TEST REPORT
EN 50549-10:2022
TÜV SÜD Test Report for requirements for generating plants to be connected in parallel with distribution network
Part 10: Tests for conformity assessment of generating units

Report No. ..... :	704092514249-00 Part 1 of 2
Date of issue..... :	2025-10-28
Project handler ..... :	Shuhan Dai, Jianyong Li
Testing laboratory ..... :	TÜV SÜD New Energy Vehicle Testing (Jiangsu) Co., Ltd.
Address..... :	Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China
Testing location ..... :	Same as above
Client ..... :	Ginlong Technologies Co., Ltd.
Client number ..... :	86470
Address..... :	No.57 Jintong Road, Binhai Industrial Park, Xiangshan, 315712 Ningbo, Zhejiang, PEOPLE'S REPUBLIC OF CHINA
Contact person ..... :	Mr. Ruyi Pan
Standard ..... :	This TÜV SÜD test report form is based on the following requirements: EN 50549-10: 2022
TRF number and revision..... :	TRF EN 50549-10: 2022 rev. 0:2023-03-01
eDoc_ID..... :	N/A
TRF originated by..... :	TÜV SÜD Product Service, Mr. Kai Zhao
Copyright blank test report ..... :	This test report is based on the content of the standard (see above). The test report considered selected clauses of the a.m. standard(s) and experience gained with product testing. It was prepared by TÜV SÜD Product Service. TÜV SÜD Group takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.
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Scheme..... :	☐ TÜV Mark ☐ without certification ☐ AoC/CoC for EU-Directive / EU-Regulation: ☐GS Mark ☐ NRTL Mark ☒ other: ESY Certificate
Non-standard test method..... :	☒ No ☒ Yes, see details under *Summary of testing*
National deviations..... :	N/A
Number of pages *(Report)* ..... :	565
Number of pages *(Attachments)*.... :	See Attachments

Compiled by.....: (+ signature)	*Shuhan Dai, Jianyong Li* Shuhan Dai Jianyong Li	Approved by .. :	Xu Xu

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Test sample ..... :	Engineering sample
Type of test object..... :	Grid-connected PV inverter
Trademark ..... :	solis
Model and/ or type reference ..... :	S6-GU3P275K06-EV-ND, S6-GU3P300K06-EV-ND, S6-GU3P333K06-EV-ND, S6-GU3P350K06-EV-ND
Rating(s) ..... :	See copy of marking plates
Manufacturer..... :	Ginlong Technologies Co., Ltd.
Manufacturer number ..... :	86470
Address ..... :	No.57 Jintong Road, Binhai Industrial Park, Xiangshan, 315712 Ningbo, Zhejiang, PEOPLE'S REPUBLIC OF CHINA

Name and address of factory(ies)
N/A

Sub-contractors / tests (clause) . :	N/A
Name..... :	N/A
Order description ..... :	☒ Complete test according to TRF
	☐ Partial test according to manufacturer's specifications
	☐ Preliminary test
	☐ Spot check
	☐ Others:
Date of order ..... :	2025-04-11
Date of receipt of test item..... :	2025-06-12
Date(s) of performance of test ... :	2025-07-22 to 2025-10-28

Test item particulars:
All the test results confirmed to the requirements of the standard.

Purpose of the product (description of intended use):

These devices are transformer-less grid connected Grid-connected PV inverter which converts direct current to alternating current, and they are intended to be connected in parallel with the MV distribution grid via step-up transformer for generating plants up to and including Type B. The Interface Protection System will be installed close to grid connection point externally and detial settings of interface protection system and power controls should be discussed with local DSO and followed with local grid regulation. They are intended for professional incorporation into energy storage system, and they are assessed on a component test basis.

Characteristic data (extract from marking plate directly for reference)

Models	S6-GU3P275K06-EV-ND	S6-GU3P300K06-EV-ND
PV-Input:		
Max. input voltage	DC 1500 V	
Mppt voltage range	DC 480 V, ..., 1500 V	
Max. input current	DC 6*70 A	DC 6*80 A
Isc PV (absolute	DC 6*105 A	DC 6*125 A

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maximum)		
AC-Output (Grid side):		
Rated output voltage	3/PE AC 800 V	
Rated output frequency	50 Hz	
Rated output power	275000 W	300000 W
Max. output power	275000 W	300000 W
Max. apparent output power	275000 VA	300000 VA
Max. continuous output current	AC 198.5 A	AC 216.5 A
Power factor range	-0.8, …, 1, …, +0.8	

Models	S6-GU3P333K06-EV-ND	S6-GU3P350K06-EV-ND
PV-Input:		
Max. input voltage	DC 1500 V	
Mppt voltage range	DC 480 V, ..., 1500 V	
Max. input current	DC 6*80 A	
Isc PV (absolute maximum)	DC 6*125 A	
AC-Output (Grid side):		
Rated output voltage	3/PE AC 800 V	
Rated output frequency	50 Hz	
Rated output power	333000 W	350000 W
Max. output power	333000 W	350000 W
Max. apparent output power	333000 VA	350000 VA
Max. continuous output current	AC 240.3 A	AC 252.6 A
Power factor range	-0.8, …, 1, …, +0.8	

Attachments:

Item	Description	Certificate No. or Test Report No.	Issued by	Models	Pages
1	CE-LVD certificate	No. N8A 086470 0250 Rev. 00	TÜV SÜD	S6-GU3P275K06-EV-ND, S6-GU3P300K06-EV-ND, S6-GU3P333K06-EV-ND, S6-GU3P350K06-EV-ND	2
2	EMC certificate	No. T8A 086470 0255 Rev. 00	TÜV SÜD		4
3	EN50549-10 report	704092514249-00 Part 1 of 2	TÜV SÜD		565
4	EN50549-2 report	704092514249-00 Part 2 of 2	TÜV SÜD		47

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If additional information is necessary, please provide

N/A

Copy of marking plate:

solis

Model: S6-GU3P275K06-EV-ND

Max.input voltage d.c.	1500V
Mppt voltage range d.c.	480-1500V
Max.input current d.c.	6×70A
Isc PV(absolute maximum) d.c.	6×105A
Nominal grid voltage a.c.	3/PE 800V
Nominal grid frequency	50/60Hz
Nominal output power	275000W
Max.(Rated) AC output active power	275000W
Max.(Rated) Ac output apparent power	275000VA
Max.(Rated)continuous output current a.c.	198.5A
Adjustable cos(φ)	-0.8...1...+0.8
Operating temperature range	-30...+60℃
Ingress protection	IP66
Protective class	I
Overvoltage category	II(PV) III(MAINS)
Inverter topology	Non-isolated

S/N:
154FD01257030006

Name：Ginlong Technologies Co.,Ltd.
Address:No.57 Jintong Road,Binhai Industrial Park,
Xiangshan,Ningbo,Zhejiang,315712,P.R.China

www.solisinverters.com Made in China

solis

Model: S6-GU3P300K06-EV-ND

Max.input voltage d.c.	1500V
Mppt voltage range d.c.	480-1500V
Max.input current d.c.	6×80A
Isc PV(absolute maximum) d.c.	6×125A
Nominal grid voltage a.c.	3/PE 800V
Nominal grid frequency	50/60Hz
Nominal output power	300000W
Max.(Rated) AC output active power	300000W
Max.(Rated) Ac output apparent power	300000VA
Max.(Rated)continuous output current a.c.	216.5A
Adjustable cos(φ)	-0.8...1...+0.8
Operating temperature range	-30...+60℃
Ingress protection	IP66
Protective class	I
Overvoltage category	II(PV) III(MAINS)
Inverter topology	Non-isolated

S/N:
154FD01257030004

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solis	
Model: S6-GU3P333K06-EV-ND	
Max.input voltage d.c.	1500V
Mppt voltage range d.c.	480-1500V
Max.input current d.c.	6×80A
Isc PV(absolute maximum) d.c.	6×125A
Nominal grid voltage a.c.	3/PE 800V
Nominal grid frequency	50/60Hz
Nominal output power	333000W
Max.(Rated) AC output active power	333000W
Max.(Rated) Ac output apparent power	333000VA
Max.(Rated)continuous output current a.c.	240.3A
Adjustable cos(φ)	-0.8...1...+0.8
Operating temperature range	-30...+60℃
Ingress protection	IP66
Protective class	I
Overvoltage category	II(PV) III(MAINS)
Inverter topology	Non-isolated
S/N: 154FD01257030002	
Name：Ginlong Technologies Co.,Ltd. Address:No.57 Jintong Road,Binhai Industrial Park, Xiangshan,Ningbo,Zhejiang,315712,P.R.China www.solisinverters.com Made in China	

solis	
Model: S6-GU3P350K06-EV-ND	
Max.input voltage d.c.	1500V
Mppt voltage range d.c.	480-1500V
Max.input current d.c.	6×80A
Isc PV(absolute maximum) d.c.	6×125A
Nominal grid voltage a.c.	3/PE 800V
Nominal grid frequency	50/60Hz
Nominal output power	350000W
Max.(Rated) AC output active power	350000W
Max.(Rated) Ac output apparent power	350000VA
Max.(Rated)continuous output current a.c.	252.6A
Adjustable cos(φ)	-0.8...1...+0.8
Operating temperature range	-30...+60℃
Ingress protection	IP66
Protective class	I
Overvoltage category	II(PV) III(MAINS)
Inverter topology	Non-isolated
S/N: 154FD01257030009	
Name：Ginlong Technologies Co.,Ltd. Address:No.57 Jintong Road,Binhai Industrial Park, Xiangshan,Ningbo,Zhejiang,315712,P.R.China www.solisinverters.com Made in China	

Marking plate material: pressure-sensitive unprinted label stocks stamped into aluminium surface; Suitable for outdoor use with respect to exposure to Ultraviolet Light, Water Exposure and thermal transfer printed label stock applications, -60°C to 95°C
An additional PET film provided to cover label.

Interface protection has been tested and evaluated on basis of rated grid voltage 3/PE ~ 800 V, 50Hz according to the grid code on page 1.

Interface protection settings are limited to authorized installer, password and seal provided to protect these from unpermitted interference.

Inverters with multi-voltage and/or frequency ratings are available in difference versions based on output voltages and frequencies, the ratings on which the testing has been based was identified on paper tag and control panel.

Pictures of the product:

Representative model: S6-GU3P350K06-EV-ND

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Front view

Rear view

Top view

Bottom view

Summary of testing:

Basic model: S6-GU3P350K06-EV-ND
Other model: S6-GU3P275K06-EV-ND, S6-GU3P300K06-EV-ND, S6-GU3P333K06-EV-ND are family design products, with the same control electronics, firmware and construction solutions including the power part, except for the components numbers, and AC output current and power derated by software.
All tests were conducted as type tests on representative model S6-GU3P350K06-EV-ND of family design products.
The results of the evaluation are considered valid for the whole production of this type of generating unit manufactured to the same design and operating with the same software as during the type test of the EUT.
All tests were carried out at rated voltage of 3/PE 800 V, rated frequency of 50 Hz if not specified.

☐ deviation(s) found

☒ no deviations found

Individual inverter assessed based on component basis.

Software/Firmware version of family design products: A2

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Evaluated protection function and operational capabilities			
Clause(s) / subclause(s) of EN 50549-2:2019	**Applicable clause(s) / subclause (s) of EN 50549-10:2022**	**Remarks, optional modes and constraints**	**Verdict**
4.4.2 Operating frequency range	5.2.1 Frequency operating range	--	Pass
4.4.3 Minimal requirement for active power delivery at underfrequency	5.2.1 Frequency operating range	--	Pass
4.4.4 Continuous operating voltage range	5.2.2 Voltage operating range	--	Pass
4.5.2 Rate of change of frequency (ROCOF) immunity	5.3.1 Immunity to disturbances – Rated of change of frequency (ROCOF)	--	Pass
4.5.3.2 Generating plant with non-synchronous generating technology	5.3.3 Immunity to disturbances - Fault ride through, over-voltage (OVRT) and under-voltage (UVRT)	--	Pass
4.5.4 Over-voltage ride through (OVRT)	5.3.3 Immunity to disturbances - Fault ride through, over-voltage (OVRT) and under-voltage (UVRT)	--	Pass
4.6.1 Power response to overfrequency	5.4 Active response to frequency deviation	--	Pass
4.6.2 Power response to underfrequency	5.4 Active response to frequency deviation	--	N/A
4.7.2.2 Voltage support by reactive power, Capabilities	5.5.1 Power capabilities assessment	--	Pass
4.7.2.3 Voltage support by reactive power, Control modes	5.5.2 Voltage support by reactive power - test to determine the reactive power control modes	Q setp. Q (U) Q (P) Cos φ setp. Cos φ (P)	Pass
4.7.2.3.2 Set point control modes	5.5.2.3 Verification procedure for set point control	Q setp. Cos φ setp.	Pass
4.7.2.3.3 Voltage related control modes	5.5.2.5 Verification procedure for power related control modes for reactive power	Q (U)	Pass
4.7.2.3.4 Power related control mode	5.5.2.5 Verification procedure for power related control modes for reactive power	Q (P) Cos φ (P)	Pass
4.7.3 Voltage related active power reduction	5.6 Voltage related active power reduction - P(U)	P (U)	Pass
NOTE 1 EN 50549-2:2019 evaluates reactive power delivery of generating plants above a defined power threshold at the POC. In this case, the accuracy chain for reactive power delivery for a specific generating plant is excluded from the scope of this conformity assessment but must be considered during design and tested during commissioning of a specific plant.			

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4.7.4.2.1.1 Voltage support during faults and voltage steps – General	5.3.3 Immunity to disturbances - Fault ride through, over-voltage (OVRT) and under-voltage (UVRT)	--	Pass
4.7.4.2.1.2 Voltage support during faults and voltage steps – Optional Modes	5.3.3 Immunity to disturbances - Fault ride through, over-voltage (OVRT) and under-voltage (UVRT)	1. Active power priority 2. Reactive current limitation 3. Zero current threshold	Pass
4.7.4.2.2 Zero current mode for converter connected generating technology	5.3.3 Immunity to disturbances - Fault ride through, over-voltage (OVRT) and under-voltage (UVRT)	--	Pass
4.9.3. Requirements on voltage and frequency protection	5.8.5 Verification procedure for generating plants to be connected to a MV distribution network	A dedicated device is required	N/A
NOTE 2 If the interface protection is designed as dedicated device, the disconnection chain and the accuracy of the measuring chain including voltage transformers for a specific generating plant is excluded from the scope of this conformity assessment but must be considered during design and tested during commissioning of a specific plant.			
4.9.4 Means to detect island situation	5.8.6 Islanding detection	Active methods tested with a resonant circuit according to EN 62116	Pass
4.10.2 Automatic reconnection after tripping	5.9.3 Automatic reconnection after tripping	--	Pass
4.10.3 Starting to generate electrical power	5.9.4 Starting to generate electrical power	--	Pass
4.11.1 Ceasing active power	5.10 Active power reduction on set point	--	Pass
4.11.2 Reduction of active power on set point	5.10 Active power reduction on set point	--	Pass
4.12 Remote information exchange	5.11 Remote information exchange	Standardized communication protocol not provided by manufacturer	N/A
4.13 single fault tolerance of interface protection system and interface switch	5.12 Requirements regarding single fault tolerance of interface protection system and interface switch	--	N/A

Evaluated parameter and parameter range

Name of parameter set	EN50549-2
Specific technical requirement (e.g. grid codes)	EN 50549-2:2019

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Clause(s) / subclause(s) of EN 50549-2:2019	Parameter	Remarks/ additional information	Configurable value range	Default value	
4.4.2 Operating frequency range	47.0 – 47.5 Hz Duration	--	0 – 20 s	Unlimited with protection setting only	
	47.5 – 48.5 Hz Duration	--	30 – 90 min	Unlimited with protection setting only	
	48.5 – 49.0 Hz Duration	--	30 – 90 min	Unlimited	
	49.0 – 51.0 Hz Duration	--	not configurable	Unlimited	
	51.0 – 51.5 Hz Duration	--	30 – 90 min	Unlimited with protection setting only	
	51. 5 – 52 Hz Duration	--	0 – 15 min	Unlimited with protection setting only	
4.4.3 Minimal requirement for active power delivery at underfrequency	Reduction threshold	--	not configurable	No reduction	
	Maximum reduction rate	--	not configurable	N/A	
4.4.4 Continuous operating voltage range	Upper limit	--	not configurable	110% U_n	
	Lower limit	--	not configurable	90% U_n	
4.5.2 Rate of change of frequency (ROCOF) immunity	ROCOF withstand capability (defined with a sliding measurement window of 500 ms)	--	not configurable	2 Hz/s	
4.5.3.2 Under-voltage ride through (UVRT) Generating plant with non-synchronous generating technology	Maximum power resumption time	--	not configurable	1 s	
	Voltage-Time-Diagram	--	See figure 6 default requirement curve of EN 50549-2:2019	Time [s]	U [p.u.]
				0.0	0.05
				0.25	0.05
				3	0.85
				180	0.85
				180	0.90
4.5.4 Over-voltage ride through (OVRT)	Voltage-Time-Diagram	--	not configurable See figure 8 of EN 50549-2:2019	Time [s]	U [p.u.]
				0.0	1.25
				0.1	1.25
				0.1	1.20
				5.0	1.20
				5.0	1.15
				60	1.15
				60	1.10

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4.6.1 Power response to overfrequency	Threshold frequency f_1	--	50.2 Hz – 52 Hz	50.2 Hz
	Droop	--	2 % – 12 %	5 %
	Power reference	--	P_M | P_{max}	P_M
	Intentional delay	--	0 – 2 s	0 s
	Deactivation threshold f_{stop}	--	50.0 Hz – f_1	deactivated
	Deactivation time t_{stop}	--	0 – 600 s	-
	Acceptance of staged disconnection	--	yes | no	No
4.6.2 Power response to underfrequency	Threshold frequency f_1	--	49.8 Hz – 46 Hz	49.8 Hz
	Droop	--	2 – 12 %	5 %
	Power reference	--	P_M | P_{max}	P_M
	Intentional delay	--	0 – 2 s	0 s
4.7.2.2 Voltage support by reactive power - Capabilities	Active factor / Reactive power (%Pd) range overexcited	--	0.8 – 1 / 66.67 % P_D – 0	0.8 – 1 / 66.67 % P_D – 0
	Active factor / Reactive power (%Pd) range underexcited	--	0.8 – 1 / 66.67 % P_D – 0	0.8 – 1 / 66.67 % P_D – 0
4.7.2.3 Voltage support by reactive power - Control modes	Enabled control mode	--	Q setp. Q(U) Cos φ setp. Cos φ (P)	Cos φ setp.
4.7.2.3.2 Voltage support by reactive power - Setpoint control modes	Q setpoint and excitation	--	0 –66.67 % P_D	0
	cos φ setpoint and excitation	--	1 – 0.8	1
4.7.2.3.3 Voltage support by reactive power - Voltage related control modes	Characteristic curve – Q (U)	--	--	Indicate default characteristic
	Point a	--	50%Un – 100%Un	93 %Un
	Point b	--	50%Un – 100%Un	94 %Un
	Point c	--	100%Un – 120%Un	106%Un
	Point d	--	100%Un – 120%Un	108 %Un
	Min. reactive power	--	0 –66.67 % P_D ($Q_{max\ under}$)	66.67 % P_D
	Max. reactive power	--	0 –66.67 % P_D ($Q_{max\ over}$)	66.67 % P_D
	Time constant	--	3 s – 60 s	3.0 s
	Min cos φ	--	0.0 – 1	0.4
	Lock in power	--	0 % – 20 %	20%
	Lock out	--	0 % – 20 %	5%

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	power			
4.7.2.3.4 Voltage support by reactive power - Power related control mode	Characteristic curve – Cos φ (P)	--	--	Indicate default characteristic
	Point a	--	0 – 100%Pn/ PF:-0.8, …,+0.8	15%Pn/ PF=0.8
	Point b	--	0 – 100%Pn/ PF:-0.8, …,+0.8	20%Pn/ PF=1
	Point c	--	0 – 100%Pn/ PF:-0.8, …,+0.8	80%Pn/ PF=1
	Point d	--	0 – 100%Pn/ PF:-0.8, …,+0.8	90%Pn/ PF=-0.8
	Cos φ	--	0.8 – 1	0.8
	Time constant	--	3 s – 60 s	3.33 s
	Lock in voltage	--	105 %Un	deactivated
	Lock out voltage	--	100 %Un	deactivated
	Characteristic curve – Q (P)	--	--	Indicate default characteristic
	Point a	--	0 – 100%Pn/ Q: -0.6Pn– 0.6Pn	15%Pn/ Q=0.6Pn
	Point b	--	0 – 100%Pn/ Q: -0.6Pn– 0.6Pn	20%Pn/ Q=0
	Point c	--	0 – 100%Pn/ Q: -0.6Pn– 0.6Pn	80%Pn/ Q=0
	Point d	--	0 – 100%Pn/ Q: -0.6Pn– 0.6Pn	90%Pn/ Q=-0.6Pn
4.7.3 Voltage related active power reduction	Characteristic curve - P (U)	--	--	Indicate default characteristic
	Point a	--	0 – 100%Pn/ U:0 V, …,264.5 V	100%Pn/ U=207 V
	Point b	--	0 – 100%Pn/ U:0 V, …,264.5 V	100%Pn/ U=230 V
	Point c	--	0 – 100%Pn/ U:0 V, …,264.5 V	100%Pn/ U=253 V
	Point d	--	0 – 100%Pn/ U:0 V, …,264.5 V	0%Pn/ U=264.5 V
	Time constant	--	3 s – 60 s	3.33 s
4.7.4.2.1 Voltage support during faults and voltage steps – General / Generating plant with non-synchronous generator	Enabling	--	enable | disable	disable
	Static voltage range overvoltage	--	100 % U_n – 120 % U_n	120 % U_n
	Static voltage range undervoltage	--	80 % Un – 100 % U_n	80% U_n
	Insensitivity range of ΔU50per	--	0 % – 15 %	5%
	Gradient k1	--	0 - 6	2
	Gradient k2	--	0 - 6	2
4.7.4.2.1.2 Optional	Active power	--	enable | disable	disable

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Modes / Generating plant with non-synchronous generator	priority			
	Reactive current limitation [% rated current]	--	0 % – 100 %	90 %
	Zero current threshold	--	20 % U_n – 100 % U_n	50 %U_n
4.7.4.2.2 Zero current mode for converter connected generating technology	Enabling	--	enable | disable	disable
	Static voltage range overvoltage	--	100 %U_n – 120 %U_n	120 %U_n
	Static voltage range undervoltage	--	20 %U_n – 100 %U_n	50 %U_n
4.9.3 Requirements on voltage and frequency protection	Threshold for protection as dedicated device [in A or kW. kVA]	--	16 A – 250 kVA	A dedicated device is required
	Undervoltage threshold stage 1	--	0.2 U_n – 1 U_n	--
	Undervoltage operate time stage 1	--	0.1 s – 100 s	--
	Undervoltage threshold stage 2	--	0.2 U_n – 1 U_n	--
	Undervoltage operate time stage 2	--	0.1 s – 5 s	--
	Overvoltage threshold stage 1	--	1.0 U_n – 1.2 U_n	--
	Overvoltage operate time stage 1	--	0.1 s – 100 s	--
	Overvoltage threshold stage 2	--	1.0 U_n – 1.3 U_n	--
	Overvoltage operate time stage 2	--	0.1 s – 5 s	--
	Overvoltage threshold 10 min mean protection	--	1.0 U_n – 1.15 U_n	--
	Underfrequency threshold stage 1	--	47.0 Hz– 50.0 Hz	--
	Underfrequency operate time stage 1	--	0.1 s – 100 s	--

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	Underfrequency threshold stage 2	--	47.0 Hz – 50.0 Hz	--
	Underfrequency operate time stage 2	--	0.1 s – 5 s	--
	Overfrequency threshold stage 1	--	50.0 Hz – 52.0 Hz	--
	Overfrequency operate time stage 1	--	0.1 s – 100 s	--
	Overfrequency threshold stage 2	--	50.0 Hz – 52.0 Hz	--
	Overfrequency operate time stage 2	--	0.1 s – 5 s	--
	ROCOF protection	--	--	--
	ROCOF operate time	--	0 - 1 s	--
4.10.2 Automatic reconnection after tripping	Lower frequency	--	47.0 Hz – 50.0 Hz	49.5 Hz
	Upper frequency	--	50.0 Hz – 52.0 Hz	50.2 Hz
	Lower voltage	--	50 %U_n – 100 %U_n	90 %U_n
	Upper voltage	--	100 %U_n – 120 %U_n	110 %U_n
	Observation time	--	10 s – 600 s	60 s
	Active power increase gradient	--	5% – 3000%/min	10 %/min
4.10.3 Starting to generate electrical power	Lower frequency	--	47.0 Hz – 50.0 Hz	49.5 Hz
	Upper frequency	--	50.0 Hz – 52.0 Hz	50.1 Hz
	Lower voltage	--	50 %U_n – 100 %U_n	90 %U_n
	Upper voltage	--	100 %U_n – 120 %U_n	110 %U_n
	Observation time	--	10 s – 600 s	60 s
	Active power increase gradient	--	5% – 3000 %/min	disabled
4.11.1 Ceasing active power	Activation option	--	Can be achieved by APP or Solis cloud, acceptance should be made by the DSO and responsible party	
4.11.2 Reduction of active power on set point	Activation option	--	Can be achieved by APP or Solis cloud, acceptance should be made by the DSO and responsible party	
4.12 Remote information	Available	--	Standardized communication protocol	

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exchange	communication standards		not provided by manufacturer

Unauthorised access to factory safety parameters setting and software should be prohibited.

A reset to the factory safety parameters requires retesting and verification in conjunction with the end-use system.

Additional information on non-standard test method(s)

Sub clause ..... : N/A

Page ..... : N/A

Rational ..... : N/A

Possible test case verdicts:

test case does not apply to the test object ..... : N/A (not applicable / not included in the order)
test object does meet the requirement ..... : P (Pass)
test object does not meet the requirement ..... : F (Fail)

General remarks:

"(see remark #)" refers to a remark appended to the report.
"(see appended table)" refers to a table appended to the report.
*Throughout this report **a point** is used as the decimal separator.*
The test results presented in this report relate only to the object tested.
This report shall not be reproduced except in full without the written approval of the testing laboratory.

Abbreviations and Symbols maybe used in this test report

AVR	automatic voltage regulator
CHP	combined heat and power
CT	current transformer
DFIG	doubly fed induction generator
DSO	distribution system operator
EES	electrical energy storage
EHV	extra high voltage
EMC	electromagnetic compatibility
HV	high voltage
IEV	international electrotechnical vocabulary (IEC 60050)
LV	low voltage
MV	medium voltage
OEL	overexcitation limit
OVRT	over voltage ride through
POC	point of connection
PV	photovoltaic
ROCOF	rate of change of frequency
THD	total harmonic distortion
UEL	underexcitation Limit
UVRT	under voltage ride through
VT	voltage transformer

A_r	required accuracy
G_R	reset value of the characteristic quantity
G_S	setting value of the characteristic quantity (activation threshold)

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k_i	switching current factor
T_{Op}	operate time (equals start time plus time delay setting)
T_{Res}	reset time
T_{Ov}	overshoot time
> / > >	first / second stage of protection function
Δf	frequency step
Δt	time step
ΔU	voltage step

Parameters in symbols

$U_{0.2}$	RMS voltage of fundamental (averaging period 0.2 s)
$I_{0.2}$	RMS current of fundamental (averaging period 0.2 s)
$f_{0.2}$	frequency of fundamental (averaging period 0.2 s)
$P_{0.2}$	Active power of fundamental (averaging period 0.2 s)
P_{30}	Active power of fundamental (averaging period 30 s)
P_{60}	Active power of fundamental (averaging period 60 s)
P_{600}	Active power of fundamental (averaging period 600 s)
$Q_{0.2}$	Reactive power of fundamental (averaging period 0.2 s)
Q_{30}	Reactive power of fundamental (averaging period 30 s)
Q_{60}	Reactive power of fundamental (averaging period 60 s)
Q_{600}	Reactive power of fundamental (averaging period 600 s)
$S_{0.2}$	Apparent power of fundamental (averaging period 0.2 s)
S_{30}	Apparent power of fundamental (averaging period 60 s)
S_{60}	Apparent power of fundamental (averaging period 60 s)
S_{600}	Apparent power of fundamental (averaging period 600 s)
cos φ	Active factor
T_d	Dead time
T_{sr}	Step response time
T_s	Settling time
$\underline{U}_1$	Voltage in positive sequency system of fundamental
$\underline{I}_1$	Current in positive sequency system of fundamental
$\underline{P}_1$	Active power in positive sequency system of fundamental
$\underline{Q}_1$	Reactive power in positive sequency system of fundamental
$\underline{S}_1$	Apparent power in positive sequency system of fundamental

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EN 50549-10:2022			
Clause	Requirement + Test	Result – Remark	Verdict
4.	**Assessment methods and test equipment**		P
4.1	**General**		P
	All tests shall be conducted as type tests either on a unique generating unit		P
	or on an item representative of the production of one type of generating unit.		P
	The results of the evaluation are considered valid for the whole production of this type of generating unit manufactured to the same design and operating with the same software as during the type test of the EUT.		P
	changed software (updates) intended to be used in the product		P
4.2	**Assessment methods**		P
4.2.1	**Test on complete generating unit**		N/A
4.2.2	**Test on the electrical generation system**		P
4.2.3	**Test on the nacelle of a wind turbine**		N/A
4.2.4	**Test on the primary energy converter**		N/A
4.2.5	**Test at limited power**		N/A
4.2.6	**Test on stopped generating unit**		N/A
4.2.7	**Test on an independent component**		N/A
4.2.8	**Simulated input test**		N/A
4.2.9	**Test by changing a control parameter**		N/A
4.2.10	**Field measurements**		N/A
4.2.11	**Test by calculation and numerical simulation for generating units of synchronous generating technology**		N/A
4.2.12	**Test of the real generating unit control unit in a simulated environment ("Controller-Hardware-in-the-loop" (HIL) test)**		N/A
4.2.13	**Evaluation by inspection and test of dependent components**		N/A
4.3	**Requirements for the measuring equipment**		P
	Required sampling rates and measurement uncertainty requirements		P
	The test report shall declare the measurement uncertainty for the measured electrical quantities, also including the contribution of voltage and current transducer.		P
4.4	**Configuration range and parameter sets**		P

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EN 50549-10:2022			
Clause	Requirement + Test	Result – Remark	Verdict
4.4.1	**General**		P
	The test on each function was carried out	☐ one specific setting verifying one specific grid code _____ ☒ testing multiple settings verifying the overall function that may be configured to a specific grid code by the user: EN 50549-2:2019	P
4.4.2	**Documentation**		P
	Refer to test report and statement of conformity	Test records see appendix tables	P
4.5	**EUT Software change requirements**		N/A
	each change of software version applied in the equipment under test (EUT), or in the generating unit affecting the protection function or operational capability assessed according to this document shall be evaluated as per this section.	☐ software changes do not potentially affect the results of the assessment ☐ software changes do potentially affect the results of the assessment but compliance with the following: – EN 60730-1:20161, H.11.12.3 (measures to avoid errors), or – avoid errors during the development process (V-Model) of EN 61508-3:2010 for SIL2 or UL 1998:2013 for class 1 software	N/A
5	**Testing**		P
5.1	**General**		P
	If not stated otherwise in relevant clauses of this document, all assessed protection functions and operational capabilities available in the GUT or EUT shall be active during all described tests.		P
	For all tests and measurements defined below, the environmental condition, temperature and humidity shall be stated in the test report.		P
5.2	**Normal operating range**		P
5.2.1	**Frequency operating range**		P
5.2.1.1	**General**		P

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EN 50549-10:2022			
Clause	Requirement + Test	Result – Remark	Verdict
5.2.1.2	**Test application and verification methodology**		P
	Regarding the energy source and the prime mover of generating units, in the verification process of a complete unit of some specific technology	☒ PV generating unit ☐ full converter generating units (Wind or CHP) ☐ DFIG generating units ☐ Battery inverter units	P
	Depending on the generating unit size, generating unit technology, site test or laboratory availability the verification can be carried out	☒ using a grid simulator ☐ using a dedicated prime mover capable of changing the speed of the generating unit or relevant component ☐ in island operation with sufficient load ☐ evaluation through documentation and calculation (4.2.13) ☐ In case of synchronous generating technology, verification by calculation and numerical simulation according to 4.2.11	P
	Alternative methodologies can be proposed by the manufacturer.		P
	The duration of the verification can be based on reduced time whereas longer duration does not affect the result of the test.		P
	Justification shall be documented by the manufacturer.		P
5.2.1.3	**Verification procedures**		P
	Refer to test report	Verification procedure see appendix table 5.2.1	P
5.2.1.4	**Verification through documentation and calculation**		P
	This verification process can be adopted, for example, when it is not economically reasonable or technically feasible to conduct the verification described in the previous clauses.		P
5.2.1.5	**Acceptance criteria**		P
	Refer to test report	Assessment criteria see appendix table 5.2.1	P
5.2.1.6	**Documentation**		P
	Refer to test report	Test records see appendix table 5.2.1	P

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EN 50549-10:2022			
Clause	Requirement + Test	Result – Remark	Verdict
5.2.2	**Voltage operating range**		P
5.2.2.1	**General**		P
5.2.2.2	**Test application and verification methodology**		P
	The approaches are considered justified in the verification process of some specific technology:	☒ PV generating unit ☐ full converter generating units (Wind or CHP) ☐ DFIG generating units ☐ Battery inverter units ☐ generating unit connected to the grid through a synchronous generator	P
	Depending on the generating unit size, generating unit technology, site test or laboratory availability the verification can be carried out	☒ using a grid simulator in a laboratory ☐ at site ☐ at manufacturer testing facility ☐ through analysis and/or calculation provided by manufacturer	P
	Alternative methodologies can be proposed by the manufacturer.		P
	The duration of the verification can be based on reduced time whereas longer duration does not affect the result of the test.		P
	Justification shall be documented by the manufacturer.		P
5.2.2.3	**Verification procedure using Grid Simulator**		P
	Refer to test report	Verification procedure see appendix table 5.2.2	P
5.2.2.4	**Verification procedure at site**		P
	This clause refers to the possibility of testing a generating unit or component using equipment at site that permits a change in the voltage, different from a grid simulator.		P
	detailed procedure shall be agreed among involved parties		P
5.2.2.5	**Verification using documentation, calculation and if applicable combined with manufacturer tests**		P
	The verification can be carried out based on documentation, calculation if applicable combined with manufacturer test or product specific test.		P

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EN 50549-10:2022			
Clause	Requirement + Test	Result – Remark	Verdict
5.2.2.6	**Assessment criteria**		P
	Refer to test report	Assessment criteria see appendix table 5.2.2	P
5.2.2.7	**Documentation**		P
	Refer to test report	Test records see appendix table 5.2.2	P
5.3	**Immunity to disturbances**		P
5.3.1	**Rate of change of frequency (ROCOF)**		P
5.3.1.1	**General**		P
	The aim of this test is to provide evidence of generating unit capability to withstand defined rate of change of frequency.		P
5.3.1.2	**Test application and verification methodology**		P
	The approaches are considered justified in the verification process of some specific technology:	☒ PV generating unit ☐ full converter generating units (Wind or CHP) ☐ DFIG generating units ☐ Battery inverter units	
	The verification can be conducted using:	☒ using a grid simulator ☐ in island operation with sufficient load ☐ through calculation and numerical simulation (4.2.11)	P
	Alternative methodologies can be proposed by the manufacturer.		P
5.3.1.3	**Verification procedure using Grid Simulator**		P
	Refer to test report	Verification procedure see appendix table 5.3.1	P
5.3.1.4	**Verification at reduced output power using Grid Simulator**		P
	The verification process shall be the same as described in 5.3.1.3.		P
5.3.1.5	**Verification of the generating unit or relevant component in island operation with sufficient load**		P
	The verification process shall be the same as described in 5.3.1.3.		P
5.3.1.6	**Verification procedure using documentation and calculation or numerical simulation**		P
	The manufacturer shall provide associated documentation and/or simulation providing evidence of requirement capability.		P

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EN 50549-10:2022			
Clause	Requirement + Test	Result – Remark	Verdict
5.3.1.7	**Assessment criteria**		P
	Refer to test report	Assessment criteria see appendix table 5.3.1	P
5.3.1.8	**Documentation**		P
	Refer to test report	Test records see appendix table 5.3.1	P
5.3.2	**Phase jump**		P
5.3.2.1	**General**		P
	This test procedure is intended to provide evidence of the capability of generating units to withstand a phase jump.		P
5.3.2.2	**Test application and verification methodology**		P
	The approaches are considered justified in the verification process of some specific technology:	☒ PV generating unit ☐ full converter generating units (Wind or CHP) ☐ DFIG generating units ☐ Battery inverter units ☐ synchronous generating technology	P
	Alternative methodologies can be proposed by the manufacturer.		P
5.3.2.3	**Verification procedure**		P
	Refer to test report	Verification procedure see appendix table 5.3.2	P
5.3.2.4	**Assessment criteria**		P
	Refer to test report	Assessment criteria see appendix table 5.3.2	P
5.3.2.5	**Documentation**		P
	Refer to test report	Test records see appendix table 5.3.2	P
5.3.3	**Fault ride through, over-voltage (OVRT) and under-voltage (UVRT)**		P
5.3.3.1	**General**		P
	The aim of this procedure is to provide evidence of the capability of generating units to withstand dynamic voltage changes.		P
5.3.3.2	**Test application and verification methodology**		P
	The assessment shall be performed:	☒ PV generating unit ☐ Battery generating units ☐ Wind Turbines generating units ☐ generating units using	P

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EN 50549-10:2022			
Clause	Requirement + Test	Result – Remark	Verdict
		synchronous generating technology	
5.3.3.3	**Verification procedure through generating unit test**		P
	Refer to test report	Verification procedure see appendix table 5.3.3	P
5.3.3.4	**Additional specifications for test of inverters with specified DC input voltage range**		P
	The two consecutive tests as specified in 5.3.3.3 shall be conducted with different DC input voltages:		P
	– One test near the minimum DC input voltage, between 0 % – 20 % of the voltage range;		P
	– One test near the maximum DC input voltage, between 80 % – 100 % of the voltage range.		P
	For PV inverter the maximum and minimum DC input voltage shall be the minimum and maximum MPP voltage according to EN 50524.		P
5.3.3.5	**Verification procedure through generating unit simulation for units with synchronous generating technology**		N/A
	This verification method is only applicable for generating units with synchronous generating technology.		N/A
5.3.3.6	**Assessment criteria of immunity**		P
	Refer to test report	Assessment criteria see appendix table 5.3.3	P
5.3.3.7	**Assessment criteria of zero current mode for non-synchronous generating technology**		P
	Refer to test report	Assessment criteria see appendix table 5.3.3	P
5.3.3.8	**Assessment criteria of controlled short circuit current contribution for non-synchronous generating technology**		N/A
5.3.3.9	**Assessment criteria for short circuit current for synchronous generating technology**		N/A
5.3.3.10	**Documentation**		P
	Refer to test report	Test records see appendix table 5.3.3	P
5.4	**Active response to frequency deviation**		P
5.4.1	**General**		P
	The aim of this procedure is to provide evidence of the capability of generating		P

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EN 50549-10:2022			
Clause	Requirement + Test	Result – Remark	Verdict
	units to respond to frequency changes according to the requirements as given in EN 50549-1:2019 and EN 50549-2:2019, 4.6.		
5.4.2	**Test application and verification methodology**		P
	The assessment performed on:	☒ primary energy converter that individually adjusts the level of its generated power without requiring any control device (e.g. PV or battery without BMS) ☐ primary energy converter which requires a suitable control device (e.g. battery without BMS, fuel cells) ☐ primary energy converter which requires a suitable control device (e.g. battery without BMS, fuel cells) with the generator equipped with a converter absorbing constant power ☐ primary energy converter which is controlled on the primary energy source and its controller ☐ synchronous generating technology ☐ re-testing of previously tested generating unit with similar ratings and hardware components ☐ other cases not mentioned above	P
5.4.2.2	**Setup n. 1 – Reference test with grid simulator**		P
5.4.2.3	**Setup n. 2 – Simulated input test**		P
5.4.2.4	**Setup n. 3 – Changing the control parameter**		P
5.4.3	**Verification procedure**		P
5.4.3.1	**General**		P
	Refer to test report	Verification procedure see appendix table 5.4.3.2 and 5.4.3.3	P
5.4.3.2	**Power response to over-frequencies**		P
5.4.3.2.1	**Selection of frequency threshold and droop**		P
	Refer to test report	see appendix table 5.4.3.2	P
5.4.3.2.2	**Selection of frequency points**		P
	Refer to test report	see appendix table 5.4.3.2	P
5.4.3.2.3	**Testing procedure for verification of response time and active power**		P

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EN 50549-10:2022			
Clause	Requirement + Test	Result – Remark	Verdict
	response accuracy		
	Refer to test report	Verification procedure see appendix table 5.4.3.2	P
5.4.3.2.4	**Testing procedure for generating units disconnecting at randomized frequencies**		P
	If permitted by the DSO and the responsible party, the generating units shall disconnect at randomized frequencies, ideally uniformly distributed between threshold value and 52 Hz.		P
	The manufacturer provides the documentation showing the principle of the used randomizing concept.		P
	Compliance is performed by inspection and comparing with EN 50549-1:2019 or EN 50549-2:2019.		P
5.4.3.3	**Power response to under-frequency**		N/A
5.4.3.3.1	**Selection of frequency threshold and droop**		N/A
	Refer to test report		N/A
5.4.3.3.2	**Selection of frequency points**		N/A
	Refer to test report		N/A
5.4.3.3.3	**Testing procedure for verification of response time and active power response accuracy**		N/A
	Refer to test report		N/A
5.4.4	**Assessment criteria**		P
	Refer to test report	Assessment criteria see appendix table 5.4.3.2	P
5.4.5	**Documentation**		P
	Refer to test report	Test records see appendix table 5.4.3.2	P
5.5	**Power specification and response to voltage variations**		P
5.5.1	**Power capabilities assessment - voltage support by reactive power**		P
5.5.1.1	**General**		P
	The aim of this measurement is to determine:		P
	– the values of the rated current, of the maximum active power (P_{max}) and of the maximum apparent power (S_{max}) of the GUT;		P
	– the maximum possible under ($Q_{max\ under}$) and overexcited ($Q_{max\ over}$) reactive power		P

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Clause	Requirement + Test	Result – Remark	Verdict
	capability of the EUT as function of the active power; this includes verification of the reactive power limits valid at maximum active power condition;		
	– the dependency of the reactive power capability to voltage.		P
5.5.1.2	**Test application and verification methodology**		P
	This verification process can be conducted on the complete unit or on the component related to voltage and reactive power and their control.		P
	The approaches are considered justified when defining the boundary of the Power Generating Unit:	☒ PV generating unit ☐ Battery generating units ☐ full converter generating units (Wind or CHP) ☐ generating unit having batteries as a power supply ☐ DFIG generating units ☐ generating unit coupled with a synchronous generator ☐ synchronous generating technology	P
	In case the power generating unit includes a step-up transformer as declared by its manufacturer, the verification shall be carried out at the generating unit terminals as declared by the manufacturer, therefore including the step-up transformer.		P
	Depending on the generating unit size, generating unit technology, site test or laboratory availability the verification can be carried out:	☒ using a grid simulator or a test bench in a laboratory ☐ at site ☐ at manufacturer testing facility ☒ based both on tests and calculation	P
5.5.1.3	**Verification procedure to determine the power capability (active, reactive, apparent) at nominal voltage**		P
	Refer to test report	Verification procedure see appendix table 5.5.1	P
5.5.1.4	**Acceptance Criteria – power capability at nominal voltage**		P
	Refer to test report	Assessment criteria see appendix table 5.5.1	P
5.5.1.5	**Documentation – power capability at nominal voltage**		P
	Refer to test report	Test records see appendix table 5.5.1	P

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Clause	Requirement + Test	Result – Remark	Verdict
5.5.1.6	**Verification procedure for reactive power capability considering voltage range**		P
	Refer to test report	Verification procedure see appendix table 5.5.1	P
5.5.1.7	**Acceptance Criteria – power capability considering voltage range**		P
	Refer to test report	Assessment criteria see appendix table 5.5.1	P
5.5.1.8	**Documentation – power capability considering voltage range**		P
	Refer to test report	Test records see appendix table 5.5.1	
5.5.2	**Voltage support by reactive power - test to determine the reactive power control modes**		P
5.5.2.1	**General**		P
	The aim of this procedure is to determine:		P
	– the response of the generating unit to set point commands regarding the static accuracy, the dead time, the step response time and the settling time of reactive power,		P
	– the response of the generating unit to voltage changes while operating in voltage related control modes regarding the static accuracy, the dead time the step response time and the settling time of reactive power,		P
	– the response of the generating unit to power changes while operating in power related control modes regarding the static accuracy, the dead time the step response time and the settling time of reactive power.		P
5.5.2.2	**Test application and verification methodology**		P
	The test application of 5.5.1.2 applies. Additionally, the approaches are considered justified when defining the boundary of the Power Generating Unit	☐ re-testing of previously tested generating unit with similar ratings and hardware components, performed according 4.2.12. ☒ performed as simulated input test according 4.2.8 ☐ performed as test by changing a control parameter according 4.2.9.	P
5.5.2.3	**Verification procedure for Set point control**		P
5.5.2.3.1	**General**		P
	The aim of this procedure is to determine the response of the generating unit to set point commands regarding the static accuracy, the dead time, the step response time and the settling time of reactive power		P

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Clause	Requirement + Test	Result – Remark	Verdict
	using either reactive power or active factor set points or optional voltage set value depending on the generating unit control system specified by the manufacturer.		
	The test procedure and documentation are identical for all reactive power set point modes.		P
5.5.2.3.2	**Reactive power set point control accuracy**		P
	Refer to test report	Verification procedure see appendix table 5.5.2.3	P
5.5.2.3.3	**Reactive power dynamic behaviour**		P
	Refer to test report	Verification procedure see appendix table 5.5.2.3	P
5.5.2.3.4	**Assessment criteria**		P
	Refer to test report	Assessment criteria see appendix table 5.5.2.3	P
5.5.2.3.5	**Documentation**		P
	Refer to test report	Test records see appendix table 5.5.2.3	P
5.5.2.4	**Verification procedure for voltage related control mode for reactive power Q(U)**		P
5.5.2.4.1	**General**		P
	The aim of this procedure is to test the response of voltage related control mode Q(U) for reactive power as specified in EN 50549-1:2019 and EN 50549-2:2019 section 4.7.2.3.3.		P
	If the conformity assessment is conducted for a specific grid code, the EUT control shall be configured as defined in this grid code.		P
	If the conformity assessment is conducted in general, the configuration shall be chosen in a way that each parameter shall be tested once configured to its minimum and once to its maximum according to the principle given in Table 17 and Table 18.		P
5.5.2.4.2	**Test procedure for steady-state behaviour**		P
	Depending on the used test set up this might be done by	☒ utilizing a grid simulator or OLTC transformer ☐ simulating to the measurement inputs of the control unit or to measurement sensors of the EUT instead of to the terminals of the	P

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Clause	Requirement + Test	Result – Remark	Verdict
		EUT ☐ modifying the reading of the voltage measurement of the EUT control system ☐ modifying the threshold parameters and characteristic curve that define the EUT response as a function of the measured voltage	
	Refer to test report	Verification procedure see appendix table 5.5.2.4	P
5.5.2.4.3	**Test procedure for dynamic behaviour**		P
	Refer to test report	Verification procedure see appendix table 5.5.2.4	P
5.5.2.4.4	**Assessment criteria**		P
	Refer to test report	Assessment criteria see appendix table 5.5.2.4	P
5.5.2.4.5	**Documentation**		P
	Refer to test report	Test records see appendix table 5.5.2.4	P
5.5.2.5	**Verification procedure for power related control modes for reactive power**		P
5.5.2.5.1	**General**		P
	The aim of this procedure is to test the response of power related control mode Q (P) and cos φ (P) for reactive power as specified in EN 50549-1:2019 and EN 50549-2:2019 section 4.7.2.3.4.		P
	If the conformity assessment is conducted for a specific grid code, the EUT control shall be configured as defined in this grid code.		P
	If the conformity assessment is conducted in general, the configuration shall be chosen in a way that each parameter shall be tested once configured to its minimum and once to its maximum according to the principle given in Table 17 and Table 18.		P
5.5.2.5.2	**Test procedure for quasi-stationary behaviour**		P
	Refer to test report	Verification procedure see appendix table 5.5.2.5	P
5.5.2.5.3	**Test procedure for dynamic behaviour**		P
	Refer to test report	Verification procedure see appendix table 5.5.2.5	P

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Clause	Requirement + Test	Result – Remark	Verdict
5.5.2.5.4	**Assessment criteria**		P
	Refer to test report	Assessment criteria see appendix table 5.5.2.5	P
5.5.2.5.5	**Documentation**		P
	Refer to test report	Test records see appendix table 5.5.2.5	P
5.6	**Voltage related active power reduction - P(U)**		P
5.6.1	**General**		P
	The aim of this procedure is to test the optional operational capability of active power reduction in case of overvoltage as specified in EN 50549-1:2019 and EN 50549-2:2019 section 4.7.3.		P
	If the conformity assessment is conducted for a specific grid code, the EUT control shall be configured as defined in this grid code.		P
	If the conformity assessment is conducted in general, the configuration shall be chosen in a way that each parameter shall be tested once configured to its minimum and once to its maximum.		P
5.6.2	**Test application and verification**		P
	The same verification methods as described in 5.4.2 apply.		P
5.6.3	**Test procedure for steady-state behaviour**		P
	Depending on the used test set up this might be done by	☒ utilizing a grid simulator or OLTC transformer ☐ simulating to the measurement inputs of the control unit or to measurement sensors of the EUT instead of to the terminals of the EUT ☐ modifying the reading of the voltage measurement of the EUT control system ☐ modifying the threshold parameters and characteristic curve that define the EUT response as a function of the measured voltage	P
	Refer to test report	Verification procedure see appendix table 5.6	P

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Clause	Requirement + Test	Result – Remark	Verdict
5.6.4	**Test procedure for dynamic behaviour**		P
	Refer to test report	Verification procedure see appendix table 5.6	P
5.6.5	**Assessment criteria**		P
	Refer to test report	Assessment criteria see appendix table 5.6	P
5.6.6	**Documentation**		P
	Refer to test report	Test records see appendix table 5.6	P
5.7	**EMC and power quality**		P
	The goal of this clause is to define the procedure to identify the EMC and the power quality characteristics of the generating unit.		P
5.7.1	**EMC**		P
	The generating units shall comply with the requirements on electromagnetic compatibility.		P
	The interface protection systems, including integrated systems, shall comply to EN 60255-26.	See test report from attachments 3	P
5.7.2	**Power Quality**		P
5.7.2.1	**Test application and verification methodology**		P
	The assessment shall be performed as complete unit test or by using alternative methods as indicated in the flow chart (see Figure 37).		P
5.7.2.2	**Verification procedure for harmonics, interharmonics and higher frequencies up to 9 kHz**		P
5.7.2.2.1	**General**		P
	This test aims at evaluating the emissions of current harmonics, interharmonics and higher frequency components of a generating unit in continuous operation.	☐ ≤ 16A, EN 61000-3-2 ☐ > 16A and ≤ 75A, EN 61000-3-12 ☐ > 75A, EN 61000-4-7 or ☒ > 75A, EN IEC 61400-21-1	P
5.7.2.2.2	**Documentation**		P
	Refer to test report	Test records see appendix table 5.7.2.2	P
5.7.2.3	**Verification procedure for flicker and rapid voltage changes**		P
5.7.2.3.1	**General**		P
	This test aims at evaluating the emissions of		P

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Clause	Requirement + Test	Result – Remark	Verdict
	flicker and the generation of rapid voltage changes by a generating unit.		
	The real applied operational mode during the test shall be clearly stated in the report.		P
5.7.2.3.2	**Flicker - Generation units with a rated current ≤ 75 A**		N/A
	The following standards shall be used for verification	☐ ≤ 16A, EN 61000-3-3 ☐ > 16A and ≤ 75A, EN 61000-3-11	N/A
5.7.2.3.3	**Flicker - Generation units with a rated current > 75 A**		P
	The objective of the test is to determine the system flicker coefficient $c(\Psi_k)$ at the system impedance angles 30°, 50°, 70° and 85°.		P
	The flicker coefficient is determined according to the equation in 3.1.8.2.		P
	For controllable generating units with rated currents > 75 A, at least 12 measurements of 10 min each shall be performed. One measurement shall be made for each of the 10 % active power bins from 0 % P_n or minimum regulating level, whichever is the higher to 90 % P_n and three measurements shall be made for the 10 % active power bin from 100 % P_n.		P
	A measurement consists of determining the short-term flicker strength P_{st} as a 3-tuple (phases L1, L2 and L3).		P
	The maximum over all P_{st} shall be selected as the value for the long-term flicker strength P_{lt}.		P
5.7.2.3.4	**Rapid voltage changes - Generation units with a rated current ≤ 75 A**		N/A
	The following standards shall be used for the verification	☐ ≤ 16A, EN 61000-3-3 ☐ > 16A and ≤ 75A, EN 61000-3-11	N/A
5.7.2.3.5	**Rapid voltage changes - Generation units with a rated current > 75 A**		P
	The aim of the tests is to determine k_i and $k_{i,max}$.		P
	If the manufacturer is aware of critical cases deviating from this (e.g. in the case of deviating cos(φ) specifications), these shall be additionally tested and identified.		P
5.7.2.3.6	**Documentation**		P
	Refer to test report	Test records see appendix table 5.7.2.3	P

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Clause	Requirement + Test	Result – Remark	Verdict
5.7.2.4	**Verification procedure for DC injection**		P
5.7.2.4.1	**General**		P
	The purpose of the test is to verify that no inadmissible amounts of DC current or AC current with frequency < 1 Hz are injected into the low voltage network.		P
	This test is required for converters only.		P
5.7.2.4.2	**Acceptance criteria and documentation**		P
	Refer to test report	Test records see appendix table 5.7.2.4	P
5.8	**Interface protection**		N/A
5.8.1	**General**		N/A
	The aim of this procedure is to provide evidence of compliance with the requirement of the interface protection as required by EN 50549-1:2019 / EN 50549-2:2019, 4.9.	☐ integrated device ☒ dedicated device (not provided by inverter manufacturer)	N/A
	For single-phase generating units only the feed-in phase needs to be tested, in all other cases the tests shall be conducted three-phase.		N/A
5.8.2	**Test application and verification methodology**		N/A
	For interface protections as internal device the verification process can be conducted as:	☐ Test on complete generating unit ☐ Test on the electrical generation system ☐ Test at limited power ☐ Test on stopped generating unit ☐ simulated input test ☐ Test of the real generating unit control unit in a simulated environment	N/A
	For interface protections as dedicated device the verification process can be conducted as:	☐ Component test on an independent component ☐ Evaluation by inspection and test of dependent components	N/A
5.8.3	**Verification procedure for generating plants to be connected to a LV distribution network with Interface protection as internal device**		N/A
5.8.3.1	**General**		N/A
	The procedure of this part applies to the following protection functions:		N/A
	– Voltage protection (Undervoltage protection [27] and Overvoltage protection		N/A

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Clause	Requirement + Test	Result – Remark	Verdict
	[59]);		
	– Overvoltage 10 min mean protection;		N/A
	– Frequency protection (Underfrequency protection [81 <] and Overfrequency protection [81 >];		N/A
	– ROCOF protection.		N/A
5.8.3.2	**Voltage and frequency protections**		N/A
5.8.3.2.1	**Undervoltage and overvoltage of unbalanced three-phase systems**		N/A
5.8.3.2.2	**Accuracy of the voltage and frequency setting values: verification methods**		N/A
5.8.3.2.3	**Start, operate and disconnection times: measurements methods**		N/A
5.8.3.2.4	**Reset time and reset ratio: verification methods**		N/A
5.8.3.2.5	**Verification procedure**		N/A
	Refer to test report	Verification procedure see appendix table 5.8.3.2	N/A
5.8.3.2.6	**Immunity to voltage harmonics**		N/A
	The aim of this test is to assess the ability of the protection function to perform the steady-state measurement of the fundamental power system with superimposed harmonics on the voltage signals.		N/A
5.8.3.2.7	**Assessment criteria for voltage and frequency protection**		N/A
	Refer to test report	Assessment criteria see appendix table 5.8.3.2	N/A
5.8.3.2.8	**Documentation**		N/A
	Refer to test report	Test records see appendix table 5.8.3.2	N/A
5.8.3.3	**Overvoltage 10 min mean protection**		N/A
5.8.3.3.1	**Verification method**		N/A
5.8.3.3.2	**Verification procedure**		N/A
	Refer to test report	Verification procedure see appendix table 5.8.3.3	N/A
5.8.3.3.3	**Assessment criteria**		N/A
	Refer to test report	Assessment criteria see appendix table 5.8.3.3	N/A
5.8.3.3.4	**Documentation**		N/A
	Refer to test report	Test records see appendix table 5.8.3.3	N/A

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Clause	Requirement + Test	Result – Remark	Verdict
5.8.3.4	**ROCOF protection**		N/A
5.8.3.4.1	**Accuracy of the ROCOF setting values and operate time: verification method**		N/A
5.8.3.4.2	**Reset time and reset ratio: verification methods (under consideration)**		N/A
5.8.3.4.3	**Verification procedure for ROCOF protection**		N/A
	Refer to test report	Verification procedure see appendix table 5.8.3.4	N/A
5.8.3.4.4	**Assessment criteria for ROCOF protection**		N/A
	Refer to test report	Assessment criteria see appendix table 5.8.3.4	N/A
5.8.3.4.5	**Documentation**		N/A
	Refer to test report	Test records see appendix table 5.8.3.4	N/A
5.8.4	**Verification procedure for generating plants to be connected to a LV distribution network with Interface protection as dedicated device**		N/A
5.8.5	**Verification procedure for generating plants to be connected to a MV distribution network**		N/A
5.8.5.1	**Voltage protections**		N/A
	The following protection functions are concerned:		N/A
	– Undervoltage protection [27]		N/A
	– Overvoltage protection [59]		N/A
	– Positive sequence undervoltage protection [27D]		N/A
	– Negative sequence overvoltage protection [47]		N/A
	– Zero sequence overvoltage protection [59N]		N/A
	– The Overvoltage 10 min mean protection is treated in 5.8.5.2.		N/A
	The testing of the interface protection shall comply with EN 60255-127.		N/A
	By complying with EN 60255-127, the interface protection shall also comply with EN 60255-1, EN 60255-26 and EN 60255-27.		N/A
	tests related to undervoltage and overvoltage shall be performed for each phase to phase and phase to neutral voltages.		N/A
5.8.5.2	**Overvoltage 10 min mean protection**		N/A

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Clause	Requirement + Test	Result – Remark	Verdict
	The test of part 5.8.3.3. shall be conducted.		N/A
5.8.5.3	**Frequency protections**		N/A
	The following protection functions are concerned:		N/A
	– Underfrequency protection [81 <]		N/A
	– Overfrequency protection [81 >]		N/A
	– Rate of change of frequency protection (ROCOF) [81R]		N/A
	The testing of the interface protection shall comply with IEC 60255-181.		N/A
	By complying with EN 60255-127, the interface protection shall also comply with EN 60255-1, EN 60255-26 and EN 60255-27.		N/A
5.8.6	**Islanding detection**		P
5.8.6.1	**Verification method and documentation for passive means to detect island situation**		P
	If only passive anti islanding detection is applied such as ROCOF protection and voltage and frequency protection, the procedures according to 5.8.3, 5.8.4 or 5.8.5 apply. This shall be stated in the report.		P
5.8.6.2	**Verification method and documentation for active means to detect island situation**		P
	If active anti islanding detection is applied, EN 62116 is used to verify correct behaviour of active islanding detection. The test report according EN 62116 shall be annexed to the test report.		P
5.9	**Connection and starting**		P
5.9.1	**General**		P
	The aim of this procedure is to provide evidence of the capability of generating units to comply with the requirements given in EN 50549-1:2019 and EN 50549-2:2019, 4.10 regarding connection and starting to generate electrical energy		P
5.9.2	**Test application and verification methodology**		P
	This test shall be performed as	☐ Test on complete generating unit ☒ As test on the electrical generation system ☐ As component test on an independent component	P

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Clause	Requirement + Test	Result – Remark	Verdict
		☐ As simulated input test ☐ As test by changing a control parameter ☐ As Test of the real generating unit control unit in a simulated environment	
5.9.3	**Automatic reconnection after tripping**		P
5.9.3.1	**Verification procedure**		P
	Refer to test report	Verification procedure see appendix table 5.9.3	P
5.9.3.2	**Assessment criteria**		P
	Refer to test report	Assessment criteria see appendix table 5.9.3	P
5.9.4	**Starting to generate electrical power**		P
5.9.4.1	**Verification procedure**		P
	Refer to test report	Verification procedure see appendix table 5.9.4	P
5.9.5	**Assessment criteria**		P
	Refer to test report	Verification procedure see appendix table 5.9.4	P
5.9.6	**Documentation**		P
	Refer to test report	Test records see appendix table 5.9.3 and 5.9.4	P
5.9.7	**Synchronisation**		P
5.9.7.1	**General**		P
	The generating unit has to provide an operation mode that allows synchronisation with the distribution network fully automatically.		P
	For inverter-based generators this topic is considered with the switching current factor dealt with in 5.7.2.3.		P
	For synchronous generators this topic is considered in the verification of the settings on the synchronization device.		N/A
	The test has the aim to verify the generators have smooth connection to the grid.		P
5.9.7.2	**Verification procedure**		P
	Refer to test report	Verification procedure see appendix table 5.7.2.3	P

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Clause	Requirement + Test	Result – Remark	Verdict
5.9.7.3	**Documentation**		P
	Refer to test report	Test records see appendix table 5.7.2.3	P
5.10	**Active power reduction on set point**		P
5.10.1	**General**		P
	The aim of this procedure is to determine the response of the generating unit to active power reduction or active power set point commands regarding the static accuracy, the dead time, the step response time and the settling time.		P
5.10.2	**Test application and verification methodology**		P
	The assessment shall be performed:	☒ primary energy converter that individually adjusts the level of its generated power without requiring any control device (e.g. PV or battery without BMS) ☐ primary energy converter which requires a suitable control device (e.g. battery without BMS, fuel cells) ☐ primary energy converter which requires a suitable control device (e.g. battery without BMS, fuel cells) with the generator equipped with a converter absorbing constant power ☐ primary energy converter which is controlled on the primary energy source and its controller ☐ synchronous generating technology ☐ re-testing of previously tested generating unit with similar ratings and hardware components ☐ other cases not mentioned above	P
	Depending on the generating unit size, generating unit technology, site test or laboratory availability the verification can be carried out using one the following methods:	☒ using a grid simulator ☐ at site	P
5.10.3	**Verification procedure**		P
5.10.3.1	**General**		P
	The verification procedure consists of the verification of the accuracy and of the		P

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EN 50549-10:2022			
Clause	Requirement + Test	Result – Remark	Verdict
	settling time		
5.10.3.2	**Verification of the accuracy**		P
5.10.3.2.1	**Verification procedure of the accuracy**		P
	Refer to test report	Verification procedure see appendix table 5.10	P
5.10.3.2.2	**Assessment criteria**		P
	Refer to test report	Assessment criteria see appendix table 5.10	P
5.10.3.2.3	**Documentation**		P
	Refer to test report	Test records see appendix table 5.10	P
5.10.3.3	**Test procedure for dynamic behaviour**		P
5.10.3.3.1	**Verification procedure for dynamic behaviour**		P
	Refer to test report	Verification procedure see appendix table 5.10	P
5.10.3.3.2	**Acceptance criteria for dynamic behaviour**		P
	Refer to test report	Assessment criteria see appendix table 5.10	P
5.10.3.3.2	**Documentation for dynamic behaviour**		P
	Refer to test report	Test records see appendix table 5.10	P
5.11	**Remote information exchange**		P
	Regarding remote information exchange and communication the test procedures of the applied communication standards shall be applied.		P
5.12	**Requirements regarding single fault tolerance of interface protection system and interface switch**		N/A
5.12.1	**General**		N/A
	The aim of this procedure is to provide evidence of the single fault tolerance of the interface protection system and the interface switch as required by EN 50549-1:2019, 4.13.		N/A
5.12.2	**Single fault tolerance of interface protection system**		N/A
5.12.2.1	**Verification methodology**		N/A

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EN 50549-10:2022			
Clause	Requirement + Test	Result – Remark	Verdict
	The test for correct function under single fault conditions and fault detection with subsequent shutdown is performed by fault simulation, if necessary with additional fault tests.		N/A
	It shall be checked that a single fault does not lead to the loss of the interface protection function.		N/A
5.12.2.2	**Verification process**		N/A
	Refer to test report	Verification procedure see appendix table 5.12	N/A
5.12.2.3	**Assessment criteria**		N/A
	Refer to test report	Assessment criteria see appendix table 5.12	N/A
5.12.2.4	**Documentation**		N/A
	Refer to test report	Test records see appendix table 5.12	N/A
5.12.3	**Single fault tolerance of the interface switch**		N/A
5.12.3.1	**Verification methodology**		N/A
	The conformity is assessed by inspection of the interface switch		N/A
5.12.3.2	**Assessment criteria**		N/A
	Refer to test report	Assessment criteria see appendix table 5.12	N/A
5.12.3.3	**Documentation**		N/A
	Refer to test report	Test records see appendix table 5.12	N/A
5.13	**Model definition and model validation for generating units of synchronous generating technology**		N/A
Annex A	**Fault ride through test setup (normative)**		P
Annex B	**Template for statements of conformity and parameters (normative)**		P
Annex C	**Table 8 of EN 61000-4-13:2002 and Table 26 of EN IEC 60255-181:2019 (informative)**		P

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5.2.1	Test for frequency operating range				P
Test at	Temperature (°C):	25	Humidity (%)	45	
Active power declared by manufacturer during frequency range			350		kW
Function deactivated during the testing		LFSM-O, LFSM-U, cos φ (P), OF/UF protection			
Conformity to		☐ EN 50549-1:2019 ☒ EN 50549-2:2019 ☐ specific grid code_____ ☐ As declared by manufacturer			
Manufacturer declared maximum duration (if declared by manufacturer)		Unlimited with protection only @47.5 Hz			min
		Unlimited with protection only @51.5 Hz			min
		Unlimited with protection only @47 Hz			s
		Unlimited with protection only @52 Hz			min

Test procedure:

The verification shall be carried out:
– at the maximum active power for this operating frequency as stated by the manufacturer and;
– an active factor equal to 1 shall be used.

Test conditions	U_1 [p.u.]	I_1 [A]	$f_{0.2}$ [Hz]	$P_{0.2}$ [W]	$Q_{0.2}$ [VAr]	cos φ	Power reduction [%]	Power reduction limit [%]	Trip
Minimum requirements									
47.5 Hz @5min	1.000	251.46	47.50	348508	7904	1.000	0.4	20	☐ Yes ☒ No
51.5 Hz @5min	1.000	119.71	51.50	165836	4332	1.000	52.6	-	☐ Yes ☒ No
Stringent requirements									
47 Hz @20s	1.000	251.46	47.50	348508	7904	1.000	0.4	25	☐ Yes ☒ No
52 Hz @5min	1.000	70.07	52.00	97029	3654	0.999	72.3	-	☐ Yes ☒ No

Remark:

5.2.2	Test for voltage operating range				P
Test at	Temperature (°C):	25	Humidity (%)	45	
Test power (Max. apparent power)			350	kVA	
Cos φ setpoint range:	-0.8, …, 1, …, +0.8		Q setpoint range:	-0.6 Pn, …, +0.6 Pn	
Generating unit documentation showing nominal voltage and limits, as well as apparent power within the voltage range limits					

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Function deactivated during the testing	Q (U), cos φ (P), UV/OV protection, UVRT, OVRT	
Conformity to	☐ EN 50549-1:2019 ☒ EN 50549-2:2019 ☐ specific grid code_____ ☐ As declared by manufacturer	
Manufacturer declared minimum and maximum limits (if declared by manufacturer)	720	V
	880	V

Test procedure:

At least 2 verifications shall be conducted, one at each voltage limit.
The test shall be carried out with the generating unit operating as follows:
– at the apparent power for this operating point as stated by the manufacturer;
– at an active factor or reactive power set point within normal operation range of the generating unit as stated by the manufacturer;
– at nominal frequency or in general not exceeding the voltage over frequency (U/f) ratio as stated by the manufacturer (or as stated in the applicable product standard).
The voltage at the terminals shall be modified in steps according to the following sequence:
– The voltage shall be reduced to the minimum voltage and maintained for a minimum of 10 min time;
– The voltage shall be increased to its nominal value and maintained for a minimum of 5 min and up to 10 min;
– The voltage shall be increased to its maximum limit and maintained for a minimum of 10 min time;
– The voltage shall be decreased to the voltage nominal value.
The followings values shall be used as reference when verifying compliance to the EN 50549-1:2019:
– U ≤ 85 % Un
– U ≥ 110 % Un
The followings values shall be used as reference when verifying compliance to the EN 50549-2:2019:
– U ≤ 90 % Un
– U ≥ 110 % Un

Test conditions (one by one)	$\underline{U}_1$ [p.u.]	$\underline{I}_1$ [A]	$f_{0.2}$ [Hz]	$P_{0.2}$ [W]	$Q_{0.2}$ [VAr]	$S_{0.2}$ [VA]	cos φ	Trip
Q=0								
90% Un @10min	0.900	251.80	50.00	314031	-795	314046	1.000	☐ Yes ☒ No
Un @5min – 10min	1.000	168.19	50.00	233055	5357	233121	1.000	☐ Yes ☒ No
110% Un @10min	1.100	228.21	50.00	347738	7556	347821	1.000	☐ Yes ☒ No
Un	1.000	251.66	50.00	348791	7088	348863	1.000	☐ Yes ☒ No
Q=min								
90% Un @10min	0.899	251.27	50.00	249300	-189415	313109	0.796	☐ Yes ☒ No
Un @5min –	1.000	249.26	50.00	275377	208364	345324	0.797	☐ Yes ☒ No

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10min								
110% Un @10min	1.099	229.16	50.00	278649	210284	349092	0.798	☐ Yes ☒ No
Un	1.000	249.09	50.00	275192	208224	345092	0.797	☐ Yes ☒ No
Q=max								
90% Un @10min	0.900	255.97	50.00	253684	191098	317602	0.799	☐ Yes ☒ No
Un @5min – 10min	1.001	254.51	50.00	278963	216278	352983	0.790	☐ Yes ☒ No
110% Un @10min	1.100	231.49	50.00	278581	216712	352948	0.789	☐ Yes ☒ No
Un	1.001	254.46	50.00	278959	216167	352912	0.790	☐ Yes ☒ No
Remark:								

5.3.1	**Test for rate of change of frequency (ROCOF)**			**P**
Test at	**Temperature (°C):**	25	**Humidity (%)**	45
Test power (80-100%Pn)		350		kW
ROCOF for testing		2		Hz/s
ROCOF protection setting		-		Hz/s
Vector shift protection setting		90		°
Function deactivated during the testing		ROCOF protection, LFSM-O, LFSM-U, cos φ (P)		
Conformity to		☐ EN 50549-1:2019 ☒ EN 50549-2:2019 ☐ specific grid code_____ ☐ As declared by manufacturer _____		

Test procedure:

Initial status of the generating unit before the test shall be as follows:
– The generating unit, connected to a grid simulator, shall be operating between 100 % and 80 % of the nominal power
– with an active factor equal to 1.
– ROCOF protection function shall be inactive during the test. The ROCOF protection function and correspondent settings shall be tested as described in 5.7.
Then the test shall be conducted following the sequence represented in the Figure 4 below.

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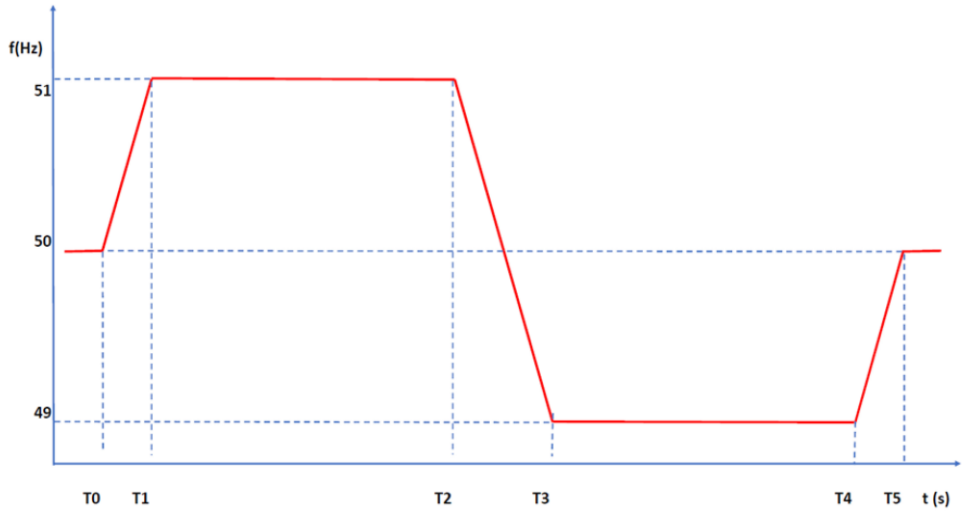

Test sequence	$\underline{U}_1$ [p.u.]	$\underline{I}_1$ [A]	$f_{0.2}$ [Hz]	$P_{0.2}$ [W]	$Q_{0.2}$ [VAr]	cos φ	Trip
Before T0 (0 s) @50Hz	1.000	251.64	50.00	348794.00	5987	1.000	☐ Yes ☒ No
T0 to T1(0.5 s) @50-51Hz	--	--	---	--	--	--	☐ Yes ☒ No
T1 to T2(3.5 s) @51Hz	1.000	170.54	51.00	236313.00	5344	1.000	☐ Yes ☒ No
T2 to T3(4.5 s) @51-49Hz	--	--	---	--	--	--	☐ Yes ☒ No
T3 to T4(7.5 s) @49Hz	1.000	251.46	49.00	348502.00	8194	1.000	☐ Yes ☒ No
T4 to T5 (8 s) @49-50Hz	--	--	---	--	--	--	☐ Yes ☒ No
After T5(8 s) @50Hz	1.000	251.50	50.00	348601.00	5989	1.000	☐ Yes ☒ No

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5.3.2	**Test for phase jump**				**P**
Test at	**Temperature (°C):**	25	**Humidity (%)**	45	
Test power before phase jump (>90%Pn)			350000		**W**
Nominal voltage	800	V	**Nominal frequency**	50	Hz
Power factor	cos φ = 1				
Frequency protection setting (if applicable)			/		Hz
ROCOF protection setting (if applicable)			2.5		Hz/s
Vector shift protection setting (if applicable)			90		°
1) No tripping and fast recovery phase jump ride through capability for testing			+δ_1 = +_90_° and -δ_1 = -_90_°		
Active power and reactive power recovery response time			1 s		
Active power and reactive power recovery settling time			1 s		
2) Phase jump without damage for testing			+$\delta_{2.1}$ = +_90_° and -$\delta_{2.1}$ = -_90_° +$\delta_{2.2}$ = +_180_° and -$\delta_{2.2}$ = -_180_°		
Conformity to			☒ EN 50549-10:2022 ☐ specific grid code_____ ☐ As declared by manufacturer _____		

Test procedure:

Tests are conducted at nominal frequency. In case of three-phase generating unit. a symmetric three-phase system and all phase to phase voltages shall be tested. In case of single-phase generating unit test is conducted for the active phase only.

Tests are conducted according to the following procedure:

– Before the test the EUT is operating at nominal voltage. at a power level above 0.9 P_n and with a unit power factor (cos φ = 1) at least for 5 min or the needed time for the internal temperature stabilization. whatever is the longer.

– Phase jumps are introduced simultaneously on all phases

– For capability 1 a phase jump shall be applied with two different values. +δ_1 and -δ_1. The phase jump shall be introduced with two different inception angles. One test shall be performed with a phase jump at the voltage zero crossing (0°) of the sinewave and the other with a phase jump at the top of the sinewave (+90°). For three-phase systems phase 1 is used as reference.

– For capability 2: The phase jump shall be applied with two different values. +$\delta_{2.1}$ and +$\delta_{2.2}$ at the voltage zero crossing (0°) of the sinewave. The two-phase jumps shall be introduced with two different inception angles. One test shall be performed with a phase jump at the voltage zero crossing (0°) of the sinewave and the other with a phase jump at the top of the sinewave (+90°). For three-phase systems phase 1 is used as reference.

Test sequence	U_{phasor_before} [°] L-L	U_{phasor_after} [°] L-L	$T_{P_response}$ [s]	$T_{P_settling}$ [s]	$T_{Q_response}$ [s]	$T_{Q_settling}$ [s]	Results
1) +δ_1 (0° crossing)	30	120	0.292	0.292	0.067	0.067	☒ ride through ☐ no ride through
1) -δ_1 (0°	30	-60	0.118	0.118	0.051	0.051	☒ ride through

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crossing)							☐ no ride through
1) +δ_1 (+90° crossing)	120	210	0.278	0.278	0.070	0.070	☒ ride through ☐ no ride through
1) -δ_1 (+90° crossing)	120	30	0.265	0.265	0.049	0.049	☒ ride through ☐ no ride through
2) +90° (0° crossing)	30	120	---	---	---	---	☒ No damage ☐ damage
2) -90° (0° crossing)	30	-60	---	---	---	---	☒ No damage ☐ damage
2) +90° (+90° crossing)	120	210	---	---	---	---	☒ No damage ☐ damage
2) -90° (+90° crossing)	120	30	---	---	---	---	☒ No damage ☐ damage
2) +180° (0° crossing)	30	210	---	---	---	---	☒ No damage ☐ damage
2) -180° (0° crossing)	30	-150	---	---	---	---	☒ No damage ☐ damage
2) +180° (+90° crossing)	120	300	---	---	---	---	☒ No damage ☐ damage
2) -180° (+90° crossing)	120	-60	---	---	---	---	☒ No damage ☐ damage

Remark:
For each test. time-series of voltage and current values shall be recorded with a sufficient sampling rate ≥ 10kHz. The measurement is taken at the terminals of the EUT for at least 5 s (or according to the DSO's / national regulation) prior to the phase jump and until the effect of the phase jump on the generating unit has abated. but at least for 10 s after the event. The positive and negative sequence of active power. reactive power. active current. reactive current and voltage shall be calculated from the recorded data.

1) X-Y graph (current VS time. 5 s before to 10s after)

Or root mean square values calculated over a time window running from 20 ms including amplitude and angle.

2) positive and negative sequence of active power. reactive power. active current. reactive current

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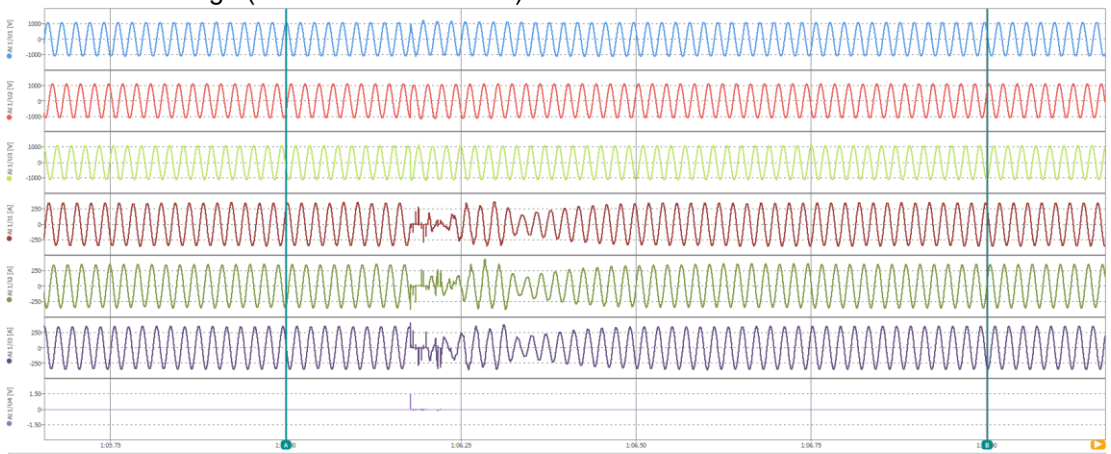
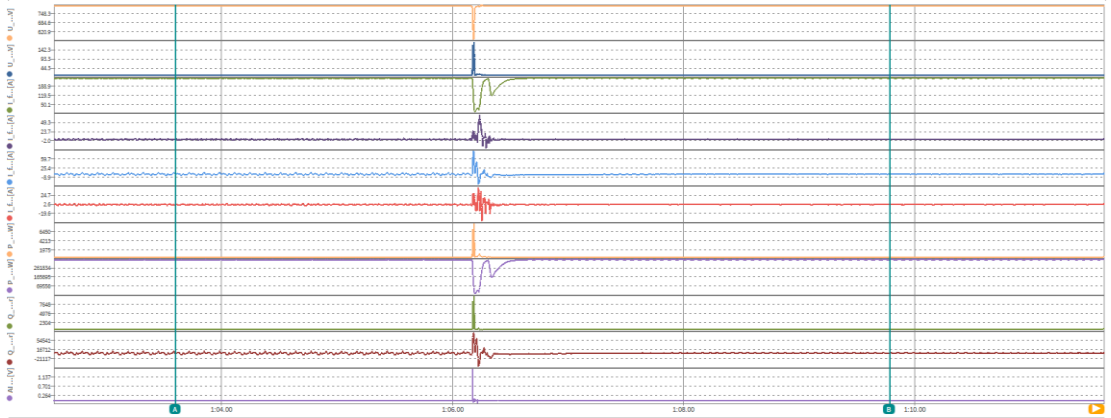
and voltage (5 s before to 10s after)



时间 [s]	A	B	相差
AI 1/U1 [V]	1:06.0020000	1:07.0013000	0.9993000
AI 1/U2 [V]	1093.694	524.9794	-568.7144
AI 1/U3 [V]	-802.7967	600.4081	1403.205
AI 1/I1 [A]	-291.0569	-1125.478	-834.4210
AI 1/I2 [A]	248.7066	291.7046	42.99796
AI 1/I3 [A]	-344.9214	14.22286	359.1442
AI 1/U4 [V]	96.02390	-305.9060	-401.9298
	-9.298e-3	-3.815e-3	5.484e-3



时间 [s]	A	B	相差
U_fund_SYM+_rc@POWER/0 [V]	1:03.6041	1:09.7826	6.1785
U_fund_SYM-_rc@POWER/0 [V]	800.2819	800.2835	1.587e-3
I_fund_P_SYM+_rc@POWER/0 [A]	0.476087	0.428793	-0.047294
I_fund_P_SYM-_rc@POWER/0 [A]	249.5697	249.6372	0.067535
I_fund_Q_SYM+_rc@POWER/0 [A]	0.070491	-0.773381	-0.843872
I_fund_Q_SYM-_rc@POWER/0 [A]	2.960341	-0.201078	-3.161419
P_fund_SYM-_rc@POWER/0 [W]	-0.612886	0.472705	1.085591
P_fund_SYM+_rc@POWER/0 [W]	0.058128	-0.574383	-0.632511
Q_fund_SYM-_rc@POWER/0 [var]	345935.8	346030.1	94.28125
Q_fund_SYM+_rc@POWER/0 [var]	-0.505390	0.351074	0.856464
AI 1/U4 [V]	4103.415	-278.7210	-4382.136
	-8.821e-3	-8.583e-3	2.384e-4

1) +δ1 (0° crossing)

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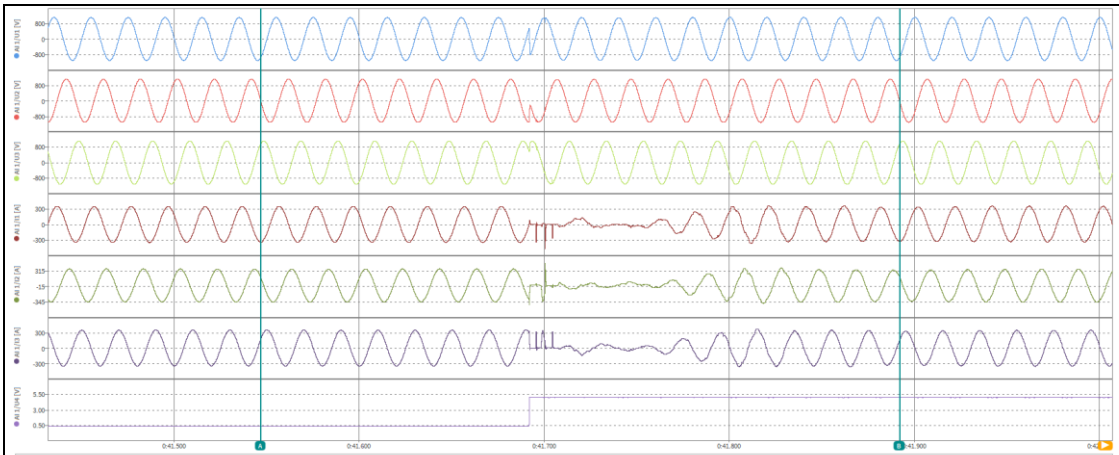
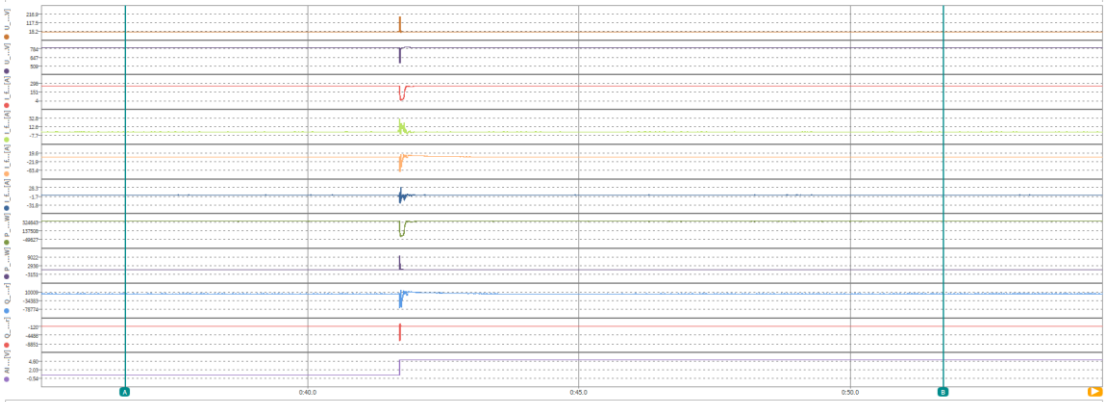


时间 [s]	A	B	ΔE
AI 1/U1 [V]	0:41.5469524	0:41.8920299	0.3450776
AI 1/U2 [V]	-1027.032	-1014.844	12.18724
AI 1/U3 [V]	95.98590	61.56421	-34.42168
AI 1/U4 [V]	931.2032	953.4486	22.24541
AI 1/I1 [A]	-350.5945	-335.4252	15.16938
AI 1/I2 [A]	200.8081	205.5466	4.738570
AI 1/I3 [A]	151.3064	131.3984	-19.90795
AI 1/U4 [V]	0.311136	5.056143	4.745007



时间 [s]	A	B	ΔE
U_fund_SYM-_rc@AC [V]	0:36.643650	0:51.720807	0:15.077156
U_fund_SYM+_rc@AC [V]	1.999024	1.936031	-0.062993
I_fund_P_SYM+_rc@AC [A]	804.4863	804.5240	0.037720
I_fund_P_SYM-_rc@AC [A]	250.3917	250.9467	0.555023
I_fund_Q_SYM+_rc@AC [A]	-0.599611	-0.538580	0.061031
I_fund_Q_SYM-_rc@AC [A]	-0.706946	-0.563931	0.143015
P_fund_SYM+_rc@AC [W]	1.502208	1.371214	-0.130995
P_fund_SYM-_rc@AC [W]	348898.5	349688.3	789.7500
Q_fund_SYM+_rc@AC [var]	-2.076101	-1.806024	0.270077
Q_fund_SYM-_rc@AC [var]	-985.0663	-785.8240	199.2423
AI 1/U4 [V]	5.201262	4.598095	-0.603167
	0.303745	5.045653	4.741907

1) -δ1 (0° crossing)

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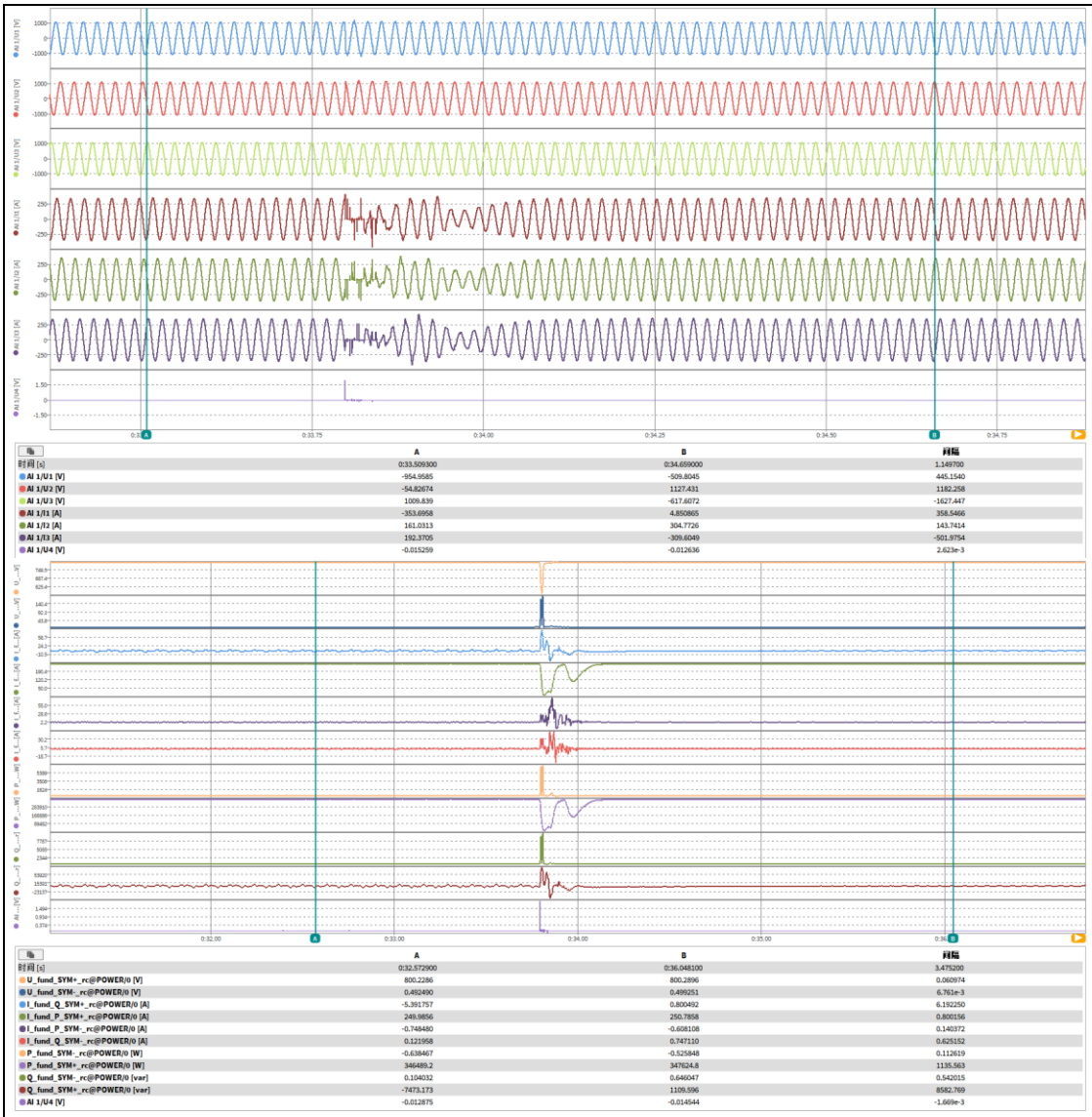
Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China



	A	B	Δ
时间 [s]	0:33.509300	0:34.659000	1.149700
AI 1/U1 [V]	-954.9585	-509.8045	445.1540
AI 1/U2 [V]	-54.82674	1127.431	1182.258
AI 1/U3 [V]	1009.839	-617.6072	-1627.447
AI 1/I1 [A]	-353.6958	4.859665	358.5466
AI 1/I2 [A]	161.0313	304.7726	143.7414
AI 1/I3 [A]	192.3705	-309.6049	-501.9754
AI 1/U4 [V]	-0.015259	-0.012636	2.623e-3

	A	B	Δ
时间 [s]	0:32.572900	0:36.048100	3.475200
U_fund_SYM+_rc@POWER/0 [V]	800.2286	800.2896	0.060974
U_fund_SYM-_rc@POWER/0 [V]	0.492490	0.499251	6.761e-3
I_fund_Q_SYM+_rc@POWER/0 [A]	-5.391757	0.800492	6.192250
I_fund_P_SYM+_rc@POWER/0 [A]	249.9856	250.7858	0.800156
I_fund_P_SYM-_rc@POWER/0 [A]	-0.748480	-0.608108	0.140372
I_fund_Q_SYM-_rc@POWER/0 [A]	0.121958	0.747110	0.625152
P_fund_SYM-_rc@POWER/0 [W]	-0.638467	-0.525848	0.112619
P_fund_SYM+_rc@POWER/0 [W]	346489.2	347624.8	1135.563
Q_fund_SYM-_rc@POWER/0 [var]	0.104032	0.646047	0.542015
Q_fund_SYM+_rc@POWER/0 [var]	-7473.173	1109.596	8582.769
AI 1/U4 [V]	-0.012875	-0.014544	-1.669e-3

1) +δ1 (+90° crossing)

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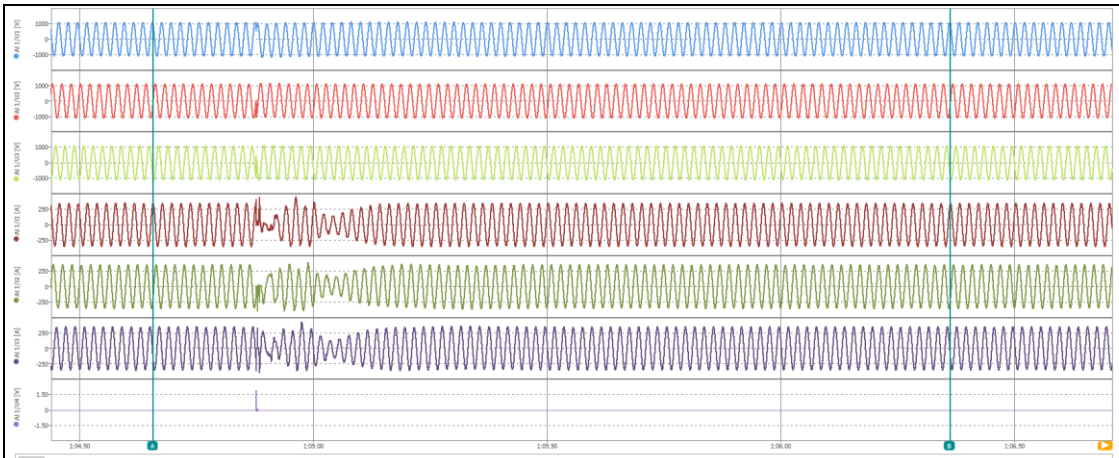
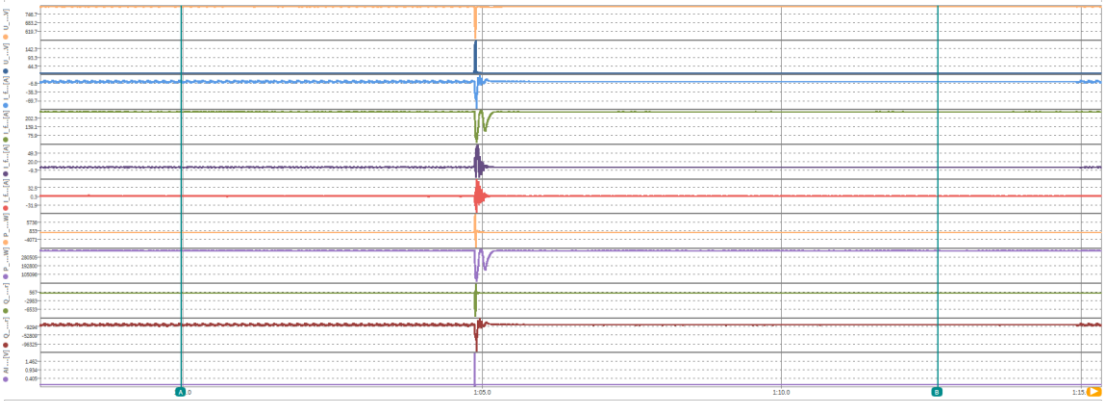


时间 [s]	A	B	Δ
AI 1/U1 [V]	1:04.658400	1:06.362200	1.703800
AI 1/U2 [V]	1126.583	1072.616	-53.96748
AI 1/U3 [V]	-504.1170	-848.5940	-344.4770
AI 1/I1 [A]	-622.6128	-224.1709	398.4418
AI 1/I2 [A]	316.3852	234.0800	-82.30520
AI 1/I3 [A]	-293.0142	-354.5169	-61.50270
AI 1/U4 [V]	-23.48864	120.3700	143.8587
	-4.530e-3	-9.298e-3	-4.768e-3



时间 [s]	A	B	Δ
U_fund_SYM+_rc@POWER/0 [V]	0:59.975300	1:12.599600	0:12.624300
U_fund_SYM-_rc@POWER/0 [V]	800.2835	800.2747	-8.850e-3
I_fund_Q_SYM+_rc@POWER/0 [A]	0.479362	0.467593	-0.011769
I_fund_P_SYM+_rc@POWER/0 [A]	1.966622	-0.396876	-2.363497
I_fund_P_SYM-_rc@POWER/0 [A]	250.3357	249.0201	-1.315598
I_fund_Q_SYM-_rc@POWER/0 [A]	-0.382655	-0.589187	-0.206532
P_fund_SYM-_rc@POWER/0 [W]	0.275549	0.381255	0.105706
P_fund_SYM+_rc@POWER/0 [W]	-0.317711	-0.477179	-0.159468
Q_fund_SYM-_rc@POWER/0 [var]	346998.2	345170.8	-1827.406
Q_fund_SYM+_rc@POWER/0 [var]	0.228783	0.308776	0.079993
AI 1/U4 [V]	2725.997	-550.1157	-3276.112
	-0.011444	-0.012875	-1.431e-3

1) -δ1 (+90° crossing)

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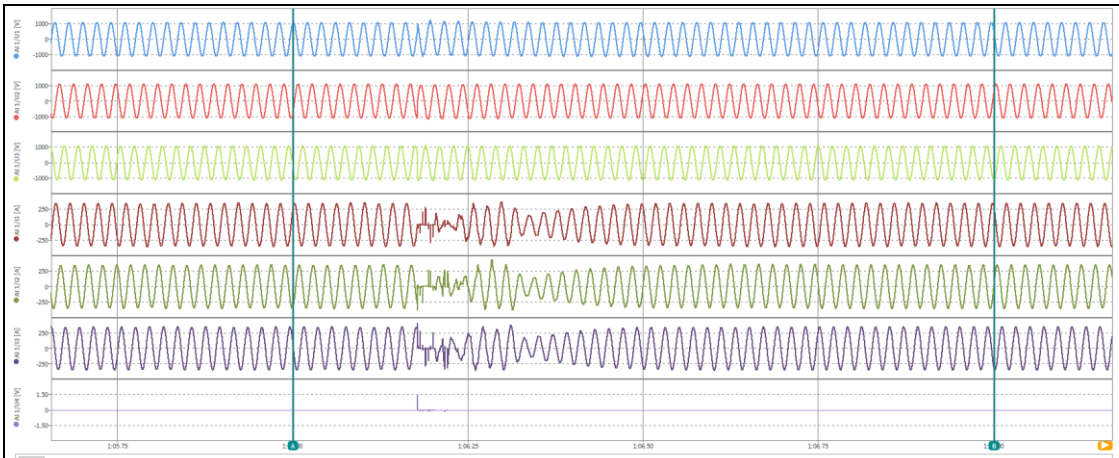
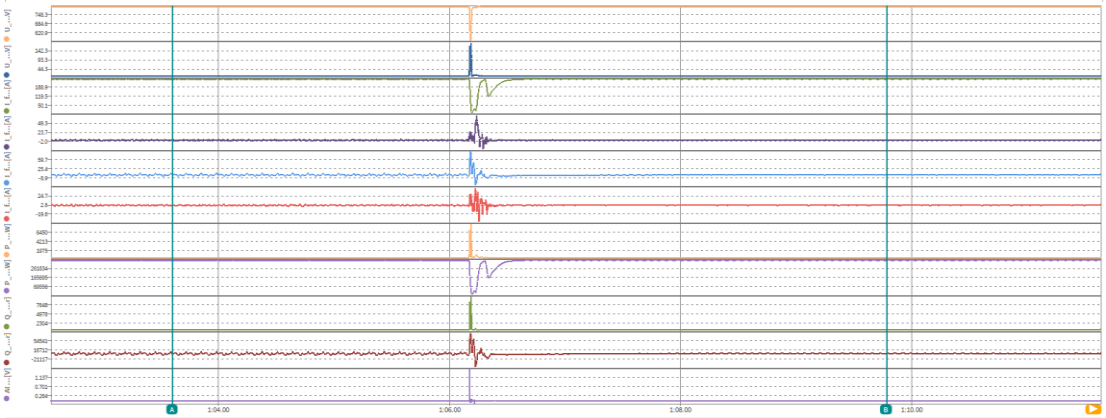


	A	B	
时间 [s]	1:06.0020000	1:07.0013000	0.9993000
AI 1/U1 [V]	1093.694	524.9794	-568.7144
AI 1/U2 [V]	-802.7967	600.4081	1403.205
AI 1/U3 [V]	-291.0569	-1125.478	-834.4210
AI 1/I1 [A]	248.7066	291.7046	42.99796
AI 1/I2 [A]	-344.9214	14.22286	359.1442
AI 1/I3 [A]	96.02380	-305.9060	-401.9298
AI 1/U4 [V]	-9.298e-3	-3.815e-3	5.484e-3



	A	B	
时间 [s]	1:03.6041	1:09.7826	6.1785
U_fund_SYM+_rc@POWER/0 [V]	800.2819	800.2835	1.587e-3
U_fund_SYM-_rc@POWER/0 [V]	0.476087	0.428793	-0.047294
I_fund_P_SYM+_rc@POWER/0 [A]	249.5697	249.6372	0.067535
I_fund_P_SYM-_rc@POWER/0 [A]	0.070491	-0.773381	-0.843872
I_fund_Q_SYM+_rc@POWER/0 [A]	2.960341	-0.201078	-3.161419
I_fund_Q_SYM-_rc@POWER/0 [A]	-0.612886	0.472705	1.085591
P_fund_SYM-_rc@POWER/0 [W]	0.058128	-0.574383	-0.632511
P_fund_SYM+_rc@POWER/0 [W]	345935.8	346030.1	94.28125
Q_fund_SYM-_rc@POWER/0 [var]	-0.505390	0.351074	0.856464
Q_fund_SYM+_rc@POWER/0 [var]	4103.415	-278.7210	-4382.136
AI 1/U4 [V]	-8.821e-3	-8.583e-3	2.384e-4

2) +90° (0° crossing)

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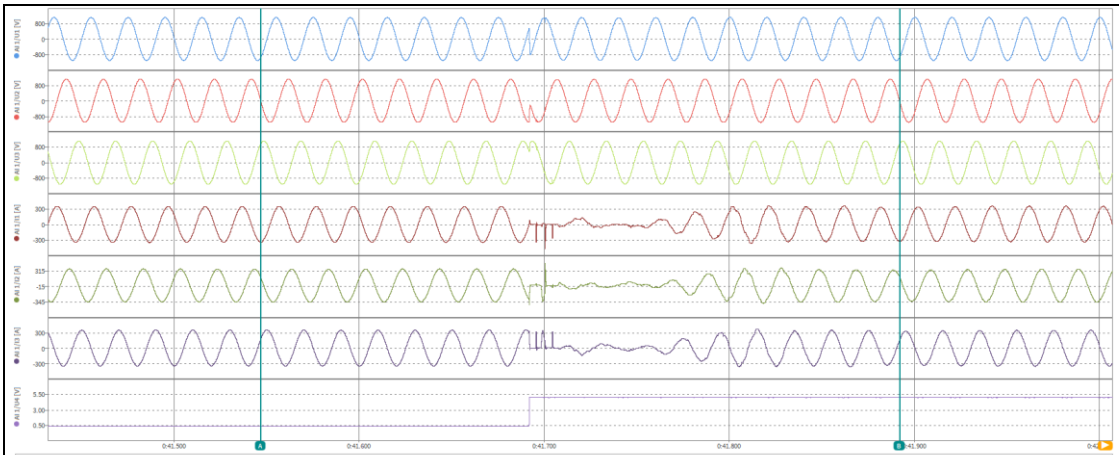
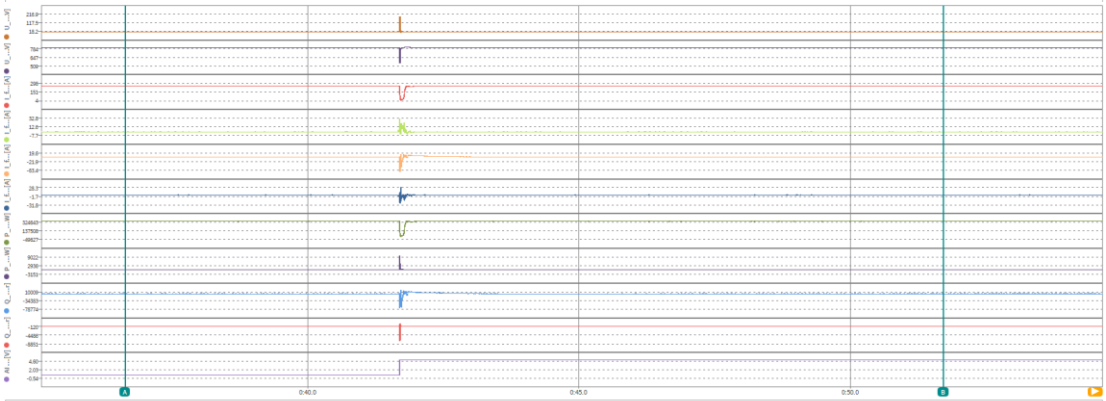


	A	B	Δ
时间 [s]	0:41.5469524	0:41.8920299	0.3450776
AI 1/U1 [V]	-1027.032	-1014.844	12.18724
AI 1/U2 [V]	95.98590	61.56421	-34.42168
AI 1/U3 [V]	931.2032	953.4486	22.24541
AI 1/I1 [A]	-350.5945	-335.4252	15.16938
AI 1/I2 [A]	200.8081	205.5466	4.738570
AI 1/I3 [A]	151.3064	131.3984	-19.90795
AI 1/U4 [V]	0.311136	5.056143	4.745007



	A	B	Δ
时间 [s]	0:36.643650	0:51.720807	0:15.077156
U_fund_SYM-_rc@AC [V]	1.999024	1.936031	-0.062993
U_fund_SYM+_rc@AC [V]	804.4863	804.5240	0.037720
I_fund_P_SYM+_rc@AC [A]	250.3917	250.9467	0.555023
I_fund_P_SYM-_rc@AC [A]	-0.599611	-0.538580	0.061031
I_fund_Q_SYM+_rc@AC [A]	-0.706946	-0.563931	0.143015
I_fund_Q_SYM-_rc@AC [A]	1.502208	1.371214	-0.130995
P_fund_SYM+_rc@AC [W]	348898.5	349688.3	789.7500
P_fund_SYM-_rc@AC [W]	-2.076101	-1.806024	0.270077
Q_fund_SYM+_rc@AC [var]	-985.0663	-785.8240	199.2423
Q_fund_SYM-_rc@AC [var]	5.201262	4.598095	-0.603167
AI 1/U4 [V]	0.303745	5.045653	4.741907

2) -90° (0° crossing)

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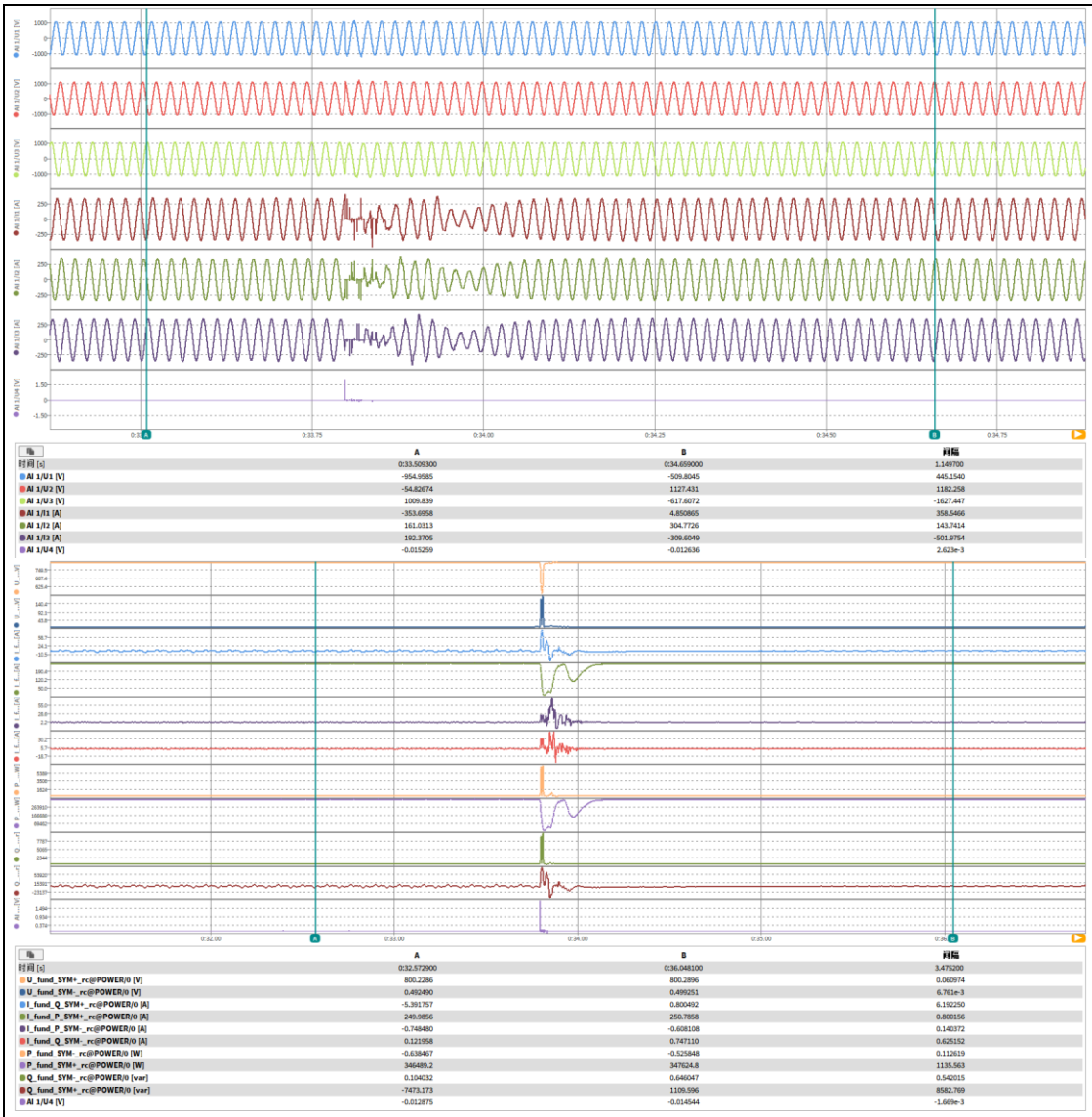

时间 [s]	A	B	ΔB
AI 1/U1 [V]	0:33.509300	0:34.659000	1.149700
AI 1/U2 [V]	-954.9585	-509.8045	445.1540
AI 1/U3 [V]	-54.82674	1127.431	1182.258
AI 1/I1 [A]	1009.839	-617.6072	-1627.447
AI 1/I2 [A]	-353.6958	4.850965	358.5466
AI 1/I3 [A]	161.0313	304.7726	143.7414
AI 1/U4 [V]	192.3705	-309.6049	-501.9754

时间 [s]	A	B	ΔB
U_fund_SYM+_rc@POWER/0 [V]	0:32.572900	0:36.048100	3.475200
U_fund_SYM-_rc@POWER/0 [V]	800.2286	800.2896	0.060974
I_fund_Q_SYM+_rc@POWER/0 [A]	0.492490	0.499251	6.761e-3
I_fund_P_SYM+_rc@POWER/0 [A]	-5.391757	0.800492	6.192250
I_fund_P_SYM-_rc@POWER/0 [A]	249.9856	250.7858	0.800156
I_fund_Q_SYM-_rc@POWER/0 [A]	-0.748480	-0.608108	0.140372
P_fund_SYM-_rc@POWER/0 [W]	0.121958	0.747110	0.625152
P_fund_SYM+_rc@POWER/0 [W]	-0.638467	-0.525848	0.112619
Q_fund_SYM-_rc@POWER/0 [var]	346489.2	347624.8	1135.563
Q_fund_SYM+_rc@POWER/0 [var]	0.104032	0.646047	0.542015
AI 1/U4 [V]	-7473.173	1109.596	8582.769
	-0.012875	-0.014544	-1.669e-3

