Prüfbericht-Nr.: *Test Report No.*:	CN224DKW 001	**Auftrags-Nr.:** *Order No.*:	168385936	Seite 1 von 9 *Page 1 of 9*
Kunden-Referenz-Nr.: *Client Reference No.*:	1282992	**Auftragsdatum:** *Order date*:	2022.08.10	
Auftraggeber: *Client*:	**HUAWEI TECHNOLOGIES CO., LTD.** Administration Building, Headquarters of Huawei Technologies Co., Ltd. Bantian, Longgang District, Shenzhen, 518129 Guangdong, P.R. China			
Prüfgegenstand: *Test item*:	SOLAR INVERTER			
Bezeichnung / Typ-Nr.: *Identification / Type No.*:	SUN2000-100KTL-M2, SUN2000-115KTL-M2			
Auftrags-Inhalt: *Order content*:	A3 certificate			
Prüfgrundlage: *Test specification*:	VDE-AR-N 4105/11.18 *Generators connected to the low-voltage distribution network – Technical requirements for the connection to and parallel operation with low-voltage distribution networks* DIN VDE V 0124-100/06.20 *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*			

Wareneingangsdatum: *Date of receipt*:	2022.08.10
Prüfmuster-Nr.: *Test sample No.*:	Engineering samples
Prüfzeitraum: *Testing period*:	2022.08.10 – 2022.10.19
Ort der Prüfung: *Place of testing*:	TÜV Rheinland (Shanghai) Co., Ltd.
Prüflaboratorium: *Testing laboratory*:	TÜV Rheinland (Shanghai) Co., Ltd.
Prüfergebnis*: *Test result**:	Pass

erstellt von: / *created by:*			**genehmigt von:** / authorized by:		
2022.11.01	Edward Li / PE	Edward Li	2022.11.01	Zhiwei Yan / Reviewer	Zhiwei Yan
Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*	**Datum** *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*

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: *Condition of the test item at delivery*: Prüfmuster vollständig und unbeschädigt *Test item complete and undamaged*

* 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*

V05

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.

Produktbeschreibung
Product description

1	**Produktdetails** *Product details*	See below.

Copy of marking plate:

Produktbeschreibung
Product description

Product description:

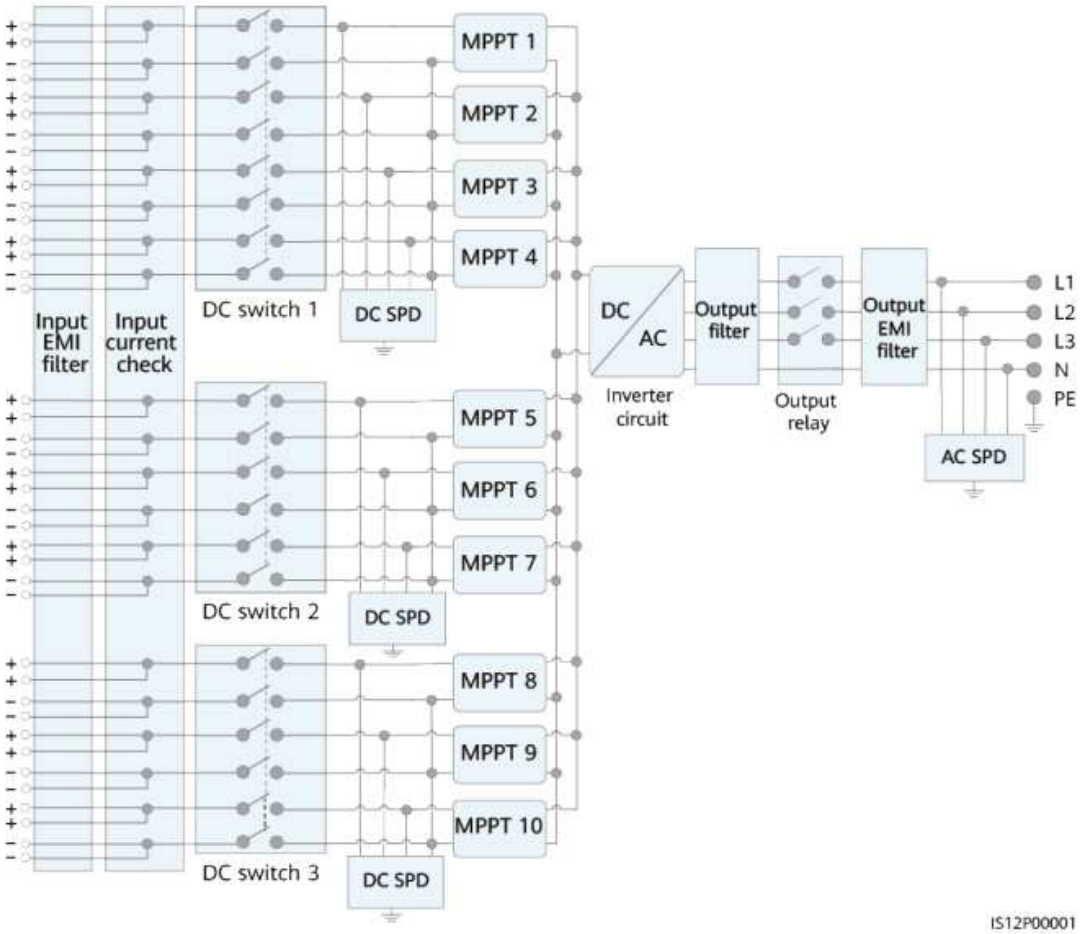
The equipment with model name SUN2000-100KTL-M2 and SUN2000-115KTL-M2 are three phase non-isolated type Solar Inverter which will be installed and connected to the grid network.
The equipment shall be fixed to suitable manner as specified in the installation instruction.

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 gird 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 gird, when any grid fault had happened.



Block Diagram

Model Difference:

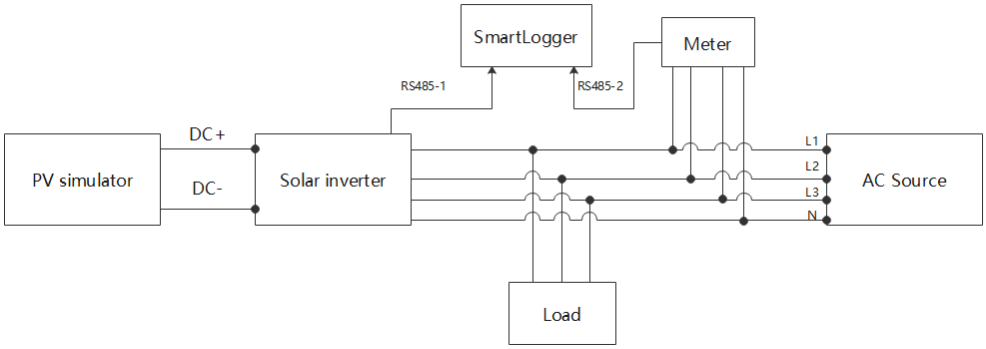
The models SUN2000-100KTL-M2 and SUN2000-115KTL-M2 are same as the construction, hardware and software, except the output power is different due to be adjusted by software.

Produktbeschreibung
Product description

Remote control and logical interface:

Remote control and logical interface is through RS485/USB.

$P_{AV,E}$ 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	

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_{Emax} [kVA]	110	125
	Rated Output Current Ir [A]	144.4	166.0
	Max. Output Current Imax [A]	160.4	182.3
	Power Factor cosφ [λ]	0.8 leading ~0.8lagging	
	THD [Ѵ / 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 [ºC]	-25°C to +60°C	
	Pollution degree (PD)	PD3	
	Altitude [m]	4000m	
	Size(W*H*D) [mm]	1035*700*365	
	Weight [kg]	93	
Note:			

Produktbeschreibung
Product description

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

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

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

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.: *Test Report No.*:	See test report CN224DKW 001	**Auftrags-Nr.:** *Order No.*:	See test report CN224DKW 001	Seite 1 von 153 *Page 1 of 153*
Kunden-Referenz-Nr.: *Client Reference No.*:	See test report CN224DKW 001	**Auftragsdatum:** *Order date*:	See test report CN224DKW 001	
Auftraggeber: *Client*:	See test report CN224DKW 001			
Prüfgegenstand: *Test item*:	See test report CN224DKW 001			
Bezeichnung / Typ-Nr.: *Identification / Type No.*:	See test report CN224DKW 001			
Auftrags-Inhalt: *Order content*:	A3 certificate			
Prüfgrundlage: *Test specification*:	DIN VDE V 0124-100/06.20 *Netzintegration von Erzeugungsanlagen –Niederspannung –Prüfanforderungen an Erzeugungseinheiten vorgesehen zum Anschluss und Parallelbetrieb am Niederspannungsnetz* *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*			
Wareneingangsdatum: *Date of receipt*:	See test report CN224DKW 001	See test report CN224DKW 001		
Prüfmuster-Nr.: *Test sample No.*:	See test report CN224DKW 001			
Prüfzeitraum: *Testing period*:	See test report CN224DKW 001			
Ort der Prüfung: *Place of testing*:	See test report CN224DKW 001			
Prüflaboratorium: *Testing laboratory*:	See test report CN224DKW 001			
Prüfergebnis*: *Test result**:	Pass			

erstellt von: / *created by:*			**genehmigt von:** / authorized by:		
See test report CN224DKW 001			See test report CN224DKW 001		
Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*	**Datum** *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*

Sonstiges / *Other*:

Zustand des Prüfgegenstandes bei Anlieferung: *Condition of the test item at delivery*: Prüfmuster vollständig und unbeschädigt *Test item complete and undamaged*

* 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*

V05

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

Liste der verwendeten Prüfmittel
List of used test equipment

See test report CN224DKW 001

Produktbeschreibung
Product description

See test report CN224DKW 001

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. *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.*	
5	**Prüfungen** ***Tests***	
5.1	**Allgemeines** ***General information***	**P**
5.2	**Nachweis zulässger Netzrückwirkungen** ***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 synchrouzation***	**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**

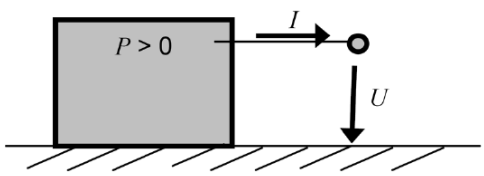
ZUSATZ-DOKUMENTATION
ADDITIONAL DOCUMENTATION

See following pages for test data.

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

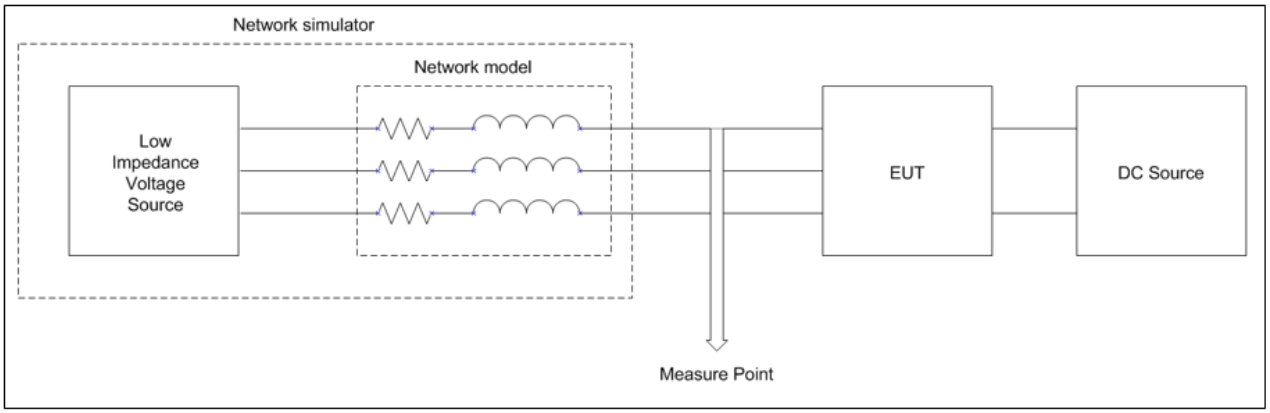
Testing Location: See cover page	
Name:	See cover page
Address:	See cover page

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.

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 cosφ)	
	5.4.8.3	Tests of displacement factor- / active power character curve (cosφ(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)		

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	$C_{\psi k}$	Pst	$C_{\psi k}$	Pst	$C_{\psi k}$	Pst	$C_{\psi k}$
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	$C_{\psi k}$	Pst	$C_{\psi k}$	Pst	$C_{\psi k}$	Pst	$C_{\psi k}$
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							

	30°		50°		70°		85°	
P/Pn [%]	Pst	$C_{\Psi k}$	Pst	$C_{\Psi k}$	Pst	$C_{\Psi k}$	Pst	$C_{\Psi k}$
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	$C_{\Psi k}$	Pst	$C_{\Psi k}$	Pst	$C_{\Psi k}$	Pst	$C_{\Psi k}$
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	$C_{\Psi k}$	Pst	$C_{\Psi k}$	Pst	$C_{\Psi k}$	Pst	$C_{\Psi k}$
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

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	$C_{\psi k}$	Pst	$C_{\psi k}$	Pst	$C_{\psi k}$	Pst	$C_{\psi k}$
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/In [%]										
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

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

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	--

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	--

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/In [%]											
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	--

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	--

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_{Emax}	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 Idc / In [%]			Limit 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%

> 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
cosφ	S/S_{Emax} [%]	S_{asy}/S_{Emax} [%]					S_{asy}/S_{Emax} [%]
1.0	100	0.20%	0.21%	0.21%	0.20%	0.21%	≤ ±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):								

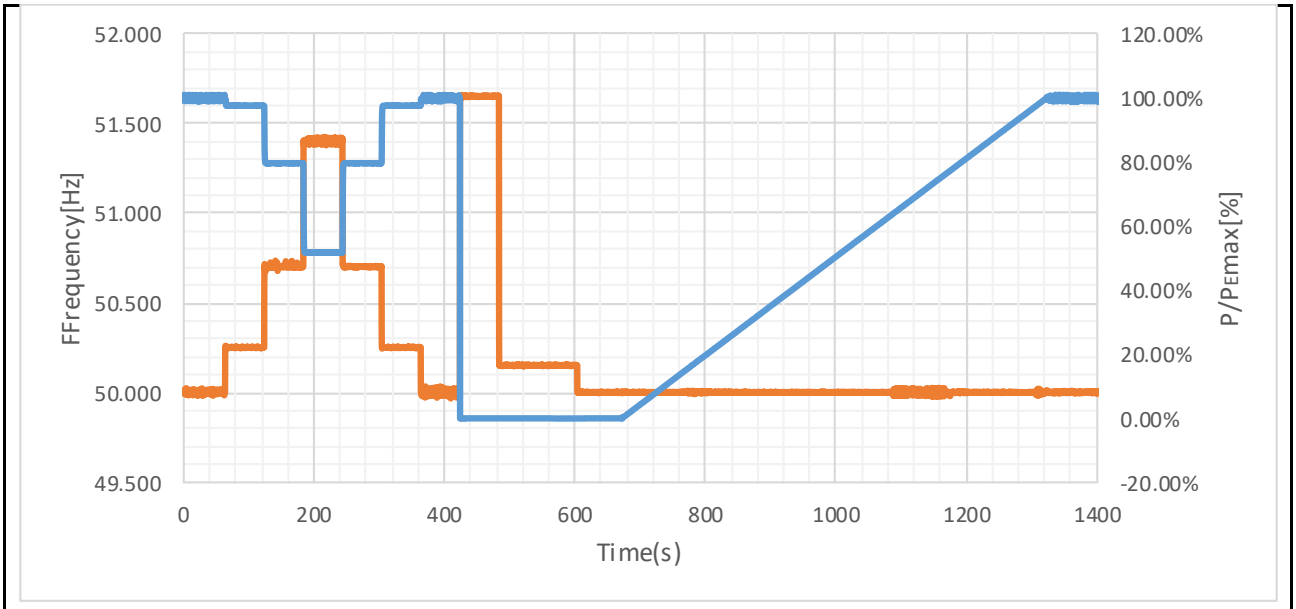
5.4.3(a)	TABLE: Active power reduction through setting provision (P control)		P
Test Conditions	Measurements		Limit
P/Pn [%]	P/P_n [%]	$\Delta P/P_n$ [%]	Δ P/Pn [%]
100	99.94	-0.06	≤ 5%
90	90.27	0.27	
80	80.24	0.24	
70	70.20	0.2	
60	60.14	0.14	
50	50.12	0.12	
40	40.06	0.06	
30	30.02	0.02	
20	19.98	-0.02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

5.4.3(b)	TABLE: Active power reduction through setting provision (P control)	P
Test Conditions	Measurements	Limit
P/Pn [%]	ΔP/Δt [%Pn/s]	ΔP/Δt [%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/Pn [%]	$T_{response}$ [s]	$T_{response}$ [s]
100->0	1.2	≤ 5
Note(s):		

5.4.4(a)	TABLE: Active power output of PGU by over-frequency (LFSM-O)								P		
LFSM-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_{rim} [%]	P/P_{Emax} [%]	f [Hz]	T_{rise} [s]	T_{set} [s]	T_v [s]	P/P_{Emax} [%]	$\Delta P/P_{Emax}$ [%]	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_{rim} [%]	P/P_{Emax} [%]	f [Hz]	Δ$P/Δt$ [%/min]	P/P_{Emax} [%]	$\Delta P/P_{Emax}$ [%]	ΔP [%]	Δ$P/Δt$ [%/min]
50.00	100	99.87	50.00	9.20	100	-0.13	≤±10	≤10
Note(s):								
Plotting diagram:								

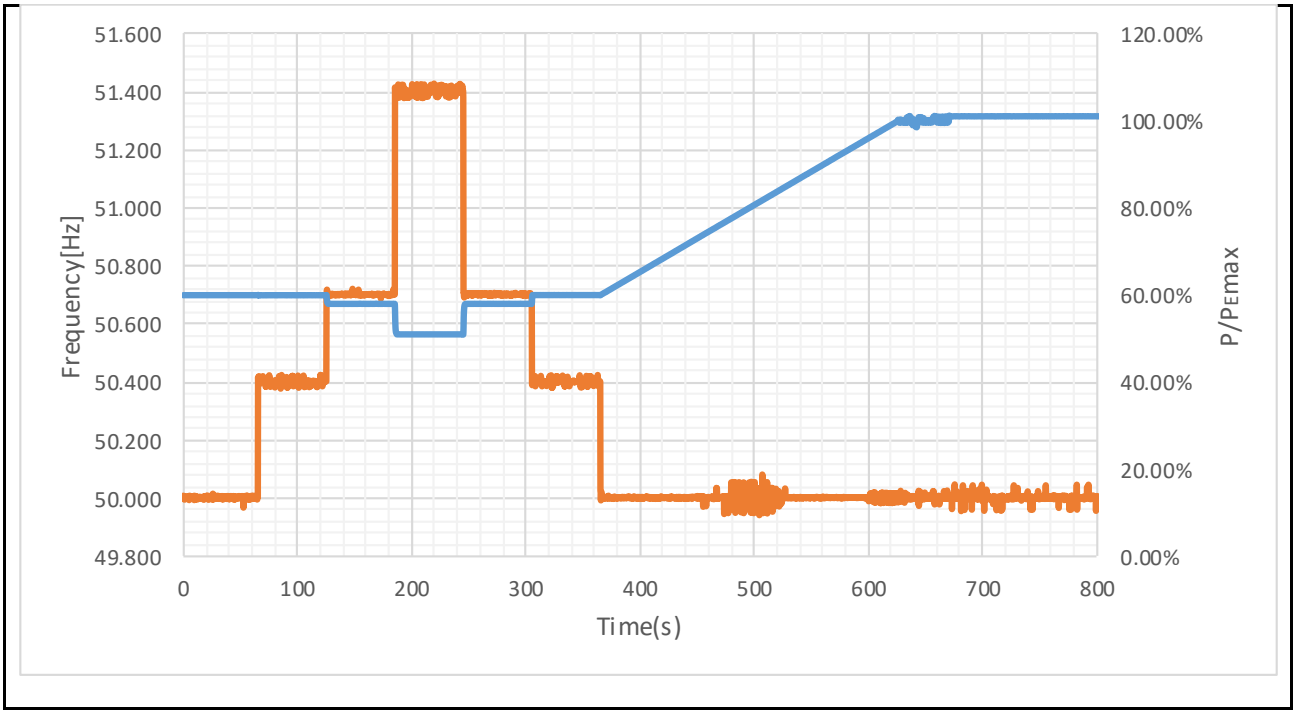


5.4.4(b)	TABLE: Active power output of PGU by over-frequency (LFSM-O)									P
LFSM-O settings	f_{active}		f_{stop}		$f_{deactive}$		Droop			
	50.5		N/A		50.2		12%(16.67%P_M/Hz)			
Test Conditions	Measurements						Target	Tolerance	Limit		
f [Hz]	P_{rim} [%]	P/P_{Emax} [%]	f [Hz]	T_{rise} [s]	T_{set} [s]	T_v [s]	P/P_{Emax} [%]	$\Delta P/P_{Emax}$ [%]	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_{Emax} [%]	f [Hz]	$\Delta P/\Delta t$ [%/min]	P/P_{Emax} [%]	$\Delta P/P_{Emax}$ [%]	ΔP [%]	$\Delta P/\Delta t$ [%/min]
50.00	100	101.09	50.00	9.21	100	1.09	≤±10	≤10

Note(s):

Plotting diagram:



5.4.5(a)	TABLE: Active power output of ESS by over-frequency (LFSM-O)										N/A
LFSM-O settings	f_{active}		f_{stop}			$f_{deactive}$			Droop		
	50.2		N/A			50.2			5%(40%P_{Emax}/Hz)		
Test Conditions			Measurements					Target	Tolerance	Limit		
f [Hz]	P_{rim} [%]	P/P_{Emax} [%]	f [Hz]	T_{rise} [s]	T_{set} [s]	T_v [s]		P/P_{Emax} [%]	$\Delta P/P_{Emax}$ [%]	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_{rim} [%]	P/P_{Emax} [%]	f [Hz]	$\Delta P/\Delta t$ [%/min]				P/P_{Emax} [%]	$\Delta P/P_{Emax}$ [%]	ΔP [%]	$\Delta P/\Delta t$ [%/min]	
50.00	100							100		≤±10	≤10	
Note(s):												
Plotting diagram:												

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_{Emax}/Hz)			
Test Conditions	Measurements					Target	Tolerance	Limit			
f [Hz]	P_{rim} [%]	P/P_{Emax} [%]	f [Hz]	T_{rise} [s]	T_{set} [s]	T_v [s]	P/P_{Emax} [%]	$\Delta P/P_{Emax}$ [%]	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_{rim} [%]	P/P_{Emax} [%]	f [Hz]	$\Delta P/\Delta t$ [%/min]	P/P_{Emax} [%]	$\Delta P/P_{Emax}$ [%]	ΔP [%]	$\Delta P/\Delta t$ [%/min]
50.10	100				100		≤±10	≤10
50.00	100			--	100		≤±10	--

Note(s):

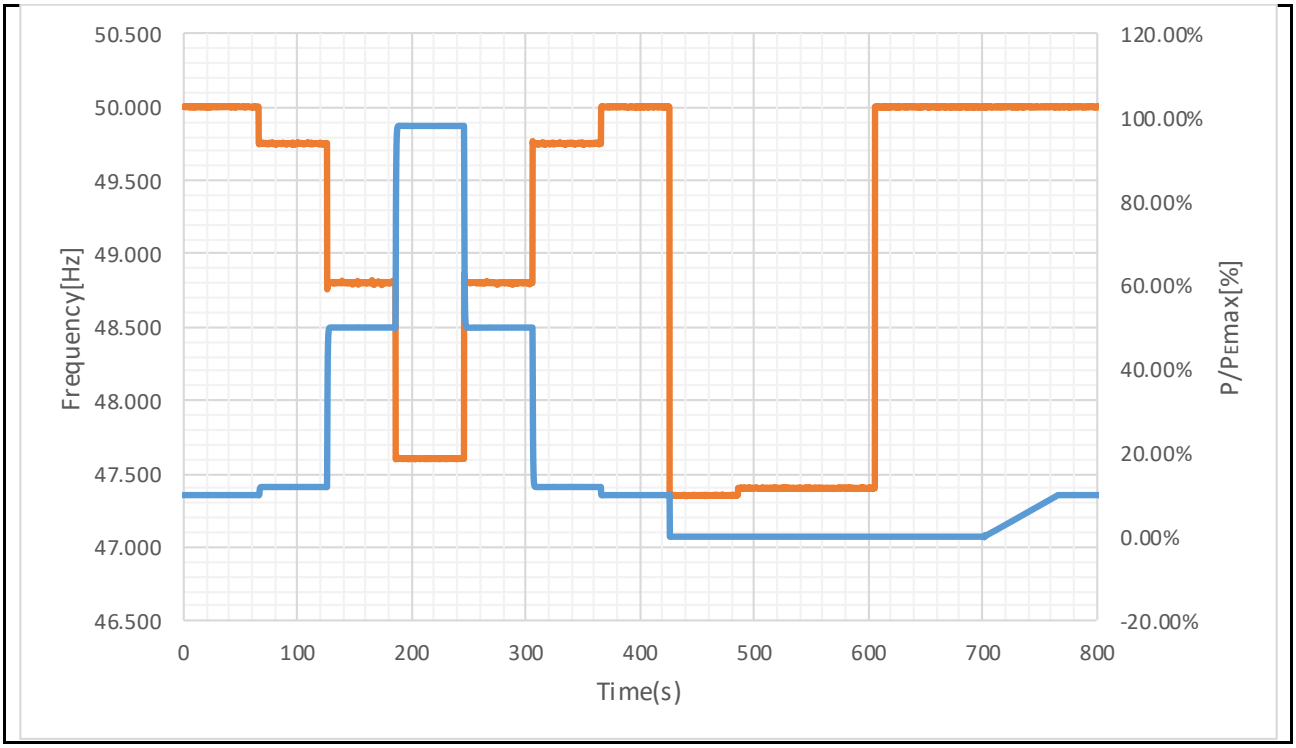
Plotting diagram:

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_{Emax}/Hz)			
Test Conditions	Measurements					Target	Tolerance	Limit			
f [Hz]	P_{rim} [%]	P/P_{Emax} [%]	f [Hz]	T_{rise} [s]	T_{set} [s]	T_v [s]	P/P_{Emax} [%]	$\Delta P/P_{Emax}$ [%]	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	--			

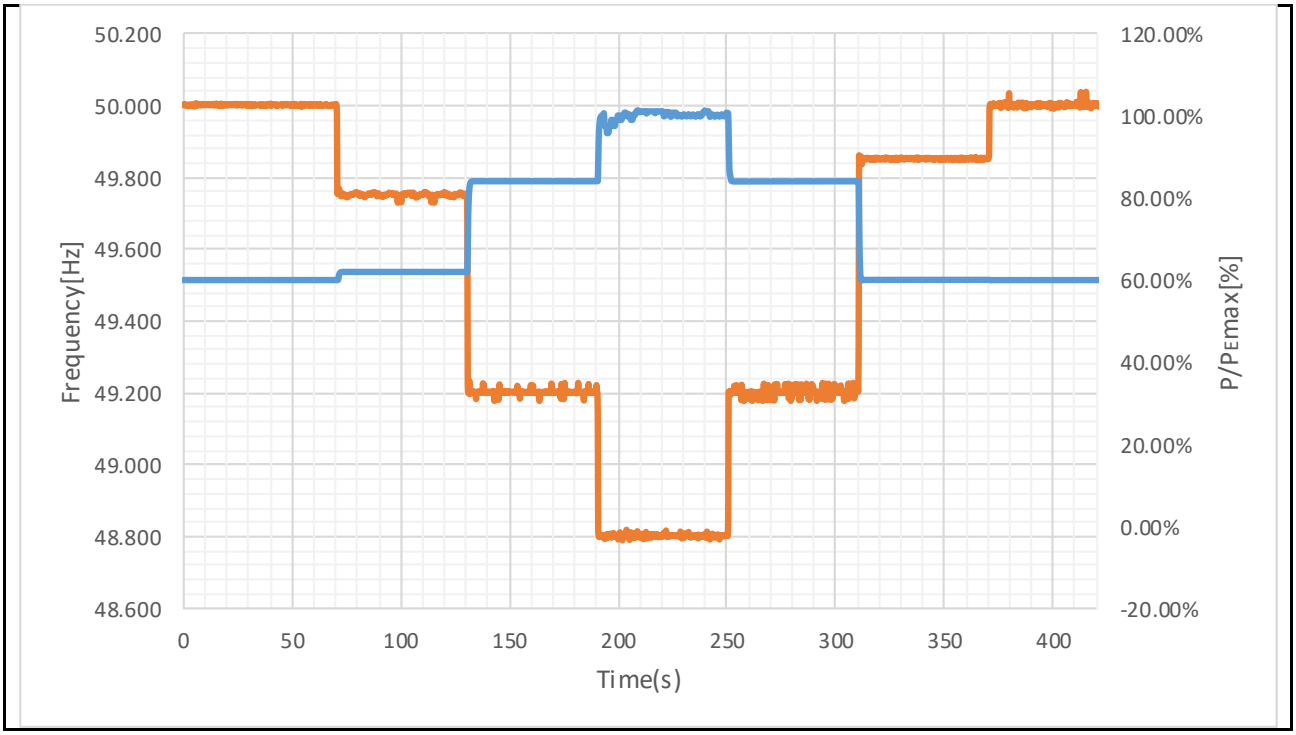
Test Conditions		Measurements			Target	Tolerance	Limit	
f [Hz]	P_{rim} [%]	P/P_{Emax} [%]	f [Hz]	$\Delta P/\Delta t$ [%/min]	P/P_{Emax} [%]	$\Delta P/P_{Emax}$ [%]	ΔP [%]	$\Delta P/\Delta t$ [%/min]
50.00	100	9.91	50.00	9.21	10	-0.09	≤±10	≤10

Note(s):
Product power was limited to 10% at the beginning of test by a lower priority command from user.

Plotting diagram:



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_{Emax}/Hz)		
Test Conditions	Measurements						Target	Tolerance	Limit		
f [Hz]	P_{rim} [%]	P/P_{Emax} [%]	f [Hz]	T_{rise} [s]	T_{set} [s]	T_v [s]	P/P_{Emax} [%]	$\Delta P/P_{Emax}$ [%]	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:											



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_{Emax}/Hz)		
Test Conditions		Measurements					Target	Tolerance	Limit		
f [Hz]	P_{rim} [%]	P/P_{Emax} [%]	f [Hz]	T_{rise} [s]	T_{set} [s]	T_v [s]	P/P_{Emax} [%]	$\Delta P/P_{Emax}$ [%]	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_{Emax} [%]	f [Hz]	$\Delta P/\Delta t$ [%/min]	P/P_{Emax} [%]	$\Delta P/P_{Emax}$ [%]	ΔP [%]	$\Delta P/\Delta t$ [%/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:

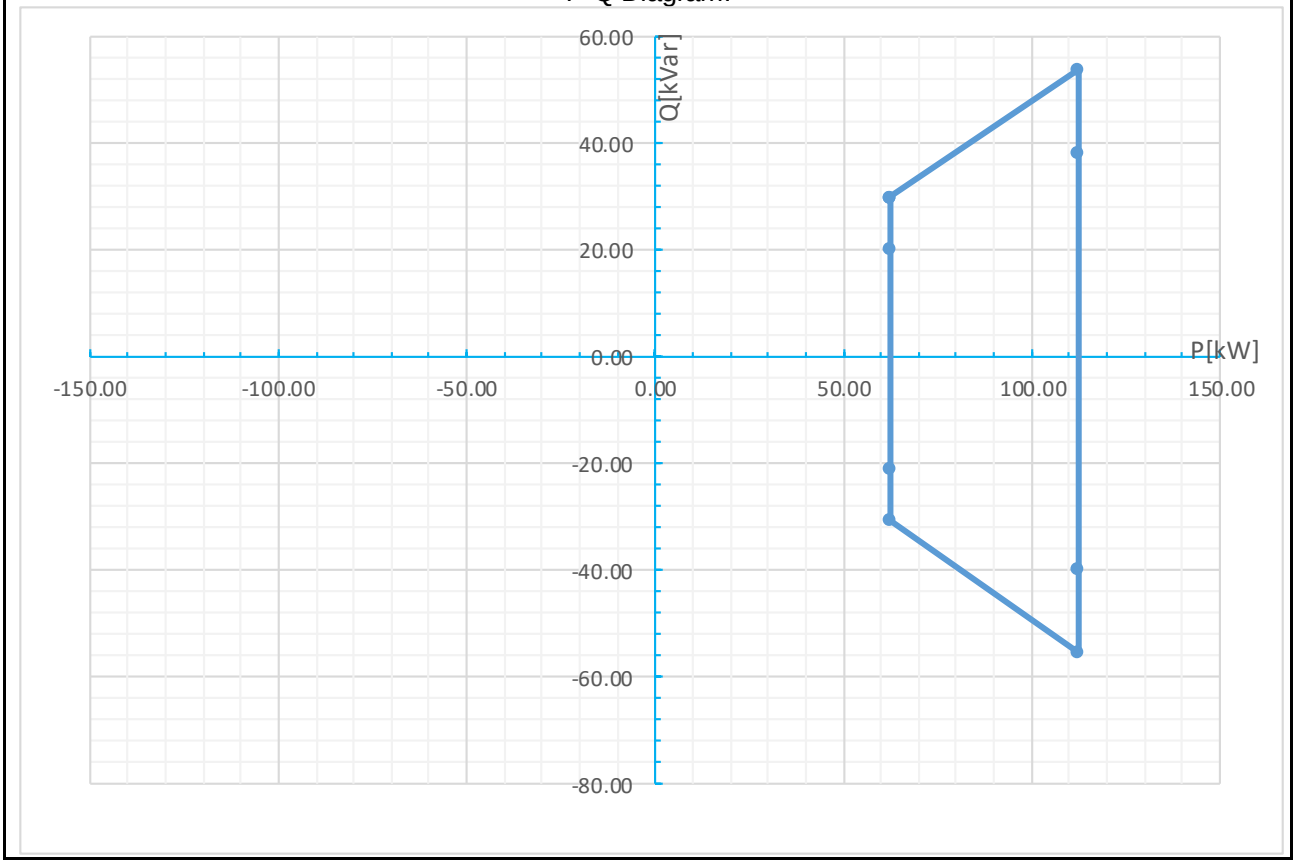
5.4.7(b)	TABLE: Active power output of ESS by under-frequency (LFSM-U)										N/A
LFSM-U settings	f_{active}		f_{stop}		$f_{deactive}$			Droop			
	49.8		N/A		49.8			2%(100%P_{Emax}/Hz)			
Test Conditions	Measurements						Target	Tolerance	Limit		
f [Hz]	P_{rim} [%]	P/P_{Emax} [%]	f [Hz]	T_{rise} [s]	T_{set} [s]	T_v [s]	P/P_{Emax} [%]	$\Delta P/P_{Emax}$ [%]	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_{Emax} [%]	cosφ	P [W]	Q [Var]	S [VA]	U [V]	cosφ	Q [Var]	$\Delta Q/P_{Emax}$ [%]	$\Delta Q/P_{Emax}$ [%]
90	50	0.90 under-excited	62501	-30554	69571	207.48	0.898	-30271	0.23	≤± 4
90	S_{Emax}		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_{Emax}		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_{Emax}		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_{Emax}		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_{Emax}		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_{Emax}		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_{Emax}		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_{Emax}		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_{Emax}		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_{Emax}		104416	33662	109707	207.82	0.952	34320	0.53	≤± 4
100	50		62606	20268	65805	230.58	0.951	20578	0.25	≤± 4

100	S_{Emax}		119204	38348	125221	230.87	0.952	39180	0.67	≤± 4
110	50		62600	20264	65798	253.58	0.951	20576	0.25	≤± 4
110	S_{Emax}		119047	38569	125138	253.83	0.951	39129	0.45	≤± 4

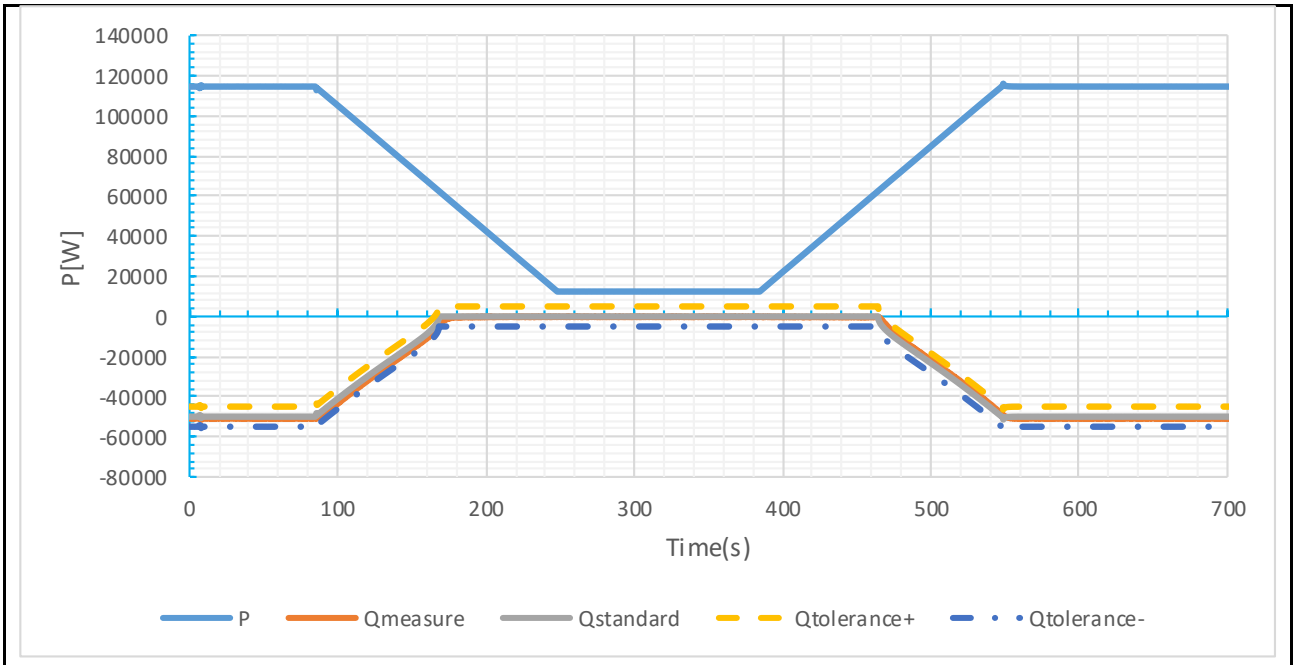
Note(s):

P-Q Diagram:

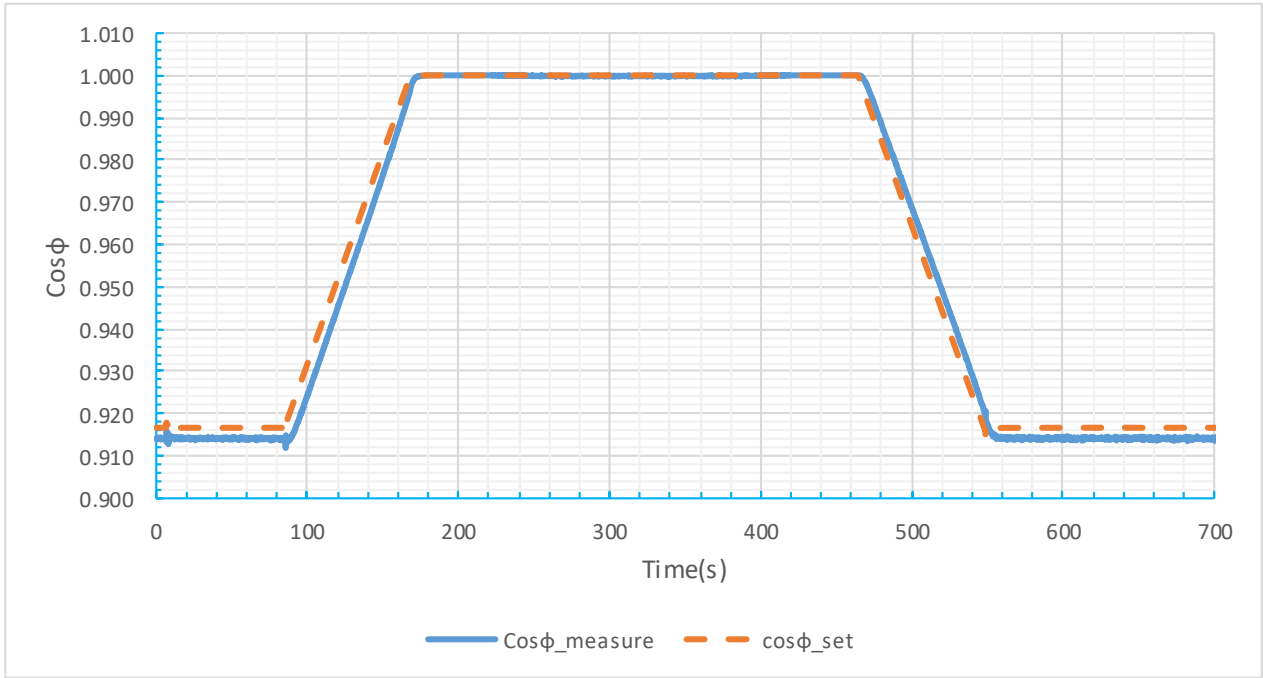


5.4.8.3(a)	TABLE: Tests of displacement factor- / active power character curve (cosφ(P))			P
cosφ (P) curve settings:	P/P_{Emax} [%]	10	50	100
	cosφ	1.0	1.0	0.9
	3Tau [s]	10		

Test Conditions	Limit
$P_{dc}/P_{dc,r}$ [%]	$\Delta Q/P_{Emax}$ [%]
100->10->100 with ramp ≤30%$P_{dc,r}$/min	≤±4.0
Plotting diagram: $P_{AC}(t)$, $Q_{measure}(t)$, $Q_{standard}(t)$, $Q_{tolerance}(t)$	



Cosφ(t)

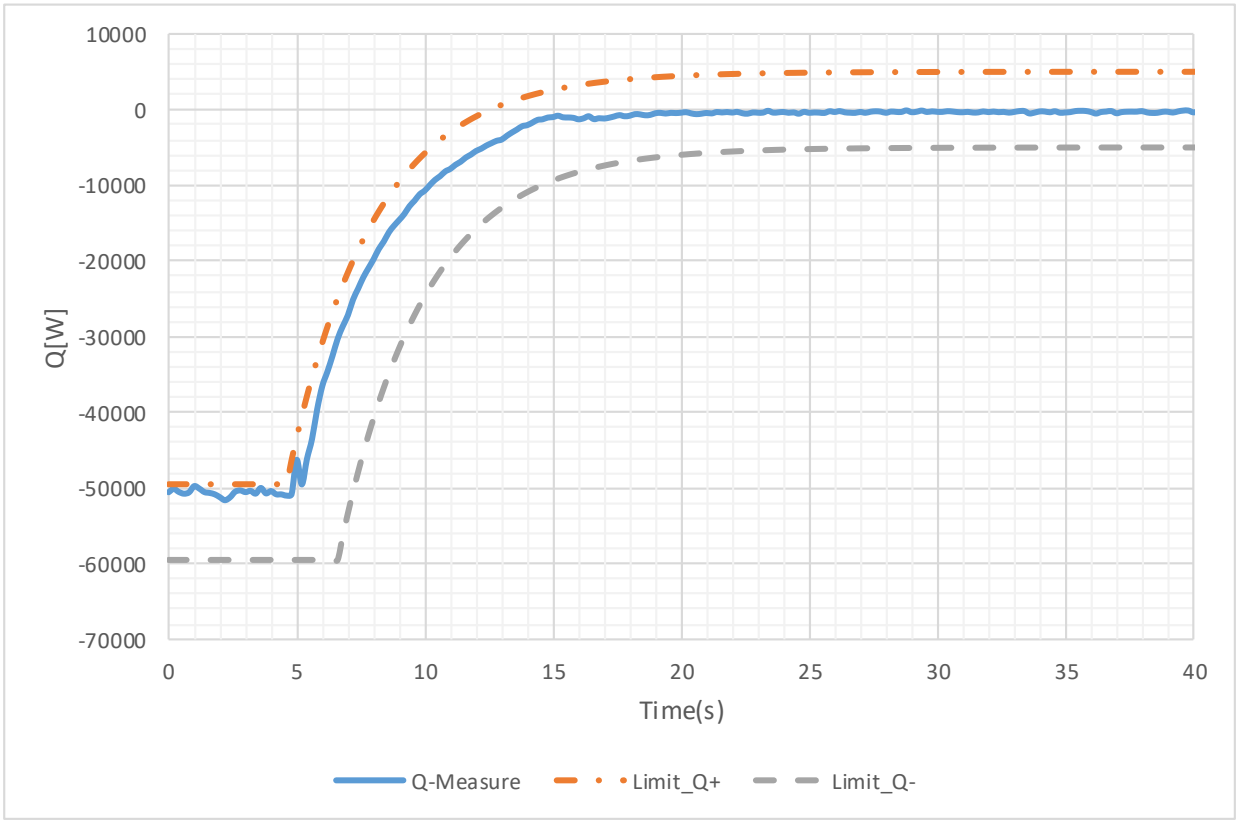


5.4.8.3(b)	TABLE: Tests of displacement factor- / active power character curve (cosφ(P))	P

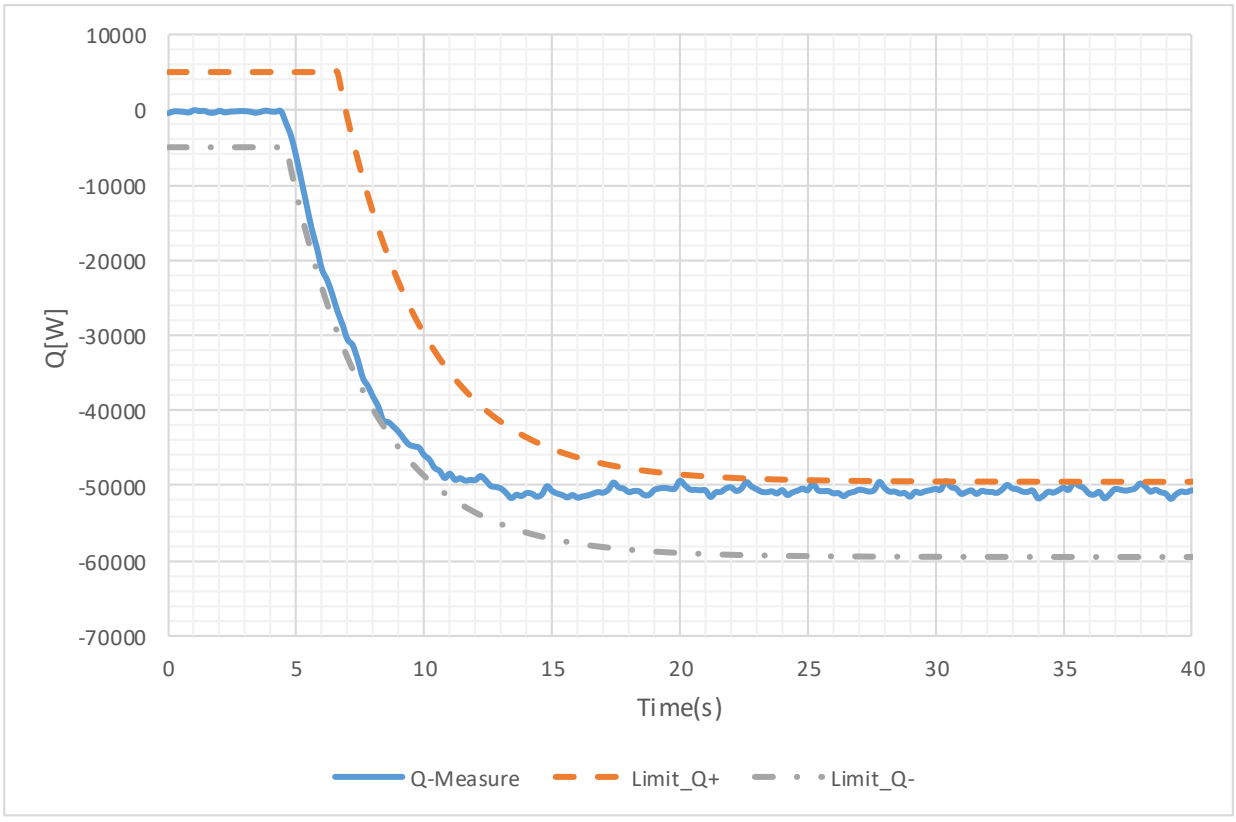
Test Conditions	Measurements	Limit
$P_{rim}/P_{dc,r}$ [%]	Response time T [s]	Response time T [s]
100->40	9.8	Complied with PT-1 curve
40->100	8.0	
100->75	8.6	

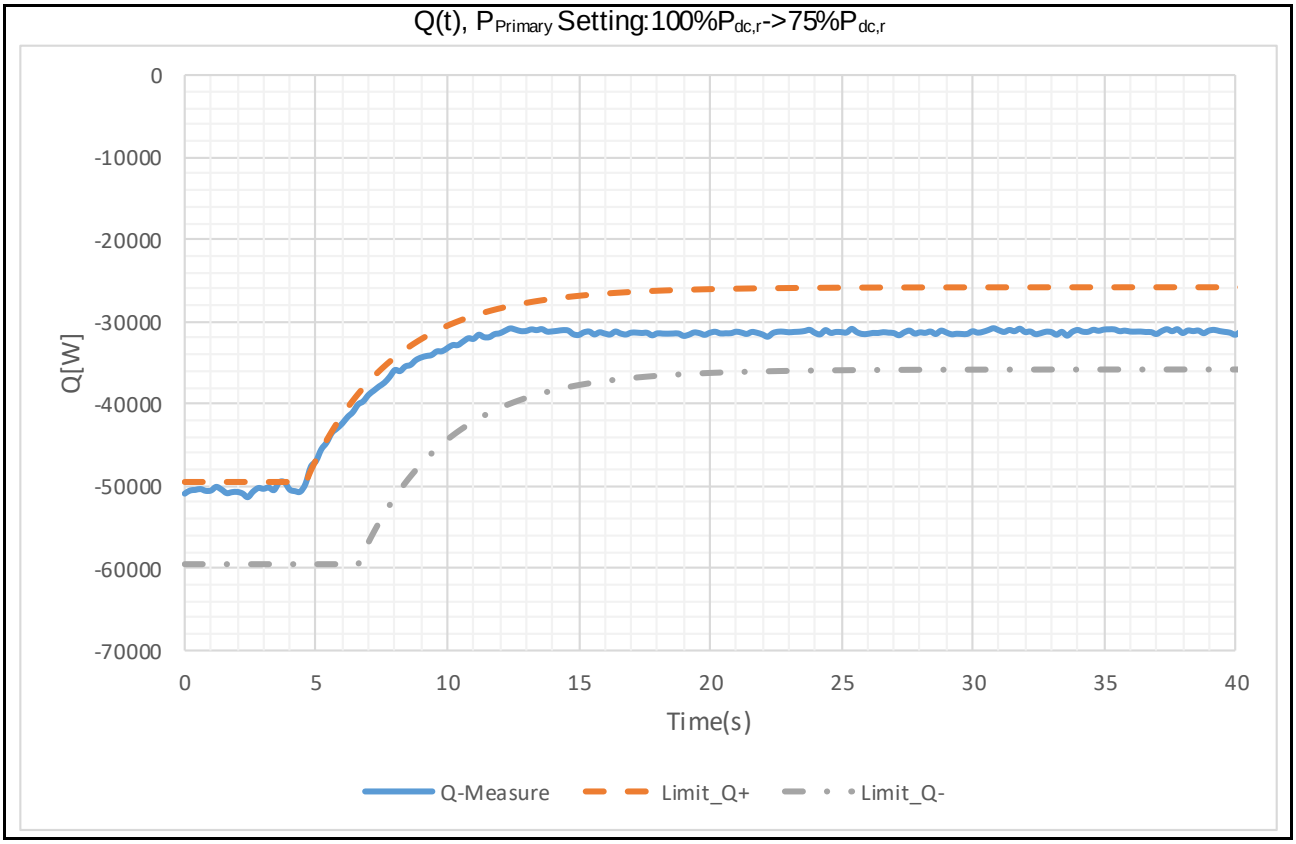
Plotting diagram:

Q(t), $P_{Primary}$ Setting:100%$P_{dc,r}$->40%$P_{dc,r}$



Q(t), $P_{Primary}$ Setting:40%$P_{dc,r}$->100%$P_{dc,r}$



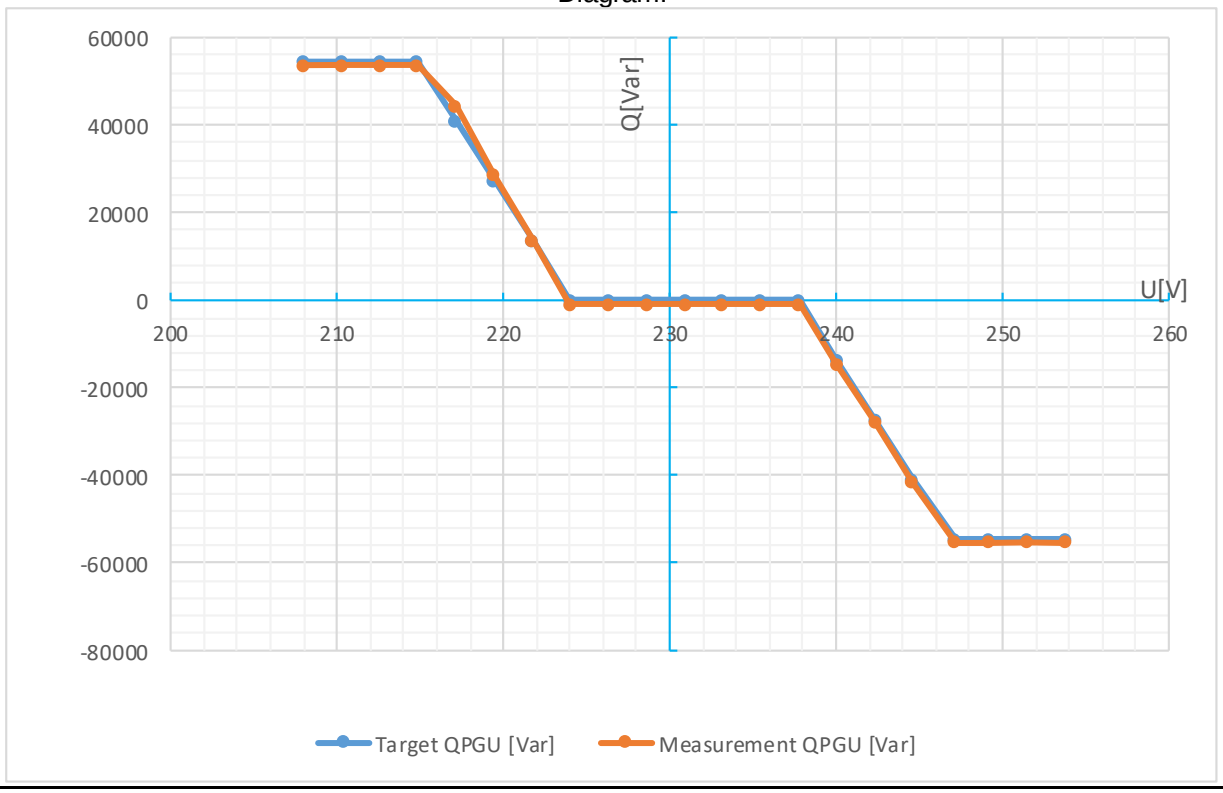


5.4.8.4(a)	TABLE: Tests of reactive power-voltage character curve (Q(U))				P
Q (U) curve settings:	U/Un	0.93	0.97	1.03	1.07
	Q/S_{Emax}	+0.436	0	0	-0.436
	3Tau [s]	10			

Test Conditions	Measurements		Target	Tolerance	Limit
U/Un[%]	Q[Var]	U [V]	Q[Var]	$\Delta Q/P_{Emax}$[%]	ΔQ [Var]
100	-1017	230.95	0	-0.81	±(0.01*Un,Y*KQU +0.04PEmax), KQU=|Qmax|/ (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	

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:

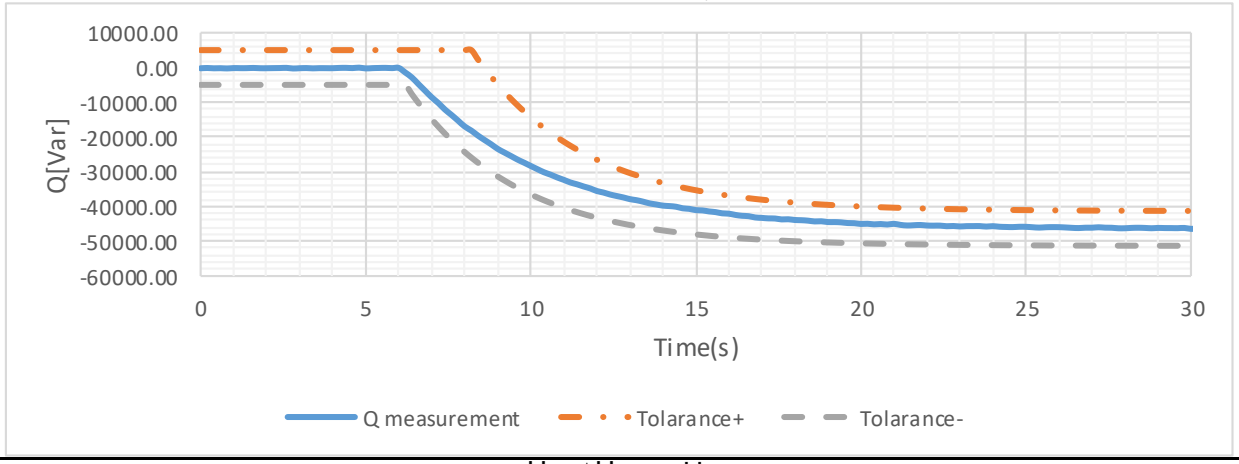


5.4.8.4(b)	TABLE: Tests of reactive power-voltage character curve (Q(U))	P

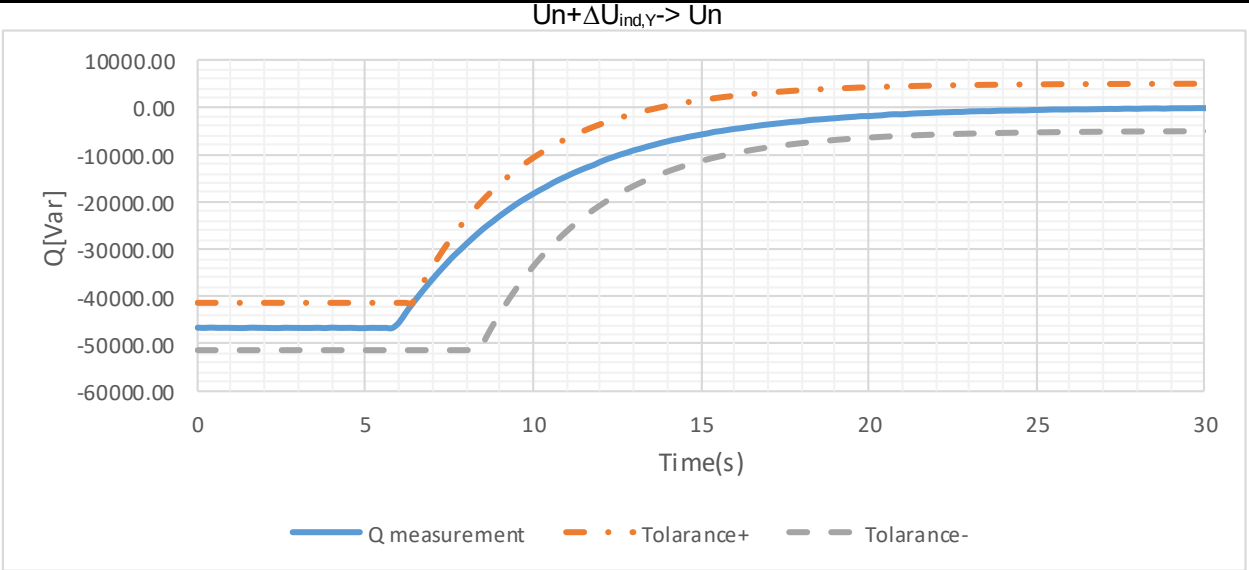
Test Conditions	Measurement			Target	Limit	
	Settling time T [s]	Q_{Start} [Var]	Q_{end} [Var]	Q_{end}/S_{Emax} [%]	Settling time T [s]	$\Delta Q_{end}/P_{Emax}$ [%]
Un -> Un+$\Delta U_{ind,Y}$	12.4	-129	-44064	-0.85Qmax	PT1 complied, See attached curve for detail.	≤±4
Un+$\Delta U_{ind,Y}$-> Un	12.4	-46651	-35	0		≤±4
Un -> Un+$\Delta U_{ind,Y}$	12.4	-139	-44061	-0.85Qmax		≤±4
Un+$\Delta U_{ind,Y}$-> Un	12.4	-46591	-282	0		≤±4
Un -> Un+$\Delta U_{ind,Y}$	12.4	-239	-44059	-0.85Qmax		≤±4
Un+$\Delta U_{ind,Y}$-> Un	12.4	-46567	-280	0		≤±4
Un -> Un+$\Delta U_{cap,Y}$	13	-213	44115	0.85Qmax		≤±4
Un+$\Delta U_{cap,Y}$-> Un	13	46536	37	0		≤±4
Un -> Un+$\Delta U_{cap,Y}$	13	-93	44041	0.85Qmax		≤±4
Un+$\Delta U_{cap,Y}$-> Un	13	46555	11	0		≤±4
Un -> Un+$\Delta U_{cap,Y}$	13.2	-156	44043	0.85Qmax		≤±4
Un+$\Delta U_{cap,Y}$-> Un	13	46566	-13	0		≤±4

