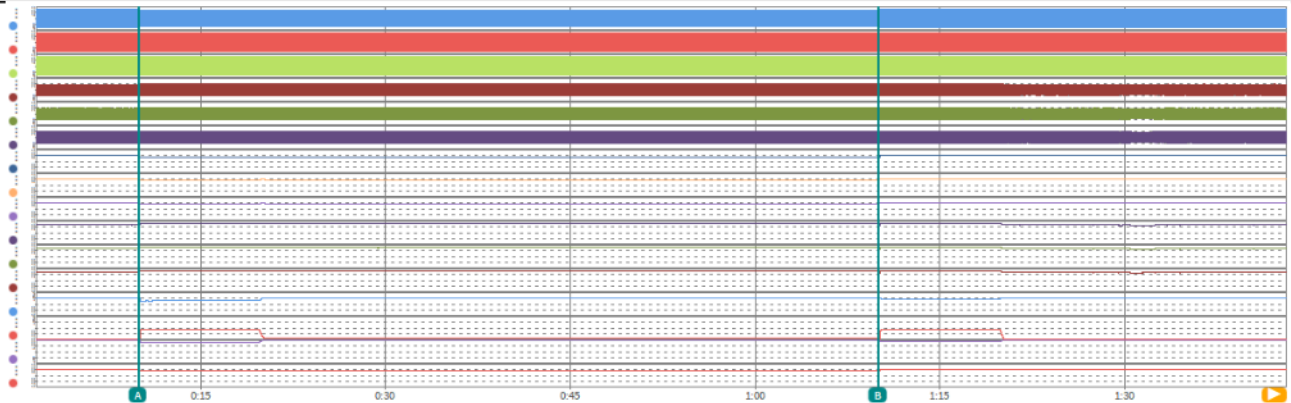
Test No. 4.3 idle test

Test No. 4.3 with PGU
Before dip

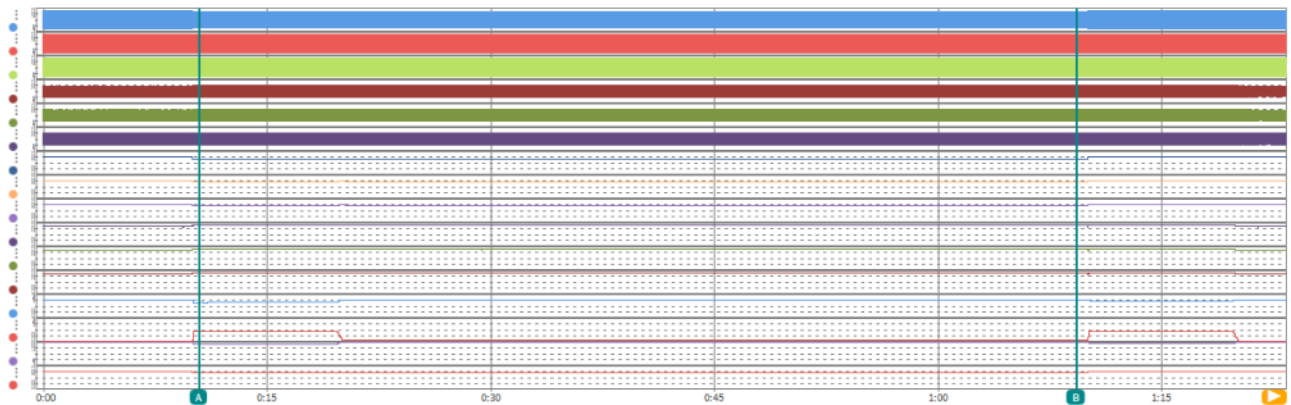
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 102 von 153
Page 102 of 153

Time [s]	A	B	Delta
AI 1/U1 [V]	9.99253	1:10.00025	1:00.00772
AI 1/U2 [V]	-196.4171	203.3434	399.7605
AI 1/U3 [V]	-102.3305	91.42566	193.7561
AI 1/I1 [A]	294.8585	-290.9875	-585.8460
AI 1/I2 [A]	-184.4802	186.6355	371.1157
AI 1/I3 [A]	-66.68461	63.85184	130.5364
U1_tRMS@POWER/0 [V]	250.9692	-250.2271	-501.1963
U2_tRMS@POWER/0 [V]	229.8323	196.3072	-33.52513
U3_tRMS@POWER/0 [V]	229.9572	220.9846	-8.972595
I1_tRMS@POWER/0 [A]	229.7419	220.7462	-8.995728
I2_tRMS@POWER/0 [A]	168.0219	180.2715	12.24959
I3_tRMS@POWER/0 [A]	168.3278	180.2413	11.91356
P_t@POWER/0 [W]	168.7443	183.0274	14.28304
Q_t@POWER/0 [var]	116086.5	115434.1	-652.3672
PF_t@POWER/0 []	1198.549	6583.855	5385.306
U_fundRMS_SYM+@POWER/0 [V]	0.999947	0.998377	-1.569e-3
	229.8404	212.3198	-17.52066

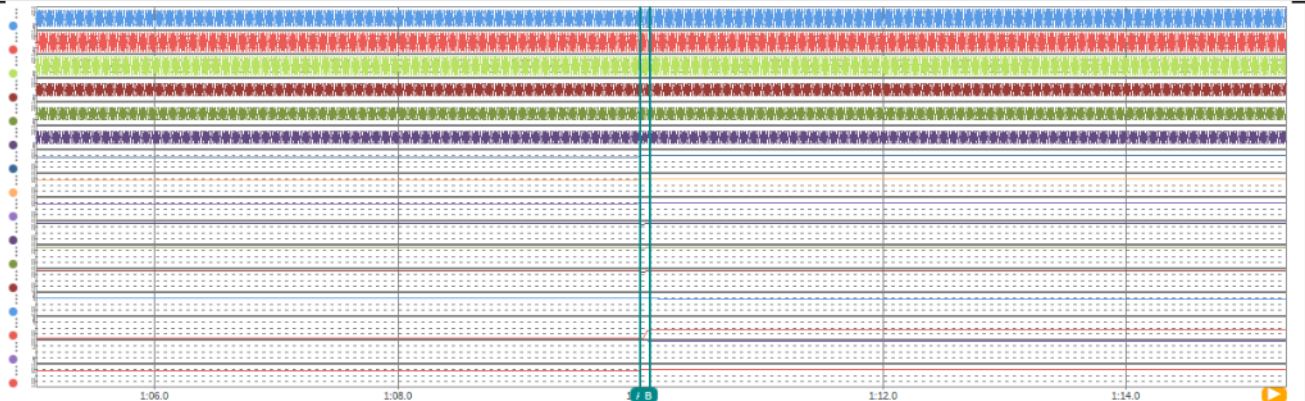


Time [s]	A	B	Delta
AI 1/U1 [V]	0:10.48583	1:09.27176	0:58.78593
AI 1/U2 [V]	-70.30249	-97.32152	-27.01903
AI 1/U3 [V]	305.5353	-214.2601	-519.7954
AI 1/I1 [A]	-235.7757	311.0757	546.8514
AI 1/I2 [A]	-188.4375	-89.28013	99.15734
AI 1/I3 [A]	242.8547	-167.0859	-409.9406
U1_tRMS@POWER/0 [V]	-54.43549	256.4229	310.8584
U2_tRMS@POWER/0 [V]	195.8147	196.3072	0.492493
U3_tRMS@POWER/0 [V]	220.3722	220.9538	0.581650
I1_tRMS@POWER/0 [A]	219.7593	220.7493	0.990005
I2_tRMS@POWER/0 [A]	179.7402	180.5197	0.779449
I3_tRMS@POWER/0 [A]	180.2829	180.4749	0.191986
P_t@POWER/0 [W]	180.5460	183.0882	2.542191
Q_t@POWER/0 [var]	95971.85	115544.2	19572.30
PF_t@POWER/0 []	62633.62	6565.050	-56068.57
U_fundRMS_SYM+@POWER/0 [V]	0.837438	0.998390	0.160952
	211.6113	212.3106	0.699234

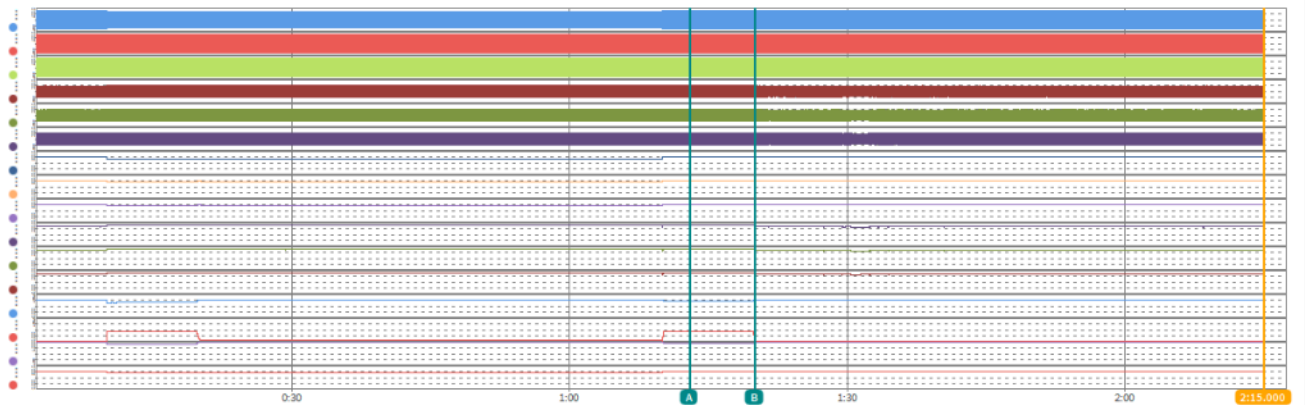
After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 103 von 153
Page 103 of 153

Time [s]	A	B	Delta
1:09.99769	1:10.07506	0.07737	
AI 1/U1 [V]	276.9585	206.6522	-70.30631
AI 1/U2 [V]	-156.3599	-323.2954	-166.9355
AI 1/U3 [V]	-117.4126	118.0246	235.4372
AI 1/I1 [A]	255.1687	59.53920	-195.6295
AI 1/I2 [A]	-141.5378	-250.8651	-109.3273
AI 1/I3 [A]	-113.6625	191.1508	304.8133
U1_tRMS@POWER/0 [V]	196.3072	231.5695	35.26225
U2_tRMS@POWER/0 [V]	220.9846	231.5825	10.59782
U3_tRMS@POWER/0 [V]	220.7462	232.2519	11.50572
I1_tRMS@POWER/0 [A]	180.2715	183.3045	3.033035
I2_tRMS@POWER/0 [A]	180.2413	184.9414	4.700058
I3_tRMS@POWER/0 [A]	183.0274	183.7723	0.744904
P_t@POWER/0 [W]	115434.1	114967.3	-466.8906
Q_t@POWER/0 [var]	6583.855	56177.17	49593.32
PF_t@POWER/0 []	0.998377	0.898474	-0.099904
U_fundRMS_SYM+@POWER/0 [V]	212.3198	231.7977	19.47792



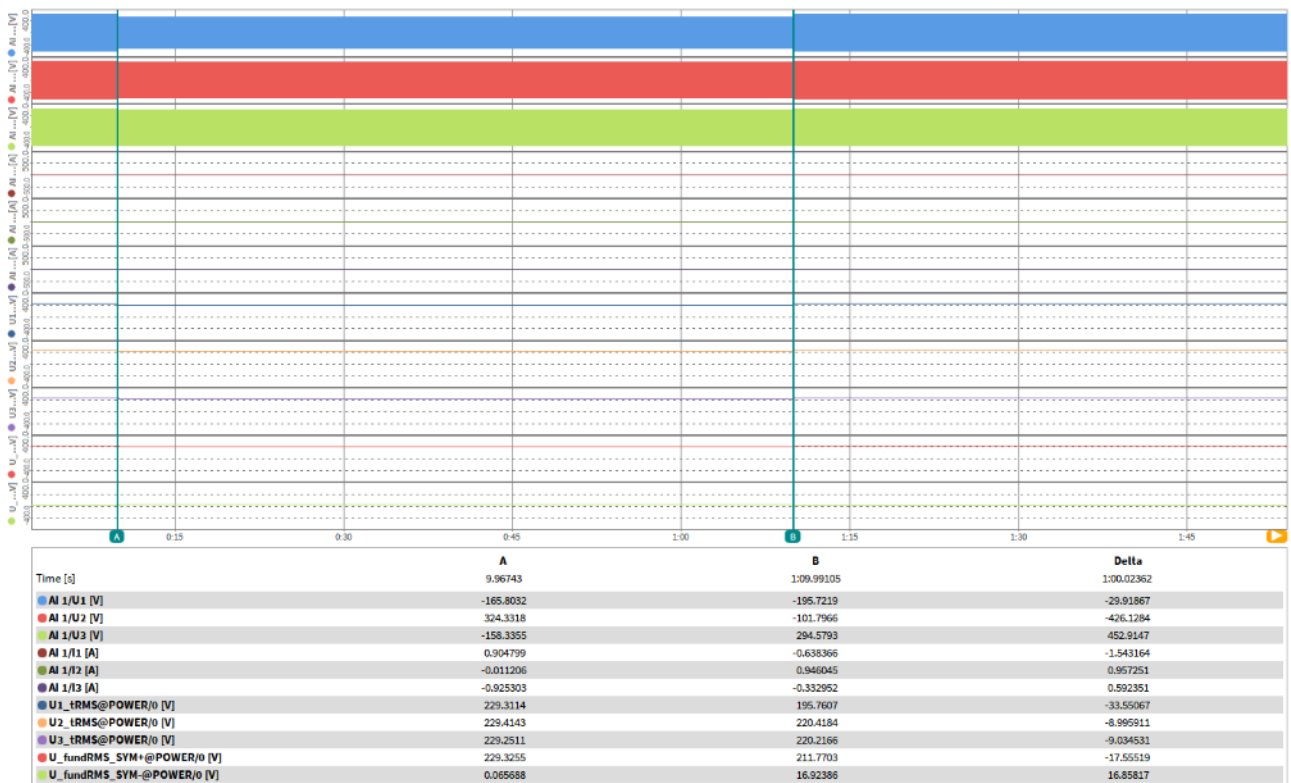
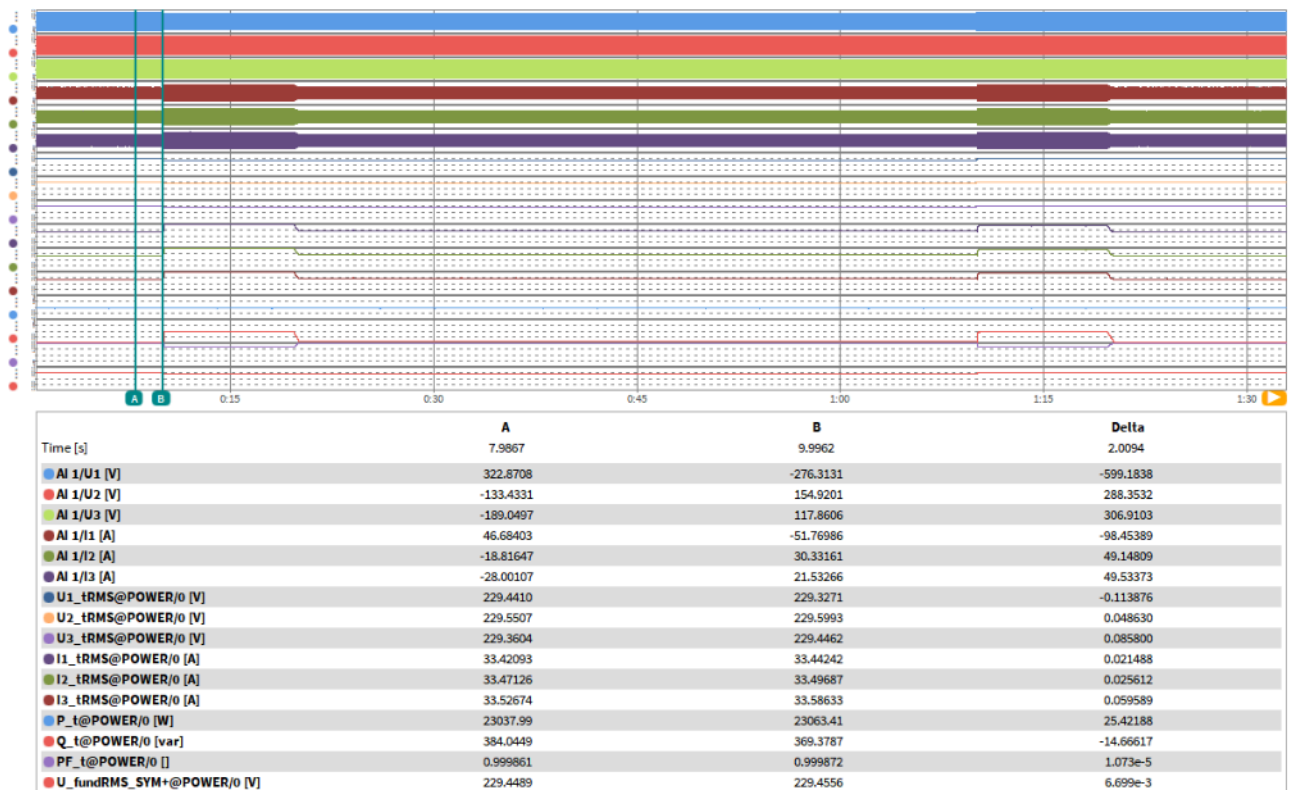
Time [s]	A	B	Delta
1:12.97030	1:20.02548	7.05517	
AI 1/U1 [V]	-224.9243	-257.0803	-32.15599
AI 1/U2 [V]	-91.44617	297.9126	389.3588
AI 1/U3 [V]	315.4159	-40.08460	-355.5005
AI 1/I1 [A]	-247.9483	-175.9330	72.01529
AI 1/I2 [A]	58.65610	228.3569	169.7008
AI 1/I3 [A]	189.2102	-52.21808	-241.4283
U1_tRMS@POWER/0 [V]	229.8499	228.8384	-1.011444
U2_tRMS@POWER/0 [V]	230.0182	228.9559	-1.062347
U3_tRMS@POWER/0 [V]	229.8282	228.7375	-1.090759
I1_tRMS@POWER/0 [A]	182.4960	168.7500	-13.74603
I2_tRMS@POWER/0 [A]	183.2829	170.2900	-12.99289
I3_tRMS@POWER/0 [A]	183.8648	170.8519	-13.01288
P_t@POWER/0 [W]	110181.5	115637.9	5456.414
Q_t@POWER/0 [var]	61866.81	15601.64	-46265.17
PF_t@POWER/0 []	0.871948	0.991021	0.119073
U_fundRMS_SYM+@POWER/0 [V]	229.8950	228.8398	-1.055191

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 104 von 153
Page 104 of 153

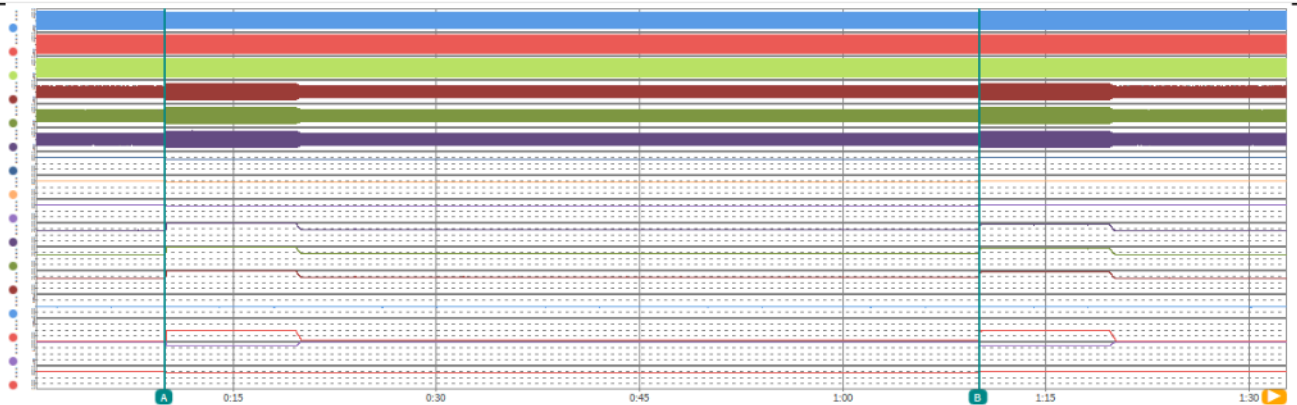
Test No. 4.4 idle test

Test No. 4.4 with PGU
Before dip

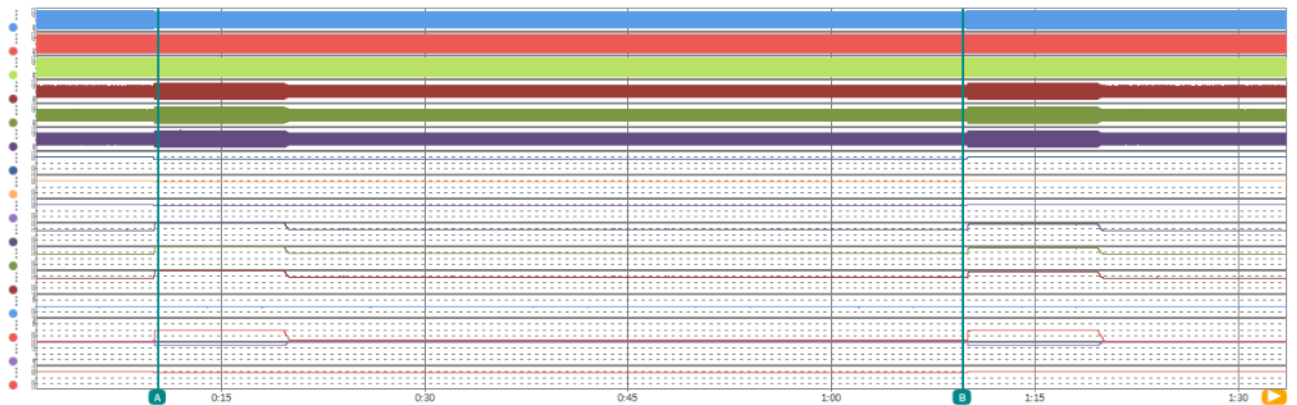
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 105 von 153
Page 105 of 153

Time [s]	A	B	Delta
	0:10.0052	1:10.0233	1:00.0182
AI 1/U1 [V]	257.9079	313.7489	55.84097
AI 1/U2 [V]	-230.8252	-229.1279	1.697302
AI 1/U3 [V]	-26.87311	-86.17354	-59.30043
AI 1/I1 [A]	49.07775	45.30382	-3.773928
AI 1/I2 [A]	-39.10661	-30.63488	8.471728
AI 1/I3 [A]	-10.37633	-15.02133	-4.644990
U1_tRMS@POWER/0 [V]	206.2952	220.0394	13.74425
U2_tRMS@POWER/0 [V]	225.7958	224.3736	-1.422180
U3_tRMS@POWER/0 [V]	220.3664	229.3215	8.955139
I1_tRMS@POWER/0 [A]	36.07198	33.67678	-2.395191
I2_tRMS@POWER/0 [A]	34.67519	34.97339	0.298199
I3_tRMS@POWER/0 [A]	34.96234	35.15065	0.188309
P_t@POWER/0 [W]	22846.72	23233.85	387.1289
Q_t@POWER/0 [var]	2429.345	1980.770	-448.5750
PF_t@POWER/0 []	0.994394	0.996386	1.991e-3
U_fundRMS_SYM+@POWER/0 [V]	217.0487	224.2963	7.247635

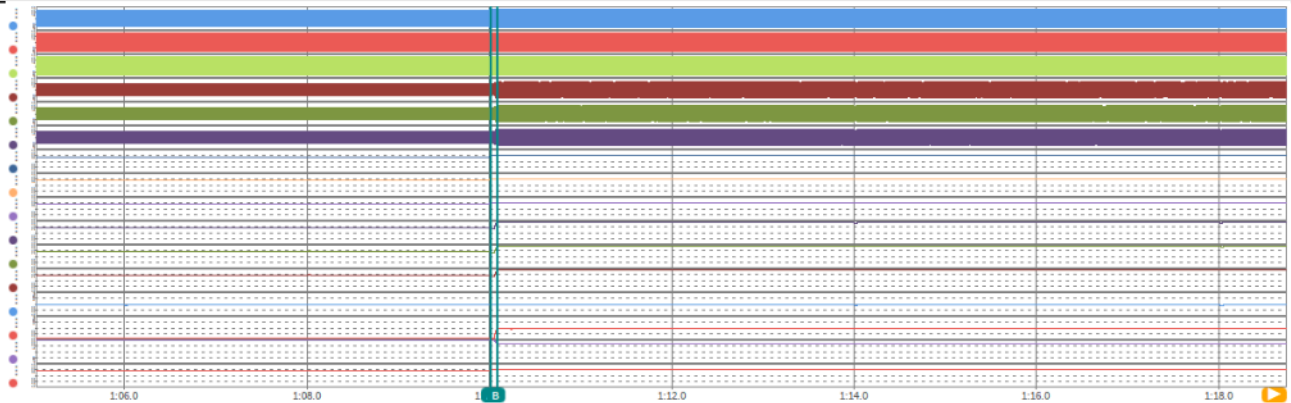


Time [s]	A	B	Delta
	0:10.3693	1:09.6850	0:59.3157
AI 1/U1 [V]	160.6135	267.2866	106.6730
AI 1/U2 [V]	147.3117	-57.25408	-204.5658
AI 1/U3 [V]	-306.5806	-205.7705	100.8101
AI 1/I1 [A]	-11.67178	49.53575	61.20754
AI 1/I2 [A]	68.24756	-12.43937	-80.68693
AI 1/I3 [A]	-56.63169	-37.07516	19.55652
U1_tRMS@POWER/0 [V]	195.4323	195.8782	0.445877
U2_tRMS@POWER/0 [V]	220.0990	220.5247	0.425797
U3_tRMS@POWER/0 [V]	219.8108	220.3458	0.534988
I1_tRMS@POWER/0 [A]	51.17042	36.08535	-15.08506
I2_tRMS@POWER/0 [A]	50.89818	36.15257	-14.74561
I3_tRMS@POWER/0 [A]	51.58488	36.44878	-15.13610
P_t@POWER/0 [W]	22841.15	23031.50	190.3555
Q_t@POWER/0 [var]	23178.81	1369.856	-21808.96
PF_t@POWER/0 []	0.701900	0.998236	0.296336
U_fundRMS_SYM+@POWER/0 [V]	211.4119	211.8835	0.471588

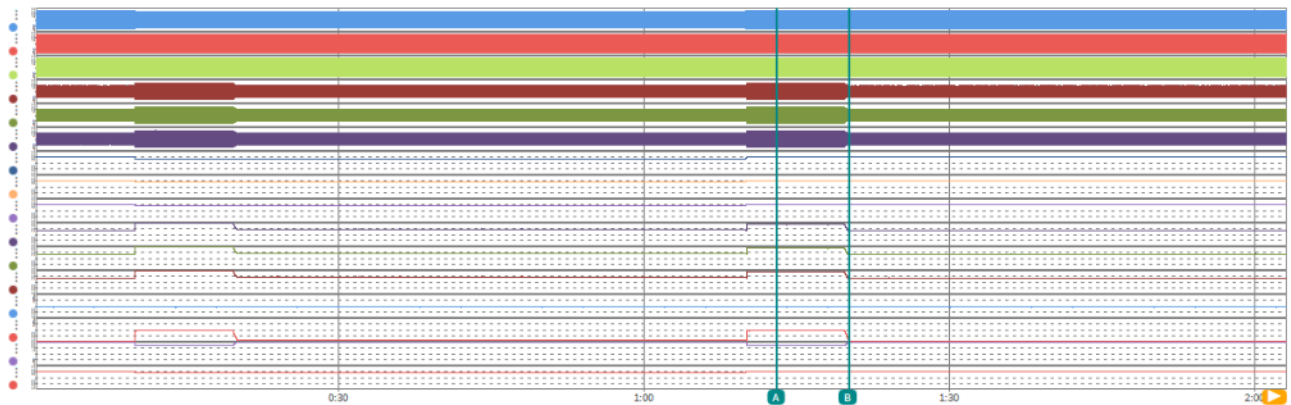
After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 106 von 153
Page 106 of 153

Time [s]	A	B	Delta
	1:10.0179	1:10.0868	0.0689
AI 1/U1 [V]	-122.9050	218.3709	341.2760
AI 1/U2 [V]	-198.6075	100.8489	299.4564
AI 1/U3 [V]	321.5764	-318.8191	-640.3954
AI 1/I1 [A]	-16.39950	64.77499	81.17450
AI 1/I2 [A]	-32.05800	-29.38807	2.669931
AI 1/I3 [A]	48.55848	-35.57348	-84.13196
U1_tRMS@POWER/0 [V]	195.9826	230.2460	34.26343
U2_tRMS@POWER/0 [V]	220.4661	230.2567	9.790527
U3_tRMS@POWER/0 [V]	220.2973	230.4875	10.19020
I1_tRMS@POWER/0 [A]	36.14815	44.65837	8.510220
I2_tRMS@POWER/0 [A]	36.14095	43.73486	7.593910
I3_tRMS@POWER/0 [A]	36.38800	42.28710	5.899105
P_t@POWER/0 [W]	23026.88	23099.58	72.69531
Q_t@POWER/0 [var]	1384.044	19297.08	17913.04
PF_t@POWER/0 []	0.998199	0.767446	-0.230753
U_fundRMS_SYM+@POWER/0 [V]	211.8863	230.3285	18.44223



Time [s]	A	B	Delta
	1:13.0905	1:20.1112	7.0207
AI 1/U1 [V]	-144.4960	-215.9853	-71.48934
AI 1/U2 [V]	323.7763	316.9217	-6.854535
AI 1/U3 [V]	-179.2448	-100.5988	78.64595
AI 1/I1 [A]	20.42484	-31.33309	-51.75793
AI 1/I2 [A]	44.88004	46.13436	1.254320
AI 1/I3 [A]	-65.21297	-14.78791	50.42506
U1_tRMS@POWER/0 [V]	229.4383	229.0444	-0.393814
U2_tRMS@POWER/0 [V]	229.5756	229.1604	-0.415237
U3_tRMS@POWER/0 [V]	229.4265	228.9366	-0.489883
I1_tRMS@POWER/0 [A]	46.76833	33.52144	-13.24689
I2_tRMS@POWER/0 [A]	46.89233	33.61323	-13.27910
I3_tRMS@POWER/0 [A]	46.93529	33.60671	-13.32858
P_t@POWER/0 [W]	22897.31	23058.00	160.6914
Q_t@POWER/0 [var]	22730.55	873.2086	-21857.34
PF_t@POWER/0 []	0.709686	0.999284	0.289597
U_fundRMS_SYM+@POWER/0 [V]	229.4790	229.0447	-0.434311

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 107 von 153
Page 107 of 153

Condition						Measurement	
	No.	Parameter	Phase ref.	Time ref.	unit		
General Info.	0	Test number	--	--	--	4.3	4.4
	1	Date	--	--	yyyy.mm.dd	2022.08.15	2022.08.15
	2	Time (start of test)	--	--	hh:mm:ss	18:33:00	18:33:00
	3	Fault type (phase)	--	--		2 phase	2 phase
	4	Setting voltage depth	Line to neutral	--	p.u.	0.85	0.85
	5	Setting dip duration		--	ms	60000	60000
	6	Point of fault entry	Total	--	s	9.96743	9.96743
	7	Point of fault clearance	Total	--	s	69.99105	69.99105
	8	Fault duration in empty load test	Total	--	ms	60000	60000
	9	Voltage depth/height in empty load test	Total	t1+100ms to t2 and t1-10s to t1	p.u.	0.851	0.851
	10		Pos.		p.u.	1.001	1.001
Before dip <t1	11	Voltage	Line to neutral	t1-100s to t1	p.u.	0.999	0.997
	12	Current	Pos.	t1-500ms to t1-100ms	p.u.	1.013	0.201
	13	Active power	Total	t1-10s to t1	p.u.	1.009	0.200
	14		Pos.			1.009	0.201
	15	Reactive power	Total	t1-10s to t1	p.u.	0.010	0.003
	16		Pos.			0.010	0.003
	17	Cos φ	--	t1-10s to t1	--	0.999	0.999
During dip t1 to t2	18	Voltage	Line to neutral	t1+100ms to t2-20ms	p.u.	0.852	0.851
	19	Line current	Phase 1	t1+60ms	p.u.	1.090	0.219
	20		Phase 2			1.084	0.217
	21		Phase 3			1.087	0.220
	22	Line current	Phase 1	t1+100ms	p.u.	1.084	0.219
	23		Phase 2			1.089	0.217
	24		Phase 3			1.084	0.220
	25	Active power	Total	t1+100ms to t2-20ms	p.u.	0.835	0.199
	26		Pos.			1.005	0.200
After dip > t2	27	Voltage	Line to neutral	t2+3s to t2+10s	p.u.	1.000	0.997
	28	Active power	Total	t2+3s to t2+10s	p.u.	0.958	0.199
	29		Pos.			1.006	0.201
	30	Active power rising time	Pos.	--	s	0.077	0.069
	31	Reactive power	Total	t2+3s to t2+10s	p.u.	N/A	N/A
	32		Pos.			N/A	N/A
	33	Reactive power rising time	Pos.	--	s	N/A	N/A
	34	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	Yes	Yes