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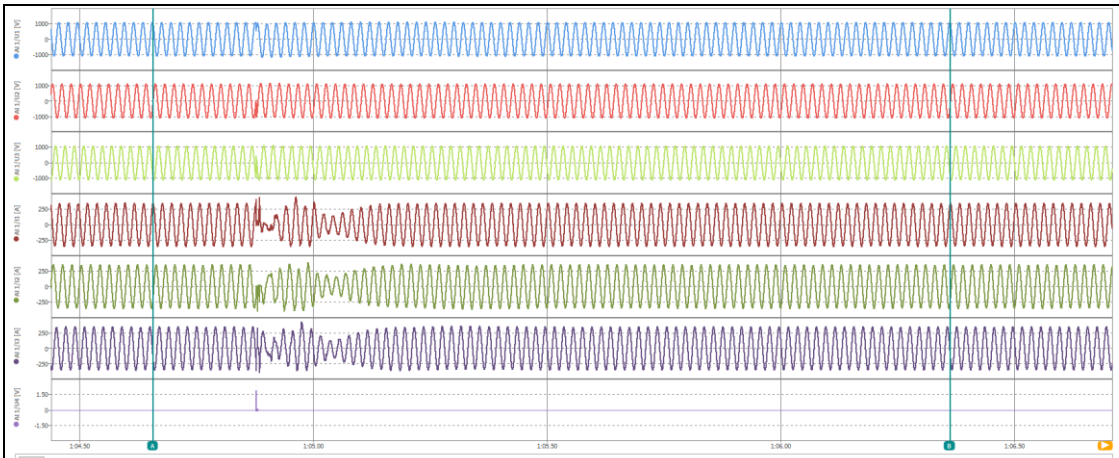
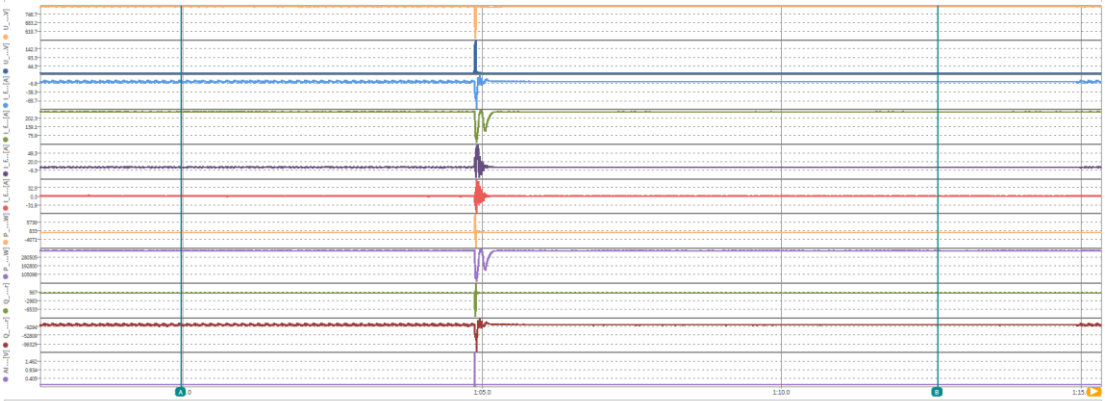


	A	B	Δ
时间 [s]	1:04.658400	1:06.362200	1.703800
AI 1/U1 [V]	1126.583	1072.616	-53.96748
AI 1/U2 [V]	-504.1170	-848.5940	-344.4770
AI 1/U3 [V]	-622.6128	-224.1709	398.4418
AI 1/I1 [A]	316.3852	234.0800	-82.30520
AI 1/I2 [A]	-293.0142	-354.5169	-61.50270
AI 1/I3 [A]	-23.48864	120.3700	143.8587
AI 1/U4 [V]	-4.530e-3	-9.298e-3	-4.768e-3



	A	B	Δ
时间 [s]	0:59.975300	1:12.599600	0:12.624300
U_fund_SYM+_rc@POWER/0 [V]	800.2835	800.2747	-8.850e-3
U_fund_SYM-_rc@POWER/0 [V]	0.479362	0.467593	-0.011769
I_fund_Q_SYM+_rc@POWER/0 [A]	1.966622	-0.396876	-2.363497
I_fund_P_SYM+_rc@POWER/0 [A]	250.3357	249.0201	-1.315598
I_fund_P_SYM-_rc@POWER/0 [A]	-0.382655	-0.589187	-0.206532
I_fund_Q_SYM-_rc@POWER/0 [A]	0.275549	0.381255	0.105706
P_fund_SYM-_rc@POWER/0 [W]	-0.317711	-0.477179	-0.159468
P_fund_SYM+_rc@POWER/0 [W]	346998.2	345170.8	-1827.406
Q_fund_SYM-_rc@POWER/0 [var]	0.228783	0.308776	0.079993
Q_fund_SYM+_rc@POWER/0 [var]	2725.997	-550.1157	-3276.112
AI 1/U4 [V]	-0.011444	-0.012875	-1.431e-3

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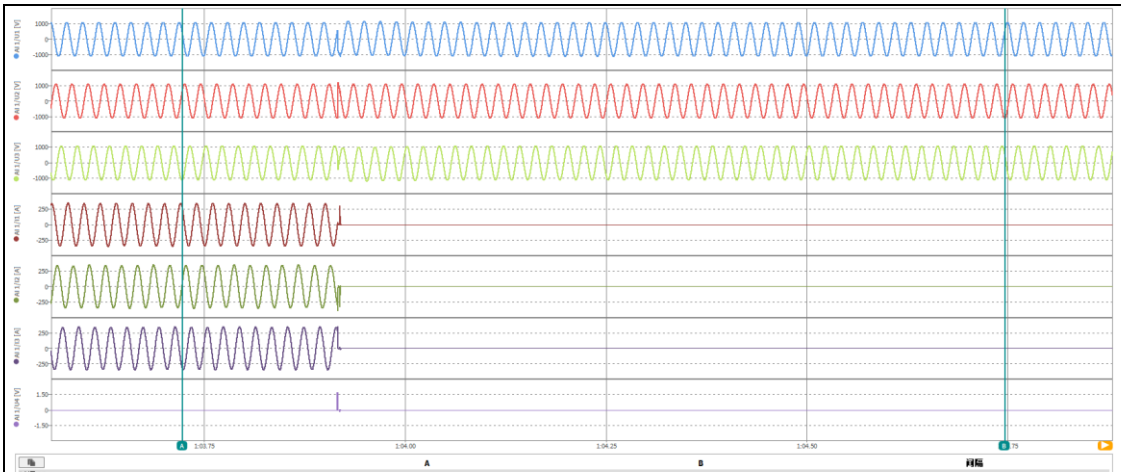

	A	B	
时间 [s]	1:03.723100	1:04.745600	1.022500
AI 1/U1 [V]	380.7965	455.7548	74.95833
AI 1/U2 [V]	731.3498	-1122.788	-1854.138
AI 1/U3 [V]	-1112.238	666.9062	1779.145
AI 1/I1 [A]	266.5436	-0.057936	-266.6016
AI 1/I2 [A]	67.89637	-0.048637	-67.94501
AI 1/I3 [A]	-334.4565	-0.060797	334.3957
AI 1/U4 [V]	-0.010490	-0.016451	-5.960e-3

	A	B	
时间 [s]	1:03.379	1:04.588	1.209
U_fund_SYM+_rc@POWER/0 [V]	800.2123	799.7985	-0.413818
U_fund_SYM-_rc@POWER/0 [V]	0.466031	0.445417	-0.020614
I_fund_Q_SYM+_rc@POWER/0 [A]	-0.281274	1.566e-3	0.282840
I_fund_P_SYM+_rc@POWER/0 [A]	248.8284	-6.415e-3	-248.8349
I_fund_P_SYM-_rc@POWER/0 [A]	-2.633410	6.299e-4	2.634039
I_fund_Q_SYM-_rc@POWER/0 [A]	0.037707	-1.147e-4	-0.037822
P_fund_SYM-_rc@POWER/0 [W]	-2.125663	4.859e-4	2.126148
P_fund_SYM+_rc@POWER/0 [W]	344878.3	-8.886210	-344887.2
Q_fund_SYM-_rc@POWER/0 [var]	0.030437	-8.846e-5	-0.030525
Q_fund_SYM+_rc@POWER/0 [var]	-389.8484	2.168934	392.0173
AI 1/U4 [V]	-7.153e-3	-0.012636	-5.484e-3

2) +180° (0° crossing)

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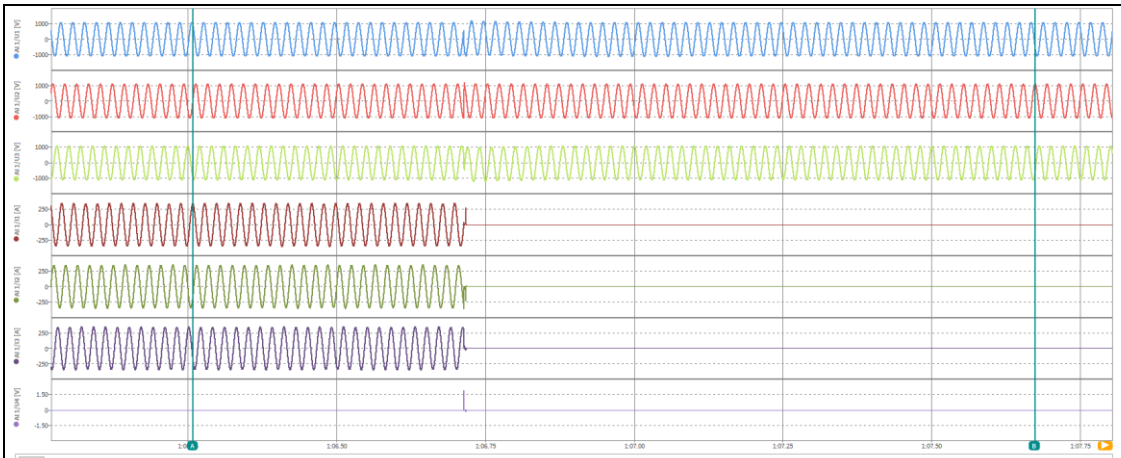

	A	B	Δ
时间 [s]	1:06.25890	1:07.67310	1.41420
AI 1/U1 [V]	993.1245	-257.6006	-1250.725
AI 1/U2 [V]	-19.22774	1084.981	1104.209
AI 1/U3 [V]	-974.0565	-827.3895	146.6670
AI 1/I1 [A]	350.1860	-0.016809	-350.2028
AI 1/I2 [A]	-182.3255	-0.058651	182.2668
AI 1/I3 [A]	-168.1144	0.011802	168.1262
AI 1/U4 [V]	-0.010490	-0.014544	-4.053e-3

	A	B	Δ
时间 [s]	1:06.521300	1:06.870700	0.349400
U_fund_SYM+_rc@POWER/0 [V]	800.1888	799.5698	-0.619019
U_fund_SYM-_rc@POWER/0 [V]	0.364511	0.994630	0.630119
I_fund_Q_SYM+_rc@POWER/0 [A]	-4.513229	0.023564	4.536794
I_fund_P_SYM+_rc@POWER/0 [A]	247.5567	-0.157957	-247.7146
I_fund_P_SYM-_rc@POWER/0 [A]	-0.419488	5.887e-4	0.420077
I_fund_Q_SYM-_rc@POWER/0 [A]	2.283700	1.229e-4	-2.283578
P_fund_SYM-_rc@POWER/0 [W]	-0.264844	1.014e-3	0.265859
P_fund_SYM+_rc@POWER/0 [W]	343105.5	-218.7545	-343324.3
Q_fund_SYM-_rc@POWER/0 [var]	1.441818	2.117e-4	-1.441607
Q_fund_SYM+_rc@POWER/0 [var]	-6255.189	32.63425	6287.824
AI 1/U4 [V]	-0.011921	-0.015020	-3.099e-3

2) -180° (0° crossing)

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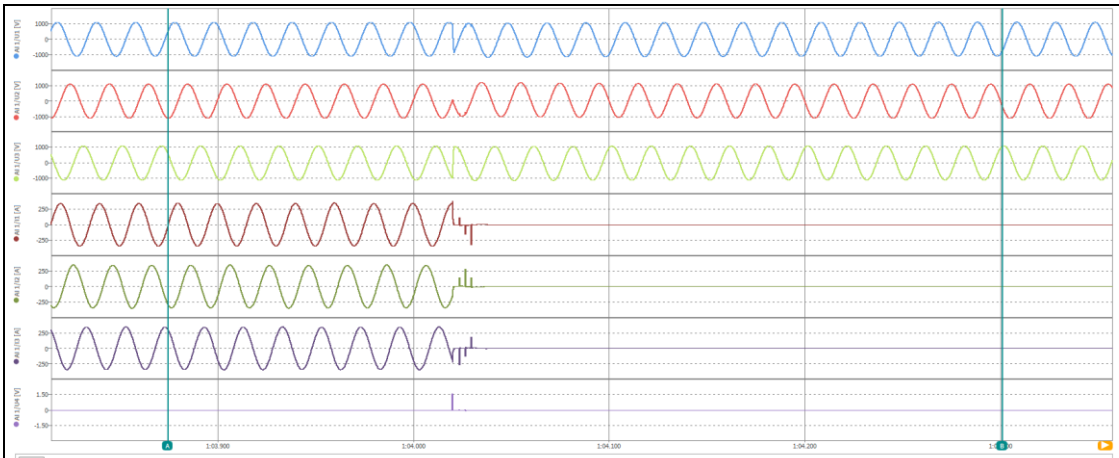
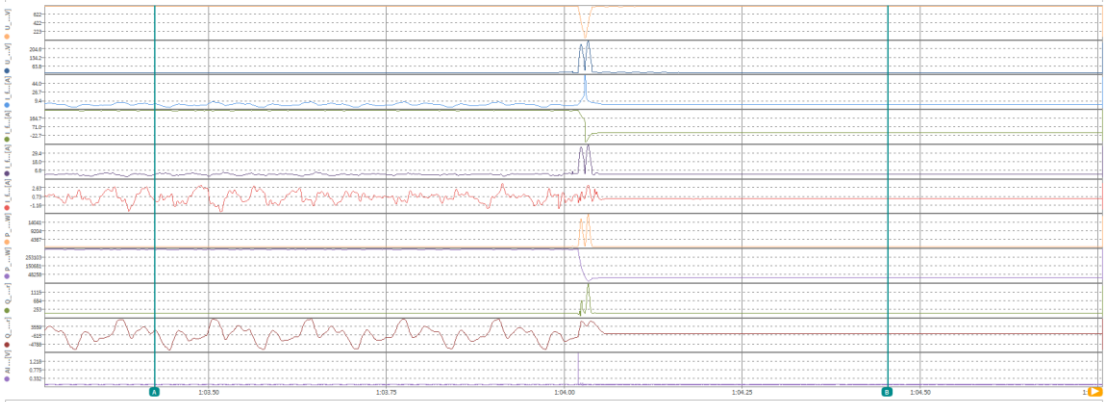


	A	B	
时间 [s]	1:03.8746000	1:04.3008000	0.4262000
AI 1/U1 [V]	434.8138	-817.3688	-1252.183
AI 1/U2 [V]	-1119.955	-272.9361	847.0192
AI 1/U3 [V]	685.0303	1090.337	405.3071
AI 1/I1 [A]	-43.68246	-0.045061	43.63740
AI 1/I2 [A]	-277.9702	-0.054717	277.9155
AI 1/I3 [A]	321.7195	0.011086	-321.7085
AI 1/U4 [V]	-0.017643	-0.016212	1.431e-3



	A	B	
时间 [s]	1:03.425300	1:04.454400	1.029100
U_fund_SYM+_rc@POWER/0 [V]	800.2865	799.7986	-0.487915
U_fund_SYM-_rc@POWER/0 [V]	0.445581	0.436396	-9.185e-3
I_fund_Q_SYM+_rc@POWER/0 [A]	1.008603	1.431e-3	-1.007173
I_fund_P_SYM+_rc@POWER/0 [A]	248.5888	-6.849e-3	-248.5956
I_fund_P_SYM-_rc@POWER/0 [A]	-0.778176	5.275e-4	0.778704
I_fund_Q_SYM-_rc@POWER/0 [A]	-0.188390	4.568e-4	0.188847
P_fund_SYM-_rc@POWER/0 [W]	-0.600572	3.987e-4	0.600971
P_fund_SYM+_rc@POWER/0 [W]	344578.0	-9.488524	-344587.5
Q_fund_SYM-_rc@POWER/0 [var]	-0.145394	3.453e-4	0.145739
Q_fund_SYM+_rc@POWER/0 [var]	1398.062	1.981761	-1396.080
AI 1/U4 [V]	-0.011206	-0.014305	-3.099e-3

2) +180° (+90° crossing)

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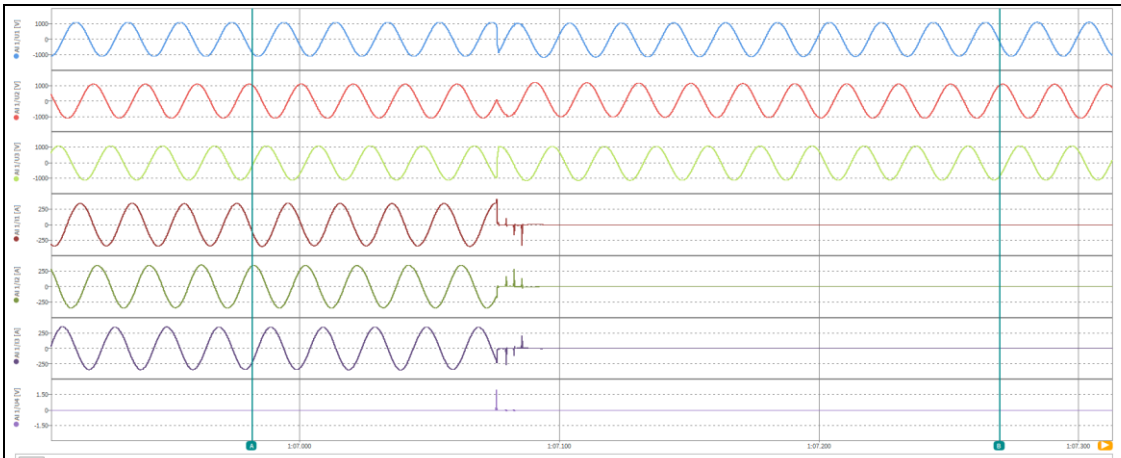

时间 [s]	A	B	ΔB
	1:06.9816000	1:07.2695000	0.2879000
AI 1/U1 [V]	-784.2358	-92.66449	691.5713
AI 1/U2 [V]	1097.010	1021.904	-75.10615
AI 1/U3 [V]	-312.7365	-929.2594	-616.5228
AI 1/I1 [A]	-74.44311	-0.024319	74.41879
AI 1/I2 [A]	334.0727	-0.068307	-334.1410
AI 1/I3 [A]	-259.8195	1.788e-3	259.8213
AI 1/U4 [V]	-0.014305	-0.016212	-1.907e-3

时间 [s]	A	B	ΔB
	1:06.502000	1:07.576900	1.074900
U_fund_SYM+_rc@POWER/0 [V]	800.2831	799.8302	-0.452942
U_fund_SYM-_rc@POWER/0 [V]	0.472852	0.355118	-0.117734
I_fund_Q_SYM+_rc@POWER/0 [A]	0.455405	1.510e-3	-0.453895
I_fund_P_SYM+_rc@POWER/0 [A]	248.3856	-6.586e-3	-248.3922
I_fund_P_SYM-_rc@POWER/0 [A]	-0.054878	6.517e-4	0.055530
I_fund_Q_SYM-_rc@POWER/0 [A]	0.669558	-3.788e-4	-0.669936
P_fund_SYM-_rc@POWER/0 [W]	-0.044945	4.008e-4	0.045346
P_fund_SYM+_rc@POWER/0 [W]	344295.0	-9.123663	-344304.1
Q_fund_SYM-_rc@POWER/0 [var]	0.548370	-2.330e-4	-0.548603
Q_fund_SYM+_rc@POWER/0 [var]	631.2515	2.092026	-629.1594
AI 1/U4 [V]	-0.011921	-0.012875	-9.537e-4

2) -180° (+90° crossing)

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<table>
<tr><td>5.3.3</td><td colspan="4">Test for fault ride through, over-voltage (OVRT) and under-voltage (UVRT)</td><td>P</td></tr>
<tr><td>Test at</td><td colspan="2">Temperature (°C):</td><td>25</td><td>Humidity (%)</td><td>45</td></tr>
<tr><td colspan="2">minimum DC input voltage, between 0 % – 20 % of the voltage range</td><td>948</td><td>V</td><td>maximum DC input voltage, between 80 % – 100 % of the voltage range.</td><td>1212</td><td>V</td></tr>
<tr><td colspan="7">Remark: If voltage range is 860 V – 1300 V: 860 V = 0 %; 1300 V = 100 %, Utestmin = 860 V – 948 V as 860 V+0.2*440 V = 948 V; Utestmax = 1212 V – 1300 V as 860+0.8*440 V = 1212 V
For PV inverter the maximum and minimum DC input voltage shall be the minimum and maximum MPP voltage according to EN 50524.</td></tr>
<tr><td colspan="2">UVRT and OVRT capability settings</td><td colspan="5">1) Manufacturer settings according to EN 50549-2 of most stringent requirement:
☒ UVRT
<table>
<tr><td>Time [s]</td><td>U [p.u.]</td></tr>
<tr><td>0.0</td><td>0.05</td></tr>
<tr><td>0.25</td><td>0.05</td></tr>
<tr><td>3</td><td>0.85</td></tr>
<tr><td>180</td><td>0.85</td></tr>
<tr><td>180</td><td>0.90</td></tr>
</table>
☒ OVRT
<table>
<tr><td>Time [s]</td><td>U [p.u.]</td></tr>
<tr><td>0.0</td><td>1.25</td></tr>
<tr><td>0.1</td><td>1.25</td></tr>
<tr><td>0.1</td><td>1.20</td></tr>
<tr><td>5.0</td><td>1.20</td></tr>
<tr><td>5.0</td><td>1.15</td></tr>
<tr><td>60</td><td>1.15</td></tr>
<tr><td>60</td><td>1.10</td></tr>
</table>
2) Specified in grid code _____
☐ UVRT
<table>
<tr><td>Time [s]</td><td>U [p.u.]</td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
</table></td></tr>
</table>

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	☐ OVRT Time [s] / U [p.u.] (empty rows)
Active islanding detection function activation during the test	☒ Yes ☐ No
Under/Over voltage protection, ROCOF protection function activation during the test	☐ Yes ☒ No

General mode for controlled short circuit current contribution			
Gradient setting	**k=2 throughout**	**Insensitive setting**	**5%**

Condition@Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD1-1
	1	Date	--	--	dd.mm.yyyy	10.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	14:52:01
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.05
	5	Setting fault duration	--	--	ms	260
	6	Point of fault occur (t1)	Total	--	ms	12435
	7	Point of fault clearance (t2)	Total	--	ms	12695
	8	Fault duration in load test	Total	--	ms	260
	9	Fault duration in no load test	Total	--	ms	260
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	0.999
	11		Line to neutral (L2-N)		p.u.	1.000

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	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.05
	15		Line to neutral (L2-N)		p.u.	0.05
	16		Line to neutral (L3-N)		p.u.	0.05
	17		Pos.		p.u.	0.05
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.004
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.005
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.008
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.005
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.005
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.987
	26		L2	t1-1s to t1	p.u.	0.998
	27		L3	t1-1s to t1	p.u.	0.985
	28	Active current	Pos.	t1-1s to t1	p.u.	0.99
	29		Neg.	t1-1s to t1	p.u.	-0.002
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.995
	34		Pos.		p.u.	0.995
	35	Reactive power	Total	t1-10s to t1	p.u.	0.001
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.049
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.049
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.049
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.049
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	43	Line current	L1	t1+60ms	p.u.	1.03
	44		L2		p.u.	1.032
	45		L3		p.u.	1.02
	46	Line current	L1	t1+100ms	p.u.	1.028
	47		L2		p.u.	1.032
	48		L3		p.u.	1.019

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	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.115
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.005
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	1.017
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.006
	53	Determined proportionality constant K-factor	Pos.	-	-	1.064
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	7
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	7
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.006
	64		Pos.		p.u.	0.006
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.004
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.005
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.008
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.005
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.99
	71		Neg.	t2+1s to t2+10s	p.u.	-0.002
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.996
	75		Pos.		p.u.	0.996
	76	Active power response time (<1s)	Total	--	s	0.08
	77		Pos.	--	s	0.08

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	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	15
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	15
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.022
	89		Pos.	--	s	0.022
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD1-2
	1	Date	--	--	dd.mm.yyyy	10.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	15:36:13
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.05
	5	Setting fault duration	--	--	ms	260
	6	Point of fault occur (t1)	Total	--	ms	13014
	7	Point of fault clearance (t2)	Total	--	ms	13274
	8	Fault duration in load test	Total	--	ms	260
	9	Fault duration in no load test	Total	--	ms	260
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	0.999
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003

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	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.05
	15		Line to neutral (L2-N)		p.u.	0.05
	16		Line to neutral (L3-N)		p.u.	0.05
	17		Pos.		p.u.	0.05
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.003
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.005
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.008
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.005
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.005
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.987
	26		L2	t1-1s to t1	p.u.	0.998
	27		L3	t1-1s to t1	p.u.	0.985
	28	Active current	Pos.	t1-1s to t1	p.u.	0.99
	29		Neg.	t1-1s to t1	p.u.	-0.002
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.995
	34		Pos.		p.u.	0.995
	35	Reactive power	Total	t1-10s to t1	p.u.	0.001
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.049
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.049
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.049
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.049
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	43	Line current	L1	t1+60ms	p.u.	1.033
	44		L2		p.u.	1.044
	45		L3		p.u.	1.012
	46	Line current	L1	t1+100ms	p.u.	1.031
	47		L2		p.u.	1.042
	48		L3		p.u.	1.013
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.117

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	50		Neg.	t1+100ms to t2-20ms	p.u.	0.007
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	1.018
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.012
	53	Determined proportionality constant K-factor	Pos.	-	-	1.065
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	5
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	5
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.006
	64		Pos.		p.u.	0.006
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.003
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.005
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.008
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.005
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.99
	71		Neg.	t2+1s to t2+10s	p.u.	-0.002
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.996
	75		Pos.		p.u.	0.996
	76	Active power response time (<1s)	Total	--	s	0.058
	77		Pos.	--	s	0.058
	78	Active current step response	Pos.	-	ms	-
	79		Neg.	-	ms	-

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		time (<30 ms)				
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	5
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	5
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.022
	89		Pos.	--	s	0.022
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD1-3
	1	Date	--	--	dd.mm.yyyy	10.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	14:55:54
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.05
	5	Setting fault duration	--	--	ms	260
	6	Point of fault occur (t1)	Total	--	ms	25044
	7	Point of fault clearance (t2)	Total	--	ms	25305
	8	Fault duration in load test	Total	--	ms	261
	9	Fault duration in no load test	Total	--	ms	260
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	0.999
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001

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	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.05
	15		Line to neutral (L2-N)		p.u.	0.05
	16		Line to neutral (L3-N)		p.u.	0.05
	17		Pos.		p.u.	0.05
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.002
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.003
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.302
	26		L2	t1-1s to t1	p.u.	0.303
	27		L3	t1-1s to t1	p.u.	0.302
	28	Active current	Pos.	t1-1s to t1	p.u.	0.302
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.303
	34		Pos.		p.u.	0.303
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.05
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.05
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.05
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.05
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	43	Line current	L1	t1+60ms	p.u.	1.034
	44		L2		p.u.	1.031
	45		L3		p.u.	1.013
	46	Line current	L1	t1+100ms	p.u.	1.029
	47		L2		p.u.	1.04
	48		L3		p.u.	1.021
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.112
	50		Neg.	t1+100ms to	p.u.	0.009

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				t2-20ms		
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	1.018
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.01
	53	Determined proportionality constant K-factor	Pos.	-	-	1.068
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	5
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	5
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.006
	64		Pos.		p.u.	0.006
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.002
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.003
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.302
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.001
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.304
	75		Pos.		p.u.	0.304
	76	Active power response time (<1s)	Total	--	s	0.049
	77		Pos.	--	s	0.049
	78	Active current step response time	Pos.	-	ms	-
	79		Neg.	-	ms	-

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		(<30 ms)				
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	16
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	16
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.02
	89		Pos.	--	s	0.02
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD1-4
	1	Date	--	--	dd.mm.yyyy	10.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	15:07:40
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.05
	5	Setting fault duration	--	--	ms	260
	6	Point of fault occur (t1)	Total	--	ms	12356
	7	Point of fault clearance (t2)	Total	--	ms	12616
	8	Fault duration in load test	Total	--	ms	260
	9	Fault duration in no load test	Total	--	ms	260
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	0.999
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-	t1+100ms to	p.u.	0.05

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			N)	t2		
	15		Line to neutral (L2-N)		p.u.	0.05
	16		Line to neutral (L3-N)		p.u.	0.05
	17		Pos.		p.u.	0.05
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.3
	26		L2	t1-1s to t1	p.u.	0.301
	27		L3	t1-1s to t1	p.u.	0.3
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.05
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.05
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.05
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.05
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	43	Line current	L1	t1+60ms	p.u.	1.03
	44		L2		p.u.	1.046
	45		L3		p.u.	1.012
	46	Line current	L1	t1+100ms	p.u.	1.029
	47		L2		p.u.	1.038
	48		L3		p.u.	1.01
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.103
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.01

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	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	1.021
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.012
	53	Determined proportionality constant K-factor	Pos.	-	-	1.071
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	5
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	5
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.005
	64		Pos.		p.u.	0.005
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.3
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.301
	75		Pos.		p.u.	0.301
	76	Active power response time (<1s)	Total	--	s	0.021
	77		Pos.	--	s	0.021
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-

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	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	1
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	1
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.041
	89		Pos.	--	s	0.041
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD2-1
	1	Date	--	--	dd.mm.yyyy	08.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	14:40:12
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	16884
	7	Point of fault clearance (t2)	Total	--	ms	17804
	8	Fault duration in load test	Total	--	ms	920
	9	Fault duration in no load test	Total	--	ms	920
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	0.999
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.24

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	15		Line to neutral (L2-N)		p.u.	0.24
	16		Line to neutral (L3-N)		p.u.	0.241
	17		Pos.		p.u.	0.24
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.004
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.005
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.008
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.006
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.006
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.986
	26		L2	t1-1s to t1	p.u.	0.996
	27		L3	t1-1s to t1	p.u.	0.984
	28	Active current	Pos.	t1-1s to t1	p.u.	0.988
	29		Neg.	t1-1s to t1	p.u.	-0.002
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.007
	33	Active power	Total	t1-10s to t1	p.u.	0.994
	34		Pos.		p.u.	0.994
	35	Reactive power	Total	t1-10s to t1	p.u.	0.001
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.243
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.243
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.243
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.243
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	43	Line current	L1	t1+60ms	p.u.	1.006
	44		L2		p.u.	1.015
	45		L3		p.u.	1.003
	46	Line current	L1	t1+100ms	p.u.	1.01
	47		L2		p.u.	1.022
	48		L3		p.u.	1.008
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.098
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.008
	51	Reactive	Pos.	t1+100ms to	p.u.	1.008

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		current		t2-20ms		
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.003
	53	Determined proportionality constant K-factor	Pos.	-	-	1.321
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	6
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	6
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.024
	64		Pos.		p.u.	0.024
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.004
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.005
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.008
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.006
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.988
	71		Neg.	t2+1s to t2+10s	p.u.	-0.002
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.007
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.994
	75		Pos.		p.u.	0.994
	76	Active power response time (<1s)	Total	--	s	0.078
	77		Pos.	--	s	0.078
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current	Pos.	-	ms	-

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	81	settling time (<60 ms)	Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	6
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	6
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.002
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.041
	89		Pos.	--	s	0.041
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD2-2
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	15:20:54
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	12652
	7	Point of fault clearance (t2)	Total	--	ms	13572
	8	Fault duration in load test	Total	--	ms	920
	9	Fault duration in no load test	Total	--	ms	920
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	0.999
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.24
	15		Line to neutral (L2-N)		p.u.	0.24

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	16		Line to neutral (L3-N)		p.u.	0.241
	17		Pos.		p.u.	0.24
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.005
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.006
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.009
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.007
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.007
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.985
	26		L2	t1-1s to t1	p.u.	0.997
	27		L3	t1-1s to t1	p.u.	0.983
	28	Active current	Pos.	t1-1s to t1	p.u.	0.988
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.002
	31		Pos.	t1-60s to t1	p.u.	0.002
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.995
	34		Pos.		p.u.	0.995
	35	Reactive power	Total	t1-10s to t1	p.u.	0.002
	36		Pos.		p.u.	0.002
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.243
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.243
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.243
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.243
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	43	Line current	L1	t1+60ms	p.u.	1.005
	44		L2		p.u.	1.015
	45		L3		p.u.	1.005
	46	Line current	L1	t1+100ms	p.u.	1.011
	47		L2		p.u.	1.023
	48		L3		p.u.	1.011
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.099
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.008
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	1.009
	52		Neg.	t1+100ms to	p.u.	-0.004

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				t2-20ms		
	53	Determined proportionality constant K-factor	Pos.	-	-	1.321
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	6
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	6
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.024
	64		Pos.		p.u.	0.024
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.005
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.006
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.009
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.007
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.988
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.995
	75		Pos.		p.u.	0.995
	76	Active power response time (<1s)	Total	--	s	0.047
	77		Pos.	--	s	0.047
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-

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	82	Reactive current step response time (<30 ms)	Pos.	-	ms	5
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	5
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.023
	89		Pos.	--	s	0.023
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD2-3
	1	Date	--	--	dd.mm.yyyy	08.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	16:19:04
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	16943
	7	Point of fault clearance (t2)	Total	--	ms	17863
	8	Fault duration in load test	Total	--	ms	920
	9	Fault duration in no load test	Total	--	ms	920
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	0.999
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.24
	15		Line to neutral (L2-N)		p.u.	0.24
	16		Line to neutral (L3-N)		p.u.	0.241

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	17		Pos.		p.u.	0.24
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.003
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.004
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.007
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.005
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.005
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.299
	26		L2	t1-1s to t1	p.u.	0.3
	27		L3	t1-1s to t1	p.u.	0.299
	28	Active current	Pos.	t1-1s to t1	p.u.	0.299
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.243
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.243
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.244
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.243
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	43	Line current	L1	t1+60ms	p.u.	1.006
	44		L2		p.u.	1.022
	45		L3		p.u.	1.004
	46	Line current	L1	t1+100ms	p.u.	1.011
	47		L2		p.u.	1.027
	48		L3		p.u.	1.007
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.098
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.009
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	1.01
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.005
	53	Determined	Pos.	-	-	1.325

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	54	proportionality constant K-factor	Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	6
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	6
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.024
	64		Pos.		p.u.	0.024
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.003
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.004
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.007
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.005
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.299
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.3
	75		Pos.		p.u.	0.3
	76	Active power response time (<1s)	Total	--	s	0.044
	77		Pos.	--	s	0.044
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step	Pos.	-	ms	7
	83		Neg.	-	ms	-

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		response time (<30 ms)				
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	7
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.04
	89		Pos.	--	s	0.04
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD2-4
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	16:29:22
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	11868
	7	Point of fault clearance (t2)	Total	--	ms	12788
	8	Fault duration in load test	Total	--	ms	920
	9	Fault duration in no load test	Total	--	ms	920
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	0.999
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.24
	15		Line to neutral (L2-N)		p.u.	0.24
	16		Line to neutral (L3-N)		p.u.	0.241
	17		Pos.		p.u.	0.24

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Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.3
	26		L2	t1-1s to t1	p.u.	0.301
	27		L3	t1-1s to t1	p.u.	0.3
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.243
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.243
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.243
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.243
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	43	Line current	L1	t1+60ms	p.u.	1.011
	44		L2		p.u.	1.015
	45		L3		p.u.	1.002
	46	Line current	L1	t1+100ms	p.u.	1.016
	47		L2		p.u.	1.023
	48		L3		p.u.	1.003
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.099
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.007
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	1.009
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.005
	53	Determined proportionality	Pos.	-	-	1.328
	54		Neg.	-	-	-

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		constant K-factor				
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	6
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	6
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.024
	64		Pos.		p.u.	0.024
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.3
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.301
	75		Pos.		p.u.	0.301
	76	Active power response time (<1s)	Total	--	s	0.019
	77		Pos.	--	s	0.02
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time	Pos.	-	ms	4
	83		Neg.	-	ms	-

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		(<30 ms)				
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	4
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.04
	89		Pos.	--	s	0.04
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Optional mode for active power priority			
Gradient setting	**k=2**	**Insensitive setting**	**5%**

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD2-5
	1	Date	--	--	dd.mm.yyyy	29.10.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	15:31:48
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	10714
	7	Point of fault clearance (t2)	Total	--	ms	11634
	8	Fault duration in load test	Total	--	ms	920
	9	Fault duration in no load test	Total	--	ms	920
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	0.999
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.24
	15		Line to neutral (L2-N)		p.u.	0.24
	16		Line to neutral (L3-		p.u.	0.241

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			N)			
	17		Pos.		p.u.	0.24
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.001
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.003
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.001
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.001
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.305
	26		L2	t1-1s to t1	p.u.	0.307
	27		L3	t1-1s to t1	p.u.	0.305
	28	Active current	Pos.	t1-1s to t1	p.u.	0.305
	29		Neg.	t1-1s to t1	p.u.	-0.001
	30	Reactive current	Pos.	t1-1s to t1	p.u.	-0.001
	31		Pos.	t1-60s to t1	p.u.	-0.001
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.306
	34		Pos.		p.u.	0.306
	35	Reactive power	Total	t1-10s to t1	p.u.	-0.001
	36		Pos.		p.u.	-0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.242
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.242
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.243
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.242
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	43	Line current	L1	t1+60ms	p.u.	0.706
	44		L2		p.u.	0.707
	45		L3		p.u.	0.703
	46	Line current	L1	t1+100ms	p.u.	0.712
	47		L2		p.u.	0.706
	48		L3		p.u.	0.706
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.705
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.002
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.003

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	53	Determined proportionality constant K-factor	Pos.	-	-	0.003
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	5
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	20
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.171
	64		Pos.		p.u.	0.171
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.000
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.001
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.003
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.001
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.305
	71		Neg.	t2+1s to t2+10s	p.u.	-0.001
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	-0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.001
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.305
	75		Pos.		p.u.	0.305
	76	Active power response time (<1s)	Total	--	s	0.039
	77		Pos.	--	s	0.039
	78	Active current step response time (<30 ms)	Pos.	-	ms	-5
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	16
	81		Neg.	-	ms	-
	82	Reactive	Pos.	-	ms	28

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	83	current step response time (<30 ms)	Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	28
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	-0.001
	87		Pos.			-0.001
	88	Reactive power rising time	Total	--	s	0.048
	89		Pos.	--	s	0.048
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD2-6
	1	Date	--	--	dd.mm.yyyy	29.10.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	16:52:14
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	11079
	7	Point of fault clearance (t2)	Total	--	ms	11999
	8	Fault duration in load test	Total	--	ms	920
	9	Fault duration in no load test	Total	--	ms	920
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	0.999
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.24
	15		Line to neutral (L2-N)		p.u.	0.24
	16		Line to neutral (L3-N)		p.u.	0.241

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	17		Pos.		p.u.	0.24
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	0.999
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.001
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.003
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.001
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.001
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.3
	26		L2	t1-1s to t1	p.u.	0.302
	27		L3	t1-1s to t1	p.u.	0.3
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	-0.001
	31		Pos.	t1-60s to t1	p.u.	-0.001
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	-0.001
	36		Pos.		p.u.	-0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.242
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.242
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.243
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.242
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	43	Line current	L1	t1+60ms	p.u.	0.705
	44		L2		p.u.	0.717
	45		L3		p.u.	0.698
	46	Line current	L1	t1+100ms	p.u.	0.709
	47		L2		p.u.	0.717
	48		L3		p.u.	0.703
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.707
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.001
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.000
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.003
	53	Determined	Pos.	-	-	0.000

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	54	proportionality constant K-factor	Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	3
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	20
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.171
	64		Pos.		p.u.	0.171
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	0.999
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.001
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.003
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.001
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.3
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	-0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.001
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.301
	75		Pos.		p.u.	0.301
	76	Active power response time (<1s)	Total	--	s	0.006
	77		Pos.	--	s	0.006
	78	Active current step response time (<30 ms)	Pos.	-	ms	0.000
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	8
	81		Neg.	-	ms	-
	82	Reactive current step	Pos.	-	ms	-
	83		Neg.	-	ms	-

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		response time (<30 ms)				
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	-0.001
	87		Pos.			-0.001
	88	Reactive power rising time	Total	--	s	0.001
	89		Pos.	--	s	0.001
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Optional mode for reactive current limitation			
Gradient setting	**k=2**	**Insensitive setting**	**5%**
Reactive current limit setting	**90%In**		

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD2-7
	1	Date	--	--	dd.mm.yyyy	08.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	17:35:45
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	13213
	7	Point of fault clearance (t2)	Total	--	ms	14133
	8	Fault duration in load test	Total	--	ms	920
	9	Fault duration in no load test	Total	--	ms	920
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	0.999
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-	t1+100ms to	p.u.	0.24

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			N)	t2		
	15		Line to neutral (L2-N)		p.u.	0.24
	16		Line to neutral (L3-N)		p.u.	0.241
	17		Pos.		p.u.	0.24
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.3
	26		L2	t1-1s to t1	p.u.	0.301
	27		L3	t1-1s to t1	p.u.	0.3
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.244
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.244
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.244
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.244
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	43	Line current	L1	t1+60ms	p.u.	1.012
	44		L2		p.u.	0.989
	45		L3		p.u.	0.996
	46	Line current	L1	t1+100ms	p.u.	1.004
	47		L2		p.u.	1.005
	48		L3		p.u.	0.996
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.419
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.006

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	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.906
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	53	Determined proportionality constant K-factor	Pos.	-	-	1.194
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	5
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	5
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.102
	64		Pos.		p.u.	0.102
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.3
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.301
	75		Pos.		p.u.	0.301
	76	Active power response time (<1s)	Total	--	s	0.044
	77		Pos.	--	s	0.044
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-

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	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	8
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	8
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.041
	89		Pos.	--	s	0.041
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD2-8
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	17:12:34
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	15368
	7	Point of fault clearance (t2)	Total	--	ms	16288
	8	Fault duration in load test	Total	--	ms	920
	9	Fault duration in no load test	Total	--	ms	920
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	0.999
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.24

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	15		Line to neutral (L2-N)		p.u.	0.24
	16		Line to neutral (L3-N)		p.u.	0.241
	17		Pos.		p.u.	0.24
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.001
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.004
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.002
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.002
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.3
	26		L2	t1-1s to t1	p.u.	0.301
	27		L3	t1-1s to t1	p.u.	0.3
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.244
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.244
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.244
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.244
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	43	Line current	L1	t1+60ms	p.u.	1.002
	44		L2		p.u.	1.003
	45		L3		p.u.	0.999
	46	Line current	L1	t1+100ms	p.u.	1.003
	47		L2		p.u.	1.008
	48		L3		p.u.	0.998
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.419
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.007
	51	Reactive	Pos.	t1+100ms to	p.u.	0.907

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		current		t2-20ms		
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	53	Determined proportionality constant K-factor	Pos.	-	-	1.197
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	3
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	3
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.102
	64		Pos.		p.u.	0.102
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.000
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.004
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.002
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.3
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.301
	75		Pos.		p.u.	0.301
	76	Active power response time (<1s)	Total	--	s	0.017
	77		Pos.	--	s	0.019
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current	Pos.	-	ms	-

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	81	settling time (<60 ms)	Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	6
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	6
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.039
	89		Pos.	--	s	0.039
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Zero current mode			
Static operating voltage setting (under voltage)	**50%Un**	**Static operating voltage setting (over voltage)**	**120%Un**

Condition@Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD2-9
	1	Date	--	--	dd.mm.yyyy	08.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	20:21:08
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	13510
	7	Point of fault clearance (t2)	Total	--	ms	14430
	8	Fault duration in load test	Total	--	ms	920
	9	Fault duration in no load test	Total	--	ms	920
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	0.999
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003

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	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.24
	15		Line to neutral (L2-N)		p.u.	0.24
	16		Line to neutral (L3-N)		p.u.	0.241
	17		Pos.		p.u.	0.24
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.003
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.005
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.008
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.005
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.005
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.987
	26		L2	t1-1s to t1	p.u.	0.997
	27		L3	t1-1s to t1	p.u.	0.985
	28	Active current	Pos.	t1-1s to t1	p.u.	0.989
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.007
	33	Active power	Total	t1-10s to t1	p.u.	0.995
	34		Pos.		p.u.	0.995
	35	Reactive power	Total	t1-10s to t1	p.u.	0.001
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.239
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.24
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.24
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.24
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	43	Line current	L1	t1+60ms	p.u.	0.031
	44		L2		p.u.	0.033
	45		L3		p.u.	0.025
	46	Line current	L1	t1+100ms	p.u.	0.037
	47		L2		p.u.	0.032
	48		L3		p.u.	0.042
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.02

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	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.001
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.011
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	53	Determined proportionality constant K-factor	Pos.	-	-	-
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.005
	64		Pos.		p.u.	0.005
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.003
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.005
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.008
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.005
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.99
	71		Neg.	t2+1s to t2+10s	p.u.	-0.002
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.007
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.996
	75		Pos.		p.u.	0.996
	76	Active power response time (<1s)	Total	--	s	0.074
	77		Pos.	--	s	0.074
	78	Active current step response	Pos.	-	ms	-
	79		Neg.	-	ms	-

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		time (<30 ms)				
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	-
	89		Pos.	--	s	-
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD2-10
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	13:57:41
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	13440
	7	Point of fault clearance (t2)	Total	--	ms	14360
	8	Fault duration in load test	Total	--	ms	920
	9	Fault duration in no load test	Total	--	ms	920
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	0.999
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001

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	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.24
	15		Line to neutral (L2-N)		p.u.	0.24
	16		Line to neutral (L3-N)		p.u.	0.241
	17		Pos.		p.u.	0.24
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.003
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.005
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.008
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.005
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.005
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.988
	26		L2	t1-1s to t1	p.u.	0.998
	27		L3	t1-1s to t1	p.u.	0.987
	28	Active current	Pos.	t1-1s to t1	p.u.	0.991
	29		Neg.	t1-1s to t1	p.u.	-0.002
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.007
	33	Active power	Total	t1-10s to t1	p.u.	0.996
	34		Pos.		p.u.	0.996
	35	Reactive power	Total	t1-10s to t1	p.u.	0.001
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.239
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.24
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.24
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.24
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	43	Line current	L1	t1+60ms	p.u.	0.03
	44		L2		p.u.	0.034
	45		L3		p.u.	0.026
	46	Line current	L1	t1+100ms	p.u.	0.034
	47		L2		p.u.	0.034
	48		L3		p.u.	0.041
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.02
	50		Neg.	t1+100ms to	p.u.	-0.001

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				t2-20ms		
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.011
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	53	Determined proportionality constant K-factor	Pos.	-	-	-
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.005
	64		Pos.		p.u.	0.005
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.003
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.005
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.008
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.005
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.991
	71		Neg.	t2+1s to t2+10s	p.u.	-0.002
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.007
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.997
	75		Pos.		p.u.	0.997
	76	Active power response time (<1s)	Total	--	s	0.061
	77		Pos.	--	s	0.061
	78	Active current step response time	Pos.	-	ms	-
	79		Neg.	-	ms	-

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Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

		(<30 ms)				
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	-
	89		Pos.	--	s	-
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD2-11
	1	Date	--	--	dd.mm.yyyy	08.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	17:47:58
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	12663
	7	Point of fault clearance (t2)	Total	--	ms	13583
	8	Fault duration in load test	Total	--	ms	920
	9	Fault duration in no load test	Total	--	ms	920
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	0.999
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-	t1+100ms to	p.u.	0.24

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			N)	t2		
	15		Line to neutral (L2-N)		p.u.	0.24
	16		Line to neutral (L3-N)		p.u.	0.241
	17		Pos.		p.u.	0.24
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.3
	26		L2	t1-1s to t1	p.u.	0.301
	27		L3	t1-1s to t1	p.u.	0.3
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.24
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.24
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.241
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.24
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	43	Line current	L1	t1+60ms	p.u.	0.027
	44		L2		p.u.	0.028
	45		L3		p.u.	0.024
	46	Line current	L1	t1+100ms	p.u.	0.032
	47		L2		p.u.	0.03
	48		L3		p.u.	0.029
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.02
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.000

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	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.011
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	53	Determined proportionality constant K-factor	Pos.	-	-	-
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.005
	64		Pos.		p.u.	0.005
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.299
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.3
	75		Pos.		p.u.	0.3
	76	Active power response time (<1s)	Total	--	s	0.041
	77		Pos.	--	s	0.041
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-

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	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.002
	89		Pos.	--	s	0.002
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD2-12
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	16:23:57
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	12032
	7	Point of fault clearance (t2)	Total	--	ms	12952
	8	Fault duration in load test	Total	--	ms	920
	9	Fault duration in no load test	Total	--	ms	920
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	0.999
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.24

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	15		Line to neutral (L2-N)		p.u.	0.24
	16		Line to neutral (L3-N)		p.u.	0.241
	17		Pos.		p.u.	0.24
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.3
	26		L2	t1-1s to t1	p.u.	0.301
	27		L3	t1-1s to t1	p.u.	0.3
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.24
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.24
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.241
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.24
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	43	Line current	L1	t1+60ms	p.u.	0.033
	44		L2		p.u.	0.037
	45		L3		p.u.	0.026
	46	Line current	L1	t1+100ms	p.u.	0.035
	47		L2		p.u.	0.031
	48		L3		p.u.	0.032
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.019
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.001
	51	Reactive	Pos.	t1+100ms to	p.u.	-0.011

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		current		t2-20ms		
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	53	Determined proportionality constant K-factor	Pos.	-	-	-
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.005
	64		Pos.		p.u.	0.005
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.299
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.3
	75		Pos.		p.u.	0.3
	76	Active power response time (<1s)	Total	--	s	0.026
	77		Pos.	--	s	0.026
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current	Pos.	-	ms	-

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	81	settling time (<60 ms)	Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	-
	89		Pos.	--	s	-
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

General mode for controlled short circuit current contribution			
Gradient setting	**k=2 throughout**	**Insensitive setting**	**5%**

Condition@Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD3-1
	1	Date	--	--	dd.mm.yyyy	08.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	14:59:32
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.52
	5	Setting fault duration	--	--	ms	1880
	6	Point of fault occur (t1)	Total	--	ms	15599
	7	Point of fault clearance (t2)	Total	--	ms	17479
	8	Fault duration in load test	Total	--	ms	1880
	9	Fault duration in no load test	Total	--	ms	1880
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001

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	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.52
	15		Line to neutral (L2-N)		p.u.	0.52
	16		Line to neutral (L3-N)		p.u.	0.522
	17		Pos.		p.u.	0.521
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.005
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.006
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.009
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.007
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.007
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.984
	26		L2	t1-1s to t1	p.u.	0.996
	27		L3	t1-1s to t1	p.u.	0.982
	28	Active current	Pos.	t1-1s to t1	p.u.	0.987
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.002
	31		Pos.	t1-60s to t1	p.u.	0.002
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.994
	34		Pos.		p.u.	0.994
	35	Reactive power	Total	t1-10s to t1	p.u.	0.002
	36		Pos.		p.u.	0.002
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.524
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.524
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.525
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.524
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	43	Line current	L1	t1+60ms	p.u.	0.991
	44		L2		p.u.	1.001
	45		L3		p.u.	0.991
	46	Line current	L1	t1+100ms	p.u.	0.993
	47		L2		p.u.	1.005
	48		L3		p.u.	0.993
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.101
	50		Neg.	t1+100ms to	p.u.	-0.006

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				t2-20ms		
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.982
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.006
	53	Determined proportionality constant K-factor	Pos.	-	-	2.033
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	5
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	5
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.053
	64		Pos.		p.u.	0.053
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.005
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.006
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.009
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.007
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.986
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.993
	75		Pos.		p.u.	0.993
	76	Active power response time (<1s)	Total	--	s	0.081
	77		Pos.	--	s	0.081
	78	Active current step response time	Pos.	-	ms	-
	79		Neg.	-	ms	-

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Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

		(<30 ms)				
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	3
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	3
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.029
	89		Pos.	--	s	0.029
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD3-2
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	15:24:38
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.52
	5	Setting fault duration	--	--	ms	1880
	6	Point of fault occur (t1)	Total	--	ms	12396
	7	Point of fault clearance (t2)	Total	--	ms	14276
	8	Fault duration in load test	Total	--	ms	1880
	9	Fault duration in no load test	Total	--	ms	1880
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-	t1+100ms to	p.u.	0.52

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			N)	t2		
	15		Line to neutral (L2-N)		p.u.	0.52
	16		Line to neutral (L3-N)		p.u.	0.522
	17		Pos.		p.u.	0.521
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.005
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.006
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.009
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.007
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.007
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.985
	26		L2	t1-1s to t1	p.u.	0.997
	27		L3	t1-1s to t1	p.u.	0.984
	28	Active current	Pos.	t1-1s to t1	p.u.	0.989
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.002
	31		Pos.	t1-60s to t1	p.u.	0.002
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.995
	34		Pos.		p.u.	0.995
	35	Reactive power	Total	t1-10s to t1	p.u.	0.002
	36		Pos.		p.u.	0.002
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.524
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.524
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.525
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.524
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	43	Line current	L1	t1+60ms	p.u.	0.99
	44		L2		p.u.	1.001
	45		L3		p.u.	0.99
	46	Line current	L1	t1+100ms	p.u.	0.992
	47		L2		p.u.	1.005
	48		L3		p.u.	0.993
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.102
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.005

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	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.982
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.006
	53	Determined proportionality constant K-factor	Pos.	-	-	2.033
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	5
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	5
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.053
	64		Pos.		p.u.	0.053
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.005
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.006
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.009
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.007
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.988
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.002
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.994
	75		Pos.		p.u.	0.994
	76	Active power response time (<1s)	Total	--	s	0.048
	77		Pos.	--	s	0.048
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-

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	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	2
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	2
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.002
	87		Pos.			0.002
	88	Reactive power rising time	Total	--	s	0.028
	89		Pos.	--	s	0.028
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD3-3
	1	Date	--	--	dd.mm.yyyy	08.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	16:22:13
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.52
	5	Setting fault duration	--	--	ms	1880
	6	Point of fault occur (t1)	Total	--	ms	14439
	7	Point of fault clearance (t2)	Total	--	ms	16319
	8	Fault duration in load test	Total	--	ms	1880
	9	Fault duration in no load test	Total	--	ms	1880
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.52

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	15		Line to neutral (L2-N)		p.u.	0.52
	16		Line to neutral (L3-N)		p.u.	0.522
	17		Pos.		p.u.	0.521
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.003
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.004
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.007
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.005
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.005
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.299
	26		L2	t1-1s to t1	p.u.	0.3
	27		L3	t1-1s to t1	p.u.	0.299
	28	Active current	Pos.	t1-1s to t1	p.u.	0.299
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.524
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.524
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.526
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.525
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	43	Line current	L1	t1+60ms	p.u.	0.993
	44		L2		p.u.	0.997
	45		L3		p.u.	0.972
	46	Line current	L1	t1+100ms	p.u.	0.995
	47		L2		p.u.	1.001
	48		L3		p.u.	0.978
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.101
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.005
	51	Reactive	Pos.	t1+100ms to	p.u.	0.982

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		current		t2-20ms		
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.007
	53	Determined proportionality constant K-factor	Pos.	-	-	2.046
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	5
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	5
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.053
	64		Pos.		p.u.	0.053
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.003
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.004
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.007
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.005
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.299
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.3
	75		Pos.		p.u.	0.3
	76	Active power response time (<1s)	Total	--	s	0.043
	77		Pos.	--	s	0.043
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current	Pos.	-	ms	-

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	81	settling time (<60 ms)	Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	1
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	1
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.024
	89		Pos.	--	s	0.024
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD3-4
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	16:31:51
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.52
	5	Setting fault duration	--	--	ms	1880
	6	Point of fault occur (t1)	Total	--	ms	11850
	7	Point of fault clearance (t2)	Total	--	ms	13730
	8	Fault duration in load test	Total	--	ms	1880
	9	Fault duration in no load test	Total	--	ms	1880
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.52
	15		Line to neutral (L2-N)		p.u.	0.52

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	16		Line to neutral (L3-N)		p.u.	0.522
	17		Pos.		p.u.	0.521
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.3
	26		L2	t1-1s to t1	p.u.	0.3
	27		L3	t1-1s to t1	p.u.	0.299
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.3
	34		Pos.		p.u.	0.3
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.523
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.523
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.525
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.524
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	43	Line current	L1	t1+60ms	p.u.	1.011
	44		L2		p.u.	0.989
	45		L3		p.u.	0.965
	46	Line current	L1	t1+100ms	p.u.	1.011
	47		L2		p.u.	0.995
	48		L3		p.u.	0.974
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.102
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.004
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.983
	52		Neg.	t1+100ms to	p.u.	-0.007

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				t2-20ms		
	53	Determined proportionality constant K-factor	Pos.	-	-	2.052
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	6
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	6
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.053
	64		Pos.		p.u.	0.053
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.3
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.301
	75		Pos.		p.u.	0.301
	76	Active power response time (<1s)	Total	--	s	0.018
	77		Pos.	--	s	0.018
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-

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Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

	82	Reactive current step response time (<30 ms)	Pos.	-	ms	3
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	3
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.025
	89		Pos.	--	s	0.025
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Optional mode for zero current threshold			
Gradient setting	**k=2**	**Insensitive setting**	**5%**
zero current threshold setting	**60%Un**		

Condition@Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD3-5
	1	Date	--	--	dd.mm.yyyy	08.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	20:04:19
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.52
	5	Setting fault duration	--	--	ms	1880
	6	Point of fault occur (t1)	Total	--	ms	11849
	7	Point of fault clearance (t2)	Total	--	ms	13729
	8	Fault duration in load test	Total	--	ms	1880
	9	Fault duration in no load test	Total	--	ms	1880
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001

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	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.52
	15		Line to neutral (L2-N)		p.u.	0.52
	16		Line to neutral (L3-N)		p.u.	0.522
	17		Pos.		p.u.	0.521
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.002
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.003
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.006
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.004
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.004
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.988
	26		L2	t1-1s to t1	p.u.	0.997
	27		L3	t1-1s to t1	p.u.	0.986
	28	Active current	Pos.	t1-1s to t1	p.u.	0.99
	29		Neg.	t1-1s to t1	p.u.	-0.002
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.006
	33	Active power	Total	t1-10s to t1	p.u.	0.994
	34		Pos.		p.u.	0.994
	35	Reactive power	Total	t1-10s to t1	p.u.	0.001
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.519
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.52
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.521
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.52
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	43	Line current	L1	t1+60ms	p.u.	0.033
	44		L2		p.u.	0.036
	45		L3		p.u.	0.028
	46	Line current	L1	t1+100ms	p.u.	0.03
	47		L2		p.u.	0.041
	48		L3		p.u.	0.033
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.02
	50		Neg.	t1+100ms to	p.u.	-0.001

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				t2-20ms		
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.007
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	53	Determined proportionality constant K-factor	Pos.	-	-	-
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.01
	64		Pos.		p.u.	0.01
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.002
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.003
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.006
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.004
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.99
	71		Neg.	t2+1s to t2+10s	p.u.	-0.002
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.007
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.994
	75		Pos.		p.u.	0.994
	76	Active power response time (<1s)	Total	--	s	0.08
	77		Pos.	--	s	0.08
	78	Active current step response time	Pos.	-	ms	-
	79		Neg.	-	ms	-

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		(<30 ms)				
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.002
	89		Pos.	--	s	0.002
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD3-6
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	15:50:02
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.52
	5	Setting fault duration	--	--	ms	1880
	6	Point of fault occur (t1)	Total	--	ms	12666
	7	Point of fault clearance (t2)	Total	--	ms	14546
	8	Fault duration in load test	Total	--	ms	1880
	9	Fault duration in no load test	Total	--	ms	1880
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-	t1+100ms to	p.u.	0.52

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			N)	t2		
	15		Line to neutral (L2-N)		p.u.	0.52
	16		Line to neutral (L3-N)		p.u.	0.522
	17		Pos.		p.u.	0.521
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.005
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.006
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.009
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.007
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.007
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.985
	26		L2	t1-1s to t1	p.u.	0.997
	27		L3	t1-1s to t1	p.u.	0.983
	28	Active current	Pos.	t1-1s to t1	p.u.	0.988
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.002
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.995
	34		Pos.		p.u.	0.995
	35	Reactive power	Total	t1-10s to t1	p.u.	0.002
	36		Pos.		p.u.	0.002
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.52
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.521
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.523
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.521
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	43	Line current	L1	t1+60ms	p.u.	0.028
	44		L2		p.u.	0.033
	45		L3		p.u.	0.028
	46	Line current	L1	t1+100ms	p.u.	0.027
	47		L2		p.u.	0.04
	48		L3		p.u.	0.034
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.02
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.000

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	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.007
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	53	Determined proportionality constant K-factor	Pos.	-	-	-
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.01
	64		Pos.		p.u.	0.01
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.005
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.006
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.009
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.007
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.987
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.994
	75		Pos.		p.u.	0.994
	76	Active power response time (<1s)	Total	--	s	0.074
	77		Pos.	--	s	0.074
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-

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	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	--
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.002
	89		Pos.	--	s	0.002
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD3-7
	1	Date	--	--	dd.mm.yyyy	08.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	17:40:22
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.52
	5	Setting fault duration	--	--	ms	1880
	6	Point of fault occur (t1)	Total	--	ms	12535
	7	Point of fault clearance (t2)	Total	--	ms	14416
	8	Fault duration in load test	Total	--	ms	1881
	9	Fault duration in no load test	Total	--	ms	1880
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.52

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	15		Line to neutral (L2-N)		p.u.	0.52
	16		Line to neutral (L3-N)		p.u.	0.522
	17		Pos.		p.u.	0.521
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.3
	26		L2	t1-1s to t1	p.u.	0.3
	27		L3	t1-1s to t1	p.u.	0.299
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.52
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.52
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.522
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.521
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	43	Line current	L1	t1+60ms	p.u.	0.03
	44		L2		p.u.	0.026
	45		L3		p.u.	0.026
	46	Line current	L1	t1+100ms	p.u.	0.03
	47		L2		p.u.	0.029
	48		L3		p.u.	0.027
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.02
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	51	Reactive	Pos.	t1+100ms to	p.u.	-0.007

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		current		t2-20ms		
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	53	Determined proportionality constant K-factor	Pos.	-	-	-
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.01
	64		Pos.		p.u.	0.01
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.299
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.3
	75		Pos.		p.u.	0.3
	76	Active power response time (<1s)	Total	--	s	0.045
	77		Pos.	--	s	0.045
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current	Pos.	-	ms	-

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Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

	81	settling time (<60 ms)	Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.001
	89		Pos.	--	s	0.001
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD3-8
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	16:20:58
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.52
	5	Setting fault duration	--	--	ms	1880
	6	Point of fault occur (t1)	Total	--	ms	12120
	7	Point of fault clearance (t2)	Total	--	ms	14000
	8	Fault duration in load test	Total	--	ms	1880
	9	Fault duration in no load test	Total	--	ms	1880
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.52
	15		Line to neutral (L2-N)		p.u.	0.52

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	16		Line to neutral (L3-N)		p.u.	0.522
	17		Pos.		p.u.	0.521
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.3
	26		L2	t1-1s to t1	p.u.	0.301
	27		L3	t1-1s to t1	p.u.	0.3
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.52
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.52
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.522
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.521
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	43	Line current	L1	t1+60ms	p.u.	0.028
	44		L2		p.u.	0.026
	45		L3		p.u.	0.04
	46	Line current	L1	t1+100ms	p.u.	0.032
	47		L2		p.u.	0.03
	48		L3		p.u.	0.039
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.02
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.007
	52		Neg.	t1+100ms to	p.u.	-0.001

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				t2-20ms		
	53	Determined proportionality constant K-factor	Pos.	-	-	-
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.011
	64		Pos.		p.u.	0.011
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.3
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.301
	75		Pos.		p.u.	0.301
	76	Active power response time (<1s)	Total	--	s	0.017
	77		Pos.	--	s	0.018
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-

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	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.002
	89		Pos.	--	s	0.002
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

General mode for controlled short circuit current contribution			
Gradient setting	**k=2 throughout**	**Insensitive setting**	**5%**

Condition@Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD4-1
	1	Date	--	--	dd.mm.yyyy	08.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	15:37:12
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	13931
	7	Point of fault clearance (t2)	Total	--	ms	16631
	8	Fault duration in load test	Total	--	ms	2700
	9	Fault duration in no load test	Total	--	ms	2701
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.76

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	15		Line to neutral (L2-N)		p.u.	0.76
	16		Line to neutral (L3-N)		p.u.	0.763
	17		Pos.		p.u.	0.761
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.005
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.007
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.01
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.007
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.007
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.984
	26		L2	t1-1s to t1	p.u.	0.995
	27		L3	t1-1s to t1	p.u.	0.982
	28	Active current	Pos.	t1-1s to t1	p.u.	0.987
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.002
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.994
	34		Pos.		p.u.	0.994
	35	Reactive power	Total	t1-10s to t1	p.u.	0.002
	36		Pos.		p.u.	0.002
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.766
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.767
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.769
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.767
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	43	Line current	L1	t1+60ms	p.u.	1.002
	44		L2		p.u.	1.005
	45		L3		p.u.	1.011
	46	Line current	L1	t1+100ms	p.u.	1.007
	47		L2		p.u.	1.007
	48		L3		p.u.	1.005
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.863
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.008
	51	Reactive	Pos.	t1+100ms to	p.u.	0.505

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		current		t2-20ms		
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.004
	53	Determined proportionality constant K-factor	Pos.	-	-	2.104
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	6
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	22
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.662
	64		Pos.		p.u.	0.662
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.005
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.007
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.01
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.007
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.985
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.002
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.993
	75		Pos.		p.u.	0.993
	76	Active power response time (<1s)	Total	--	s	0.05
	77		Pos.	--	s	0.05
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current	Pos.	-	ms	-

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	81	settling time (<60 ms)	Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	12
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	12
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.002
	87		Pos.			0.002
	88	Reactive power rising time	Total	--	s	0.034
	89		Pos.	--	s	0.034
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD4-2
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	14:39:11
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	12982
	7	Point of fault clearance (t2)	Total	--	ms	15683
	8	Fault duration in load test	Total	--	ms	2701
	9	Fault duration in no load test	Total	--	ms	2701
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.76
	15		Line to neutral (L2-N)		p.u.	0.76

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	16		Line to neutral (L3-N)		p.u.	0.763
	17		Pos.		p.u.	0.761
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.003
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.005
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.008
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.005
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.005
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.986
	26		L2	t1-1s to t1	p.u.	0.998
	27		L3	t1-1s to t1	p.u.	0.985
	28	Active current	Pos.	t1-1s to t1	p.u.	0.989
	29		Neg.	t1-1s to t1	p.u.	-0.002
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.995
	34		Pos.		p.u.	0.995
	35	Reactive power	Total	t1-10s to t1	p.u.	0.002
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.764
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.765
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.768
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.766
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	43	Line current	L1	t1+60ms	p.u.	1.01
	44		L2		p.u.	0.998
	45		L3		p.u.	0.996
	46	Line current	L1	t1+100ms	p.u.	1.014
	47		L2		p.u.	1.003
	48		L3		p.u.	0.999
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.862
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.008
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.506
	52		Neg.	t1+100ms to	p.u.	-0.005

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				t2-20ms		
	53	Determined proportionality constant K-factor	Pos.	-	-	2.117
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	4
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	19
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.66
	64		Pos.		p.u.	0.66
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.003
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.005
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.008
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.005
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.989
	71		Neg.	t2+1s to t2+10s	p.u.	-0.002
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.002
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.995
	75		Pos.		p.u.	0.995
	76	Active power response time (<1s)	Total	--	s	0.045
	77		Pos.	--	s	0.045
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-

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Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

	82	Reactive current step response time (<30 ms)	Pos.	-	ms	2
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	2
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.002
	87		Pos.			0.002
	88	Reactive power rising time	Total	--	s	0.022
	89		Pos.	--	s	0.022
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD4-3
	1	Date	--	--	dd.mm.yyyy	08.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	16:25:35
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	17917
	7	Point of fault clearance (t2)	Total	--	ms	20617
	8	Fault duration in load test	Total	--	ms	2700
	9	Fault duration in no load test	Total	--	ms	2701
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.76
	15		Line to neutral (L2-N)		p.u.	0.76
	16		Line to neutral (L3-N)		p.u.	0.763

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	17		Pos.		p.u.	0.761
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.003
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.004
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.007
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.005
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.005
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.299
	26		L2	t1-1s to t1	p.u.	0.3
	27		L3	t1-1s to t1	p.u.	0.299
	28	Active current	Pos.	t1-1s to t1	p.u.	0.299
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.764
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.765
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.767
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.765
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	43	Line current	L1	t1+60ms	p.u.	0.641
	44		L2		p.u.	0.649
	45		L3		p.u.	0.634
	46	Line current	L1	t1+100ms	p.u.	0.643
	47		L2		p.u.	0.645
	48		L3		p.u.	0.635
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.386
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.5
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.005
	53	Determined	Pos.	-	-	2.083

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	54	proportionality constant K-factor	Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	3
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	3
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.295
	64		Pos.		p.u.	0.295
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.003
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.004
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.007
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.005
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.299
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.301
	75		Pos.		p.u.	0.301
	76	Active power response time (<1s)	Total	--	s	0.002
	77		Pos.	--	s	0.002
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step	Pos.	-	ms	6
	83		Neg.	-	ms	-

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		response time (<30 ms)				
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	6
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.027
	89		Pos.	--	s	0.027
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD4-4
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	16:34:12
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	12169
	7	Point of fault clearance (t2)	Total	--	ms	14869
	8	Fault duration in load test	Total	--	ms	2700
	9	Fault duration in no load test	Total	--	ms	2701
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.76
	15		Line to neutral (L2-N)		p.u.	0.76
	16		Line to neutral (L3-N)		p.u.	0.763
	17		Pos.		p.u.	0.761

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Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.3
	26		L2	t1-1s to t1	p.u.	0.301
	27		L3	t1-1s to t1	p.u.	0.3
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.763
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.763
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.766
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.764
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	43	Line current	L1	t1+60ms	p.u.	0.658
	44		L2		p.u.	0.64
	45		L3		p.u.	0.636
	46	Line current	L1	t1+100ms	p.u.	0.657
	47		L2		p.u.	0.641
	48		L3		p.u.	0.637
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.387
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.502
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.006
	53	Determined proportionality	Pos.	-	-	2.1
	54		Neg.	-	-	-

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		constant K-factor				
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	3
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	3
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.296
	64		Pos.		p.u.	0.296
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.3
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.3
	75		Pos.		p.u.	0.3
	76	Active power response time (<1s)	Total	--	s	0.002
	77		Pos.	--	s	0.002
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time	Pos.	-	ms	7
	83		Neg.	-	ms	-

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		(<30 ms)				
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	7
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.028
	89		Pos.	--	s	0.028
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=-0.9						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD4-5
	1	Date	--	--	dd.mm.yyyy	08.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	17:19:17
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	13132
	7	Point of fault clearance (t2)	Total	--	ms	15832
	8	Fault duration in load test	Total	--	ms	2700
	9	Fault duration in no load test	Total	--	ms	2701
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.76
	15		Line to neutral (L2-N)		p.u.	0.76
	16		Line to neutral (L3-N)		p.u.	0.763
	17		Pos.		p.u.	0.761
Before	18	Voltage	Line to neutral (L1-	t1-10s to t1	p.u.	1.001

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fault <t1			N)			
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.334
	26		L2	t1-1s to t1	p.u.	0.335
	27		L3	t1-1s to t1	p.u.	0.334
	28	Active current	Pos.	t1-1s to t1	p.u.	0.299
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	-0.148
	31		Pos.	t1-60s to t1	p.u.	-0.148
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.3
	34		Pos.		p.u.	0.3
	35	Reactive power	Total	t1-10s to t1	p.u.	-0.148
	36		Pos.		p.u.	-0.148
	37	Cos φ	--	t1-10s to t1	p.u.	0.897
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.763
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.763
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.766
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.764
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	43	Line current	L1	t1+60ms	p.u.	0.542
	44		L2		p.u.	0.533
	45		L3		p.u.	0.529
	46	Line current	L1	t1+100ms	p.u.	0.543
	47		L2		p.u.	0.531
	48		L3		p.u.	0.532
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.389
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.352
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.007
	53	Determined proportionality constant K-	Pos.	-	-	1.473
	54		Neg.	-	-	-

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		factor				
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	2
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	2
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.297
	64		Pos.		p.u.	0.297
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.299
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	-0.148
	73		Neg.	t2+1s to t2+10s	p.u.	0.001
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.3
	75		Pos.		p.u.	0.3
	76	Active power response time (<1s)	Total	--	s	0.002
	77		Pos.	--	s	0.002
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	4
	83		Neg.	-	ms	-

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Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

	84	Reactive current settling time (<60 ms)	Pos.	-	ms	4
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	-0.148
	87		Pos.			-0.148
	88	Reactive power rising time	Total	--	s	0.025
	89		Pos.	--	s	0.025
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=-0.9						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD4-6
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	16:58:31
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	12640
	7	Point of fault clearance (t2)	Total	--	ms	15340
	8	Fault duration in load test	Total	--	ms	2700
	9	Fault duration in no load test	Total	--	ms	2701
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.76
	15		Line to neutral (L2-N)		p.u.	0.76
	16		Line to neutral (L3-N)		p.u.	0.763
	17		Pos.		p.u.	0.761
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000

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	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.001
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.004
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.002
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.002
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.334
	26		L2	t1-1s to t1	p.u.	0.335
	27		L3	t1-1s to t1	p.u.	0.334
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	-0.148
	31		Pos.	t1-60s to t1	p.u.	-0.148
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	-0.148
	36		Pos.		p.u.	-0.148
	37	Cos φ	--	t1-10s to t1	p.u.	0.897
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.762
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.763
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.765
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.763
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	43	Line current	L1	t1+60ms	p.u.	0.545
	44		L2		p.u.	0.526
	45		L3		p.u.	0.529
	46	Line current	L1	t1+100ms	p.u.	0.544
	47		L2		p.u.	0.527
	48		L3		p.u.	0.529
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.39
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.353
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.006
	53	Determined proportionality constant K-factor	Pos.	-	-	1.477
	54		Neg.	-	-	-

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	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	3
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	3
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.297
	64		Pos.		p.u.	0.297
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.000
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.001
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.004
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.002
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.3
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	-0.148
	73		Neg.	t2+1s to t2+10s	p.u.	0.001
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.3
	75		Pos.		p.u.	0.3
	76	Active power response time (<1s)	Total	--	s	0.002
	77		Pos.	--	s	0.002
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	7
	83		Neg.	-	ms	-
	84	Reactive	Pos.	-	ms	7

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	85	current settling time (<60 ms)	Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	-0.148
	87		Pos.			-0.148
	88	Reactive power rising time	Total	--	s	0.028
	89		Pos.	--	s	0.028
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Optional mode for zero current threshold			
Gradient setting	**k=2**	**Insensitive setting**	**5%**
zero current threshold setting	**60%Un**		

Condition@Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD4-7
	1	Date	--	--	dd.mm.yyyy	08.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	20:18:01
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	13546
	7	Point of fault clearance (t2)	Total	--	ms	16246
	8	Fault duration in load test	Total	--	ms	2700
	9	Fault duration in no load test	Total	--	ms	2701
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.76
	15		Line to neutral (L2-N)		p.u.	0.76
	16		Line to neutral (L3-		p.u.	0.763

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			N)			
	17		Pos.		p.u.	0.761
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.003
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.005
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.008
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.005
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.005
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.987
	26		L2	t1-1s to t1	p.u.	0.997
	27		L3	t1-1s to t1	p.u.	0.985
	28	Active current	Pos.	t1-1s to t1	p.u.	0.989
	29		Neg.	t1-1s to t1	p.u.	-0.002
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.007
	33	Active power	Total	t1-10s to t1	p.u.	0.995
	34		Pos.		p.u.	0.995
	35	Reactive power	Total	t1-10s to t1	p.u.	0.001
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.764
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.765
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.768
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.766
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	43	Line current	L1	t1+60ms	p.u.	0.875
	44		L2		p.u.	0.879
	45		L3		p.u.	0.881
	46	Line current	L1	t1+100ms	p.u.	0.915
	47		L2		p.u.	0.915
	48		L3		p.u.	0.916
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.862
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.004
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.5
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.000

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	53	Determined proportionality constant K-factor	Pos.	-	-	2.092
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	3
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	18
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.66
	64		Pos.		p.u.	0.66
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.003
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.005
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.008
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.005
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.989
	71		Neg.	t2+1s to t2+10s	p.u.	-0.002
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.007
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.995
	75		Pos.		p.u.	0.995
	76	Active power response time (<1s)	Total	--	s	0.043
	77		Pos.	--	s	0.043
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive	Pos.	-	ms	4

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	83	current step response time (<30 ms)	Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	4
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.025
	89		Pos.	--	s	0.025
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD4-8
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	16:13:34
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	12049
	7	Point of fault clearance (t2)	Total	--	ms	14749
	8	Fault duration in load test	Total	--	ms	2700
	9	Fault duration in no load test	Total	--	ms	2701
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.76
	15		Line to neutral (L2-N)		p.u.	0.76
	16		Line to neutral (L3-N)		p.u.	0.763

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	17		Pos.		p.u.	0.761
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.004
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.005
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.008
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.005
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.005
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.987
	26		L2	t1-1s to t1	p.u.	0.998
	27		L3	t1-1s to t1	p.u.	0.985
	28	Active current	Pos.	t1-1s to t1	p.u.	0.99
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.002
	31		Pos.	t1-60s to t1	p.u.	0.002
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.996
	34		Pos.		p.u.	0.996
	35	Reactive power	Total	t1-10s to t1	p.u.	0.002
	36		Pos.		p.u.	0.002
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.765
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.765
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.768
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.766
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	43	Line current	L1	t1+60ms	p.u.	1.016
	44		L2		p.u.	0.996
	45		L3		p.u.	1.001
	46	Line current	L1	t1+100ms	p.u.	1.014
	47		L2		p.u.	0.998
	48		L3		p.u.	0.999
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.86
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.007
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.506
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.004
	53	Determined	Pos.	-	-	2.117

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	54	proportionality constant K-factor	Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	2
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	19
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.659
	64		Pos.		p.u.	0.659
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.004
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.005
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.008
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.005
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.989
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.995
	75		Pos.		p.u.	0.995
	76	Active power response time (<1s)	Total	--	s	0.048
	77		Pos.	--	s	0.049
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step	Pos.	-	ms	4
	83		Neg.	-	ms	-

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Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

		response time (<30 ms)				
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	4
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.025
	89		Pos.	--	s	0.025
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD4-9
	1	Date	--	--	dd.mm.yyyy	08.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	17:44:16
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	12322
	7	Point of fault clearance (t2)	Total	--	ms	15022
	8	Fault duration in load test	Total	--	ms	2700
	9	Fault duration in no load test	Total	--	ms	2701
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.76
	15		Line to neutral (L2-N)		p.u.	0.76
	16		Line to neutral (L3-N)		p.u.	0.763
	17		Pos.		p.u.	0.761

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Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.3
	26		L2	t1-1s to t1	p.u.	0.301
	27		L3	t1-1s to t1	p.u.	0.3
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.763
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.763
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.766
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.764
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	43	Line current	L1	t1+60ms	p.u.	0.653
	44		L2		p.u.	0.644
	45		L3		p.u.	0.642
	46	Line current	L1	t1+100ms	p.u.	0.652
	47		L2		p.u.	0.643
	48		L3		p.u.	0.644
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.386
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.503
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.004
	53	Determined proportionality	Pos.	-	-	2.105
	54		Neg.	-	-	-

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		constant K-factor				
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	3
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	3
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.295
	64		Pos.		p.u.	0.295
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.3
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.301
	75		Pos.		p.u.	0.301
	76	Active power response time (<1s)	Total	--	s	0.002
	77		Pos.	--	s	0.002
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time	Pos.	-	ms	6
	83		Neg.	-	ms	-

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		(<30 ms)				
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	6
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.027
	89		Pos.	--	s	0.027
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD4-10
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	16:17:58
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	11447
	7	Point of fault clearance (t2)	Total	--	ms	14148
	8	Fault duration in load test	Total	--	ms	2701
	9	Fault duration in no load test	Total	--	ms	2701
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.76
	15		Line to neutral (L2-N)		p.u.	0.76
	16		Line to neutral (L3-N)		p.u.	0.763
	17		Pos.		p.u.	0.761
Before	18	Voltage	Line to neutral (L1-	t1-10s to t1	p.u.	1.002

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fault <t1			N)			
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.3
	26		L2	t1-1s to t1	p.u.	0.3
	27		L3	t1-1s to t1	p.u.	0.299
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.763
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.764
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.766
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.764
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	43	Line current	L1	t1+60ms	p.u.	0.657
	44		L2		p.u.	0.64
	45		L3		p.u.	0.635
	46	Line current	L1	t1+100ms	p.u.	0.654
	47		L2		p.u.	0.641
	48		L3		p.u.	0.636
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.387
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.502
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.006
	53	Determined proportionality constant K-	Pos.	-	-	2.1
	54		Neg.	-	-	-

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		factor				
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	3
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	3
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.295
	64		Pos.		p.u.	0.295
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.002
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.3
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.301
	75		Pos.		p.u.	0.301
	76	Active power response time (<1s)	Total	--	s	0.002
	77		Pos.	--	s	0.002
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	6
	83		Neg.	-	ms	-

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	84	Reactive current settling time (<60 ms)	Pos.	-	ms	6
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.027
	89		Pos.	--	s	0.027
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Zero current mode			
Static operating voltage setting (under voltage)	**50%Un**	**Static operating voltage setting (over voltage)**	**120%Un**

Condition@Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD4-11
	1	Date	--	--	dd.mm.yyyy	08.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	20:25:22
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	17106
	7	Point of fault clearance (t2)	Total	--	ms	19806
	8	Fault duration in load test	Total	--	ms	2700
	9	Fault duration in no load test	Total	--	ms	2701
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.76
	15		Line to neutral (L2-N)		p.u.	0.76
	16		Line to neutral (L3-		p.u.	0.763

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			N)			
	17		Pos.		p.u.	0.761
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.004
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.005
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.008
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.005
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.005
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.987
	26		L2	t1-1s to t1	p.u.	0.998
	27		L3	t1-1s to t1	p.u.	0.985
	28	Active current	Pos.	t1-1s to t1	p.u.	0.99
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.996
	34		Pos.		p.u.	0.996
	35	Reactive power	Total	t1-10s to t1	p.u.	0.001
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.761
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.761
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.764
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.762
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	43	Line current	L1	t1+60ms	p.u.	0.139
	44		L2		p.u.	0.153
	45		L3		p.u.	0.156
	46	Line current	L1	t1+100ms	p.u.	0.146
	47		L2		p.u.	0.157
	48		L3		p.u.	0.159
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.149
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.003
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.001

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	53	Determined proportionality constant K-factor	Pos.	-	-	-0.012
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.113
	64		Pos.		p.u.	0.113
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.004
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.005
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.008
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.005
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.99
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.996
	75		Pos.		p.u.	0.996
	76	Active power response time (<1s)	Total	--	s	0.067
	77		Pos.	--	s	0.067
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-

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Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	-
	89		Pos.	--	s	-
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD4-12
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	14:07:14
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	12985
	7	Point of fault clearance (t2)	Total	--	ms	15685
	8	Fault duration in load test	Total	--	ms	2700
	9	Fault duration in no load test	Total	--	ms	2701
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.76
	15		Line to neutral (L2-N)		p.u.	0.76
	16		Line to neutral (L3-N)		p.u.	0.763

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	17		Pos.		p.u.	0.761
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.004
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.005
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.008
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.006
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.006
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.988
	26		L2	t1-1s to t1	p.u.	0.999
	27		L3	t1-1s to t1	p.u.	0.986
	28	Active current	Pos.	t1-1s to t1	p.u.	0.991
	29		Neg.	t1-1s to t1	p.u.	-0.002
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.997
	34		Pos.		p.u.	0.997
	35	Reactive power	Total	t1-10s to t1	p.u.	0.001
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.761
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.762
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.764
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.762
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	43	Line current	L1	t1+60ms	p.u.	0.164
	44		L2		p.u.	0.17
	45		L3		p.u.	0.122
	46	Line current	L1	t1+100ms	p.u.	0.163
	47		L2		p.u.	0.168
	48		L3		p.u.	0.127
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.149
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.002
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.003
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	53	Determined	Pos.	-	-	-

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	54	proportionality constant K-factor	Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.113
	64		Pos.		p.u.	0.113
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.004
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.005
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.008
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.006
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.991
	71		Neg.	t2+1s to t2+10s	p.u.	-0.002
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.997
	75		Pos.		p.u.	0.997
	76	Active power response time (<1s)	Total	--	s	0.064
	77		Pos.	--	s	0.064
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step	Pos.	-	ms	-
	83		Neg.	-	ms	-

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		response time (<30 ms)				
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	-
	89		Pos.	--	s	-
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD4-13
	1	Date	--	--	dd.mm.yyyy	08.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	17:51:51
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	12470
	7	Point of fault clearance (t2)	Total	--	ms	15170
	8	Fault duration in load test	Total	--	ms	2700
	9	Fault duration in no load test	Total	--	ms	2701
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.76
	15		Line to neutral (L2-N)		p.u.	0.76
	16		Line to neutral (L3-N)		p.u.	0.763
	17		Pos.		p.u.	0.761

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Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.3
	26		L2	t1-1s to t1	p.u.	0.301
	27		L3	t1-1s to t1	p.u.	0.3
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.761
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.761
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.764
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.762
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	43	Line current	L1	t1+60ms	p.u.	0.15
	44		L2		p.u.	0.162
	45		L3		p.u.	0.145
	46	Line current	L1	t1+100ms	p.u.	0.154
	47		L2		p.u.	0.16
	48		L3		p.u.	0.151
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.149
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.004
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	53	Determined proportionality	Pos.	-	-	-
	54		Neg.	-	-	-

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		constant K-factor				
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.114
	64		Pos.		p.u.	0.114
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.299
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.3
	75		Pos.		p.u.	0.3
	76	Active power response time (<1s)	Total	--	s	0.035
	77		Pos.	--	s	0.035
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive	Pos.	-	ms	-

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	83	current step response time (<30 ms)	Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	-
	89		Pos.	--	s	-
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD4-14
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	16:26:15
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	11793
	7	Point of fault clearance (t2)	Total	--	ms	14493
	8	Fault duration in load test	Total	--	ms	2700
	9	Fault duration in no load test	Total	--	ms	2701
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.000
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.76
	15		Line to neutral (L2-N)		p.u.	0.76
	16		Line to neutral (L3-N)		p.u.	0.763

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	17		Pos.		p.u.	0.761
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.3
	26		L2	t1-1s to t1	p.u.	0.301
	27		L3	t1-1s to t1	p.u.	0.3
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.761
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.761
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.764
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.762
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	43	Line current	L1	t1+60ms	p.u.	0.141
	44		L2		p.u.	0.16
	45		L3		p.u.	0.15
	46	Line current	L1	t1+100ms	p.u.	0.146
	47		L2		p.u.	0.159
	48		L3		p.u.	0.151
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.149
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.003
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	53	Determined	Pos.	-	-	-0.012

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	54	proportionality constant K-factor	Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.114
	64		Pos.		p.u.	0.114
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.3
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.301
	75		Pos.		p.u.	0.301
	76	Active power response time (<1s)	Total	--	s	0.015
	77		Pos.	--	s	0.015
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step	Pos.	-	ms	-
	83		Neg.	-	ms	-

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		response time (<30 ms)				
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.002
	89		Pos.	--	s	0.002
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

General mode for controlled short circuit current contribution			
Gradient setting	**k=2 throughout**	**Insensitive setting**	**8%**

Condition@Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD5-1
	1	Date	--	--	dd.mm.yyyy	08.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	15:41:31
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.90
	5	Setting fault duration	--	--	ms	180020
	6	Point of fault occur (t1)	Total	--	ms	13722
	7	Point of fault clearance (t2)	Total	--	ms	193742
	8	Fault duration in load test	Total	--	ms	180020
	9	Fault duration in no load test	Total	--	ms	180020
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.900
	15		Line to neutral (L2-		p.u.	0.900

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			N)			
	16		Line to neutral (L3-N)		p.u.	0.903
	17		Pos.		p.u.	0.901
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.005
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.007
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.010
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.007
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.007
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.984
	26		L2	t1-1s to t1	p.u.	0.996
	27		L3	t1-1s to t1	p.u.	0.982
	28	Active current	Pos.	t1-1s to t1	p.u.	0.987
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.002
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.994
	34		Pos.		p.u.	0.994
	35	Reactive power	Total	t1-10s to t1	p.u.	0.002
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.905
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.906
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.909
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.907
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.003
	43	Line current	L1	t1+60ms	p.u.	0.993
	44		L2		p.u.	0.992
	45		L3		p.u.	1.000
	46	Line current	L1	t1+100ms	p.u.	0.991
	47		L2		p.u.	0.987
	48		L3		p.u.	0.992
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.994
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.003
	51	Reactive current	Pos.	t1+100ms to t1+4900ms	p.u.	0.006

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	52		Neg.	t1+100ms to t1+4900ms	p.u.	0.009
	53	Determined proportionality constant K-factor	Pos.	-	-	2
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	10
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	11
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.902
	64		Pos.		p.u.	0.902
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.005
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.007
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.010
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.007
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.986
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.002
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.993
	75		Pos.		p.u.	0.993
	76	Active power response time (<1s)	Total	--	s	0.035
	77		Pos.	--	s	0.035
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time	Pos.	-	ms	-
	81		Neg.	-	ms	-

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		(<60 ms)				
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.002
	87		Pos.			0.002
	88	Reactive power rising time	Total	--	s	-
	89		Pos.	--	s	-
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD5-2
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	15:15:13
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.9
	5	Setting fault duration	--	--	ms	180020
	6	Point of fault occur (t1)	Total	--	ms	14085
	7	Point of fault clearance (t2)	Total	--	ms	194105
	8	Fault duration in load test	Total	--	ms	180020
	9	Fault duration in no load test	Total	--	ms	180020
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.9
	15		Line to neutral (L2-N)		p.u.	0.9

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	16		Line to neutral (L3-N)		p.u.	0.903
	17		Pos.		p.u.	0.901
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.005
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.006
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.009
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.007
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.007
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.986
	26		L2	t1-1s to t1	p.u.	0.997
	27		L3	t1-1s to t1	p.u.	0.984
	28	Active current	Pos.	t1-1s to t1	p.u.	0.989
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.002
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.995
	34		Pos.		p.u.	0.995
	35	Reactive power	Total	t1-10s to t1	p.u.	0.002
	36		Pos.		p.u.	0.002
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.905
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.906
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.909
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.906
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	43	Line current	L1	t1+60ms	p.u.	0.984
	44		L2		p.u.	0.992
	45		L3		p.u.	0.997
	46	Line current	L1	t1+100ms	p.u.	0.985
	47		L2		p.u.	0.99
	48		L3		p.u.	0.991
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.998
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.003
	51	Reactive current	Pos.	t1+100ms to t1+4900ms	p.u.	0.006
	52		Neg.	t1+100ms to	p.u.	0.01

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				t1+4900ms		
	53	Determined proportionality constant K-factor	Pos.	-	-	2
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	10
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	10
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.905
	64		Pos.		p.u.	0.905
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.005
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.006
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.009
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.007
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.988
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.002
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.995
	75		Pos.		p.u.	0.995
	76	Active power response time (<1s)	Total	--	s	0.019
	77		Pos.	--	s	0.019
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-

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	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.002
	87		Pos.			0.002
	88	Reactive power rising time	Total	--	s	-
	89		Pos.	--	s	-
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD5-3
	1	Date	--	--	dd.mm.yyyy	08.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	16:32:20
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.9
	5	Setting fault duration	--	--	ms	180020
	6	Point of fault occur (t1)	Total	--	ms	13950
	7	Point of fault clearance (t2)	Total	--	ms	193971
	8	Fault duration in load test	Total	--	ms	180021
	9	Fault duration in no load test	Total	--	ms	180020
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.9
	15		Line to neutral (L2-N)		p.u.	0.9
	16		Line to neutral (L3-N)		p.u.	0.903

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	17		Pos.		p.u.	0.901
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.003
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.004
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.007
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.004
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.004
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.3
	26		L2	t1-1s to t1	p.u.	0.3
	27		L3	t1-1s to t1	p.u.	0.299
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.903
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.903
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.906
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.904
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	43	Line current	L1	t1+60ms	p.u.	0.393
	44		L2		p.u.	0.409
	45		L3		p.u.	0.407
	46	Line current	L1	t1+100ms	p.u.	0.397
	47		L2		p.u.	0.408
	48		L3		p.u.	0.405
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.332
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.001
	51	Reactive current	Pos.	t1+100ms to t1+4900ms	p.u.	0.005
	52		Neg.	t1+100ms to t1+4900ms	p.u.	0.000
	53	Determined	Pos.	-	-	2

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	54	proportionality constant K-factor	Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	10
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	10
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.3
	64		Pos.		p.u.	0.3
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.003
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.004
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.007
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.004
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.299
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.301
	75		Pos.		p.u.	0.301
	76	Active power response time (<1s)	Total	--	s	0.001
	77		Pos.	--	s	0.001
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step	Pos.	-	ms	-
	83		Neg.	-	ms	-

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Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

		response time (<30 ms)				
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	-
	89		Pos.	--	s	-
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD5-4
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	16:36:55
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.9
	5	Setting fault duration	--	--	ms	180020
	6	Point of fault occur (t1)	Total	--	ms	16313
	7	Point of fault clearance (t2)	Total	--	ms	196333
	8	Fault duration in load test	Total	--	ms	180020
	9	Fault duration in no load test	Total	--	ms	180020
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.9
	15		Line to neutral (L2-N)		p.u.	0.9
	16		Line to neutral (L3-N)		p.u.	0.903
	17		Pos.		p.u.	0.901

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Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.3
	26		L2	t1-1s to t1	p.u.	0.3
	27		L3	t1-1s to t1	p.u.	0.299
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.3
	34		Pos.		p.u.	0.3
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.901
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.902
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.905
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.903
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	43	Line current	L1	t1+60ms	p.u.	0.409
	44		L2		p.u.	0.399
	45		L3		p.u.	0.411
	46	Line current	L1	t1+100ms	p.u.	0.409
	47		L2		p.u.	0.401
	48		L3		p.u.	0.41
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.333
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	51	Reactive current	Pos.	t1+100ms to t1+4900ms	p.u.	0.005
	52		Neg.	t1+100ms to t1+4900ms	p.u.	-0.001
	53	Determined proportionality	Pos.	-	-	2
	54		Neg.	-	-	-

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		constant K-factor				
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	10
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	10
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.3
	64		Pos.		p.u.	0.3
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.3
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.301
	75		Pos.		p.u.	0.301
	76	Active power response time (<1s)	Total	--	s	0.002
	77		Pos.	--	s	0.002
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time	Pos.	-	ms	-
	83		Neg.	-	ms	-

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		(<30 ms)				
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.001
	89		Pos.	--	s	0.001
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

General mode for controlled short circuit current contribution			
Gradient setting	**k=6 throughout**	**Insensitive setting**	**8%**

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD5-5
	1	Date	--	--	dd.mm.yyyy	08.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	17:23:36
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.9
	5	Setting fault duration	--	--	ms	180020
	6	Point of fault occur (t1)	Total	--	ms	13058
	7	Point of fault clearance (t2)	Total	--	ms	193078
	8	Fault duration in load test	Total	--	ms	180020
	9	Fault duration in no load test	Total	--	ms	180020
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.9
	15		Line to neutral (L2-N)		p.u.	0.9
	16		Line to neutral (L3-		p.u.	0.903

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			N)			
	17		Pos.		p.u.	0.901
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.002
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.003
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.006
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.3
	26		L2	t1-1s to t1	p.u.	0.301
	27		L3	t1-1s to t1	p.u.	0.3
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.902
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.903
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.905
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.903
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	43	Line current	L1	t1+60ms	p.u.	0.743
	44		L2		p.u.	0.716
	45		L3		p.u.	0.722
	46	Line current	L1	t1+100ms	p.u.	0.745
	47		L2		p.u.	0.723
	48		L3		p.u.	0.72
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.332
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.001
	51	Reactive current	Pos.	t1+100ms to t1+4900ms	p.u.	0.016
	52		Neg.	t1+100ms to t1+4900ms	p.u.	0.000

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	53	Determined proportionality constant K-factor	Pos.	-	-	6
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	10
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	10
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.3
	64		Pos.		p.u.	0.3
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.002
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.003
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.006
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.3
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.301
	75		Pos.		p.u.	0.301
	76	Active power response time (<1s)	Total	--	s	0.002
	77		Pos.	--	s	0.002
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive	Pos.	-	ms	-

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	83	current step response time (<30 ms)	Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.002
	89		Pos.	--	s	0.002
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD5-6
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	17:03:00
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.9
	5	Setting fault duration	--	--	ms	180020
	6	Point of fault occur (t1)	Total	--	ms	12013
	7	Point of fault clearance (t2)	Total	--	ms	192032
	8	Fault duration in load test	Total	--	ms	180019
	9	Fault duration in no load test	Total	--	ms	180020
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.9
	15		Line to neutral (L2-N)		p.u.	0.9
	16		Line to neutral (L3-N)		p.u.	0.903

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	17		Pos.		p.u.	0.901
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.004
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.002
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.002
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.3
	26		L2	t1-1s to t1	p.u.	0.301
	27		L3	t1-1s to t1	p.u.	0.3
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	-0.001
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.901
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.902
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.904
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.902
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	43	Line current	L1	t1+60ms	p.u.	0.751
	44		L2		p.u.	0.714
	45		L3		p.u.	0.723
	46	Line current	L1	t1+100ms	p.u.	0.75
	47		L2		p.u.	0.719
	48		L3		p.u.	0.723
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.332
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	51	Reactive current	Pos.	t1+100ms to t1+4900ms	p.u.	0.017
	52		Neg.	t1+100ms to t1+4900ms	p.u.	-0.001
	53	Determined	Pos.	-	-	6

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	54	proportionality constant K-factor	Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	10
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	10
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.3
	64		Pos.		p.u.	0.3
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.004
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.002
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.3
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.301
	75		Pos.		p.u.	0.301
	76	Active power response time (<1s)	Total	--	s	0.002
	77		Pos.	--	s	0.002
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step	Pos.	-	ms	-
	83		Neg.	-	ms	-

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Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

		response time (<30 ms)				
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	-
	89		Pos.	--	s	-
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

General mode for controlled short circuit current contribution			
Gradient setting	**k=2 throughout**	**Insensitive setting**	**5%**

Condition@Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD6-1
	1	Date	--	--	dd.mm.yyyy	12.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	11:49:51
	3	Fault type (phase)	--	--		two-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.05
	5	Setting fault duration	--	--	ms	260
	6	Point of fault occur (t1)	Total	--	ms	12189
	7	Point of fault clearance (t2)	Total	--	ms	12449
	8	Fault duration in load test	Total	--	ms	260
	9	Fault duration in no load test	Total	--	ms	260
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.051
	15		Line to neutral (L2-N)		p.u.	0.872
	16		Line to neutral (L3-		p.u.	0.873

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			N)			
	17		Pos.		p.u.	0.529
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.003
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.004
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.007
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.005
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.005
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.984
	26		L2	t1-1s to t1	p.u.	0.995
	27		L3	t1-1s to t1	p.u.	0.982
	28	Active current	Pos.	t1-1s to t1	p.u.	0.987
	29		Neg.	t1-1s to t1	p.u.	-0.002
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.992
	34		Pos.		p.u.	0.992
	35	Reactive power	Total	t1-10s to t1	p.u.	0.001
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.052
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.864
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.876
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.527
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.477
	43	Line current	L1	t1+60ms	p.u.	0.943
	44		L2		p.u.	0.423
	45		L3		p.u.	0.531
	46	Line current	L1	t1+100ms	p.u.	0.971
	47		L2		p.u.	0.438
	48		L3		p.u.	0.54
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.097
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.01
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.496
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.467

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	53	Determined proportionality constant K-factor	Pos.	-	-	1.038
	54		Neg.	-	-	-0.985
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	2
	60		Neg.	-	ms	29
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	2
	62		Neg.	-	ms	29
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.046
	64		Pos.		p.u.	0.051
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.003
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.004
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.007
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.005
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.987
	71		Neg.	t2+1s to t2+10s	p.u.	-0.002
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.992
	75		Pos.		p.u.	0.992
	76	Active power response time (<1s)	Total	--	s	0.1
	77		Pos.	--	s	0.1
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive	Pos.	-	ms	0.000

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	83	current step response time (<30 ms)	Neg.	-	ms	1.000
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	26
	85		Neg.	-	ms	9
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.025
	89		Pos.	--	s	0.02
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD6-2
	1	Date	--	--	dd.mm.yyyy	12.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	11:46:38
	3	Fault type (phase)	--	--		two-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.05
	5	Setting fault duration	--	--	ms	260
	6	Point of fault occur (t1)	Total	--	ms	12073
	7	Point of fault clearance (t2)	Total	--	ms	12333
	8	Fault duration in load test	Total	--	ms	260
	9	Fault duration in no load test	Total	--	ms	260
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.051
	15		Line to neutral (L2-N)		p.u.	0.872
	16		Line to neutral (L3-N)		p.u.	0.873
	17		Pos.		p.u.	0.529

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Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.003
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.004
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.007
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.005
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.005
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.99
	26		L2	t1-1s to t1	p.u.	1.003
	27		L3	t1-1s to t1	p.u.	0.989
	28	Active current	Pos.	t1-1s to t1	p.u.	0.994
	29		Neg.	t1-1s to t1	p.u.	-0.002
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.999
	34		Pos.		p.u.	0.999
	35	Reactive power	Total	t1-10s to t1	p.u.	0.001
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.052
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.864
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.876
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.527
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.477
	43	Line current	L1	t1+60ms	p.u.	0.935
	44		L2		p.u.	0.412
	45		L3		p.u.	0.534
	46	Line current	L1	t1+100ms	p.u.	0.96
	47		L2		p.u.	0.421
	48		L3		p.u.	0.545
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.096
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.002
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.495
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.467
	53	Determined proportionality	Pos.	-	-	1.036
	54		Neg.	-	-	-0.983

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		constant K-factor				
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	2
	60		Neg.	-	ms	27
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	4
	62		Neg.	-	ms	27
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.05
	64		Pos.		p.u.	0.051
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.003
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.004
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.007
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.005
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.994
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.009
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.999
	75		Pos.		p.u.	0.999
	76	Active power response time (<1s)	Total	--	s	0.075
	77		Pos.	--	s	0.075
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time	Pos.	-	ms	27
	83		Neg.	-	ms	21

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		(<30 ms)				
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	27
	85		Neg.	-	ms	21
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.021
	89		Pos.	--	s	0.02
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD6-3
	1	Date	--	--	dd.mm.yyyy	12.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	11:52:28
	3	Fault type (phase)	--	--		two-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.05
	5	Setting fault duration	--	--	ms	260
	6	Point of fault occur (t1)	Total	--	ms	11640
	7	Point of fault clearance (t2)	Total	--	ms	11900
	8	Fault duration in load test	Total	--	ms	260
	9	Fault duration in no load test	Total	--	ms	260
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.051
	15		Line to neutral (L2-N)		p.u.	0.872
	16		Line to neutral (L3-N)		p.u.	0.873
	17		Pos.		p.u.	0.529
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001

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	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.305
	26		L2	t1-1s to t1	p.u.	0.306
	27		L3	t1-1s to t1	p.u.	0.305
	28	Active current	Pos.	t1-1s to t1	p.u.	0.305
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.306
	34		Pos.		p.u.	0.306
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.053
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.866
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.878
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.529
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.478
	43	Line current	L1	t1+60ms	p.u.	0.954
	44		L2		p.u.	0.424
	45		L3		p.u.	0.537
	46	Line current	L1	t1+100ms	p.u.	0.969
	47		L2		p.u.	0.431
	48		L3		p.u.	0.545
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.096
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.01
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.495
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.472
	53	Determined proportionality constant K-factor	Pos.	-	-	1.044
	54		Neg.	-	-	-0.992

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	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	2
	60		Neg.	-	ms	28
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	2
	62		Neg.	-	ms	28
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.046
	64		Pos.		p.u.	0.051
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.305
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.001
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.306
	75		Pos.		p.u.	0.306
	76	Active power response time (<1s)	Total	--	s	0.038
	77		Pos.	--	s	0.038
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	26
	83		Neg.	-	ms	10
	84	Reactive	Pos.	-	ms	26

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Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

	85	current settling time (<60 ms)	Neg.	-	ms	10
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.025
	89		Pos.	--	s	0.021
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD6-4
	1	Date	--	--	dd.mm.yyyy	12.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	11:42:33
	3	Fault type (phase)	--	--		two-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.05
	5	Setting fault duration	--	--	ms	260
	6	Point of fault occur (t1)	Total	--	ms	12082
	7	Point of fault clearance (t2)	Total	--	ms	12342
	8	Fault duration in load test	Total	--	ms	260
	9	Fault duration in no load test	Total	--	ms	260
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.003
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.051
	15		Line to neutral (L2-N)		p.u.	0.872
	16		Line to neutral (L3-N)		p.u.	0.873
	17		Pos.		p.u.	0.529
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002

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	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.004
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.002
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.002
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.304
	26		L2	t1-1s to t1	p.u.	0.305
	27		L3	t1-1s to t1	p.u.	0.304
	28	Active current	Pos.	t1-1s to t1	p.u.	0.304
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.305
	34		Pos.		p.u.	0.305
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.053
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.865
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.877
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.528
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.477
	43	Line current	L1	t1+60ms	p.u.	0.959
	44		L2		p.u.	0.414
	45		L3		p.u.	0.55
	46	Line current	L1	t1+100ms	p.u.	0.979
	47		L2		p.u.	0.422
	48		L3		p.u.	0.559
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.097
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.495
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.481
	53	Determined proportionality constant K-factor	Pos.	-	-	1.044
	54		Neg.	-	-	-1.013
	55	Active current step response	Pos.	-	ms	-
	56		Neg.	-	ms	-

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		time (<30 ms)				
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	2
	60		Neg.	-	ms	14
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	4
	62		Neg.	-	ms	21
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.052
	64		Pos.		p.u.	0.051
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.004
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.002
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.304
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.001
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.304
	75		Pos.		p.u.	0.304
	76	Active power response time (<1s)	Total	--	s	0.038
	77		Pos.	--	s	0.038
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	26
	83		Neg.	-	ms	10
	84	Reactive current settling time	Pos.	-	ms	26
	85		Neg.	-	ms	10

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		(<60 ms)				
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.02
	89		Pos.	--	s	0.019
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD7-1
	1	Date	--	--	dd.mm.yyyy	08.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	15:48:25
	3	Fault type (phase)	--	--		two-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	13680
	7	Point of fault clearance (t2)	Total	--	ms	14600
	8	Fault duration in load test	Total	--	ms	920
	9	Fault duration in no load test	Total	--	ms	920
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.24
	15		Line to neutral (L2-N)		p.u.	0.872
	16		Line to neutral (L3-N)		p.u.	0.873
	17		Pos.		p.u.	0.619
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.006
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.007
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.01

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	21	Voltage	Pos.	t1-60s to t1	p.u.	1.007
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.007
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.984
	26		L2	t1-1s to t1	p.u.	0.996
	27		L3	t1-1s to t1	p.u.	0.982
	28	Active current	Pos.	t1-1s to t1	p.u.	0.987
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.002
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.994
	34		Pos.		p.u.	0.994
	35	Reactive power	Total	t1-10s to t1	p.u.	0.002
	36		Pos.		p.u.	0.002
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.243
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.869
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.88
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.621
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.379
	43	Line current	L1	t1+60ms	p.u.	0.944
	44		L2		p.u.	0.418
	45		L3		p.u.	0.553
	46	Line current	L1	t1+100ms	p.u.	0.971
	47		L2		p.u.	0.443
	48		L3		p.u.	0.558
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.093
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.022
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.509
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.479
	53	Determined proportionality constant K-factor	Pos.	-	-	1.319
	54		Neg.	-	-	-1.274
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-

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	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	8
	60		Neg.	-	ms	20
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	8
	62		Neg.	-	ms	20
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.049
	64		Pos.		p.u.	0.058
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.006
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.007
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.01
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.007
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.986
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.993
	75		Pos.		p.u.	0.993
	76	Active power response time (<1s)	Total	--	s	-
	77		Pos.	--	s	-
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	12
	83		Neg.	-	ms	20
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	12
	85		Neg.	-	ms	20
	86	Reactive power	Total	t2+1s to	p.u.	0.001

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	87		Pos.	t2+10s		0.001
	88	Reactive power rising time	Total	--	s	0.02
	89		Pos.	--	s	0.02
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD7-2
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	15:10:39
	3	Fault type (phase)	--	--		two-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	12357
	7	Point of fault clearance (t2)	Total	--	ms	13277
	8	Fault duration in load test	Total	--	ms	920
	9	Fault duration in no load test	Total	--	ms	920
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.24
	15		Line to neutral (L2-N)		p.u.	0.872
	16		Line to neutral (L3-N)		p.u.	0.873
	17		Pos.		p.u.	0.619
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.005
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.006
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.009
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.006
	22		Neg.	t1-60s to t1	p.u.	0.003

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	23		Pos.	t1-1s to t1	p.u.	1.006
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.986
	26		L2	t1-1s to t1	p.u.	0.997
	27		L3	t1-1s to t1	p.u.	0.984
	28	Active current	Pos.	t1-1s to t1	p.u.	0.989
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.002
	31		Pos.	t1-60s to t1	p.u.	0.002
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.995
	34		Pos.		p.u.	0.995
	35	Reactive power	Total	t1-10s to t1	p.u.	0.002
	36		Pos.		p.u.	0.002
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.243
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.868
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.879
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.621
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.378
	43	Line current	L1	t1+60ms	p.u.	0.947
	44		L2		p.u.	0.424
	45		L3		p.u.	0.548
	46	Line current	L1	t1+100ms	p.u.	0.97
	47		L2		p.u.	0.435
	48		L3		p.u.	0.559
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.101
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.014
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.51
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.484
	53	Determined proportionality constant K-factor	Pos.	-	-	1.325
	54		Neg.	-	-	-1.291
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time	Pos.	-	ms	-
	58		Neg.	-	ms	-

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		(<60 ms)				
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	15
	60		Neg.	-	ms	17
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	15
	62		Neg.	-	ms	17
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.057
	64		Pos.		p.u.	0.063
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.005
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.006
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.009
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.007
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.988
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.002
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.995
	75		Pos.		p.u.	0.995
	76	Active power response time (<1s)	Total	--	s	0.063
	77		Pos.	--	s	0.063
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	24
	83		Neg.	-	ms	22
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	24
	85		Neg.	-	ms	22
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.002
	87		Pos.			0.002
	88	Reactive power	Total	--	s	0.019

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TÜV SÜD New Energy Vehicle Testing (Jiangsu) Co., Ltd., TÜV SÜD Group
Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

	89	rising time	Pos.	--	s	0.019
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD7-3
	1	Date	--	--	dd.mm.yyyy	12.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	11:56:23
	3	Fault type (phase)	--	--		two-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	12141
	7	Point of fault clearance (t2)	Total	--	ms	13061
	8	Fault duration in load test	Total	--	ms	920
	9	Fault duration in no load test	Total	--	ms	920
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.24
	15		Line to neutral (L2-N)		p.u.	0.872
	16		Line to neutral (L3-N)		p.u.	0.873
	17		Pos.		p.u.	0.619
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002

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	25	Current	L1	t1-1s to t1	p.u.	0.305
	26		L2	t1-1s to t1	p.u.	0.306
	27		L3	t1-1s to t1	p.u.	0.305
	28	Active current	Pos.	t1-1s to t1	p.u.	0.305
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.306
	34		Pos.		p.u.	0.306
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.243
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.868
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.878
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.62
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.378
	43	Line current	L1	t1+60ms	p.u.	0.957
	44		L2		p.u.	0.408
	45		L3		p.u.	0.573
	46	Line current	L1	t1+100ms	p.u.	0.983
	47		L2		p.u.	0.426
	48		L3		p.u.	0.583
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.093
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.02
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.511
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.48
	53	Determined proportionality constant K-factor	Pos.	-	-	1.334
	54		Neg.	-	-	-1.277
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive	Pos.	-	ms	12

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	60	current step response time (<30 ms)	Neg.	-	ms	14
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	12
	62		Neg.	-	ms	49
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.05
	64		Pos.		p.u.	0.058
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.305
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.001
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.306
	75		Pos.		p.u.	0.306
	76	Active power response time (<1s)	Total	--	s	0.038
	77		Pos.	--	s	0.038
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	26
	83		Neg.	-	ms	9
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	26
	85		Neg.	-	ms	9
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.019
	89		Pos.	--	s	0.019

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	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD7-4
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	16:42:47
	3	Fault type (phase)	--	--		two-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	12163
	7	Point of fault clearance (t2)	Total	--	ms	13083
	8	Fault duration in load test	Total	--	ms	920
	9	Fault duration in no load test	Total	--	ms	920
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.24
	15		Line to neutral (L2-N)		p.u.	0.872
	16		Line to neutral (L3-N)		p.u.	0.873
	17		Pos.		p.u.	0.619
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.3