Plotting Diagram

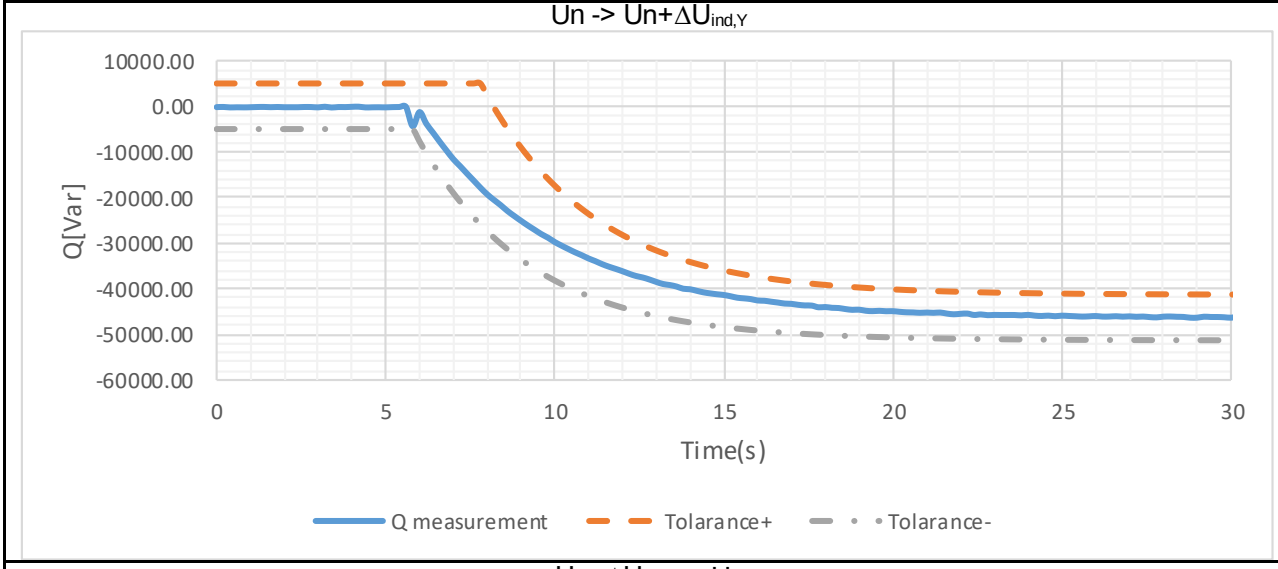
Un -> Un+$\Delta U_{ind,Y}$



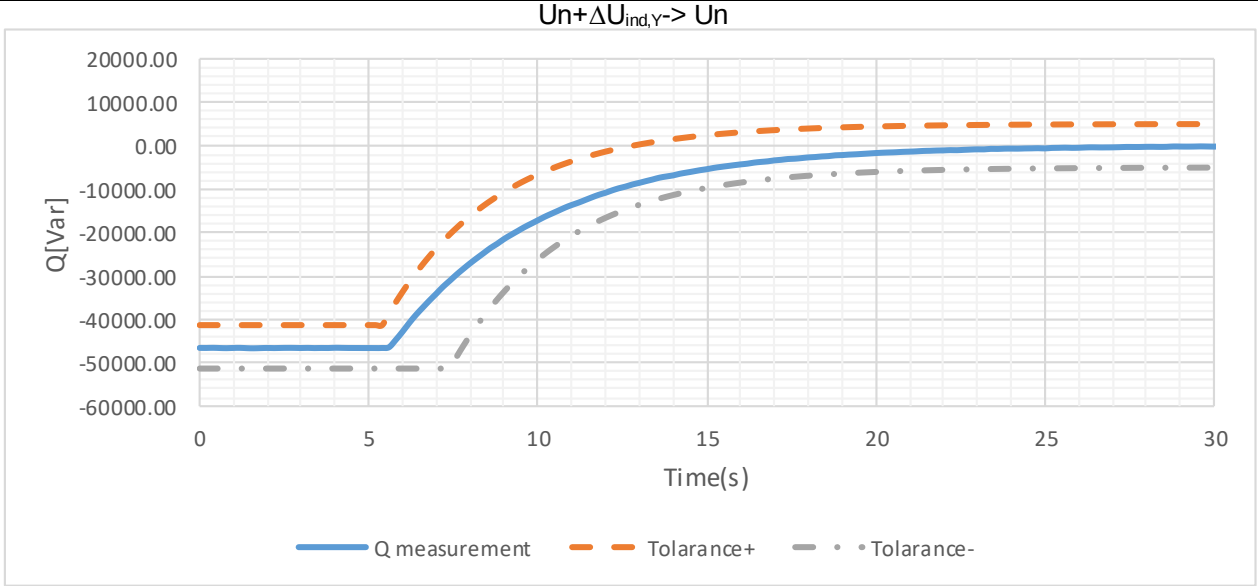
Un+$\Delta U_{ind,Y}$-> Un



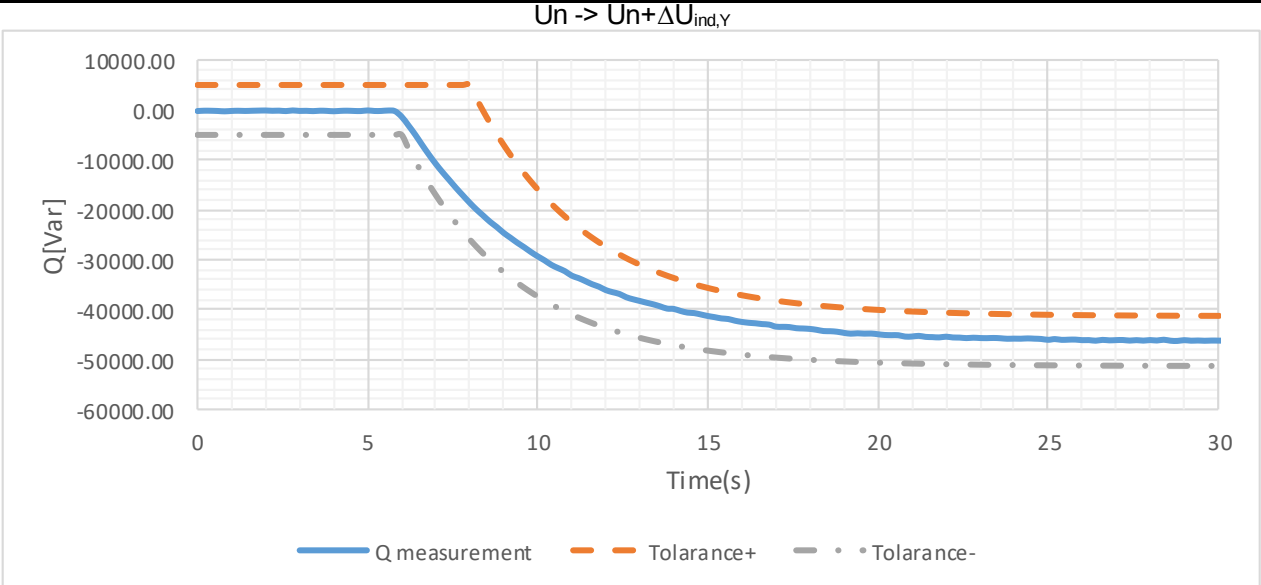
Un -> Un+$\Delta U_{ind,Y}$

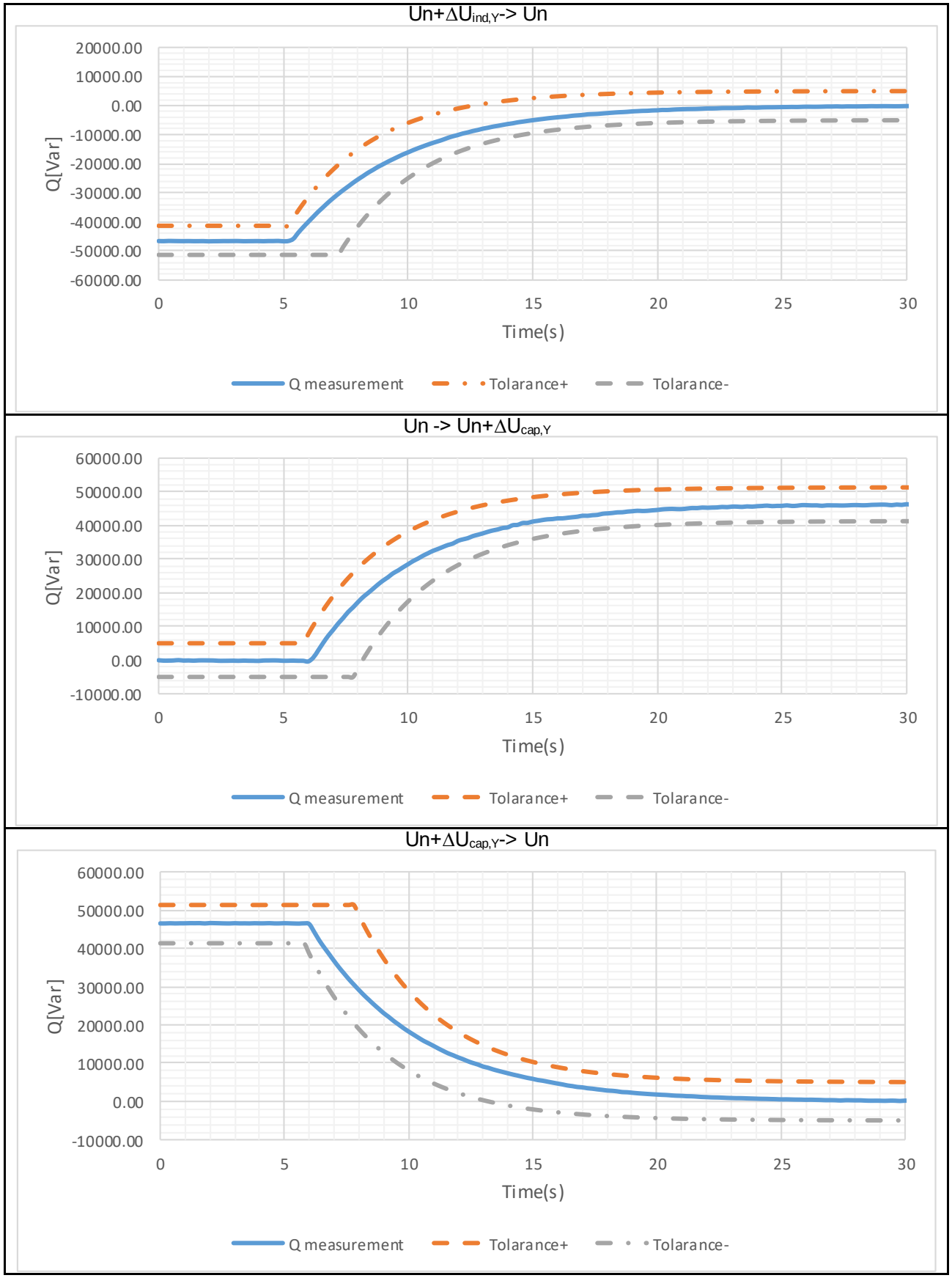


Un+$\Delta U_{ind,Y}$-> Un

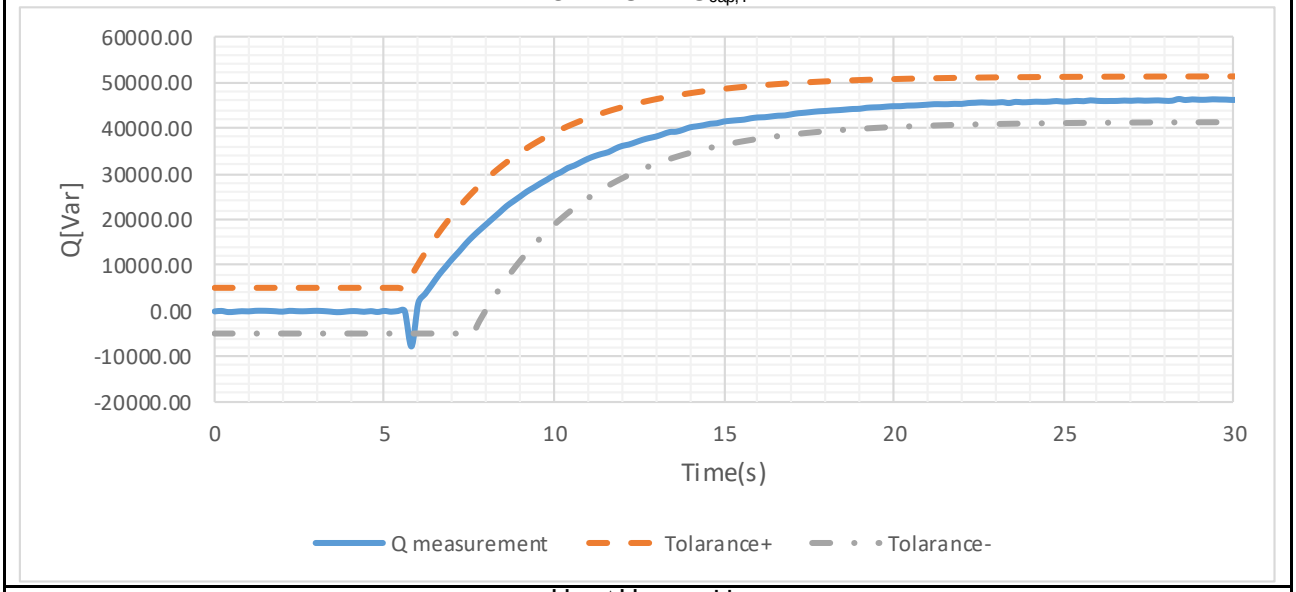


Un -> Un+$\Delta U_{ind,Y}$

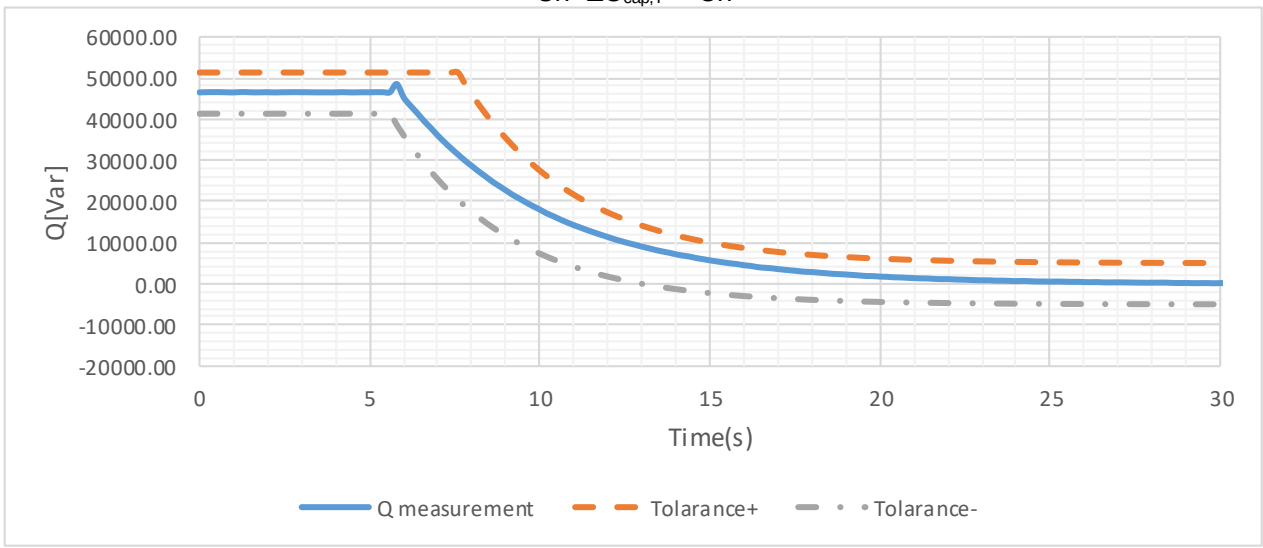



Un+ΔUind,Y-> Un
20000.00
10000.00
0.00
-10000.00
-20000.00
-30000.00
-40000.00
-50000.00
-60000.00
Q[Var]
0
5
10
15
20
25
30
Time(s)
Q measurement
Tolarance+
Tolarance-
Un -> Un+ΔUcap,Y
60000.00
50000.00
40000.00
30000.00
20000.00
10000.00
0.00
-10000.00
Q[Var]
0
5
10
15
20
25
30
Time(s)
Q measurement
Tolarance+
Tolarance-
Un+ΔUcap,Y-> Un
60000.00
50000.00
40000.00
30000.00
20000.00
10000.00
0.00
-10000.00
Q[Var]
0
5
10
15
20
25
30
Time(s)
Q measurement
Tolarance+
Tolarance-

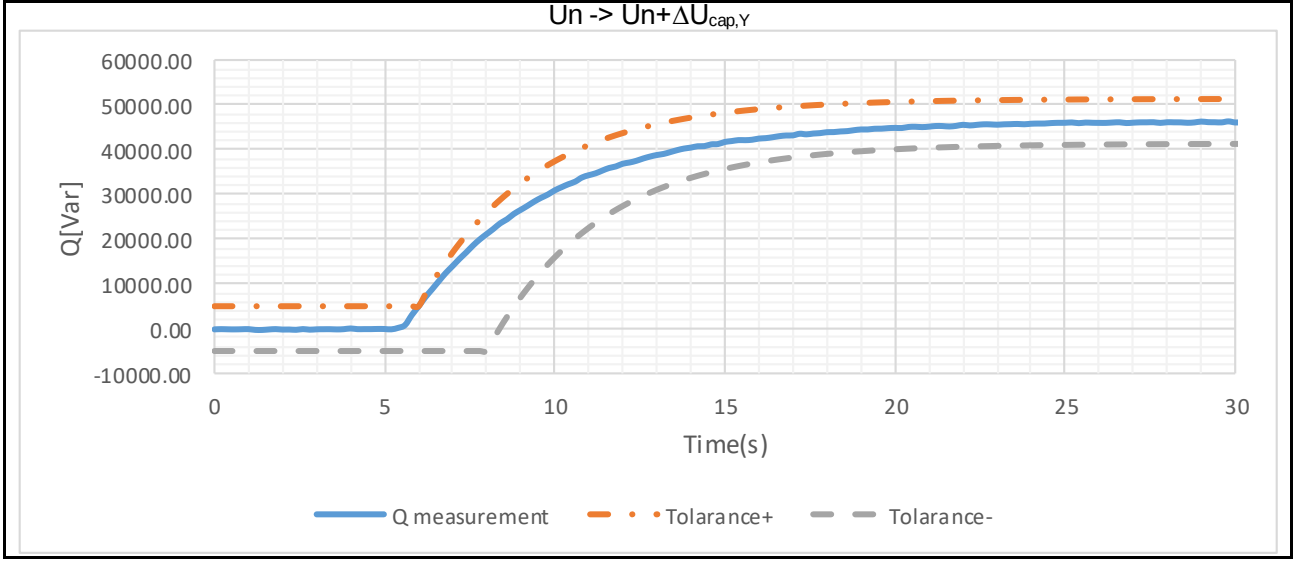
Un -> Un+$\Delta U_{cap,Y}$

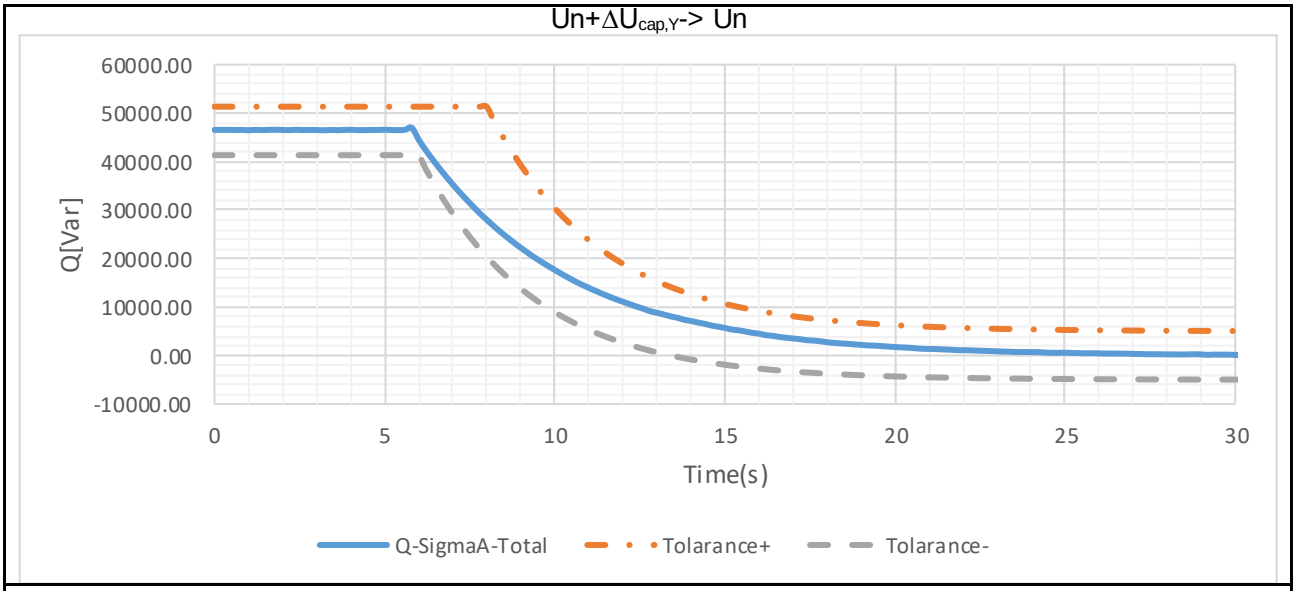


Un+$\Delta U_{cap,Y}$-> Un



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





Note(s):

5.5.2, 5.5.4, 5.5.6	TABLE: NS-protection, Integrated interface switch (Functional safety)	P

The max. initial short-circuited current Ik" [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.

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.

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_BOOST_A_CUR_DC-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_BOOST_A_CUR_DC-AGND	o-c	230Vac 600Vdc	10min	--	--	PV inverter shut down. Error message “Device Fault”. No components damage, no hazard.

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.

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 Trip value [V]				Limitation ΔU/Un [%]
		L123	L1	L2	L3	
U>>	125	286.9	286.5	286.8	287.2	≤±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 Trip value [V]				Limitation ΔU/Un [%]
		L123	L1-L2	L2-L3	L3-L1	
U>>	125	--	286.2	286.6	286.9	≤±1.0
U<	80	--	185.3	185.3	185.3	
U<<	45	--	104.8	104.8	103.8	
Condition	Setting [ms]	Measurement Trip time [ms]				Limitation [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 Trip time [ms]				Limitation [ms]
		L123	L1-L2	L2-L3	L3-L1	
U>>	100	--	125	125	125	≤200

U<	3000	--	3030	3020	3020	3000-3100
U<<	300	--	340	330	340	300-400
Condition	Setting [s]	Measurement Trip time [s]				Limitation [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 Trip value [Hz]	Limitation Δf/fn [%]
f>	51.5	51.49	≤±0.1
f<	47.5	47.50	
Condition	Setting [ms]	Measurement Trip time [ms]	Limitation [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 ≤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.	

	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: Passoword 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

	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	
	L2: 41.62	L2: 45.81	L2: 41.62	1.04		9000
	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	
	L2: 39.62	L2: 43.71	L2: 41.63	1.07		9000
	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	
	L2: 39.62	L2: 41.66	L2: 41.68	1.05		9000
	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	
	L2: 39.65	L2: 39.57	L2: 41.67	1.03		9000
	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	
	L2: 41.57	L2: 43.77	L2: 41.58	1.02		9000
	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	
	L2: 41.68	L2: 41.61	L2: 41.73	1.00		9000
	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	
	L2: 41.71	L2: 39.59	L2: 41.59	0.97		9000
	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	
	L2: 43.79	L2: 39.59	L2: 41.59	0.93		9000
	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	
	L2: 41.64	L2: 37.55	L2: 41.56	0.95		9000
	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	
	L2: 43.79	L2: 45.81	L2: 41.62	1.00		9000
	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	
	L2: 43.79	L2: 37.55	L2: 41.56	0.9		9000
	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	
	L2: 45.81	L2: 45.81	L2: 41.62	0.95		9000
	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	
	L2: 45.81	L2: 43.77	L2: 41.58	0.93		9000

	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

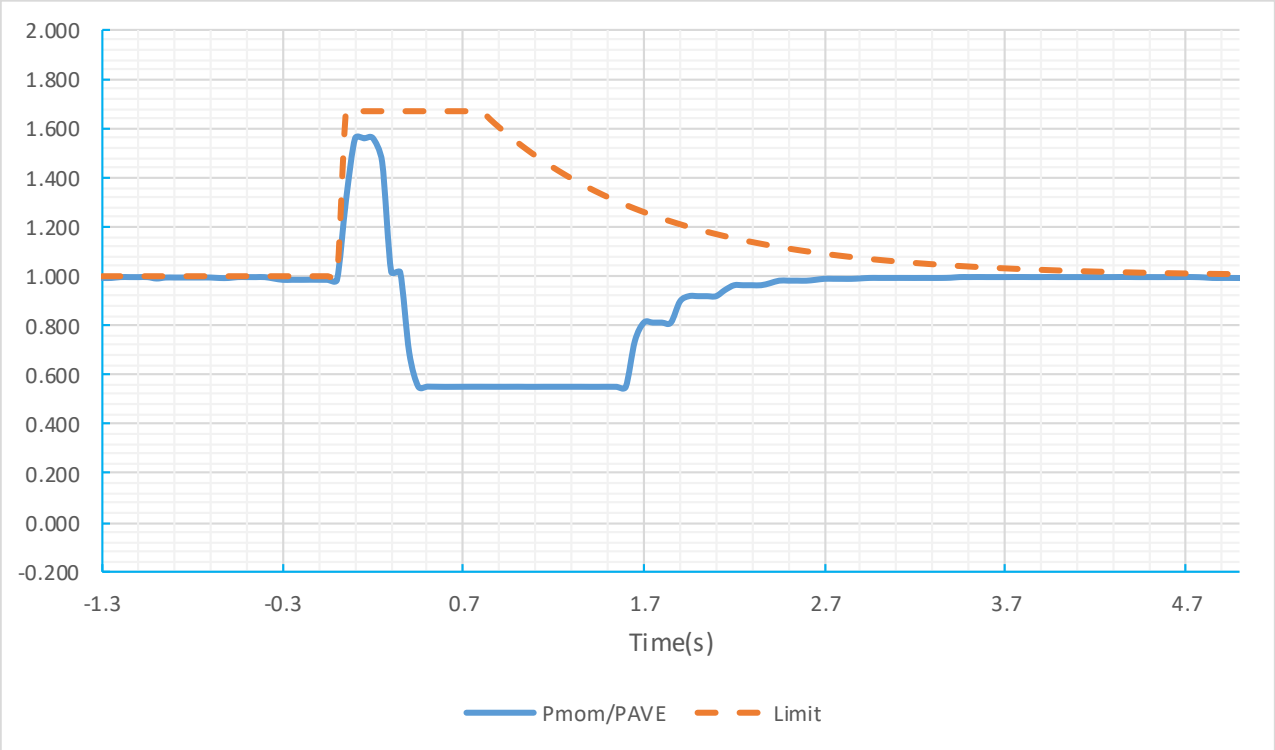
	L3: 27.46	L3: 28.12	L3: 27.54	1.02		
P_R: 0% Q_C: +2%	L1: 27.45	L1: 28.58	L1: 27.58	1.02	252	
	L2: 27.50	L2: 28.62	L2: 27.61	1.02		9000
	L3: 27.46	L3: 28.51	L3: 27.57	1.02		
P_R: 0% Q_C: +3%	L1: 27.51	L1: 28.91	L1: 27.62	1.03	215	
	L2: 27.55	L2: 28.94	L2: 27.61	1.03		9000
	L3: 27.46	L3: 29.01	L3: 27.54	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

	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	
	L2:	13.78	L2:	15.34	L2:	13.79	1.05		9000
	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	
	L2:	13.78	L2:	15.72	L2:	13.82	1.07		9000
	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	
	L2:	13.78	L2:	16.18	L2:	13.79	1.08		9000
	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% Pn		
Power limit method		
Test method	Condition	
Jump of primary energy	P_{rim}/ $P_{dc,r}$: 60%->100%	
Cut of load	P_{load}/Pn: 40%->0%	

Power curve:

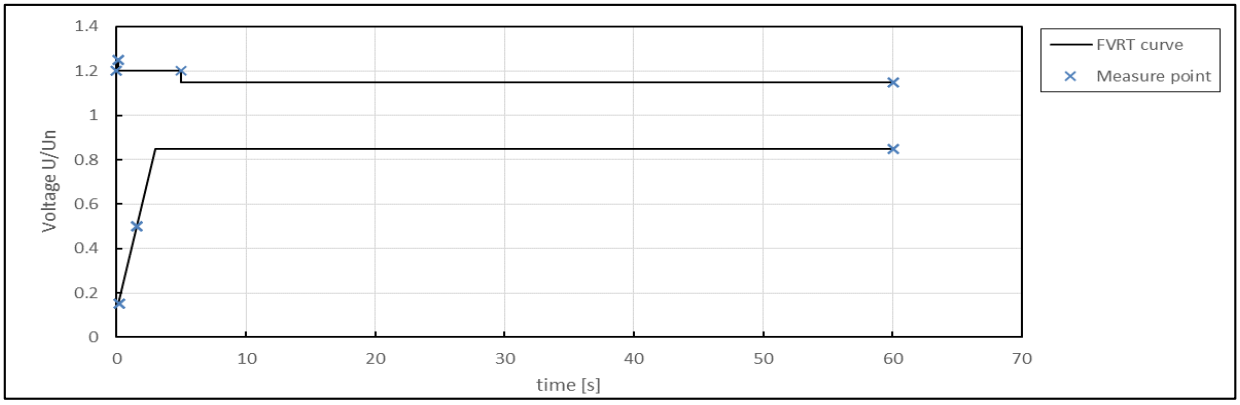


Disconnection method

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

5.8	TABLE: Verification of dynamic network supporting (FVRT)	P

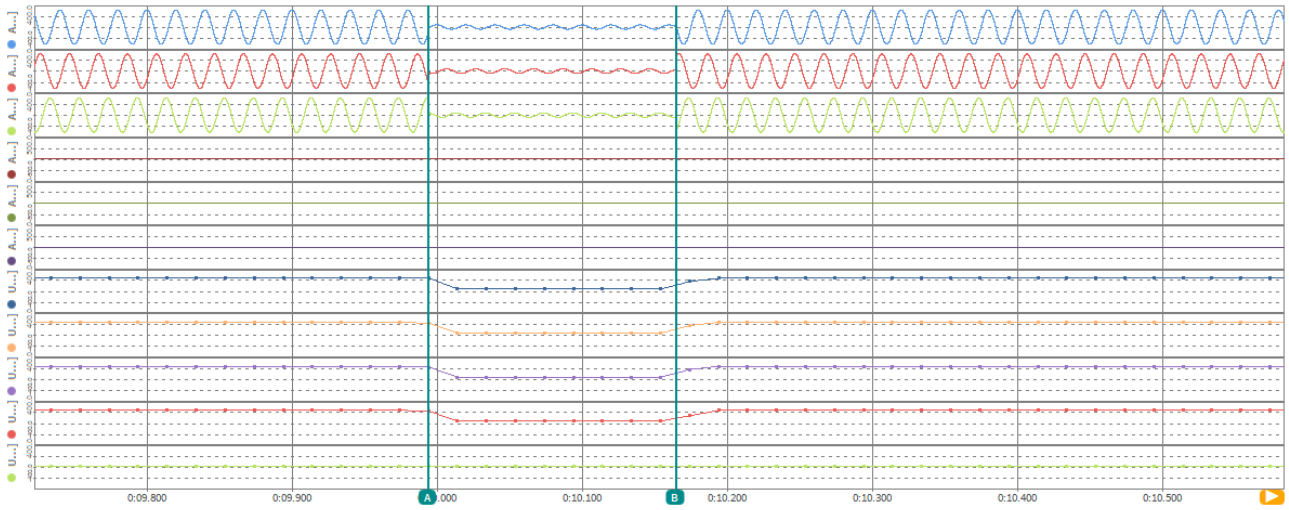
FRT curve settings:



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

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

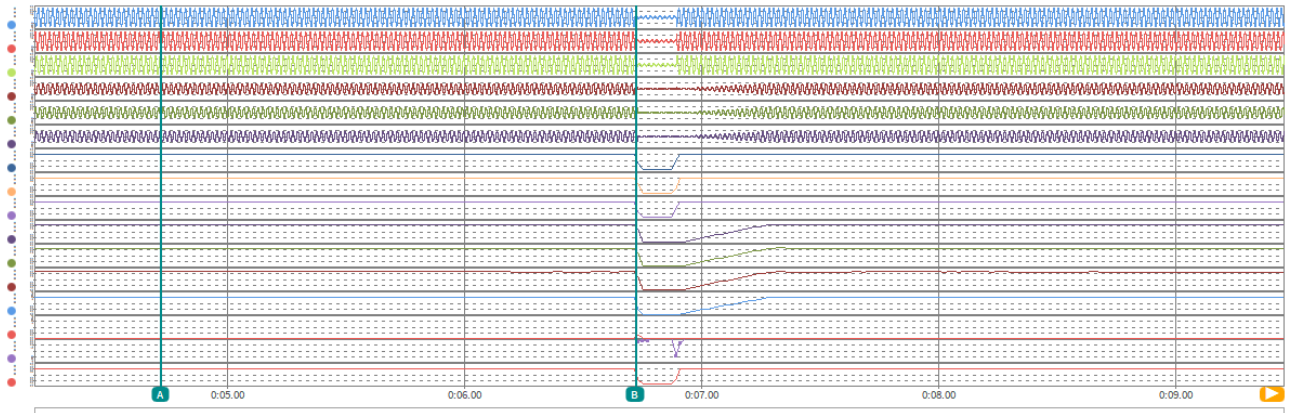
Test No. 1.1 idle test



	A	B	Delta
Time [s]	9.99369	0:10.16454	0.17085
AI 1/U1 [V]	-160.5587	9.770394	170.3291
AI 1/U2 [V]	-165.5908	31.02660	196.6174
AI 1/U3 [V]	325.5811	-40.64584	-366.2269
AI 1/I1 [A]	-0.921249	0.130057	1.051307
AI 1/I2 [A]	0.888586	-0.118971	-1.007557
AI 1/I3 [A]	5.007e-3	-0.041246	-0.046253
U1_tRMS@POWER/0 [V]	230.3129	29.96355	-200.3494
U2_tRMS@POWER/0 [V]	230.4378	30.13037	-200.3074
U3_tRMS@POWER/0 [V]	230.2596	30.03052	-200.2291
U_fundRMS_SYM+@POWER/0 [V]	230.3367	30.04126	-200.2954
U_fundRMS_SYM-@POWER/0 [V]	0.063896	0.063543	-3.536e-4

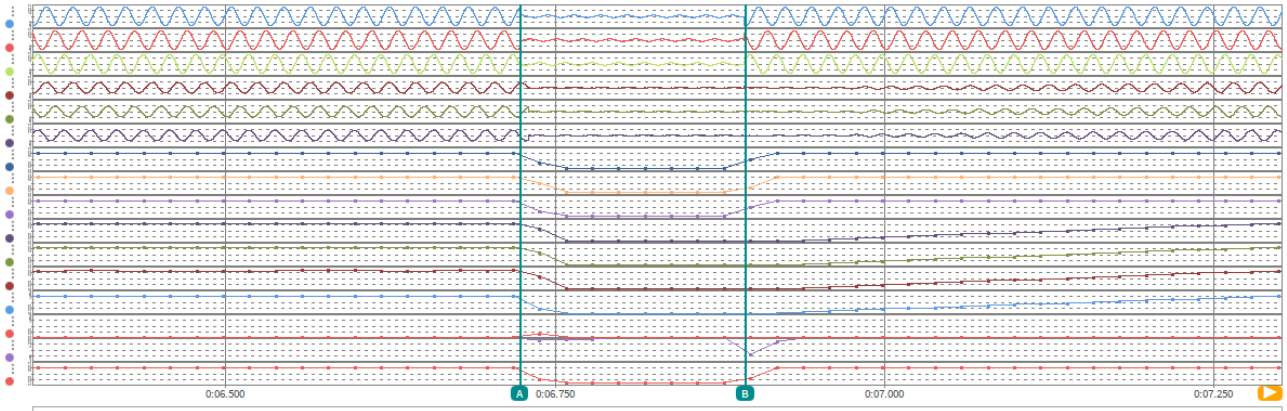
Test No. 1.1 with PGU

Before dip

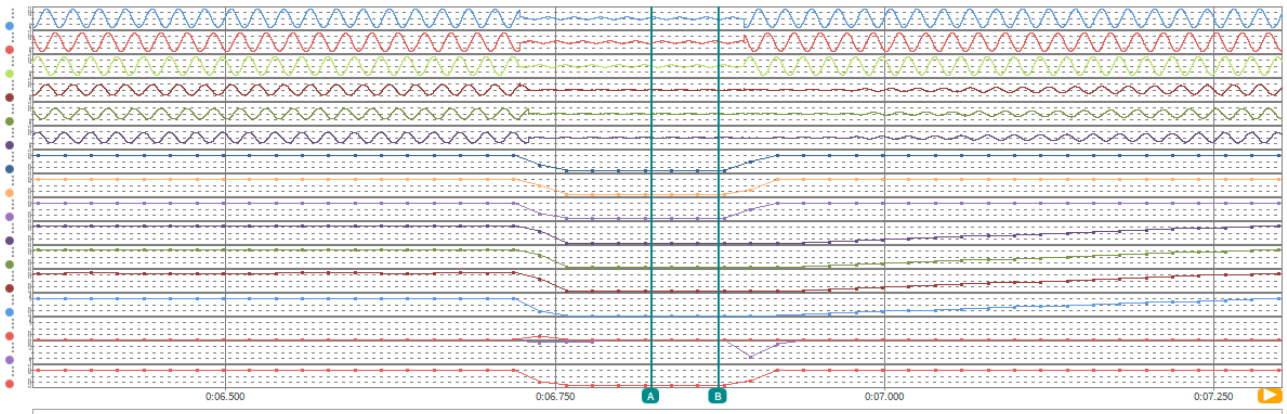


	A	B	Delta
Time [s]	4.72338	6.72407	2.00069
AI 1/U1 [V]	280.7491	66.06579	-214.6833
AI 1/U2 [V]	-283.8013	-85.51002	198.2913
AI 1/U3 [V]	-0.793934	-35.62498	-34.83105
AI 1/I1 [A]	203.2113	307.5026	104.2913
AI 1/I2 [A]	-202.3902	-239.5028	-37.11260
AI 1/I3 [A]	1.669e-3	-67.23202	-67.23369
U1_tRMS@POWER/0 [V]	230.8028	230.6610	-0.141739
U2_tRMS@POWER/0 [V]	230.9451	230.9664	0.021347
U3_tRMS@POWER/0 [V]	230.7197	230.7673	0.047668
I1_tRMS@POWER/0 [A]	166.1521	165.8797	-0.272415
I2_tRMS@POWER/0 [A]	166.4600	166.3286	-0.131378
I3_tRMS@POWER/0 [A]	166.8282	166.7179	-0.110336
P_t@POWER/0 [W]	115276.8	115145.0	-131.8750
Q_t@POWER/0 [var]	1093.076	1210.888	117.8116
PF_t@POWER/0 []	0.999955	0.999945	-1.037e-5
U_fundRMS_SYM+@POWER/0 [V]	230.8191	230.7946	-0.024536

During dip

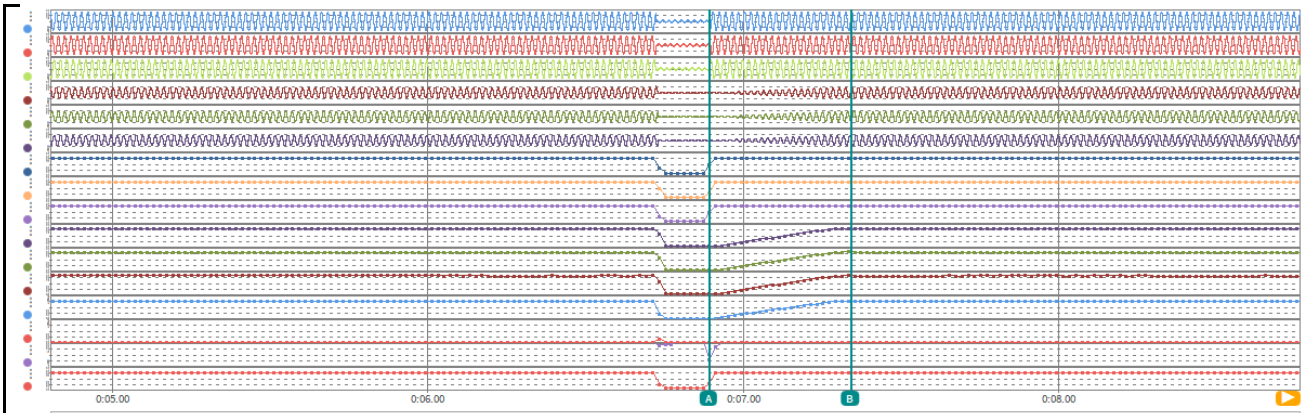


	A	B	Delta
Time [s]	6.72368	6.89480	0.17112
AI 1/U1 [V]	299.3405	-322.5806	-621.9211
AI 1/U2 [V]	-262.0976	175.9324	438.0300
AI 1/U3 [V]	-40.74407	147.3188	188.0629
AI 1/I1 [A]	215.9245	22.04955	-193.8750
AI 1/I2 [A]	-185.9217	-7.794857	178.1268
AI 1/I3 [A]	-30.31361	-14.19246	16.12115
U1_tRMS@POWER/0 [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

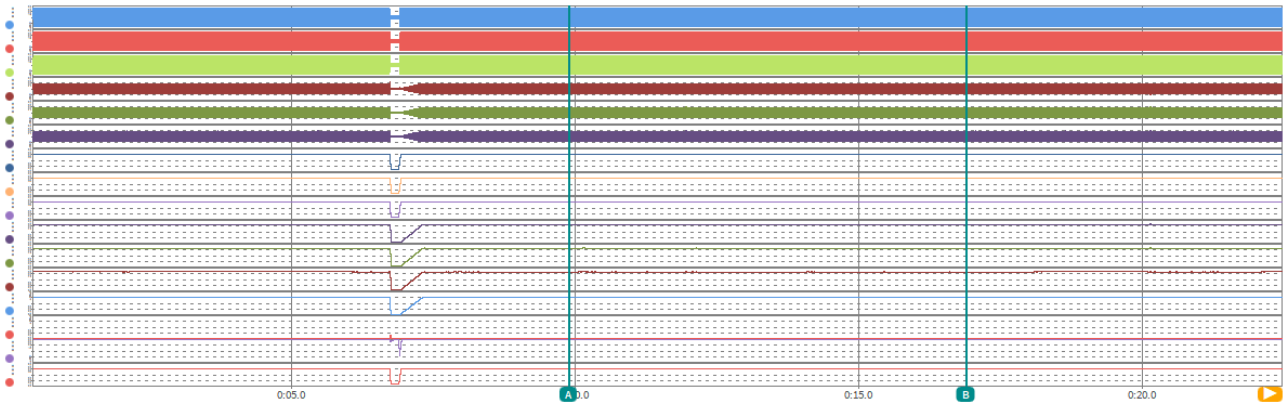


	A	B	Delta
Time [s]	6.82301	6.87389	0.05088
AI 1/U1 [V]	34.88612	-39.40344	-74.28956
AI 1/U2 [V]	-38.79452	32.83143	71.62595
AI 1/U3 [V]	3.725529	6.903649	3.178120
AI 1/I1 [A]	13.36801	-11.01601	-24.38402
AI 1/I2 [A]	-13.29911	11.35445	24.65356
AI 1/I3 [A]	-0.044823	-0.413537	-0.368714
U1_tRMS@POWER/0 [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

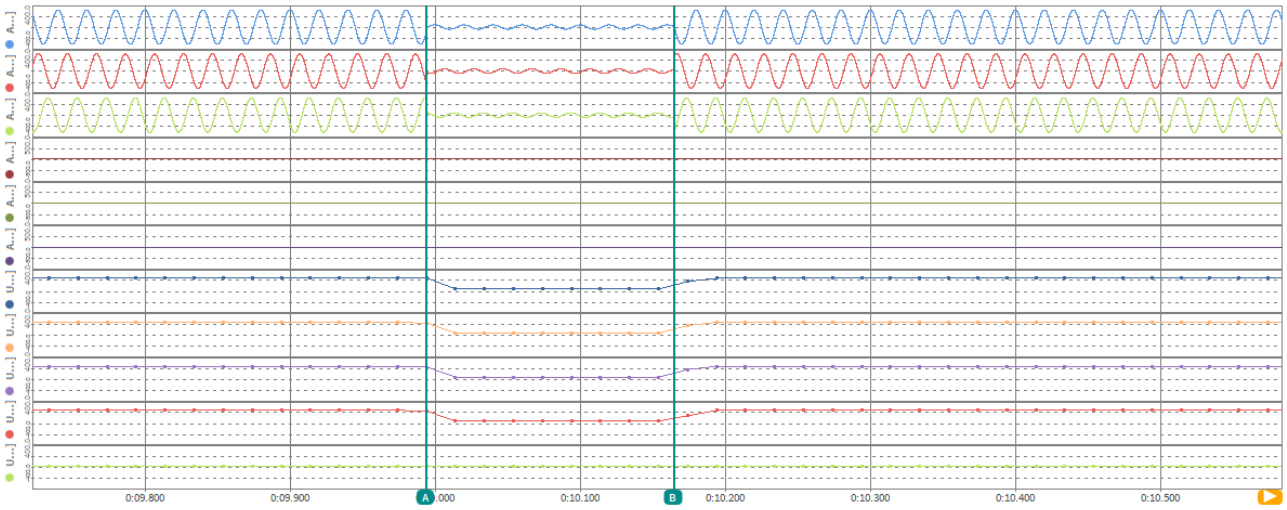


Time [s]	A 6.89277	B 7.34166	Delta 0.44889
AI 1/U1 [V]	-32.66239	166.6479	199.3103
AI 1/U2 [V]	40.26413	-326.5031	-366.7672
AI 1/U3 [V]	-6.234646	159.2772	165.5119
AI 1/I1 [A]	-11.46746	119.0929	130.5604
AI 1/I2 [A]	11.71410	-234.4648	-246.1789
AI 1/I3 [A]	-0.392914	115.2468	115.6397
U1_tRMS@POWER/0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



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

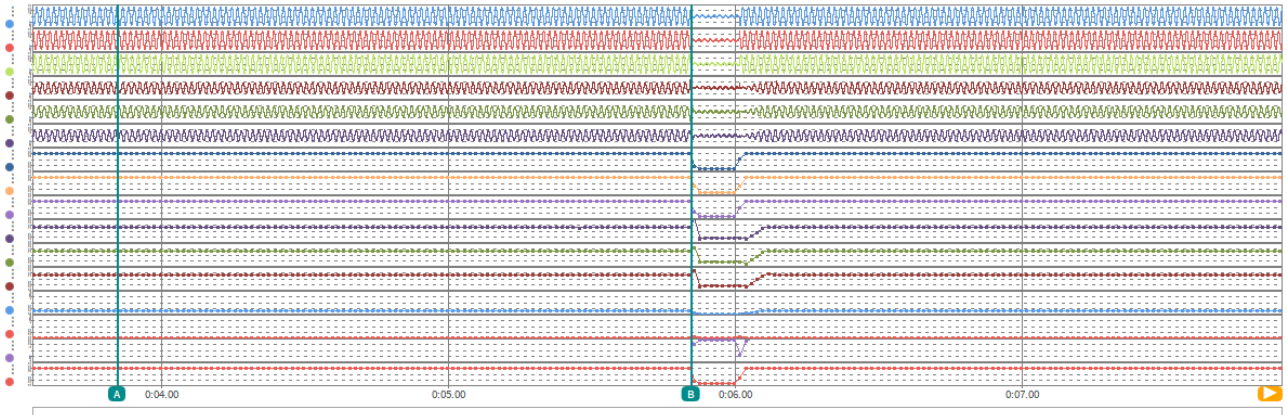
Test No. 1.2 idle test



	A	B	Delta
Time [s]	9.99369	0:10.16454	0.17085
AI 1/U1 [V]	-160.5587	9.770394	170.3291
AI 1/U2 [V]	-165.5908	31.02660	196.6174
AI 1/U3 [V]	325.5811	-40.64584	-366.2269
AI 1/I1 [A]	-0.921249	0.130057	1.051307
AI 1/I2 [A]	0.888586	-0.118971	-1.007557
AI 1/I3 [A]	5.007e-3	-0.041246	-0.046253
U1_tRMS@POWER/0 [V]	230.3129	29.96355	-200.3494
U2_tRMS@POWER/0 [V]	230.4378	30.13037	-200.3074
U3_tRMS@POWER/0 [V]	230.2596	30.03052	-200.2291
U_fundRMS_SYM+@POWER/0 [V]	230.3367	30.04126	-200.2954
U_fundRMS_SYM-@POWER/0 [V]	0.063896	0.063543	-3.536e-4

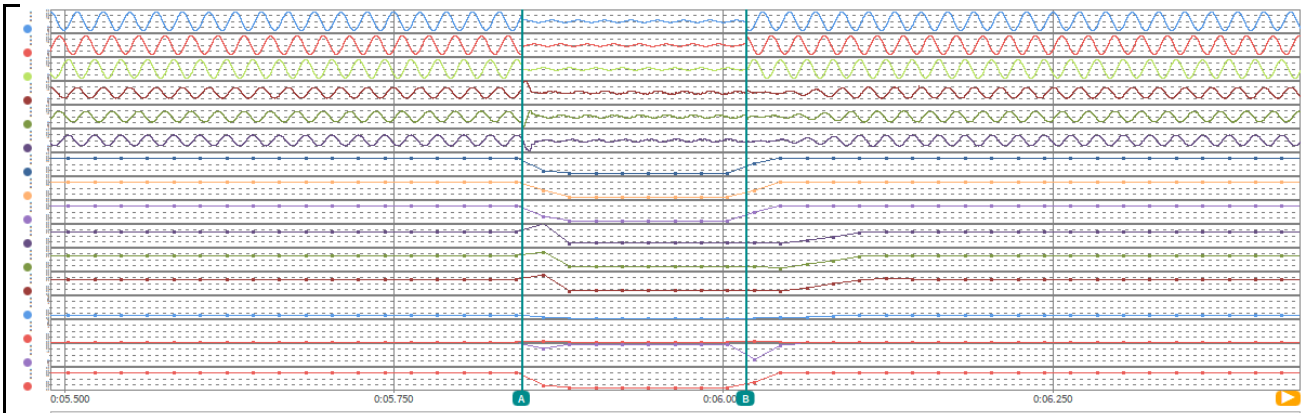
Test No. 1.2 with PGU

Before dip

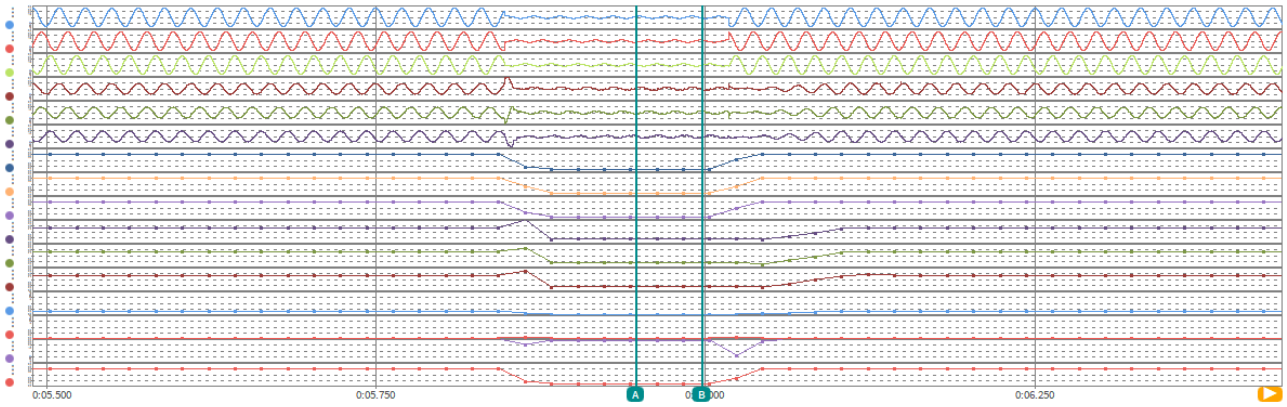


	A	B	Delta
Time [s]	3.85001	5.84901	1.99900
AI 1/U1 [V]	325.7930	43.43987	-282.3532
AI 1/U2 [V]	-170.0482	-32.52268	137.5256
AI 1/U3 [V]	-155.6389	-12.26163	143.3773
AI 1/I1 [A]	46.72766	103.5423	56.81467
AI 1/I2 [A]	-23.81599	-79.87631	-56.06032
AI 1/I3 [A]	-22.78221	-23.83900	-1.056790
U1_tRMS@POWER/0 [V]	230.4339	231.3441	0.910141
U2_tRMS@POWER/0 [V]	230.5291	230.1390	-0.390152
U3_tRMS@POWER/0 [V]	230.3736	229.7945	-0.579056
I1_tRMS@POWER/0 [A]	33.33472	33.47761	0.142883
I2_tRMS@POWER/0 [A]	33.38157	33.34067	-0.040897
I3_tRMS@POWER/0 [A]	33.43444	33.31470	-0.119736
P_t@POWER/0 [W]	23076.26	23070.61	-5.642578
Q_t@POWER/0 [var]	373.8032	356.5409	-17.26227
PF_t@POWER/0 []	0.999869	0.999881	1.180e-5
U_fundRMS_SYM+@POWER/0 [V]	230.4438	230.3984	-0.045334

During dip

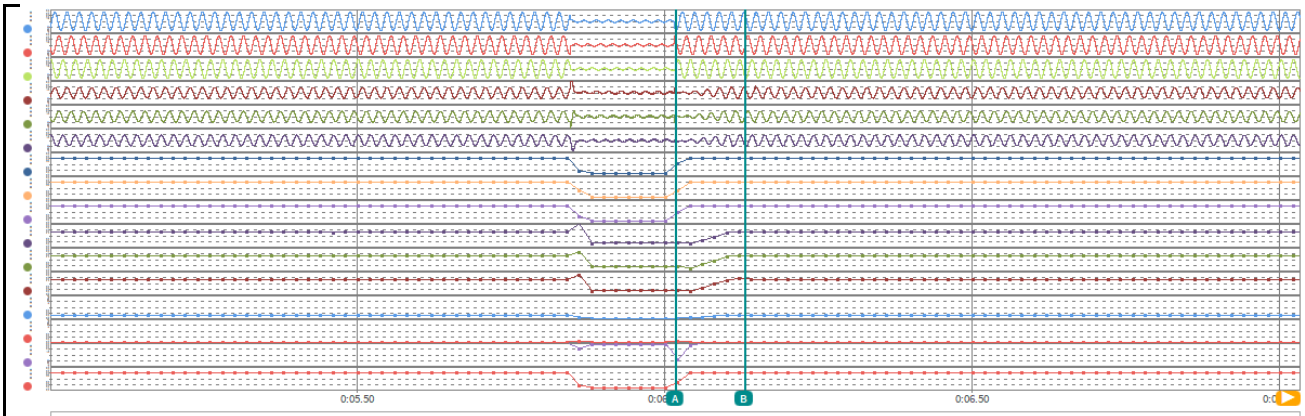


	A	B	Delta
Time [s]	5.84739	6.01732	0.16993
AI 1/U1 [V]	214.5696	-31.31366	-245.8832
AI 1/U2 [V]	-319.6454	41.36420	361.0096
AI 1/U3 [V]	104.7280	-9.456635	-114.1846
AI 1/I1 [A]	31.57997	-7.348061	-38.92803
AI 1/I2 [A]	-46.36312	7.889271	54.25239
AI 1/I3 [A]	14.67490	-0.546932	-15.22184
U1_tRMS@POWER/0 [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

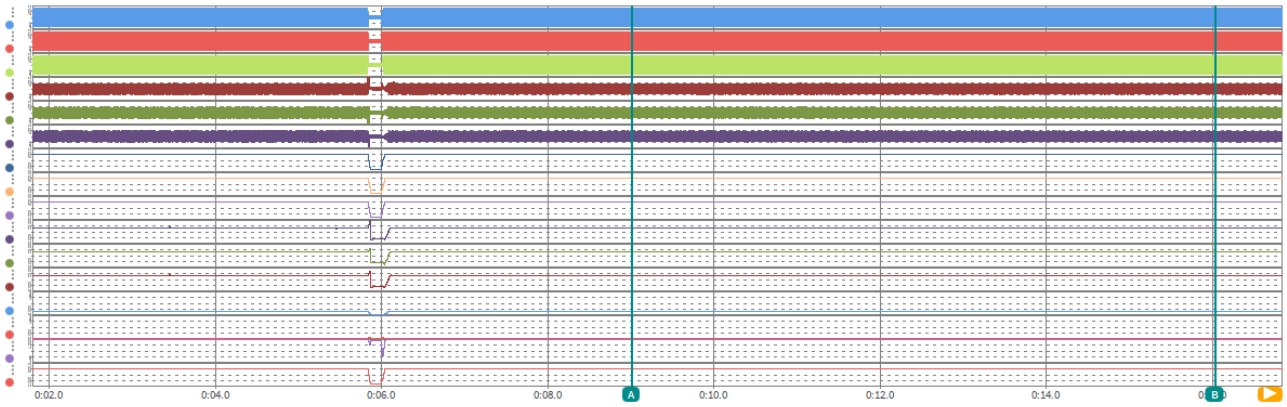


	A	B	Delta
Time [s]	5.94753	5.99759	0.05006
AI 1/U1 [V]	31.06451	-31.56066	-62.62517
AI 1/U2 [V]	-41.46528	41.08095	82.54624
AI 1/U3 [V]	8.682251	-7.991791	-16.67404
AI 1/I1 [A]	9.450436	-8.272529	-17.72297
AI 1/I2 [A]	-9.037972	7.966400	17.00437
AI 1/I3 [A]	-0.309229	0.180006	0.489235
U1_tRMS@POWER/0 [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



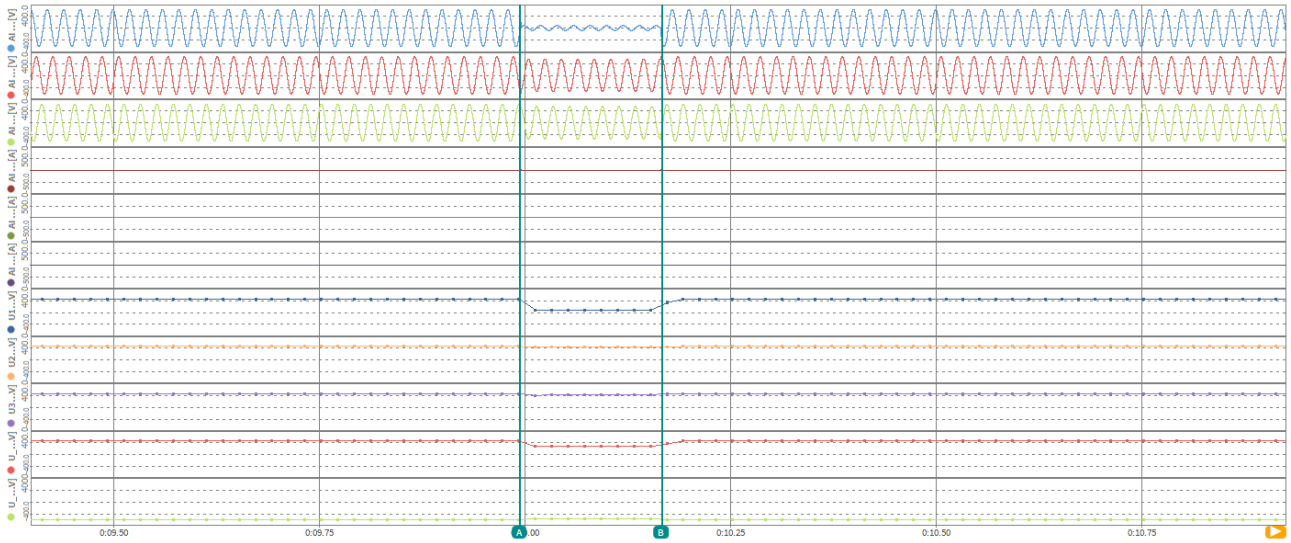
Time [s]	A 6.01810	B 6.13030	Delta 0.11220
AI 1/U1 [V]	-264.2408	324.3530	588.5938
AI 1/U2 [V]	285.0712	-131.3725	-416.4436
AI 1/U3 [V]	-22.90559	-192.8148	-169.9092
AI 1/I1 [A]	28.00775	48.06030	20.05255
AI 1/I2 [A]	-23.29743	-20.48326	2.814174
AI 1/I3 [A]	-2.912998	-27.59671	-24.68372
U1_tRMS@POWER/0 [V]	30.28657	230.7673	200.4808
U2_tRMS@POWER/0 [V]	30.32703	230.8999	200.5729
U3_tRMS@POWER/0 [V]	30.18974	230.7541	200.5643
I1_tRMS@POWER/0 [A]	8.535676	34.48613	25.95045
I2_tRMS@POWER/0 [A]	8.536753	34.46298	25.92623
I3_tRMS@POWER/0 [A]	8.515320	34.53261	26.01729
P_t@POWER/0 [W]	731.6088	23830.92	23099.31
Q_t@POWER/0 [var]	254.1205	1596.089	1341.969
PF_t@POWER/0 []	0.944638	0.997765	0.053127
U_fundRMS_SYM+@POWER/0 [V]	30.24769	230.8068	200.5591



Time [s]	A 9.01432	B 0:16.03121	Delta 7.01689
AI 1/U1 [V]	60.56238	287.4541	226.8918
AI 1/U2 [V]	247.0830	-8.745432	-255.8284
AI 1/U3 [V]	-307.4544	-276.1994	31.25501
AI 1/I1 [A]	8.746267	41.21065	32.46439
AI 1/I2 [A]	35.22361	-1.049519	-36.27312
AI 1/I3 [A]	-44.14356	-40.15398	3.989578
U1_tRMS@POWER/0 [V]	230.3887	230.4230	0.034271
U2_tRMS@POWER/0 [V]	230.5568	230.5345	-0.022339
U3_tRMS@POWER/0 [V]	230.3455	230.3337	-0.011810
I1_tRMS@POWER/0 [A]	33.10852	33.06697	-0.041550
I2_tRMS@POWER/0 [A]	33.21882	33.09098	-0.127842
I3_tRMS@POWER/0 [A]	33.24154	33.16905	-0.072491
P_t@POWER/0 [W]	22941.78	22884.73	-57.04883
Q_t@POWER/0 [var]	296.5412	384.0612	87.51999
PF_t@POWER/0 []	0.999916	0.999859	-5.728e-5
U_fundRMS_SYM+@POWER/0 [V]	230.4286	230.4285	-3.052e-5

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

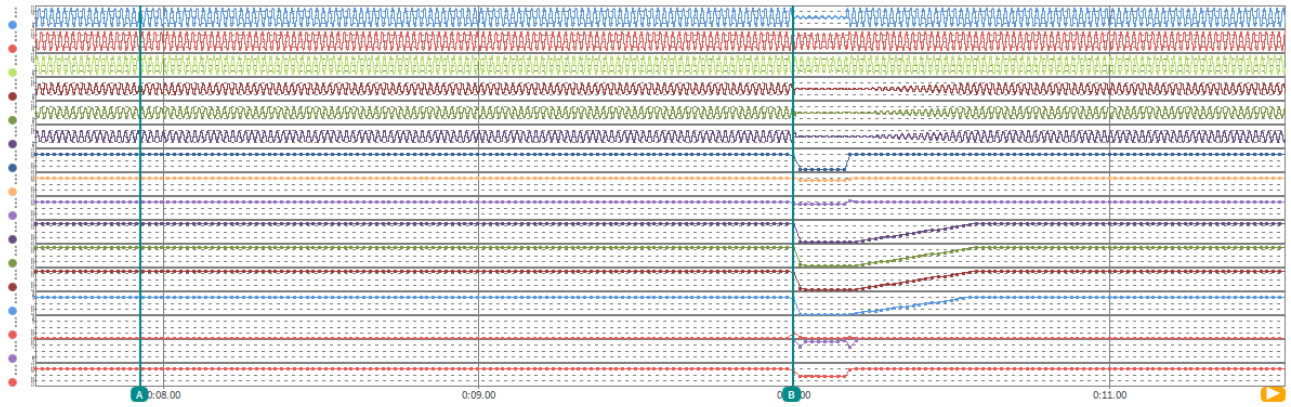
Test No. 1.3 idle test



	A	B	Delta
Time [s]	9.99408	0:10.16669	0.17261
AI 1/U1 [V]	-91.21848	-165.1471	-73.92860
AI 1/U2 [V]	-225.6210	325.6986	551.3196
AI 1/U3 [V]	316.1335	-158.6094	-474.7429
AI 1/I1 [A]	-1.019120	0.439167	1.458287
AI 1/I2 [A]	0.823259	0.186920	-0.636339
AI 1/I3 [A]	0.167727	-0.657558	-0.825286
U1_tRMS@POWER/0 [V]	230.3315	30.00147	-200.3301
U2_tRMS@POWER/0 [V]	230.4291	200.3651	-30.06396
U3_tRMS@POWER/0 [V]	230.2664	200.0640	-30.20239
U_fundRMS_SYM+@POWER/0 [V]	230.3423	126.7167	-103.6255
U_fundRMS_SYM-@POWER/0 [V]	0.061871	104.4374	104.3756

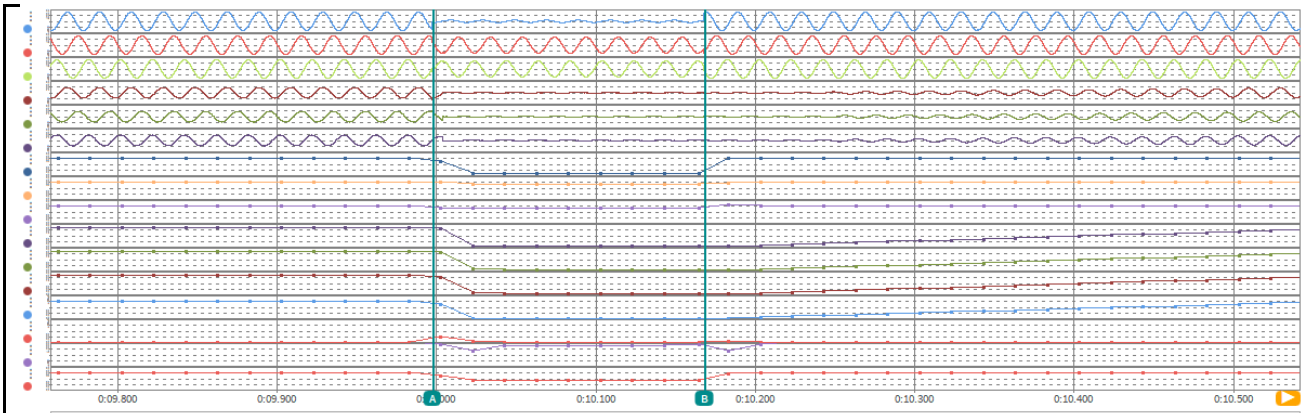
Test No. 1.3 with PGU

Before dip

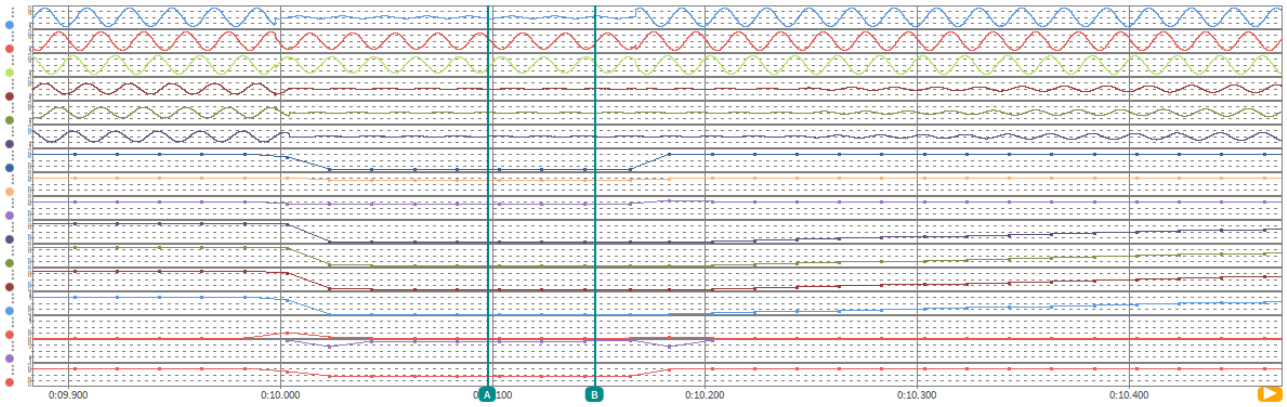


	A	B	Delta
Time [s]	7.929693	9.995181	2.065488
AI 1/U1 [V]	326.4435	-72.73913	-399.1826
AI 1/U2 [V]	-151.6378	311.1789	462.8167
AI 1/U3 [V]	-174.5646	-239.2328	-64.66818
AI 1/I1 [A]	236.3410	-52.44148	-288.7825
AI 1/I2 [A]	-108.0766	225.3357	333.4123
AI 1/I3 [A]	-128.4224	-173.8906	-45.46821
U1_tRMS@POWER/0 [V]	230.8079	230.7792	-0.028748
U2_tRMS@POWER/0 [V]	230.9005	230.9467	0.046234
U3_tRMS@POWER/0 [V]	230.7677	230.7464	-0.021301
I1_tRMS@POWER/0 [A]	167.3970	167.3129	-0.084183
I2_tRMS@POWER/0 [A]	167.6432	167.6494	6.180e-3
I3_tRMS@POWER/0 [A]	168.0531	168.0878	0.034714
P_t@POWER/0 [W]	116121.4	116109.7	-11.71875
Q_t@POWER/0 [var]	1105.872	1214.455	108.5830
PF_t@POWER/0 []	0.999955	0.999945	-9.358e-6
U_fundRMS_SYM+@POWER/0 [V]	230.8221	230.8207	-1.373e-3