Prüfbericht-Nr.:
Test report no.:

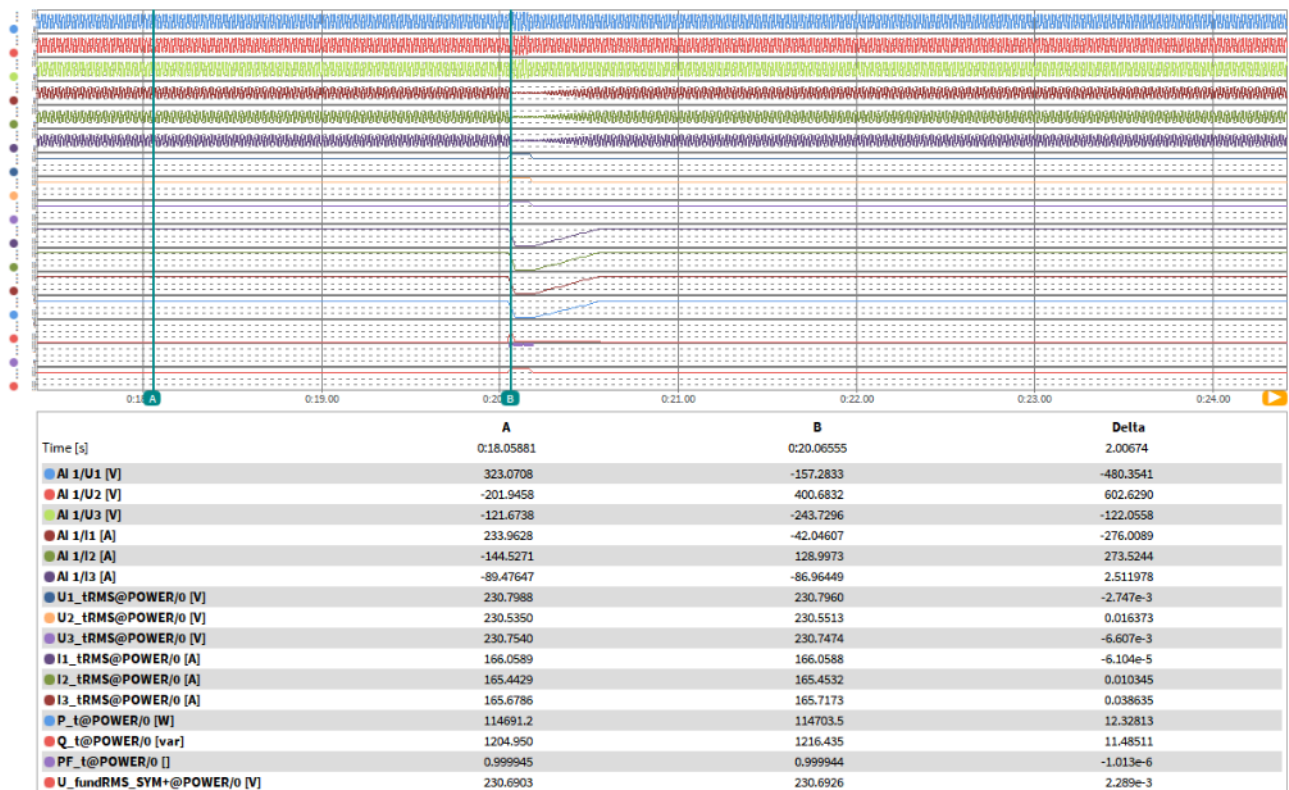
CN224DKW 001 Attachment 1

Seite 108 von 153
Page 108 of 153

Test No. 5.1 idle test



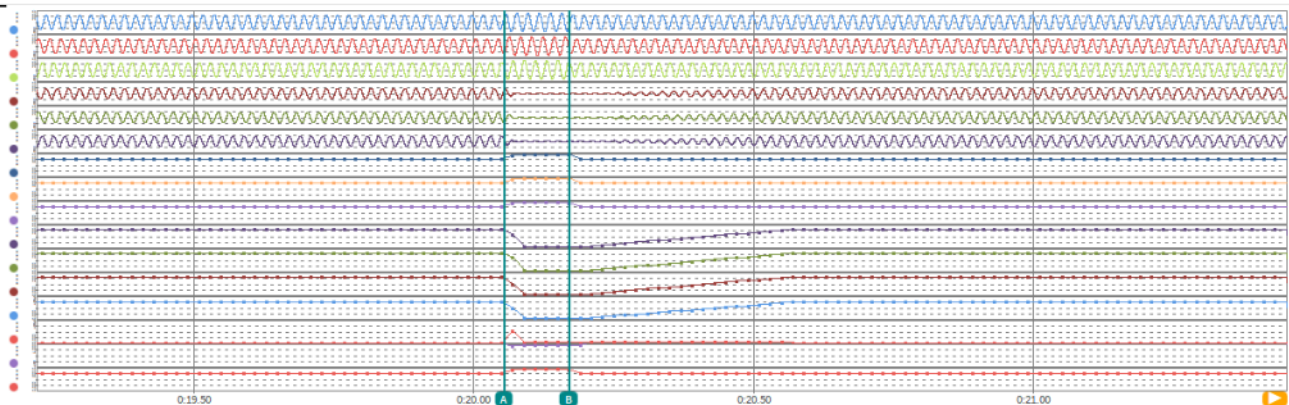
Test No. 5.1 with PGU Before dip



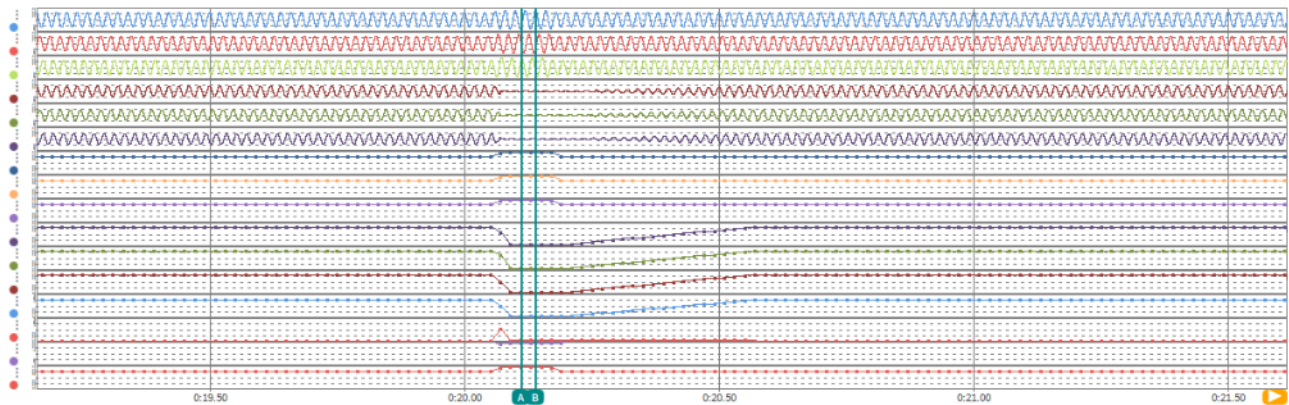
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 109 von 153
Page 109 of 153

Time [s]	A	B	Delta
	0:20.05595	0:20.17145	0.11550
AI 1/U1 [V]	165.9896	-255.8091	-421.7987
AI 1/U2 [V]	-326.1421	-50.35758	275.7845
AI 1/U3 [V]	160.0423	304.1535	144.1112
AI 1/I1 [A]	120.3774	-14.53793	-134.9154
AI 1/I2 [A]	-233.8880	-1.325607	232.5624
AI 1/I3 [A]	113.6066	15.41305	-98.19353
U1_tRMS@POWER/0 [V]	230.7960	286.4783	55.68225
U2_tRMS@POWER/0 [V]	230.5513	286.3427	55.79132
U3_tRMS@POWER/0 [V]	230.7474	286.5828	55.83540
I1_tRMS@POWER/0 [A]	166.0588	8.499860	-157.5590
I2_tRMS@POWER/0 [A]	165.4532	8.618752	-156.8344
I3_tRMS@POWER/0 [A]	165.7173	8.222830	-157.4944
P_t@POWER/0 [W]	114703.5	6785.918	-107917.6
Q_t@POWER/0 [var]	1216.435	2578.974	1362.539
PF_t@POWER/0 []	0.999944	0.934769	-0.065175
U_fundRMS_SYM+@POWER/0 [V]	230.6926	286.4654	55.77277

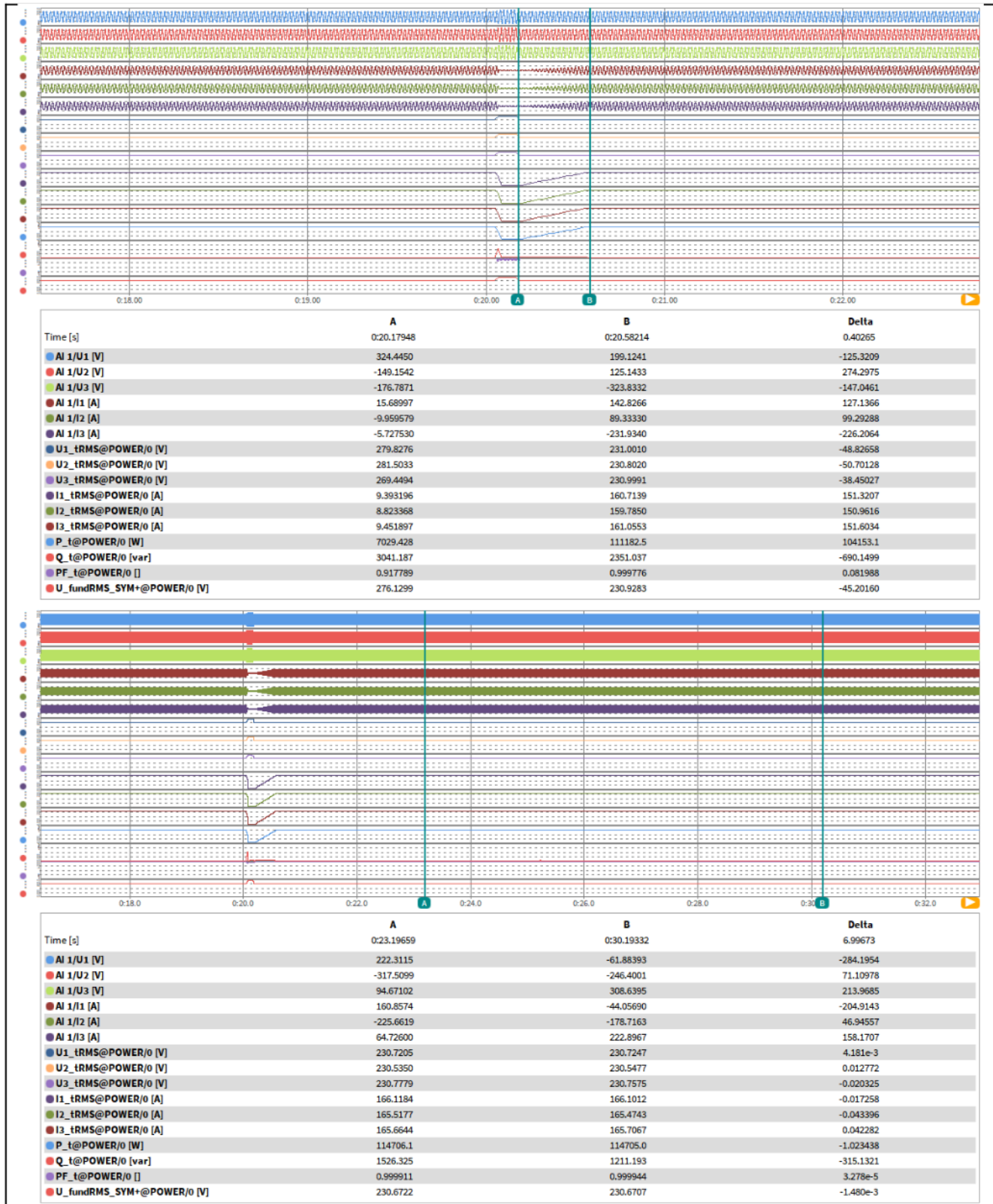


Time [s]	A	B	Delta
	0:20.11125	0:20.13936	0.02811
AI 1/U1 [V]	-332.9745	405.4249	738.3993
AI 1/U2 [V]	-34.92451	-196.9493	-164.0248
AI 1/U3 [V]	368.2332	-207.7658	-575.9991
AI 1/I1 [A]	-8.723379	14.27686	23.00024
AI 1/I2 [A]	1.852036	-10.75792	-12.60996
AI 1/I3 [A]	6.822825	-3.559828	-10.38265
U1_tRMS@POWER/0 [V]	286.3428	286.4437	0.100922
U2_tRMS@POWER/0 [V]	286.3334	286.3486	0.015137
U3_tRMS@POWER/0 [V]	286.4813	286.5714	0.090057
I1_tRMS@POWER/0 [A]	8.283027	8.518106	0.235079
I2_tRMS@POWER/0 [A]	8.619269	8.724524	0.105254
I3_tRMS@POWER/0 [A]	6.621188	8.060544	1.439356
P_t@POWER/0 [W]	6353.521	6787.929	434.4082
Q_t@POWER/0 [var]	2239.368	2541.547	302.1790
PF_t@POWER/0 []	0.943132	0.936507	-6.625e-3
U_fundRMS_SYM+@POWER/0 [V]	286.3833	286.4520	0.068665

After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 110 von 153
Page 110 of 153

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 111 von 153
Page 111 of 153

Test No. 5.2 idle test



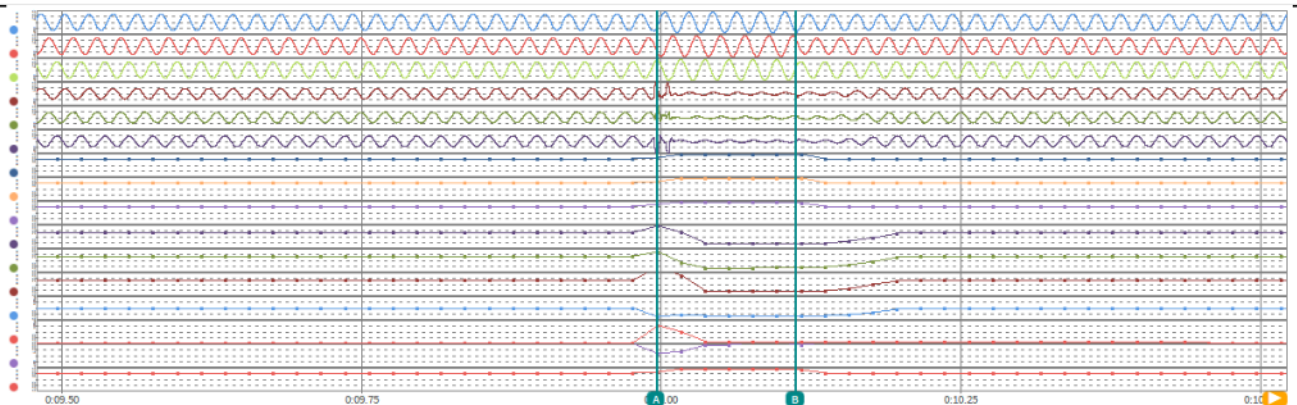
Test No. 5.2 with PGU Before dip



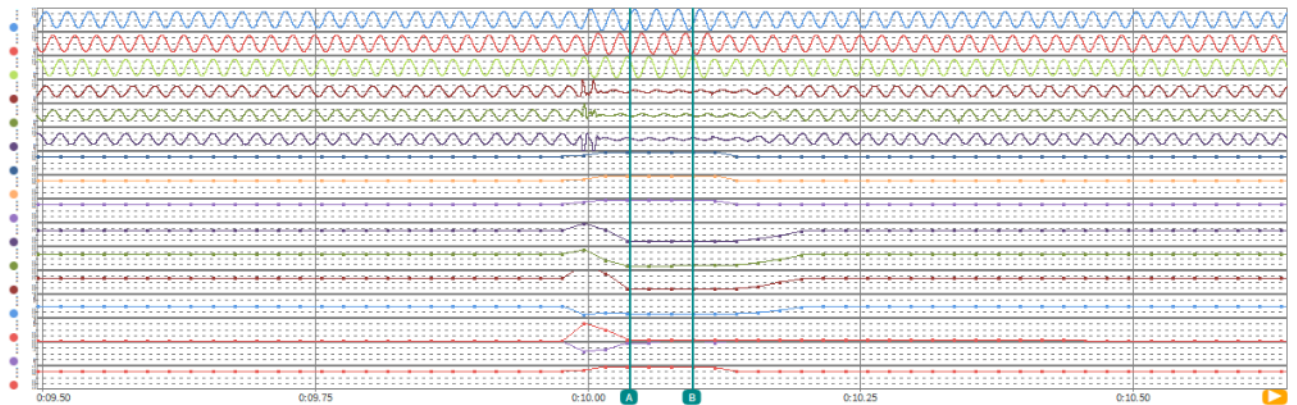
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 112 von 153
Page 112 of 153

Time [s]	A	B	Delta
9.99610	0:10.11231	0.11621	
AI 1/U1 [V]	-272.5189	-381.8736	-109.3547
AI 1/U2 [V]	-119.0317	311.3516	430.3832
AI 1/U3 [V]	390.0564	70.11176	-319.9446
AI 1/I1 [A]	133.4486	-9.153009	-142.6016
AI 1/I2 [A]	42.08386	11.85548	-30.22838
AI 1/I3 [A]	-177.5533	-2.595902	174.9574
U1_trMS@POWER/0 [V]	230.4349	287.4577	57.02275
U2_trMS@POWER/0 [V]	230.5300	287.4116	56.88161
U3_trMS@POWER/0 [V]	230.3692	287.2990	56.92975
I1_trMS@POWER/0 [A]	33.31125	8.545745	-24.76551
I2_trMS@POWER/0 [A]	33.38980	8.403592	-24.98621
I3_trMS@POWER/0 [A]	33.40276	8.587940	-24.81482
P_t@POWER/0 [W]	23065.05	7007.206	-16057.85
Q_t@POWER/0 [var]	392.5746	2182.197	1789.623
PF_t@POWER/0 []	0.999855	0.954773	-0.045083
U_fundRMS_SYM+@POWER/0 [V]	230.4430	287.3886	56.94568

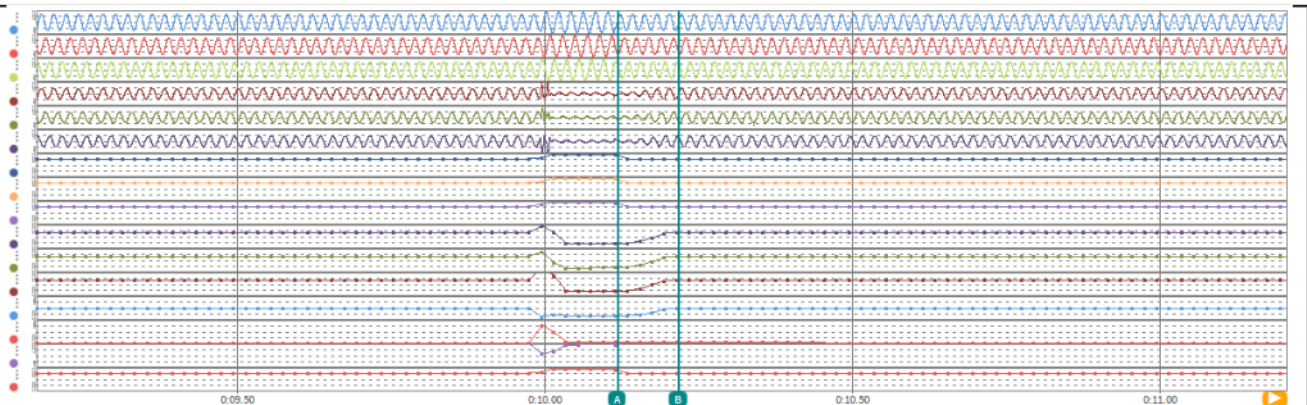


Time [s]	A	B	Delta
0:10.03874	0:10.09633	0.05759	
AI 1/U1 [V]	34.91664	-251.5633	-286.4800
AI 1/U2 [V]	-368.6176	-152.1273	216.4903
AI 1/U3 [V]	332.2356	402.4213	70.18567
AI 1/I1 [A]	-1.258969	-9.619117	-8.360148
AI 1/I2 [A]	-8.070350	-2.560377	5.509973
AI 1/I3 [A]	8.645177	12.15732	3.512144
U1_trMS@POWER/0 [V]	287.5060	287.4633	-0.042664
U2_trMS@POWER/0 [V]	287.3788	287.4287	0.049896
U3_trMS@POWER/0 [V]	287.2591	287.3087	0.049561
I1_trMS@POWER/0 [A]	8.388242	8.564362	0.176120
I2_trMS@POWER/0 [A]	6.835315	8.282463	1.447148
I3_trMS@POWER/0 [A]	8.903139	8.682918	-0.220222
P_t@POWER/0 [W]	6408.110	6992.387	584.2769
Q_t@POWER/0 [var]	2647.561	2222.957	-424.6040
PF_t@POWER/0 []	0.924224	0.953000	0.028776
U_fundRMS_SYM+@POWER/0 [V]	287.3803	287.3995	0.019135

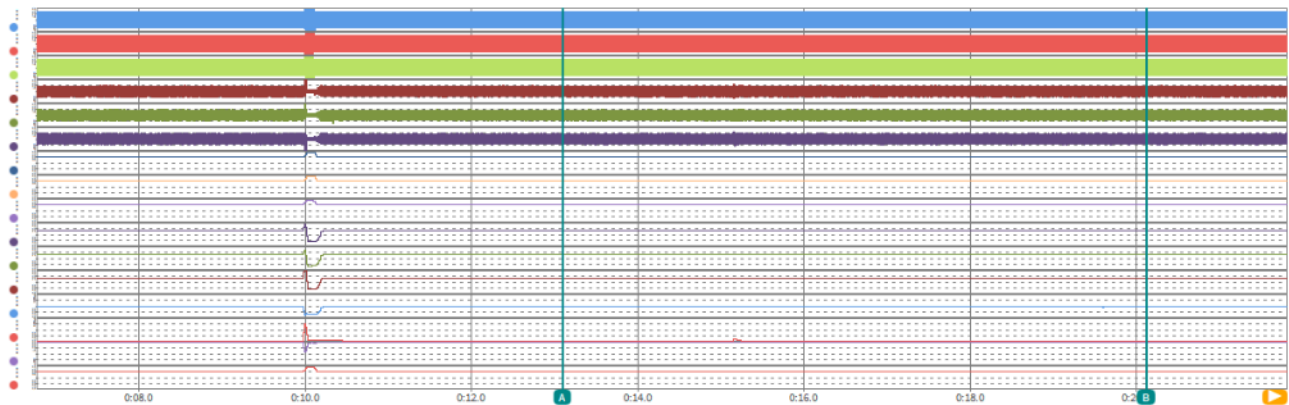
After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 113 von 153
Page 113 of 153

Time [s]	A	B	Delta
	0:10.11917	0:10.21859	0.09942
AI 1/U1 [V]	68.17580	14.63604	-53.53976
AI 1/U2 [V]	-310.4720	-289.7599	20.71214
AI 1/U3 [V]	241.8935	275.6019	33.70834
AI 1/I1 [A]	-1.645327	-0.778914	0.866413
AI 1/I2 [A]	-14.39786	-38.88762	-24.48976
AI 1/I3 [A]	15.40160	40.33149	24.92988
U1_tRMS@POWER/0 [V]	278.6357	230.3436	-48.29208
U2_tRMS@POWER/0 [V]	282.4256	230.7760	-51.64963
U3_tRMS@POWER/0 [V]	268.8715	230.7696	-38.10188
I1_tRMS@POWER/0 [A]	9.801789	33.36053	23.55874
I2_tRMS@POWER/0 [A]	9.010550	33.37833	24.36778
I3_tRMS@POWER/0 [A]	10.28833	33.28491	22.99658
P_t@POWER/0 [W]	7407.043	22989.37	15582.33
Q_t@POWER/0 [var]	3132.461	1908.422	-1224.039
PF_t@POWER/0 []	0.921025	0.996572	0.075547
U_fundRMS_SYM+@POWER/0 [V]	275.7709	230.6270	-45.14395



Time [s]	A	B	Delta
	0:13.10606	0:20.12295	7.01689
AI 1/U1 [V]	215.7192	325.5356	109.8163
AI 1/U2 [V]	104.8443	-175.7796	-280.6239
AI 1/U3 [V]	-319.1788	-149.7860	169.3928
AI 1/I1 [A]	31.15404	46.61382	15.45978
AI 1/I2 [A]	14.66382	-25.54226	-40.20608
AI 1/I3 [A]	-45.83800	-21.24131	24.59669
U1_tRMS@POWER/0 [V]	230.4402	230.4314	-8.896e-3
U2_tRMS@POWER/0 [V]	230.5363	230.5470	0.010635
U3_tRMS@POWER/0 [V]	230.3572	230.3351	-0.022079
I1_tRMS@POWER/0 [A]	33.08952	33.09704	7.515e-3
I2_tRMS@POWER/0 [A]	33.13964	33.21971	0.080067
I3_tRMS@POWER/0 [A]	33.18937	33.22904	0.039673
P_t@POWER/0 [W]	22908.29	22935.17	26.88086
Q_t@POWER/0 [var]	315.4896	425.4656	109.9761
PF_t@POWER/0 []	0.999905	0.999828	-7.719e-5
U_fundRMS_SYM+@POWER/0 [V]	230.4429	230.4360	-6.866e-3

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 114 von 153
Page 114 of 153

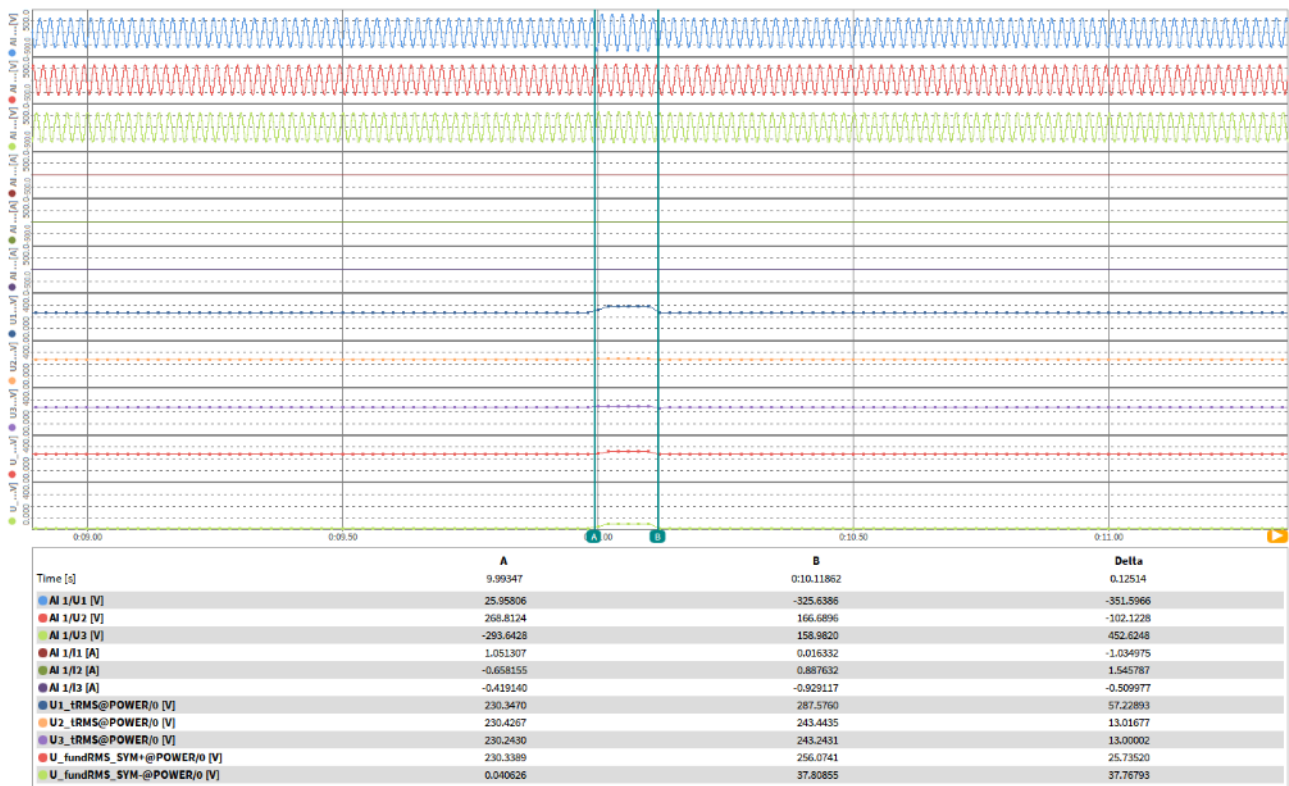
Condition						Measurement	
	No.	Parameter	Phase ref.	Time ref.	unit		
General Info.	0	Test number	--	--	--	5.1	5.2
	1	Date	--	--	yyyy.mm.dd	2022.08.15	2022.08.15
	2	Time (start of test)	--	--	hh:mm:ss	18:39:00	18:39:00
	3	Fault type (phase)	--	--		3 phase	3 phase
	4	Setting voltage depth	Line to neutral	--	p.u.	1.25	1.25
	5	Setting dip duration		--	ms	120	120
	6	Point of fault entry	Total	--	s	9.99074	9.99074
	7	Point of fault clearance	Total	--	s	10.11065	10.11065
	8	Fault duration in empty load test	Total	--	ms	120	120
	9	Voltage depth/height in empty load test	Total	t1+100ms to t2 and t1-10s to t1	p.u.	1.249	1.249
	10		Pos.		p.u.	1.001	1.001
Before dip <t1	11	Voltage	Line to neutral	t1-100s to t1	p.u.	1.003	1.002
	12	Current	Pos.	t1-500ms to t1-100ms	p.u.	0.996	0.201
	13	Active power	Total	t1-10s to t1	p.u.	0.997	0.201
	14		Pos.			0.997	0.201
	15	Reactive power	Total	t1-10s to t1	p.u.	0.010	0.003
	16		Pos.			0.011	0.003
	17	Cos ϕ	--	t1-10s to t1	--	0.999	0.999
During dip t1 to t2	18	Voltage	Line to neutral	t1+100ms to t2-20ms	p.u.	1.246	1.250
	19	Line current	Phase 1	t1+60ms	p.u.	0.052	0.051
	20		Phase 2			0.054	0.041
	21		Phase 3			0.047	0.054
	22	Line current	Phase 1	t1+100ms	p.u.	0.051	0.052
	23		Phase 2			0.052	0.050
	24		Phase 3			0.049	0.052
	25	Active power	Total	t1+100ms to t2-20ms	p.u.	0.019	0.023
	26		Pos.			0.022	0.019
After dip > t2	27	Voltage	Line to neutral	t2+3s to t2+10s	p.u.	1.003	1.002
	28	Active power	Total	t2+3s to t2+10s	p.u.	0.997	0.199
	29		Pos.			0.997	0.199
	30	Active power rising time	Pos.	--	s	0.403	0.099
	31	Reactive power	Total	t2+3s to t2+10s	p.u.	N/A	N/A
	32		Pos.			N/A	N/A
	33	Reactive power rising time	Pos.	--	s	N/A	N/A
	34	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	Yes	Yes