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	26		L2	t1-1s to t1	p.u.	0.301
	27		L3	t1-1s to t1	p.u.	0.3
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.243
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.867
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.878
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.62
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.378
	43	Line current	L1	t1+60ms	p.u.	0.973
	44		L2		p.u.	0.436
	45		L3		p.u.	0.555
	46	Line current	L1	t1+100ms	p.u.	0.991
	47		L2		p.u.	0.444
	48		L3		p.u.	0.567
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.102
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.015
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.511
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.488
	53	Determined proportionality constant K-factor	Pos.	-	-	1.334
	54		Neg.	-	-	-1.298
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time	Pos.	-	ms	11
	60		Neg.	-	ms	13

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		(<30 ms)				
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	11
	62		Neg.	-	ms	27
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.057
	64		Pos.		p.u.	0.063
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.3
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.301
	75		Pos.		p.u.	0.301
	76	Active power response time (<1s)	Total	--	s	0.03
	77		Pos.	--	s	0.03
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	19
	83		Neg.	-	ms	10
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	19
	85		Neg.	-	ms	10
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.019
	89		Pos.	--	s	0.019
	90	PGU does not disconnect from	--	t2 to t2+60s	Yes / No	yes

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		grid till 60s after fault				

Condition@Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD8-1
	1	Date	--	--	dd.mm.yyyy	12.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	10:56:38
	3	Fault type (phase)	--	--		two-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.52
	5	Setting fault duration	--	--	ms	1880
	6	Point of fault occur (t1)	Total	--	ms	12455
	7	Point of fault clearance (t2)	Total	--	ms	14335
	8	Fault duration in load test	Total	--	ms	1880
	9	Fault duration in no load test	Total	--	ms	1880
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.519
	15		Line to neutral (L2-N)		p.u.	0.902
	16		Line to neutral (L3-N)		p.u.	0.904
	17		Pos.		p.u.	0.759
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.003
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.005
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.008
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.005
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.005
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.986
	26		L2	t1-1s to t1	p.u.	0.998
	27		L3	t1-1s to t1	p.u.	0.984

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	28	Active current	Pos.	t1-1s to t1	p.u.	0.989
	29		Neg.	t1-1s to t1	p.u.	-0.002
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.002
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.994
	34		Pos.		p.u.	0.994
	35	Reactive power	Total	t1-10s to t1	p.u.	0.001
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.522
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.899
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.908
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.76
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.239
	43	Line current	L1	t1+60ms	p.u.	0.881
	44		L2		p.u.	0.325
	45		L3		p.u.	0.607
	46	Line current	L1	t1+100ms	p.u.	0.894
	47		L2		p.u.	0.391
	48		L3		p.u.	0.561
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.056
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.006
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.47
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.456
	53	Determined proportionality constant K-factor	Pos.	-	-	1.918
	54		Neg.	-	-	-1.932
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	10
	60		Neg.	-	ms	19
	61	Reactive	Pos.	-	ms	10

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	62	current settling time (<60 ms)	Neg.	-	ms	19
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.041
	64		Pos.		p.u.	0.043
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.003
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.005
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.008
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.005
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.988
	71		Neg.	t2+1s to t2+10s	p.u.	-0.002
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.993
	75		Pos.		p.u.	0.993
	76	Active power response time (<1s)	Total	--	s	0.073
	77		Pos.	--	s	0.073
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	14
	83		Neg.	-	ms	25
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	14
	85		Neg.	-	ms	49
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.036
	89		Pos.	--	s	0.035
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

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TÜV SÜD New Energy Vehicle Testing (Jiangsu) Co., Ltd., TÜV SÜD Group
Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

Condition@Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD8-2
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	15:07:21
	3	Fault type (phase)	--	--		two-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.52
	5	Setting fault duration	--	--	ms	1880
	6	Point of fault occur (t1)	Total	--	ms	12785
	7	Point of fault clearance (t2)	Total	--	ms	14666
	8	Fault duration in load test	Total	--	ms	1881
	9	Fault duration in no load test	Total	--	ms	1880
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.519
	15		Line to neutral (L2-N)		p.u.	0.902
	16		Line to neutral (L3-N)		p.u.	0.904
	17		Pos.		p.u.	0.759
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.005
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.006
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.009
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.006
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.006
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.986
	26		L2	t1-1s to t1	p.u.	0.997
	27		L3	t1-1s to t1	p.u.	0.984
	28	Active current	Pos.	t1-1s to t1	p.u.	0.989
	29		Neg.	t1-1s to t1	p.u.	-0.003

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	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.002
	31		Pos.	t1-60s to t1	p.u.	0.002
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.995
	34		Pos.		p.u.	0.995
	35	Reactive power	Total	t1-10s to t1	p.u.	0.002
	36		Pos.		p.u.	0.002
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.522
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.9
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.909
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.761
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.239
	43	Line current	L1	t1+60ms	p.u.	0.886
	44		L2		p.u.	0.336
	45		L3		p.u.	0.599
	46	Line current	L1	t1+100ms	p.u.	0.904
	47		L2		p.u.	0.362
	48		L3		p.u.	0.588
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.102
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.006
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.484
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.466
	53	Determined proportionality constant K-factor	Pos.	-	-	1.976
	54		Neg.	-	-	-1.975
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	14
	60		Neg.	-	ms	10
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	14
	62		Neg.	-	ms	37

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	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.076
	64		Pos.		p.u.	0.078
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.005
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.006
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.009
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.006
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.988
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.995
	75		Pos.		p.u.	0.995
	76	Active power response time (<1s)	Total	--	s	0.048
	77		Pos.	--	s	0.048
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	20
	83		Neg.	-	ms	14
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	20
	85		Neg.	-	ms	28
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.028
	89		Pos.	--	s	0.022
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=1	Measurement

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Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD8-3
	1	Date	--	--	dd.mm.yyyy	12.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	10:59:57
	3	Fault type (phase)	--	--		two-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.52
	5	Setting fault duration	--	--	ms	1880
	6	Point of fault occur (t1)	Total	--	ms	14744
	7	Point of fault clearance (t2)	Total	--	ms	16624
	8	Fault duration in load test	Total	--	ms	1880
	9	Fault duration in no load test	Total	--	ms	1880
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.519
	15		Line to neutral (L2-N)		p.u.	0.902
	16		Line to neutral (L3-N)		p.u.	0.904
	17		Pos.		p.u.	0.759
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.305
	26		L2	t1-1s to t1	p.u.	0.306
	27		L3	t1-1s to t1	p.u.	0.304
	28	Active current	Pos.	t1-1s to t1	p.u.	0.305
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000

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	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.306
	34		Pos.		p.u.	0.306
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.522
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.899
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.908
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.76
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.239
	43	Line current	L1	t1+60ms	p.u.	0.874
	44		L2		p.u.	0.326
	45		L3		p.u.	0.604
	46	Line current	L1	t1+100ms	p.u.	0.886
	47		L2		p.u.	0.356
	48		L3		p.u.	0.584
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.054
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.007
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.469
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.456
	53	Determined proportionality constant K-factor	Pos.	-	-	1.93
	54		Neg.	-	-	-1.924
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	19
	60		Neg.	-	ms	18
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	19
	62		Neg.	-	ms	18
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.039
	64		Pos.		p.u.	0.041

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After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.304
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.001
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.305
	75		Pos.		p.u.	0.305
	76	Active power response time (<1s)	Total	--	s	0.039
	77		Pos.	--	s	0.039
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	14
	83		Neg.	-	ms	20
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	14
	85		Neg.	-	ms	46
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.036
	89		Pos.	--	s	0.035
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General	0	Test number	--	--	--	VD8-4

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Info.	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	16:45:08
	3	Fault type (phase)	--	--		two-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.52
	5	Setting fault duration	--	--	ms	1880
	6	Point of fault occur (t1)	Total	--	ms	13076
	7	Point of fault clearance (t2)	Total	--	ms	14956
	8	Fault duration in load test	Total	--	ms	1880
	9	Fault duration in no load test	Total	--	ms	1880
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.519
	15		Line to neutral (L2-N)		p.u.	0.902
	16		Line to neutral (L3-N)		p.u.	0.904
	17		Pos.		p.u.	0.759
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.002
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.002
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.3
	26		L2	t1-1s to t1	p.u.	0.301
	27		L3	t1-1s to t1	p.u.	0.3
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.301

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	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.522
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.899
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.908
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.76
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.239
	43	Line current	L1	t1+60ms	p.u.	0.901
	44		L2		p.u.	0.337
	45		L3		p.u.	0.609
	46	Line current	L1	t1+100ms	p.u.	0.919
	47		L2		p.u.	0.363
	48		L3		p.u.	0.599
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.103
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.006
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.487
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.467
	53	Determined proportionality constant K-factor	Pos.	-	-	2.012
	54		Neg.	-	-	-1.97
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	19
	60		Neg.	-	ms	20
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	26
	62		Neg.	-	ms	45
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.077
	64		Pos.		p.u.	0.078
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001

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	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.002
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.3
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.301
	75		Pos.		p.u.	0.301
	76	Active power response time (<1s)	Total	--	s	0.015
	77		Pos.	--	s	0.014
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	9
	83		Neg.	-	ms	1
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	9
	85		Neg.	-	ms	40
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.035
	89		Pos.	--	s	0.034
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD9-1
	1	Date	--	--	dd.mm.yyyy	08.09.2025
	2	Time (start of	--	--	hh:mm:ss.f	16:01:54

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		test)				
	3	Fault type (phase)	--	--		two-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	13050
	7	Point of fault clearance (t2)	Total	--	ms	15750
	8	Fault duration in load test	Total	--	ms	2700
	9	Fault duration in no load test	Total	--	ms	2700
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.761
	15		Line to neutral (L2-N)		p.u.	0.951
	16		Line to neutral (L3-N)		p.u.	0.953
	17		Pos.		p.u.	0.884
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.006
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.007
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.01
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.008
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.008
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.984
	26		L2	t1-1s to t1	p.u.	0.996
	27		L3	t1-1s to t1	p.u.	0.982
	28	Active current	Pos.	t1-1s to t1	p.u.	0.987
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.002
	31		Pos.	t1-60s to t1	p.u.	0.002
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.994
	34		Pos.		p.u.	0.994
	35	Reactive power	Total	t1-10s to t1	p.u.	0.002

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	36		Pos.		p.u.	0.002
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.768
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.953
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.96
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.89
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.122
	43	Line current	L1	t1+60ms	p.u.	0.824
	44		L2		p.u.	0.495
	45		L3		p.u.	0.932
	46	Line current	L1	t1+100ms	p.u.	0.821
	47		L2		p.u.	0.481
	48		L3		p.u.	0.9
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.656
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.015
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.254
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.249
	53	Determined proportionality constant K-factor	Pos.	-	-	2.153
	54		Neg.	-	-	-2.092
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	20
	60		Neg.	-	ms	6
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	21
	62		Neg.	-	ms	6
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.582
	64		Pos.		p.u.	0.584
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.006
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.007

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	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.01
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.008
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.984
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.002
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.992
	75		Pos.		p.u.	0.992
	76	Active power response time (<1s)	Total	--	s	0.045
	77		Pos.	--	s	0.045
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	8
	83		Neg.	-	ms	19
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	28
	85		Neg.	-	ms	56
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.002
	87		Pos.			0.002
	88	Reactive power rising time	Total	--	s	0.03
	89		Pos.	--	s	0.029
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD9-2
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	15:28:08
	3	Fault type	--	--		two-phase

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		(phase)				undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	13209
	7	Point of fault clearance (t2)	Total	--	ms	15909
	8	Fault duration in load test	Total	--	ms	2700
	9	Fault duration in no load test	Total	--	ms	2700
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.761
	15		Line to neutral (L2-N)		p.u.	0.951
	16		Line to neutral (L3-N)		p.u.	0.953
	17		Pos.		p.u.	0.884
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.005
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.006
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.009
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.007
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.007
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.986
	26		L2	t1-1s to t1	p.u.	0.997
	27		L3	t1-1s to t1	p.u.	0.984
	28	Active current	Pos.	t1-1s to t1	p.u.	0.989
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.002
	31		Pos.	t1-60s to t1	p.u.	0.002
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.995
	34		Pos.		p.u.	0.995
	35	Reactive power	Total	t1-10s to t1	p.u.	0.002
	36		Pos.		p.u.	0.002
	37	Cos φ	--	t1-10s to t1	p.u.	1.000

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During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.766
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.951
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.959
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.888
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.122
	43	Line current	L1	t1+60ms	p.u.	0.688
	44		L2		p.u.	0.337
	45		L3		p.u.	0.762
	46	Line current	L1	t1+100ms	p.u.	0.702
	47		L2		p.u.	0.331
	48		L3		p.u.	0.757
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.499
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.257
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.267
	53	Determined proportionality constant K-factor	Pos.	-	-	2.16
	54		Neg.	-	-	-2.244
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	20
	60		Neg.	-	ms	8
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	21
	62		Neg.	-	ms	36
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.443
	64		Pos.		p.u.	0.443
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.005
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.006
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.009

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	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.007
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.988
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.002
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.994
	75		Pos.		p.u.	0.994
	76	Active power response time (<1s)	Total	--	s	0.037
	77		Pos.	--	s	0.037
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	10
	83		Neg.	-	ms	14
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	10
	85		Neg.	-	ms	50
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.002
	87		Pos.			0.002
	88	Reactive power rising time	Total	--	s	0.032
	89		Pos.	--	s	0.031
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD9-3
	1	Date	--	--	dd.mm.yyyy	11.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	20:27:51
	3	Fault type (phase)	--	--		two-phase undervoltage
	4	Setting voltage	Line to line	--	p.u.	0.76

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		depth				
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	14689
	7	Point of fault clearance (t2)	Total	--	ms	17389
	8	Fault duration in load test	Total	--	ms	2700
	9	Fault duration in no load test	Total	--	ms	2700
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.761
	15		Line to neutral (L2-N)		p.u.	0.951
	16		Line to neutral (L3-N)		p.u.	0.953
	17		Pos.		p.u.	0.884
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.001
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.004
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.001
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.001
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.306
	26		L2	t1-1s to t1	p.u.	0.306
	27		L3	t1-1s to t1	p.u.	0.305
	28	Active current	Pos.	t1-1s to t1	p.u.	0.306
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.306
	34		Pos.		p.u.	0.306
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.763

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t2	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.949
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.956
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.885
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.122
	43	Line current	L1	t1+60ms	p.u.	0.454
	44		L2		p.u.	0.298
	45		L3		p.u.	0.63
	46	Line current	L1	t1+100ms	p.u.	0.508
	47		L2		p.u.	0.276
	48		L3		p.u.	0.568
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.341
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.013
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.174
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.214
	53	Determined proportionality constant K-factor	Pos.	-	-	1.5
	54		Neg.	-	-	-1.783
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	17
	60		Neg.	-	ms	17
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	35
	62		Neg.	-	ms	37
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.3
	64		Pos.		p.u.	0.302
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.000
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.001
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.004
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.001

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	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.306
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.001
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.306
	75		Pos.		p.u.	0.306
	76	Active power response time (<1s)	Total	--	s	0.003
	77		Pos.	--	s	0.002
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	16
	83		Neg.	-	ms	12
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	16
	85		Neg.	-	ms	47
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.037
	89		Pos.	--	s	0.036
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD9-4
	1	Date	--	--	dd.mm.yyyy	11.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	20:24:11
	3	Fault type (phase)	--	--		two-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault	--	--	ms	2700

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		duration				
	6	Point of fault occur (t1)	Total	--	ms	13801
	7	Point of fault clearance (t2)	Total	--	ms	16501
	8	Fault duration in load test	Total	--	ms	2700
	9	Fault duration in no load test	Total	--	ms	2700
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.761
	15		Line to neutral (L2-N)		p.u.	0.951
	16		Line to neutral (L3-N)		p.u.	0.953
	17		Pos.		p.u.	0.884
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.001
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.004
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.001
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.001
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.301
	26		L2	t1-1s to t1	p.u.	0.301
	27		L3	t1-1s to t1	p.u.	0.3
	28	Active current	Pos.	t1-1s to t1	p.u.	0.301
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.762
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.948

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	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.956
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.885
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.123
	43	Line current	L1	t1+60ms	p.u.	0.447
	44		L2		p.u.	0.29
	45		L3		p.u.	0.667
	46	Line current	L1	t1+100ms	p.u.	0.492
	47		L2		p.u.	0.265
	48		L3		p.u.	0.619
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.331
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.015
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.173
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.246
	53	Determined proportionality constant K-factor	Pos.	-	-	1.491
	54		Neg.	-	-	-2.033
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	16
	60		Neg.	-	ms	19
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	34
	62		Neg.	-	ms	39
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.295
	64		Pos.		p.u.	0.293
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.000
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.001
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.004
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.001
	69		Neg.	t2+1s to t2+10s	p.u.	0.002

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	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.301
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.301
	75		Pos.		p.u.	0.301
	76	Active power response time (<1s)	Total	--	s	0.027
	77		Pos.	--	s	0.004
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	15
	83		Neg.	-	ms	17
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	15
	85		Neg.	-	ms	37
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.02
	89		Pos.	--	s	0.02
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

General mode for controlled short circuit current contribution			
Gradient setting	**k=2 throughout**	**Insensitive setting**	**3%**

Condition@Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD10-1
	1	Date	--	--	dd.mm.yyyy	08.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	16:08:54
	3	Fault type (phase)	--	--		two-phase undervoltage
	4	Setting voltage	Line to line	--	p.u.	0.9

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		depth				
	5	Setting fault duration	--	--	ms	180020
	6	Point of fault occur (t1)	Total	--	ms	13958
	7	Point of fault clearance (t2)	Total	--	ms	193979
	8	Fault duration in load test	Total	--	ms	180021
	9	Fault duration in no load test	Total	--	ms	180020
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.901
	15		Line to neutral (L2-N)		p.u.	0.98
	16		Line to neutral (L3-N)		p.u.	0.983
	17		Pos.		p.u.	0.954
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.006
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.007
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.01
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.008
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.008
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.983
	26		L2	t1-1s to t1	p.u.	0.995
	27		L3	t1-1s to t1	p.u.	0.982
	28	Active current	Pos.	t1-1s to t1	p.u.	0.987
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.002
	31		Pos.	t1-60s to t1	p.u.	0.002
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.994
	34		Pos.		p.u.	0.994
	35	Reactive power	Total	t1-10s to t1	p.u.	0.002
	36		Pos.		p.u.	0.002
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.907

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t2	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.986
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.989
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.96
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.053
	43	Line current	L1	t1+60ms	p.u.	0.881
	44		L2		p.u.	0.765
	45		L3		p.u.	0.958
	46	Line current	L1	t1+100ms	p.u.	0.879
	47		L2		p.u.	0.762
	48		L3		p.u.	0.954
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.986
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	51	Reactive current	Pos.	t1+100ms to t1+4900ms	p.u.	0.004
	52		Neg.	t1+100ms to t1+4900ms	p.u.	0.005
	53	Determined proportionality constant K-factor	Pos.	-	-	2
	54		Neg.	-	-	2
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	7
	60		Neg.	-	ms	9
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	7
	62		Neg.	-	ms	9
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.947
	64		Pos.		p.u.	0.947
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.006
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.007
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.01
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.008

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	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.985
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.002
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.993
	75		Pos.		p.u.	0.993
	76	Active power response time (<1s)	Total	--	s	0.032
	77		Pos.	--	s	0.032
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	10
	83		Neg.	-	ms	11
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	10
	85		Neg.	-	ms	11
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.002
	87		Pos.			0.002
	88	Reactive power rising time	Total	--	s	0.000
	89		Pos.	--	s	0.000
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD10-2
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	15:43:11
	3	Fault type (phase)	--	--		two-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.9
	5	Setting fault	--	--	ms	180020

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		duration				
	6	Point of fault occur (t1)	Total	--	ms	12866
	7	Point of fault clearance (t2)	Total	--	ms	192886
	8	Fault duration in load test	Total	--	ms	180020
	9	Fault duration in no load test	Total	--	ms	180020
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.901
	15		Line to neutral (L2-N)		p.u.	0.98
	16		Line to neutral (L3-N)		p.u.	0.983
	17		Pos.		p.u.	0.954
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.005
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.006
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.009
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.007
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.007
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.985
	26		L2	t1-1s to t1	p.u.	0.997
	27		L3	t1-1s to t1	p.u.	0.984
	28	Active current	Pos.	t1-1s to t1	p.u.	0.989
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.002
	31		Pos.	t1-60s to t1	p.u.	0.002
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.995
	34		Pos.		p.u.	0.995
	35	Reactive power	Total	t1-10s to t1	p.u.	0.002
	36		Pos.		p.u.	0.002
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.907
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.985

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	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.988
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.959
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.053
	43	Line current	L1	t1+60ms	p.u.	0.897
	44		L2		p.u.	0.773
	45		L3		p.u.	0.976
	46	Line current	L1	t1+100ms	p.u.	0.901
	47		L2		p.u.	0.772
	48		L3		p.u.	0.972
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.99
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	51	Reactive current	Pos.	t1+100ms to t1+4900ms	p.u.	0.004
	52		Neg.	t1+100ms to t1+4900ms	p.u.	0.006
	53	Determined proportionality constant K-factor	Pos.	-	-	2
	54		Neg.	-	-	2
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	7
	60		Neg.	-	ms	9
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	7
	62		Neg.	-	ms	9
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.95
	64		Pos.		p.u.	0.95
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.005
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.006
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.009
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.007
	69		Neg.	t2+1s to t2+10s	p.u.	0.003

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	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.988
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.995
	75		Pos.		p.u.	0.995
	76	Active power response time (<1s)	Total	--	s	0.015
	77		Pos.	--	s	0.015
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	11
	83		Neg.	-	ms	11
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	11
	85		Neg.	-	ms	11
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.001
	89		Pos.	--	s	0.001
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD10-3
	1	Date	--	--	dd.mm.yyyy	12.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	11:23:31
	3	Fault type (phase)	--	--		two-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.9
	5	Setting fault duration	--	--	ms	180020
	6	Point of fault	Total	--	ms	11632

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		occur (t1)				
	7	Point of fault clearance (t2)	Total	--	ms	191652
	8	Fault duration in load test	Total	--	ms	180020
	9	Fault duration in no load test	Total	--	ms	180020
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.901
	15		Line to neutral (L2-N)		p.u.	0.98
	16		Line to neutral (L3-N)		p.u.	0.983
	17		Pos.		p.u.	0.954
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.002
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.002
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.305
	26		L2	t1-1s to t1	p.u.	0.306
	27		L3	t1-1s to t1	p.u.	0.305
	28	Active current	Pos.	t1-1s to t1	p.u.	0.305
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.306
	34		Pos.		p.u.	0.306
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.903
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.981
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.984

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	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.955
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.053
	43	Line current	L1	t1+60ms	p.u.	0.358
	44		L2		p.u.	0.286
	45		L3		p.u.	0.374
	46	Line current	L1	t1+100ms	p.u.	0.364
	47		L2		p.u.	0.285
	48		L3		p.u.	0.372
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.32
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.006
	51	Reactive current	Pos.	t1+100ms to t1+4900ms	p.u.	0.001
	52		Neg.	t1+100ms to t1+4900ms	p.u.	-0.006
	53	Determined proportionality constant K-factor	Pos.	-	-	2
	54		Neg.	-	-	2
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	12
	60		Neg.	-	ms	7
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	20
	62		Neg.	-	ms	8
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.306
	64		Pos.		p.u.	0.306
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.002
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.305

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	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.001
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.306
	75		Pos.		p.u.	0.306
	76	Active power response time (<1s)	Total	--	s	0.000
	77		Pos.	--	s	0.004
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	10
	83		Neg.	-	ms	14
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	10
	85		Neg.	-	ms	14
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.001
	89		Pos.	--	s	0.000
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VD10-4
	1	Date	--	--	dd.mm.yyyy	12.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	11:30:20
	3	Fault type (phase)	--	--		two-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.9
	5	Setting fault duration	--	--	ms	180020
	6	Point of fault occur (t1)	Total	--	ms	12326
	7	Point of fault	Total	--	ms	192345

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		clearance (t2)				
	8	Fault duration in load test	Total	--	ms	180019
	9	Fault duration in no load test	Total	--	ms	180020
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	0.901
	15		Line to neutral (L2-N)		p.u.	0.98
	16		Line to neutral (L3-N)		p.u.	0.983
	17		Pos.		p.u.	0.954
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.002
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.002
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.304
	26		L2	t1-1s to t1	p.u.	0.304
	27		L3	t1-1s to t1	p.u.	0.304
	28	Active current	Pos.	t1-1s to t1	p.u.	0.304
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.304
	34		Pos.		p.u.	0.304
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	0.903
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	0.981
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	0.984
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	0.955

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	42		Neg.	t1+100ms to t2-20ms	p.u.	0.053
	43	Line current	L1	t1+60ms	p.u.	0.364
	44		L2		p.u.	0.268
	45		L3		p.u.	0.392
	46	Line current	L1	t1+100ms	p.u.	0.372
	47		L2		p.u.	0.269
	48		L3		p.u.	0.386
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.319
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.005
	51	Reactive current	Pos.	t1+100ms to t1+4900ms	p.u.	0.001
	52		Neg.	t1+100ms to t1+4900ms	p.u.	-0.007
	53	Determined proportionality constant K-factor	Pos.	-	-	2
	54		Neg.	-	-	2
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	21
	60		Neg.	-	ms	17
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	21
	62		Neg.	-	ms	17
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.304
	64		Pos.		p.u.	0.304
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.004
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.002
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.304
	71		Neg.	t2+1s to t2+10s	p.u.	0.000

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	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.001
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.304
	75		Pos.		p.u.	0.304
	76	Active power response time (<1s)	Total	--	s	0.002
	77		Pos.	--	s	0.002
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	1
	83		Neg.	-	ms	5
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	1
	85		Neg.	-	ms	5
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.001
	89		Pos.	--	s	0.001
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

General mode for controlled short circuit current contribution			
Gradient setting	**k=2 throughout**	**Insensitive setting**	**5%**

Condition@Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS1-1
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	17:44:13
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.05
	5	Setting fault duration	--	--	ms	260

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	6	Point of fault occur (t1)	Total	--	ms	13028
	7	Point of fault clearance (t2)	Total	--	ms	13148
	8	Fault duration in load test	Total	--	ms	120
	9	Fault duration in no load test	Total	--	ms	120
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.249
	15		Line to neutral (L2-N)		p.u.	1.25
	16		Line to neutral (L3-N)		p.u.	1.254
	17		Pos.		p.u.	1.251
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.004
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.005
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.008
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.005
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.005
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.986
	26		L2	t1-1s to t1	p.u.	0.998
	27		L3	t1-1s to t1	p.u.	0.984
	28	Active current	Pos.	t1-1s to t1	p.u.	0.989
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.002
	31		Pos.	t1-60s to t1	p.u.	0.002
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.995
	34		Pos.		p.u.	0.995
	35	Reactive power	Total	t1-10s to t1	p.u.	0.002
	36		Pos.		p.u.	0.002
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.247
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.249
	40		Line to neutral (L3-	t1+100ms to	p.u.	1.252

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			N)	t2-20ms		
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.249
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.003
	43	Line current	L1	t1+60ms	p.u.	0.667
	44		L2		p.u.	0.67
	45		L3		p.u.	0.639
	46	Line current	L1	t1+100ms	p.u.	0.667
	47		L2		p.u.	0.669
	48		L3		p.u.	0.644
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.455
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.005
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.478
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.011
	53	Determined proportionality constant K-factor	Pos.	-	-	-1.959
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	5
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	5
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.568
	64		Pos.		p.u.	0.568
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.004
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.005
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.008
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.005
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to	p.u.	0.989

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				t2+10s		
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.002
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.995
	75		Pos.		p.u.	0.995
	76	Active power response time (<1s)	Total	--	s	0.037
	77		Pos.	--	s	0.037
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	--
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	19
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	19
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.002
	87		Pos.			0.002
	88	Reactive power rising time	Total	--	s	0.036
	89		Pos.	--	s	0.036
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS1-2
	1	Date	--	--	dd.mm.yyyy	10.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	16:27:17
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.05
	5	Setting fault duration	--	--	ms	260
	6	Point of fault	Total	--	ms	12560

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TÜV SÜD New Energy Vehicle Testing (Jiangsu) Co., Ltd., TÜV SÜD Group
Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

		occur (t1)				
	7	Point of fault clearance (t2)	Total	--	ms	12680
	8	Fault duration in load test	Total	--	ms	120
	9	Fault duration in no load test	Total	--	ms	120
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.249
	15		Line to neutral (L2-N)		p.u.	1.25
	16		Line to neutral (L3-N)		p.u.	1.254
	17		Pos.		p.u.	1.251
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.004
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.005
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.008
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.006
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.006
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.989
	26		L2	t1-1s to t1	p.u.	1.001
	27		L3	t1-1s to t1	p.u.	0.987
	28	Active current	Pos.	t1-1s to t1	p.u.	0.992
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.998
	34		Pos.		p.u.	0.998
	35	Reactive power	Total	t1-10s to t1	p.u.	0.001
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.247
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.249
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.252

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	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.25
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.003
	43	Line current	L1	t1+60ms	p.u.	0.663
	44		L2		p.u.	0.657
	45		L3		p.u.	0.656
	46	Line current	L1	t1+100ms	p.u.	0.661
	47		L2		p.u.	0.661
	48		L3		p.u.	0.66
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.453
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.479
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.001
	53	Determined proportionality constant K-factor	Pos.	-	-	-1.963
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	5
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	5
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.566
	64		Pos.		p.u.	0.566
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.004
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.005
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.008
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.006
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.992

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	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.998
	75		Pos.		p.u.	0.998
	76	Active power response time (<1s)	Total	--	s	0.039
	77		Pos.	--	s	0.039
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	16
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	16
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.027
	89		Pos.	--	s	0.027
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS1-3
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	20:31:14
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.05
	5	Setting fault duration	--	--	ms	260
	6	Point of fault occur (t1)	Total	--	ms	14572

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	7	Point of fault clearance (t2)	Total	--	ms	14693
	8	Fault duration in load test	Total	--	ms	121
	9	Fault duration in no load test	Total	--	ms	120
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.249
	15		Line to neutral (L2-N)		p.u.	1.25
	16		Line to neutral (L3-N)		p.u.	1.254
	17		Pos.		p.u.	1.251
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.002
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.003
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.006
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.305
	26		L2	t1-1s to t1	p.u.	0.306
	27		L3	t1-1s to t1	p.u.	0.304
	28	Active current	Pos.	t1-1s to t1	p.u.	0.305
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.306
	34		Pos.		p.u.	0.306
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.248
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.249
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.253
	41	Voltage	Pos.	t1+100ms to	p.u.	1.25

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				t2-20ms		
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.003
	43	Line current	L1	t1+60ms	p.u.	0.523
	44		L2		p.u.	0.545
	45		L3		p.u.	0.535
	46	Line current	L1	t1+100ms	p.u.	0.529
	47		L2		p.u.	0.55
	48		L3		p.u.	0.541
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.242
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.009
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.48
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	53	Determined proportionality constant K-factor	Pos.	-	-	-1.943
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	5
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	5
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.303
	64		Pos.		p.u.	0.303
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.002
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.003
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.006
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.305
	71		Neg.	t2+1s to	p.u.	0.000

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				t2+10s		
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.306
	75		Pos.		p.u.	0.306
	76	Active power response time (<1s)	Total	--	s	0.007
	77		Pos.	--	s	0.006
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	--
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	20
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	20
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.038
	89		Pos.	--	s	0.038
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS1-4
	1	Date	--	--	dd.mm.yyyy	10.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	10:56:09
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.05
	5	Setting fault duration	--	--	ms	260
	6	Point of fault occur (t1)	Total	--	ms	12028
	7	Point of fault	Total	--	ms	12149

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		clearance (t2)				
	8	Fault duration in load test	Total	--	ms	121
	9	Fault duration in no load test	Total	--	ms	120
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.249
	15		Line to neutral (L2-N)		p.u.	1.25
	16		Line to neutral (L3-N)		p.u.	1.254
	17		Pos.		p.u.	1.251
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.307
	26		L2	t1-1s to t1	p.u.	0.308
	27		L3	t1-1s to t1	p.u.	0.307
	28	Active current	Pos.	t1-1s to t1	p.u.	0.307
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.308
	34		Pos.		p.u.	0.308
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.247
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.248
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.252
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.249

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	42		Neg.	t1+100ms to t2-20ms	p.u.	0.003
	43	Line current	L1	t1+60ms	p.u.	0.537
	44		L2		p.u.	0.546
	45		L3		p.u.	0.545
	46	Line current	L1	t1+100ms	p.u.	0.52
	47		L2		p.u.	0.542
	48		L3		p.u.	0.534
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.238
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.009
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.478
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.001
	53	Determined proportionality constant K-factor	Pos.	-	-	-1.943
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	6
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	6
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.297
	64		Pos.		p.u.	0.297
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.307
	71		Neg.	t2+1s to t2+10s	p.u.	0.000

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	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.001
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.308
	75		Pos.		p.u.	0.308
	76	Active power response time (<1s)	Total	--	s	0.004
	77		Pos.	--	s	0.004
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	--
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	16
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	22
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.035
	89		Pos.	--	s	0.035
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Zero current mode			
Static operating voltage setting (under voltage)	**50%Un**	**Static operating voltage setting (over voltage)**	**120%Un**

Condition@Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS1-5
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	20:18:14
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.05
	5	Setting fault	--	--	ms	260

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Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

		duration				
	6	Point of fault occur (t1)	Total	--	ms	12729
	7	Point of fault clearance (t2)	Total	--	ms	12850
	8	Fault duration in load test	Total	--	ms	121
	9	Fault duration in no load test	Total	--	ms	120
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.249
	15		Line to neutral (L2-N)		p.u.	1.25
	16		Line to neutral (L3-N)		p.u.	1.254
	17		Pos.		p.u.	1.251
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.004
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.005
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.008
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.006
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.006
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.987
	26		L2	t1-1s to t1	p.u.	0.998
	27		L3	t1-1s to t1	p.u.	0.985
	28	Active current	Pos.	t1-1s to t1	p.u.	0.99
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.996
	34		Pos.		p.u.	0.996
	35	Reactive power	Total	t1-10s to t1	p.u.	0.001
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.247
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.246

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	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.247
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.247
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	43	Line current	L1	t1+60ms	p.u.	0.087
	44		L2		p.u.	0.075
	45		L3		p.u.	0.053
	46	Line current	L1	t1+100ms	p.u.	0.082
	47		L2		p.u.	0.068
	48		L3		p.u.	0.049
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.02
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.017
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.004
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.053
	53	Determined proportionality constant K-factor	Pos.	-	-	0.017
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.025
	64		Pos.		p.u.	0.025
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.004
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.005
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.008
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.006
	69		Neg.	t2+1s to t2+10s	p.u.	0.003

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	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.99
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.002
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.996
	75		Pos.		p.u.	0.996
	76	Active power response time (<1s)	Total	--	s	0.061
	77		Pos.	--	s	0.061
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	--
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.002
	87		Pos.			0.002
	88	Reactive power rising time	Total	--	s	0.002
	89		Pos.	--	s	0.002
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS1-6
	1	Date	--	--	dd.mm.yyyy	11.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	17:38:13
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.05
	5	Setting fault duration	--	--	ms	260

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	6	Point of fault occur (t1)	Total	--	ms	10913
	7	Point of fault clearance (t2)	Total	--	ms	11030
	8	Fault duration in load test	Total	--	ms	117
	9	Fault duration in no load test	Total	--	ms	120
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.249
	15		Line to neutral (L2-N)		p.u.	1.25
	16		Line to neutral (L3-N)		p.u.	1.254
	17		Pos.		p.u.	1.251
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.003
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.005
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.008
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.005
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.005
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.989
	26		L2	t1-1s to t1	p.u.	1.000
	27		L3	t1-1s to t1	p.u.	0.987
	28	Active current	Pos.	t1-1s to t1	p.u.	0.992
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.998
	34		Pos.		p.u.	0.998
	35	Reactive power	Total	t1-10s to t1	p.u.	0.001
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.245
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.246
	40		Line to neutral (L3-	t1+100ms to	p.u.	1.249

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			N)	t2-20ms		
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.246
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	43	Line current	L1	t1+60ms	p.u.	0.053
	44		L2		p.u.	0.044
	45		L3		p.u.	0.035
	46	Line current	L1	t1+100ms	p.u.	0.045
	47		L2		p.u.	0.045
	48		L3		p.u.	0.035
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.02
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.013
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.004
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.006
	53	Determined proportionality constant K-factor	Pos.	-	-	-
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	--
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	--
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	--
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.025
	64		Pos.		p.u.	0.025
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.003
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.005
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.008
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.005
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to	p.u.	0.992

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				t2+10s		
	71		Neg.	t2+1s to t2+10s	p.u.	-0.002
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.998
	75		Pos.		p.u.	0.998
	76	Active power response time (<1s)	Total	--	s	0.063
	77		Pos.	--	s	0.063
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.006
	89		Pos.	--	s	0.006
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS1-7
	1	Date	--	--	dd.mm.yyyy	10.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	10:33:13
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.05
	5	Setting fault duration	--	--	ms	260
	6	Point of fault	Total	--	ms	12203

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		occur (t1)				
	7	Point of fault clearance (t2)	Total	--	ms	12324
	8	Fault duration in load test	Total	--	ms	121
	9	Fault duration in no load test	Total	--	ms	120
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.249
	15		Line to neutral (L2-N)		p.u.	1.25
	16		Line to neutral (L3-N)		p.u.	1.254
	17		Pos.		p.u.	1.251
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.001
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.004
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.002
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.002
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.306
	26		L2	t1-1s to t1	p.u.	0.306
	27		L3	t1-1s to t1	p.u.	0.305
	28	Active current	Pos.	t1-1s to t1	p.u.	0.306
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.306
	34		Pos.		p.u.	0.306
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.245
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.248
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.249

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	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.247
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.003
	43	Line current	L1	t1+60ms	p.u.	0.032
	44		L2		p.u.	0.057
	45		L3		p.u.	0.039
	46	Line current	L1	t1+100ms	p.u.	0.03
	47		L2		p.u.	0.055
	48		L3		p.u.	0.036
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.021
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.012
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.004
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.026
	53	Determined proportionality constant K-factor	Pos.	-	-	-
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.026
	64		Pos.		p.u.	0.026
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.000
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.001
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.004
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.002
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.306

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	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.001
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.306
	75		Pos.		p.u.	0.306
	76	Active power response time (<1s)	Total	--	s	0.034
	77		Pos.	--	s	0.034
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.002
	89		Pos.	--	s	0.002
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS1-8
	1	Date	--	--	dd.mm.yyyy	10.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	11:35:23
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.05
	5	Setting fault duration	--	--	ms	260
	6	Point of fault occur (t1)	Total	--	ms	10932

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Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

	7	Point of fault clearance (t2)	Total	--	ms	11052
	8	Fault duration in load test	Total	--	ms	120
	9	Fault duration in no load test	Total	--	ms	120
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.249
	15		Line to neutral (L2-N)		p.u.	1.25
	16		Line to neutral (L3-N)		p.u.	1.254
	17		Pos.		p.u.	1.251
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.307
	26		L2	t1-1s to t1	p.u.	0.308
	27		L3	t1-1s to t1	p.u.	0.307
	28	Active current	Pos.	t1-1s to t1	p.u.	0.307
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.308
	34		Pos.		p.u.	0.308
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.247
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.248
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.25
	41	Voltage	Pos.	t1+100ms to	p.u.	1.248

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				t2-20ms		
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	43	Line current	L1	t1+60ms	p.u.	0.035
	44		L2		p.u.	0.029
	45		L3		p.u.	0.022
	46	Line current	L1	t1+100ms	p.u.	0.033
	47		L2		p.u.	0.03
	48		L3		p.u.	0.023
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.02
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.007
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.004
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	53	Determined proportionality constant K-factor	Pos.	-	-	-
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	57
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.025
	64		Pos.		p.u.	0.025
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.307
	71		Neg.	t2+1s to	p.u.	0.000

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				t2+10s		
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.001
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.308
	75		Pos.		p.u.	0.308
	76	Active power response time (<1s)	Total	--	s	0.031
	77		Pos.	--	s	0.031
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.002
	89		Pos.	--	s	0.002
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

General mode for controlled short circuit current contribution			
Gradient setting	**k=2 throughout**	**Insensitive setting**	**13%**

Condition@Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS2.1-1
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	17:50:41
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920

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	6	Point of fault occur (t1)	Total	--	ms	12300
	7	Point of fault clearance (t2)	Total	--	ms	17315
	8	Fault duration in load test	Total	--	ms	5015
	9	Fault duration in no load test	Total	--	ms	5021
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.2
	15		Line to neutral (L2-N)		p.u.	1.201
	16		Line to neutral (L3-N)		p.u.	1.204
	17		Pos.		p.u.	1.202
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.004
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.005
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.008
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.006
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.006
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.987
	26		L2	t1-1s to t1	p.u.	0.998
	27		L3	t1-1s to t1	p.u.	0.985
	28	Active current	Pos.	t1-1s to t1	p.u.	0.989
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.002
	31		Pos.	t1-60s to t1	p.u.	0.002
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.995
	34		Pos.		p.u.	0.995
	35	Reactive power	Total	t1-10s to t1	p.u.	0.002
	36		Pos.		p.u.	0.002
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.202
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.204
	40		Line to neutral (L3-	t1+100ms to	p.u.	1.207

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			N)	t2-20ms		
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.204
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.003
	43	Line current	L1	t1+60ms	p.u.	0.88
	44		L2		p.u.	0.802
	45		L3		p.u.	0.786
	46	Line current	L1	t1+100ms	p.u.	0.968
	47		L2		p.u.	0.905
	48		L3		p.u.	0.886
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.822
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.39
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.002
	53	Determined proportionality constant K-factor	Pos.	-	-	-1.97
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	3
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	3
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.99
	64		Pos.		p.u.	0.99
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.004
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.005
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.008
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.006
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to	p.u.	0.989

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				t2+10s		
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.995
	75		Pos.		p.u.	0.995
	76	Active power response time (<1s)	Total	--	s	0.006
	77		Pos.	--	s	0.006
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	13
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	13
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.002
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.013
	89		Pos.	--	s	0.013
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS2.1-2
	1	Date	--	--	dd.mm.yyyy	10.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	16:29:03
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault	Total	--	ms	11809

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		occur (t1)				
	7	Point of fault clearance (t2)	Total	--	ms	16829
	8	Fault duration in load test	Total	--	ms	5020
	9	Fault duration in no load test	Total	--	ms	5021
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.2
	15		Line to neutral (L2-N)		p.u.	1.201
	16		Line to neutral (L3-N)		p.u.	1.204
	17		Pos.		p.u.	1.202
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.004
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.005
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.008
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.006
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.006
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.989
	26		L2	t1-1s to t1	p.u.	1.001
	27		L3	t1-1s to t1	p.u.	0.987
	28	Active current	Pos.	t1-1s to t1	p.u.	0.992
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.009
	33	Active power	Total	t1-10s to t1	p.u.	0.998
	34		Pos.		p.u.	0.998
	35	Reactive power	Total	t1-10s to t1	p.u.	0.001
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.202
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.204
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.207

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	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.205
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.003
	43	Line current	L1	t1+60ms	p.u.	0.894
	44		L2		p.u.	0.901
	45		L3		p.u.	0.903
	46	Line current	L1	t1+100ms	p.u.	0.911
	47		L2		p.u.	0.918
	48		L3		p.u.	0.921
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.827
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.003
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.392
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.004
	53	Determined proportionality constant K-factor	Pos.	-	-	-1.97
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	3
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	3
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.996
	64		Pos.		p.u.	0.996
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.004
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.005
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.008
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.006
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.992

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	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.998
	75		Pos.		p.u.	0.998
	76	Active power response time (<1s)	Total	--	s	0.03
	77		Pos.	--	s	0.03
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	18
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	18
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.028
	89		Pos.	--	s	0.028
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS2.1-3
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	20:34:02
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	15274

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Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

	7	Point of fault clearance (t2)	Total	--	ms	20295
	8	Fault duration in load test	Total	--	ms	5021
	9	Fault duration in no load test	Total	--	ms	5021
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.2
	15		Line to neutral (L2-N)		p.u.	1.201
	16		Line to neutral (L3-N)		p.u.	1.204
	17		Pos.		p.u.	1.202
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.002
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.003
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.006
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.305
	26		L2	t1-1s to t1	p.u.	0.306
	27		L3	t1-1s to t1	p.u.	0.305
	28	Active current	Pos.	t1-1s to t1	p.u.	0.305
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.306
	34		Pos.		p.u.	0.306
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.201
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.202
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.205
	41	Voltage	Pos.	t1+100ms to	p.u.	1.203

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				t2-20ms		
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.003
	43	Line current	L1	t1+60ms	p.u.	0.454
	44		L2		p.u.	0.461
	45		L3		p.u.	0.428
	46	Line current	L1	t1+100ms	p.u.	0.468
	47		L2		p.u.	0.471
	48		L3		p.u.	0.445
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.252
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.003
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.384
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.004
	53	Determined proportionality constant K-factor	Pos.	-	-	-1.92
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	7
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	7
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.303
	64		Pos.		p.u.	0.303
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.002
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.003
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.006
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.305
	71		Neg.	t2+1s to	p.u.	0.000

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				t2+10s		
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.001
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.306
	75		Pos.		p.u.	0.306
	76	Active power response time (<1s)	Total	--	s	0.004
	77		Pos.	--	s	0.004
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	7
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	7
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.007
	89		Pos.	--	s	0.007
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS2.1-4
	1	Date	--	--	dd.mm.yyyy	10.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	10:58:53
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	11785
	7	Point of fault	Total	--	ms	16793

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		clearance (t2)				
	8	Fault duration in load test	Total	--	ms	5008
	9	Fault duration in no load test	Total	--	ms	5021
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.2
	15		Line to neutral (L2-N)		p.u.	1.201
	16		Line to neutral (L3-N)		p.u.	1.204
	17		Pos.		p.u.	1.202
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.307
	26		L2	t1-1s to t1	p.u.	0.308
	27		L3	t1-1s to t1	p.u.	0.307
	28	Active current	Pos.	t1-1s to t1	p.u.	0.307
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.308
	34		Pos.		p.u.	0.308
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.2
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.201
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.204
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.202

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	42		Neg.	t1+100ms to t2-20ms	p.u.	0.003
	43	Line current	L1	t1+60ms	p.u.	0.491
	44		L2		p.u.	0.468
	45		L3		p.u.	0.438
	46	Line current	L1	t1+100ms	p.u.	0.48
	47		L2		p.u.	0.458
	48		L3		p.u.	0.439
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.252
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.383
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.005
	53	Determined proportionality constant K-factor	Pos.	-	-	-1.925
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	--
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	9
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	9
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.303
	64		Pos.		p.u.	0.303
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.307
	71		Neg.	t2+1s to t2+10s	p.u.	0.000

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	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.001
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.308
	75		Pos.		p.u.	0.308
	76	Active power response time (<1s)	Total	--	s	0.01
	77		Pos.	--	s	0.01
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	19
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	19
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.019
	89		Pos.	--	s	0.019
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=0.9						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS2.1-5
	1	Date	--	--	dd.mm.yyyy	10.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	10:19:23
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	12926
	7	Point of fault clearance (t2)	Total	--	ms	17947

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	8	Fault duration in load test	Total	--	ms	5021
	9	Fault duration in no load test	Total	--	ms	5021
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.2
	15		Line to neutral (L2-N)		p.u.	1.201
	16		Line to neutral (L3-N)		p.u.	1.204
	17		Pos.		p.u.	1.202
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.001
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.004
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.002
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.002
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.34
	26		L2	t1-1s to t1	p.u.	0.341
	27		L3	t1-1s to t1	p.u.	0.339
	28	Active current	Pos.	t1-1s to t1	p.u.	0.305
	29		Neg.	t1-1s to t1	p.u.	-0.001
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.149
	31		Pos.	t1-60s to t1	p.u.	0.149
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.306
	34		Pos.		p.u.	0.306
	35	Reactive power	Total	t1-10s to t1	p.u.	0.149
	36		Pos.		p.u.	0.149
	37	Cos φ	--	t1-10s to t1	p.u.	0.898
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.199
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.2
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.203
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.201
	42		Neg.	t1+100ms to	p.u.	0.003

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				t2-20ms		
	43	Line current	L1	t1+60ms	p.u.	0.339
	44		L2		p.u.	0.349
	45		L3		p.u.	0.303
	46	Line current	L1	t1+100ms	p.u.	0.353
	47		L2		p.u.	0.36
	48		L3		p.u.	0.326
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.254
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.001
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.229
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.003
	53	Determined proportionality constant K-factor	Pos.	-	-	2
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	6
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	6
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.305
	64		Pos.		p.u.	0.305
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.000
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.001
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.004
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.002
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.305
	71		Neg.	t2+1s to t2+10s	p.u.	-0.001
	72	Reactive	Pos.	t2+1s to	p.u.	0.149

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		current		t2+10s		
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.306
	75		Pos.		p.u.	0.306
	76	Active power response time (<1s)	Total	--	s	0.000
	77		Pos.	--	s	0.001
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.149
	87		Pos.			0.149
	88	Reactive power rising time	Total	--	s	0.006
	89		Pos.	--	s	0.006
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=0.9						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS2.1-6
	1	Date	--	--	dd.mm.yyyy	10.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	11:18:35
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	15158
	7	Point of fault clearance (t2)	Total	--	ms	20167
	8	Fault duration	Total	--	ms	5009

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Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

		in load test				
	9	Fault duration in no load test	Total	--	ms	5021
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.2
	15		Line to neutral (L2-N)		p.u.	1.201
	16		Line to neutral (L3-N)		p.u.	1.204
	17		Pos.		p.u.	1.202
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.341
	26		L2	t1-1s to t1	p.u.	0.342
	27		L3	t1-1s to t1	p.u.	0.34
	28	Active current	Pos.	t1-1s to t1	p.u.	0.306
	29		Neg.	t1-1s to t1	p.u.	-0.001
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.149
	31		Pos.	t1-60s to t1	p.u.	0.149
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.307
	34		Pos.		p.u.	0.307
	35	Reactive power	Total	t1-10s to t1	p.u.	0.149
	36		Pos.		p.u.	0.149
	37	Cos φ	--	t1-10s to t1	p.u.	0.899
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.2
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.201
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.205
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.202
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.003

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	43	Line current	L1	t1+60ms	p.u.	0.375
	44		L2		p.u.	0.353
	45		L3		p.u.	0.33
	46	Line current	L1	t1+100ms	p.u.	0.365
	47		L2		p.u.	0.353
	48		L3		p.u.	0.334
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.254
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.232
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.004
	53	Determined proportionality constant K-factor	Pos.	-	-	2
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	9
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	9
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.305
	64		Pos.		p.u.	0.305
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.306
	71		Neg.	t2+1s to t2+10s	p.u.	-0.001
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.149

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	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.307
	75		Pos.		p.u.	0.307
	76	Active power response time (<1s)	Total	--	s	0.005
	77		Pos.	--	s	0.005
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	15
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	15
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.149
	87		Pos.			0.149
	88	Reactive power rising time	Total	--	s	0.013
	89		Pos.	--	s	0.013
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

General mode for controlled short circuit current contribution			
Gradient setting	**k=2 throughout**	**Insensitive setting**	**13%**

Condition@Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS2.2-1
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	20:08:10
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	13286
	7	Point of fault	Total	--	ms	73306

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		clearance (t2)				
	8	Fault duration in load test	Total	--	ms	60020
	9	Fault duration in no load test	Total	--	ms	60020
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.15
	15		Line to neutral (L2-N)		p.u.	1.151
	16		Line to neutral (L3-N)		p.u.	1.154
	17		Pos.		p.u.	1.152
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.003
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.005
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.008
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.005
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.005
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.987
	26		L2	t1-1s to t1	p.u.	0.998
	27		L3	t1-1s to t1	p.u.	0.985
	28	Active current	Pos.	t1-1s to t1	p.u.	0.99
	29		Neg.	t1-1s to t1	p.u.	-0.002
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.995
	34		Pos.		p.u.	0.995
	35	Reactive power	Total	t1-10s to t1	p.u.	0.001
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.153
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.154
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.158
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.155

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	42		Neg.	t1+100ms to t2-20ms	p.u.	0.003
	43	Line current	L1	t1+60ms	p.u.	0.899
	44		L2		p.u.	0.908
	45		L3		p.u.	0.915
	46	Line current	L1	t1+100ms	p.u.	0.911
	47		L2		p.u.	0.919
	48		L3		p.u.	0.917
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.865
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.001
	51	Reactive current	Pos.	t1+100ms to t1+4900ms	p.u.	-0.021
	52		Neg.	t1+100ms to t1+4900ms	p.u.	0.002
	53	Determined proportionality constant K-factor	Pos.	-	-	2
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	14
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	14
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	1.000
	64		Pos.		p.u.	1.000
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.003
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.005
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.008
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.005
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.99
	71		Neg.	t2+1s to t2+10s	p.u.	-0.002

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	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.995
	75		Pos.		p.u.	0.995
	76	Active power response time (<1s)	Total	--	s	0.002
	77		Pos.	--	s	0.002
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.001
	89		Pos.	--	s	0.001
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS2.2-2
	1	Date	--	--	dd.mm.yyyy	10.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	16:50:10
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	12580
	7	Point of fault clearance (t2)	Total	--	ms	72600

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	8	Fault duration in load test	Total	--	ms	60020
	9	Fault duration in no load test	Total	--	ms	60020
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.15
	15		Line to neutral (L2-N)		p.u.	1.151
	16		Line to neutral (L3-N)		p.u.	1.154
	17		Pos.		p.u.	1.152
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.004
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.005
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.008
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.006
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.006
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.988
	26		L2	t1-1s to t1	p.u.	1.001
	27		L3	t1-1s to t1	p.u.	0.987
	28	Active current	Pos.	t1-1s to t1	p.u.	0.992
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.002
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.998
	34		Pos.		p.u.	0.998
	35	Reactive power	Total	t1-10s to t1	p.u.	0.001
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.154
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.155
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.158
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.156
	42		Neg.	t1+100ms to	p.u.	0.003

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				t2-20ms		
	43	Line current	L1	t1+60ms	p.u.	0.885
	44		L2		p.u.	0.906
	45		L3		p.u.	0.871
	46	Line current	L1	t1+100ms	p.u.	0.913
	47		L2		p.u.	0.924
	48		L3		p.u.	0.902
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.863
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.001
	51	Reactive current	Pos.	t1+100ms to t1+4900ms	p.u.	-0.021
	52		Neg.	t1+100ms to t1+4900ms	p.u.	0.001
	53	Determined proportionality constant K-factor	Pos.	-	-	2
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	7
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	8
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.998
	64		Pos.		p.u.	0.998
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.004
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.005
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.008
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.006
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.991
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive	Pos.	t2+1s to	p.u.	0.002

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		current		t2+10s		
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.997
	75		Pos.		p.u.	0.997
	76	Active power response time (<1s)	Total	--	s	0.002
	77		Pos.	--	s	0.002
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.002
	87		Pos.			0.002
	88	Reactive power rising time	Total	--	s	0.003
	89		Pos.	--	s	0.003
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS2.2-3
	1	Date	--	--	dd.mm.yyyy	10.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	10:07:25
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	14579
	7	Point of fault clearance (t2)	Total	--	ms	74599
	8	Fault duration	Total	--	ms	60020

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Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

		in load test				
	9	Fault duration in no load test	Total	--	ms	60020
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.15
	15		Line to neutral (L2-N)		p.u.	1.151
	16		Line to neutral (L3-N)		p.u.	1.154
	17		Pos.		p.u.	1.152
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	0.999
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.000
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.003
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.001
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.001
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.306
	26		L2	t1-1s to t1	p.u.	0.306
	27		L3	t1-1s to t1	p.u.	0.305
	28	Active current	Pos.	t1-1s to t1	p.u.	0.306
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.306
	34		Pos.		p.u.	0.306
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.149
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.15
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.153
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.151
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002

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	43	Line current	L1	t1+60ms	p.u.	0.404
	44		L2		p.u.	0.397
	45		L3		p.u.	0.337
	46	Line current	L1	t1+100ms	p.u.	0.409
	47		L2		p.u.	0.399
	48		L3		p.u.	0.356
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.265
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.001
	51	Reactive current	Pos.	t1+100ms to t1+4900ms	p.u.	-0.021
	52		Neg.	t1+100ms to t1+4900ms	p.u.	0.000
	53	Determined proportionality constant K-factor	Pos.	-	-	2
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	10
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	10
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.305
	64		Pos.		p.u.	0.305
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	0.999
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.001
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.003
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.001
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.306
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000

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	73		Neg.	t2+1s to t2+10s	p.u.	0.001
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.306
	75		Pos.		p.u.	0.306
	76	Active power response time (<1s)	Total	--	s	0.001
	77		Pos.	--	s	0.001
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.002
	89		Pos.	--	s	0.002
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS2.2-4
	1	Date	--	--	dd.mm.yyyy	10.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	11:08:39
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	11593
	7	Point of fault clearance (t2)	Total	--	ms	71614
	8	Fault duration in load test	Total	--	ms	60021

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	9	Fault duration in no load test	Total	--	ms	60020
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.15
	15		Line to neutral (L2-N)		p.u.	1.151
	16		Line to neutral (L3-N)		p.u.	1.154
	17		Pos.		p.u.	1.152
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.307
	26		L2	t1-1s to t1	p.u.	0.308
	27		L3	t1-1s to t1	p.u.	0.307
	28	Active current	Pos.	t1-1s to t1	p.u.	0.307
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.308
	34		Pos.		p.u.	0.308
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.151
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.152
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.155
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.153
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.003
	43	Line current	L1	t1+60ms	p.u.	0.413

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	44		L2		p.u.	0.413
	45		L3		p.u.	0.378
	46	Line current	L1	t1+100ms	p.u.	0.4
	47		L2		p.u.	0.399
	48		L3		p.u.	0.373
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.266
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.001
	51	Reactive current	Pos.	t1+100ms to t1+4900ms	p.u.	-0.021
	52		Neg.	t1+100ms to t1+4900ms	p.u.	0.000
	53	Determined proportionality constant K-factor	Pos.	-	-	2
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	8
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	9
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.306
	64		Pos.		p.u.	0.306
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.307
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.001

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	74	Active power	Total	t2+1s to t2+10s	p.u.	0.308
	75		Pos.		p.u.	0.308
	76	Active power response time (<1s)	Total	--	s	0.004
	77		Pos.	--	s	0.004
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.002
	89		Pos.	--	s	0.002
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=0.9						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS2.2-5
	1	Date	--	--	dd.mm.yyyy	10.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	10:23:29
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	12263
	7	Point of fault clearance (t2)	Total	--	ms	72282
	8	Fault duration in load test	Total	--	ms	60019
	9	Fault duration in no load test	Total	--	ms	60020

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	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.15
	15		Line to neutral (L2-N)		p.u.	1.151
	16		Line to neutral (L3-N)		p.u.	1.154
	17		Pos.		p.u.	1.152
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.001
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.004
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.002
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.002
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.34
	26		L2	t1-1s to t1	p.u.	0.341
	27		L3	t1-1s to t1	p.u.	0.339
	28	Active current	Pos.	t1-1s to t1	p.u.	0.305
	29		Neg.	t1-1s to t1	p.u.	-0.001
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.149
	31		Pos.	t1-60s to t1	p.u.	0.149
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.306
	34		Pos.		p.u.	0.306
	35	Reactive power	Total	t1-10s to t1	p.u.	0.149
	36		Pos.		p.u.	0.149
	37	Cos φ	--	t1-10s to t1	p.u.	0.899
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.15
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.151
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.154
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.152
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	43	Line current	L1	t1+60ms	p.u.	0.277
	44		L2		p.u.	0.306

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	45		L3		p.u.	0.277
	46	Line current	L1	t1+100ms	p.u.	0.296
	47		L2		p.u.	0.315
	48		L3		p.u.	0.294
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.265
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	51	Reactive current	Pos.	t1+100ms to t1+4900ms	p.u.	0.128
	52		Neg.	t1+100ms to t1+4900ms	p.u.	0.000
	53	Determined proportionality constant K-factor	Pos.	-	-	0.853
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	6
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	6
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.305
	64		Pos.		p.u.	0.305
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.000
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.001
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.004
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.002
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.305
	71		Neg.	t2+1s to t2+10s	p.u.	-0.001
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.149
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to	p.u.	0.306

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	75		Pos.	t2+10s	p.u.	0.306
	76	Active power response time (<1s)	Total	--	s	0.001
	77		Pos.	--	s	0.001
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	2
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	2
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.149
	87		Pos.			0.149
	88	Reactive power rising time	Total	--	s	0.02
	89		Pos.	--	s	0.02
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=0.9						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS2.2-6
	1	Date	--	--	dd.mm.yyyy	10.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	11:21:44
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	11328
	7	Point of fault clearance (t2)	Total	--	ms	71348
	8	Fault duration in load test	Total	--	ms	60020
	9	Fault duration in no load test	Total	--	ms	60020
	10	Voltage depth/height in	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000

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TÜV SÜD New Energy Vehicle Testing (Jiangsu) Co., Ltd., TÜV SÜD Group
Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

	11	no load test	Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.15
	15		Line to neutral (L2-N)		p.u.	1.151
	16		Line to neutral (L3-N)		p.u.	1.154
	17		Pos.		p.u.	1.152
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.341
	26		L2	t1-1s to t1	p.u.	0.342
	27		L3	t1-1s to t1	p.u.	0.34
	28	Active current	Pos.	t1-1s to t1	p.u.	0.306
	29		Neg.	t1-1s to t1	p.u.	-0.001
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.149
	31		Pos.	t1-60s to t1	p.u.	0.149
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.307
	34		Pos.		p.u.	0.307
	35	Reactive power	Total	t1-10s to t1	p.u.	0.149
	36		Pos.		p.u.	0.149
	37	Cos φ	--	t1-10s to t1	p.u.	0.899
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.151
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.152
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.155
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.153
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.003
	43	Line current	L1	t1+60ms	p.u.	0.322
	44		L2		p.u.	0.318
	45		L3		p.u.	0.282
	46	Line current	L1	t1+100ms	p.u.	0.316

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	47		L2		p.u.	0.314
	48		L3		p.u.	0.288
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.265
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	51	Reactive current	Pos.	t1+100ms to t1+4900ms	p.u.	0.128
	52		Neg.	t1+100ms to t1+4900ms	p.u.	0.000
	53	Determined proportionality constant K-factor	Pos.	-	-	0.853
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	10
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	10
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.306
	64		Pos.		p.u.	0.306
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.306
	71		Neg.	t2+1s to t2+10s	p.u.	-0.001
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.149
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.307
	75		Pos.		p.u.	0.307
	76	Active power	Total	--	s	0.001

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	77	response time (<1s)	Pos.	--	s	0.001
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	2
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	2
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.149
	87		Pos.			0.149
	88	Reactive power rising time	Total	--	s	0.027
	89		Pos.	--	s	0.027
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Zero current mode			
Static operating voltage setting (under voltage)	**50%Un**	**Static operating voltage setting (over voltage)**	**120%Un**

Condition@Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS2.2-7
	1	Date	--	--	dd.mm.yyyy	12.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	13:45:05
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	15167
	7	Point of fault clearance (t2)	Total	--	ms	75187
	8	Fault duration in load test	Total	--	ms	60020
	9	Fault duration	Total	--	ms	60020

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		in no load test				
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.15
	15		Line to neutral (L2-N)		p.u.	1.151
	16		Line to neutral (L3-N)		p.u.	1.154
	17		Pos.		p.u.	1.152
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.002
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.003
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.006
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.004
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.004
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.986
	26		L2	t1-1s to t1	p.u.	0.995
	27		L3	t1-1s to t1	p.u.	0.984
	28	Active current	Pos.	t1-1s to t1	p.u.	0.988
	29		Neg.	t1-1s to t1	p.u.	-0.002
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.007
	33	Active power	Total	t1-10s to t1	p.u.	0.993
	34		Pos.		p.u.	0.993
	35	Reactive power	Total	t1-10s to t1	p.u.	0.001
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.151
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.153
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.156
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.153
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.003
	43	Line current	L1	t1+60ms	p.u.	0.861

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	44		L2		p.u.	0.875
	45		L3		p.u.	0.862
	46	Line current	L1	t1+100ms	p.u.	0.852
	47		L2		p.u.	0.849
	48		L3		p.u.	0.847
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.858
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.001
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.003
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	53	Determined proportionality constant K-factor	Pos.	-	-	-
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.99
	64		Pos.		p.u.	0.99
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.002
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.003
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.006
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.004
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.985
	71		Neg.	t2+1s to t2+10s	p.u.	-0.002
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.007

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	74	Active power	Total	t2+1s to t2+10s	p.u.	0.989
	75		Pos.		p.u.	0.989
	76	Active power response time (<1s)	Total	--	s	0.003
	77		Pos.	--	s	0.003
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.002
	89		Pos.	--	s	0.002
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS2.2-8
	1	Date	--	--	dd.mm.yyyy	10.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	11:48:04
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	11599
	7	Point of fault clearance (t2)	Total	--	ms	71619
	8	Fault duration in load test	Total	--	ms	60020
	9	Fault duration in no load test	Total	--	ms	60020

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	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.15
	15		Line to neutral (L2-N)		p.u.	1.151
	16		Line to neutral (L3-N)		p.u.	1.154
	17		Pos.		p.u.	1.152
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.004
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.005
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.008
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.005
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.005
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.987
	26		L2	t1-1s to t1	p.u.	0.998
	27		L3	t1-1s to t1	p.u.	0.985
	28	Active current	Pos.	t1-1s to t1	p.u.	0.99
	29		Neg.	t1-1s to t1	p.u.	-0.002
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.996
	34		Pos.		p.u.	0.996
	35	Reactive power	Total	t1-10s to t1	p.u.	0.001
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.153
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.155
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.158
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.155
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.003
	43	Line current	L1	t1+60ms	p.u.	0.856
	44		L2		p.u.	0.852

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	45		L3		p.u.	0.861
	46	Line current	L1	t1+100ms	p.u.	0.856
	47		L2		p.u.	0.865
	48		L3		p.u.	0.859
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.821
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.001
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.003
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	53	Determined proportionality constant K-factor	Pos.	-	-	-
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.949
	64		Pos.		p.u.	0.949
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.004
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.005
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.008
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.006
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.989
	71		Neg.	t2+1s to t2+10s	p.u.	-0.002
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to	p.u.	0.995

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	75		Pos.	t2+10s	p.u.	0.995
	76	Active power response time (<1s)	Total	--	s	0.726
	77		Pos.	--	s	0.726
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.002
	89		Pos.	--	s	0.002
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS2.2-9
	1	Date	--	--	dd.mm.yyyy	12.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	13:38:39
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	15701
	7	Point of fault clearance (t2)	Total	--	ms	75721
	8	Fault duration in load test	Total	--	ms	60020
	9	Fault duration in no load test	Total	--	ms	60020
	10	Voltage depth/height in	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000

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Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

	11	no load test	Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.15
	15		Line to neutral (L2-N)		p.u.	1.151
	16		Line to neutral (L3-N)		p.u.	1.154
	17		Pos.		p.u.	1.152
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.001
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.003
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.001
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.001
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.306
	26		L2	t1-1s to t1	p.u.	0.307
	27		L3	t1-1s to t1	p.u.	0.305
	28	Active current	Pos.	t1-1s to t1	p.u.	0.306
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.306
	34		Pos.		p.u.	0.306
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.149
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.151
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.153
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.151
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.002
	43	Line current	L1	t1+60ms	p.u.	0.271
	44		L2		p.u.	0.27
	45		L3		p.u.	0.264
	46	Line current	L1	t1+100ms	p.u.	0.263

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	47		L2		p.u.	0.269
	48		L3		p.u.	0.269
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.266
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.002
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	53	Determined proportionality constant K-factor	Pos.	-	-	-
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.306
	64		Pos.		p.u.	0.306
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.000
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.001
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.003
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.001
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.306
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.001
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.306
	75		Pos.		p.u.	0.306
	76	Active power	Total	--	s	0.001

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	77	response time (<1s)	Pos.	--	s	0.001
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.028
	89		Pos.	--	s	0.028
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS2.2-10
	1	Date	--	--	dd.mm.yyyy	10.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	11:31:18
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.24
	5	Setting fault duration	--	--	ms	920
	6	Point of fault occur (t1)	Total	--	ms	11652
	7	Point of fault clearance (t2)	Total	--	ms	71672
	8	Fault duration in load test	Total	--	ms	60020
	9	Fault duration in no load test	Total	--	ms	60020
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001

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	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.15
	15		Line to neutral (L2-N)		p.u.	1.151
	16		Line to neutral (L3-N)		p.u.	1.154
	17		Pos.		p.u.	1.152
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.001
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.002
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.005
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.003
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.003
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.307
	26		L2	t1-1s to t1	p.u.	0.308
	27		L3	t1-1s to t1	p.u.	0.307
	28	Active current	Pos.	t1-1s to t1	p.u.	0.307
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.006
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.308
	34		Pos.		p.u.	0.308
	35	Reactive power	Total	t1-10s to t1	p.u.	0.004
	36		Pos.		p.u.	0.004
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.151
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.152
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.155
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.153
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.003
	43	Line current	L1	t1+60ms	p.u.	0.261
	44		L2		p.u.	0.275
	45		L3		p.u.	0.271
	46	Line current	L1	t1+100ms	p.u.	0.275
	47		L2		p.u.	0.27
	48		L3		p.u.	0.266

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	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.266
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	0.002
	52		Neg.	t1+100ms to t2-20ms	p.u.	0.000
	53	Determined proportionality constant K-factor	Pos.	-	-	-
	54		Neg.	-	-	-
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	60		Neg.	-	ms	-
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	62		Neg.	-	ms	-
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.307
	64		Pos.		p.u.	0.307
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.001
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.002
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.005
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.003
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.307
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.001
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.308
	75		Pos.		p.u.	0.308
	76	Active power response time (<1s)	Total	--	s	0.001
	77		Pos.	--	s	0.001

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	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.002
	89		Pos.	--	s	0.002
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

General mode for controlled short circuit current contribution			
Gradient setting	**k=2 throughout**	**Insensitive setting**	**5%**

Condition@Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS3-1
	1	Date	--	--	dd.mm.yyyy	10.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	17:48:27
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.52
	5	Setting fault duration	--	--	ms	1880
	6	Point of fault occur (t1)	Total	--	ms	11560
	7	Point of fault clearance (t2)	Total	--	ms	11681
	8	Fault duration in load test	Total	--	ms	121
	9	Fault duration in no load test	Total	--	ms	200
	10	Voltage depth/height in	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000

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	11	no load test	Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.002
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.25
	15		Line to neutral (L2-N)		p.u.	1.07
	16		Line to neutral (L3-N)		p.u.	1.073
	17		Pos.		p.u.	1.128
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.004
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.005
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.008
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.006
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.006
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.986
	26		L2	t1-1s to t1	p.u.	0.997
	27		L3	t1-1s to t1	p.u.	0.984
	28	Active current	Pos.	t1-1s to t1	p.u.	0.989
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.995
	34		Pos.		p.u.	0.995
	35	Reactive power	Total	t1-10s to t1	p.u.	0.001
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.249
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.072
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.071
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.127
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.122
	43	Line current	L1	t1+60ms	p.u.	0.648
	44		L2		p.u.	0.628
	45		L3		p.u.	0.262
	46	Line current	L1	t1+100ms	p.u.	0.67

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	47		L2		p.u.	0.656
	48		L3		p.u.	0.258
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.43
	50		Neg.	t1+100ms to t2-20ms	p.u.	0.016
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.232
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.232
	53	Determined proportionality constant K-factor	Pos.	-	-	-1.917
	54		Neg.	-	-	-1.95
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	22
	60		Neg.	-	ms	19
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	22
	62		Neg.	-	ms	22
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.486
	64		Pos.		p.u.	0.484
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.004
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.005
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.008
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.006
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.989
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.002
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.995
	75		Pos.		p.u.	0.995
	76	Active power	Total	--	s	0.023

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	77	response time (<1s)	Pos.	--	s	0.023
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	27
	83		Neg.	-	ms	16
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	45
	85		Neg.	-	ms	54
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.002
	87		Pos.			0.002
	88	Reactive power rising time	Total	--	s	0.042
	89		Pos.	--	s	0.055
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS3-2
	1	Date	--	--	dd.mm.yyyy	11.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	17:32:29
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.52
	5	Setting fault duration	--	--	ms	1880
	6	Point of fault occur (t1)	Total	--	ms	11060
	7	Point of fault clearance (t2)	Total	--	ms	11180
	8	Fault duration in load test	Total	--	ms	120
	9	Fault duration in no load test	Total	--	ms	200
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001

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Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.002
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.25
	15		Line to neutral (L2-N)		p.u.	1.07
	16		Line to neutral (L3-N)		p.u.	1.073
	17		Pos.		p.u.	1.128
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.003
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.004
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.007
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.005
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.005
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.989
	26		L2	t1-1s to t1	p.u.	1.001
	27		L3	t1-1s to t1	p.u.	0.988
	28	Active current	Pos.	t1-1s to t1	p.u.	0.992
	29		Neg.	t1-1s to t1	p.u.	-0.002
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.998
	34		Pos.		p.u.	0.998
	35	Reactive power	Total	t1-10s to t1	p.u.	0.001
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.247
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.071
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.07
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.126
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.121
	43	Line current	L1	t1+60ms	p.u.	0.676
	44		L2		p.u.	0.671
	45		L3		p.u.	0.263
	46	Line current	L1	t1+100ms	p.u.	0.685
	47		L2		p.u.	0.694
	48		L3		p.u.	0.27

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	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.451
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.009
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.248
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.26
	53	Determined proportionality constant K-factor	Pos.	-	-	-2.05
	54		Neg.	-	-	-2.203
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	21
	60		Neg.	-	ms	19
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	29
	62		Neg.	-	ms	28
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.507
	64		Pos.		p.u.	0.508
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.003
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.004
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.007
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.005
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.992
	71		Neg.	t2+1s to t2+10s	p.u.	-0.002
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.997
	75		Pos.		p.u.	0.997
	76	Active power response time (<1s)	Total	--	s	0.024
	77		Pos.	--	s	0.024

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	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	21
	83		Neg.	-	ms	16
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	21
	85		Neg.	-	ms	25
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.037
	89		Pos.	--	s	0.039
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS3-3
	1	Date	--	--	dd.mm.yyyy	11.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	17:19:18
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.52
	5	Setting fault duration	--	--	ms	1880
	6	Point of fault occur (t1)	Total	--	ms	12489
	7	Point of fault clearance (t2)	Total	--	ms	12609
	8	Fault duration in load test	Total	--	ms	120
	9	Fault duration in no load test	Total	--	ms	200
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004

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	13		Pos.		p.u.	1.002
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.25
	15		Line to neutral (L2-N)		p.u.	1.07
	16		Line to neutral (L3-N)		p.u.	1.073
	17		Pos.		p.u.	1.128
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.001
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.004
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.002
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.002
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.301
	26		L2	t1-1s to t1	p.u.	0.301
	27		L3	t1-1s to t1	p.u.	0.3
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.249
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.071
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.07
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.127
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.122
	43	Line current	L1	t1+60ms	p.u.	0.523
	44		L2		p.u.	0.528
	45		L3		p.u.	0.15
	46	Line current	L1	t1+100ms	p.u.	0.525
	47		L2		p.u.	0.534
	48		L3		p.u.	0.157
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.266

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	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.022
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.211
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.22
	53	Determined proportionality constant K-factor	Pos.	-	-	-1.688
	54		Neg.	-	-	-1.833
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	25
	60		Neg.	-	ms	21
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	29
	62		Neg.	-	ms	39
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.297
	64		Pos.		p.u.	0.299
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.000
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.001
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.004
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.002
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.3
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.301
	75		Pos.		p.u.	0.301
	76	Active power response time (<1s)	Total	--	s	0.007
	77		Pos.	--	s	0.007
	78	Active current step response	Pos.	-	ms	-12
	79		Neg.	-	ms	-12

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		time (<30 ms)				
	80	Active current settling time (<60 ms)	Pos.	-	ms	90
	81		Neg.	-	ms	963
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	25
	83		Neg.	-	ms	18
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	25
	85		Neg.	-	ms	18
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.043
	89		Pos.	--	s	0.052
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS3-4
	1	Date	--	--	dd.mm.yyyy	11.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	17:04:35
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.52
	5	Setting fault duration	--	--	ms	1880
	6	Point of fault occur (t1)	Total	--	ms	12527
	7	Point of fault clearance (t2)	Total	--	ms	12647
	8	Fault duration in load test	Total	--	ms	120
	9	Fault duration in no load test	Total	--	ms	200
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.002

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	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.25
	15		Line to neutral (L2-N)		p.u.	1.07
	16		Line to neutral (L3-N)		p.u.	1.073
	17		Pos.		p.u.	1.128
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.001
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.004
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.002
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.002
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.304
	26		L2	t1-1s to t1	p.u.	0.304
	27		L3	t1-1s to t1	p.u.	0.303
	28	Active current	Pos.	t1-1s to t1	p.u.	0.304
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.304
	34		Pos.		p.u.	0.304
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.249
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.071
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.07
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.127
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.122
	43	Line current	L1	t1+60ms	p.u.	0.542
	44		L2		p.u.	0.538
	45		L3		p.u.	0.161
	46	Line current	L1	t1+100ms	p.u.	0.525
	47		L2		p.u.	0.53
	48		L3		p.u.	0.162
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.256
	50		Neg.	t1+100ms to	p.u.	-0.027

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				t2-20ms		
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.213
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.218
	53	Determined proportionality constant K-factor	Pos.	-	-	-1.704
	54		Neg.	-	-	-1.817
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	2
	60		Neg.	-	ms	2
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	15
	62		Neg.	-	ms	50
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.285
	64		Pos.		p.u.	0.288
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.000
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.001
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.004
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.002
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.304
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.304
	75		Pos.		p.u.	0.304
	76	Active power response time (<1s)	Total	--	s	0.006
	77		Pos.	--	s	0.006
	78	Active current step response time	Pos.	-	ms	-
	79		Neg.	-	ms	-

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		(<30 ms)				
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	3
	83		Neg.	-	ms	18
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	33
	85		Neg.	-	ms	21
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.022
	89		Pos.	--	s	0.023
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

General mode for controlled short circuit current contribution			
Gradient setting	**k=2 throughout**	**Insensitive setting**	**5%**

Condition@Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS4.1-1
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	20:04:25
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	13094
	7	Point of fault clearance (t2)	Total	--	ms	18114
	8	Fault duration in load test	Total	--	ms	5020
	9	Fault duration in no load test	Total	--	ms	5020
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-		p.u.	1.004

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TÜV SÜD New Energy Vehicle Testing (Jiangsu) Co., Ltd., TÜV SÜD Group
Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

			N)			
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.198
	15		Line to neutral (L2-N)		p.u.	1.051
	16		Line to neutral (L3-N)		p.u.	1.055
	17		Pos.		p.u.	1.099
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.003
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.004
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.007
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.005
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.005
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.984
	26		L2	t1-1s to t1	p.u.	0.994
	27		L3	t1-1s to t1	p.u.	0.982
	28	Active current	Pos.	t1-1s to t1	p.u.	0.987
	29		Neg.	t1-1s to t1	p.u.	-0.002
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.007
	33	Active power	Total	t1-10s to t1	p.u.	0.992
	34		Pos.		p.u.	0.992
	35	Reactive power	Total	t1-10s to t1	p.u.	0.001
	36		Pos.		p.u.	0.001
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.199
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.055
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.056
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.101
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.098
	43	Line current	L1	t1+60ms	p.u.	0.784
	44		L2		p.u.	0.878
	45		L3		p.u.	0.743
	46	Line current	L1	t1+100ms	p.u.	0.851
	47		L2		p.u.	0.904
	48		L3		p.u.	0.546
	49	Active current	Pos.	t1+100ms to	p.u.	0.733

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				t2-20ms		
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.02
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.216
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.216
	53	Determined proportionality constant K-factor	Pos.	-	-	-2.25
	54		Neg.	-	-	-2.274
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	21
	60		Neg.	-	ms	22
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	51
	62		Neg.	-	ms	56
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.805
	64		Pos.		p.u.	0.807
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.003
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.004
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.007
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.005
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.985
	71		Neg.	t2+1s to t2+10s	p.u.	-0.002
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.007
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.99
	75		Pos.		p.u.	0.99
	76	Active power response time (<1s)	Total	--	s	0.032
	77		Pos.	--	s	0.032
	78	Active current	Pos.	-	ms	-

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	79	step response time (<30 ms)	Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	25
	83		Neg.	-	ms	16
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	35
	85		Neg.	-	ms	59
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.048
	89		Pos.	--	s	0.052
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS4.1-2
	1	Date	--	--	dd.mm.yyyy	10.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	17:26:47
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	12322
	7	Point of fault clearance (t2)	Total	--	ms	17342
	8	Fault duration in load test	Total	--	ms	5020
	9	Fault duration in no load test	Total	--	ms	5020
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001

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	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.198
	15		Line to neutral (L2-N)		p.u.	1.051
	16		Line to neutral (L3-N)		p.u.	1.055
	17		Pos.		p.u.	1.099
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.004
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.006
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.009
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.006
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.006
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.986
	26		L2	t1-1s to t1	p.u.	0.997
	27		L3	t1-1s to t1	p.u.	0.984
	28	Active current	Pos.	t1-1s to t1	p.u.	0.989
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.002
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.995
	34		Pos.		p.u.	0.995
	35	Reactive power	Total	t1-10s to t1	p.u.	0.002
	36		Pos.		p.u.	0.002
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.201
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.057
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.057
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.102
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.098
	43	Line current	L1	t1+60ms	p.u.	0.859
	44		L2		p.u.	0.928
	45		L3		p.u.	0.525
	46	Line current	L1	t1+100ms	p.u.	0.867
	47		L2		p.u.	0.938
	48		L3		p.u.	0.544
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.751
	50		Neg.	t1+100ms to	p.u.	-0.014

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				t2-20ms		
	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.188
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.213
	53	Determined proportionality constant K-factor	Pos.	-	-	-1.958
	54		Neg.	-	-	-2.242
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	21
	60		Neg.	-	ms	18
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	21
	62		Neg.	-	ms	47
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.827
	64		Pos.		p.u.	0.828
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.004
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.006
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.009
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.006
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.988
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.002
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.994
	75		Pos.		p.u.	0.994
	76	Active power response time (<1s)	Total	--	s	0.022
	77		Pos.	--	s	0.022
	78	Active current step response time	Pos.	-	ms	-
	79		Neg.	-	ms	-

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		(<30 ms)				
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	26
	83		Neg.	-	ms	15
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	46
	85		Neg.	-	ms	48
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.002
	87		Pos.			0.002
	88	Reactive power rising time	Total	--	s	0.065
	89		Pos.	--	s	0.066
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS4.1-3
	1	Date	--	--	dd.mm.yyyy	11.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	17:22:08
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	12841
	7	Point of fault clearance (t2)	Total	--	ms	17862
	8	Fault duration in load test	Total	--	ms	5021
	9	Fault duration in no load test	Total	--	ms	5020
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-	t1+100ms to	p.u.	1.198

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			N)	t2		
	15		Line to neutral (L2-N)		p.u.	1.051
	16		Line to neutral (L3-N)		p.u.	1.055
	17		Pos.		p.u.	1.099
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.001
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.004
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.002
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.002
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.3
	26		L2	t1-1s to t1	p.u.	0.301
	27		L3	t1-1s to t1	p.u.	0.3
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.198
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.053
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.053
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.099
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.099
	43	Line current	L1	t1+60ms	p.u.	0.404
	44		L2		p.u.	0.433
	45		L3		p.u.	0.186
	46	Line current	L1	t1+100ms	p.u.	0.425
	47		L2		p.u.	0.464
	48		L3		p.u.	0.205
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.272
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.016

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	51	Reactive current	Pos.	t1+100ms to t2-20ms	p.u.	-0.157
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.15
	53	Determined proportionality constant K-factor	Pos.	-	-	-1.619
	54		Neg.	-	-	-1.546
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	22
	60		Neg.	-	ms	21
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	22
	62		Neg.	-	ms	29
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.298
	64		Pos.		p.u.	0.299
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.000
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.001
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.004
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.002
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.3
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.301
	75		Pos.		p.u.	0.301
	76	Active power response time (<1s)	Total	--	s	0.005
	77		Pos.	--	s	0.004
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-

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	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	12
	83		Neg.	-	ms	10
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	12
	85		Neg.	-	ms	10
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.002
	89		Pos.	--	s	0.002
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS4.1-4
	1	Date	--	--	dd.mm.yyyy	11.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	16:56:43
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	12610
	7	Point of fault clearance (t2)	Total	--	ms	17630
	8	Fault duration in load test	Total	--	ms	5020
	9	Fault duration in no load test	Total	--	ms	5020
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.198

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	15		Line to neutral (L2-N)		p.u.	1.051
	16		Line to neutral (L3-N)		p.u.	1.055
	17		Pos.		p.u.	1.099
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.001
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.004
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.002
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.002
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.303
	26		L2	t1-1s to t1	p.u.	0.304
	27		L3	t1-1s to t1	p.u.	0.303
	28	Active current	Pos.	t1-1s to t1	p.u.	0.303
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.304
	34		Pos.		p.u.	0.304
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.198
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.053
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.053
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.099
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.099
	43	Line current	L1	t1+60ms	p.u.	0.424
	44		L2		p.u.	0.459
	45		L3		p.u.	0.2
	46	Line current	L1	t1+100ms	p.u.	0.432
	47		L2		p.u.	0.473
	48		L3		p.u.	0.206
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.275
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.018
	51	Reactive	Pos.	t1+100ms to	p.u.	-0.157

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		current		t2-20ms		
	52		Neg.	t1+100ms to t2-20ms	p.u.	-0.16
	53	Determined proportionality constant K-factor	Pos.	-	-	-1.619
	54		Neg.	-	-	-1.649
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	20
	60		Neg.	-	ms	19
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	20
	62		Neg.	-	ms	21
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.3
	64		Pos.		p.u.	0.302
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.000
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.001
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.004
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.002
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.303
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.304
	75		Pos.		p.u.	0.304
	76	Active power response time (<1s)	Total	--	s	0.004
	77		Pos.	--	s	0.004
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current	Pos.	-	ms	-

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	81	settling time (<60 ms)	Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	21
	83		Neg.	-	ms	18
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	41
	85		Neg.	-	ms	27
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.056
	89		Pos.	--	s	0.059
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS4.2-1
	1	Date	--	--	dd.mm.yyyy	09.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	20:13:15
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	11338
	7	Point of fault clearance (t2)	Total	--	ms	71358
	8	Fault duration in load test	Total	--	ms	60020
	9	Fault duration in no load test	Total	--	ms	60020
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.15
	15		Line to neutral (L2-N)		p.u.	1.04

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	16		Line to neutral (L3-N)		p.u.	1.043
	17		Pos.		p.u.	1.077
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.004
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.005
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.008
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.005
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.005
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.987
	26		L2	t1-1s to t1	p.u.	0.998
	27		L3	t1-1s to t1	p.u.	0.985
	28	Active current	Pos.	t1-1s to t1	p.u.	0.99
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.001
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.996
	34		Pos.		p.u.	0.996
	35	Reactive power	Total	t1-10s to t1	p.u.	0.002
	36		Pos.		p.u.	0.002
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.153
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.045
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.048
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.081
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.073
	43	Line current	L1	t1+60ms	p.u.	0.891
	44		L2		p.u.	0.966
	45		L3		p.u.	0.673
	46	Line current	L1	t1+100ms	p.u.	0.885
	47		L2		p.u.	0.965
	48		L3		p.u.	0.676
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.916
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.025
	51	Reactive current	Pos.	t1+100ms to t1+4900ms	p.u.	-0.011
	52		Neg.	t1+100ms to	p.u.	-0.032

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				t1+4900ms		
	53	Determined proportionality constant K-factor	Pos.	-	-	2
	54		Neg.	-	-	2
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	9
	60		Neg.	-	ms	6
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	9
	62		Neg.	-	ms	6
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.988
	64		Pos.		p.u.	0.99
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.004
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.005
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.008
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.006
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.99
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.001
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.995
	75		Pos.		p.u.	0.995
	76	Active power response time (<1s)	Total	--	s	0.002
	77		Pos.	--	s	0.002
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-

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	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.001
	87		Pos.			0.001
	88	Reactive power rising time	Total	--	s	0.001
	89		Pos.	--	s	0.001
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS4.2-2
	1	Date	--	--	dd.mm.yyyy	10.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	17:03:55
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	12536
	7	Point of fault clearance (t2)	Total	--	ms	72556
	8	Fault duration in load test	Total	--	ms	60020
	9	Fault duration in no load test	Total	--	ms	60020
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.15
	15		Line to neutral (L2-N)		p.u.	1.04
	16		Line to neutral (L3-N)		p.u.	1.043

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	17		Pos.		p.u.	1.077
Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.004
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.005
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.008
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.006
	22		Neg.	t1-60s to t1	p.u.	0.003
	23		Pos.	t1-1s to t1	p.u.	1.006
	24		Neg.	t1-1s to t1	p.u.	0.003
	25	Current	L1	t1-1s to t1	p.u.	0.984
	26		L2	t1-1s to t1	p.u.	0.996
	27		L3	t1-1s to t1	p.u.	0.982
	28	Active current	Pos.	t1-1s to t1	p.u.	0.987
	29		Neg.	t1-1s to t1	p.u.	-0.003
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.001
	31		Pos.	t1-60s to t1	p.u.	0.002
	32		Neg.	t1-1s to t1	p.u.	0.008
	33	Active power	Total	t1-10s to t1	p.u.	0.995
	34		Pos.		p.u.	0.995
	35	Reactive power	Total	t1-10s to t1	p.u.	0.002
	36		Pos.		p.u.	0.002
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.154
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.045
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.048
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.081
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.073
	43	Line current	L1	t1+60ms	p.u.	0.894
	44		L2		p.u.	0.957
	45		L3		p.u.	0.674
	46	Line current	L1	t1+100ms	p.u.	0.892
	47		L2		p.u.	0.959
	48		L3		p.u.	0.681
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.912
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.023
	51	Reactive current	Pos.	t1+100ms to t1+4900ms	p.u.	-0.01
	52		Neg.	t1+100ms to t1+4900ms	p.u.	-0.032
	53	Determined	Pos.	-	-	2

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	54	proportionality constant K-factor	Neg.	-	-	2
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	7
	60		Neg.	-	ms	5
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	7
	62		Neg.	-	ms	5
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.984
	64		Pos.		p.u.	0.986
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.004
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.005
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.008
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.006
	69		Neg.	t2+1s to t2+10s	p.u.	0.003
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.988
	71		Neg.	t2+1s to t2+10s	p.u.	-0.003
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.002
	73		Neg.	t2+1s to t2+10s	p.u.	0.008
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.994
	75		Pos.		p.u.	0.994
	76	Active power response time (<1s)	Total	--	s	0.021
	77		Pos.	--	s	0.001
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step	Pos.	-	ms	-
	83		Neg.	-	ms	-

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		response time (<30 ms)				
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.002
	87		Pos.			0.002
	88	Reactive power rising time	Total	--	s	0.001
	89		Pos.	--	s	0.001
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and min. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS4.2-3
	1	Date	--	--	dd.mm.yyyy	11.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	17:14:10
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	15690
	7	Point of fault clearance (t2)	Total	--	ms	75710
	8	Fault duration in load test	Total	--	ms	60020
	9	Fault duration in no load test	Total	--	ms	60020
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.15
	15		Line to neutral (L2-N)		p.u.	1.04
	16		Line to neutral (L3-N)		p.u.	1.043
	17		Pos.		p.u.	1.077

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Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

Before fault <t1	18	Voltage	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.001
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.004
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.002
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.002
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.3
	26		L2	t1-1s to t1	p.u.	0.301
	27		L3	t1-1s to t1	p.u.	0.3
	28	Active current	Pos.	t1-1s to t1	p.u.	0.3
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.000
	33	Active power	Total	t1-10s to t1	p.u.	0.301
	34		Pos.		p.u.	0.301
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.15
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.041
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.044
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.077
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.073
	43	Line current	L1	t1+60ms	p.u.	0.372
	44		L2		p.u.	0.394
	45		L3		p.u.	0.193
	46	Line current	L1	t1+100ms	p.u.	0.391
	47		L2		p.u.	0.416
	48		L3		p.u.	0.213
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.278
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.005
	51	Reactive current	Pos.	t1+100ms to t1+4900ms	p.u.	-0.008
	52		Neg.	t1+100ms to t1+4900ms	p.u.	-0.016
	53	Determined proportionality	Pos.	-	-	-0.107
	54		Neg.	-	-	-0.225

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		constant K-factor				
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	9
	60		Neg.	-	ms	7
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	10
	62		Neg.	-	ms	7
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.3
	64		Pos.		p.u.	0.3
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.000
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.001
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.004
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.002
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.3
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.301
	75		Pos.		p.u.	0.301
	76	Active power response time (<1s)	Total	--	s	0.001
	77		Pos.	--	s	0.001
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time	Pos.	-	ms	-
	83		Neg.	-	ms	-

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		(<30 ms)				
	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.001
	89		Pos.	--	s	0.000
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

Condition@0.3Pn and max. DC input voltage and cos φ=1						Measurement
Item	No.	Parameter	Phase ref.	Time ref.	unit	
General Info.	0	Test number	--	--	--	VS4.2-4
	1	Date	--	--	dd.mm.yyyy	11.09.2025
	2	Time (start of test)	--	--	hh:mm:ss.f	17:09:53
	3	Fault type (phase)	--	--		symmetrical three-phase undervoltage
	4	Setting voltage depth	Line to line	--	p.u.	0.76
	5	Setting fault duration	--	--	ms	2700
	6	Point of fault occur (t1)	Total	--	ms	12784
	7	Point of fault clearance (t2)	Total	--	ms	72804
	8	Fault duration in load test	Total	--	ms	60020
	9	Fault duration in no load test	Total	--	ms	60020
	10	Voltage depth/height in no load test	Line to neutral (L1-N)	t1-10s to t1	p.u.	1.000
	11		Line to neutral (L2-N)		p.u.	1.001
	12		Line to neutral (L3-N)		p.u.	1.004
	13		Pos.		p.u.	1.001
	14		Line to neutral (L1-N)	t1+100ms to t2	p.u.	1.15
	15		Line to neutral (L2-N)		p.u.	1.04
	16		Line to neutral (L3-N)		p.u.	1.043
	17		Pos.		p.u.	1.077
Before	18	Voltage	Line to neutral (L1-	t1-10s to t1	p.u.	1.000

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fault <t1			N)			
	19		Line to neutral (L2-N)	t1-10s to t1	p.u.	1.001
	20		Line to neutral (L3-N)	t1-10s to t1	p.u.	1.004
	21	Voltage	Pos.	t1-60s to t1	p.u.	1.002
	22		Neg.	t1-60s to t1	p.u.	0.002
	23		Pos.	t1-1s to t1	p.u.	1.002
	24		Neg.	t1-1s to t1	p.u.	0.002
	25	Current	L1	t1-1s to t1	p.u.	0.304
	26		L2	t1-1s to t1	p.u.	0.304
	27		L3	t1-1s to t1	p.u.	0.303
	28	Active current	Pos.	t1-1s to t1	p.u.	0.304
	29		Neg.	t1-1s to t1	p.u.	0.000
	30	Reactive current	Pos.	t1-1s to t1	p.u.	0.000
	31		Pos.	t1-60s to t1	p.u.	0.000
	32		Neg.	t1-1s to t1	p.u.	0.001
	33	Active power	Total	t1-10s to t1	p.u.	0.304
	34		Pos.		p.u.	0.304
	35	Reactive power	Total	t1-10s to t1	p.u.	0.000
	36		Pos.		p.u.	0.000
	37	Cos φ	--	t1-10s to t1	p.u.	1.000
During dip t1 to t2	38	Voltage	Line to neutral (L1-N)	t1+100ms to t2-20ms	p.u.	1.15
	39		Line to neutral (L2-N)	t1+100ms to t2-20ms	p.u.	1.041
	40		Line to neutral (L3-N)	t1+100ms to t2-20ms	p.u.	1.044
	41	Voltage	Pos.	t1+100ms to t2-20ms	p.u.	1.077
	42		Neg.	t1+100ms to t2-20ms	p.u.	0.073
	43	Line current	L1	t1+60ms	p.u.	0.413
	44		L2		p.u.	0.436
	45		L3		p.u.	0.223
	46	Line current	L1	t1+100ms	p.u.	0.399
	47		L2		p.u.	0.427
	48		L3		p.u.	0.216
	49	Active current	Pos.	t1+100ms to t2-20ms	p.u.	0.281
	50		Neg.	t1+100ms to t2-20ms	p.u.	-0.005
	51	Reactive current	Pos.	t1+100ms to t1+4900ms	p.u.	-0.008
	52		Neg.	t1+100ms to t1+4900ms	p.u.	-0.016
	53	Determined proportionality constant K-	Pos.	-	-	2
	54		Neg.	-	-	2

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		factor				
	55	Active current step response time (<30 ms)	Pos.	-	ms	-
	56		Neg.	-	ms	-
	57	Active current settling time (<60 ms)	Pos.	-	ms	-
	58		Neg.	-	ms	-
	59	Reactive current step response time (<30 ms)	Pos.	-	ms	7
	60		Neg.	-	ms	6
	61	Reactive current settling time (<60 ms)	Pos.	-	ms	7
	62		Neg.	-	ms	6
	63	Active power	Total	t1+100ms to t2-20ms	p.u.	0.302
	64		Pos.		p.u.	0.303
After dip > t2	65	Voltage	Line to neutral (L1-N)	t2+1s to t2+10s	p.u.	1.000
	66		Line to neutral (L2-N)	t2+1s to t2+10s	p.u.	1.001
	67		Line to neutral (L3-N)	t2+1s to t2+10s	p.u.	1.004
	68	Voltage	Pos.	t2+1s to t2+10s	p.u.	1.002
	69		Neg.	t2+1s to t2+10s	p.u.	0.002
	70	Active current	Pos.	t2+1s to t2+10s	p.u.	0.304
	71		Neg.	t2+1s to t2+10s	p.u.	0.000
	72	Reactive current	Pos.	t2+1s to t2+10s	p.u.	0.000
	73		Neg.	t2+1s to t2+10s	p.u.	0.000
	74	Active power	Total	t2+1s to t2+10s	p.u.	0.304
	75		Pos.		p.u.	0.304
	76	Active power response time (<1s)	Total	--	s	0.005
	77		Pos.	--	s	0.005
	78	Active current step response time (<30 ms)	Pos.	-	ms	-
	79		Neg.	-	ms	-
	80	Active current settling time (<60 ms)	Pos.	-	ms	-
	81		Neg.	-	ms	-
	82	Reactive current step response time (<30 ms)	Pos.	-	ms	-
	83		Neg.	-	ms	-

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	84	Reactive current settling time (<60 ms)	Pos.	-	ms	-
	85		Neg.	-	ms	-
	86	Reactive power	Total	t2+1s to t2+10s	p.u.	0.000
	87		Pos.			0.000
	88	Reactive power rising time	Total	--	s	0.004
	89		Pos.	--	s	0.000
	90	PGU does not disconnect from grid till 60s after fault	--	t2 to t2+60s	Yes / No	yes

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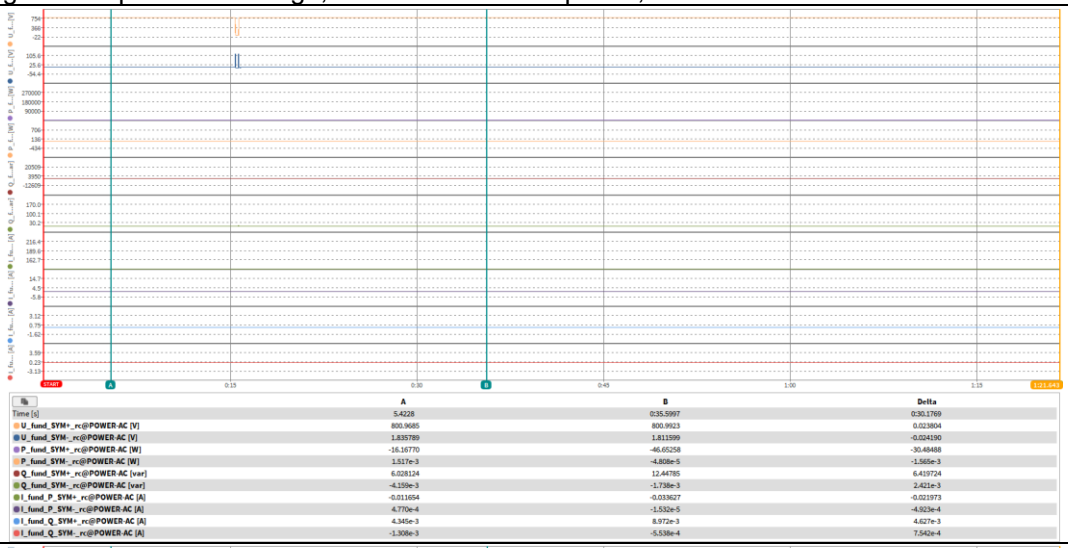
VD1 (no-load test)

a) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



Time [s]	A	B	Delta
U_fund_SYM+_rc@POWER-AC [V]	800.9685	800.9923	0.023804
U_fund_SYM-_rc@POWER-AC [V]	1.835789	1.811599	-0.024190
P_fund_SYM+_rc@POWER-AC [W]	-16.16770	-46.65258	-30.48488
P_fund_SYM-_rc@POWER-AC [W]	1.517e-3	-4.808e-5	-1.565e-3
Q_fund_SYM+_rc@POWER-AC [var]	6.028124	12.44785	6.419724
Q_fund_SYM-_rc@POWER-AC [var]	-4.159e-3	-1.738e-3	2.421e-3
I_fund_P_SYM+_rc@POWER-AC [A]	-0.011654	-0.033627	-0.021973
I_fund_P_SYM-_rc@POWER-AC [A]	4.770e-4	-1.532e-5	-4.923e-4
I_fund_Q_SYM+_rc@POWER-AC [A]	4.345e-3	8.972e-3	4.627e-3
I_fund_Q_SYM-_rc@POWER-AC [A]	-1.308e-3	-5.538e-4	7.542e-4

Time [s]	A	B	Delta
I1_tRMS_rc@POWER-AC [A]	0.124369	0.132846	8.477e-3
I2_tRMS_rc@POWER-AC [A]	0.211323	0.216257	4.933e-3
I3_tRMS_rc@POWER-AC [A]	0.121003	0.130349	9.346e-3
U_fund_SYM+_rc@POWER-AC [V]	800.9685	800.9571	-0.011414
U_fund_SYM-_rc@POWER-AC [V]	1.835789	1.829584	-6.205e-3
AI 1/I1@TRIONet3_1674 [A]	0.208616	0.089407	-0.119209
AI 1/I2@TRIONet3_1674 [A]	0.149012	0.238419	0.089407
AI 1/I3@TRIONet3_1674 [A]	-0.119209	-0.119209	0.000000
AI 1/U1@TRIONet3_1674 [V]	-1127.194	649.9110	1777.105
AI 1/U2@TRIONet3_1674 [V]	634.8777	-1129.403	-1764.281
AI 1/U3@TRIONet3_1674 [V]	492.3613	479.4035	-12.95781

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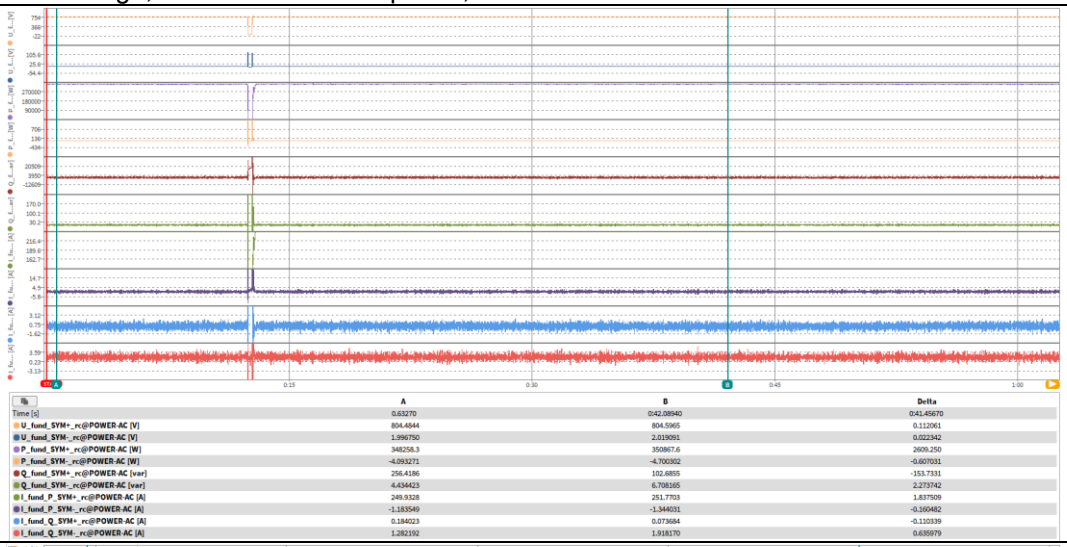
VD1-1 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	0.63270	0:42.08940	0:41.45670
U_fund_SYM+_rc@POWER-AC [V]	804.4844	804.5965	0.112061
U_fund_SYM-_rc@POWER-AC [V]	1.996750	2.019091	0.022342
P_fund_SYM+_rc@POWER-AC [W]	348258.3	350867.6	2609.250
P_fund_SYM-_rc@POWER-AC [W]	-4.093271	-4.700302	-0.607031
Q_fund_SYM+_rc@POWER-AC [var]	256.4186	102.6855	-153.7331
Q_fund_SYM-_rc@POWER-AC [var]	4.434423	6.708165	2.273742
I_fund_P_SYM+_rc@POWER-AC [A]	249.9328	251.7703	1.837509
I_fund_P_SYM-_rc@POWER-AC [A]	-1.183549	-1.344031	-0.160482
I_fund_Q_SYM+_rc@POWER-AC [A]	0.184023	0.073684	-0.110339
I_fund_Q_SYM-_rc@POWER-AC [A]	1.282192	1.918170	0.635979

	A	B	Delta
Time [s]	4.7836	0:25.0009	0:20.2173
I1_tRMS_rc@POWER-AC [A]	250.1032	250.7610	0.657867
I2_tRMS_rc@POWER-AC [A]	251.9189	254.3407	2.421783
I3_tRMS_rc@POWER-AC [A]	247.0990	248.7381	1.639008
U_fund_SYM+_rc@POWER-AC [V]	804.4440	804.5382	0.094177
U_fund_SYM-_rc@POWER-AC [V]	1.972740	1.953969	-0.018771
AI 1/I1@TRIONet3_1674 [A]	28.04399	-245.6010	-273.6449
AI 1/I2@TRIONet3_1674 [A]	-321.5075	-87.61883	233.8886
AI 1/I3@TRIONet3_1674 [A]	293.7615	333.3390	39.57749
AI 1/U1@TRIONet3_1674 [V]	633.1096	-293.2806	-926.3902
AI 1/U2@TRIONet3_1674 [V]	-1135.958	-807.4124	328.5454
AI 1/U3@TRIONet3_1674 [V]	502.8057	1100.841	598.0349

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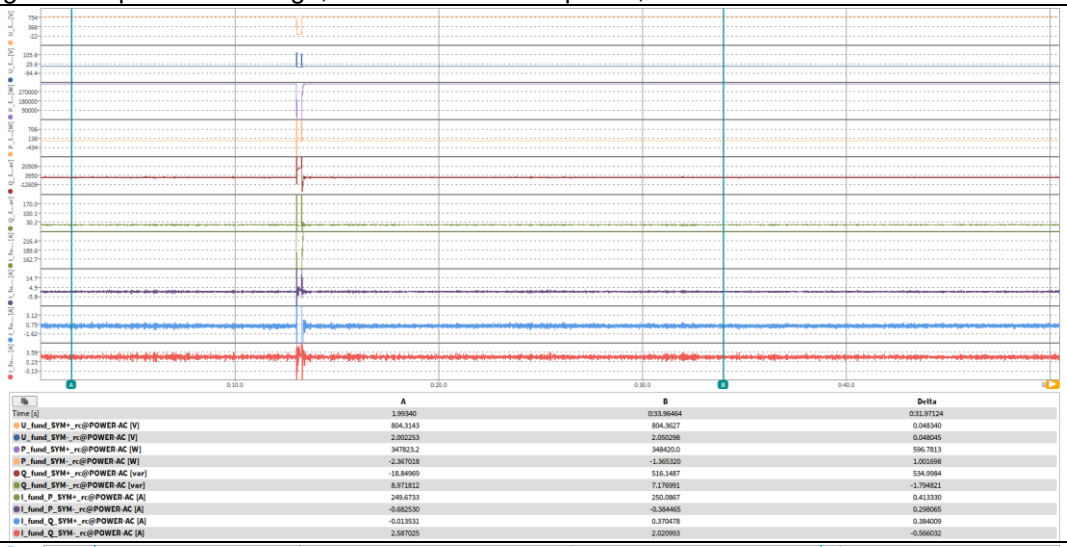
VD1-2 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	1.99340	0:33.96464	0:31.97124
U_fund_SYM+_rc@POWER-AC [V]	804.3143	804.3627	0.048340
U_fund_SYM-_rc@POWER-AC [V]	2.002253	2.050298	0.048045
P_fund_SYM+_rc@POWER-AC [W]	347823.2	348420.0	596.7813
P_fund_SYM-_rc@POWER-AC [W]	-2.367018	-1.365320	1.001698
Q_fund_SYM+_rc@POWER-AC [var]	-18.84969	516.1487	534.9984
Q_fund_SYM-_rc@POWER-AC [var]	8.971812	7.176991	-1.794821
I_fund_P_SYM+_rc@POWER-AC [A]	249.6733	250.0867	0.413330
I_fund_P_SYM-_rc@POWER-AC [A]	-0.682530	-0.384465	0.298065
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.013531	0.370478	0.384009
I_fund_Q_SYM-_rc@POWER-AC [A]	2.587025	2.020993	-0.566032

	A	B	Delta
Time [s]	2.39777	0:29.24396	0:26.84619
I1_tRMS_rc@POWER-AC [A]	249.1061	248.8196	-0.286530
I2_tRMS_rc@POWER-AC [A]	251.9538	252.0574	0.103546
I3_tRMS_rc@POWER-AC [A]	248.9503	248.7136	-0.245697
U_fund_SYM+_rc@POWER-AC [V]	804.3235	804.3397	0.016113
U_fund_SYM-_rc@POWER-AC [V]	2.018687	2.009951	-8.736e-3
AI 1/I1@TRIONet3_1674 [A]	-333.1006	235.2595	568.3601
AI 1/I2@TRIONet3_1674 [A]	68.48574	-354.5583	-423.0440
AI 1/I3@TRIONet3_1674 [A]	264.6446	119.5967	-145.0479
AI 1/U1@TRIONet3_1674 [V]	-738.3702	1072.769	1811.139
AI 1/U2@TRIONet3_1674 [V]	-379.5724	-858.8663	-479.2939
AI 1/U3@TRIONet3_1674 [V]	1118.089	-214.1302	-1332.219

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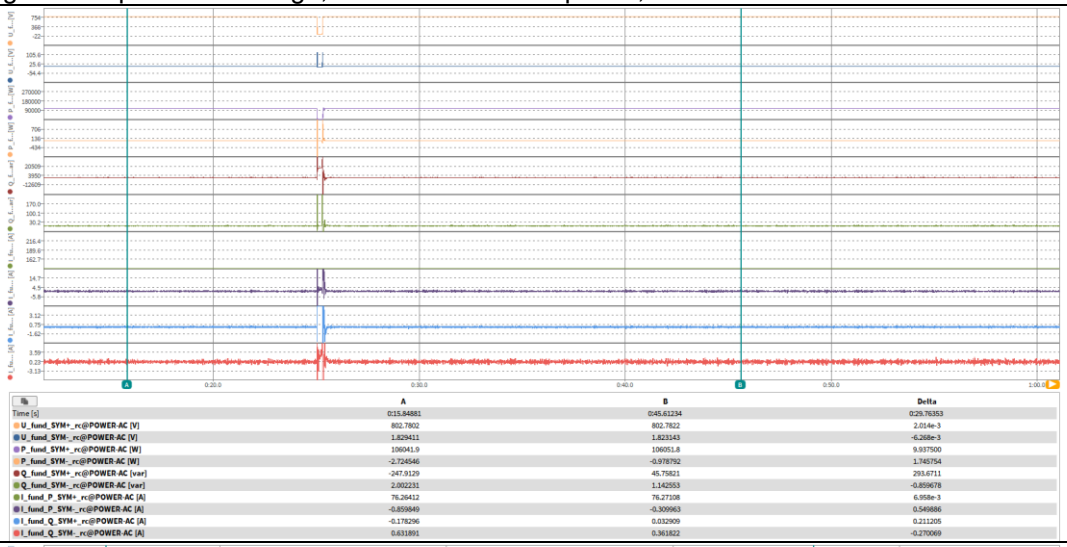
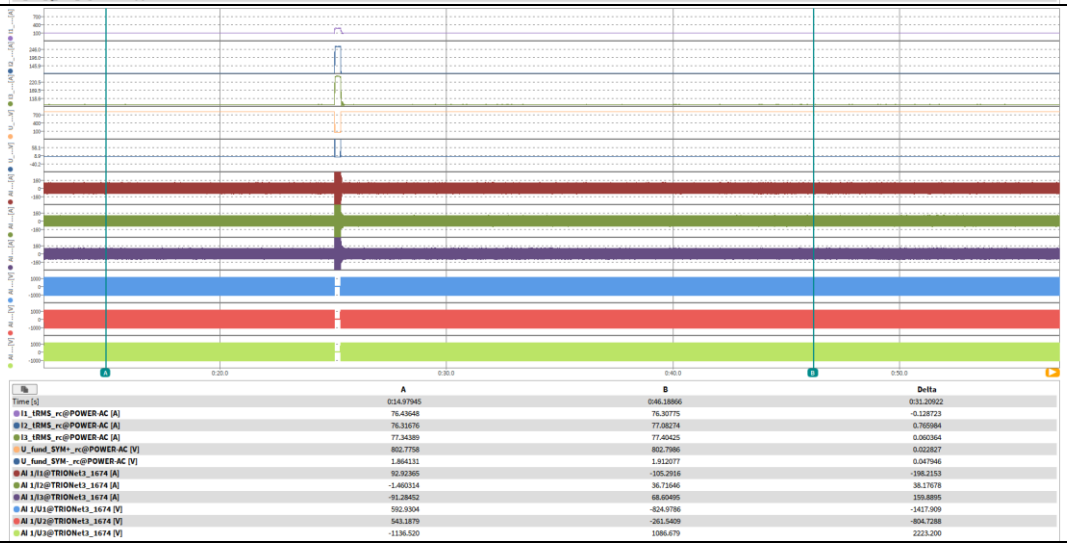
VD1-3 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