During dip

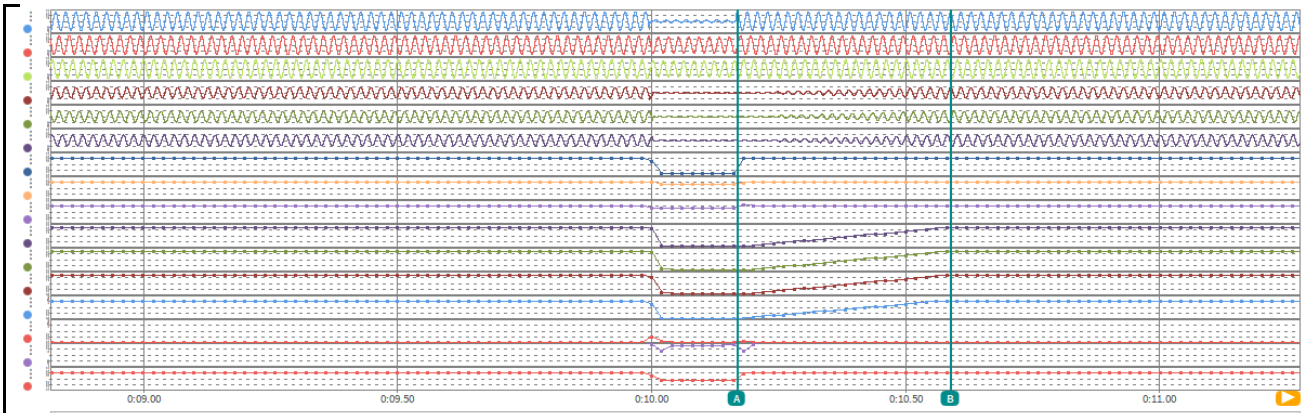


	A	B	Delta
Time [s]	9.998027	0:10.168539	0.170512
AI 1/U1 [V]	-23.38672	298.4126	321.7993
AI 1/U2 [V]	111.2204	-230.8879	-342.1083
AI 1/U3 [V]	-112.6535	-65.75561	46.89789
AI 1/I1 [A]	-265.1210	-24.02222	241.0988
AI 1/I2 [A]	228.4585	4.782439	-223.6761
AI 1/I3 [A]	39.70361	17.51983	-22.18378
U1_tRMS@POWER/0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

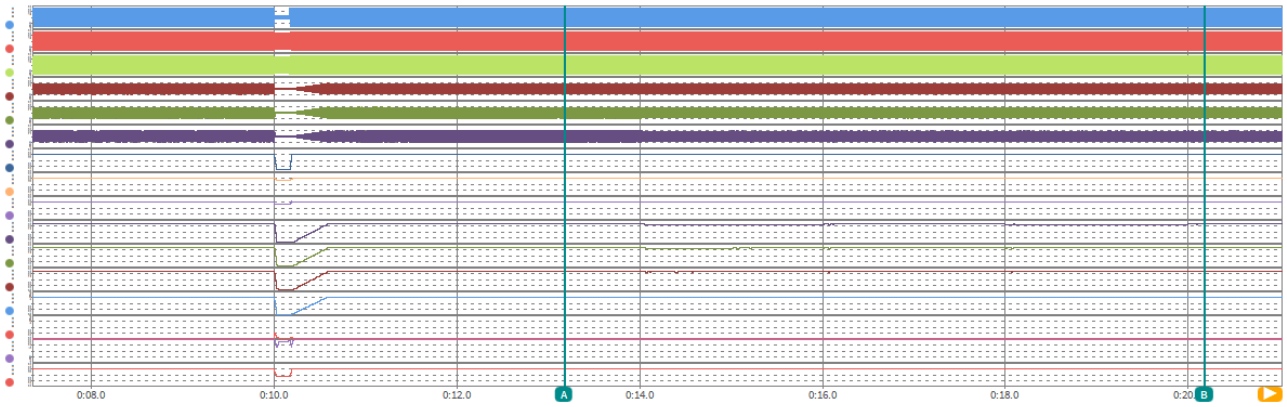


	A	B	Delta
Time [s]	0:10.097968	0:10.148416	0.050448
AI 1/U1 [V]	-37.74262	40.07936	77.82197
AI 1/U2 [V]	136.4472	-95.37244	-231.8196
AI 1/U3 [V]	-126.4343	85.53148	211.9658
AI 1/I1 [A]	-11.00218	12.66956	23.67175
AI 1/I2 [A]	10.81669	-10.94616	-21.76285
AI 1/I3 [A]	0.161052	-1.752496	-1.913548
U1_tRMS@POWER/0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

After dip

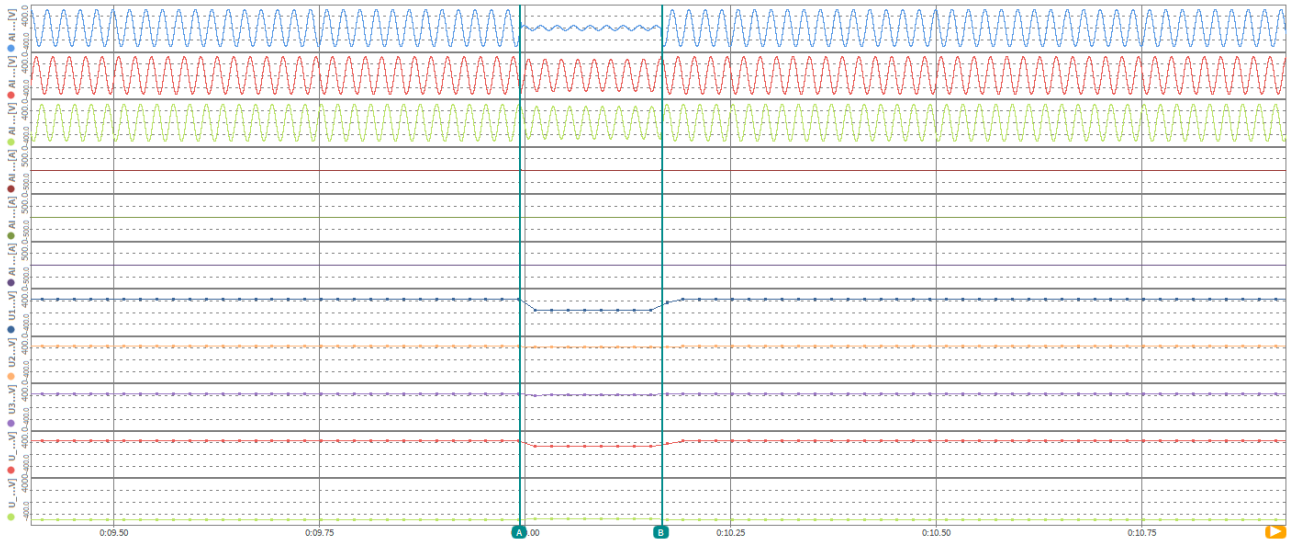


Time [s]	A 0:10.168475	B 0:10.588429	Delta 0.419954
AI 1/U1 [V]	299.8226	311.7829	11.96027
AI 1/U2 [V]	-243.6514	-241.0877	2.563715
AI 1/U3 [V]	-57.78742	-72.36934	-14.58192
AI 1/I1 [A]	-20.83671	227.5865	248.4232
AI 1/I2 [A]	5.447984	-175.7882	-181.2362
AI 1/I3 [A]	17.05694	-52.92142	-69.97836
U1_tRMS@POWER/0 [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 0:13.178617	B 0:20.180483	Delta 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

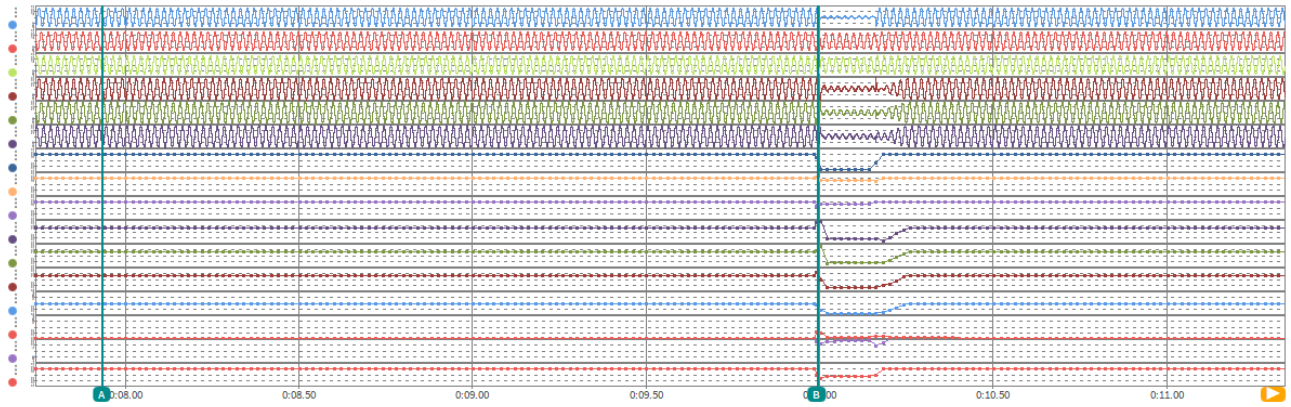
Test No. 1.4 idle test



	A	B	Delta
Time [s]	9.99408	0:10.16669	0.17261
AI 1/U1 [V]	-91.21848	-165.1471	-73.92860
AI 1/U2 [V]	-225.6210	325.6986	551.3196
AI 1/U3 [V]	316.1335	-158.6094	-474.7429
AI 1/I1 [A]	-1.019120	0.439167	1.458287
AI 1/I2 [A]	0.823259	0.186920	-0.636339
AI 1/I3 [A]	0.167727	-0.657558	-0.825286
U1_tRMS@POWER/0 [V]	230.3315	30.00147	-200.3301
U2_tRMS@POWER/0 [V]	230.4291	200.3651	-30.06396
U3_tRMS@POWER/0 [V]	230.2664	200.0640	-30.20239
U_fundRMS_SYM+@POWER/0 [V]	230.3423	126.7167	-103.6255
U_fundRMS_SYM-@POWER/0 [V]	0.061871	104.4374	104.3756

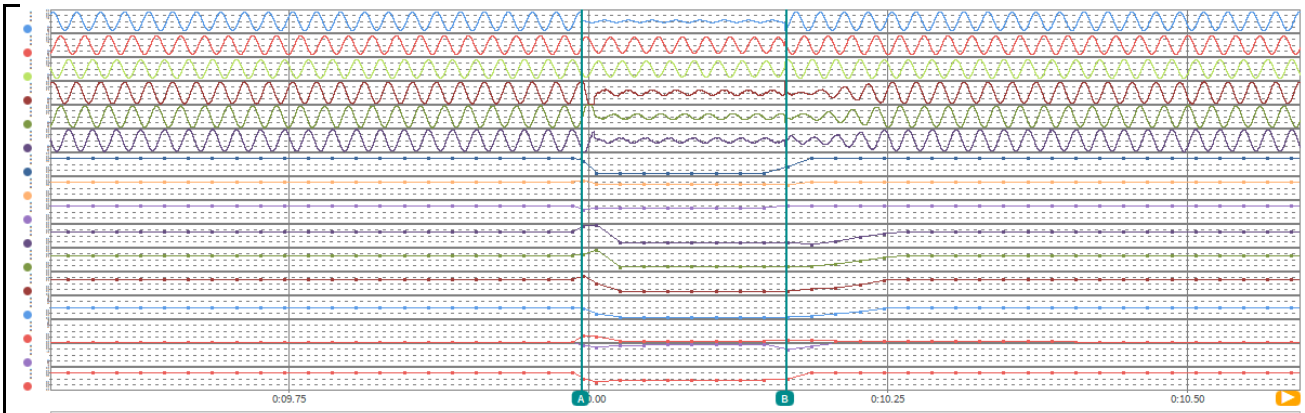
Test No. 1.4 with PGU

Before dip

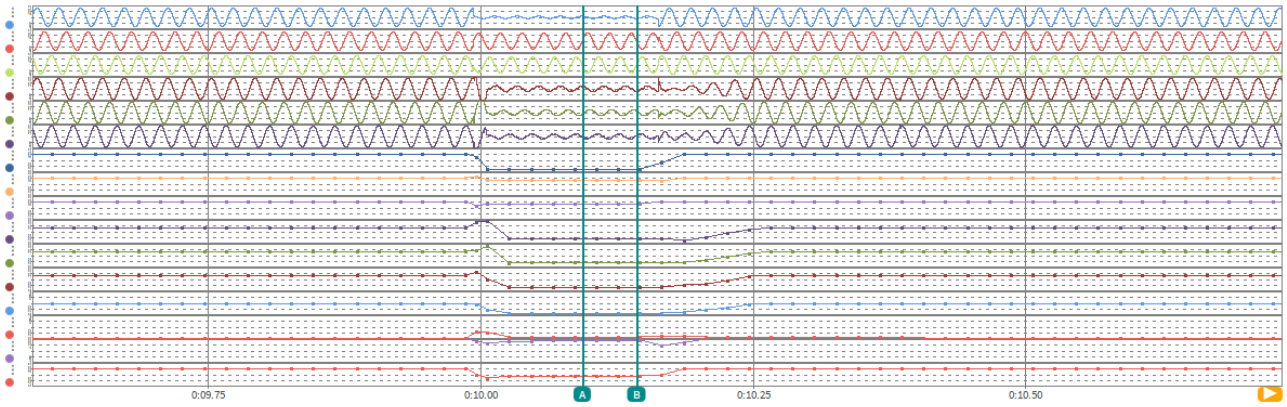


	A	B	Delta
Time [s]	7.93576	9.99406	2.05831
AI 1/U1 [V]	252.8696	249.1086	-3.761053
AI 1/U2 [V]	55.49693	-94.40089	-149.8978
AI 1/U3 [V]	-304.6084	-201.9091	102.6993
AI 1/I1 [A]	36.22961	79.31078	43.08117
AI 1/I2 [A]	7.487417	-34.88887	-42.37628
AI 1/I3 [A]	-45.05170	-44.04164	1.010060
U1_tRMS@POWER/0 [V]	230.4341	229.8936	-0.540558
U2_tRMS@POWER/0 [V]	230.5313	230.7866	0.255356
U3_tRMS@POWER/0 [V]	230.3413	230.6276	0.286301
I1_tRMS@POWER/0 [A]	33.34333	33.22286	-0.120476
I2_tRMS@POWER/0 [A]	33.39005	33.40812	0.018078
I3_tRMS@POWER/0 [A]	33.42233	33.42044	-1.884e-3
P_t@POWER/0 [W]	23076.80	23053.04	-23.76367
Q_t@POWER/0 [var]	348.7491	340.1598	-8.589355
PF_t@POWER/0 []	0.999886	0.999891	5.364e-6
U_fundRMS_SYM+@POWER/0 [V]	230.4338	230.4267	-7.080e-3

During dip

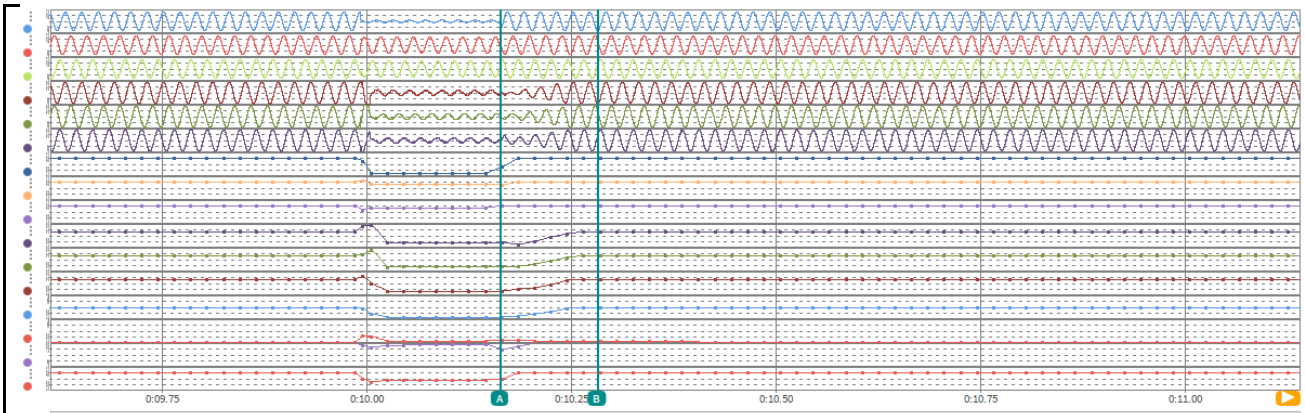


	A	B	Delta
Time [s]	9.99434	0:10.16483	0.17048
AI 1/U1 [V]	60.54569	-293.5357	-354.0814
AI 1/U2 [V]	68.25185	29.92535	-38.32650
AI 1/U3 [V]	-81.66433	262.8861	344.5504
AI 1/I1 [A]	91.74967	17.58921	-74.16046
AI 1/I2 [A]	-29.32108	-11.53243	17.78865
AI 1/I3 [A]	-66.08713	-6.110549	59.97658
U1_tRMS@POWER/0 [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

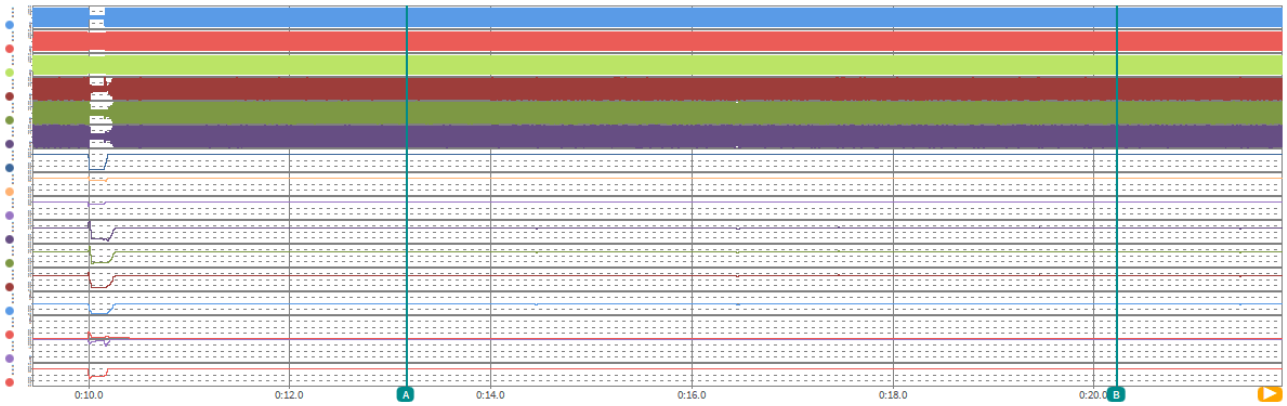


	A	B	Delta
Time [s]	0:10.09394	0:10.14359	0.04965
AI 1/U1 [V]	42.39083	-41.28075	-83.67157
AI 1/U2 [V]	35.51531	-0.505209	-36.02052
AI 1/U3 [V]	-46.44585	7.012129	53.45798
AI 1/I1 [A]	9.512306	-7.861376	-17.37368
AI 1/I2 [A]	-5.189300	6.954909	12.14421
AI 1/I3 [A]	-4.362107	0.794888	5.156994
U1_tRMS@POWER/0 [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



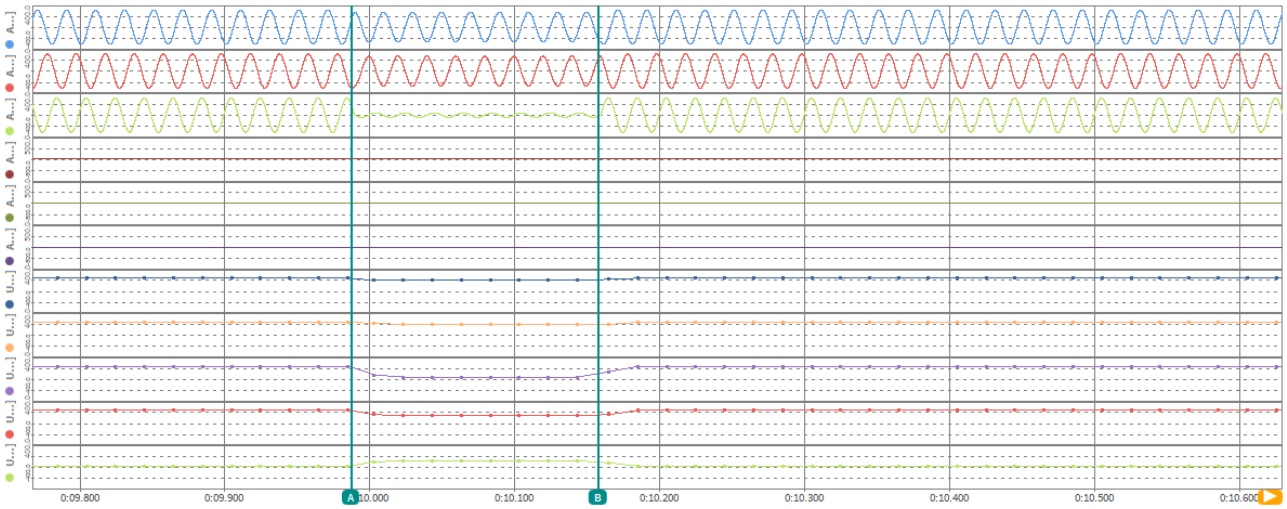
Time [s]	A 0:10.16397	B 0:10.28283	Delta 0.11886
AI 1/U1 [V]	-283.7551	-320.6990	-36.94391
AI 1/U2 [V]	90.21640	212.7092	122.4928
AI 1/U3 [V]	137.4283	108.5086	-28.91970
AI 1/I1 [A]	54.41046	-45.14575	-99.55621
AI 1/I2 [A]	-27.86660	32.69077	60.55737
AI 1/I3 [A]	-26.23701	12.48074	38.71775
U1_tRMS@POWER/0 [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 0:13.16105	B 0:20.22506	Delta 7.06401
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

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

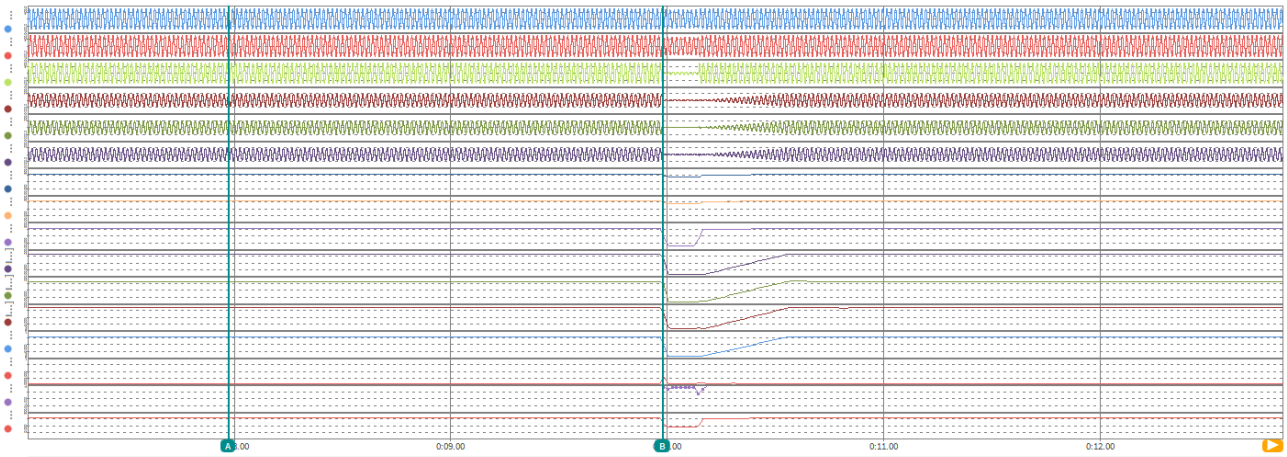
Test No. 1.3(D2) idle test



	A	B	Delta
Time [s]	9.98758	0:10.15790	0.17032
AI 1/U1 [V]	112.5615	-236.2373	-348.7988
AI 1/U2 [V]	-321.2395	241.8795	563.1190
AI 1/U3 [V]	208.2889	-22.82691	-231.1158
AI 1/I1 [A]	-0.998497	0.664830	1.663327
AI 1/I2 [A]	0.156760	-0.598192	-0.754952
AI 1/I3 [A]	0.812650	-0.093937	-0.906587
U1_tRMS@POWER/0 [V]	230.2165	200.3036	-29.91293
U2_tRMS@POWER/0 [V]	230.4737	200.4272	-30.04648
U3_tRMS@POWER/0 [V]	230.3135	30.01465	-200.2988
U_fundRMS_SYM+@POWER/0 [V]	230.3342	126.8795	-103.4548
U_fundRMS_SYM-@POWER/0 [V]	0.154177	104.4444	104.2902

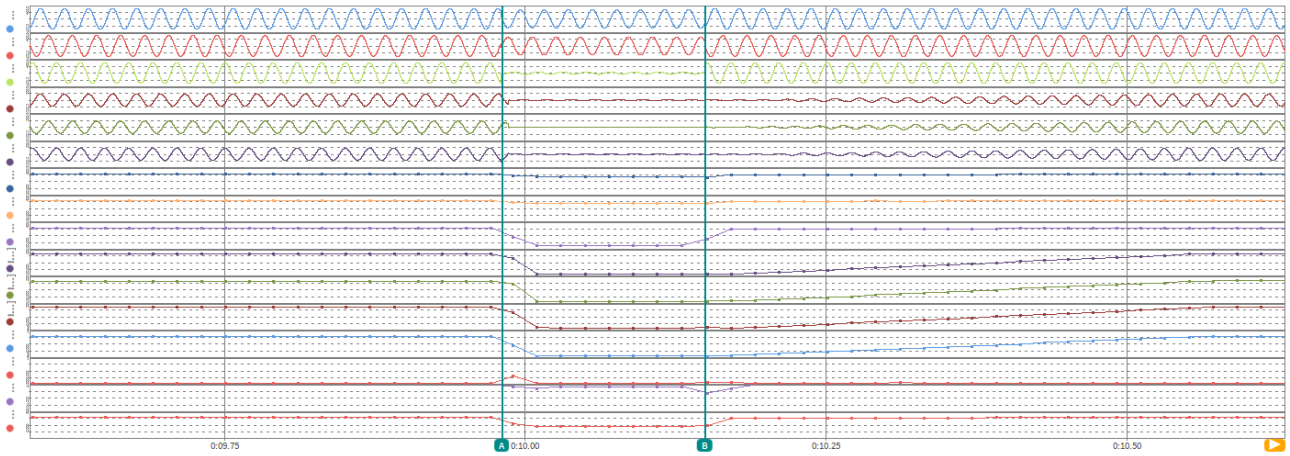
Test No. 1.3(D2) with PGU

Before dip

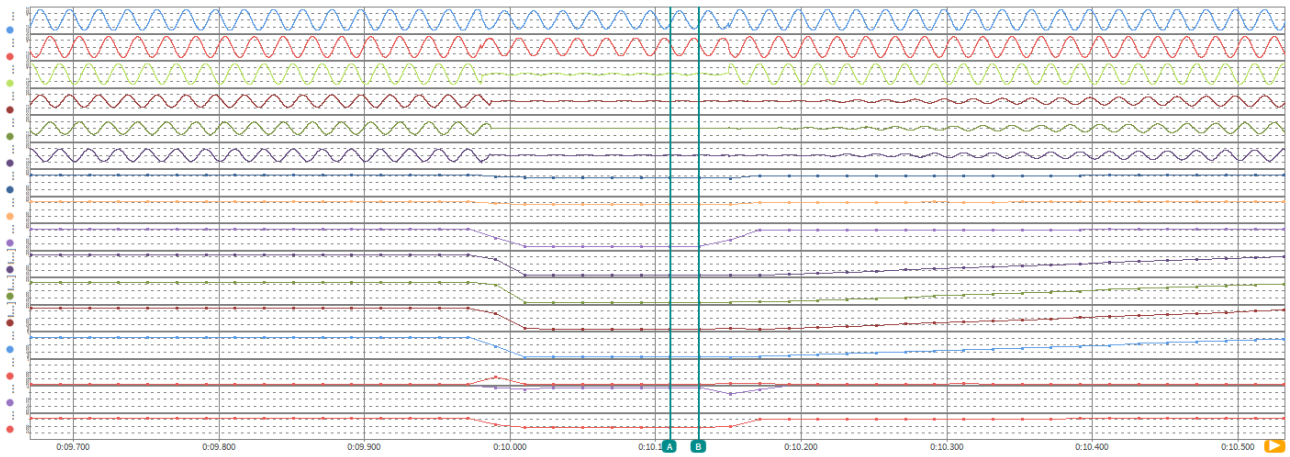


	A	B	Delta
Time [s]	7.97560	9.98106	2.00545
AI 1/U1 [V]	248.9433	17.77315	-231.1702
AI 1/U2 [V]	-307.6749	6.106377	313.7813
AI 1/U3 [V]	57.91164	-57.97410	-115.8857
AI 1/I1 [A]	181.6110	117.9237	-63.68721
AI 1/I2 [A]	-222.8596	85.31714	308.1768
AI 1/I3 [A]	41.03995	-202.5186	-243.5585
U1_tRMS@POWER/0 [V]	230.7859	230.9818	0.195862
U2_tRMS@POWER/0 [V]	230.9412	230.8354	-0.105743
U3_tRMS@POWER/0 [V]	230.7357	230.6851	-0.050690
I1_tRMS@POWER/0 [A]	167.3821	167.4865	0.104370
I2_tRMS@POWER/0 [A]	167.6494	167.5263	-0.123077
I3_tRMS@POWER/0 [A]	168.0116	167.9316	-0.080002
P_t@POWER/0 [W]	116106.8	116091.6	-15.21094
Q_t@POWER/0 [var]	1184.255	1080.700	-103.5546
PF_t@POWER/0 []	0.999948	0.999957	8.702e-6
U_fundRMS_SYM+@POWER/0 [V]	230.8177	230.8297	0.011963

During dip

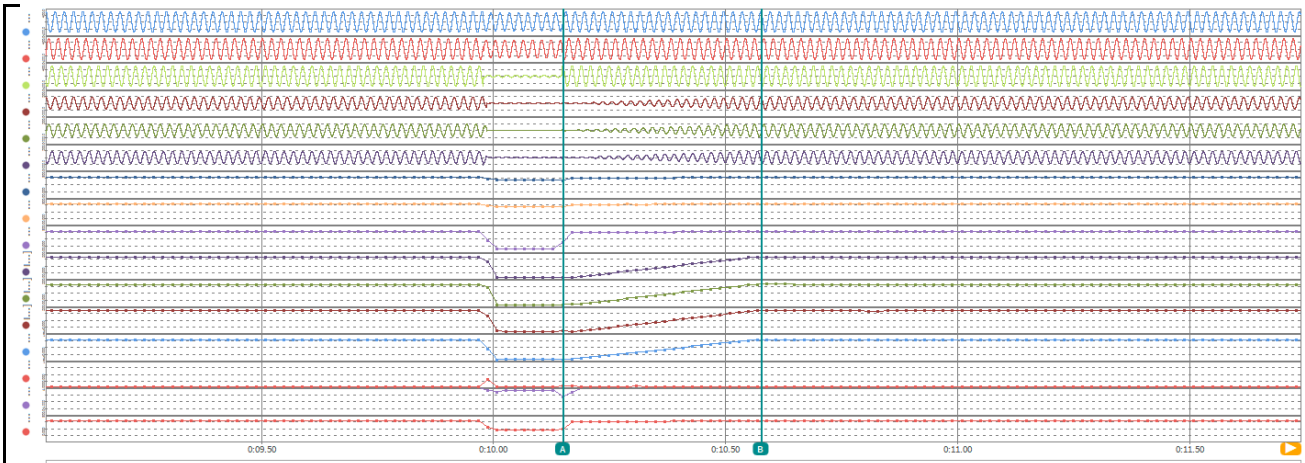


	A	B	Delta
Time [s]	9.98117	0:10.14970	0.16853
AI 1/U1 [V]	4.254818	-128.4101	-132.6649
AI 1/U2 [V]	12.70938	116.5681	103.8587
AI 1/U3 [V]	-53.19262	38.57780	91.77042
AI 1/I1 [A]	108.3900	-12.76589	-121.1559
AI 1/I2 [A]	110.6639	0.123262	-110.5406
AI 1/I3 [A]	-218.5465	12.61735	231.1639
U1_tRMS@POWER/0 [V]	230.9818	200.1271	-30.85474
U2_tRMS@POWER/0 [V]	230.8354	199.5444	-31.29108
U3_tRMS@POWER/0 [V]	230.6851	30.05199	-200.6331
I1_tRMS@POWER/0 [A]	167.4865	8.923440	-158.5631
I2_tRMS@POWER/0 [A]	167.5263	7.614997	-159.9113
I3_tRMS@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

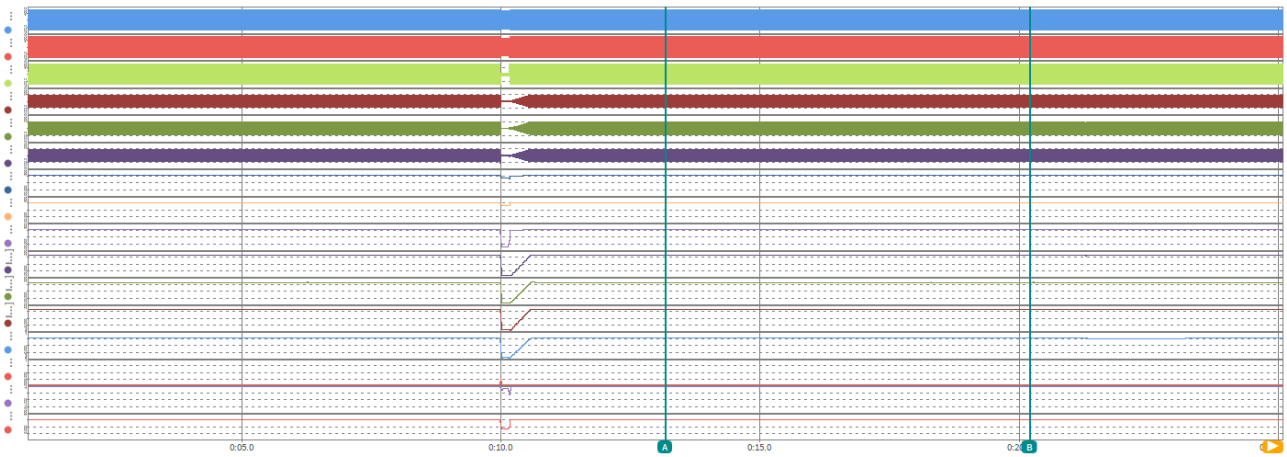


	A	B	Delta
Time [s]	0:10.10986	0:10.12990	0.02004
AI 1/U1 [V]	-120.9638	-112.5844	8.379460
AI 1/U2 [V]	110.0779	101.8014	-8.276463
AI 1/U3 [V]	39.09803	39.41131	0.313282
AI 1/I1 [A]	-11.31153	-11.50143	-0.189900
AI 1/I2 [A]	-1.052022	-1.404882	-0.352860
AI 1/I3 [A]	12.36093	12.84802	0.487089
U1_tRMS@POWER/0 [V]	200.1217	200.1255	3.754e-3
U2_tRMS@POWER/0 [V]	199.5491	199.5442	-4.868e-3
U3_tRMS@POWER/0 [V]	30.05639	30.04866	-7.729e-3
I1_tRMS@POWER/0 [A]	8.939065	8.918580	-0.020485
I2_tRMS@POWER/0 [A]	7.694782	7.651060	-0.043722
I3_tRMS@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



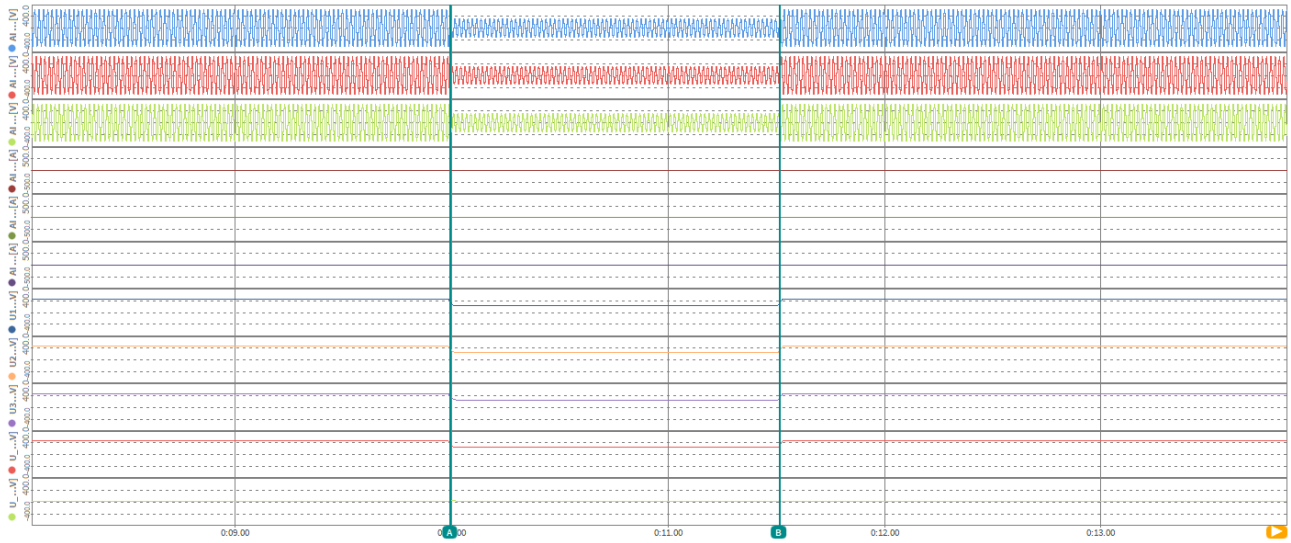
	A	B	Delta
Time [s]	0:10.15078	0:10.57764	0.42686
AI 1/U1 [V]	-186.9819	326.3970	513.3789
AI 1/U2 [V]	-104.4064	-176.1861	-71.77973
AI 1/U3 [V]	279.5713	-150.3379	-429.9093
AI 1/I1 [A]	11.34253	236.7171	225.3746
AI 1/I2 [A]	19.79280	-127.7524	-147.5452
AI 1/I3 [A]	-31.45445	-108.9537	-77.49928
U1_tRMS@POWER/0 [V]	200.1271	230.9650	30.83789
U2_tRMS@POWER/0 [V]	199.5444	231.1224	31.57803
U3_tRMS@POWER/0 [V]	30.05199	230.9588	200.9068
I1_tRMS@POWER/0 [A]	8.923440	167.5032	158.5797
I2_tRMS@POWER/0 [A]	7.614997	167.7009	160.0859
I3_tRMS@POWER/0 [A]	8.370033	168.3080	159.9380
P_t@POWER/0 [W]	3061.342	116312.9	113251.5
Q_t@POWER/0 [var]	1810.977	1194.504	-616.4734
PF_t@POWER/0 []	0.860680	0.999947	0.139267
U_fundRMS_SYM+@POWER/0 [V]	126.6065	231.0123	104.4057



	A	B	Delta
Time [s]	0:13.17845	0:20.20603	7.02758
AI 1/U1 [V]	317.5564	-295.6889	-613.2453
AI 1/U2 [V]	-92.33237	267.1073	359.4396
AI 1/U3 [V]	-224.5159	34.40786	258.9238
AI 1/I1 [A]	228.0021	-215.3304	-443.3325
AI 1/I2 [A]	-62.80339	194.3425	257.1459
AI 1/I3 [A]	-165.2124	22.24207	187.4545
U1_tRMS@POWER/0 [V]	230.8313	230.8092	-0.022095
U2_tRMS@POWER/0 [V]	230.9440	230.9457	1.678e-3
U3_tRMS@POWER/0 [V]	230.7544	230.7419	-0.012527
I1_tRMS@POWER/0 [A]	167.3855	167.3262	-0.059296
I2_tRMS@POWER/0 [A]	167.7206	167.6951	-0.025467
I3_tRMS@POWER/0 [A]	167.9836	168.0498	0.066162
P_t@POWER/0 [W]	116126.2	116118.8	-7.476563
Q_t@POWER/0 [var]	1412.663	1204.285	-208.3776
PF_t@POWER/0 []	0.999926	0.999946	2.021e-5
U_fundRMS_SYM+@POWER/0 [V]	230.8403	230.8290	-0.011307

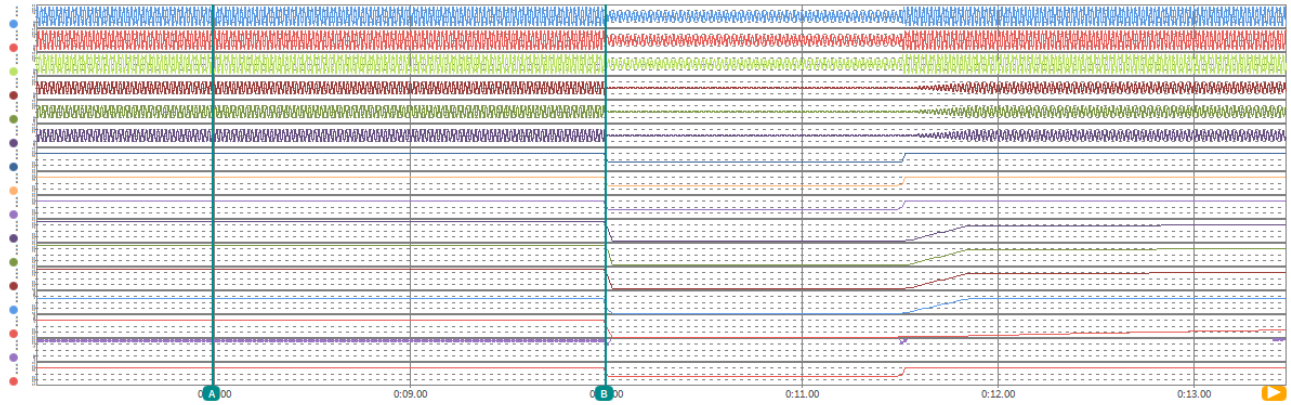
Condition						Measurement
	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	1.3(D2)
	1	Date	--	--	yyyy.mm.dd	2022.08.15
	2	Time (start of test)	--	--	hh:mm:ss	16:42:00
	3	Fault type (phase)	--	--		2 phase
	4	Setting voltage depth	Line to neutral	--	p.u.	0.15
	5	Setting dip 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

Test No. 2.1 idle test



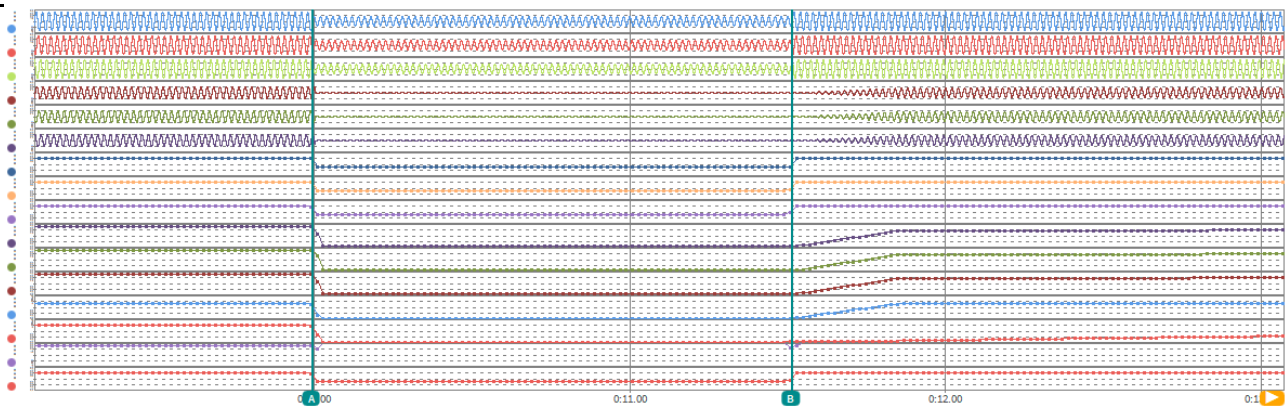
	A	B	Delta
Time [s]	9.99644	0:11.51463	1.51820
AI 1/U1 [V]	102.6073	24.33634	-78.27092
AI 1/U2 [V]	-155.4327	-148.1013	7.331372
AI 1/U3 [V]	52.58608	123.3718	70.78577
AI 1/I1 [A]	-0.518084	-0.511646	6.437e-3
AI 1/I2 [A]	0.079751	0.165701	0.085950
AI 1/I3 [A]	0.409484	0.316024	-0.093460
U1_tRMS@POWER/0 [V]	230.3078	112.1656	-118.1422
U2_tRMS@POWER/0 [V]	230.4459	112.2028	-118.2430
U3_tRMS@POWER/0 [V]	230.2341	112.1044	-118.1297
U_fundRMS_SYM+@POWER/0 [V]	230.3292	112.1576	-118.1716
U_fundRMS_SYM-@POWER/0 [V]	0.061962	0.026060	-0.035902

Test No. 2.1 with PGU
Before dip

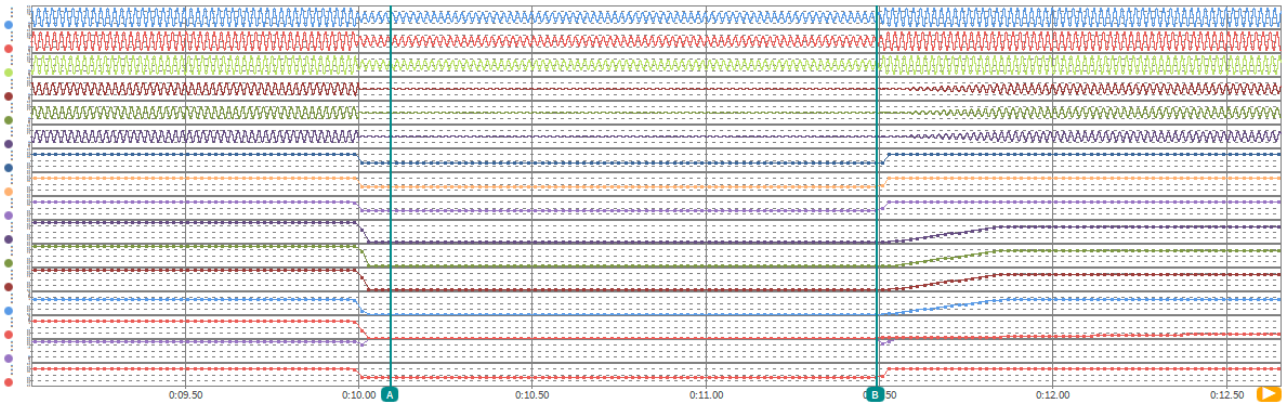


	A	B	Delta
Time [s]	7.98971	9.99308	2.00337
AI 1/U1 [V]	-323.5409	-104.2857	219.2552
AI 1/U2 [V]	196.9879	-67.84797	-264.8359
AI 1/U3 [V]	126.9949	169.2290	42.23418
AI 1/I1 [A]	-183.5692	-272.7026	-89.13339
AI 1/I2 [A]	243.9084	55.09878	-188.8096
AI 1/I3 [A]	-60.31108	217.7931	278.1042
U1_tRMS@POWER/0 [V]	230.8565	230.8119	-0.044586
U2_tRMS@POWER/0 [V]	230.9679	230.9640	-3.952e-3
U3_tRMS@POWER/0 [V]	230.7696	230.7938	0.024200
I1_tRMS@POWER/0 [A]	179.7357	179.8022	0.066498
I2_tRMS@POWER/0 [A]	180.5546	180.6296	0.074982
I3_tRMS@POWER/0 [A]	181.1642	181.1508	-0.013306
P_t@POWER/0 [W]	100398.3	100395.5	-2.867188
Q_t@POWER/0 [var]	74470.42	74516.67	46.25000
PF_t@POWER/0 []	0.803169	0.802984	-1.851e-4
U_fundRMS_SYM+@POWER/0 [V]	230.8605	230.8527	-7.843e-3

During dip

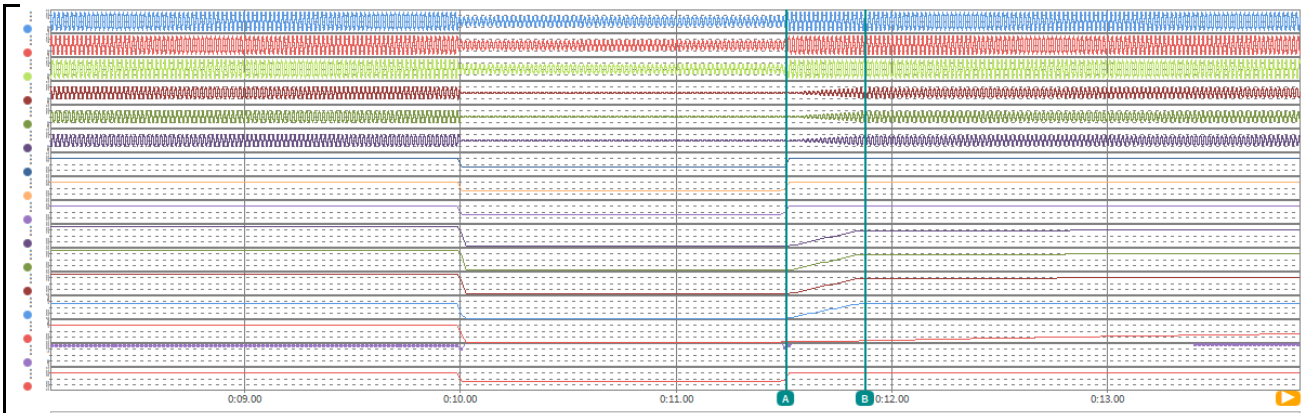


	A	B	Delta
Time [s]	9.99292	0:11.51242	1.51950
AI 1/U1 [V]	-109.8483	-213.6781	-103.8299
AI 1/U2 [V]	-58.87032	-61.48267	-2.612353
AI 1/U3 [V]	172.9550	223.1755	50.22049
AI 1/I1 [A]	-248.8405	18.21923	267.0597
AI 1/I2 [A]	63.10213	6.509185	-56.59294
AI 1/I3 [A]	184.9806	-24.56737	-209.5480
U1_tRMS@POWER/0 [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

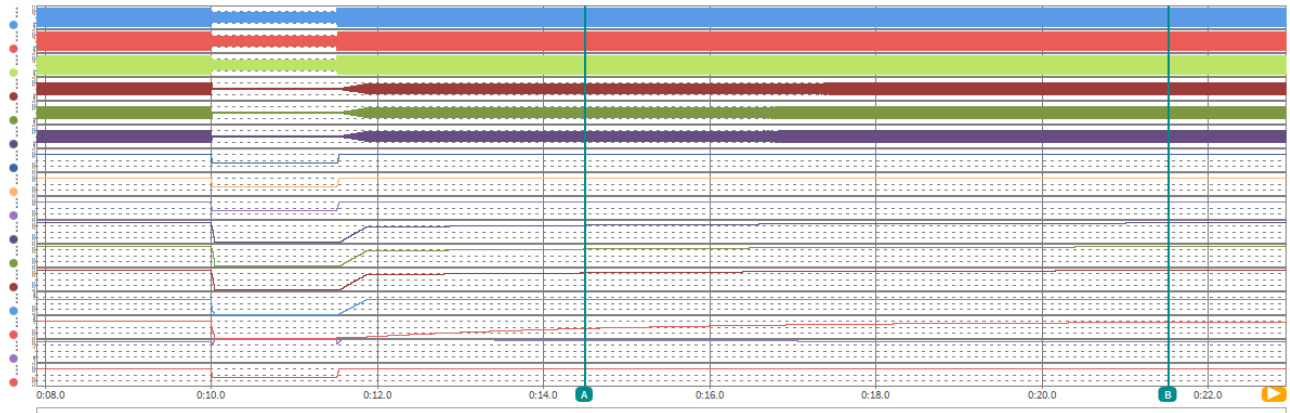


	A	B	Delta
Time [s]	0:10.09245	0:11.49100	1.39856
AI 1/U1 [V]	-115.6147	-150.1570	-34.54232
AI 1/U2 [V]	-34.99437	30.47180	65.46617
AI 1/U3 [V]	148.6697	119.4429	-29.22678
AI 1/I1 [A]	-9.604097	-11.09612	-1.492024
AI 1/I2 [A]	-0.626087	2.526999	3.153086
AI 1/I3 [A]	10.21349	8.546830	-1.666665
U1_tRMS@POWER/0 [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

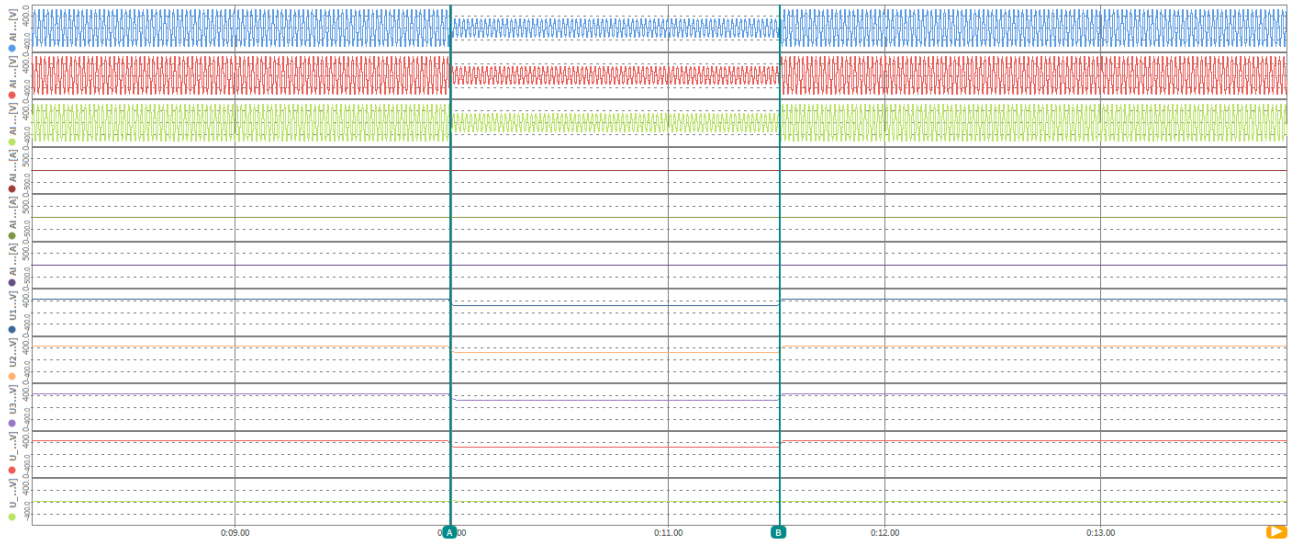


	A	B	Delta
Time [s]	0:11.51252	0:11.88056	0.36803
AI 1/U1 [V]	-240.3853	321.8291	562.2144
AI 1/U2 [V]	-89.36501	-111.5079	-22.14289
AI 1/U3 [V]	317.1985	-209.7180	-526.9165
AI 1/I1 [A]	12.10582	202.0279	189.9221
AI 1/I2 [A]	12.77351	-82.76463	-95.53815
AI 1/I3 [A]	-24.89090	-119.2381	-94.34724
U1_tRMS@POWER/0 [V]	112.1751	231.1305	118.9554
U2_tRMS@POWER/0 [V]	112.2249	231.1040	118.8791
U3_tRMS@POWER/0 [V]	112.1175	231.0961	118.9786
I1_tRMS@POWER/0 [A]	8.307678	144.0594	135.7517
I2_tRMS@POWER/0 [A]	8.329228	144.0765	135.7473
I3_tRMS@POWER/0 [A]	8.267489	144.3320	136.0645
P_t@POWER/0 [W]	2768.030	99689.90	96921.87
Q_t@POWER/0 [var]	377.0446	7174.917	6797.873
PF_t@POWER/0 []	0.990850	0.997420	6.570e-3
U_fundRMS_SYM+@POWER/0 [V]	112.1723	231.1070	118.9347



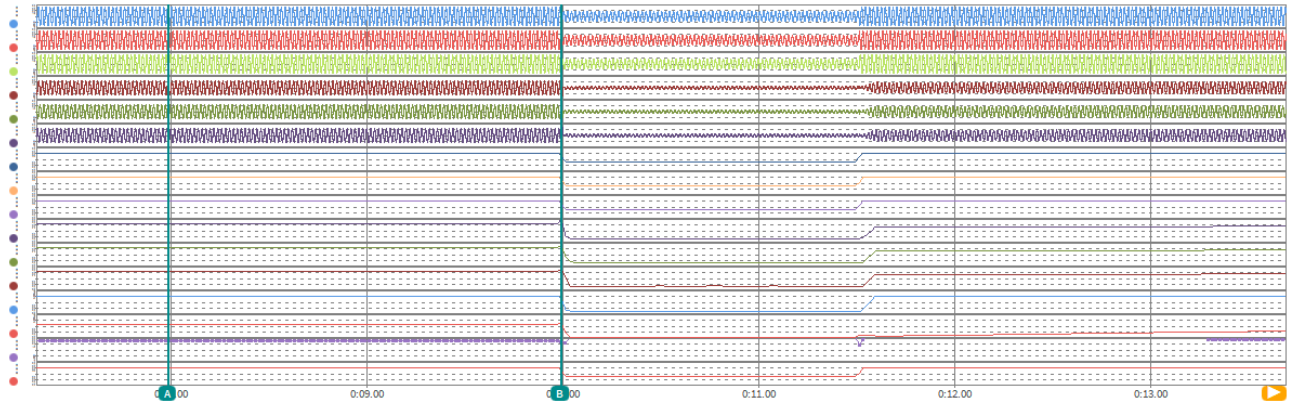
	A	B	Delta
Time [s]	0:14.49793	0:21.51482	7.01689
AI 1/U1 [V]	266.8574	23.40102	-243.4564
AI 1/U2 [V]	-295.7871	-294.1704	1.616716
AI 1/U3 [V]	28.62477	270.4685	241.8437
AI 1/I1 [A]	116.1197	-119.7205	-235.8402
AI 1/I2 [A]	-220.7991	-121.3696	99.42949
AI 1/I3 [A]	104.3741	242.1246	137.7505
U1_tRMS@POWER/0 [V]	230.8453	230.8154	-0.029968
U2_tRMS@POWER/0 [V]	231.0143	230.9771	-0.037292
U3_tRMS@POWER/0 [V]	230.8491	230.7682	-0.080933
I1_tRMS@POWER/0 [A]	157.0523	176.7307	19.67836
I2_tRMS@POWER/0 [A]	157.3123	177.4922	20.17986
I3_tRMS@POWER/0 [A]	157.5296	177.8573	20.32764
P_t@POWER/0 [W]	99814.20	100476.3	662.1250
Q_t@POWER/0 [var]	43701.16	70656.53	26955.38
PF_t@POWER/0 []	0.916048	0.817994	-0.098054
U_fundRMS_SYM+@POWER/0 [V]	230.8999	230.8503	-0.049683

Test No. 2.2 idle test



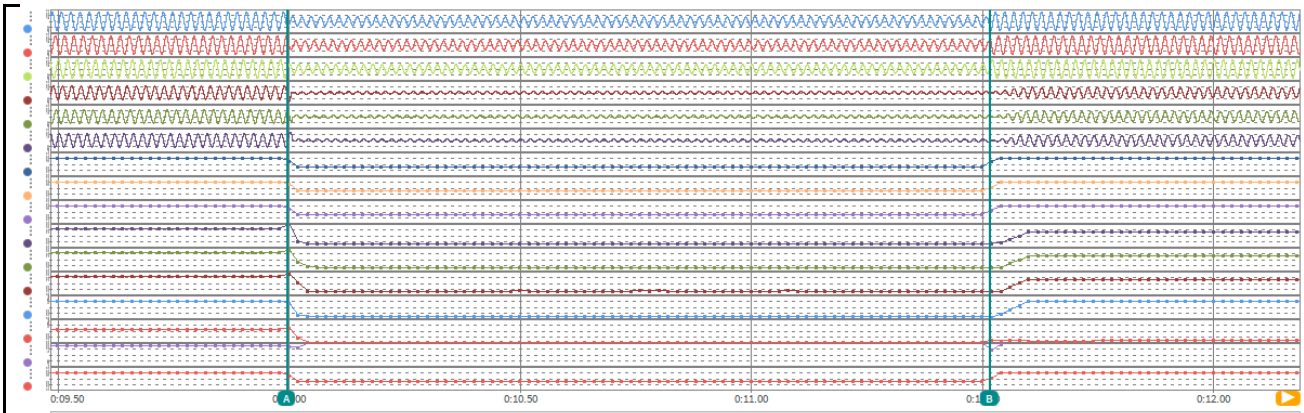
Time [s]	A 9.99644	B 0:11.51463	Delta 1.51820
AI 1/U1 [V]	102.6073	24.33634	-78.27092
AI 1/U2 [V]	-155.4327	-148.1013	7.331372
AI 1/U3 [V]	52.58608	123.3718	70.78577
AI 1/I1 [A]	-0.518084	-0.511646	6.437e-3
AI 1/I2 [A]	0.079751	0.165701	0.085950
AI 1/I3 [A]	0.409484	0.316024	-0.093460
U1_tRMS@POWER/0 [V]	230.3078	112.1656	-118.1422
U2_tRMS@POWER/0 [V]	230.4459	112.2028	-118.2430
U3_tRMS@POWER/0 [V]	230.2341	112.1044	-118.1297
U_fundRMS_SYM+@POWER/0 [V]	230.3292	112.1576	-118.1716
U_fundRMS_SYM-@POWER/0 [V]	0.061962	0.026060	-0.035902

Test No. 2.2 with PGU
Before dip

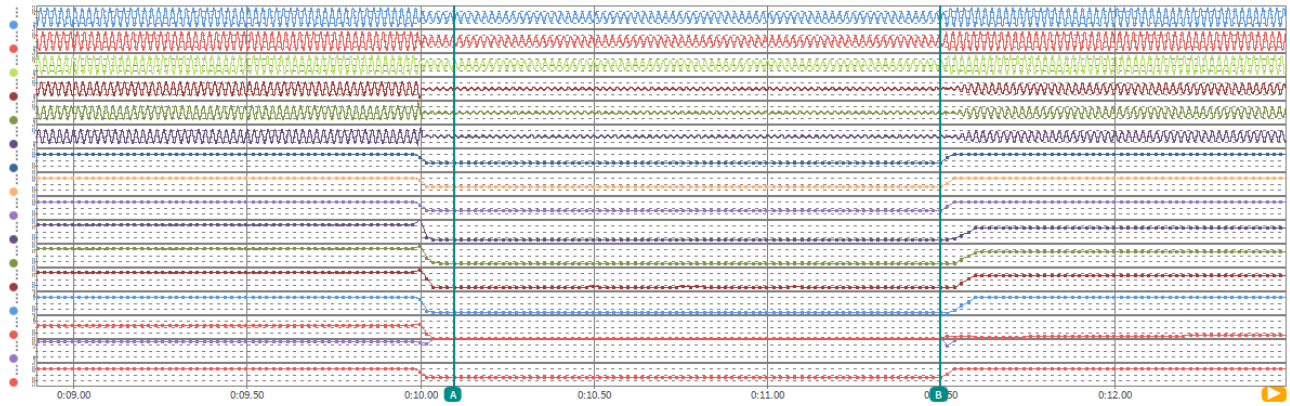


Time [s]	A 7.98817	B 9.99157	Delta 2.00340
AI 1/U1 [V]	312.6686	224.4551	-88.21345
AI 1/U2 [V]	-234.8983	92.53836	327.4367
AI 1/U3 [V]	-77.42596	-316.0570	-238.6310
AI 1/I1 [A]	35.37405	56.68092	21.30687
AI 1/I2 [A]	-58.03311	-20.27476	37.75835
AI 1/I3 [A]	22.35150	-36.98063	-59.33214
U1_tRMS@POWER/0 [V]	230.4145	230.3957	-0.018784
U2_tRMS@POWER/0 [V]	230.5515	230.5858	0.034378
U3_tRMS@POWER/0 [V]	230.3805	230.3908	0.010345
I1_tRMS@POWER/0 [A]	41.09729	41.18972	0.092438
I2_tRMS@POWER/0 [A]	41.17150	41.17127	-2.289e-4
I3_tRMS@POWER/0 [A]	41.20959	41.21570	6.115e-3
P_t@POWER/0 [W]	22839.34	22890.12	50.77930
Q_t@POWER/0 [var]	16972.82	16944.18	-28.64063
PF_t@POWER/0 []	0.802635	0.803750	1.114e-3
U_fundRMS_SYM+@POWER/0 [V]	230.4477	230.4563	8.575e-3