Prüfbericht-Nr.:
Test report no.:

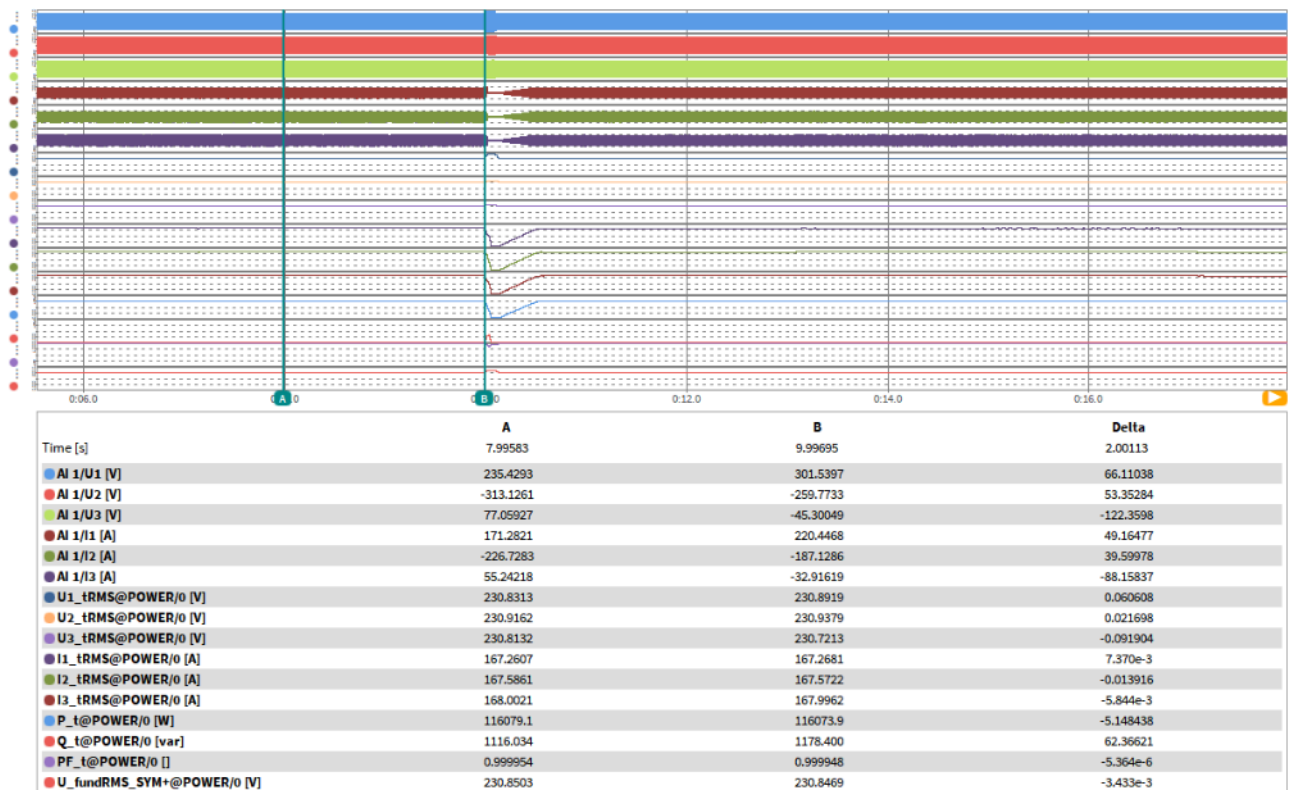
CN224DKW 001 Attachment 1

Seite 115 von 153
Page 115 of 153

Test No. 5.3 idle test



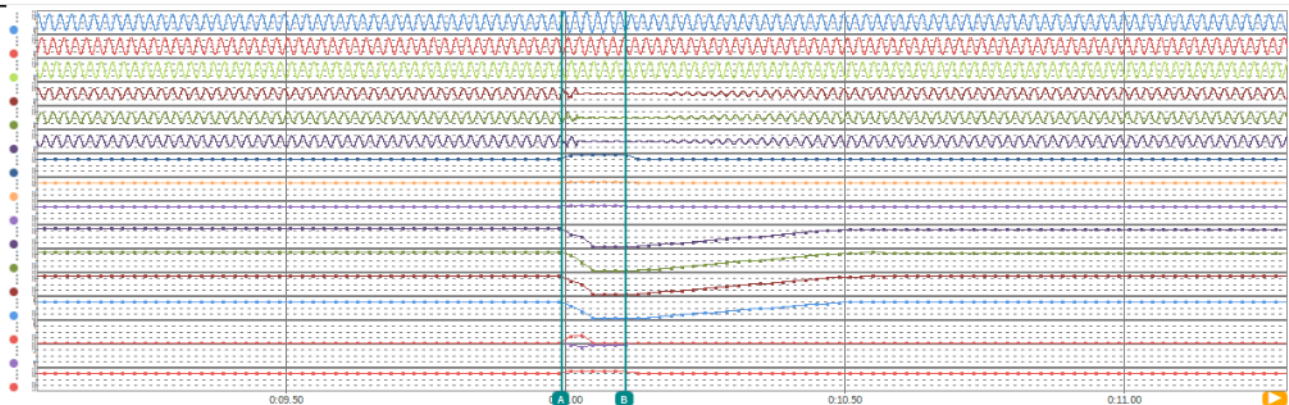
Test No. 5.3 with PGU
Before dip



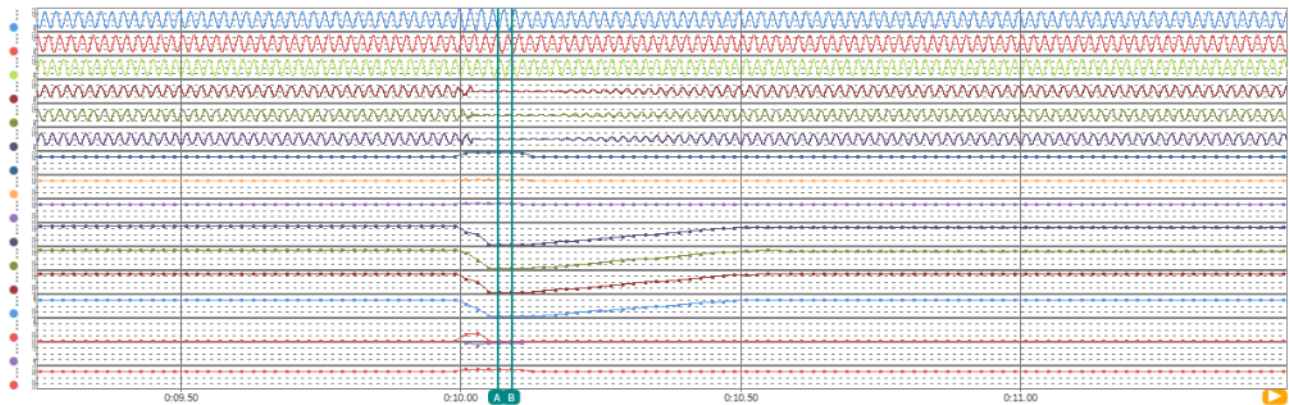
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 116 von 153
Page 116 of 153

Time [s]	A	B	Delta
	9.99347	0:10.10732	0.11385
AI 1/U1 [V]	32.82738	-363.9097	-396.7371
AI 1/U2 [V]	-295.3305	274.5359	569.8665
AI 1/U3 [V]	268.9531	129.3252	-139.6279
AI 1/I1 [A]	17.03334	-20.32411	-37.35745
AI 1/I2 [A]	-211.6932	16.59334	228.2865
AI 1/I3 [A]	196.1057	3.605008	-192.5007
U1_tRMS@POWER/0 [V]	230.8919	286.6622	55.77032
U2_tRMS@POWER/0 [V]	230.9379	242.8780	11.94019
U3_tRMS@POWER/0 [V]	230.7213	242.7065	11.98518
I1_tRMS@POWER/0 [A]	167.2681	8.999678	-158.2684
I2_tRMS@POWER/0 [A]	167.5722	7.298168	-160.2740
I3_tRMS@POWER/0 [A]	167.9962	8.825060	-159.1712
P_t@POWER/0 [W]	116073.9	6176.939	-109897.0
Q_t@POWER/0 [var]	1178.400	2005.434	827.0344
PF_t@POWER/0 []	0.999948	0.951128	-0.048821
U_fundRMS_SYM+@POWER/0 [V]	230.8469	255.4360	24.58908

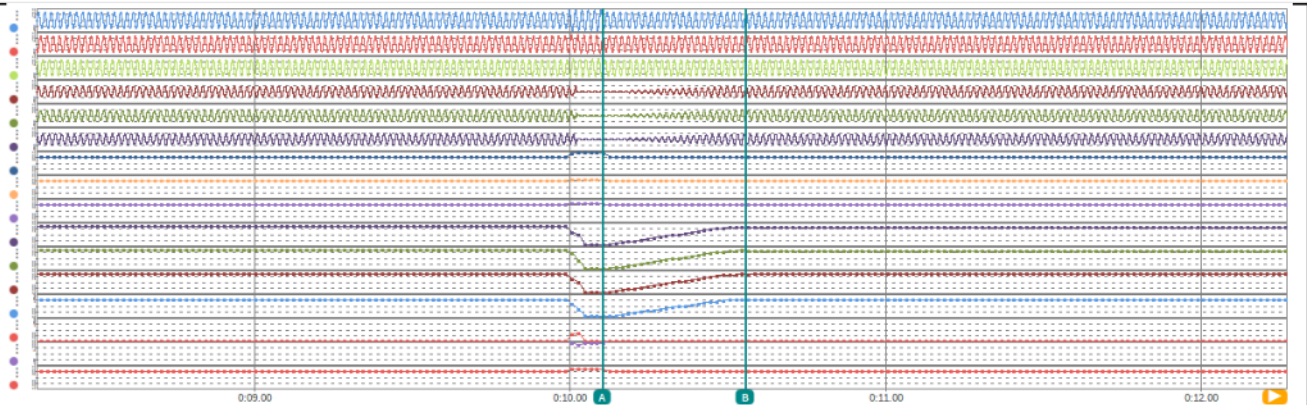


Time [s]	A	B	Delta
	0:10.06613	0:10.09128	0.02516
AI 1/U1 [V]	-319.3302	-239.2872	80.04308
AI 1/U2 [V]	335.3260	-89.42843	-424.7544
AI 1/U3 [V]	4.661083	342.7704	338.1093
AI 1/I1 [A]	-4.334212	-10.20229	-5.868078
AI 1/I2 [A]	10.96833	-2.374888	-13.34322
AI 1/I3 [A]	-7.234097	12.62581	19.85991
U1_tRMS@POWER/0 [V]	286.7079	286.6896	-0.018311
U2_tRMS@POWER/0 [V]	242.9449	242.9021	-0.042816
U3_tRMS@POWER/0 [V]	242.3929	242.6211	0.228134
I1_tRMS@POWER/0 [A]	12.93689	10.00200	-2.934894
I2_tRMS@POWER/0 [A]	5.408334	6.418877	1.010543
I3_tRMS@POWER/0 [A]	10.52150	9.148273	-1.373222
P_t@POWER/0 [W]	7003.253	6283.841	-719.4126
Q_t@POWER/0 [var]	2882.783	2164.535	-718.2476
PF_t@POWER/0 []	0.924720	0.945480	0.020760
U_fundRMS_SYM+@POWER/0 [V]	255.3529	255.4181	0.065201

After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 117 von 153
Page 117 of 153

Time [s]	A	B	Delta
	0:10.10483	0:10.55663	0.45180
AI 1/U1 [V]	-194.4909	288.4898	482.9808
AI 1/U2 [V]	337.6231	-276.9892	-614.6124
AI 1/U3 [V]	-130.5261	-18.48602	112.0400
AI 1/I1 [A]	-2.196193	205.6844	207.8806
AI 1/I2 [A]	11.02293	-199.4958	-210.5187
AI 1/I3 [A]	-9.058118	-5.606771	3.451348
U1_trMS@POWER/0 [V]	286.6622	230.9243	-55.73788
U2_trMS@POWER/0 [V]	242.8780	231.0795	-11.79851
U3_trMS@POWER/0 [V]	242.7065	230.9433	-11.76324
I1_trMS@POWER/0 [A]	8.999678	166.4285	157.4288
I2_trMS@POWER/0 [A]	7.298168	167.0572	159.7590
I3_trMS@POWER/0 [A]	8.825060	167.1587	158.3337
P_t@POWER/0 [W]	6176.939	115633.5	109456.5
Q_t@POWER/0 [var]	2005.434	1236.022	-769.4119
PF_t@POWER/0 []	0.951128	0.999943	0.048815
U_fundRMS_SYM+@POWER/0 [V]	255.4360	230.9793	-24.45668



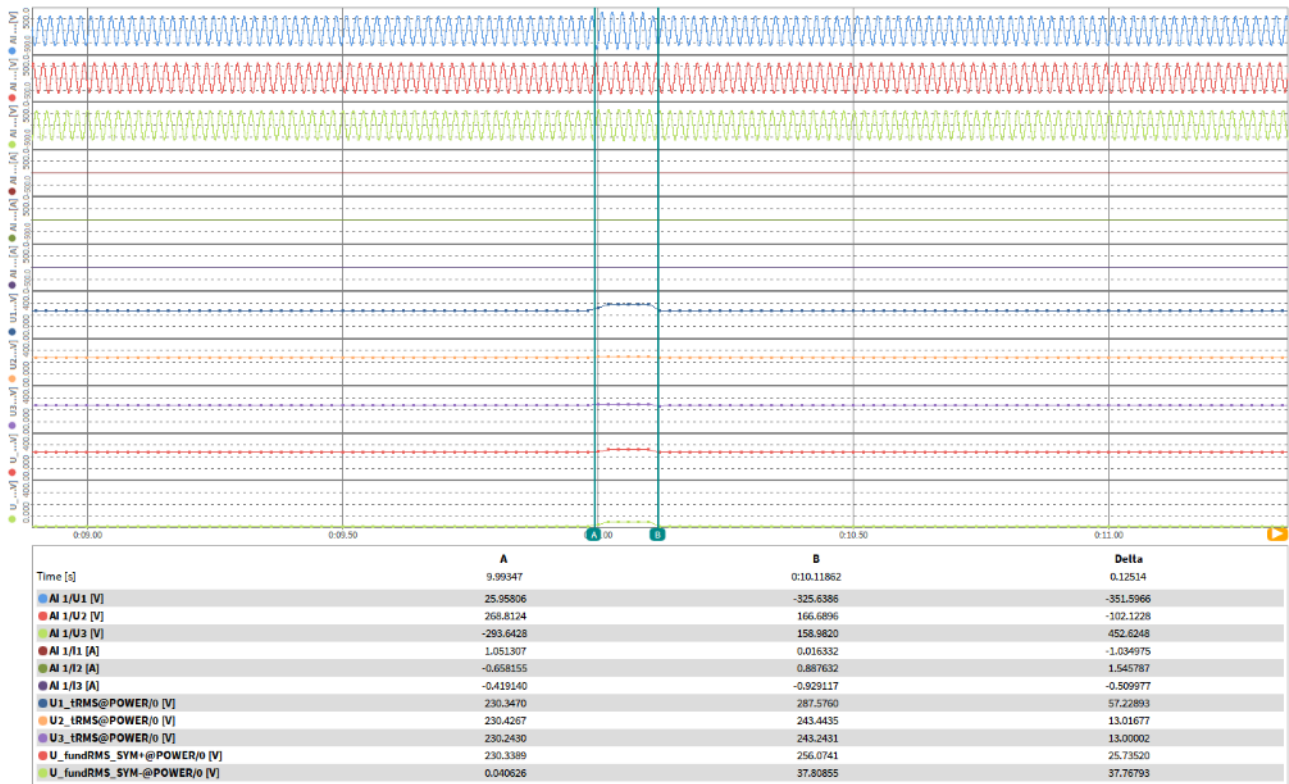
Time [s]	A	B	Delta
	0:13.08171	0:20.17020	7.08849
AI 1/U1 [V]	133.6734	-242.9776	-376.6511
AI 1/U2 [V]	190.8987	-73.16471	-264.0634
AI 1/U3 [V]	-324.3072	308.3315	632.6387
AI 1/I1 [A]	94.38766	-196.9586	-291.3462
AI 1/I2 [A]	140.4325	-21.02375	-161.4562
AI 1/I3 [A]	-235.0007	217.3990	452.3998
U1_trMS@POWER/0 [V]	230.8349	230.0967	-0.738235
U2_trMS@POWER/0 [V]	230.9735	230.2125	-0.761017
U3_trMS@POWER/0 [V]	230.7536	229.9086	-0.844971
I1_trMS@POWER/0 [A]	166.2507	168.7768	2.526108
I2_trMS@POWER/0 [A]	166.4614	171.8579	5.396454
I3_trMS@POWER/0 [A]	166.8965	173.0036	6.107132
P_t@POWER/0 [W]	115322.8	116059.3	736.5156
Q_t@POWER/0 [var]	1783.681	22255.04	20471.36
PF_t@POWER/0 []	0.999880	0.982107	-0.017774
U_fundRMS_SYM+@POWER/0 [V]	230.8508	230.0686	-0.782181

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

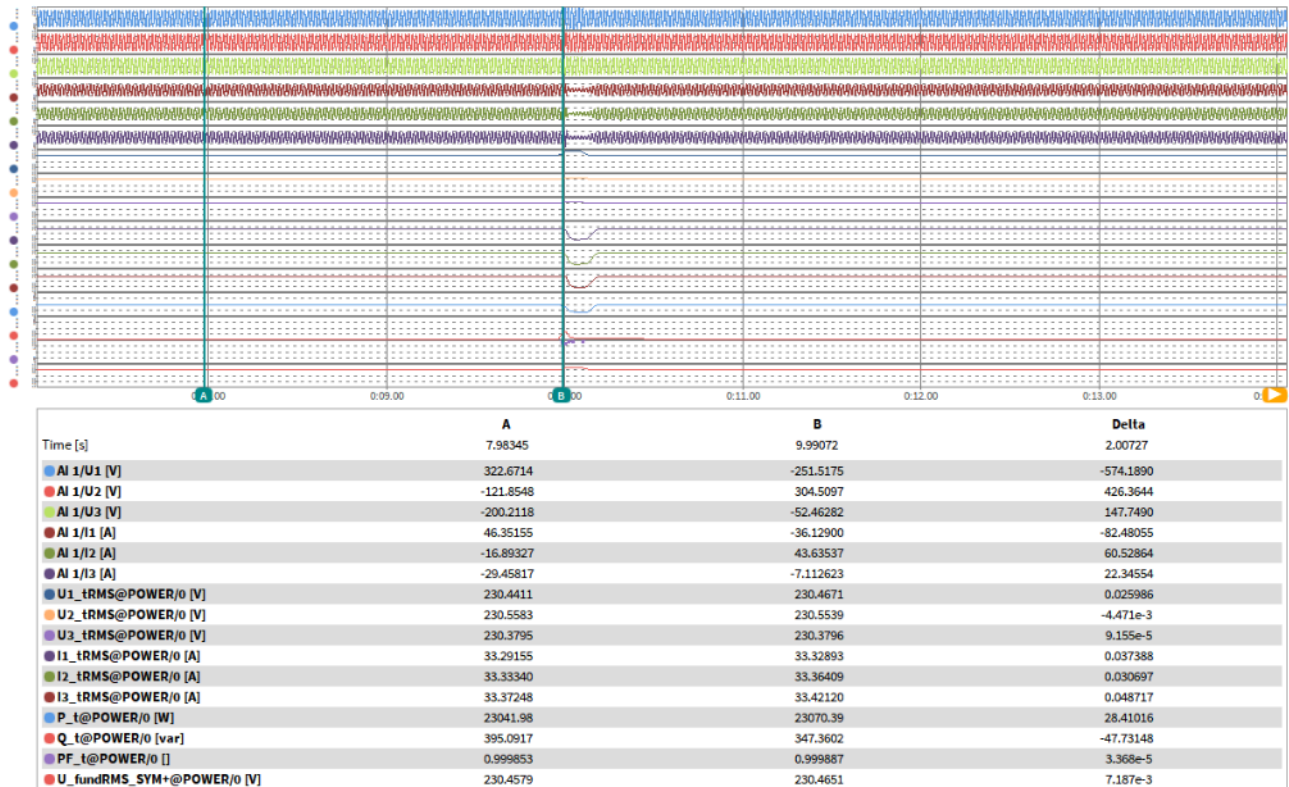
Seite 118 von 153
Page 118 of 153

Test No. 5.4 idle test



Test No. 5.4 with PGU

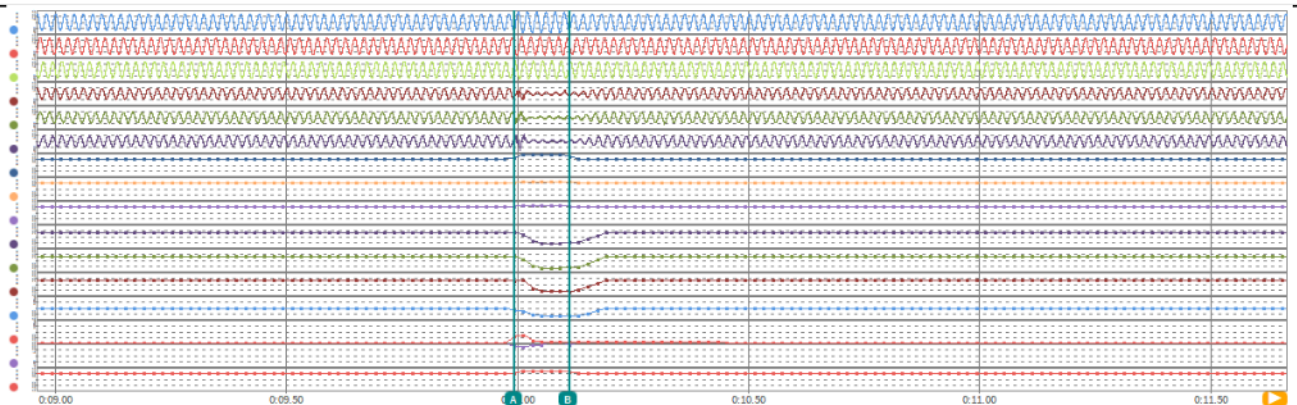
Before dip



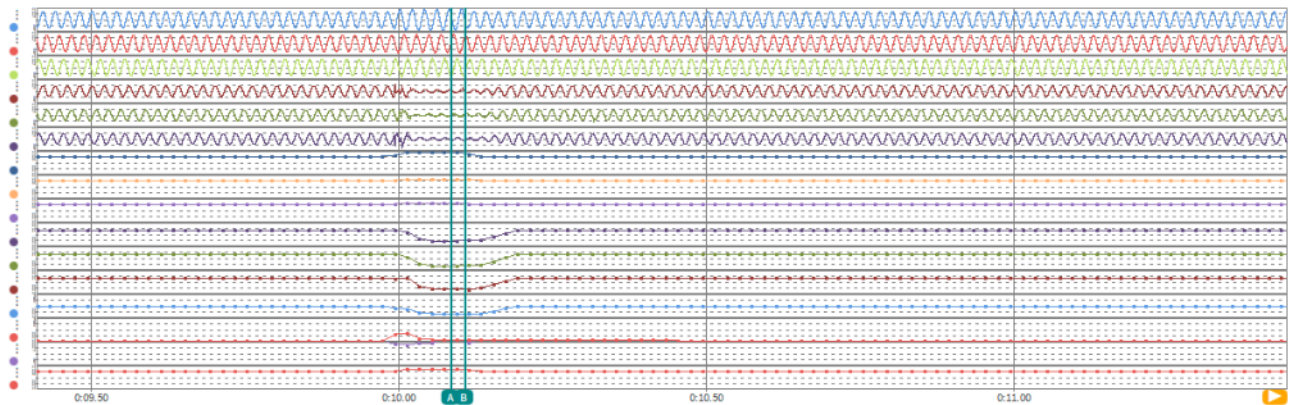
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 119 von 153
Page 119 of 153

Time [s]	A	B	Delta
9.99329	0:10.11107	0.11778	
AI 1/U1 [V]	-324.2550	-269.3231	54.93188
AI 1/U2 [V]	134.0079	292.0516	158.0436
AI 1/U3 [V]	189.8978	-22.81666	-212.7144
AI 1/I1 [A]	-46.94522	-11.01780	35.92742
AI 1/I2 [A]	19.02616	11.72006	-7.306099
AI 1/I3 [A]	27.90404	-1.831889	-29.73592
U1_tRMS@POWER/0 [V]	230.4671	287.4210	56.95386
U2_tRMS@POWER/0 [V]	230.5539	243.4965	12.94267
U3_tRMS@POWER/0 [V]	230.3796	243.4715	13.09195
I1_tRMS@POWER/0 [A]	33.32893	8.520208	-24.80873
I2_tRMS@POWER/0 [A]	33.36409	7.823732	-25.54036
I3_tRMS@POWER/0 [A]	33.42120	8.766411	-24.65479
P_t@POWER/0 [W]	23070.39	6197.849	-16872.54
Q_t@POWER/0 [var]	347.3602	1919.591	1572.231
PF_t@POWER/0 []	0.999887	0.955233	-0.044653
U_fundRMS_SYM+@POWER/0 [V]	230.4651	256.1568	25.69170

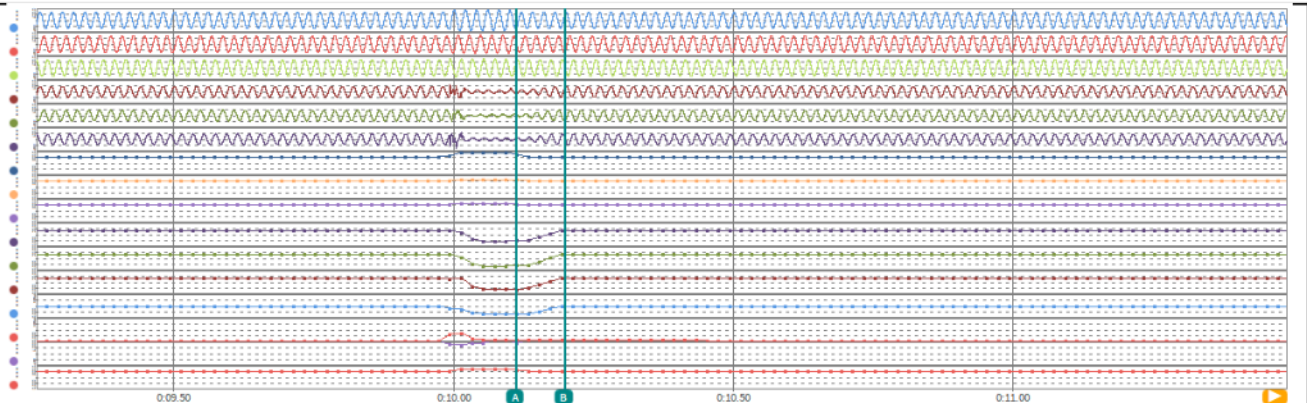


Time [s]	A	B	Delta
0:10.08498	0:10.10785	0.02287	
AI 1/U1 [V]	328.4967	8.303881	-320.1928
AI 1/U2 [V]	-17.33351	277.1316	294.4651
AI 1/U3 [V]	-331.8505	-285.8823	45.96830
AI 1/I1 [A]	12.18641	0.062108	-12.12430
AI 1/I2 [A]	-3.372312	6.650329	10.02264
AI 1/I3 [A]	-8.465410	-6.151796	2.313614
U1_tRMS@POWER/0 [V]	287.5146	287.4210	-0.093628
U2_tRMS@POWER/0 [V]	243.4893	243.4965	7.278e-3
U3_tRMS@POWER/0 [V]	243.4457	243.4715	0.025818
I1_tRMS@POWER/0 [A]	8.721050	8.520208	-0.200842
I2_tRMS@POWER/0 [A]	7.392101	7.823732	0.431631
I3_tRMS@POWER/0 [A]	9.022191	8.766411	-0.255780
P_t@POWER/0 [W]	6194.959	6197.849	2.889648
Q_t@POWER/0 [var]	1980.180	1919.591	-60.58936
PF_t@POWER/0 []	0.952523	0.955233	2.711e-3
U_fundRMS_SYM+@POWER/0 [V]	256.1685	256.1568	-0.011719

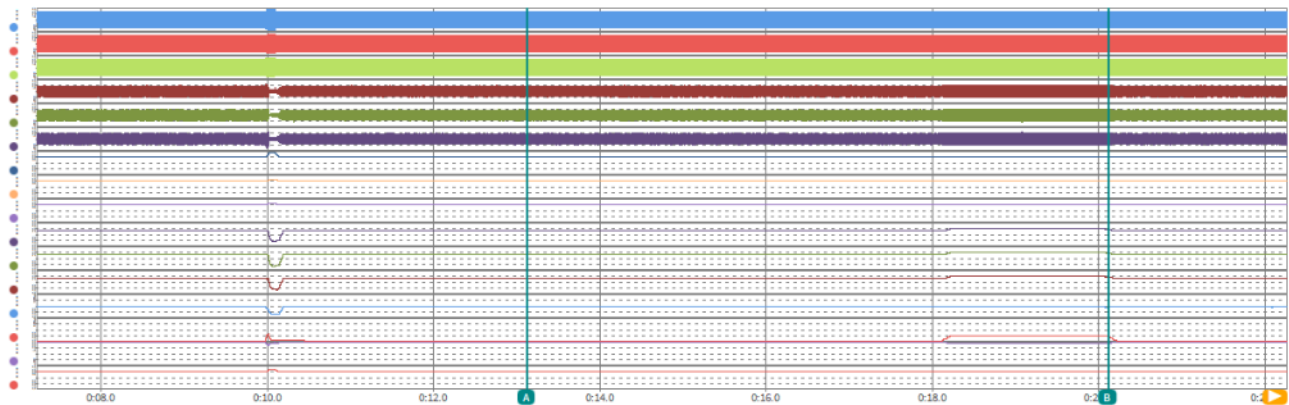
After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 120 von 153
Page 120 of 153

Time [s]	A	B	Delta
AI 1/U1 [V]	0:10.11180	0:10.19930	0.08750
AI 1/U2 [V]	-306.7119	145.1950	451.9069
AI 1/U3 [V]	249.1470	-325.8903	-575.0373
AI 1/I1 [A]	57.55258	180.5582	123.0056
AI 1/I2 [A]	-14.79578	17.66253	32.45831
AI 1/I3 [A]	14.32908	-47.22619	-61.55527
U1_tRMS@POWER/0 [V]	0.352263	29.56498	29.21271
U2_tRMS@POWER/0 [V]	287.4210	230.7390	-56.68201
U3_tRMS@POWER/0 [V]	243.4965	230.4841	-13.01241
I1_tRMS@POWER/0 [A]	243.4715	230.8071	-12.66443
I2_tRMS@POWER/0 [A]	8.520208	33.26740	24.74719
I3_tRMS@POWER/0 [A]	7.823732	32.69786	24.87413
P_t@POWER/0 [W]	8.766411	33.19558	24.42917
Q_t@POWER/0 [var]	6197.849	22796.17	16598.32
PF_t@POWER/0 []	1919.591	1867.804	-31.78735
U_fundRMS_SYM+@POWER/0 [V]	0.955233	0.996589	0.041355
	256.1568	230.6738	-25.48296



Time [s]	A	B	Delta
AI 1/U1 [V]	0:13.12463	0:20.11317	6.98854
AI 1/U2 [V]	273.8877	-320.1628	-594.0504
AI 1/U3 [V]	21.92760	108.7341	86.80654
AI 1/I1 [A]	-289.9184	212.5478	502.4662
AI 1/I2 [A]	39.80494	-51.36752	-91.17246
AI 1/I3 [A]	2.606630	34.91247	32.30584
U1_tRMS@POWER/0 [V]	-43.32781	16.36648	59.69429
U2_tRMS@POWER/0 [V]	230.4358	230.4122	-0.023666
U3_tRMS@POWER/0 [V]	230.5461	230.5385	-7.675e-3
I1_tRMS@POWER/0 [A]	230.3662	230.3673	1.175e-3
I2_tRMS@POWER/0 [A]	33.40783	36.33474	2.926910
I3_tRMS@POWER/0 [A]	33.44892	35.88858	2.439659
P_t@POWER/0 [W]	33.49592	36.52573	3.029808
Q_t@POWER/0 [var]	23124.44	22355.97	-768.4648
PF_t@POWER/0 []	286.1922	11523.17	11036.97
U_fundRMS_SYM+@POWER/0 [V]	0.999923	0.892098	-0.107826
	230.4477	230.4381	-9.659e-3