Time [s]	A	B	Delta
U_fund_SYM+_rc@POWER-AC [V]	0:15.84881	0:45.61234	0:29.76353
U_fund_SYM-_rc@POWER-AC [V]	802.7802	802.7822	2.014e-3
P_fund_SYM+_rc@POWER-AC [W]	1.829411	1.823143	-6.268e-3
P_fund_SYM-_rc@POWER-AC [W]	106041.9	106051.8	9.937500
Q_fund_SYM+_rc@POWER-AC [var]	-2.724546	-0.978792	1.745754
Q_fund_SYM-_rc@POWER-AC [var]	-247.9129	45.75821	293.6711
I_fund_P_SYM+_rc@POWER-AC [A]	2.002231	1.142553	-0.859678
I_fund_P_SYM-_rc@POWER-AC [A]	76.26412	76.27108	6.958e-3
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.859849	-0.309963	0.549886
I_fund_Q_SYM-_rc@POWER-AC [A]	-0.178296	0.032909	0.211205
	0.631891	0.361822	-0.270069



Time [s]	A	B	Delta
I1_tRMS_rc@POWER-AC [A]	0:14.97945	0:46.18866	0:31.20922
I2_tRMS_rc@POWER-AC [A]	76.43648	76.30775	-0.128723
I3_tRMS_rc@POWER-AC [A]	76.31676	77.08274	0.765984
U_fund_SYM+_rc@POWER-AC [V]	77.34389	77.40425	0.060364
U_fund_SYM-_rc@POWER-AC [V]	802.7758	802.7986	0.022827
AI 1/I1@TRIONet3_1674 [A]	1.864131	1.912077	0.047946
AI 1/I2@TRIONet3_1674 [A]	92.92365	-105.2916	-198.2153
AI 1/I3@TRIONet3_1674 [A]	-1.460314	36.71646	38.17678
AI 1/U1@TRIONet3_1674 [V]	-91.28452	68.60495	159.8895
AI 1/U2@TRIONet3_1674 [V]	592.9304	-824.9786	-1417.909
AI 1/U3@TRIONet3_1674 [V]	543.1879	-261.5409	-804.7288
	-1136.520	1086.679	2223.200

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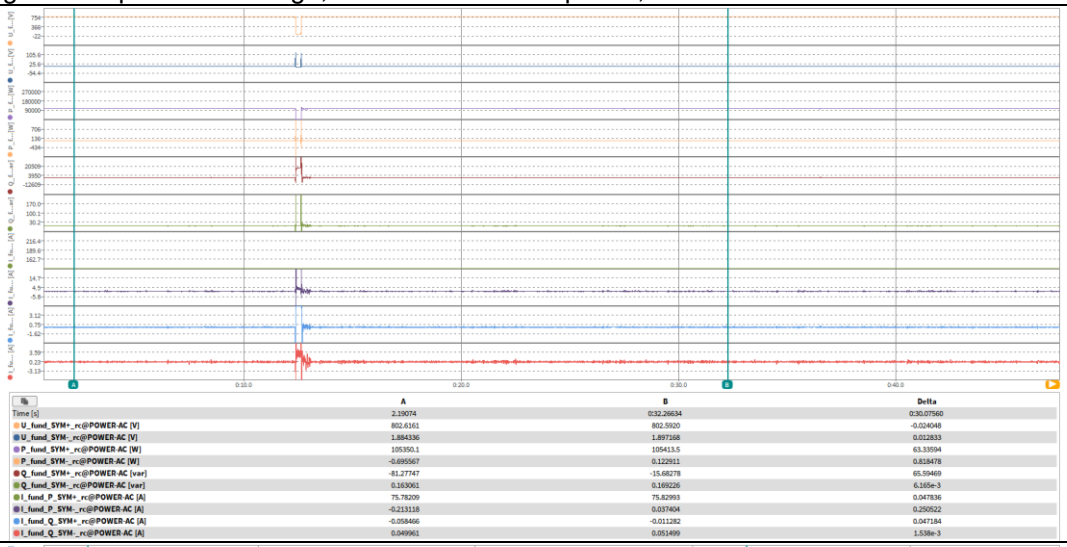
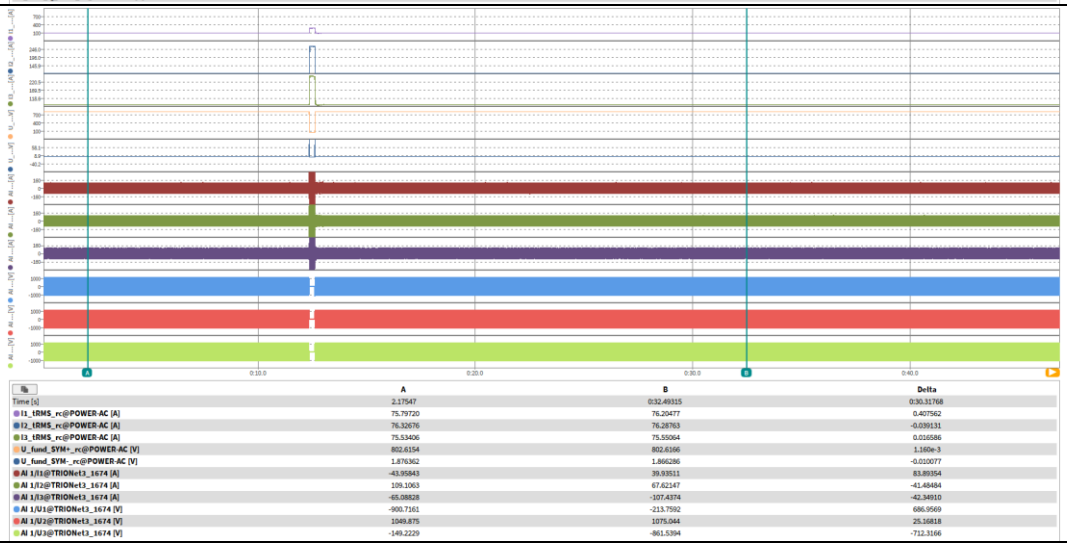
VD1-4 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



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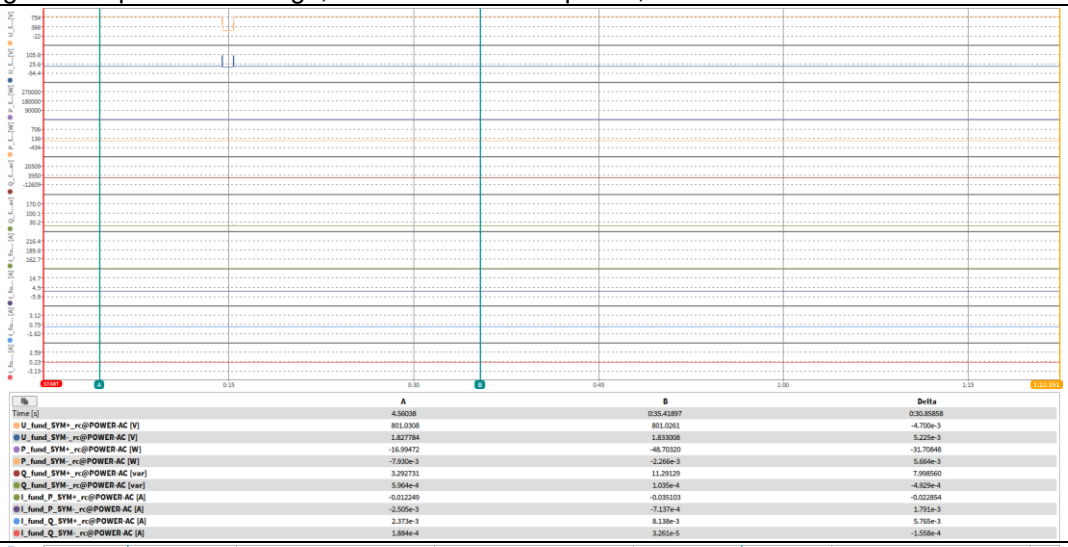
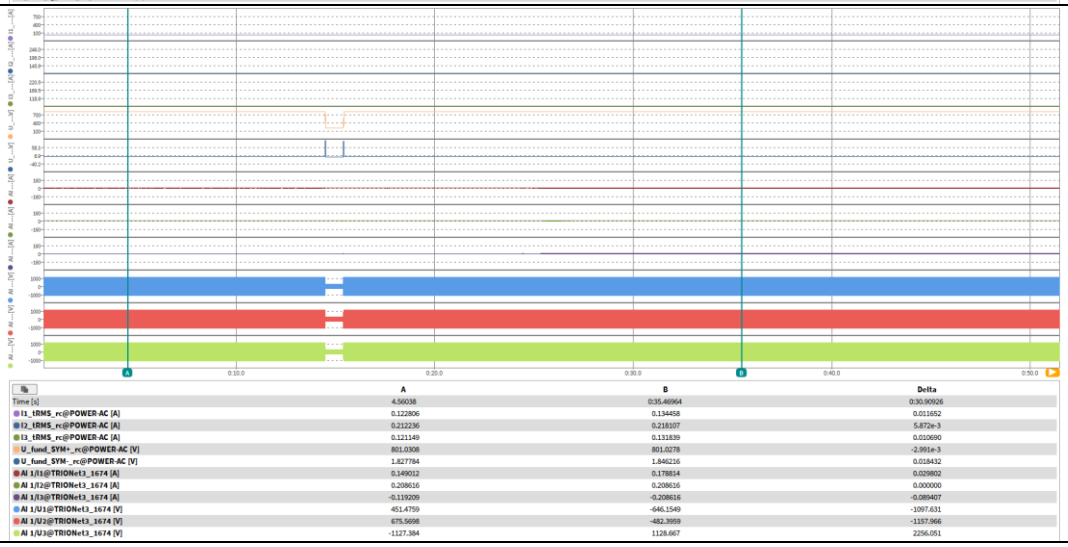
VD2 (no-load test)

a) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	4.56038	0:35.41897	0:30.85858
U_fund_SYM+_rc@POWER-AC [V]	801.0308	801.0261	-4.700e-3
U_fund_SYM-_rc@POWER-AC [V]	1.827784	1.833008	5.225e-3
P_fund_SYM+_rc@POWER-AC [W]	-16.99472	-48.70320	-31.70848
P_fund_SYM-_rc@POWER-AC [W]	-7.930e-3	-2.266e-3	5.664e-3
Q_fund_SYM+_rc@POWER-AC [var]	3.292731	11.29129	7.998560
Q_fund_SYM-_rc@POWER-AC [var]	5.364e-4	1.035e-4	-4.329e-4
I_fund_P_SYM+_rc@POWER-AC [A]	-0.012249	-0.035103	-0.022854
I_fund_P_SYM-_rc@POWER-AC [A]	-2.505e-3	-7.137e-4	1.791e-3
I_fund_Q_SYM+_rc@POWER-AC [A]	2.373e-3	8.138e-3	5.765e-3
I_fund_Q_SYM-_rc@POWER-AC [A]	1.884e-4	3.261e-5	-1.558e-4



	A	B	Delta
Time [s]	4.56038	0:35.46964	0:30.90926
I1_tRMS_rc@POWER-AC [A]	0.122806	0.134458	0.011652
I2_tRMS_rc@POWER-AC [A]	0.212236	0.218107	5.872e-3
I3_tRMS_rc@POWER-AC [A]	0.121149	0.131839	0.010690
U_fund_SYM+_rc@POWER-AC [V]	801.0308	801.0278	-2.991e-3
U_fund_SYM-_rc@POWER-AC [V]	1.827784	1.846216	0.018432
AI 1/I1@TRIONet3_1674 [A]	0.149012	0.178814	0.029802
AI 1/I2@TRIONet3_1674 [A]	0.208616	0.208616	0.000000
AI 1/I3@TRIONet3_1674 [A]	-0.119209	-0.208616	-0.089407
AI 1/U1@TRIONet3_1674 [V]	451.4759	-646.1549	-1097.631
AI 1/U2@TRIONet3_1674 [V]	675.5698	-482.3959	-1157.966
AI 1/U3@TRIONet3_1674 [V]	-1127.384	1128.667	2256.051

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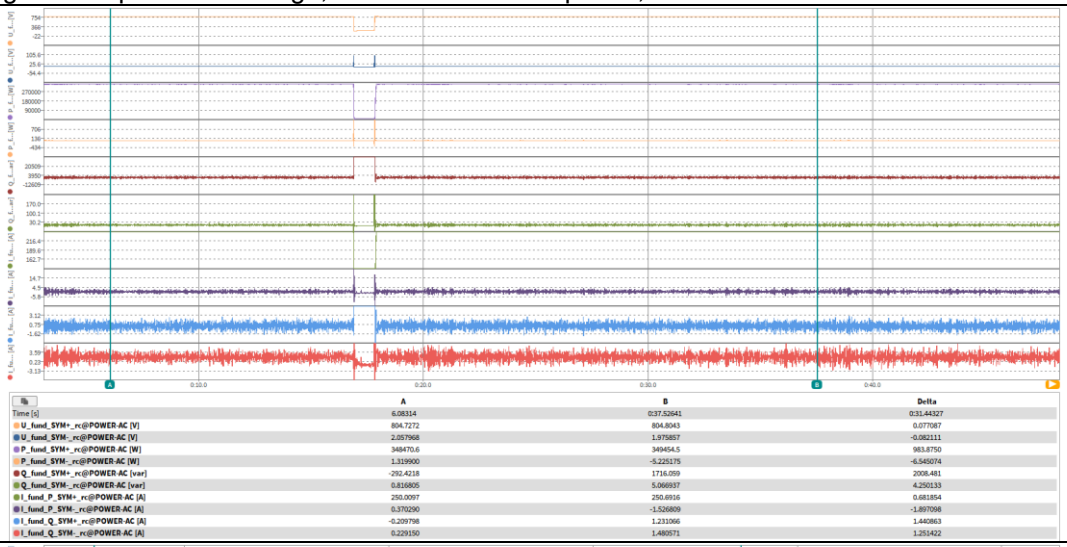
VD2-1 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	6.08314	0:37.52641	0:31.44327
U_fund_SYM+_rc@POWER-AC [V]	804.7272	804.8043	0.077087
U_fund_SYM-_rc@POWER-AC [V]	2.057968	1.975857	-0.082111
P_fund_SYM+_rc@POWER-AC [W]	348470.6	349454.5	983.8750
P_fund_SYM-_rc@POWER-AC [W]	1.319900	-5.225175	-6.545074
Q_fund_SYM+_rc@POWER-AC [var]	-292.4218	1716.059	2008.481
Q_fund_SYM-_rc@POWER-AC [var]	0.816905	5.066937	4.250133
I_fund_P_SYM+_rc@POWER-AC [A]	250.0097	250.6916	0.681854
I_fund_P_SYM-_rc@POWER-AC [A]	0.370290	-1.526809	-1.897098
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.209798	1.231066	1.440863
I_fund_Q_SYM-_rc@POWER-AC [A]	0.229150	1.480571	1.251422

	A	B	Delta
Time [s]	5.59596	0:37.24669	0:31.65073
I1_tRMS_rc@POWER-AC [A]	250.9381	249.0134	-1.924667
I2_tRMS_rc@POWER-AC [A]	250.5914	251.8650	1.273666
I3_tRMS_rc@POWER-AC [A]	248.1211	247.1783	-0.942841
U_fund_SYM+_rc@POWER-AC [V]	804.7836	804.7130	-0.070679
U_fund_SYM-_rc@POWER-AC [V]	1.962250	1.991488	0.029238
AI 1/I1@TRIONet3_1674 [A]	305.3546	-346.0646	-651.4192
AI 1/I2@TRIONet3_1674 [A]	-291.3177	252.0681	543.3858
AI 1/I3@TRIONet3_1674 [A]	-13.53026	93.99653	107.5268
AI 1/U1@TRIONet3_1674 [V]	1135.668	-1098.532	-2234.199
AI 1/U2@TRIONet3_1674 [V]	-518.4529	299.0506	817.5035
AI 1/U3@TRIONet3_1674 [V]	-617.5070	799.5940	1417.101

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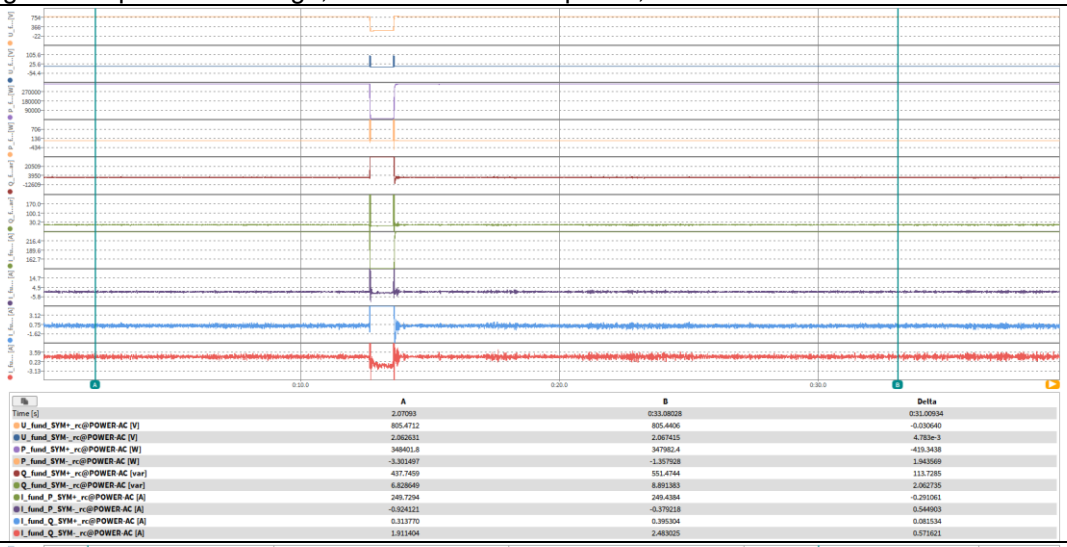
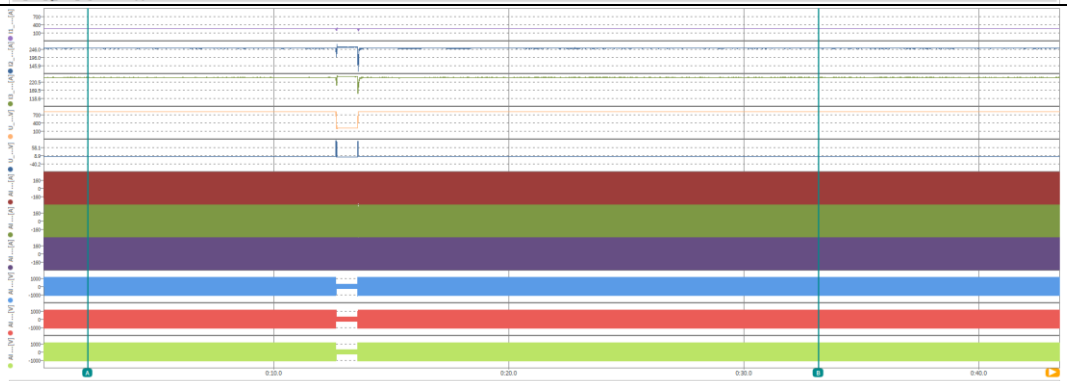
VD2-2 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.07093	0:33.08028	0:31.00934
U_fund_SYM+_rc@POWER-AC [V]	805.4712	805.4406	-0.030640
U_fund_SYM-_rc@POWER-AC [V]	2.062631	2.067415	4.783e-3
P_fund_SYM+_rc@POWER-AC [W]	348401.8	347982.4	-419.3438
P_fund_SYM-_rc@POWER-AC [W]	-3.301497	-1.357928	1.943569
Q_fund_SYM+_rc@POWER-AC [var]	437.7459	551.4744	113.7285
Q_fund_SYM-_rc@POWER-AC [var]	6.829649	8.891383	2.061735
I_fund_P_SYM+_rc@POWER-AC [A]	249.7294	249.4384	-0.291061
I_fund_P_SYM-_rc@POWER-AC [A]	-0.924121	-0.379218	0.544903
I_fund_Q_SYM+_rc@POWER-AC [A]	0.313770	0.395304	0.081534
I_fund_Q_SYM-_rc@POWER-AC [A]	1.911404	2.483025	0.571621



	A	B	Delta
Time [s]	2.11800	0:33.17438	0:31.05638
I1_tRMS_rc@POWER-AC [A]	249.8560	249.1042	-0.751801
I2_tRMS_rc@POWER-AC [A]	253.1808	252.1168	-1.064056
I3_tRMS_rc@POWER-AC [A]	247.6221	248.3481	0.725998
U_fund_SYM+_rc@POWER-AC [V]	805.5051	805.4680	-0.037048
U_fund_SYM-_rc@POWER-AC [V]	1.989459	2.064743	0.075284
AI 1/I1@TRIONet3_1674 [A]	-257.9689	-312.8350	-54.86608
AI 1/I2@TRIONet3_1674 [A]	-76.62178	292.2714	368.8932
AI 1/I3@TRIONet3_1674 [A]	334.7397	20.74242	-313.9973
AI 1/U1@TRIONet3_1674 [V]	-333.5707	-1132.864	-799.2929
AI 1/U2@TRIONet3_1674 [V]	-778.5278	492.3940	1270.922
AI 1/U3@TRIONet3_1674 [V]	1112.238	640.5857	-471.6521

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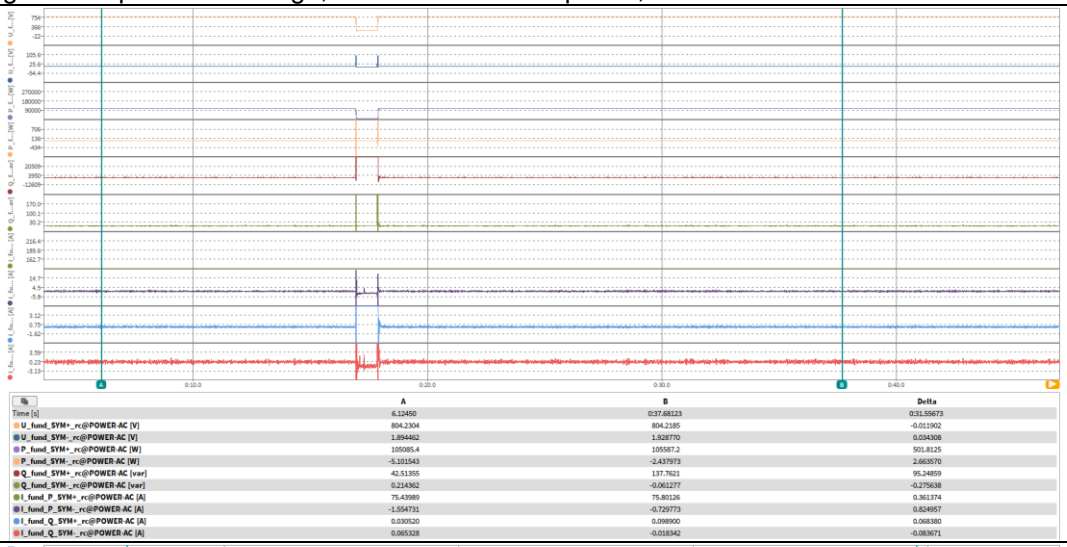
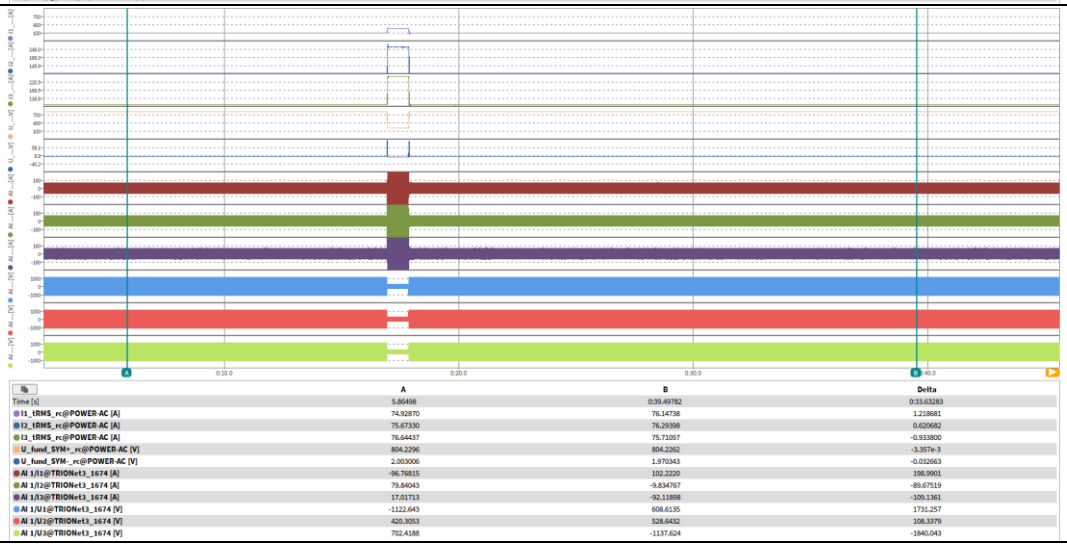
VD2-3 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	6.12450	0:37.68123	0:31.55673
U_fund_SYM+_rc@POWER-AC [V]	804.2304	804.2185	-0.011902
U_fund_SYM-_rc@POWER-AC [V]	1.894462	1.928770	0.034308
P_fund_SYM+_rc@POWER-AC [W]	105085.4	105587.2	501.8125
P_fund_SYM-_rc@POWER-AC [W]	-5.101543	-2.437973	2.663570
Q_fund_SYM+_rc@POWER-AC [var]	42.51355	137.7621	95.24859
Q_fund_SYM-_rc@POWER-AC [var]	0.214362	-0.061277	-0.275638
I_fund_P_SYM+_rc@POWER-AC [A]	75.43989	75.80126	0.361374
I_fund_P_SYM-_rc@POWER-AC [A]	-1.554731	-0.729773	0.824957
I_fund_Q_SYM+_rc@POWER-AC [A]	0.030520	0.098900	0.068380
I_fund_Q_SYM-_rc@POWER-AC [A]	0.065328	-0.018342	-0.083671



	A	B	Delta
Time [s]	5.86498	0:39.49782	0:33.63283
I1_tRMS_rc@POWER-AC [A]	74.92870	76.14738	1.218681
I2_tRMS_rc@POWER-AC [A]	75.67330	76.29398	0.620682
I3_tRMS_rc@POWER-AC [A]	76.64437	75.71057	-0.933800
U_fund_SYM+_rc@POWER-AC [V]	804.2296	804.2262	-3.357e-3
U_fund_SYM-_rc@POWER-AC [V]	2.003006	1.970343	-0.032663
AI 1/I1@TRIONet3_1674 [A]	-96.76815	102.2220	198.9901
AI 1/I2@TRIONet3_1674 [A]	79.84043	-9.834767	-89.67519
AI 1/I3@TRIONet3_1674 [A]	17.01713	-92.11898	-109.1361
AI 1/U1@TRIONet3_1674 [V]	-1122.643	608.6135	1731.257
AI 1/U2@TRIONet3_1674 [V]	420.3053	528.6432	108.3379
AI 1/U3@TRIONet3_1674 [V]	702.4188	-1137.624	-1840.043

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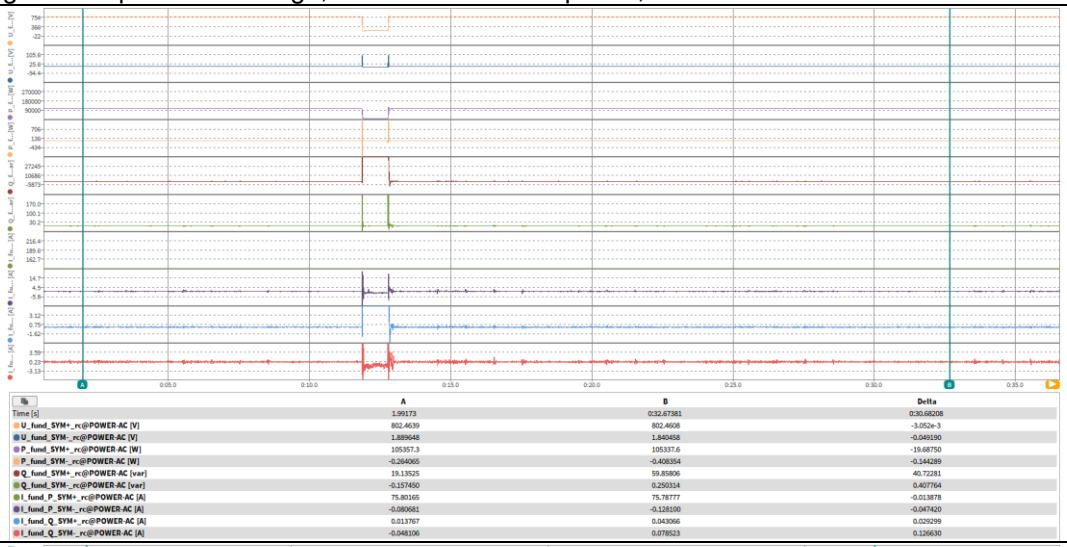
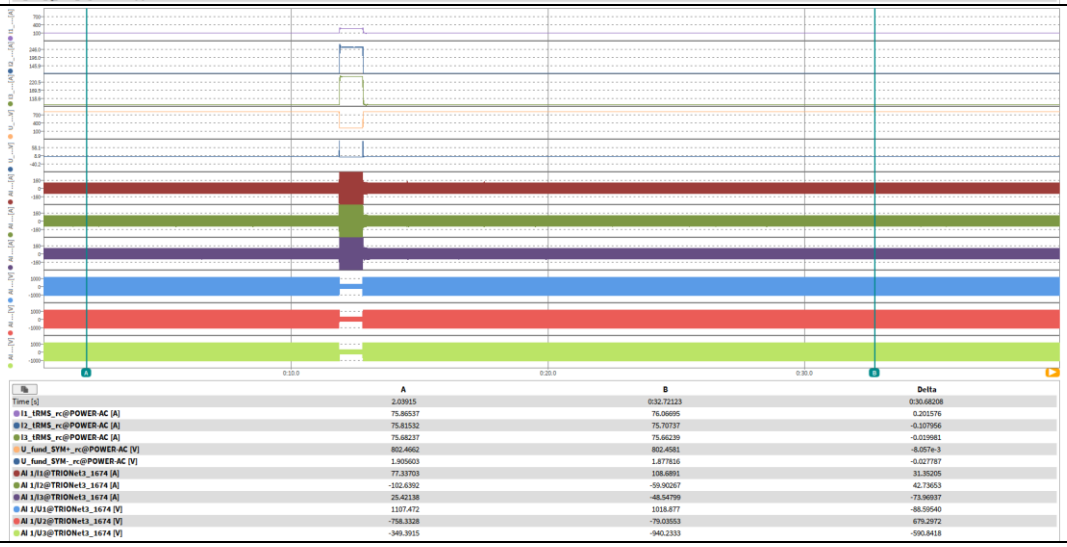
VD2-4 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	1.99173	0:32.67381	0:30.68208
U_fund_SYM+_rc@POWER-AC [V]	802.4639	802.4608	-3.052e-3
U_fund_SYM-_rc@POWER-AC [V]	1.889648	1.840458	-0.049190
P_fund_SYM+_rc@POWER-AC [W]	105357.3	105337.6	-19.68750
P_fund_SYM-_rc@POWER-AC [W]	-0.264065	-0.408354	-0.144289
Q_fund_SYM+_rc@POWER-AC [var]	19.13525	59.85806	40.72281
Q_fund_SYM-_rc@POWER-AC [var]	-0.157450	0.250314	0.407764
I_fund_P_SYM+_rc@POWER-AC [A]	75.80165	75.78777	-0.013878
I_fund_P_SYM-_rc@POWER-AC [A]	-0.080681	-0.128100	-0.047420
I_fund_Q_SYM+_rc@POWER-AC [A]	0.013767	0.043066	0.029299
I_fund_Q_SYM-_rc@POWER-AC [A]	-0.048106	0.078523	0.126630



	A	B	Delta
Time [s]	2.03915	0:32.72123	0:30.68208
I1_tRMS_rc@POWER-AC [A]	75.86537	76.06695	0.201576
I2_tRMS_rc@POWER-AC [A]	75.81532	75.70737	-0.107956
I3_tRMS_rc@POWER-AC [A]	75.68237	75.66259	-0.019981
U_fund_SYM+_rc@POWER-AC [V]	802.4662	802.4581	-8.057e-3
U_fund_SYM-_rc@POWER-AC [V]	1.905603	1.877816	-0.027787
AI 1/I1@TRIONet3_1674 [A]	77.33703	108.6891	31.35205
AI 1/I2@TRIONet3_1674 [A]	-102.6392	-59.90267	42.73653
AI 1/I3@TRIONet3_1674 [A]	25.42138	-48.54799	-73.96937
AI 1/U1@TRIONet3_1674 [V]	1107.472	1018.877	-88.59540
AI 1/U2@TRIONet3_1674 [V]	-758.3328	-79.03553	679.2972
AI 1/U3@TRIONet3_1674 [V]	-349.3915	-940.2333	-590.8418

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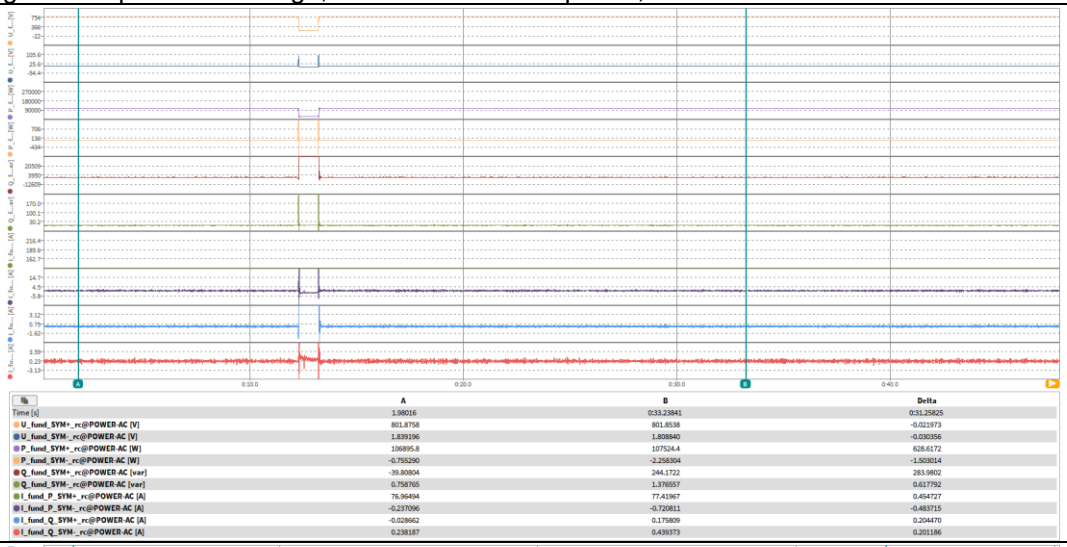
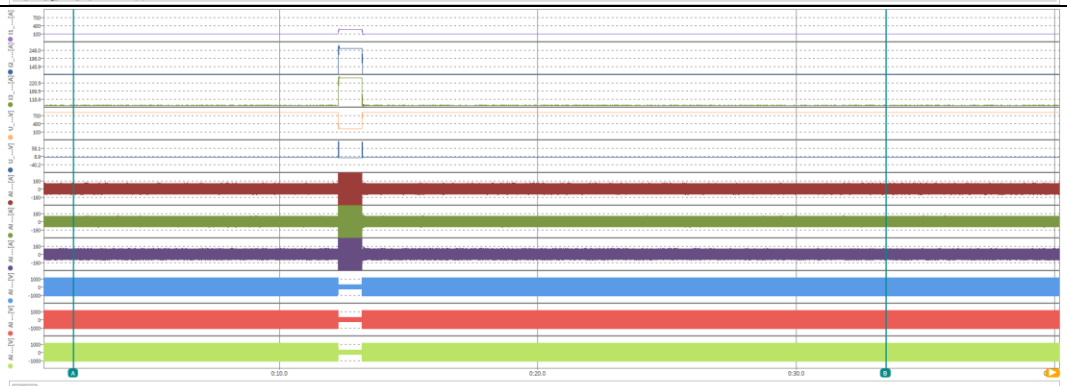
VD2-5 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	1.98016	0:33.23841	0:31.25825
U_fund_SYM+_rc@POWER-AC [V]	801.8758	801.8538	-0.021973
U_fund_SYM-_rc@POWER-AC [V]	1.839196	1.808840	-0.030356
P_fund_SYM+_rc@POWER-AC [W]	106895.8	107524.4	628.6172
P_fund_SYM-_rc@POWER-AC [W]	-0.755290	-2.258304	-1.503014
Q_fund_SYM+_rc@POWER-AC [var]	-39.80804	244.1722	283.9802
Q_fund_SYM-_rc@POWER-AC [var]	0.758765	1.376557	0.617792
I_fund_P_SYM+_rc@POWER-AC [A]	76.96494	77.41967	0.454727
I_fund_P_SYM-_rc@POWER-AC [A]	-0.237096	-0.720811	-0.483715
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.028662	0.175809	0.204470
I_fund_Q_SYM-_rc@POWER-AC [A]	0.238187	0.439373	0.201186



	A	B	Delta
Time [s]	2.02731	0:33.47454	0:31.44683
I1_tRMS_rc@POWER-AC [A]	77.17144	76.99233	-0.179108
I2_tRMS_rc@POWER-AC [A]	77.78513	77.47238	-0.312752
I3_tRMS_rc@POWER-AC [A]	76.61516	77.13332	0.518166
U_fund_SYM+_rc@POWER-AC [V]	801.8676	801.8517	-0.015930
U_fund_SYM-_rc@POWER-AC [V]	1.816536	1.842904	0.026369
AI 1/I1@TRIONet3_1674 [A]	-33.79584	-70.18447	-36.38864
AI 1/I2@TRIONet3_1674 [A]	103.9207	-38.96144	-142.9021
AI 1/I3@TRIONet3_1674 [A]	-70.09507	109.1957	179.2908
AI 1/U1@TRIONet3_1674 [V]	-798.7769	-224.0017	574.7753
AI 1/U2@TRIONet3_1674 [V]	1095.781	-851.8785	-1947.659
AI 1/U3@TRIONet3_1674 [V]	-297.1261	1076.010	1373.136

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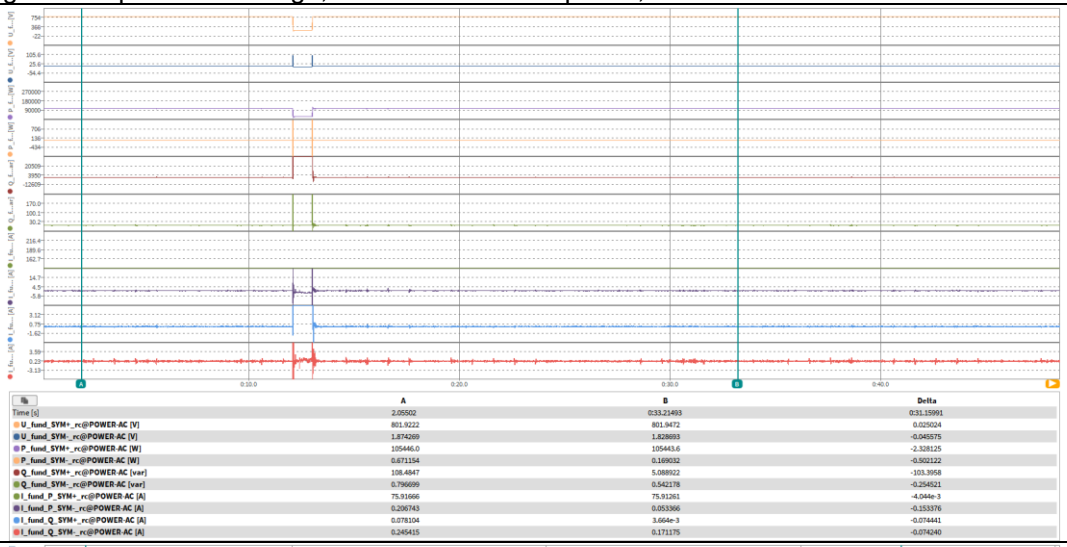
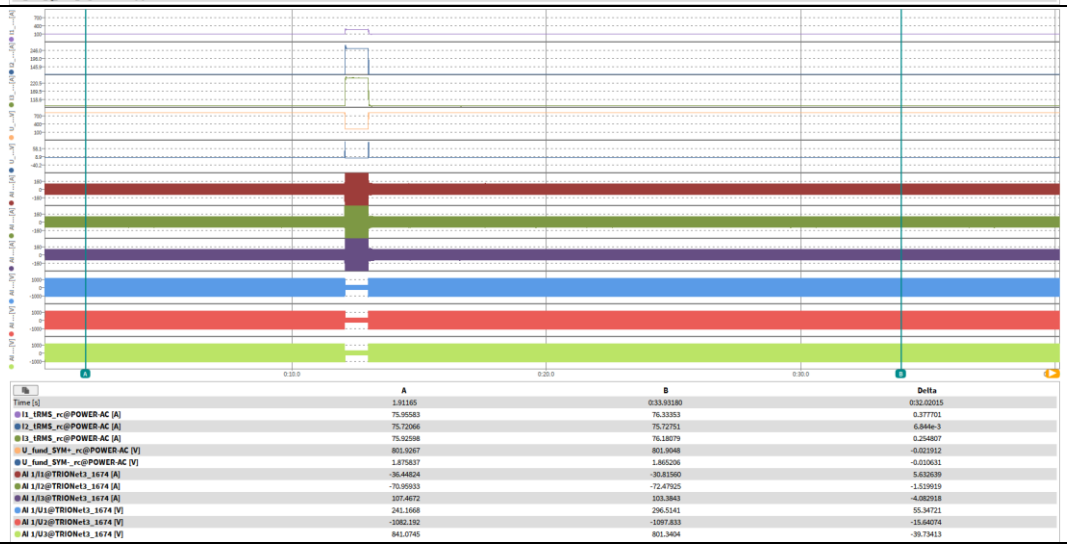
VD2-6 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



Time [s]	A	B	Delta
U_fund_SYM+_rc@POWER-AC [V]	2.05502	0:33.21493	0:31.15991
U_fund_SYM-_rc@POWER-AC [V]	801.9222	801.9472	0.025024
P_fund_SYM+_rc@POWER-AC [W]	1.874269	1.828693	-0.045575
P_fund_SYM-_rc@POWER-AC [W]	105446.0	105443.6	-2.328125
Q_fund_SYM+_rc@POWER-AC [var]	0.671154	0.169032	-0.502122
Q_fund_SYM-_rc@POWER-AC [var]	108.4847	5.088922	-103.3958
I_fund_P_SYM+_rc@POWER-AC [A]	0.796699	0.542178	-0.254521
I_fund_P_SYM-_rc@POWER-AC [A]	75.91666	75.91261	-4.044e-3
I_fund_Q_SYM+_rc@POWER-AC [A]	0.206743	0.053366	-0.153376
I_fund_Q_SYM-_rc@POWER-AC [A]	0.078104	3.664e-3	-0.074441
	0.245415	0.171175	-0.074240



Time [s]	A	B	Delta
I1_tRMS_rc@POWER-AC [A]	1.91165	0:33.93180	0:32.02015
I2_tRMS_rc@POWER-AC [A]	75.95583	76.33353	0.377701
I3_tRMS_rc@POWER-AC [A]	75.72066	75.72751	6.844e-3
U_fund_SYM+_rc@POWER-AC [V]	75.92598	76.18079	0.254807
U_fund_SYM-_rc@POWER-AC [V]	801.9267	801.9048	-0.021912
AI 1/I1@TRIONet3_1674 [A]	1.875837	1.865206	-0.010631
AI 1/I2@TRIONet3_1674 [A]	-36.44824	-30.81560	5.632639
AI 1/I3@TRIONet3_1674 [A]	-70.95933	-72.47925	-1.519919
AI 1/U1@TRIONet3_1674 [V]	107.4672	103.3843	-4.082918
AI 1/U2@TRIONet3_1674 [V]	241.1668	296.5141	55.34721
AI 1/U3@TRIONet3_1674 [V]	-1082.192	-1097.833	-15.64074
	841.0745	801.3404	-39.73413

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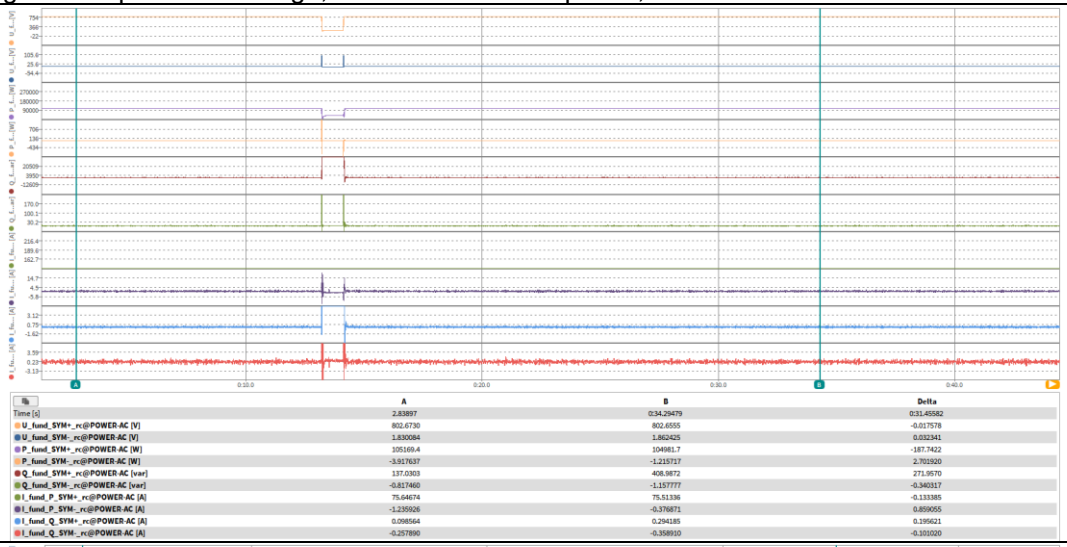
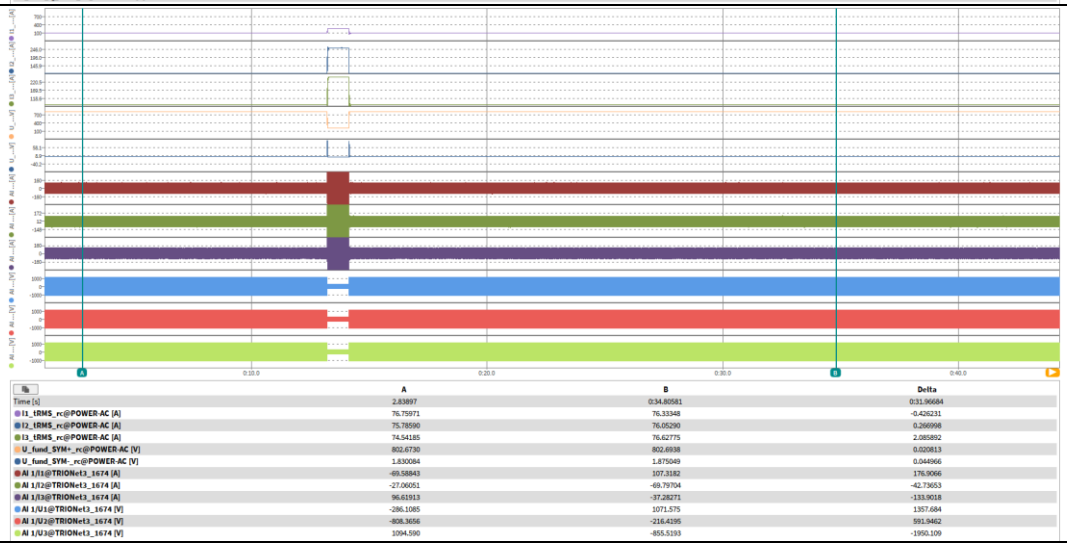
VD2-7 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.83897	0:34.29479	0:31.45582
U_fund_SYM+_rc@POWER-AC [V]	802.6730	802.6555	-0.017578
U_fund_SYM-_rc@POWER-AC [V]	1.830084	1.862425	0.032341
P_fund_SYM+_rc@POWER-AC [W]	105169.4	104981.7	-187.7422
P_fund_SYM-_rc@POWER-AC [W]	-3.917637	-1.215717	2.701920
Q_fund_SYM+_rc@POWER-AC [var]	137.0303	408.9872	271.9570
Q_fund_SYM-_rc@POWER-AC [var]	-0.817460	-1.157777	-0.340317
I_fund_P_SYM+_rc@POWER-AC [A]	75.64674	75.51336	-0.133385
I_fund_P_SYM-_rc@POWER-AC [A]	-1.235926	-0.376871	0.859055
I_fund_Q_SYM+_rc@POWER-AC [A]	0.098564	0.294185	0.195621
I_fund_Q_SYM-_rc@POWER-AC [A]	-0.257890	-0.358910	-0.101020



	A	B	Delta
Time [s]	2.83897	0:34.80581	0:31.96684
I1_tRMS_rc@POWER-AC [A]	76.75971	76.33348	-0.426231
I2_tRMS_rc@POWER-AC [A]	75.78590	76.05290	0.266998
I3_tRMS_rc@POWER-AC [A]	74.54185	76.62775	2.085892
U_fund_SYM+_rc@POWER-AC [V]	802.6730	802.6938	0.020813
U_fund_SYM-_rc@POWER-AC [V]	1.830084	1.875049	0.044966
AI 1/I1@TRIONet3_1674 [A]	-69.58843	107.3182	176.9066
AI 1/I2@TRIONet3_1674 [A]	-27.06051	-69.79704	-42.73653
AI 1/I3@TRIONet3_1674 [A]	96.61913	-37.28271	-133.9018
AI 1/U1@TRIONet3_1674 [V]	-286.1085	1071.575	1357.684
AI 1/U2@TRIONet3_1674 [V]	-808.3656	-216.4195	591.9462
AI 1/U3@TRIONet3_1674 [V]	1094.590	-855.5193	-1950.109

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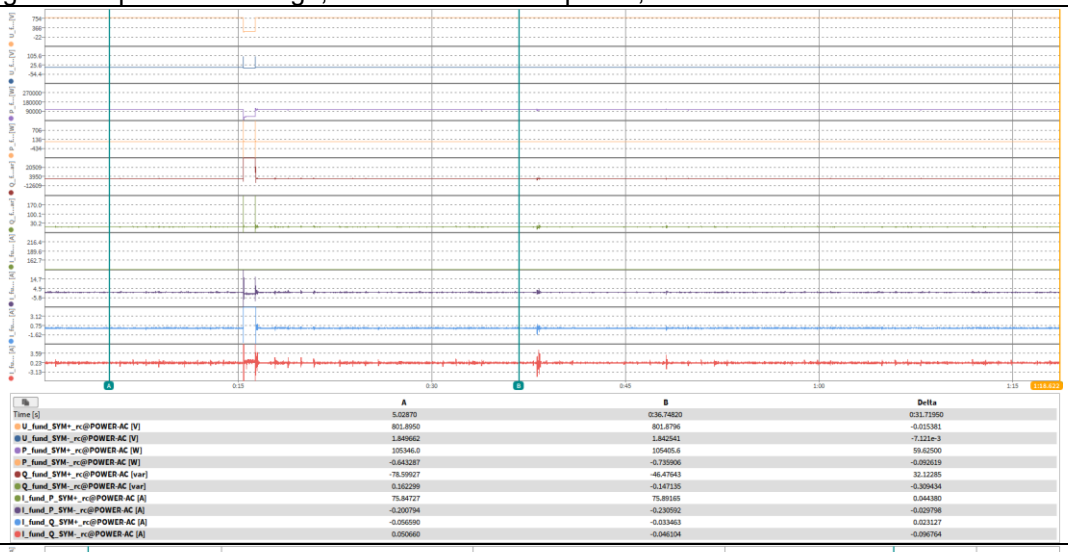
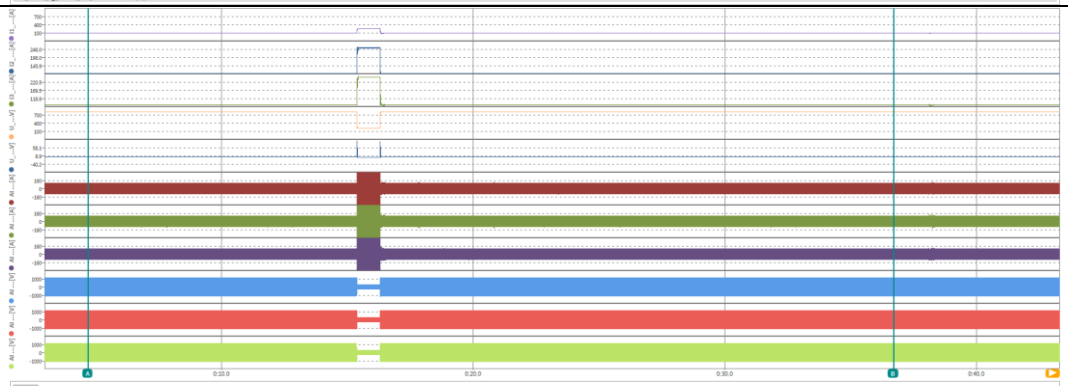
VD2-8 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	5.02870	0:36.74820	0:31.71950
U_fund_SYM+_rc@POWER-AC [V]	801.8950	801.8796	-0.015381
U_fund_SYM-_rc@POWER-AC [V]	1.849662	1.842541	-7.121e-3
P_fund_SYM+_rc@POWER-AC [W]	105346.0	105405.6	59.62500
P_fund_SYM-_rc@POWER-AC [W]	-0.643287	-0.735906	-0.092619
Q_fund_SYM+_rc@POWER-AC [var]	-78.59927	-46.47643	32.12285
Q_fund_SYM-_rc@POWER-AC [var]	0.162299	-0.147135	-0.309434
I_fund_P_SYM+_rc@POWER-AC [A]	75.84727	75.89165	0.044380
I_fund_P_SYM-_rc@POWER-AC [A]	-0.200794	-0.230592	-0.029798
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.056590	-0.033463	0.023127
I_fund_Q_SYM-_rc@POWER-AC [A]	0.050660	-0.046104	-0.096764



	A	B	Delta
Time [s]	4.69023	0:36.69984	0:32.00961
I1_tRMS_rc@POWER-AC [A]	75.72419	76.03622	0.312027
I2_tRMS_rc@POWER-AC [A]	76.27215	75.89732	-0.374825
I3_tRMS_rc@POWER-AC [A]	75.69337	76.01872	0.325348
U_fund_SYM+_rc@POWER-AC [V]	801.8913	801.9157	0.024414
U_fund_SYM-_rc@POWER-AC [V]	1.859156	1.866876	7.720e-3
AI 1/I1@TRIONet3_1674 [A]	-106.2751	101.5365	207.8116
AI 1/I2@TRIONet3_1674 [A]	74.35680	-81.21133	-155.5681
AI 1/I3@TRIONet3_1674 [A]	31.94809	-20.17617	-52.12426
AI 1/U1@TRIONet3_1674 [V]	-1084.441	1111.475	2195.916
AI 1/U2@TRIONet3_1674 [V]	262.7847	-377.2803	-640.0650
AI 1/U3@TRIONet3_1674 [V]	821.7941	-734.5455	-1556.340

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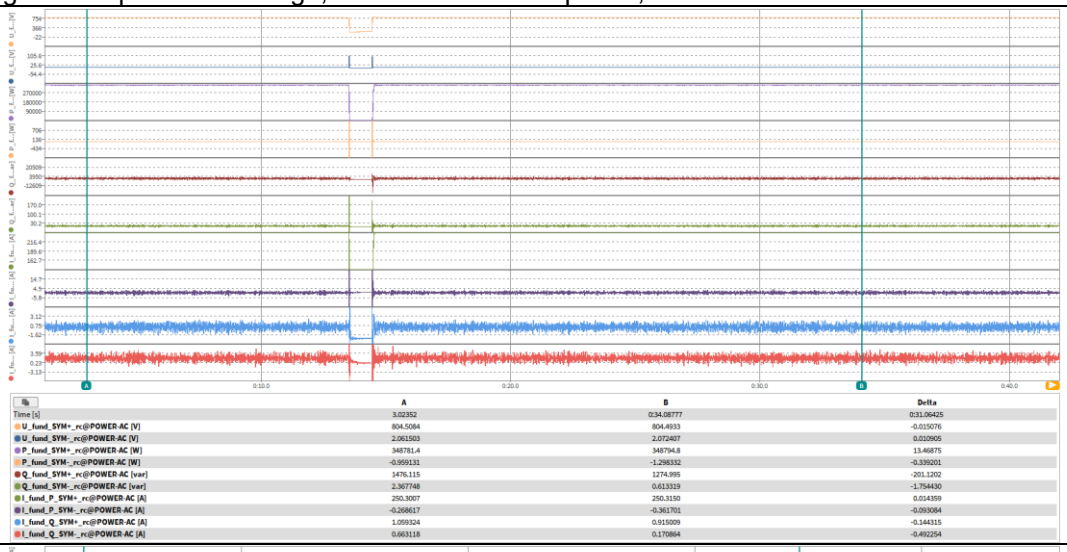
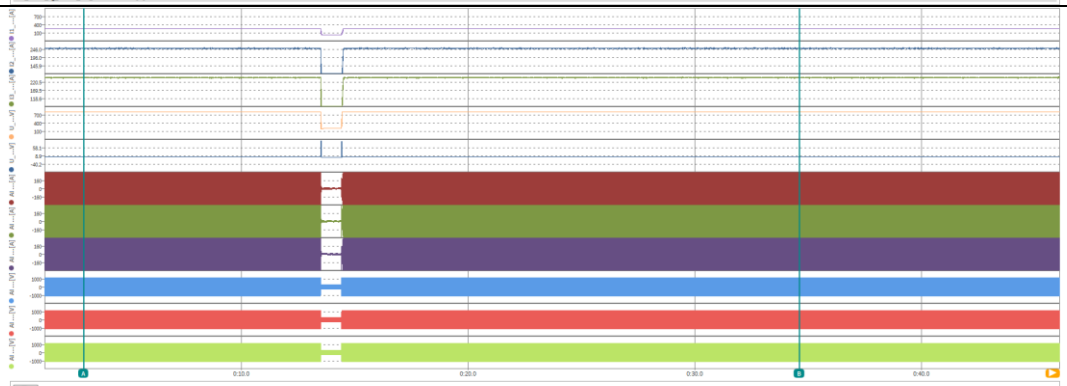
VD2-9 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	3.02352	0:34.08777	0:31.06425
U_fund_SYM+_rc@POWER-AC [V]	804.5084	804.4933	-0.015076
U_fund_SYM-_rc@POWER-AC [V]	2.061503	2.072407	0.010905
P_fund_SYM+_rc@POWER-AC [W]	348781.4	348794.8	13.46875
P_fund_SYM-_rc@POWER-AC [W]	-0.959131	-1.298332	-0.339201
Q_fund_SYM+_rc@POWER-AC [var]	1476.115	1274.995	-201.1202
Q_fund_SYM-_rc@POWER-AC [var]	2.367748	0.613319	-1.754430
I_fund_P_SYM+_rc@POWER-AC [A]	250.3007	250.3150	0.014359
I_fund_P_SYM-_rc@POWER-AC [A]	-0.268617	-0.361701	-0.093084
I_fund_Q_SYM+_rc@POWER-AC [A]	1.059324	0.915009	-0.144315
I_fund_Q_SYM-_rc@POWER-AC [A]	0.663118	0.170864	-0.492254



	A	B	Delta
Time [s]	3.07229	0:34.62420	0:31.55191
I1_tRMS_rc@POWER-AC [A]	246.5392	250.1053	3.566116
I2_tRMS_rc@POWER-AC [A]	250.5916	253.9717	3.380051
I3_tRMS_rc@POWER-AC [A]	248.4349	249.2924	0.857468
U_fund_SYM+_rc@POWER-AC [V]	804.4084	804.4796	0.071167
U_fund_SYM-_rc@POWER-AC [V]	2.103999	2.038384	-0.065615
AI 1/I1@TRIONet3_1674 [A]	-339.8061	335.2463	675.0524
AI 1/I2@TRIONet3_1674 [A]	247.8063	-57.39928	-305.2056
AI 1/I3@TRIONet3_1674 [A]	92.05938	-277.0722	-369.1316
AI 1/U1@TRIONet3_1674 [V]	-1092.788	710.2657	1803.054
AI 1/U2@TRIONet3_1674 [V]	281.4388	414.6533	133.2145
AI 1/U3@TRIONet3_1674 [V]	811.4608	-1125.253	-1936.714

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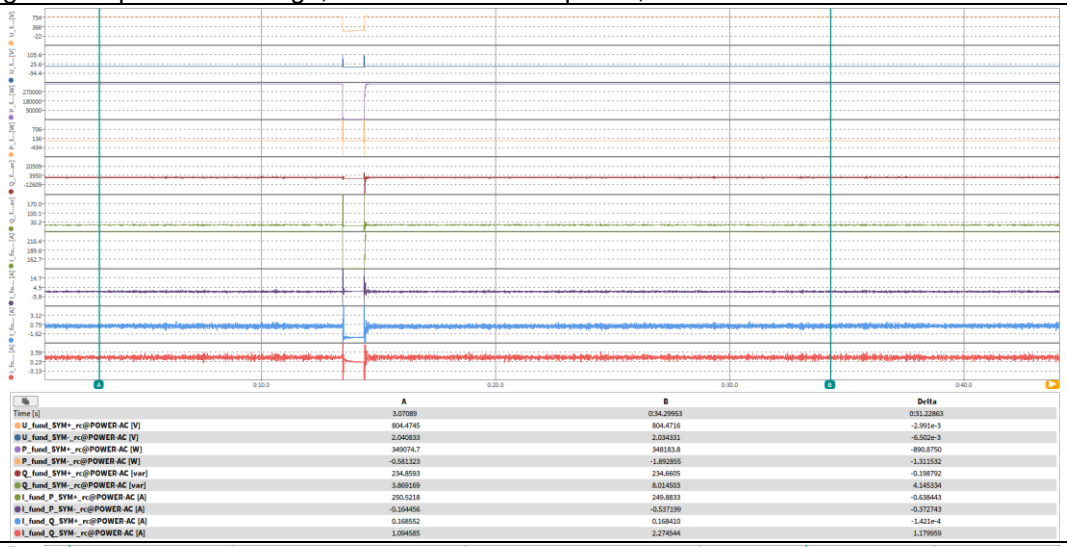
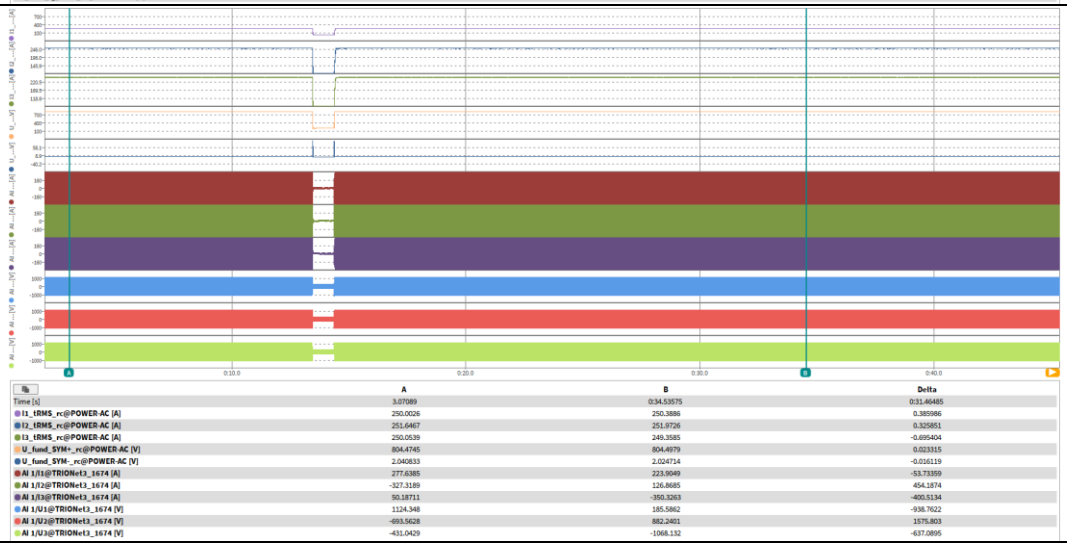
VD2-10 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	3.07089	0:34.29953	0:31.22863
U_fund_SYM+_rc@POWER-AC [V]	804.4745	804.4716	-2.991e-3
U_fund_SYM-_rc@POWER-AC [V]	2.040833	2.034331	-6.502e-3
P_fund_SYM+_rc@POWER-AC [W]	349074.7	348183.8	-890.8750
P_fund_SYM-_rc@POWER-AC [W]	-0.581323	-1.892855	-1.311532
Q_fund_SYM+_rc@POWER-AC [var]	234.8593	234.6605	-0.198792
Q_fund_SYM-_rc@POWER-AC [var]	3.869169	8.014503	4.145334
I_fund_P_SYM+_rc@POWER-AC [A]	250.5218	249.8833	-0.638443
I_fund_P_SYM-_rc@POWER-AC [A]	-0.164456	-0.537199	-0.372743
I_fund_Q_SYM+_rc@POWER-AC [A]	0.168552	0.168410	-1.421e-4
I_fund_Q_SYM-_rc@POWER-AC [A]	1.094585	2.274544	1.179959



	A	B	Delta
Time [s]	3.07089	0:34.53575	0:31.46485
I1_tRMS_rc@POWER-AC [A]	250.0026	250.3886	0.385986
I2_tRMS_rc@POWER-AC [A]	251.6467	251.9726	0.325851
I3_tRMS_rc@POWER-AC [A]	250.0539	249.3585	-0.695404
U_fund_SYM+_rc@POWER-AC [V]	804.4745	804.4979	0.023315
U_fund_SYM-_rc@POWER-AC [V]	2.040833	2.024714	-0.016119
AI 1/I1@TRIONet3_1674 [A]	277.6385	223.9049	-53.73359
AI 1/I2@TRIONet3_1674 [A]	-327.3189	126.8685	454.1874
AI 1/I3@TRIONet3_1674 [A]	50.18711	-350.3263	-400.5134
AI 1/U1@TRIONet3_1674 [V]	1124.348	185.5862	-938.7622
AI 1/U2@TRIONet3_1674 [V]	-693.5628	882.2401	1575.803
AI 1/U3@TRIONet3_1674 [V]	-431.0429	-1068.132	-637.0895

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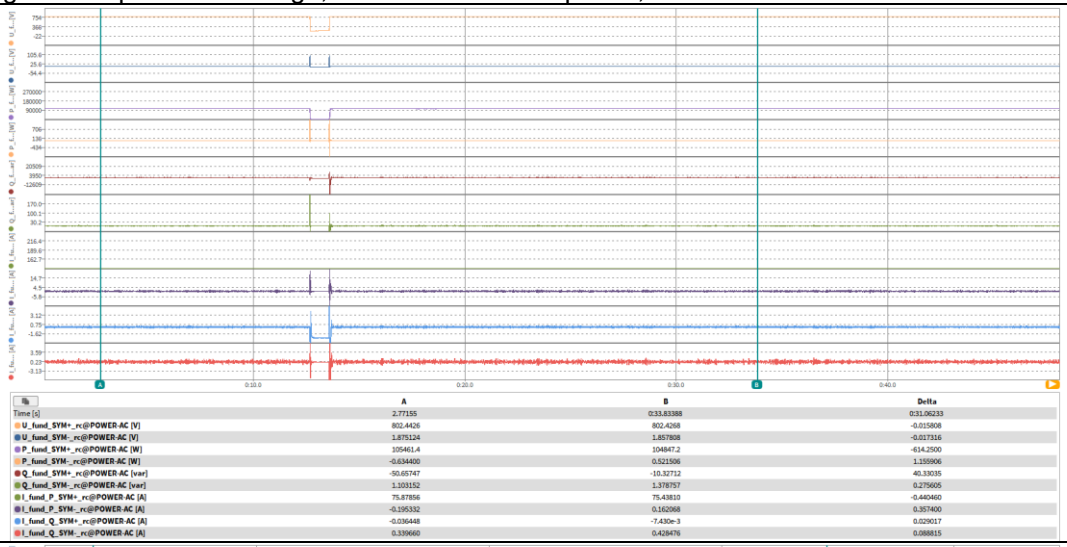
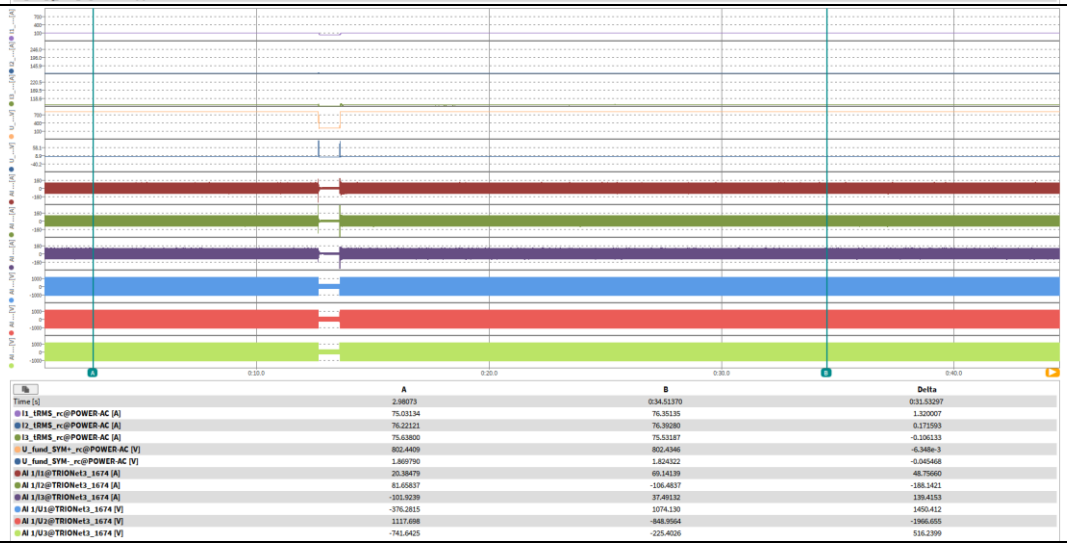
VD2-11 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



Time [s]	A	B	Delta
U_fund_SYM+_rc@POWER-AC [V]	2.77155	0:33.83388	0:31.06233
U_fund_SYM-_rc@POWER-AC [V]	802.4426	802.4268	-0.015808
P_fund_SYM+_rc@POWER-AC [W]	1.875124	1.857808	-0.017316
P_fund_SYM-_rc@POWER-AC [W]	105461.4	104847.2	-614.2500
Q_fund_SYM+_rc@POWER-AC [var]	-0.634400	0.521506	1.155906
Q_fund_SYM-_rc@POWER-AC [var]	-50.65747	-10.32712	40.33035
I_fund_P_SYM+_rc@POWER-AC [A]	1.103152	1.378757	0.275605
I_fund_P_SYM-_rc@POWER-AC [A]	75.87856	75.43810	-0.440460
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.195332	0.162068	0.357400
I_fund_Q_SYM-_rc@POWER-AC [A]	-0.036448	-7.430e-3	0.029017
	0.339660	0.428476	0.088815



Time [s]	A	B	Delta
I1_tRMS_rc@POWER-AC [A]	2.98073	0:34.51370	0:31.53297
I2_tRMS_rc@POWER-AC [A]	75.03134	76.35135	1.320007
I3_tRMS_rc@POWER-AC [A]	76.22121	76.39280	0.171593
U_fund_SYM+_rc@POWER-AC [V]	75.63800	75.53187	-0.106133
U_fund_SYM-_rc@POWER-AC [V]	802.4409	802.4346	-6.348e-3
AI 1/I1@TRIONet3_1674 [A]	1.869790	1.824322	-0.045468
AI 1/I2@TRIONet3_1674 [A]	20.38479	69.14139	48.75660
AI 1/I3@TRIONet3_1674 [A]	81.65837	-106.4837	-188.1421
AI 1/U1@TRIONet3_1674 [V]	-101.9239	37.49132	139.4153
AI 1/U2@TRIONet3_1674 [V]	-376.2815	1074.130	1450.412
AI 1/U3@TRIONet3_1674 [V]	1117.698	-848.9564	-1966.655
	-741.6425	-225.4026	516.2399

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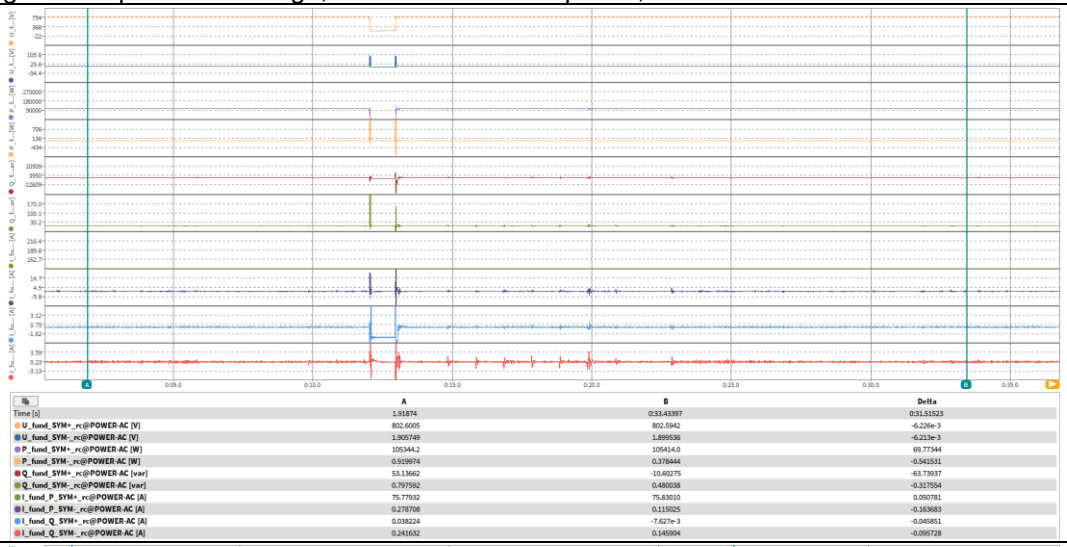
VD2-12 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	1.91874	0:33.43397	0:31.51523
U_fund_SYM+_rc@POWER-AC [V]	802.6005	802.5942	-6.226e-3
U_fund_SYM-_rc@POWER-AC [V]	1.905749	1.899536	-6.213e-3
P_fund_SYM+_rc@POWER-AC [W]	105344.2	105414.0	69.77344
P_fund_SYM-_rc@POWER-AC [W]	0.319874	0.178444	-0.141531
Q_fund_SYM+_rc@POWER-AC [var]	53.13662	-10.60275	-63.73937
Q_fund_SYM-_rc@POWER-AC [var]	0.797592	0.480038	-0.317554
I_fund_P_SYM+_rc@POWER-AC [A]	75.77932	75.83010	0.050781
I_fund_P_SYM-_rc@POWER-AC [A]	0.278708	0.115025	-0.163683
I_fund_Q_SYM+_rc@POWER-AC [A]	0.038224	-7.627e-3	-0.045851
I_fund_Q_SYM-_rc@POWER-AC [A]	0.241632	0.145904	-0.095728

	A	B	Delta
Time [s]	2.01467	0:33.57787	0:31.56320
I1_tRMS_rc@POWER-AC [A]	75.76495	75.94162	0.176666
I2_tRMS_rc@POWER-AC [A]	75.73591	75.83567	0.099762
I3_tRMS_rc@POWER-AC [A]	75.59859	75.70941	0.110817
U_fund_SYM+_rc@POWER-AC [V]	802.5774	802.5838	6.409e-3
U_fund_SYM-_rc@POWER-AC [V]	1.888702	1.897693	8.991e-3
AI 1/I1@TRIONet3_1674 [A]	-107.2884	-73.61174	33.67663
AI 1/I2@TRIONet3_1674 [A]	71.94281	-31.73948	-103.6823
AI 1/I3@TRIONet3_1674 [A]	35.37536	105.3512	69.97586
AI 1/U1@TRIONet3_1674 [V]	-1077.195	-286.1309	791.0638
AI 1/U2@TRIONet3_1674 [V]	234.2007	-809.1429	-1043.344
AI 1/U3@TRIONet3_1674 [V]	843.1244	1095.404	252.2798

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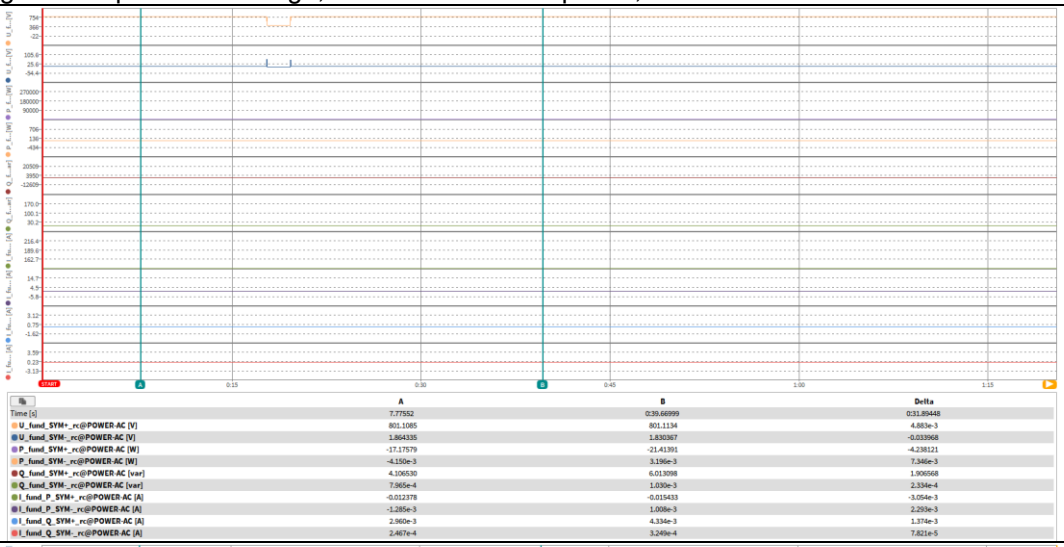
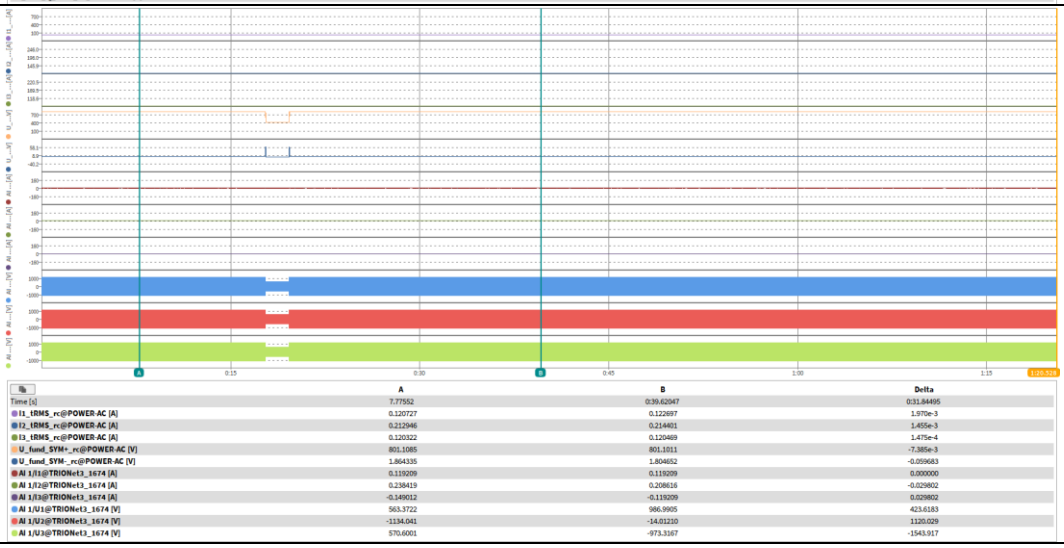
VD3 (no-load test)
a) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	7.77552	0:39.66999	0:31.89448
U_fund_SYM+_rc@POWER-AC [V]	801.1085	801.1134	4.883e-3
U_fund_SYM-_rc@POWER-AC [V]	1.864335	1.830367	-0.033968
P_fund_SYM+_rc@POWER-AC [W]	-17.17579	-21.41391	-4.238121
P_fund_SYM-_rc@POWER-AC [W]	-4.150e-3	3.196e-3	7.346e-3
Q_fund_SYM+_rc@POWER-AC [var]	4.106530	6.013098	1.906568
Q_fund_SYM-_rc@POWER-AC [var]	7.965e-4	1.030e-3	2.334e-4
I_fund_P_SYM+_rc@POWER-AC [A]	-0.012378	-0.015433	-3.054e-3
I_fund_P_SYM-_rc@POWER-AC [A]	-1.285e-3	1.008e-3	2.293e-3
I_fund_Q_SYM+_rc@POWER-AC [A]	2.960e-3	4.334e-3	1.374e-3
I_fund_Q_SYM-_rc@POWER-AC [A]	2.467e-4	3.249e-4	7.821e-5



	A	B	Delta
Time [s]	7.77552	0:39.62047	0:31.84495
I1_tRMS_rc@POWER-AC [A]	0.120727	0.122697	1.970e-3
I2_tRMS_rc@POWER-AC [A]	0.212946	0.214401	1.455e-3
I3_tRMS_rc@POWER-AC [A]	0.120322	0.120469	1.475e-4
U_fund_SYM+_rc@POWER-AC [V]	801.1085	801.1011	-7.385e-3
U_fund_SYM-_rc@POWER-AC [V]	1.864335	1.804652	-0.059683
AI 1/I1@TRIONet3_1674 [A]	0.119209	0.119209	0.000000
AI 1/I2@TRIONet3_1674 [A]	0.238419	0.208616	-0.029802
AI 1/I3@TRIONet3_1674 [A]	-0.149012	-0.119209	0.029802
AI 1/U1@TRIONet3_1674 [V]	563.3722	986.9905	423.6183
AI 1/U2@TRIONet3_1674 [V]	-1134.041	-14.01210	1120.029
AI 1/U3@TRIONet3_1674 [V]	570.6001	-973.3167	-1543.917

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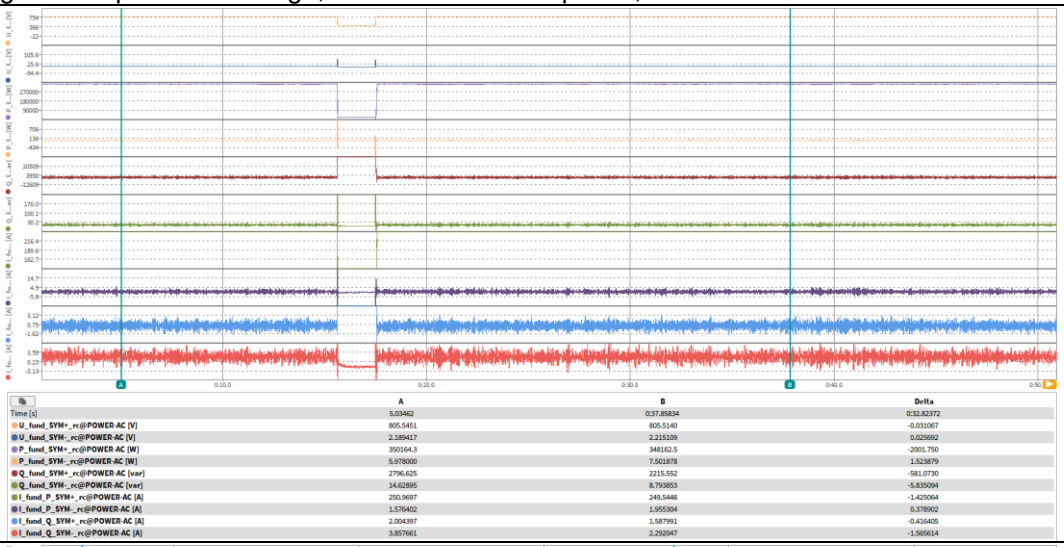
VD3-1 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	5.03462	0:37.85834	0:32.82372
U_fund_SYM+_rc@POWER-AC [V]	805.5451	805.5140	-0.031067
U_fund_SYM-_rc@POWER-AC [V]	2.189417	2.215109	0.025692
P_fund_SYM+_rc@POWER-AC [W]	350164.3	348162.5	-2001.750
P_fund_SYM-_rc@POWER-AC [W]	5.978000	7.501878	1.523879
Q_fund_SYM+_rc@POWER-AC [var]	2796.625	2215.552	-581.0730
Q_fund_SYM-_rc@POWER-AC [var]	14.62895	8.793853	-5.835094
I_fund_P_SYM+_rc@POWER-AC [A]	250.9697	249.5446	-1.425064
I_fund_P_SYM-_rc@POWER-AC [A]	1.576402	1.955304	0.378902
I_fund_Q_SYM+_rc@POWER-AC [A]	2.004397	1.587991	-0.416405
I_fund_Q_SYM-_rc@POWER-AC [A]	3.857661	2.292047	-1.565614

	A	B	Delta
Time [s]	5.08397	0:37.01923	0:31.93526
I1_tRMS_rc@POWER-AC [A]	251.5635	246.8865	-4.677002
I2_tRMS_rc@POWER-AC [A]	253.0181	251.6457	-1.372437
I3_tRMS_rc@POWER-AC [A]	245.9337	246.6906	0.756927
U_fund_SYM+_rc@POWER-AC [V]	805.5216	805.4543	-0.067322
U_fund_SYM-_rc@POWER-AC [V]	1.890377	2.083684	0.193307
AI 1/I1@TRIONet3_1674 [A]	-295.3708	-212.1329	83.23789
AI 1/I2@TRIONet3_1674 [A]	-13.08322	356.2868	369.3700
AI 1/I3@TRIONet3_1674 [A]	308.6627	-143.9750	-452.6377
AI 1/U1@TRIONet3_1674 [V]	-534.1091	-1031.888	-497.7787
AI 1/U2@TRIONet3_1674 [V]	-901.5478	931.0601	1532.608
AI 1/U3@TRIONet3_1674 [V]	1135.846	100.8284	-1035.018

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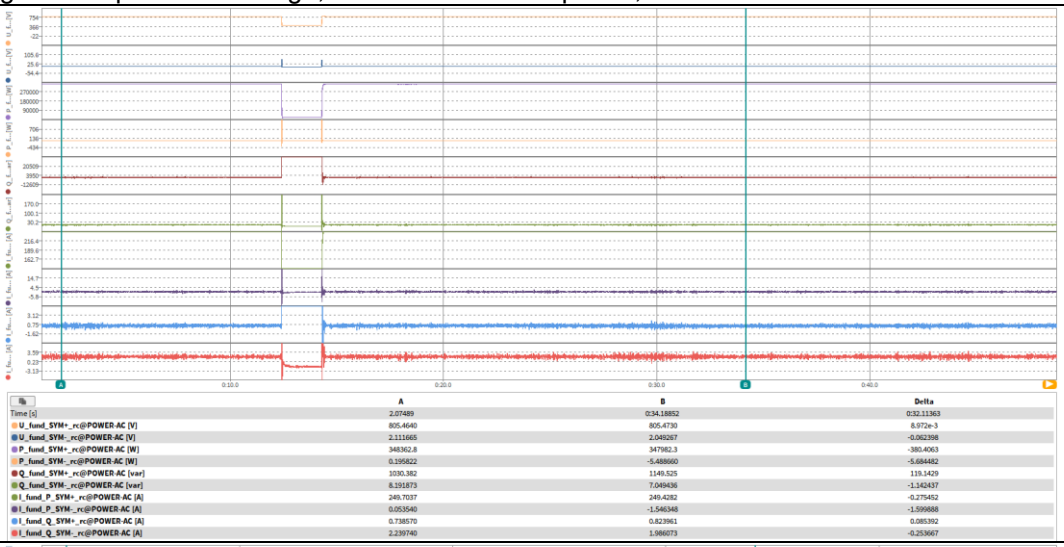
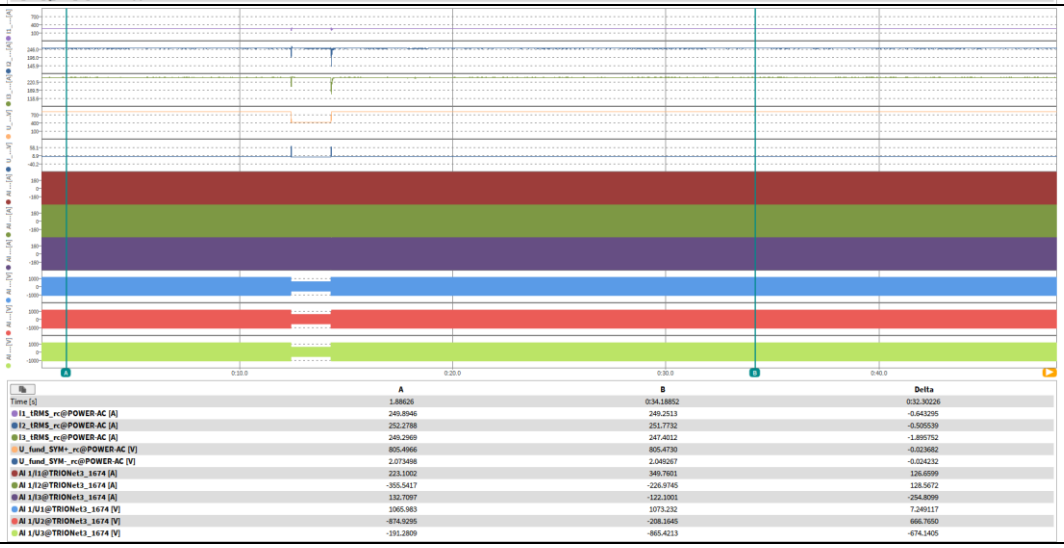
VD3-2 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



Time [s]	A	B	Delta
U_fund_SYM+_rc@POWER-AC [V]	805.4640	805.4730	8.972e-3
U_fund_SYM-_rc@POWER-AC [V]	2.111665	2.049267	-0.062398
P_fund_SYM+_rc@POWER-AC [W]	348362.8	347982.3	-380.4063
P_fund_SYM-_rc@POWER-AC [W]	0.195822	-5.488660	-5.684482
Q_fund_SYM+_rc@POWER-AC [var]	1030.382	1149.525	119.1429
Q_fund_SYM-_rc@POWER-AC [var]	8.191873	7.049436	-1.142437
I_fund_P_SYM+_rc@POWER-AC [A]	249.7037	249.4282	-0.275452
I_fund_P_SYM-_rc@POWER-AC [A]	0.053540	-1.546348	-1.599888
I_fund_Q_SYM+_rc@POWER-AC [A]	0.738570	0.823961	0.085392
I_fund_Q_SYM-_rc@POWER-AC [A]	2.239740	1.986073	-0.253667



Time [s]	A	B	Delta
I1_tRMS_rc@POWER-AC [A]	249.8946	249.2513	-0.643295
I2_tRMS_rc@POWER-AC [A]	252.2788	251.7732	-0.505539
I3_tRMS_rc@POWER-AC [A]	249.2969	247.4012	-1.895752
U_fund_SYM+_rc@POWER-AC [V]	805.4966	805.4730	-0.023682
U_fund_SYM-_rc@POWER-AC [V]	2.073498	2.049267	-0.024232
AI 1/I1@TRIONet3_1674 [A]	223.1002	349.7601	126.6599
AI 1/I2@TRIONet3_1674 [A]	-355.5417	-226.9745	128.5672
AI 1/I3@TRIONet3_1674 [A]	132.7097	-122.1001	-254.8099
AI 1/U1@TRIONet3_1674 [V]	1065.983	1073.232	7.249117
AI 1/U2@TRIONet3_1674 [V]	-874.9295	-208.1645	666.7650
AI 1/U3@TRIONet3_1674 [V]	-191.2809	-865.4213	-674.1405

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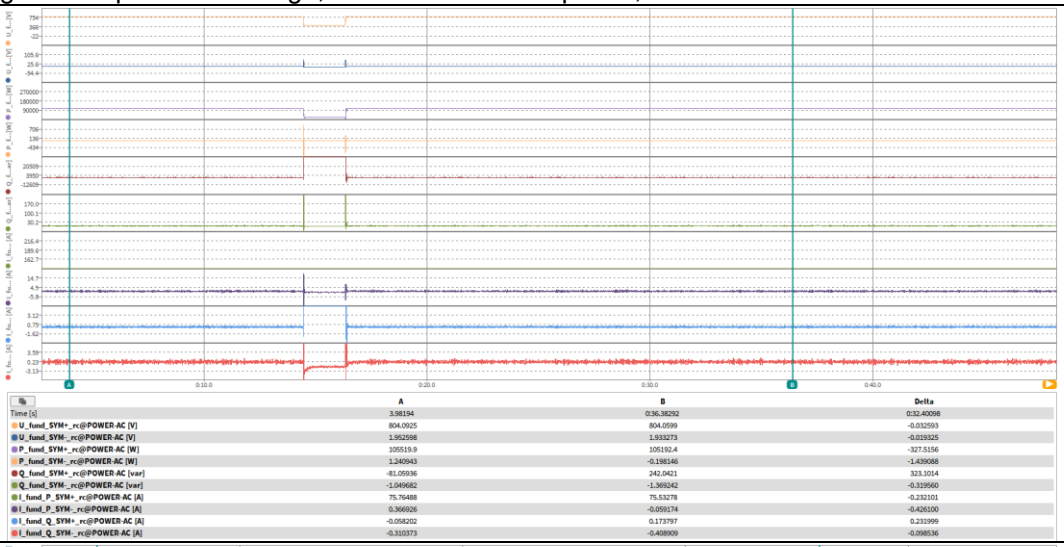
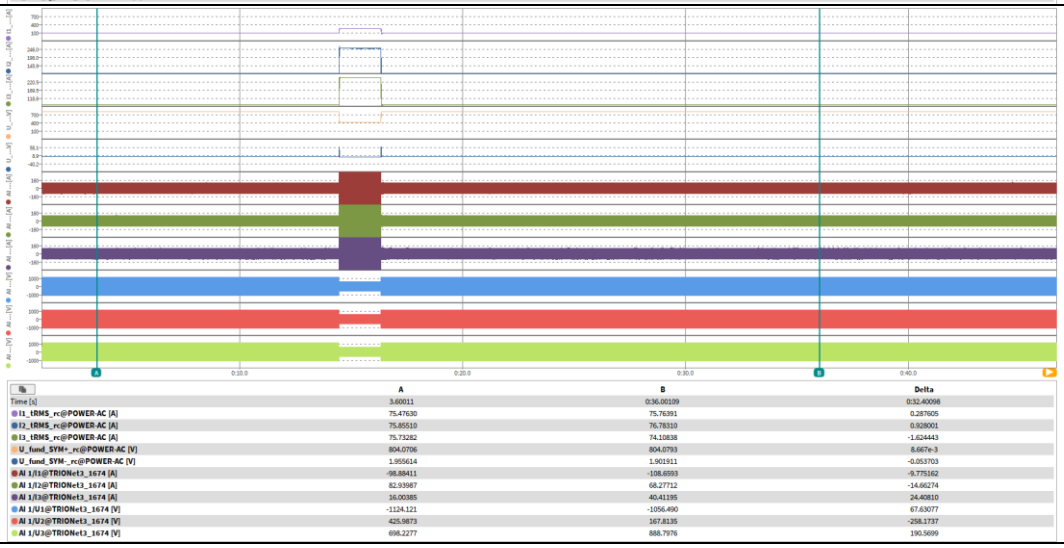
VD3-3 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	3.98194	0:36.38292	0:32.40098
U_fund_SYM+_rc@POWER-AC [V]	804.0925	804.0599	-0.032593
U_fund_SYM-_rc@POWER-AC [V]	1.952598	1.933273	-0.019325
P_fund_SYM+_rc@POWER-AC [W]	105519.9	105192.4	-327.5156
P_fund_SYM-_rc@POWER-AC [W]	1.240943	-0.198146	-1.439088
Q_fund_SYM+_rc@POWER-AC [var]	-81.05936	242.0421	323.1014
Q_fund_SYM-_rc@POWER-AC [var]	-1.049682	-1.369242	-0.319560
I_fund_P_SYM+_rc@POWER-AC [A]	75.76488	75.53278	-0.232101
I_fund_P_SYM-_rc@POWER-AC [A]	0.366926	-0.059174	-0.426100
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.058202	0.173797	0.231999
I_fund_Q_SYM-_rc@POWER-AC [A]	-0.310373	-0.408909	-0.098536



	A	B	Delta
Time [s]	3.60011	0:36.00109	0:32.40098
I1_tRMS_rc@POWER-AC [A]	75.47630	75.76391	0.287605
I2_tRMS_rc@POWER-AC [A]	75.85510	76.78310	0.928001
I3_tRMS_rc@POWER-AC [A]	75.73282	74.10838	-1.624443
U_fund_SYM+_rc@POWER-AC [V]	804.0706	804.0793	8.667e-3
U_fund_SYM-_rc@POWER-AC [V]	1.955614	1.901911	-0.053703
AI 1/I1@TRIONet3_1674 [A]	-98.88411	-108.6593	-9.775162
AI 1/I2@TRIONet3_1674 [A]	82.93987	68.27712	-14.66274
AI 1/I3@TRIONet3_1674 [A]	16.00385	40.41195	24.40810
AI 1/U1@TRIONet3_1674 [V]	-1124.121	-1056.490	67.63077
AI 1/U2@TRIONet3_1674 [V]	425.9673	167.8135	-258.1737
AI 1/U3@TRIONet3_1674 [V]	696.2277	888.7976	190.5699

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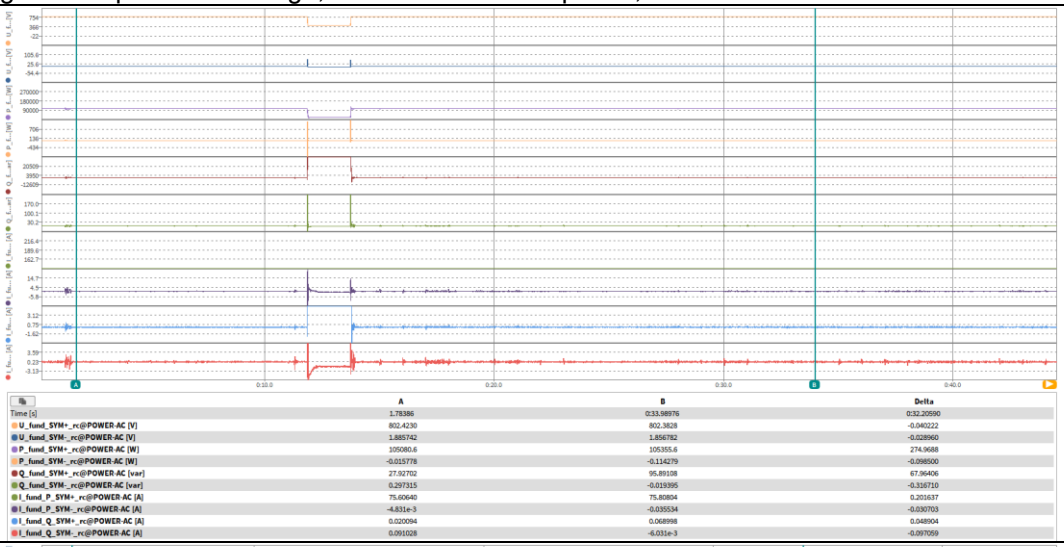
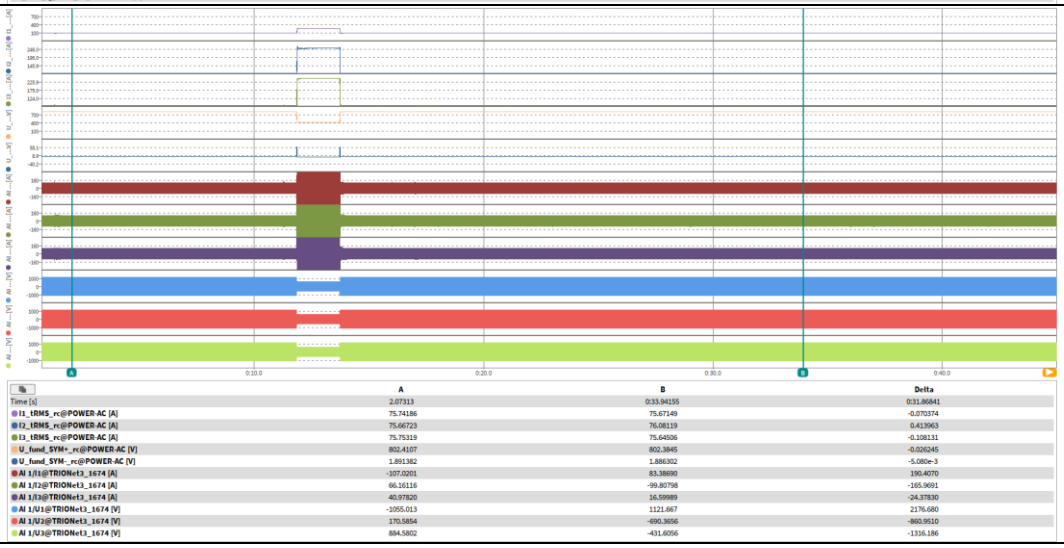
VD3-4 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



Time [s]	A	B	Delta
U_fund_SYM+_rc@POWER-AC [V]	802.4230	802.3828	-0.040222
U_fund_SYM-_rc@POWER-AC [V]	1.885742	1.856782	-0.028960
P_fund_SYM+_rc@POWER-AC [W]	105080.6	105355.6	274.9688
P_fund_SYM-_rc@POWER-AC [W]	-0.015778	-0.114279	-0.098500
Q_fund_SYM+_rc@POWER-AC [var]	27.92702	95.89108	67.96406
Q_fund_SYM-_rc@POWER-AC [var]	0.297315	-0.019395	-0.316710
I_fund_P_SYM+_rc@POWER-AC [A]	75.60640	75.80804	0.201637
I_fund_P_SYM-_rc@POWER-AC [A]	-4.831e-3	-0.035534	-0.030703
I_fund_Q_SYM+_rc@POWER-AC [A]	0.020094	0.068998	0.048904
I_fund_Q_SYM-_rc@POWER-AC [A]	0.091028	-6.031e-3	-0.097059



Time [s]	A	B	Delta
I1_tRMS_rc@POWER-AC [A]	75.74186	75.67149	-0.070374
I2_tRMS_rc@POWER-AC [A]	75.66723	76.08119	0.413963
I3_tRMS_rc@POWER-AC [A]	75.75319	75.64506	-0.108131
U_fund_SYM+_rc@POWER-AC [V]	802.4107	802.3845	-0.026245
U_fund_SYM-_rc@POWER-AC [V]	1.891382	1.886302	-5.080e-3
AI 1/I1@TRIONet3_1674 [A]	-107.0201	83.38690	190.4070
AI 1/I2@TRIONet3_1674 [A]	66.16116	-99.80796	-165.9691
AI 1/I3@TRIONet3_1674 [A]	40.97820	16.59989	-24.37830
AI 1/U1@TRIONet3_1674 [V]	-1055.013	1121.667	2176.680
AI 1/U2@TRIONet3_1674 [V]	170.5854	-690.3656	-860.9510
AI 1/U3@TRIONet3_1674 [V]	884.5802	-431.6056	-1316.186

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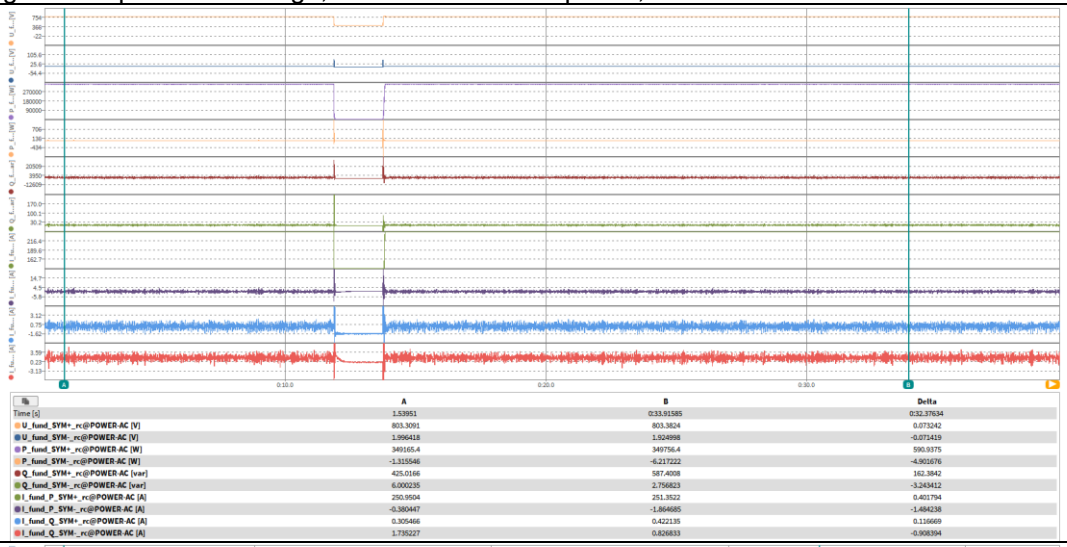
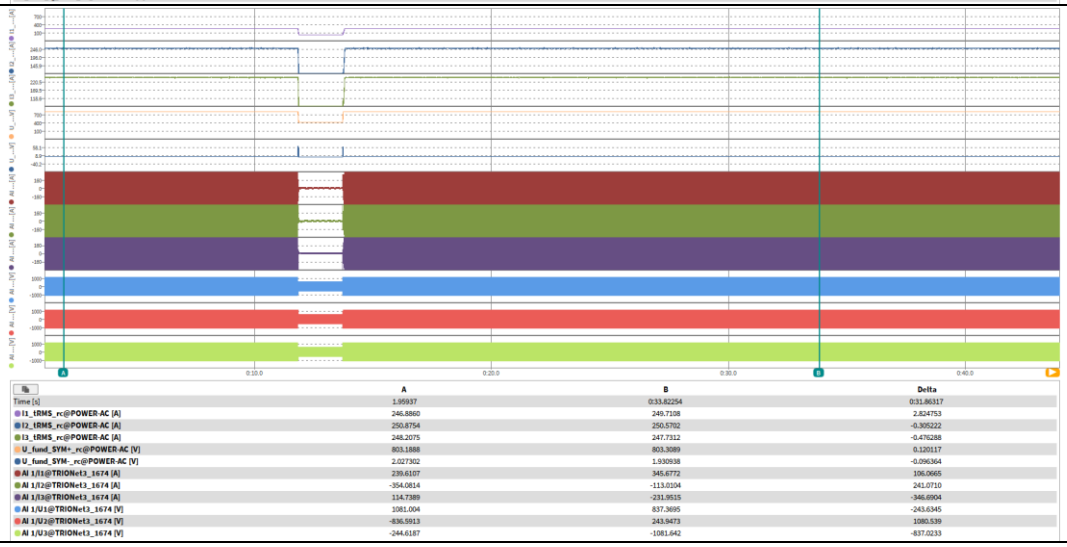
VD3-5 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



Time [s]	A	B	Delta
U_fund_SYM+_rc@POWER-AC [V]	1.53951	0:33.91585	0:32.37634
U_fund_SYM-_rc@POWER-AC [V]	803.3091	803.3824	0.073242
P_fund_SYM+_rc@POWER-AC [W]	1.996418	1.924998	-0.071419
Q_fund_SYM+_rc@POWER-AC [var]	349165.4	349756.4	590.9375
I_fund_P_SYM+_rc@POWER-AC [A]	-1.315546	-6.217222	-4.901676
I_fund_P_SYM-_rc@POWER-AC [A]	425.0166	587.4008	162.3842
I_fund_Q_SYM+_rc@POWER-AC [A]	6.000235	2.756823	-3.243412
I_fund_Q_SYM-_rc@POWER-AC [A]	250.9504	251.3522	0.401794
	-0.380447	-1.864685	-1.484238
	0.305466	0.422135	0.116669
	1.735227	0.826833	-0.908394



Time [s]	A	B	Delta
I1_tRMS_rc@POWER-AC [A]	1.99937	0:33.82254	0:31.86317
I2_tRMS_rc@POWER-AC [A]	246.8860	249.7108	2.824753
I3_tRMS_rc@POWER-AC [A]	250.8754	250.5702	-0.305222
U_fund_SYM+_rc@POWER-AC [V]	248.2075	247.7312	-0.476288
U_fund_SYM-_rc@POWER-AC [V]	803.1888	803.3089	0.120117
AI 1/I1@TRIONet3_1674 [A]	2.027302	1.930938	-0.096364
AI 1/I2@TRIONet3_1674 [A]	239.6107	345.6772	106.0665
AI 1/I3@TRIONet3_1674 [A]	-354.0814	-113.0104	241.0710
AI 1/U1@TRIONet3_1674 [V]	114.7389	-231.9515	-346.6904
AI 1/U2@TRIONet3_1674 [V]	1081.004	837.3695	-243.6345
AI 1/U3@TRIONet3_1674 [V]	-836.5913	243.9473	1080.539
	-244.6187	-1081.642	-837.0233

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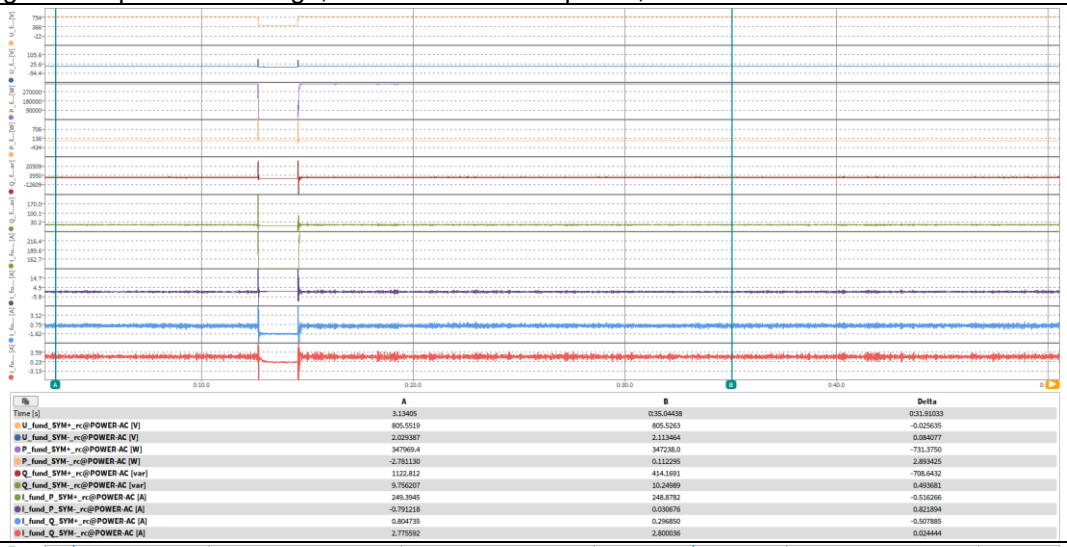
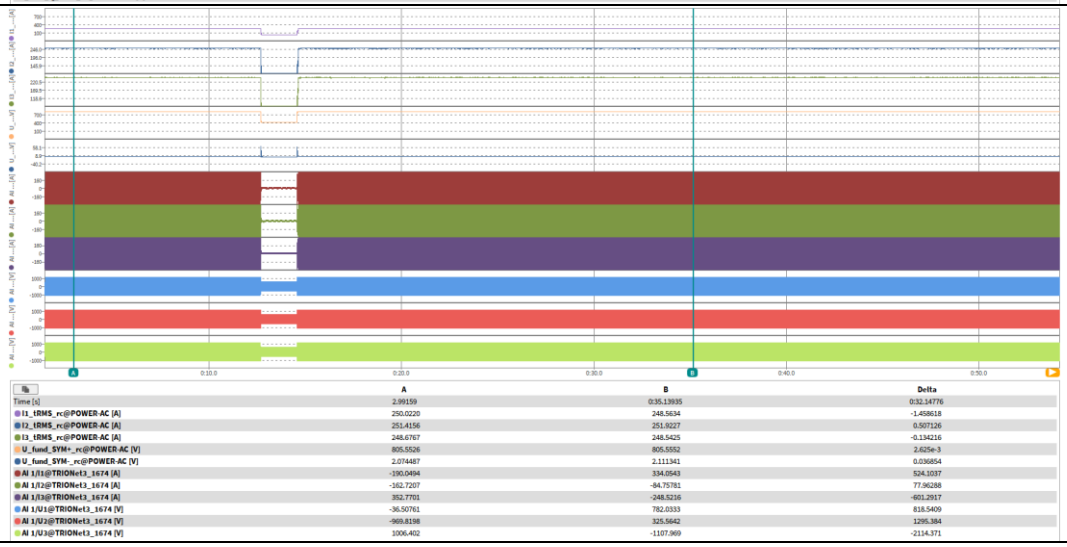
VD3-6 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	3.13405	0:35.04438	0:31.91033
U_fund_SYM+_rc@POWER-AC [V]	805.5519	805.5263	-0.025635
U_fund_SYM-_rc@POWER-AC [V]	2.029387	2.113464	0.084077
P_fund_SYM+_rc@POWER-AC [W]	347969.4	347238.0	-731.3750
P_fund_SYM-_rc@POWER-AC [W]	-2.781130	0.112295	2.893425
Q_fund_SYM+_rc@POWER-AC [var]	1122.812	414.1691	-708.6432
Q_fund_SYM-_rc@POWER-AC [var]	9.756207	10.24989	0.493681
I_fund_P_SYM+_rc@POWER-AC [A]	249.3945	248.8782	-0.516266
I_fund_P_SYM-_rc@POWER-AC [A]	-0.791218	0.030676	0.821894
I_fund_Q_SYM+_rc@POWER-AC [A]	0.804735	0.296850	-0.507885
I_fund_Q_SYM-_rc@POWER-AC [A]	2.775592	2.800036	0.024444