During dip

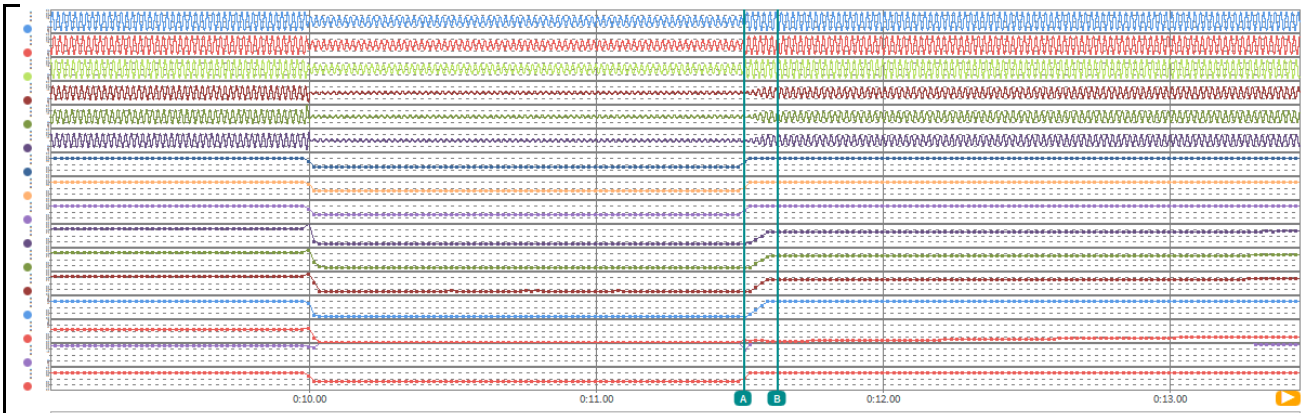


	A	B	Delta
Time [s]	9.99600	0:11.51646	1.52046
AI 1/U1 [V]	-96.49277	-235.9710	-139.4782
AI 1/U2 [V]	170.9414	313.4916	142.5502
AI 1/U3 [V]	-72.62898	-77.64554	-5.016566
AI 1/I1 [A]	-6.790758	6.673098	13.46386
AI 1/I2 [A]	69.29028	-5.326987	-74.61727
AI 1/I3 [A]	-67.16502	-1.355648	65.80937
U1_tRMS@POWER/0 [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

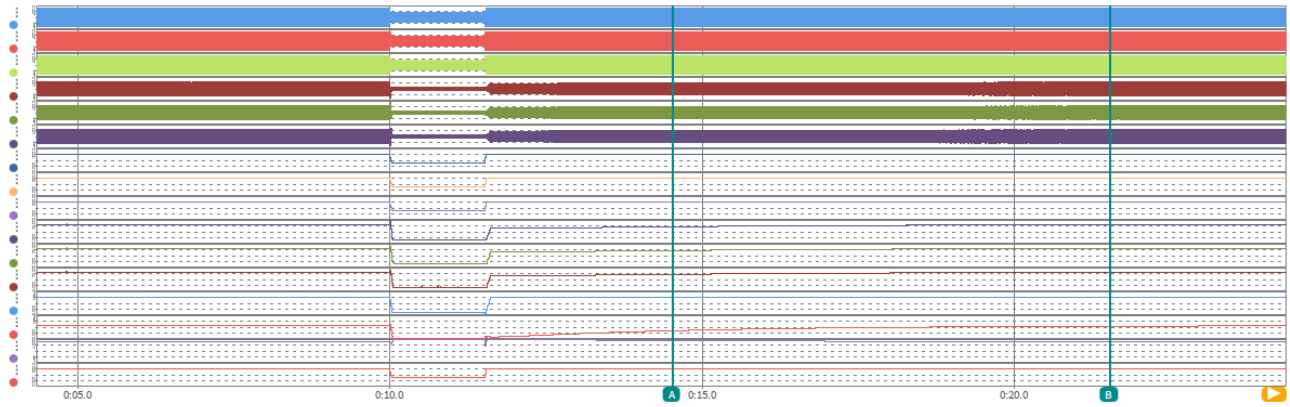


	A	B	Delta
Time [s]	0:10.09608	0:11.49571	1.39964
AI 1/U1 [V]	-96.26842	-88.19342	8.074999
AI 1/U2 [V]	156.9097	158.2339	1.324177
AI 1/U3 [V]	-60.36878	-70.00828	-9.639502
AI 1/I1 [A]	-6.995202	-5.666733	1.328468
AI 1/I2 [A]	11.96051	11.45697	-0.503540
AI 1/I3 [A]	-4.961729	-5.827666	-0.865936
U1_tRMS@POWER/0 [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



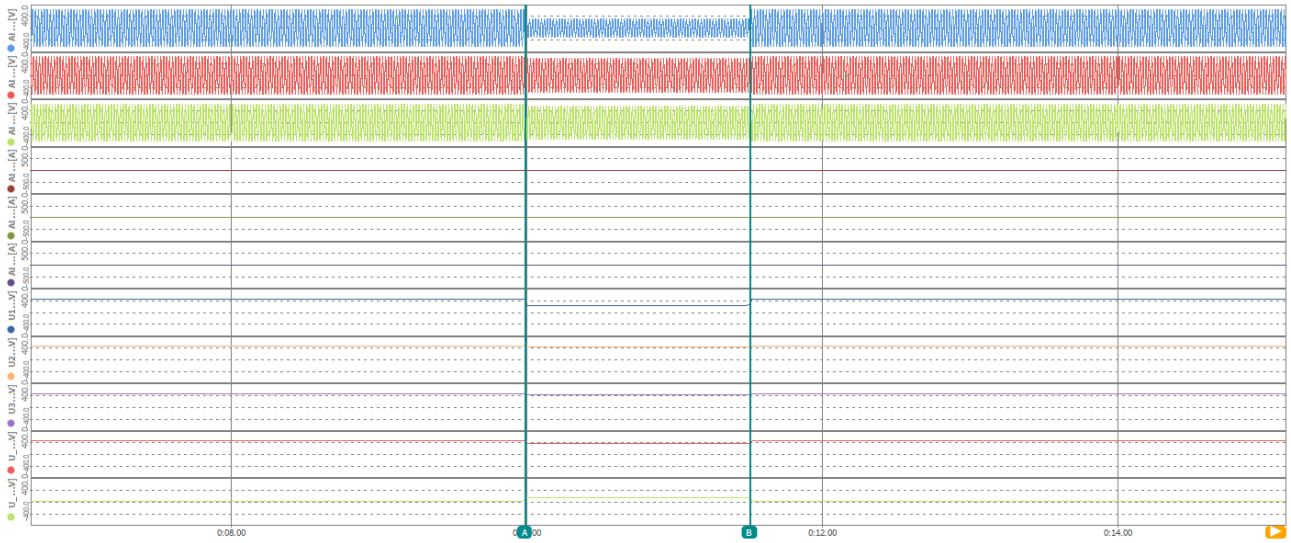
	A	B	Delta
Time [s]	0:11.51462	0:11.63251	0.11788
AI 1/U1 [V]	-38.46026	131.1092	169.5695
AI 1/U2 [V]	152.4122	192.9698	40.55763
AI 1/U3 [V]	-114.0401	-324.3623	-210.3222
AI 1/I1 [A]	-0.781655	21.92700	22.70866
AI 1/I2 [A]	10.84292	25.69056	14.84764
AI 1/I3 [A]	-10.09619	-47.65082	-37.55462
U1_tRMS@POWER/0 [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



	A	B	Delta
Time [s]	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

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

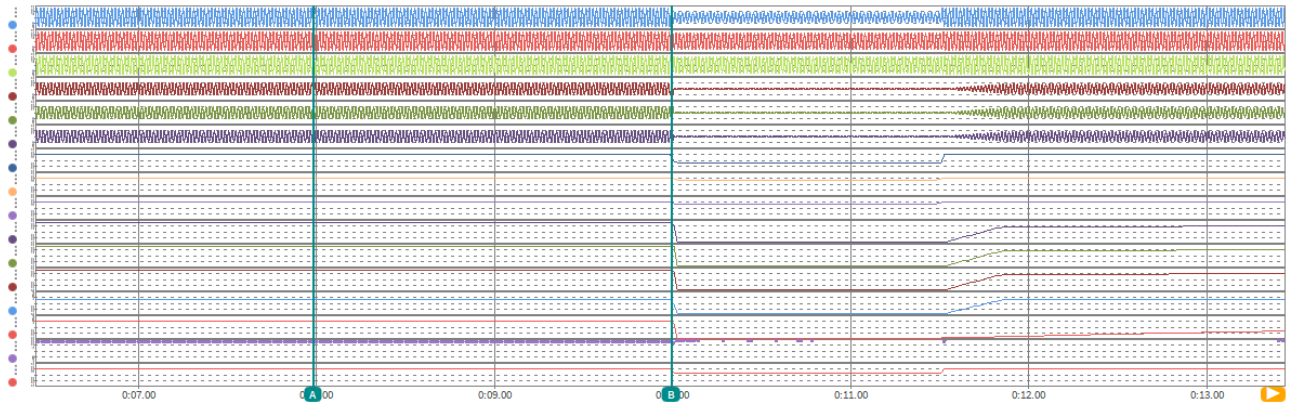
Test No. 2.3 idle test



	A	B	Delta
Time [s]	9.99042	0:11.51136	1.52095
AI 1/U1 [V]	-325.5797	-150.4293	175.1504
AI 1/U2 [V]	156.7004	-12.51888	-169.2193
AI 1/U3 [V]	168.9129	164.9640	-3.948927
AI 1/I1 [A]	-0.033617	-0.164628	-0.131011
AI 1/I2 [A]	0.909567	0.928521	0.018954
AI 1/I3 [A]	-0.906706	-0.795484	0.111222
U1_tRMS@POWER/0 [V]	230.3169	112.1389	-118.1780
U2_tRMS@POWER/0 [V]	230.4380	206.3845	-24.05348
U3_tRMS@POWER/0 [V]	230.2601	206.2181	-24.04201
U_fundRMS_SYM+@POWER/0 [V]	230.3383	170.8156	-59.52266
U_fundRMS_SYM-@POWER/0 [V]	0.060675	58.19781	58.13714

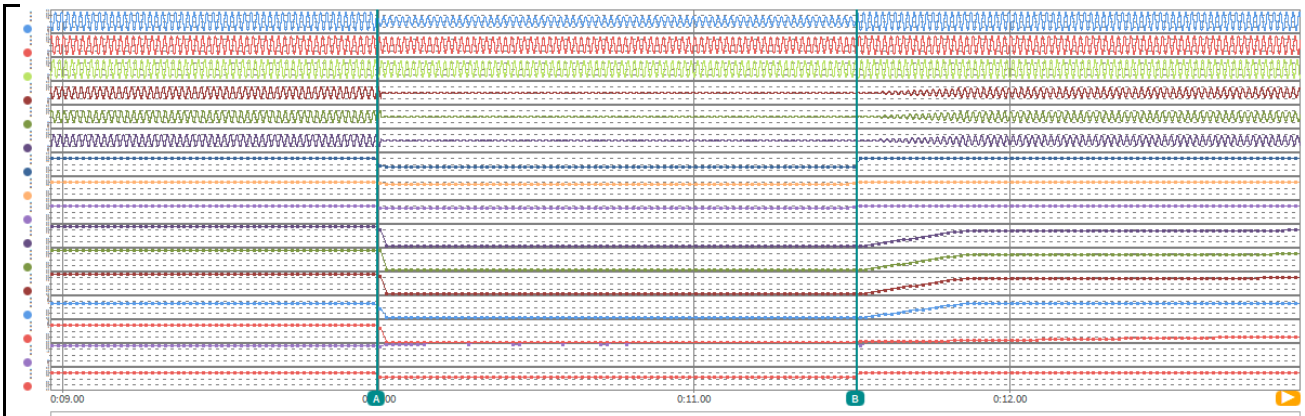
Test No. 2.3 with PGU

Before dip

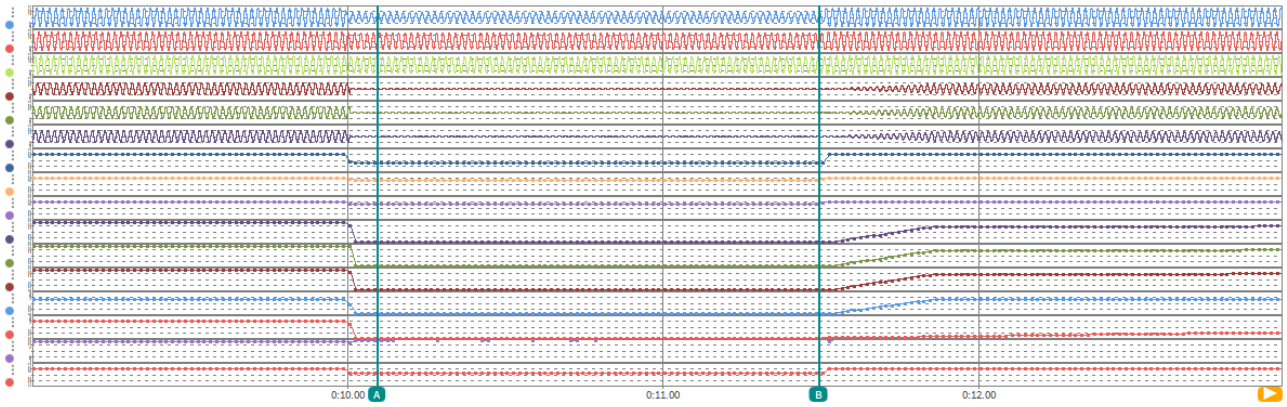


	A	B	Delta
Time [s]	7.98708	9.99525	2.00817
AI 1/U1 [V]	-303.2105	201.1523	504.3629
AI 1/U2 [V]	255.8336	-322.9206	-578.7542
AI 1/U3 [V]	47.57881	125.0248	77.44599
AI 1/I1 [A]	-133.5586	4.458905	138.0175
AI 1/I2 [A]	258.8072	-223.1658	-481.9730
AI 1/I3 [A]	-125.3872	218.5705	343.9577
U1_tRMS@POWER/0 [V]	230.8317	231.2300	0.398331
U2_tRMS@POWER/0 [V]	230.9642	230.7951	-0.169083
U3_tRMS@POWER/0 [V]	230.8084	230.5341	-0.274353
I1_tRMS@POWER/0 [A]	179.6613	179.8327	0.171448
I2_tRMS@POWER/0 [A]	180.5352	180.9214	0.386200
I3_tRMS@POWER/0 [A]	181.0273	180.8060	-0.221283
P_t@POWER/0 [W]	100419.3	100405.4	-13.95313
Q_t@POWER/0 [var]	74355.81	74490.75	134.9375
PF_t@POWER/0 []	0.803668	0.803112	-5.561e-4
U_fundRMS_SYM+@POWER/0 [V]	230.8646	230.8452	-0.019394

During dip

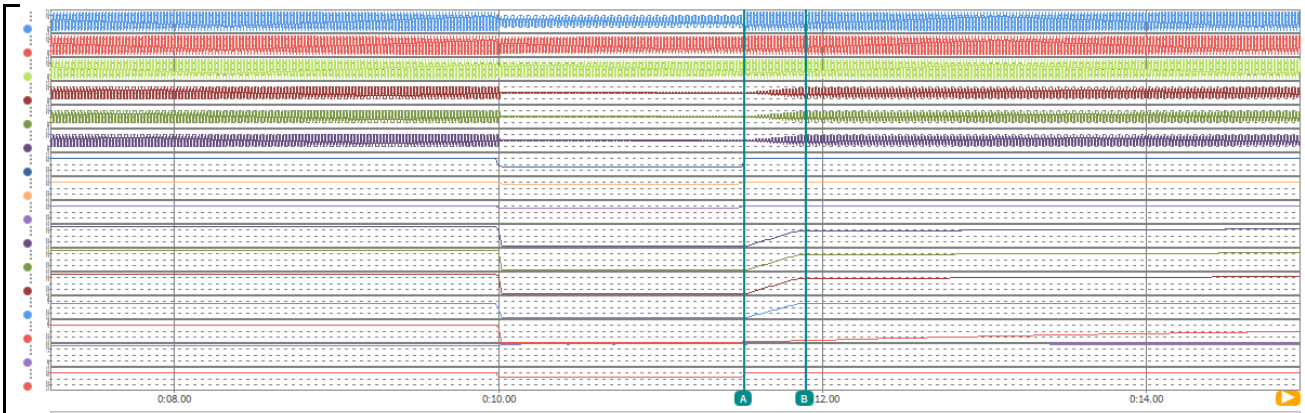


	A	B	Delta
Time [s]	9.99655	0:11.51451	1.51796
AI 1/U1 [V]	146.5974	70.18304	-76.41435
AI 1/U2 [V]	-207.3486	-287.5009	-80.15228
AI 1/U3 [V]	65.51814	216.5542	151.0360
AI 1/I1 [A]	120.4454	3.791929	-116.6534
AI 1/I2 [A]	-253.7244	-12.41505	241.3093
AI 1/I3 [A]	133.2027	8.647204	-124.5555
U1_tRMS@POWER/0 [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

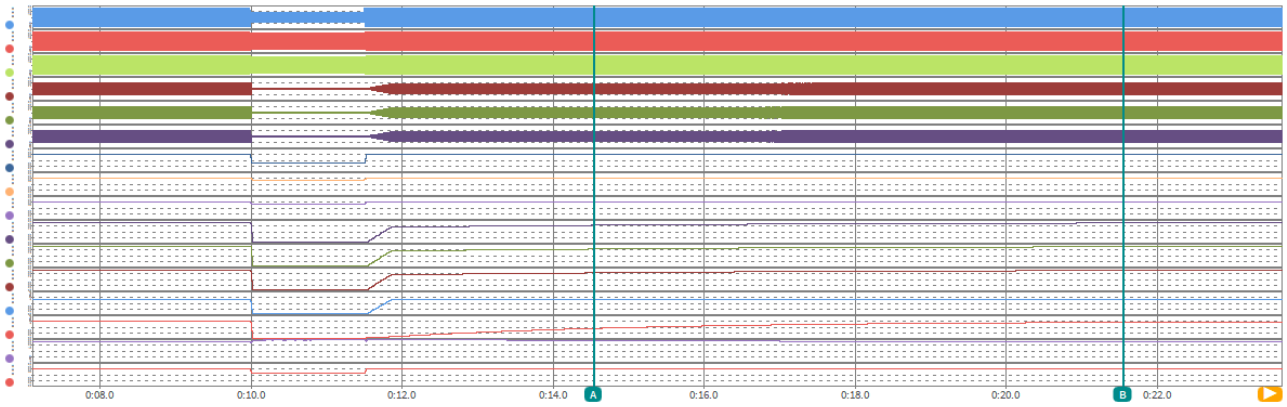


	A	B	Delta
Time [s]	0:10.09580	0:11.49408	1.39828
AI 1/U1 [V]	115.9926	47.04452	-68.94803
AI 1/U2 [V]	-244.9050	-291.8866	-46.98158
AI 1/U3 [V]	126.7417	244.4403	117.6987
AI 1/I1 [A]	8.302093	1.600385	-6.701708
AI 1/I2 [A]	-11.75630	-11.12437	0.631928
AI 1/I3 [A]	3.392577	9.485007	6.092430
U1_tRMS@POWER/0 [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

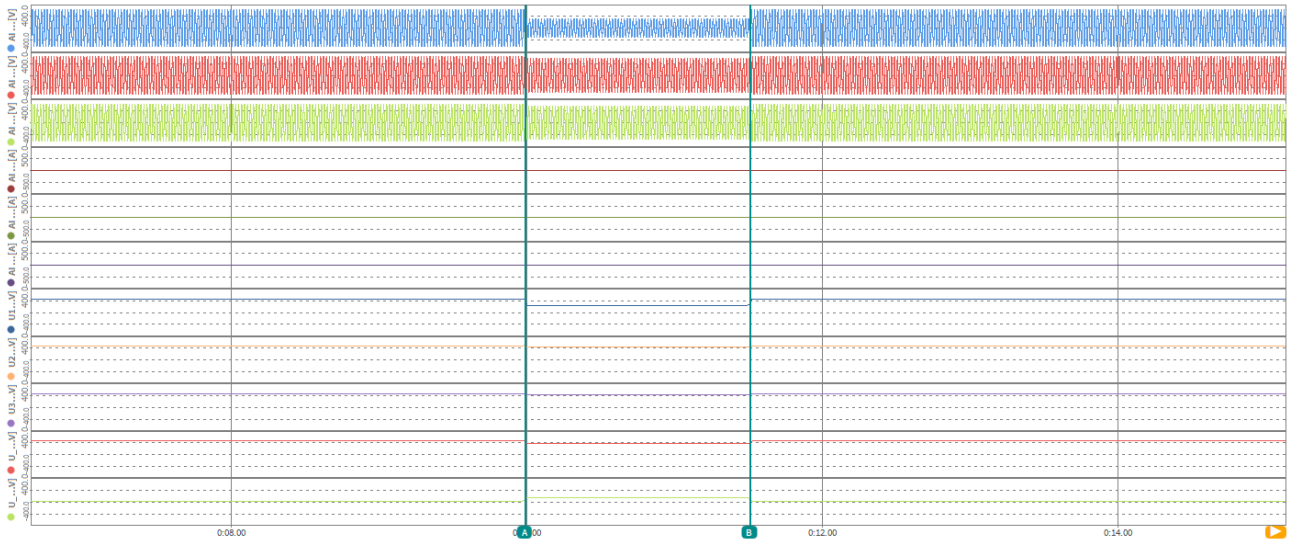


	A	B	Delta
Time [s]	0:11.51642	0:11.89624	0.37982
AI 1/U1 [V]	284.0564	272.9006	-11.15584
AI 1/U2 [V]	-286.5496	-291.3532	-4.803658
AI 1/U3 [V]	-10.35547	18.17942	28.53489
AI 1/I1 [A]	-3.855348	160.9739	164.8293
AI 1/I2 [A]	-5.231977	-186.0459	-180.8139
AI 1/I3 [A]	9.198666	25.37668	16.17801
U1_tRMS@POWER/0 [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



	A	B	Delta
Time [s]	0:14.54199	0:21.54457	7.00257
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

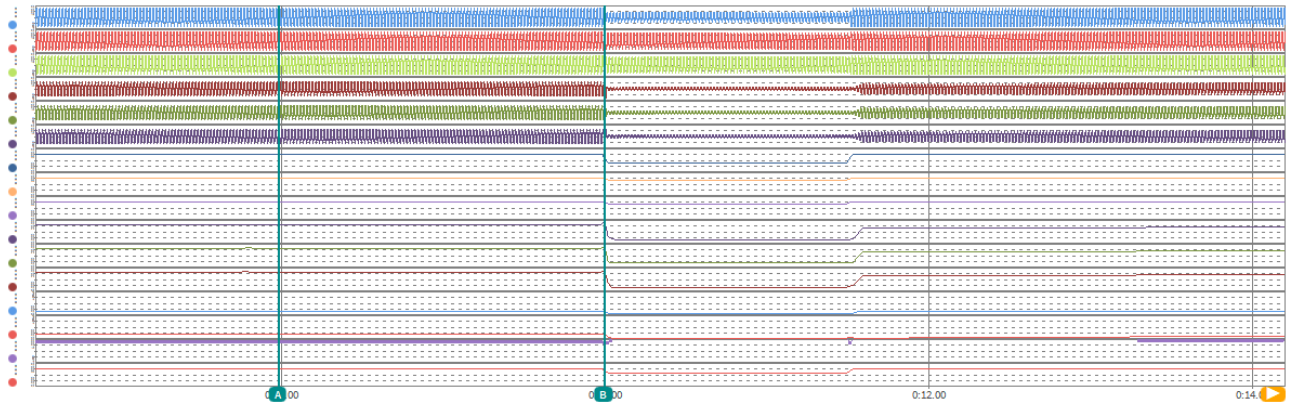
Test No. 2.4 idle test



	A	B	Delta
Time [s]	9.99042	0:11.51136	1.52095
AI 1/U1 [V]	-325.5797	-150.4293	175.1504
AI 1/U2 [V]	156.7004	-12.51888	-169.2193
AI 1/U3 [V]	168.9129	164.9640	-3.948927
AI 1/I1 [A]	-0.033617	-0.164628	-0.131011
AI 1/I2 [A]	0.909567	0.928521	0.018954
AI 1/I3 [A]	-0.906706	-0.795484	0.111222
U1_tRMS@POWER/0 [V]	230.3169	112.1389	-118.1780
U2_tRMS@POWER/0 [V]	230.4380	206.3845	-24.05348
U3_tRMS@POWER/0 [V]	230.2601	206.2181	-24.04201
U_fundRMS_SYM+@POWER/0 [V]	230.3383	170.8156	-59.52266
U_fundRMS_SYM-@POWER/0 [V]	0.060675	58.19781	58.13714

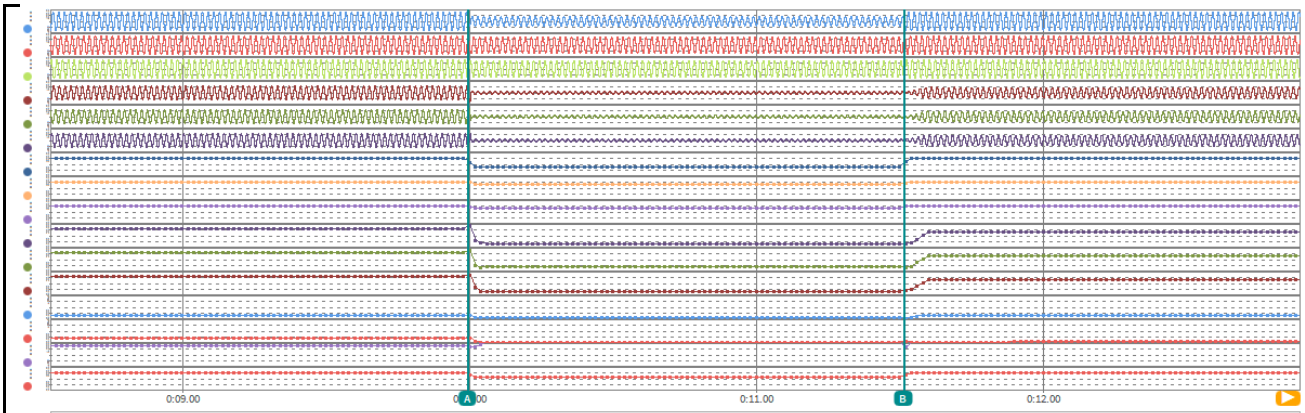
Test No. 2.4 with PGU

Before dip

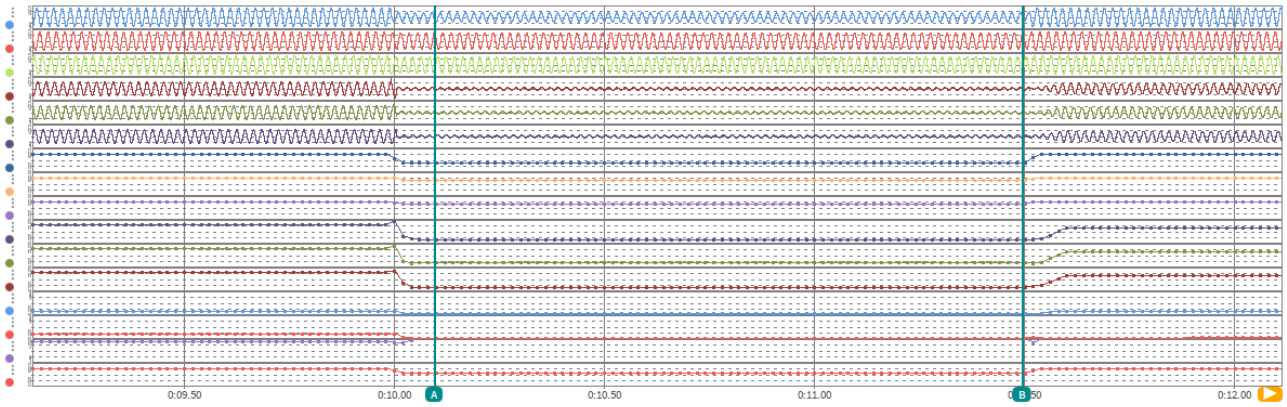


	A	B	Delta
Time [s]	7.98268	9.99468	2.01200
AI 1/U1 [V]	-247.4897	32.90129	280.3910
AI 1/U2 [V]	-60.15325	259.9394	320.0927
AI 1/U3 [V]	306.8497	-290.3741	-597.2238
AI 1/I1 [A]	-57.39665	41.40759	98.80424
AI 1/I2 [A]	25.24114	15.42735	-9.813786
AI 1/I3 [A]	32.03666	-56.92935	-88.96602
U1_tRMS@POWER/0 [V]	230.4536	230.5723	0.118729
U2_tRMS@POWER/0 [V]	230.5766	230.5058	-0.070801
U3_tRMS@POWER/0 [V]	230.3629	230.3216	-0.041382
I1_tRMS@POWER/0 [A]	41.09126	41.08278	-8.476e-3
I2_tRMS@POWER/0 [A]	41.18712	41.19530	8.186e-3
I3_tRMS@POWER/0 [A]	41.21467	41.12214	-0.092533
P_t@POWER/0 [W]	22811.89	22828.36	16.46484
Q_t@POWER/0 [var]	17018.57	16961.08	-57.48438
PF_t@POWER/0 []	0.801521	0.802696	1.174e-3
U_fundRMS_SYM+@POWER/0 [V]	230.4633	230.4651	1.831e-3

During dip

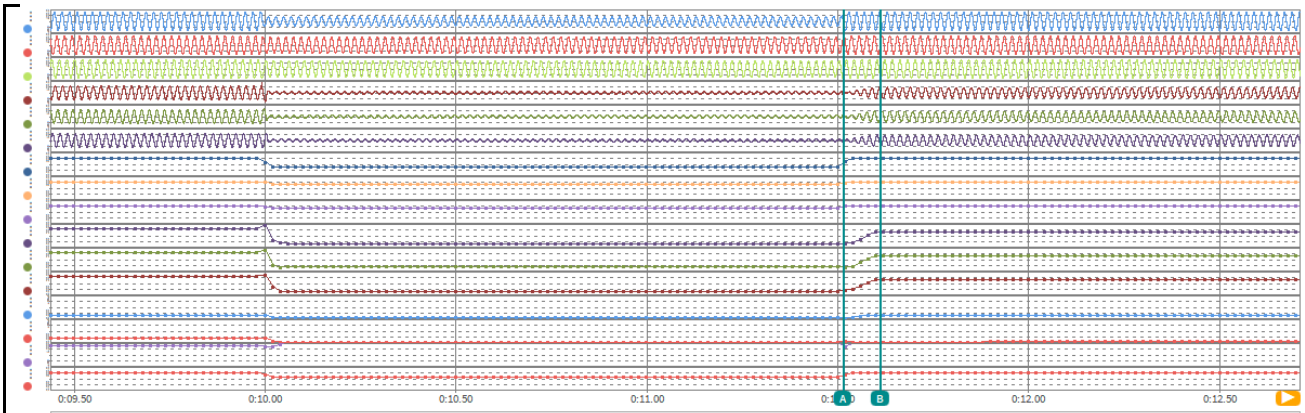


	A	B	Delta
Time [s]	9.99444	0:11.51326	1.51881
AI 1/U1 [V]	42.57965	183.0156	140.4359
AI 1/U2 [V]	251.9932	133.9951	-117.9981
AI 1/U3 [V]	-291.0767	-326.0358	-34.95908
AI 1/I1 [A]	45.94744	-0.180244	-46.12768
AI 1/I2 [A]	10.40018	4.766226	-5.633951
AI 1/I3 [A]	-56.43666	-4.405737	52.03092
U1_tRMS@POWER/0 [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

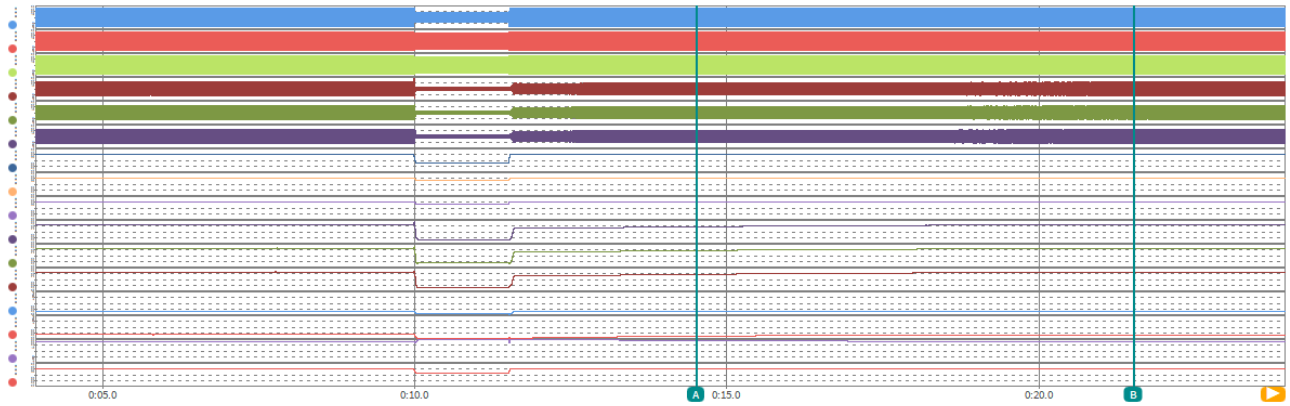


	A	B	Delta
Time [s]	0:10.09640	0:11.49496	1.39856
AI 1/U1 [V]	-56.14114	13.93437	70.07552
AI 1/U2 [V]	290.3738	272.2063	-18.16750
AI 1/U3 [V]	-234.4849	-286.3898	-51.90492
AI 1/I1 [A]	-2.480030	0.604868	3.084898
AI 1/I2 [A]	11.05201	7.655383	-3.396630
AI 1/I3 [A]	-8.650542	-8.282304	0.368238
U1_tRMS@POWER/0 [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



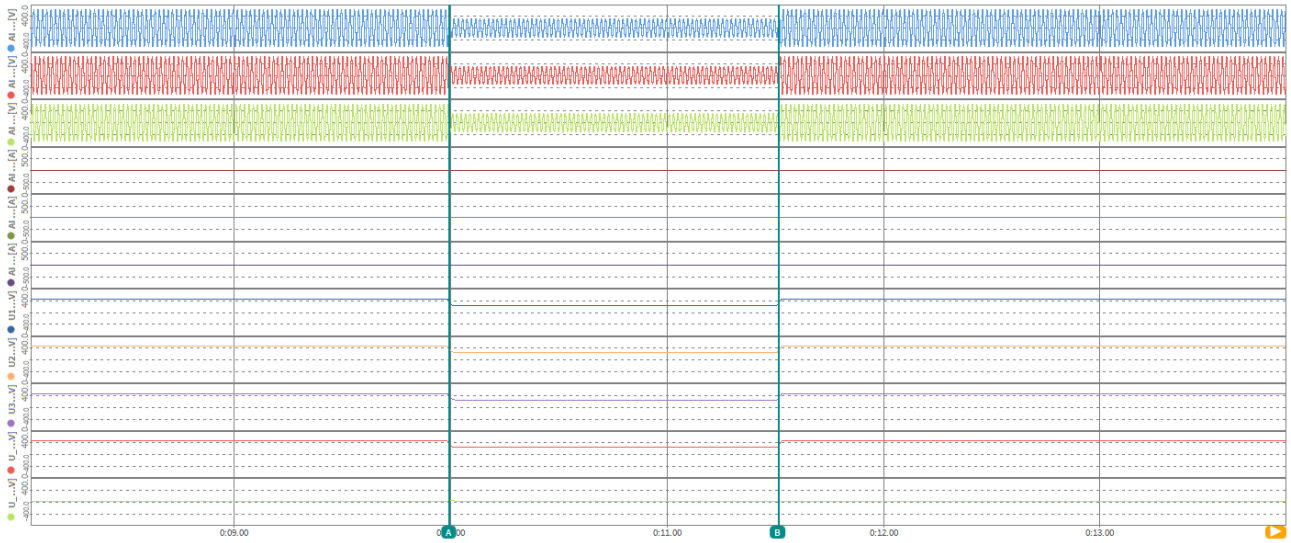
Time [s]	A 0:11.51459	B 0:11.61268	Delta 0.09809
AI 1/U1 [V]	70.74905	236.2278	165.4787
AI 1/U2 [V]	240.5775	77.26932	-163.3082
AI 1/U3 [V]	-310.7991	-312.7072	-1.908064
AI 1/I1 [A]	3.505469	37.36222	33.85675
AI 1/I2 [A]	6.035328	6.587267	0.551939
AI 1/I3 [A]	-9.434105	-43.92326	-34.48916
U1_tRMS@POWER/0 [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 0:14.51557	B 0:21.51585	Delta 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	-8.087e-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

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

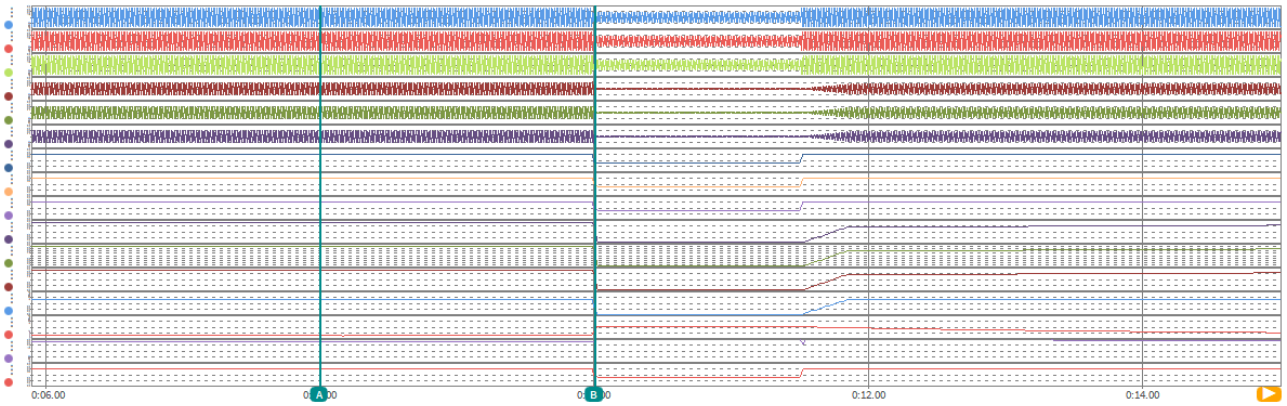
Test No. 3.1 idle test



	A	B	Delta
Time [s]	9.99644	0:11.51463	1.51820
AI 1/U1 [V]	102.6073	24.33634	-78.27092
AI 1/U2 [V]	-155.4327	-148.1013	7.331372
AI 1/U3 [V]	52.58608	123.3718	70.78577
AI 1/I1 [A]	-0.518084	-0.511646	6.437e-3
AI 1/I2 [A]	0.079751	0.165701	0.085950
AI 1/I3 [A]	0.409484	0.316024	-0.093460
U1_tRMS@POWER/0 [V]	230.3078	112.1656	-118.1422
U2_tRMS@POWER/0 [V]	230.4459	112.2028	-118.2430
U3_tRMS@POWER/0 [V]	230.2341	112.1044	-118.1297
U_fundRMS_SYM+@POWER/0 [V]	230.3292	112.1576	-118.1716
U_fundRMS_SYM-@POWER/0 [V]	0.061962	0.026060	-0.035902

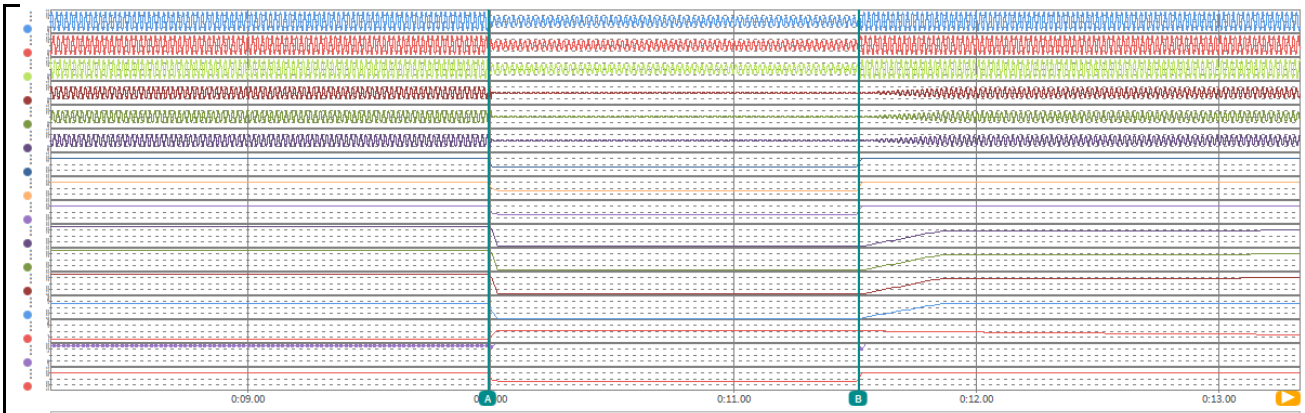
Test No. 3.1 with PGU

Before dip

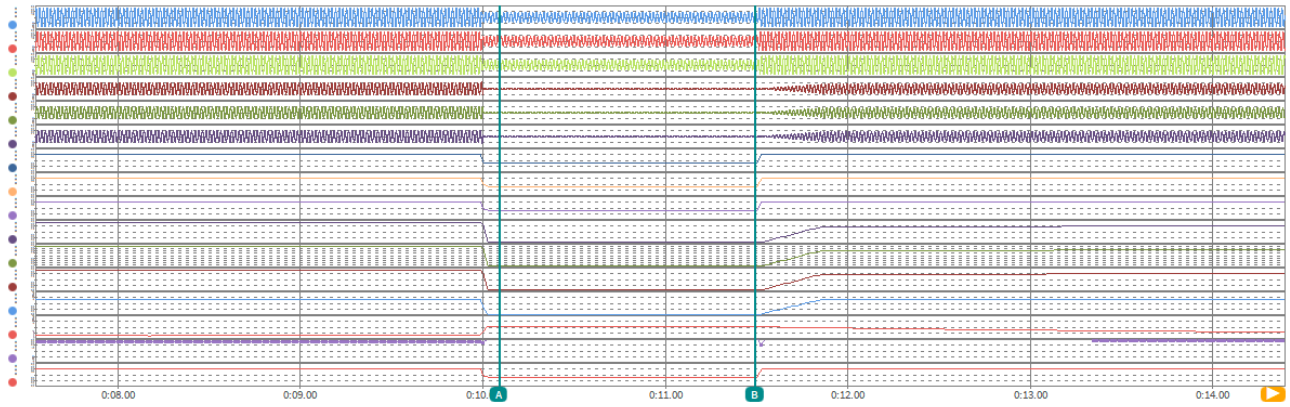


	A	B	Delta
Time [s]	8.002182	0:10.006888	2.004706
AI 1/U1 [V]	228.8034	-107.1870	-335.9904
AI 1/U2 [V]	87.43859	154.9361	67.49750
AI 1/U3 [V]	-315.9397	-45.57348	270.3662
AI 1/I1 [A]	29.98865	-240.9207	-270.9093
AI 1/I2 [A]	202.1229	192.4824	-9.640575
AI 1/I3 [A]	-232.0594	48.46001	280.5194
U1_tRMS@POWER/0 [V]	230.5943	231.1245	0.530151
U2_tRMS@POWER/0 [V]	230.7175	230.4772	-0.240295
U3_tRMS@POWER/0 [V]	230.4720	230.1949	-0.277191
I1_tRMS@POWER/0 [A]	180.6931	179.3985	-1.294601
I2_tRMS@POWER/0 [A]	181.1469	179.2746	-1.872269
I3_tRMS@POWER/0 [A]	181.7996	180.5626	-1.236938
P_t@POWER/0 [W]	99817.86	99599.98	-217.8750
Q [var]	-75839.25	-74444.20	1395.047
PF_t@POWER/0 []	0.796248	0.800986	4.738e-3
U_fundRMS_SYM+@POWER/0 [V]	230.5901	230.5864	-3.693e-3

During dip

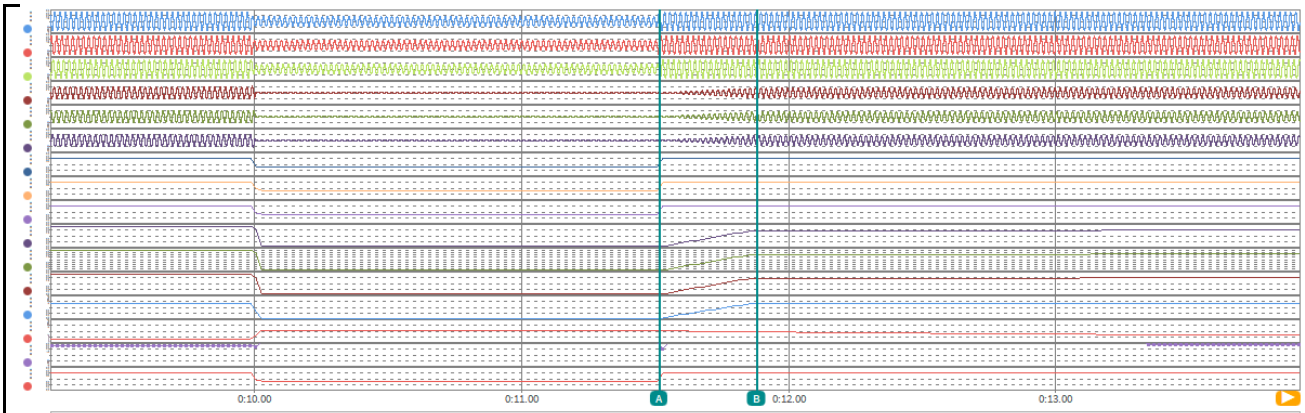


	A	B	Delta
Time [s]	9.992405	0:11.516296	1.523891
AI 1/U1 [V]	-196.7707	83.01712	279.7878
AI 1/U2 [V]	-123.4093	-158.6320	-35.22277
AI 1/U3 [V]	323.6220	75.64736	-247.9746
AI 1/I1 [A]	-4.280567	5.154014	9.434581
AI 1/I2 [A]	-217.9462	-11.67762	206.2686
AI 1/I3 [A]	222.2828	6.468773	-215.8140
U1_tRMS@POWER/0 [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

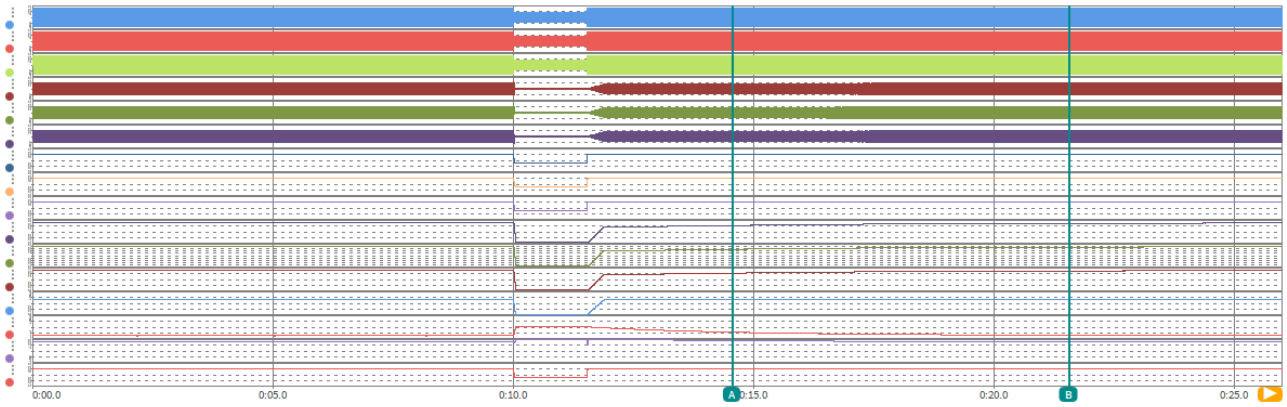


	A	B	Delta
Time [s]	0:10.091023	0:11.493493	1.402470
AI 1/U1 [V]	-143.7919	-51.49412	92.29780
AI 1/U2 [V]	9.684802	-104.4400	-114.1248
AI 1/U3 [V]	132.8323	155.5905	22.75825
AI 1/I1 [A]	-9.992719	-4.445792	5.546928
AI 1/I2 [A]	0.679255	-7.375479	-8.054734
AI 1/I3 [A]	9.306789	11.78348	2.476692
U1_tRMS@POWER/0 [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

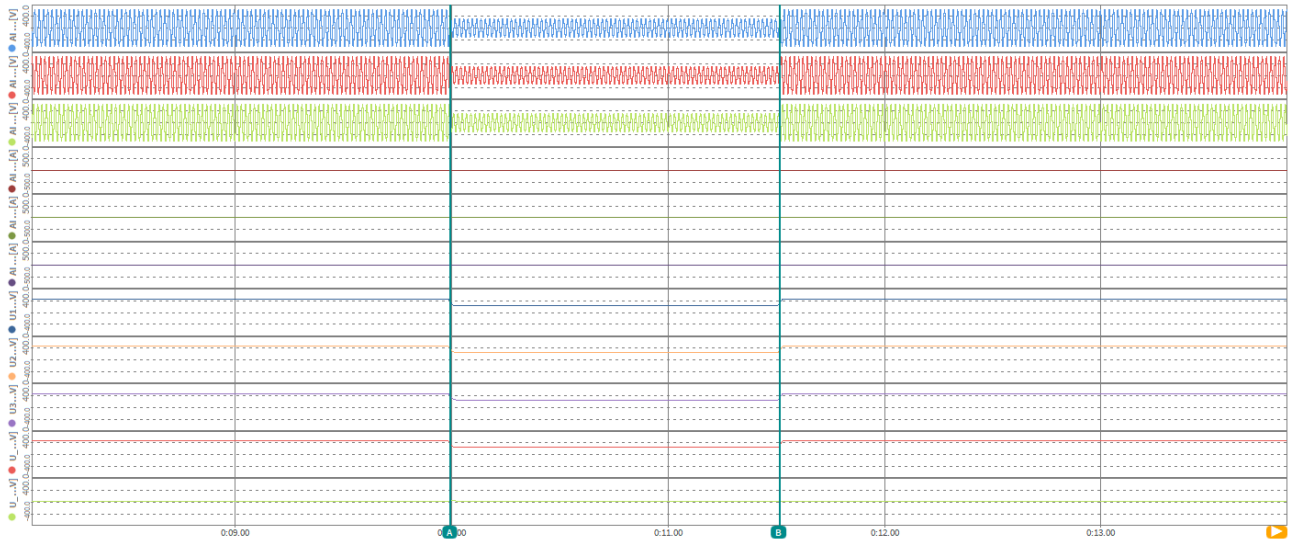


	A	B	Delta
Time [s]	0:11.517507	0:11.881962	0.364455
AI 1/U1 [V]	265.7566	234.1612	-31.59547
AI 1/U2 [V]	-294.2805	80.80864	375.0892
AI 1/U3 [V]	29.77801	-314.1191	-343.8971
AI 1/I1 [A]	-5.584002	135.9966	141.5806
AI 1/I2 [A]	2.985001	62.28865	59.30364
AI 1/I3 [A]	2.532959	-198.3708	-200.9038
U1_tRMS@POWER/0 [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



	A	B	Delta
Time [s]	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

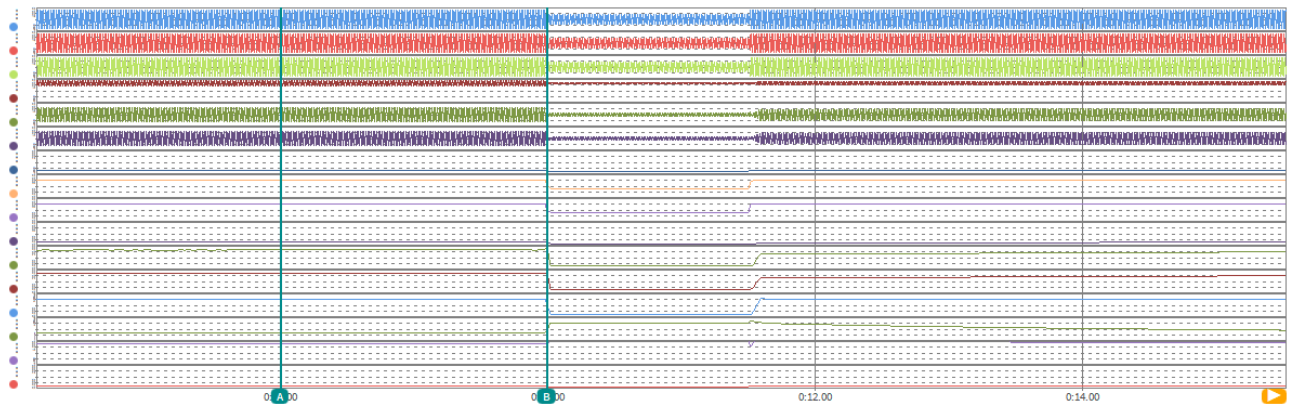
Test No. 3.2 idle test



Time [s]	A 9.99644	B 0:11.51463	Delta 1.51820
AI 1/U1 [V]	102.6073	24.33634	-78.27092
AI 1/U2 [V]	-155.4327	-148.1013	7.331372
AI 1/U3 [V]	52.58608	123.3718	70.78577
AI 1/I1 [A]	-0.518084	-0.511646	6.437e-3
AI 1/I2 [A]	0.079751	0.165701	0.085950
AI 1/I3 [A]	0.409484	0.316024	-0.093460
U1_tRMS@POWER/0 [V]	230.3078	112.1656	-118.1422
U2_tRMS@POWER/0 [V]	230.4459	112.2028	-118.2430
U3_tRMS@POWER/0 [V]	230.2341	112.1044	-118.1297
U_fundRMS_SYM+@POWER/0 [V]	230.3292	112.1576	-118.1716
U_fundRMS_SYM-@POWER/0 [V]	0.061962	0.026060	-0.035902

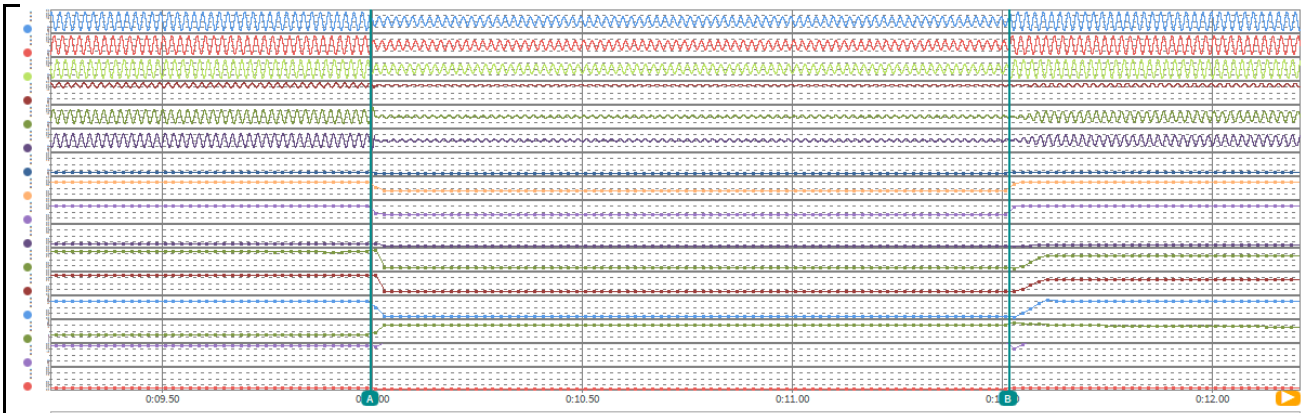
Test No. 3.2 with PGU

Before dip

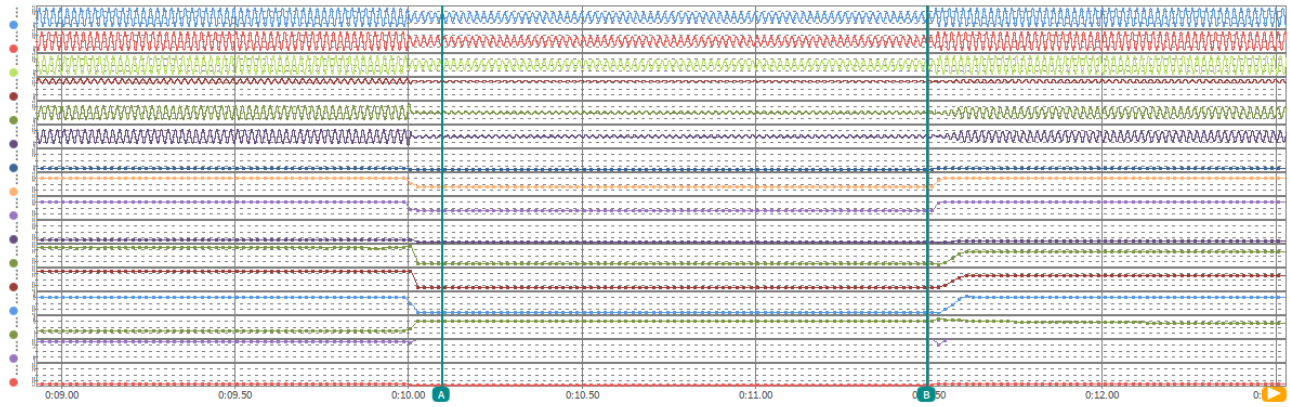


Time [s]	A 8.00763	B 9.99900	Delta 1.99137
AI 1/U1 [V]	-320.7493	154.6059	475.3552
AI 1/U2 [V]	213.0373	-43.53452	-256.5718
AI 1/U3 [V]	104.6431	-109.9236	-214.5667
AI 1/I1 [A]	-53.27404	56.91505	110.1891
AI 1/I2 [A]	3.983855	17.52901	13.54516
AI 1/I3 [A]	49.39282	-74.57316	-123.9660
U1_tRMS@POWER/0 [V]	230.4056	230.3986	-6.989e-3
U2_tRMS@POWER/0 [V]	230.4878	230.4892	1.343e-3
U3_tRMS@POWER/0 [V]	230.3425	230.3150	-0.027496
I1_tRMS@POWER/0 [A]	41.73882	41.69176	-0.047050
I2_tRMS@POWER/0 [A]	41.71970	41.72783	8.129e-3
I3_tRMS@POWER/0 [A]	41.82335	41.76194	-0.061409
P_t@POWER/0 [W]	22940.39	22953.43	13.04492
Q [var]	-17521.69	-17464.18	57.51563
PF_t@POWER/0 []	0.794708	0.795835	1.127e-3
U_fundRMS_SYM+@POWER/0 [V]	230.4107	230.3996	-0.011093

During dip

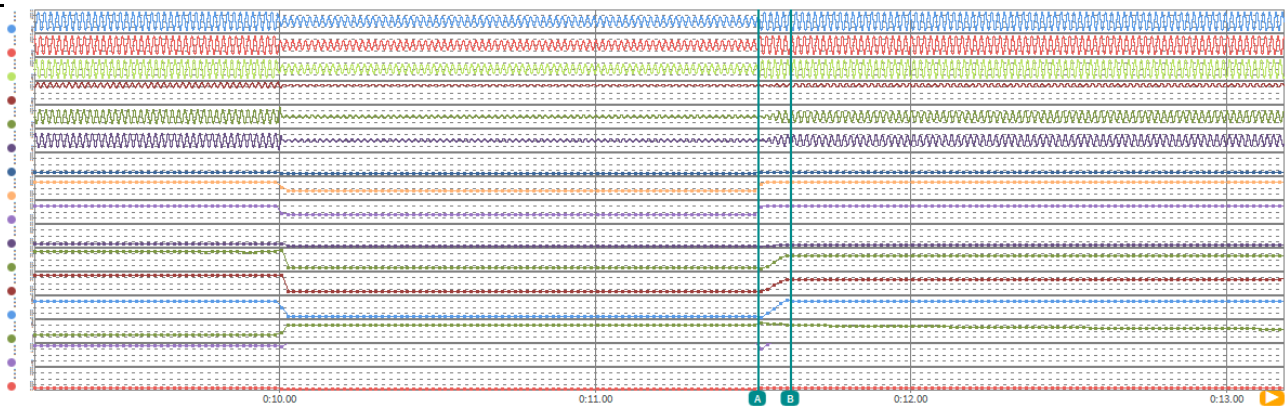


	A	B	Delta
Time [s]	9.99784	0:11.51614	1.51830
AI 1/U1 [V]	162.7488	129.5631	-33.18572
AI 1/U2 [V]	-98.65952	-144.2053	-45.54582
AI 1/U3 [V]	-65.27090	14.32014	79.59104
AI 1/I1 [A]	65.83298	9.869815	-55.96316
AI 1/I2 [A]	-6.372810	-10.68592	-4.313112
AI 1/I3 [A]	-57.66261	0.778675	58.44128
U1_tRMS@POWER/0 [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

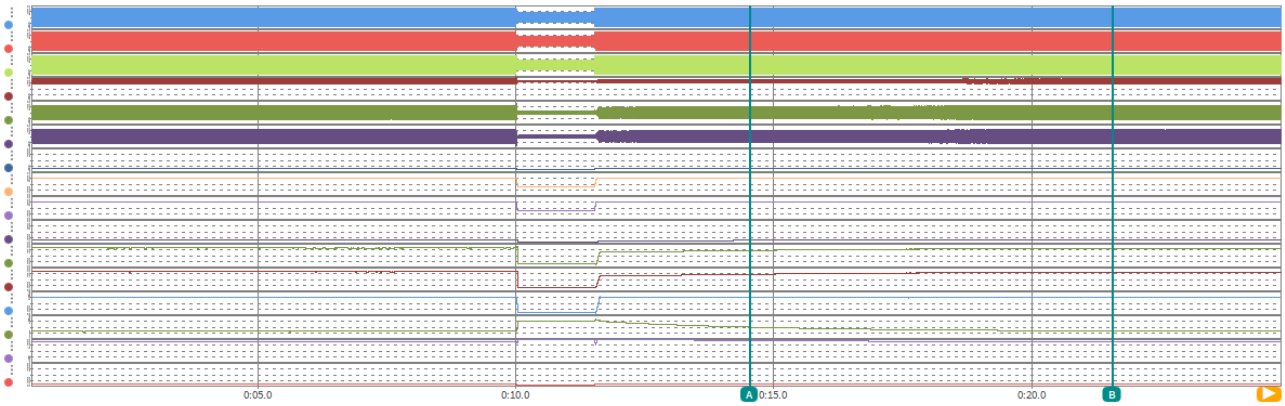


	A	B	Delta
Time [s]	0:10.09723	0:11.49470	1.39747
AI 1/U1 [V]	152.2110	78.38941	-73.82155
AI 1/U2 [V]	-116.9374	-158.8359	-41.89849
AI 1/U3 [V]	-36.43966	80.37186	116.8115
AI 1/I1 [A]	10.39112	4.824996	-5.566120
AI 1/I2 [A]	-9.103656	-11.88076	-2.777100
AI 1/I3 [A]	-1.313329	7.011652	8.324981
U1_tRMS@POWER/0 [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