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 121 von 153
Page 121 of 153

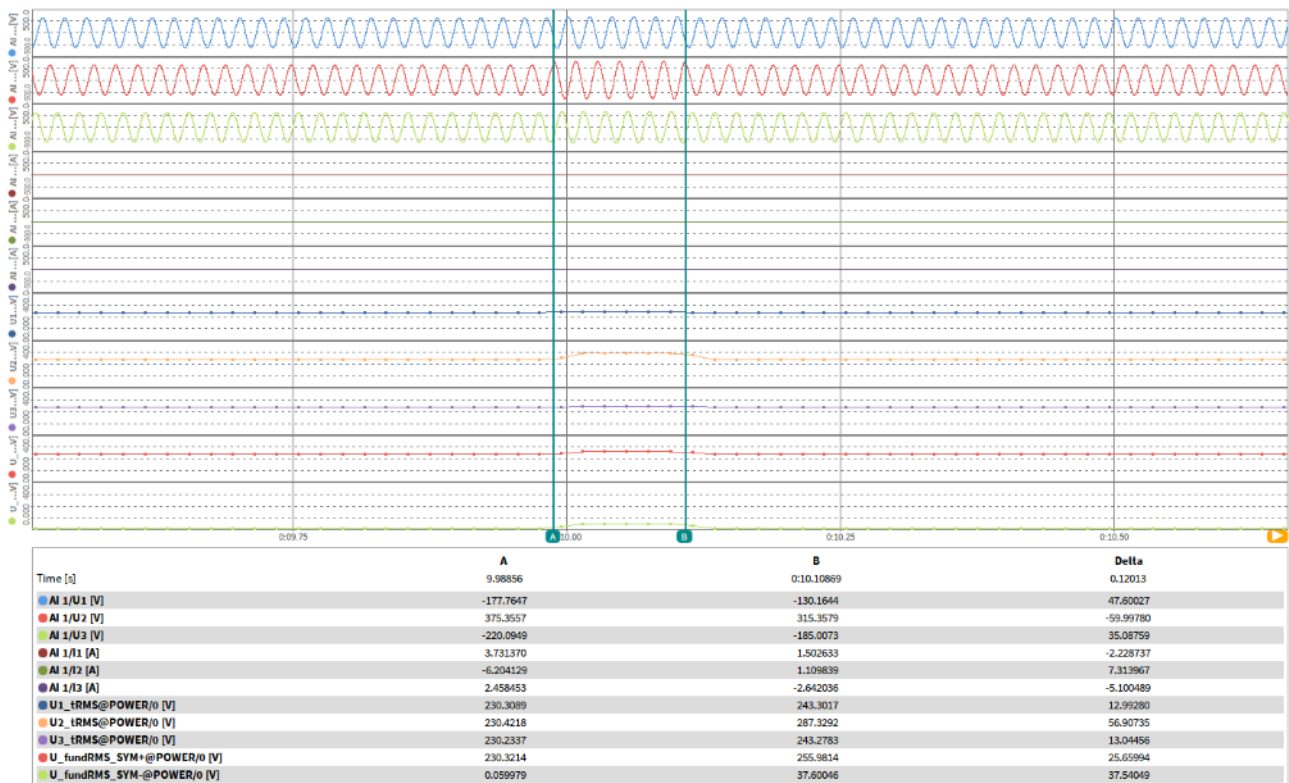
Condition						Measurement	
	No.	Parameter	Phase ref.	Time ref.	unit		
General Info.	0	Test number	--	--	--	5.3	5.4
	1	Date	--	--	yyyy.mm.dd	2022.08.16	2022.08.16
	2	Time (start of test)	--	--	hh:mm:ss	09:00:00	09:00:00
	3	Fault type (phase)	--	--		2 phase	2 phase
	4	Setting voltage depth	Line to neutral	--	p.u.	1.25	1.25
	5	Setting dip duration		--	ms	120	120
	6	Point of fault entry	Total	--	s	9.99347	9.99347
	7	Point of fault clearance	Total	--	s	10.11862	10.11862
	8	Fault duration in empty load test	Total	--	ms	125.14	125.14
	9	Voltage depth/height in empty load test	Total	t1+100ms to t2 and t1-10s to t1	p.u.	1.250	1.250
	10		Pos.		p.u.	1.001	1.001
Before dip <t1	11	Voltage	Line to neutral	t1-100s to t1	p.u.	1.003	1.002
	12	Current	Pos.	t1-500ms to t1-100ms	p.u.	1.010	0.201
	13	Active power	Total	t1-10s to t1	p.u.	1.009	0.200
	14		Pos.			1.009	0.201
	15	Reactive power	Total	t1-10s to t1	p.u.	0.010	0.003
	16		Pos.			0.010	0.003
	17	Cos ϕ	--	t1-10s to t1	--	0.999	0.999
During dip t1 to t2	18	Voltage	Line to neutral	t1+100ms to t2-20ms	p.u.	1.247	1.250
	19	Line current	Phase 1	t1+60ms	p.u.	0.078	0.080
	20		Phase 2			0.033	0.072
	21		Phase 3			0.063	0.081
	22	Line current	Phase 1	t1+100ms	p.u.	0.054	0.052
	23		Phase 2			0.044	0.045
	24		Phase 3			0.053	0.054
	25	Active power	Total	t1+100ms to t2-20ms	p.u.	0.061	0.017
	26		Pos.			0.055	0.017
After dip > t2	27	Voltage	Line to neutral	t2+3s to t2+10s	p.u.	1.003	1.002
	28	Active power	Total	t2+3s to t2+10s	p.u.	1.003	0.201
	29		Pos.			1.009	0.194
	30	Active power rising time	Pos.	--	s	0.452	0.088
	31	Reactive power	Total	t2+3s to t2+10s	p.u.	N/A	N/A
	32		Pos.			N/A	N/A
	33	Reactive power rising time	Pos.	--	s	N/A	N/A
	34	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	Yes	Yes

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 122 von 153
Page 122 of 153

Test No. 5.3(D2) idle test



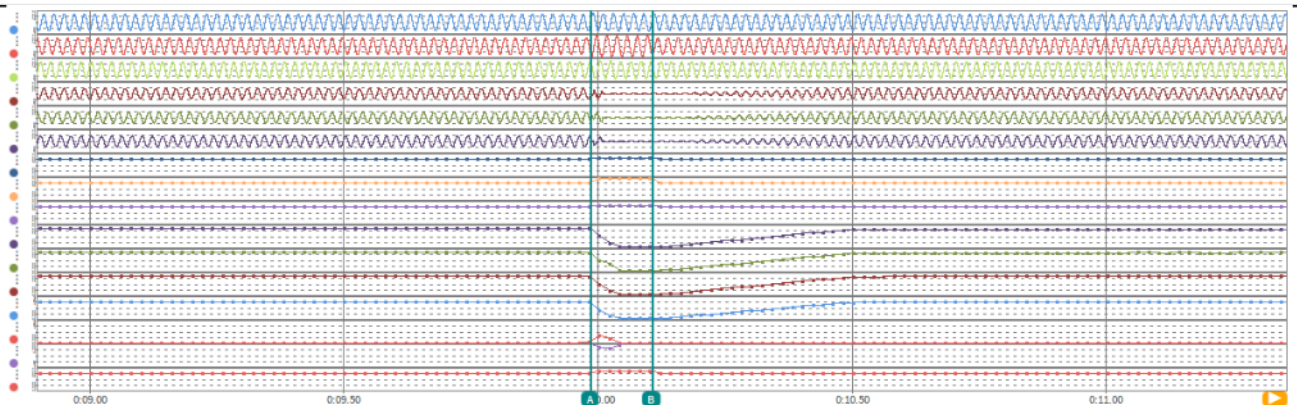
Test No. 5.3(D2) with PGU
Before dip



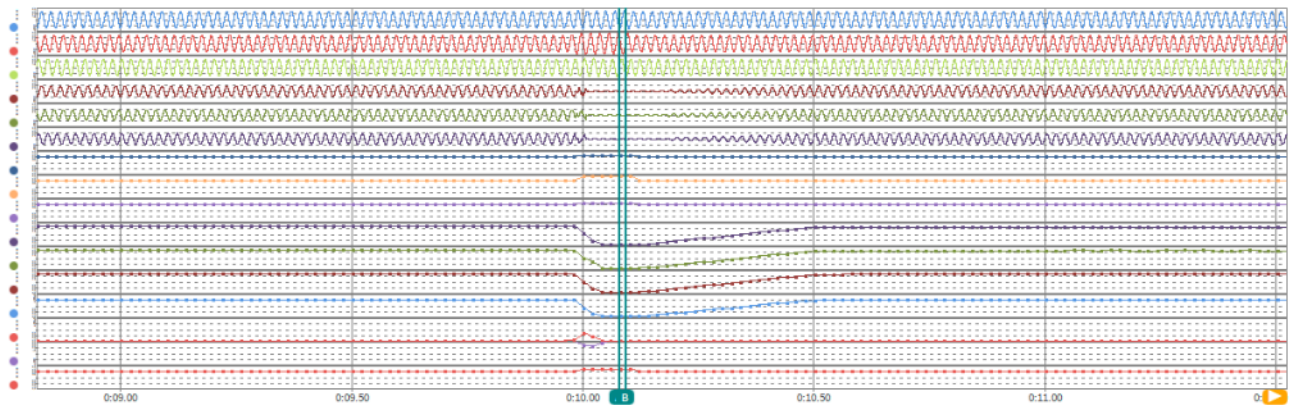
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 123 von 153
Page 123 of 153

Time [s]	A	B	Delta
9.98594	0:10.10698	0.12104	
AI 1/U1 [V]	-98.82928	-48.87677	49.95251
AI 1/U2 [V]	-220.5560	-254.6175	-34.06143
AI 1/U3 [V]	336.3636	302.3317	-34.03187
AI 1/I1 [A]	-114.5146	-2.414704	112.0999
AI 1/I2 [A]	-116.1826	-13.04054	103.1420
AI 1/I3 [A]	230.6411	15.75983	-214.8813
U1_trMS@POWER/0 [V]	230.8118	242.8126	12.00085
U2_trMS@POWER/0 [V]	230.9458	286.6833	55.73743
U3_trMS@POWER/0 [V]	230.7318	242.6080	-11.87616
I1_trMS@POWER/0 [A]	167.2630	8.334314	-158.9287
I2_trMS@POWER/0 [A]	167.5798	9.038194	-158.5416
I3_trMS@POWER/0 [A]	167.9557	7.672824	-160.2828
P_t@POWER/0 [W]	116053.3	6214.108	-109839.2
Q_t@POWER/0 [var]	1321.998	1823.965	501.9664
PF_t@POWER/0 []	0.999935	0.959521	-0.040415
U_fundRMS_SYM+@POWER/0 [V]	230.8265	255.3726	24.54605

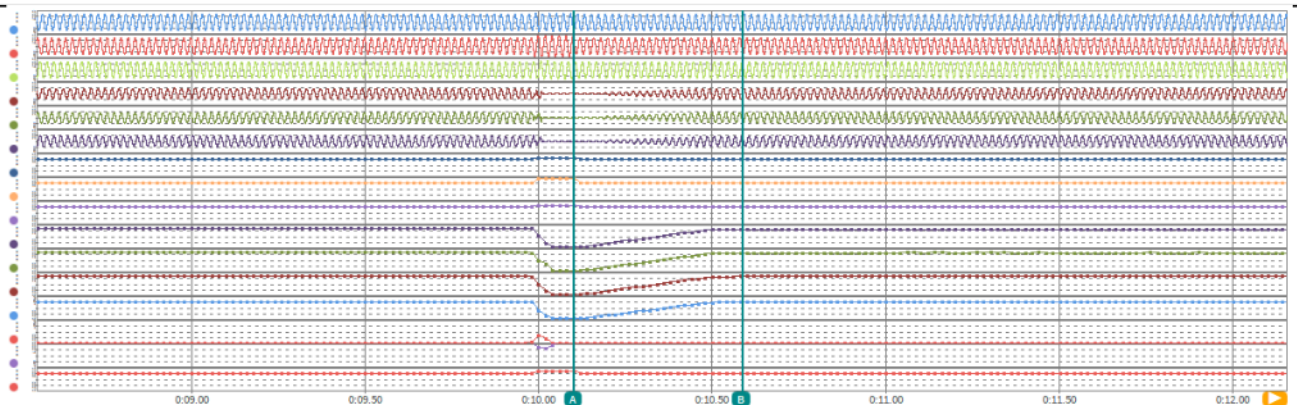


Time [s]	A	B	Delta
0:10.07830	0:10.09356	0.01527	
AI 1/U1 [V]	-139.5309	299.1300	438.6609
AI 1/U2 [V]	391.6469	-67.29913	-458.9460
AI 1/U3 [V]	-277.4406	-226.7673	50.67325
AI 1/I1 [A]	-0.737309	12.41899	13.15630
AI 1/I2 [A]	10.46538	-4.753351	-15.21874
AI 1/I3 [A]	-9.647608	-7.490993	2.156615
U1_trMS@POWER/0 [V]	242.7404	242.8126	0.072159
U2_trMS@POWER/0 [V]	286.7085	286.6833	-0.025208
U3_trMS@POWER/0 [V]	242.6482	242.6080	-0.040268
I1_trMS@POWER/0 [A]	8.286405	8.334314	0.047910
I2_trMS@POWER/0 [A]	9.993858	9.038194	-0.955665
I3_trMS@POWER/0 [A]	7.309680	7.672824	0.363144
P_t@POWER/0 [W]	6381.010	6214.108	-166.9019
Q_t@POWER/0 [var]	1873.820	1823.965	-49.85486
PF_t@POWER/0 []	0.959485	0.959521	3.517e-5
U_fundRMS_SYM+@POWER/0 [V]	255.3666	255.3726	5.966e-3

After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 124 von 153
Page 124 of 153

Time [s]	A	B	Delta
0:10.10206	0:10.58581	0.48375	
AI 1/U1 [V]	-343.1573	-147.8460	195.3113
AI 1/U2 [V]	242.2946	-178.2904	-420.5849
AI 1/U3 [V]	85.40249	325.7806	240.3782
AI 1/I1 [A]	-11.12056	-102.6707	-91.55012
AI 1/I2 [A]	9.728075	-131.7207	-141.4487
AI 1/I3 [A]	1.205325	234.4304	233.2251
U1_tRMS@POWER/0 [V]	242.8126	230.8966	-11.91597
U2_tRMS@POWER/0 [V]	286.6833	231.0289	-55.65431
U3_tRMS@POWER/0 [V]	242.6080	230.8229	-11.78508
I1_tRMS@POWER/0 [A]	8.334314	165.3739	157.0396
I2_tRMS@POWER/0 [A]	9.038194	165.4044	156.3662
I3_tRMS@POWER/0 [A]	7.672824	166.1191	158.4463
P_t@POWER/0 [W]	6214.108	114722.6	108508.5
Q_t@POWER/0 [var]	1823.965	2067.270	263.3051
PF_t@POWER/0 []	0.959521	0.999835	0.040314
U_fundRMS_SYM+@POWER/0 [V]	255.3726	230.9130	-24.45959



Time [s]	A	B	Delta
0:13.11037	0:20.11294	7.00257	
AI 1/U1 [V]	269.8910	311.3098	41.41879
AI 1/U2 [V]	-294.1950	-72.53695	221.6580
AI 1/U3 [V]	23.30971	-238.2476	-261.5574
AI 1/I1 [A]	198.1629	244.0801	45.91716
AI 1/I2 [A]	-211.2477	-120.5081	90.73961
AI 1/I3 [A]	12.86388	-123.5969	-136.4608
U1_tRMS@POWER/0 [V]	230.8595	230.7103	-0.149170
U2_tRMS@POWER/0 [V]	230.9383	230.7830	-0.155289
U3_tRMS@POWER/0 [V]	230.7890	230.6135	-0.175507
I1_tRMS@POWER/0 [A]	166.6434	177.1031	10.45961
I2_tRMS@POWER/0 [A]	166.9776	178.1030	11.12543
I3_tRMS@POWER/0 [A]	167.3240	178.1384	10.81442
P_t@POWER/0 [W]	115634.3	115402.5	-231.8125
Q_t@POWER/0 [var]	1862.351	42685.35	40823.00
PF_t@POWER/0 []	0.999870	0.937898	-0.061973
U_fundRMS_SYM+@POWER/0 [V]	230.8592	230.6985	-0.160660

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 125 von 153
Page 125 of 153

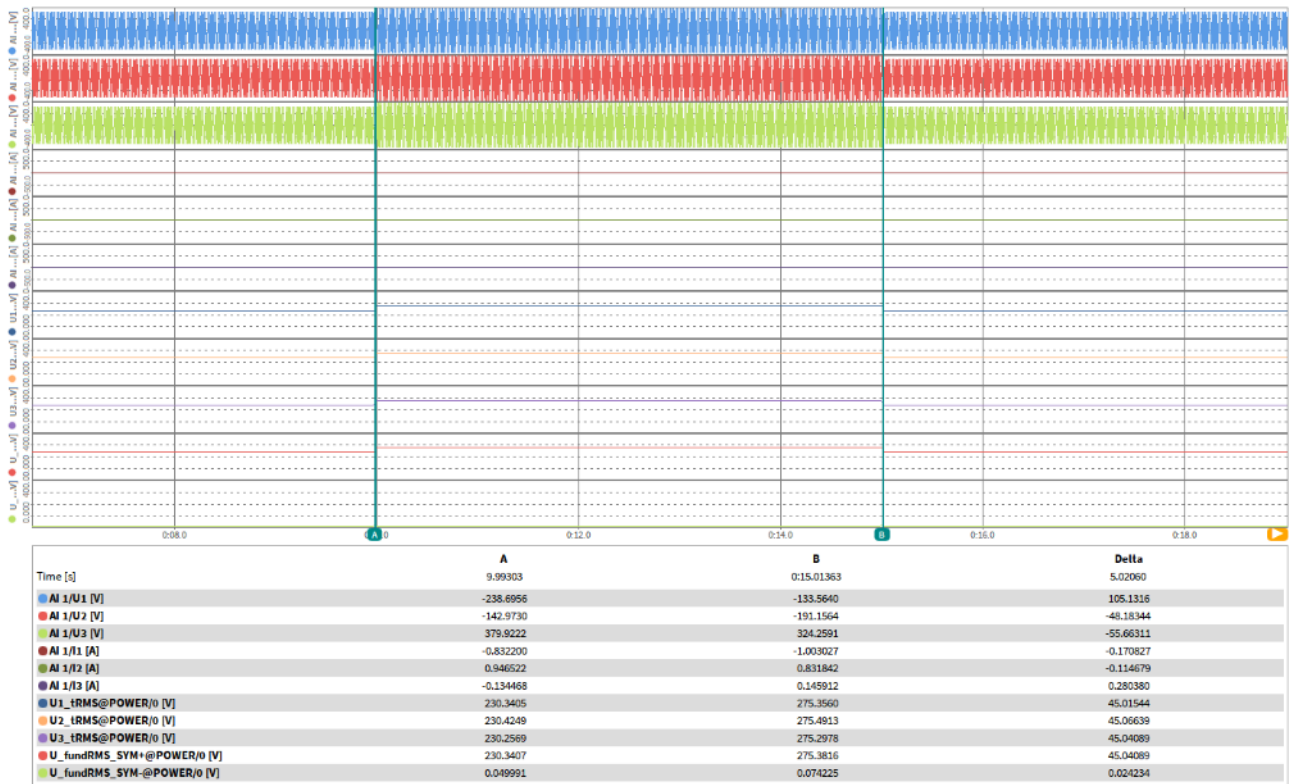
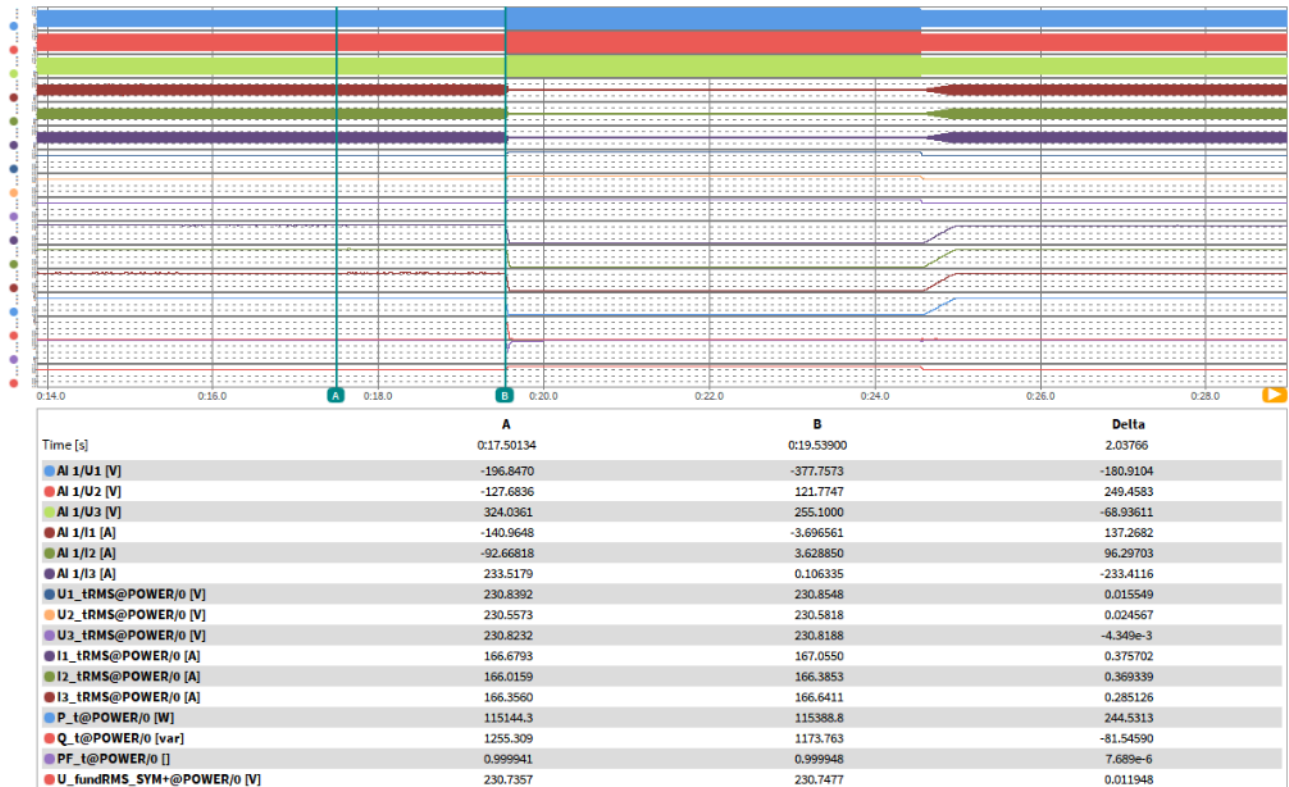
Condition						Measurement
	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	5.3(D2)
	1	Date	--	--	yyyy.mm.dd	2022.08.16
	2	Time (start of test)	--	--	hh:mm:ss	09:03:38
	3	Fault type (phase)	--	--		2 phase
	4	Setting voltage depth	Line to neutral	--	p.u.	1.25
	5	Setting dip duration		--	ms	120
	6	Point of fault entry	Total	--	s	9.98856
	7	Point of fault clearance	Total	--	s	10.10869
	8	Fault duration in empty load test	Total	--	ms	120.13
	9	Voltage depth/height in empty load test	Total	t1+100ms to t2 and t1-10s to t1	p.u.	1.249
	10		Pos.		p.u.	1.001
Before dip <t1	11	Voltage	Line to neutral	t1-100s to t1	p.u.	1.003
	12	Current	Pos.	t1-500ms to t1-100ms	p.u.	1.008
	13	Active power	Total	t1-10s to t1	p.u.	1.008
	14		Pos.			1.009
	15	Reactive power	Total	t1-10s to t1	p.u.	0.010
	16		Pos.			0.011
	17	Cos φ	--	t1-10s to t1	--	0.999
During dip t1 to t2	18	Voltage	Line to neutral	t1+100ms to t2-20ms	p.u.	1.247
	19	Line current	Phase 1	t1+60ms	p.u.	0.181
	20		Phase 2			0.175
	21		Phase 3			0.169
	22	Line current	Phase 1	t1+100ms	p.u.	0.049
	23		Phase 2			0.060
	24		Phase 3			0.044
	25	Active power	Total	t1+100ms to t2-20ms	p.u.	0.016
	26		Pos.			0.016
After dip > t2	27	Voltage	Line to neutral	t2+3s to t2+10s	p.u.	1.003
	28	Active power	Total	t2+3s to t2+10s	p.u.	1.006
	29		Pos.			1.004
	30	Active power rising time	Pos.	--	s	0.484
	31	Reactive power	Total	t2+3s to t2+10s	p.u.	N/A
	32		Pos.			N/A
	33	Reactive power rising time	Pos.	--	s	N/A
	34	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	Yes

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 126 von 153
Page 126 of 153

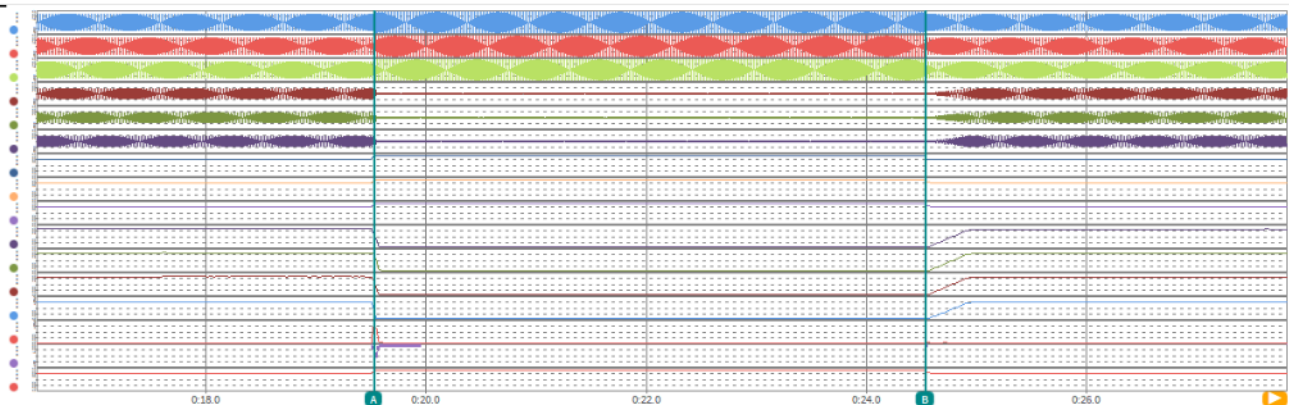
Test No. 6.1 idle test

Test No. 6.1 with PGU
Before dip

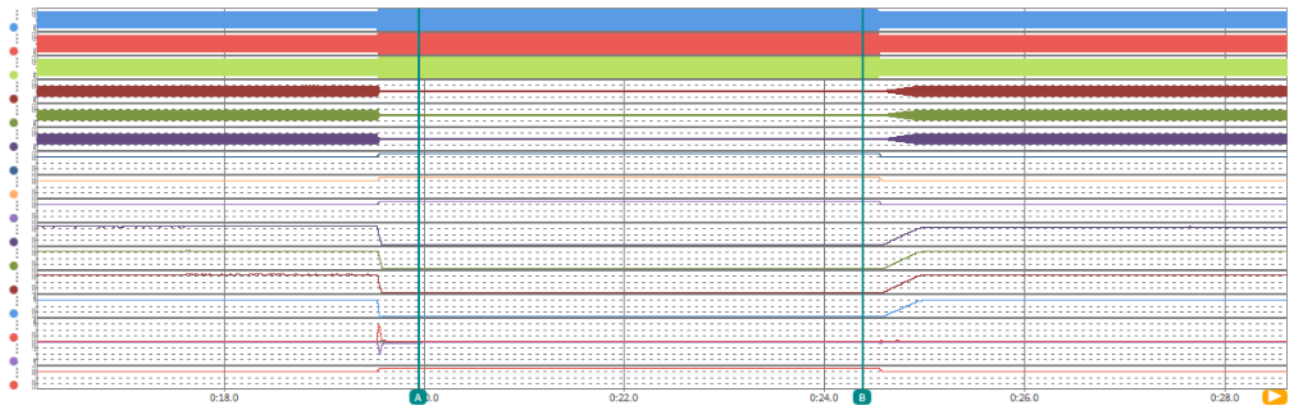
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 127 von 153
Page 127 of 153

Time [s]	A	B	Delta
	0:19.53372	0:24.53586	5.00213
AI 1/U1 [V]	-45.11237	-288.4176	-243.3052
AI 1/U2 [V]	301.2517	372.5200	71.26832
AI 1/U3 [V]	-259.9065	-84.33605	175.5705
AI 1/I1 [A]	-31.15356	-6.055117	25.09844
AI 1/I2 [A]	217.4355	11.38389	-206.0516
AI 1/I3 [A]	-186.3334	-5.229831	181.1036
U1_tRMS@POWER/0 [V]	230.8548	276.4972	45.64244
U2_tRMS@POWER/0 [V]	230.5818	276.2507	45.66891
U3_tRMS@POWER/0 [V]	230.8188	276.5273	45.70842
I1_tRMS@POWER/0 [A]	167.0550	8.348897	-158.7061
I2_tRMS@POWER/0 [A]	166.3853	8.328238	-158.0570
I3_tRMS@POWER/0 [A]	166.6411	8.340902	-158.3002
P_t@POWER/0 [W]	115388.8	6645.165	-108743.6
Q_t@POWER/0 [var]	1173.763	1915.077	741.3141
PF_t@POWER/0 []	0.999948	0.960893	-0.039056
U_fundRMS_SYM+@POWER/0 [V]	230.7477	276.4248	45.67715

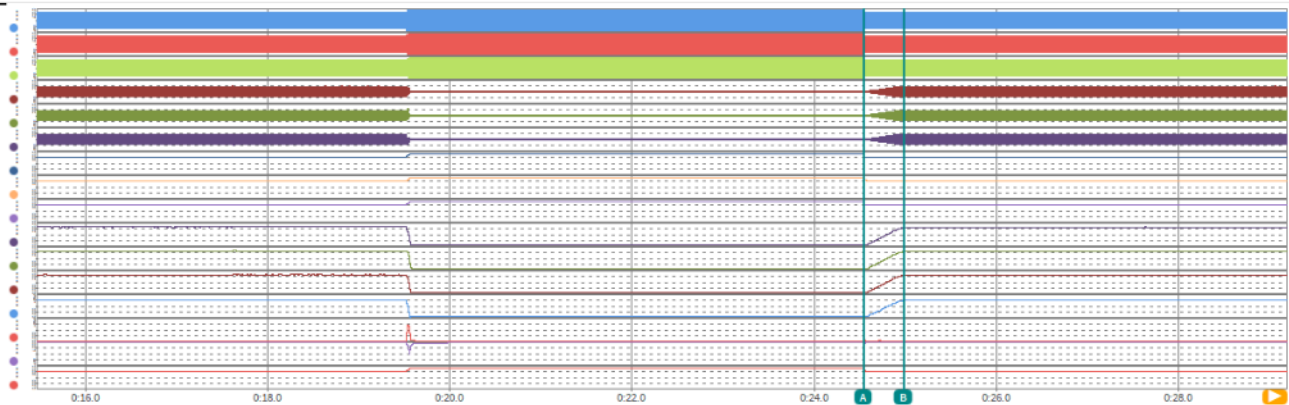


Time [s]	A	B	Delta
	0:19.95193	0:24.38169	4.42976
AI 1/U1 [V]	166.1821	-185.4017	-351.5837
AI 1/U2 [V]	223.2523	-205.7314	-428.9837
AI 1/U3 [V]	-389.2546	390.7221	779.9767
AI 1/I1 [A]	7.004619	-8.487464	-15.49208
AI 1/I2 [A]	3.230214	-3.385306	-6.615520
AI 1/I3 [A]	-10.24377	11.85572	22.09950
U1_tRMS@POWER/0 [V]	276.2521	276.4658	0.213654
U2_tRMS@POWER/0 [V]	276.0084	276.2607	0.252258
U3_tRMS@POWER/0 [V]	276.4082	276.5545	0.146301
I1_tRMS@POWER/0 [A]	8.000976	8.348076	0.347100
I2_tRMS@POWER/0 [A]	7.793654	8.344248	0.550593
I3_tRMS@POWER/0 [A]	7.921794	8.394350	0.472556
P_t@POWER/0 [W]	6222.341	6662.601	440.2593
Q_t@POWER/0 [var]	2049.077	1923.275	-125.8016
PF_t@POWER/0 []	0.949824	0.960771	0.010947
U_fundRMS_SYM+@POWER/0 [V]	276.2226	276.4267	0.204102