	A	B	Delta
Time [s]	2.99159	0:35.13935	0:32.14776
I1_tRMS_rc@POWER-AC [A]	250.0220	248.5634	-1.458618
I2_tRMS_rc@POWER-AC [A]	251.4156	251.9227	0.507126
I3_tRMS_rc@POWER-AC [A]	248.6767	248.5425	-0.134216
U_fund_SYM+_rc@POWER-AC [V]	805.5526	805.5552	2.625e-3
U_fund_SYM-_rc@POWER-AC [V]	2.074487	2.111341	0.036854
AI 1/I1@TRIONet3_1674 [A]	-190.0494	334.0543	524.1037
AI 1/I2@TRIONet3_1674 [A]	-162.7207	-84.75781	77.96288
AI 1/I3@TRIONet3_1674 [A]	352.7701	-248.5216	-601.2917
AI 1/U1@TRIONet3_1674 [V]	-36.50761	782.0333	818.5409
AI 1/U2@TRIONet3_1674 [V]	-969.8198	325.5642	1295.384
AI 1/U3@TRIONet3_1674 [V]	1006.402	-1107.969	-2114.371

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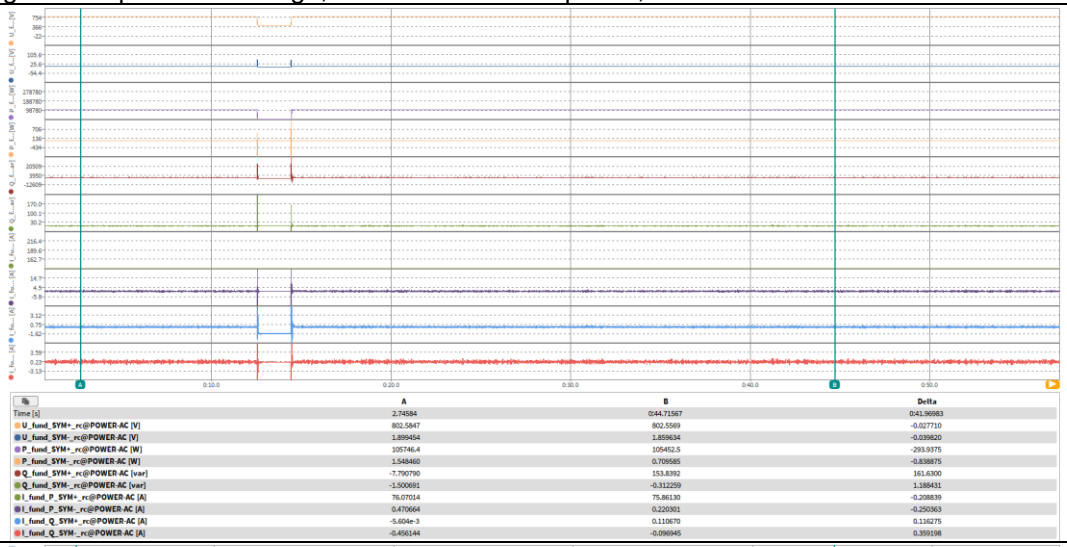
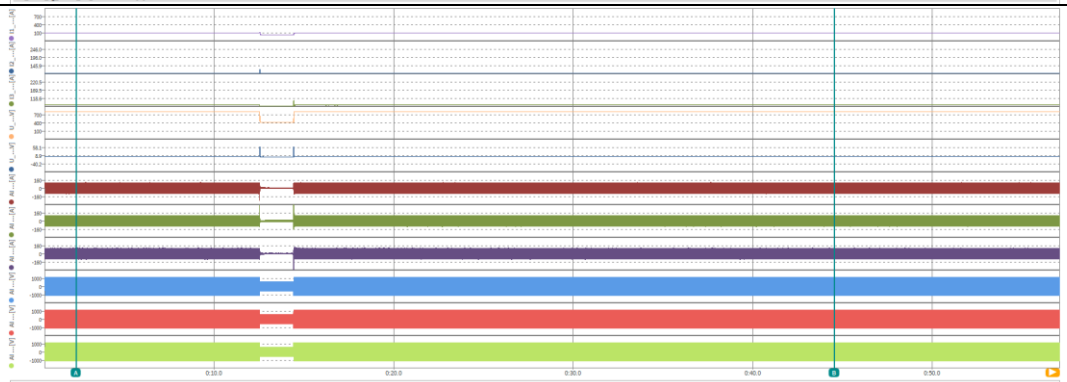
VD3-7 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.74584	0:44.71567	0:41.96983
U_fund_SYM+_rc@POWER-AC [V]	802.5847	802.5569	-0.027710
U_fund_SYM-_rc@POWER-AC [V]	1.899454	1.859634	-0.039820
P_fund_SYM+_rc@POWER-AC [W]	105746.4	105452.5	-293.9375
P_fund_SYM-_rc@POWER-AC [W]	1.549460	0.709585	-0.839875
Q_fund_SYM+_rc@POWER-AC [var]	-7.790790	153.8392	161.6300
Q_fund_SYM-_rc@POWER-AC [var]	-1.500691	-0.312259	1.188431
I_fund_P_SYM+_rc@POWER-AC [A]	76.07014	75.86130	-0.208839
I_fund_P_SYM-_rc@POWER-AC [A]	0.470664	0.220301	-0.250363
I_fund_Q_SYM+_rc@POWER-AC [A]	-5.604e-3	0.110670	0.116275
I_fund_Q_SYM-_rc@POWER-AC [A]	-0.456144	-0.096945	0.359198



	A	B	Delta
Time [s]	2.35139	0:44.54398	0:42.19260
I1_tRMS_rc@POWER-AC [A]	75.88683	76.80239	0.915558
I2_tRMS_rc@POWER-AC [A]	74.54609	75.72739	1.181297
I3_tRMS_rc@POWER-AC [A]	76.04362	75.31274	-0.730873
U_fund_SYM+_rc@POWER-AC [V]	802.5825	802.5712	-0.011353
U_fund_SYM-_rc@POWER-AC [V]	1.907971	1.835184	-0.072788
AI 1/I1@TRIONet3_1674 [A]	57.69730	28.13339	-29.56391
AI 1/I2@TRIONet3_1674 [A]	51.34940	-107.2884	-158.6378
AI 1/I3@TRIONet3_1674 [A]	-108.8083	79.33379	188.1421
AI 1/U1@TRIONet3_1674 [V]	74.38279	767.4838	693.1010
AI 1/U2@TRIONet3_1674 [V]	946.5283	-1109.091	-2055.619
AI 1/U3@TRIONet3_1674 [V]	-1021.224	341.5075	1362.732

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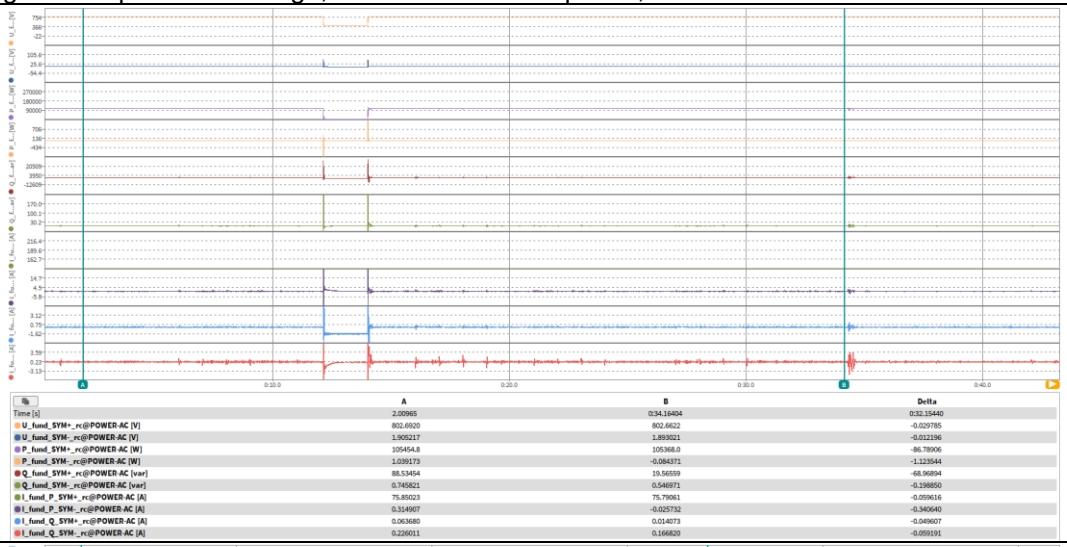
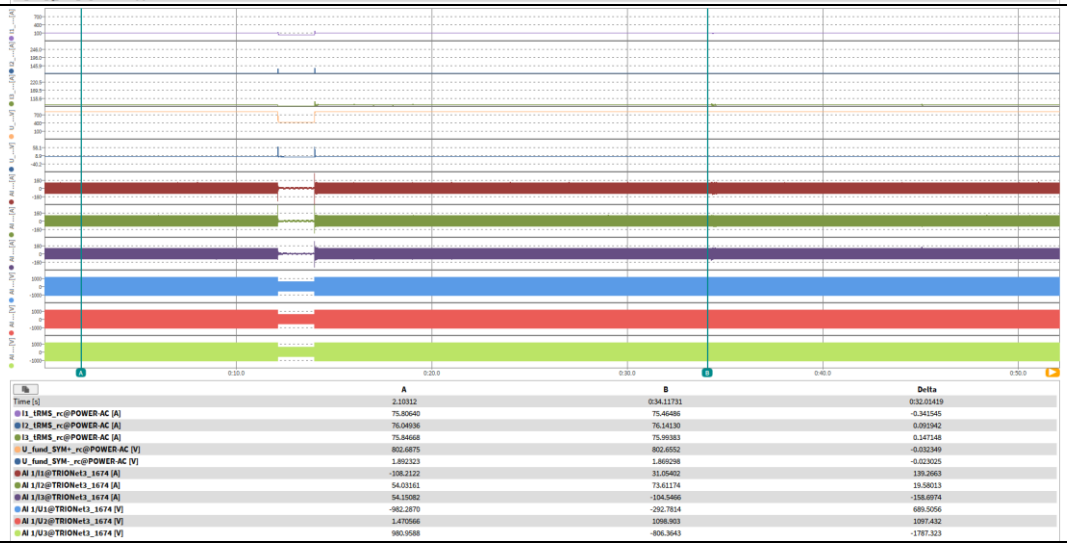
VD3-8 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



Time [s]	A	B	Delta
U_fund_SYM+_rc@POWER-AC [V]	2.00965	0:34.16404	0:32.15440
U_fund_SYM-_rc@POWER-AC [V]	802.6920	802.6622	-0.029785
P_fund_SYM+_rc@POWER-AC [W]	1.905217	1.893021	-0.012196
P_fund_SYM-_rc@POWER-AC [W]	105454.8	105368.0	-86.78906
Q_fund_SYM+_rc@POWER-AC [var]	1.039173	-0.084371	-1.123544
Q_fund_SYM-_rc@POWER-AC [var]	88.53454	19.56559	-68.96894
I_fund_P_SYM+_rc@POWER-AC [A]	0.745821	0.546971	-0.198850
I_fund_P_SYM-_rc@POWER-AC [A]	75.85023	75.79061	-0.059616
I_fund_Q_SYM+_rc@POWER-AC [A]	0.314907	-0.025732	-0.340640
I_fund_Q_SYM-_rc@POWER-AC [A]	0.063680	0.014073	-0.049607
	0.226011	0.166820	-0.059191



Time [s]	A	B	Delta
I1_tRMS_rc@POWER-AC [A]	2.10312	0:34.11731	0:32.01419
I2_tRMS_rc@POWER-AC [A]	75.80640	75.46486	-0.341545
I3_tRMS_rc@POWER-AC [A]	76.04936	76.14130	0.091942
U_fund_SYM+_rc@POWER-AC [V]	75.84668	75.99383	0.147148
U_fund_SYM-_rc@POWER-AC [V]	802.6875	802.6552	-0.032349
AI 1/I1@TRIONet3_1674 [A]	1.892323	1.869298	-0.023025
AI 1/I2@TRIONet3_1674 [A]	-108.2122	31.05402	139.2663
AI 1/I3@TRIONet3_1674 [A]	54.03161	73.61174	19.58013
AI 1/U1@TRIONet3_1674 [V]	54.15082	-104.5466	-158.6974
AI 1/U2@TRIONet3_1674 [V]	-982.2870	-292.7814	689.5056
AI 1/U3@TRIONet3_1674 [V]	1.470566	1098.903	1097.432
	980.9588	-806.3643	-1787.323

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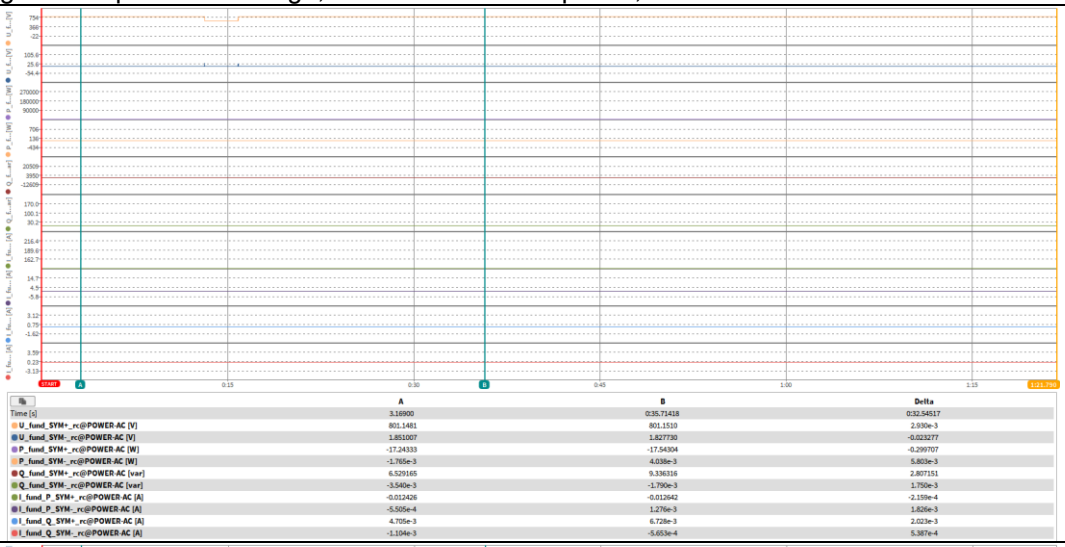
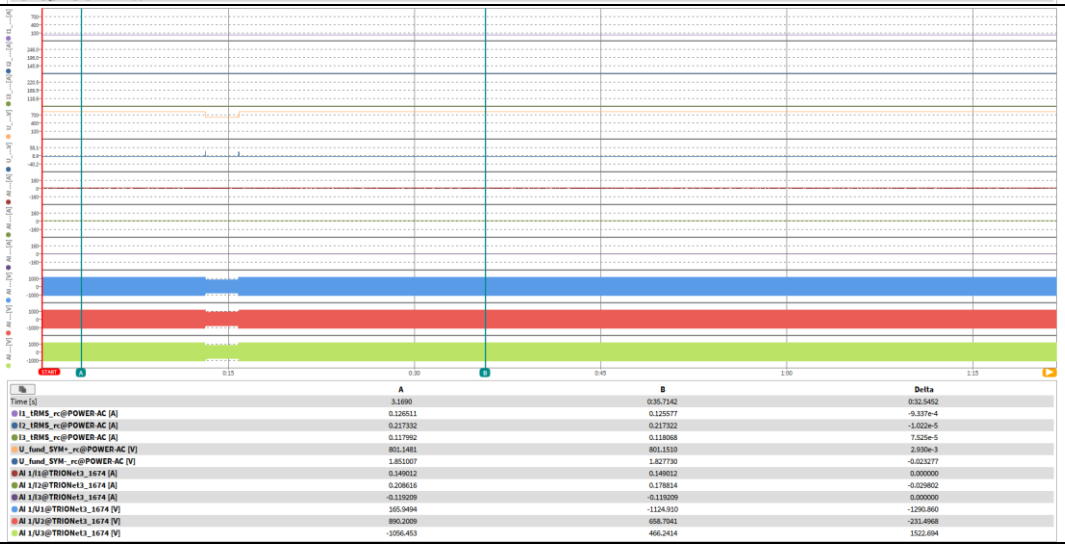
VD4 (no-load test)

a) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



Time [s]	A	B	Delta
	3.16900	0:35.71418	0:32.54517
U_fund_SYM+_rc@POWER-AC [V]	801.1481	801.1510	2.930e-3
U_fund_SYM-_rc@POWER-AC [V]	1.851007	1.827730	-0.023277
P_fund_SYM+_rc@POWER-AC [W]	-17.24333	-17.54304	-0.299707
P_fund_SYM-_rc@POWER-AC [W]	-1.765e-3	4.038e-3	5.803e-3
Q_fund_SYM+_rc@POWER-AC [var]	6.529165	9.336316	2.807151
Q_fund_SYM-_rc@POWER-AC [var]	-3.540e-3	-1.790e-3	1.750e-3
I_fund_P_SYM+_rc@POWER-AC [A]	-0.012426	-0.012642	-2.159e-4
I_fund_P_SYM-_rc@POWER-AC [A]	-5.505e-4	1.276e-3	1.826e-3
I_fund_Q_SYM+_rc@POWER-AC [A]	4.705e-3	6.728e-3	2.023e-3
I_fund_Q_SYM-_rc@POWER-AC [A]	-1.104e-3	-5.653e-4	5.387e-4



Time [s]	A	B	Delta
	3.1690	0:35.7142	0:32.5452
I1_tRMS_rc@POWER-AC [A]	0.126511	0.125577	-9.337e-4
I2_tRMS_rc@POWER-AC [A]	0.217332	0.217322	-1.022e-5
I3_tRMS_rc@POWER-AC [A]	0.117952	0.118068	7.525e-5
U_fund_SYM+_rc@POWER-AC [V]	801.1481	801.1510	2.930e-3
U_fund_SYM-_rc@POWER-AC [V]	1.851007	1.827730	-0.023277
AI 1/I1@TRIONet3_1674 [A]	0.149012	0.149012	0.000000
AI 1/I2@TRIONet3_1674 [A]	0.208616	0.178814	-0.029802
AI 1/I3@TRIONet3_1674 [A]	-0.119209	-0.119209	0.000000
AI 1/U1@TRIONet3_1674 [V]	165.9494	-1124.910	-1290.860
AI 1/U2@TRIONet3_1674 [V]	890.2009	658.7041	-231.4968
AI 1/U3@TRIONet3_1674 [V]	-1056.453	466.2414	1522.694

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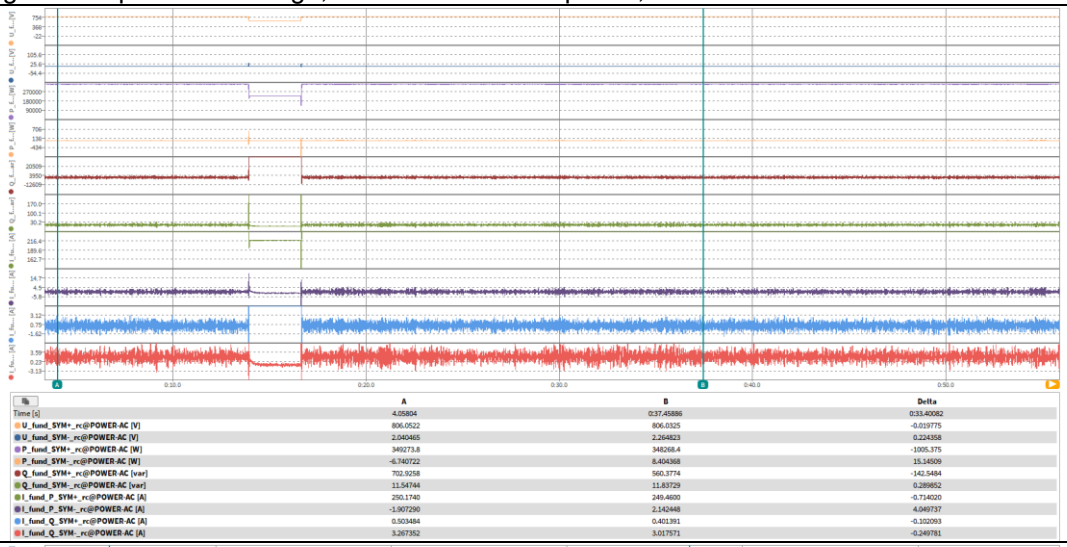
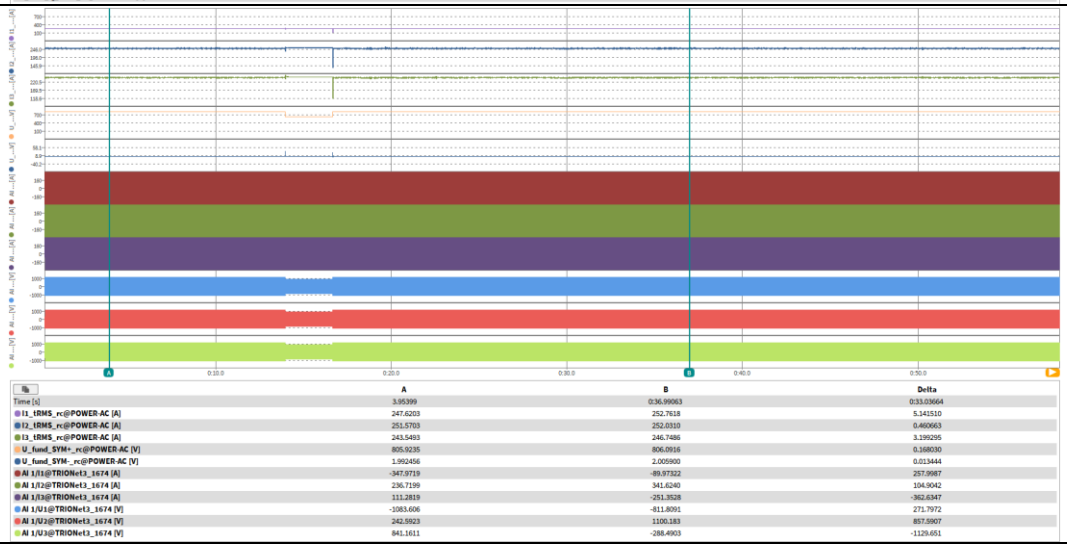
VD4-1 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



Time [s]	A	B	Delta
U_fund_SYM+_rc@POWER-AC [V]	806.0522	806.0325	-0.019775
U_fund_SYM-_rc@POWER-AC [V]	2.040465	2.264823	0.224358
P_fund_SYM+_rc@POWER-AC [W]	349273.8	348268.4	-1005.375
P_fund_SYM-_rc@POWER-AC [W]	-6.740722	8.404368	15.14509
Q_fund_SYM+_rc@POWER-AC [var]	702.9258	560.3774	-142.5484
Q_fund_SYM-_rc@POWER-AC [var]	11.54744	11.83729	0.289852
I_fund_P_SYM+_rc@POWER-AC [A]	250.1740	249.4600	-0.714020
I_fund_P_SYM-_rc@POWER-AC [A]	-1.907290	2.142448	4.049737
I_fund_Q_SYM+_rc@POWER-AC [A]	0.503484	0.401391	-0.102093
I_fund_Q_SYM-_rc@POWER-AC [A]	3.267352	3.017571	-0.249781



Time [s]	A	B	Delta
I1_tRMS_rc@POWER-AC [A]	247.6203	252.7618	5.141510
I2_tRMS_rc@POWER-AC [A]	251.5703	252.0310	0.460663
I3_tRMS_rc@POWER-AC [A]	243.5493	246.7486	3.199295
U_fund_SYM+_rc@POWER-AC [V]	805.9235	806.0916	0.168030
U_fund_SYM-_rc@POWER-AC [V]	1.992456	2.005900	0.013444
AI 1/I1@TRIONet3_1674 [A]	-347.9719	-89.97322	257.9987
AI 1/I2@TRIONet3_1674 [A]	236.7199	341.6240	104.9042
AI 1/I3@TRIONet3_1674 [A]	111.2819	-251.3528	-362.6347
AI 1/U1@TRIONet3_1674 [V]	-1083.606	-811.8091	271.7972
AI 1/U2@TRIONet3_1674 [V]	242.5923	1100.183	857.5907
AI 1/U3@TRIONet3_1674 [V]	841.1611	-288.4903	-1129.651

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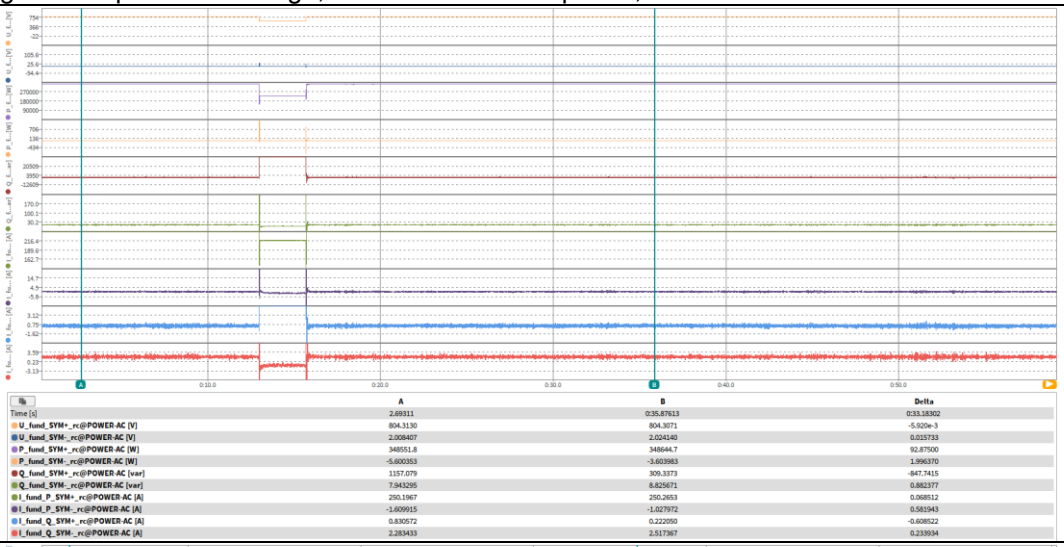
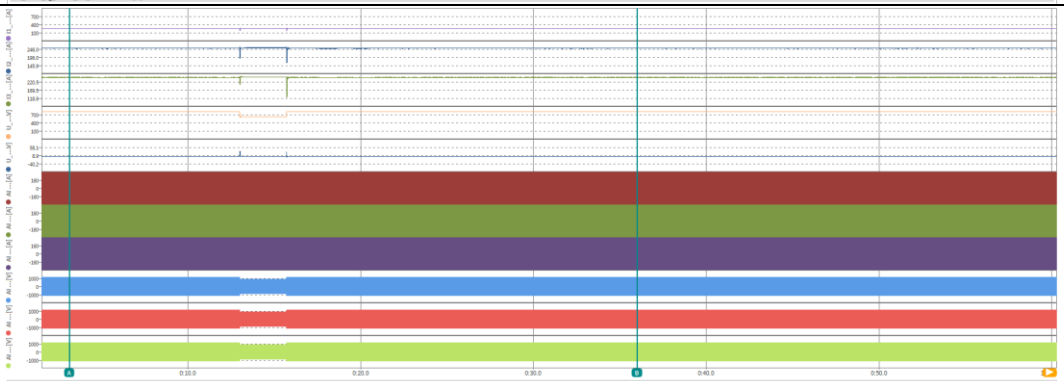
VD4-2 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.69311	0:35.87613	0:33.18302
U_fund_SYM+_rc@POWER-AC [V]	804.3130	804.3071	-5.920e-3
U_fund_SYM-_rc@POWER-AC [V]	2.008407	2.024140	0.015733
P_fund_SYM+_rc@POWER-AC [W]	348551.8	348644.7	92.87500
P_fund_SYM-_rc@POWER-AC [W]	-5.600353	-3.603983	1.996370
Q_fund_SYM+_rc@POWER-AC [var]	1157.079	309.3373	-847.7415
Q_fund_SYM-_rc@POWER-AC [var]	7.941295	8.825671	0.882377
I_fund_P_SYM+_rc@POWER-AC [A]	250.1967	250.2653	0.068512
I_fund_P_SYM-_rc@POWER-AC [A]	-1.609915	-1.027972	0.581943
I_fund_Q_SYM+_rc@POWER-AC [A]	0.830572	0.222050	-0.608522
I_fund_Q_SYM-_rc@POWER-AC [A]	2.283433	2.517367	0.233934



	A	B	Delta
Time [s]	3.17403	0:36.02040	0:32.84638
I1_tRMS_rc@POWER-AC [A]	249.6206	249.9433	0.322723
I2_tRMS_rc@POWER-AC [A]	252.4639	251.9900	-0.473938
I3_tRMS_rc@POWER-AC [A]	248.9383	248.9133	-0.024994
U_fund_SYM+_rc@POWER-AC [V]	804.3140	804.3133	-7.324e-4
U_fund_SYM-_rc@POWER-AC [V]	2.040446	2.032259	-8.187e-3
AI 1/I1@TRIONet3_1674 [A]	286.5791	57.30987	-229.2693
AI 1/I2@TRIONet3_1674 [A]	-325.7394	270.8733	596.6127
AI 1/I3@TRIONet3_1674 [A]	39.69670	-327.7362	-367.4329
AI 1/U1@TRIONet3_1674 [V]	1129.387	-388.8791	-1518.267
AI 1/U2@TRIONet3_1674 [V]	-658.3159	1122.752	1781.068
AI 1/U3@TRIONet3_1674 [V]	-471.3397	-734.0851	-262.7454

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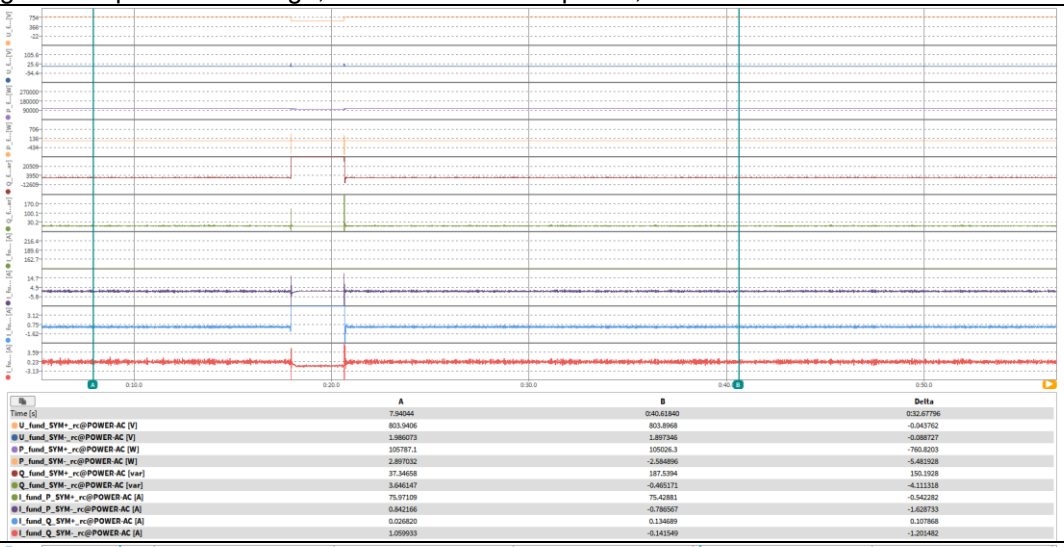
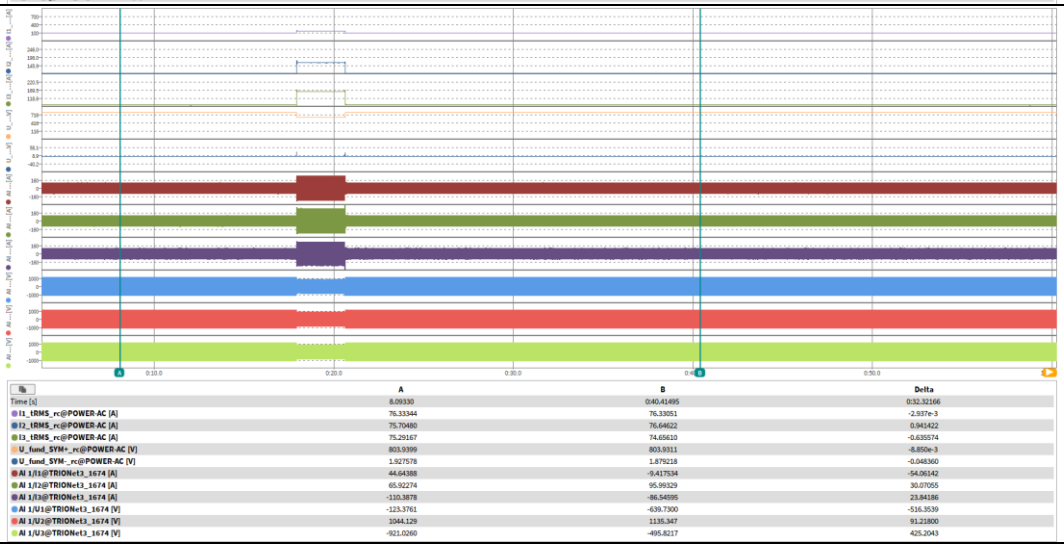
VD4-3 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	7.94044	0:40.61840	0:32.67796
U_fund_SYM+_rc@POWER-AC [V]	803.9406	803.8968	-0.043762
U_fund_SYM-_rc@POWER-AC [V]	1.986073	1.897346	-0.088727
P_fund_SYM+_rc@POWER-AC [W]	105787.1	105026.3	-760.8203
P_fund_SYM-_rc@POWER-AC [W]	2.897032	-2.584896	-5.481928
Q_fund_SYM+_rc@POWER-AC [var]	37.34658	187.5394	150.1928
Q_fund_SYM-_rc@POWER-AC [var]	3.640147	-0.465171	-4.111318
I_fund_P_SYM+_rc@POWER-AC [A]	75.97109	75.42881	-0.542282
I_fund_P_SYM-_rc@POWER-AC [A]	0.842166	-0.786567	-1.628733
I_fund_Q_SYM+_rc@POWER-AC [A]	0.026820	0.134689	0.107868
I_fund_Q_SYM-_rc@POWER-AC [A]	1.059933	-0.141549	-1.201482



	A	B	Delta
Time [s]	8.09330	0:40.41495	0:32.32166
I1_tRMS_rc@POWER-AC [A]	76.33344	76.33051	-2.937e-3
I2_tRMS_rc@POWER-AC [A]	75.70480	76.64622	0.941422
I3_tRMS_rc@POWER-AC [A]	75.29167	74.65610	-0.635574
U_fund_SYM+_rc@POWER-AC [V]	803.9399	803.9311	-8.850e-3
U_fund_SYM-_rc@POWER-AC [V]	1.927578	1.879218	-0.048360
AI 1/I1@TRIONet3_1674 [A]	44.64388	-9.417534	-54.06142
AI 1/I2@TRIONet3_1674 [A]	65.92274	95.99329	30.07055
AI 1/I3@TRIONet3_1674 [A]	-110.3878	-86.54995	23.84186
AI 1/U1@TRIONet3_1674 [V]	-123.3761	-639.7300	-516.3539
AI 1/U2@TRIONet3_1674 [V]	1044.129	1135.347	91.21800
AI 1/U3@TRIONet3_1674 [V]	-921.0260	-495.8217	425.2043

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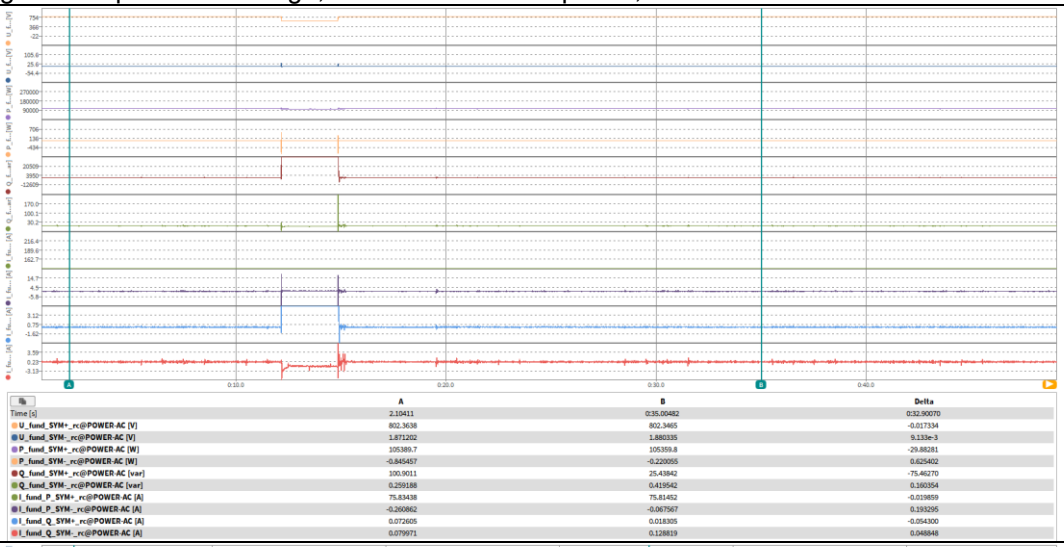
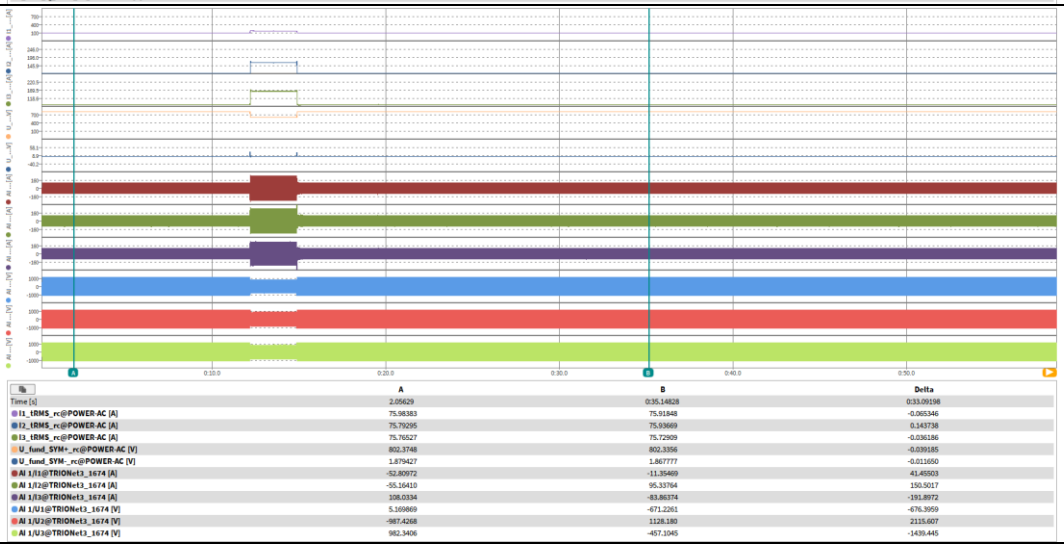
VD4-4 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.10411	0:35.00482	0:32.90070
U_fund_SYM+_rc@POWER-AC [V]	802.3638	802.3465	-0.017334
U_fund_SYM-_rc@POWER-AC [V]	1.871202	1.880335	9.133e-3
P_fund_SYM+_rc@POWER-AC [W]	105389.7	105359.8	-29.88281
P_fund_SYM-_rc@POWER-AC [W]	-0.645457	-0.220055	0.625402
Q_fund_SYM+_rc@POWER-AC [var]	100.9011	25.43842	-75.46270
Q_fund_SYM-_rc@POWER-AC [var]	0.259188	0.419542	0.160354
I_fund_P_SYM+_rc@POWER-AC [A]	75.83438	75.81452	-0.019859
I_fund_P_SYM-_rc@POWER-AC [A]	-0.260862	-0.067567	0.193295
I_fund_Q_SYM+_rc@POWER-AC [A]	0.072605	0.018305	-0.054300
I_fund_Q_SYM-_rc@POWER-AC [A]	0.079971	0.128819	0.048848



	A	B	Delta
Time [s]	2.05629	0:35.14828	0:33.09198
I1_tRMS_rc@POWER-AC [A]	75.98383	75.91848	-0.065346
I2_tRMS_rc@POWER-AC [A]	75.79295	75.93669	0.143738
I3_tRMS_rc@POWER-AC [A]	75.76527	75.72909	-0.036186
U_fund_SYM+_rc@POWER-AC [V]	802.3748	802.3356	-0.039185
U_fund_SYM-_rc@POWER-AC [V]	1.879427	1.867777	-0.011650
AI 1/I1@TRIONet3_1674 [A]	-52.80972	-11.35469	41.45503
AI 1/I2@TRIONet3_1674 [A]	-55.16410	95.33764	150.5017
AI 1/I3@TRIONet3_1674 [A]	108.0334	-83.86374	-191.8972
AI 1/U1@TRIONet3_1674 [V]	5.169869	-671.2261	-676.3959
AI 1/U2@TRIONet3_1674 [V]	-987.4268	1128.180	2115.607
AI 1/U3@TRIONet3_1674 [V]	982.3406	-457.1045	-1439.445

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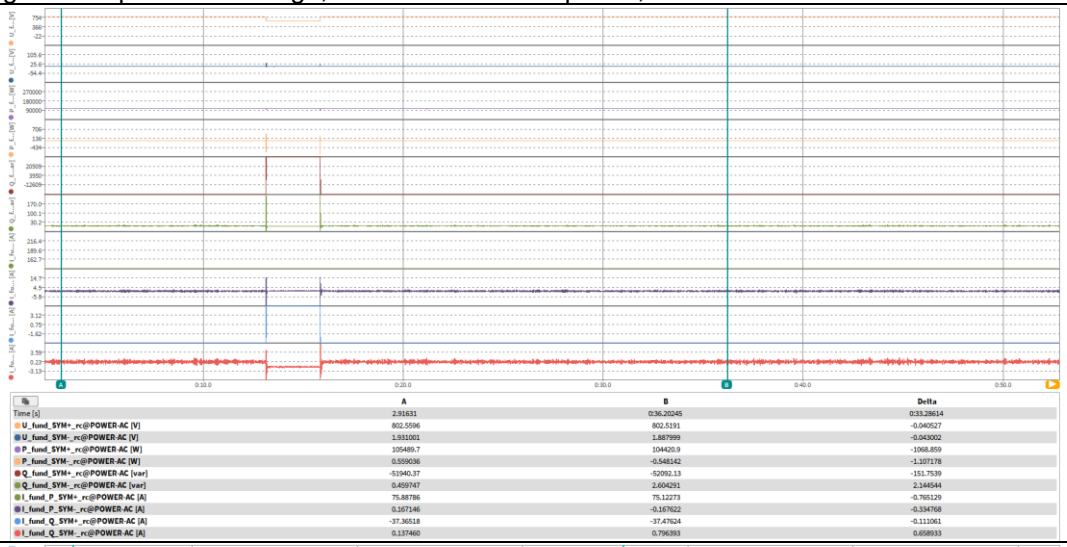
VD4-5 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.91631	0:36.20245	0:33.28614
U_fund_SYM+_rc@POWER-AC [V]	802.5596	802.5191	-0.040527
U_fund_SYM-_rc@POWER-AC [V]	1.931001	1.887999	-0.043002
P_fund_SYM+_rc@POWER-AC [W]	105489.7	104420.9	-1068.859
P_fund_SYM-_rc@POWER-AC [W]	0.359036	-0.548142	-1.107178
Q_fund_SYM+_rc@POWER-AC [var]	-51940.37	-52092.13	-151.7539
Q_fund_SYM-_rc@POWER-AC [var]	0.459747	2.604291	2.144544
I_fund_P_SYM+_rc@POWER-AC [A]	75.88786	75.12273	-0.765129
I_fund_P_SYM-_rc@POWER-AC [A]	0.167146	-0.167622	-0.334768
I_fund_Q_SYM+_rc@POWER-AC [A]	-37.36518	-37.47624	-0.111061
I_fund_Q_SYM-_rc@POWER-AC [A]	0.137469	0.796393	0.658933

	A	B	Delta
Time [s]	2.81575	0:36.10189	0:33.28614
I1_tRMS_rc@POWER-AC [A]	83.83969	83.68053	-0.159164
I2_tRMS_rc@POWER-AC [A]	83.48540	84.56502	1.079620
I3_tRMS_rc@POWER-AC [A]	84.52673	84.30732	-0.219414
U_fund_SYM+_rc@POWER-AC [V]	802.5701	802.5391	-0.031006
U_fund_SYM-_rc@POWER-AC [V]	1.907539	1.933264	0.025725
AI 1/I1@TRIONet3_1674 [A]	-95.42704	101.5067	196.9338
AI 1/I2@TRIONet3_1674 [A]	-12.60638	-109.7620	-97.15558
AI 1/I3@TRIONet3_1674 [A]	108.0632	8.463860	-99.59937
AI 1/U1@TRIONet3_1674 [V]	-840.3798	988.0739	1828.454
AI 1/U2@TRIONet3_1674 [V]	-238.7509	-975.2651	-736.5141
AI 1/U3@TRIONet3_1674 [V]	1079.301	-12.98714	-1092.288

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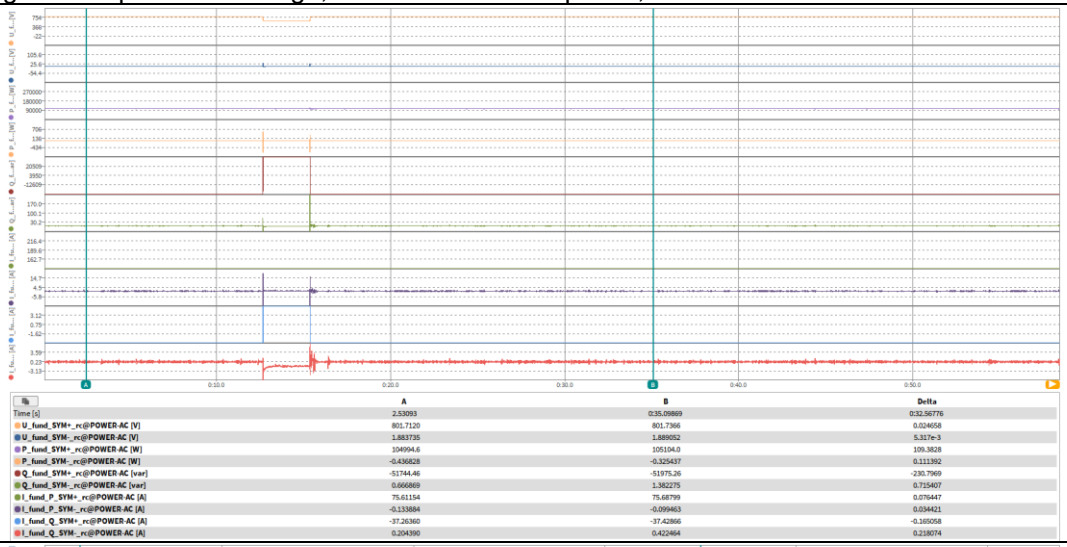
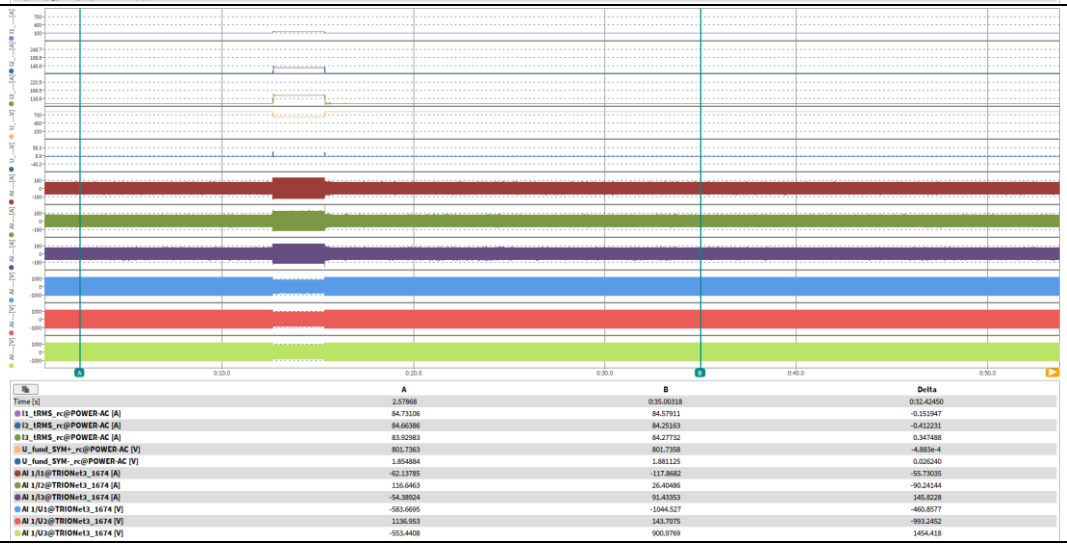
VD4-6 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.53093	0:35.09869	0:32.56776
U_fund_SYM+_rc@POWER-AC [V]	801.7120	801.7366	0.024658
U_fund_SYM-_rc@POWER-AC [V]	1.883735	1.889052	5.317e-3
P_fund_SYM+_rc@POWER-AC [W]	104994.6	105104.0	109.3828
P_fund_SYM-_rc@POWER-AC [W]	-0.436628	-0.325437	0.111392
Q_fund_SYM+_rc@POWER-AC [var]	-51744.46	-51975.26	-230.7969
Q_fund_SYM-_rc@POWER-AC [var]	0.666869	1.382275	0.715407
I_fund_P_SYM+_rc@POWER-AC [A]	75.61154	75.68799	0.076447
I_fund_P_SYM-_rc@POWER-AC [A]	-0.133884	-0.099463	0.034421
I_fund_Q_SYM+_rc@POWER-AC [A]	-37.26360	-37.42866	-0.165058
I_fund_Q_SYM-_rc@POWER-AC [A]	0.204390	0.422464	0.218074



	A	B	Delta
Time [s]	2.57868	0:35.00318	0:32.42450
I1_tRMS_rc@POWER-AC [A]	84.73106	84.57911	-0.151947
I2_tRMS_rc@POWER-AC [A]	84.66386	84.25163	-0.412231
I3_tRMS_rc@POWER-AC [A]	83.92983	84.27732	0.347488
U_fund_SYM+_rc@POWER-AC [V]	801.7363	801.7358	-4.883e-4
U_fund_SYM-_rc@POWER-AC [V]	1.854884	1.881125	0.026240
AI 1/I1@TRIONet3_1674 [A]	-62.13785	-117.8682	-55.73035
AI 1/I2@TRIONet3_1674 [A]	116.6463	26.40486	-90.24144
AI 1/I3@TRIONet3_1674 [A]	-54.38924	91.43353	145.8228
AI 1/U1@TRIONet3_1674 [V]	-583.6695	-1044.527	-460.8577
AI 1/U2@TRIONet3_1674 [V]	1136.953	143.7075	-993.2452
AI 1/U3@TRIONet3_1674 [V]	-553.4408	900.9769	1454.418

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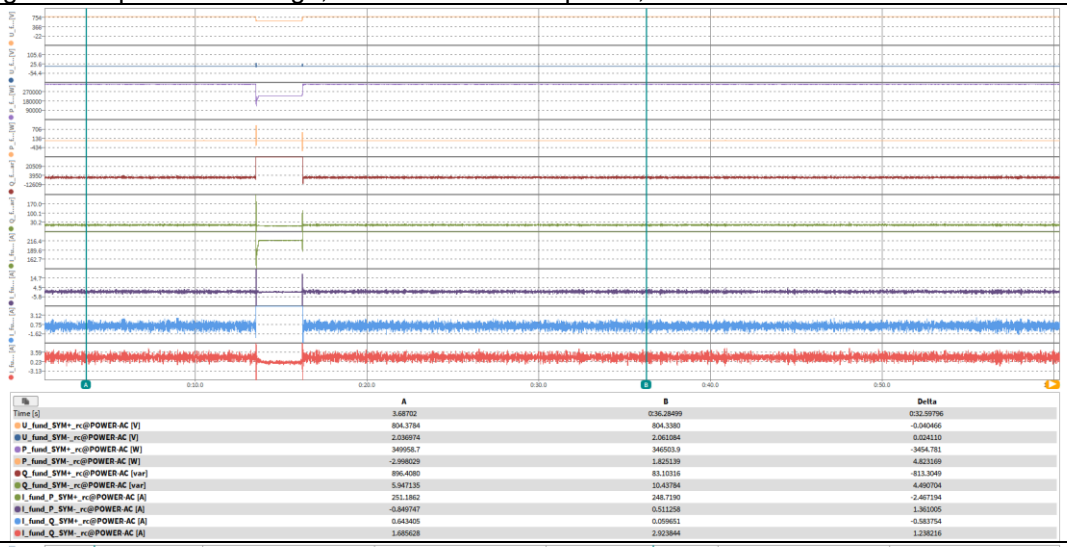
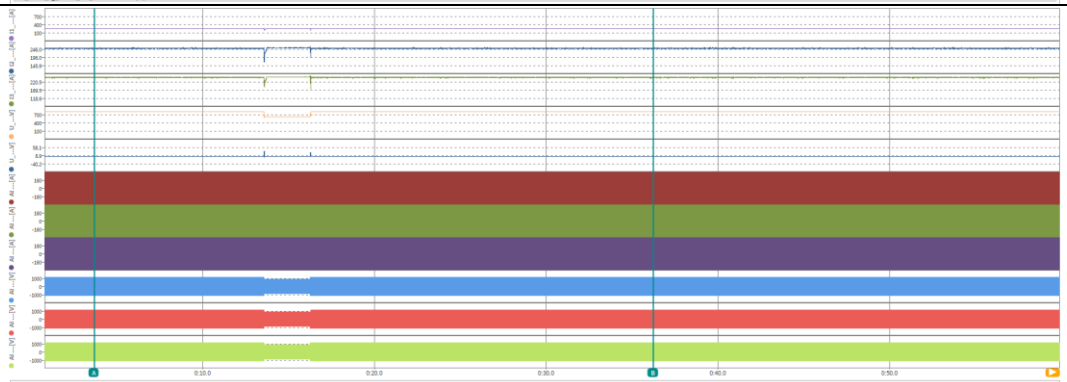
VD4-7 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	3.68702	0:36.28499	0:32.59796
U_fund_SYM+_rc@POWER-AC [V]	804.3784	804.3380	-0.040466
U_fund_SYM-_rc@POWER-AC [V]	2.036974	2.061084	0.024110
P_fund_SYM+_rc@POWER-AC [W]	349958.7	346503.9	-3454.781
P_fund_SYM-_rc@POWER-AC [W]	-2.998029	1.825139	4.823169
Q_fund_SYM+_rc@POWER-AC [var]	896.4080	83.10316	-813.3049
Q_fund_SYM-_rc@POWER-AC [var]	5.947135	10.43784	4.490704
I_fund_P_SYM+_rc@POWER-AC [A]	251.1862	248.7190	-2.467194
I_fund_P_SYM-_rc@POWER-AC [A]	-0.849747	0.511258	1.361005
I_fund_Q_SYM+_rc@POWER-AC [A]	0.643405	0.059651	-0.583754
I_fund_Q_SYM-_rc@POWER-AC [A]	1.685628	2.923844	1.238216



	A	B	Delta
Time [s]	3.68702	0:36.22646	0:32.53944
I1_tRMS_rc@POWER-AC [A]	250.7702	250.0498	-0.720490
I2_tRMS_rc@POWER-AC [A]	253.0525	252.1781	-0.874451
I3_tRMS_rc@POWER-AC [A]	249.8664	247.9751	-1.891281
U_fund_SYM+_rc@POWER-AC [V]	804.3784	804.3887	0.010315
U_fund_SYM-_rc@POWER-AC [V]	2.036974	2.012024	-0.024950
AI 1/I1@TRIONet3_1674 [A]	-309.6760	-269.7110	39.96492
AI 1/I2@TRIONet3_1674 [A]	307.8878	333.0410	25.15316
AI 1/I3@TRIONet3_1674 [A]	1.877546	-63.15112	-65.02867
AI 1/U1@TRIONet3_1674 [V]	-1133.447	-1111.935	21.51179
AI 1/U2@TRIONet3_1674 [V]	566.4282	737.0758	170.6476
AI 1/U3@TRIONet3_1674 [V]	567.0648	374.8949	-192.1699

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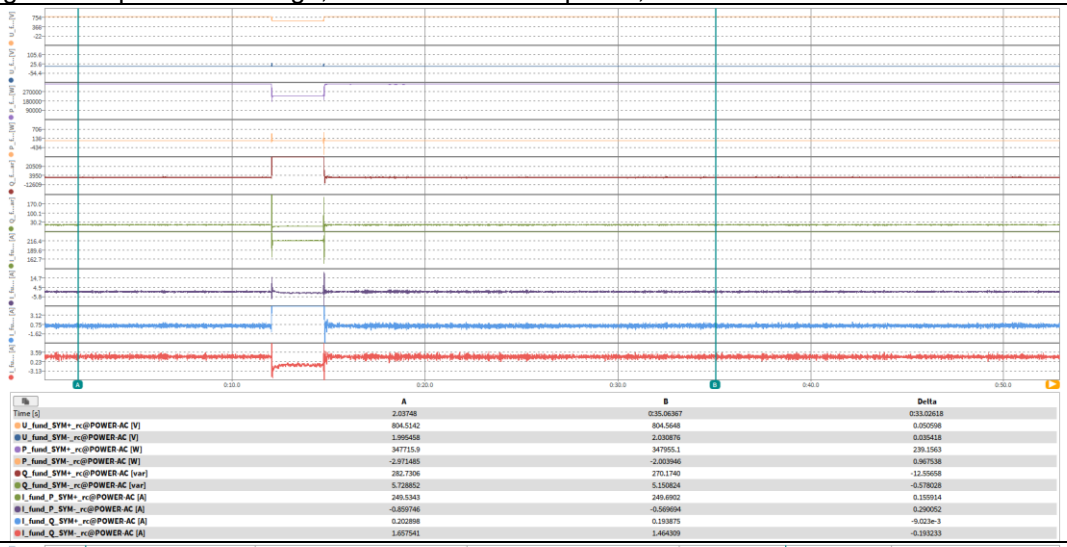
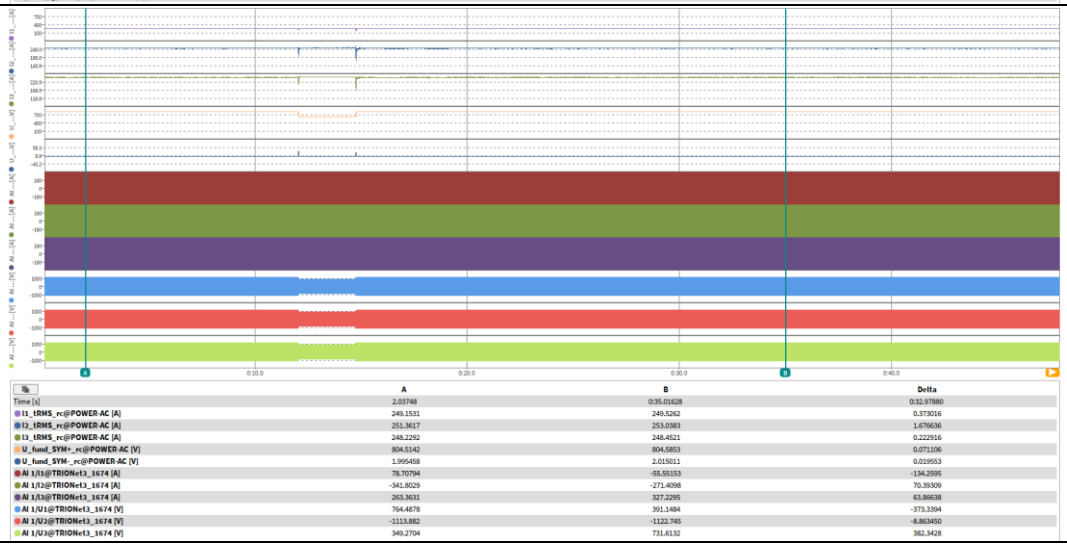
VD4-8 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.03748	0:35.06367	0:33.02618
U_fund_SYM+_rc@POWER-AC [V]	804.5142	804.5648	0.050598
U_fund_SYM-_rc@POWER-AC [V]	1.995458	2.030876	0.035418
P_fund_SYM+_rc@POWER-AC [W]	347715.9	347955.1	239.1563
P_fund_SYM-_rc@POWER-AC [W]	-2.971485	-2.003946	0.967538
Q_fund_SYM+_rc@POWER-AC [var]	282.7306	270.1740	-12.55658
Q_fund_SYM-_rc@POWER-AC [var]	5.728852	5.150824	-0.578028
I_fund_P_SYM+_rc@POWER-AC [A]	249.5343	249.6902	0.155914
I_fund_P_SYM-_rc@POWER-AC [A]	-0.859746	-0.569694	0.290052
I_fund_Q_SYM+_rc@POWER-AC [A]	0.202898	0.193875	-9.023e-3
I_fund_Q_SYM-_rc@POWER-AC [A]	1.657541	1.464309	-0.193233



	A	B	Delta
Time [s]	2.03748	0:35.01628	0:32.97880
I1_tRMS_rc@POWER-AC [A]	249.1531	249.5262	0.373016
I2_tRMS_rc@POWER-AC [A]	251.3617	253.0383	1.676636
I3_tRMS_rc@POWER-AC [A]	248.2292	248.4521	0.222916
U_fund_SYM+_rc@POWER-AC [V]	804.5142	804.5853	0.071106
U_fund_SYM-_rc@POWER-AC [V]	1.995458	2.015011	0.019553
AI 1/I1@TRIONet3_1674 [A]	78.70794	-55.55153	-134.2595
AI 1/I2@TRIONet3_1674 [A]	-341.8029	-271.4098	70.39309
AI 1/I3@TRIONet3_1674 [A]	263.3631	327.2295	63.86638
AI 1/U1@TRIONet3_1674 [V]	764.4878	391.1484	-373.3394
AI 1/U2@TRIONet3_1674 [V]	-1113.882	-1122.745	-8.863450
AI 1/U3@TRIONet3_1674 [V]	349.2704	731.6132	382.3428

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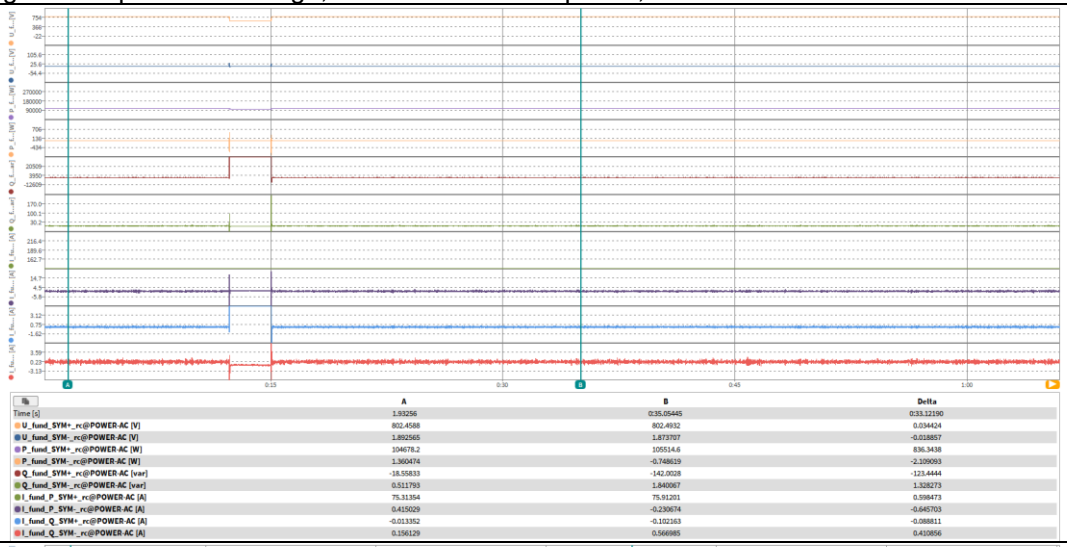
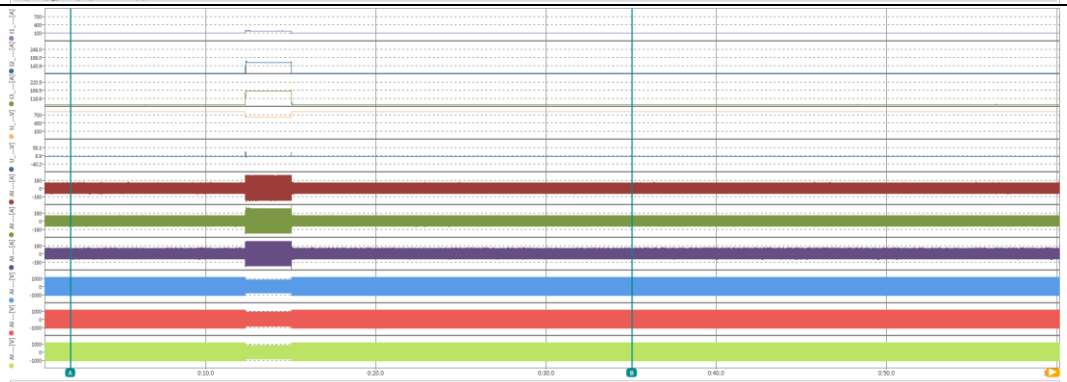
Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

VD4-9 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	1.93256	0:35.05445	0:33.12190
U_fund_SYM+_rc@POWER-AC [V]	802.4588	802.4932	0.034424
U_fund_SYM-_rc@POWER-AC [V]	1.892565	1.873707	-0.018857
P_fund_SYM+_rc@POWER-AC [W]	104678.2	105514.6	836.3438
P_fund_SYM-_rc@POWER-AC [W]	1.360474	-0.748619	-2.109093
Q_fund_SYM+_rc@POWER-AC [var]	-18.55833	-142.0028	-123.4444
Q_fund_SYM-_rc@POWER-AC [var]	0.511793	1.840067	1.328273
I_fund_P_SYM+_rc@POWER-AC [A]	75.31354	75.91201	0.598473
I_fund_P_SYM-_rc@POWER-AC [A]	0.415029	-0.230674	-0.645703
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.013352	-0.102163	-0.088811
I_fund_Q_SYM-_rc@POWER-AC [A]	0.156129	0.566985	0.410856



	A	B	Delta
Time [s]	2.09360	0:35.05445	0:32.96085
I1_tRMS_rc@POWER-AC [A]	76.21265	75.75571	-0.456940
I2_tRMS_rc@POWER-AC [A]	76.81052	76.56774	-0.242775
I3_tRMS_rc@POWER-AC [A]	75.89443	75.58431	-0.310120
U_fund_SYM+_rc@POWER-AC [V]	802.4927	802.4932	4.883e-4
U_fund_SYM-_rc@POWER-AC [V]	1.845781	1.873707	0.027926
AI 1/I1@TRIONet3_1674 [A]	85.62208	104.3677	18.74566
AI 1/I2@TRIONet3_1674 [A]	-95.33764	-82.93987	12.39777
AI 1/I3@TRIONet3_1674 [A]	9.834767	-21.27886	-31.11363
AI 1/U1@TRIONet3_1674 [V]	1129.428	1114.292	-15.13648
AI 1/U2@TRIONet3_1674 [V]	-633.3685	-380.2500	253.1185
AI 1/U3@TRIONet3_1674 [V]	-496.3458	-734.3812	-238.0355

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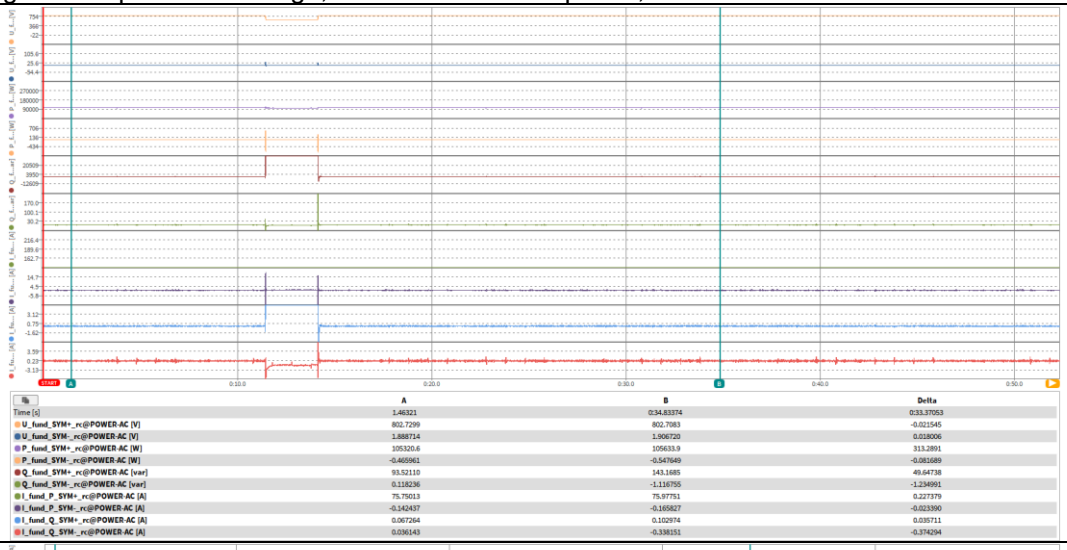
VD4-10 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	1.46321	0:34.83374	0:33.37053
U_fund_SYM+_rc@POWER-AC [V]	802.7299	802.7083	-0.021545
U_fund_SYM-_rc@POWER-AC [V]	1.888714	1.906720	0.018006
P_fund_SYM+_rc@POWER-AC [W]	105320.6	105633.9	313.2891
P_fund_SYM-_rc@POWER-AC [W]	-0.465961	-0.547649	-0.081689
Q_fund_SYM+_rc@POWER-AC [var]	93.52110	143.1685	49.64738
Q_fund_SYM-_rc@POWER-AC [var]	0.118236	-1.116755	-1.234991
I_fund_P_SYM+_rc@POWER-AC [A]	75.75013	75.97751	0.227379
I_fund_P_SYM-_rc@POWER-AC [A]	-0.142437	-0.165827	-0.023390
I_fund_Q_SYM+_rc@POWER-AC [A]	0.067264	0.102974	0.035711
I_fund_Q_SYM-_rc@POWER-AC [A]	0.036143	-0.338151	-0.374294

	A	B	Delta
Time [s]	1.51041	0:34.12573	0:32.61533
I1_tRMS_rc@POWER-AC [A]	75.54801	75.86511	0.317101
I2_tRMS_rc@POWER-AC [A]	76.11345	75.87778	-0.235664
I3_tRMS_rc@POWER-AC [A]	76.05167	75.77431	-0.277351
U_fund_SYM+_rc@POWER-AC [V]	802.7148	802.7278	0.012939
U_fund_SYM-_rc@POWER-AC [V]	1.928944	1.888891	-0.040053
AI 1/I1@TRIONet3_1674 [A]	-106.6625	-24.58692	82.07560
AI 1/I2@TRIONet3_1674 [A]	42.25970	102.4008	60.14109
AI 1/I3@TRIONet3_1674 [A]	64.43262	-77.66486	-142.0975
AI 1/U1@TRIONet3_1674 [V]	-911.5682	-750.2044	161.3638
AI 1/U2@TRIONet3_1674 [V]	-128.4733	1115.957	1244.430
AI 1/U3@TRIONet3_1674 [V]	1040.218	-365.8602	-1406.078

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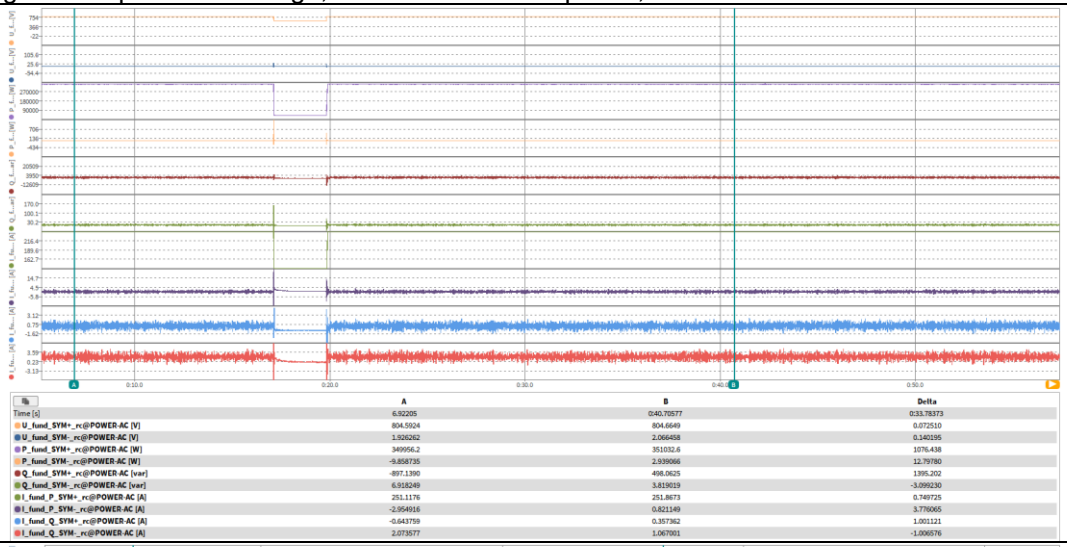
VD4-11 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	6.92205	0:40.70577	0:33.78373
U_fund_SYM+_rc@POWER-AC [V]	804.5924	804.6649	0.072510
U_fund_SYM-_rc@POWER-AC [V]	1.926262	2.066458	0.140195
P_fund_SYM+_rc@POWER-AC [W]	349956.2	351032.6	1076.438
P_fund_SYM-_rc@POWER-AC [W]	-5.858735	2.936066	12.79780
Q_fund_SYM+_rc@POWER-AC [var]	-897.1390	498.0625	1395.202
Q_fund_SYM-_rc@POWER-AC [var]	6.918249	3.819019	-3.099230
I_fund_P_SYM+_rc@POWER-AC [A]	251.1176	251.8673	0.749725
I_fund_P_SYM-_rc@POWER-AC [A]	-2.954916	0.821149	3.776065
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.643759	0.357362	1.001121
I_fund_Q_SYM-_rc@POWER-AC [A]	2.073577	1.067001	-1.006576

	A	B	Delta
Time [s]	7.07702	0:40.03423	0:32.95721
I1_tRMS_rc@POWER-AC [A]	247.0069	248.1432	1.136261
I2_tRMS_rc@POWER-AC [A]	250.6092	249.7217	-0.887482
I3_tRMS_rc@POWER-AC [A]	248.3104	248.5692	0.258850
U_fund_SYM+_rc@POWER-AC [V]	804.4921	804.5376	0.045471
U_fund_SYM-_rc@POWER-AC [V]	2.056918	2.058486	1.568e-3
AI 1/I1@TRIONet3_1674 [A]	285.8043	21.45767	-264.3466
AI 1/I2@TRIONet3_1674 [A]	-319.2127	-301.0631	18.14962
AI 1/I3@TRIONet3_1674 [A]	33.97465	279.8736	245.8990
AI 1/U1@TRIONet3_1674 [V]	1127.117	635.9926	-491.1249
AI 1/U2@TRIONet3_1674 [V]	-655.6082	-1131.576	-475.9677
AI 1/U3@TRIONet3_1674 [V]	-471.7436	495.5545	967.2981

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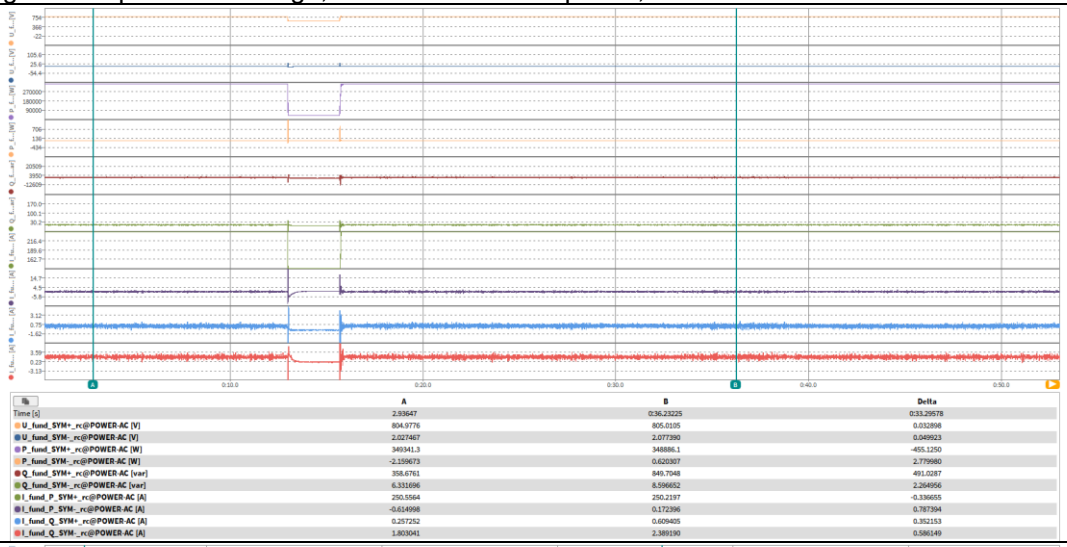
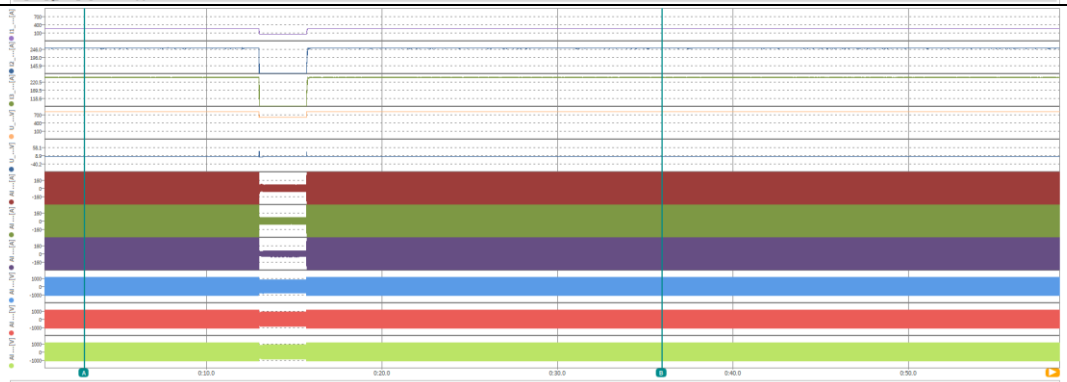
VD4-12 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.93647	0:36.23225	0:33.29578
U_fund_SYM+_rc@POWER-AC [V]	804.9776	805.0105	0.032898
U_fund_SYM-_rc@POWER-AC [V]	2.027467	2.077390	0.049923
P_fund_SYM+_rc@POWER-AC [W]	349341.3	348886.1	-455.1250
P_fund_SYM-_rc@POWER-AC [W]	-2.159673	0.620307	2.779980
Q_fund_SYM+_rc@POWER-AC [var]	358.6761	849.7048	491.0287
Q_fund_SYM-_rc@POWER-AC [var]	6.331696	8.596652	2.264956
I_fund_P_SYM+_rc@POWER-AC [A]	250.5564	250.2197	-0.336655
I_fund_P_SYM-_rc@POWER-AC [A]	-0.614998	0.172396	0.787394
I_fund_Q_SYM+_rc@POWER-AC [A]	0.257252	0.609405	0.352153
I_fund_Q_SYM-_rc@POWER-AC [A]	1.803041	2.389190	0.586149



	A	B	Delta
Time [s]	3.03120	0:35.94808	0:32.91688
I1_tRMS_rc@POWER-AC [A]	250.2953	249.6371	-0.658264
I2_tRMS_rc@POWER-AC [A]	251.9186	251.8805	-0.038116
I3_tRMS_rc@POWER-AC [A]	248.7138	250.3940	1.680206
U_fund_SYM+_rc@POWER-AC [V]	804.9786	805.0159	0.037354
U_fund_SYM-_rc@POWER-AC [V]	2.015877	2.080151	0.064274
AI 1/I1@TRIONet3_1674 [A]	-262.2903	-335.6636	-73.37332
AI 1/I2@TRIONet3_1674 [A]	-72.38985	250.0117	322.4015
AI 1/I3@TRIONet3_1674 [A]	334.7695	85.65188	-249.1176
AI 1/U1@TRIONet3_1674 [V]	-368.9769	-1103.417	-734.4399
AI 1/U2@TRIONet3_1674 [V]	-748.9353	315.6109	1064.546
AI 1/U3@TRIONet3_1674 [V]	1118.030	787.9184	-330.1115

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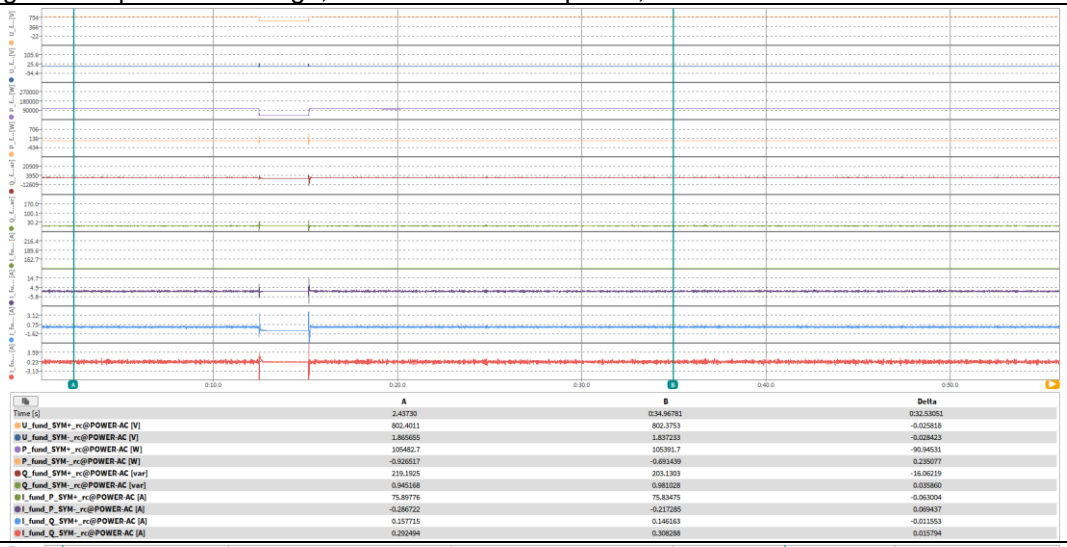
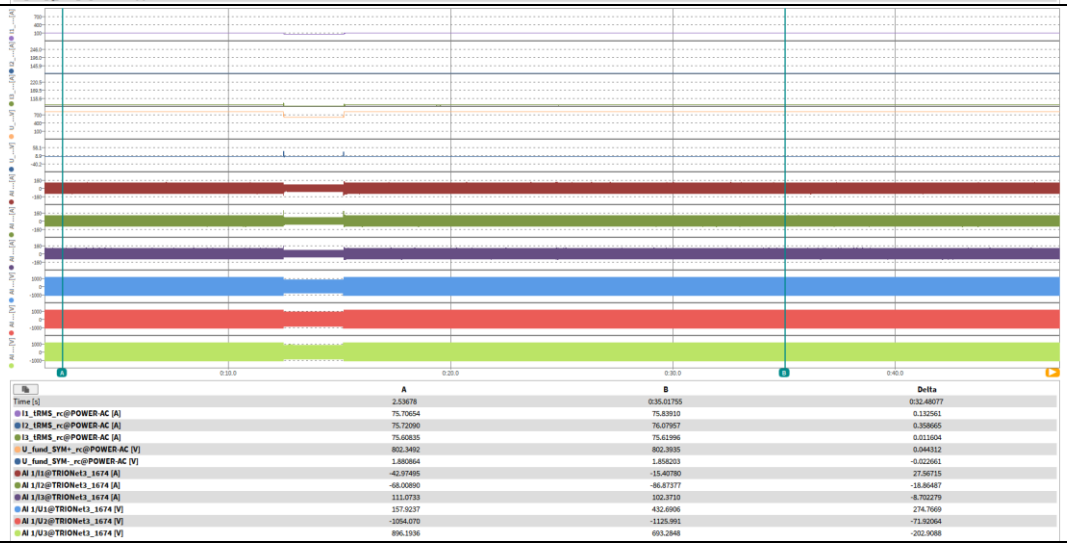
VD4-13 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.43730	0:34.96781	0:32.53051
U_fund_SYM+_rc@POWER-AC [V]	802.4011	802.3753	-0.025818
U_fund_SYM-_rc@POWER-AC [V]	1.865655	1.837233	-0.028423
P_fund_SYM+_rc@POWER-AC [W]	105482.7	105391.7	-90.94531
P_fund_SYM-_rc@POWER-AC [W]	-0.926517	-0.691439	0.235077
Q_fund_SYM+_rc@POWER-AC [var]	219.1925	203.1303	-16.06219
Q_fund_SYM-_rc@POWER-AC [var]	0.945168	0.981028	0.035860
I_fund_P_SYM+_rc@POWER-AC [A]	75.89776	75.83475	-0.063004
I_fund_P_SYM-_rc@POWER-AC [A]	-0.286722	-0.217285	0.069437
I_fund_Q_SYM+_rc@POWER-AC [A]	0.157715	0.146163	-0.011553
I_fund_Q_SYM-_rc@POWER-AC [A]	0.292494	0.308288	0.015794



	A	B	Delta
Time [s]	2.53678	0:35.01755	0:32.48077
I1_tRMS_rc@POWER-AC [A]	75.70654	75.83910	0.132561
I2_tRMS_rc@POWER-AC [A]	75.72090	76.07957	0.358665
I3_tRMS_rc@POWER-AC [A]	75.60835	75.61996	0.011604
U_fund_SYM+_rc@POWER-AC [V]	802.3492	802.3935	0.044312
U_fund_SYM-_rc@POWER-AC [V]	1.880864	1.858203	-0.022661
AI 1/I1@TRIONet3_1674 [A]	-42.97495	-15.40780	27.56715
AI 1/I2@TRIONet3_1674 [A]	-68.00890	-86.87377	-18.86487
AI 1/I3@TRIONet3_1674 [A]	111.0733	102.3710	-8.702279
AI 1/U1@TRIONet3_1674 [V]	157.9237	432.6906	274.7669
AI 1/U2@TRIONet3_1674 [V]	-1054.070	-1125.991	-71.92064
AI 1/U3@TRIONet3_1674 [V]	896.1936	693.2848	-202.9088

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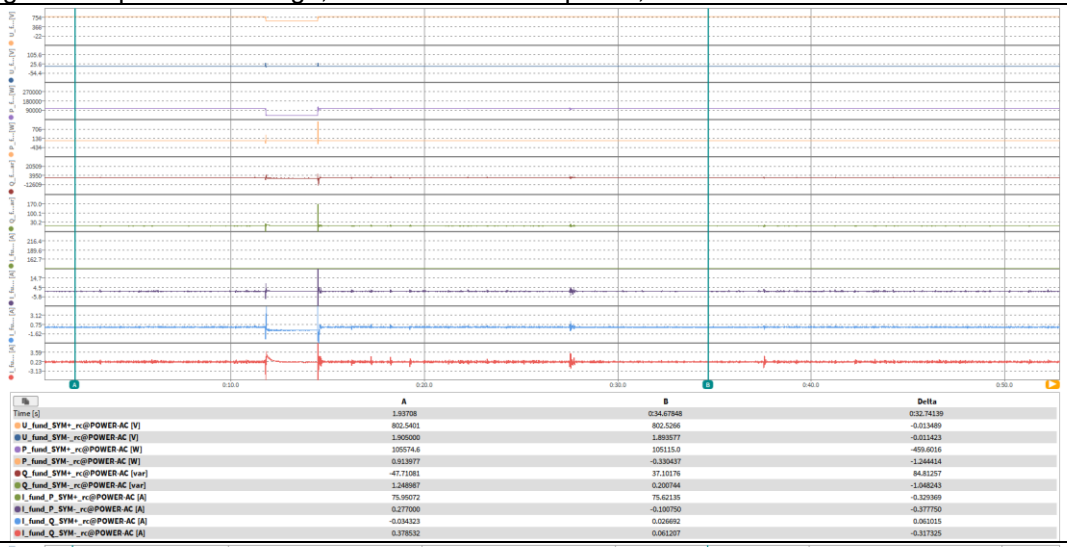
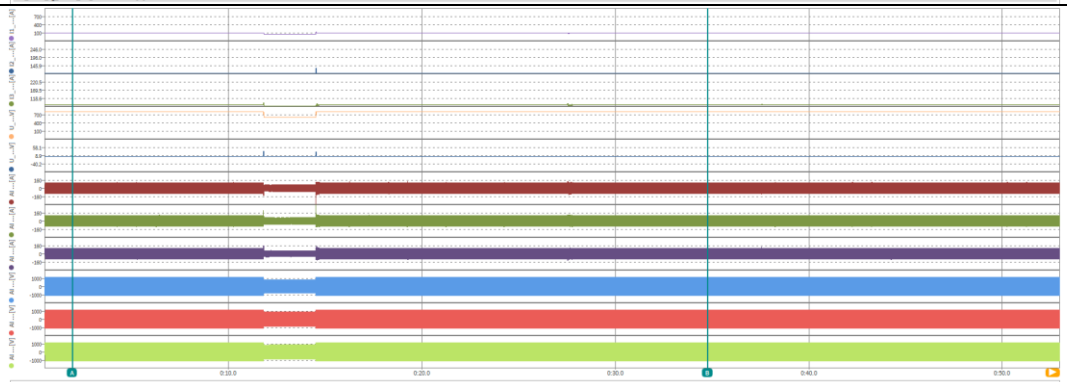
VD4-14 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	1.93708	0:34.67848	0:32.74139
U_fund_SYM+_rc@POWER-AC [V]	802.5401	802.5266	-0.013489
U_fund_SYM-_rc@POWER-AC [V]	1.905000	1.893577	-0.011423
P_fund_SYM+_rc@POWER-AC [W]	105574.6	105115.0	-459.6016
P_fund_SYM-_rc@POWER-AC [W]	0.913977	-0.330437	-1.244414
Q_fund_SYM+_rc@POWER-AC [var]	-47.71081	37.10176	84.81257
Q_fund_SYM-_rc@POWER-AC [var]	1.248987	0.200744	-1.048243
I_fund_P_SYM+_rc@POWER-AC [A]	75.95072	75.62135	-0.329369
I_fund_P_SYM-_rc@POWER-AC [A]	0.277000	-0.100750	-0.377750
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.034323	0.026692	0.061015
I_fund_Q_SYM-_rc@POWER-AC [A]	0.378532	0.061207	-0.317325



	A	B	Delta
Time [s]	1.93708	0:34.77297	0:32.83589
I1_tRMS_rc@POWER-AC [A]	75.56189	75.58409	0.022202
I2_tRMS_rc@POWER-AC [A]	76.28013	75.82743	-0.452698
I3_tRMS_rc@POWER-AC [A]	76.16096	75.69617	-0.464790
U_fund_SYM+_rc@POWER-AC [V]	802.5401	802.5328	-7.263e-3
U_fund_SYM-_rc@POWER-AC [V]	1.905000	1.888096	-0.016904
AI 1/I1@TRIONet3_1674 [A]	-99.65897	-61.81002	37.84895
AI 1/I2@TRIONet3_1674 [A]	18.86487	107.1692	88.30429
AI 1/I3@TRIONet3_1674 [A]	80.73450	-45.21013	-125.9446
AI 1/U1@TRIONet3_1674 [V]	-710.5215	-1043.688	-333.1664
AI 1/U2@TRIONet3_1674 [V]	-410.1608	906.3376	1316.498
AI 1/U3@TRIONet3_1674 [V]	1120.823	137.3432	-983.4796

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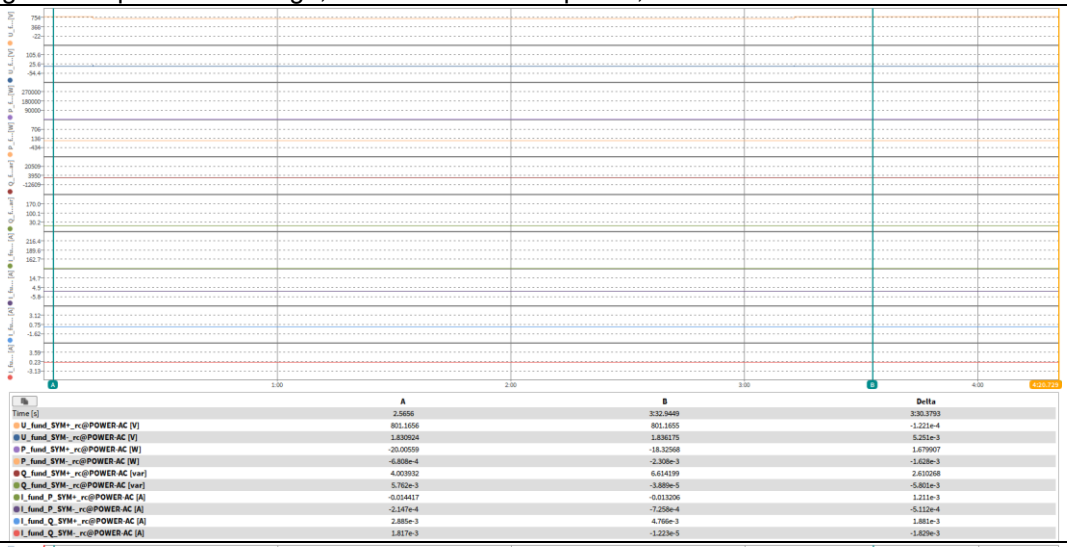
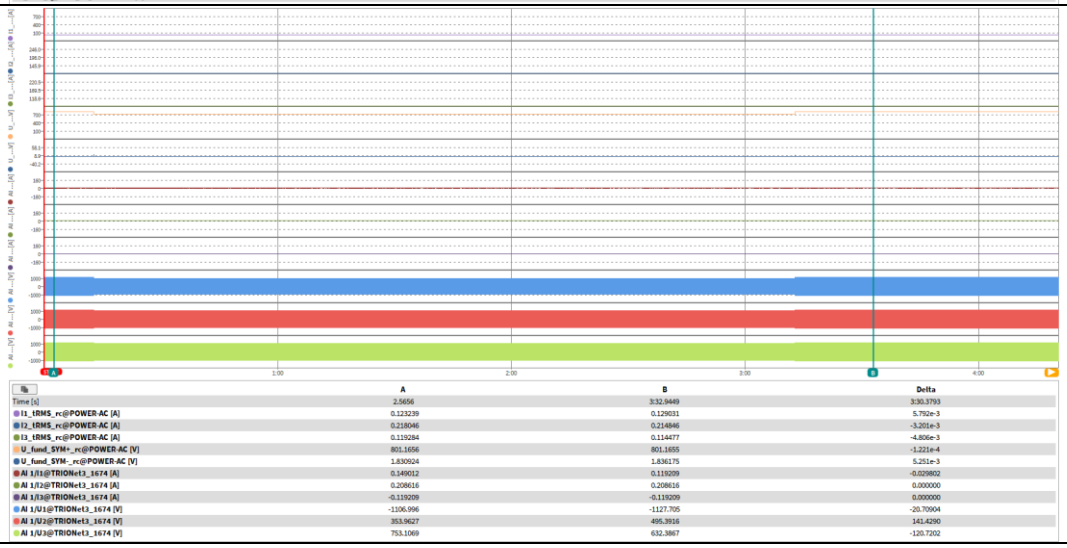
VD5 (no-load test)

a) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.5656	3:32.9449	3:30.3793
U_fund_SYM+_rc@POWER-AC [V]	801.1656	801.1655	-1.221e-4
U_fund_SYM-_rc@POWER-AC [V]	1.830924	1.836175	5.251e-3
P_fund_SYM+_rc@POWER-AC [W]	-20.00559	-18.32568	1.679907
P_fund_SYM-_rc@POWER-AC [W]	-6.808e-4	-2.308e-3	-1.628e-3
Q_fund_SYM+_rc@POWER-AC [var]	4.003932	6.614199	2.610268
Q_fund_SYM-_rc@POWER-AC [var]	5.762e-3	-3.889e-5	-5.801e-3
I_fund_P_SYM+_rc@POWER-AC [A]	-0.014417	-0.013206	1.211e-3
I_fund_P_SYM-_rc@POWER-AC [A]	-2.147e-4	-7.258e-4	-5.112e-4
I_fund_Q_SYM+_rc@POWER-AC [A]	2.885e-3	4.766e-3	1.881e-3
I_fund_Q_SYM-_rc@POWER-AC [A]	1.817e-3	-1.223e-5	-1.829e-3



	A	B	Delta
Time [s]	2.5656	3:32.9449	3:30.3793
I1_tRMS_rc@POWER-AC [A]	0.123239	0.129031	5.792e-3
I2_tRMS_rc@POWER-AC [A]	0.218046	0.214846	-3.201e-3
I3_tRMS_rc@POWER-AC [A]	0.119284	0.114477	-4.806e-3
U_fund_SYM+_rc@POWER-AC [V]	801.1656	801.1655	-1.221e-4
U_fund_SYM-_rc@POWER-AC [V]	1.830924	1.836175	5.251e-3
AI 1/I1@TRIONet3_1674 [A]	0.149012	0.119209	-0.029802
AI 1/I2@TRIONet3_1674 [A]	0.208616	0.208616	0.000000
AI 1/I3@TRIONet3_1674 [A]	-0.119209	-0.119209	0.000000
AI 1/U1@TRIONet3_1674 [V]	-1106.096	-1127.705	-20.70904
AI 1/U2@TRIONet3_1674 [V]	353.9627	495.3916	141.4290
AI 1/U3@TRIONet3_1674 [V]	753.1069	632.3867	-120.7202

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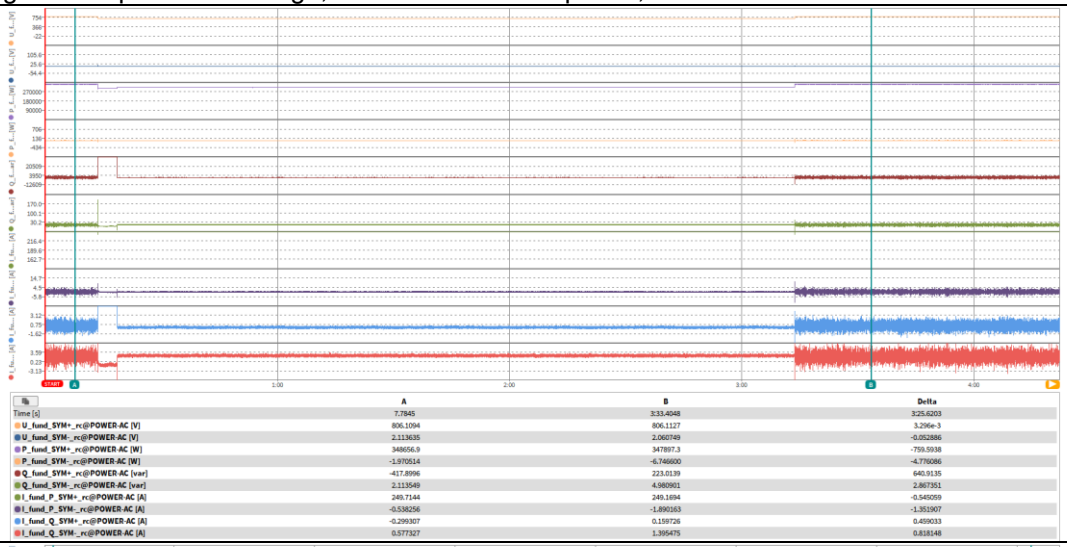
VD5-1 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	7.7845	3:33.4048	3:25.6203
U_fund_SYM+_rc@POWER-AC [V]	806.1094	806.1127	3.296e-3
U_fund_SYM-_rc@POWER-AC [V]	2.113635	2.060749	-0.052886
P_fund_SYM+_rc@POWER-AC [W]	348656.9	347897.3	-759.5938
P_fund_SYM-_rc@POWER-AC [W]	-1.970514	-6.746600	-4.776086
Q_fund_SYM+_rc@POWER-AC [var]	-417.8996	223.0139	640.9135
Q_fund_SYM-_rc@POWER-AC [var]	2.113549	4.980901	2.867351
I_fund_P_SYM+_rc@POWER-AC [A]	249.7144	249.1694	-0.545059
I_fund_P_SYM-_rc@POWER-AC [A]	-0.538256	-1.890163	-1.351907
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.299307	0.159726	0.459033
I_fund_Q_SYM-_rc@POWER-AC [A]	0.577327	1.395475	0.818148

	A	B	Delta
Time [s]	4.3382	3:33.0226	3:28.6844
I1_tRMS_rc@POWER-AC [A]	247.7011	248.9822	1.281113
I2_tRMS_rc@POWER-AC [A]	252.5166	252.0677	-0.448837
I3_tRMS_rc@POWER-AC [A]	250.3021	249.0470	-1.255142
U_fund_SYM+_rc@POWER-AC [V]	806.1288	806.1252	-3.601e-3
U_fund_SYM-_rc@POWER-AC [V]	2.152584	2.114869	-0.037715
AI 1/I1@TRIONet3_1674 [A]	118.7325	-236.2728	-355.0053
AI 1/I2@TRIONet3_1674 [A]	224.9181	355.9292	131.0110
AI 1/I3@TRIONet3_1674 [A]	-343.2632	-119.5669	223.6962
AI 1/U1@TRIONet3_1674 [V]	-189.1105	-1079.246	-890.1351
AI 1/U2@TRIONet3_1674 [V]	1070.612	852.8798	-217.7317
AI 1/U3@TRIONet3_1674 [V]	-881.7401	226.3816	1108.122

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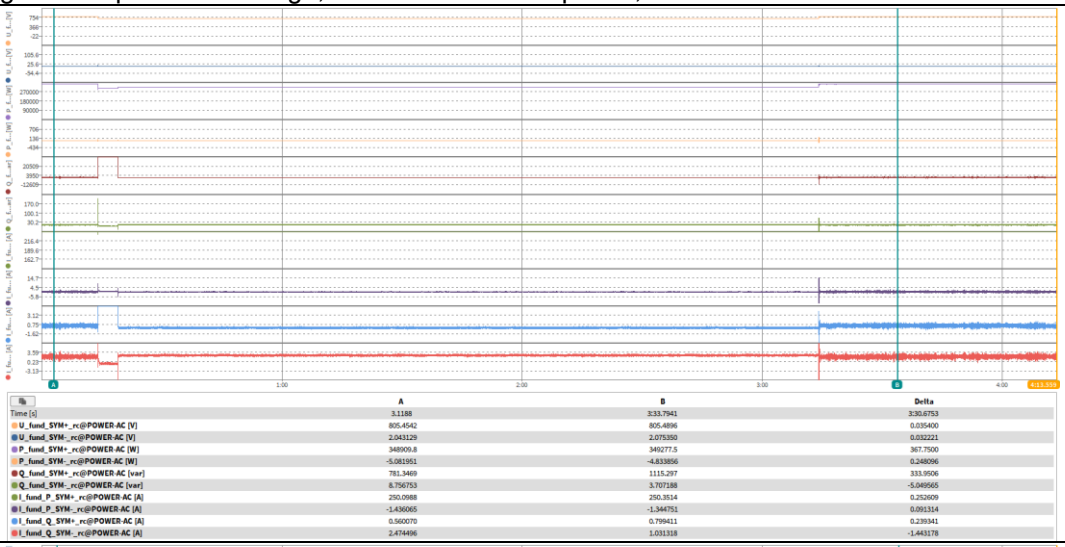
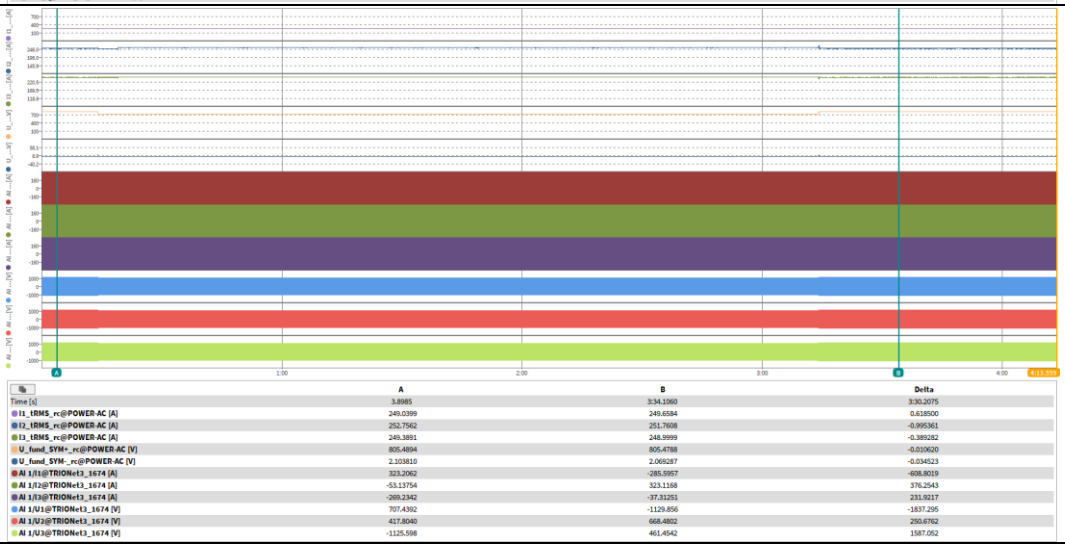
VD5-2 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



Time [s]	A	B	Delta
U_fund_SYM+_rc@POWER-AC [V]	805.4542	805.4896	0.035400
U_fund_SYM-_rc@POWER-AC [V]	2.043129	2.075350	0.032221
P_fund_SYM+_rc@POWER-AC [W]	348909.8	349277.5	367.7500
P_fund_SYM-_rc@POWER-AC [W]	-5.081951	-4.833856	0.248096
Q_fund_SYM+_rc@POWER-AC [var]	781.3469	1115.297	333.9506
Q_fund_SYM-_rc@POWER-AC [var]	8.756753	3.707188	-5.049565
I_fund_P_SYM+_rc@POWER-AC [A]	250.0988	250.3514	0.252609
I_fund_P_SYM-_rc@POWER-AC [A]	-1.436065	-1.344751	0.091314
I_fund_Q_SYM+_rc@POWER-AC [A]	0.560070	0.799411	0.239341
I_fund_Q_SYM-_rc@POWER-AC [A]	2.474496	1.031318	-1.443178



Time [s]	A	B	Delta
I1_tRMS_rc@POWER-AC [A]	249.0399	249.6584	0.618500
I2_tRMS_rc@POWER-AC [A]	252.7562	251.7608	-0.995361
I3_tRMS_rc@POWER-AC [A]	249.3891	248.9999	-0.389282
U_fund_SYM+_rc@POWER-AC [V]	805.4894	805.4788	-0.010620
U_fund_SYM-_rc@POWER-AC [V]	2.103810	2.069287	-0.034523
AI 1/I1@TRIONet3_1674 [A]	323.2062	-285.5957	-608.8019
AI 1/I2@TRIONet3_1674 [A]	-53.13754	323.1168	376.2543
AI 1/I3@TRIONet3_1674 [A]	-269.2342	-37.31251	231.9217
AI 1/U1@TRIONet3_1674 [V]	707.4392	-1129.856	-1837.295
AI 1/U2@TRIONet3_1674 [V]	417.8040	668.4802	250.6762
AI 1/U3@TRIONet3_1674 [V]	-1125.598	461.4542	1587.052

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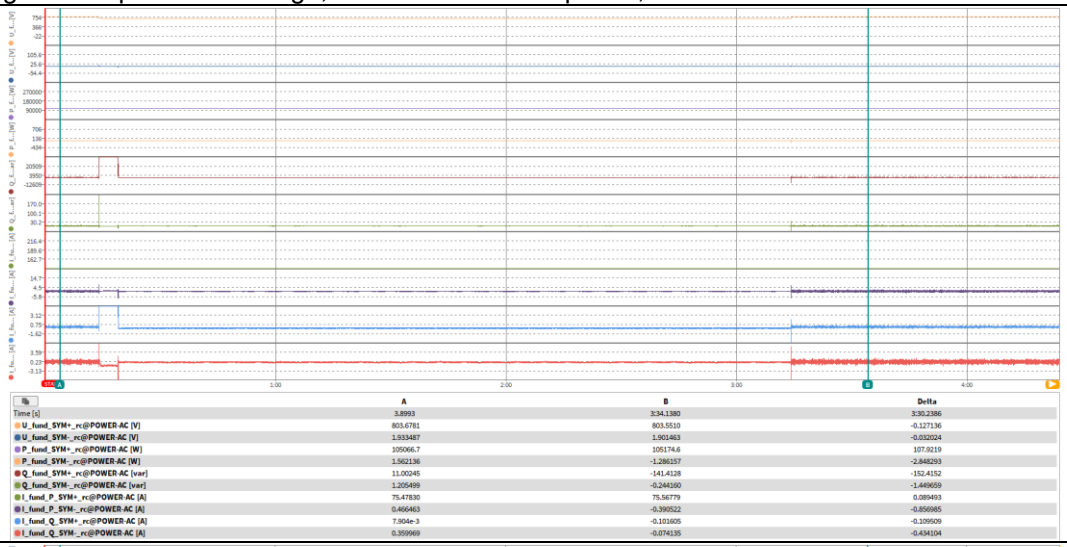
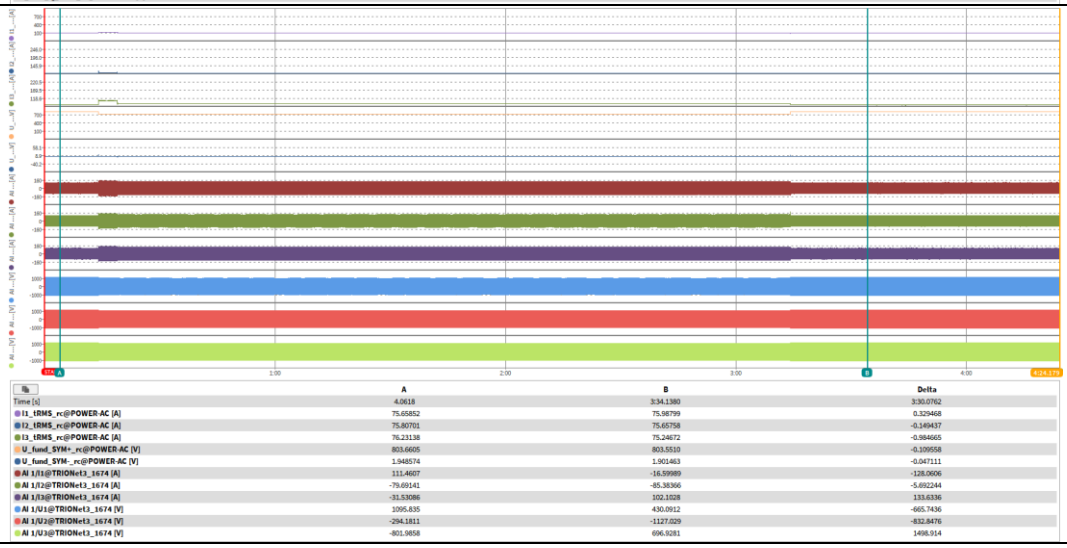
VD5-3 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	3.8993	3:34.1380	3:30.2386
U_fund_SYM+_rc@POWER-AC [V]	803.6781	803.5510	-0.127136
U_fund_SYM-_rc@POWER-AC [V]	1.933487	1.901463	-0.032024
P_fund_SYM+_rc@POWER-AC [W]	105066.7	105174.6	107.9219
P_fund_SYM-_rc@POWER-AC [W]	1.562136	-1.286157	-2.848293
Q_fund_SYM+_rc@POWER-AC [var]	11.00245	-141.4128	-152.4152
Q_fund_SYM-_rc@POWER-AC [var]	1.205499	-0.244160	-1.449659
I_fund_P_SYM+_rc@POWER-AC [A]	75.47830	75.56779	0.089493
I_fund_P_SYM-_rc@POWER-AC [A]	0.466463	-0.390522	-0.856985
I_fund_Q_SYM+_rc@POWER-AC [A]	7.904e-3	-0.101605	-0.109509
I_fund_Q_SYM-_rc@POWER-AC [A]	0.359969	-0.074135	-0.434104