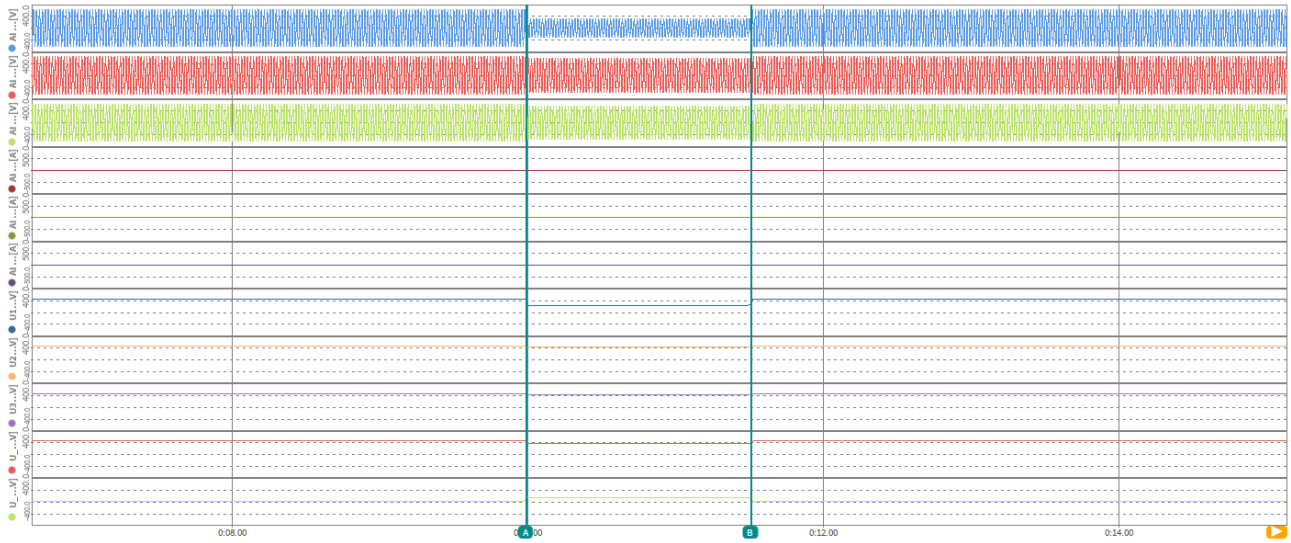
	A	B	Delta
Time [s]	0:11.51638	0:11.61978	0.10340
AI 1/U1 [V]	134.9161	283.1621	148.2461
AI 1/U2 [V]	-139.8711	-2.469063	137.4021
AI 1/U3 [V]	4.926205	-281.0590	-285.9852
AI 1/I1 [A]	10.18858	42.80222	32.61364
AI 1/I2 [A]	-11.12068	-5.831361	5.289316
AI 1/I3 [A]	0.937700	-38.21194	-39.14964
U1_tRMS@POWER/0 [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



	A	B	Delta
Time [s]	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

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

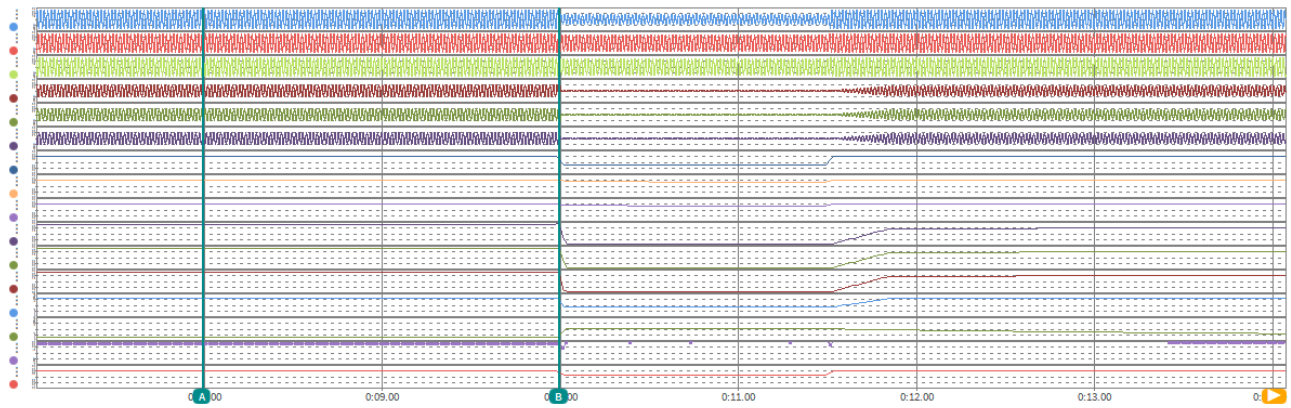
Test No. 3.3 idle test



	A	B	Delta
Time [s]	9.99042	0:11.51136	1.52095
AI 1/U1 [V]	-325.5797	-150.4293	175.1504
AI 1/U2 [V]	156.7004	-12.51888	-169.2193
AI 1/U3 [V]	168.9129	164.9640	-3.948927
AI 1/I1 [A]	-0.033617	-0.164628	-0.131011
AI 1/I2 [A]	0.909567	0.928521	0.018954
AI 1/I3 [A]	-0.906706	-0.795484	0.111222
U1_tRMS@POWER/0 [V]	230.3169	112.1389	-118.1780
U2_tRMS@POWER/0 [V]	230.4380	206.3845	-24.05348
U3_tRMS@POWER/0 [V]	230.2601	206.2181	-24.04201
U_fundRMS_SYM+@POWER/0 [V]	230.3383	170.8156	-59.52266
U_fundRMS_SYM-@POWER/0 [V]	0.060675	58.19781	58.13714

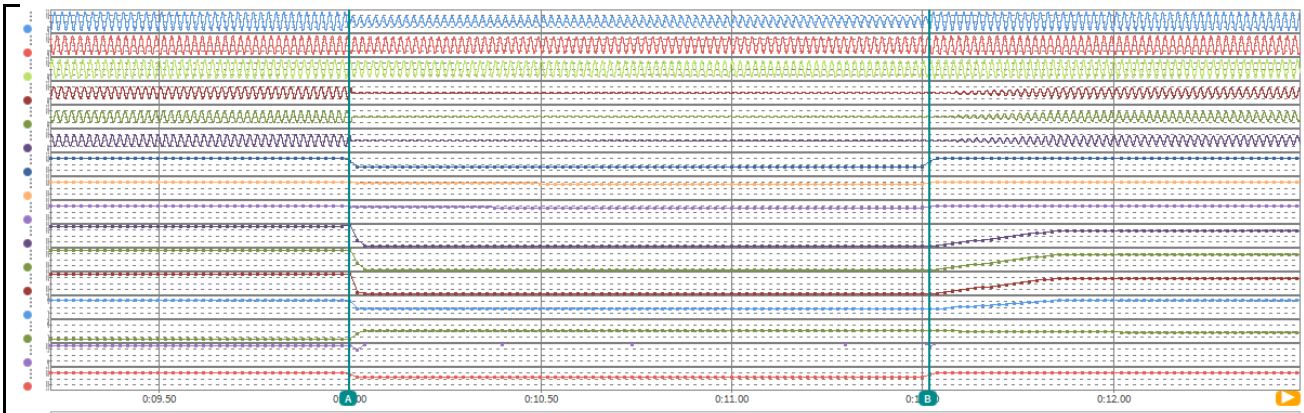
Test No. 3.3 with PGU

Before dip

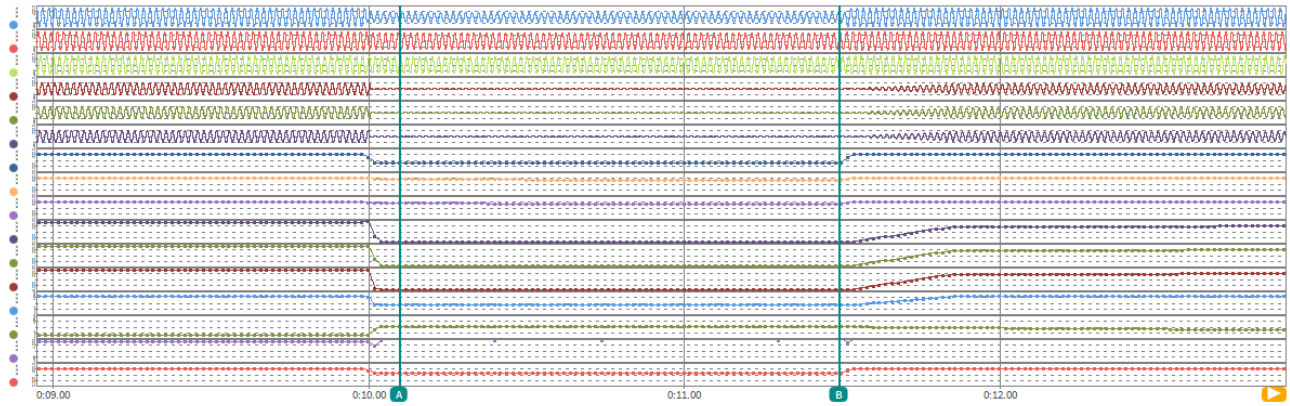


	A	B	Delta
Time [s]	7.99258	9.99541	2.00282
AI 1/U1 [V]	179.0099	-103.8768	-282.8868
AI 1/U2 [V]	139.0526	320.0865	181.0339
AI 1/U3 [V]	-325.3412	-214.5636	110.7776
AI 1/I1 [A]	-9.590626	-211.2848	-201.6941
AI 1/I2 [A]	225.4005	229.9502	4.549742
AI 1/I3 [A]	-215.8505	-18.70406	197.1464
U1_tRMS@POWER/0 [V]	230.6132	230.5720	-0.041245
U2_tRMS@POWER/0 [V]	230.6969	230.7235	0.026627
U3_tRMS@POWER/0 [V]	230.5090	230.5322	0.023117
I1_tRMS@POWER/0 [A]	180.5485	180.7570	0.208511
I2_tRMS@POWER/0 [A]	181.0822	181.2468	0.164612
I3_tRMS@POWER/0 [A]	181.6889	181.8569	0.168076
P_t@POWER/0 [W]	99914.20	99842.47	-71.73438
Q [var]	-75600.68	-75904.40	-303.7188
PF_t@POWER/0 []	0.797445	0.796070	-1.376e-3
U_fundRMS_SYM+@POWER/0 [V]	230.6021	230.6049	2.777e-3

During dip

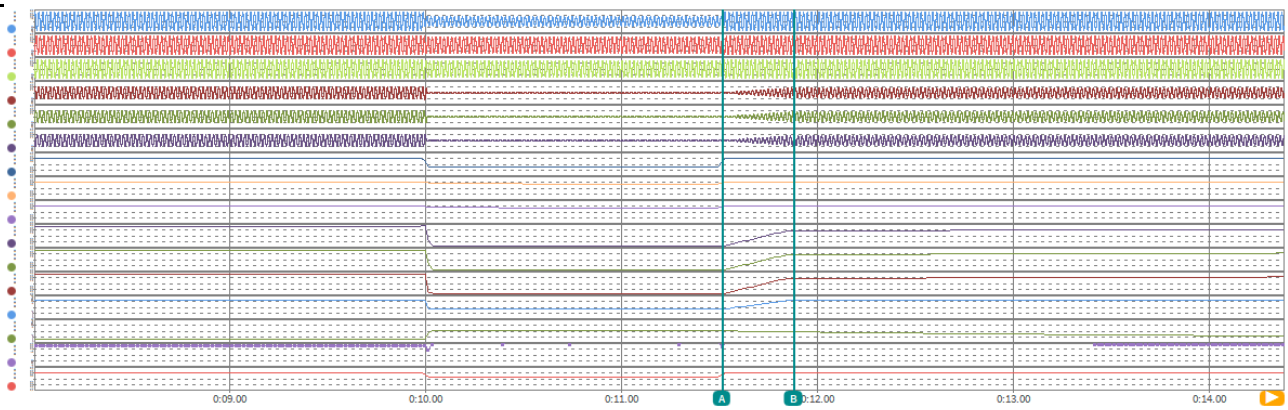


	A	B	Delta
Time [s]	9.99878	0:11.51614	1.51736
AI 1/U1 [V]	-160.8989	-122.0794	38.81955
AI 1/U2 [V]	134.9540	292.6626	157.7087
AI 1/U3 [V]	27.77434	-189.0772	-216.8515
AI 1/I1 [A]	-271.5480	10.22899	281.7770
AI 1/I2 [A]	38.09619	4.323244	-33.77295
AI 1/I3 [A]	235.2370	-14.49311	-249.7301
U1_tRMS@POWER/0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

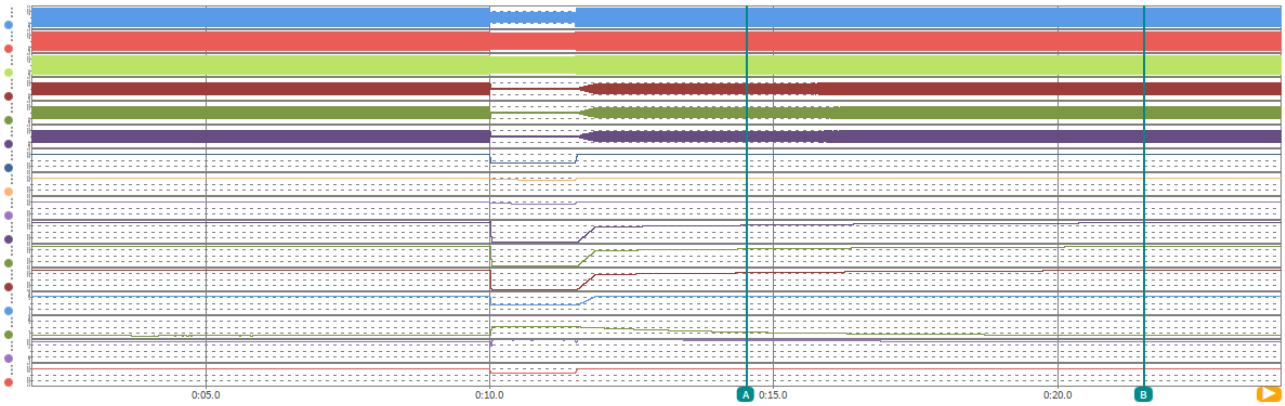


	A	B	Delta
Time [s]	0:10.09819	0:11.49103	1.39284
AI 1/U1 [V]	-146.6713	136.9834	283.6547
AI 1/U2 [V]	188.3965	72.37769	-116.0188
AI 1/U3 [V]	-38.95331	-210.7229	-171.7696
AI 1/I1 [A]	-11.61599	11.96754	23.58353
AI 1/I2 [A]	11.54602	-3.783703	-15.32972
AI 1/I3 [A]	0.081778	-8.177042	-8.258820
U1_tRMS@POWER/0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

After dip

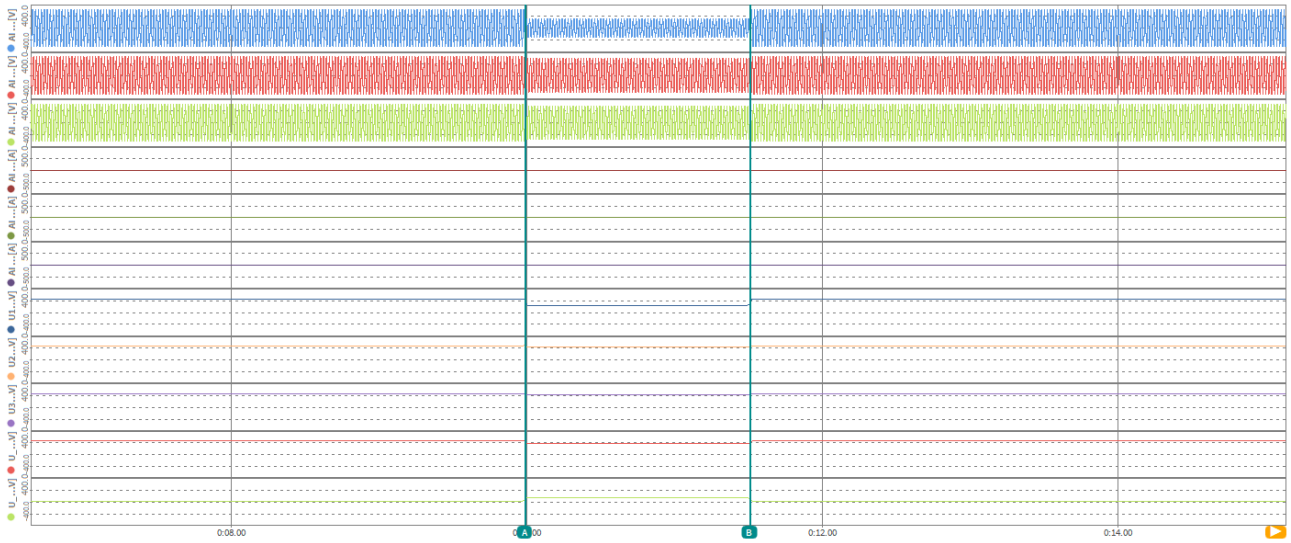


	A	B	Delta
Time [s]	0:11.51608	0:11.88137	0.36528
AI 1/U1 [V]	-85.12641	-264.2799	-179.1535
AI 1/U2 [V]	283.1903	-35.95519	-319.1455
AI 1/U3 [V]	-202.0066	297.4007	499.4073
AI 1/I1 [A]	-2.027750	-157.8957	-155.8679
AI 1/I2 [A]	11.54947	-35.25377	-46.80324
AI 1/I3 [A]	-9.511829	193.1261	202.6379
U1_tRMS@POWER/0 [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



	A	B	Delta
Time [s]	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

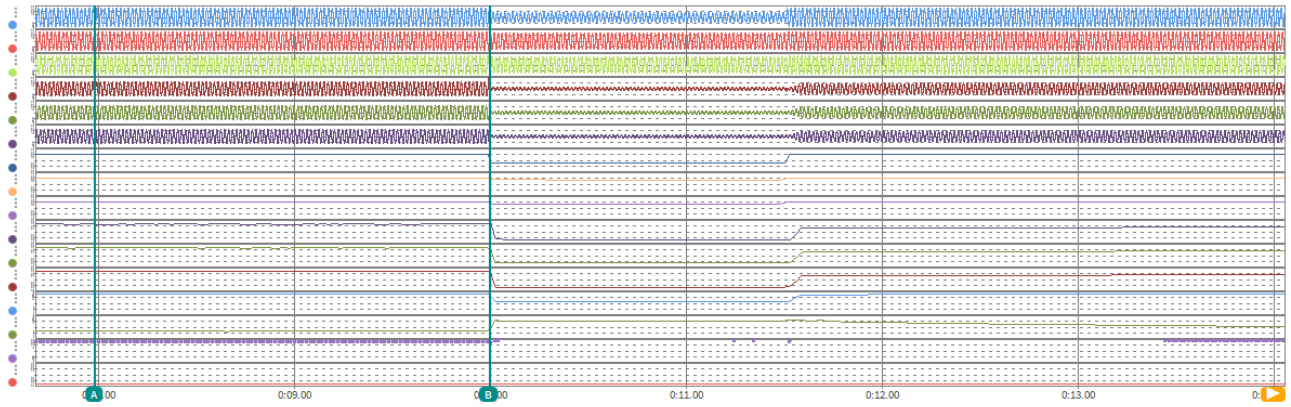
Test No. 3.4 idle test



Time [s]	A 9.99042	B 0:11.51136	Delta 1.52095
AI 1/U1 [V]	-325.5797	-150.4293	175.1504
AI 1/U2 [V]	156.7004	-12.51888	-169.2193
AI 1/U3 [V]	168.9129	164.9640	-3.948927
AI 1/I1 [A]	-0.033617	-0.164628	-0.131011
AI 1/I2 [A]	0.909567	0.928521	0.018954
AI 1/I3 [A]	-0.906706	-0.795484	0.111222
U1_tRMS@POWER/0 [V]	230.3169	112.1389	-118.1780
U2_tRMS@POWER/0 [V]	230.4380	206.3845	-24.05348
U3_tRMS@POWER/0 [V]	230.2601	206.2181	-24.04201
U_fundRMS_SYM+@POWER/0 [V]	230.3383	170.8156	-59.52266
U_fundRMS_SYM-@POWER/0 [V]	0.060675	58.19781	58.13714

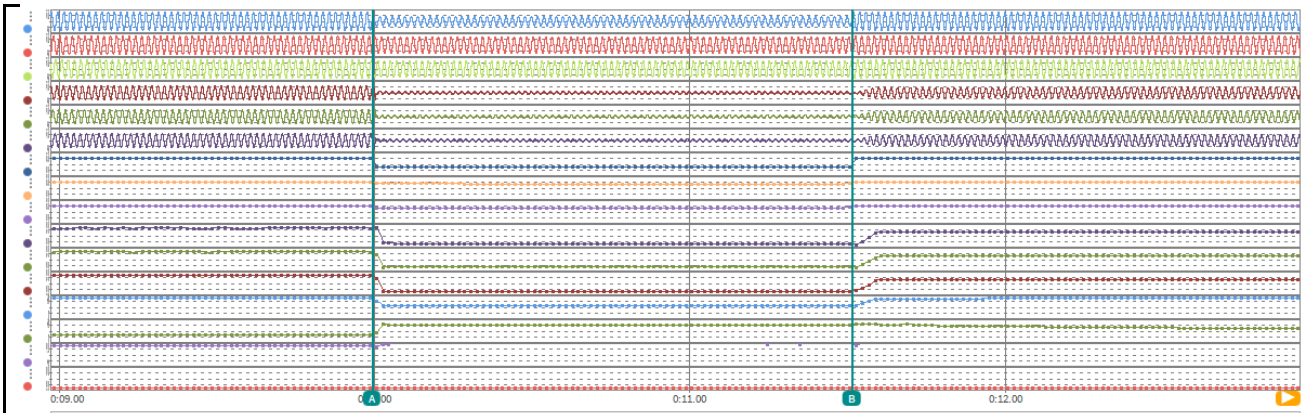
Test No. 3.4 with PGU

Before dip

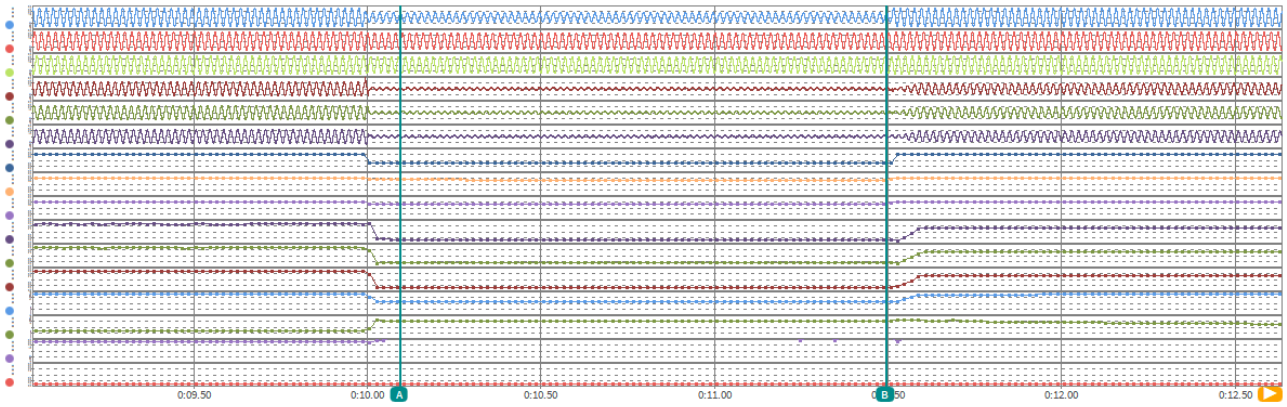


Time [s]	A 7.98539	B 9.99587	Delta 2.01048
AI 1/U1 [V]	-148.8266	198.5643	347.3909
AI 1/U2 [V]	325.9890	-323.5369	-649.5259
AI 1/U3 [V]	-174.6042	123.9593	298.5635
AI 1/I1 [A]	-53.12395	56.70464	109.8286
AI 1/I2 [A]	48.09881	-41.38077	-89.47957
AI 1/I3 [A]	4.291415	-15.26141	-19.55283
U1_tRMS@POWER/0 [V]	230.4104	231.0423	0.631805
U2_tRMS@POWER/0 [V]	230.5167	230.2438	-0.272903
U3_tRMS@POWER/0 [V]	230.3077	229.9477	-0.360031
I1_tRMS@POWER/0 [A]	41.66878	41.65191	-0.016865
I2_tRMS@POWER/0 [A]	41.70798	41.51966	-0.188324
I3_tRMS@POWER/0 [A]	41.76771	41.81450	0.046791
P_t@POWER/0 [W]	22917.76	22896.35	-21.41406
Q [var]	-17499.09	-17466.84	32.25391
PF_t@POWER/0 []	0.794797	0.795063	2.663e-4
U_fundRMS_SYM+@POWER/0 [V]	230.4104	230.3995	-0.010895

During dip

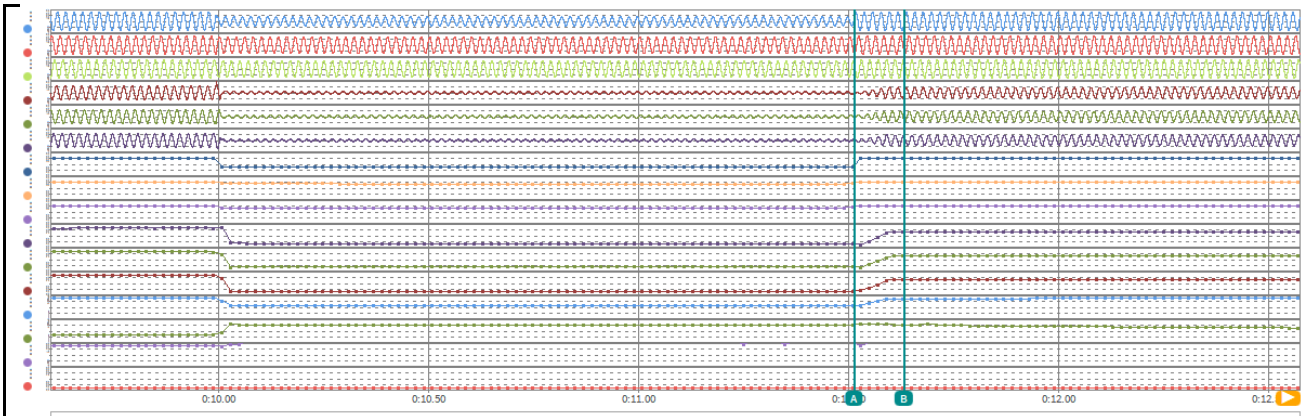


	A	B	Delta
Time [s]	9.99522	0:11.51516	1.51994
AI 1/U1 [V]	146.7049	71.34343	-75.36149
AI 1/U2 [V]	-326.0322	-287.0517	38.98049
AI 1/U3 [V]	177.0082	214.8352	37.82702
AI 1/I1 [A]	53.65026	3.903866	-49.74640
AI 1/I2 [A]	-49.05379	-12.20346	36.85034
AI 1/I3 [A]	-3.848315	8.278847	12.12716
U1_tRMS@POWER/0 [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

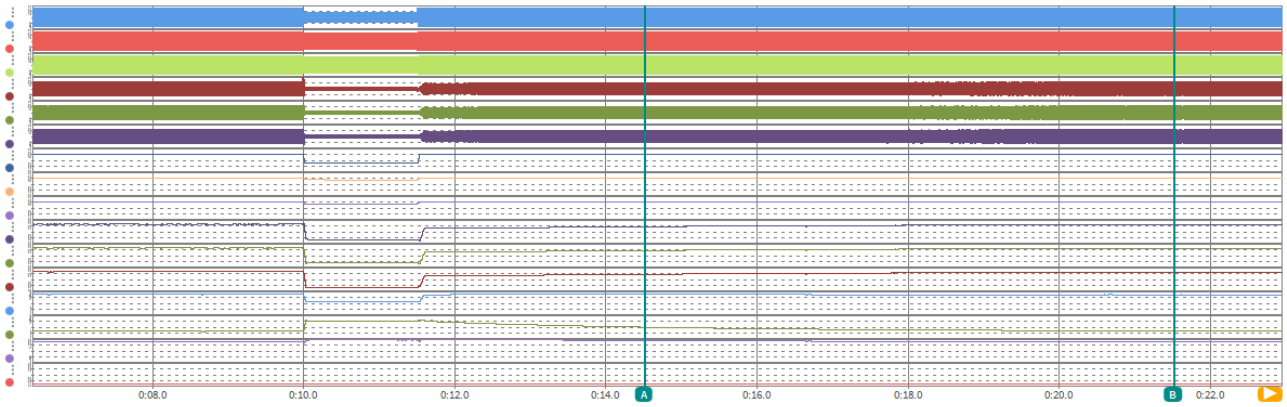


	A	B	Delta
Time [s]	0:10.09436	0:11.49456	1.40020
AI 1/U1 [V]	30.67398	43.41936	12.74538
AI 1/U2 [V]	-291.8937	-291.8749	0.018835
AI 1/U3 [V]	261.5910	247.9675	-13.62348
AI 1/I1 [A]	0.763893	1.290083	0.526190
AI 1/I2 [A]	-10.63836	-10.43451	0.203848
AI 1/I3 [A]	9.976149	9.061575	-0.914574
U1_tRMS@POWER/0 [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



Time [s]	A 0:11.51443	B 0:11.63291	Delta 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 0:14.51288	B 0:21.51545	Delta 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

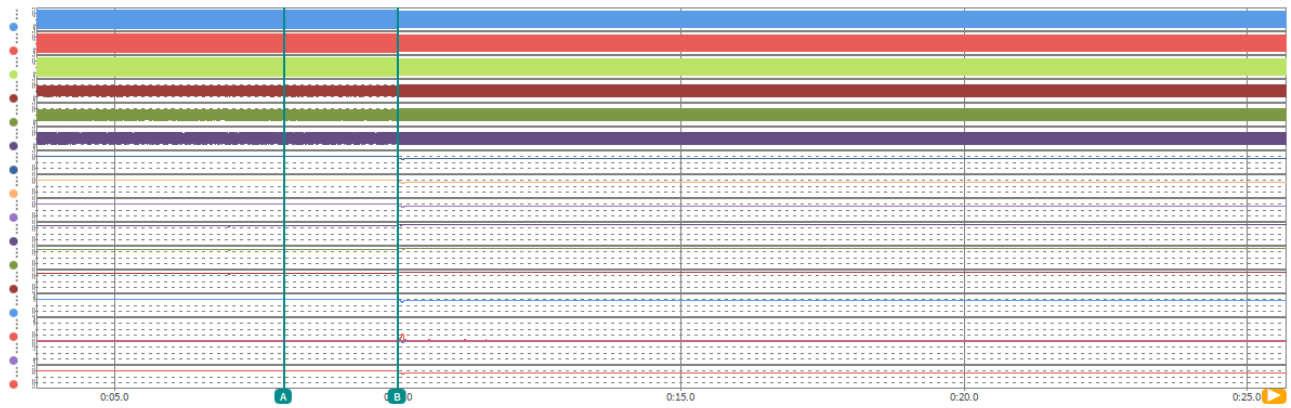
Condition						Measurement	
	No.	Parameter	Phase ref.	Time ref.	unit		
General Info.	0	Test number	--	--	--	3.3	3.4
	1	Date	--	--	yyyy.mm.dd	2022.08.15	2022.08.15
	2	Time (start of test)	--	--	hh:mm:ss	17:58:00	17:58:00
	3	Fault type (phase)	--	--		2 phase	2 phase
	4	Setting voltage depth	Line to neutral	--	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

Test No. 4.1 idle test

Time [s]	A 9.98254	B 1:10.00041	Delta 1:00.01786
AI 1/U1 [V]	-288.2335	-238.2510	49.98255
AI 1/U2 [V]	12.83956	3.144980	-9.694577
AI 1/U3 [V]	275.3668	235.0011	-40.36570
AI 1/I1 [A]	-0.477791	-0.427365	0.050426
AI 1/I2 [A]	1.039624	0.868082	-0.171542
AI 1/I3 [A]	-0.590444	-0.468016	0.122428
U1_tRMS@POWER/0 [V]	230.3310	193.2630	-37.06802
U2_tRMS@POWER/0 [V]	230.4284	193.3660	-37.06239
U3_tRMS@POWER/0 [V]	230.2374	193.2166	-37.02081
U_fundRMS_SYM+@POWER/0 [V]	230.3322	193.2818	-37.05040
U_fundRMS_SYM-@POWER/0 [V]	0.052447	0.057075	4.628e-3

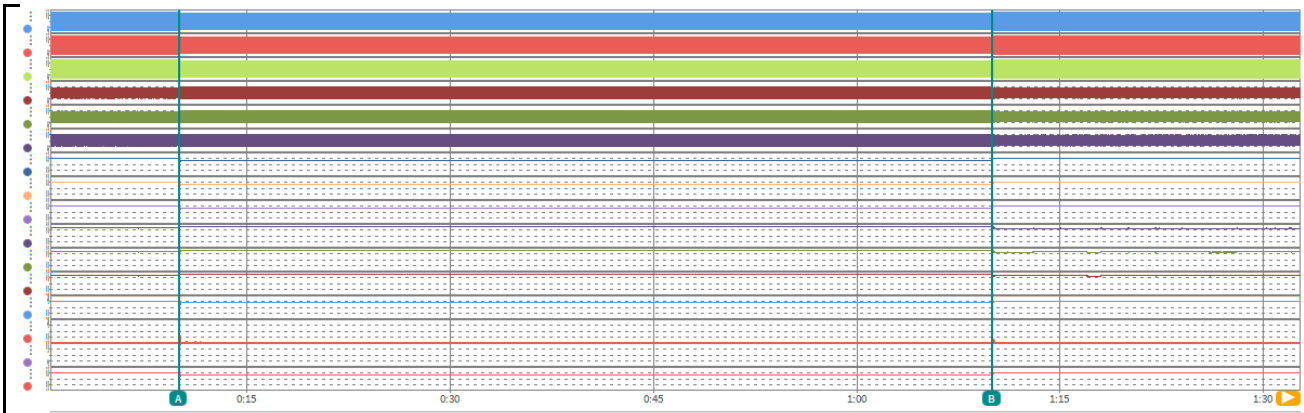
Test No. 4.1 with PGU

Before dip

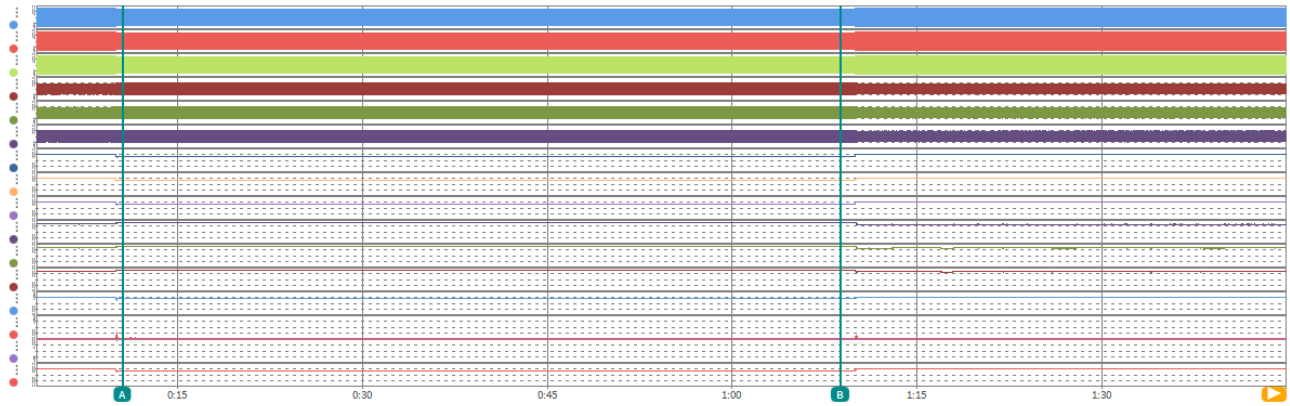


Time [s]	A 7.9900	B 9.9967	Delta 2.0067
AI 1/U1 [V]	253.0029	-259.6200	-512.6229
AI 1/U2 [V]	53.74742	207.2160	153.4686
AI 1/U3 [V]	-303.8156	54.47817	358.2938
AI 1/I1 [A]	181.0380	-243.5029	-424.5409
AI 1/I2 [A]	40.36331	202.2591	161.8958
AI 1/I3 [A]	-221.9015	41.02993	262.9315
U1_tRMS@POWER/0 [V]	230.8032	230.7215	-0.081741
U2_tRMS@POWER/0 [V]	230.9370	230.9872	0.050201
U3_tRMS@POWER/0 [V]	230.7774	230.8215	0.044128
I1_tRMS@POWER/0 [A]	167.3485	167.2387	-0.109802
I2_tRMS@POWER/0 [A]	167.5881	167.6576	0.069504
I3_tRMS@POWER/0 [A]	168.0593	168.0655	6.210e-3
P_t@POWER/0 [W]	116105.9	116100.5	-5.406250
Q_t@POWER/0 [var]	1109.188	1078.839	-30.34863
PF_t@POWER/0 []	0.999954	0.999957	2.503e-6
U_fundRMS_SYM+@POWER/0 [V]	230.8360	230.8399	3.891e-3

During dip

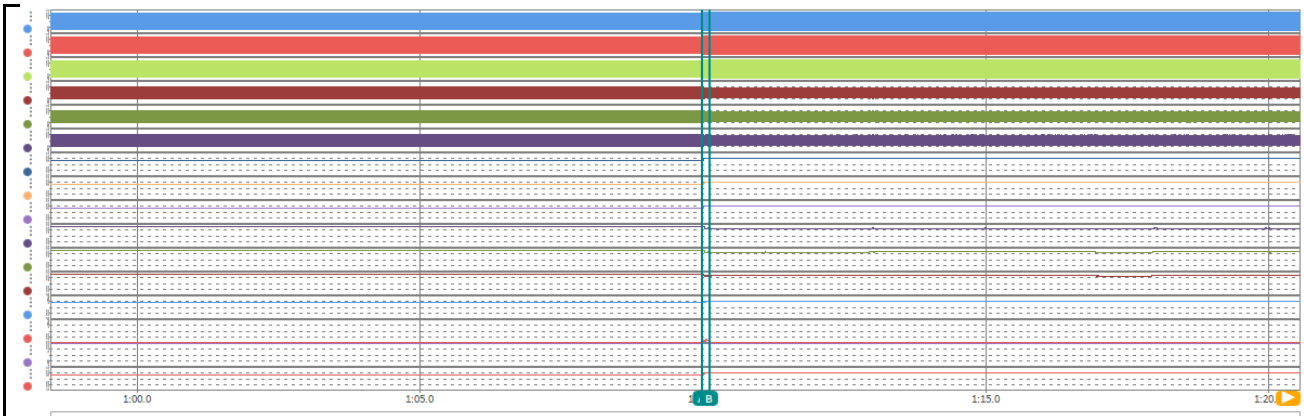


	A	B	Delta
Time [s]	0:10.0017	1:09.9987	0:59.9970
AI 1/U1 [V]	-88.31358	-144.3102	-55.99666
AI 1/U2 [V]	-180.7890	-129.5948	51.19419
AI 1/U3 [V]	268.8201	273.5644	4.744292
AI 1/I1 [A]	-86.21800	-133.7645	-47.54651
AI 1/I2 [A]	-166.9498	-124.8489	42.10091
AI 1/I3 [A]	253.2762	258.6686	5.392313
U1_tRMS@POWER/0 [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

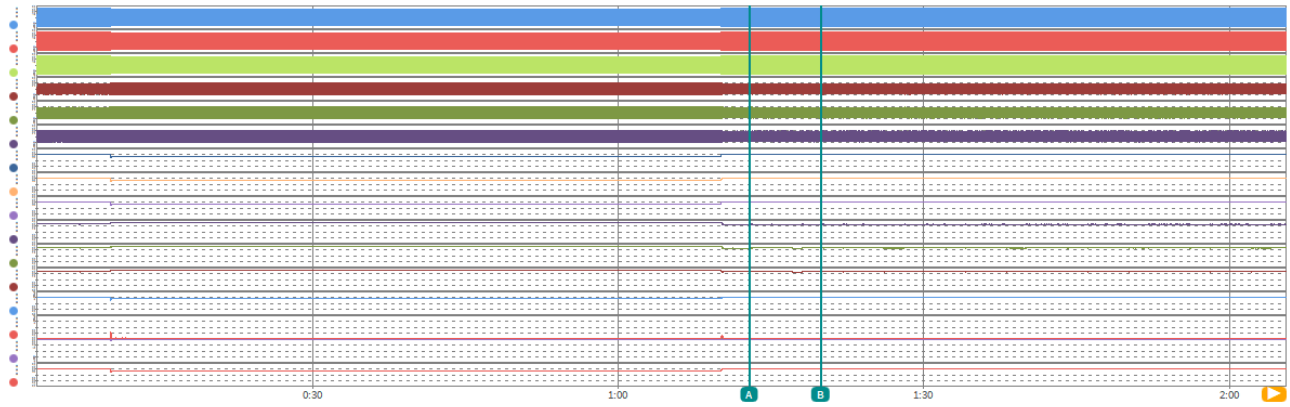


	A	B	Delta
Time [s]	0:10.6158	1:08.8449	0:58.2290
AI 1/U1 [V]	-230.0141	267.3097	497.3238
AI 1/U2 [V]	243.6018	-186.0426	-429.6444
AI 1/U3 [V]	-10.43272	-82.11017	-71.67745
AI 1/I1 [A]	-219.1503	252.0627	471.2130
AI 1/I2 [A]	222.3477	-172.0798	-394.4276
AI 1/I3 [A]	-3.381849	-80.36197	-76.98012
U1_tRMS@POWER/0 [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



Time [s]	A 1:09.9907	B 1:10.1236	Delta 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



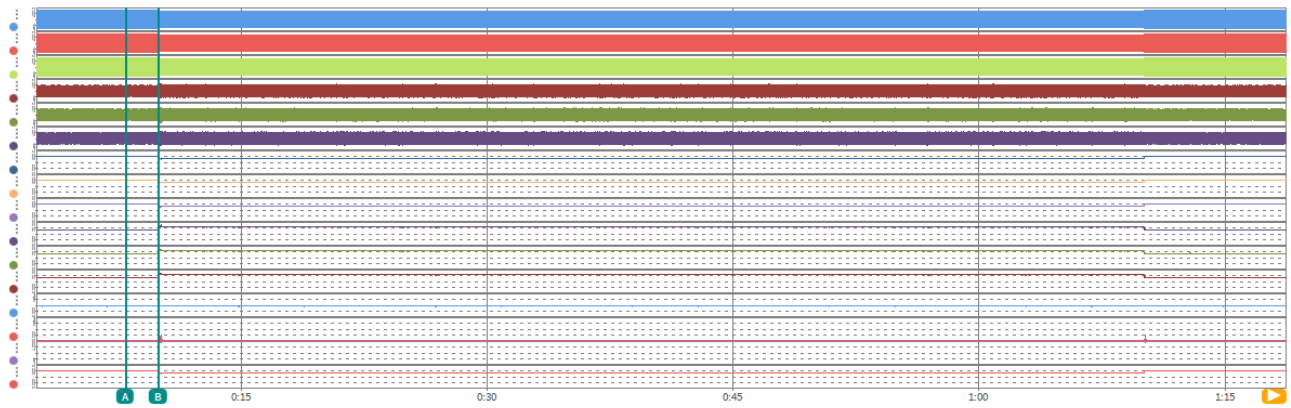
Time [s]	A 1:12.9228	B 1:19.9180	Delta 6.9952
AI 1/U1 [V]	217.4318	-209.9822	-427.4140
AI 1/U2 [V]	-319.5875	-112.3567	207.2308
AI 1/U3 [V]	101.5210	321.4917	219.9707
AI 1/I1 [A]	156.0733	-153.0247	-309.0980
AI 1/I2 [A]	-231.4317	-81.00522	150.4265
AI 1/I3 [A]	75.20259	234.1110	158.9084
U1_tRMS@POWER/0 [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

Test No. 4.2 idle test

	A	B	Delta
Time [s]	9.98254	1:10.00041	1:00.01786
AI 1/U1 [V]	-288.2335	-238.2510	49.98255
AI 1/U2 [V]	12.83956	3.144980	-9.694577
AI 1/U3 [V]	275.3668	235.0011	-40.36570
AI 1/I1 [A]	-0.477791	-0.427365	0.050426
AI 1/I2 [A]	1.039624	0.868082	-0.171542
AI 1/I3 [A]	-0.590444	-0.468016	0.122428
U1_tRMS@POWER/0 [V]	230.3310	193.2630	-37.06802
U2_tRMS@POWER/0 [V]	230.4284	193.3660	-37.06239
U3_tRMS@POWER/0 [V]	230.2374	193.2166	-37.02081
U_fundRMS_SYM+@POWER/0 [V]	230.3322	193.2818	-37.05040
U_fundRMS_SYM-@POWER/0 [V]	0.052447	0.057075	4.628e-3

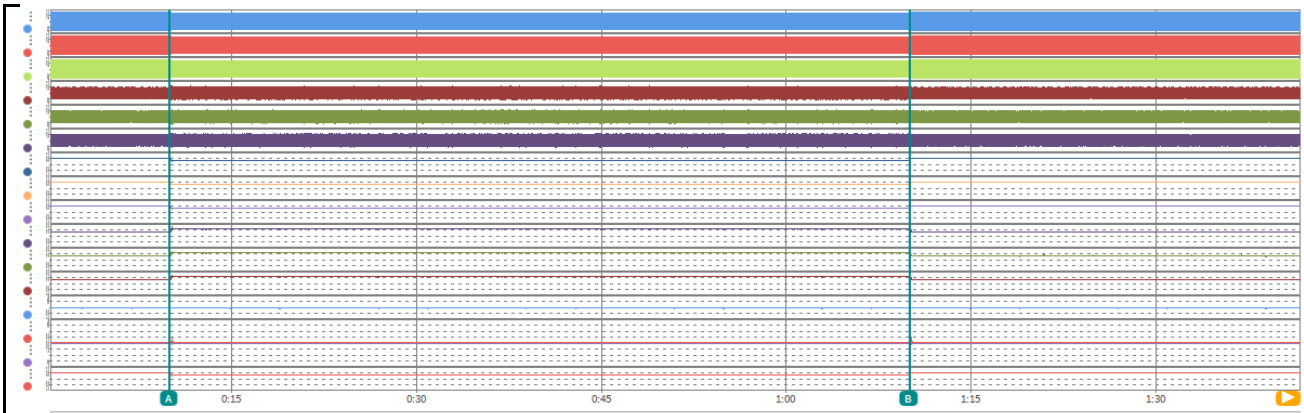
Test No. 4.2 with PGU

Before dip

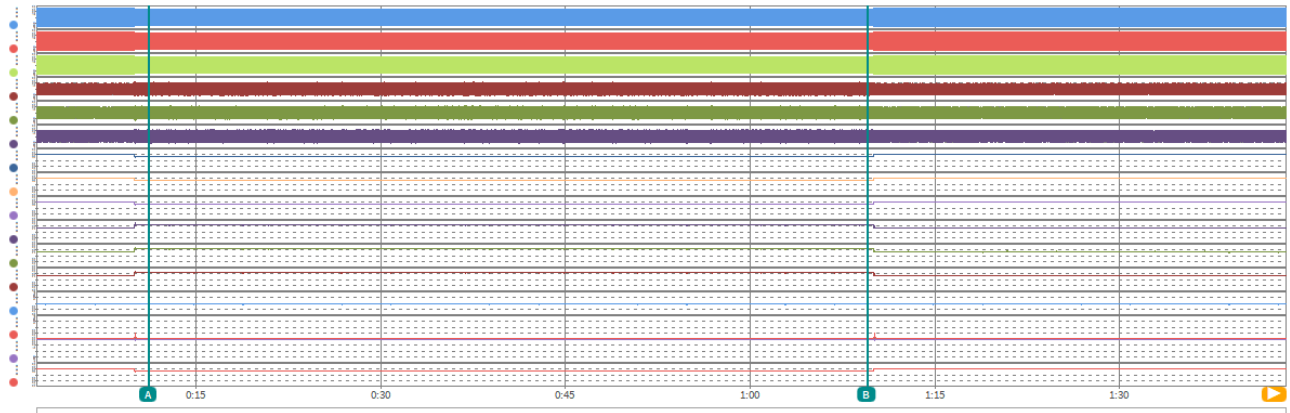


	A	B	Delta
Time [s]	7.9931	0:10.0022	2.0091
AI 1/U1 [V]	17.05217	50.68040	33.62823
AI 1/U2 [V]	-288.5490	207.7263	496.2752
AI 1/U3 [V]	275.6658	-258.1809	-533.8466
AI 1/I1 [A]	2.328992	11.15835	8.829356
AI 1/I2 [A]	-42.84358	41.32235	84.16594
AI 1/I3 [A]	39.13272	-52.61612	-91.74884
U1_tRMS@POWER/0 [V]	230.4063	220.9921	-9.414230
U2_tRMS@POWER/0 [V]	230.5385	226.7437	-3.794800
U3_tRMS@POWER/0 [V]	230.3509	216.8540	-13.49693
I1_tRMS@POWER/0 [A]	33.24933	34.57976	1.330429
I2_tRMS@POWER/0 [A]	33.28264	34.03442	0.751774
I3_tRMS@POWER/0 [A]	33.35575	35.40199	2.046242
P_t@POWER/0 [W]	23014.17	22834.66	-179.5059
Q_t@POWER/0 [var]	380.4964	3039.036	2658.539
PF_t@POWER/0 []	0.999863	0.991260	-8.604e-3
U_fundRMS_SYM+@POWER/0 [V]	230.4302	220.9828	-9.447342

During dip

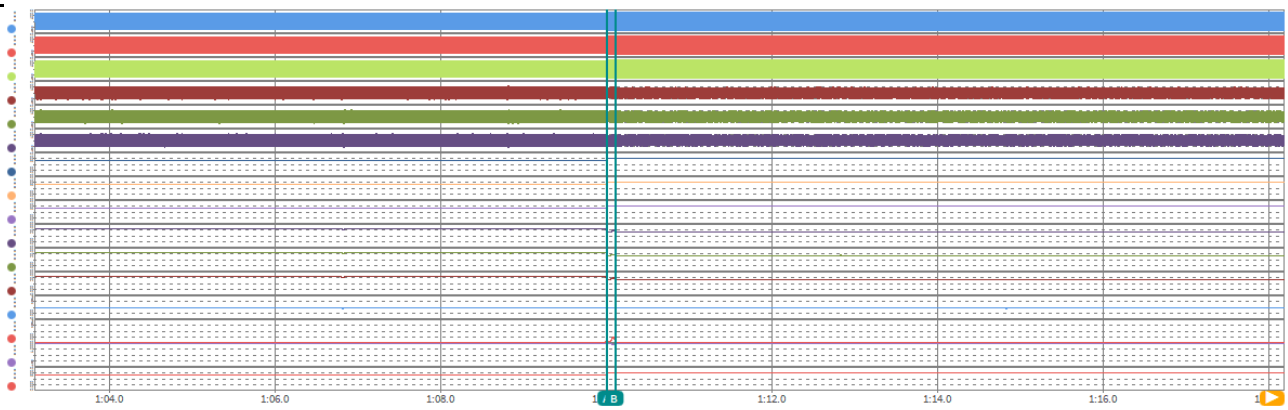


	A	B	Delta
Time [s]	9.9750	1:09.9942	1:00.0192
AI 1/U1 [V]	199.2724	246.6984	47.42599
AI 1/U2 [V]	-323.0858	-225.8320	97.25381
AI 1/U3 [V]	123.5328	-24.92452	-148.4573
AI 1/I1 [A]	29.45066	51.21541	21.76476
AI 1/I2 [A]	-46.46671	-45.53378	0.932932
AI 1/I3 [A]	16.94989	-4.921675	-21.87157
U1_tRMS@POWER/0 [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

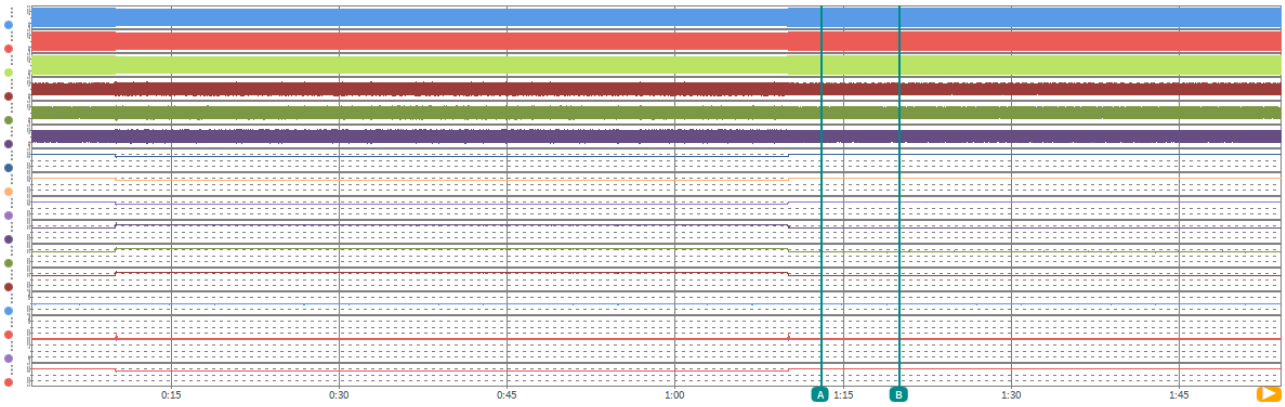


	A	B	Delta
Time [s]	0:11.2127	1:09.5067	0:58.2940
AI 1/U1 [V]	-11.21163	-261.4460	-250.2344
AI 1/U2 [V]	-230.0632	60.06718	290.1304
AI 1/U3 [V]	243.0039	200.7413	-42.26256
AI 1/I1 [A]	-1.478434	-54.49200	-53.01357
AI 1/I2 [A]	-47.93275	12.07542	60.00817
AI 1/I3 [A]	47.99021	42.33027	-5.659938
U1_tRMS@POWER/0 [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



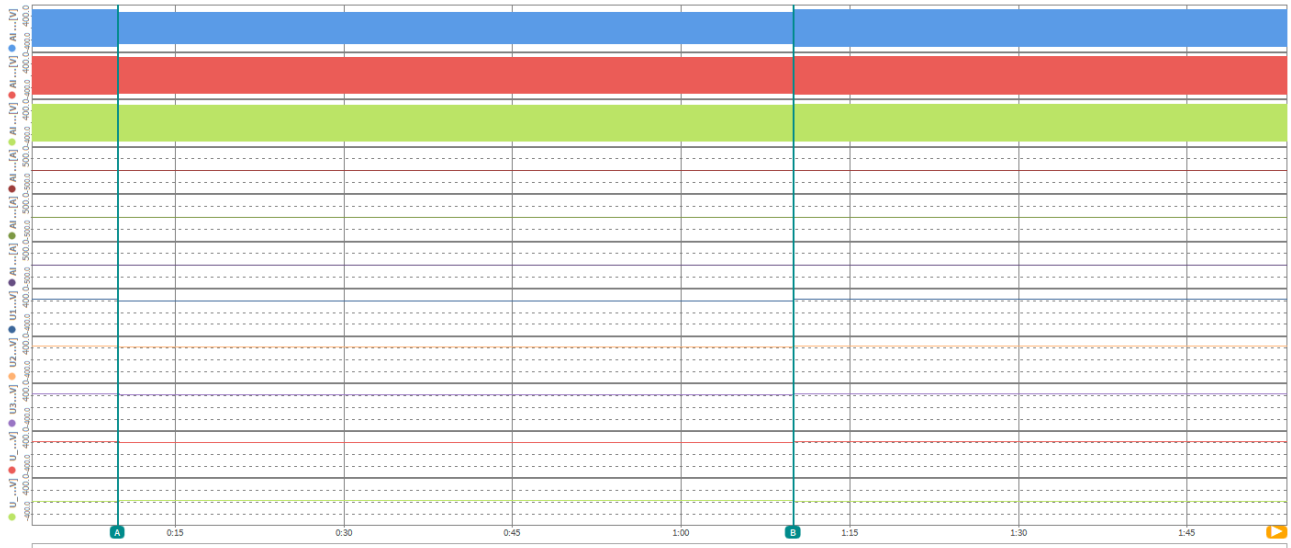
	A	B	Delta
Time [s]	1:10.0111	1:10.1116	0.1006
AI 1/U1 [V]	39.54387	98.53459	58.99072
AI 1/U2 [V]	-298.5738	-318.2507	-19.67692
AI 1/U3 [V]	261.0719	220.4304	-40.64155
AI 1/I1 [A]	3.575444	15.51545	11.94000
AI 1/I2 [A]	-42.18436	-47.61148	-5.427122
AI 1/I3 [A]	40.34746	31.99470	-8.352757
U1_tRMS@POWER/0 [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



	A	B	Delta
Time [s]	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

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

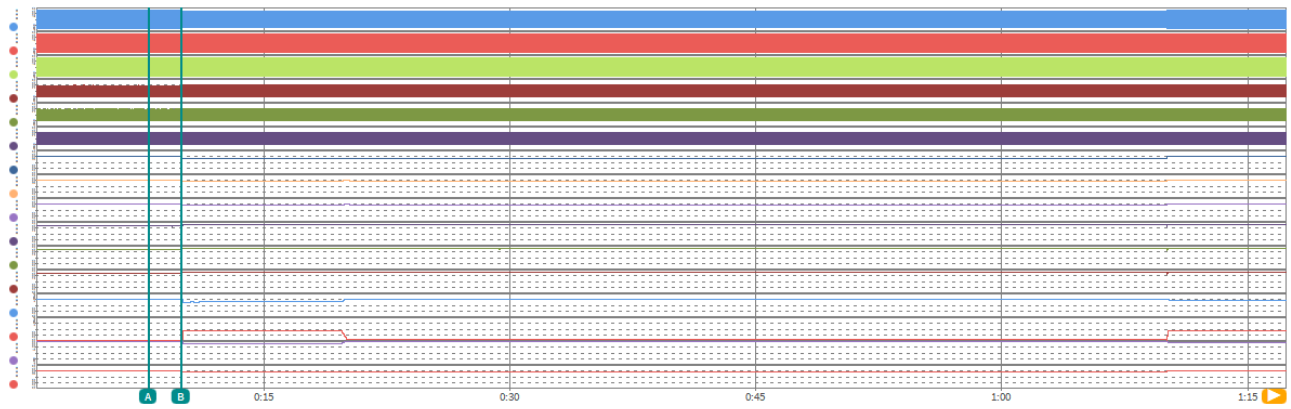
Test No. 4.3 idle test



	A	B	Delta
Time [s]	9.96743	1:09.99105	1:00.02362
AI 1/U1 [V]	-165.8032	-195.7219	-29.91867
AI 1/U2 [V]	324.3318	-101.7966	-426.1284
AI 1/U3 [V]	-158.3355	294.5793	452.9147
AI 1/I1 [A]	0.904799	-0.638366	-1.543164
AI 1/I2 [A]	-0.011206	0.946045	0.957251
AI 1/I3 [A]	-0.925303	-0.332952	0.592351
U1_tRMS@POWER/0 [V]	229.3114	195.7607	-33.55067
U2_tRMS@POWER/0 [V]	229.4143	220.4184	-8.995911
U3_tRMS@POWER/0 [V]	229.2511	220.2166	-9.034531
U_fundRMS_SYM+@POWER/0 [V]	229.3255	211.7703	-17.55519
U_fundRMS_SYM-@POWER/0 [V]	0.065688	16.92386	16.85817

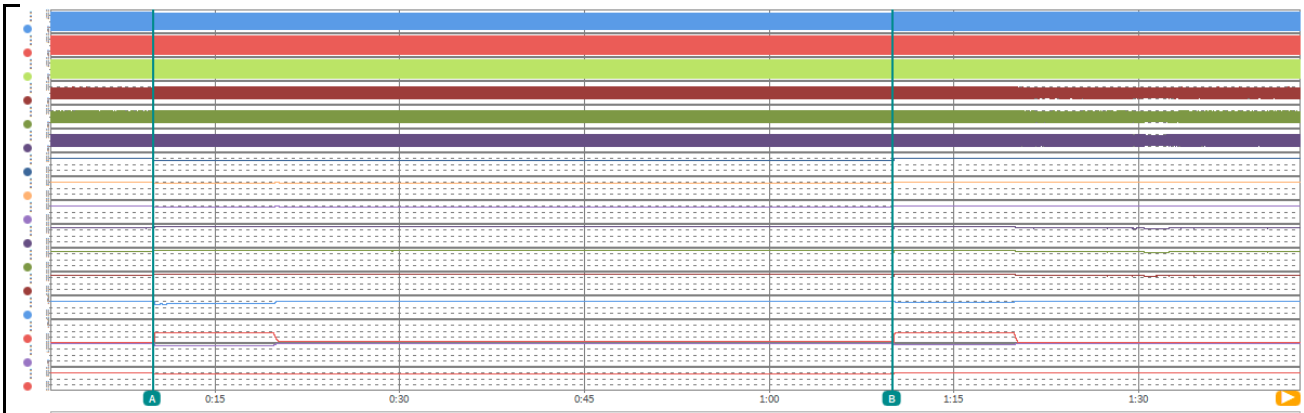
Test No. 4.3 with PGU

Before dip

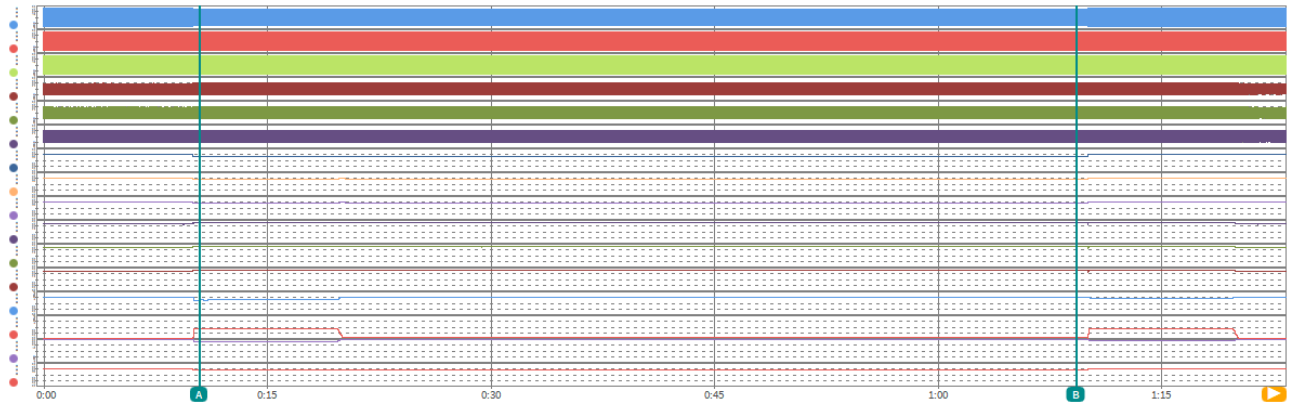


	A	B	Delta
Time [s]	7.99002	9.98929	1.99926
AI 1/U1 [V]	-325.1584	-269.5835	55.57490
AI 1/U2 [V]	169.5702	203.3846	33.81443
AI 1/U3 [V]	155.6985	63.80415	-91.89439
AI 1/I1 [A]	-237.6666	-241.8835	-4.216910
AI 1/I2 [A]	122.8349	177.9168	55.08185
AI 1/I3 [A]	115.0256	64.09037	-50.93527
U1_tRMS@POWER/0 [V]	229.8461	229.8323	-0.013733
U2_tRMS@POWER/0 [V]	229.9418	229.9572	0.015457
U3_tRMS@POWER/0 [V]	229.7654	229.7419	-0.023453
I1_tRMS@POWER/0 [A]	167.9099	168.0219	0.111954
I2_tRMS@POWER/0 [A]	168.2166	168.3278	0.111206
I3_tRMS@POWER/0 [A]	168.5896	168.7443	0.154739
P_t@POWER/0 [W]	116004.1	116086.5	82.35938
Q_t@POWER/0 [var]	1114.300	1198.549	84.24927
PF_t@POWER/0 []	0.999954	0.999947	-7.153e-6
U_fundRMS_SYM+@POWER/0 [V]	229.8476	229.8404	-7.202e-3

During dip

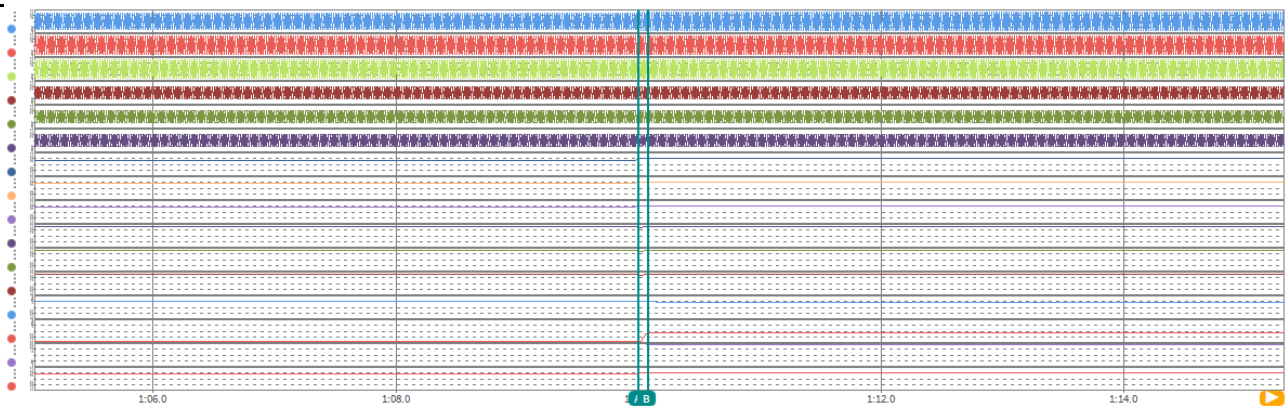


	A	B	Delta
Time [s]	9.99253	1:10.00025	1:00.00772
AI 1/U1 [V]	-196.4171	203.3434	399.7605
AI 1/U2 [V]	-102.3305	91.42566	193.7561
AI 1/U3 [V]	294.8585	-290.9875	-585.8460
AI 1/I1 [A]	-184.4802	186.6355	371.1157
AI 1/I2 [A]	-66.68461	63.85184	130.5364
AI 1/I3 [A]	250.9692	-250.2271	-501.1963
U1_tRMS@POWER/0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