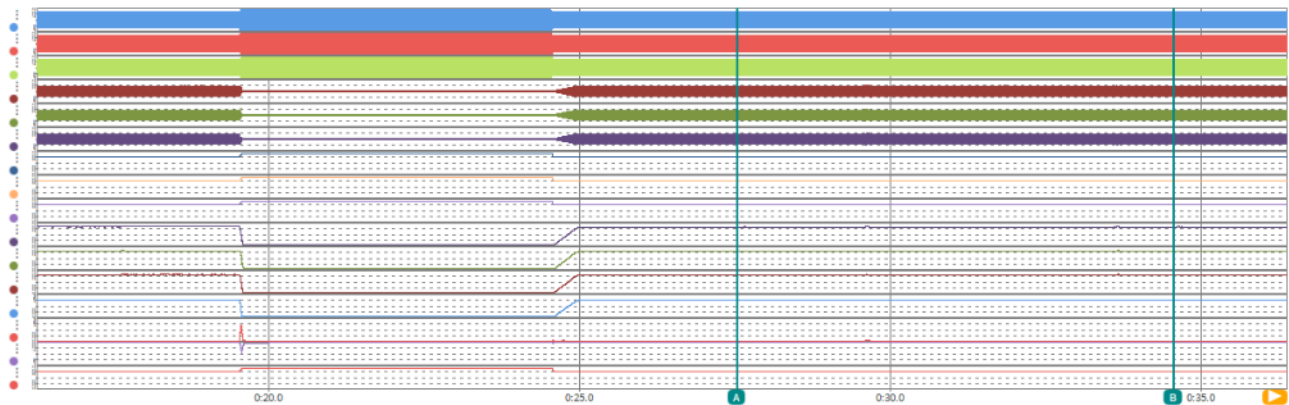
After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 128 von 153
Page 128 of 153

Time [s]	A	B	Delta
0:24.54657	0:24.98500	0.43843	
AI 1/U1 [V]	283.4566	179.6398	-103.8168
AI 1/U2 [V]	-282.6603	-325.8071	-43.14685
AI 1/U3 [V]	-1.542091	145.9911	147.5332
AI 1/I1 [A]	9.599567	129.9017	120.3021
AI 1/I2 [A]	-14.37724	-233.0220	-218.6448
AI 1/I3 [A]	1.989842	103.1137	101.1238
U1_tRMS@POWER/0 [V]	276.7384	231.0114	-45.72705
U2_tRMS@POWER/0 [V]	276.1373	230.8984	-45.23889
U3_tRMS@POWER/0 [V]	276.3979	231.1077	-45.29030
I1_tRMS@POWER/0 [A]	8.295808	165.3840	157.0882
I2_tRMS@POWER/0 [A]	8.321455	164.1743	155.8528
I3_tRMS@POWER/0 [A]	8.301194	165.0386	156.7374
P_t@POWER/0 [W]	6615.206	114242.0	107626.8
Q_t@POWER/0 [var]	1919.505	1711.381	-208.1238
PF_t@POWER/0 []	0.960387	0.999888	0.039501
U_fundRMS_SYM+@POWER/0 [V]	276.4229	231.0016	-45.42133



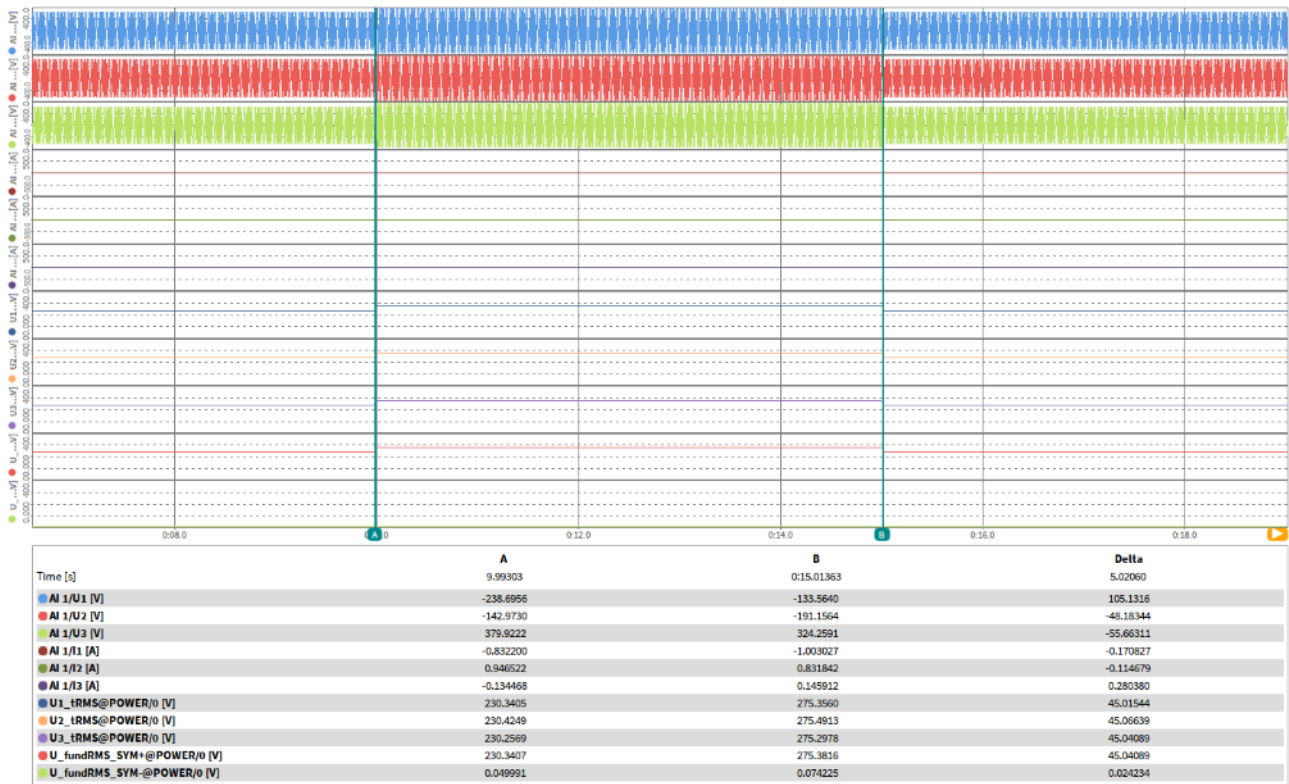
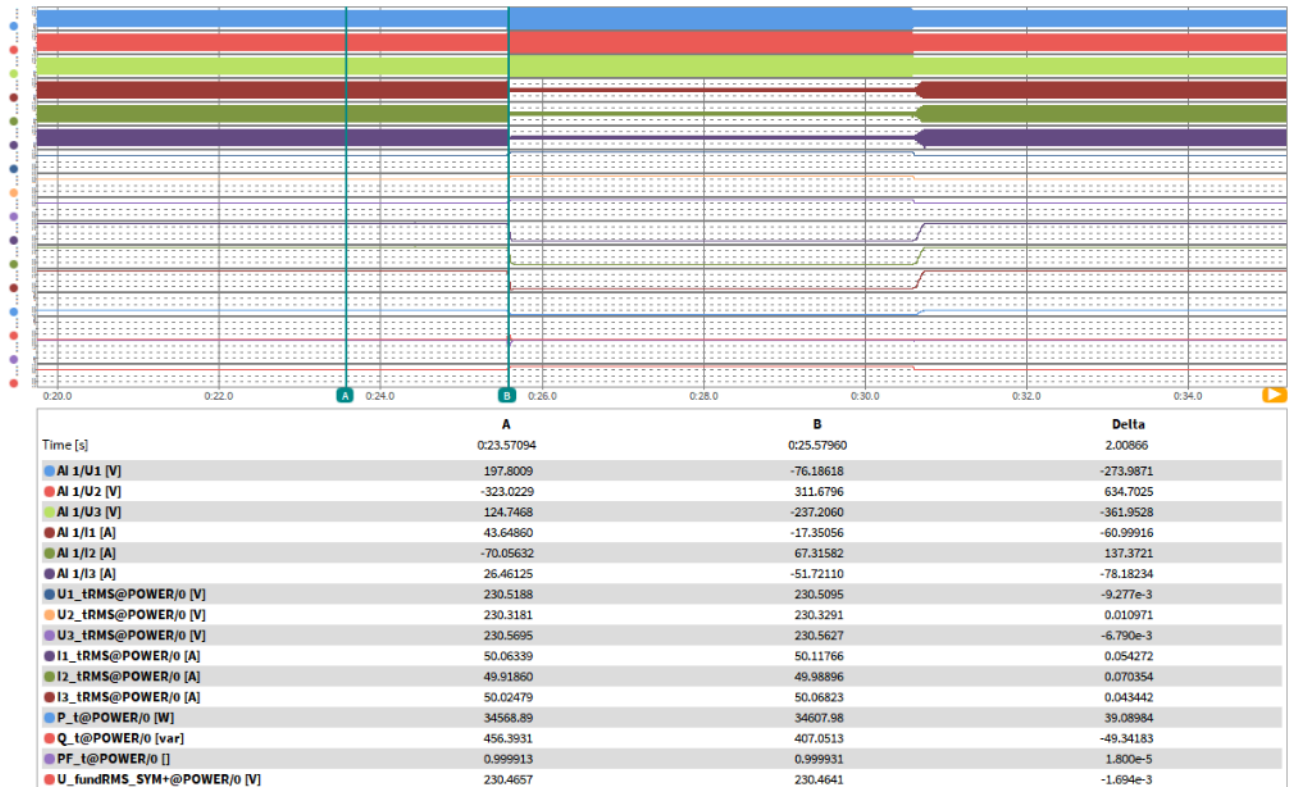
Time [s]	A	B	Delta
0:27.53339	0:34.54665	7.01326	
AI 1/U1 [V]	-31.16131	300.6764	331.8377
AI 1/U2 [V]	292.4411	-260.4225	-552.8636
AI 1/U3 [V]	-269.9070	-44.42144	225.4856
AI 1/I1 [A]	-13.39912	216.6973	230.0965
AI 1/I2 [A]	207.1556	-183.1439	-390.2995
AI 1/I3 [A]	-195.1870	-32.47750	162.7095
U1_tRMS@POWER/0 [V]	230.8385	230.8266	-0.011932
U2_tRMS@POWER/0 [V]	230.5709	230.6151	0.044250
U3_tRMS@POWER/0 [V]	230.7984	230.8210	0.022568
I1_tRMS@POWER/0 [A]	165.6378	165.9629	0.325150
I2_tRMS@POWER/0 [A]	165.0315	165.3531	0.321548
I3_tRMS@POWER/0 [A]	165.1579	165.6028	0.444855
P_t@POWER/0 [W]	114396.8	114660.1	263.3125
Q_t@POWER/0 [var]	1389.763	1180.197	-209.5657
PF_t@POWER/0 []	0.999926	0.999947	2.080e-5
U_fundRMS_SYM+@POWER/0 [V]	230.7319	230.7500	0.018158

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 129 von 153
Page 129 of 153

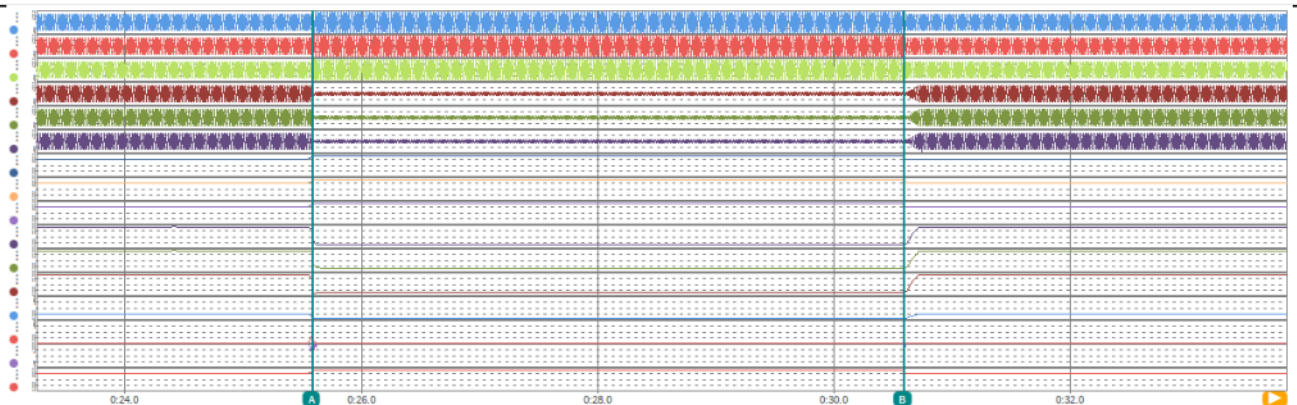
Test No. 6.2 idle test

Test No. 6.2 with PGU
Before dip

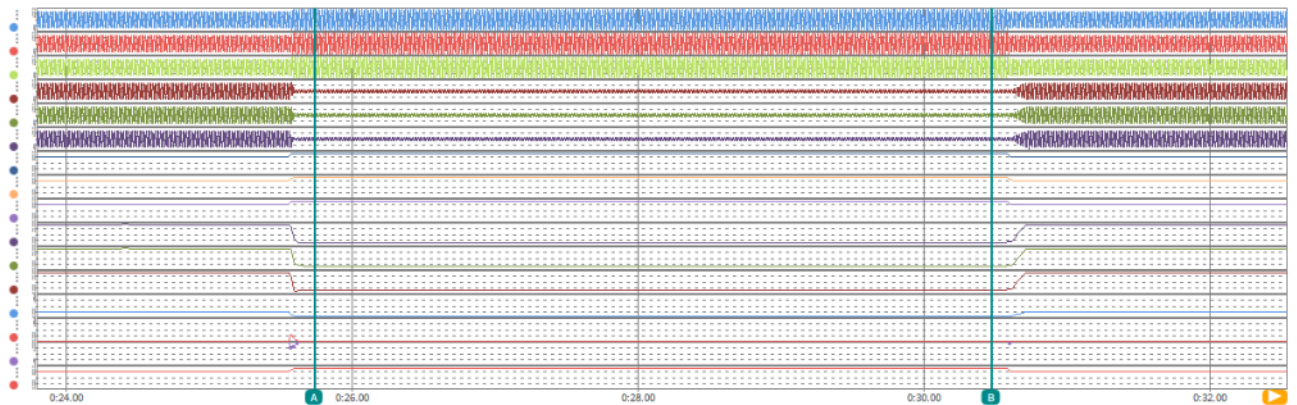
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 130 von 153
Page 130 of 153

Time [s]	A	B	Delta
	0:25.58449	0:30.58514	5.00065
AI 1/U1 [V]	-385.1257	-348.3463	36.77941
AI 1/U2 [V]	128.8972	20.34330	-108.5539
AI 1/U3 [V]	256.9308	328.4679	71.53702
AI 1/I1 [A]	50.20404	-12.38823	-62.59227
AI 1/I2 [A]	-15.48994	3.756404	19.24634
AI 1/I3 [A]	-34.78074	8.392692	43.17343
U1_tRMS@POWER/0 [V]	230.5095	276.4921	45.98262
U2_tRMS@POWER/0 [V]	230.3291	276.2622	45.93317
U3_tRMS@POWER/0 [V]	230.5627	276.5859	46.02318
I1_tRMS@POWER/0 [A]	50.11766	8.421359	-41.69630
I2_tRMS@POWER/0 [A]	49.98896	8.386193	-41.60276
I3_tRMS@POWER/0 [A]	50.06823	8.432419	-41.63581
P_t@POWER/0 [W]	34607.98	6709.523	-27898.45
Q_t@POWER/0 [var]	407.0513	1915.209	1508.158
PF_t@POWER/0 []	0.999931	0.961592	-0.038339
U_fundRMS_SYM+@POWER/0 [V]	230.4641	276.4465	45.98245

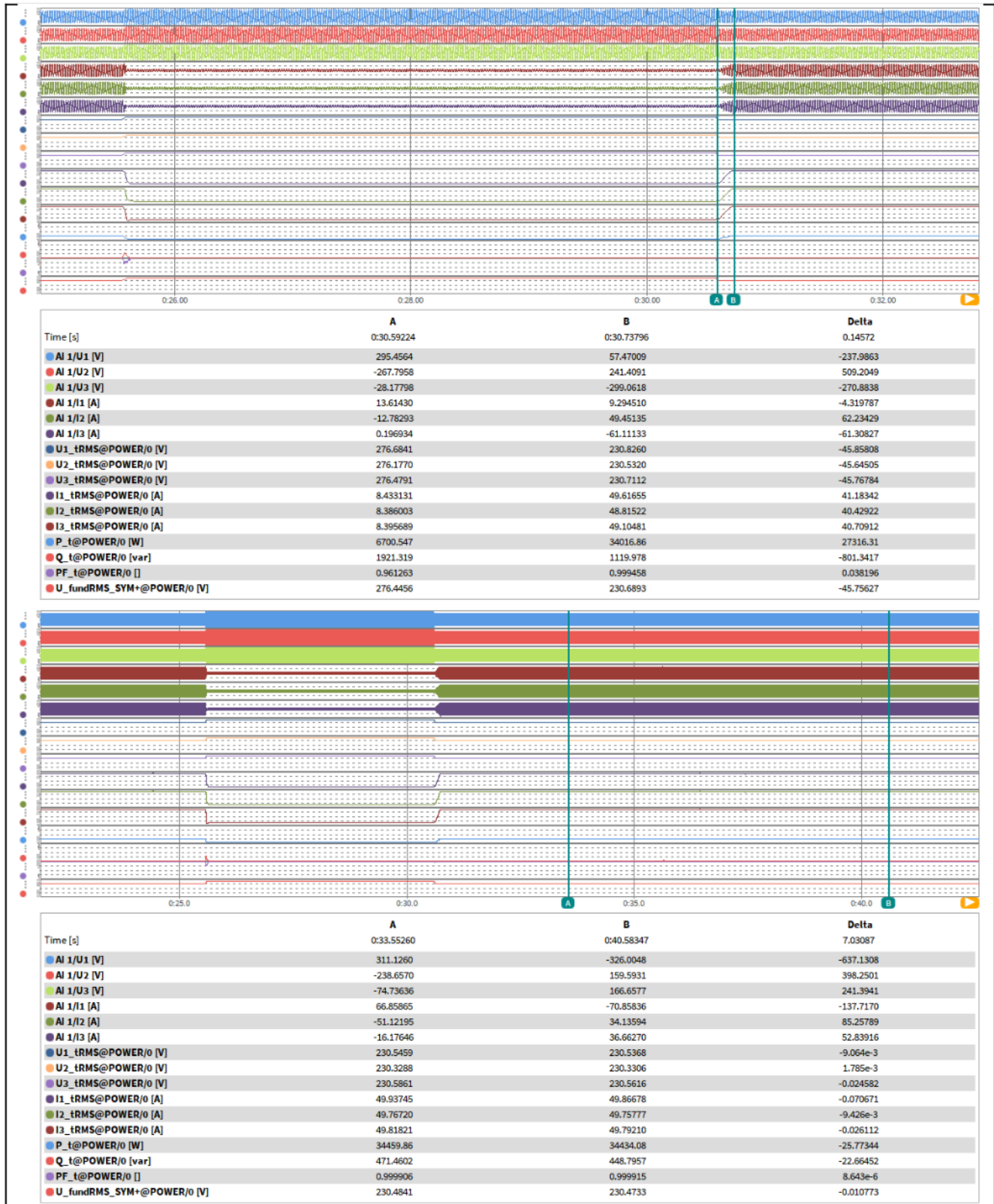


Time [s]	A	B	Delta
	0:25.74218	0:30.47215	4.72997
AI 1/U1 [V]	-337.6498	348.1903	685.8402
AI 1/U2 [V]	338.6154	-327.6353	-666.2507
AI 1/U3 [V]	-0.632525	-20.96439	-20.33186
AI 1/I1 [A]	-8.946777	9.310127	18.25690
AI 1/I2 [A]	12.10010	-10.80537	-22.90547
AI 1/I3 [A]	-3.042937	1.737714	4.780650
U1_tRMS@POWER/0 [V]	276.2903	276.4859	0.195679
U2_tRMS@POWER/0 [V]	276.1801	276.2573	0.077271
U3_tRMS@POWER/0 [V]	276.5245	276.5705	0.046021
I1_tRMS@POWER/0 [A]	8.427090	8.402516	-0.024573
I2_tRMS@POWER/0 [A]	8.378959	8.400582	0.021624
I3_tRMS@POWER/0 [A]	8.298465	8.396769	0.098304
P_t@POWER/0 [W]	6663.100	6701.579	38.47900
Q_t@POWER/0 [var]	1930.592	1901.778	-28.81433
PF_t@POWER/0 []	0.960495	0.962014	1.519e-3
U_fundRMS_SYM+@POWER/0 [V]	276.3309	276.4377	0.106812

After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 131 von 153
Page 131 of 153

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 132 von 153
Page 132 of 153

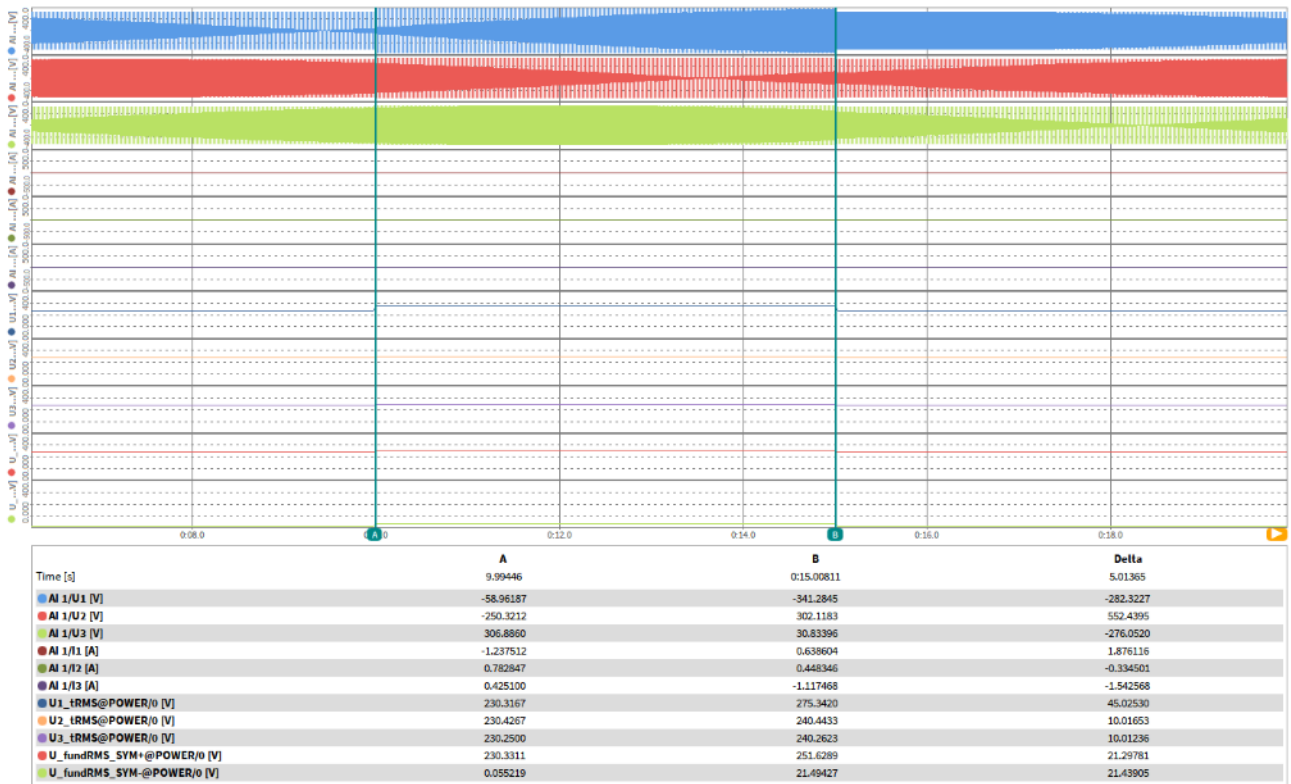
Condition						Measurement	
	No.	Parameter	Phase ref.	Time ref.	unit		
General Info.	0	Test number	--	--	--	6.1	6.2
	1	Date	--	--	yyyy.mm.dd	2022.08.16	2022.08.16
	2	Time (start of test)	--	--	hh:mm:ss	09:11:00	09:11:00
	3	Fault type (phase)	--	--		3 phase	3 phase
	4	Setting voltage depth	Line to neutral	--	p.u.	1.20	1.20
	5	Setting dip duration		--	ms	5000	5000
	6	Point of fault entry	Total	--	s	9.99303	9.99303
	7	Point of fault clearance	Total	--	s	15.01363	15.01363
	8	Fault duration in empty load test	Total	--	ms	5072	5072
	9	Voltage depth/height in empty load test	Total	t1+100ms to t2 and t1-10s to t1	p.u.	1.197	1.197
	10		Pos.		p.u.	1.001	1.001
Before dip <t1	11	Voltage	Line to neutral	t1-100s to t1	p.u.	1.003	1.002
	12	Current	Pos.	t1-500ms to t1-100ms	p.u.	1.000	0.301
	13	Active power	Total	t1-10s to t1	p.u.	1.001	0.301
	14		Pos.			1.003	0.301
	15	Reactive power	Total	t1-10s to t1	p.u.	0.011	0.004
	16		Pos.			0.010	0.004
	17	Cos ϕ	--	t1-10s to t1	--	0.999	0.999
During dip t1 to t2	18	Voltage	Line to neutral	t1+100ms to t2-20ms	p.u.	1.202	1.202
	19	Line current	Phase 1	t1+60ms	p.u.	0.030	0.054
	20		Phase 2			0.088	0.062
	21		Phase 3			0.070	0.036
	22	Line current	Phase 1	t1+100ms	p.u.	0.045	0.049
	23		Phase 2			0.053	0.052
	24		Phase 3			0.048	0.047
	25	Active power	Total	t1+100ms to t2-20ms	p.u.	0.054	0.017
	26		Pos.			0.058	0.017
After dip > t2	27	Voltage	Line to neutral	t2+3s to t2+10s	p.u.	1.003	1.002
	28	Active power	Total	t2+3s to t2+10s	p.u.	0.995	0.300
	29		Pos.			0.997	0.299
	30	Active power rising time	Pos.	--	s	0.438	0.146
	31	Reactive power	Total	t2+3s to t2+10s	p.u.	N/A	N/A
	32		Pos.			N/A	N/A
	33	Reactive power rising time	Pos.	--	s	N/A	N/A
	34	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	Yes	Yes

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 133 von 153
Page 133 of 153

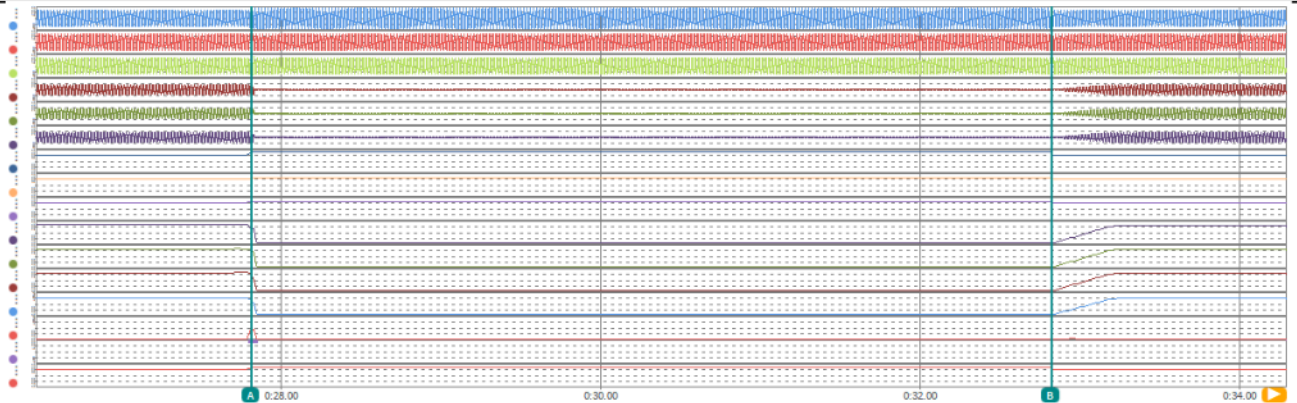
Test No. 6.3 idle test

Test No. 6.3 with PGU
Before dip

During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 134 von 153
Page 134 of 153

Time [s]	A	B	Delta
	0:27.81532	0:32.81935	5.00402
AI 1/U1 [V]	-384.1610	-90.47986	293.6812
AI 1/U2 [V]	184.5482	-225.5969	-410.1451
AI 1/U3 [V]	200.6583	315.9321	115.2737
AI 1/I1 [A]	-58.70343	-5.556822	53.14660
AI 1/I2 [A]	22.82393	-6.666303	-29.49023
AI 1/I3 [A]	35.81274	12.35151	-23.46122
U1_tRMS@POWER/0 [V]	230.8370	275.4811	44.64413
U2_tRMS@POWER/0 [V]	230.5891	240.2174	9.628372
U3_tRMS@POWER/0 [V]	230.8402	240.4808	9.640625
I1_tRMS@POWER/0 [A]	167.0867	8.324073	-158.7626
I2_tRMS@POWER/0 [A]	166.4093	8.169434	-158.2399
I3_tRMS@POWER/0 [A]	166.7206	8.459362	-158.2612
P_t@POWER/0 [W]	115421.7	6051.085	-109370.6
Q_t@POWER/0 [var]	1186.123	1716.667	530.5449
PF_t@POWER/0 []	0.999947	0.962035	-0.037912
U_fundRMS_SYM+@POWER/0 [V]	230.7513	251.4420	20.69063



Time [s]	A	B	Delta
	0:27.93412	0:32.75471	4.82059
AI 1/U1 [V]	-364.4366	-387.1703	-22.73369
AI 1/U2 [V]	278.4012	223.7952	-54.60596
AI 1/U3 [V]	87.42738	164.2597	76.83230
AI 1/I1 [A]	-9.522200	-10.82194	-1.299739
AI 1/I2 [A]	9.830714	7.975102	-1.855612
AI 1/I3 [A]	-0.053048	3.017307	3.070355
U1_tRMS@POWER/0 [V]	274.5955	275.4804	0.884949
U2_tRMS@POWER/0 [V]	239.5184	240.2144	0.696045
U3_tRMS@POWER/0 [V]	239.8932	240.4820	0.588806
I1_tRMS@POWER/0 [A]	8.389889	8.325805	-0.064084
I2_tRMS@POWER/0 [A]	8.034066	8.139540	0.105474
I3_tRMS@POWER/0 [A]	8.510057	8.459631	-0.050426
P_t@POWER/0 [W]	6036.799	6046.923	10.12451
Q_t@POWER/0 [var]	1692.752	1706.917	14.16504
PF_t@POWER/0 []	0.962863	0.962393	-4.700e-4
U_fundRMS_SYM+@POWER/0 [V]	250.7167	251.4410	0.724319