	A	B	Delta
Time [s]	4.0618	3:34.1380	3:30.0762
I1_tRMS_rc@POWER-AC [A]	75.65852	75.98799	0.329468
I2_tRMS_rc@POWER-AC [A]	75.80701	75.65758	-0.149437
I3_tRMS_rc@POWER-AC [A]	76.23138	75.24672	-0.984665
U_fund_SYM+_rc@POWER-AC [V]	803.6605	803.5510	-0.109558
U_fund_SYM-_rc@POWER-AC [V]	1.948574	1.901463	-0.047111
AI 1/I1@TRIONet3_1674 [A]	111.4607	-16.59989	-128.0606
AI 1/I2@TRIONet3_1674 [A]	-79.69141	-85.38366	-5.692244
AI 1/I3@TRIONet3_1674 [A]	-31.53086	102.1028	133.6336
AI 1/U1@TRIONet3_1674 [V]	1095.835	430.0912	-665.7436
AI 1/U2@TRIONet3_1674 [V]	-294.1811	-1127.029	-832.8476
AI 1/U3@TRIONet3_1674 [V]	-801.9858	696.9281	1498.914

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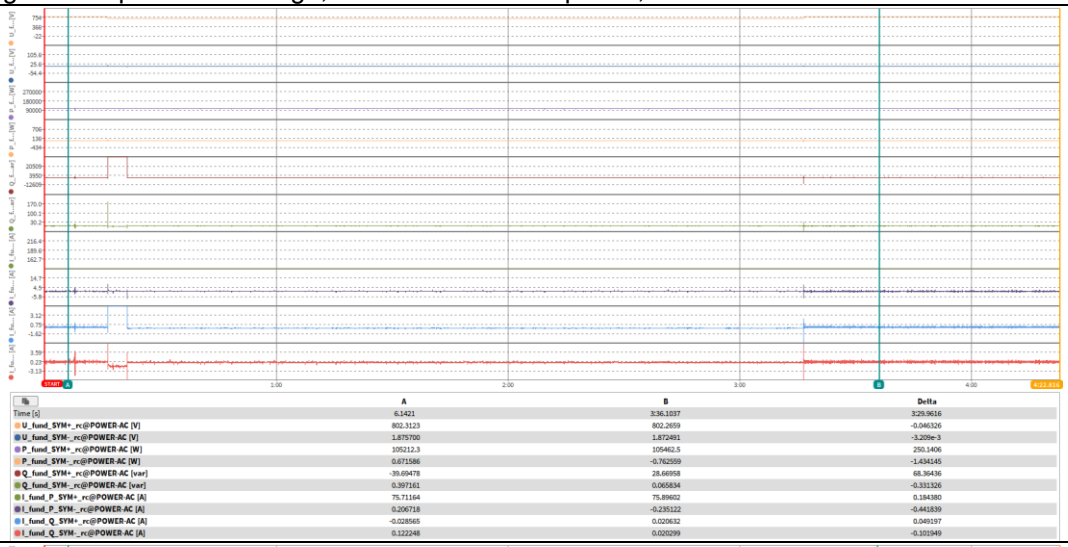
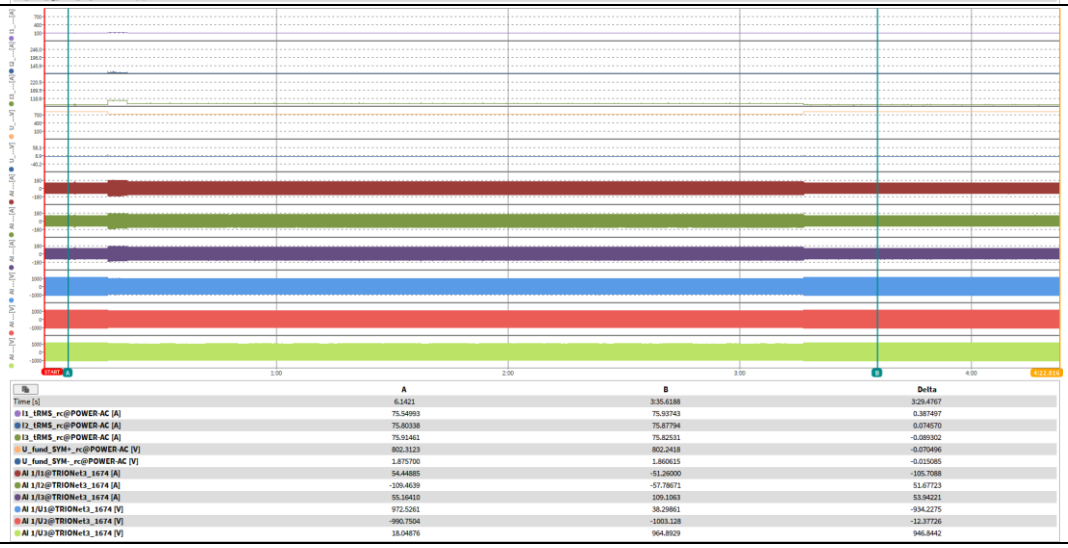
VD5-4 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	6.1421	336.1037	329.9616
U_fund_SYM+_rc@POWER-AC [V]	802.3123	802.2659	-0.046326
U_fund_SYM-_rc@POWER-AC [V]	1.875700	1.872491	-3.209e-3
P_fund_SYM+_rc@POWER-AC [W]	105212.3	105462.5	250.1406
P_fund_SYM-_rc@POWER-AC [W]	0.671586	-0.762559	-1.434145
Q_fund_SYM+_rc@POWER-AC [var]	-39.69478	28.66958	68.36436
Q_fund_SYM-_rc@POWER-AC [var]	0.397161	0.065834	-0.331326
I_fund_P_SYM+_rc@POWER-AC [A]	75.71164	75.89602	0.184380
I_fund_P_SYM-_rc@POWER-AC [A]	0.206718	-0.235122	-0.441839
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.028565	0.020632	0.049197
I_fund_Q_SYM-_rc@POWER-AC [A]	0.122248	0.020299	-0.101949



	A	B	Delta
Time [s]	6.1421	335.6188	329.4767
I1_tRMS_rc@POWER-AC [A]	75.54993	75.93743	0.387497
I2_tRMS_rc@POWER-AC [A]	75.80338	75.87794	0.074570
I3_tRMS_rc@POWER-AC [A]	75.91461	75.82531	-0.089302
U_fund_SYM+_rc@POWER-AC [V]	802.3123	802.2418	-0.070496
U_fund_SYM-_rc@POWER-AC [V]	1.875700	1.860615	-0.015085
AI 1/I1@TRIONet3_1674 [A]	54.44885	-51.26000	-105.7088
AI 1/I2@TRIONet3_1674 [A]	-109.4639	-57.78671	51.67723
AI 1/I3@TRIONet3_1674 [A]	55.16410	109.1063	53.94221
AI 1/U1@TRIONet3_1674 [V]	972.5261	38.29861	-934.2275
AI 1/U2@TRIONet3_1674 [V]	-990.7504	-1003.128	-12.37726
AI 1/U3@TRIONet3_1674 [V]	18.04876	964.8929	946.8442

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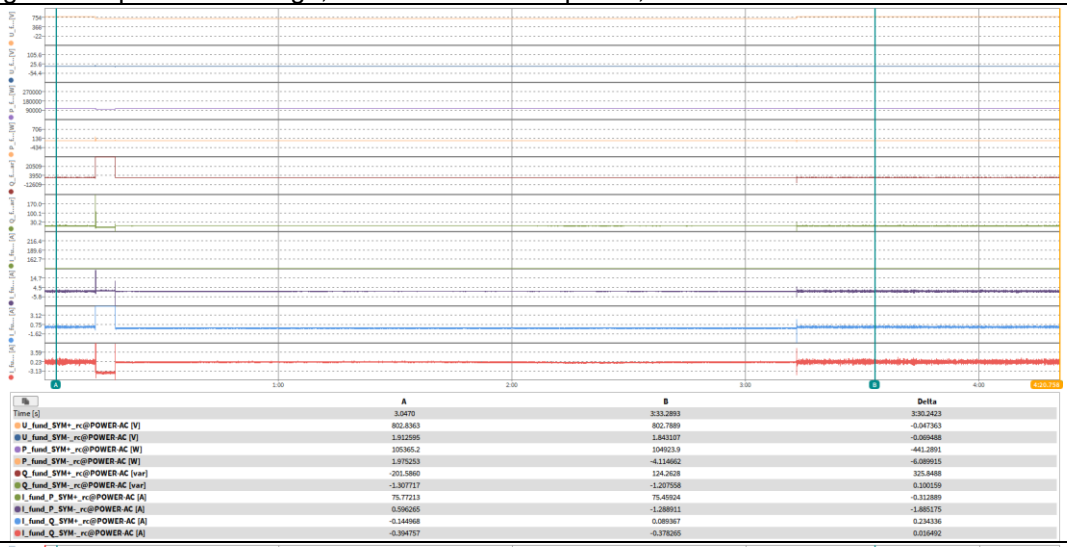
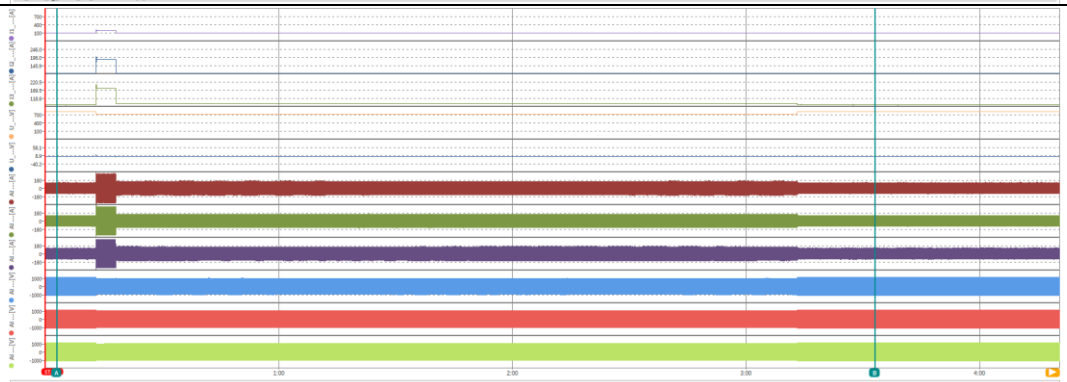
VD5-5 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	3.0470	3:33.2893	3:30.2423
U_fund_SYM+_rc@POWER-AC [V]	802.8363	802.7889	-0.047363
U_fund_SYM-_rc@POWER-AC [V]	1.912595	1.843107	-0.069488
P_fund_SYM+_rc@POWER-AC [W]	105365.2	104923.9	-441.2891
P_fund_SYM-_rc@POWER-AC [W]	1.975253	-4.114462	-6.089915
Q_fund_SYM+_rc@POWER-AC [var]	-201.5860	124.2628	325.8488
Q_fund_SYM-_rc@POWER-AC [var]	-1.307717	-1.207558	0.100159
I_fund_P_SYM+_rc@POWER-AC [A]	75.77213	75.45924	-0.312889
I_fund_P_SYM-_rc@POWER-AC [A]	0.596265	-1.288911	-1.885175
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.144968	0.089367	0.234336
I_fund_Q_SYM-_rc@POWER-AC [A]	-0.394757	-0.378265	0.016492



	A	B	Delta
Time [s]	3.0470	3:33.1289	3:30.0819
I1_tRMS_rc@POWER-AC [A]	75.75476	76.53822	0.783455
I2_tRMS_rc@POWER-AC [A]	75.27763	75.98699	0.709366
I3_tRMS_rc@POWER-AC [A]	76.47601	76.11950	-0.356506
U_fund_SYM+_rc@POWER-AC [V]	802.8363	802.7926	-0.043701
U_fund_SYM-_rc@POWER-AC [V]	1.912595	1.903639	-8.956e-3
AI 1/I1@TRIONet3_1674 [A]	54.12102	90.98650	36.86547
AI 1/I2@TRIONet3_1674 [A]	-105.1128	-88.00626	17.10653
AI 1/I3@TRIONet3_1674 [A]	51.17059	-2.712011	-53.88260
AI 1/U1@TRIONet3_1674 [V]	981.1833	1130.216	149.0326
AI 1/U2@TRIONet3_1674 [V]	-983.8708	-557.6935	426.1773
AI 1/U3@TRIONet3_1674 [V]	2.501965	-572.7797	-575.2817

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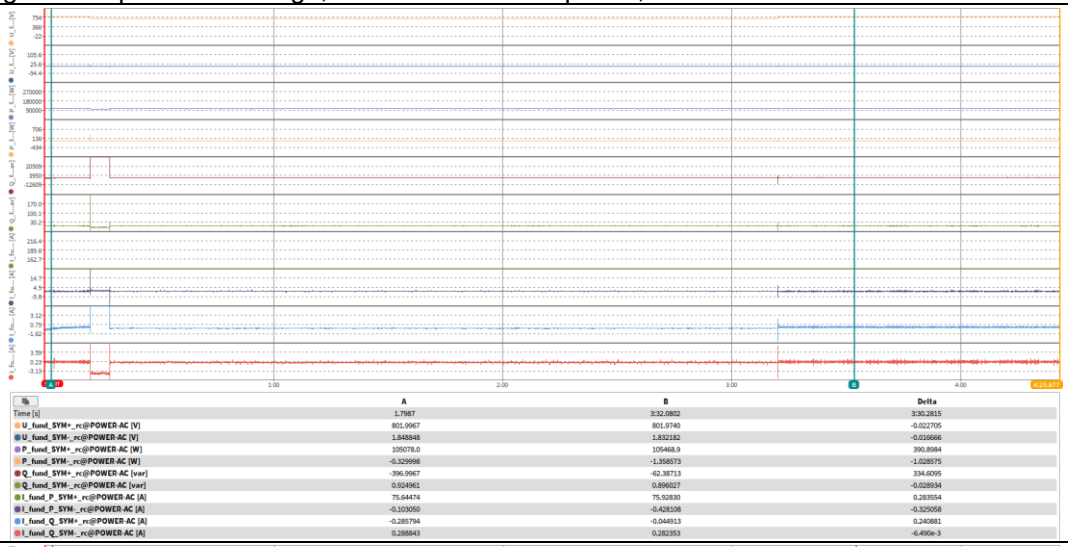
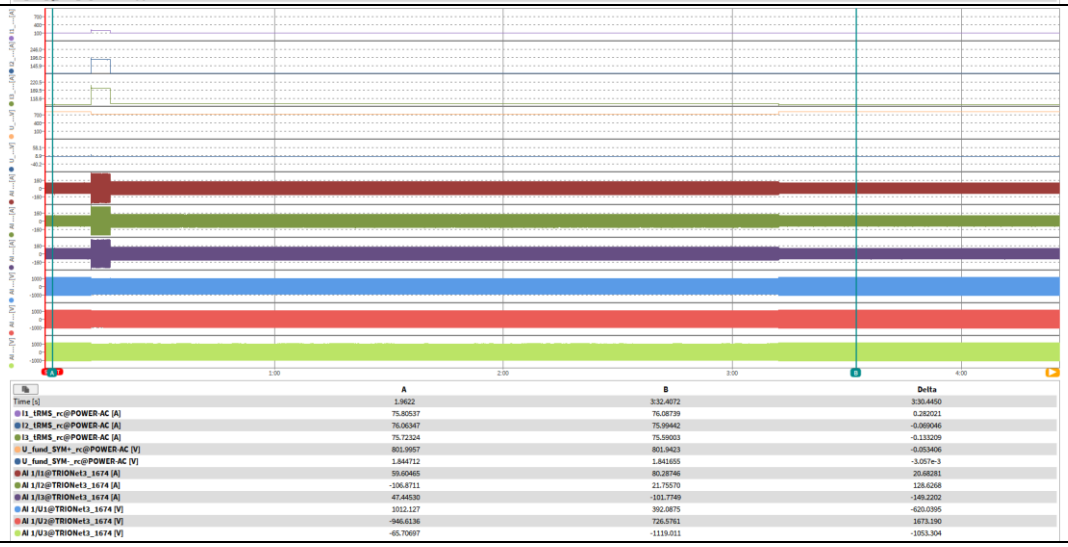
VD5-6 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	1.7987	3:32.0802	3:30.2815
U_fund_SYM+_rc@POWER-AC [V]	801.9967	801.9740	-0.022705
U_fund_SYM-_rc@POWER-AC [V]	1.848848	1.832182	-0.016666
P_fund_SYM+_rc@POWER-AC [W]	105078.0	105468.9	390.8984
P_fund_SYM-_rc@POWER-AC [W]	-0.329998	-1.358573	-1.028575
Q_fund_SYM+_rc@POWER-AC [var]	-396.9967	-62.38713	334.6095
Q_fund_SYM-_rc@POWER-AC [var]	0.924961	0.896027	-0.028934
I_fund_P_SYM+_rc@POWER-AC [A]	75.64474	75.92830	0.283554
I_fund_P_SYM-_rc@POWER-AC [A]	-0.103050	-0.428108	-0.325058
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.285794	-0.044913	0.240881
I_fund_Q_SYM-_rc@POWER-AC [A]	0.288643	0.282353	-6.490e-3



	A	B	Delta
Time [s]	1.9622	3:32.4072	3:30.4450
I1_tRMS_rc@POWER-AC [A]	75.80537	76.08739	0.282021
I2_tRMS_rc@POWER-AC [A]	76.06347	75.99442	-0.069046
I3_tRMS_rc@POWER-AC [A]	75.72324	75.59003	-0.133209
U_fund_SYM+_rc@POWER-AC [V]	801.9957	801.9423	-0.053406
U_fund_SYM-_rc@POWER-AC [V]	1.844712	1.841655	-3.057e-3
AI 1/I1@TRIONet3_1674 [A]	59.60465	80.28746	20.68281
AI 1/I2@TRIONet3_1674 [A]	-106.8711	21.75570	128.6268
AI 1/I3@TRIONet3_1674 [A]	47.44530	-101.7749	-149.2202
AI 1/U1@TRIONet3_1674 [V]	1012.127	392.0875	-620.0395
AI 1/U2@TRIONet3_1674 [V]	-946.6136	726.5761	1673.190
AI 1/U3@TRIONet3_1674 [V]	-65.70697	-1119.011	-1053.304

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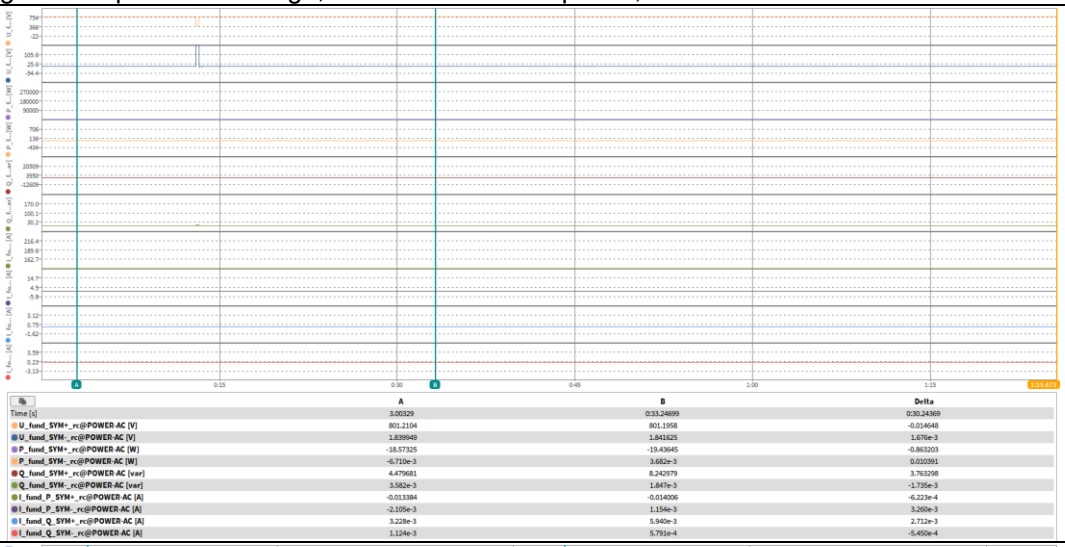
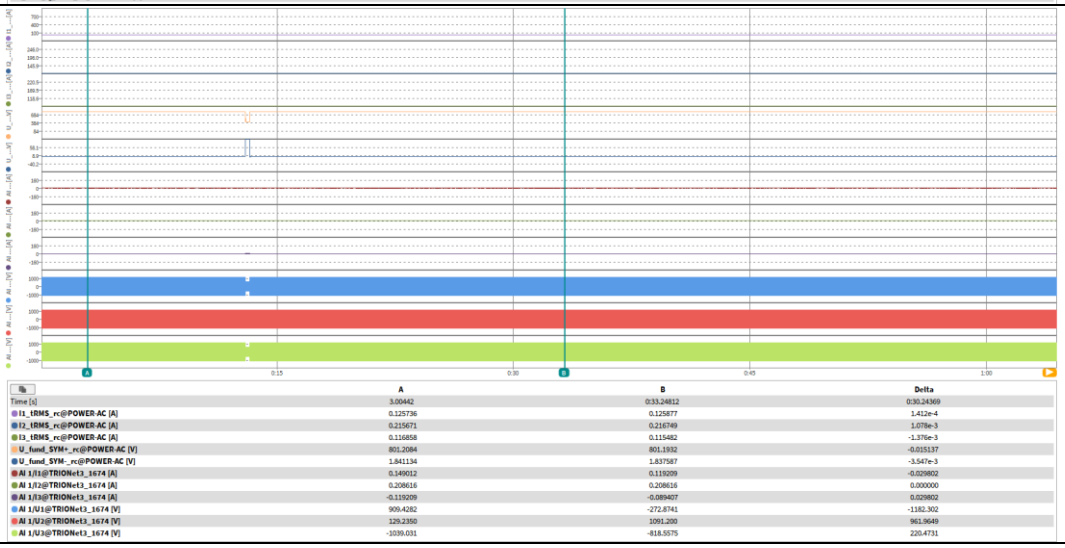
VD6 (no-load test)

a) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	3.00329	0:33.24699	0:30.24369
U_fund_SYM+_rc@POWER-AC [V]	801.2104	801.1958	-0.014648
U_fund_SYM-_rc@POWER-AC [V]	1.839949	1.841625	1.676e-3
P_fund_SYM+_rc@POWER-AC [W]	-18.57325	-19.43645	-0.863203
P_fund_SYM-_rc@POWER-AC [W]	-6.710e-3	3.682e-3	0.010391
Q_fund_SYM+_rc@POWER-AC [var]	4.479681	8.242979	3.763298
Q_fund_SYM-_rc@POWER-AC [var]	3.582e-3	1.847e-3	-1.735e-3
I_fund_P_SYM+_rc@POWER-AC [A]	-0.013384	-0.014006	-6.223e-4
I_fund_P_SYM-_rc@POWER-AC [A]	-2.105e-3	1.154e-3	3.260e-3
I_fund_Q_SYM+_rc@POWER-AC [A]	3.228e-3	5.940e-3	2.712e-3
I_fund_Q_SYM-_rc@POWER-AC [A]	1.124e-3	5.791e-4	-5.450e-4



	A	B	Delta
Time [s]	3.00442	0:33.24812	0:30.24369
I1_tRMS_rc@POWER-AC [A]	0.125736	0.125877	1.412e-4
I2_tRMS_rc@POWER-AC [A]	0.215671	0.216749	1.078e-3
I3_tRMS_rc@POWER-AC [A]	0.116858	0.115482	-1.376e-3
U_fund_SYM+_rc@POWER-AC [V]	801.2084	801.1932	-0.015137
U_fund_SYM-_rc@POWER-AC [V]	1.841134	1.837587	-3.547e-3
AI 1/I1@TRIONet3_1674 [A]	0.149012	0.119209	-0.029802
AI 1/I2@TRIONet3_1674 [A]	0.208616	0.208616	0.000000
AI 1/I3@TRIONet3_1674 [A]	-0.119209	-0.089407	0.029802
AI 1/U1@TRIONet3_1674 [V]	909.4282	-272.8741	-1182.302
AI 1/U2@TRIONet3_1674 [V]	129.2350	1091.209	961.9649
AI 1/U3@TRIONet3_1674 [V]	-1039.031	-818.5575	220.4731

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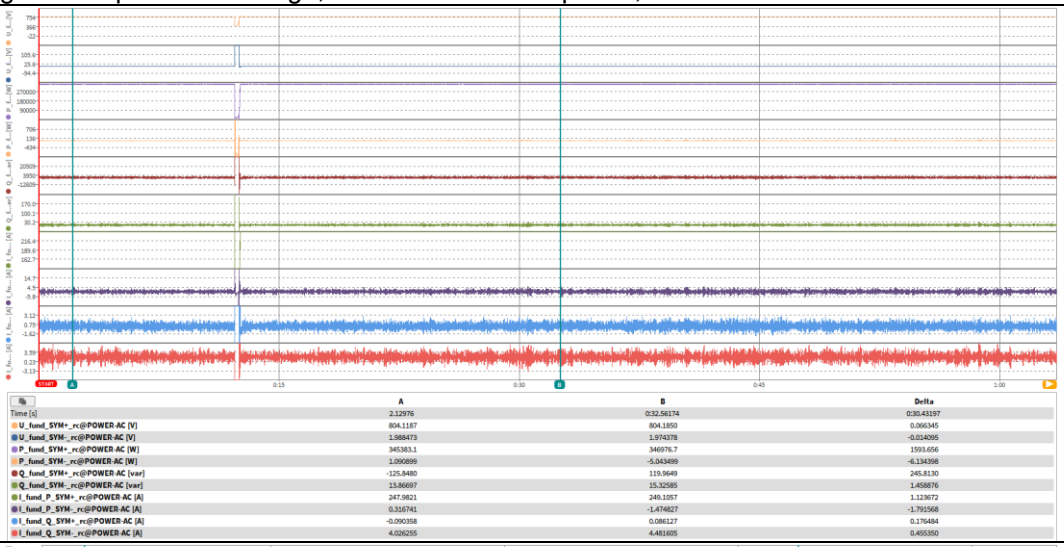
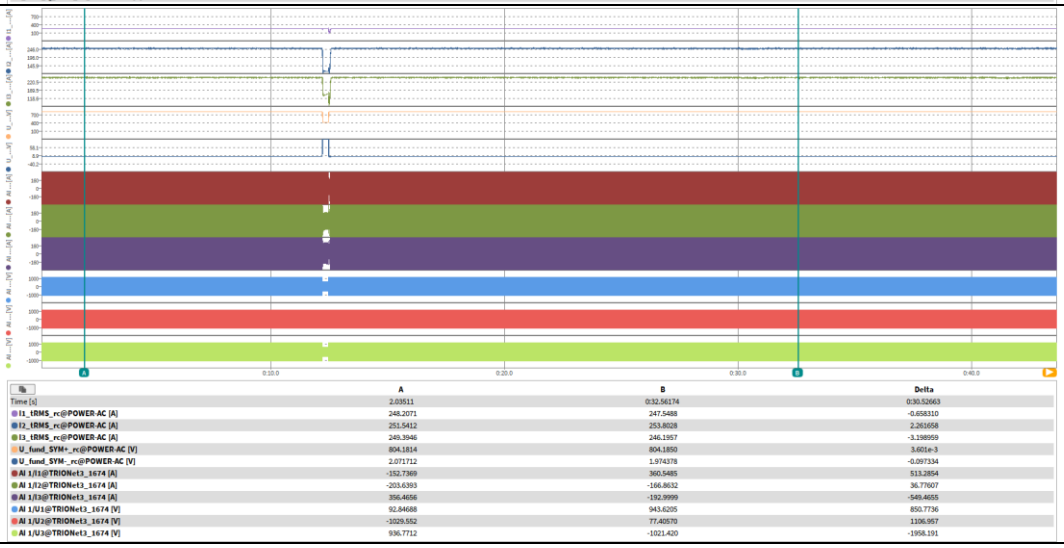
VD6-1 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.12976	0:32.56174	0:30.43197
U_fund_SYM+_rc@POWER-AC [V]	804.1187	804.1850	0.066345
U_fund_SYM-_rc@POWER-AC [V]	1.988473	1.974378	-0.014095
P_fund_SYM+_rc@POWER-AC [W]	345383.1	346976.7	1593.656
P_fund_SYM-_rc@POWER-AC [W]	1.090899	-5.043499	-6.134398
Q_fund_SYM+_rc@POWER-AC [var]	-125.8480	119.9649	245.8130
Q_fund_SYM-_rc@POWER-AC [var]	13.86697	15.32585	1.458876
I_fund_P_SYM+_rc@POWER-AC [A]	247.9821	249.1057	1.123672
I_fund_P_SYM-_rc@POWER-AC [A]	0.316741	-1.474827	-1.791568
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.090358	0.086127	0.176484
I_fund_Q_SYM-_rc@POWER-AC [A]	4.026255	4.481605	0.455350



	A	B	Delta
Time [s]	2.03511	0:32.56174	0:30.52663
I1_tRMS_rc@POWER-AC [A]	248.2071	247.5488	-0.658310
I2_tRMS_rc@POWER-AC [A]	251.5412	253.8018	2.260658
I3_tRMS_rc@POWER-AC [A]	249.3946	246.1957	-3.198959
U_fund_SYM+_rc@POWER-AC [V]	804.1814	804.1850	3.601e-3
U_fund_SYM-_rc@POWER-AC [V]	2.071712	1.974378	-0.097334
AI 1/I1@TRIONet3_1674 [A]	-152.7369	360.5485	513.2854
AI 1/I2@TRIONet3_1674 [A]	-203.6393	-166.8632	36.77607
AI 1/I3@TRIONet3_1674 [A]	356.4656	-192.9999	-549.4655
AI 1/U1@TRIONet3_1674 [V]	92.84688	943.6205	850.7736
AI 1/U2@TRIONet3_1674 [V]	-1026.552	77.40570	1106.957
AI 1/U3@TRIONet3_1674 [V]	936.7712	-1021.420	-1958.191

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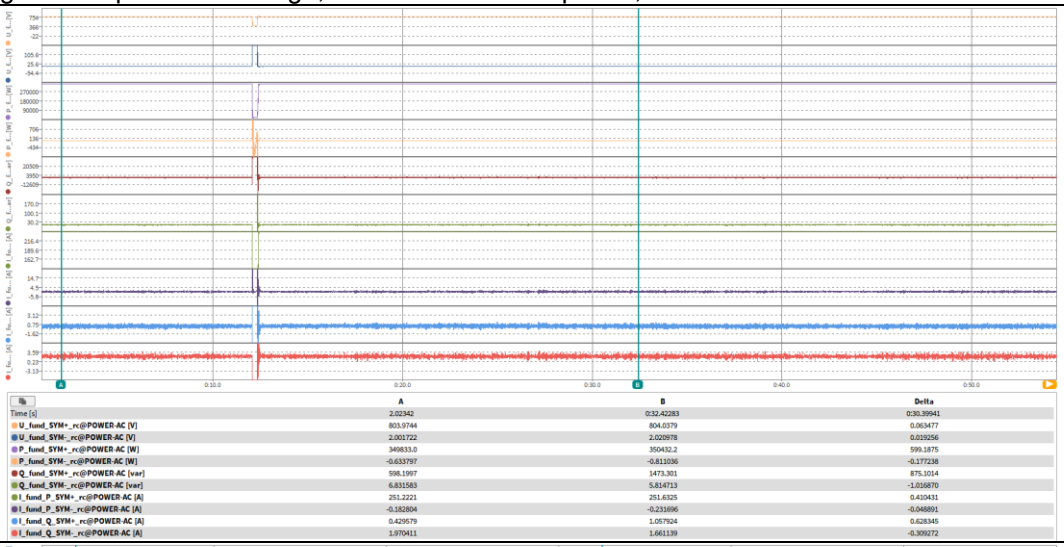
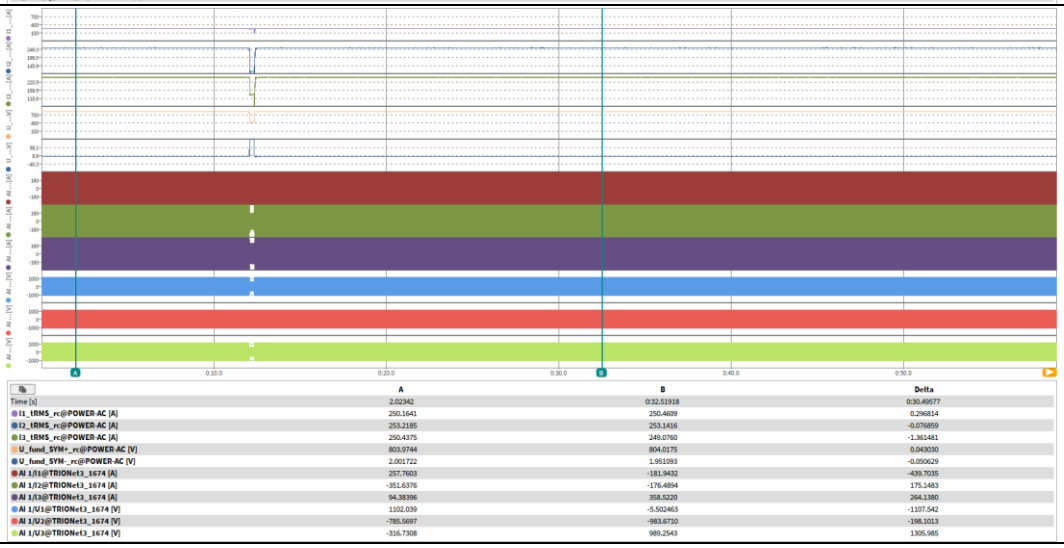
VD6-2 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.02342	0:32.42283	0:30.39941
U_fund_SYM+_rc@POWER-AC [V]	803.9744	804.0379	0.063477
U_fund_SYM-_rc@POWER-AC [V]	2.001722	2.020978	0.019256
P_fund_SYM+_rc@POWER-AC [W]	349833.0	350432.2	599.1875
P_fund_SYM-_rc@POWER-AC [W]	-0.633797	-0.811036	-0.177238
Q_fund_SYM+_rc@POWER-AC [var]	598.1997	1473.301	875.1014
Q_fund_SYM-_rc@POWER-AC [var]	6.831583	5.814713	-1.016870
I_fund_P_SYM+_rc@POWER-AC [A]	251.2221	251.6325	0.410431
I_fund_P_SYM-_rc@POWER-AC [A]	-0.182804	-0.231696	-0.048891
I_fund_Q_SYM+_rc@POWER-AC [A]	0.429579	1.057924	0.628345
I_fund_Q_SYM-_rc@POWER-AC [A]	1.970411	1.661139	-0.309272



	A	B	Delta
Time [s]	2.02342	0:32.51918	0:30.49577
I1_tRMS_rc@POWER-AC [A]	250.1641	250.4609	0.296814
I2_tRMS_rc@POWER-AC [A]	253.2185	253.1416	-0.076859
I3_tRMS_rc@POWER-AC [A]	250.4375	249.0760	-1.361481
U_fund_SYM+_rc@POWER-AC [V]	803.9744	804.0175	0.043030
U_fund_SYM-_rc@POWER-AC [V]	2.001722	1.951093	-0.050629
AI 1/I1@TRIONet3_1674 [A]	257.7603	-181.9432	-439.7035
AI 1/I2@TRIONet3_1674 [A]	-351.6376	-176.4894	175.1483
AI 1/I3@TRIONet3_1674 [A]	94.38396	358.5220	264.1380
AI 1/U1@TRIONet3_1674 [V]	1102.039	-5.502463	-1107.542
AI 1/U2@TRIONet3_1674 [V]	-785.5697	-983.6710	-198.1013
AI 1/U3@TRIONet3_1674 [V]	-316.7308	989.2543	1305.985

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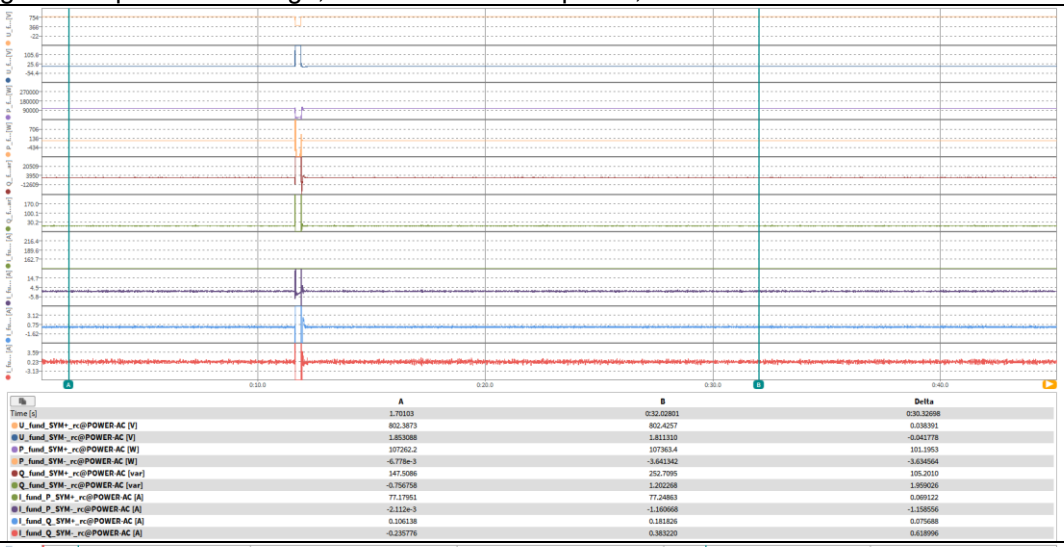
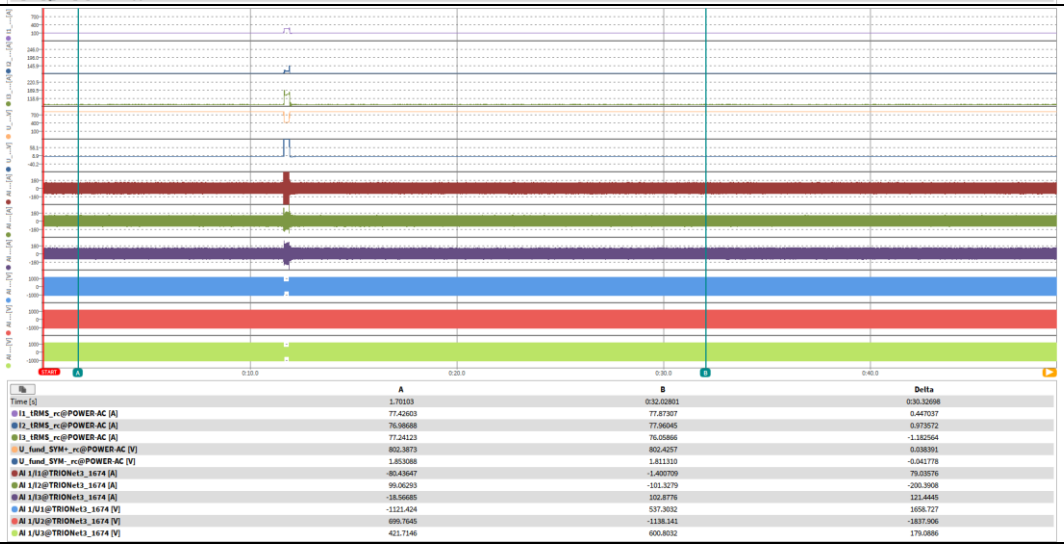
VD6-3 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	1.70103	0:32.02801	0:30.32698
U_fund_SYM+_rc@POWER-AC [V]	802.3873	802.4257	0.038391
U_fund_SYM-_rc@POWER-AC [V]	1.853088	1.811310	-0.041778
P_fund_SYM+_rc@POWER-AC [W]	107262.2	107363.4	101.1953
P_fund_SYM-_rc@POWER-AC [W]	-6.778e-3	-3.641342	-3.634564
Q_fund_SYM+_rc@POWER-AC [var]	147.5086	252.7095	105.2010
Q_fund_SYM-_rc@POWER-AC [var]	-0.756758	1.202268	1.959026
I_fund_P_SYM+_rc@POWER-AC [A]	77.17951	77.24863	0.069122
I_fund_P_SYM-_rc@POWER-AC [A]	-2.112e-3	-1.160668	-1.158556
I_fund_Q_SYM+_rc@POWER-AC [A]	0.106138	0.181826	0.075688
I_fund_Q_SYM-_rc@POWER-AC [A]	-0.235776	0.383220	0.618996



	A	B	Delta
Time [s]	1.70103	0:32.02801	0:30.32698
I1_tRMS_rc@POWER-AC [A]	77.42603	77.87307	0.447037
I2_tRMS_rc@POWER-AC [A]	76.98688	77.96046	0.973572
I3_tRMS_rc@POWER-AC [A]	77.24123	76.05866	-1.182564
U_fund_SYM+_rc@POWER-AC [V]	802.3873	802.4257	0.038391
U_fund_SYM-_rc@POWER-AC [V]	1.853088	1.811310	-0.041778
AI 1/I1@TRIONet3_1674 [A]	-80.43647	-1.400709	79.03576
AI 1/I2@TRIONet3_1674 [A]	99.06293	-101.3279	-200.3908
AI 1/I3@TRIONet3_1674 [A]	-18.56685	102.8776	121.4445
AI 1/U1@TRIONet3_1674 [V]	-1121.424	537.3032	1658.727
AI 1/U2@TRIONet3_1674 [V]	699.7645	-1138.141	-1837.906
AI 1/U3@TRIONet3_1674 [V]	421.7146	600.8032	179.0886

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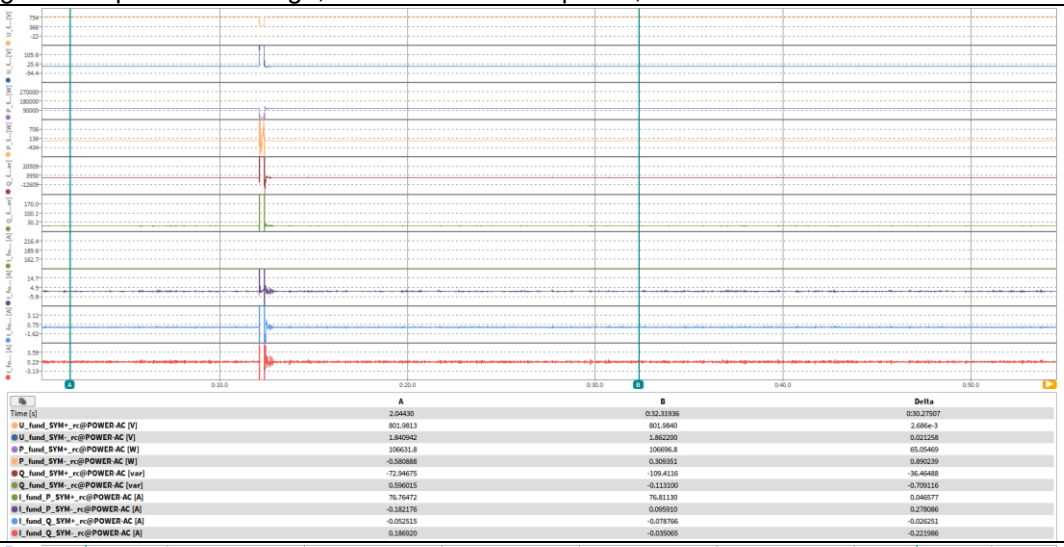
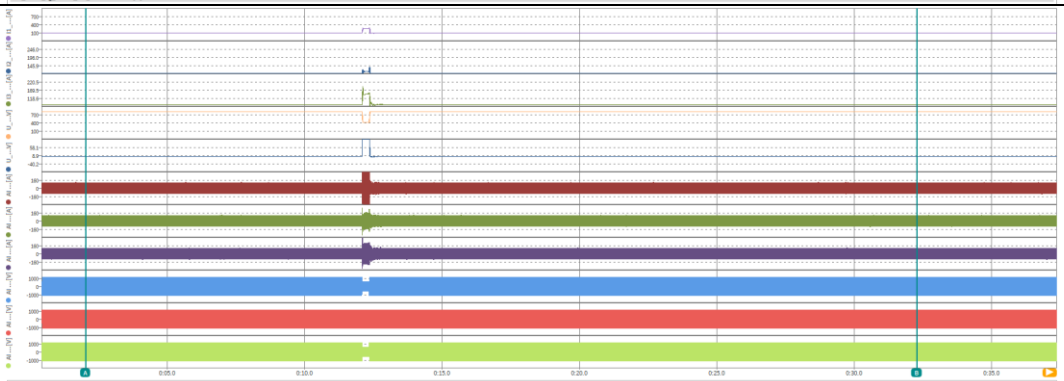
VD6-4 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.04430	0:32.31936	0:30.27507
U_fund_SYM+_rc@POWER-AC [V]	801.9813	801.9840	2.686e-3
U_fund_SYM-_rc@POWER-AC [V]	1.840942	1.862200	0.021258
P_fund_SYM+_rc@POWER-AC [W]	106631.8	106696.8	65.05469
P_fund_SYM-_rc@POWER-AC [W]	-0.580888	0.309351	0.890239
Q_fund_SYM+_rc@POWER-AC [var]	-72.94675	-109.4116	-36.46488
Q_fund_SYM-_rc@POWER-AC [var]	0.596015	-0.113190	-0.709116
I_fund_P_SYM+_rc@POWER-AC [A]	76.76472	76.81130	0.046577
I_fund_P_SYM-_rc@POWER-AC [A]	-0.182176	0.095910	0.278086
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.052515	-0.078766	-0.026251
I_fund_Q_SYM-_rc@POWER-AC [A]	0.186920	-0.035065	-0.221986



	A	B	Delta
Time [s]	2.04430	0:32.27069	0:30.22639
I1_tRMS_rc@POWER-AC [A]	76.82101	76.48468	-0.336327
I2_tRMS_rc@POWER-AC [A]	77.01507	77.28320	0.268127
I3_tRMS_rc@POWER-AC [A]	76.56579	76.62636	0.060570
U_fund_SYM+_rc@POWER-AC [V]	801.9813	801.9797	-1.587e-3
U_fund_SYM-_rc@POWER-AC [V]	1.840942	1.884814	0.043872
AI 1/I1@TRIONet3_1674 [A]	-110.4176	40.91859	151.3362
AI 1/I2@TRIONet3_1674 [A]	63.00211	-108.4209	-171.4230
AI 1/I3@TRIONet3_1674 [A]	47.41550	67.65128	20.23578
AI 1/U1@TRIONet3_1674 [V]	-1025.363	876.9081	1906.271
AI 1/U2@TRIONet3_1674 [V]	105.9191	-1060.948	-1166.867
AI 1/U3@TRIONet3_1674 [V]	923.5674	183.8873	-739.6801

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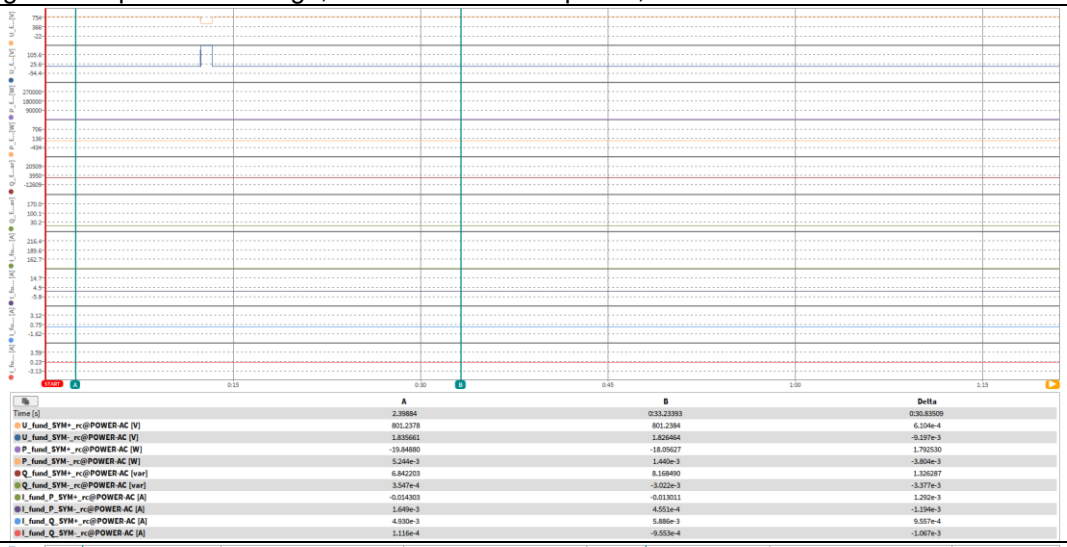
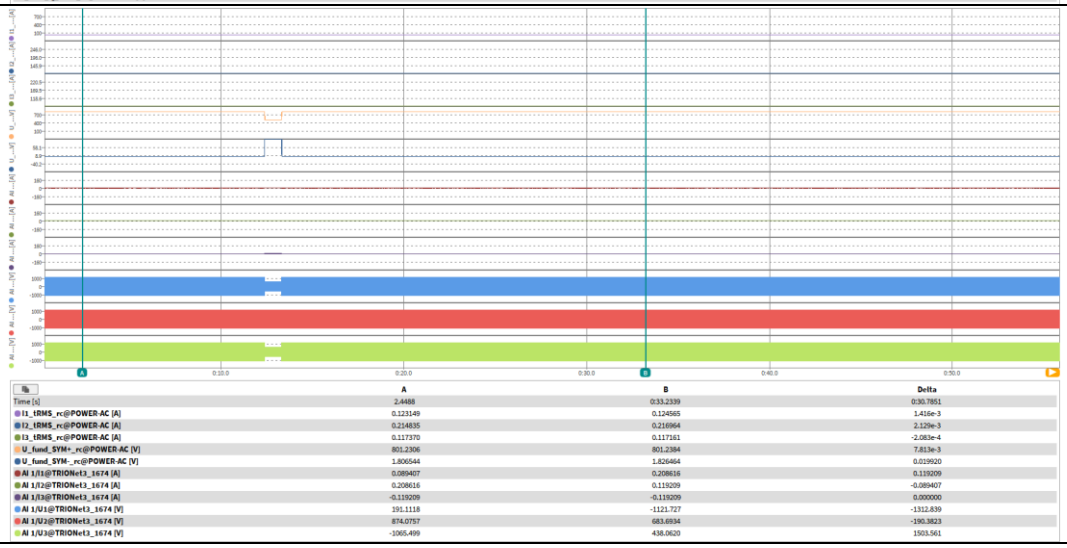
VD7 (no-load test)

a) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.39884	0:33.23393	0:30.83509
U_fund_SYM+_rc@POWER-AC [V]	801.2378	801.2384	6.104e-4
U_fund_SYM-_rc@POWER-AC [V]	1.835661	1.826464	-9.197e-3
P_fund_SYM+_rc@POWER-AC [W]	-19.84880	-18.05627	1.792530
P_fund_SYM-_rc@POWER-AC [W]	5.244e-3	1.440e-3	-3.804e-3
Q_fund_SYM+_rc@POWER-AC [var]	6.842203	8.168490	1.326287
Q_fund_SYM-_rc@POWER-AC [var]	3.547e-4	-3.022e-3	-3.377e-3
I_fund_P_SYM+_rc@POWER-AC [A]	-0.014303	-0.013011	1.292e-3
I_fund_P_SYM-_rc@POWER-AC [A]	1.649e-3	4.551e-4	-1.194e-3
I_fund_Q_SYM+_rc@POWER-AC [A]	4.930e-3	5.886e-3	9.557e-4
I_fund_Q_SYM-_rc@POWER-AC [A]	1.116e-4	-9.553e-4	-1.067e-3



	A	B	Delta
Time [s]	2.4488	0:33.2339	0:30.7851
I1_tRMS_rc@POWER-AC [A]	0.123149	0.124565	1.416e-3
I2_tRMS_rc@POWER-AC [A]	0.214835	0.216964	2.129e-3
I3_tRMS_rc@POWER-AC [A]	0.117370	0.117161	-2.083e-4
U_fund_SYM+_rc@POWER-AC [V]	801.2306	801.2384	7.813e-3
U_fund_SYM-_rc@POWER-AC [V]	1.806544	1.826464	0.019920
AI 1/I1@TRIONet3_1674 [A]	0.089407	0.208616	0.119209
AI 1/I2@TRIONet3_1674 [A]	0.208616	0.119209	-0.089407
AI 1/I3@TRIONet3_1674 [A]	-0.119209	-0.119209	0.000000
AI 1/U1@TRIONet3_1674 [V]	191.1118	-1121.727	-1312.839
AI 1/U2@TRIONet3_1674 [V]	874.0757	683.6934	-190.3823
AI 1/U3@TRIONet3_1674 [V]	-1065.499	438.0620	1503.561

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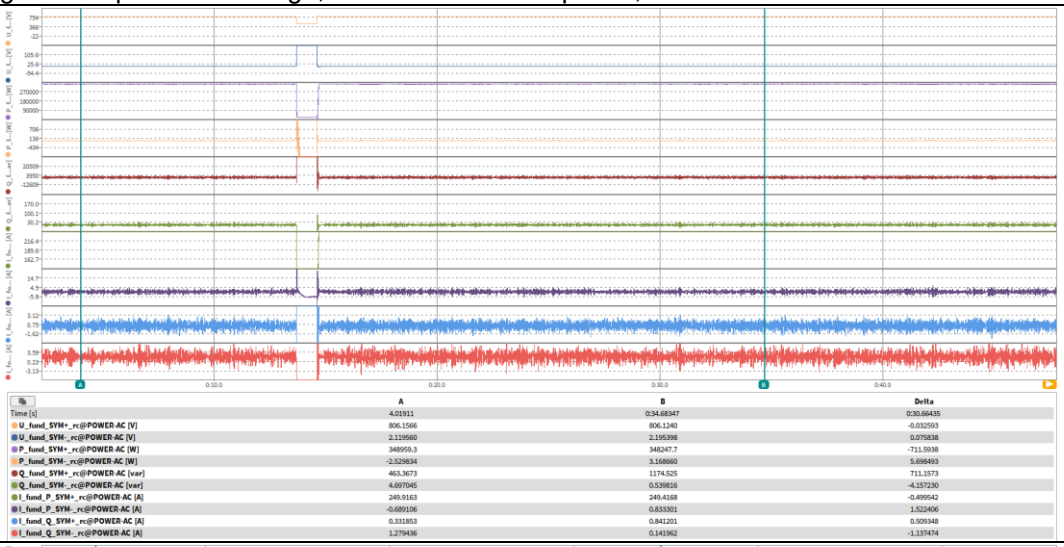
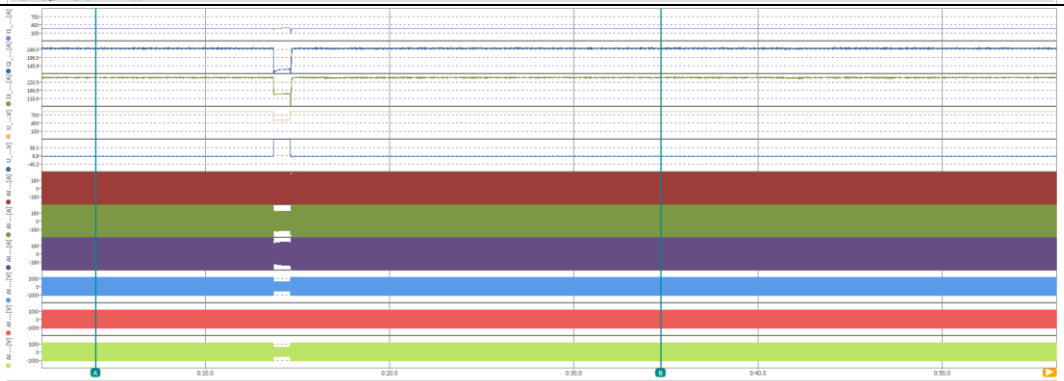
VD7-1 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	4.01911	0:34.68347	0:30.66435
U_fund_SYM+_rc@POWER-AC [V]	806.1566	806.1240	-0.032593
U_fund_SYM-_rc@POWER-AC [V]	2.119560	2.195398	0.075838
P_fund_SYM+_rc@POWER-AC [W]	348959.3	348247.7	-711.5938
P_fund_SYM-_rc@POWER-AC [W]	-2.529834	3.168660	5.698493
Q_fund_SYM+_rc@POWER-AC [var]	463.3673	1174.525	711.1573
Q_fund_SYM-_rc@POWER-AC [var]	4.697045	0.539816	-4.157230
I_fund_P_SYM+_rc@POWER-AC [A]	249.9163	249.4168	-0.499542
I_fund_P_SYM-_rc@POWER-AC [A]	-0.689106	0.833301	1.522406
I_fund_Q_SYM+_rc@POWER-AC [A]	0.331853	0.841201	0.509348
I_fund_Q_SYM-_rc@POWER-AC [A]	1.279436	0.141962	-1.137474



	A	B	Delta
Time [s]	4.06873	0:34.73309	0:30.66435
I1_tRMS_rc@POWER-AC [A]	248.2271	246.5878	-1.639343
I2_tRMS_rc@POWER-AC [A]	251.2902	255.1775	3.887283
I3_tRMS_rc@POWER-AC [A]	248.4788	248.2385	-0.240311
U_fund_SYM+_rc@POWER-AC [V]	806.1241	806.1418	0.017639
U_fund_SYM-_rc@POWER-AC [V]	2.113458	2.195655	0.082197
AI 1/I1@TRIONet3_1674 [A]	107.4374	352.5913	245.1539
AI 1/I2@TRIONet3_1674 [A]	-347.4355	-172.3170	175.1185
AI 1/I3@TRIONet3_1674 [A]	240.2663	-179.5888	-419.8551
AI 1/U1@TRIONet3_1674 [V]	823.2956	974.3972	151.1016
AI 1/U2@TRIONet3_1674 [V]	-1096.147	22.72248	1118.869
AI 1/U3@TRIONet3_1674 [V]	272.7547	-997.4900	-1270.245

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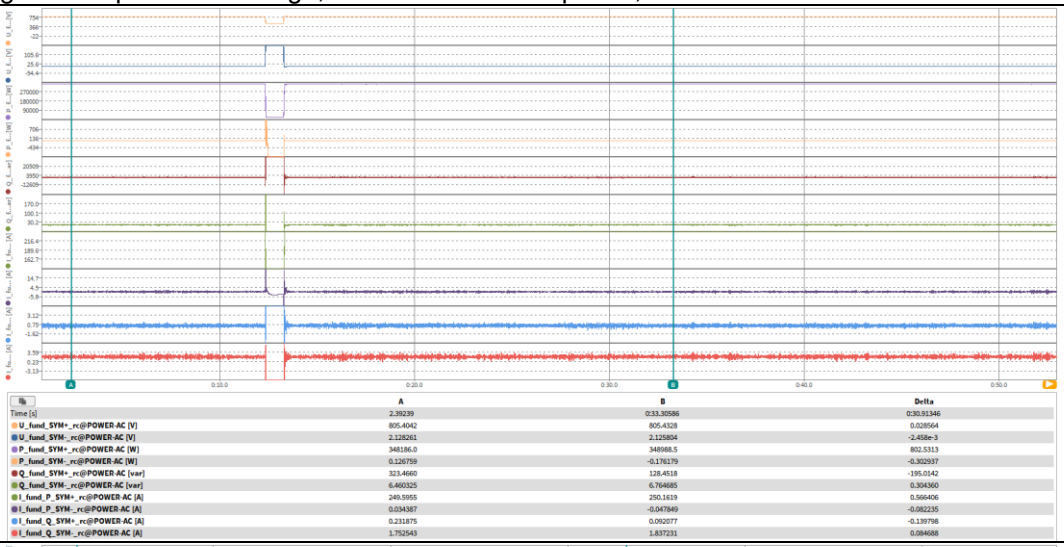
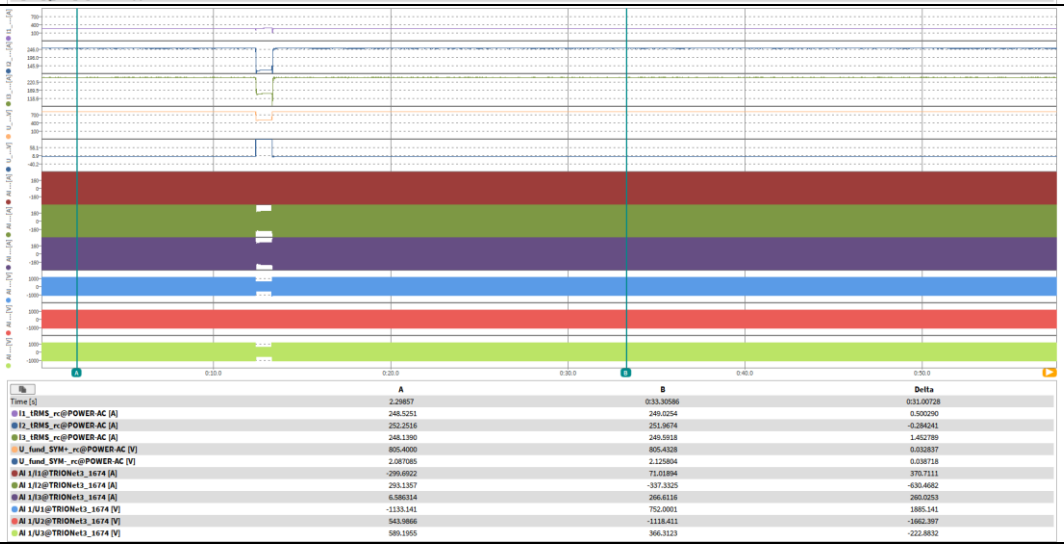
VD7-2 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.39239	0:33.30586	0:30.91346
U_fund_SYM+_rc@POWER-AC [V]	805.4042	805.4328	0.028564
U_fund_SYM-_rc@POWER-AC [V]	2.128261	2.125804	-2.458e-3
P_fund_SYM+_rc@POWER-AC [W]	348186.0	348988.5	802.5313
P_fund_SYM-_rc@POWER-AC [W]	0.126759	-0.176179	-0.302937
Q_fund_SYM+_rc@POWER-AC [var]	323.4660	128.4518	-195.0142
Q_fund_SYM-_rc@POWER-AC [var]	6.460325	6.764685	0.304360
I_fund_P_SYM+_rc@POWER-AC [A]	249.5955	250.1619	0.566406
I_fund_P_SYM-_rc@POWER-AC [A]	0.034387	-0.047849	-0.082235
I_fund_Q_SYM+_rc@POWER-AC [A]	0.231875	0.092077	-0.139798
I_fund_Q_SYM-_rc@POWER-AC [A]	1.752543	1.837231	0.084688



	A	B	Delta
Time [s]	2.29857	0:33.30586	0:31.00728
I1_tRMS_rc@POWER-AC [A]	248.5251	249.0254	0.500290
I2_tRMS_rc@POWER-AC [A]	252.2516	251.9674	-0.284241
I3_tRMS_rc@POWER-AC [A]	248.1390	249.5918	1.452789
U_fund_SYM+_rc@POWER-AC [V]	805.4000	805.4328	0.032837
U_fund_SYM-_rc@POWER-AC [V]	2.087085	2.125804	0.038718
AI 1/I1@TRIONet3_1674 [A]	-299.6922	71.01894	370.7111
AI 1/I2@TRIONet3_1674 [A]	293.1357	-337.3325	-630.4682
AI 1/I3@TRIONet3_1674 [A]	6.586314	266.6116	260.0253
AI 1/U1@TRIONet3_1674 [V]	-1133.141	752.0001	1885.141
AI 1/U2@TRIONet3_1674 [V]	543.9866	-1118.411	-1662.397
AI 1/U3@TRIONet3_1674 [V]	589.1955	366.3123	-222.8832

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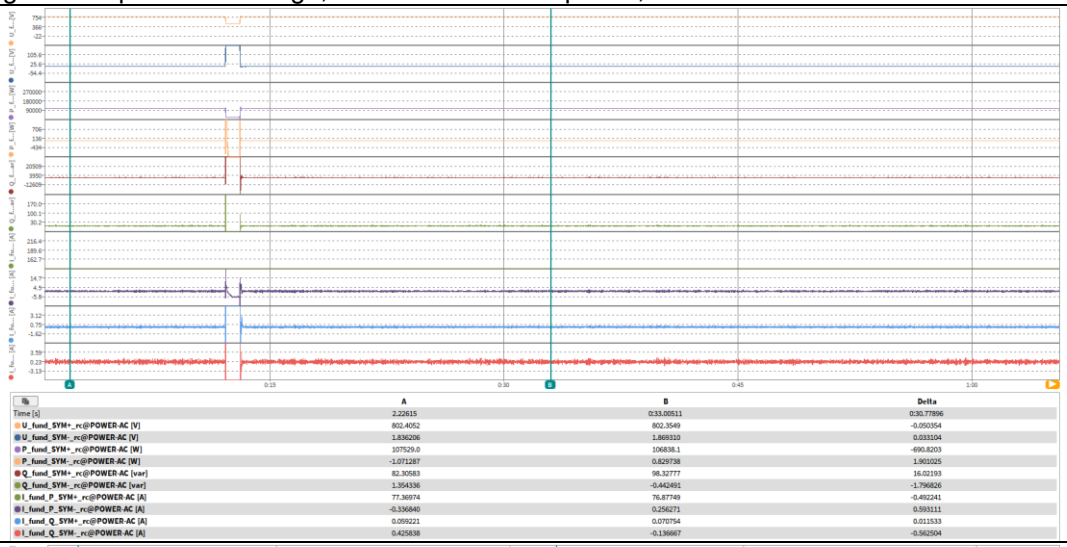
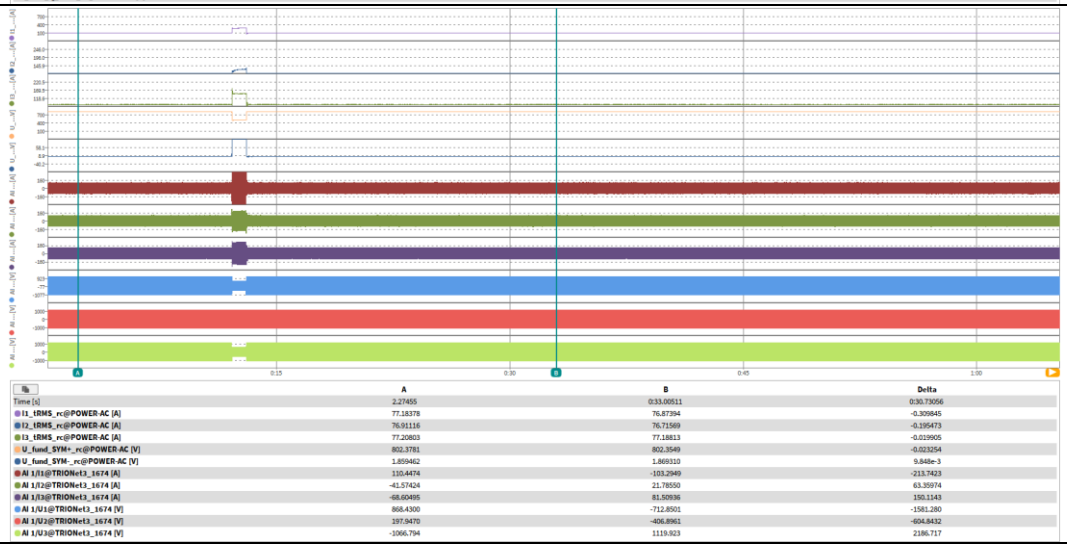
VD7-3 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



Time [s]	A	B	Delta
U_fund_SYM+_rc@POWER-AC [V]	802.4052	802.3549	-0.050354
U_fund_SYM-_rc@POWER-AC [V]	1.836206	1.869310	0.033104
P_fund_SYM+_rc@POWER-AC [W]	107529.0	106838.1	-690.8203
P_fund_SYM-_rc@POWER-AC [W]	-1.071287	0.829738	1.901025
Q_fund_SYM+_rc@POWER-AC [var]	82.30583	98.32777	16.02193
Q_fund_SYM-_rc@POWER-AC [var]	1.354336	-0.442491	-1.796826
I_fund_P_SYM+_rc@POWER-AC [A]	77.36974	76.87749	-0.492241
I_fund_P_SYM-_rc@POWER-AC [A]	-0.336840	0.256271	0.593111
I_fund_Q_SYM+_rc@POWER-AC [A]	0.059221	0.070754	0.011533
I_fund_Q_SYM-_rc@POWER-AC [A]	0.425838	-0.136667	-0.562504



Time [s]	A	B	Delta
I1_tRMS_rc@POWER-AC [A]	77.18378	76.87394	-0.309845
I2_tRMS_rc@POWER-AC [A]	76.91116	76.71569	-0.195473
I3_tRMS_rc@POWER-AC [A]	77.20803	77.18813	-0.019905
U_fund_SYM+_rc@POWER-AC [V]	802.3781	802.3549	-0.023254
U_fund_SYM-_rc@POWER-AC [V]	1.859462	1.869310	9.848e-3
AI 1/I1@TRIONet3_1674 [A]	110.4474	-103.2949	-213.7423
AI 1/I2@TRIONet3_1674 [A]	-41.57424	21.78550	63.35974
AI 1/I3@TRIONet3_1674 [A]	-68.60495	81.50936	150.1143
AI 1/U1@TRIONet3_1674 [V]	868.4300	-712.8501	-1581.280
AI 1/U2@TRIONet3_1674 [V]	197.9470	-406.8961	-604.8432
AI 1/U3@TRIONet3_1674 [V]	-1066.794	1119.923	2186.717

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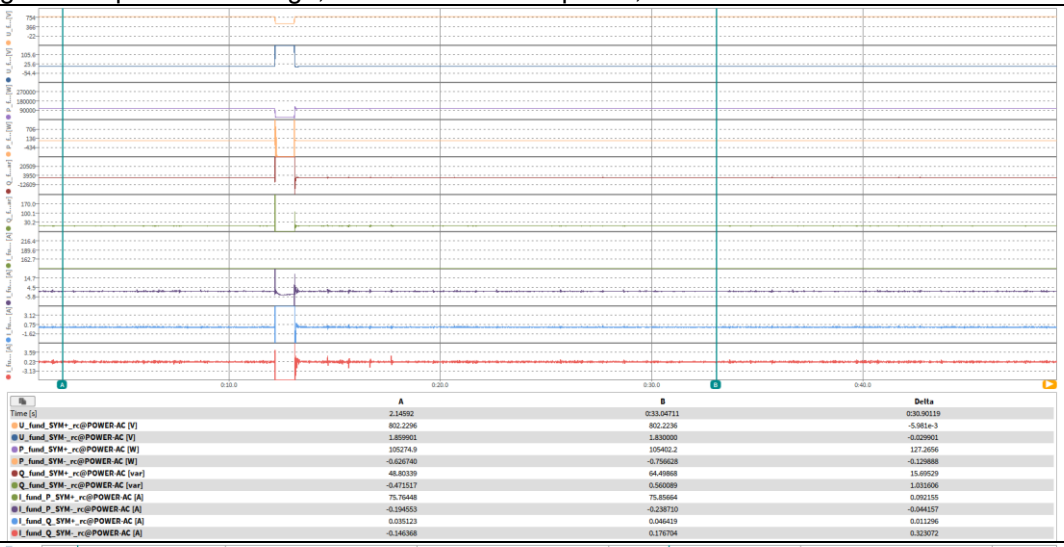
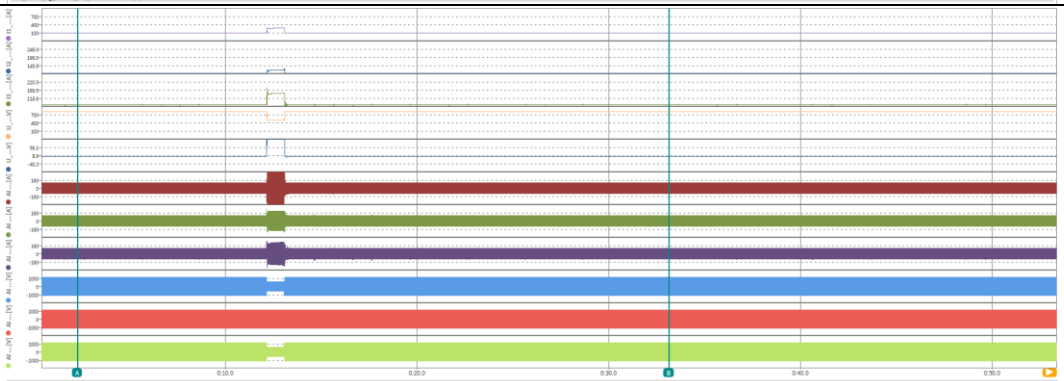
VD7-4 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.14592	0:33.04711	0:30.90119
U_fund_SYM+_rc@POWER-AC [V]	802.2296	802.2236	-5.981e-3
U_fund_SYM-_rc@POWER-AC [V]	1.859901	1.830000	-0.029901
P_fund_SYM+_rc@POWER-AC [W]	105274.9	105402.2	127.2656
P_fund_SYM-_rc@POWER-AC [W]	-0.626740	-0.756628	-0.129888
Q_fund_SYM+_rc@POWER-AC [var]	48.80339	64.49868	15.69529
Q_fund_SYM-_rc@POWER-AC [var]	-0.471517	0.560089	1.031606
I_fund_P_SYM+_rc@POWER-AC [A]	75.76448	75.85664	0.092155
I_fund_P_SYM-_rc@POWER-AC [A]	-0.194553	-0.238710	-0.044157
I_fund_Q_SYM+_rc@POWER-AC [A]	0.035123	0.046419	0.011296
I_fund_Q_SYM-_rc@POWER-AC [A]	-0.146368	0.176704	0.323072



	A	B	Delta
Time [s]	2.28898	0:33.14248	0:30.85350
I1_tRMS_rc@POWER-AC [A]	75.56362	75.76956	0.205940
I2_tRMS_rc@POWER-AC [A]	76.04289	76.05081	7.919e-3
I3_tRMS_rc@POWER-AC [A]	75.51948	76.00896	0.489487
U_fund_SYM+_rc@POWER-AC [V]	802.2195	802.2266	7.080e-3
U_fund_SYM-_rc@POWER-AC [V]	1.860725	1.875746	0.015021
AI 1/I1@TRIONet3_1674 [A]	-49.35265	-63.53856	-14.18591
AI 1/I2@TRIONet3_1674 [A]	-59.15761	106.5135	165.6711
AI 1/I3@TRIONet3_1674 [A]	108.5401	-42.88554	-151.4256
AI 1/U1@TRIONet3_1674 [V]	52.31285	-1034.730	-1087.043
AI 1/U2@TRIONet3_1674 [V]	-1006.857	918.7482	1928.605
AI 1/U3@TRIONet3_1674 [V]	957.6128	115.9439	-841.6689

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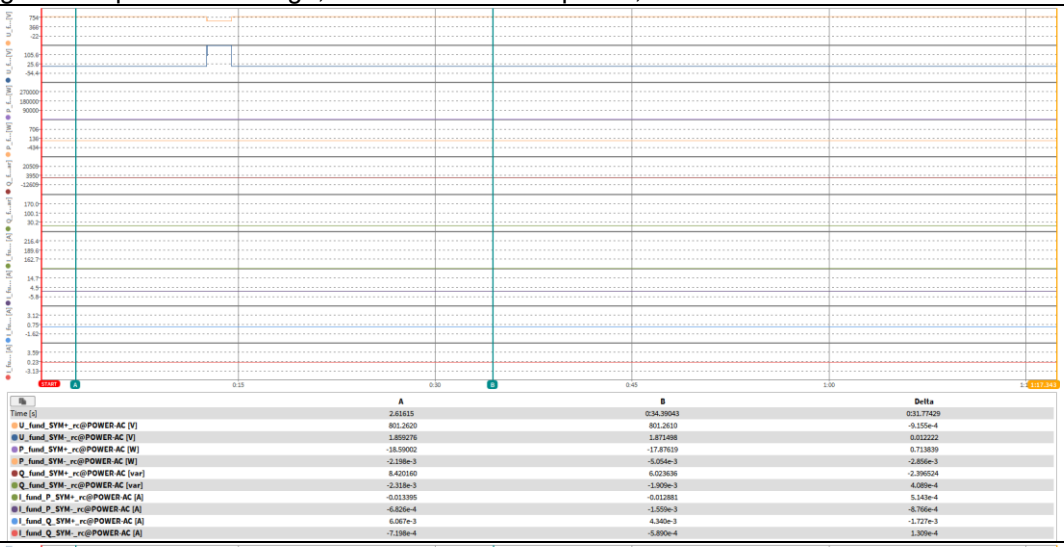
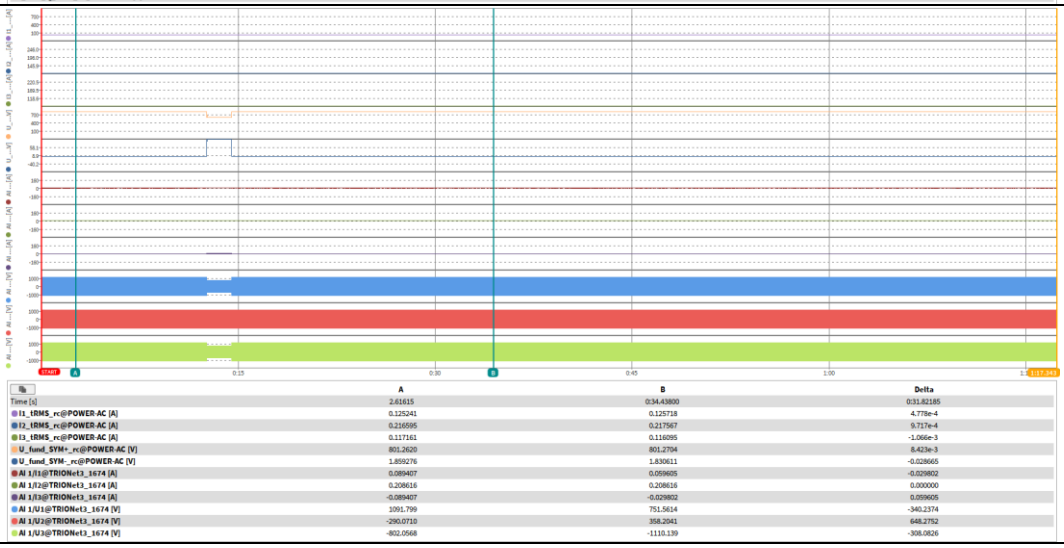
VD8 (no-load test)

a) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



Time [s]	A	B	Delta
U_fund_SYM+_rc@POWER-AC [V]	801.2620	801.2610	-9.155e-4
U_fund_SYM-_rc@POWER-AC [V]	1.859276	1.871498	0.012222
P_fund_SYM+_rc@POWER-AC [W]	-18.59002	-17.87619	0.713839
P_fund_SYM-_rc@POWER-AC [W]	-2.198e-3	-5.054e-3	-2.856e-3
Q_fund_SYM+_rc@POWER-AC [var]	8.420160	6.023636	-2.396524
Q_fund_SYM-_rc@POWER-AC [var]	-2.318e-3	-1.909e-3	4.089e-4
I_fund_P_SYM+_rc@POWER-AC [A]	-0.013395	-0.012881	5.143e-4
I_fund_P_SYM-_rc@POWER-AC [A]	-6.826e-4	-1.559e-3	-8.766e-4
I_fund_Q_SYM+_rc@POWER-AC [A]	6.067e-3	4.340e-3	-1.727e-3
I_fund_Q_SYM-_rc@POWER-AC [A]	-7.198e-4	-5.890e-4	1.309e-4



Time [s]	A	B	Delta
I1_tRMS_rc@POWER-AC [A]	0.125241	0.125718	4.778e-4
I2_tRMS_rc@POWER-AC [A]	0.216595	0.217567	9.717e-4
I3_tRMS_rc@POWER-AC [A]	0.117161	0.116095	-1.066e-3
U_fund_SYM+_rc@POWER-AC [V]	801.2620	801.2704	8.423e-3
U_fund_SYM-_rc@POWER-AC [V]	1.859276	1.830611	-0.028665
AI 1/I1@TRIONet3_1674 [A]	0.089407	0.059605	-0.029802
AI 1/I2@TRIONet3_1674 [A]	0.208616	0.208616	0.000000
AI 1/I3@TRIONet3_1674 [A]	-0.089407	-0.029802	0.059605
AI 1/U1@TRIONet3_1674 [V]	1091.799	751.5614	-340.2374
AI 1/U2@TRIONet3_1674 [V]	-290.0710	358.2041	648.2752
AI 1/U3@TRIONet3_1674 [V]	-802.0568	-1110.139	-308.0826

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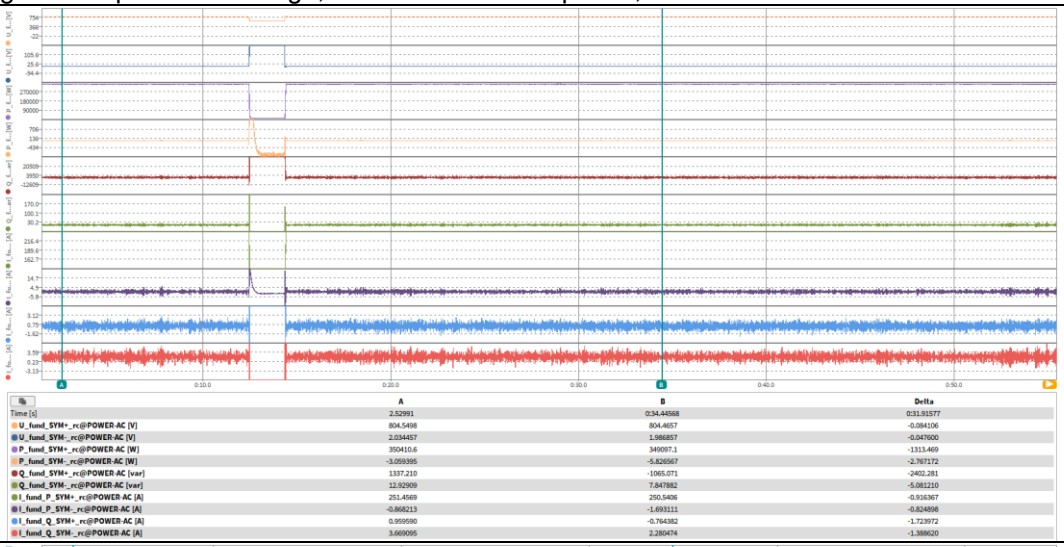
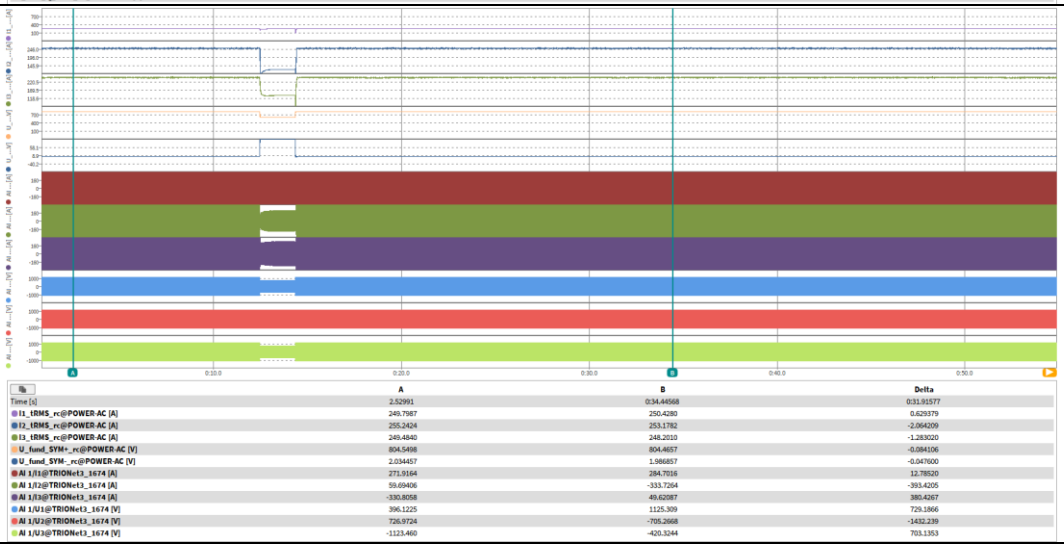
VD8-1 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.52991	0:34.44568	0:31.91577
U_fund_SYM+_rc@POWER-AC [V]	804.5498	804.4657	-0.084106
U_fund_SYM-_rc@POWER-AC [V]	2.034457	1.986857	-0.047600
P_fund_SYM+_rc@POWER-AC [W]	350410.6	349097.1	-1313.469
P_fund_SYM-_rc@POWER-AC [W]	-3.059395	-5.826567	-2.767172
Q_fund_SYM+_rc@POWER-AC [var]	1337.210	-1065.071	-2402.281
Q_fund_SYM-_rc@POWER-AC [var]	12.92909	7.847882	-5.081210
I_fund_P_SYM+_rc@POWER-AC [A]	251.4569	250.5406	-0.916367
I_fund_P_SYM-_rc@POWER-AC [A]	-0.868213	-1.693111	-0.824898
I_fund_Q_SYM+_rc@POWER-AC [A]	0.959590	-0.764382	-1.723972
I_fund_Q_SYM-_rc@POWER-AC [A]	3.669095	2.280474	-1.388620



	A	B	Delta
Time [s]	2.52991	0:34.44568	0:31.91577
I1_tRMS_rc@POWER-AC [A]	249.7987	250.4280	0.629379
I2_tRMS_rc@POWER-AC [A]	255.2424	253.1782	-2.064209
I3_tRMS_rc@POWER-AC [A]	249.4840	248.2010	-1.283020
U_fund_SYM+_rc@POWER-AC [V]	804.5498	804.4657	-0.084106
U_fund_SYM-_rc@POWER-AC [V]	2.034457	1.986857	-0.047600
AI 1/I1@TRIONet3_1674 [A]	271.9164	284.7016	12.78520
AI 1/I2@TRIONet3_1674 [A]	59.69406	-333.7264	-393.4205
AI 1/I3@TRIONet3_1674 [A]	-330.8058	49.62087	380.4267
AI 1/U1@TRIONet3_1674 [V]	396.1225	1125.309	729.1866
AI 1/U2@TRIONet3_1674 [V]	726.9724	-705.2668	-1432.239
AI 1/U3@TRIONet3_1674 [V]	-1123.460	-420.3244	703.1353

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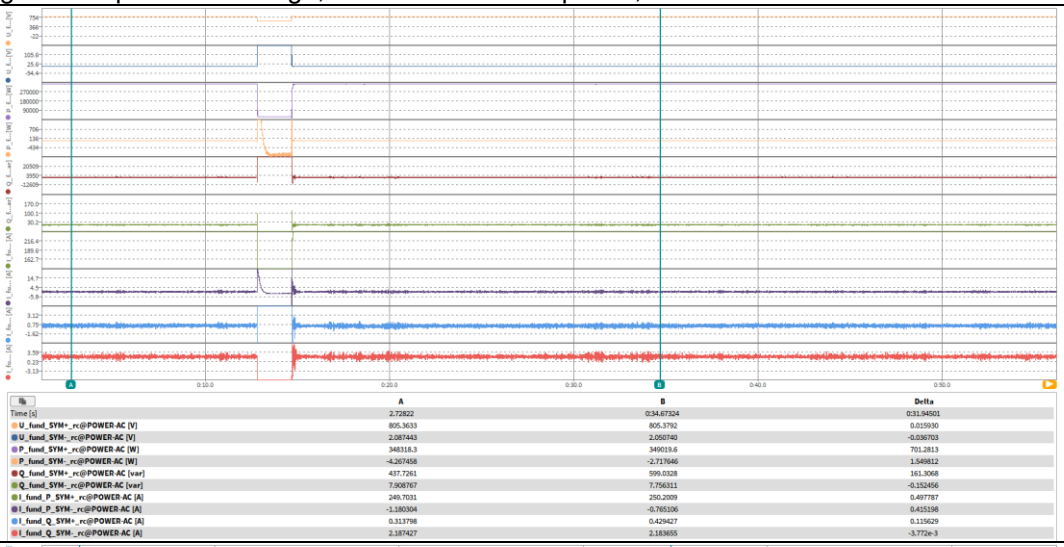
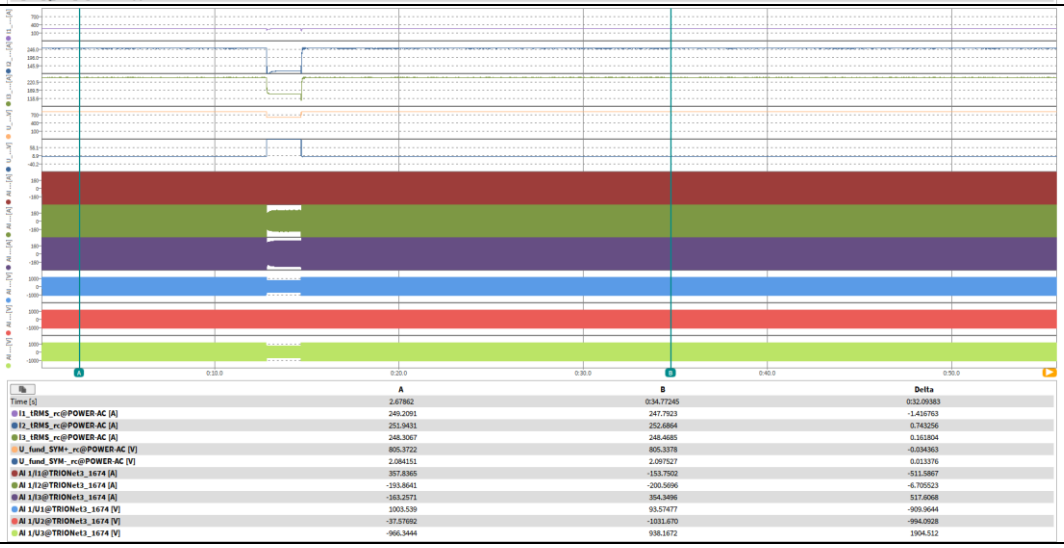
VD8-2 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



Time [s]	A	B	Delta
U_fund_SYM+_rc@POWER-AC [V]	805.3633	805.3792	0.015930
U_fund_SYM-_rc@POWER-AC [V]	2.087443	2.050740	-0.036703
P_fund_SYM+_rc@POWER-AC [W]	348318.3	349019.6	701.2813
P_fund_SYM-_rc@POWER-AC [W]	-4.267458	-2.717646	1.549812
Q_fund_SYM+_rc@POWER-AC [var]	437.7261	599.0328	161.3068
Q_fund_SYM-_rc@POWER-AC [var]	7.908767	7.756311	-0.152456
I_fund_P_SYM+_rc@POWER-AC [A]	249.7031	250.2009	0.497787
I_fund_P_SYM-_rc@POWER-AC [A]	-1.180304	-0.765106	0.415198
I_fund_Q_SYM+_rc@POWER-AC [A]	0.313798	0.429427	0.115629
I_fund_Q_SYM-_rc@POWER-AC [A]	2.187427	2.183655	-3.772e-3



Time [s]	A	B	Delta
I1_tRMS_rc@POWER-AC [A]	249.2091	247.7923	-1.416763
I2_tRMS_rc@POWER-AC [A]	251.9431	252.6864	0.743256
I3_tRMS_rc@POWER-AC [A]	248.3067	248.4685	0.161804
U_fund_SYM+_rc@POWER-AC [V]	805.3722	805.3378	-0.034363
U_fund_SYM-_rc@POWER-AC [V]	2.084151	2.097527	0.013376
AI 1/I1@TRIONet3_1674 [A]	357.8365	-153.7502	-511.5867
AI 1/I2@TRIONet3_1674 [A]	-193.8641	-200.5696	-6.705523
AI 1/I3@TRIONet3_1674 [A]	-163.2571	354.3496	517.6068
AI 1/U1@TRIONet3_1674 [V]	1003.539	93.57477	-909.9644
AI 1/U2@TRIONet3_1674 [V]	-37.57692	-1031.670	-994.0928
AI 1/U3@TRIONet3_1674 [V]	-966.3444	938.1672	1904.512

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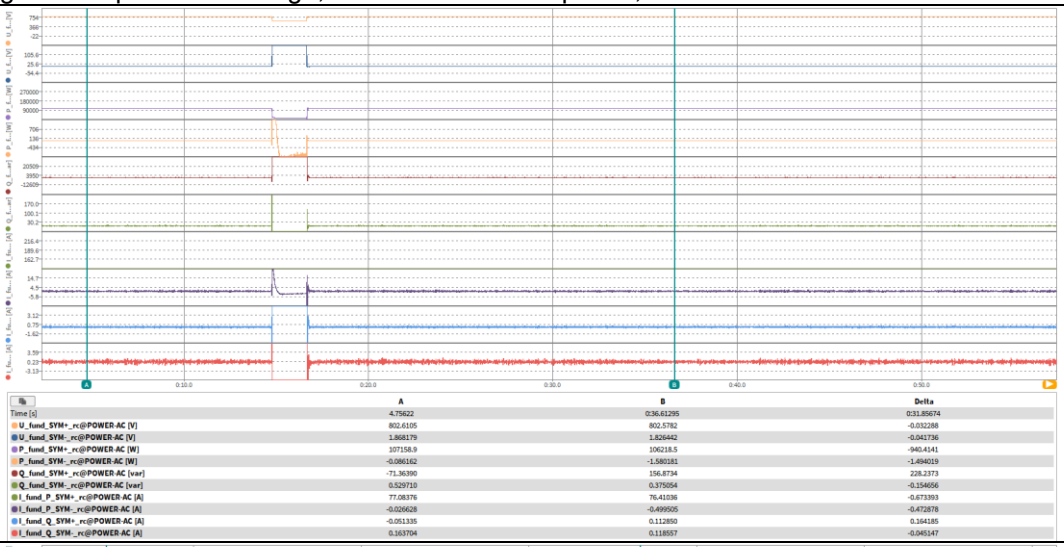
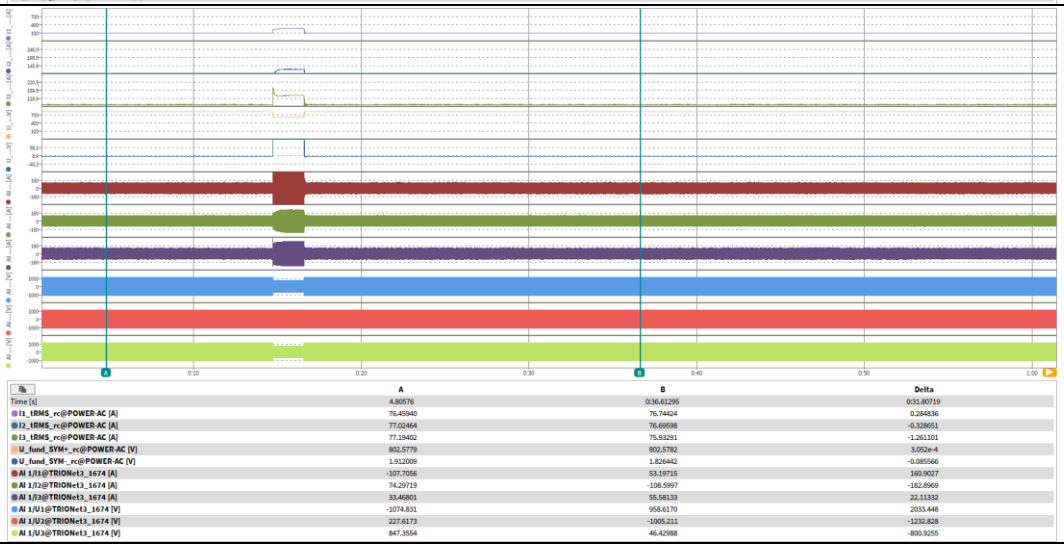
Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

VD8-3 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	4.75622	0:36.61295	0:31.85674
U_fund_SYM+_rc@POWER-AC [V]	802.6105	802.5782	-0.032288
U_fund_SYM-_rc@POWER-AC [V]	1.868179	1.826442	-0.041736
P_fund_SYM+_rc@POWER-AC [W]	107158.9	106218.5	-940.4141
P_fund_SYM-_rc@POWER-AC [W]	-0.086162	-1.580181	-1.494019
Q_fund_SYM+_rc@POWER-AC [var]	-71.36390	156.8734	228.2373
Q_fund_SYM-_rc@POWER-AC [var]	0.329710	0.175054	-0.154656
I_fund_P_SYM+_rc@POWER-AC [A]	77.08376	76.41036	-0.673393
I_fund_P_SYM-_rc@POWER-AC [A]	-0.026628	-0.499505	-0.472878
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.051335	0.112850	0.164185
I_fund_Q_SYM-_rc@POWER-AC [A]	0.163704	0.118557	-0.045147



	A	B	Delta
Time [s]	4.80576	0:36.61295	0:31.80719
I1_tRMS_rc@POWER-AC [A]	76.45940	76.74424	0.284836
I2_tRMS_rc@POWER-AC [A]	77.02464	76.69598	-0.328651
I3_tRMS_rc@POWER-AC [A]	77.19402	75.93291	-1.261101
U_fund_SYM+_rc@POWER-AC [V]	802.5779	802.5782	3.052e-4
U_fund_SYM-_rc@POWER-AC [V]	1.912009	1.826442	-0.085566
AI 1/I1@TRIONet3_1674 [A]	-107.7056	53.19715	160.9027
AI 1/I2@TRIONet3_1674 [A]	74.29719	-108.5997	-182.8969
AI 1/I3@TRIONet3_1674 [A]	33.46801	55.58133	22.11332
AI 1/U1@TRIONet3_1674 [V]	-1074.831	958.6170	2033.448
AI 1/U2@TRIONet3_1674 [V]	227.6173	-1005.211	-1232.828
AI 1/U3@TRIONet3_1674 [V]	847.3554	46.42988	-800.9255

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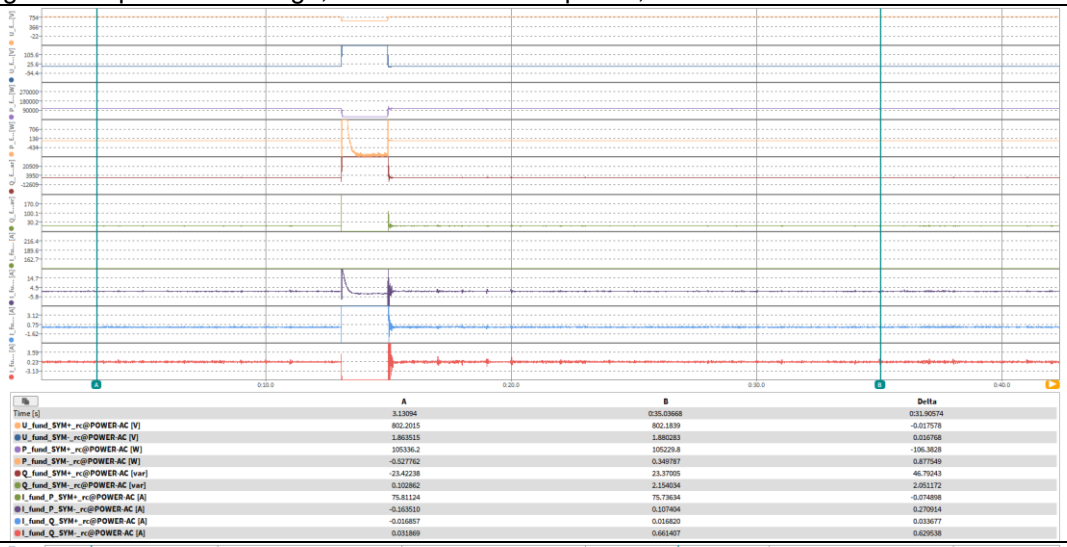
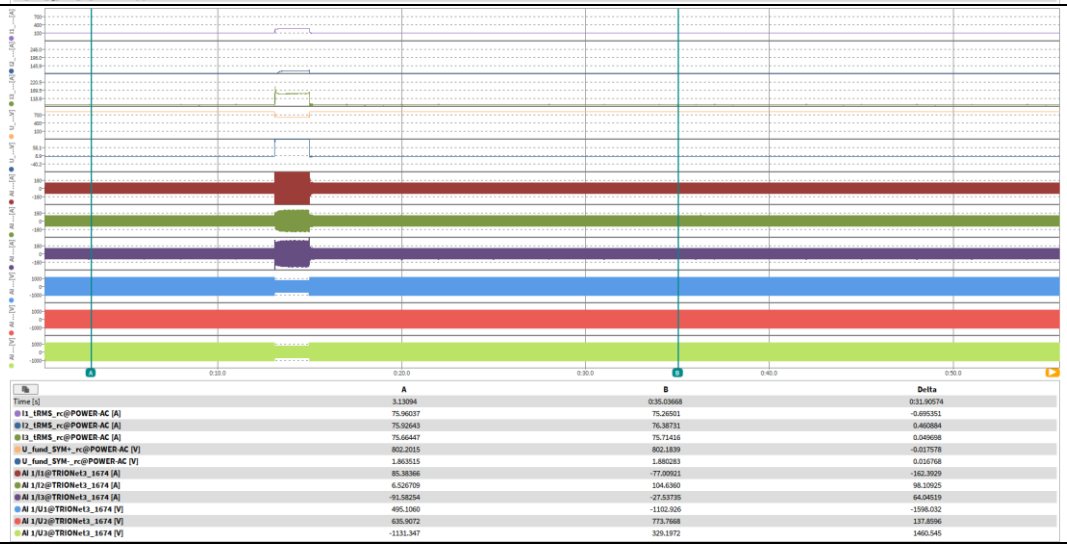
VD8-4 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



Time [s]	A	B	Delta
U_fund_SYM+_rc@POWER-AC [V]	802.2015	802.1839	-0.017578
U_fund_SYM-_rc@POWER-AC [V]	1.863515	1.880283	0.016768
P_fund_SYM+_rc@POWER-AC [W]	105336.2	105229.8	-106.3828
P_fund_SYM-_rc@POWER-AC [W]	-0.527762	0.349787	0.877549
Q_fund_SYM+_rc@POWER-AC [var]	-23.42238	23.37005	46.79243
Q_fund_SYM-_rc@POWER-AC [var]	0.102862	2.154034	2.051172
I_fund_P_SYM+_rc@POWER-AC [A]	75.81124	75.73634	-0.074898
I_fund_P_SYM-_rc@POWER-AC [A]	-0.163510	0.107404	0.270914
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.016857	0.016820	0.033677
I_fund_Q_SYM-_rc@POWER-AC [A]	0.031869	0.661407	0.629538



Time [s]	A	B	Delta
I1_tRMS_rc@POWER-AC [A]	75.96037	75.26501	-0.695351
I2_tRMS_rc@POWER-AC [A]	75.92643	76.38731	0.460884
I3_tRMS_rc@POWER-AC [A]	75.66447	75.71416	0.049698
U_fund_SYM+_rc@POWER-AC [V]	802.2015	802.1839	-0.017578
U_fund_SYM-_rc@POWER-AC [V]	1.863515	1.880283	0.016768
AI 1/I1@TRIONet3_1674 [A]	85.38366	-77.00921	-162.3929
AI 1/I2@TRIONet3_1674 [A]	6.526709	104.6360	98.10925
AI 1/I3@TRIONet3_1674 [A]	-91.58254	-27.53735	64.04519
AI 1/U1@TRIONet3_1674 [V]	495.1060	-1102.926	-1598.032
AI 1/U2@TRIONet3_1674 [V]	635.9072	773.7668	137.8596
AI 1/U3@TRIONet3_1674 [V]	-1131.347	329.1972	1460.545

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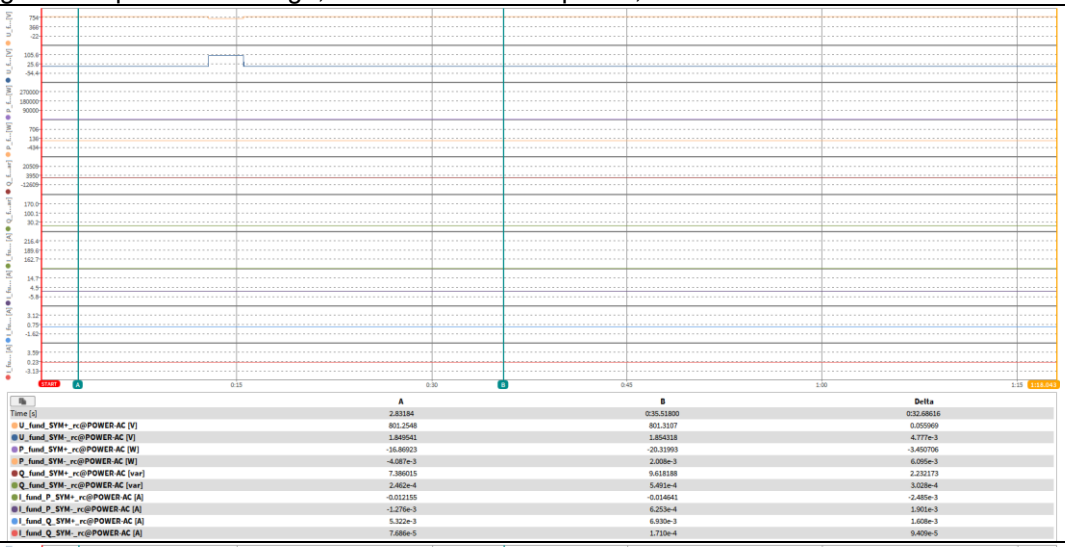
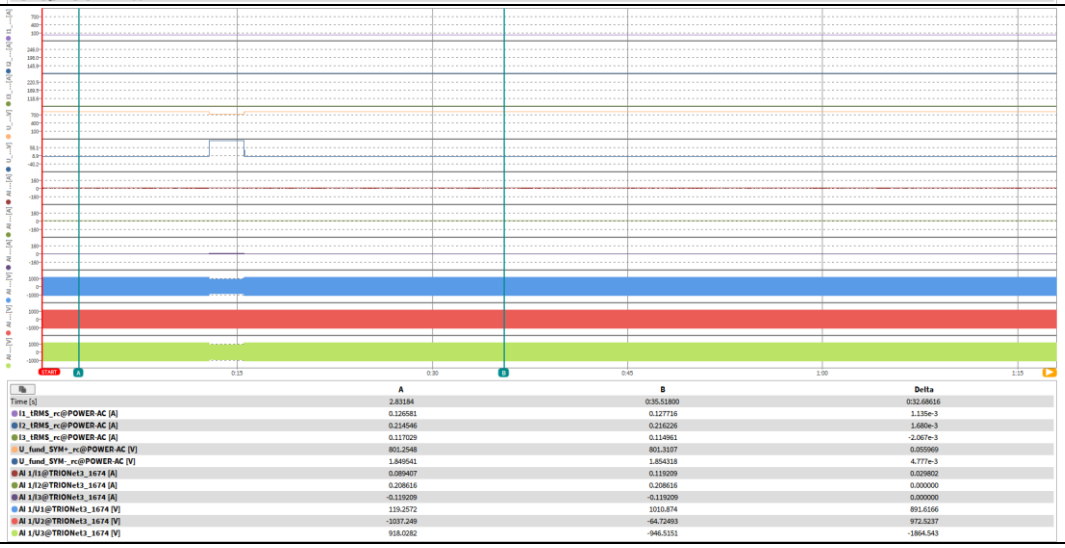
VD9 (no-load test)
a) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



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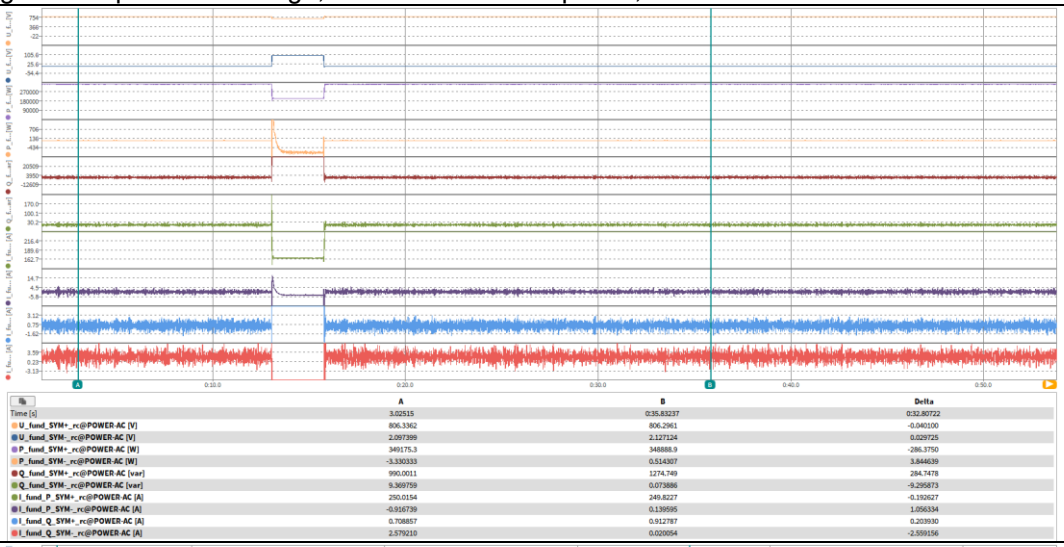
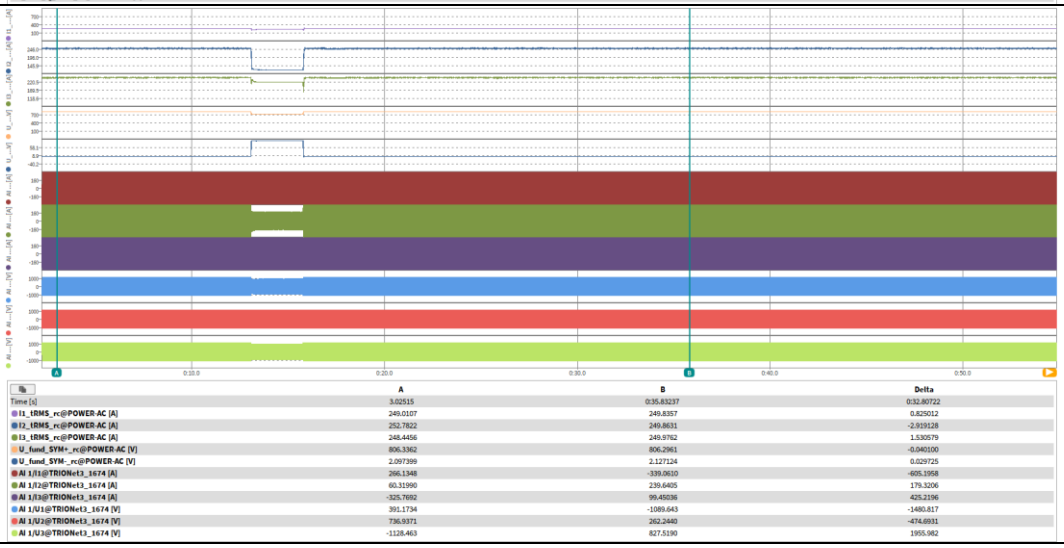
VD9-1 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	3.02515	0:35.83237	0:32.80722
U_fund_SYM+_rc@POWER-AC [V]	806.3362	806.2961	-0.040100
U_fund_SYM-_rc@POWER-AC [V]	2.097399	2.127124	0.029725
P_fund_SYM+_rc@POWER-AC [W]	349175.3	348888.9	-286.3750
P_fund_SYM-_rc@POWER-AC [W]	-3.330333	0.514307	3.844639
Q_fund_SYM+_rc@POWER-AC [var]	990.0011	1274.749	284.7478
Q_fund_SYM-_rc@POWER-AC [var]	9.369759	0.073686	-9.295873
I_fund_P_SYM+_rc@POWER-AC [A]	250.0154	249.8227	-0.192627
I_fund_P_SYM-_rc@POWER-AC [A]	-0.916739	0.139595	1.056334
I_fund_Q_SYM+_rc@POWER-AC [A]	0.708857	0.912787	0.203930
I_fund_Q_SYM-_rc@POWER-AC [A]	2.579210	0.020054	-2.559156



	A	B	Delta
Time [s]	3.02515	0:35.83237	0:32.80722
I1_tRMS_rc@POWER-AC [A]	249.0107	249.8357	0.825012
I2_tRMS_rc@POWER-AC [A]	252.7822	249.8631	-2.919128
I3_tRMS_rc@POWER-AC [A]	248.4456	249.9762	1.530579
U_fund_SYM+_rc@POWER-AC [V]	806.3362	806.2961	-0.040100
U_fund_SYM-_rc@POWER-AC [V]	2.097399	2.127124	0.029725
AI 1/I1@TRIONet3_1674 [A]	266.1348	-339.0610	-605.1958
AI 1/I2@TRIONet3_1674 [A]	60.31990	239.6405	179.3206
AI 1/I3@TRIONet3_1674 [A]	-325.7692	99.45036	425.2196
AI 1/U1@TRIONet3_1674 [V]	391.1734	-1089.643	-1480.817
AI 1/U2@TRIONet3_1674 [V]	736.9371	262.2440	-474.6931
AI 1/U3@TRIONet3_1674 [V]	-1128.463	827.5190	1955.982