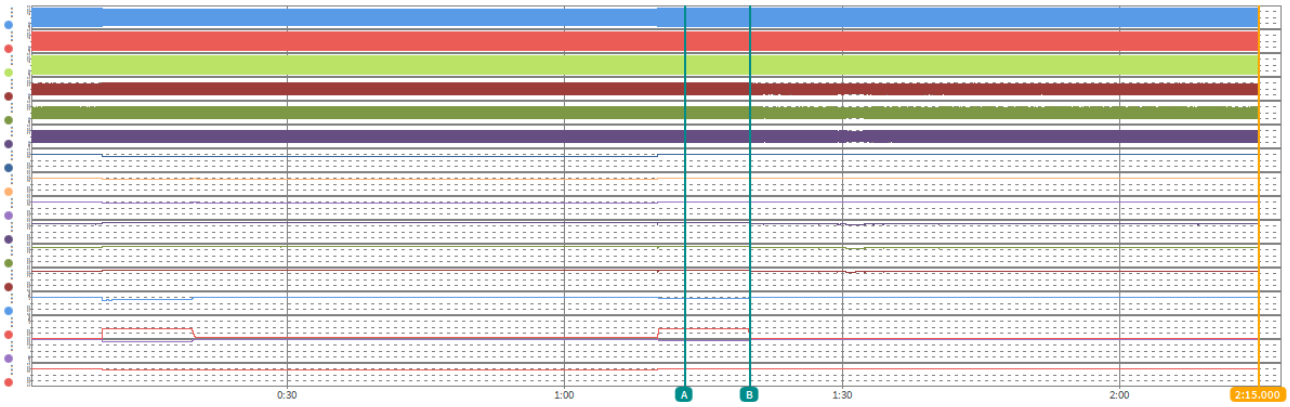


	A	B	Delta
Time [s]	0:10.48583	1:09.27176	0:58.78593
AI 1/U1 [V]	-70.30249	-97.32152	-27.01903
AI 1/U2 [V]	305.5353	-214.2601	-519.7954
AI 1/U3 [V]	-235.7757	311.0757	546.8514
AI 1/I1 [A]	-188.4375	-89.28013	99.15734
AI 1/I2 [A]	242.8547	-167.0859	-409.9406
AI 1/I3 [A]	-54.43549	256.4229	310.8584
U1_tRMS@POWER/0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

After dip

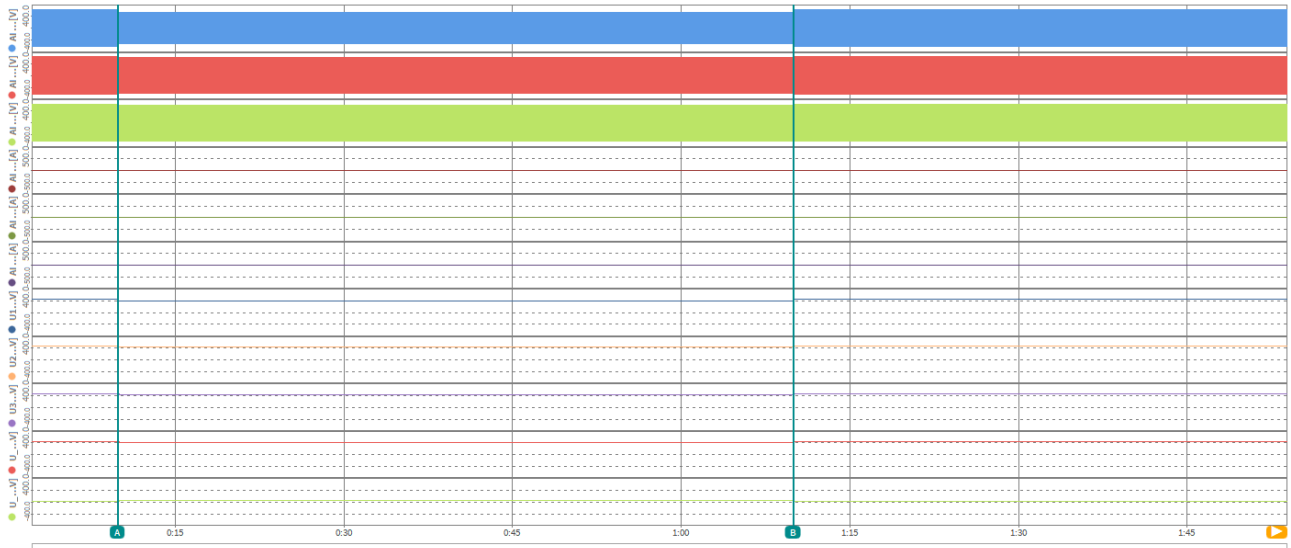


	A	B	Delta
Time [s]	1:09.99769	1:10.07506	0.07737
AI 1/U1 [V]	276.9585	206.6522	-70.30631
AI 1/U2 [V]	-156.3599	-323.2954	-166.9355
AI 1/U3 [V]	-117.4126	118.0246	235.4372
AI 1/I1 [A]	255.1687	59.53920	-195.6295
AI 1/I2 [A]	-141.5378	-250.8651	-109.3273
AI 1/I3 [A]	-113.6625	191.1508	304.8133
U1_tRMS@POWER/0 [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



	A	B	Delta
Time [s]	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

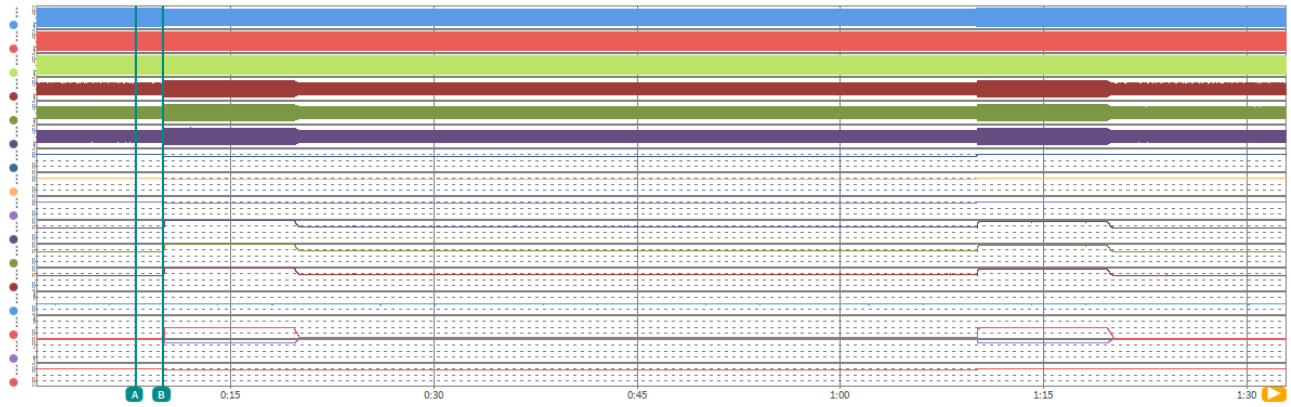
Test No. 4.4 idle test



Time [s]	A 9.96743	B 1:09.99105	Delta 1:00.02362
AI 1/U1 [V]	-165.8032	-195.7219	-29.91867
AI 1/U2 [V]	324.3318	-101.7966	-426.1284
AI 1/U3 [V]	-158.3355	294.5793	452.9147
AI 1/I1 [A]	0.904799	-0.638366	-1.543164
AI 1/I2 [A]	-0.011206	0.946045	0.957251
AI 1/I3 [A]	-0.925303	-0.332952	0.592351
U1_tRMS@POWER/0 [V]	229.3114	195.7607	-33.55067
U2_tRMS@POWER/0 [V]	229.4143	220.4184	-8.995911
U3_tRMS@POWER/0 [V]	229.2511	220.2166	-9.034531
U_fundRMS_SYM+@POWER/0 [V]	229.3255	211.7703	-17.55519
U_fundRMS_SYM-@POWER/0 [V]	0.065688	16.92386	16.85817

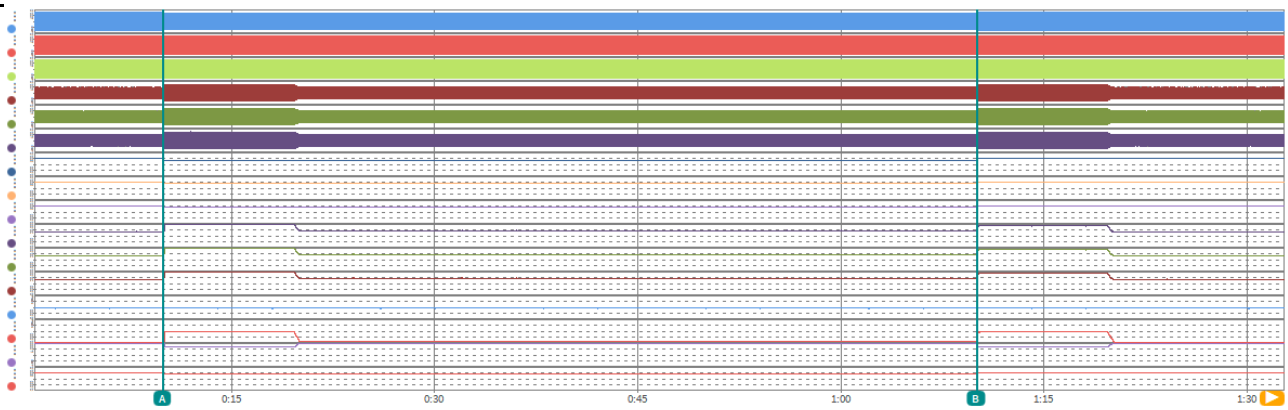
Test No. 4.4 with PGU

Before dip

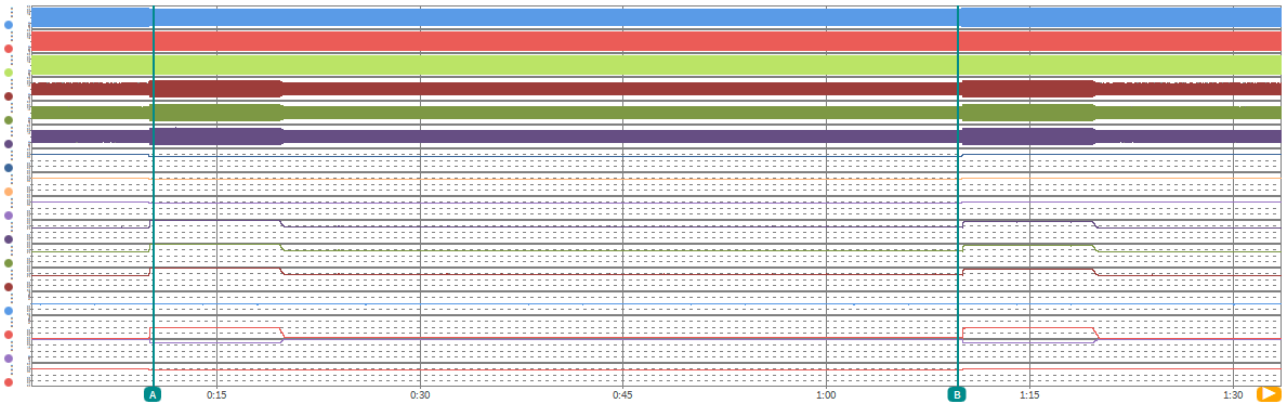


Time [s]	A 7.9867	B 9.9962	Delta 2.0094
AI 1/U1 [V]	322.8708	-276.3131	-599.1838
AI 1/U2 [V]	-133.4331	154.9201	288.3532
AI 1/U3 [V]	-189.0497	117.8606	306.9103
AI 1/I1 [A]	46.68403	-51.76986	-98.45389
AI 1/I2 [A]	-18.81647	30.33161	49.14809
AI 1/I3 [A]	-28.00107	21.53266	49.53373
U1_tRMS@POWER/0 [V]	229.4410	229.3271	-0.113876
U2_tRMS@POWER/0 [V]	229.5507	229.5993	0.048630
U3_tRMS@POWER/0 [V]	229.3604	229.4462	0.085800
I1_tRMS@POWER/0 [A]	33.42093	33.44242	0.021488
I2_tRMS@POWER/0 [A]	33.47126	33.49687	0.025612
I3_tRMS@POWER/0 [A]	33.52674	33.58633	0.059589
P_t@POWER/0 [W]	23037.99	23063.41	25.42188
Q_t@POWER/0 [var]	384.0449	369.3787	-14.66617
PF_t@POWER/0 []	0.999861	0.999872	1.073e-5
U_fundRMS_SYM+@POWER/0 [V]	229.4489	229.4556	6.699e-3

During dip

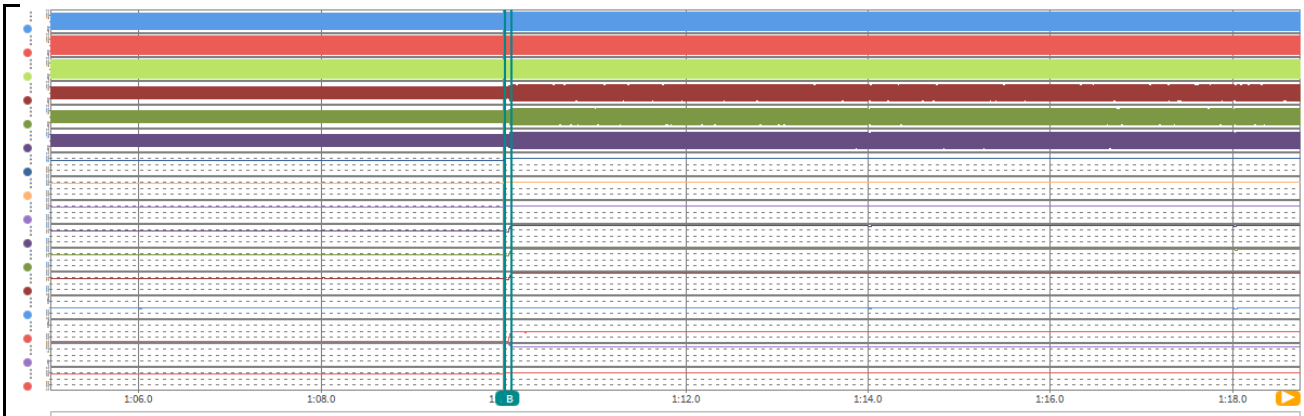


	A	B	Delta
Time [s]	0:10.0052	1:10.0233	1:00.0182
AI 1/U1 [V]	257.9079	313.7489	55.84097
AI 1/U2 [V]	-230.8252	-229.1279	1.697302
AI 1/U3 [V]	-26.87311	-86.17354	-59.30043
AI 1/I1 [A]	49.07775	45.30382	-3.773928
AI 1/I2 [A]	-39.10661	-30.63488	8.471728
AI 1/I3 [A]	-10.37633	-15.02133	-4.644990
U1_tRMS@POWER/0 [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



	A	B	Delta
Time [s]	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



	A	B	Delta
Time [s]	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

	A	B	Delta
Time [s]	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

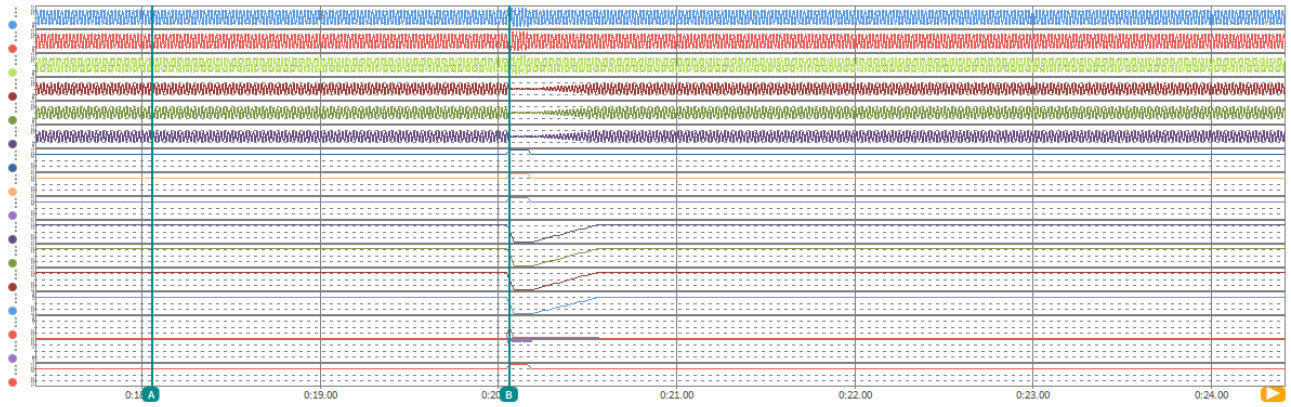
Condition						Measurement	
	No.	Parameter	Phase ref.	Time ref.	unit		
General Info.	0	Test number	--	--	--	4.3	4.4
	1	Date	--	--	yyyy.mm.dd	2022.08.15	2022.08.15
	2	Time (start of test)	--	--	hh:mm:ss	18:33:00	18:33:00
	3	Fault type (phase)	--	--		2 phase	2 phase
	4	Setting voltage depth	Line to neutral	--	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

Test No. 5.1 idle test

	A	B	Delta
Time [s]	9.99074	0:10.11065	0.11991
AI 1/U1 [V]	-325.4023	-406.1749	-80.77264
AI 1/U2 [V]	153.0864	201.6447	48.55824
AI 1/U3 [V]	172.4193	204.6952	32.27592
AI 1/I1 [A]	-0.041723	-6.914e-3	0.034809
AI 1/I2 [A]	0.915885	1.128197	0.212312
AI 1/I3 [A]	-0.898361	-1.146913	-0.248551
U1_tRMS@POWER/0 [V]	230.2719	287.2610	56.98914
U2_tRMS@POWER/0 [V]	230.4494	287.3545	56.90511
U3_tRMS@POWER/0 [V]	230.2775	287.2729	56.99538
U_fundRMS_SYM+@POWER/0 [V]	230.3329	287.2960	56.96317
U_fundRMS_SYM-@POWER/0 [V]	0.082897	0.099927	0.017030

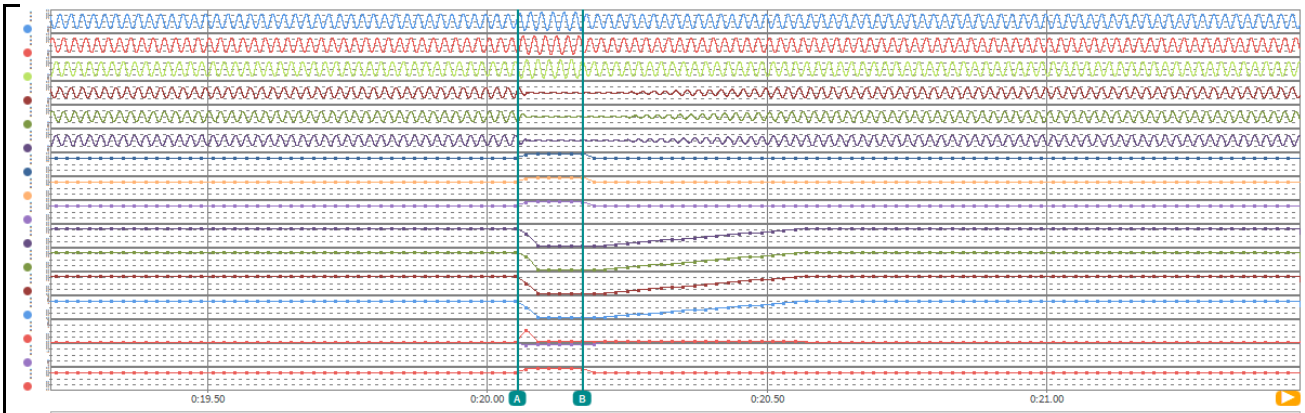
Test No. 5.1 with PGU

Before dip

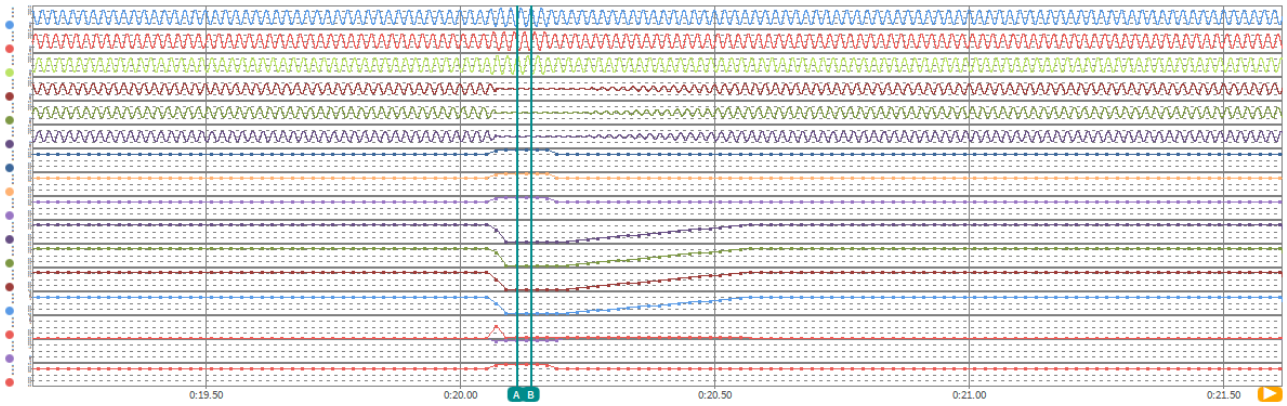


	A	B	Delta
Time [s]	0:18.05881	0:20.06555	2.00674
AI 1/U1 [V]	323.0708	-157.2833	-480.3541
AI 1/U2 [V]	-201.9458	400.6832	602.6290
AI 1/U3 [V]	-121.6738	-243.7296	-122.0558
AI 1/I1 [A]	233.9628	-42.04607	-276.0089
AI 1/I2 [A]	-144.5271	128.9973	273.5244
AI 1/I3 [A]	-89.47647	-86.96449	2.511978
U1_tRMS@POWER/0 [V]	230.7988	230.7960	-2.747e-3
U2_tRMS@POWER/0 [V]	230.5350	230.5513	0.016373
U3_tRMS@POWER/0 [V]	230.7540	230.7474	-6.607e-3
I1_tRMS@POWER/0 [A]	166.0589	166.0588	-6.104e-5
I2_tRMS@POWER/0 [A]	165.4429	165.4532	0.010345
I3_tRMS@POWER/0 [A]	165.6786	165.7173	0.038635
P_t@POWER/0 [W]	114691.2	114703.5	12.32813
Q_t@POWER/0 [var]	1204.950	1216.435	11.48511
PF_t@POWER/0 []	0.999945	0.999944	-1.013e-6
U_fundRMS_SYM+@POWER/0 [V]	230.6903	230.6926	2.289e-3

During dip

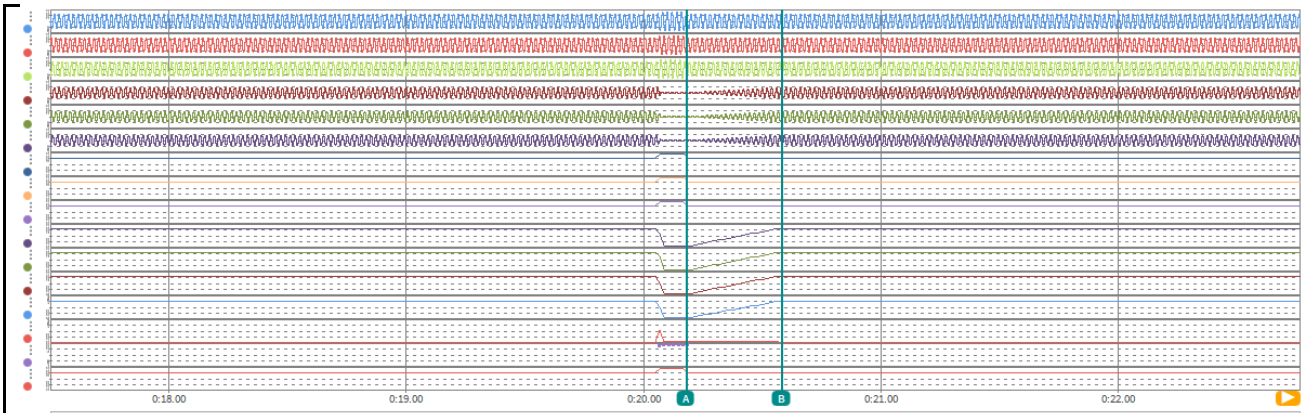


	A	B	Delta
Time [s]	0:20.05595	0:20.17145	0.11550
AI 1/U1 [V]	165.9896	-255.8091	-421.7987
AI 1/U2 [V]	-326.1421	-50.35758	275.7845
AI 1/U3 [V]	160.0423	304.1535	144.1112
AI 1/I1 [A]	120.3774	-14.53793	-134.9154
AI 1/I2 [A]	-233.8880	-1.325607	232.5624
AI 1/I3 [A]	113.6066	15.41305	-98.19353
U1_tRMS@POWER/0 [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



	A	B	Delta
Time [s]	0:20.11125	0:20.13936	0.02811
AI 1/U1 [V]	-332.9745	405.4249	738.3993
AI 1/U2 [V]	-34.92451	-198.9493	-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



	A	B	Delta
Time [s]	0:20.17948	0:20.58214	0.40265
AI 1/U1 [V]	324.4450	199.1241	-125.3209
AI 1/U2 [V]	-149.1542	125.1433	274.2975
AI 1/U3 [V]	-176.7871	-323.8332	-147.0461
AI 1/I1 [A]	15.68997	142.8266	127.1366
AI 1/I2 [A]	-9.959579	89.33330	99.29288
AI 1/I3 [A]	-5.727530	-231.9340	-226.2064
U1_tRMS@POWER/0 [V]	279.8276	231.0010	-48.82658
U2_tRMS@POWER/0 [V]	281.5033	230.8020	-50.70128
U3_tRMS@POWER/0 [V]	269.4494	230.9991	-38.45027
I1_tRMS@POWER/0 [A]	9.393196	160.7139	151.3207
I2_tRMS@POWER/0 [A]	8.823368	159.7850	150.9616
I3_tRMS@POWER/0 [A]	9.451897	161.0553	151.6034
P_t@POWER/0 [W]	7029.428	111182.5	104153.1
Q_t@POWER/0 [var]	3041.187	2351.037	-690.1499
PF_t@POWER/0 []	0.917789	0.999776	0.081988
U_fundRMS_SYM+@POWER/0 [V]	276.1299	230.9283	-45.20160

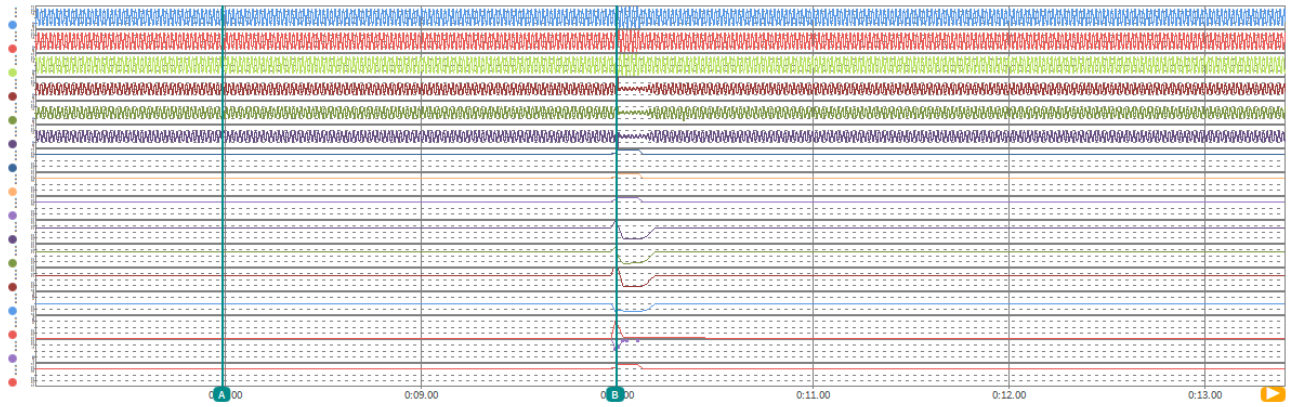
	A	B	Delta
Time [s]	0:23.19659	0:30.19332	6.99673
AI 1/U1 [V]	222.3115	-61.88393	-284.1954
AI 1/U2 [V]	-317.5099	-246.4001	71.10978
AI 1/U3 [V]	94.67102	308.6395	213.9685
AI 1/I1 [A]	160.8574	-44.05690	-204.9143
AI 1/I2 [A]	-225.6619	-178.7163	46.94557
AI 1/I3 [A]	64.72600	222.8967	158.1707
U1_tRMS@POWER/0 [V]	230.7205	230.7247	4.181e-3
U2_tRMS@POWER/0 [V]	230.5350	230.5477	0.012772
U3_tRMS@POWER/0 [V]	230.7779	230.7575	-0.020325
I1_tRMS@POWER/0 [A]	166.1184	166.1012	-0.017258
I2_tRMS@POWER/0 [A]	165.5177	165.4743	-0.043396
I3_tRMS@POWER/0 [A]	165.6644	165.7067	0.042282
P_t@POWER/0 [W]	114706.1	114705.0	-1.023438
Q_t@POWER/0 [var]	1526.325	1211.193	-315.1321
PF_t@POWER/0 []	0.999911	0.999944	3.278e-5
U_fundRMS_SYM+@POWER/0 [V]	230.6722	230.6707	-1.480e-3

Test No. 5.2 idle test

	A	B	Delta
Time [s]	9.99074	0:10.11065	0.11991
AI 1/U1 [V]	-325.4023	-406.1749	-80.77264
AI 1/U2 [V]	153.0864	201.6447	48.55824
AI 1/U3 [V]	172.4193	204.6952	32.27592
AI 1/I1 [A]	-0.041723	-6.914e-3	0.034809
AI 1/I2 [A]	0.915885	1.128197	0.212312
AI 1/I3 [A]	-0.898361	-1.146913	-0.248551
U1_tRMS@POWER/0 [V]	230.2719	287.2610	56.98914
U2_tRMS@POWER/0 [V]	230.4494	287.3545	56.90511
U3_tRMS@POWER/0 [V]	230.2775	287.2729	56.99538
U_fundRMS_SYM+@POWER/0 [V]	230.3329	287.2960	56.96317
U_fundRMS_SYM-@POWER/0 [V]	0.082897	0.099927	0.017030

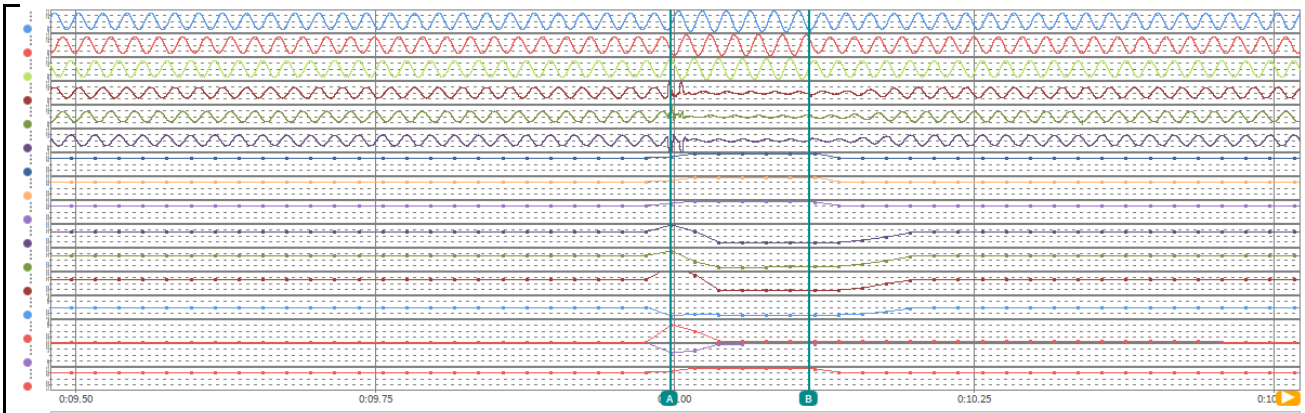
Test No. 5.2 with PGU

Before dip

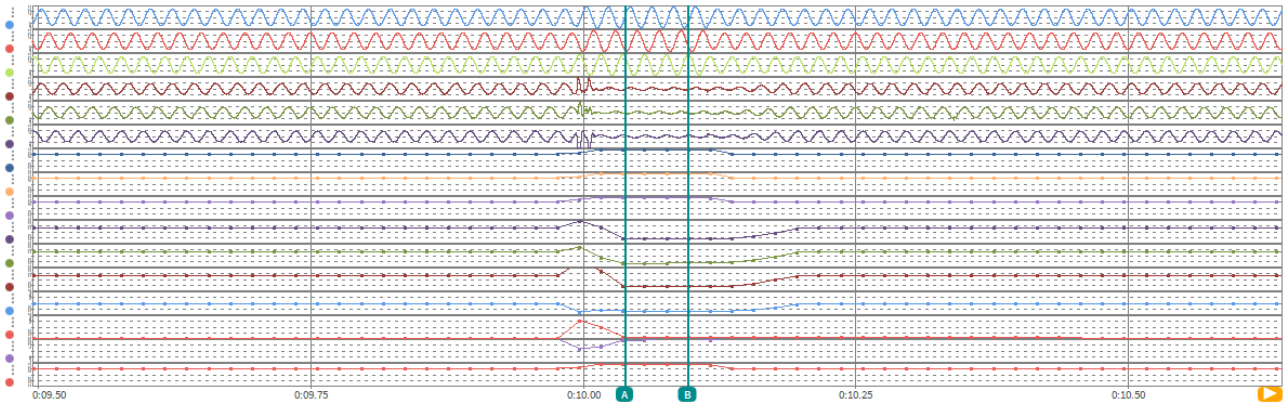


	A	B	Delta
Time [s]	7.98988	9.99649	2.00661
AI 1/U1 [V]	-130.8203	-248.4141	-117.5938
AI 1/U2 [V]	324.0931	-156.6684	-480.7616
AI 1/U3 [V]	-193.3715	403.6410	597.0126
AI 1/I1 [A]	-19.33801	97.52310	116.8611
AI 1/I2 [A]	46.97430	64.54087	17.56656
AI 1/I3 [A]	-27.97818	-161.7816	-133.8034
U1_tRMS@POWER/0 [V]	230.4412	230.4349	-6.241e-3
U2_tRMS@POWER/0 [V]	230.5480	230.5300	-0.017975
U3_tRMS@POWER/0 [V]	230.4001	230.3692	-0.030899
I1_tRMS@POWER/0 [A]	33.31824	33.31125	-6.992e-3
I2_tRMS@POWER/0 [A]	33.34523	33.38980	0.044579
I3_tRMS@POWER/0 [A]	33.42552	33.40276	-0.022758
P_t@POWER/0 [W]	23063.96	23065.05	1.089844
Q_t@POWER/0 [var]	362.5922	392.5746	29.98233
PF_t@POWER/0 []	0.999876	0.999855	-2.128e-5
U_fundRMS_SYM+@POWER/0 [V]	230.4614	230.4430	-0.018402

During dip

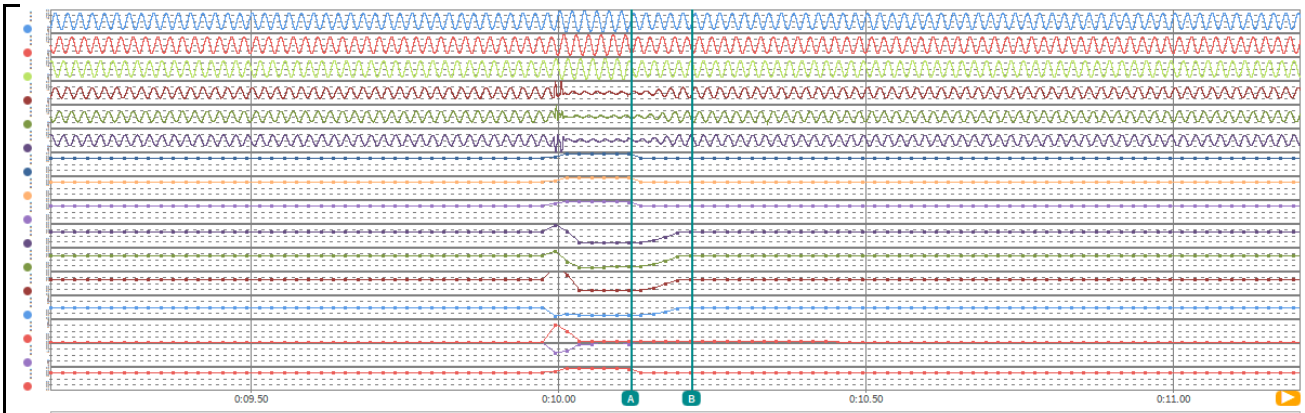


	A	B	Delta
Time [s]	9.99610	0:10.11231	0.11621
AI 1/U1 [V]	-272.5189	-381.8736	-109.3547
AI 1/U2 [V]	-119.0317	311.3516	430.3832
AI 1/U3 [V]	390.0564	70.11176	-319.9446
AI 1/I1 [A]	133.4486	-9.153009	-142.6016
AI 1/I2 [A]	42.08386	11.85548	-30.22838
AI 1/I3 [A]	-177.5533	-2.595902	174.9574
U1_tRMS@POWER/0 [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



	A	B	Delta
Time [s]	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

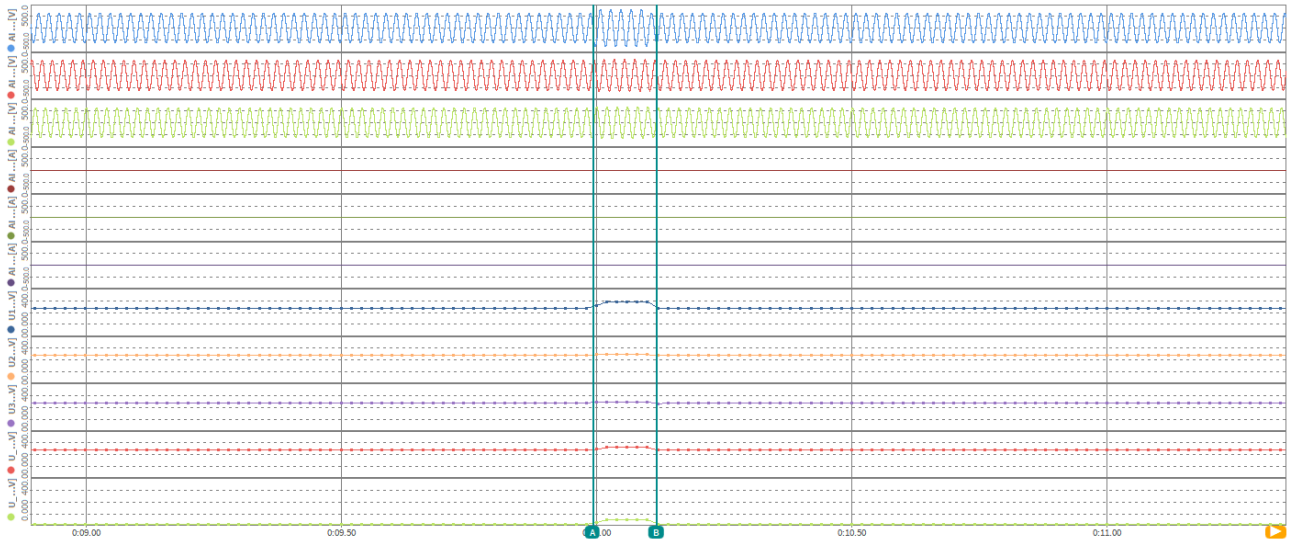


	A	B	Delta
Time [s]	0:10.11917	0:10.21859	0.09942
AI 1/U1 [V]	68.17580	14.63604	-53.53976
AI 1/U2 [V]	-310.4720	-289.7599	20.71214
AI 1/U3 [V]	241.8935	275.6019	33.70834
AI 1/I1 [A]	-1.645327	-0.778914	0.866413
AI 1/I2 [A]	-14.39786	-38.88762	-24.48976
AI 1/I3 [A]	15.40160	40.33149	24.92988
U1_tRMS@POWER/0 [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

	A	B	Delta
Time [s]	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

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

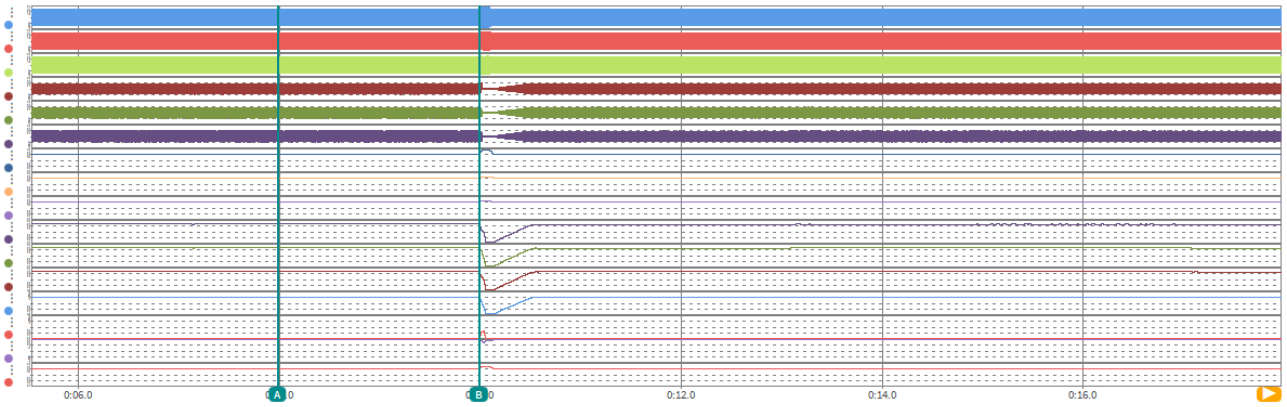
Test No. 5.3 idle test



	A	B	Delta
Time [s]	9.99347	0:10.11862	0.12514
AI 1/U1 [V]	25.95806	-325.6386	-351.5966
AI 1/U2 [V]	268.8124	166.6896	-102.1228
AI 1/U3 [V]	-293.6428	158.9820	452.6248
AI 1/I1 [A]	1.051307	0.016332	-1.034975
AI 1/I2 [A]	-0.658155	0.887632	1.545787
AI 1/I3 [A]	-0.419140	-0.929117	-0.509977
U1_tRMS@POWER/0 [V]	230.3470	287.5760	57.22893
U2_tRMS@POWER/0 [V]	230.4267	243.4435	13.01677
U3_tRMS@POWER/0 [V]	230.2430	243.2431	13.00002
U_fundRMS_SYM+@POWER/0 [V]	230.3389	256.0741	25.73520
U_fundRMS_SYM-@POWER/0 [V]	0.040626	37.80855	37.76793

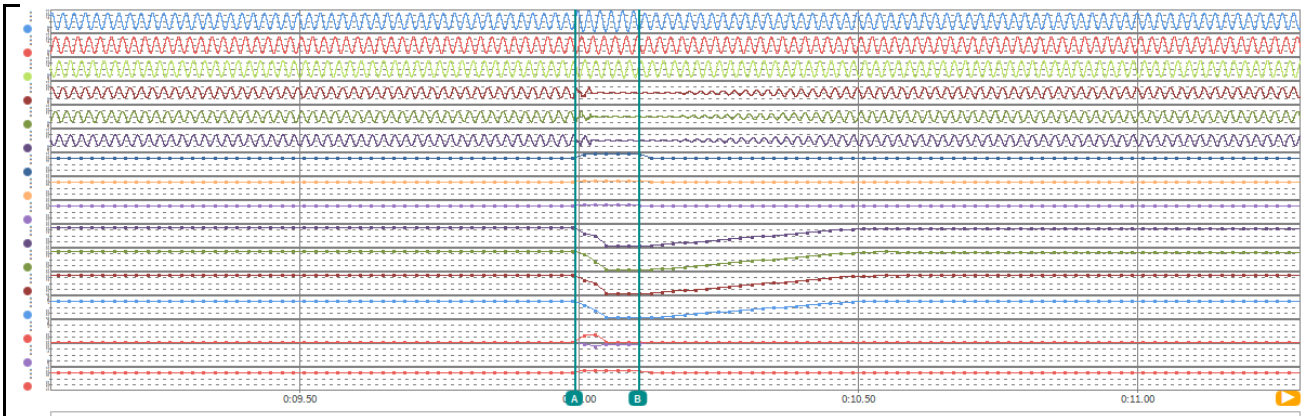
Test No. 5.3 with PGU

Before dip

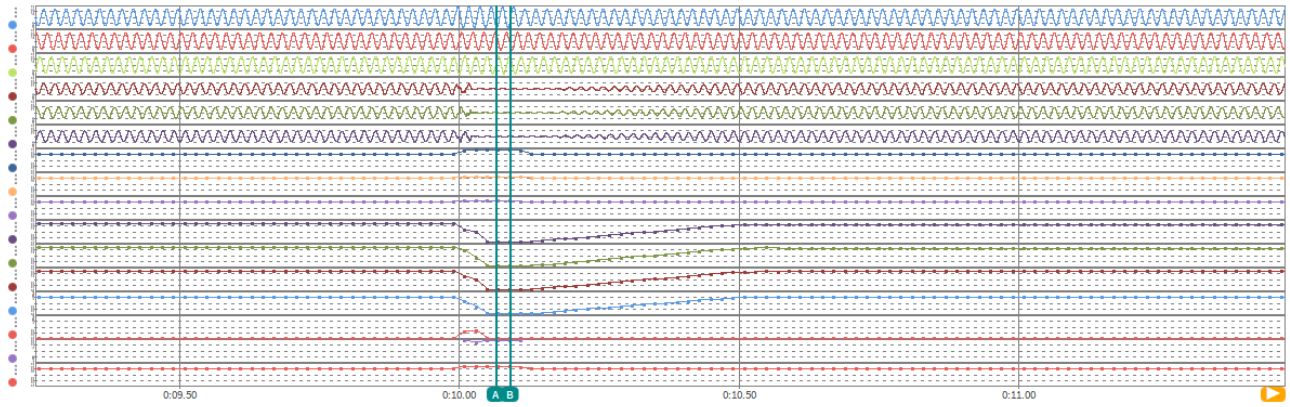


	A	B	Delta
Time [s]	7.99583	9.99695	2.00113
AI 1/U1 [V]	235.4293	301.5397	66.11038
AI 1/U2 [V]	-313.1261	-259.7733	53.35284
AI 1/U3 [V]	77.05927	-45.30049	-122.3598
AI 1/I1 [A]	171.2821	220.4468	49.16477
AI 1/I2 [A]	-226.7283	-187.1286	39.59978
AI 1/I3 [A]	55.24218	-32.91619	-88.15837
U1_tRMS@POWER/0 [V]	230.8313	230.8919	0.060608
U2_tRMS@POWER/0 [V]	230.9162	230.9379	0.021698
U3_tRMS@POWER/0 [V]	230.8132	230.7213	-0.091904
I1_tRMS@POWER/0 [A]	167.2607	167.2681	7.370e-3
I2_tRMS@POWER/0 [A]	167.5861	167.5722	-0.013916
I3_tRMS@POWER/0 [A]	168.0021	167.9962	-5.844e-3
P_t@POWER/0 [W]	116079.1	116073.9	-5.148438
Q_t@POWER/0 [var]	1116.034	1178.400	62.36621
PF_t@POWER/0 []	0.999954	0.999948	-5.364e-6
U_fundRMS_SYM+@POWER/0 [V]	230.8503	230.8469	-3.433e-3

During dip

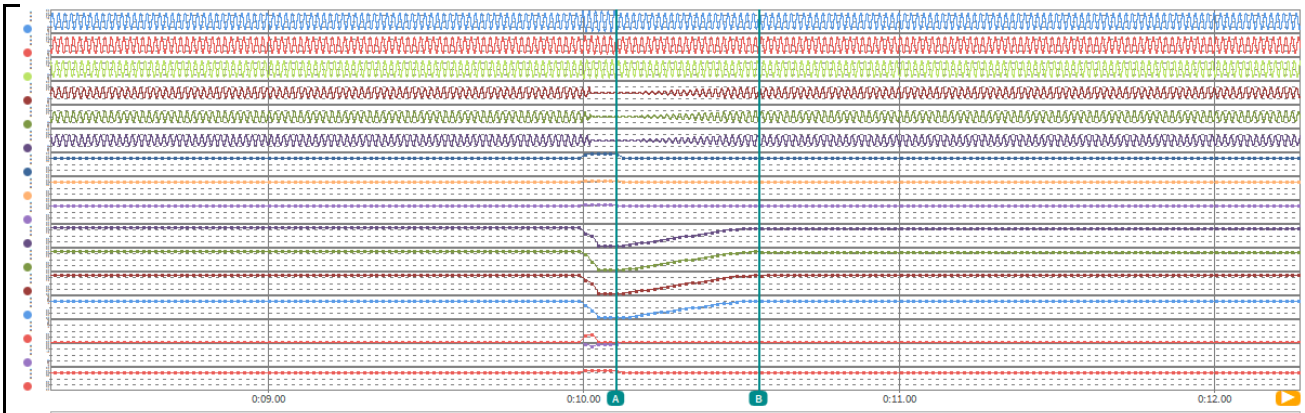


Time [s]	A 9.99347	B 0:10.10732	Delta 0.11385
AI 1/U1 [V]	32.82738	-363.9097	-396.7371
AI 1/U2 [V]	-295.3305	274.5359	569.8665
AI 1/U3 [V]	268.9531	129.3252	-139.6279
AI 1/I1 [A]	17.03334	-20.32411	-37.35745
AI 1/I2 [A]	-211.6932	16.59334	228.2865
AI 1/I3 [A]	196.1057	3.605008	-192.5007
U1_tRMS@POWER/0 [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

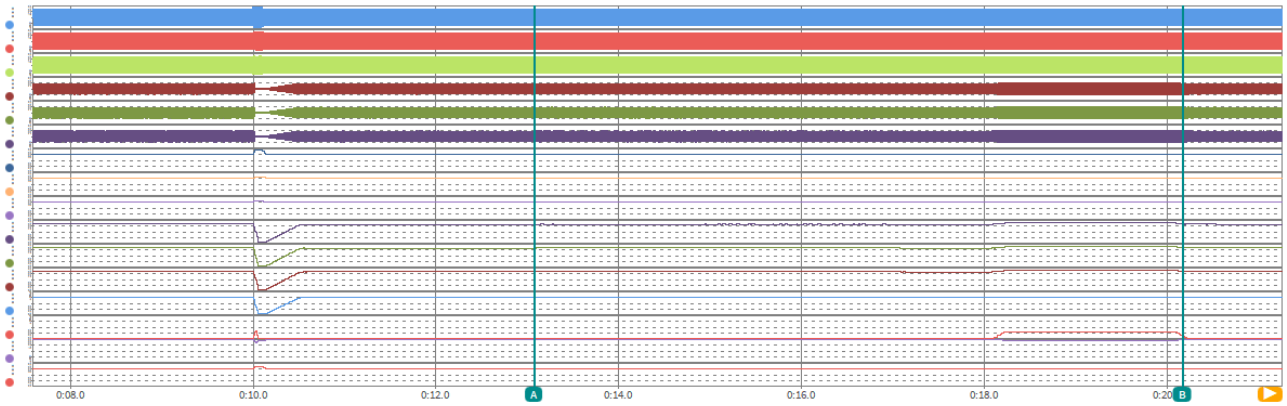


Time [s]	A 0:10.06613	B 0:10.09128	Delta 0.02516
AI 1/U1 [V]	-319.3302	-239.2872	80.04308
AI 1/U2 [V]	335.3260	-89.42843	-424.7544
AI 1/U3 [V]	4.661083	342.7704	338.1093
AI 1/I1 [A]	-4.334212	-10.20229	-5.868078
AI 1/I2 [A]	10.96833	-2.374888	-13.34322
AI 1/I3 [A]	-7.234097	12.62581	19.85991
U1_tRMS@POWER/0 [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

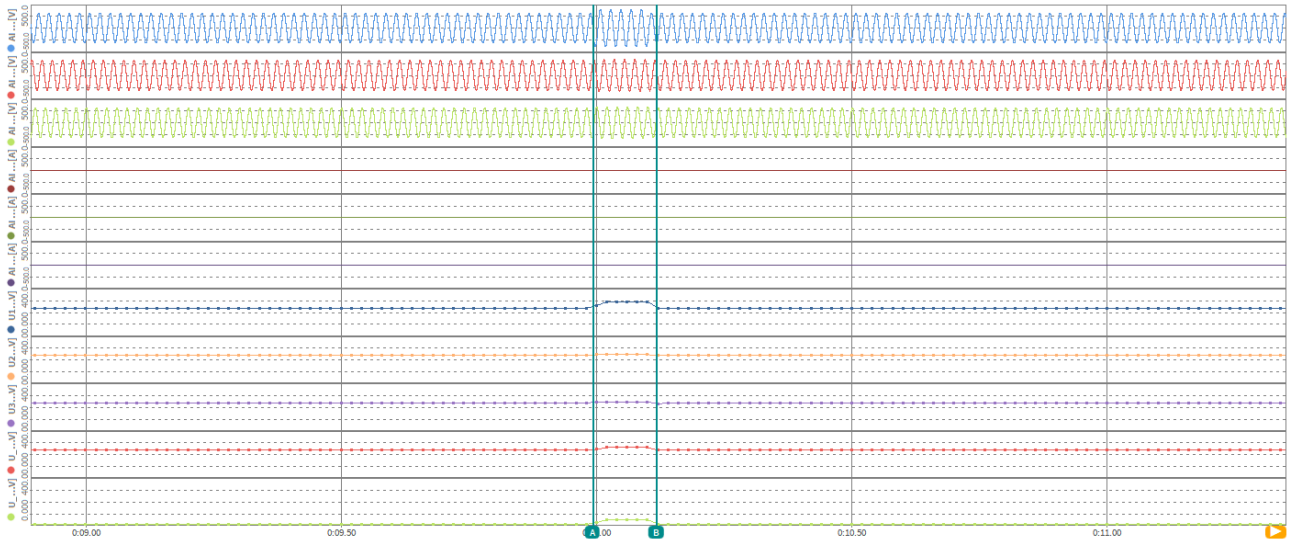


Time [s]	A 0:10.10483	B 0:10.55663	Delta 0.45180
AI 1/U1 [V]	-194.4909	288.4898	482.9808
AI 1/U2 [V]	337.6231	-276.9892	-614.6124
AI 1/U3 [V]	-130.5261	-18.48602	112.0400
AI 1/I1 [A]	-2.196193	205.6844	207.8806
AI 1/I2 [A]	11.02293	-199.4958	-210.5187
AI 1/I3 [A]	-9.058118	-5.606771	3.451348
U1_tRMS@POWER/0 [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 0:13.08171	B 0:20.17020	Delta 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

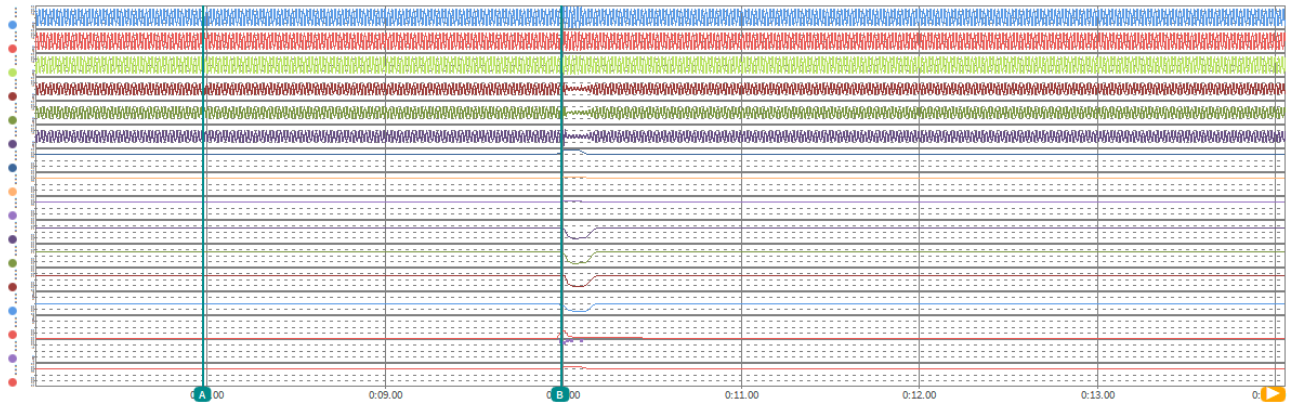
Test No. 5.4 idle test



	A	B	Delta
Time [s]	9.99347	0:10.11862	0.12514
AI 1/U1 [V]	25.95806	-325.6386	-351.5966
AI 1/U2 [V]	268.8124	166.6896	-102.1228
AI 1/U3 [V]	-293.6428	158.9820	452.6248
AI 1/I1 [A]	1.051307	0.016332	-1.034975
AI 1/I2 [A]	-0.658155	0.887632	1.545787
AI 1/I3 [A]	-0.419140	-0.929117	-0.509977
U1_tRMS@POWER/0 [V]	230.3470	287.5760	57.22893
U2_tRMS@POWER/0 [V]	230.4267	243.4435	13.01677
U3_tRMS@POWER/0 [V]	230.2430	243.2431	13.00002
U_fundRMS_SYM+@POWER/0 [V]	230.3389	256.0741	25.73520
U_fundRMS_SYM-@POWER/0 [V]	0.040626	37.80855	37.76793

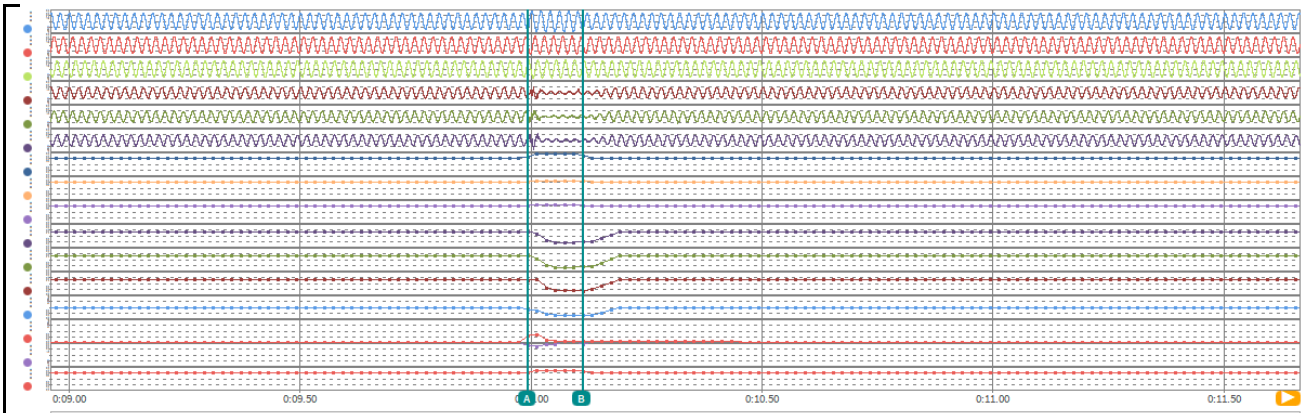
Test No. 5.4 with PGU

Before dip

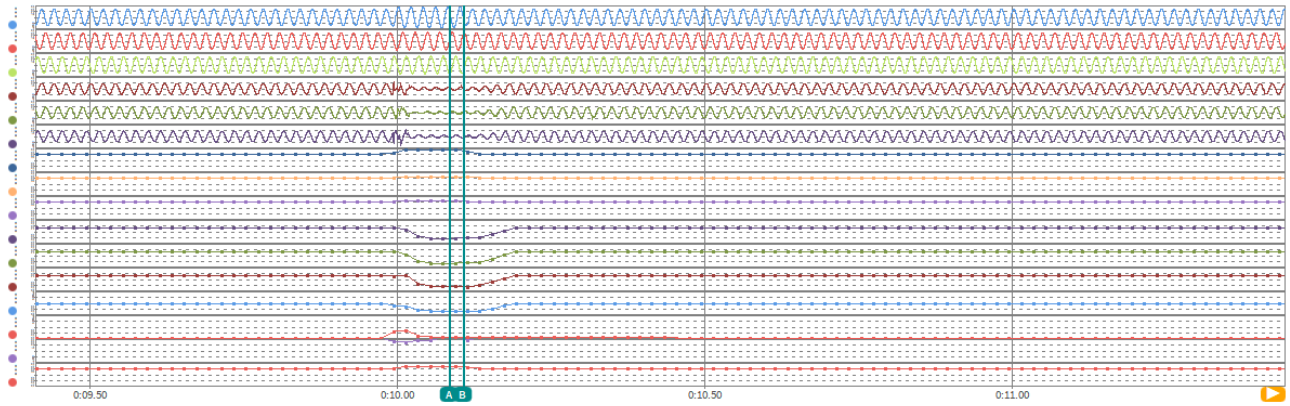


	A	B	Delta
Time [s]	7.98345	9.99072	2.00727
AI 1/U1 [V]	322.6714	-251.5175	-574.1890
AI 1/U2 [V]	-121.8548	304.5097	426.3644
AI 1/U3 [V]	-200.2118	-52.46282	147.7490
AI 1/I1 [A]	46.35155	-36.12900	-82.48055
AI 1/I2 [A]	-16.89327	43.63537	60.52864
AI 1/I3 [A]	-29.45817	-7.112623	22.34554
U1_tRMS@POWER/0 [V]	230.4411	230.4671	0.025986
U2_tRMS@POWER/0 [V]	230.5583	230.5539	-4.471e-3
U3_tRMS@POWER/0 [V]	230.3795	230.3796	9.155e-5
I1_tRMS@POWER/0 [A]	33.29155	33.32893	0.037388
I2_tRMS@POWER/0 [A]	33.33340	33.36409	0.030697
I3_tRMS@POWER/0 [A]	33.37248	33.42120	0.048717
P_t@POWER/0 [W]	23041.98	23070.39	28.41016
Q_t@POWER/0 [var]	395.0917	347.3602	-47.73148
PF_t@POWER/0 []	0.999853	0.999887	3.368e-5
U_fundRMS_SYM+@POWER/0 [V]	230.4579	230.4651	7.187e-3

During dip

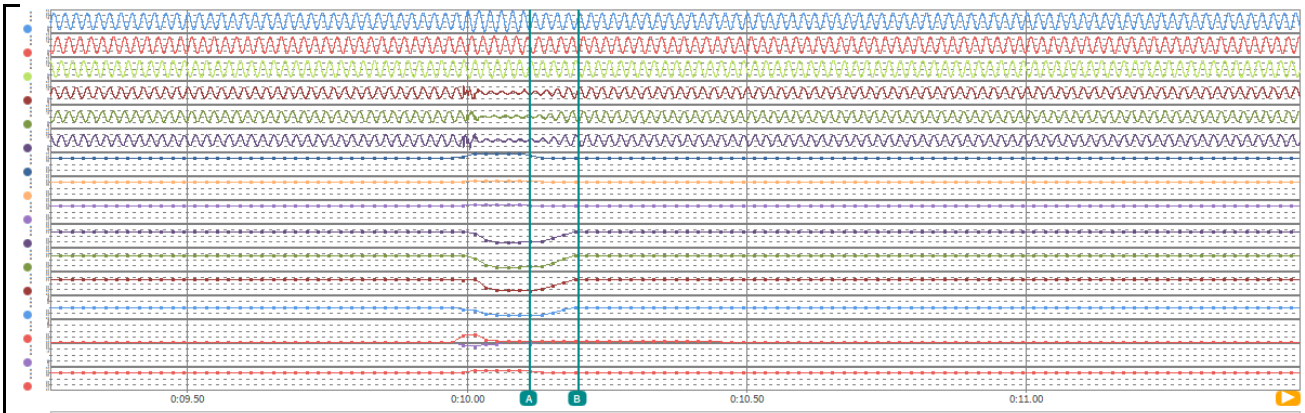


Time [s]	A 9.99329	B 0:10.11107	Delta 0.11778
AI 1/U1 [V]	-324.2550	-269.3231	54.93188
AI 1/U2 [V]	134.0079	292.0516	158.0436
AI 1/U3 [V]	189.8978	-22.81666	-212.7144
AI 1/I1 [A]	-46.94522	-11.01780	35.92742
AI 1/I2 [A]	19.02616	11.72006	-7.306099
AI 1/I3 [A]	27.90404	-1.831889	-29.73592
U1_tRMS@POWER/0 [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