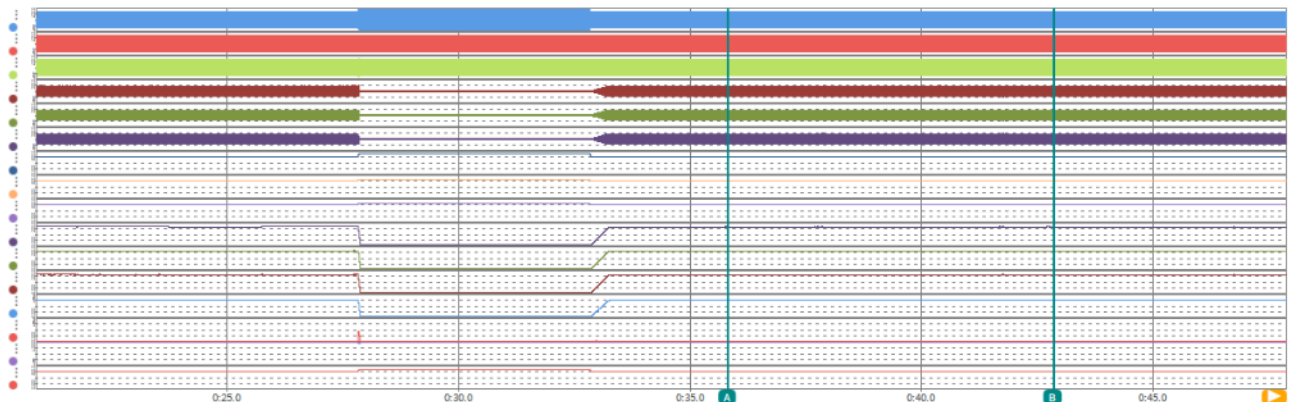
After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 135 von 153
Page 135 of 153

Time [s]	A	B	Delta
	0:32.82288	0:33.26771	0.44484
AI 1/U1 [V]	248.2901	218.2930	-29.99711
AI 1/U2 [V]	-306.8464	102.1667	409.0131
AI 1/U3 [V]	58.36082	-319.8202	-378.1810
AI 1/I1 [A]	11.01101	154.9878	143.9768
AI 1/I2 [A]	-14.69421	73.23838	87.93259
AI 1/I3 [A]	3.528357	-228.0125	-231.5408
U1_tRMS@POWER/0 [V]	275.2034	231.1171	-44.08623
U2_tRMS@POWER/0 [V]	240.3971	230.8596	-9.537460
U3_tRMS@POWER/0 [V]	240.6124	231.1140	-9.498383
I1_tRMS@POWER/0 [A]	8.336161	166.4694	158.1332
I2_tRMS@POWER/0 [A]	8.108081	165.6622	157.5541
I3_tRMS@POWER/0 [A]	8.481449	166.0262	157.5448
P_t@POWER/0 [W]	6042.926	115081.6	109038.7
Q_t@POWER/0 [var]	1724.007	1359.057	-364.9508
PF_t@POWER/0 []	0.961631	0.999930	0.038300
U_fundRMS_SYM+@POWER/0 [V]	251.4668	231.0259	-20.44090



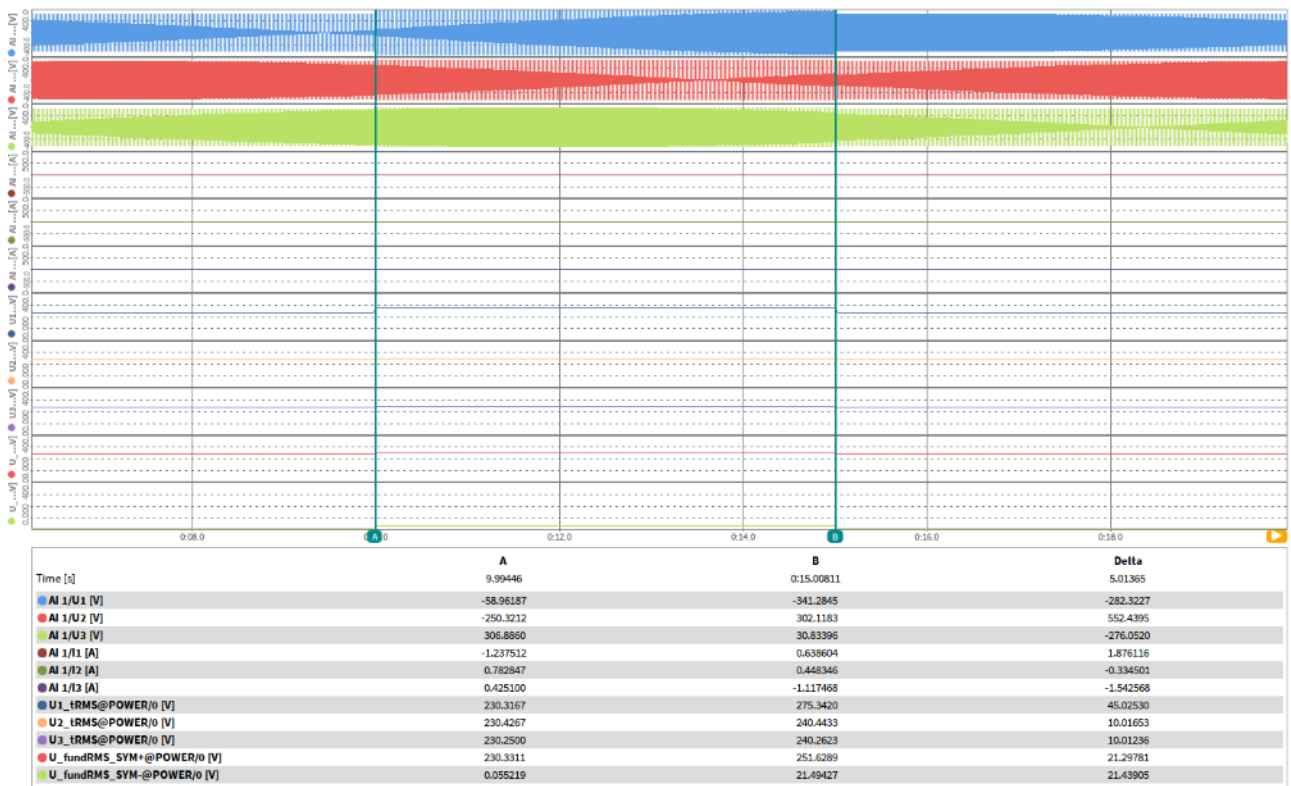
Time [s]	A	B	Delta
	0:35.81948	0:42.84854	7.02907
AI 1/U1 [V]	-56.41151	126.5788	182.9903
AI 1/U2 [V]	-249.6462	197.0165	446.6627
AI 1/U3 [V]	306.5653	-323.8239	-630.3893
AI 1/I1 [A]	-39.85715	89.81431	129.6715
AI 1/I2 [A]	-180.8553	143.6523	324.5076
AI 1/I3 [A]	220.8852	-233.5551	-454.4403
U1_tRMS@POWER/0 [V]	230.8514	230.8775	0.026169
U2_tRMS@POWER/0 [V]	230.5813	230.5813	1.526e-5
U3_tRMS@POWER/0 [V]	230.8108	230.8321	0.021240
I1_tRMS@POWER/0 [A]	166.4649	166.5640	0.099121
I2_tRMS@POWER/0 [A]	165.7424	165.8022	0.059845
I3_tRMS@POWER/0 [A]	165.9582	166.1592	0.201004
P_t@POWER/0 [W]	114941.3	115035.5	94.15625
Q_t@POWER/0 [var]	1465.772	1189.861	-275.9110
PF_t@POWER/0 []	0.999919	0.999947	2.784e-5
U_fundRMS_SYM+@POWER/0 [V]	230.7437	230.7593	0.015625

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 136 von 153
Page 136 of 153

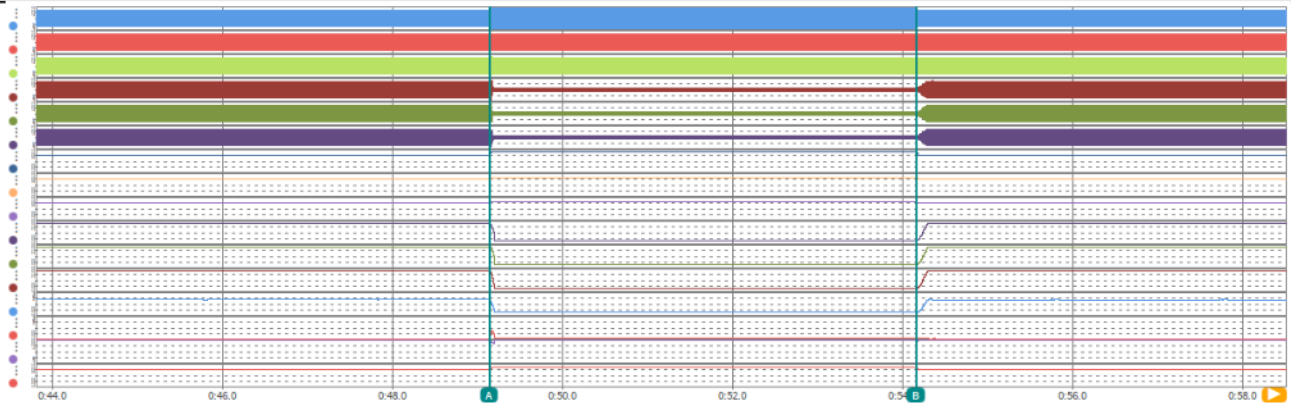
Test No. 6.4 idle test

Test No. 6.4 with PGU
Before dip

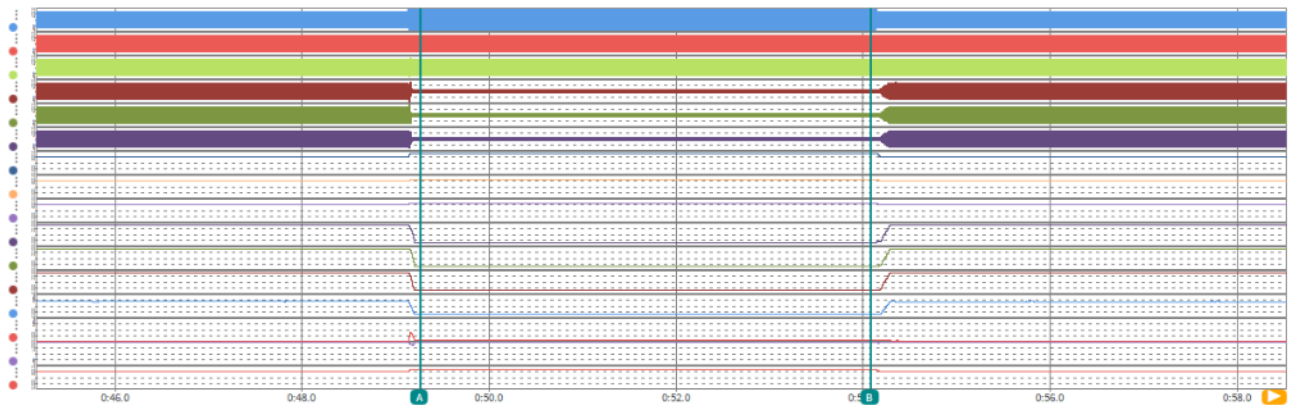
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 137 von 153
Page 137 of 153

Time [s]	A	B	Delta
	0:49.14647	0:54.16296	5.01649
AI 1/U1 [V]	-258.9390	-301.4362	-42.49716
AI 1/U2 [V]	-47.55950	259.5253	307.0848
AI 1/U3 [V]	301.1987	42.64426	-258.5545
AI 1/I1 [A]	-55.69387	-15.42616	40.26771
AI 1/I2 [A]	-9.790421	13.91018	23.70060
AI 1/I3 [A]	64.98111	0.586987	-64.39412
U1_tRMS@POWER/0 [V]	230.5563	275.4875	44.93121
U2_tRMS@POWER/0 [V]	230.3318	240.2242	9.892349
U3_tRMS@POWER/0 [V]	230.5610	240.4699	9.908875
I1_tRMS@POWER/0 [A]	50.08228	8.359995	-41.72229
I2_tRMS@POWER/0 [A]	49.99368	8.181250	-41.81243
I3_tRMS@POWER/0 [A]	50.02526	8.543894	-41.48137
P_t@POWER/0 [W]	34593.06	6088.917	-28504.14
Q_t@POWER/0 [var]	435.1125	1704.370	1269.258
PF_t@POWER/0 []	0.999921	0.962986	-0.036935
U_fundRMS_SYM+@POWER/0 [V]	230.4801	251.4413	20.96123

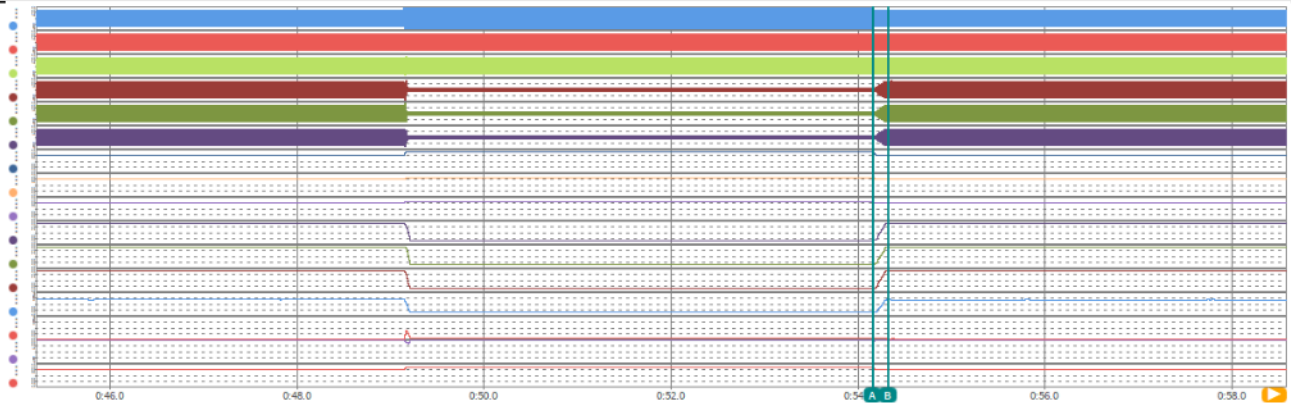


Time [s]	A	B	Delta
	0:49.26473	0:54.08127	4.81654
AI 1/U1 [V]	-386.4093	-232.7616	153.6477
AI 1/U2 [V]	162.4894	339.3460	176.8565
AI 1/U3 [V]	225.1563	-106.2410	-331.3973
AI 1/I1 [A]	-12.13586	-4.506231	7.629633
AI 1/I2 [A]	8.018852	11.67452	3.655672
AI 1/I3 [A]	4.040718	-7.273436	-11.31415
U1_tRMS@POWER/0 [V]	275.3444	275.4945	0.150116
U2_tRMS@POWER/0 [V]	240.2030	240.2301	0.027100
U3_tRMS@POWER/0 [V]	240.5294	240.4651	-0.064301
I1_tRMS@POWER/0 [A]	8.417765	8.364469	-0.053296
I2_tRMS@POWER/0 [A]	8.098846	8.191457	0.092610
I3_tRMS@POWER/0 [A]	8.468520	8.542813	0.074293
P_t@POWER/0 [W]	6074.806	6090.871	16.06494
Q_t@POWER/0 [var]	1669.652	1710.334	40.68188
PF_t@POWER/0 []	0.964243	0.962763	-1.480e-3
U_fundRMS_SYM+@POWER/0 [V]	251.4060	251.4453	0.039322

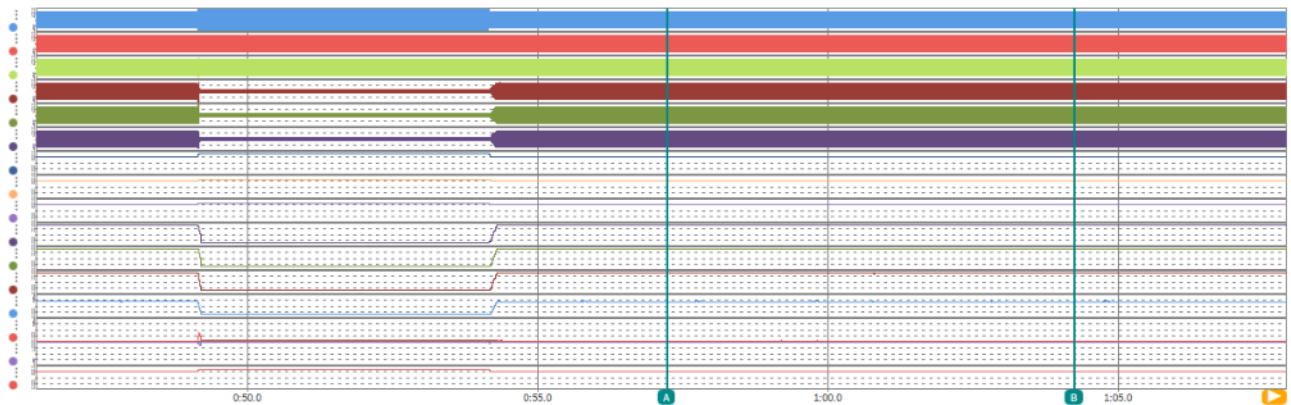
After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 138 von 153
Page 138 of 153

Time [s]	A	B	Delta
AI 1/U1 [V]	-186.7817	-317.3640	-130.5823
AI 1/U2 [V]	324.1837	223.8424	-100.3413
AI 1/U3 [V]	-137.4762	93.90522	231.3814
AI 1/I1 [A]	-7.315994	-69.54062	-62.22463
AI 1/I2 [A]	13.54754	51.01490	37.46736
AI 1/I3 [A]	-6.220937	18.65292	24.87385
U1_tRMS@POWER/0 [V]	275.4875	230.7847	-44.70284
U2_tRMS@POWER/0 [V]	240.2242	230.4712	-9.752991
U3_tRMS@POWER/0 [V]	240.4699	230.6803	-9.789566
I1_tRMS@POWER/0 [A]	8.359995	50.11709	41.75709
I2_tRMS@POWER/0 [A]	8.181250	49.95533	41.77408
I3_tRMS@POWER/0 [A]	8.543894	50.12925	41.58536
P_t@POWER/0 [W]	6088.917	34625.56	28536.64
Q_t@POWER/0 [var]	1704.370	1110.164	-594.2058
PF_t@POWER/0 []	0.962986	0.999486	0.036501
U_fundRMS_SYM+@POWER/0 [V]	251.4413	230.6450	-20.79630



Time [s]	A	B	Delta
AI 1/U1 [V]	-61.73921	-324.2603	-262.5210
AI 1/U2 [V]	-246.1355	190.0587	436.1942
AI 1/U3 [V]	308.0404	134.8114	-173.2290
AI 1/I1 [A]	-12.51006	-70.08934	-57.57928
AI 1/I2 [A]	-53.19894	40.83300	94.03194
AI 1/I3 [A]	65.85157	29.34671	-36.50487
U1_tRMS@POWER/0 [V]	230.5247	230.5443	0.019653
U2_tRMS@POWER/0 [V]	230.3526	230.3151	-0.037460
U3_tRMS@POWER/0 [V]	230.5799	230.5733	-6.577e-3
I1_tRMS@POWER/0 [A]	49.89207	49.88474	-7.324e-3
I2_tRMS@POWER/0 [A]	49.74155	49.77959	0.038036
I3_tRMS@POWER/0 [A]	49.77205	49.79708	0.025040
P_t@POWER/0 [W]	34432.69	34445.05	12.36328
Q_t@POWER/0 [var]	468.8770	412.1036	-56.77344
PF_t@POWER/0 []	0.999907	0.999928	2.110e-5
U_fundRMS_SYM+@POWER/0 [V]	230.4828	230.4746	-8.240e-3

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 139 von 153
Page 139 of 153

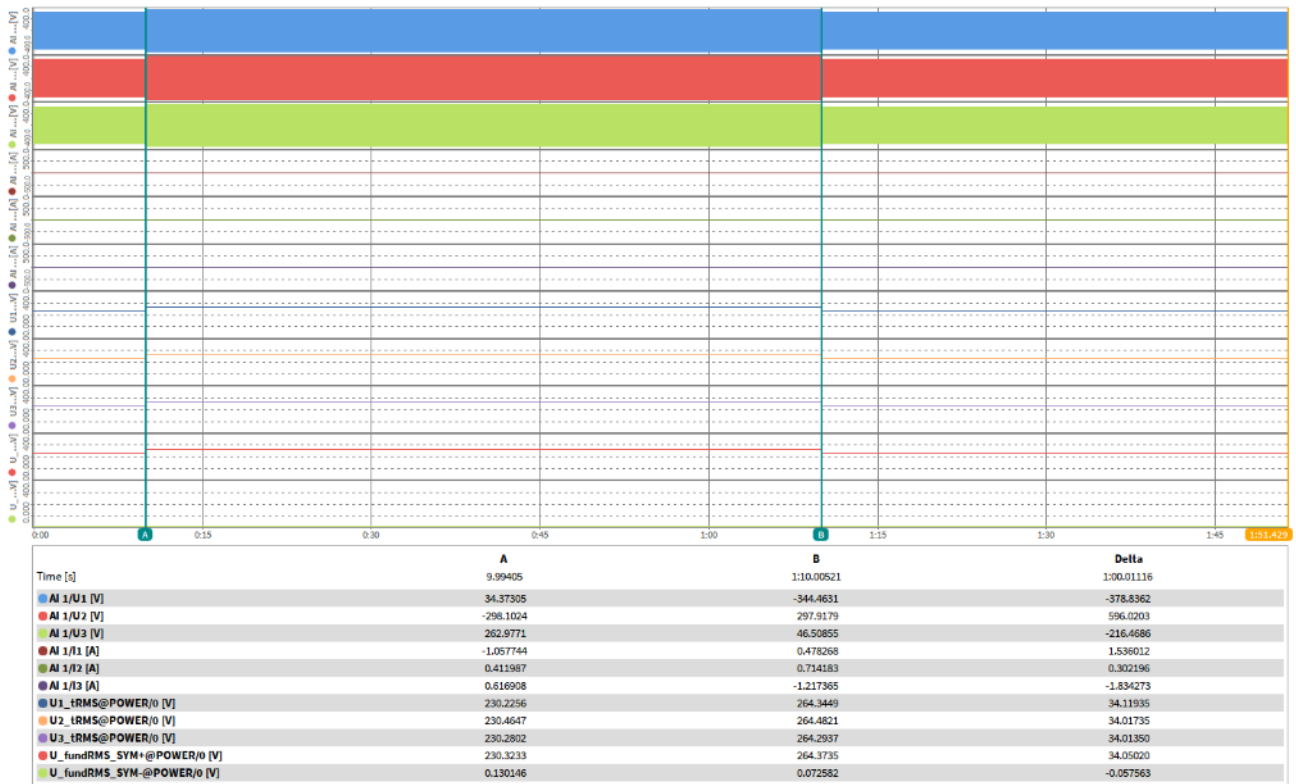
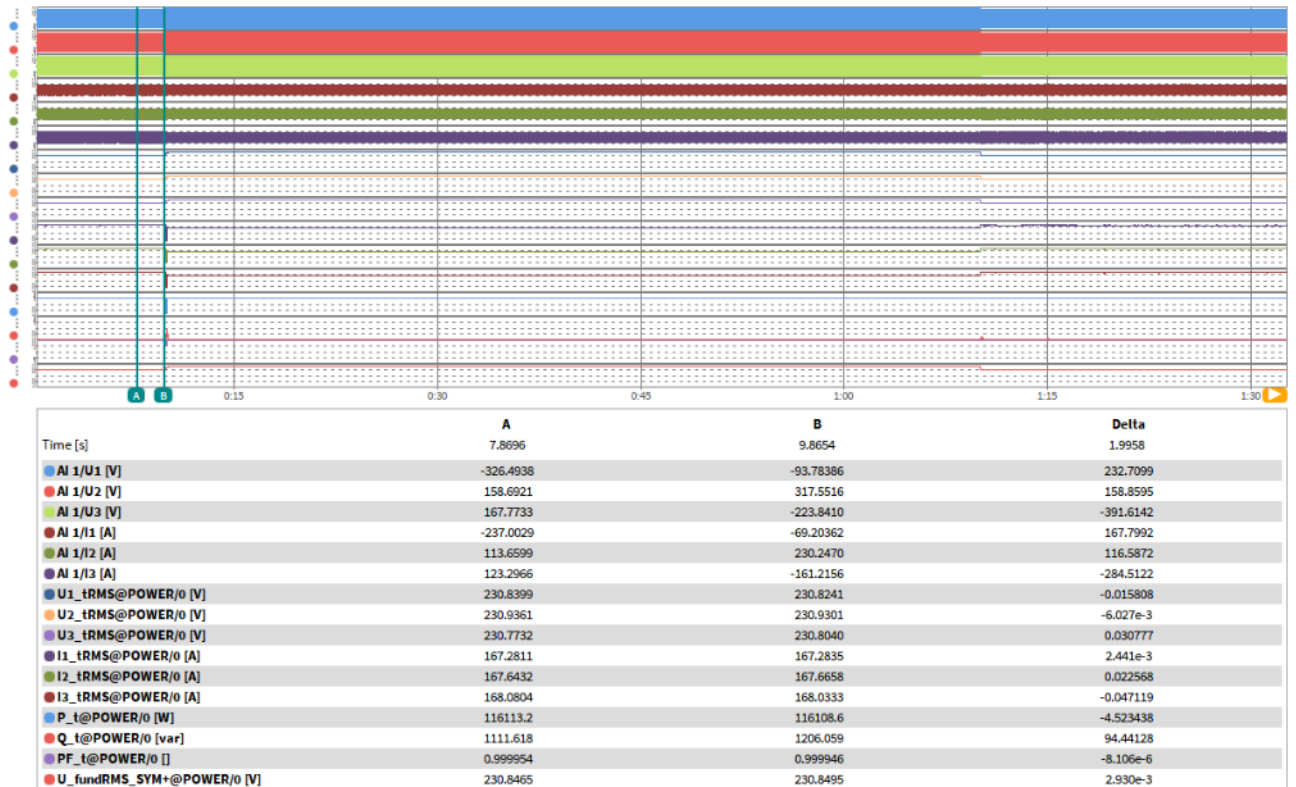
Condition						Measurement	
	No.	Parameter	Phase ref.	Time ref.	unit		
General Info.	0	Test number	--	--	--	6.3	6.4
	1	Date	--	--	yyyy.mm.dd	2022.08.16	2022.08.16
	2	Time (start of test)	--	--	hh:mm:ss	09:26:00	09:26:00
	3	Fault type (phase)	--	--		2 phase	2 phase
	4	Setting voltage depth	Line to neutral	--	p.u.	1.20	1.20
	5	Setting dip duration		--	ms	5000	5000
	6	Point of fault entry	Total	--	s	9.99446	9.99446
	7	Point of fault clearance	Total	--	s	15.00811	15.00811
	8	Fault duration in empty load test	Total	--	ms	5013.65	5013.65
	9	Voltage depth/height in empty load test	Total	t1+100ms to t2 and t1-10s to t1	p.u.	1.197	1.197
	10		Pos.		p.u.	1.001	1.001
Before dip <t1	11	Voltage	Line to neutral	t1-100s to t1	p.u.	1.003	1.002
	12	Current	Pos.	t1-500ms to t1-100ms	p.u.	1.001	0.301
	13	Active power	Total	t1-10s to t1	p.u.	1.002	0.301
	14		Pos.			1.004	0.301
	15	Reactive power	Total	t1-10s to t1	p.u.	0.011	0.004
	16		Pos.			0.010	0.004
	17	Cos ϕ	--	t1-10s to t1	--	0.999	0.999
During dip t1 to t2	18	Voltage	Line to neutral	t1+100ms to t2-20ms	p.u.	1.198	1.198
	19	Line current	Phase 1	t1+60ms	p.u.	0.062	0.175
	20		Phase 2			0.040	0.169
	21		Phase 3			0.051	0.114
	22	Line current	Phase 1	t1+100ms	p.u.	0.052	0.052
	23		Phase 2			0.048	0.048
	24		Phase 3			0.051	0.051
	25	Active power	Total	t1+100ms to t2-20ms	p.u.	0.052	0.053
	26		Pos.			0.053	0.053
After dip > t2	27	Voltage	Line to neutral	t2+3s to t2+10s	p.u.	1.003	1.002
	28	Active power	Total	t2+3s to t2+10s	p.u.	0.999	0.299
	29		Pos.			1.000	0.300
	30	Active power rising time	Pos.	--	s	0.445	0.162
	31	Reactive power	Total	t2+3s to t2+10s	p.u.	N/A	N/A
	32		Pos.			N/A	N/A
	33	Reactive power rising time	Pos.	--	s	N/A	N/A
	34	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	Yes	Yes

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 140 von 153
Page 140 of 153

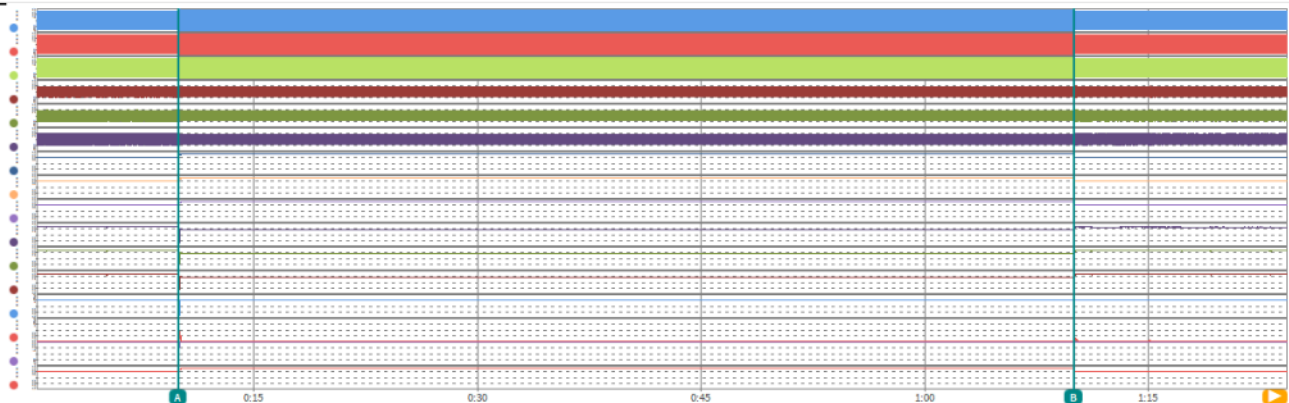
Test No. 7.1 idle test

Test No. 7.1 with PGU
Before dip

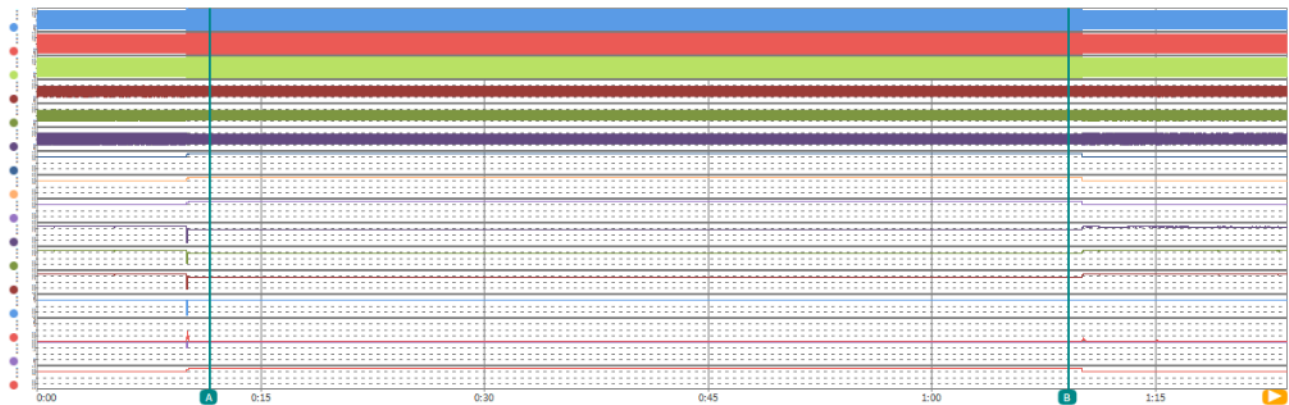
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 141 von 153
Page 141 of 153