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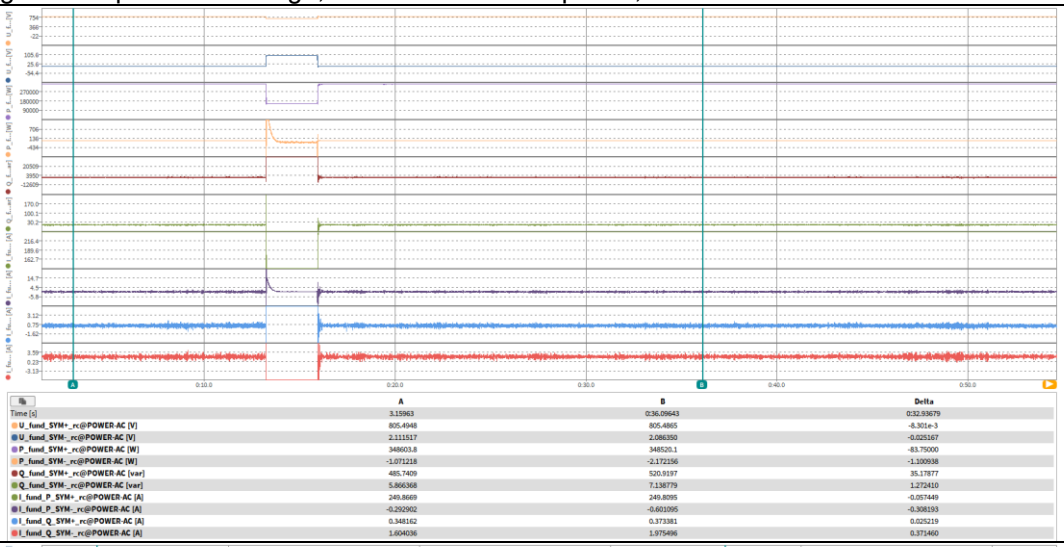
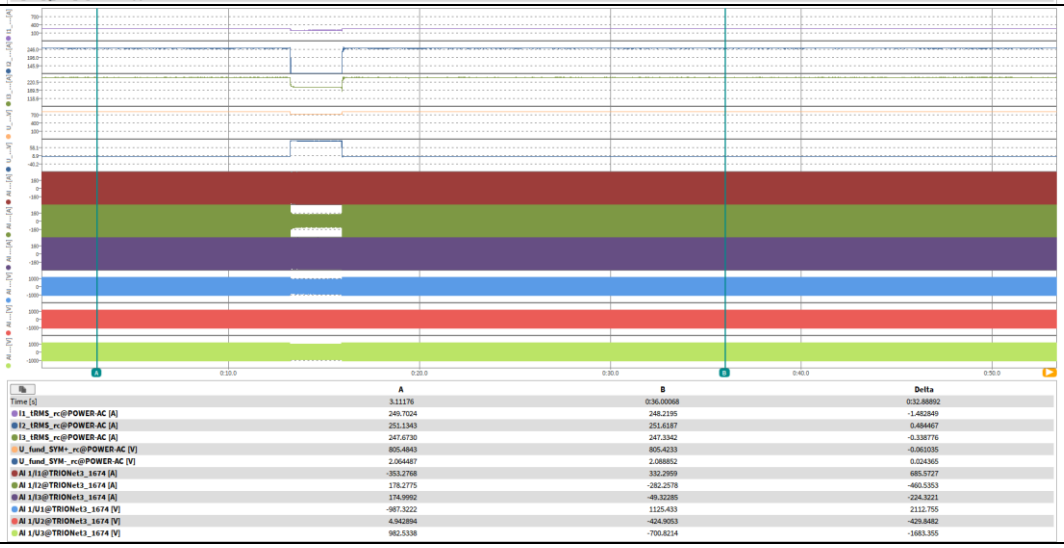
VD9-2 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	3.15963	0:36.09643	0:32.93679
U_fund_SYM+_rc@POWER-AC [V]	805.4948	805.4865	-8.301e-3
U_fund_SYM-_rc@POWER-AC [V]	2.111517	2.086350	-0.025167
P_fund_SYM+_rc@POWER-AC [W]	348603.8	348520.1	-83.75000
P_fund_SYM-_rc@POWER-AC [W]	-1.071218	-2.172156	-1.100938
Q_fund_SYM+_rc@POWER-AC [var]	485.7409	520.9197	35.17877
Q_fund_SYM-_rc@POWER-AC [var]	5.860368	7.136779	1.272410
I_fund_P_SYM+_rc@POWER-AC [A]	249.8669	249.8095	-0.057449
I_fund_P_SYM-_rc@POWER-AC [A]	-0.292902	-0.601095	-0.308193
I_fund_Q_SYM+_rc@POWER-AC [A]	0.348162	0.373381	0.025219
I_fund_Q_SYM-_rc@POWER-AC [A]	1.604036	1.975496	0.371460



	A	B	Delta
Time [s]	3.11176	0:36.00068	0:32.88892
I1_tRMS_rc@POWER-AC [A]	249.7024	248.2195	-1.482849
I2_tRMS_rc@POWER-AC [A]	251.1343	251.6187	0.484467
I3_tRMS_rc@POWER-AC [A]	247.6730	247.3342	-0.338776
U_fund_SYM+_rc@POWER-AC [V]	805.4843	805.4233	-0.061035
U_fund_SYM-_rc@POWER-AC [V]	2.064487	2.088852	0.024365
AI 1/I1@TRIONet3_1674 [A]	-353.2768	332.2959	685.5727
AI 1/I2@TRIONet3_1674 [A]	178.2775	-282.2578	-460.5353
AI 1/I3@TRIONet3_1674 [A]	174.9992	-49.32285	-224.3221
AI 1/U1@TRIONet3_1674 [V]	-987.3222	1125.433	2112.755
AI 1/U2@TRIONet3_1674 [V]	4.942894	-424.9053	-429.8482
AI 1/U3@TRIONet3_1674 [V]	982.5338	-700.8214	-1683.355

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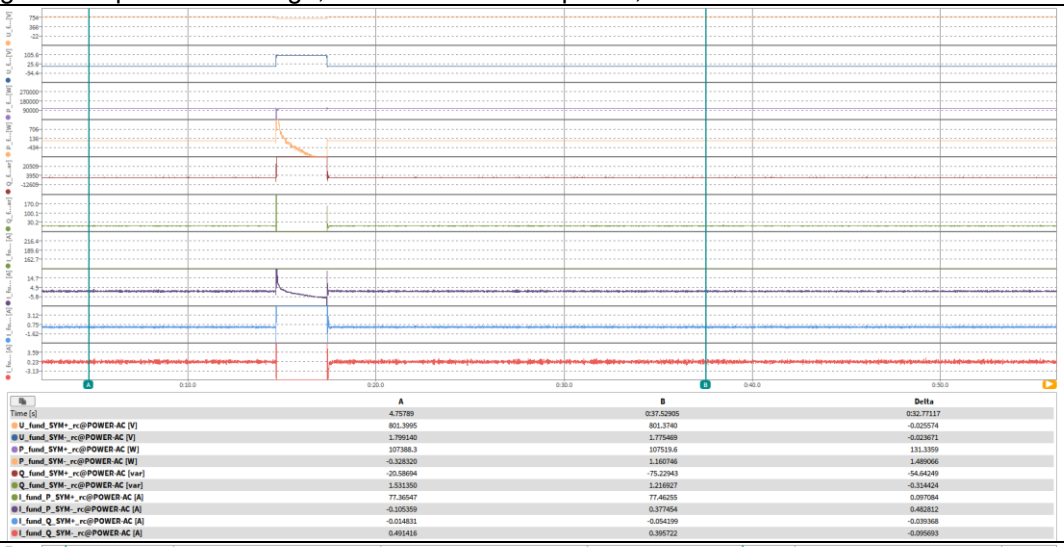
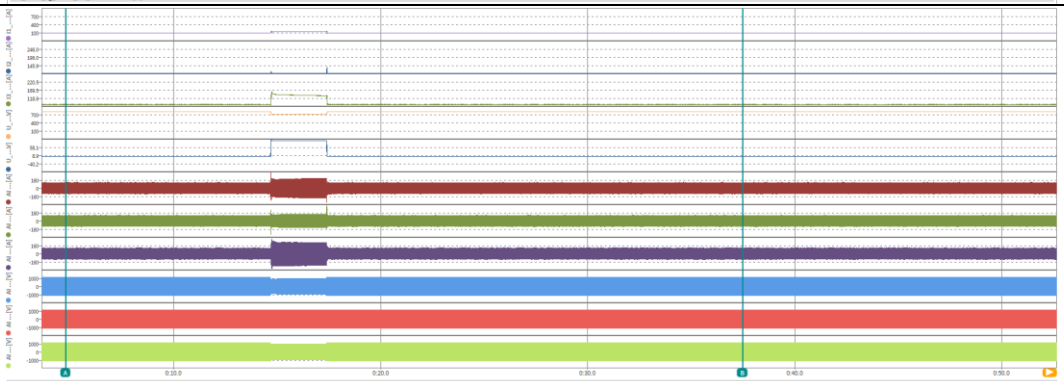
VD9-3 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	4.75789	0:37.52905	0:32.77117
U_fund_SYM+_rc@POWER-AC [V]	801.3995	801.3740	-0.025574
U_fund_SYM-_rc@POWER-AC [V]	1.799140	1.775469	-0.023671
P_fund_SYM+_rc@POWER-AC [W]	107388.3	107519.6	131.3359
P_fund_SYM-_rc@POWER-AC [W]	-0.328320	1.160746	1.489066
Q_fund_SYM+_rc@POWER-AC [var]	-20.58694	-75.22943	-54.64249
Q_fund_SYM-_rc@POWER-AC [var]	1.531350	1.216927	-0.314424
I_fund_P_SYM+_rc@POWER-AC [A]	77.36547	77.46255	0.097084
I_fund_P_SYM-_rc@POWER-AC [A]	-0.105359	0.377454	0.482812
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.014831	-0.054199	-0.039368
I_fund_Q_SYM-_rc@POWER-AC [A]	0.491416	0.395722	-0.095693



	A	B	Delta
Time [s]	4.80644	0:37.48051	0:32.67407
I1_tRMS_rc@POWER-AC [A]	77.82998	77.62319	-0.206787
I2_tRMS_rc@POWER-AC [A]	77.52380	78.06937	0.545570
I3_tRMS_rc@POWER-AC [A]	76.20758	76.47079	0.263206
U_fund_SYM+_rc@POWER-AC [V]	801.3698	801.3915	0.021667
U_fund_SYM-_rc@POWER-AC [V]	1.760990	1.769583	8.593e-3
AI 1/I1@TRIONet3_1674 [A]	23.18621	97.78143	74.59522
AI 1/I2@TRIONet3_1674 [A]	81.53916	-86.51615	-168.0553
AI 1/I3@TRIONet3_1674 [A]	-104.6062	-11.02686	93.57930
AI 1/U1@TRIONet3_1674 [V]	-375.3696	1124.340	1499.710
AI 1/U2@TRIONet3_1674 [V]	1115.995	-466.8443	-1582.839
AI 1/U3@TRIONet3_1674 [V]	-740.8636	-657.8141	83.04954

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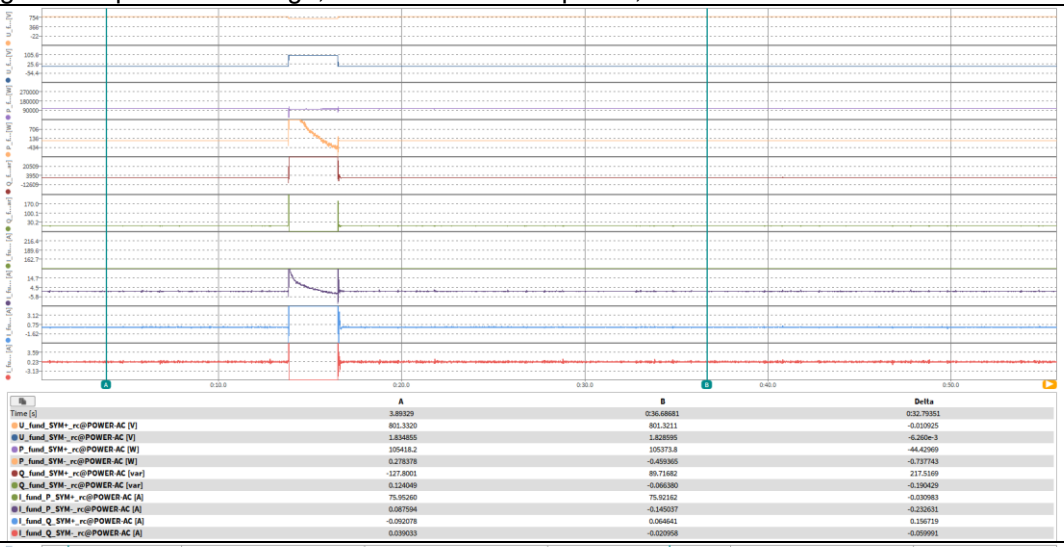
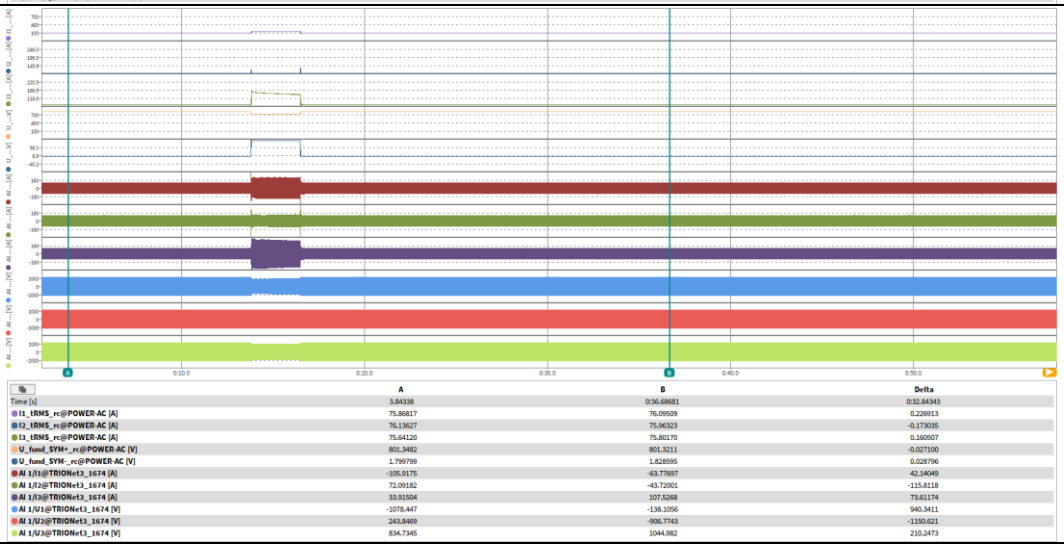
VD9-4 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	3.89329	0:36.68681	0:32.79351
U_fund_SYM+_rc@POWER-AC [V]	801.3320	801.3211	-0.010925
U_fund_SYM-_rc@POWER-AC [V]	1.834855	1.828595	-6.260e-3
P_fund_SYM+_rc@POWER-AC [W]	105418.2	105373.8	-44.42969
P_fund_SYM-_rc@POWER-AC [W]	0.278378	-0.459365	-0.737743
Q_fund_SYM+_rc@POWER-AC [var]	-127.8001	89.71682	217.5169
Q_fund_SYM-_rc@POWER-AC [var]	0.124049	-0.066380	-0.190429
I_fund_P_SYM+_rc@POWER-AC [A]	75.95260	75.92162	-0.030983
I_fund_P_SYM-_rc@POWER-AC [A]	0.087594	-0.145037	-0.232631
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.092078	0.064641	0.156719
I_fund_Q_SYM-_rc@POWER-AC [A]	0.039033	-0.020958	-0.059991



	A	B	Delta
Time [s]	3.84338	0:36.68681	0:32.84343
I1_tRMS_rc@POWER-AC [A]	75.86817	76.09509	0.226913
I2_tRMS_rc@POWER-AC [A]	76.13627	75.96323	-0.173035
I3_tRMS_rc@POWER-AC [A]	75.64120	75.80170	0.160507
U_fund_SYM+_rc@POWER-AC [V]	801.3482	801.3211	-0.027100
U_fund_SYM-_rc@POWER-AC [V]	1.799799	1.828595	0.028796
AI 1/I1@TRIONet3_1674 [A]	-105.9175	-63.77697	42.14049
AI 1/I2@TRIONet3_1674 [A]	72.09182	-43.72001	-115.8118
AI 1/I3@TRIONet3_1674 [A]	33.91504	107.5268	73.61174
AI 1/U1@TRIONet3_1674 [V]	-1078.447	-138.1056	940.3411
AI 1/U2@TRIONet3_1674 [V]	243.8469	-906.7743	-1150.621
AI 1/U3@TRIONet3_1674 [V]	834.7345	1044.982	210.2473

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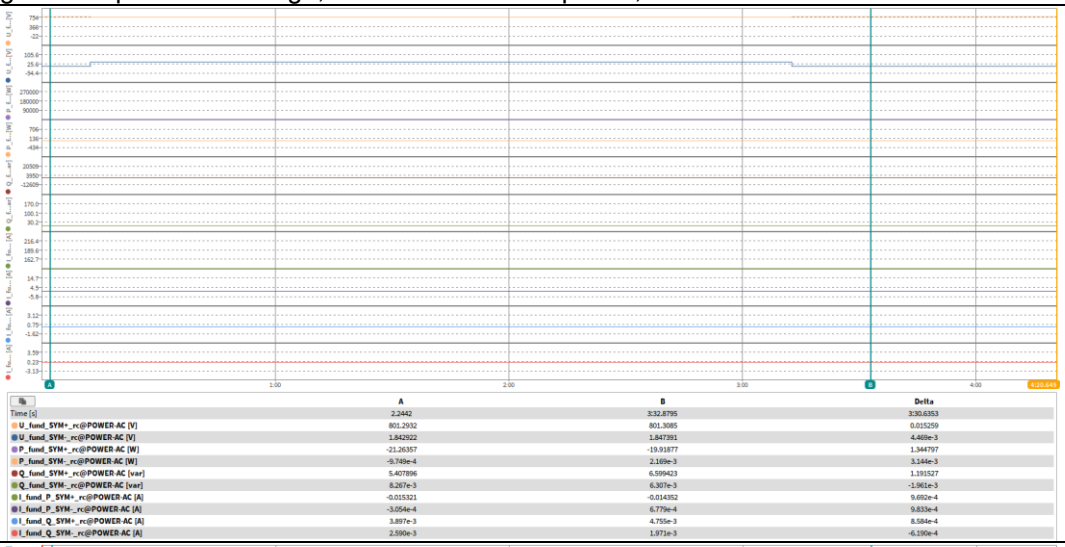
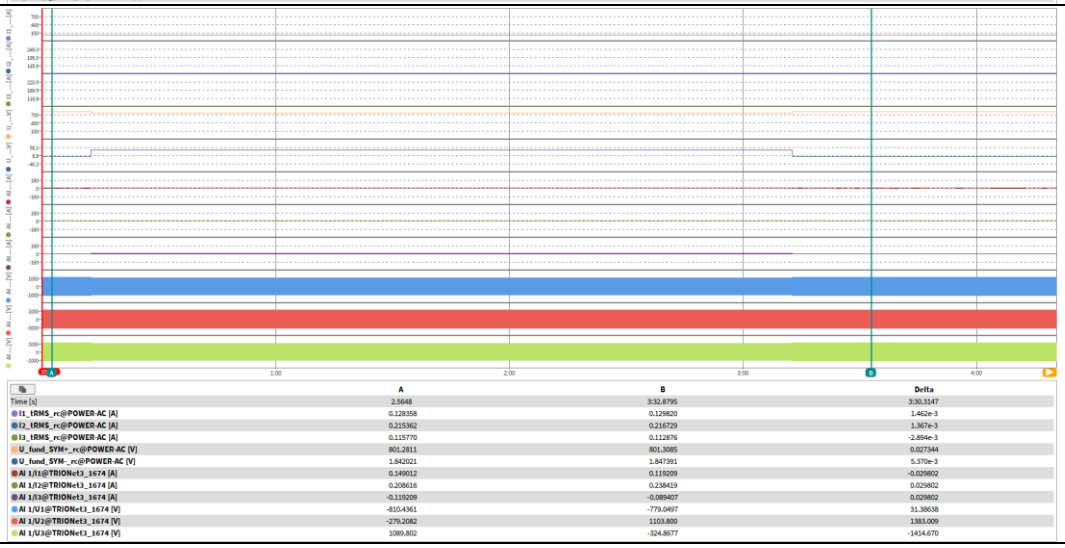
VD10 (no-load test)

a) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.2442	3:32.8795	3:30.6353
U_fund_SYM+_rc@POWER-AC [V]	801.2932	801.3085	0.015259
U_fund_SYM-_rc@POWER-AC [V]	1.842922	1.847391	4.469e-3
P_fund_SYM+_rc@POWER-AC [W]	-21.26357	-19.91877	1.344797
P_fund_SYM-_rc@POWER-AC [W]	-9.749e-4	2.169e-3	3.144e-3
Q_fund_SYM+_rc@POWER-AC [var]	5.407896	6.599423	1.191527
Q_fund_SYM-_rc@POWER-AC [var]	8.267e-3	6.307e-3	-1.961e-3
I_fund_P_SYM+_rc@POWER-AC [A]	-0.015321	-0.014352	9.692e-4
I_fund_P_SYM-_rc@POWER-AC [A]	-3.054e-4	6.779e-4	9.833e-4
I_fund_Q_SYM+_rc@POWER-AC [A]	3.897e-3	4.755e-3	8.584e-4
I_fund_Q_SYM-_rc@POWER-AC [A]	2.590e-3	1.971e-3	-6.190e-4



	A	B	Delta
Time [s]	2.5648	3:32.8795	3:30.3147
I1_tRMS_rc@POWER-AC [A]	0.128358	0.129820	1.462e-3
I2_tRMS_rc@POWER-AC [A]	0.215362	0.216729	1.367e-3
I3_tRMS_rc@POWER-AC [A]	0.115770	0.112876	-2.894e-3
U_fund_SYM+_rc@POWER-AC [V]	801.2811	801.3085	0.027344
U_fund_SYM-_rc@POWER-AC [V]	1.842021	1.847391	5.370e-3
AI 1/I1@TRIONet3_1674 [A]	0.149012	0.119209	-0.029802
AI 1/I2@TRIONet3_1674 [A]	0.208616	0.238419	0.029802
AI 1/I3@TRIONet3_1674 [A]	-0.119209	-0.089407	0.029802
AI 1/U1@TRIONet3_1674 [V]	-810.4361	-779.0497	31.38638
AI 1/U2@TRIONet3_1674 [V]	-279.2082	1103.800	1383.009
AI 1/U3@TRIONet3_1674 [V]	1089.802	-324.8677	-1414.670

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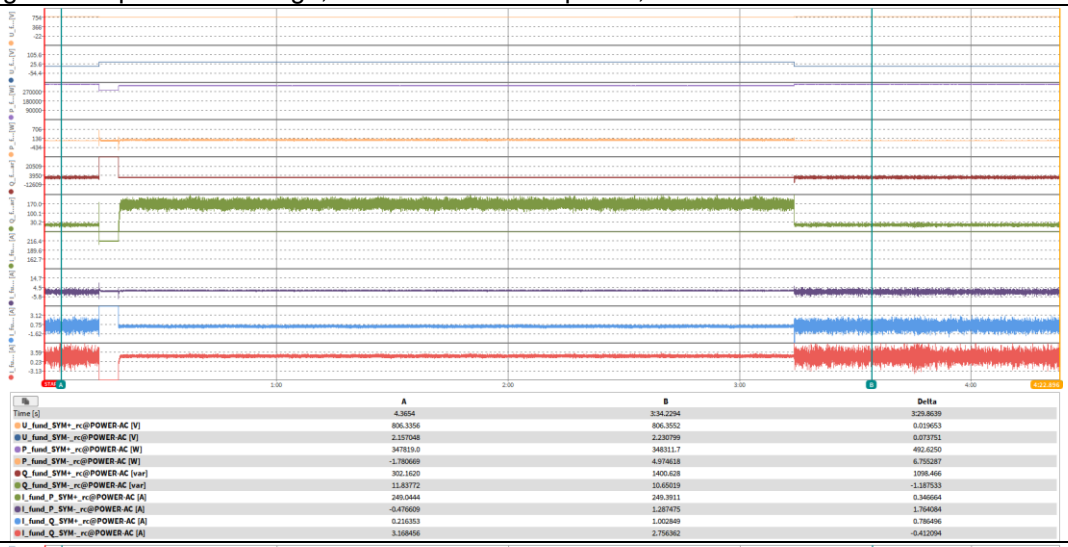
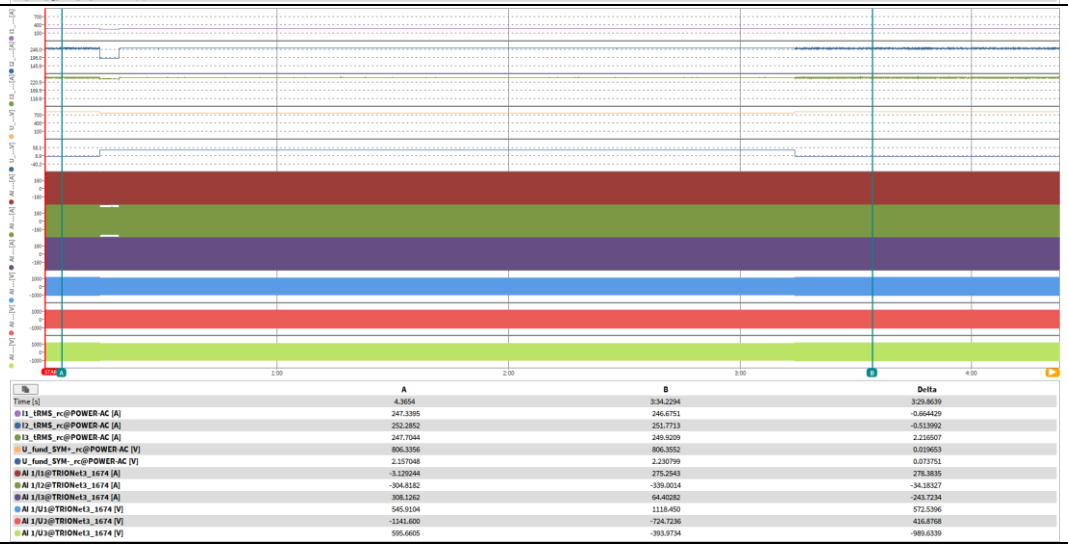
VD10-1 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	4.3654	3:34.2294	3:29.8639
U_fund_SYM+_rc@POWER-AC [V]	806.3356	806.3552	0.019653
U_fund_SYM-_rc@POWER-AC [V]	2.157048	2.230799	0.073751
P_fund_SYM+_rc@POWER-AC [W]	347819.0	348311.7	492.6250
P_fund_SYM-_rc@POWER-AC [W]	-1.780669	4.974618	6.755287
Q_fund_SYM+_rc@POWER-AC [var]	302.1620	1400.628	1098.466
Q_fund_SYM-_rc@POWER-AC [var]	11.83772	10.65019	-1.187533
I_fund_P_SYM+_rc@POWER-AC [A]	249.0444	249.3911	0.346664
I_fund_P_SYM-_rc@POWER-AC [A]	-0.476609	1.287475	1.764084
I_fund_Q_SYM+_rc@POWER-AC [A]	0.216353	1.002849	0.786496
I_fund_Q_SYM-_rc@POWER-AC [A]	3.168456	2.756362	-0.412094



	A	B	Delta
Time [s]	4.3654	3:34.2294	3:29.8639
I1_tRMS_rc@POWER-AC [A]	247.3395	246.6751	-0.664429
I2_tRMS_rc@POWER-AC [A]	252.2852	251.7713	-0.513992
I3_tRMS_rc@POWER-AC [A]	247.7044	249.9209	2.216507
U_fund_SYM+_rc@POWER-AC [V]	806.3356	806.3552	0.019653
U_fund_SYM-_rc@POWER-AC [V]	2.157048	2.230799	0.073751
AI 1/I1@TRIONet3_1674 [A]	-3.129244	275.2543	278.3835
AI 1/I2@TRIONet3_1674 [A]	-304.8182	-339.0014	-34.18327
AI 1/I3@TRIONet3_1674 [A]	308.1262	64.40282	-243.7234
AI 1/U1@TRIONet3_1674 [V]	545.9104	1118.450	572.5396
AI 1/U2@TRIONet3_1674 [V]	-1141.600	-724.7236	416.8768
AI 1/U3@TRIONet3_1674 [V]	595.6605	-393.9734	-989.6339

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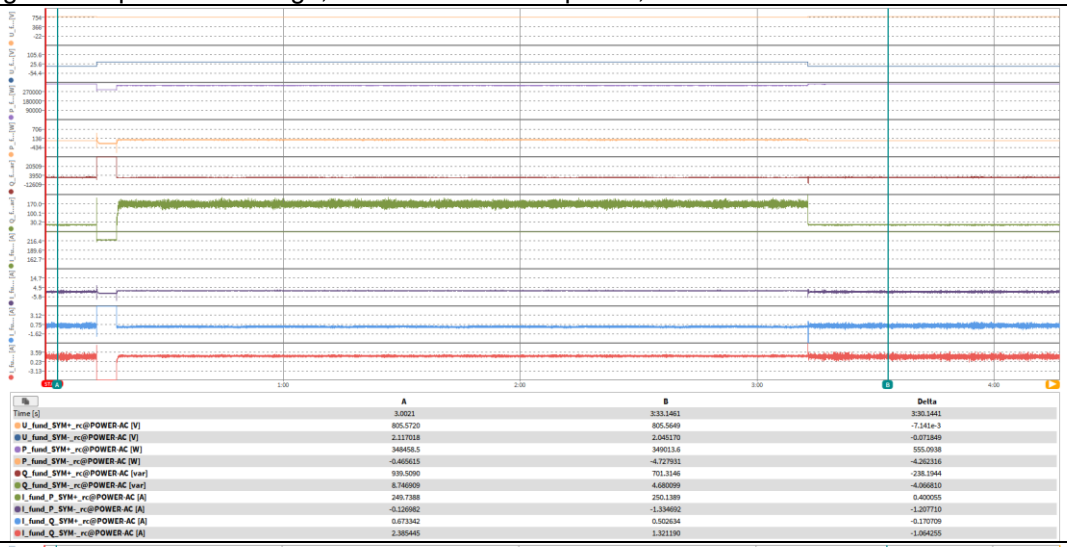
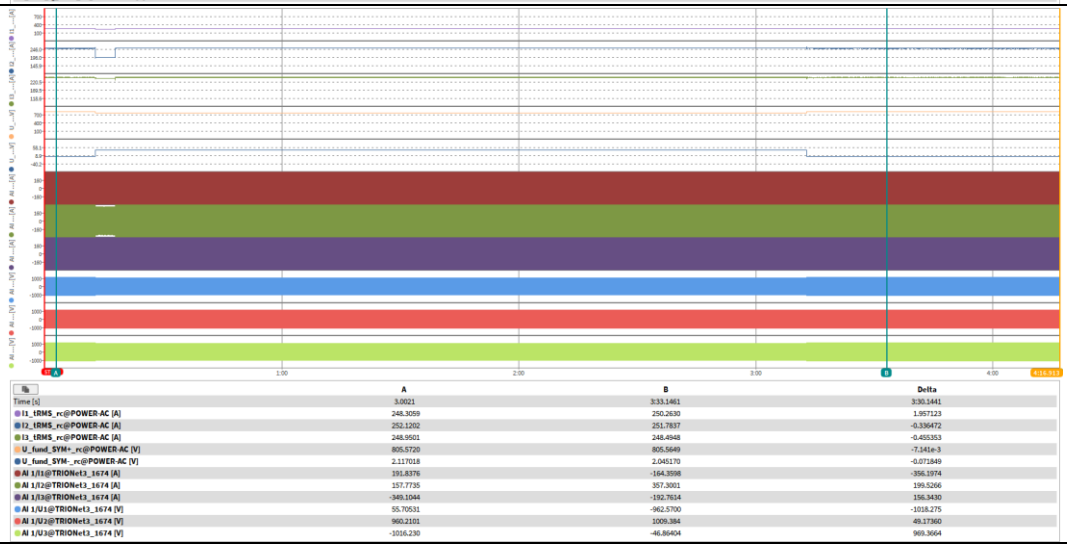
VD10-2 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	3.0021	3:33.1461	3:30.1441
U_fund_SYM+_rc@POWER-AC [V]	805.5720	805.5649	-7.141e-3
U_fund_SYM-_rc@POWER-AC [V]	2.117018	2.045170	-0.071849
P_fund_SYM+_rc@POWER-AC [W]	348458.5	349013.6	555.0938
P_fund_SYM-_rc@POWER-AC [W]	-0.465615	-4.727931	-4.262316
Q_fund_SYM+_rc@POWER-AC [var]	939.5090	701.3146	-238.1944
Q_fund_SYM-_rc@POWER-AC [var]	8.746909	4.680099	-4.066810
I_fund_P_SYM+_rc@POWER-AC [A]	249.7388	250.1389	0.400055
I_fund_P_SYM-_rc@POWER-AC [A]	-0.126982	-1.334692	-1.207710
I_fund_Q_SYM+_rc@POWER-AC [A]	0.673342	0.502634	-0.170709
I_fund_Q_SYM-_rc@POWER-AC [A]	2.385445	1.321190	-1.064255



	A	B	Delta
Time [s]	3.0021	3:33.1461	3:30.1441
I1_tRMS_rc@POWER-AC [A]	248.3059	250.2630	1.957123
I2_tRMS_rc@POWER-AC [A]	252.1202	251.7837	-0.336472
I3_tRMS_rc@POWER-AC [A]	248.9501	248.4948	-0.455353
U_fund_SYM+_rc@POWER-AC [V]	805.5720	805.5649	-7.141e-3
U_fund_SYM-_rc@POWER-AC [V]	2.117018	2.045170	-0.071849
AI 1/I1@TRIONet3_1674 [A]	191.8376	-164.3598	-356.1974
AI 1/I2@TRIONet3_1674 [A]	157.7735	357.3001	199.5266
AI 1/I3@TRIONet3_1674 [A]	-349.1044	-192.7614	156.3430
AI 1/U1@TRIONet3_1674 [V]	55.70531	-962.5700	-1018.275
AI 1/U2@TRIONet3_1674 [V]	960.2101	1009.384	49.17360
AI 1/U3@TRIONet3_1674 [V]	-1016.230	-46.86404	969.3664

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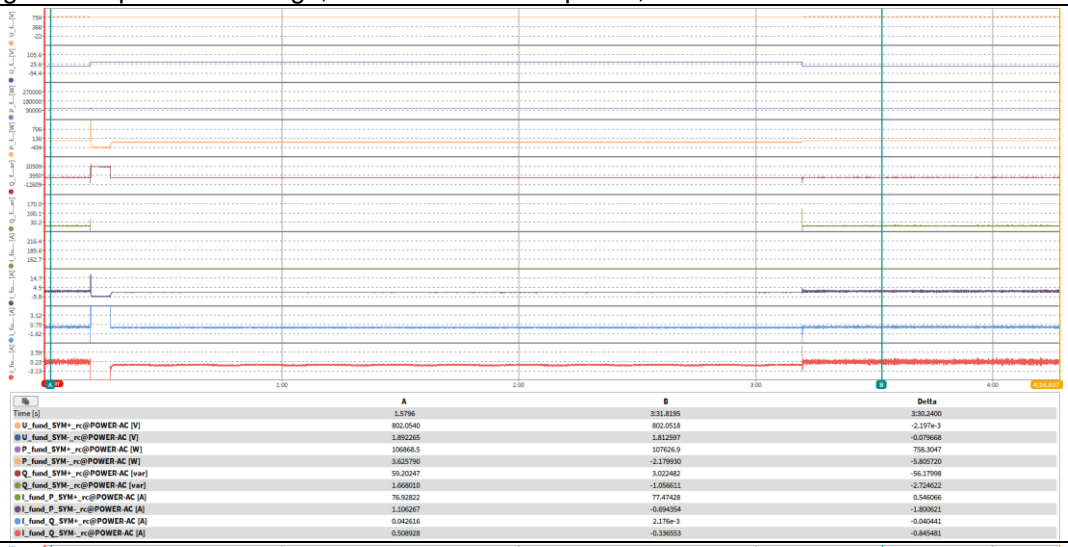
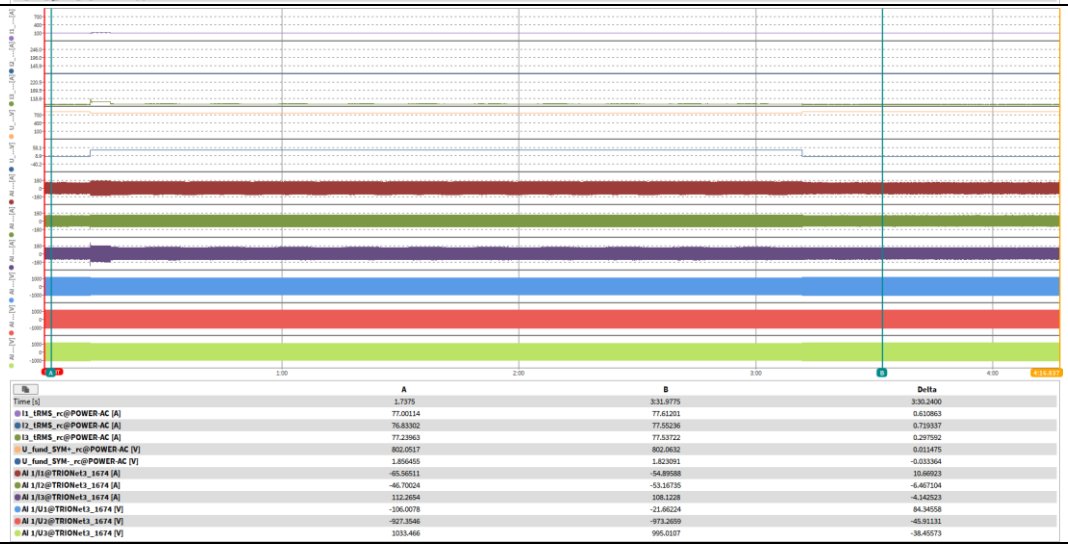
VD10-3 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



Time [s]	A	B	Delta
U_fund_SYM+_rc@POWER-AC [V]	802.0540	802.0518	-2.197e-3
U_fund_SYM-_rc@POWER-AC [V]	1.892265	1.812597	-0.079668
P_fund_SYM+_rc@POWER-AC [W]	106868.5	107626.9	758.3047
P_fund_SYM-_rc@POWER-AC [W]	3.625790	-2.179930	-5.805720
Q_fund_SYM+_rc@POWER-AC [var]	59.20247	3.022482	-56.17998
Q_fund_SYM-_rc@POWER-AC [var]	1.660010	-1.056611	-2.724622
I_fund_P_SYM+_rc@POWER-AC [A]	76.92822	77.47428	0.546066
I_fund_P_SYM-_rc@POWER-AC [A]	1.106267	-0.694354	-1.800621
I_fund_Q_SYM+_rc@POWER-AC [A]	0.042616	2.176e-3	-0.040441
I_fund_Q_SYM-_rc@POWER-AC [A]	0.508928	-0.336553	-0.845481



Time [s]	A	B	Delta
I1_tRMS_rc@POWER-AC [A]	77.00114	77.61201	0.610863
I2_tRMS_rc@POWER-AC [A]	76.83302	77.55236	0.719337
I3_tRMS_rc@POWER-AC [A]	77.23963	77.53722	0.297592
U_fund_SYM+_rc@POWER-AC [V]	802.0517	802.0632	0.011475
U_fund_SYM-_rc@POWER-AC [V]	1.856455	1.823091	-0.033364
AI 1/I1@TRIONet3_1674 [A]	-65.56511	-54.89588	10.66923
AI 1/I2@TRIONet3_1674 [A]	-46.70024	-53.16735	-6.467104
AI 1/I3@TRIONet3_1674 [A]	112.2654	108.1228	-4.142523
AI 1/U1@TRIONet3_1674 [V]	-106.0078	-21.66224	84.34558
AI 1/U2@TRIONet3_1674 [V]	-927.3546	-973.2699	-45.91131
AI 1/U3@TRIONet3_1674 [V]	1033.466	995.0107	-38.45573

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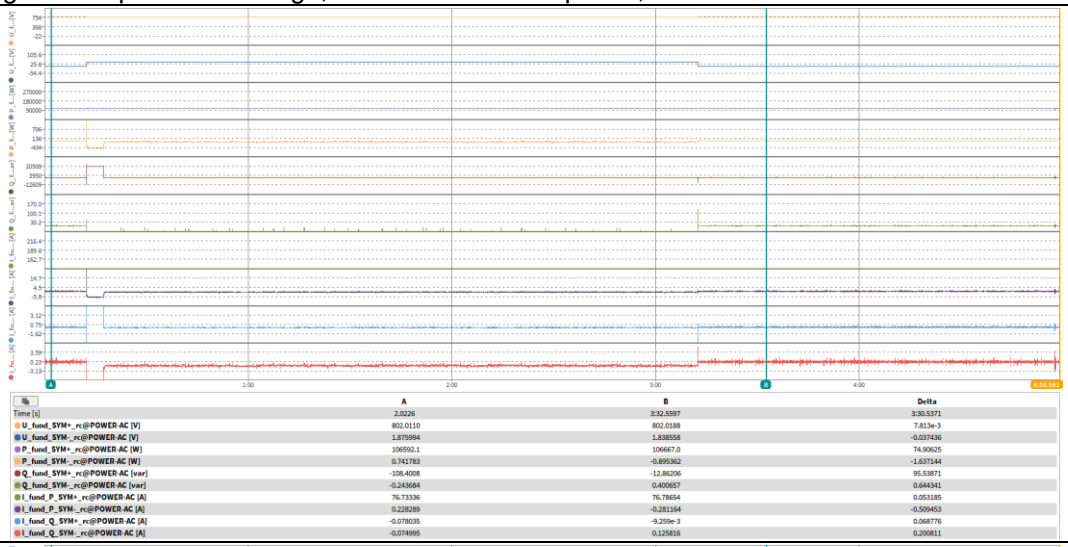
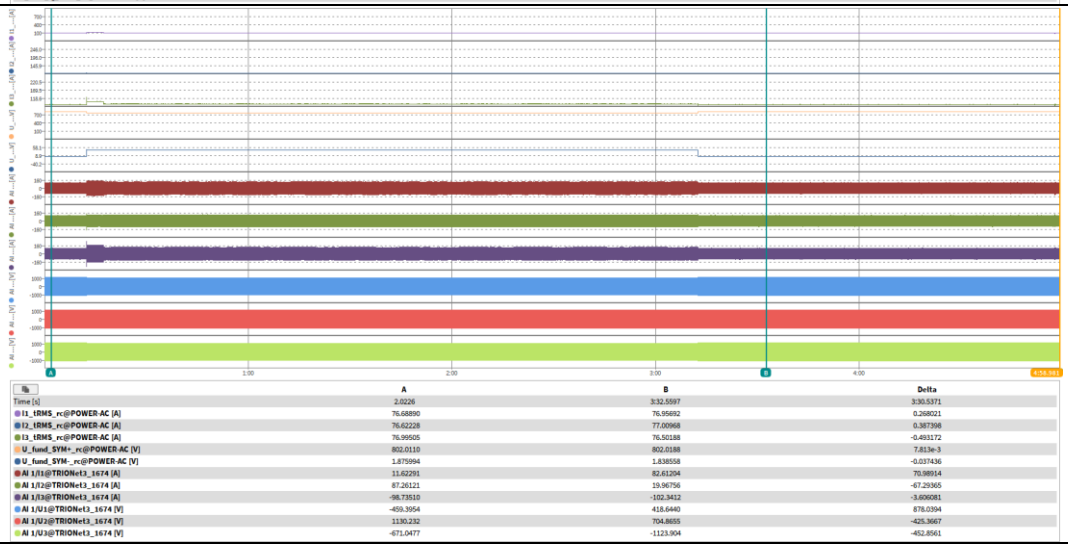
VD10-4 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.0226	3:32.5597	3:30.5371
U_fund_SYM+_rc@POWER-AC [V]	802.0110	802.0188	7.813e-3
U_fund_SYM-_rc@POWER-AC [V]	1.875994	1.838558	-0.037436
P_fund_SYM+_rc@POWER-AC [W]	106592.1	106667.0	74.90625
P_fund_SYM-_rc@POWER-AC [W]	0.741783	-0.895362	-1.637144
Q_fund_SYM+_rc@POWER-AC [var]	-108.4008	-12.86206	95.53871
Q_fund_SYM-_rc@POWER-AC [var]	-0.243684	0.400657	0.644341
I_fund_P_SYM+_rc@POWER-AC [A]	76.73336	76.78654	0.053185
I_fund_P_SYM-_rc@POWER-AC [A]	0.228289	-0.281164	-0.509453
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.078035	-9.259e-3	0.068776
I_fund_Q_SYM-_rc@POWER-AC [A]	-0.074995	0.125816	0.200811



	A	B	Delta
Time [s]	2.0226	3:32.5597	3:30.5371
I1_tRMS_rc@POWER-AC [A]	76.68890	76.95692	0.268021
I2_tRMS_rc@POWER-AC [A]	76.62228	77.00968	0.387398
I3_tRMS_rc@POWER-AC [A]	76.99505	76.50188	-0.493172
U_fund_SYM+_rc@POWER-AC [V]	802.0110	802.0188	7.813e-3
U_fund_SYM-_rc@POWER-AC [V]	1.875994	1.838558	-0.037436
AI 1/I1@TRIONet3_1674 [A]	11.62291	82.61204	70.98914
AI 1/I2@TRIONet3_1674 [A]	87.26121	19.96756	-67.29365
AI 1/I3@TRIONet3_1674 [A]	-96.73510	-102.3412	-5.606081
AI 1/U1@TRIONet3_1674 [V]	-459.3954	418.6440	878.0394
AI 1/U2@TRIONet3_1674 [V]	1130.232	704.8655	-425.3667
AI 1/U3@TRIONet3_1674 [V]	-671.0477	-1123.904	-452.8561

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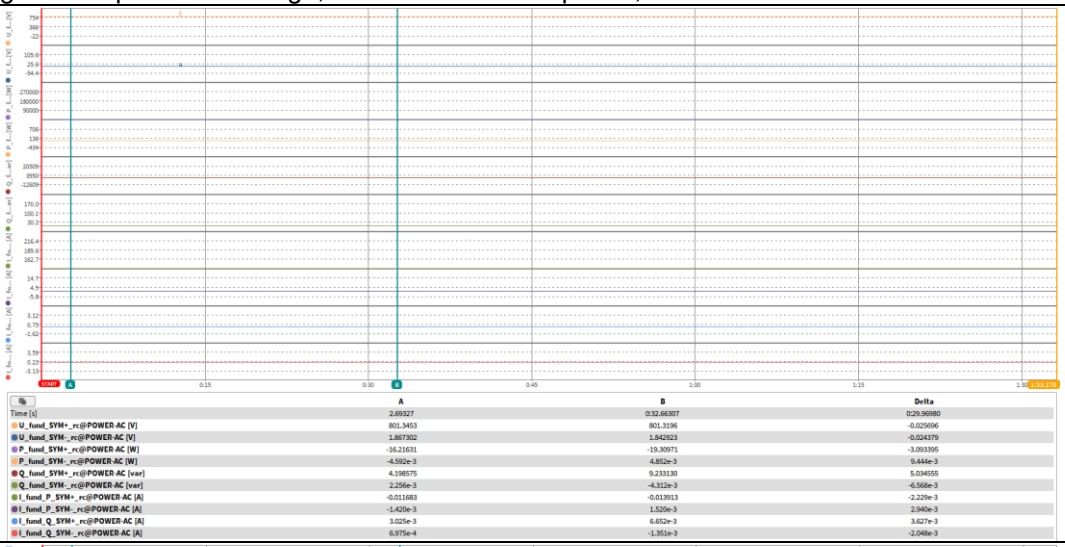
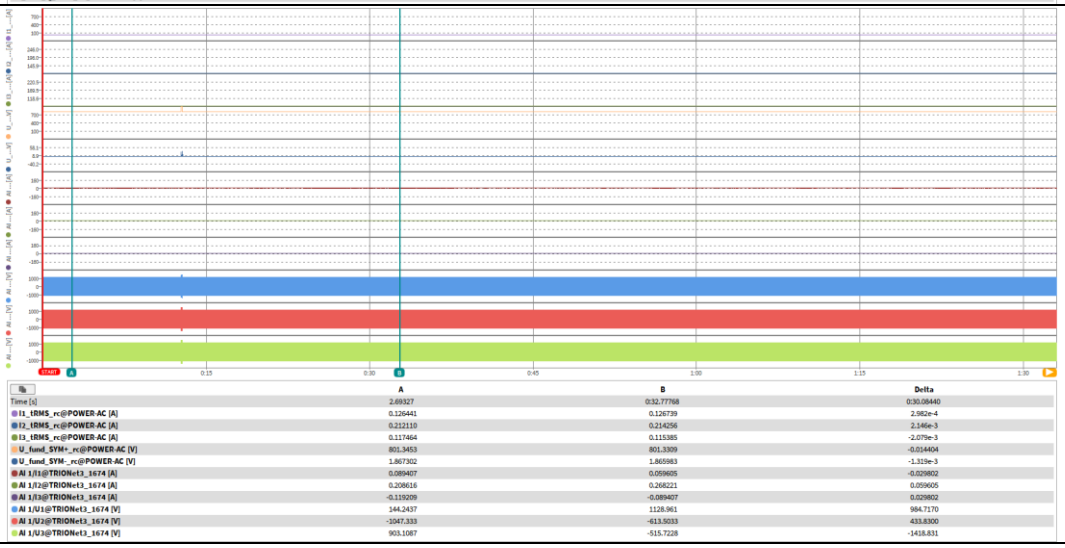
VS1 (no-load test)
a) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.69327	0:32.66307	0:29.96980
U_fund_SYM+_rc@POWER-AC [V]	801.3453	801.3196	-0.025696
U_fund_SYM-_rc@POWER-AC [V]	1.867302	1.842923	-0.024379
P_fund_SYM+_rc@POWER-AC [W]	-16.21631	-19.30971	-3.093395
P_fund_SYM-_rc@POWER-AC [W]	-4.592e-3	4.852e-3	9.444e-3
Q_fund_SYM+_rc@POWER-AC [var]	4.198575	9.233130	5.034555
Q_fund_SYM-_rc@POWER-AC [var]	2.256e-3	-4.312e-3	-6.568e-3
I_fund_P_SYM+_rc@POWER-AC [A]	-0.011683	-0.013913	-2.229e-3
I_fund_P_SYM-_rc@POWER-AC [A]	-1.420e-3	1.520e-3	2.940e-3
I_fund_Q_SYM+_rc@POWER-AC [A]	3.025e-3	6.652e-3	3.627e-3
I_fund_Q_SYM-_rc@POWER-AC [A]	6.975e-4	-1.351e-3	-2.048e-3



	A	B	Delta
Time [s]	2.69327	0:32.77768	0:30.08440
I1_tRMS_rc@POWER-AC [A]	0.126441	0.126739	2.982e-4
I2_tRMS_rc@POWER-AC [A]	0.212110	0.214256	2.146e-3
I3_tRMS_rc@POWER-AC [A]	0.117464	0.115385	-2.079e-3
U_fund_SYM+_rc@POWER-AC [V]	801.3453	801.3309	-0.014404
U_fund_SYM-_rc@POWER-AC [V]	1.867302	1.865983	-1.319e-3
AI 1/I1@TRIONet3_1674 [A]	0.089407	0.059605	-0.029802
AI 1/I2@TRIONet3_1674 [A]	0.208616	0.268221	0.059605
AI 1/I3@TRIONet3_1674 [A]	-0.119209	-0.089407	0.029802
AI 1/U1@TRIONet3_1674 [V]	144.2437	1128.961	984.7170
AI 1/U2@TRIONet3_1674 [V]	-1047.333	-613.5033	433.8300
AI 1/U3@TRIONet3_1674 [V]	903.1087	-515.7228	-1418.831

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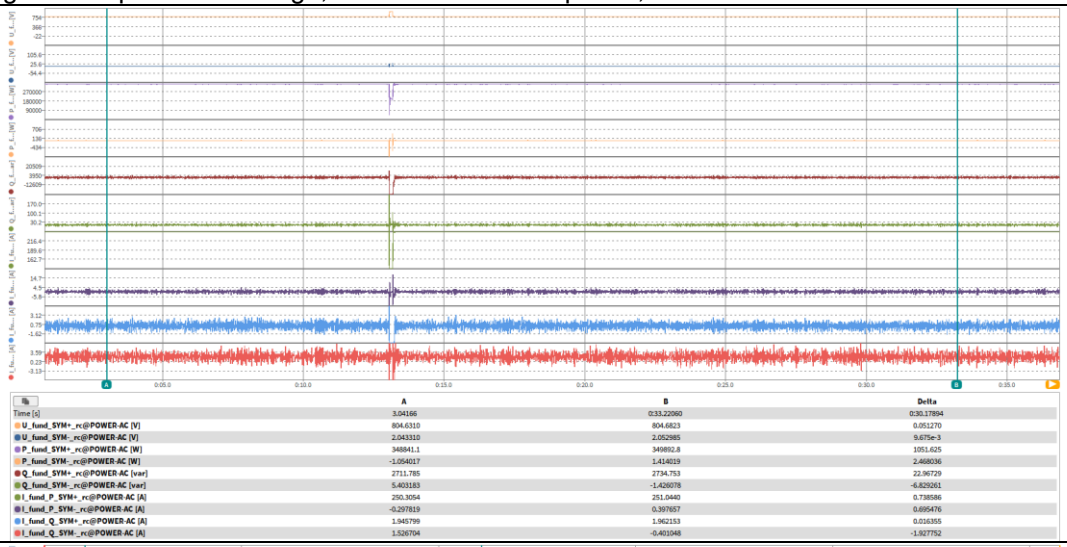
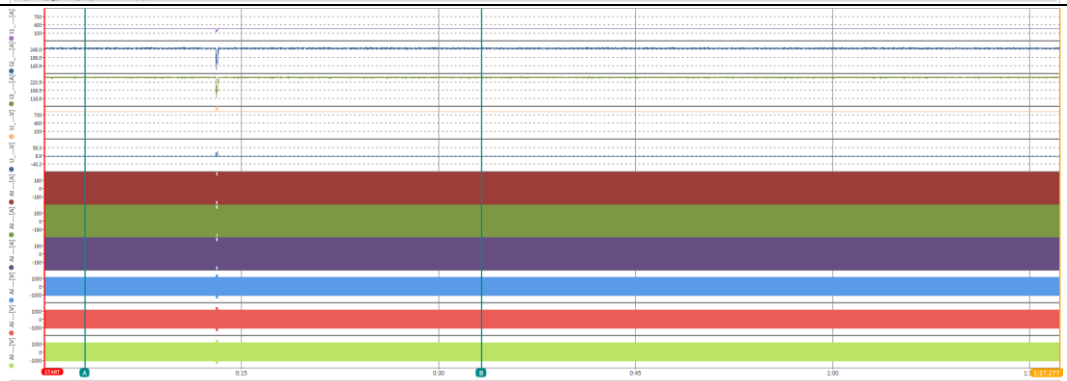
VS1-1 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	3.04166	0:33.22060	0:30.17894
U_fund_SYM+_rc@POWER-AC [V]	804.6310	804.6823	0.051270
U_fund_SYM-_rc@POWER-AC [V]	2.043310	2.052985	9.675e-3
P_fund_SYM+_rc@POWER-AC [W]	348841.1	349892.8	1051.625
P_fund_SYM-_rc@POWER-AC [W]	-1.054017	1.414019	2.468036
Q_fund_SYM+_rc@POWER-AC [var]	2711.785	2734.753	22.96729
Q_fund_SYM-_rc@POWER-AC [var]	5.403183	-1.426078	-6.829261
I_fund_P_SYM+_rc@POWER-AC [A]	250.3054	251.0440	0.738586
I_fund_P_SYM-_rc@POWER-AC [A]	-0.297819	0.397657	0.695476
I_fund_Q_SYM+_rc@POWER-AC [A]	1.945799	1.962153	0.016355
I_fund_Q_SYM-_rc@POWER-AC [A]	1.526704	-0.401048	-1.927752



	A	B	Delta
Time [s]	3.08918	0:33.26812	0:30.17894
I1_tRMS_rc@POWER-AC [A]	246.0899	247.9184	1.828506
I2_tRMS_rc@POWER-AC [A]	250.8247	254.8192	3.994583
I3_tRMS_rc@POWER-AC [A]	248.6427	248.5458	-0.096924
U_fund_SYM+_rc@POWER-AC [V]	804.5140	804.6396	0.125671
U_fund_SYM-_rc@POWER-AC [V]	2.102149	2.036448	-0.065701
AI 1/I1@TRIONet3_1674 [A]	-287.2348	-215.1430	72.09182
AI 1/I2@TRIONet3_1674 [A]	312.0601	364.6314	52.57130
AI 1/I3@TRIONet3_1674 [A]	-24.73593	-149.3692	-124.6333
AI 1/U1@TRIONet3_1674 [V]	-1126.127	-1046.550	79.57697
AI 1/U2@TRIONet3_1674 [V]	638.2194	906.7224	268.5030
AI 1/U3@TRIONet3_1674 [V]	487.9453	139.8194	-348.1260

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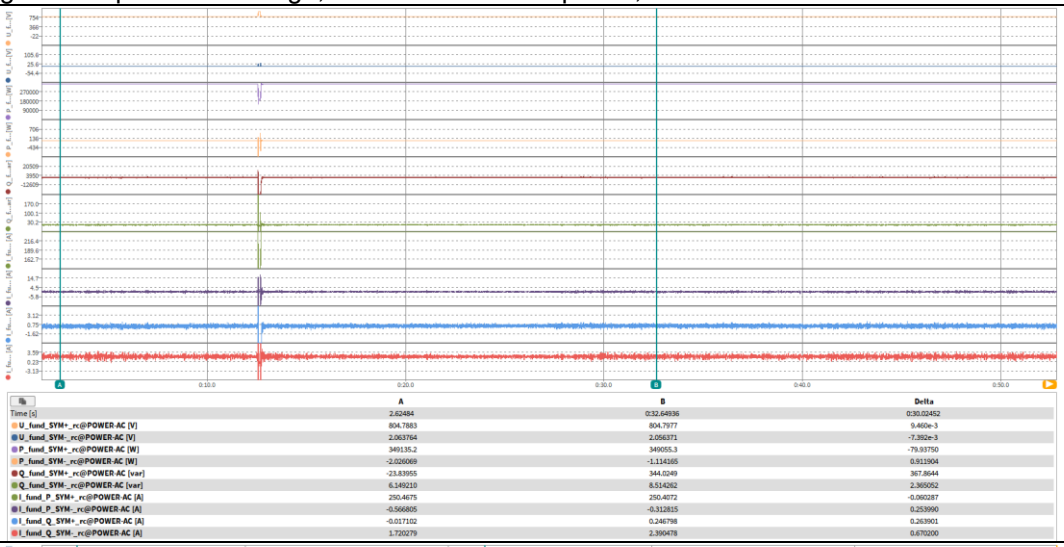
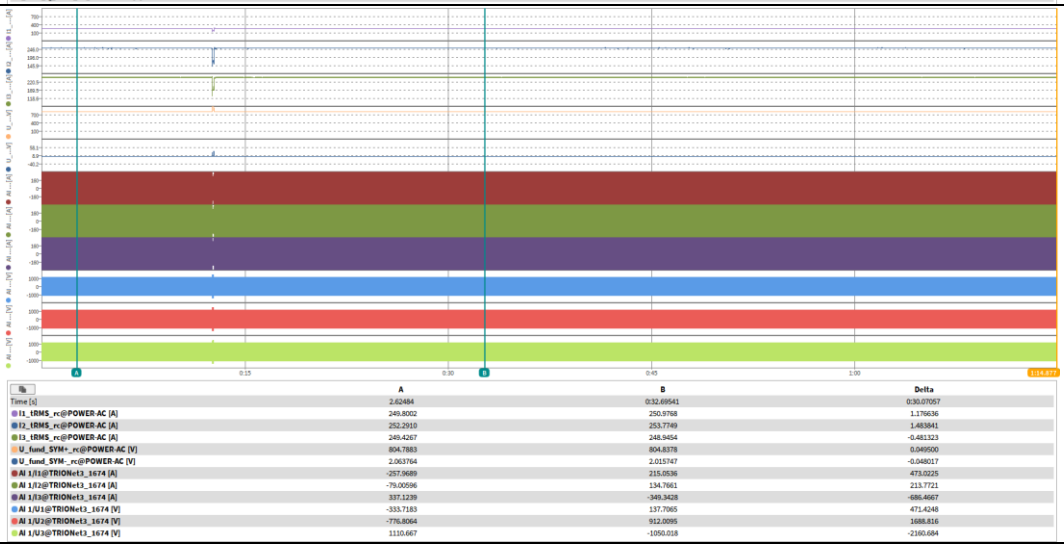
VS1-2 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.62484	0:32.64936	0:30.02452
U_fund_SYM+_rc@POWER-AC [V]	804.7883	804.7977	9.460e-3
U_fund_SYM-_rc@POWER-AC [V]	2.063764	2.056371	-7.392e-3
P_fund_SYM+_rc@POWER-AC [W]	349135.2	349055.3	-79.93750
P_fund_SYM-_rc@POWER-AC [W]	-2.026069	-1.114165	0.911904
Q_fund_SYM+_rc@POWER-AC [var]	-23.83955	344.0249	367.8644
Q_fund_SYM-_rc@POWER-AC [var]	6.149210	8.514262	2.365052
I_fund_P_SYM+_rc@POWER-AC [A]	250.4675	250.4072	-0.060287
I_fund_P_SYM-_rc@POWER-AC [A]	-0.566805	-0.312815	0.253990
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.017102	0.246798	0.263901
I_fund_Q_SYM-_rc@POWER-AC [A]	1.720279	2.390478	0.670200



	A	B	Delta
Time [s]	2.62484	0:32.69541	0:30.07057
I1_tRMS_rc@POWER-AC [A]	249.8002	250.9768	1.176636
I2_tRMS_rc@POWER-AC [A]	252.2910	253.7749	1.483841
I3_tRMS_rc@POWER-AC [A]	249.4267	248.9454	-0.481323
U_fund_SYM+_rc@POWER-AC [V]	804.7883	804.8378	0.049500
U_fund_SYM-_rc@POWER-AC [V]	2.063764	2.015747	-0.048017
AI 1/I1@TRIONet3_1674 [A]	-257.9689	215.0536	473.0225
AI 1/I2@TRIONet3_1674 [A]	-79.00596	134.7661	213.7721
AI 1/I3@TRIONet3_1674 [A]	337.1239	-349.3428	-686.4667
AI 1/U1@TRIONet3_1674 [V]	-333.7183	137.7065	471.4248
AI 1/U2@TRIONet3_1674 [V]	-776.8064	912.0095	1688.816
AI 1/U3@TRIONet3_1674 [V]	1110.667	-1050.018	-2160.684

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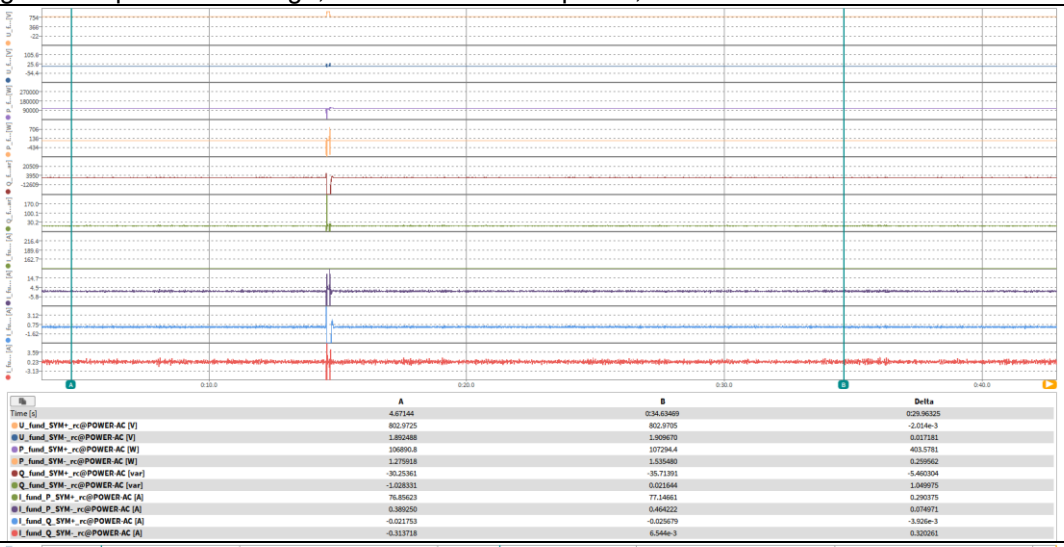
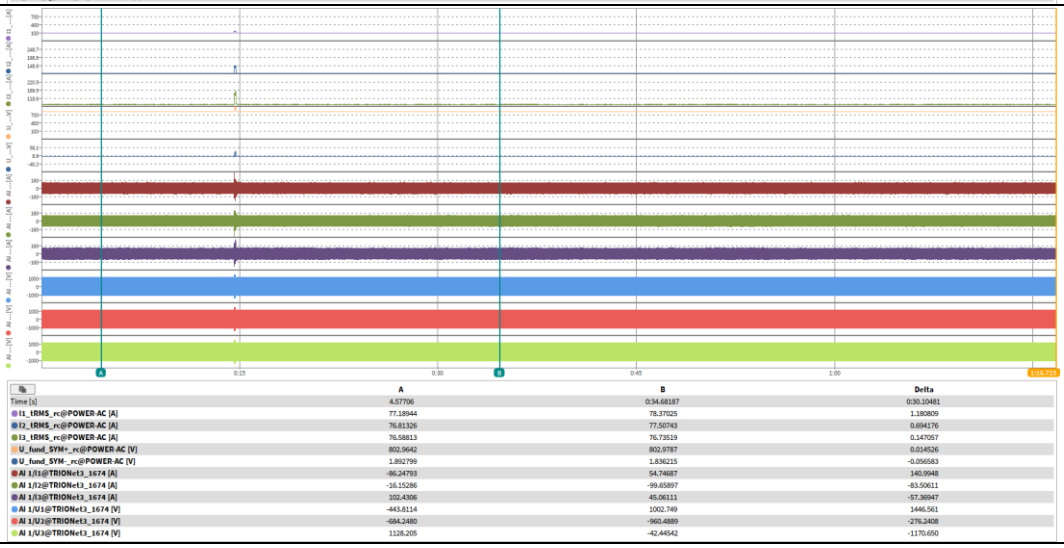
VS1-3 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



Time [s]	A	B	Delta
U_fund_SYM+_rc@POWER-AC [V]	4.67144	0:34.63469	0:29.96325
U_fund_SYM-_rc@POWER-AC [V]	802.9725	802.9705	-2.014e-3
P_fund_SYM+_rc@POWER-AC [W]	1.892488	1.909670	0.017181
P_fund_SYM-_rc@POWER-AC [W]	106890.8	107294.4	403.5781
Q_fund_SYM+_rc@POWER-AC [var]	1.275918	1.535480	0.259562
Q_fund_SYM-_rc@POWER-AC [var]	-30.25361	-35.71391	-5.460304
I_fund_P_SYM+_rc@POWER-AC [A]	-1.028331	0.021644	1.049975
I_fund_P_SYM-_rc@POWER-AC [A]	76.85623	77.14661	0.290375
I_fund_Q_SYM+_rc@POWER-AC [A]	0.389250	0.464222	0.074971
I_fund_Q_SYM-_rc@POWER-AC [A]	-0.021753	-0.025679	-3.926e-3
	-0.313718	6.544e-3	0.320261



Time [s]	A	B	Delta
I1_tRMS_rc@POWER-AC [A]	4.57706	0:34.68187	0:30.10481
I2_tRMS_rc@POWER-AC [A]	77.18944	78.37025	1.180809
I3_tRMS_rc@POWER-AC [A]	76.81326	77.50743	0.694176
U_fund_SYM+_rc@POWER-AC [V]	76.58813	76.73519	0.147057
U_fund_SYM-_rc@POWER-AC [V]	802.9642	802.9787	0.014526
AI 1/I1@TRIONet3_1674 [A]	1.892799	1.836215	-0.056583
AI 1/I2@TRIONet3_1674 [A]	-86.24793	54.74687	140.9948
AI 1/I3@TRIONet3_1674 [A]	-16.15286	-99.65897	-83.50611
AI 1/U1@TRIONet3_1674 [V]	102.4306	45.06111	-57.36947
AI 1/U2@TRIONet3_1674 [V]	-443.8114	1002.749	1446.561
AI 1/U3@TRIONet3_1674 [V]	-684.2480	-960.4889	-276.2408
	1128.205	-42.44542	-1170.650

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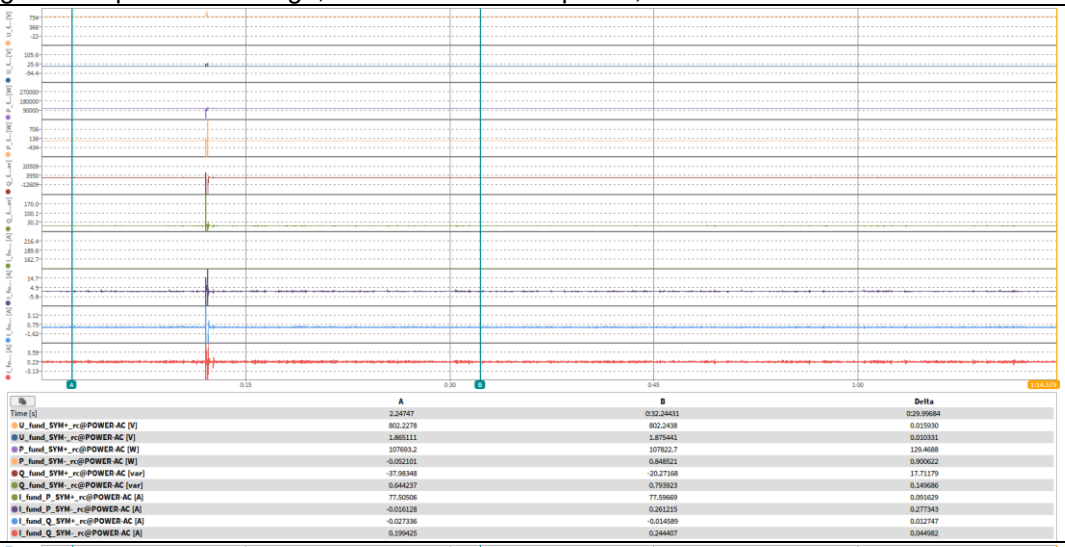
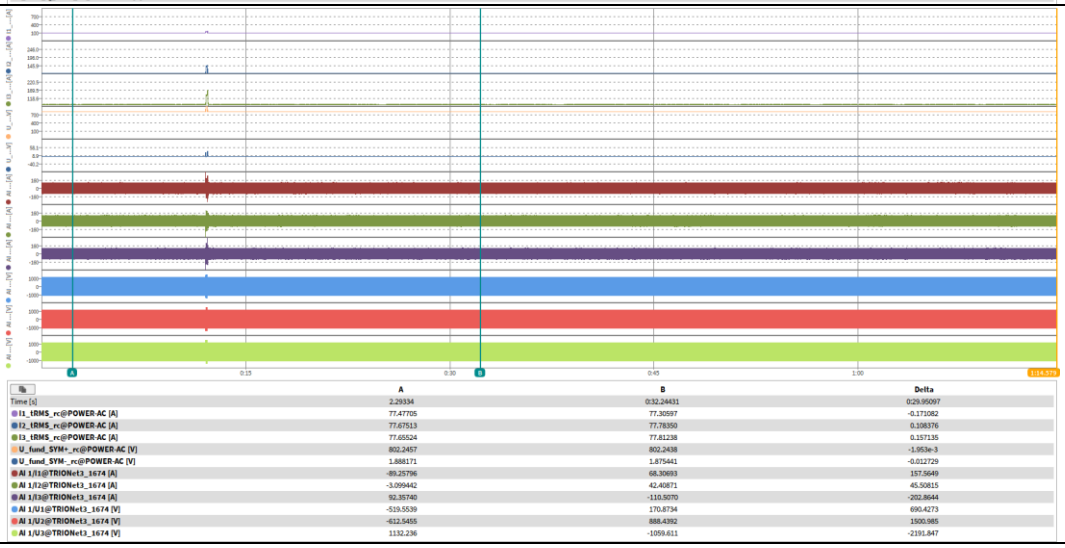
VS1-4 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



Time [s]	A	B	Delta
U_fund_SYM+_rc@POWER-AC [V]	802.2278	802.2438	0.015930
U_fund_SYM-_rc@POWER-AC [V]	1.865111	1.875441	0.010331
P_fund_SYM+_rc@POWER-AC [W]	107693.2	107822.7	129.4688
P_fund_SYM-_rc@POWER-AC [W]	-0.052101	0.848521	0.900622
Q_fund_SYM+_rc@POWER-AC [var]	-37.98348	-20.27168	17.71179
Q_fund_SYM-_rc@POWER-AC [var]	0.644237	0.793923	0.149686
I_fund_P_SYM+_rc@POWER-AC [A]	77.50506	77.59669	0.091629
I_fund_P_SYM-_rc@POWER-AC [A]	-0.016128	0.261215	0.277343
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.027336	-0.014589	0.012747
I_fund_Q_SYM-_rc@POWER-AC [A]	0.199425	0.244407	0.044982



Time [s]	A	B	Delta
I1_tRMS_rc@POWER-AC [A]	77.47705	77.30597	-0.171082
I2_tRMS_rc@POWER-AC [A]	77.67513	77.78350	0.108376
I3_tRMS_rc@POWER-AC [A]	77.65524	77.81238	0.157135
U_fund_SYM+_rc@POWER-AC [V]	802.2457	802.2438	-1.953e-3
U_fund_SYM-_rc@POWER-AC [V]	1.888171	1.875441	-0.012729
AI 1/I1@TRIONet3_1674 [A]	-89.25796	68.30693	157.5649
AI 1/I2@TRIONet3_1674 [A]	-3.099442	42.40871	45.50815
AI 1/I3@TRIONet3_1674 [A]	92.35740	-110.5070	-202.8644
AI 1/U1@TRIONet3_1674 [V]	-519.5539	170.8734	690.4273
AI 1/U2@TRIONet3_1674 [V]	-612.5455	888.4392	1500.985
AI 1/U3@TRIONet3_1674 [V]	1132.236	-1059.611	-2191.847

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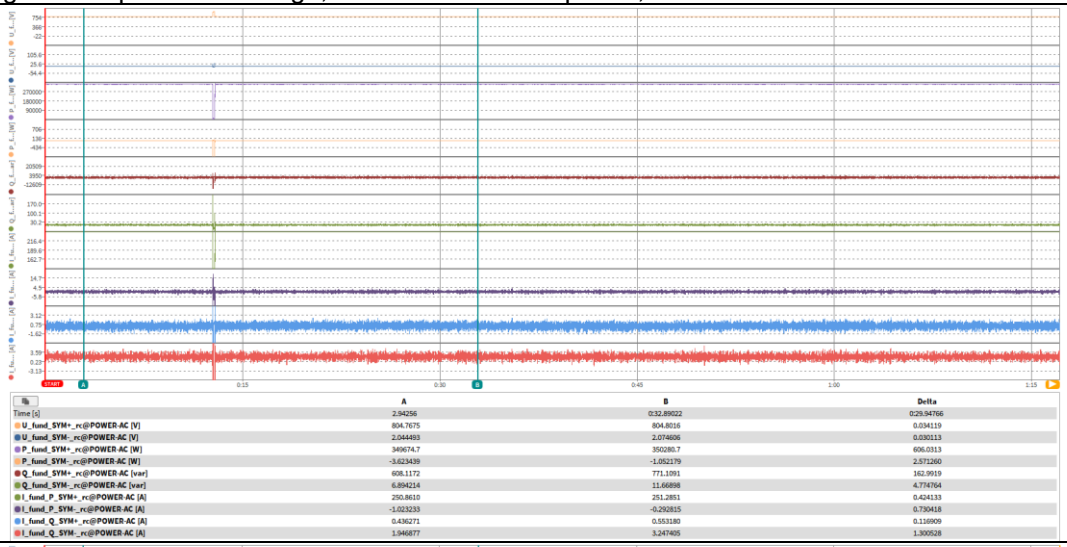
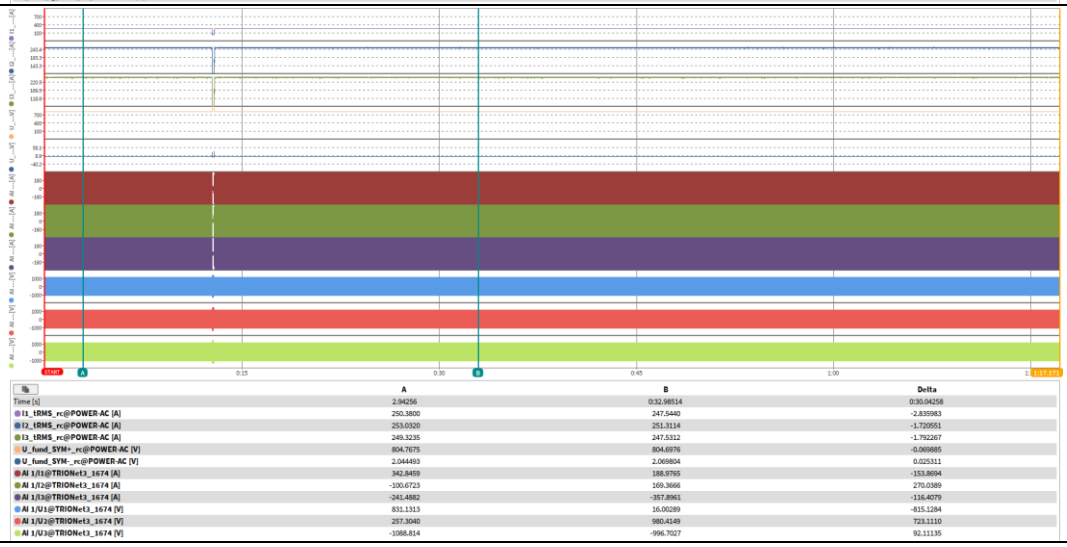
VS1-5 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.94256	0:32.89022	0:29.94766
U_fund_SYM+_rc@POWER-AC [V]	804.7675	804.8016	0.034119
U_fund_SYM-_rc@POWER-AC [V]	2.044493	2.074606	0.030113
P_fund_SYM+_rc@POWER-AC [W]	349674.7	350280.7	606.0313
P_fund_SYM-_rc@POWER-AC [W]	-3.623439	-1.052179	2.571260
Q_fund_SYM+_rc@POWER-AC [var]	608.1172	771.1091	162.9919
Q_fund_SYM-_rc@POWER-AC [var]	6.894214	11.66898	4.774764
I_fund_P_SYM+_rc@POWER-AC [A]	250.8610	251.2851	0.424133
I_fund_P_SYM-_rc@POWER-AC [A]	-1.023233	-0.292815	0.730418
I_fund_Q_SYM+_rc@POWER-AC [A]	0.436271	0.553180	0.116909
I_fund_Q_SYM-_rc@POWER-AC [A]	1.946877	3.247406	1.300528



	A	B	Delta
Time [s]	2.94256	0:32.98514	0:30.04258
I1_tRMS_rc@POWER-AC [A]	250.3800	247.5440	-2.835983
I2_tRMS_rc@POWER-AC [A]	253.0320	251.3114	-1.720551
I3_tRMS_rc@POWER-AC [A]	249.3235	247.5312	-1.792267
U_fund_SYM+_rc@POWER-AC [V]	804.7675	804.6976	-0.069885
U_fund_SYM-_rc@POWER-AC [V]	2.044493	2.069804	0.025311
AI 1/I1@TRIONet3_1674 [A]	342.8459	188.9765	-153.8694
AI 1/I2@TRIONet3_1674 [A]	-100.6723	169.3666	270.0389
AI 1/I3@TRIONet3_1674 [A]	-241.4892	-357.8961	-116.4079
AI 1/U1@TRIONet3_1674 [V]	831.1313	16.00289	-815.1284
AI 1/U2@TRIONet3_1674 [V]	257.3040	980.4149	723.1110
AI 1/U3@TRIONet3_1674 [V]	-1088.814	-996.7027	92.11135

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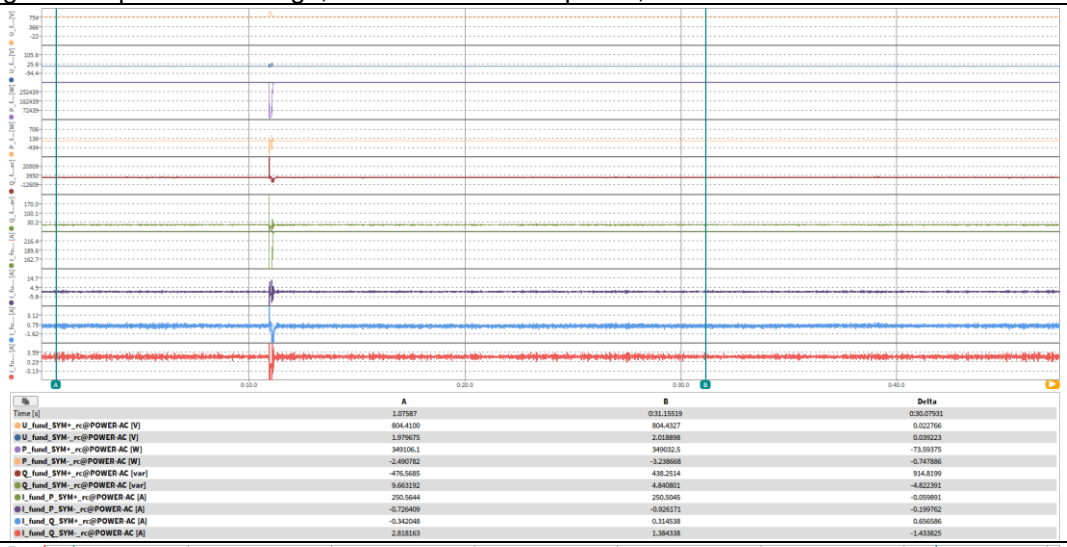
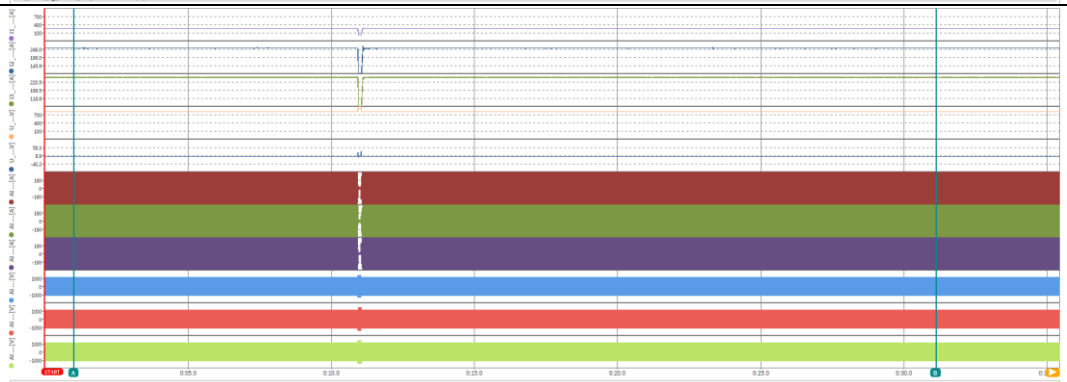
VS1-6 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	1.07587	0:31.15519	0:30.07931
U_fund_SYM+_rc@POWER-AC [V]	804.4100	804.4327	0.022766
U_fund_SYM-_rc@POWER-AC [V]	1.979675	2.018898	0.039223
P_fund_SYM+_rc@POWER-AC [W]	349106.1	349032.5	-73.59375
P_fund_SYM-_rc@POWER-AC [W]	-2.490782	-3.238668	-0.747886
Q_fund_SYM+_rc@POWER-AC [var]	-476.5685	438.2514	914.8199
Q_fund_SYM-_rc@POWER-AC [var]	9.663192	4.840801	-4.822391
I_fund_P_SYM+_rc@POWER-AC [A]	250.5644	250.5045	-0.059891
I_fund_P_SYM-_rc@POWER-AC [A]	-0.726409	-0.926171	-0.199762
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.342048	0.314538	0.656586
I_fund_Q_SYM-_rc@POWER-AC [A]	2.818163	1.384338	-1.433825



	A	B	Delta
Time [s]	1.02771	0:31.11170	0:30.08399
I1_tRMS_rc@POWER-AC [A]	248.9667	250.6119	1.645218
I2_tRMS_rc@POWER-AC [A]	252.5583	252.0793	-0.479080
I3_tRMS_rc@POWER-AC [A]	250.3685	250.7279	0.359344
U_fund_SYM+_rc@POWER-AC [V]	804.4029	804.4600	0.057068
U_fund_SYM-_rc@POWER-AC [V]	2.063598	2.050776	-0.012822
AI 1/I1@TRIONet3_1674 [A]	305.7122	-43.74981	-349.4621
AI 1/I2@TRIONet3_1674 [A]	-11.53350	325.7096	337.2431
AI 1/I3@TRIONet3_1674 [A]	-293.2947	-281.5128	11.77192
AI 1/U1@TRIONet3_1674 [V]	626.7672	-710.8365	-1337.604
AI 1/U2@TRIONet3_1674 [V]	511.4460	1125.403	613.9572
AI 1/U3@TRIONet3_1674 [V]	-1138.583	-414.7110	723.8715

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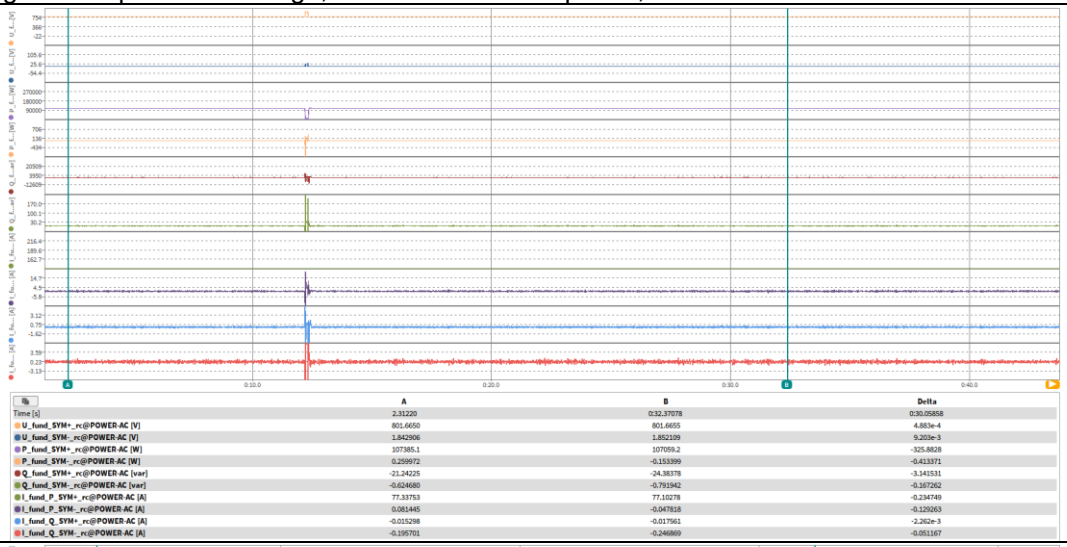
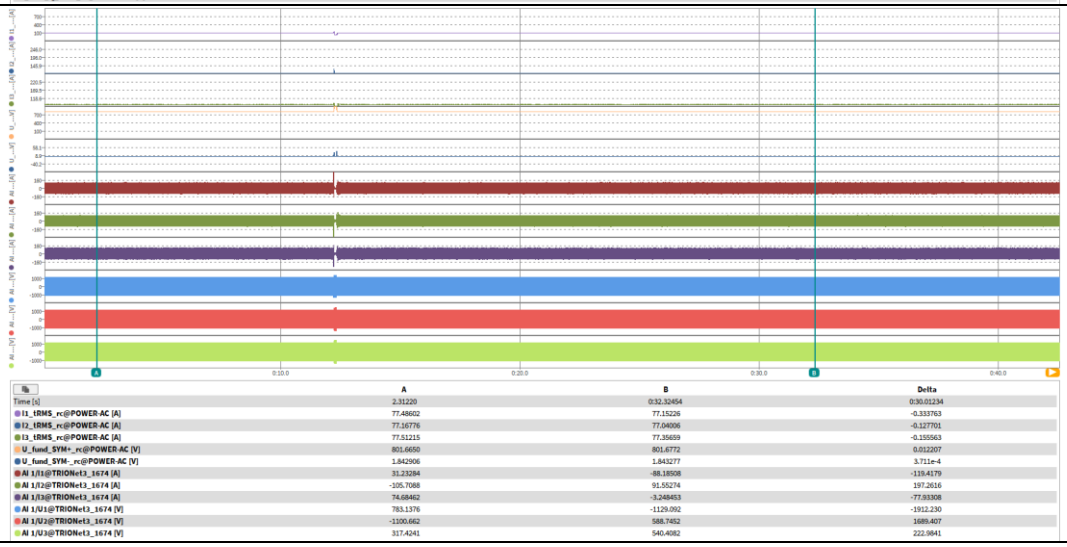
VS1-7 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



Time [s]	A	B	Delta
U_fund_SYM+_rc@POWER-AC [V]	2.31220	0:32.37078	0:30.05858
U_fund_SYM-_rc@POWER-AC [V]	801.6650	801.6655	4.883e-4
P_fund_SYM+_rc@POWER-AC [W]	1.842906	1.852109	9.203e-3
P_fund_SYM-_rc@POWER-AC [W]	107385.1	107059.2	-325.8828
Q_fund_SYM+_rc@POWER-AC [var]	0.259972	-0.153399	-0.413371
Q_fund_SYM-_rc@POWER-AC [var]	-21.24225	-24.38378	-3.141531
I_fund_P_SYM+_rc@POWER-AC [A]	-0.624680	-0.791942	-0.167262
I_fund_P_SYM-_rc@POWER-AC [A]	77.33753	77.10278	-0.234749
I_fund_Q_SYM+_rc@POWER-AC [A]	0.081445	-0.047818	-0.129263
I_fund_Q_SYM-_rc@POWER-AC [A]	-0.015298	-0.017561	-2.262e-3
	-0.195701	-0.246869	-0.051167



Time [s]	A	B	Delta
I1_tRMS_rc@POWER-AC [A]	2.31220	0:32.32464	0:30.01234
I2_tRMS_rc@POWER-AC [A]	77.48602	77.15226	-0.333763
I3_tRMS_rc@POWER-AC [A]	77.16776	77.04006	-0.127701
U_fund_SYM+_rc@POWER-AC [V]	77.51215	77.35659	-0.155563
U_fund_SYM-_rc@POWER-AC [V]	801.6650	801.6772	0.012207
AI 1/I1@TRIONet3_1674 [A]	1.842906	1.843277	3.711e-4
AI 1/I2@TRIONet3_1674 [A]	31.23284	-88.18508	-119.4179
AI 1/I3@TRIONet3_1674 [A]	-105.7088	91.55274	197.2616
AI 1/U1@TRIONet3_1674 [V]	74.68462	-3.284453	-77.93308
AI 1/U2@TRIONet3_1674 [V]	783.1376	-1129.092	-1912.230
AI 1/U3@TRIONet3_1674 [V]	-1100.662	588.7452	1689.407
	317.4241	540.4082	222.9841

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TÜV SÜD New Energy Vehicle Testing (Jiangsu) Co., Ltd., TÜV SÜD Group
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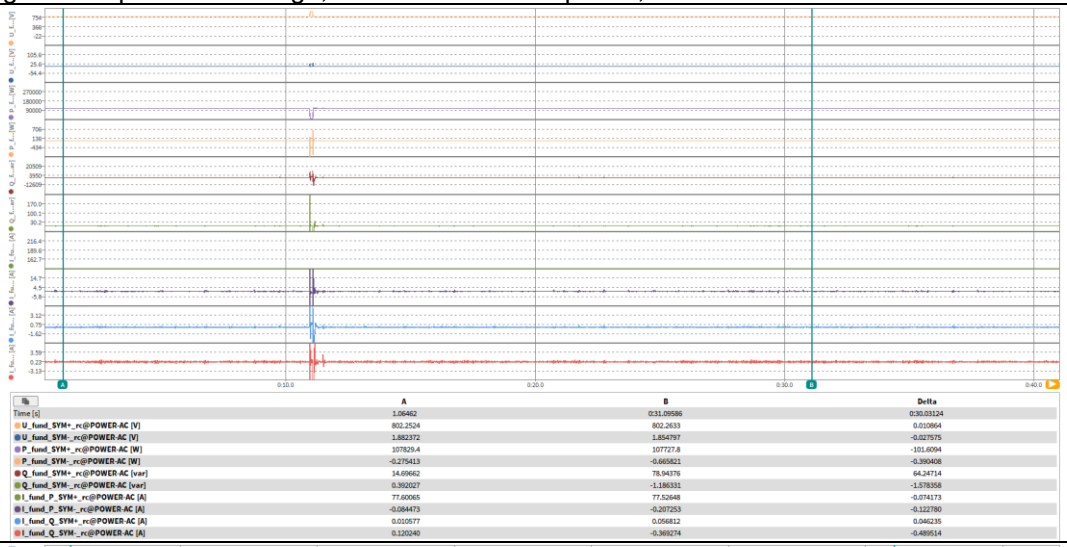
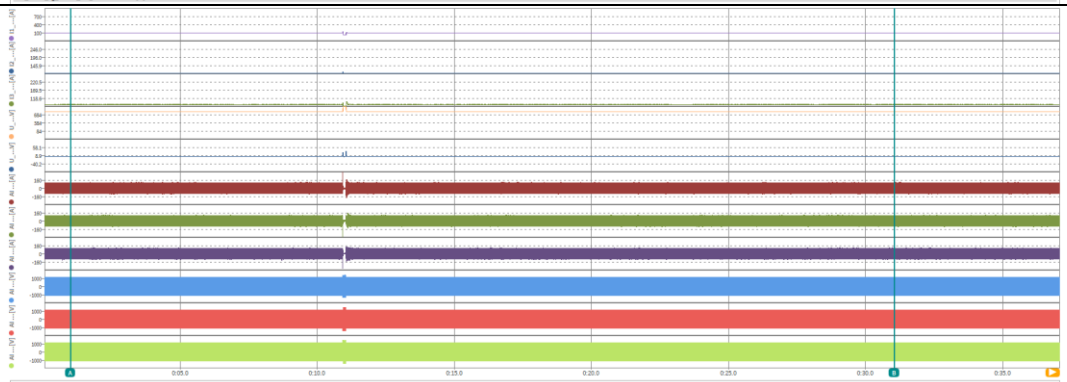
VS1-8 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	1.06462	0:31.09586	0:30.03124
U_fund_SYM+_rc@POWER-AC [V]	802.2524	802.2633	0.010864
U_fund_SYM-_rc@POWER-AC [V]	1.882372	1.854797	-0.027575
P_fund_SYM+_rc@POWER-AC [W]	107829.4	107727.8	-101.6094
P_fund_SYM-_rc@POWER-AC [W]	-0.275413	-0.665821	-0.390408
Q_fund_SYM+_rc@POWER-AC [var]	14.69662	78.94376	64.24714
Q_fund_SYM-_rc@POWER-AC [var]	0.392027	-1.186331	-1.578358
I_fund_P_SYM+_rc@POWER-AC [A]	77.60065	77.52648	-0.074173
I_fund_P_SYM-_rc@POWER-AC [A]	-0.084473	-0.207253	-0.122780
I_fund_Q_SYM+_rc@POWER-AC [A]	0.010577	0.056812	0.046235
I_fund_Q_SYM-_rc@POWER-AC [A]	0.120240	-0.369274	-0.489514



	A	B	Delta
Time [s]	1.02067	0:31.05191	0:30.03124
I1_tRMS_rc@POWER-AC [A]	77.62098	77.41766	-0.203323
I2_tRMS_rc@POWER-AC [A]	77.81100	77.82022	9.216e-3
I3_tRMS_rc@POWER-AC [A]	77.75698	77.56953	-0.187454
U_fund_SYM+_rc@POWER-AC [V]	802.2572	802.2606	3.418e-3
U_fund_SYM-_rc@POWER-AC [V]	1.870400	1.859130	-0.011270
AI 1/I1@TRIONet3_1674 [A]	43.92863	-77.06881	-120.9974
AI 1/I2@TRIONet3_1674 [A]	-108.8977	106.8413	215.7390
AI 1/I3@TRIONet3_1674 [A]	65.14788	-29.68311	-94.83100
AI 1/U1@TRIONet3_1674 [V]	900.3523	-1100.585	-2000.937
AI 1/U2@TRIONet3_1674 [V]	-1047.640	783.2609	1830.901
AI 1/U3@TRIONet3_1674 [V]	147.1281	317.3549	170.2268

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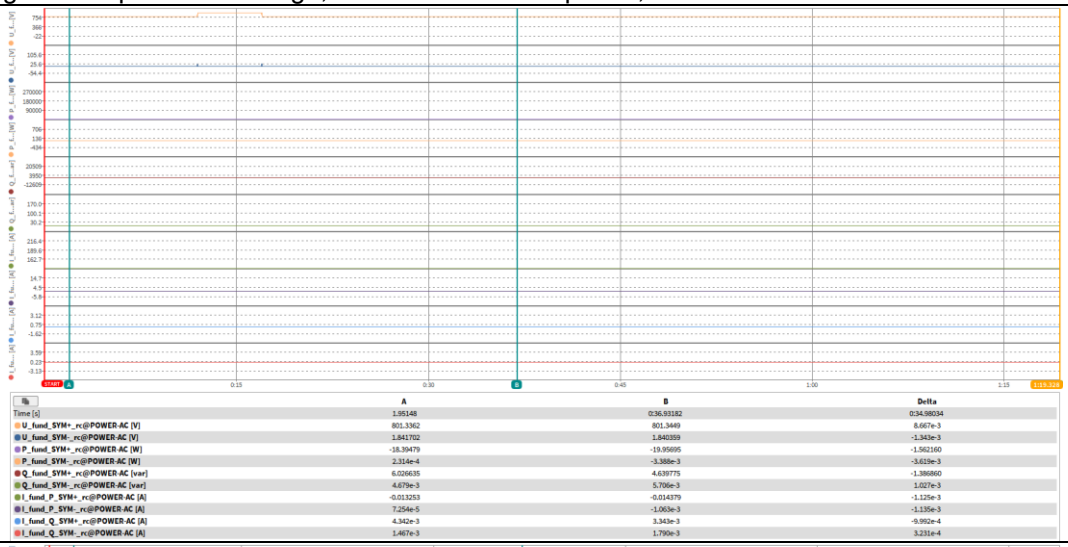
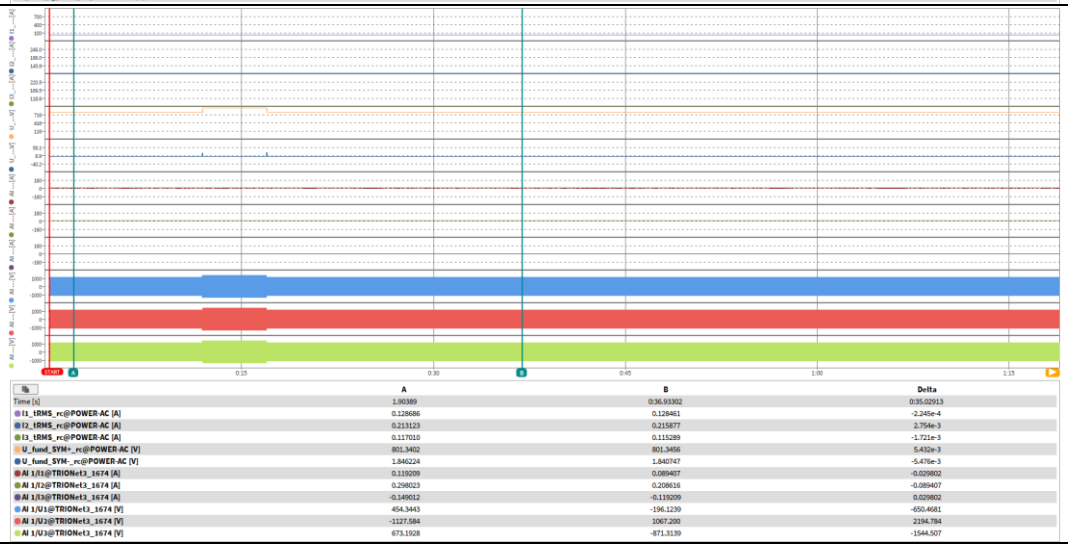
VS2.1 (no-load test)
a) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	1.95148	0:36.93182	0:34.98034
U_fund_SYM+_rc@POWER-AC [V]	801.3362	801.3449	8.667e-3
U_fund_SYM-_rc@POWER-AC [V]	1.841702	1.840359	-1.343e-3
P_fund_SYM+_rc@POWER-AC [W]	-18.39479	-19.95695	-1.562160
P_fund_SYM-_rc@POWER-AC [W]	2.314e-4	-3.388e-3	-3.619e-3
Q_fund_SYM+_rc@POWER-AC [var]	6.026635	4.639775	-1.386860
Q_fund_SYM-_rc@POWER-AC [var]	4.879e-3	5.796e-3	1.027e-3
I_fund_P_SYM+_rc@POWER-AC [A]	-0.013253	-0.014379	-1.125e-3
I_fund_P_SYM-_rc@POWER-AC [A]	7.254e-5	-1.063e-3	-1.135e-3
I_fund_Q_SYM+_rc@POWER-AC [A]	4.342e-3	3.343e-3	-9.992e-4
I_fund_Q_SYM-_rc@POWER-AC [A]	1.467e-3	1.790e-3	3.231e-4



	A	B	Delta
Time [s]	1.90389	0:36.93302	0:35.02913
I1_tRMS_rc@POWER-AC [A]	0.128686	0.128461	-2.245e-4
I2_tRMS_rc@POWER-AC [A]	0.213123	0.215877	2.754e-3
I3_tRMS_rc@POWER-AC [A]	0.117010	0.115289	-1.721e-3
U_fund_SYM+_rc@POWER-AC [V]	801.3402	801.3456	5.432e-3
U_fund_SYM-_rc@POWER-AC [V]	1.846224	1.840747	-5.476e-3
AI 1/I1@TRIONet3_1674 [A]	0.119209	0.089407	-0.029802
AI 1/I2@TRIONet3_1674 [A]	0.298023	0.208616	-0.089407
AI 1/I3@TRIONet3_1674 [A]	-0.149012	-0.119209	0.029802
AI 1/U1@TRIONet3_1674 [V]	454.3443	-196.1239	-650.4681
AI 1/U2@TRIONet3_1674 [V]	-1127.584	1067.200	2194.784
AI 1/U3@TRIONet3_1674 [V]	673.1928	-871.3139	-1544.507

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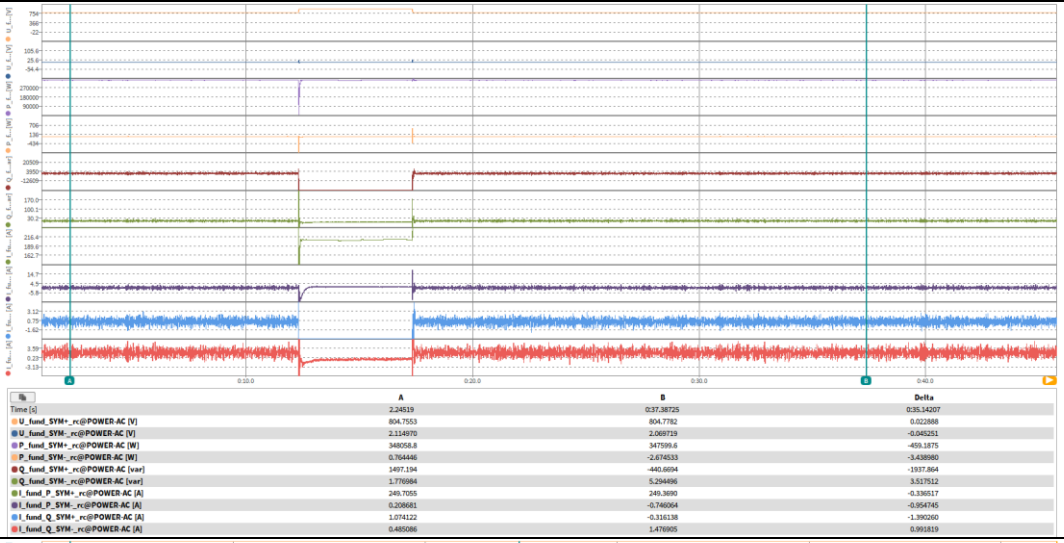
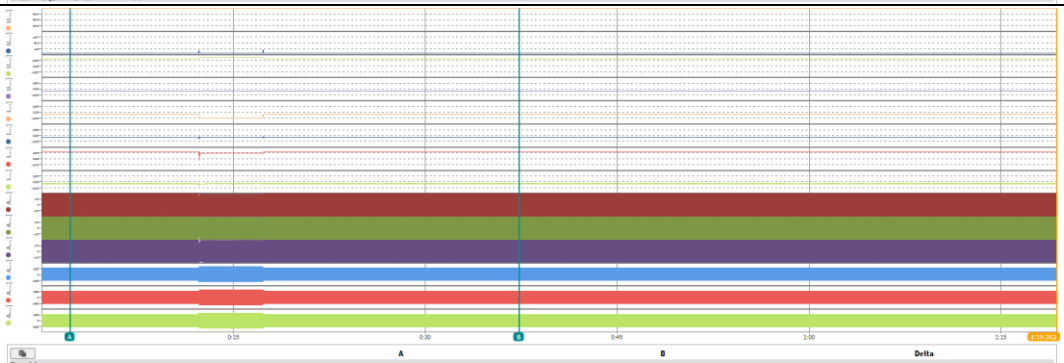
VS2.1-1 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.24519	0:37.38725	0:35.14207
U_fund_SYM+_rc@POWER-AC [V]	804.7553	804.7782	0.022888
U_fund_SYM-_rc@POWER-AC [V]	2.114970	2.069719	-0.045251
P_fund_SYM+_rc@POWER-AC [W]	348058.8	347599.6	-459.1875
P_fund_SYM-_rc@POWER-AC [W]	0.764446	-2.674533	-3.439980
Q_fund_SYM+_rc@POWER-AC [var]	1497.194	-440.6694	-1937.864
Q_fund_SYM-_rc@POWER-AC [var]	1.776984	5.294496	3.517512
I_fund_P_SYM+_rc@POWER-AC [A]	249.7055	249.3690	-0.336517
I_fund_P_SYM-_rc@POWER-AC [A]	0.208681	-0.746064	-0.954745
I_fund_Q_SYM+_rc@POWER-AC [A]	1.074122	-0.316138	-1.390260
I_fund_Q_SYM-_rc@POWER-AC [A]	0.485086	1.476905	0.991819



	A	B	Delta
Time [s]	2.24519	0:37.33845	0:35.09326
U_fund_SYM+_rc@POWER-AC [V]	804.7553	804.7964	0.041077
U_fund_SYM-_rc@POWER-AC [V]	2.114970	2.064608	-0.050362
U_Pos_p.u. [V]	1.005944	1.005995	5.135e-5
U_Neg_p.u. [V]	2.644e-3	2.581e-3	-6.295e-5
Iq_Pos_p.u. [A]	4.254e-3	-5.200e-4	-4.774e-3
Iq_Neg_p.u. [A]	1.921e-3	0.013676	0.011753
Ip_Pos_p.u. [A]	0.988933	0.991275	2.342e-3
Ip_Neg_p.u. [A]	8.265e-4	-1.695e-3	-2.521e-3
AI 1/I1@TRIONet3_1674 [A]	-278.2047	-24.97435	253.2303
AI 1/I2@TRIONet3_1674 [A]	-42.37890	321.2393	363.6182
AI 1/I3@TRIONet3_1674 [A]	320.6432	-295.9689	-616.6101
AI 1/U1@TRIONet3_1674 [V]	-466.3189	-646.8423	-180.5234
AI 1/U2@TRIONet3_1674 [V]	-664.7687	1136.996	1801.764
AI 1/U3@TRIONet3_1674 [V]	1131.232	-490.3367	-1621.569

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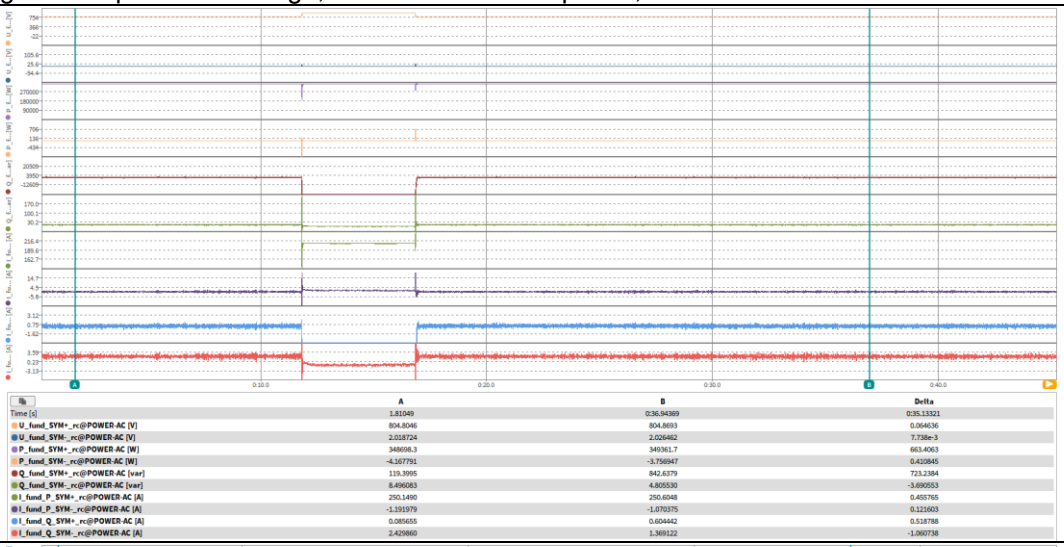
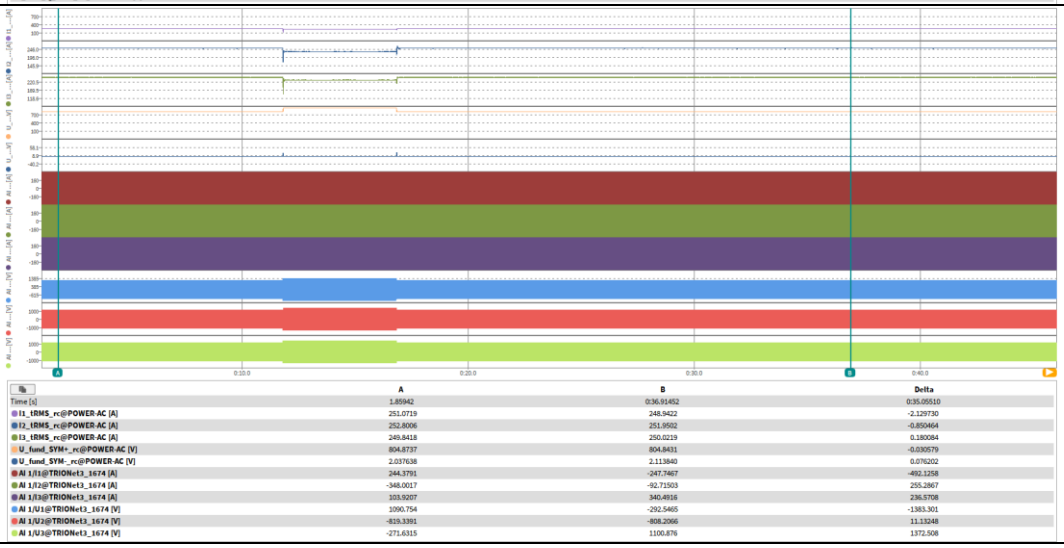
VS2.1-2 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	1.81049	0:36.94369	0:35.13321
U_fund_SYM+_rc@POWER-AC [V]	804.8046	804.8693	0.064636
U_fund_SYM-_rc@POWER-AC [V]	2.018724	2.026462	7.738e-3
P_fund_SYM+_rc@POWER-AC [W]	348698.3	349361.7	663.4063
P_fund_SYM-_rc@POWER-AC [W]	-4.167791	-3.756947	0.410845
Q_fund_SYM+_rc@POWER-AC [var]	119.3995	842.6379	723.2384
Q_fund_SYM-_rc@POWER-AC [var]	8.496083	4.805530	-3.690553
I_fund_P_SYM+_rc@POWER-AC [A]	250.1490	250.6048	0.455765
I_fund_P_SYM-_rc@POWER-AC [A]	-1.191979	-1.070375	0.121603
I_fund_Q_SYM+_rc@POWER-AC [A]	0.085655	0.604442	0.518788
I_fund_Q_SYM-_rc@POWER-AC [A]	2.429660	1.369122	-1.060738



	A	B	Delta
Time [s]	1.85942	0:36.91452	0:35.05510
I1_tRMS_rc@POWER-AC [A]	251.0719	248.9422	-2.129730
I2_tRMS_rc@POWER-AC [A]	252.8006	251.9502	-0.850464
I3_tRMS_rc@POWER-AC [A]	249.8418	250.0219	0.180084
U_fund_SYM+_rc@POWER-AC [V]	804.8737	804.8431	-0.030579
U_fund_SYM-_rc@POWER-AC [V]	2.037638	2.113840	0.076202
AI 1/I1@TRIONet3_1674 [A]	244.3791	-247.7467	-492.1258
AI 1/I2@TRIONet3_1674 [A]	-348.0017	-92.71503	255.2867
AI 1/I3@TRIONet3_1674 [A]	103.9207	340.4916	236.5708
AI 1/U1@TRIONet3_1674 [V]	1090.754	-292.5465	-1383.301
AI 1/U2@TRIONet3_1674 [V]	-819.3391	-808.2066	11.13248
AI 1/U3@TRIONet3_1674 [V]	-271.6315	1100.876	1372.508