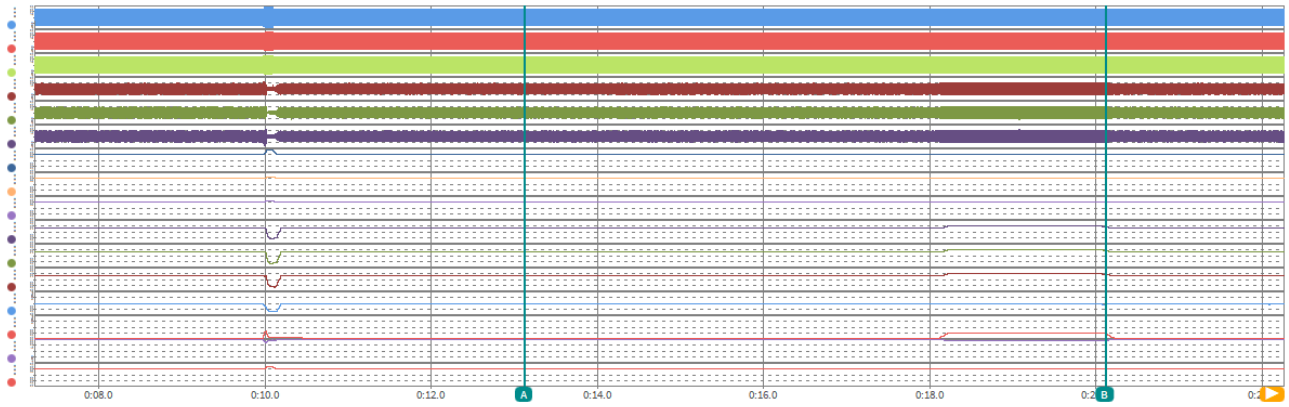


Time [s]	A 0:10.08498	B 0:10.10785	Delta 0.02287
AI 1/U1 [V]	328.4967	8.303881	-320.1928
AI 1/U2 [V]	-17.33351	277.1316	294.4651
AI 1/U3 [V]	-331.8505	-285.8823	45.96830
AI 1/I1 [A]	12.18641	0.062108	-12.12430
AI 1/I2 [A]	-3.372312	6.650329	10.02264
AI 1/I3 [A]	-8.465410	-6.151796	2.313614
U1_tRMS@POWER/0 [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



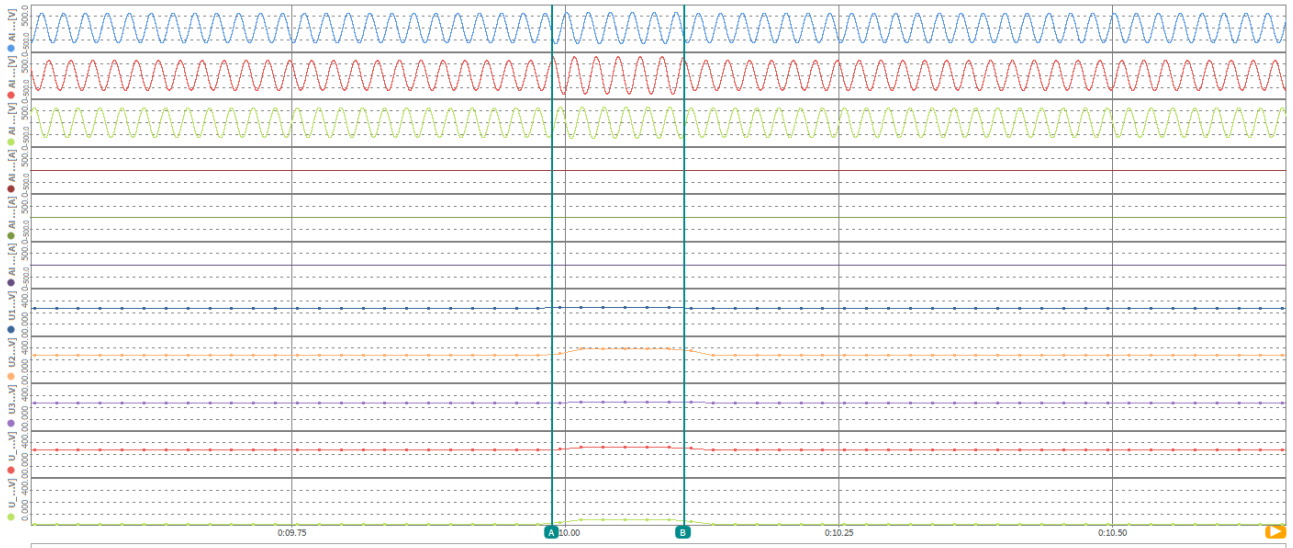
Time [s]	A 0:10.11180	B 0:10.19930	Delta 0.08750
AI 1/U1 [V]	-306.7119	145.1950	451.9069
AI 1/U2 [V]	249.1470	-325.8903	-575.0373
AI 1/U3 [V]	57.55258	180.5582	123.0056
AI 1/I1 [A]	-14.79578	17.66253	32.45831
AI 1/I2 [A]	14.32908	-47.22619	-61.55527
AI 1/I3 [A]	0.352263	29.56498	29.21271
U1_tRMS@POWER/0 [V]	287.4210	230.7390	-56.68201
U2_tRMS@POWER/0 [V]	243.4965	230.4841	-13.01241
U3_tRMS@POWER/0 [V]	243.4715	230.8071	-12.66443
I1_tRMS@POWER/0 [A]	8.520208	33.26740	24.74719
I2_tRMS@POWER/0 [A]	7.823732	32.69786	24.87413
I3_tRMS@POWER/0 [A]	8.766411	33.19558	24.42917
P_t@POWER/0 [W]	6197.849	22796.17	16598.32
Q_t@POWER/0 [var]	1919.591	1887.804	-31.78735
PF_t@POWER/0 []	0.955233	0.996589	0.041355
U_fundRMS_SYM+@POWER/0 [V]	256.1568	230.6738	-25.48296



Time [s]	A 0:13.12463	B 0:20.11317	Delta 6.98854
AI 1/U1 [V]	273.8877	-320.1628	-594.0504
AI 1/U2 [V]	21.92760	108.7341	86.80654
AI 1/U3 [V]	-289.9184	212.5478	502.4662
AI 1/I1 [A]	39.80494	-51.36752	-91.17246
AI 1/I2 [A]	2.606630	34.91247	32.30584
AI 1/I3 [A]	-43.32781	16.36648	59.69429
U1_tRMS@POWER/0 [V]	230.4358	230.4122	-0.023666
U2_tRMS@POWER/0 [V]	230.5461	230.5385	-7.675e-3
U3_tRMS@POWER/0 [V]	230.3662	230.3673	1.175e-3
I1_tRMS@POWER/0 [A]	33.40783	36.33474	2.926910
I2_tRMS@POWER/0 [A]	33.44892	35.88858	2.439659
I3_tRMS@POWER/0 [A]	33.49592	36.52573	3.029808
P_t@POWER/0 [W]	23124.44	22355.97	-768.4648
Q_t@POWER/0 [var]	286.1922	11323.17	11036.97
PF_t@POWER/0 []	0.999923	0.892098	-0.107826
U_fundRMS_SYM+@POWER/0 [V]	230.4477	230.4381	-9.659e-3

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

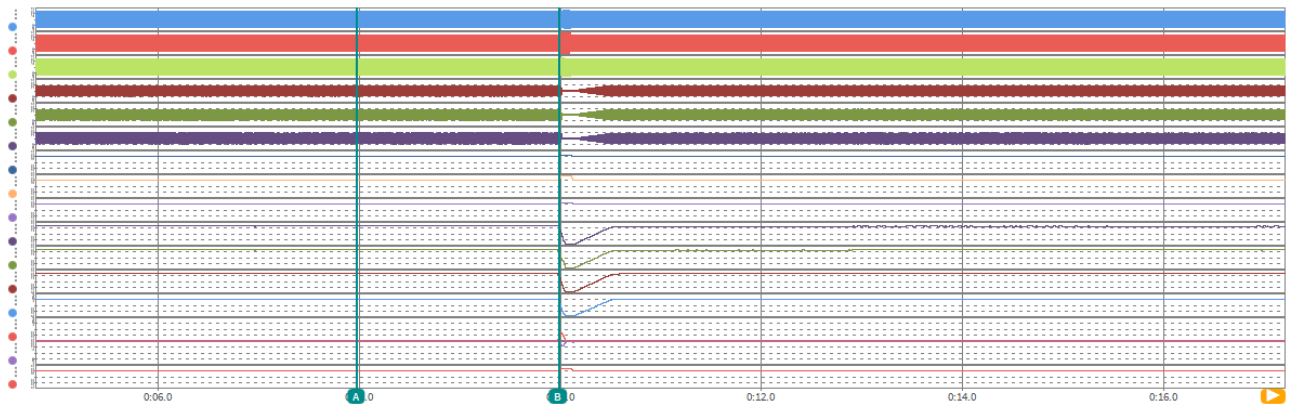
Test No. 5.3(D2) idle test



Time [s]	A 9.98856	B 0:10.10869	Delta 0.12013
AI 1/U1 [V]	-177.7647	-130.1644	47.60027
AI 1/U2 [V]	375.3557	315.3579	-59.99780
AI 1/U3 [V]	-220.0949	-185.0073	35.08759
AI 1/I1 [A]	3.731370	1.502633	-2.228737
AI 1/I2 [A]	-6.204129	1.109839	7.313967
AI 1/I3 [A]	2.458453	-2.642036	-5.100489
U1_tRMS@POWER/0 [V]	230.3089	243.3017	12.99280
U2_tRMS@POWER/0 [V]	230.4218	287.3292	56.90735
U3_tRMS@POWER/0 [V]	230.2337	243.2783	13.04456
U_fundRMS_SYM+@POWER/0 [V]	230.3214	255.9814	25.65994
U_fundRMS_SYM-@POWER/0 [V]	0.059979	37.60046	37.54049

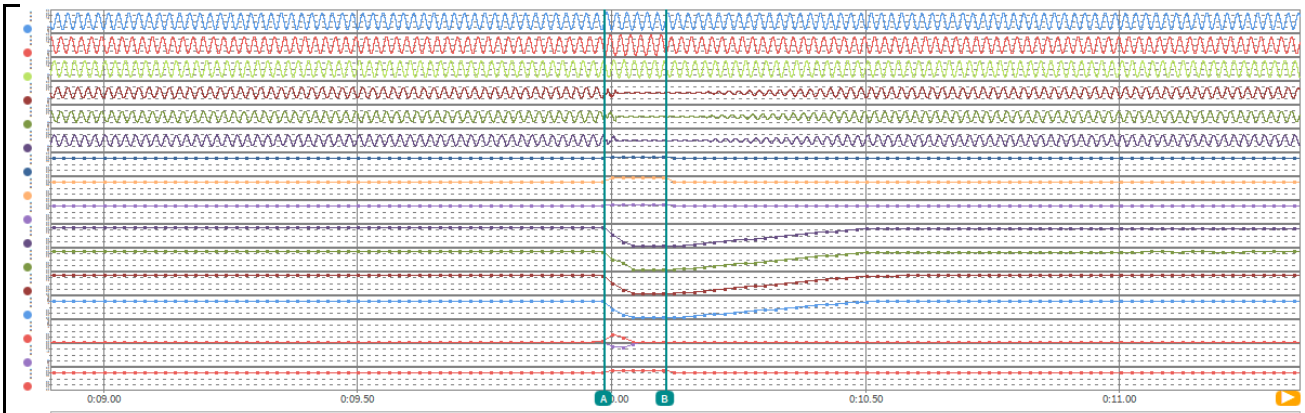
Test No. 5.3(D2) with PGU

Before dip

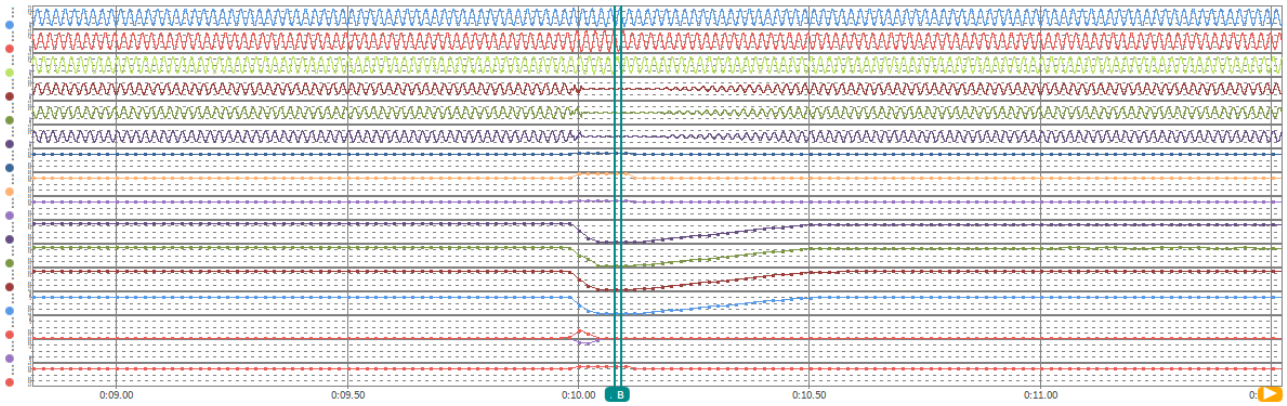


Time [s]	A 7.98108	B 9.98640	Delta 2.00533
AI 1/U1 [V]	-296.4337	-49.20960	247.2241
AI 1/U2 [V]	267.2250	-271.5023	-538.7273
AI 1/U3 [V]	33.93126	337.7290	303.7977
AI 1/I1 [A]	-215.1502	-82.51489	132.6354
AI 1/I2 [A]	194.1521	-122.7524	-316.9046
AI 1/I3 [A]	21.69204	205.3033	183.6113
U1_tRMS@POWER/0 [V]	230.8376	230.8118	-0.025833
U2_tRMS@POWER/0 [V]	230.9729	230.9458	-0.027084
U3_tRMS@POWER/0 [V]	230.7494	230.7318	-0.017624
I1_tRMS@POWER/0 [A]	167.1311	167.2630	0.131927
I2_tRMS@POWER/0 [A]	167.4471	167.5798	0.132690
I3_tRMS@POWER/0 [A]	167.8053	167.9557	0.150314
P_t@POWER/0 [W]	115970.8	116053.3	82.51563
Q_t@POWER/0 [var]	1186.914	1321.998	135.0846
PF_t@POWER/0 []	0.999948	0.999935	-1.246e-5
U_fundRMS_SYM+@POWER/0 [V]	230.8501	230.8265	-0.023514

During dip

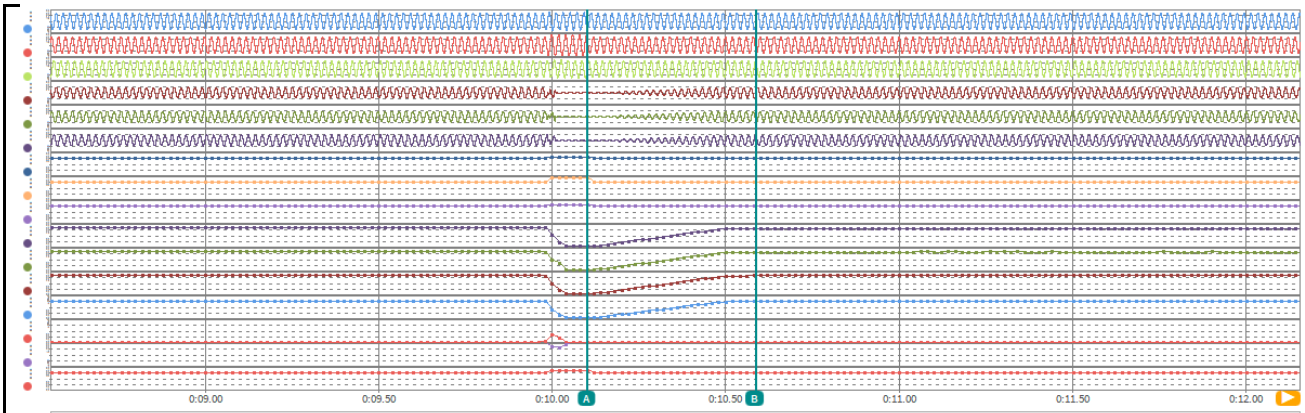


	A	B	Delta
Time [s]	9.98594	0:10.10698	0.12104
AI 1/U1 [V]	-98.82928	-48.87677	49.95251
AI 1/U2 [V]	-220.5560	-254.6175	-34.06143
AI 1/U3 [V]	336.3636	302.3317	-34.03187
AI 1/I1 [A]	-114.5146	-2.414704	112.0999
AI 1/I2 [A]	-116.1826	-13.04054	103.1420
AI 1/I3 [A]	230.6411	15.75983	-214.8813
U1_tRMS@POWER/0 [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

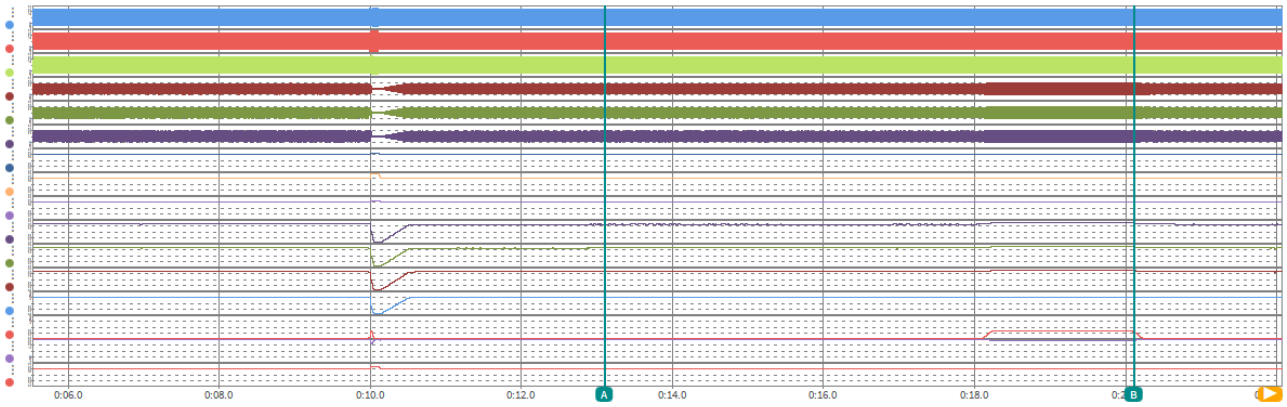


	A	B	Delta
Time [s]	0:10.07830	0:10.09356	0.01527
AI 1/U1 [V]	-139.5309	299.1300	438.6609
AI 1/U2 [V]	391.6469	-67.29913	-458.9460
AI 1/U3 [V]	-277.4406	-226.7673	50.67325
AI 1/I1 [A]	-0.737309	12.41899	13.15630
AI 1/I2 [A]	10.46538	-4.753351	-15.21874
AI 1/I3 [A]	-9.647608	-7.490993	2.156615
U1_tRMS@POWER/0 [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



Time [s]	A 0:10.10206	B 0:10.58581	Delta 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	2087.270	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 0:13.11037	B 0:20.11294	Delta 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

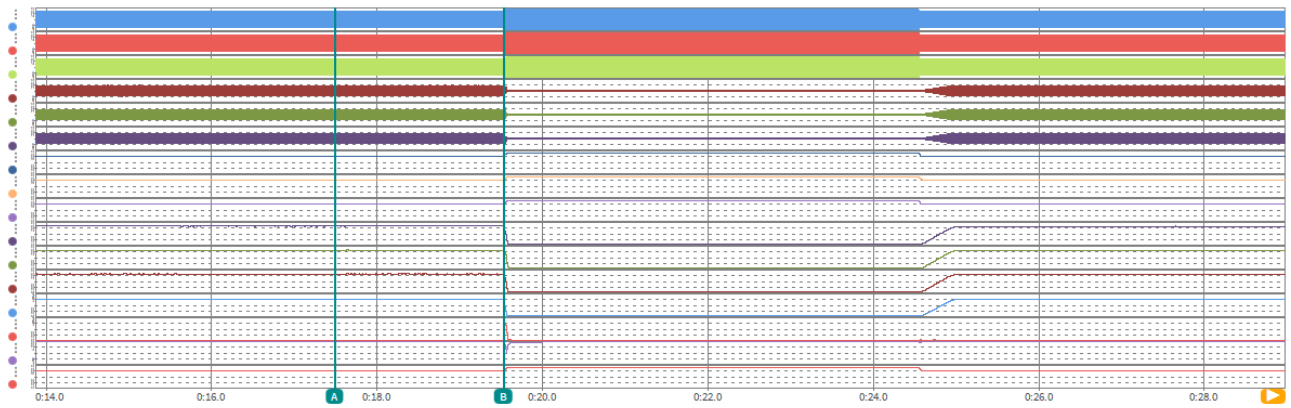
Condition						Measurement
	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	5.3(D2)
	1	Date	--	--	yyyy.mm.dd	2022.08.16
	2	Time (start of test)	--	--	hh:mm:ss	09:03:38
	3	Fault type (phase)	--	--		2 phase
	4	Setting voltage depth	Line to neutral	--	p.u.	1.25
	5	Setting dip 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

Test No. 6.1 idle test

	A	B	Delta
Time [s]	9.99303	0:15.01363	5.02060
AI 1/U1 [V]	-238.6956	-133.5640	105.1316
AI 1/U2 [V]	-142.9730	-191.1564	-48.18344
AI 1/U3 [V]	379.9222	324.2591	-55.66311
AI 1/I1 [A]	-0.832200	-1.003027	-0.170827
AI 1/I2 [A]	0.946522	0.831842	-0.114679
AI 1/I3 [A]	-0.134468	0.145912	0.280380
U1_tRMS@POWER/0 [V]	230.3405	275.3560	45.01544
U2_tRMS@POWER/0 [V]	230.4249	275.4913	45.06639
U3_tRMS@POWER/0 [V]	230.2569	275.2978	45.04089
U_fundRMS_SYM+@POWER/0 [V]	230.3407	275.3816	45.04089
U_fundRMS_SYM-@POWER/0 [V]	0.049991	0.074225	0.024234

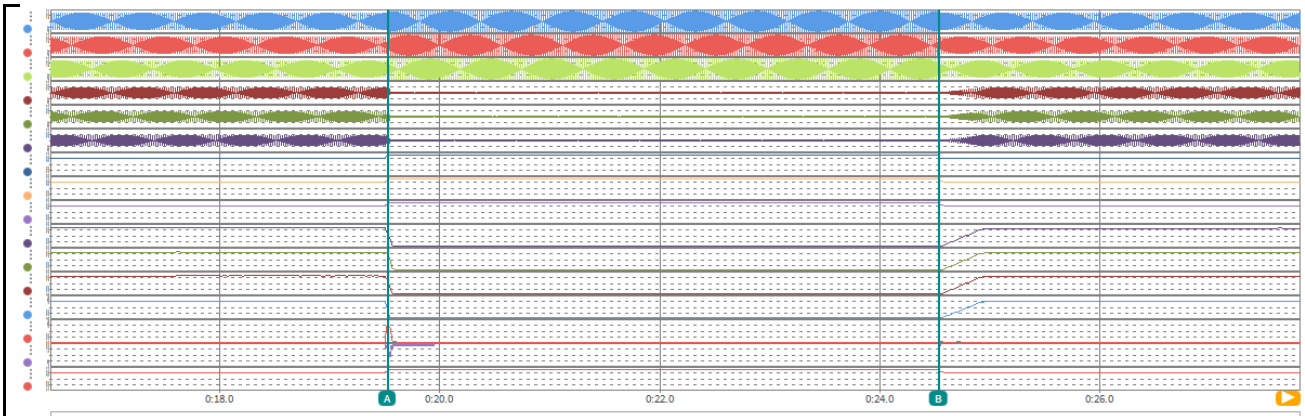
Test No. 6.1 with PGU

Before dip

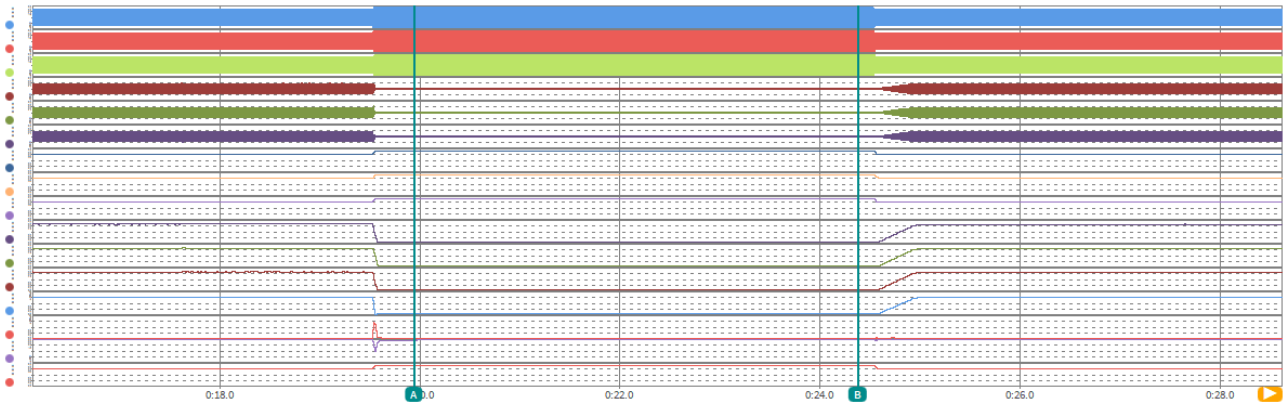


	A	B	Delta
Time [s]	0:17.50134	0:19.53900	2.03766
AI 1/U1 [V]	-196.8470	-377.7573	-180.9104
AI 1/U2 [V]	-127.6836	121.7747	249.4583
AI 1/U3 [V]	324.0361	255.1000	-68.93611
AI 1/I1 [A]	-140.9648	-3.696561	137.2682
AI 1/I2 [A]	-92.66818	3.628850	96.29703
AI 1/I3 [A]	233.5179	0.106335	-233.4116
U1_tRMS@POWER/0 [V]	230.8392	230.8548	0.015549
U2_tRMS@POWER/0 [V]	230.5573	230.5818	0.024567
U3_tRMS@POWER/0 [V]	230.8232	230.8188	-4.349e-3
I1_tRMS@POWER/0 [A]	166.6793	167.0550	0.375702
I2_tRMS@POWER/0 [A]	166.0159	166.3853	0.369339
I3_tRMS@POWER/0 [A]	166.3560	166.6411	0.285126
P_t@POWER/0 [W]	115144.3	115388.8	244.5313
Q_t@POWER/0 [var]	1255.309	1173.763	-81.54590
PF_t@POWER/0 []	0.999941	0.999948	7.689e-6
U_fundRMS_SYM+@POWER/0 [V]	230.7357	230.7477	0.011948

During dip

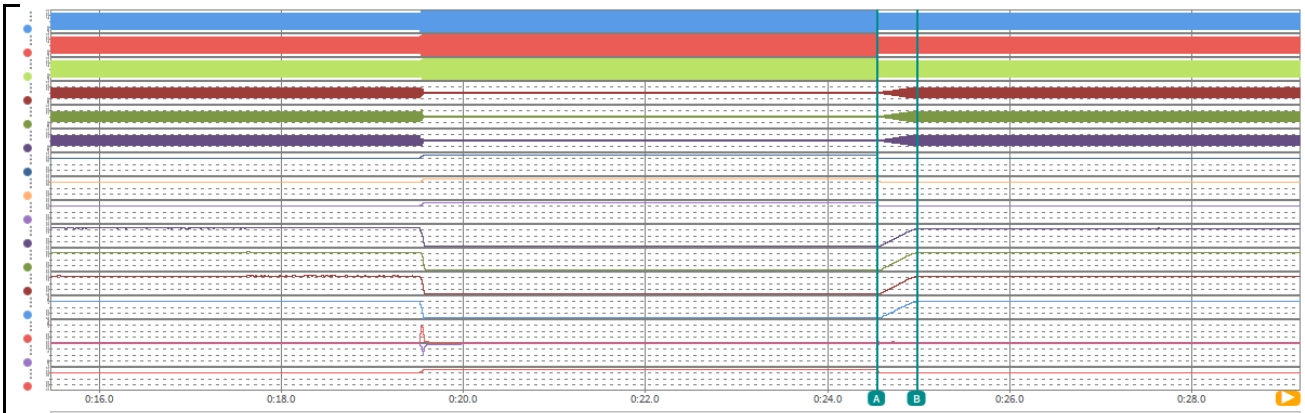


Time [s]	A 0:19.53372	B 0:24.53586	Delta 5.00213
AI 1/U1 [V]	-45.11237	-288.4176	-243.3052
AI 1/U2 [V]	301.2517	372.5200	71.26832
AI 1/U3 [V]	-259.9065	-84.33605	175.5705
AI 1/I1 [A]	-31.15356	-6.055117	25.09844
AI 1/I2 [A]	217.4355	11.38389	-206.0516
AI 1/I3 [A]	-186.3334	-5.229831	181.1036
U1_tRMS@POWER/0 [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

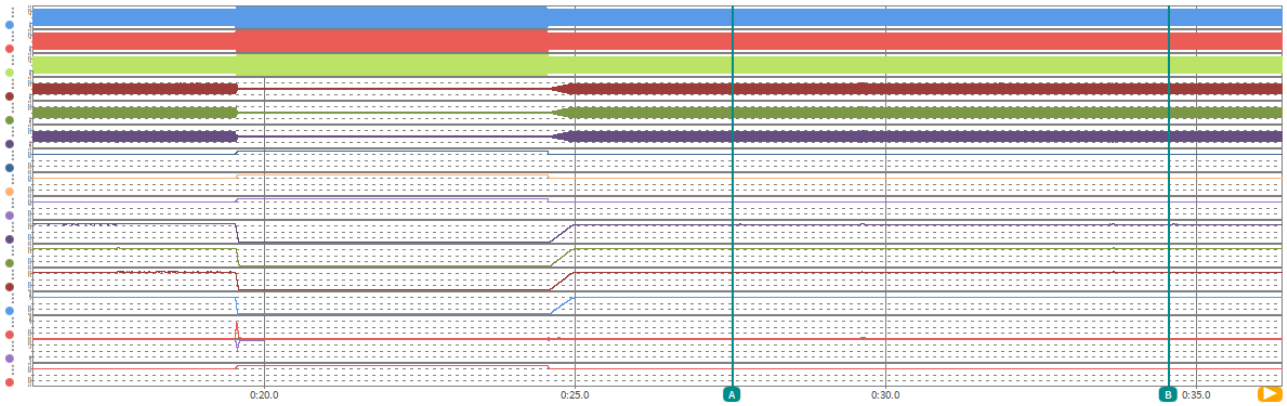


Time [s]	A 0:19.95193	B 0:24.38169	Delta 4.42976
AI 1/U1 [V]	166.1821	-185.4017	-351.5837
AI 1/U2 [V]	223.2523	-205.7314	-428.9837
AI 1/U3 [V]	-389.2546	390.7221	779.9767
AI 1/I1 [A]	7.004619	-8.487464	-15.49208
AI 1/I2 [A]	3.230214	-3.385306	-6.615520
AI 1/I3 [A]	-10.24377	11.85572	22.09950
U1_tRMS@POWER/0 [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



Time [s]	A 0:24.54657	B 0:24.98500	Delta 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



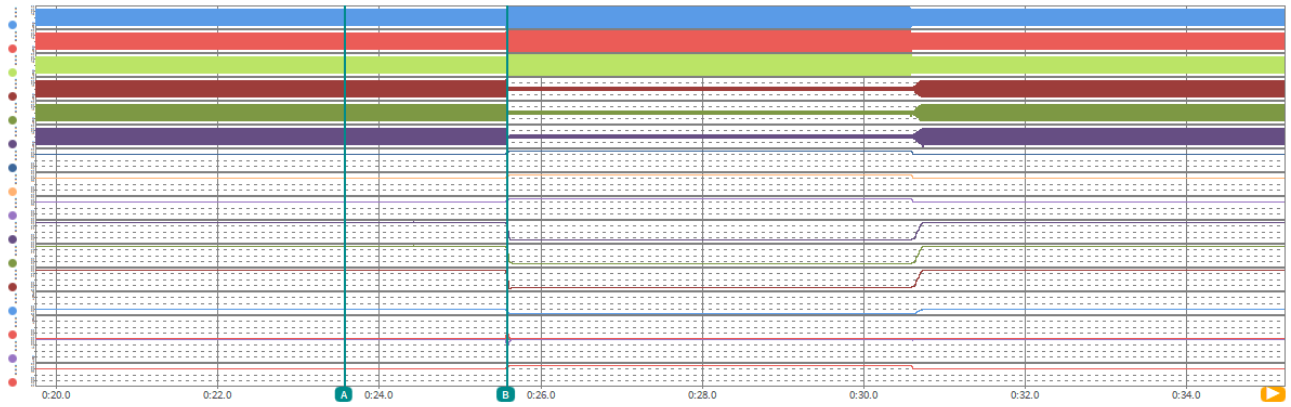
Time [s]	A 0:27.53339	B 0:34.54665	Delta 7.01326
AI 1/U1 [V]	-31.16131	300.6764	331.8377
AI 1/U2 [V]	292.4411	-260.4225	-552.8636
AI 1/U3 [V]	-269.9070	-44.42144	225.4856
AI 1/I1 [A]	-13.39912	216.6973	230.0965
AI 1/I2 [A]	207.1556	-183.1439	-390.2995
AI 1/I3 [A]	-195.1870	-32.47750	162.7095
U1_tRMS@POWER/0 [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

Test No. 6.2 idle test

	A	B	Delta
Time [s]	9.99303	0:15.01363	5.02060
AI 1/U1 [V]	-238.6956	-133.5640	105.1316
AI 1/U2 [V]	-142.9730	-191.1564	-48.18344
AI 1/U3 [V]	379.9222	324.2591	-55.66311
AI 1/I1 [A]	-0.832200	-1.003027	-0.170827
AI 1/I2 [A]	0.946522	0.831842	-0.114679
AI 1/I3 [A]	-0.134468	0.145912	0.280380
U1_tRMS@POWER/0 [V]	230.3405	275.3560	45.01544
U2_tRMS@POWER/0 [V]	230.4249	275.4913	45.06639
U3_tRMS@POWER/0 [V]	230.2569	275.2978	45.04089
U_fundRMS_SYM+@POWER/0 [V]	230.3407	275.3816	45.04089
U_fundRMS_SYM-@POWER/0 [V]	0.049991	0.074225	0.024234

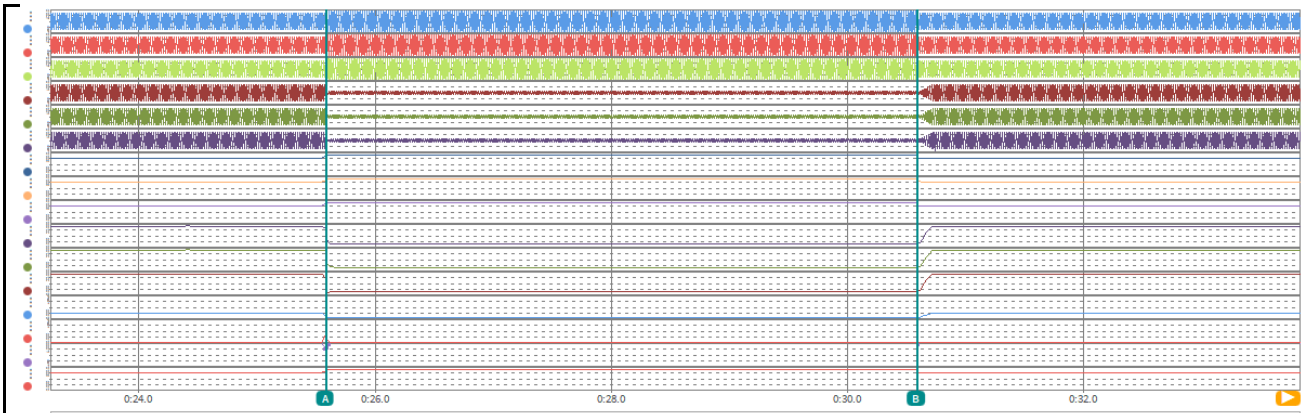
Test No. 6.2 with PGU

Before dip

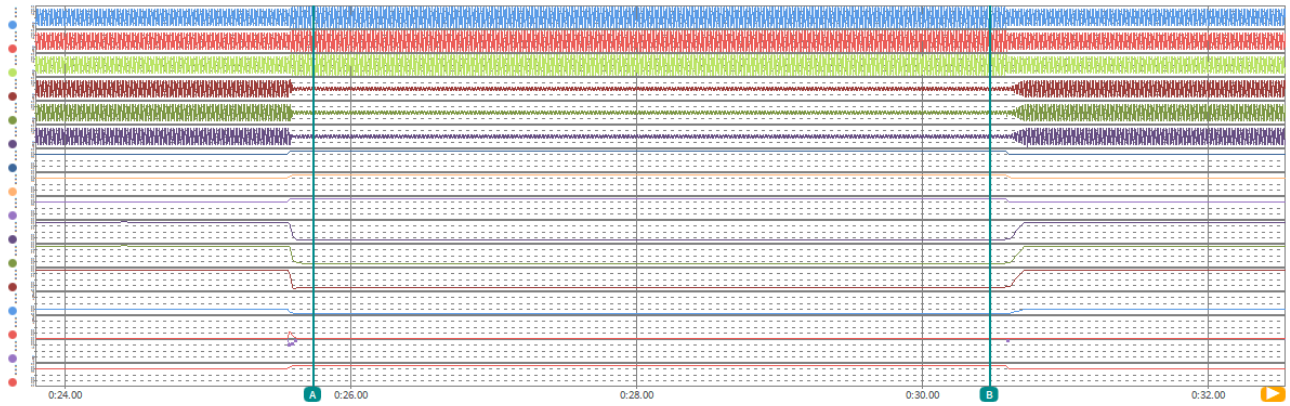


	A	B	Delta
Time [s]	0:23.57094	0:25.57960	2.00866
AI 1/U1 [V]	197.8009	-76.18618	-273.9871
AI 1/U2 [V]	-323.0229	311.6796	634.7025
AI 1/U3 [V]	124.7468	-237.2060	-361.9528
AI 1/I1 [A]	43.64860	-17.35056	-60.99916
AI 1/I2 [A]	-70.05632	67.31582	137.3721
AI 1/I3 [A]	26.46125	-51.72110	-78.18234
U1_tRMS@POWER/0 [V]	230.5188	230.5095	-9.277e-3
U2_tRMS@POWER/0 [V]	230.3181	230.3291	0.010971
U3_tRMS@POWER/0 [V]	230.5695	230.5627	-6.790e-3
I1_tRMS@POWER/0 [A]	50.06339	50.11766	0.054272
I2_tRMS@POWER/0 [A]	49.91860	49.98896	0.070354
I3_tRMS@POWER/0 [A]	50.02479	50.06823	0.043442
P_t@POWER/0 [W]	34568.89	34607.98	39.08984
Q_t@POWER/0 [var]	456.3931	407.0513	-49.34183
PF_t@POWER/0 []	0.999913	0.999931	1.800e-5
U_fundRMS_SYM+@POWER/0 [V]	230.4657	230.4641	-1.694e-3

During dip

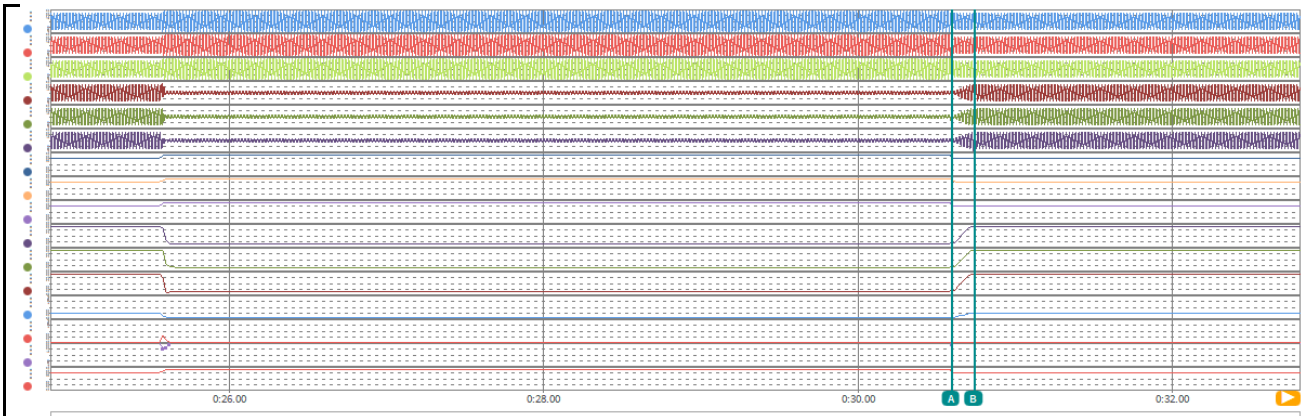


Time [s]	A 0:25.58449	B 0:30.58514	Delta 5.00065
AI 1/U1 [V]	-385.1257	-348.3463	36.77941
AI 1/U2 [V]	128.8972	20.34330	-108.5539
AI 1/U3 [V]	256.9308	328.4679	71.53702
AI 1/I1 [A]	50.20404	-12.38823	-62.59227
AI 1/I2 [A]	-15.48994	3.756404	19.24634
AI 1/I3 [A]	-34.78074	8.392692	43.17343
U1_tRMS@POWER/0 [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 0:25.74218	B 0:30.47215	Delta 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

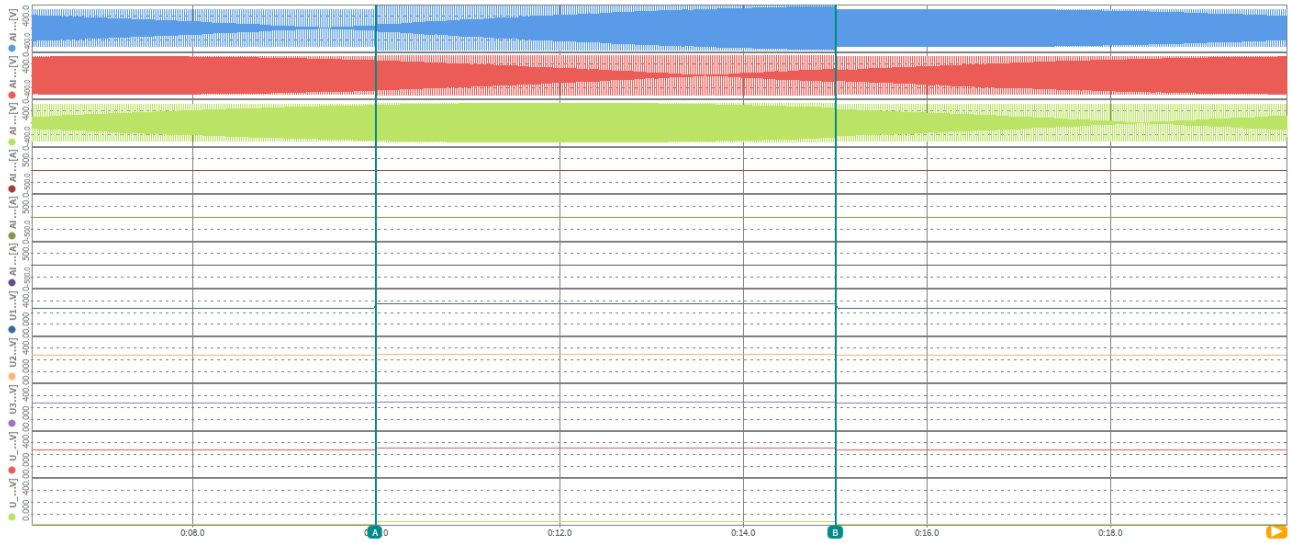


Time [s]	A 0:30.59224	B 0:30.73796	Delta 0.14572
AI 1/U1 [V]	295.4564	57.47009	-237.9863
AI 1/U2 [V]	-267.7958	241.4091	509.2049
AI 1/U3 [V]	-28.17798	-299.0618	-270.8838
AI 1/I1 [A]	13.61430	9.294510	-4.319787
AI 1/I2 [A]	-12.78293	49.45135	62.23429
AI 1/I3 [A]	0.196934	-61.11133	-61.30827
U1_tRMS@POWER/0 [V]	276.6841	230.8260	-45.85808
U2_tRMS@POWER/0 [V]	276.1770	230.5320	-45.64505
U3_tRMS@POWER/0 [V]	276.4791	230.7112	-45.76784
I1_tRMS@POWER/0 [A]	8.433131	49.61655	41.18342
I2_tRMS@POWER/0 [A]	8.386003	48.81522	40.42922
I3_tRMS@POWER/0 [A]	8.395689	49.10481	40.70912
P_t@POWER/0 [W]	6700.547	34016.86	27316.31
Q_t@POWER/0 [var]	1921.319	1119.978	-801.3417
PF_t@POWER/0 []	0.961263	0.999458	0.038196
U_fundRMS_SYM+@POWER/0 [V]	276.4456	230.6893	-45.75627

Time [s]	A 0:33.55260	B 0:40.58347	Delta 7.03087
AI 1/U1 [V]	311.1260	-326.0048	-637.1308
AI 1/U2 [V]	-238.6570	159.5931	398.2501
AI 1/U3 [V]	-74.73636	166.6577	241.3941
AI 1/I1 [A]	66.85865	-70.85836	-137.7170
AI 1/I2 [A]	-51.12195	34.13594	85.25789
AI 1/I3 [A]	-16.17646	36.66270	52.83916
U1_tRMS@POWER/0 [V]	230.5459	230.5368	-9.064e-3
U2_tRMS@POWER/0 [V]	230.3288	230.3306	1.785e-3
U3_tRMS@POWER/0 [V]	230.5861	230.5616	-0.024582
I1_tRMS@POWER/0 [A]	49.93745	49.86678	-0.070671
I2_tRMS@POWER/0 [A]	49.76720	49.75777	-9.426e-3
I3_tRMS@POWER/0 [A]	49.81821	49.79210	-0.026112
P_t@POWER/0 [W]	34459.86	34434.08	-25.77344
Q_t@POWER/0 [var]	471.4602	448.7957	-22.66452
PF_t@POWER/0 []	0.999906	0.999915	8.643e-6
U_fundRMS_SYM+@POWER/0 [V]	230.4841	230.4733	-0.010773

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

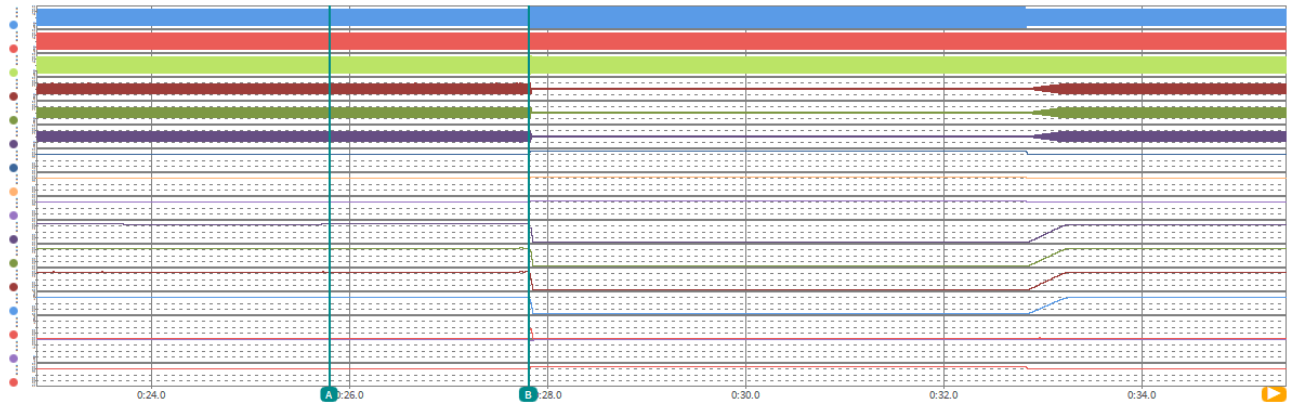
Test No. 6.3 idle test



Time [s]	A 9.99446	B 0:15.00811	Delta 5.01365
AI 1/U1 [V]	-58.96187	-341.2845	-282.3227
AI 1/U2 [V]	-250.3212	302.1183	552.4395
AI 1/U3 [V]	306.8860	30.83396	-276.0520
AI 1/I1 [A]	-1.237512	0.638604	1.876116
AI 1/I2 [A]	0.782847	0.448346	-0.334501
AI 1/I3 [A]	0.425100	-1.117468	-1.542568
U1_tRMS@POWER/0 [V]	230.3167	275.3420	45.02530
U2_tRMS@POWER/0 [V]	230.4267	240.4433	10.01653
U3_tRMS@POWER/0 [V]	230.2500	240.2623	10.01236
U_fundRMS_SYM+@POWER/0 [V]	230.3311	251.6289	21.29781
U_fundRMS_SYM-@POWER/0 [V]	0.055219	21.49427	21.43905

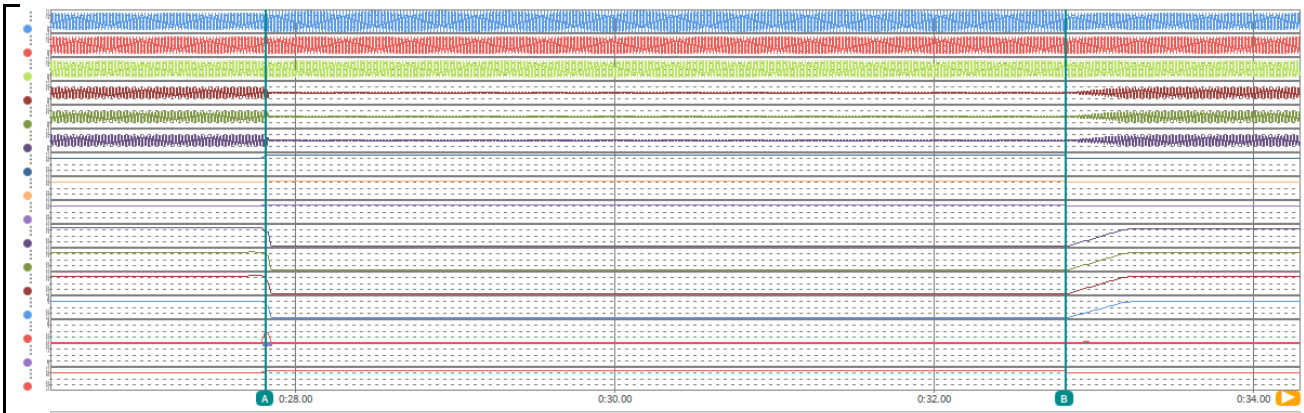
Test No. 6.3 with PGU

Before dip

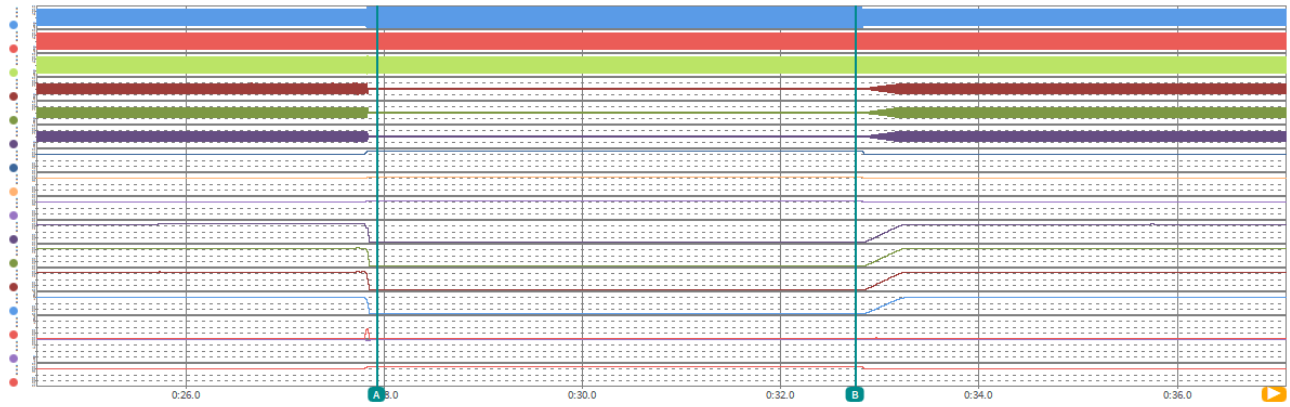


Time [s]	A 0:25.80954	B 0:27.81685	Delta 2.00732
AI 1/U1 [V]	73.97438	-346.0932	-420.0676
AI 1/U2 [V]	237.9134	39.03866	-198.8747
AI 1/U3 [V]	-312.1329	307.3013	619.4342
AI 1/I1 [A]	52.58334	-83.87590	-136.4592
AI 1/I2 [A]	172.2792	14.53519	-157.7441
AI 1/I3 [A]	-225.0369	68.93123	293.9681
U1_tRMS@POWER/0 [V]	230.8778	230.8370	-0.040863
U2_tRMS@POWER/0 [V]	230.5946	230.5891	-5.508e-3
U3_tRMS@POWER/0 [V]	230.8108	230.8402	0.029434
I1_tRMS@POWER/0 [A]	166.8403	167.0867	0.246414
I2_tRMS@POWER/0 [A]	166.1668	166.4093	0.242462
I3_tRMS@POWER/0 [A]	166.3994	166.7206	0.321152
P_t@POWER/0 [W]	115237.0	115421.7	184.6484
Q_t@POWER/0 [var]	1237.606	1186.123	-51.48389
PF_t@POWER/0 []	0.999942	0.999947	4.828e-6
U_fundRMS_SYM+@POWER/0 [V]	230.7569	230.7513	-5.569e-3

During dip

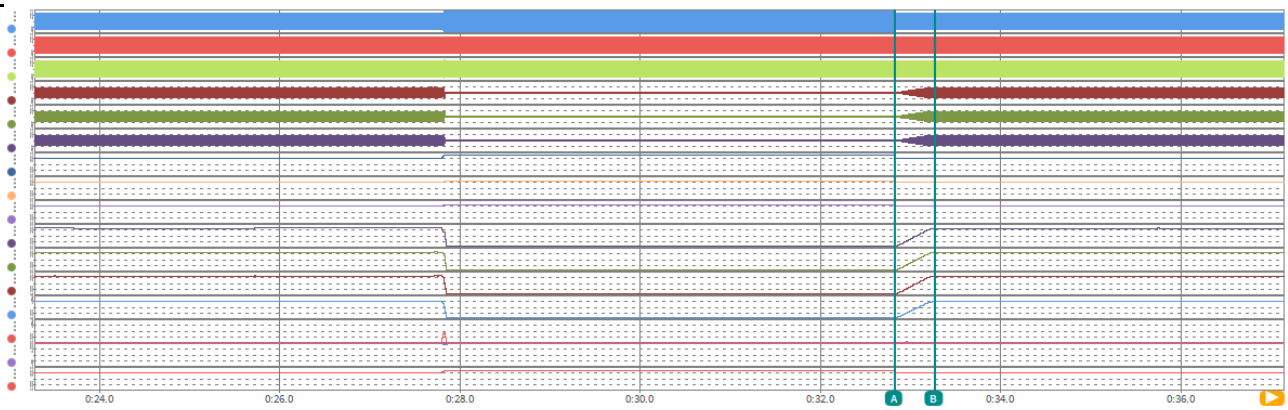


	A	B	Delta
Time [s]	0:27.81532	0:32.81935	5.00402
AI 1/U1 [V]	-384.1610	-90.47986	293.6812
AI 1/U2 [V]	184.5482	-225.5969	-410.1451
AI 1/U3 [V]	200.6583	315.9321	115.2737
AI 1/I1 [A]	-58.70343	-5.556822	53.14660
AI 1/I2 [A]	22.82393	-6.666303	-29.49023
AI 1/I3 [A]	35.81274	12.35151	-23.46122
U1_tRMS@POWER/0 [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

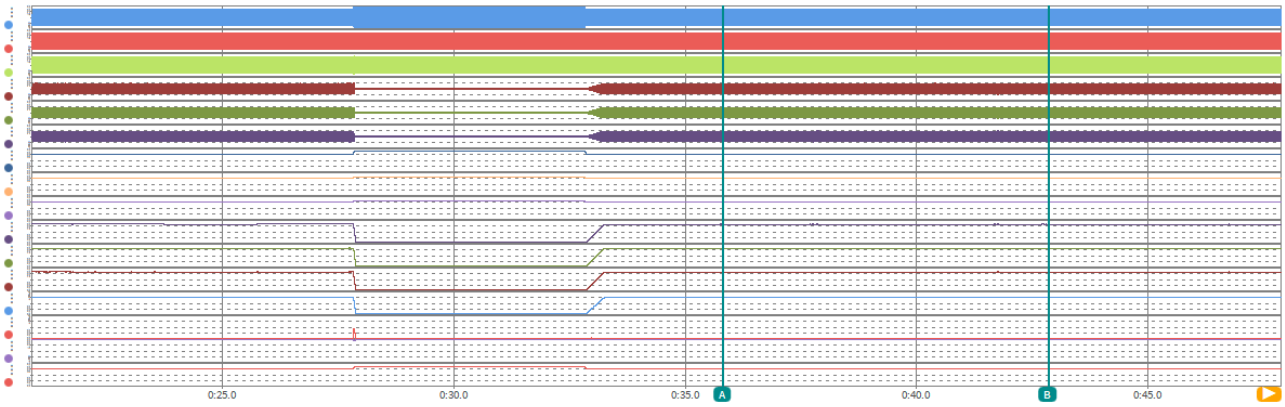


	A	B	Delta
Time [s]	0:27.93412	0:32.75471	4.82059
AI 1/U1 [V]	-364.4366	-387.1703	-22.73369
AI 1/U2 [V]	278.4012	223.7952	-54.60596
AI 1/U3 [V]	87.42738	164.2597	76.83230
AI 1/I1 [A]	-9.522200	-10.82194	-1.299739
AI 1/I2 [A]	9.830714	7.975102	-1.855612
AI 1/I3 [A]	-0.053048	3.017307	3.070355
U1_tRMS@POWER/0 [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

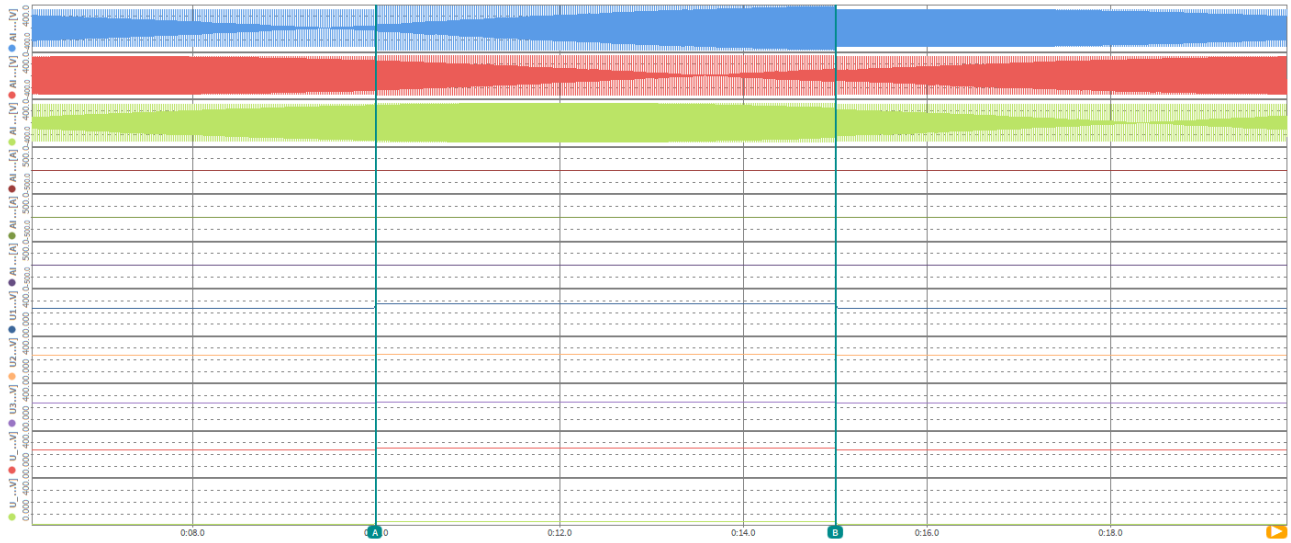


	A	B	Delta
Time [s]	0:32.82288	0:33.26771	0.44484
AI 1/U1 [V]	248.2901	218.2930	-29.99711
AI 1/U2 [V]	-306.8464	102.1667	409.0131
AI 1/U3 [V]	58.36082	-319.8202	-378.1810
AI 1/I1 [A]	11.01101	154.9878	143.9768
AI 1/I2 [A]	-14.69421	73.23838	87.93259
AI 1/I3 [A]	3.528357	-228.0125	-231.5408
U1_tRMS@POWER/0 [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



	A	B	Delta
Time [s]	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

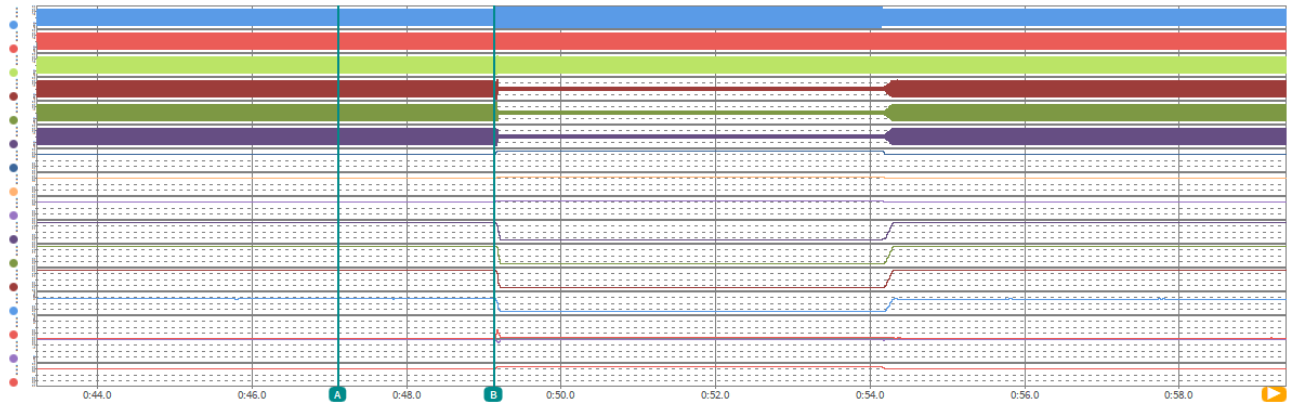
Test No. 6.4 idle test



Time [s]	A 9.99446	B 0:15.00811	Delta 5.01365
AI 1/U1 [V]	-58.96187	-341.2845	-282.3227
AI 1/U2 [V]	-250.3212	302.1183	552.4395
AI 1/U3 [V]	306.8860	30.83396	-276.0520
AI 1/I1 [A]	-1.237512	0.638604	1.876116
AI 1/I2 [A]	0.782847	0.448346	-0.334501
AI 1/I3 [A]	0.425100	-1.117468	-1.542568
U1_tRMS@POWER/0 [V]	230.3167	275.3420	45.02530
U2_tRMS@POWER/0 [V]	230.4267	240.4433	10.01653
U3_tRMS@POWER/0 [V]	230.2500	240.2623	10.01236
U_fundRMS_SYM+@POWER/0 [V]	230.3311	251.6289	21.29781
U_fundRMS_SYM-@POWER/0 [V]	0.055219	21.49427	21.43905