Time [s]	A	B	Delta
AI 1/U1 [V]	9.9924	1:10.0056	1:00.0133
AI 1/U2 [V]	-232.7550	-321.9533	-89.19836
AI 1/U3 [V]	-133.7674	326.5143	460.2816
AI 1/I1 [A]	368.9020	-0.976324	-369.8783
AI 1/I2 [A]	-134.0801	-178.9789	-44.89887
AI 1/I3 [A]	-78.72165	178.7028	257.4245
U1_tRMS@POWER/0 [V]	211.9688	0.297904	-211.6709
U2_tRMS@POWER/0 [V]	230.8006	264.7973	33.99667
U3_tRMS@POWER/0 [V]	230.9455	264.9569	34.01137
I1_tRMS@POWER/0 [A]	230.7832	264.6924	33.90923
I2_tRMS@POWER/0 [A]	167.3175	145.7107	-21.60681
I3_tRMS@POWER/0 [A]	167.6985	145.9511	-21.74739
P_t@POWER/0 [W]	168.0945	146.1364	-21.95808
Q_t@POWER/0 [var]	116133.5	115928.0	-205.4844
PF_t@POWER/0 []	1192.214	1341.690	149.4761
U_fundRMS_SYM+@POWER/0 [V]	0.999947	0.999933	-1.431e-5
	230.8398	264.8130	33.97318

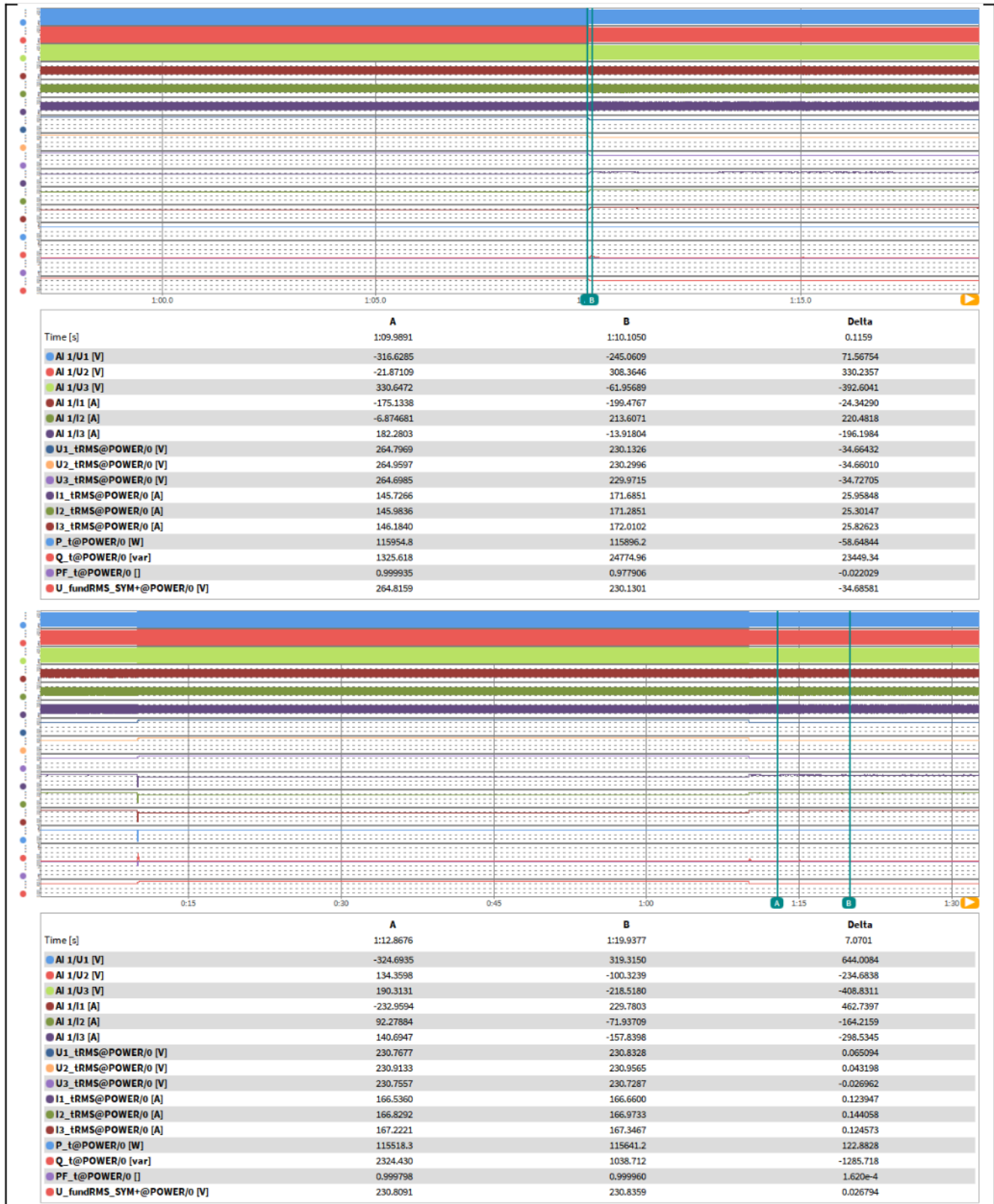


Time [s]	A	B	Delta
AI 1/U1 [V]	0:11.5817	1:09.1411	0:57.5594
AI 1/U2 [V]	283.3047	141.6762	-141.6285
AI 1/U3 [V]	72.98613	229.4257	156.4396
AI 1/I1 [A]	-354.0120	-370.9502	-16.93821
AI 1/I2 [A]	158.5704	77.37864	-81.19178
AI 1/I3 [A]	37.45198	127.2622	89.81026
U1_tRMS@POWER/0 [V]	-195.1853	-204.8005	-9.615183
U2_tRMS@POWER/0 [V]	264.8440	264.8105	-0.033539
U3_tRMS@POWER/0 [V]	264.9335	264.9113	-0.022217
I1_tRMS@POWER/0 [A]	264.7326	264.7399	7.263e-3
I2_tRMS@POWER/0 [A]	145.7919	145.6955	-0.096375
I3_tRMS@POWER/0 [A]	145.9682	146.0273	0.059067
P_t@POWER/0 [W]	146.1925	146.1421	-0.050430
Q_t@POWER/0 [var]	115978.9	115948.3	-30.64844
PF_t@POWER/0 []	1275.303	1306.023	30.71997
U_fundRMS_SYM+@POWER/0 [V]	0.999940	0.999937	-2.980e-6
	264.8342	264.8181	-0.016144

After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

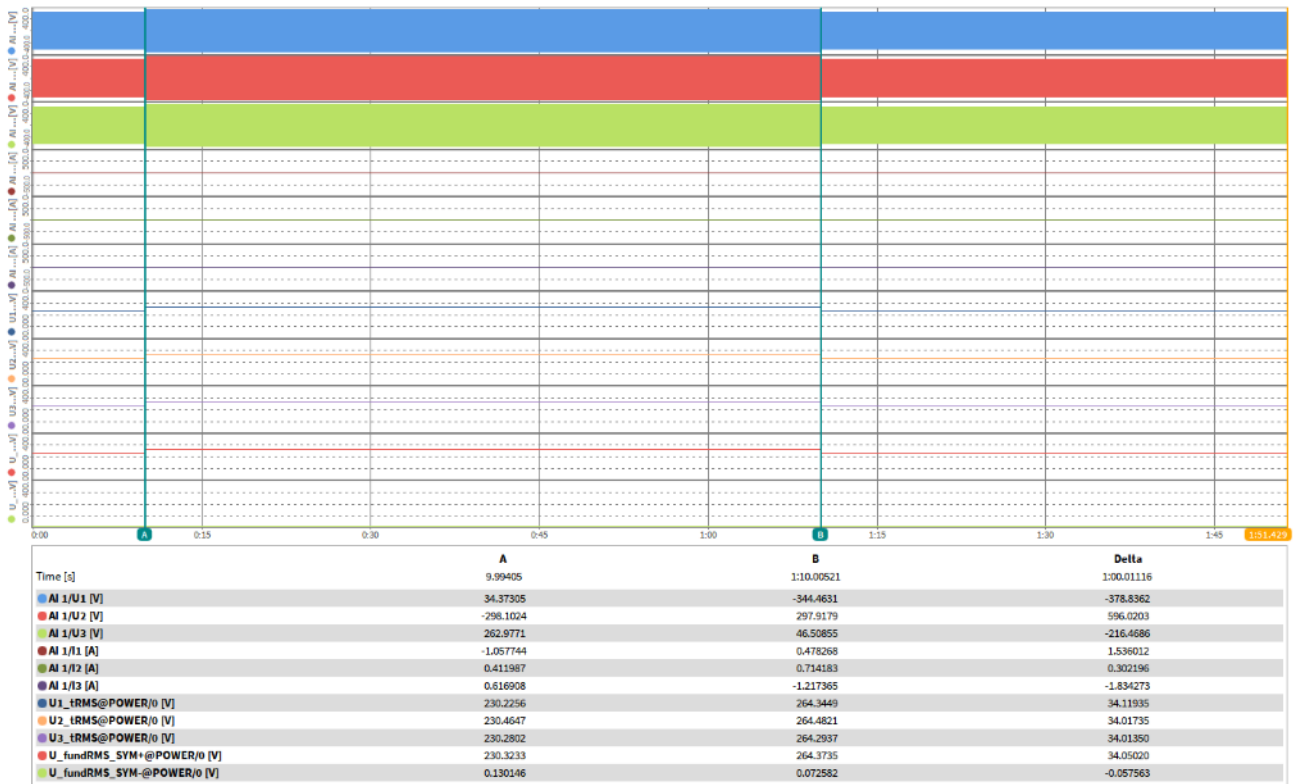
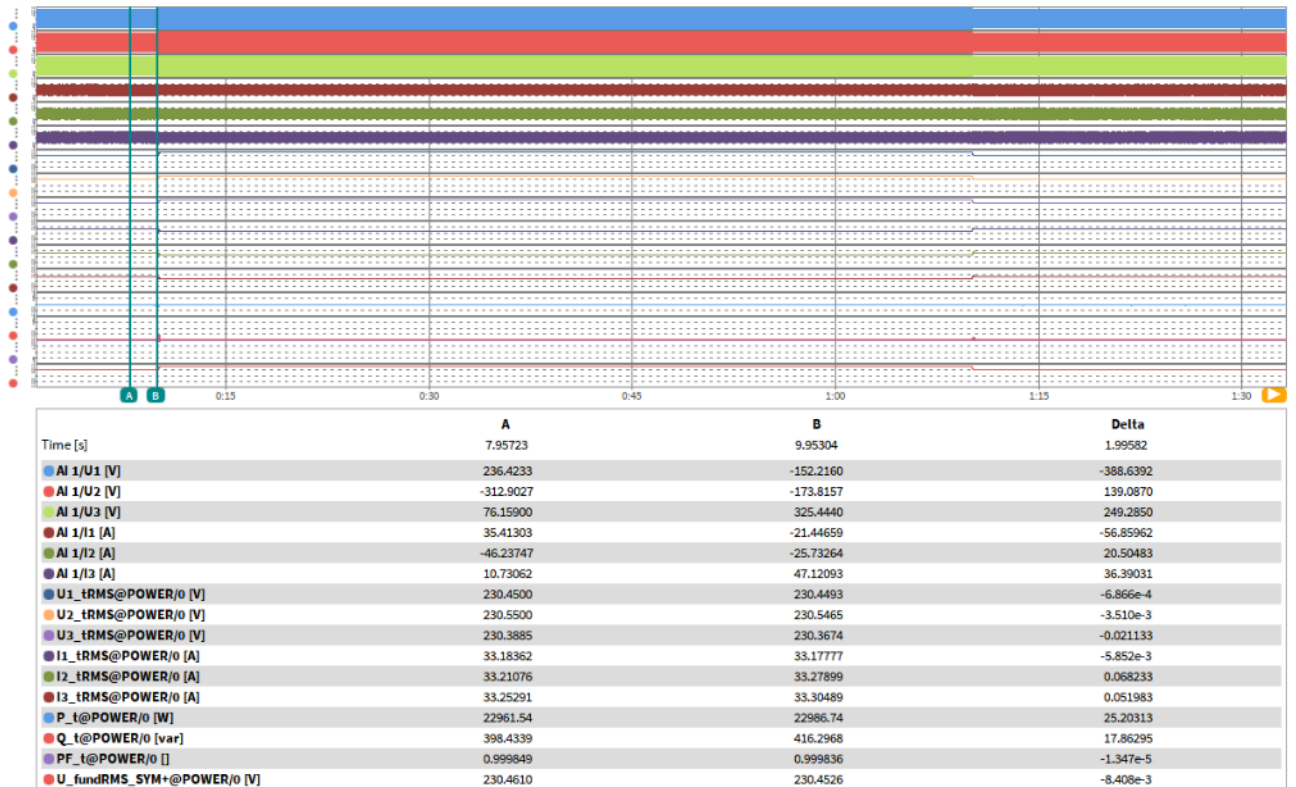
Seite 142 von 153
Page 142 of 153

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 143 von 153
Page 143 of 153

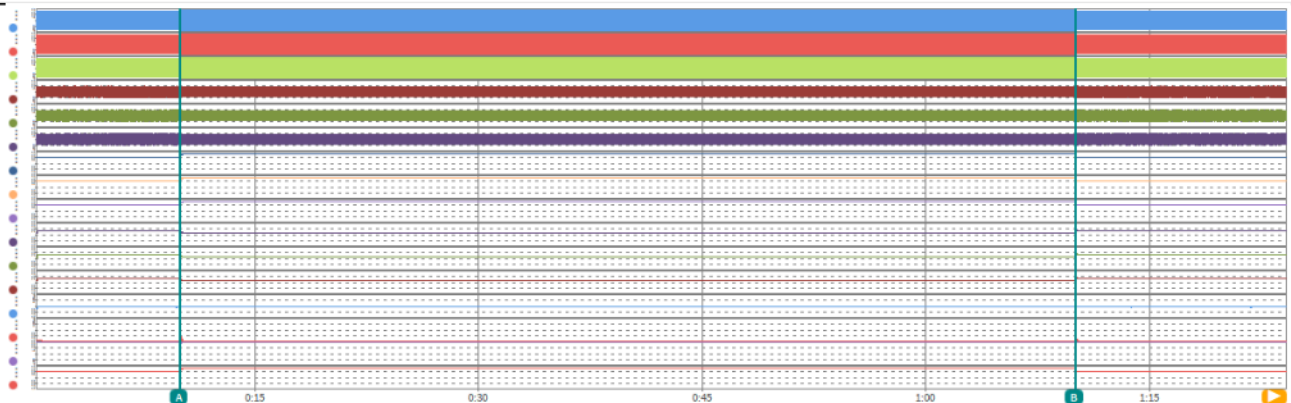
Test No. 7.2 idle test

Test No. 7.2 with PGU
Before dip

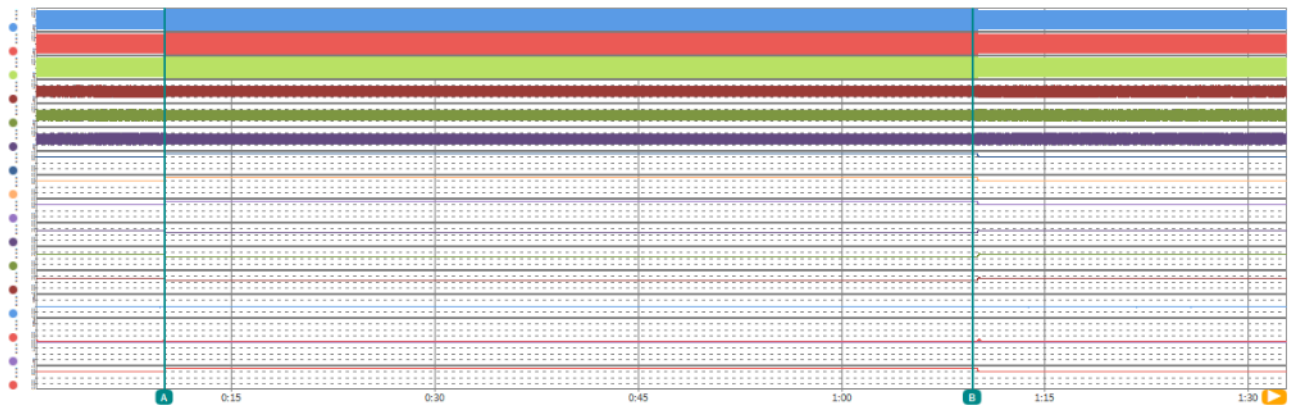
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 144 von 153
Page 144 of 153

Time [s]	A	B	Delta
AI 1/U1 [V]	9.99438	1:10.00066	1:00.00628
AI 1/U2 [V]	-29.97041	198.0195	227.9899
AI 1/U3 [V]	-303.5004	176.5776	480.0780
AI 1/I1 [A]	334.8158	-373.7233	-708.5391
AI 1/I2 [A]	-13.08477	21.23261	34.31738
AI 1/I3 [A]	-11.19101	19.91308	31.10409
U1_tRMS@POWER/0 [V]	24.59049	-41.05211	-65.64260
U2_tRMS@POWER/0 [V]	230.4489	264.4570	34.00807
U3_tRMS@POWER/0 [V]	230.5454	264.5999	34.05447
I1_tRMS@POWER/0 [A]	230.3648	264.4203	34.05557
I2_tRMS@POWER/0 [A]	33.17775	28.87746	-4.300293
I3_tRMS@POWER/0 [A]	33.22657	28.88175	-4.344824
P_t@POWER/0 [W]	33.26465	28.94184	-4.322807
Q_t@POWER/0 [var]	22965.32	22926.58	-38.74805
PF_t@POWER/0 []	411.8385	487.8681	76.02966
U_fundRMS_SYM+@POWER/0 [V]	0.999839	0.999774	-6.557e-5
	230.4513	264.4910	34.03975

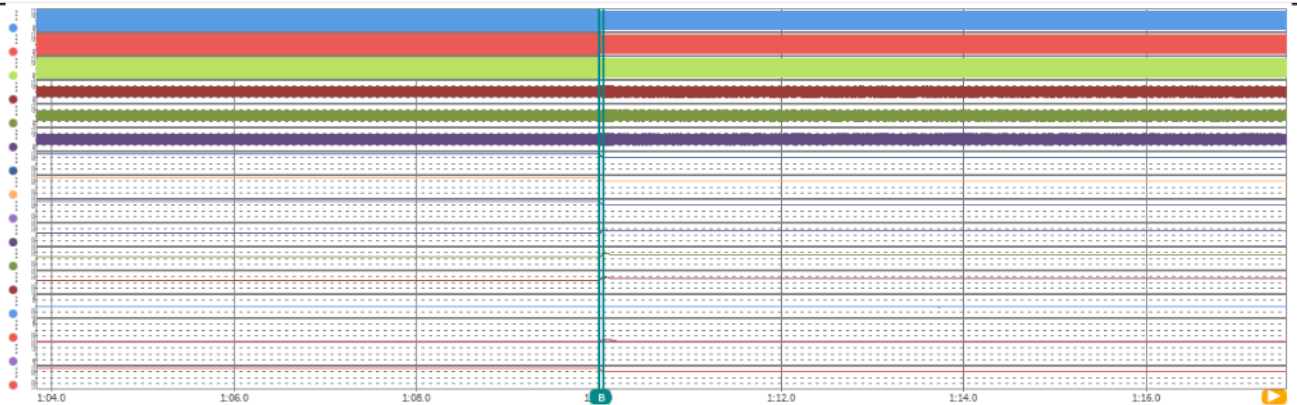


Time [s]	A	B	Delta
AI 1/U1 [V]	0:10.12241	1:09.67584	0:59.55343
AI 1/U2 [V]	233.5086	328.2547	94.74612
AI 1/U3 [V]	138.0472	-319.1037	-457.1510
AI 1/I1 [A]	-369.6318	-11.10864	358.5232
AI 1/I2 [A]	26.08431	35.46036	9.376050
AI 1/I3 [A]	13.60548	-34.27696	-47.88244
U1_tRMS@POWER/0 [V]	-39.66916	-1.058817	38.61034
U2_tRMS@POWER/0 [V]	264.4322	264.4358	3.632e-3
U3_tRMS@POWER/0 [V]	264.4880	264.5927	0.104645
I1_tRMS@POWER/0 [A]	264.3717	264.4308	0.059021
I2_tRMS@POWER/0 [A]	28.82138	28.72420	-0.097187
I3_tRMS@POWER/0 [A]	28.87807	28.79623	-0.081839
P_t@POWER/0 [W]	28.91901	28.62927	-0.289738
Q_t@POWER/0 [var]	22884.21	22779.24	-104.9688
PF_t@POWER/0 []	965.5944	531.2617	-434.3327
U_fundRMS_SYM+@POWER/0 [V]	0.999111	0.999728	6.171e-4
	264.4293	264.4850	0.055756

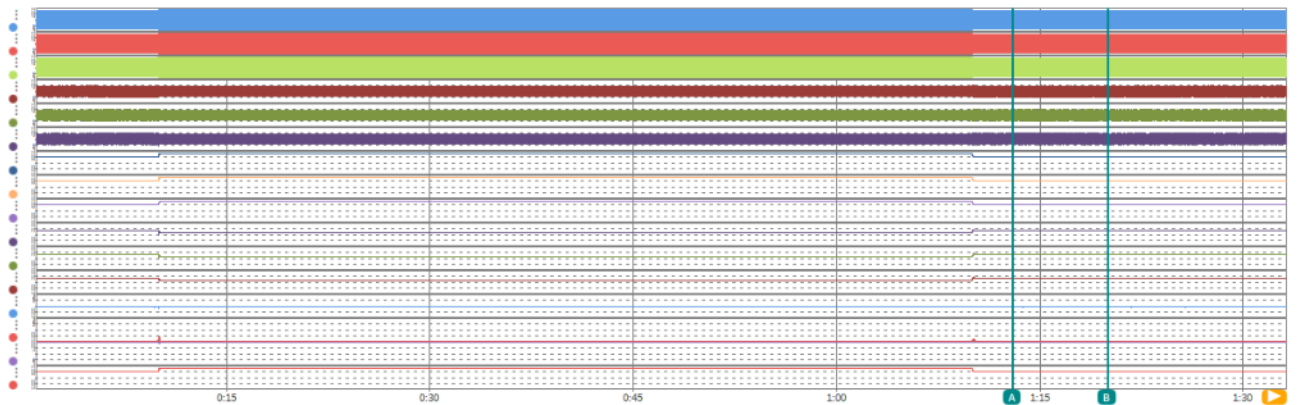
After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 145 von 153
Page 145 of 153

Time [s]	A	B	Delta
	1:10.00553	1:10.04570	0.04017
AI 1/U1 [V]	-310.8800	-281.7378	29.14214
AI 1/U2 [V]	335.4266	282.2414	-53.18523
AI 1/U3 [V]	-23.38433	3.917933	27.30227
AI 1/I1 [A]	-34.31583	-40.74621	-6.430388
AI 1/I2 [A]	36.57794	36.30614	-0.271797
AI 1/I3 [A]	-2.029657	3.125429	5.155087
U1_tRMS@POWER/0 [V]	264.4570	230.4011	-34.05592
U2_tRMS@POWER/0 [V]	264.5999	230.8090	-33.79091
U3_tRMS@POWER/0 [V]	264.4203	230.5832	-33.83713
I1_tRMS@POWER/0 [A]	28.87746	35.18704	6.309582
I2_tRMS@POWER/0 [A]	28.88175	34.64029	5.758539
I3_tRMS@POWER/0 [A]	28.94184	34.96143	6.019592
P_t@POWER/0 [W]	22926.58	24133.39	1206.811
Q_t@POWER/0 [var]	487.8681	1214.838	726.9695
PF_t@POWER/0 []	0.999774	0.998735	-1.038e-3
U_fundRMS_SYM+@POWER/0 [V]	264.4910	230.5951	-33.89597



Time [s]	A	B	Delta
	1:12.98516	1:19.98685	7.00169
AI 1/U1 [V]	-253.3279	-325.1586	-71.83075
AI 1/U2 [V]	304.0769	180.9948	-123.0822
AI 1/U3 [V]	-50.05551	144.2928	194.3483
AI 1/I1 [A]	-37.04214	-47.19770	-10.15556
AI 1/I2 [A]	43.60891	26.26121	-17.34769
AI 1/I3 [A]	-6.452442	20.98310	27.43554
U1_tRMS@POWER/0 [V]	230.4405	230.4389	-1.602e-3
U2_tRMS@POWER/0 [V]	230.5359	230.5399	4.028e-3
U3_tRMS@POWER/0 [V]	230.3888	230.3852	-3.616e-3
I1_tRMS@POWER/0 [A]	33.17471	33.08810	-0.086617
I2_tRMS@POWER/0 [A]	33.21971	33.19108	-0.028625
I3_tRMS@POWER/0 [A]	33.28030	33.17918	-0.101116
P_t@POWER/0 [W]	22967.09	22918.86	-48.23242
Q_t@POWER/0 [var]	398.2930	286.5455	-111.7475
PF_t@POWER/0 []	0.999850	0.999922	7.218e-5
U_fundRMS_SYM+@POWER/0 [V]	230.4533	230.4529	-3.967e-4

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 146 von 153
Page 146 of 153

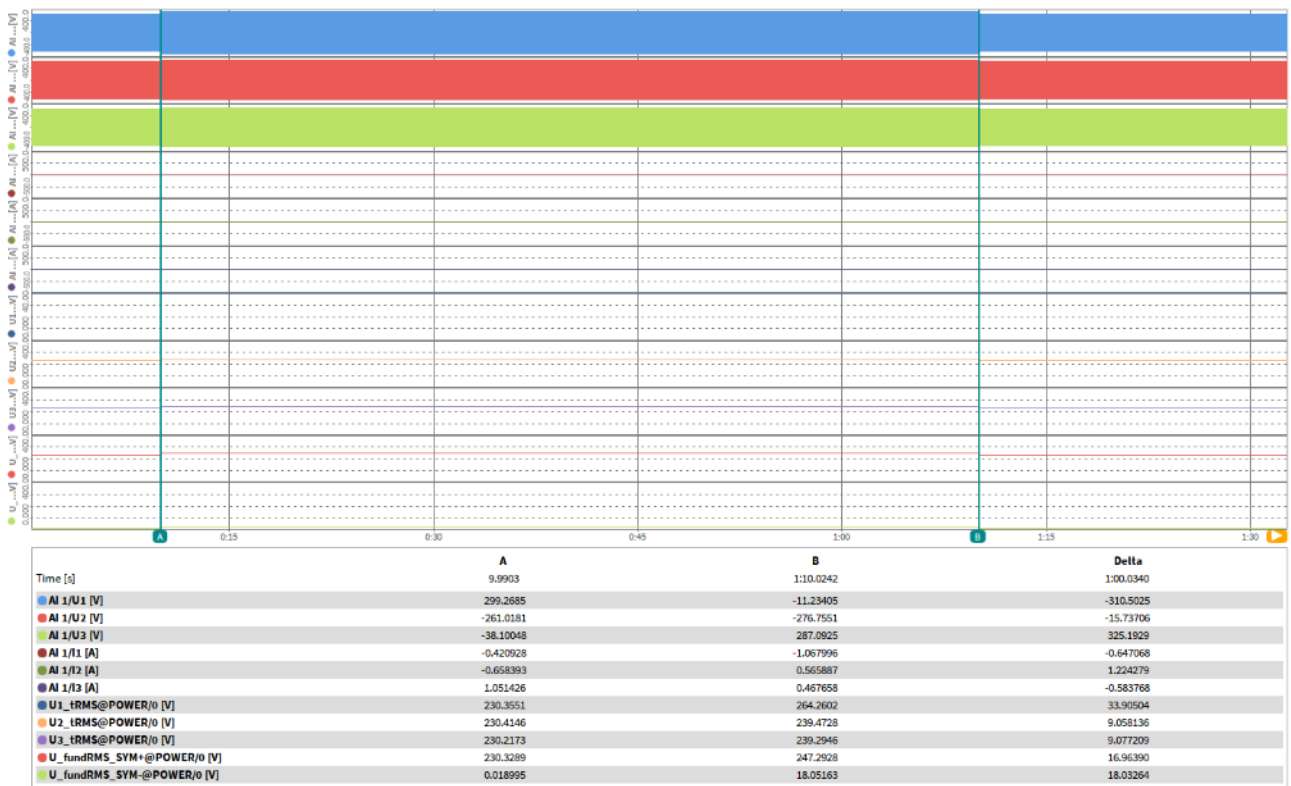
Condition						Measurement	
	No.	Parameter	Phase ref.	Time ref.	unit		
General Info.	0	Test number	--	--	--	7.1	7.2
	1	Date	--	--	yyyy.mm.dd	2022.08.16	2022.08.16
	2	Time (start of test)	--	--	hh:mm:ss	09:33:48	09:33:48
	3	Fault type (phase)	--	--		3 phase	3 phase
	4	Setting voltage depth	Line to neutral	--	p.u.	1.15	1.15
	5	Setting dip duration		--	ms	60000	60000
	6	Point of fault entry	Total	--	s	9.99405	9.99405
	7	Point of fault clearance	Total	--	s	70.00521	70.00521
	8	Fault duration in empty load test	Total	--	ms	60011	60011
	9	Voltage depth/height in empty load test	Total	t1+100ms to t2 and t1-10s to t1	p.u.	1.149	1.149
	10		Pos.		p.u.	1.001	1.001
Before dip <t1	11	Voltage	Line to neutral	t1-100s to t1	p.u.	1.003	1.002
	12	Current	Pos.	t1-500ms to t1-100ms	p.u.	1.010	0.201
	13	Active power	Total	t1-10s to t1	p.u.	1.010	0.200
	14		Pos.			1.010	0.200
	15	Reactive power	Total	t1-10s to t1	p.u.	0.010	0.003
	16		Pos.			0.010	0.004
	17	Cos ϕ	--	t1-10s to t1	--	0.999	0.999
During dip t1 to t2	18	Voltage	Line to neutral	t1+100ms to t2-20ms	p.u.	1.151	1.150
	19	Line current	Phase 1	t1+60ms	p.u.	0.723	0.177
	20		Phase 2			0.588	0.180
	21		Phase 3			0.722	0.180
	22	Line current	Phase 1	t1+100ms	p.u.	0.913	0.183
	23		Phase 2			0.943	0.174
	24		Phase 3			0.913	0.175
	25	Active power	Total	t1+100ms to t2-20ms	p.u.	1.009	0.198
	26		Pos.			1.008	0.199
After dip > t2	27	Voltage	Line to neutral	t2+3s to t2+10s	p.u.	1.003	1.002
	28	Active power	Total	t2+3s to t2+10s	p.u.	1.005	0.200
	29		Pos.			1.006	0.199
	30	Active power rising time	Pos.	--	s	0.116	0.040
	31	Reactive power	Total	t2+3s to t2+10s	p.u.	N/A	N/A
	32		Pos.			N/A	N/A
	33	Reactive power rising time	Pos.	--	s	N/A	N/A
	34	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	Yes	Yes

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 147 von 153
Page 147 of 153