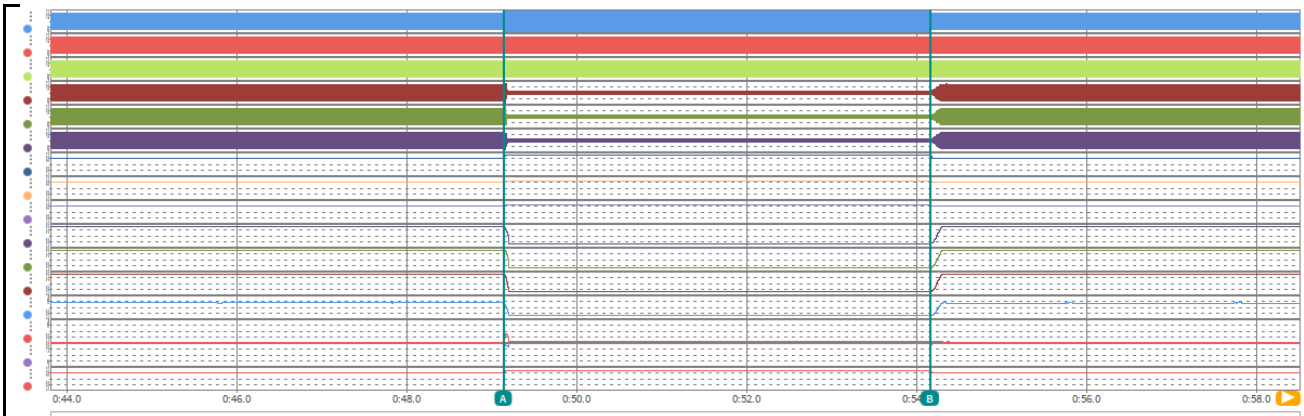
Test No. 6.4 with PGU

Before dip

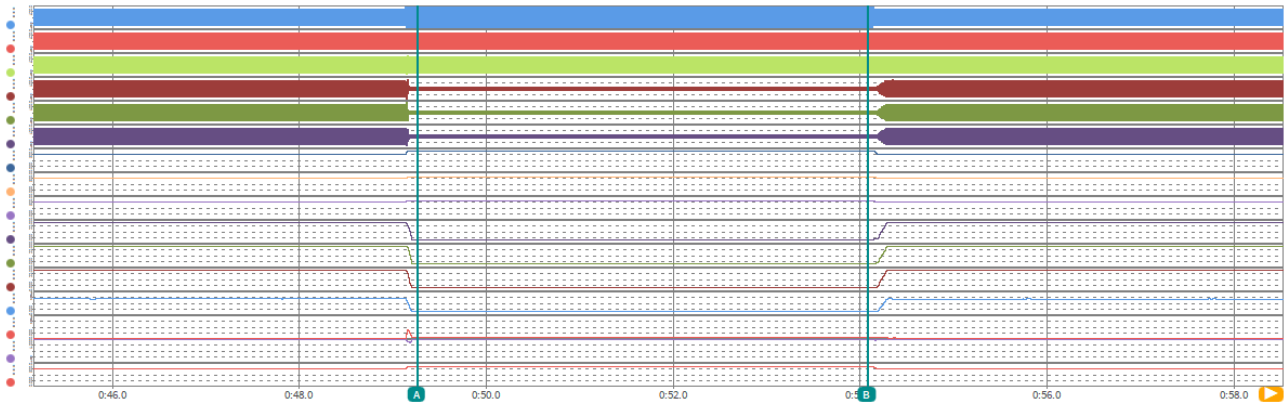


Time [s]	A 0:47.12068	B 0:49.13378	Delta 2.01310
AI 1/U1 [V]	-121.8410	319.6688	441.5097
AI 1/U2 [V]	322.2547	-214.9935	-537.2482
AI 1/U3 [V]	-200.6576	-105.8636	94.79404
AI 1/I1 [A]	-26.98553	69.92817	96.91370
AI 1/I2 [A]	69.54587	-46.32402	-115.8699
AI 1/I3 [A]	-42.92012	-23.70393	19.21618
U1_tRMS@POWER/0 [V]	230.5422	230.5563	0.014114
U2_tRMS@POWER/0 [V]	230.3047	230.3318	0.027176
U3_tRMS@POWER/0 [V]	230.5541	230.5610	6.973e-3
I1_tRMS@POWER/0 [A]	50.05975	50.08228	0.022537
I2_tRMS@POWER/0 [A]	49.95975	49.99368	0.033932
I3_tRMS@POWER/0 [A]	50.02121	50.02526	4.051e-3
P_t@POWER/0 [W]	34577.02	34593.06	16.03516
Q_t@POWER/0 [var]	408.6949	435.1125	26.41766
PF_t@POWER/0 []	0.999930	0.999921	-9.239e-6
U_fundRMS_SYM+@POWER/0 [V]	230.4640	230.4801	0.016068

During dip

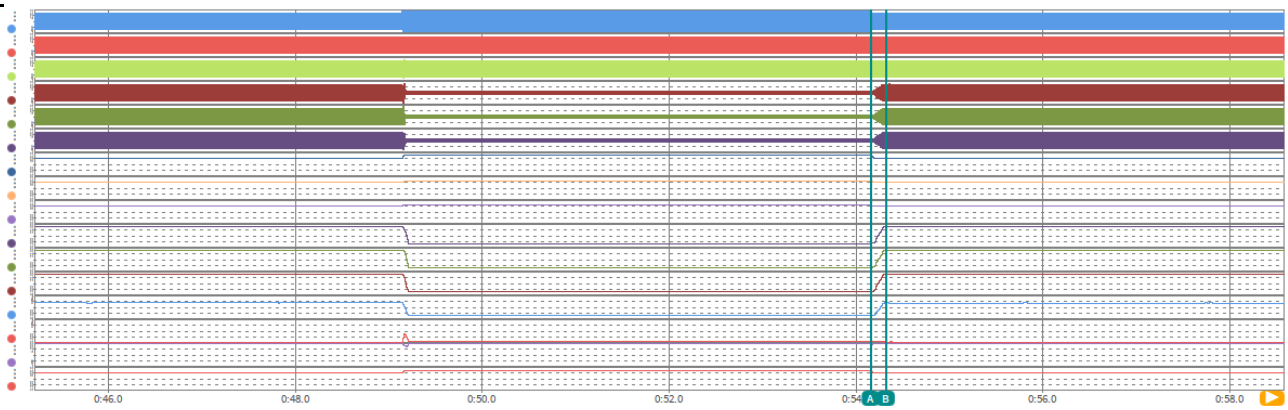


	A	B	Delta
Time [s]	0:49.14647	0:54.16296	5.01649
AI 1/U1 [V]	-258.9390	-301.4362	-42.49716
AI 1/U2 [V]	-47.55950	259.5253	307.0848
AI 1/U3 [V]	301.1987	42.64426	-258.5545
AI 1/I1 [A]	-55.69387	-15.42616	40.26771
AI 1/I2 [A]	-9.790421	13.91018	23.70060
AI 1/I3 [A]	64.98111	0.586987	-64.39412
U1_tRMS@POWER/0 [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

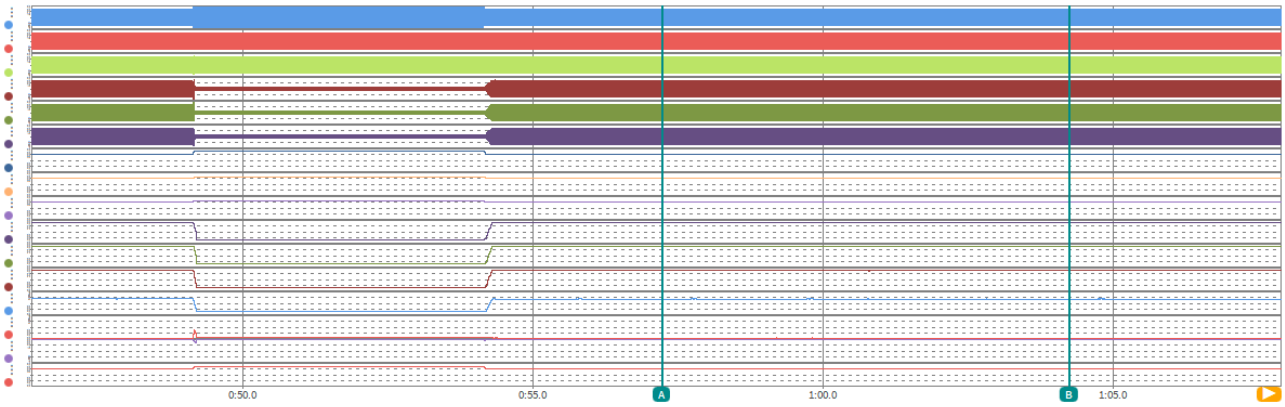


	A	B	Delta
Time [s]	0:49.26473	0:54.08127	4.81654
AI 1/U1 [V]	-386.4093	-232.7616	153.6477
AI 1/U2 [V]	162.4894	339.3460	176.8565
AI 1/U3 [V]	225.1563	-106.2410	-331.3973
AI 1/I1 [A]	-12.13586	-4.506231	7.629633
AI 1/I2 [A]	8.018852	11.67452	3.655672
AI 1/I3 [A]	4.040718	-7.273436	-11.31415
U1_tRMS@POWER/0 [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



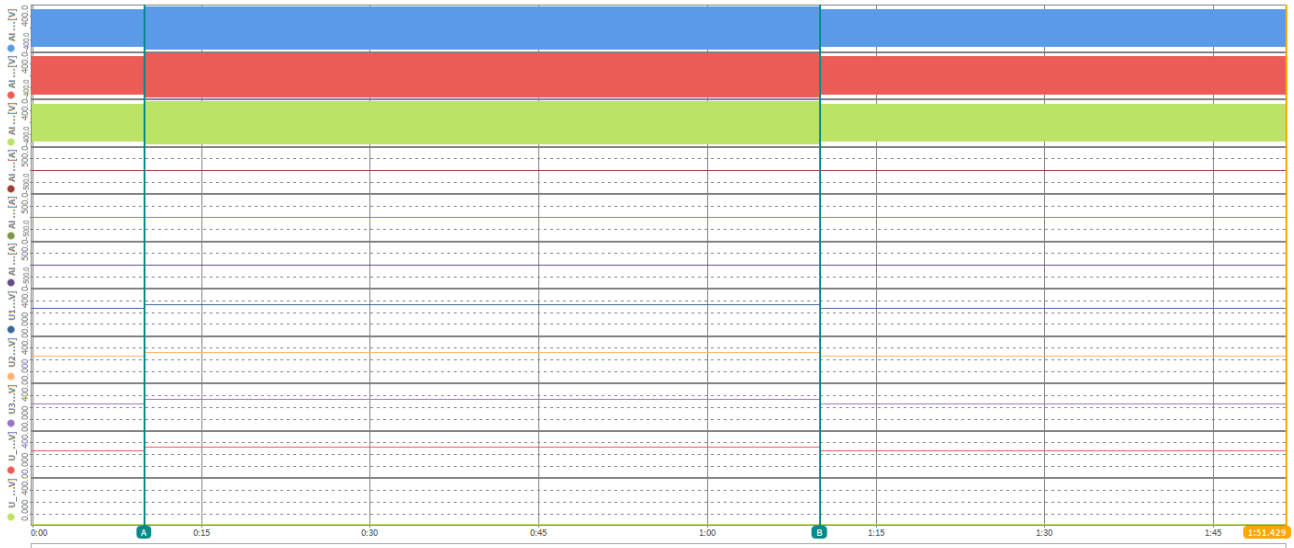
Time [s]	A 0:54.16112	B 0:54.32345	Delta 0.16233
AI 1/U1 [V]	-186.7817	-317.3640	-130.5823
AI 1/U2 [V]	324.1837	223.8424	-100.3413
AI 1/U3 [V]	-137.4762	93.90522	231.3814
AI 1/I1 [A]	-7.315994	-69.54062	-62.22463
AI 1/I2 [A]	13.54754	51.01490	37.46736
AI 1/I3 [A]	-6.220937	18.65292	24.87385
U1_tRMS@POWER/0 [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 0:57.22852	B 1:04.24362	Delta 7.01510
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

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

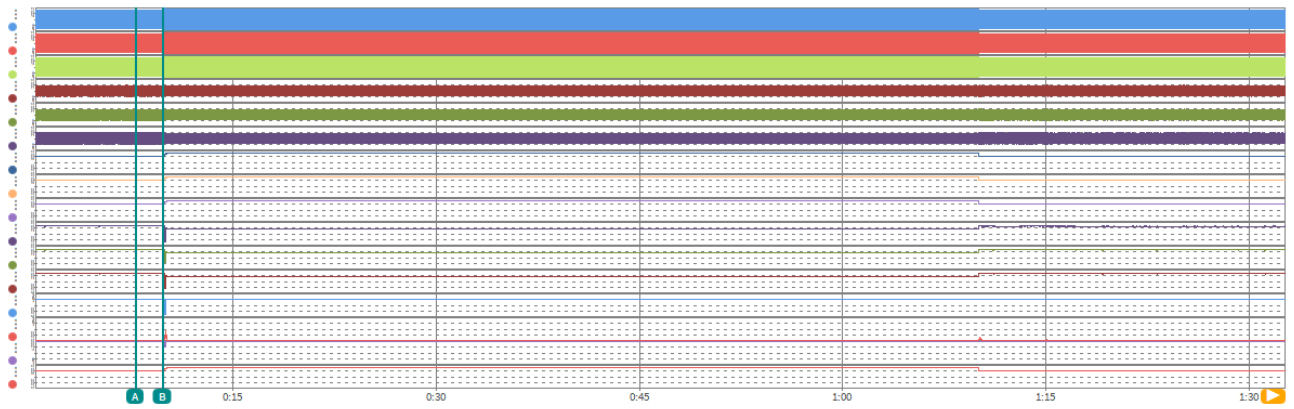
Test No. 7.1 idle test



	A	B	Delta
Time [s]	9.99405	1:10.00521	1:00.01116
AI 1/U1 [V]	34.37305	-344.4631	-378.8362
AI 1/U2 [V]	-298.1024	297.9179	596.0203
AI 1/U3 [V]	262.9771	46.50855	-216.4686
AI 1/I1 [A]	-1.057744	0.478268	1.536012
AI 1/I2 [A]	0.411987	0.714183	0.302196
AI 1/I3 [A]	0.616908	-1.217365	-1.834273
U1_tRMS@POWER/0 [V]	230.2256	264.3449	34.11935
U2_tRMS@POWER/0 [V]	230.4647	264.4821	34.01735
U3_tRMS@POWER/0 [V]	230.2802	264.2937	34.01350
U_fundRMS_SYM+@POWER/0 [V]	230.3233	264.3735	34.05020
U_fundRMS_SYM-@POWER/0 [V]	0.130146	0.072582	-0.057563

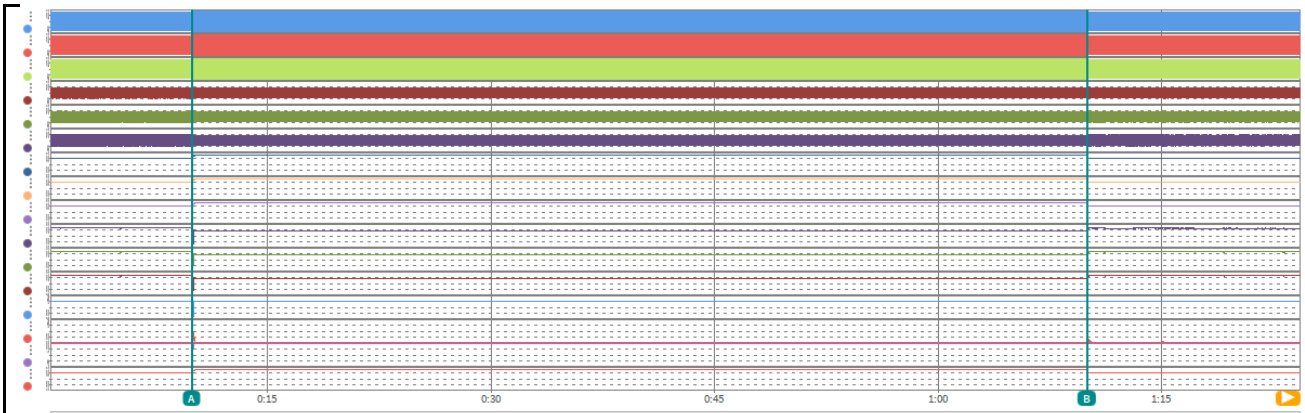
Test No. 7.1 with PGU

Before dip

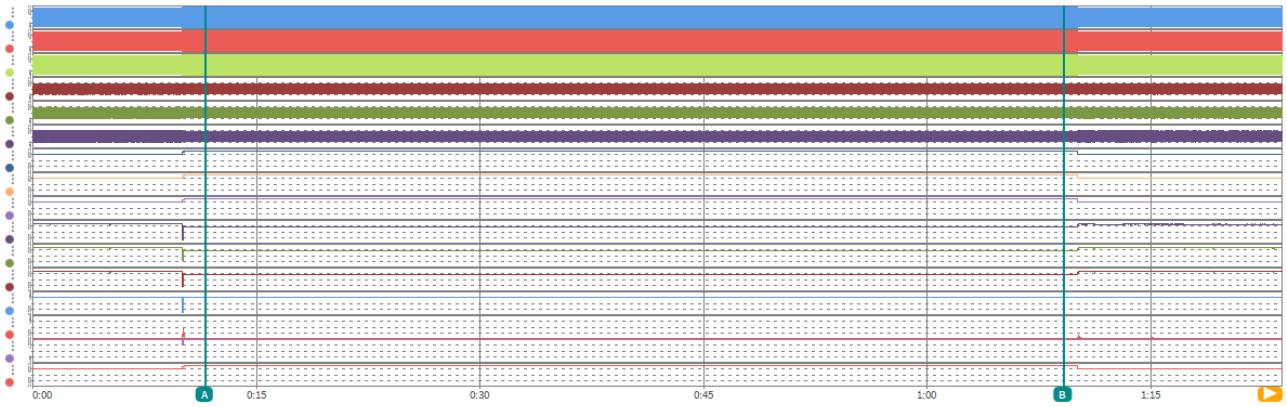


	A	B	Delta
Time [s]	7.8696	9.8654	1.9958
AI 1/U1 [V]	-326.4938	-93.78386	232.7099
AI 1/U2 [V]	158.6921	317.5516	158.8595
AI 1/U3 [V]	167.7733	-223.8410	-391.6142
AI 1/I1 [A]	-237.0029	-69.20362	167.7992
AI 1/I2 [A]	113.6599	230.2470	116.5872
AI 1/I3 [A]	123.2966	-161.2156	-284.5122
U1_tRMS@POWER/0 [V]	230.8399	230.8241	-0.015808
U2_tRMS@POWER/0 [V]	230.9361	230.9301	-6.027e-3
U3_tRMS@POWER/0 [V]	230.7732	230.8040	0.030777
I1_tRMS@POWER/0 [A]	167.2811	167.2835	2.441e-3
I2_tRMS@POWER/0 [A]	167.6432	167.6658	0.022568
I3_tRMS@POWER/0 [A]	168.0804	168.0333	-0.047119
P_t@POWER/0 [W]	116113.2	116108.6	-4.523438
Q_t@POWER/0 [var]	1111.618	1206.059	94.44128
PF_t@POWER/0 []	0.999954	0.999946	-8.106e-6
U_fundRMS_SYM+@POWER/0 [V]	230.8465	230.8495	2.930e-3

During dip

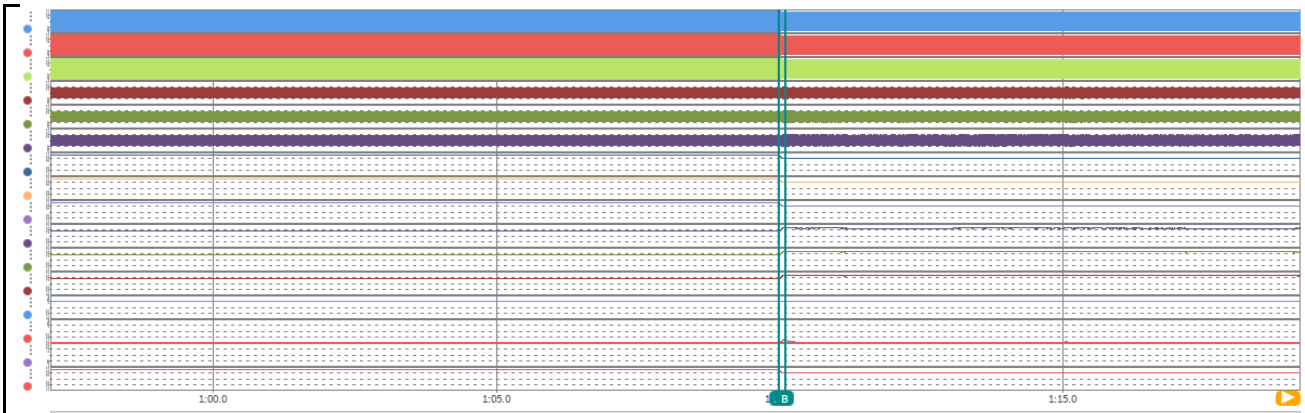


	A	B	Delta
Time [s]	9.9924	1:10.0056	1:00.0133
AI 1/U1 [V]	-232.7550	-321.9533	-89.19836
AI 1/U2 [V]	-133.7674	326.5143	460.2816
AI 1/U3 [V]	368.9020	-0.976324	-369.8783
AI 1/I1 [A]	-134.0801	-178.9789	-44.89887
AI 1/I2 [A]	-78.72165	178.7028	257.4245
AI 1/I3 [A]	211.9688	0.297904	-211.6709
U1_tRMS@POWER/0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

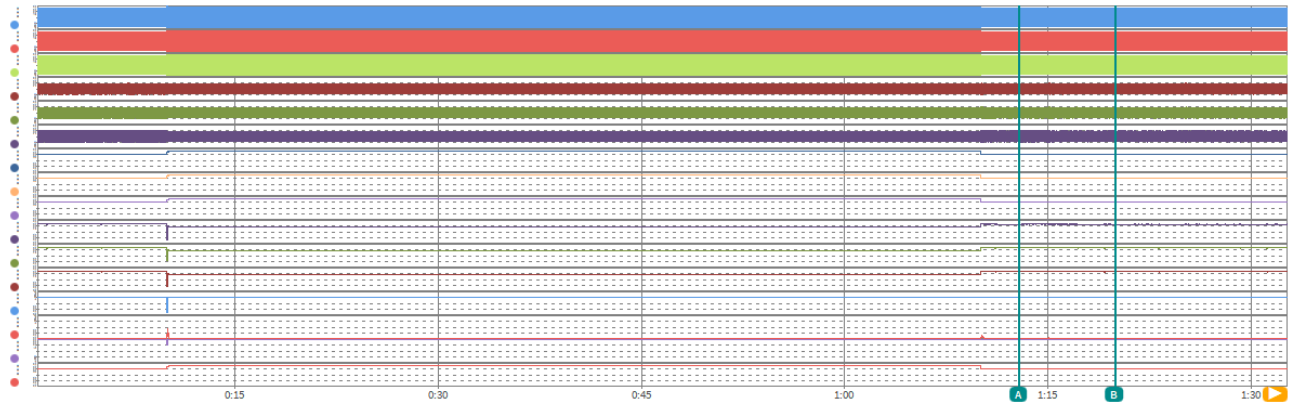


	A	B	Delta
Time [s]	0:11.5817	1:09.1411	0:57.5594
AI 1/U1 [V]	283.3047	141.6762	-141.6285
AI 1/U2 [V]	72.98613	229.4257	156.4396
AI 1/U3 [V]	-354.0120	-370.9502	-16.93821
AI 1/I1 [A]	158.5704	77.37864	-81.19178
AI 1/I2 [A]	37.45198	127.2622	89.81026
AI 1/I3 [A]	-195.1853	-204.8005	-9.615183
U1_tRMS@POWER/0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

After dip

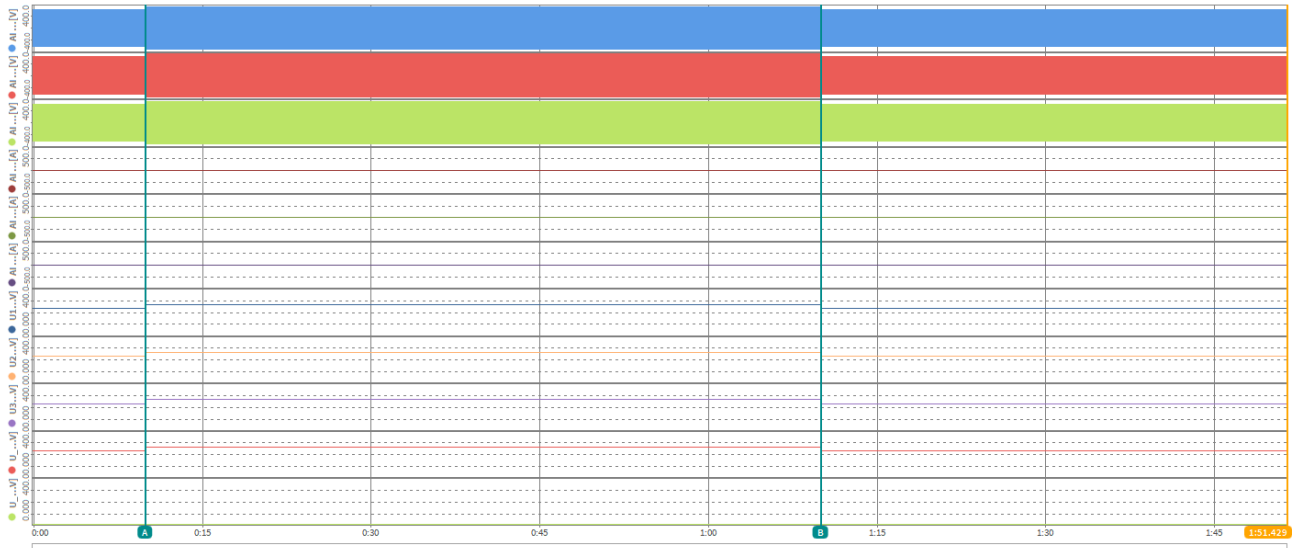


	A	B	Delta
Time [s]	1:09.9891	1:10.1050	0.1159
AI 1/U1 [V]	-316.6285	-245.0609	71.56754
AI 1/U2 [V]	-21.87109	308.3646	330.2357
AI 1/U3 [V]	330.6472	-61.95689	-392.6041
AI 1/I1 [A]	-175.1338	-199.4767	-24.34290
AI 1/I2 [A]	-6.874681	213.6071	220.4818
AI 1/I3 [A]	182.2803	-13.91804	-196.1984
U1_tRMS@POWER/0 [V]	264.7969	230.1326	-34.66432
U2_tRMS@POWER/0 [V]	264.9597	230.2996	-34.66010
U3_tRMS@POWER/0 [V]	264.6985	229.9715	-34.72705
I1_tRMS@POWER/0 [A]	145.7266	171.6851	25.95848
I2_tRMS@POWER/0 [A]	145.9836	171.2851	25.30147
I3_tRMS@POWER/0 [A]	146.1840	172.0102	25.82623
P_t@POWER/0 [W]	115954.8	115896.2	-58.64844
Q_t@POWER/0 [var]	1325.618	24774.96	23449.34
PF_t@POWER/0 []	0.999935	0.977906	-0.022029
U_fundRMS_SYM+@POWER/0 [V]	264.8159	230.1301	-34.68581



	A	B	Delta
Time [s]	1:12.8676	1:19.9377	7.0701
AI 1/U1 [V]	-324.6935	319.3150	644.0084
AI 1/U2 [V]	134.3598	-100.3239	-234.6838
AI 1/U3 [V]	190.3131	-218.5180	-408.8311
AI 1/I1 [A]	-232.9594	229.7803	462.7397
AI 1/I2 [A]	92.27884	-71.93709	-164.2159
AI 1/I3 [A]	140.6947	-157.8398	-298.5345
U1_tRMS@POWER/0 [V]	230.7677	230.8328	0.065094
U2_tRMS@POWER/0 [V]	230.9133	230.9565	0.043198
U3_tRMS@POWER/0 [V]	230.7557	230.7287	-0.026962
I1_tRMS@POWER/0 [A]	166.5360	166.6600	0.123947
I2_tRMS@POWER/0 [A]	166.8292	166.9733	0.144058
I3_tRMS@POWER/0 [A]	167.2221	167.3467	0.124573
P_t@POWER/0 [W]	115518.3	115641.2	122.8828
Q_t@POWER/0 [var]	2324.430	1038.712	-1285.718
PF_t@POWER/0 []	0.999798	0.999960	1.620e-4
U_fundRMS_SYM+@POWER/0 [V]	230.8091	230.8359	0.026794

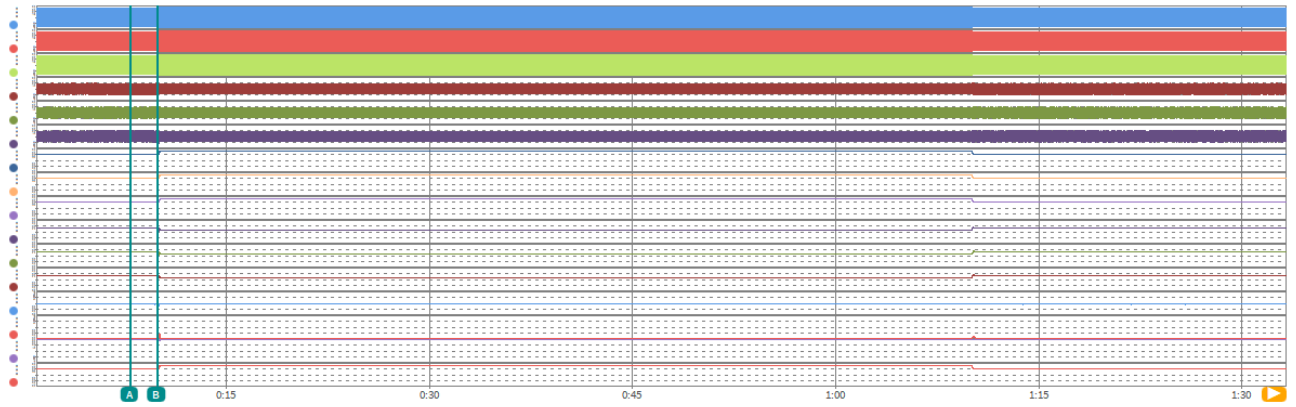
Test No. 7.2 idle test



Time [s]	A 9.99405	B 1:10.00521	Delta 1:00.01116
AI 1/U1 [V]	34.37305	-344.4631	-378.8362
AI 1/U2 [V]	-298.1024	297.9179	596.0203
AI 1/U3 [V]	262.9771	46.50855	-216.4686
AI 1/I1 [A]	-1.057744	0.478268	1.536012
AI 1/I2 [A]	0.411987	0.714183	0.302196
AI 1/I3 [A]	0.616908	-1.217365	-1.834273
U1_tRMS@POWER/0 [V]	230.2256	264.3449	34.11935
U2_tRMS@POWER/0 [V]	230.4647	264.4821	34.01735
U3_tRMS@POWER/0 [V]	230.2802	264.2937	34.01350
U_fundRMS_SYM+@POWER/0 [V]	230.3233	264.3735	34.05020
U_fundRMS_SYM-@POWER/0 [V]	0.130146	0.072582	-0.057563

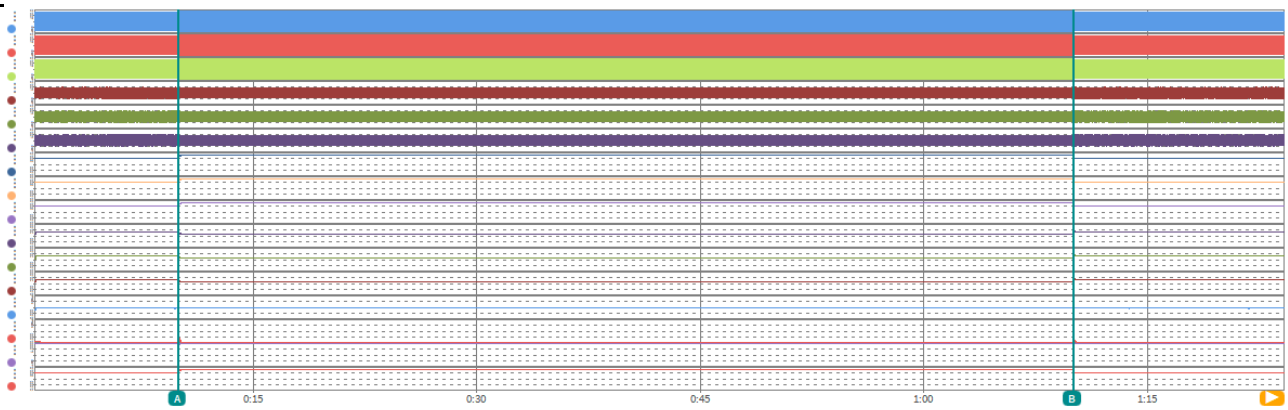
Test No. 7.2 with PGU

Before dip

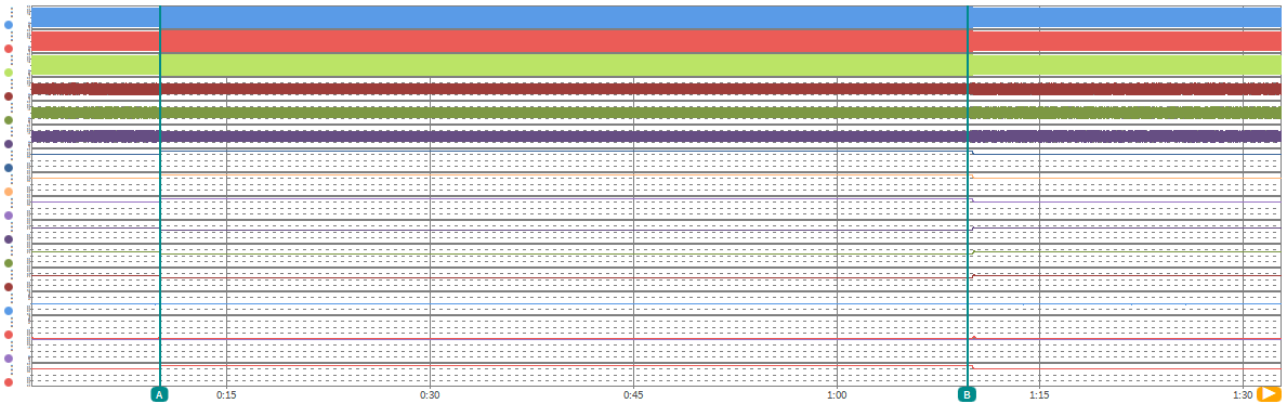


Time [s]	A 7.95723	B 9.95304	Delta 1.99582
AI 1/U1 [V]	236.4233	-152.2160	-388.6392
AI 1/U2 [V]	-312.9027	-173.8157	139.0870
AI 1/U3 [V]	76.15900	325.4440	249.2850
AI 1/I1 [A]	35.41303	-21.44659	-56.85962
AI 1/I2 [A]	-46.23747	-25.73264	20.50483
AI 1/I3 [A]	10.73062	47.12093	36.39031
U1_tRMS@POWER/0 [V]	230.4500	230.4493	-6.866e-4
U2_tRMS@POWER/0 [V]	230.5500	230.5465	-3.510e-3
U3_tRMS@POWER/0 [V]	230.3885	230.3674	-0.021133
I1_tRMS@POWER/0 [A]	33.18362	33.17777	-5.852e-3
I2_tRMS@POWER/0 [A]	33.21076	33.27899	0.068233
I3_tRMS@POWER/0 [A]	33.25291	33.30489	0.051983
P_t@POWER/0 [W]	22961.54	22986.74	25.20313
Q_t@POWER/0 [var]	398.4339	416.2968	17.86295
PF_t@POWER/0 []	0.999849	0.999836	-1.347e-5
U_fundRMS_SYM+@POWER/0 [V]	230.4610	230.4526	-8.408e-3

During dip

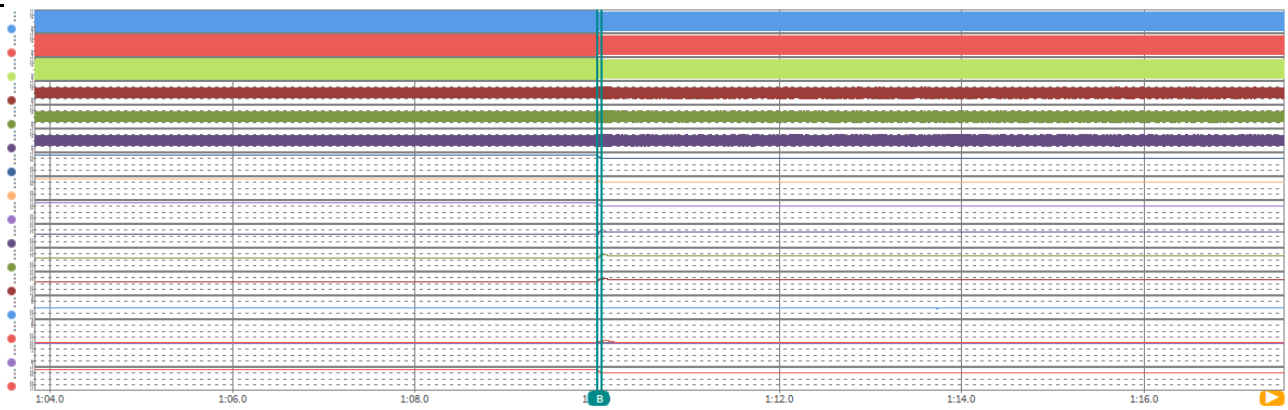


	A	B	Delta
Time [s]	9.99438	1:10.00066	1:00.00628
AI 1/U1 [V]	-29.97041	198.0195	227.9899
AI 1/U2 [V]	-303.5004	176.5776	480.0780
AI 1/U3 [V]	334.8158	-373.7233	-708.5391
AI 1/I1 [A]	-13.08477	21.23261	34.31738
AI 1/I2 [A]	-11.19101	19.91308	31.10409
AI 1/I3 [A]	24.59049	-41.05211	-65.64260
U1_tRMS@POWER/0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

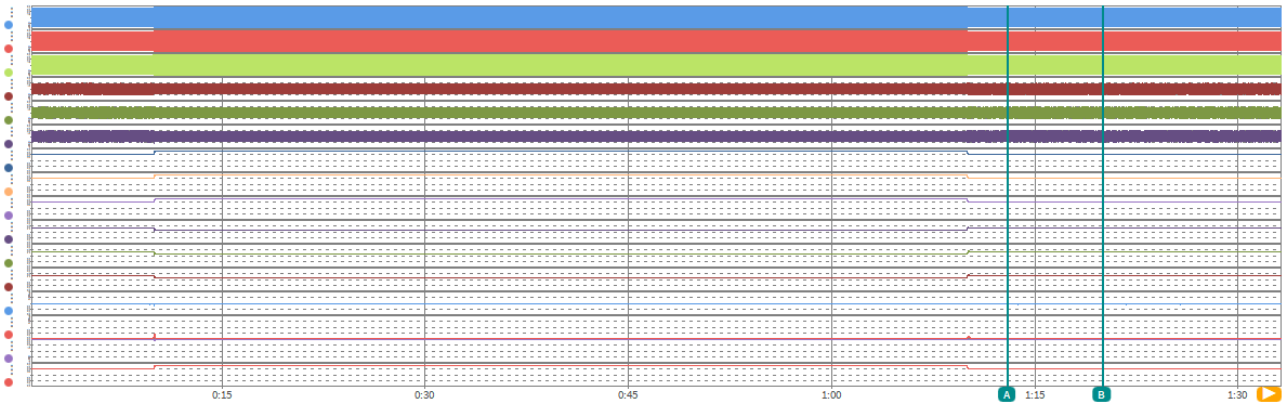


	A	B	Delta
Time [s]	0:10.12241	1:09.67584	0:59.55343
AI 1/U1 [V]	233.5086	328.2547	94.74612
AI 1/U2 [V]	138.0472	-319.1037	-457.1510
AI 1/U3 [V]	-369.6318	-11.10864	358.5232
AI 1/I1 [A]	26.08431	35.46036	9.376050
AI 1/I2 [A]	13.60548	-34.27696	-47.88244
AI 1/I3 [A]	-39.66916	-1.058817	38.61034
U1_tRMS@POWER/0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

After dip



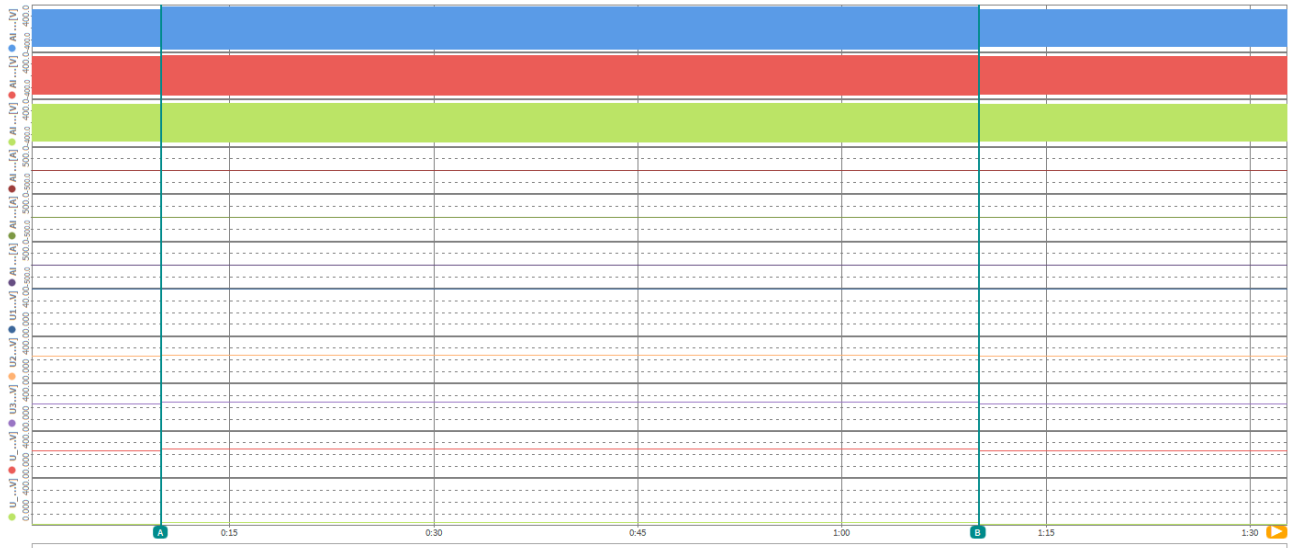
	A	B	Delta
Time [s]	1:10.00553	1:10.04570	0.04017
AI 1/U1 [V]	-310.8800	-281.7378	29.14214
AI 1/U2 [V]	335.4266	282.2414	-53.18523
AI 1/U3 [V]	-23.38433	3.917933	27.30227
AI 1/I1 [A]	-34.31583	-40.74621	-6.430388
AI 1/I2 [A]	36.57794	36.30614	-0.271797
AI 1/I3 [A]	-2.029657	3.125429	5.155087
U1_tRMS@POWER/0 [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



	A	B	Delta
Time [s]	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

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

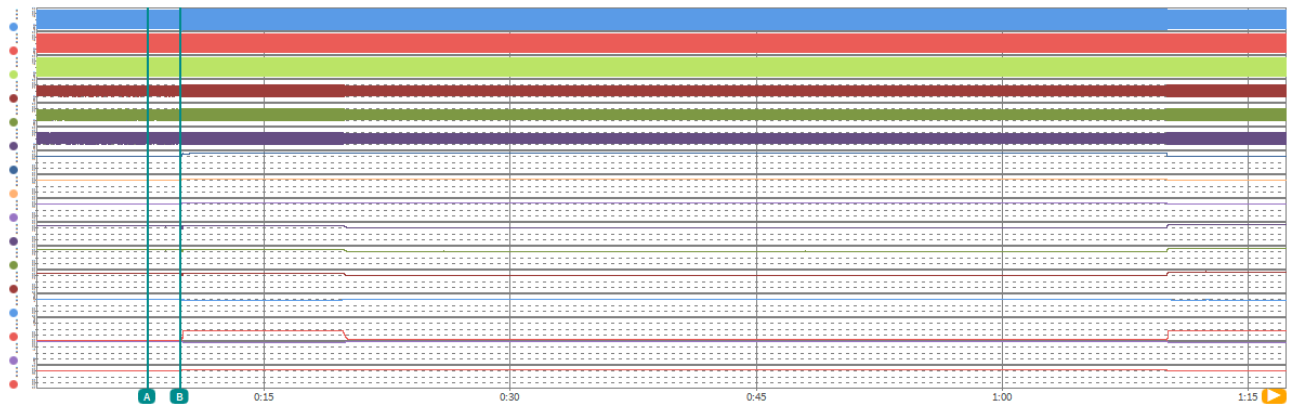
Test No. 7.3 idle test



	A	B	Delta
Time [s]	9.9903	1:10.0242	1:00.0340
AI 1/U1 [V]	299.2685	-11.23405	-310.5025
AI 1/U2 [V]	-261.0181	-276.7551	-15.73706
AI 1/U3 [V]	-38.10048	287.0925	325.1929
AI 1/I1 [A]	-0.420928	-1.067996	-0.647068
AI 1/I2 [A]	-0.658393	0.565887	1.224279
AI 1/I3 [A]	1.051426	0.467658	-0.583768
U1_tRMS@POWER/0 [V]	230.3551	264.2602	33.90504
U2_tRMS@POWER/0 [V]	230.4146	239.4728	9.058136
U3_tRMS@POWER/0 [V]	230.2173	239.2946	9.077209
U_fundRMS_SYM+@POWER/0 [V]	230.3289	247.2928	16.96390
U_fundRMS_SYM-@POWER/0 [V]	0.018995	18.05163	18.03264

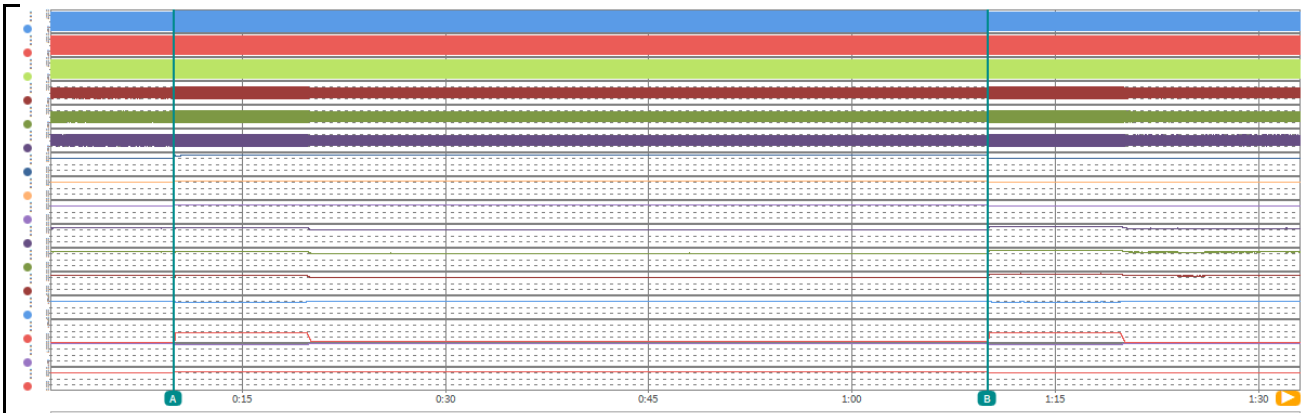
Test No. 7.3 with PGU

Before dip

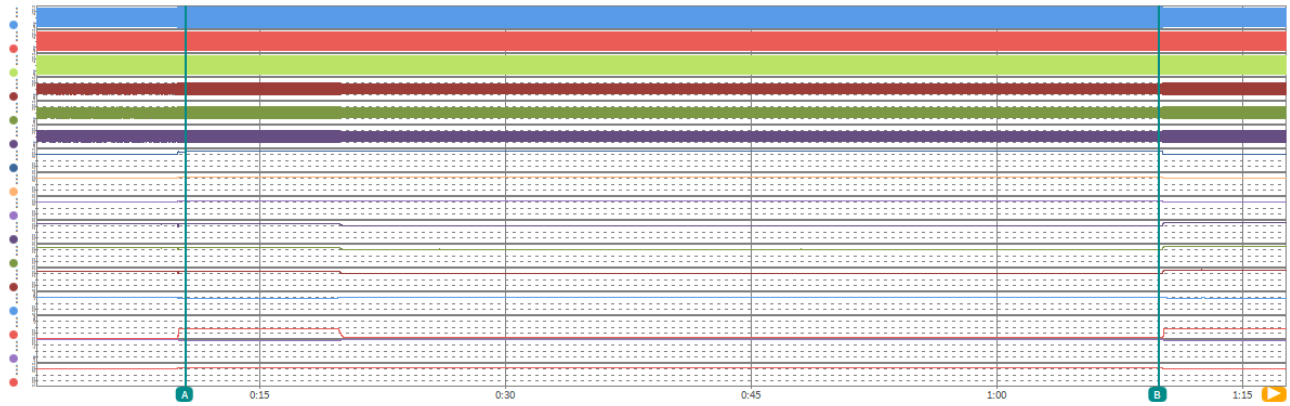


	A	B	Delta
Time [s]	7.9062	9.8856	1.9793
AI 1/U1 [V]	-173.3365	-115.8338	57.50275
AI 1/U2 [V]	326.4625	322.1734	-4.289150
AI 1/U3 [V]	-152.4406	-206.0349	-53.59435
AI 1/I1 [A]	-125.7739	-85.07252	40.70139
AI 1/I2 [A]	235.9990	233.7814	-2.217651
AI 1/I3 [A]	-110.1556	-148.6110	-38.45537
U1_tRMS@POWER/0 [V]	230.8348	230.8054	-0.029419
U2_tRMS@POWER/0 [V]	230.9596	230.9522	-7.385e-3
U3_tRMS@POWER/0 [V]	230.7592	230.7316	-0.027649
I1_tRMS@POWER/0 [A]	166.9750	167.2158	0.240784
I2_tRMS@POWER/0 [A]	167.3450	167.5566	0.211609
I3_tRMS@POWER/0 [A]	167.7526	167.9460	0.193420
P_t@POWER/0 [W]	115899.3	116036.2	136.8516
Q_t@POWER/0 [var]	1045.852	1194.712	148.8600
PF_t@POWER/0 []	0.999959	0.999947	-1.228e-5
U_fundRMS_SYM+@POWER/0 [V]	230.8481	230.8265	-0.021561

During dip

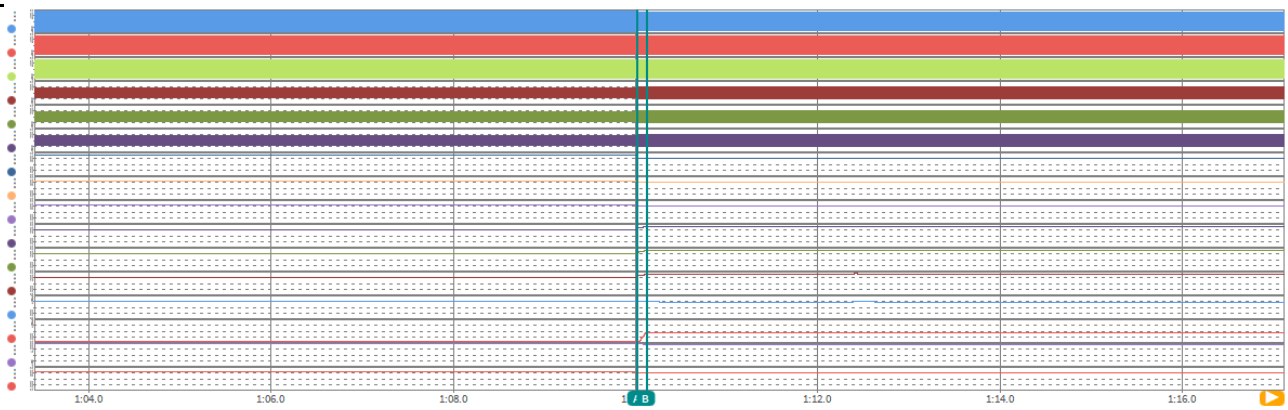


	A	B	Delta
Time [s]	9.9926	1:10.0020	1:00.0094
AI 1/U1 [V]	-169.6100	19.02580	188.6358
AI 1/U2 [V]	-156.9672	271.8530	428.8202
AI 1/U3 [V]	326.1612	-290.5336	-616.6947
AI 1/I1 [A]	-121.7719	8.284212	130.0562
AI 1/I2 [A]	-115.6902	185.5240	301.2142
AI 1/I3 [A]	237.4361	-193.2986	-430.7347
U1_tRMS@POWER/0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

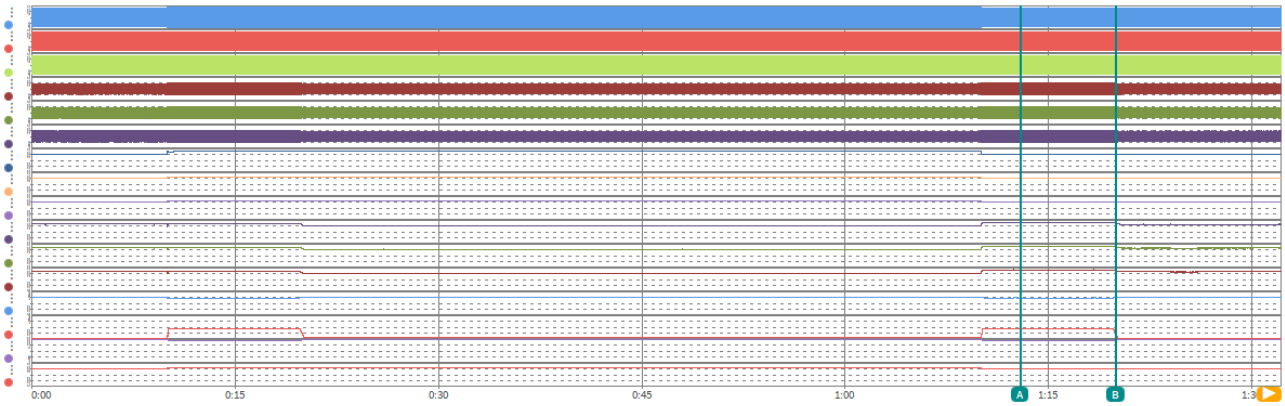


	A	B	Delta
Time [s]	0:10.4964	1:09.8162	0:59.3197
AI 1/U1 [V]	226.7904	353.4610	126.6706
AI 1/U2 [V]	-338.5635	-271.3933	67.17015
AI 1/U3 [V]	104.7843	-88.49168	-193.2759
AI 1/I1 [A]	219.8031	210.8116	-8.991480
AI 1/I2 [A]	-191.3825	-168.0036	23.37897
AI 1/I3 [A]	-28.49555	-43.14590	-14.65035
U1_tRMS@POWER/0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

After dip



	A	B	Delta
Time [s]	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



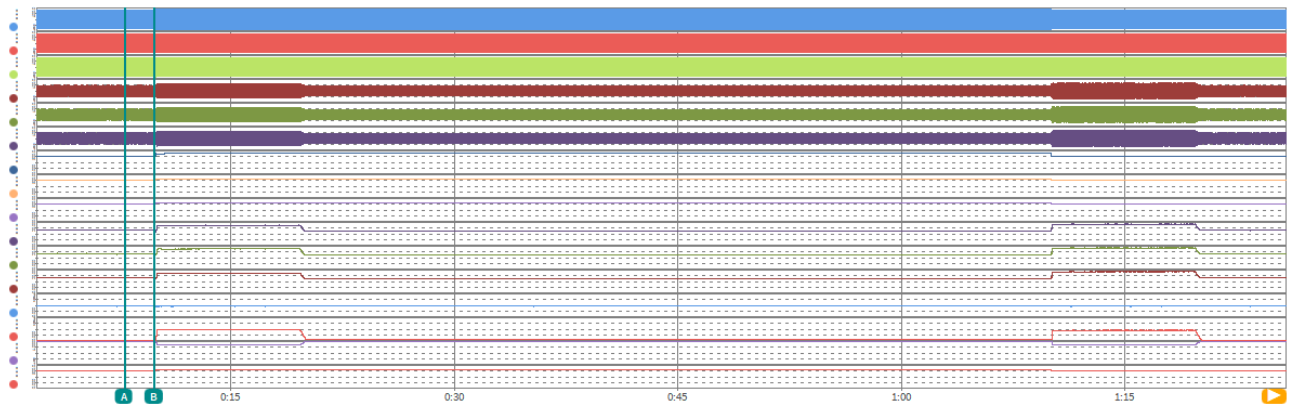
	A	B	Delta
Time [s]	1:12.9284	1:19.9907	7.0623
AI 1/U1 [V]	-301.6451	-109.7615	191.8836
AI 1/U2 [V]	43.56528	-210.1283	-253.6936
AI 1/U3 [V]	257.9954	319.5925	61.59711
AI 1/I1 [A]	-255.7902	-120.3179	135.4723
AI 1/I2 [A]	157.6077	-121.0586	-278.6663
AI 1/I3 [A]	98.03963	241.5116	143.4720
U1_tRMS@POWER/0 [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

Test No. 7.4 idle test

	A	B	Delta
Time [s]	9.9903	1:10.0242	1:00.0340
AI 1/U1 [V]	299.2685	-11.23405	-310.5025
AI 1/U2 [V]	-261.0181	-276.7551	-15.73706
AI 1/U3 [V]	-38.10048	287.0925	325.1929
AI 1/I1 [A]	-0.420928	-1.067996	-0.647068
AI 1/I2 [A]	-0.658393	0.565887	1.224279
AI 1/I3 [A]	1.051426	0.467658	-0.583768
U1_tRMS@POWER/0 [V]	230.3551	264.2602	33.90504
U2_tRMS@POWER/0 [V]	230.4146	239.4728	9.058136
U3_tRMS@POWER/0 [V]	230.2173	239.2946	9.077209
U_fundRMS_SYM+@POWER/0 [V]	230.3289	247.2928	16.96390
U_fundRMS_SYM-@POWER/0 [V]	0.018995	18.05163	18.03264

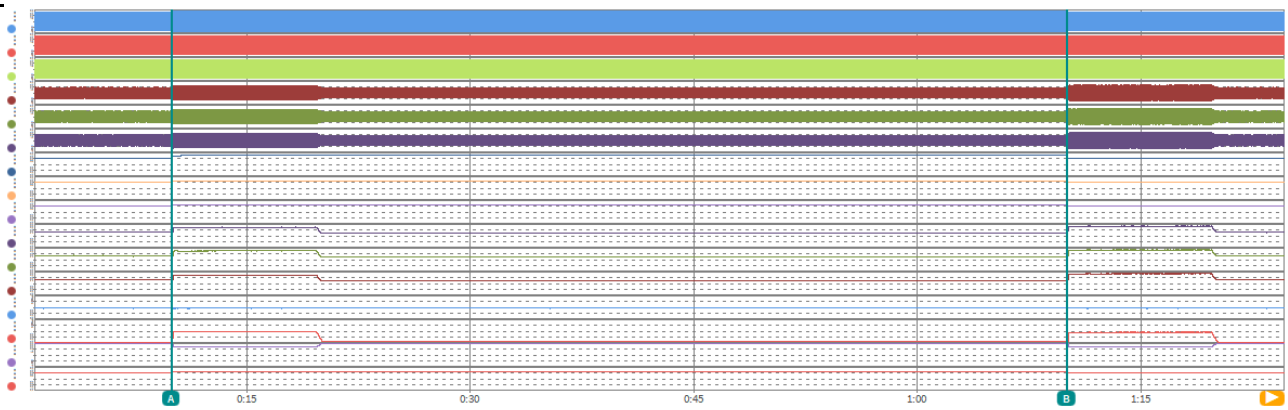
Test No. 7.4 with PGU

Before dip

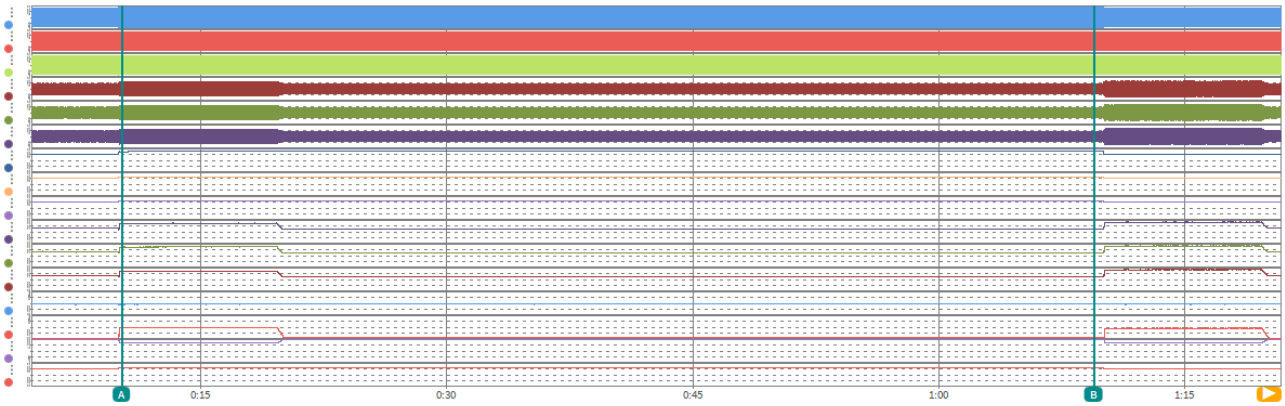


	A	B	Delta
Time [s]	7.91006	9.92755	2.01749
AI 1/U1 [V]	-111.7106	-292.1677	-180.4571
AI 1/U2 [V]	-209.4550	20.01357	229.4686
AI 1/U3 [V]	320.9102	270.5786	-50.33160
AI 1/I1 [A]	-15.58459	-42.78851	-27.20392
AI 1/I2 [A]	-31.07846	2.526879	33.60534
AI 1/I3 [A]	46.74006	39.98637	-6.753683
U1_tRMS@POWER/0 [V]	230.4244	230.4261	1.740e-3
U2_tRMS@POWER/0 [V]	230.5430	230.5251	-0.017929
U3_tRMS@POWER/0 [V]	230.3783	230.3673	-0.011063
I1_tRMS@POWER/0 [A]	33.26171	33.25313	-8.587e-3
I2_tRMS@POWER/0 [A]	33.35068	33.28025	-0.070431
I3_tRMS@POWER/0 [A]	33.31662	33.38071	0.064083
P_t@POWER/0 [W]	23024.83	23021.04	-3.794922
Q_t@POWER/0 [var]	411.1052	378.0746	-33.03058
PF_t@POWER/0 []	0.999841	0.999865	2.456e-5
U_fundRMS_SYM+@POWER/0 [V]	230.4468	230.4377	-9.094e-3

During dip

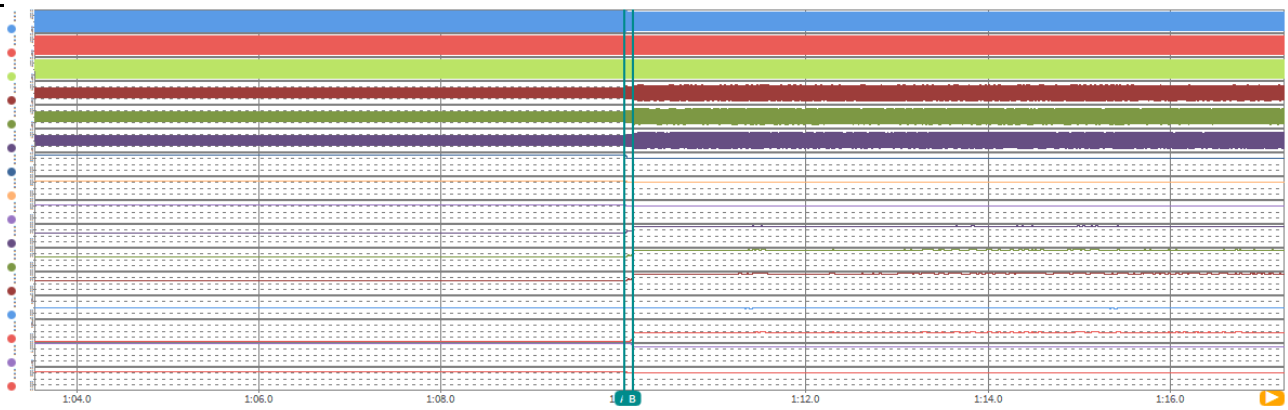


	A	B	Delta
Time [s]	9.98869	1:10.02242	1:00.03373
AI 1/U1 [V]	-226.0847	-292.7106	-66.62584
AI 1/U2 [V]	-91.76875	271.4977	363.2665
AI 1/U3 [V]	316.5407	26.57652	-289.9642
AI 1/I1 [A]	-32.79805	-46.07928	-13.28123
AI 1/I2 [A]	-13.91220	38.61773	52.52993
AI 1/I3 [A]	47.00125	7.982493	-39.01875
U1_tRMS@POWER/0 [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

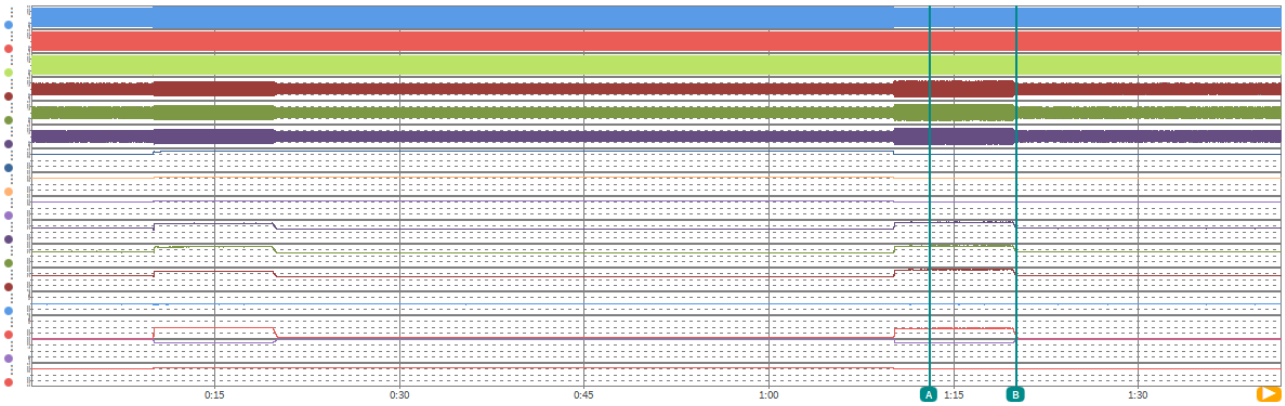


	A	B	Delta
Time [s]	0:10.23042	1:09.47263	0:59.24221
AI 1/U1 [V]	-72.99018	343.5650	416.5552
AI 1/U2 [V]	-237.6359	-284.6220	-46.98611
AI 1/U3 [V]	311.2824	-66.97369	-378.2561
AI 1/I1 [A]	34.55317	42.49025	7.937074
AI 1/I2 [A]	-62.69575	-35.30634	27.38941
AI 1/I3 [A]	28.22554	-6.172419	-34.39796
U1_tRMS@POWER/0 [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



	A	B	Delta
Time [s]	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



	A	B	Delta
Time [s]	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	-0.603806

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

TÜVRheinland®

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