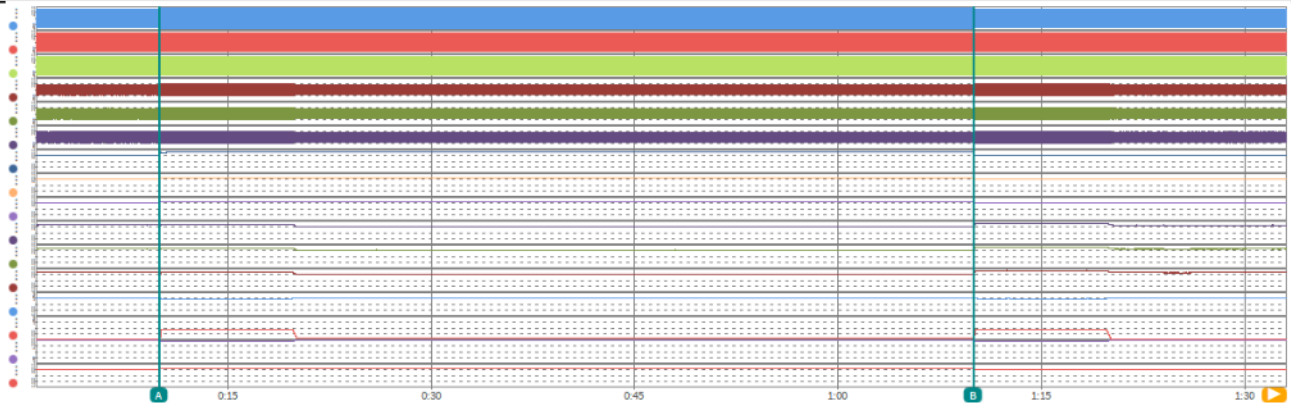
Test No. 7.3 idle test

Test No. 7.3 with PGU
Before dip

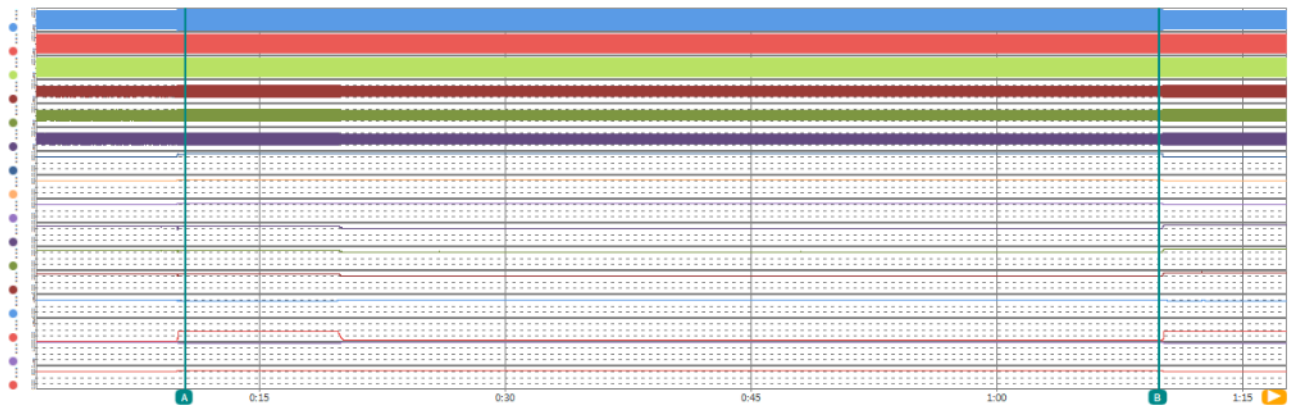
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 148 von 153
Page 148 of 153

Time [s]	A	B	Delta
AI 1/U1 [V]	9.9926	1:10.0020	1:00.0094
AI 1/U2 [V]	-169.6100	19.02580	188.6358
AI 1/U3 [V]	-156.9672	271.8530	428.8202
AI 1/I1 [A]	326.1612	-290.5336	-616.6947
AI 1/I2 [A]	-121.7719	8.284212	130.0562
AI 1/I3 [A]	-115.6902	185.5240	301.2142
U1_tRMS@POWER/0 [V]	237.4361	-193.2986	-430.7347
U2_tRMS@POWER/0 [V]	230.7807	264.8269	34.04620
U3_tRMS@POWER/0 [V]	230.9496	239.9393	8.989777
I1_tRMS@POWER/0 [A]	230.7367	239.7539	9.017227
I2_tRMS@POWER/0 [A]	167.1787	155.5001	-11.67867
I3_tRMS@POWER/0 [A]	167.4734	156.8282	-10.64513
P_t@POWER/0 [W]	167.9502	153.8785	-14.07167
Q_t@POWER/0 [var]	116005.5	115509.5	-496.0234
PF_t@POWER/0 []	1208.607	6686.546	5477.939
U_fundRMS_SYM+@POWER/0 [V]	0.999946	0.998329	-1.617e-3
	230.8191	247.7903	16.97124

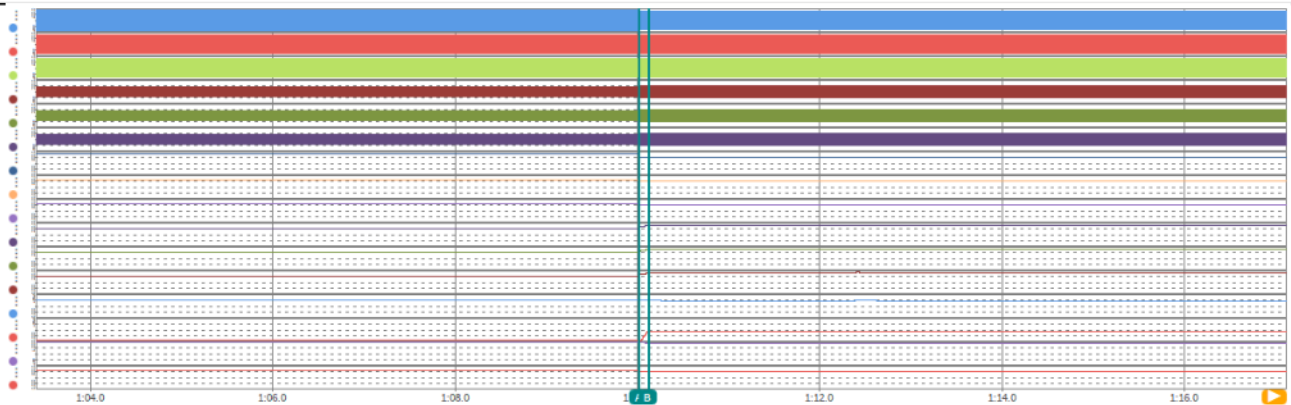


Time [s]	A	B	Delta
AI 1/U1 [V]	0:10.4964	1:09.8162	0:59.3197
AI 1/U2 [V]	226.7904	353.4610	126.6706
AI 1/U3 [V]	-338.5635	-271.3933	67.17015
AI 1/I1 [A]	104.7843	-88.49168	-193.2759
AI 1/I2 [A]	219.8031	210.8116	-8.991480
AI 1/I3 [A]	-191.3825	-168.0036	23.37897
U1_tRMS@POWER/0 [V]	-28.49555	-43.14590	-14.65035
U2_tRMS@POWER/0 [V]	264.4976	264.8341	0.336548
U3_tRMS@POWER/0 [V]	239.5615	239.9072	0.345657
I1_tRMS@POWER/0 [A]	239.4461	239.7404	0.294342
I2_tRMS@POWER/0 [A]	169.0194	155.7145	-13.30490
I3_tRMS@POWER/0 [A]	169.5867	156.9590	-12.62762
P_t@POWER/0 [W]	170.0536	154.0409	-16.01271
Q_t@POWER/0 [var]	109636.0	115631.0	5995.000
PF_t@POWER/0 []	62198.39	6683.169	-55515.23
U_fundRMS_SYM+@POWER/0 [V]	0.869779	0.998334	0.128555
	247.4415	247.7774	0.335907

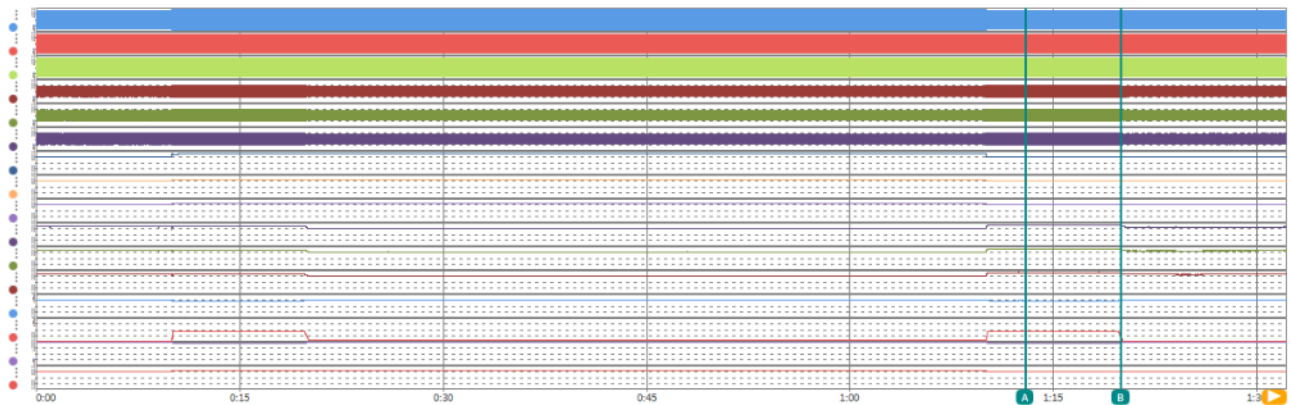
After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 149 von 153
Page 149 of 153

Time [s]	A	B	Delta
1:10.0135	1:10.1227	0.1092	
AI 1/U1 [V]	124.6657	-42.54675	-167.2125
AI 1/U2 [V]	-324.4550	304.8945	629.3495
AI 1/U3 [V]	198.9644	-261.4796	-460.4440
AI 1/I1 [A]	89.14495	99.52844	10.38349
AI 1/I2 [A]	-223.9689	160.4302	384.3991
AI 1/I3 [A]	134.8566	-258.6941	-393.5507
U1_tRMS@POWER/0 [V]	264.6531	233.2827	-31.37044
U2_tRMS@POWER/0 [V]	239.9865	233.4147	-6.571823
U3_tRMS@POWER/0 [V]	239.8074	232.8725	-6.934952
I1_tRMS@POWER/0 [A]	155.3431	180.2783	24.93518
I2_tRMS@POWER/0 [A]	156.8570	181.2171	24.36009
I3_tRMS@POWER/0 [A]	153.9925	181.6394	27.64691
P_t@POWER/0 [W]	115488.8	111020.7	-4468.141
Q_t@POWER/0 [var]	6719.512	60954.72	54235.21
PF_t@POWER/0 []	0.998312	0.876571	-0.121740
U_fundRMS_SYM+@POWER/0 [V]	247.7719	233.1861	-14.58582



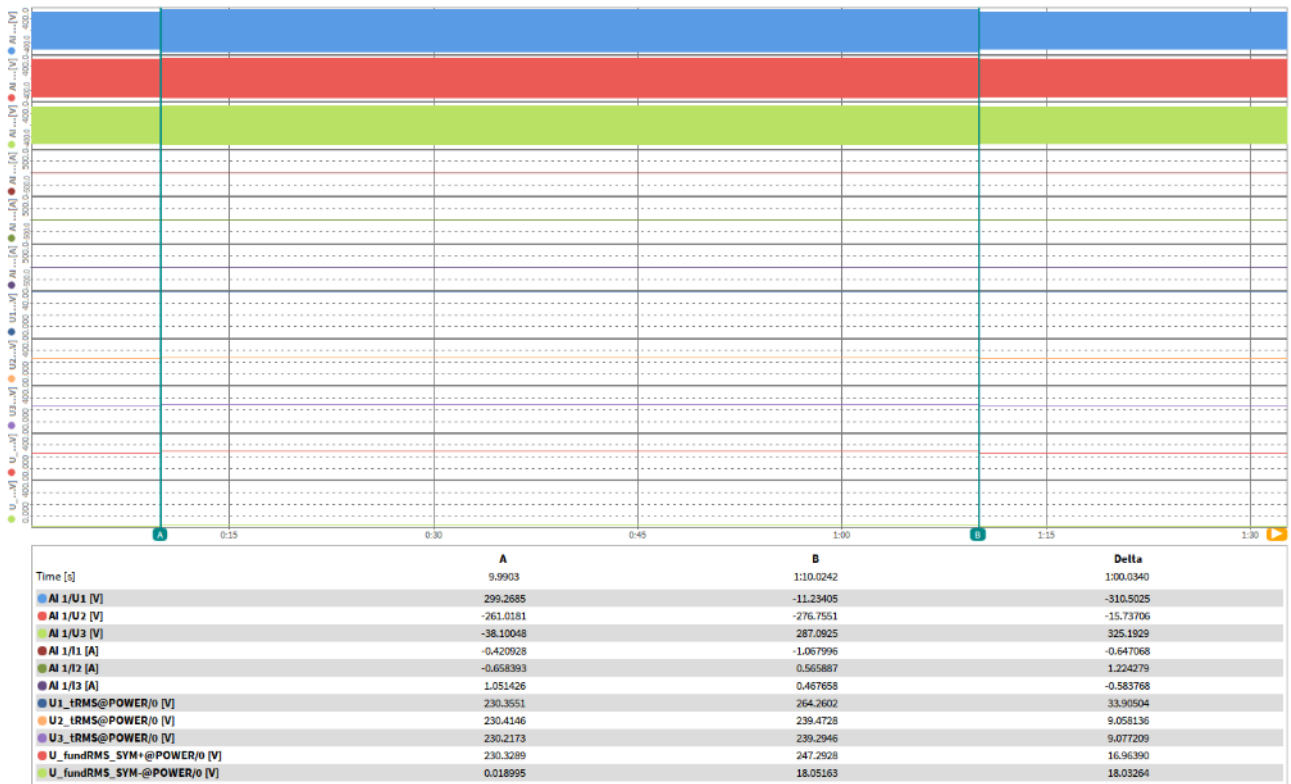
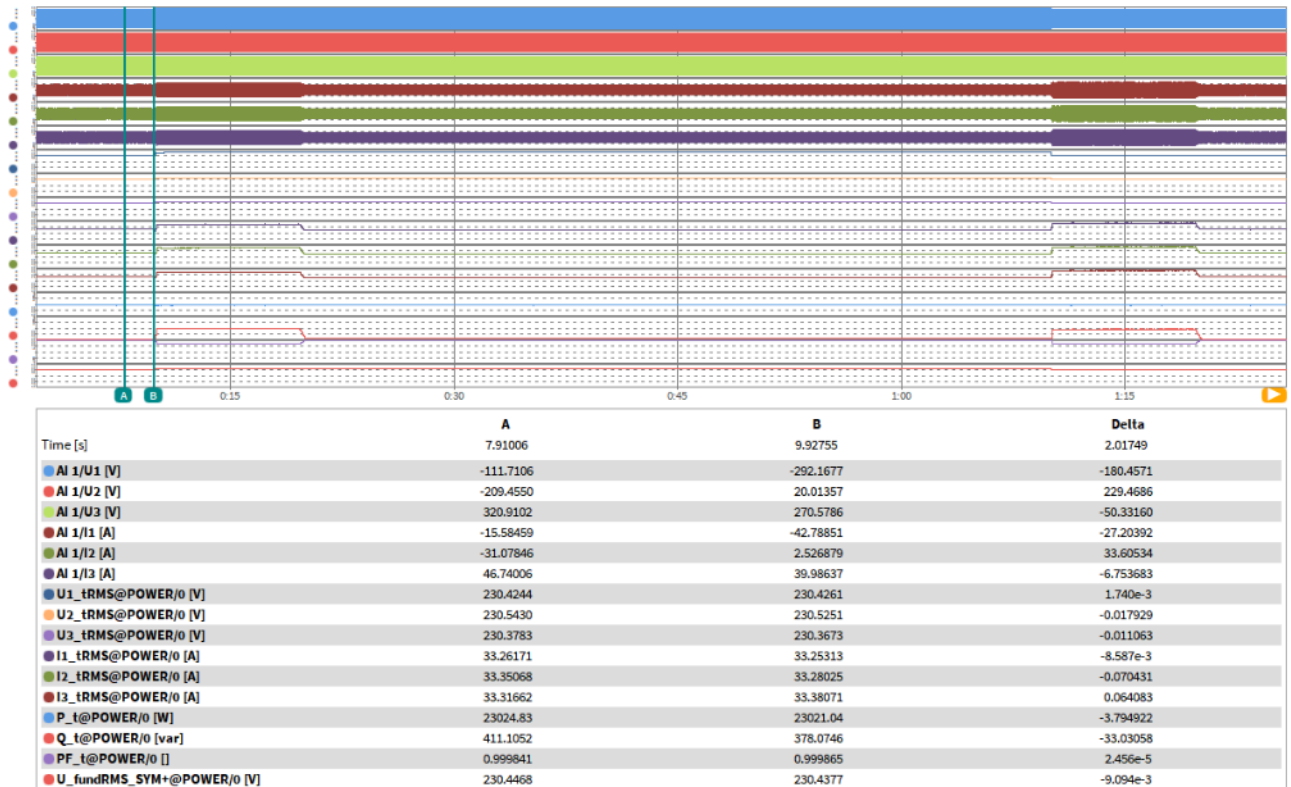
Time [s]	A	B	Delta
1:12.9284	1:19.9907	7.0623	
AI 1/U1 [V]	-301.6451	-109.7615	191.8836
AI 1/U2 [V]	43.56528	-210.1283	-253.6936
AI 1/U3 [V]	257.9954	319.5925	61.59711
AI 1/I1 [A]	-255.7902	-120.3179	135.4723
AI 1/I2 [A]	157.6077	-121.0586	-278.6663
AI 1/I3 [A]	98.03963	241.5116	143.4720
U1_tRMS@POWER/0 [V]	230.8276	229.9172	-0.910461
U2_tRMS@POWER/0 [V]	230.9930	229.9326	-1.060394
U3_tRMS@POWER/0 [V]	230.8084	229.6327	-1.175674
I1_tRMS@POWER/0 [A]	182.5314	169.8475	-12.68388
I2_tRMS@POWER/0 [A]	183.4004	171.4593	-11.94110
I3_tRMS@POWER/0 [A]	183.9372	172.1416	-11.79562
P_t@POWER/0 [W]	110192.2	115278.4	5086.234
Q_t@POWER/0 [var]	63043.11	25217.06	-37826.05
PF_t@POWER/0 []	0.867985	0.976900	0.108916
U_fundRMS_SYM+@POWER/0 [V]	230.8727	229.8236	-1.049133

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 150 von 153
Page 150 of 153

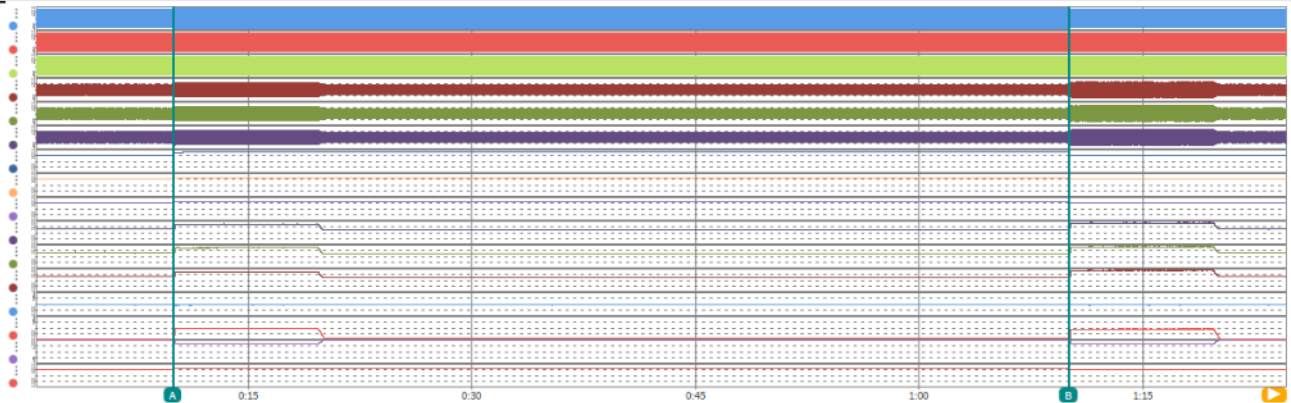
Test No. 7.4 idle test

Test No. 7.4 with PGU
Before dip

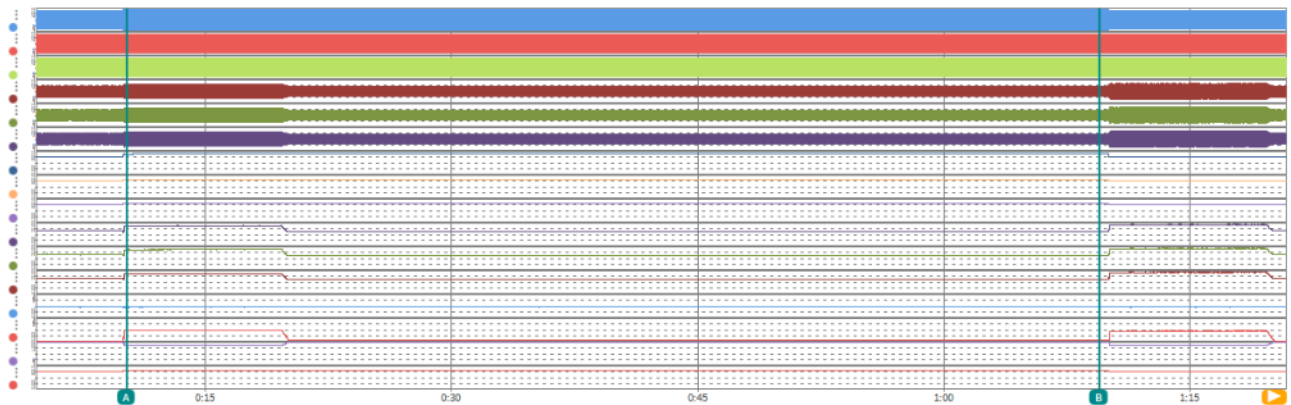
During dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 151 von 153
Page 151 of 153

Time [s]	A	B	Delta
	9.98869	1:10.02242	1:00.03373
AI 1/U1 [V]	-226.0847	-292.7106	-66.62584
AI 1/U2 [V]	-91.76875	271.4977	363.2665
AI 1/U3 [V]	316.5407	26.57652	-289.9642
AI 1/I1 [A]	-32.79805	-46.07928	-13.28123
AI 1/I2 [A]	-13.91220	38.61773	52.52993
AI 1/I3 [A]	47.00125	7.982493	-39.01875
U1_tRMS@POWER/0 [V]	230.3990	264.3749	33.97598
U2_tRMS@POWER/0 [V]	230.5556	239.5849	9.029312
U3_tRMS@POWER/0 [V]	230.3694	239.3882	9.018829
I1_tRMS@POWER/0 [A]	33.29615	30.97024	-2.325907
I2_tRMS@POWER/0 [A]	33.31534	31.26232	-2.053022
I3_tRMS@POWER/0 [A]	33.39322	30.38664	-3.006571
P_t@POWER/0 [W]	23041.97	22905.46	-136.5078
Q_t@POWER/0 [var]	386.5778	1459.913	1073.335
PF_t@POWER/0 []	0.999859	0.997975	-1.884e-3
U_fundRMS_SYM+@POWER/0 [V]	230.4395	247.4054	16.96588

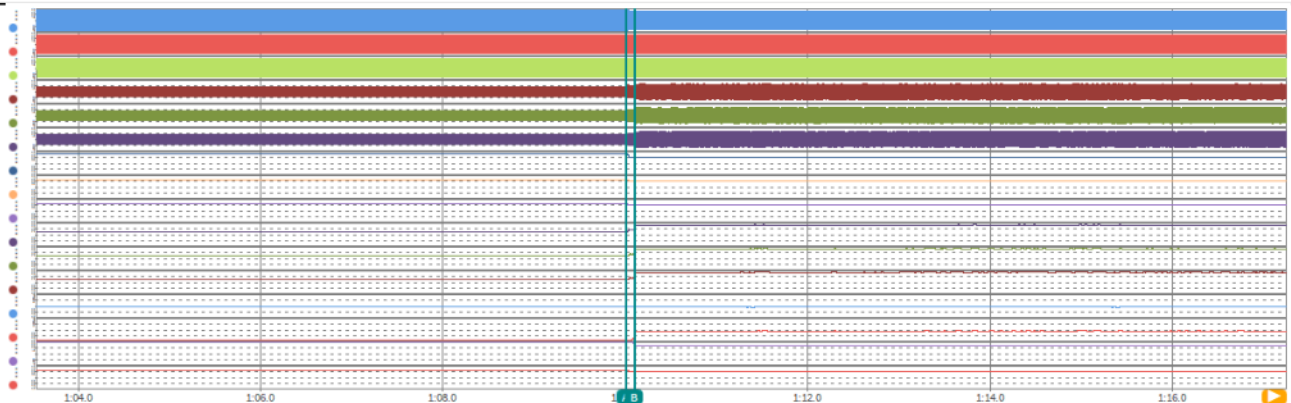


Time [s]	A	B	Delta
	0:10.23042	1:09.47263	0:59.24221
AI 1/U1 [V]	-72.99018	343.5650	416.5552
AI 1/U2 [V]	-237.6359	-284.6220	-46.98611
AI 1/U3 [V]	311.2824	-66.97369	-378.2561
AI 1/I1 [A]	34.55317	42.49025	7.937074
AI 1/I2 [A]	-62.69575	-35.30634	27.38941
AI 1/I3 [A]	28.22554	-6.172419	-34.39796
U1_tRMS@POWER/0 [V]	263.1584	264.4850	1.326660
U2_tRMS@POWER/0 [V]	238.3611	239.5683	1.207230
U3_tRMS@POWER/0 [V]	238.3327	239.3919	1.059265
I1_tRMS@POWER/0 [A]	43.84715	30.92608	-12.92107
I2_tRMS@POWER/0 [A]	44.26197	31.19189	-13.07008
I3_tRMS@POWER/0 [A]	43.42157	30.31813	-13.10345
P_t@POWER/0 [W]	22622.86	22864.34	241.4785
Q_t@POWER/0 [var]	23246.95	1445.516	-21801.43
PF_t@POWER/0 []	0.697422	0.998007	0.300586
U_fundRMS_SYM+@POWER/0 [V]	246.2337	247.4341	1.200378

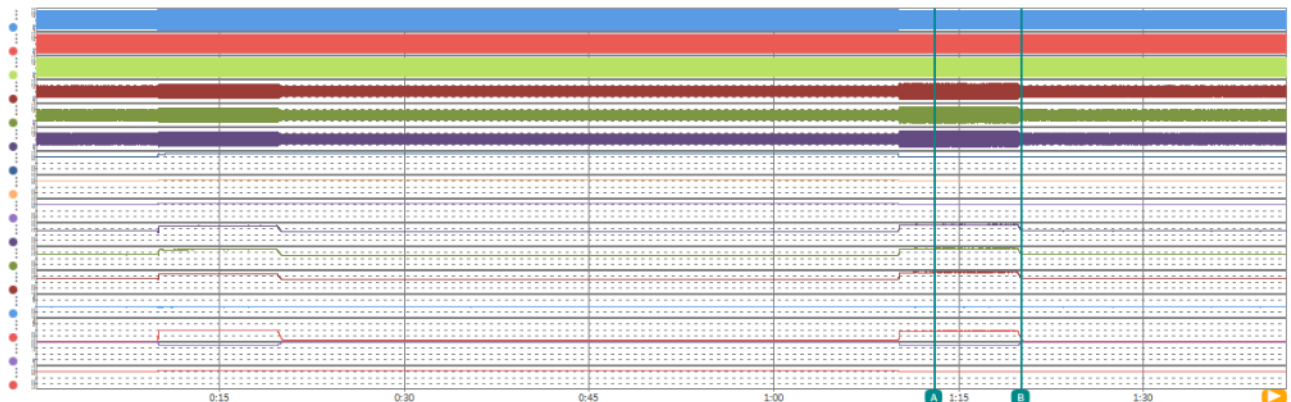
After dip

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 152 von 153
Page 152 of 153

Time [s]	A	B	Delta
	1:10.00920	1:10.10311	0.09391
AI 1/U1 [V]	43.65754	-317.7881	-361.4457
AI 1/U2 [V]	-299.4168	225.7188	525.1355
AI 1/U3 [V]	259.3610	91.84313	-167.5179
AI 1/I1 [A]	5.404830	-34.70671	-40.11154
AI 1/I2 [A]	-41.18586	64.58319	105.7690
AI 1/I3 [A]	35.63869	-30.22802	-65.86671
U1_tRMS@POWER/0 [V]	264.3749	231.0161	-33.35886
U2_tRMS@POWER/0 [V]	239.5849	231.1407	-8.444214
U3_tRMS@POWER/0 [V]	239.3882	230.8708	-8.517395
I1_tRMS@POWER/0 [A]	30.97024	37.76089	6.790648
I2_tRMS@POWER/0 [A]	31.26232	36.70574	5.443422
I3_tRMS@POWER/0 [A]	30.38664	36.17255	5.785910
P_t@POWER/0 [W]	22905.46	23363.04	457.5762
Q_t@POWER/0 [var]	1459.913	10364.27	8904.361
PF_t@POWER/0 []	0.997975	0.914092	-0.083883
U_fundRMS_SYM+@POWER/0 [V]	247.4054	231.0076	-16.39777



Time [s]	A	B	Delta
	1:13.01717	1:20.06396	7.04679
AI 1/U1 [V]	162.3600	-322.4602	-484.8202
AI 1/U2 [V]	163.9769	125.7985	-38.17845
AI 1/U3 [V]	-325.6614	196.4898	522.1513
AI 1/I1 [A]	63.41458	-47.18256	-110.5971
AI 1/I2 [A]	-16.19184	21.39425	37.58610
AI 1/I3 [A]	-47.27304	25.86436	73.13741
U1_tRMS@POWER/0 [V]	230.4523	229.8758	-0.576538
U2_tRMS@POWER/0 [V]	230.5938	229.9737	-0.620056
U3_tRMS@POWER/0 [V]	230.4234	229.8107	-0.612625
I1_tRMS@POWER/0 [A]	46.38914	33.46288	-12.92626
I2_tRMS@POWER/0 [A]	46.42680	33.61104	-12.81575
I3_tRMS@POWER/0 [A]	46.47819	33.62955	-12.84863
P_t@POWER/0 [W]	22815.92	22935.81	119.8926
Q_t@POWER/0 [var]	22588.08	3144.755	-19443.32
PF_t@POWER/0 []	0.710646	0.990731	0.280085
U_fundRMS_SYM+@POWER/0 [V]	230.4887	229.8849	-0.603906

Prüfbericht-Nr.:
Test report no.:

CN224DKW 001 Attachment 1

Seite 153 von 153
Page 153 of 153

Condition						Measurement	
	No.	Parameter	Phase ref.	Time ref.	unit		
General Info.	0	Test number	--	--	--	7.3	7.4
	1	Date	--	--	yyyy.mm.dd	2022.08.16	2022.08.16
	2	Time (start of test)	--	--	hh:mm:ss	09:38:00	09:38:00
	3	Fault type (phase)	--	--		2 phase	2 phase
	4	Setting voltage depth	Line to neutral	--	p.u.	1.15	1.15
	5	Setting dip duration		--	ms	60000	60000
	6	Point of fault entry	Total	--	s	9.9903	9.9903
	7	Point of fault clearance	Total	--	s	70.0242	70.0242
	8	Fault duration in empty load test	Total	--	ms	60034	60034
	9	Voltage depth/height in empty load test	Total	t1+100ms to t2 and t1-10s to t1	p.u.	1.149	1.149
	10		Pos.		p.u.	1.001	1.001
Before dip <t1	11	Voltage	Line to neutral	t1-100s to t1	p.u.	1.003	1.002
	12	Current	Pos.	t1-500ms to t1-100ms	p.u.	1.010	0.201
	13	Active power	Total	t1-10s to t1	p.u.	1.008	0.200
	14		Pos.			1.009	0.200
	15	Reactive power	Total	t1-10s to t1	p.u.	0.009	0.004
	16		Pos.			0.010	0.003
	17	Cos ϕ	--	t1-10s to t1	--	0.999	0.999
During dip t1 to t2	18	Voltage	Line to neutral	t1+100ms to t2-20ms	p.u.	1.150	1.150
	19	Line current	Phase 1	t1+60ms	p.u.	0.949	0.191
	20		Phase 2			0.950	0.181
	21		Phase 3			0.910	0.181
	22	Line current	Phase 1	t1+100ms	p.u.	1.036	0.253
	23		Phase 2			1.042	0.253
	24		Phase 3			1.048	0.259
	25	Active power	Total	t1+100ms to t2-20ms	p.u.	0.953	0.197
	26		Pos.			1.005	0.199
After dip > t2	27	Voltage	Line to neutral	t2+3s to t2+10s	p.u.	1.003	1.002
	28	Active power	Total	t2+3s to t2+10s	p.u.	0.958	0.198
	29		Pos.			1.002	0.199
	30	Active power rising time	Pos.	--	s	0.109	0.094
	31	Reactive power	Total	t2+3s to t2+10s	p.u.	N/A	N/A
	32		Pos.			N/A	N/A
	33	Reactive power rising time	Pos.	--	s	N/A	N/A
	34	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	Yes	Yes



PHOTO DOCUMENTATION

CN224DKW 001 ATTACHMENT 2

for

SOLAR INVERTER

SUN2000-100KTL-M2, SUN2000-115KTL-M2

HUAWEI TECHNOLOGIES CO., LTD.



This documentation consists of 4 pages (excluding this cover page)

Model: as cover



Figure 1. Front view



Figure 2. Left view

Model: as cover



Figure 3. Right view



Figure 4. Top view

Model: as cover



Figure 5. AC Connect view



Figure 6. DC Connect view