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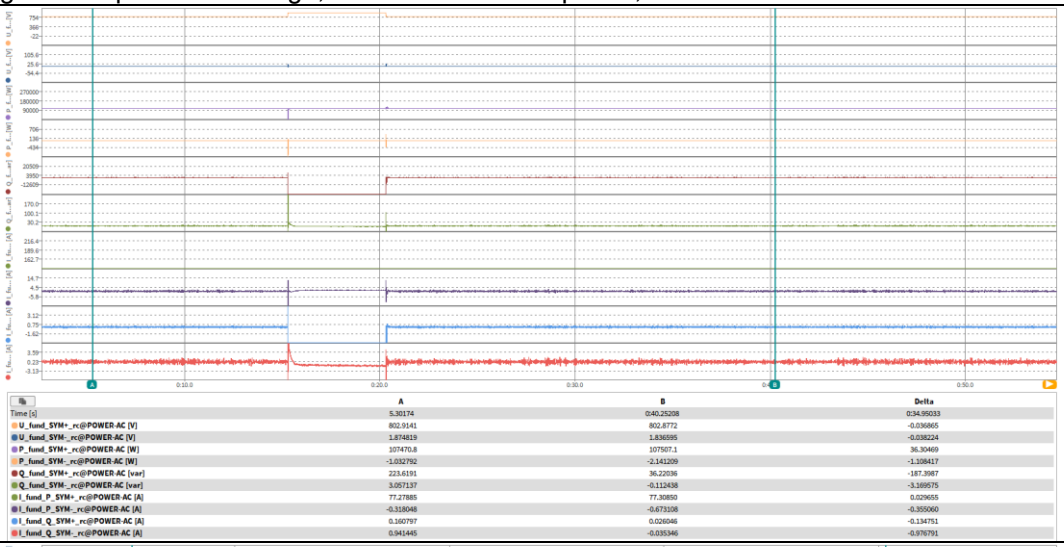
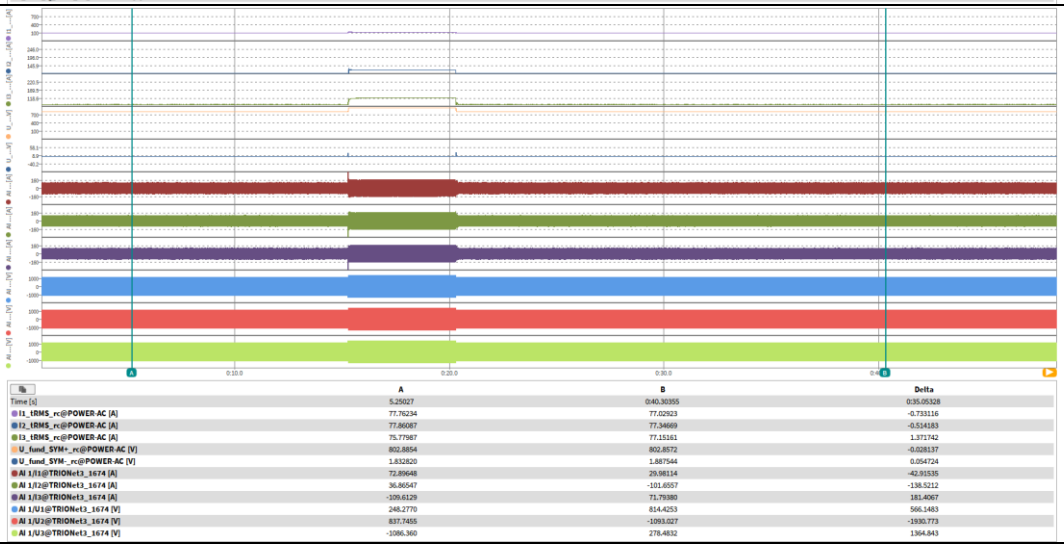
VS2.1-3 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	5.30174	0:40.25208	0:34.95033
U_fund_SYM+_rc@POWER-AC [V]	802.9141	802.8772	-0.036865
U_fund_SYM-_rc@POWER-AC [V]	1.874819	1.836595	-0.038224
P_fund_SYM+_rc@POWER-AC [W]	107470.8	107507.1	36.30469
P_fund_SYM-_rc@POWER-AC [W]	-1.032792	-2.141209	-1.108417
Q_fund_SYM+_rc@POWER-AC [var]	223.6191	36.22036	-187.3987
Q_fund_SYM-_rc@POWER-AC [var]	3.057137	-0.112438	-3.169575
I_fund_P_SYM+_rc@POWER-AC [A]	77.27885	77.30850	0.029655
I_fund_P_SYM-_rc@POWER-AC [A]	-0.318048	-0.673108	-0.355060
I_fund_Q_SYM+_rc@POWER-AC [A]	0.160797	0.026046	-0.134751
I_fund_Q_SYM-_rc@POWER-AC [A]	0.941445	-0.035346	-0.976791



	A	B	Delta
Time [s]	5.25027	0:40.30355	0:35.05328
I1_tRMS_rc@POWER-AC [A]	77.76234	77.02923	-0.733116
I2_tRMS_rc@POWER-AC [A]	77.86087	77.34669	-0.514183
I3_tRMS_rc@POWER-AC [A]	75.77987	77.15161	1.371742
U_fund_SYM+_rc@POWER-AC [V]	802.8854	802.8572	-0.028137
U_fund_SYM-_rc@POWER-AC [V]	1.832820	1.887544	0.054724
AI 1/I1@TRIONet3_1674 [A]	72.89648	29.98114	-42.91535
AI 1/I2@TRIONet3_1674 [A]	36.86547	-101.6557	-138.5212
AI 1/I3@TRIONet3_1674 [A]	-109.6129	71.79380	181.4067
AI 1/U1@TRIONet3_1674 [V]	248.2770	814.4253	566.1483
AI 1/U2@TRIONet3_1674 [V]	837.7455	-1093.027	-1930.773
AI 1/U3@TRIONet3_1674 [V]	-1086.360	278.4832	1364.843

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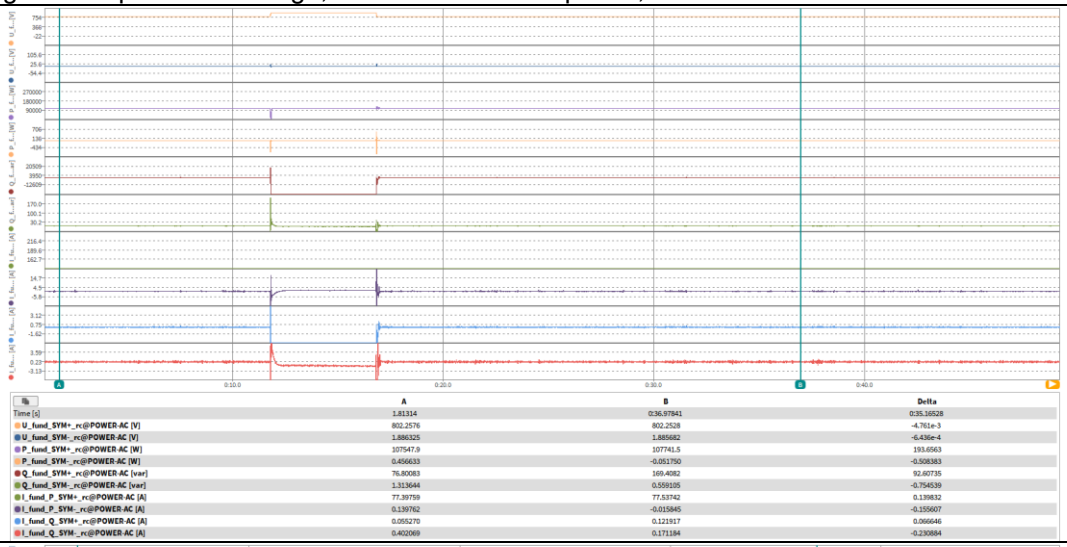
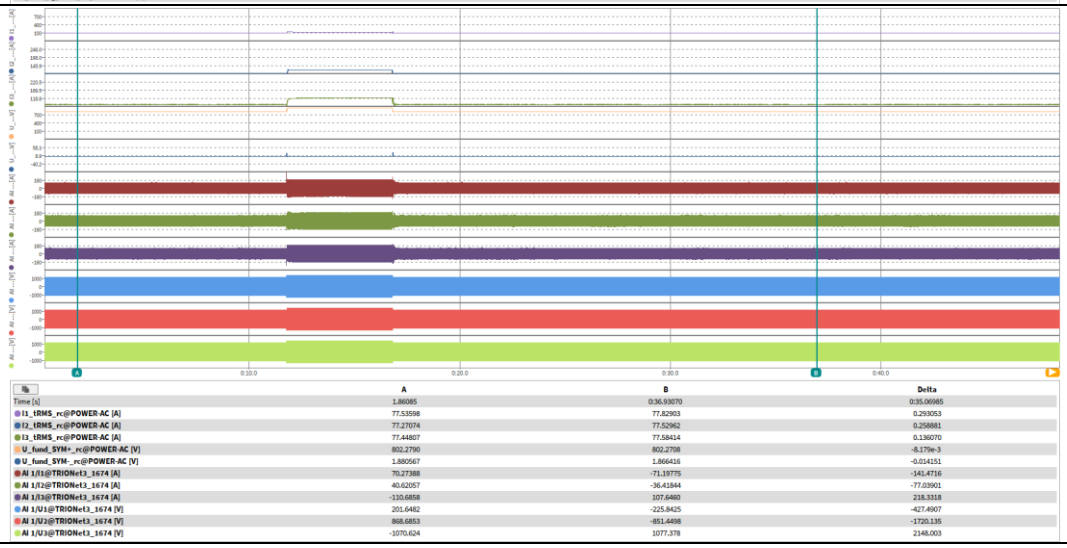
VS2.1-4 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



Time [s]	A	B	Delta
U_fund_SYM+_rc@POWER-AC [V]	1.81314	0:36.97841	0:35.16528
U_fund_SYM-_rc@POWER-AC [V]	802.2576	802.2528	-4.761e-3
P_fund_SYM+_rc@POWER-AC [W]	1.886325	1.886682	-6.436e-4
P_fund_SYM-_rc@POWER-AC [W]	107547.9	107741.5	193.6563
Q_fund_SYM+_rc@POWER-AC [var]	0.456633	-0.051750	-0.508383
Q_fund_SYM-_rc@POWER-AC [var]	76.80083	169.4082	92.60735
I_fund_P_SYM+_rc@POWER-AC [A]	1.313644	0.559105	-0.754539
I_fund_P_SYM-_rc@POWER-AC [A]	77.39759	77.53742	0.139832
I_fund_Q_SYM+_rc@POWER-AC [A]	0.139762	-0.015845	-0.155607
I_fund_Q_SYM-_rc@POWER-AC [A]	0.055270	0.121917	0.066646
	0.402069	0.171184	-0.230884



Time [s]	A	B	Delta
I1_tRMS_rc@POWER-AC [A]	1.86085	0:36.93070	0:35.06985
I2_tRMS_rc@POWER-AC [A]	77.53598	77.82903	0.293053
I3_tRMS_rc@POWER-AC [A]	77.27074	77.52962	0.258881
U_fund_SYM+_rc@POWER-AC [V]	77.44807	77.58414	0.136070
U_fund_SYM-_rc@POWER-AC [V]	802.2790	802.2708	-8.179e-3
AI 1/I1@TRIONet3_1674 [A]	1.880567	1.866416	-0.014151
AI 1/I2@TRIONet3_1674 [A]	70.27388	-71.19775	-141.4716
AI 1/I3@TRIONet3_1674 [A]	40.62057	-36.41844	-77.03901
AI 1/U1@TRIONet3_1674 [V]	-110.6858	107.6460	218.3318
AI 1/U2@TRIONet3_1674 [V]	201.6482	-225.8425	-427.4907
AI 1/U3@TRIONet3_1674 [V]	868.6853	-851.4498	-1720.135
	-1070.624	1077.378	2148.003

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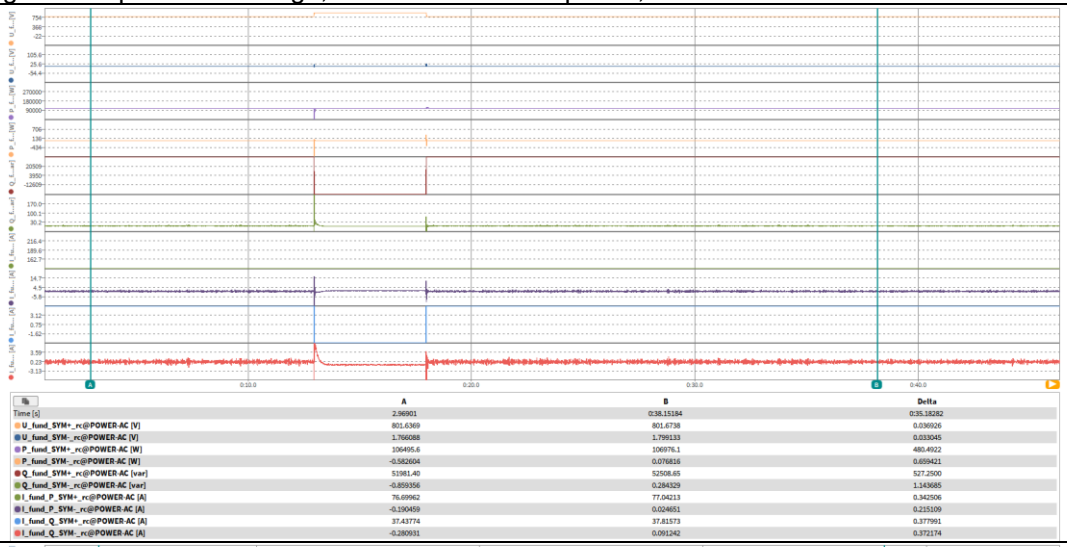
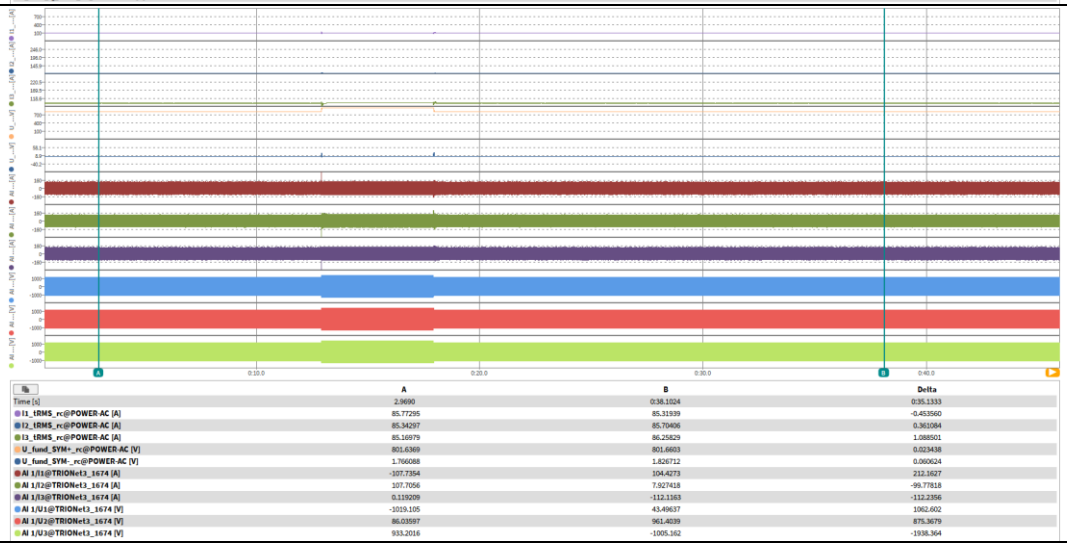
VS2.1-5 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



Time [s]	A	B	Delta
U_fund_SYM+_rc@POWER-AC [V]	2.96901	0:38.15184	0:35.18282
U_fund_SYM-_rc@POWER-AC [V]	801.6369	801.6738	0.036926
P_fund_SYM+_rc@POWER-AC [W]	1.766088	1.799133	0.033045
P_fund_SYM-_rc@POWER-AC [W]	106495.6	106976.1	480.4922
Q_fund_SYM+_rc@POWER-AC [var]	-0.582604	0.076816	0.659421
Q_fund_SYM-_rc@POWER-AC [var]	51981.40	52508.65	527.2500
I_fund_P_SYM+_rc@POWER-AC [A]	-0.859356	0.284329	1.143685
I_fund_P_SYM-_rc@POWER-AC [A]	76.69962	77.04213	0.342506
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.190459	0.024651	0.215109
I_fund_Q_SYM-_rc@POWER-AC [A]	37.43774	37.81573	0.377991
	-0.280931	0.091242	0.372174



Time [s]	A	B	Delta
I1_tRMS_rc@POWER-AC [A]	2.9690	0:36.1024	0:35.1333
I2_tRMS_rc@POWER-AC [A]	85.77295	85.31939	-0.453560
I3_tRMS_rc@POWER-AC [A]	85.34297	85.70406	0.361084
U_fund_SYM+_rc@POWER-AC [V]	85.16979	86.25829	1.088501
U_fund_SYM-_rc@POWER-AC [V]	801.6369	801.6603	0.023438
AI 1/I1@TRIONet3_1674 [A]	1.766088	1.826712	0.060624
AI 1/I2@TRIONet3_1674 [A]	-107.7354	104.4273	212.1627
AI 1/I3@TRIONet3_1674 [A]	107.7056	7.927418	-99.77818
AI 1/U1@TRIONet3_1674 [V]	0.119209	-112.1163	-112.2356
AI 1/U2@TRIONet3_1674 [V]	-1019.105	43.49637	1062.602
AI 1/U3@TRIONet3_1674 [V]	86.03597	961.4039	875.3679
	933.2016	-1005.162	-1938.364

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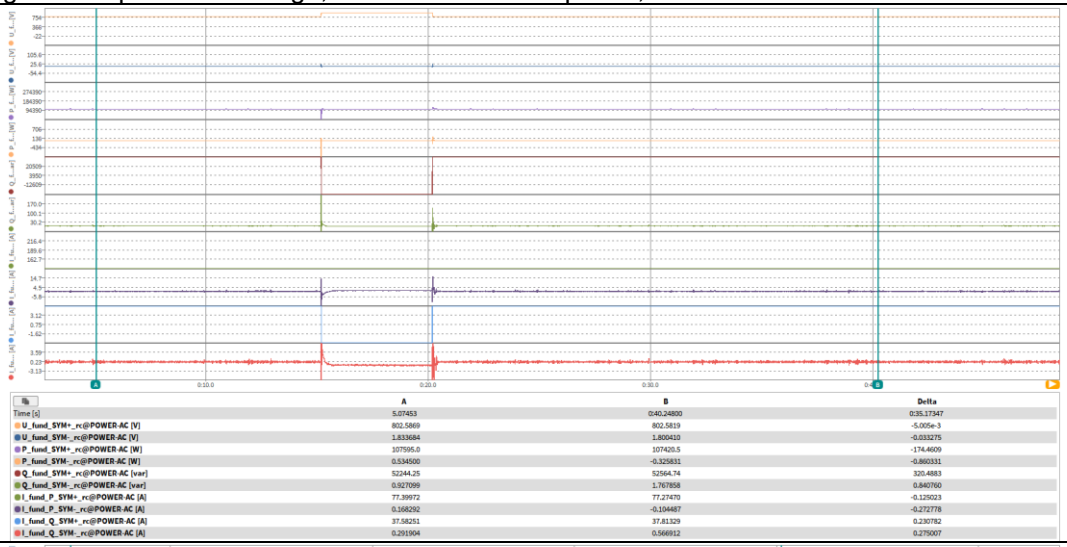
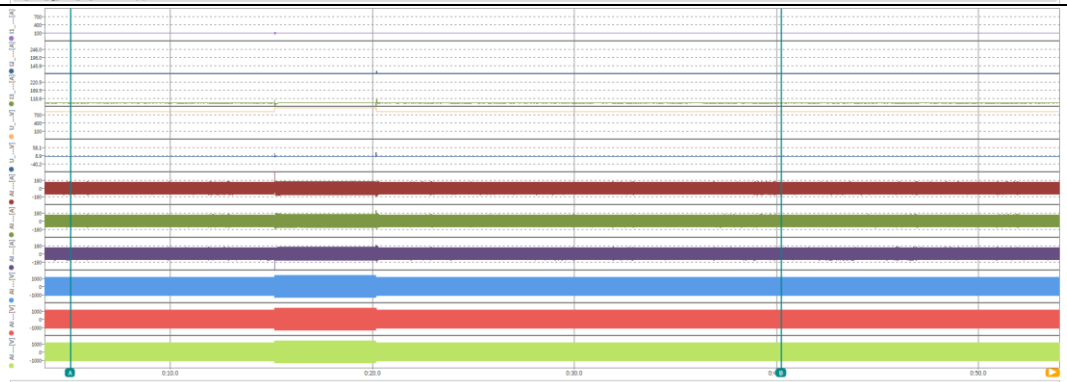
VS2.1-6 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	5.07453	0:40.24800	0:35.17347
U_fund_SYM+_rc@POWER-AC [V]	802.5869	802.5819	-5.005e-3
U_fund_SYM-_rc@POWER-AC [V]	1.833684	1.800410	-0.033275
P_fund_SYM+_rc@POWER-AC [W]	107595.0	107420.5	-174.4609
P_fund_SYM-_rc@POWER-AC [W]	0.534500	-0.325833	-0.860331
Q_fund_SYM+_rc@POWER-AC [var]	52244.25	52564.74	320.4883
Q_fund_SYM-_rc@POWER-AC [var]	0.927099	1.767858	0.840760
I_fund_P_SYM+_rc@POWER-AC [A]	77.39972	77.27470	-0.125023
I_fund_P_SYM-_rc@POWER-AC [A]	0.168292	-0.104487	-0.272778
I_fund_Q_SYM+_rc@POWER-AC [A]	37.58251	37.81329	0.230782
I_fund_Q_SYM-_rc@POWER-AC [A]	0.291904	0.566912	0.275007



	A	B	Delta
Time [s]	5.07453	0:40.24800	0:35.17347
I1_tRMS_rc@POWER-AC [A]	85.81494	85.63795	-0.176994
I2_tRMS_rc@POWER-AC [A]	86.21109	86.59522	0.384132
I3_tRMS_rc@POWER-AC [A]	86.32724	86.10481	-0.222427
U_fund_SYM+_rc@POWER-AC [V]	802.5869	802.5819	-5.005e-3
U_fund_SYM-_rc@POWER-AC [V]	1.833684	1.800410	-0.033275
AI 1/I1@TRIONet3_1674 [A]	84.81741	37.61053	-47.20688
AI 1/I2@TRIONet3_1674 [A]	33.64682	-119.8948	-153.5416
AI 1/I3@TRIONet3_1674 [A]	-118.3152	82.37362	200.6889
AI 1/U1@TRIONet3_1674 [V]	-270.3509	1096.838	1367.189
AI 1/U2@TRIONet3_1674 [V]	1093.289	-796.7940	-1890.083
AI 1/U3@TRIONet3_1674 [V]	-823.1888	-300.3097	522.8792

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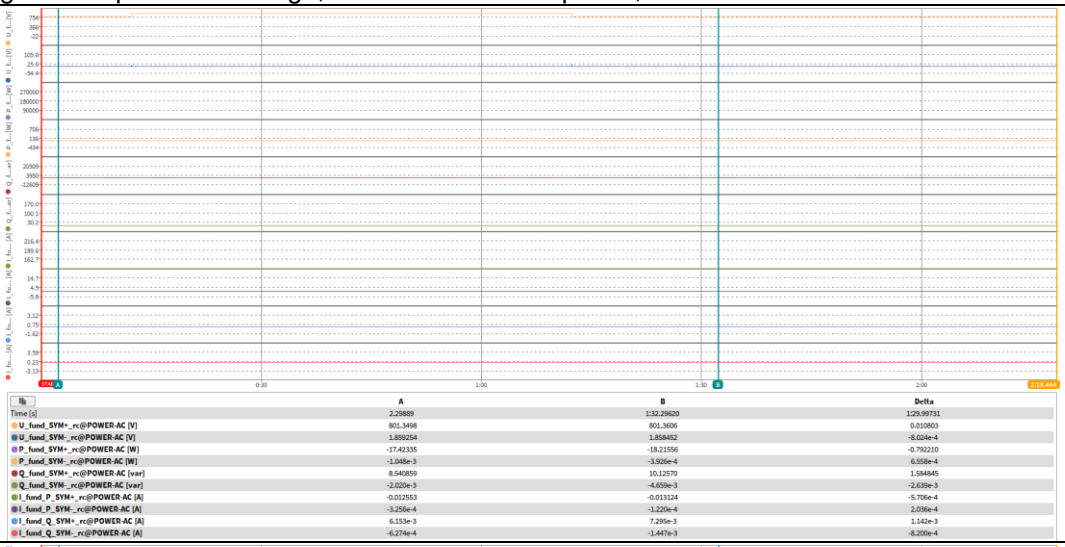
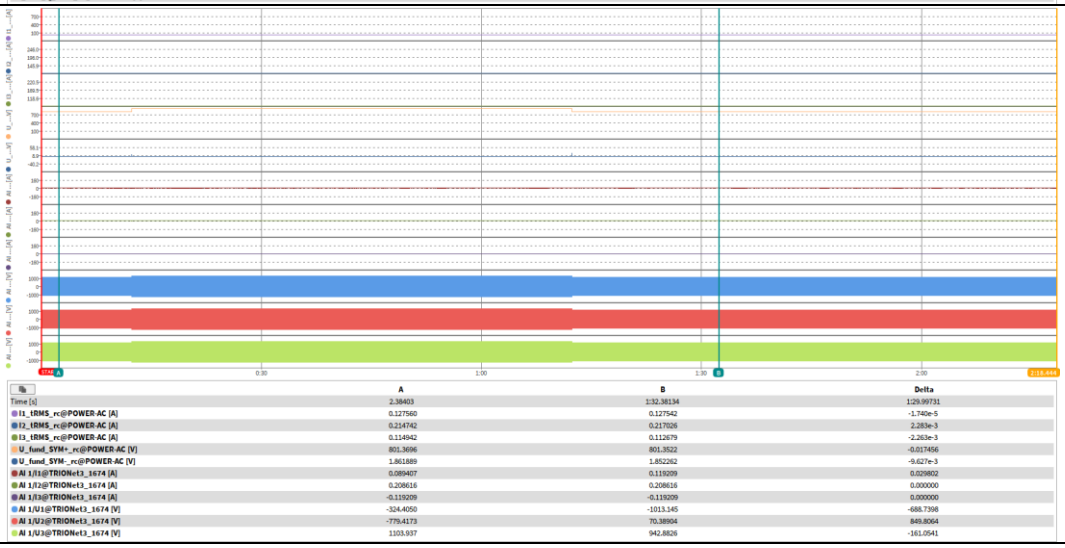
VS2.2 (no-load test)

a) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.29889	1:32.29620	1:29.99731
U_fund_SYM+_rc@POWER-AC [V]	801.3498	801.3606	0.010803
U_fund_SYM-_rc@POWER-AC [V]	1.859254	1.858452	-8.024e-4
P_fund_SYM+_rc@POWER-AC [W]	-17.42335	-18.21556	-0.792210
P_fund_SYM-_rc@POWER-AC [W]	-1.048e-3	-3.926e-4	6.558e-4
Q_fund_SYM+_rc@POWER-AC [var]	8.540859	10.12570	1.584845
Q_fund_SYM-_rc@POWER-AC [var]	-2.020e-3	-4.659e-3	-2.639e-3
I_fund_P_SYM+_rc@POWER-AC [A]	-0.012553	-0.013124	-5.706e-4
I_fund_P_SYM-_rc@POWER-AC [A]	-3.256e-4	-1.220e-4	2.036e-4
I_fund_Q_SYM+_rc@POWER-AC [A]	6.153e-3	7.295e-3	1.142e-3
I_fund_Q_SYM-_rc@POWER-AC [A]	-6.274e-4	-1.447e-3	-8.200e-4



	A	B	Delta
Time [s]	2.38403	1:32.38134	1:29.99731
I1_tRMS_rc@POWER-AC [A]	0.127560	0.127542	-1.740e-5
I2_tRMS_rc@POWER-AC [A]	0.214742	0.217026	2.283e-3
I3_tRMS_rc@POWER-AC [A]	0.114942	0.112679	-2.263e-3
U_fund_SYM+_rc@POWER-AC [V]	801.3696	801.3522	-0.017456
U_fund_SYM-_rc@POWER-AC [V]	1.861889	1.852262	-9.627e-3
AI 1/I1@TRIONet3_1674 [A]	0.089407	0.119209	0.029802
AI 1/I2@TRIONet3_1674 [A]	0.208616	0.208616	0.000000
AI 1/I3@TRIONet3_1674 [A]	-0.119209	-0.119209	0.000000
AI 1/U1@TRIONet3_1674 [V]	-324.4050	-1013.145	-688.7398
AI 1/U2@TRIONet3_1674 [V]	-779.4173	70.38904	849.8064
AI 1/U3@TRIONet3_1674 [V]	1103.937	942.8826	-161.0541

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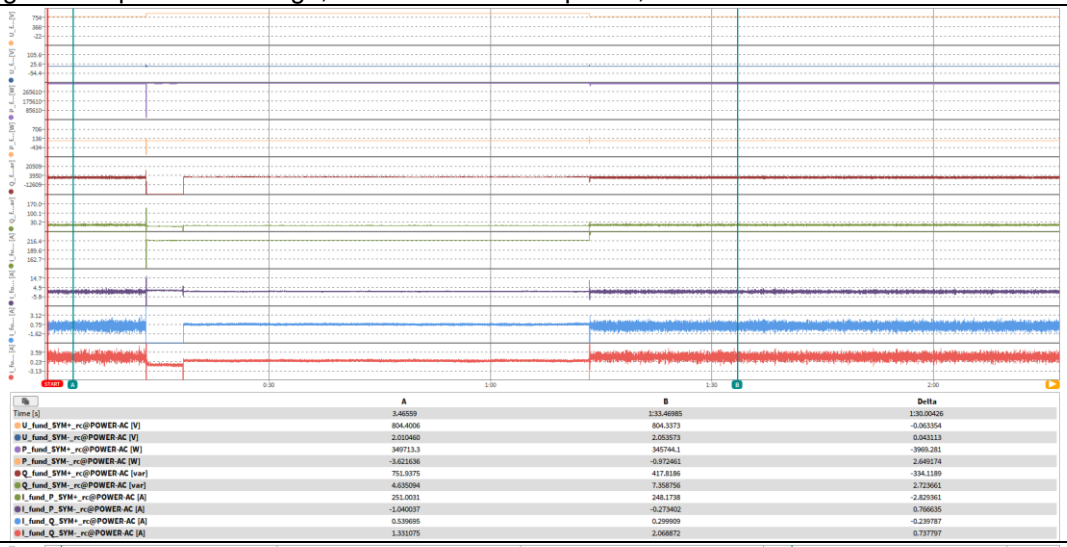
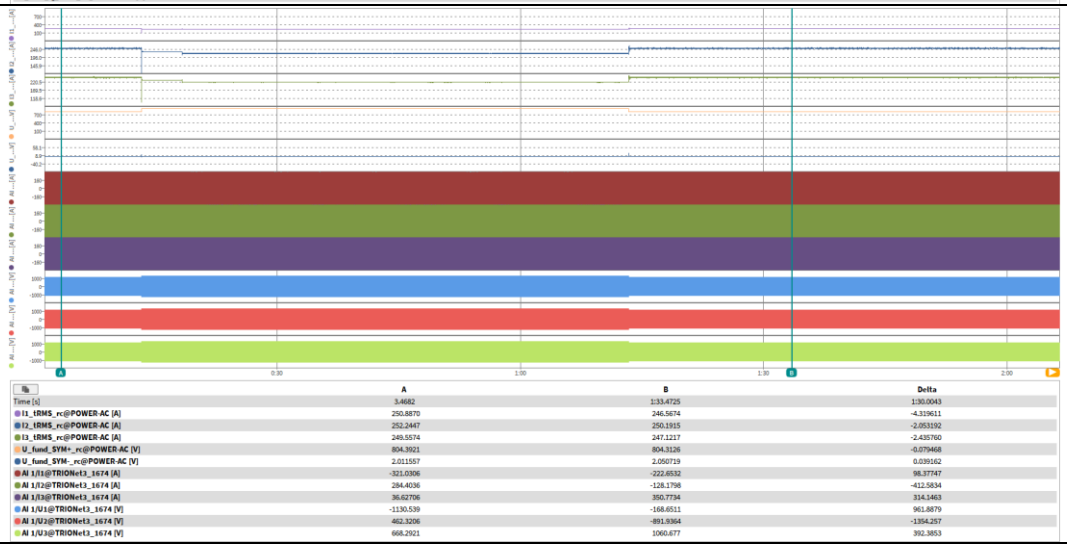
VS2.2-1 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	3.46559	1:33.46985	1:30.00426
U_fund_SYM+_rc@POWER-AC [V]	804.4006	804.3373	-0.063354
U_fund_SYM-_rc@POWER-AC [V]	2.010460	2.053573	0.043113
P_fund_SYM+_rc@POWER-AC [W]	349713.3	345744.1	-3969.281
P_fund_SYM-_rc@POWER-AC [W]	-3.621636	-0.972461	2.649174
Q_fund_SYM+_rc@POWER-AC [var]	751.9375	417.8186	-334.1189
Q_fund_SYM-_rc@POWER-AC [var]	4.635094	7.358756	2.723661
I_fund_P_SYM+_rc@POWER-AC [A]	251.0031	248.1738	-2.829361
I_fund_P_SYM-_rc@POWER-AC [A]	-1.040037	-0.273402	0.766635
I_fund_Q_SYM+_rc@POWER-AC [A]	0.539695	0.299909	-0.239787
I_fund_Q_SYM-_rc@POWER-AC [A]	1.331075	2.068872	0.737797



	A	B	Delta
Time [s]	3.4682	1:33.4725	1:30.0043
I1_tRMS_rc@POWER-AC [A]	250.8870	246.5674	-4.319611
I2_tRMS_rc@POWER-AC [A]	252.2447	250.1915	-2.053192
I3_tRMS_rc@POWER-AC [A]	249.5574	247.1217	-2.435760
U_fund_SYM+_rc@POWER-AC [V]	804.3921	804.3126	-0.079468
U_fund_SYM-_rc@POWER-AC [V]	2.011557	2.050719	0.039162
AI 1/I1@TRIONet3_1674 [A]	-321.0306	-222.6532	98.37747
AI 1/I2@TRIONet3_1674 [A]	284.4036	-128.1796	-412.5834
AI 1/I3@TRIONet3_1674 [A]	36.62706	350.7734	314.1463
AI 1/U1@TRIONet3_1674 [V]	-1130.539	-168.6511	961.8879
AI 1/U2@TRIONet3_1674 [V]	462.3206	-891.9364	-1354.257
AI 1/U3@TRIONet3_1674 [V]	668.2921	1060.677	392.3853

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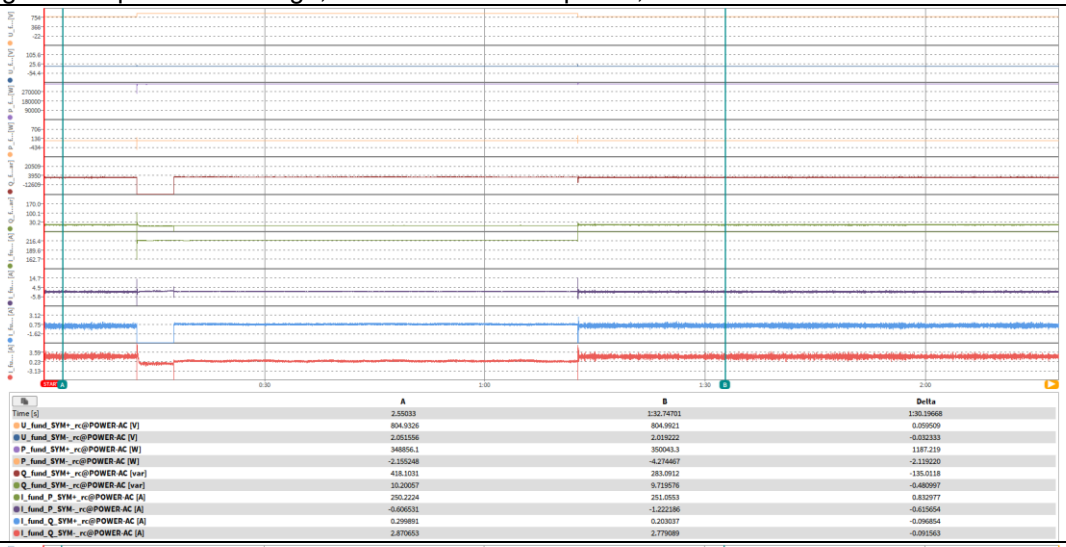
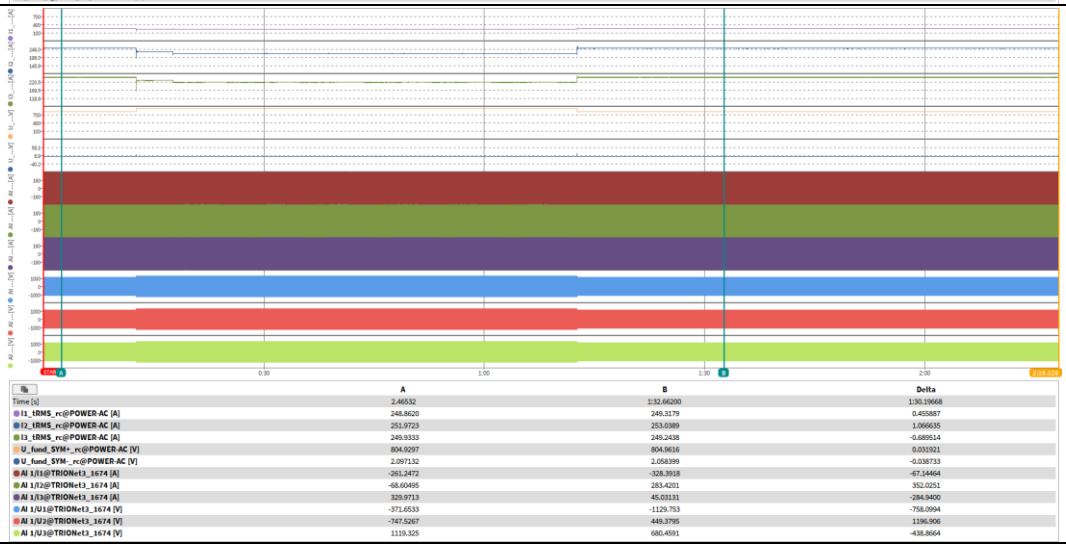
VS2.2-2 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



Time [s]	A	B	Delta
U_fund_SYM+_rc@POWER-AC [V]	804.9326	804.9921	0.059509
U_fund_SYM-_rc@POWER-AC [V]	2.051556	2.019222	-0.032333
P_fund_SYM+_rc@POWER-AC [W]	348856.1	350043.3	1187.219
P_fund_SYM-_rc@POWER-AC [W]	-2.155248	-4.274467	-2.119220
Q_fund_SYM+_rc@POWER-AC [var]	418.1031	283.0912	-135.0118
Q_fund_SYM-_rc@POWER-AC [var]	10.20057	9.719576	-0.480997
I_fund_P_SYM+_rc@POWER-AC [A]	250.2224	251.0553	0.832977
I_fund_P_SYM-_rc@POWER-AC [A]	-0.606531	-1.222186	-0.615654
I_fund_Q_SYM+_rc@POWER-AC [A]	0.299891	0.203037	-0.096854
I_fund_Q_SYM-_rc@POWER-AC [A]	2.870653	2.779089	-0.091563



Time [s]	A	B	Delta
I1_tRMS_rc@POWER-AC [A]	248.8620	249.3179	0.455887
I2_tRMS_rc@POWER-AC [A]	251.9723	253.0389	1.066635
I3_tRMS_rc@POWER-AC [A]	249.9333	249.2438	-0.689514
U_fund_SYM+_rc@POWER-AC [V]	804.9297	804.9616	0.031921
U_fund_SYM-_rc@POWER-AC [V]	2.097132	2.058399	-0.038733
AI 1/I1@TRIONet3_1674 [A]	-261.2472	-328.3918	-67.14464
AI 1/I2@TRIONet3_1674 [A]	-68.60495	283.4201	352.0251
AI 1/I3@TRIONet3_1674 [A]	329.9713	45.03131	-284.9400
AI 1/U1@TRIONet3_1674 [V]	-371.6533	-1129.753	-758.0994
AI 1/U2@TRIONet3_1674 [V]	-747.5267	1196.906	1196.906
AI 1/U3@TRIONet3_1674 [V]	1119.325	680.4591	-438.8664

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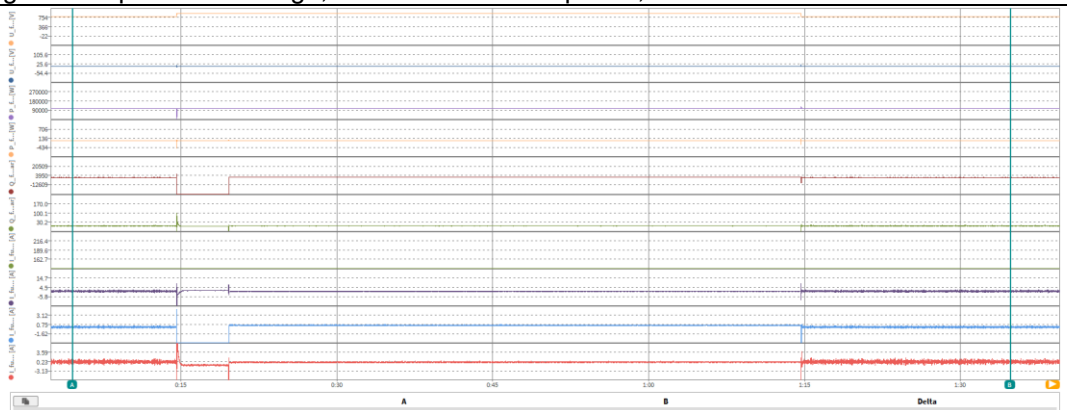
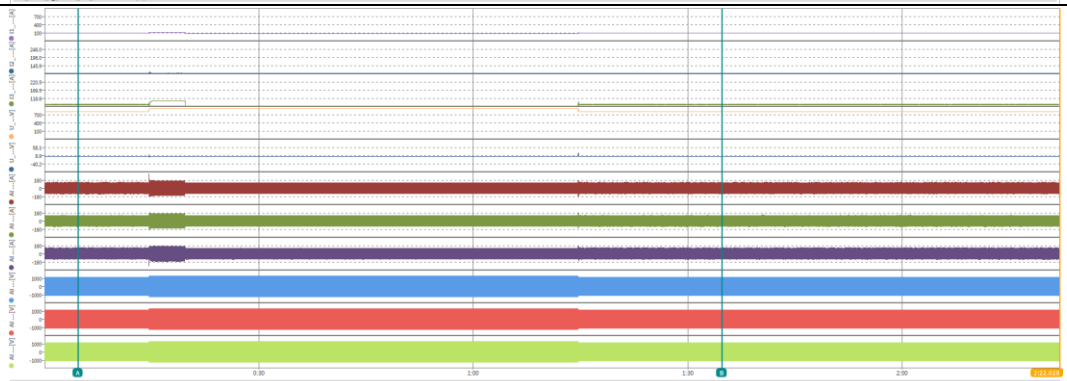
VS2.2-3 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	4.62945	1:34.77261	1:30.14317
U_fund_SYM+_rc@POWER-AC [V]	800.9934	801.0632	0.069763
U_fund_SYM-_rc@POWER-AC [V]	1.802469	1.768692	-0.033777
P_fund_SYM+_rc@POWER-AC [W]	106913.3	107199.6	286.3516
P_fund_SYM-_rc@POWER-AC [W]	0.606701	-1.685527	-2.292228
Q_fund_SYM+_rc@POWER-AC [var]	30.19669	-320.3036	-350.5003
Q_fund_SYM-_rc@POWER-AC [var]	-0.031736	2.347856	2.379592
I_fund_P_SYM+_rc@POWER-AC [A]	77.06232	77.26199	0.199669
I_fund_P_SYM-_rc@POWER-AC [A]	0.194333	-0.550203	-0.744536
I_fund_Q_SYM+_rc@POWER-AC [A]	0.021766	-0.230852	-0.252618
I_fund_Q_SYM-_rc@POWER-AC [A]	-0.010165	0.766406	0.776571



	A	B	Delta
Time [s]	4.71679	1:34.77261	1:30.05582
I1_tRMS_rc@POWER-AC [A]	76.97311	77.22657	0.253464
I2_tRMS_rc@POWER-AC [A]	77.58484	78.17871	0.593872
I3_tRMS_rc@POWER-AC [A]	77.22755	76.54645	-0.681099
U_fund_SYM+_rc@POWER-AC [V]	800.9897	801.0632	0.073425
U_fund_SYM-_rc@POWER-AC [V]	1.810478	1.768692	-0.041787
AI 1/I1@TRIONet3_1674 [A]	15.16938	109.3745	94.20515
AI 1/I2@TRIONet3_1674 [A]	88.66191	-28.22280	-116.8847
AI 1/I3@TRIONet3_1674 [A]	-103.7121	-80.82390	22.88818
AI 1/U1@TRIONet3_1674 [V]	-437.6989	760.0065	1197.705
AI 1/U2@TRIONet3_1674 [V]	1126.439	349.9449	-776.4943
AI 1/U3@TRIONet3_1674 [V]	-688.9096	-1110.249	-421.3393

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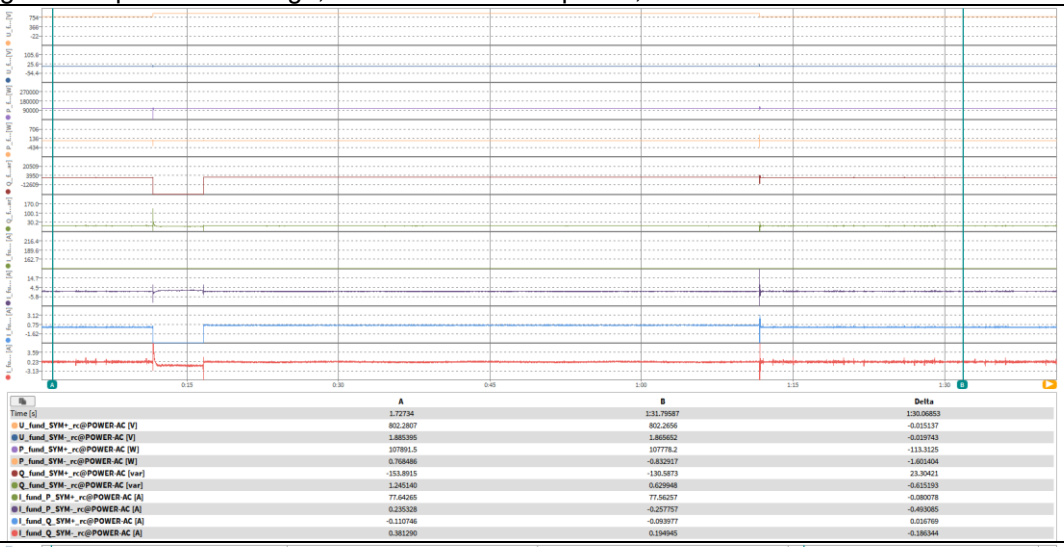
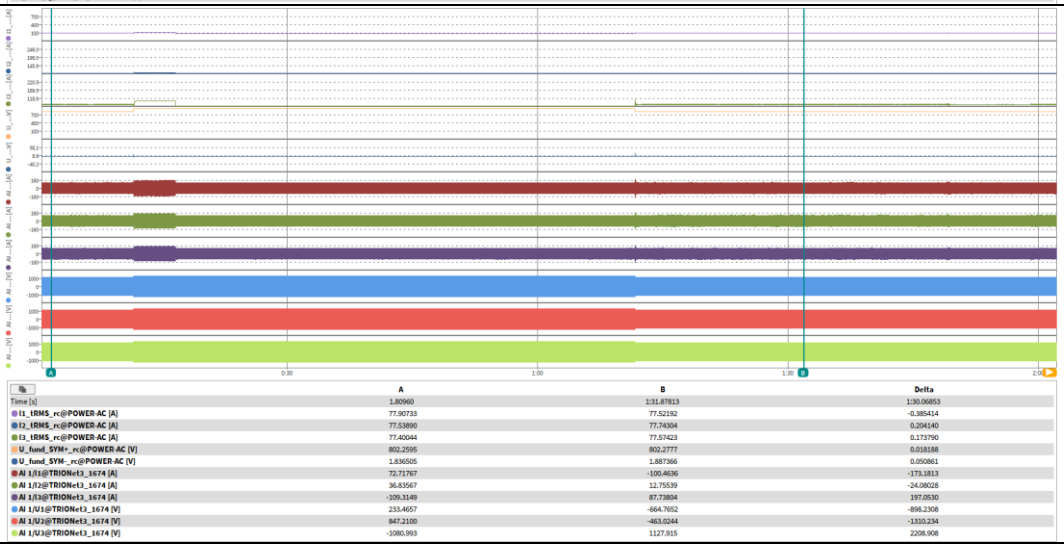
VS2.2-4 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	1.72734	1:31.79587	1:30.06853
U_fund_SYM+_rc@POWER-AC [V]	802.2807	802.2656	-0.015137
U_fund_SYM-_rc@POWER-AC [V]	1.885395	1.865652	-0.019743
P_fund_SYM+_rc@POWER-AC [W]	107891.5	107778.2	-113.3125
P_fund_SYM-_rc@POWER-AC [W]	0.768486	-0.832917	-1.601404
Q_fund_SYM+_rc@POWER-AC [var]	-153.8915	-130.5873	23.30421
Q_fund_SYM-_rc@POWER-AC [var]	1.245140	0.629948	-0.615193
I_fund_P_SYM+_rc@POWER-AC [A]	77.64265	77.56257	-0.080078
I_fund_P_SYM-_rc@POWER-AC [A]	0.235328	-0.257757	-0.493085
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.110746	-0.093977	0.016769
I_fund_Q_SYM-_rc@POWER-AC [A]	0.381290	0.194945	-0.186344



	A	B	Delta
Time [s]	1.80960	1:31.87813	1:30.06853
I1_tRMS_rc@POWER-AC [A]	77.90733	77.52192	-0.385414
I2_tRMS_rc@POWER-AC [A]	77.53890	77.74304	0.204140
I3_tRMS_rc@POWER-AC [A]	77.40044	77.57423	0.173790
U_fund_SYM+_rc@POWER-AC [V]	802.2595	802.2777	0.018188
U_fund_SYM-_rc@POWER-AC [V]	1.836505	1.887366	0.050861
AI 1/I1@TRIONet3_1674 [A]	72.71767	-100.4636	-173.1813
AI 1/I2@TRIONet3_1674 [A]	36.83567	12.75539	-24.08028
AI 1/I3@TRIONet3_1674 [A]	-109.3149	87.73804	197.0530
AI 1/U1@TRIONet3_1674 [V]	233.4657	-664.7652	-898.2308
AI 1/U2@TRIONet3_1674 [V]	847.2100	-463.0244	-1310.234
AI 1/U3@TRIONet3_1674 [V]	-1080.993	1127.915	2208.908

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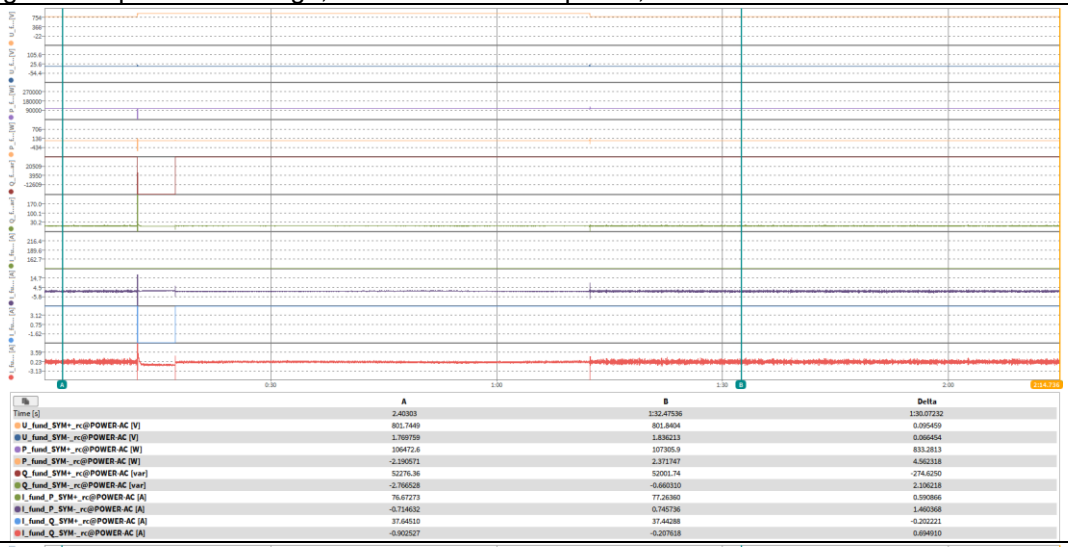
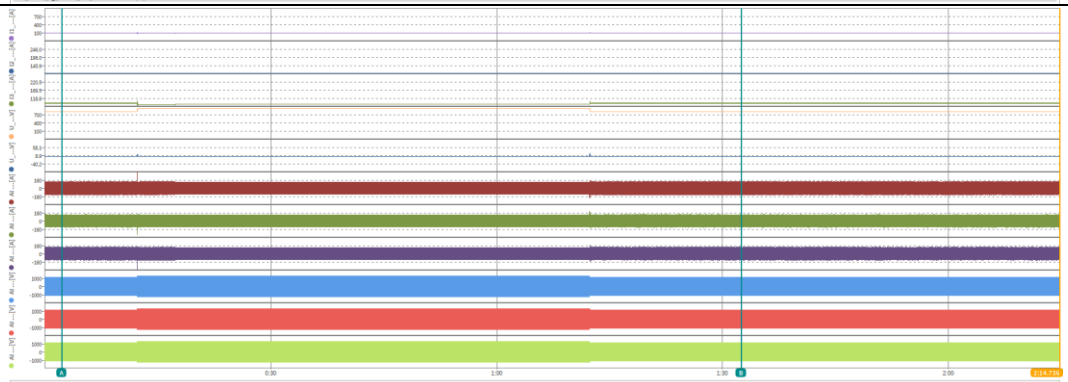
VS2.2-5 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.40303	1:32.47536	1:30.07232
U_fund_SYM+_rc@POWER-AC [V]	801.7449	801.8404	0.095459
U_fund_SYM-_rc@POWER-AC [V]	1.769759	1.836213	0.066454
P_fund_SYM+_rc@POWER-AC [W]	106472.6	107305.9	833.2813
P_fund_SYM-_rc@POWER-AC [W]	-2.190571	2.371747	4.562318
Q_fund_SYM+_rc@POWER-AC [var]	52276.36	52001.74	-274.6250
Q_fund_SYM-_rc@POWER-AC [var]	-2.766528	-0.660310	2.106218
I_fund_P_SYM+_rc@POWER-AC [A]	76.67273	77.26360	0.590866
I_fund_P_SYM-_rc@POWER-AC [A]	-0.714632	0.745736	1.460368
I_fund_Q_SYM+_rc@POWER-AC [A]	37.64510	37.44288	-0.202221
I_fund_Q_SYM-_rc@POWER-AC [A]	-0.902527	-0.207618	0.694910



	A	B	Delta
Time [s]	2.32017	1:32.47536	1:30.15519
I1_tRMS_rc@POWER-AC [A]	86.93995	85.95770	-0.982254
I2_tRMS_rc@POWER-AC [A]	86.64411	85.31999	-1.324120
I3_tRMS_rc@POWER-AC [A]	84.60520	86.65322	2.048019
U_fund_SYM+_rc@POWER-AC [V]	801.7770	801.8404	0.063354
U_fund_SYM-_rc@POWER-AC [V]	1.726867	1.836213	0.109346
AI 1/I1@TRIONet3_1674 [A]	79.33379	111.1627	31.82888
AI 1/I2@TRIONet3_1674 [A]	44.79289	-105.2618	-150.0547
AI 1/I3@TRIONet3_1674 [A]	-123.9777	-5.662442	118.3152
AI 1/U1@TRIONet3_1674 [V]	-361.8188	995.3948	1357.214
AI 1/U2@TRIONet3_1674 [V]	1115.179	-31.82936	-1147.008
AI 1/U3@TRIONet3_1674 [V]	-753.5894	-963.9128	-210.3233

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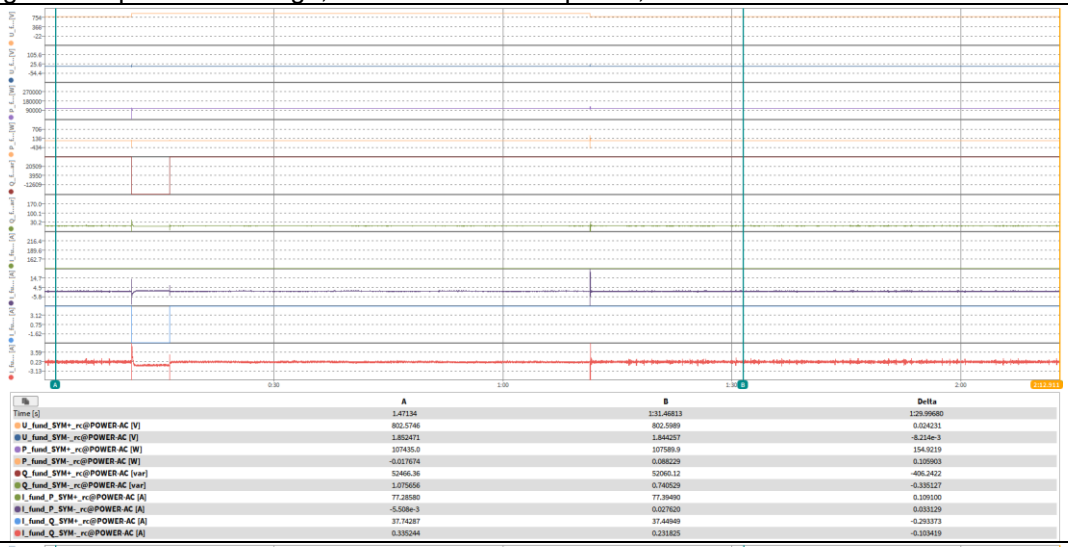
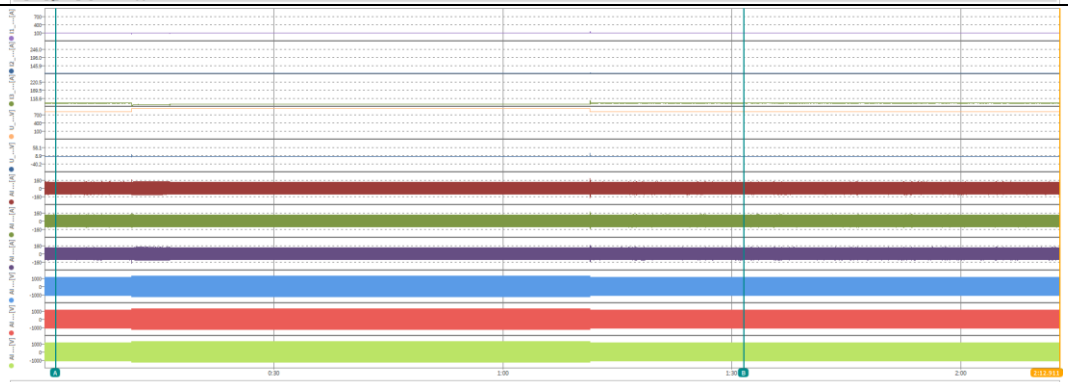
VS2.2-6 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	1.47134	1:31.46813	1:29.99680
U_fund_SYM+_rc@POWER-AC [V]	802.5746	802.5989	0.024231
U_fund_SYM-_rc@POWER-AC [V]	1.852471	1.844257	-8.214e-3
P_fund_SYM+_rc@POWER-AC [W]	107435.0	107589.9	154.9219
P_fund_SYM-_rc@POWER-AC [W]	-0.017674	0.098229	0.115903
Q_fund_SYM+_rc@POWER-AC [var]	52466.36	52060.12	-406.2422
Q_fund_SYM-_rc@POWER-AC [var]	1.075656	0.740529	-0.335127
I_fund_P_SYM+_rc@POWER-AC [A]	77.28580	77.39490	0.109100
I_fund_P_SYM-_rc@POWER-AC [A]	-5.508e-3	0.027620	0.033129
I_fund_Q_SYM+_rc@POWER-AC [A]	37.74287	37.44949	-0.293373
I_fund_Q_SYM-_rc@POWER-AC [A]	0.335244	0.231825	-0.103419



	A	B	Delta
Time [s]	1.47134	1:31.54987	1:30.07854
I1_tRMS_rc@POWER-AC [A]	85.79004	86.41650	0.626465
I2_tRMS_rc@POWER-AC [A]	86.32498	86.11605	-0.208931
I3_tRMS_rc@POWER-AC [A]	86.12527	85.56126	-0.564018
U_fund_SYM+_rc@POWER-AC [V]	802.5746	802.5753	6.714e-4
U_fund_SYM-_rc@POWER-AC [V]	1.852471	1.824087	-0.028385
AI 1/I1@TRIONet3_1674 [A]	-117.3914	-87.85725	29.53410
AI 1/I2@TRIONet3_1674 [A]	95.03961	113.9641	18.92448
AI 1/I3@TRIONet3_1674 [A]	22.38155	-26.07703	-48.45858
AI 1/U1@TRIONet3_1674 [V]	-918.1066	-1116.222	-198.1158
AI 1/U2@TRIONet3_1674 [V]	-117.4321	387.2699	504.6981
AI 1/U3@TRIONet3_1674 [V]	1035.672	729.0273	-306.6447

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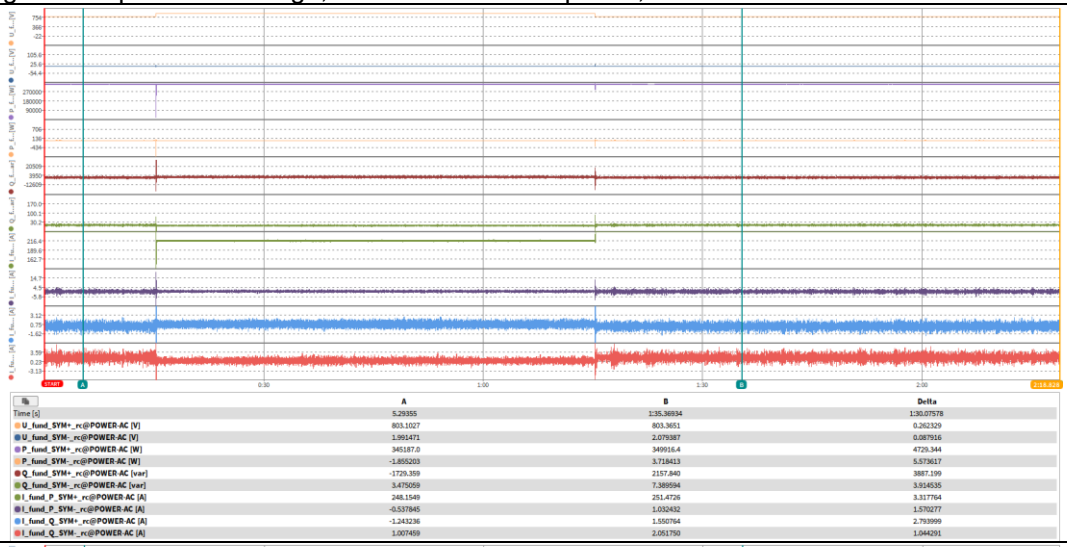
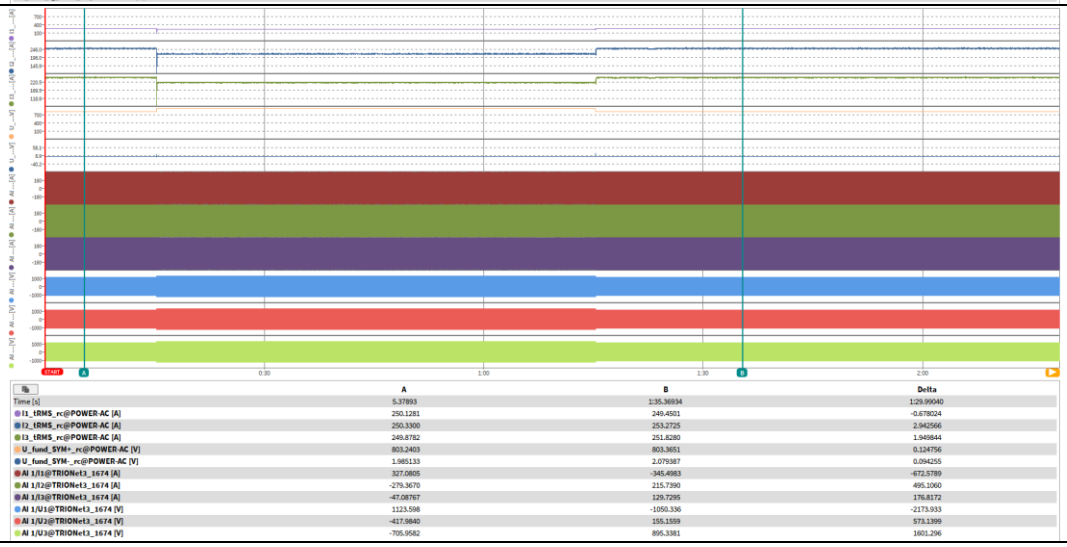
VS2.2-7 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	5.29355	1:35.36934	1:30.07578
U_fund_SYM+_rc@POWER-AC [V]	803.1027	803.3651	0.262329
U_fund_SYM-_rc@POWER-AC [V]	1.991471	2.079387	0.087916
P_fund_SYM+_rc@POWER-AC [W]	345187.0	349916.4	4729.344
P_fund_SYM-_rc@POWER-AC [W]	-1.855203	3.718413	5.573617
Q_fund_SYM+_rc@POWER-AC [var]	-1729.359	2157.840	3887.199
Q_fund_SYM-_rc@POWER-AC [var]	3.475059	7.389594	3.914535
I_fund_P_SYM+_rc@POWER-AC [A]	248.1549	251.4726	3.317764
I_fund_P_SYM-_rc@POWER-AC [A]	-0.537845	1.032432	1.570277
I_fund_Q_SYM+_rc@POWER-AC [A]	-1.243236	1.550764	2.793999
I_fund_Q_SYM-_rc@POWER-AC [A]	1.007459	2.051750	1.044291



	A	B	Delta
Time [s]	5.37893	1:35.36934	1:29.99040
I1_tRMS_rc@POWER-AC [A]	250.1281	249.4501	-0.678024
I2_tRMS_rc@POWER-AC [A]	250.3300	253.2725	2.942566
I3_tRMS_rc@POWER-AC [A]	249.8782	251.8280	1.949844
U_fund_SYM+_rc@POWER-AC [V]	803.2403	803.3651	0.124756
U_fund_SYM-_rc@POWER-AC [V]	1.985133	2.079387	0.094255
AI 1/I1@TRIONet3_1674 [A]	327.0805	-345.4983	-672.5789
AI 1/I2@TRIONet3_1674 [A]	-279.3670	215.7390	495.1060
AI 1/I3@TRIONet3_1674 [A]	-47.08767	129.7295	176.8172
AI 1/U1@TRIONet3_1674 [V]	1123.598	-1050.336	-2173.933
AI 1/U2@TRIONet3_1674 [V]	-417.9840	155.1559	573.1399
AI 1/U3@TRIONet3_1674 [V]	-705.9582	895.3381	1601.296

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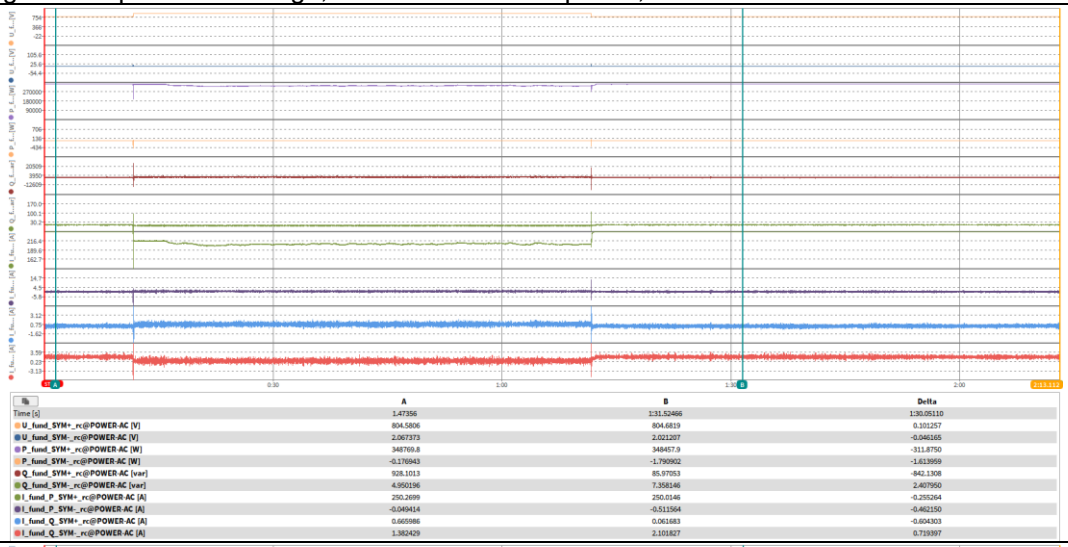
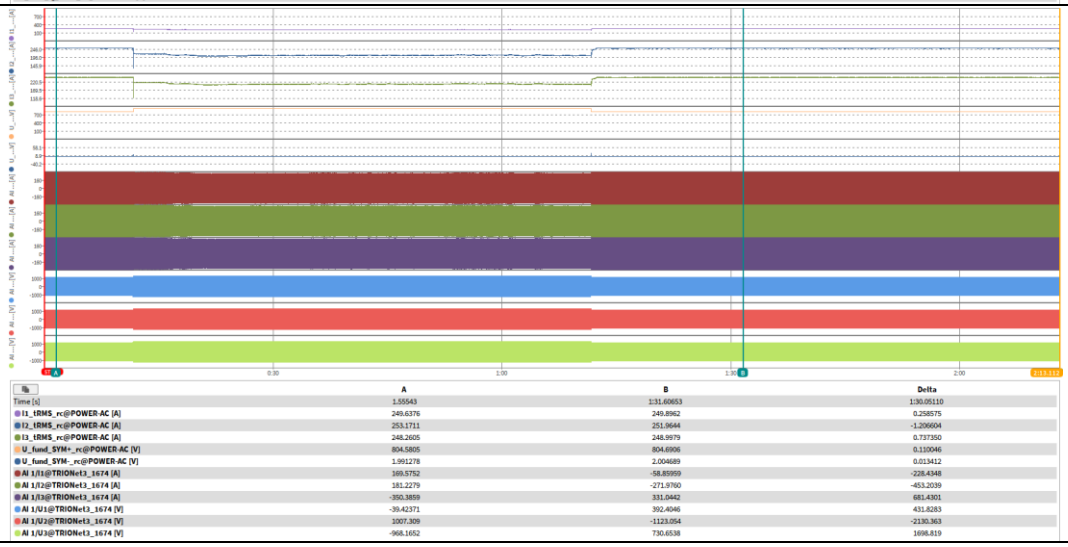
VS2.2-8 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	1.47356	1:31.52466	1:30.05110
U_fund_SYM+_rc@POWER-AC [V]	804.5806	804.6819	0.101257
U_fund_SYM-_rc@POWER-AC [V]	2.067373	2.021207	-0.046165
P_fund_SYM+_rc@POWER-AC [W]	348769.8	348457.9	-311.8750
P_fund_SYM-_rc@POWER-AC [W]	-0.176943	-1.790902	-1.613959
Q_fund_SYM+_rc@POWER-AC [var]	928.1013	85.97053	-842.1308
Q_fund_SYM-_rc@POWER-AC [var]	4.950196	7.358146	2.407950
I_fund_P_SYM+_rc@POWER-AC [A]	250.2699	250.0146	-0.255264
I_fund_P_SYM-_rc@POWER-AC [A]	-0.049414	-0.511564	-0.462150
I_fund_Q_SYM+_rc@POWER-AC [A]	0.665986	0.061683	-0.604303
I_fund_Q_SYM-_rc@POWER-AC [A]	1.382429	2.101827	0.719397



	A	B	Delta
Time [s]	1.55543	1:31.60653	1:30.05110
I1_tRMS_rc@POWER-AC [A]	249.6376	249.8962	0.258575
I2_tRMS_rc@POWER-AC [A]	253.1711	251.9644	-1.206604
I3_tRMS_rc@POWER-AC [A]	248.2605	248.9979	0.737350
U_fund_SYM+_rc@POWER-AC [V]	804.5805	804.6906	0.110046
U_fund_SYM-_rc@POWER-AC [V]	1.991278	2.004689	0.013412
AI 1/I1@TRIONet3_1674 [A]	189.5752	-58.85959	-228.4348
AI 1/I2@TRIONet3_1674 [A]	181.2279	-271.9760	-453.2039
AI 1/I3@TRIONet3_1674 [A]	-350.1859	331.0442	681.4301
AI 1/U1@TRIONet3_1674 [V]	-39.42371	392.4046	431.8283
AI 1/U2@TRIONet3_1674 [V]	1007.309	-1123.054	-2130.363
AI 1/U3@TRIONet3_1674 [V]	-968.1652	730.6538	1698.819

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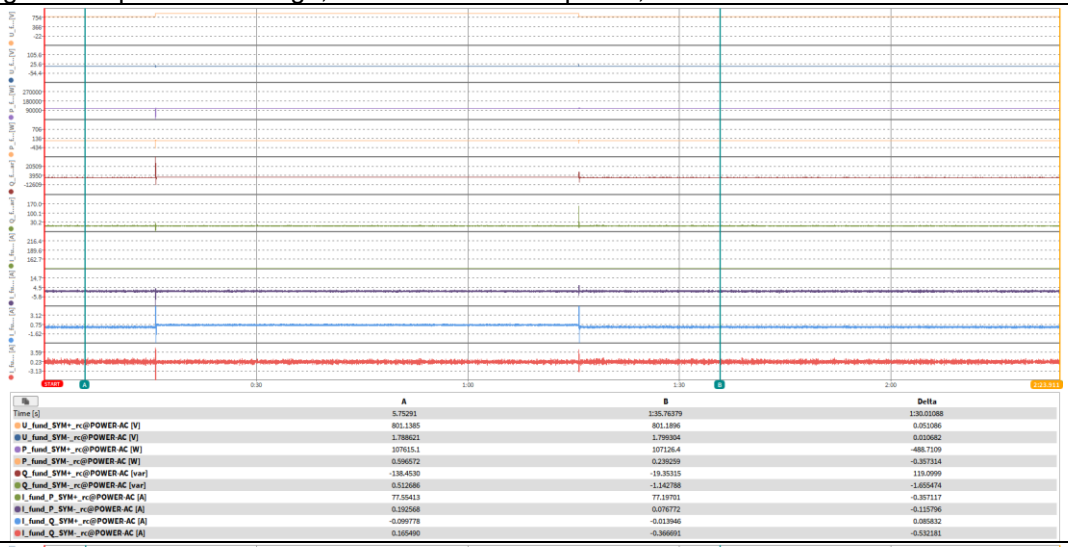
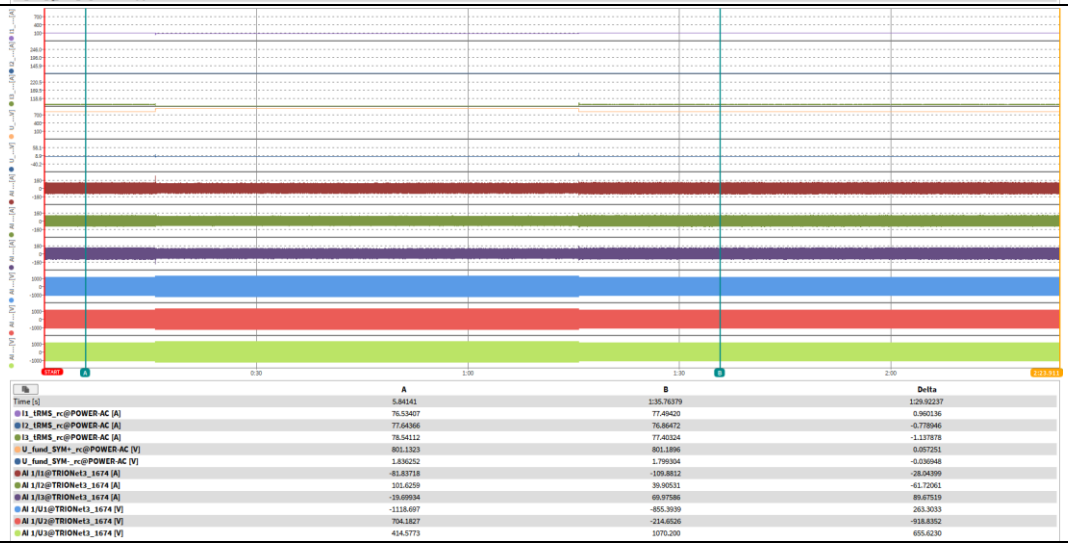
VS2.2-9 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	5.75291	1:35.76379	1:30.01088
U_fund_SYM+_rc@POWER-AC [V]	801.1385	801.1896	0.051086
U_fund_SYM-_rc@POWER-AC [V]	1.788621	1.799304	0.010682
P_fund_SYM+_rc@POWER-AC [W]	107615.1	107126.4	-488.7109
P_fund_SYM-_rc@POWER-AC [W]	0.196572	0.239259	-0.357314
Q_fund_SYM+_rc@POWER-AC [var]	-138.4530	-19.35315	119.0999
Q_fund_SYM-_rc@POWER-AC [var]	0.512686	-1.142788	-1.655474
I_fund_P_SYM+_rc@POWER-AC [A]	77.55413	77.19701	-0.357117
I_fund_P_SYM-_rc@POWER-AC [A]	0.192568	0.076772	-0.115796
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.099778	-0.013946	0.085832
I_fund_Q_SYM-_rc@POWER-AC [A]	0.165490	-0.366691	-0.532181



	A	B	Delta
Time [s]	5.84141	1:35.76379	1:29.92237
I1_tRMS_rc@POWER-AC [A]	76.53407	77.49420	0.960136
I2_tRMS_rc@POWER-AC [A]	77.64366	76.86472	-0.778946
I3_tRMS_rc@POWER-AC [A]	78.54112	77.40324	-1.137878
U_fund_SYM+_rc@POWER-AC [V]	801.1323	801.1896	0.057251
U_fund_SYM-_rc@POWER-AC [V]	1.836252	1.799304	-0.036948
AI 1/I1@TRIONet3_1674 [A]	-81.83718	-109.8812	-28.04399
AI 1/I2@TRIONet3_1674 [A]	101.6259	39.90531	-61.72061
AI 1/I3@TRIONet3_1674 [A]	-19.69934	69.97586	89.67519
AI 1/U1@TRIONet3_1674 [V]	-1118.697	-855.3939	263.3033
AI 1/U2@TRIONet3_1674 [V]	704.1827	-214.6526	-918.8352
AI 1/U3@TRIONet3_1674 [V]	414.5773	1070.200	655.6230

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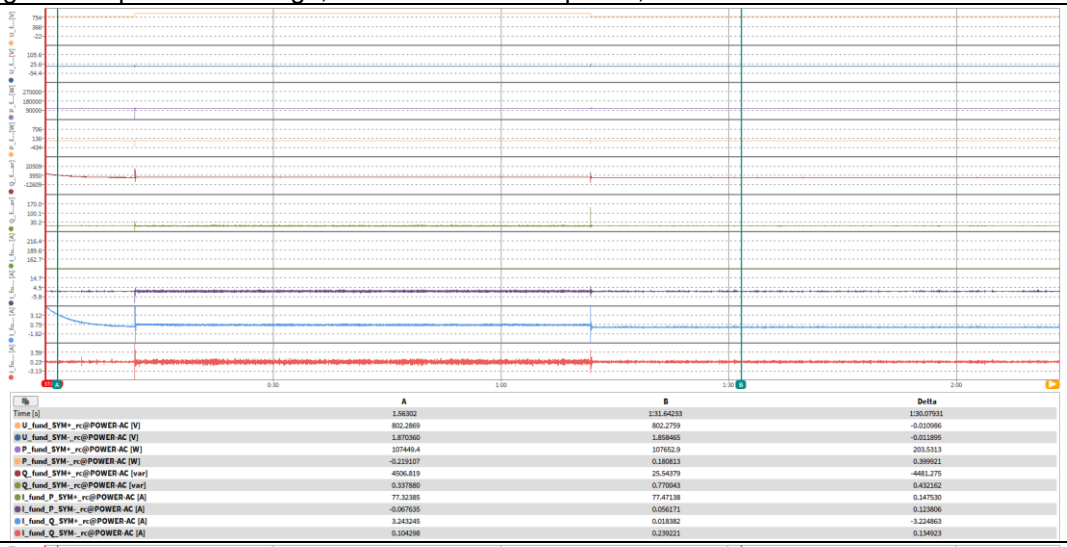
VS2.2-10 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	1.56302	1:31.64233	1:30.07931
U_fund_SYM+_rc@POWER-AC [V]	802.2869	802.2759	-0.010986
U_fund_SYM-_rc@POWER-AC [V]	1.870360	1.858465	-0.011895
P_fund_SYM+_rc@POWER-AC [W]	107449.4	107652.9	203.5313
P_fund_SYM-_rc@POWER-AC [W]	-0.219107	0.180813	0.399921
Q_fund_SYM+_rc@POWER-AC [var]	4506.819	25.54379	-4481.275
Q_fund_SYM-_rc@POWER-AC [var]	0.337880	0.770043	0.432162
I_fund_P_SYM+_rc@POWER-AC [A]	77.32385	77.47138	0.147530
I_fund_P_SYM-_rc@POWER-AC [A]	-0.067635	0.056171	0.123806
I_fund_Q_SYM+_rc@POWER-AC [A]	3.243245	0.018382	-3.224863
I_fund_Q_SYM-_rc@POWER-AC [A]	0.104298	0.239221	0.134923

	A	B	Delta
Time [s]	1.64528	1:31.72469	1:30.07931
I1_tRMS_rc@POWER-AC [A]	77.66402	77.68230	0.018272
I2_tRMS_rc@POWER-AC [A]	77.33430	77.73263	0.398323
I3_tRMS_rc@POWER-AC [A]	76.55780	77.57470	1.016899
U_fund_SYM+_rc@POWER-AC [V]	802.2687	802.2823	0.013611
U_fund_SYM-_rc@POWER-AC [V]	1.853465	1.842914	-0.010551
AI 1/I1@TRIONet3_1674 [A]	111.8779	108.8083	-3.069639
AI 1/I2@TRIONet3_1674 [A]	-55.96876	-67.77049	-11.80172
AI 1/I3@TRIONet3_1674 [A]	-55.67074	-40.76958	14.90116
AI 1/U1@TRIONet3_1674 [V]	956.9657	1056.330	99.36453
AI 1/U2@TRIONet3_1674 [V]	47.36209	-174.4540	-221.8161
AI 1/U3@TRIONet3_1674 [V]	-1004.710	-882.2222	122.4883

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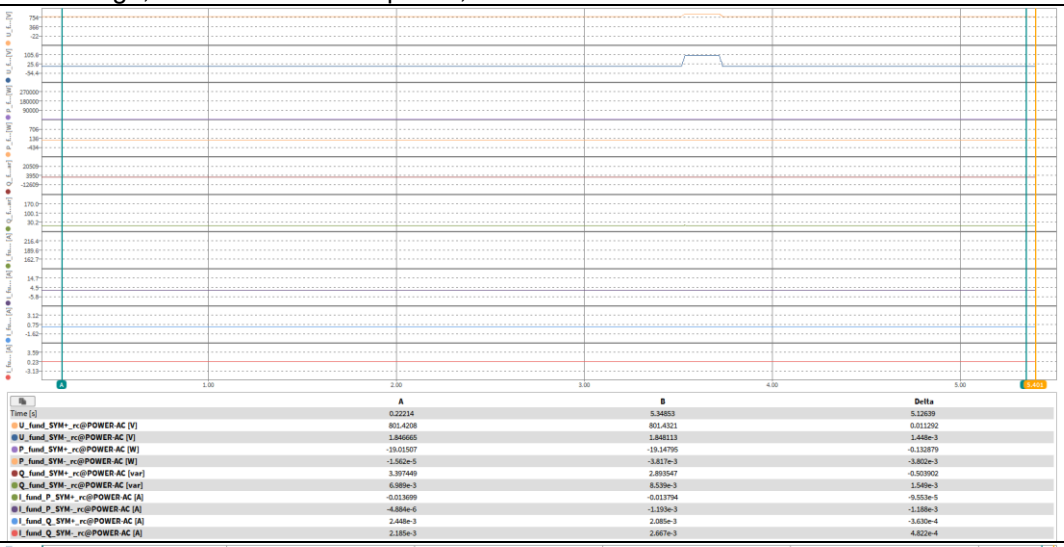
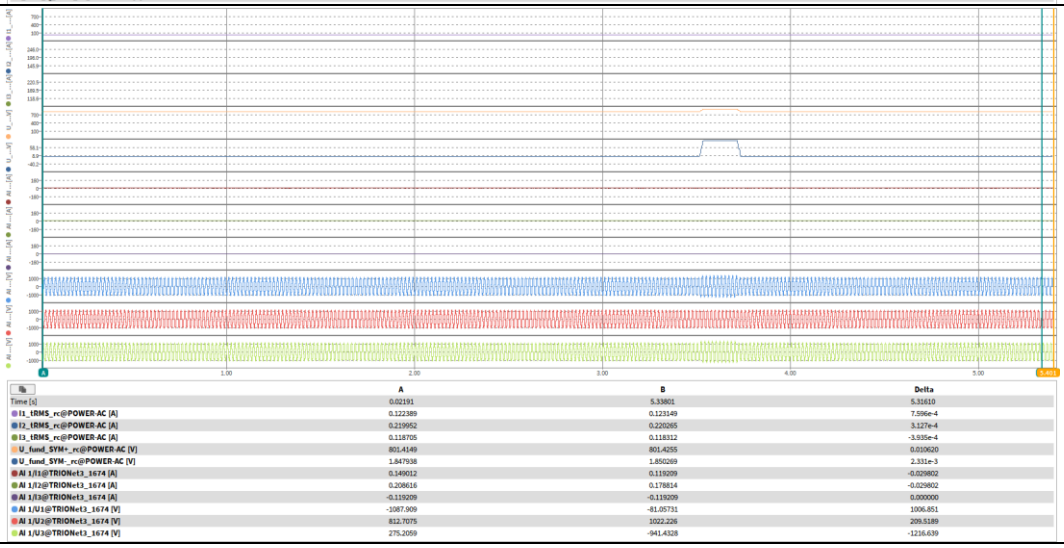
VS3-1 (no-load test)

a) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	0.22214	5.34853	5.12639
U_fund_SYM+_rc@POWER-AC [V]	801.4208	801.4321	0.011292
U_fund_SYM-_rc@POWER-AC [V]	1.846665	1.848113	1.448e-3
P_fund_SYM+_rc@POWER-AC [W]	-19.01507	-19.14795	-0.132879
P_fund_SYM-_rc@POWER-AC [W]	-1.562e-5	-3.817e-3	-3.802e-3
Q_fund_SYM+_rc@POWER-AC [var]	3.397449	2.893547	-0.503902
Q_fund_SYM-_rc@POWER-AC [var]	6.989e-3	8.539e-3	1.549e-3
I_fund_P_SYM+_rc@POWER-AC [A]	-0.013699	-0.013794	-9.553e-5
I_fund_P_SYM-_rc@POWER-AC [A]	-4.884e-6	-1.193e-3	-1.188e-3
I_fund_Q_SYM+_rc@POWER-AC [A]	2.448e-3	2.085e-3	-3.630e-4
I_fund_Q_SYM-_rc@POWER-AC [A]	2.185e-3	2.667e-3	4.822e-4



	A	B	Delta
Time [s]	0.02191	5.33801	5.31610
I1_tRMS_rc@POWER-AC [A]	0.122389	0.123149	7.596e-4
I2_tRMS_rc@POWER-AC [A]	0.219952	0.220265	3.127e-4
I3_tRMS_rc@POWER-AC [A]	0.118705	0.118312	-3.935e-4
U_fund_SYM+_rc@POWER-AC [V]	801.4149	801.4255	0.010620
U_fund_SYM-_rc@POWER-AC [V]	1.847938	1.850269	2.331e-3
AI 1/I1@TRIONet3_1674 [A]	0.149012	0.119209	-0.029802
AI 1/I2@TRIONet3_1674 [A]	0.208616	0.178814	-0.029802
AI 1/I3@TRIONet3_1674 [A]	-0.119209	-0.119209	0.000000
AI 1/U1@TRIONet3_1674 [V]	-1087.909	-81.05731	1006.851
AI 1/U2@TRIONet3_1674 [V]	812.7075	1022.226	209.5189
AI 1/U3@TRIONet3_1674 [V]	275.2059	-941.4328	-1216.639

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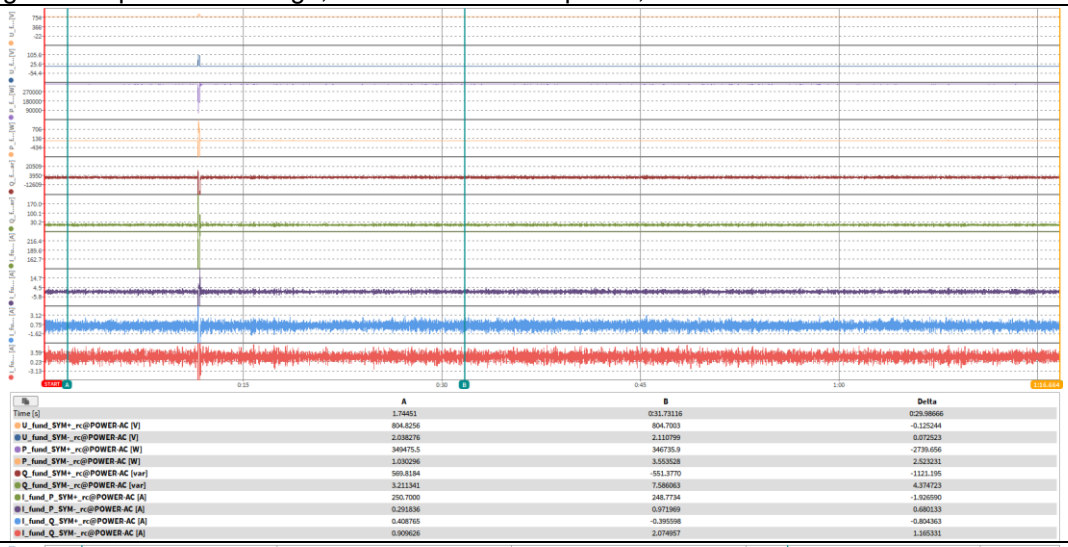
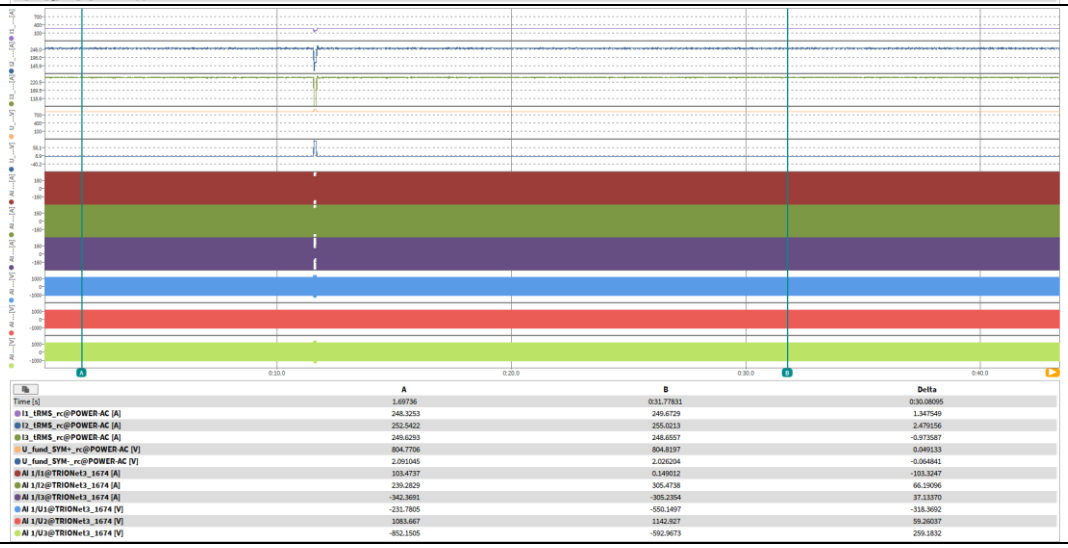
VS3-1 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	1.74451	0:31.73116	0:29.98666
U_fund_SYM+_rc@POWER-AC [V]	804.8256	804.7003	-0.125244
U_fund_SYM-_rc@POWER-AC [V]	2.038276	2.110799	0.072523
P_fund_SYM+_rc@POWER-AC [W]	349475.5	346735.9	-2739.656
P_fund_SYM-_rc@POWER-AC [W]	1.030296	3.553528	2.523231
Q_fund_SYM+_rc@POWER-AC [var]	569.8184	-551.3770	-1121.195
Q_fund_SYM-_rc@POWER-AC [var]	3.211341	7.590063	4.374723
I_fund_P_SYM+_rc@POWER-AC [A]	250.7000	248.7734	-1.926590
I_fund_P_SYM-_rc@POWER-AC [A]	0.291836	0.971969	0.680133
I_fund_Q_SYM+_rc@POWER-AC [A]	0.408765	-0.395598	-0.804363
I_fund_Q_SYM-_rc@POWER-AC [A]	0.909626	2.074957	1.165331



	A	B	Delta
Time [s]	1.69736	0:31.77831	0:30.08095
I1_tRMS_rc@POWER-AC [A]	248.3253	249.6729	1.347549
I2_tRMS_rc@POWER-AC [A]	252.5422	255.0213	2.479156
I3_tRMS_rc@POWER-AC [A]	249.6293	248.6557	-0.973587
U_fund_SYM+_rc@POWER-AC [V]	804.7706	804.8197	0.049133
U_fund_SYM-_rc@POWER-AC [V]	2.091045	2.026204	-0.064841
AI 1/I1@TRIONet3_1674 [A]	103.4737	0.149012	-103.3247
AI 1/I2@TRIONet3_1674 [A]	239.2829	305.4738	66.19096
AI 1/I3@TRIONet3_1674 [A]	-342.3691	-305.2354	37.13370
AI 1/U1@TRIONet3_1674 [V]	-231.7805	-550.1497	-318.3692
AI 1/U2@TRIONet3_1674 [V]	1083.667	1142.927	59.26037
AI 1/U3@TRIONet3_1674 [V]	-852.1505	-592.9673	259.1832

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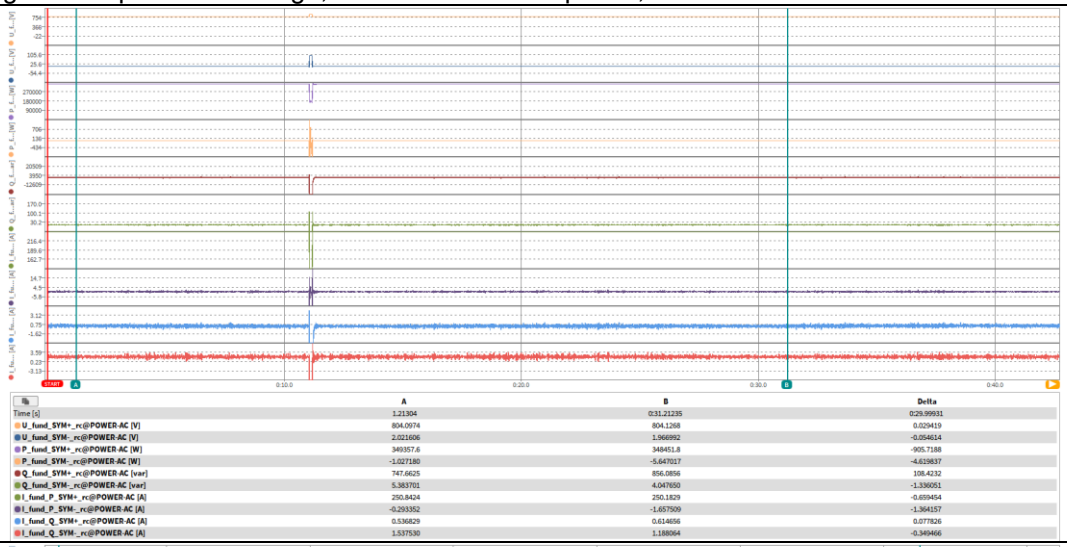
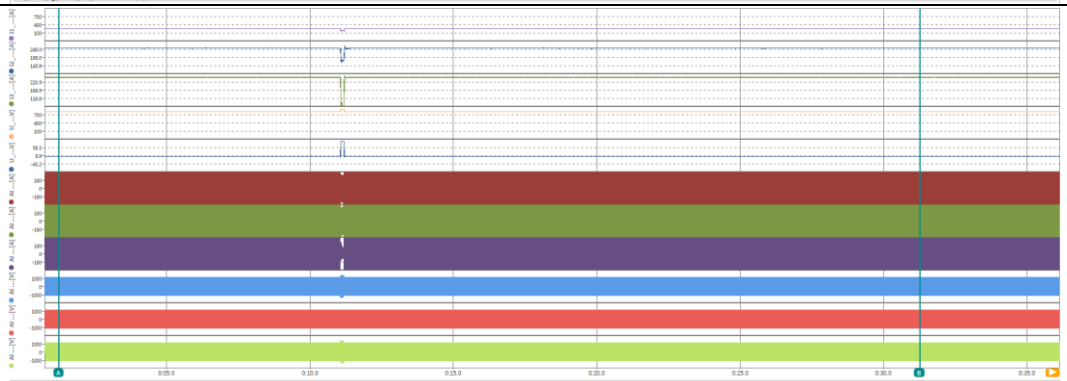
VS3-2 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	1.21304	0:31.21235	0:29.99931
U_fund_SYM+_rc@POWER-AC [V]	804.0974	804.1268	0.029419
U_fund_SYM-_rc@POWER-AC [V]	2.021606	1.966992	-0.054614
P_fund_SYM+_rc@POWER-AC [W]	349357.6	348451.8	-905.7188
P_fund_SYM-_rc@POWER-AC [W]	-1.027180	-5.647017	-4.619837
Q_fund_SYM+_rc@POWER-AC [var]	747.6625	856.0856	108.4232
Q_fund_SYM-_rc@POWER-AC [var]	5.383701	4.047650	-1.336051
I_fund_P_SYM+_rc@POWER-AC [A]	250.8424	250.1829	-0.659454
I_fund_P_SYM-_rc@POWER-AC [A]	-0.293352	-1.657509	-1.364157
I_fund_Q_SYM+_rc@POWER-AC [A]	0.536829	0.614656	0.077826
I_fund_Q_SYM-_rc@POWER-AC [A]	1.537530	1.188064	-0.349466



	A	B	Delta
Time [s]	1.25969	0:31.25900	0:29.99931
I1_tRMS_rc@POWER-AC [A]	249.8459	250.6002	0.754333
I2_tRMS_rc@POWER-AC [A]	253.3083	252.0824	-1.225876
I3_tRMS_rc@POWER-AC [A]	248.8589	249.7100	0.851181
U_fund_SYM+_rc@POWER-AC [V]	804.1149	804.1371	0.022278
U_fund_SYM-_rc@POWER-AC [V]	2.005872	2.008492	2.620e-3
AI 1/I1@TRIONet3_1674 [A]	-258.7140	-201.9107	56.80323
AI 1/I2@TRIONet3_1674 [A]	348.1508	356.8828	8.732081
AI 1/I3@TRIONet3_1674 [A]	-89.10895	-154.7933	-65.68432
AI 1/U1@TRIONet3_1674 [V]	-1097.545	-1028.824	68.72082
AI 1/U2@TRIONet3_1674 [V]	801.1718	933.0378	131.8660
AI 1/U3@TRIONet3_1674 [V]	296.4072	95.76321	-200.6440

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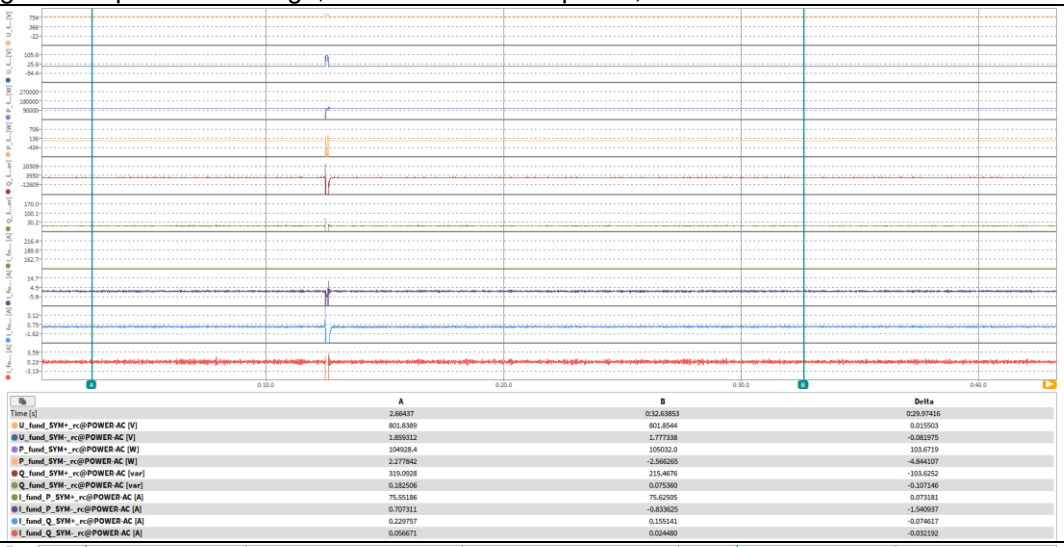
VS3-3 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current


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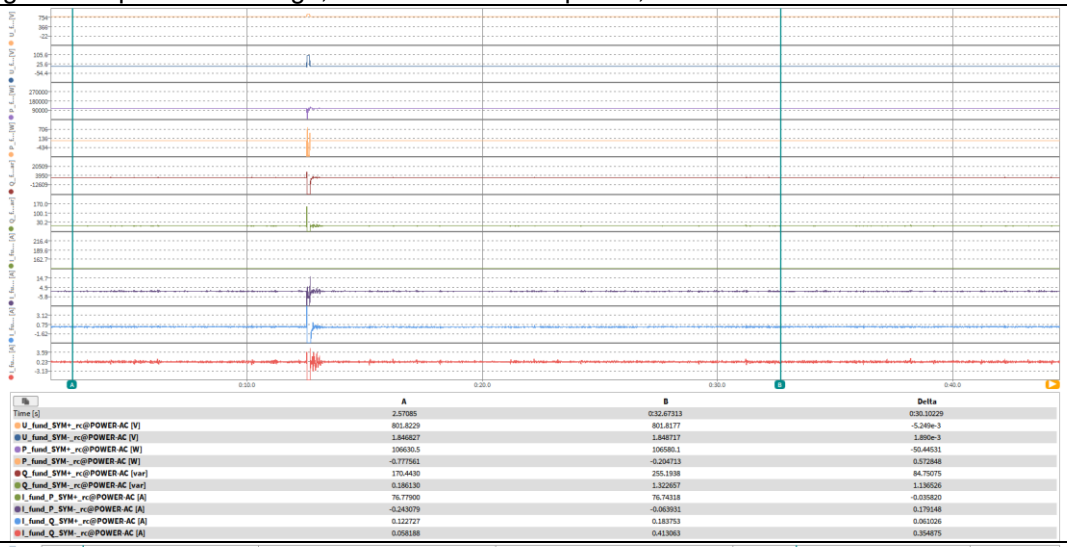
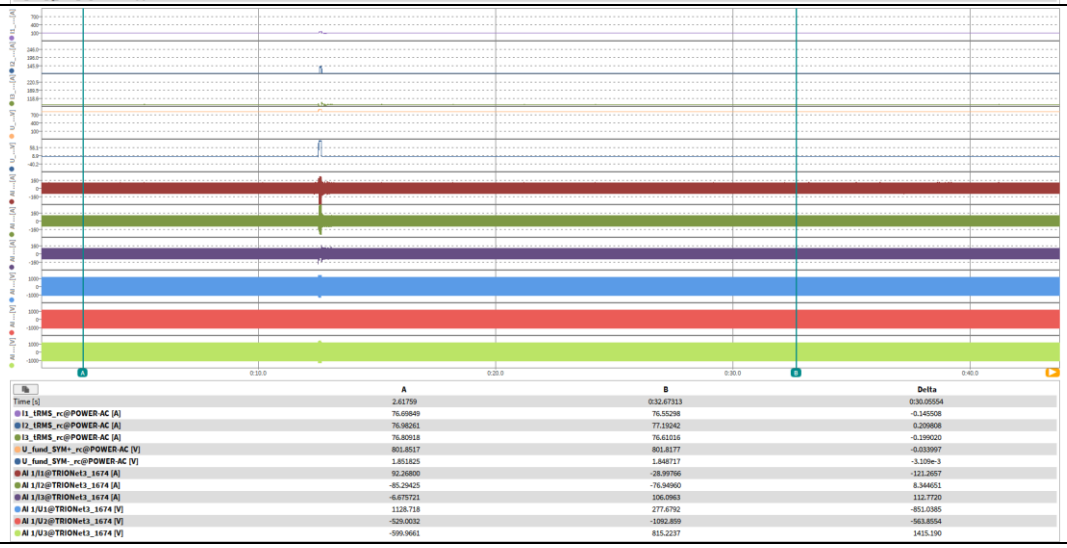
VS3-4 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



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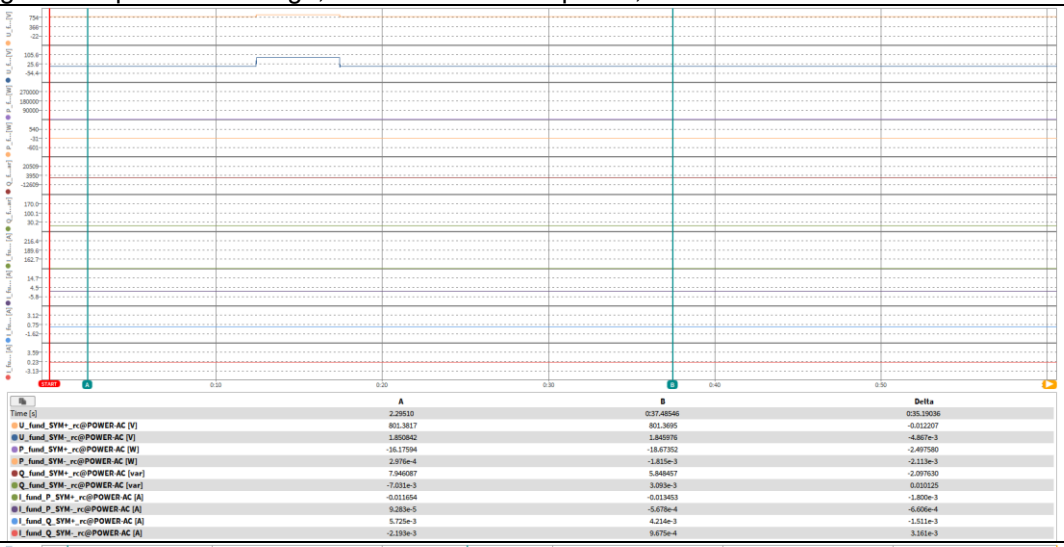
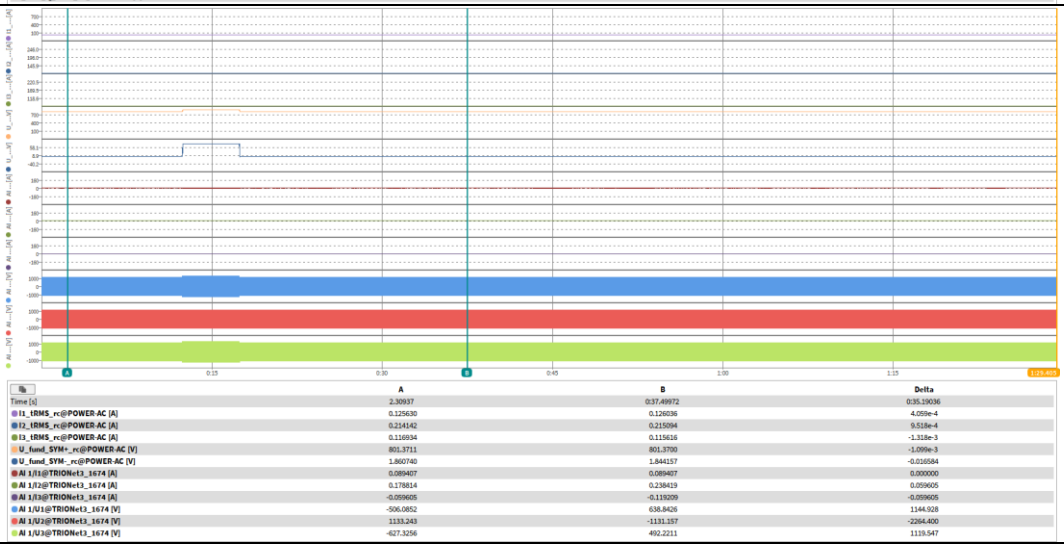
VS4.1 (no-load test)
a) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.29510	0:37.48546	0:35.19036
U_fund_SYM+_rc@POWER-AC [V]	801.3817	801.3695	-0.012207
U_fund_SYM-_rc@POWER-AC [V]	1.850842	1.845976	-4.867e-3
P_fund_SYM+_rc@POWER-AC [W]	-16.17594	-18.67352	-2.497580
P_fund_SYM-_rc@POWER-AC [W]	2.976e-4	-1.815e-3	-2.113e-3
Q_fund_SYM+_rc@POWER-AC [var]	7.946087	5.848457	-2.097630
Q_fund_SYM-_rc@POWER-AC [var]	-7.031e-3	3.093e-3	0.010125
I_fund_P_SYM+_rc@POWER-AC [A]	-0.011654	-0.013453	-1.800e-3
I_fund_P_SYM-_rc@POWER-AC [A]	9.283e-5	-5.678e-4	-6.606e-4
I_fund_Q_SYM+_rc@POWER-AC [A]	5.725e-3	4.214e-3	-1.511e-3
I_fund_Q_SYM-_rc@POWER-AC [A]	-2.193e-3	9.675e-4	3.161e-3



	A	B	Delta
Time [s]	2.30937	0:37.49972	0:35.19036
I1_tRMS_rc@POWER-AC [A]	0.125630	0.126036	4.059e-4
I2_tRMS_rc@POWER-AC [A]	0.214142	0.215094	9.518e-4
I3_tRMS_rc@POWER-AC [A]	0.116934	0.115616	-1.318e-3
U_fund_SYM+_rc@POWER-AC [V]	801.3711	801.3700	-1.099e-3
U_fund_SYM-_rc@POWER-AC [V]	1.860740	1.844157	-0.016584
AI 1/I1@TRIONet3_1674 [A]	0.089407	0.089407	0.000000
AI 1/I2@TRIONet3_1674 [A]	0.178814	0.238419	0.059605
AI 1/I3@TRIONet3_1674 [A]	-0.059605	-0.119209	-0.059605
AI 1/U1@TRIONet3_1674 [V]	-506.0852	638.8426	1144.928
AI 1/U2@TRIONet3_1674 [V]	1133.243	-1131.157	-2264.400
AI 1/U3@TRIONet3_1674 [V]	-627.3256	492.2211	1119.547

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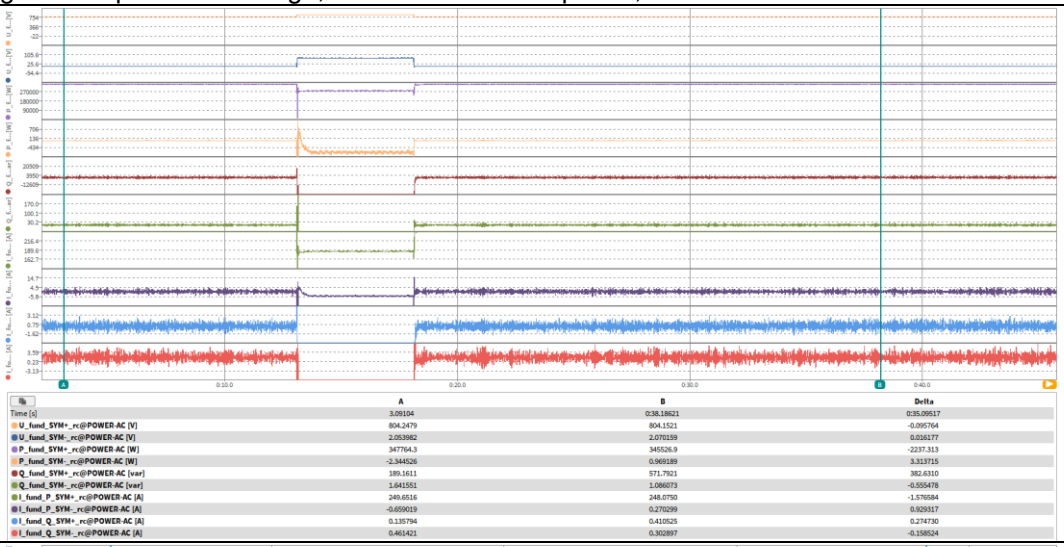
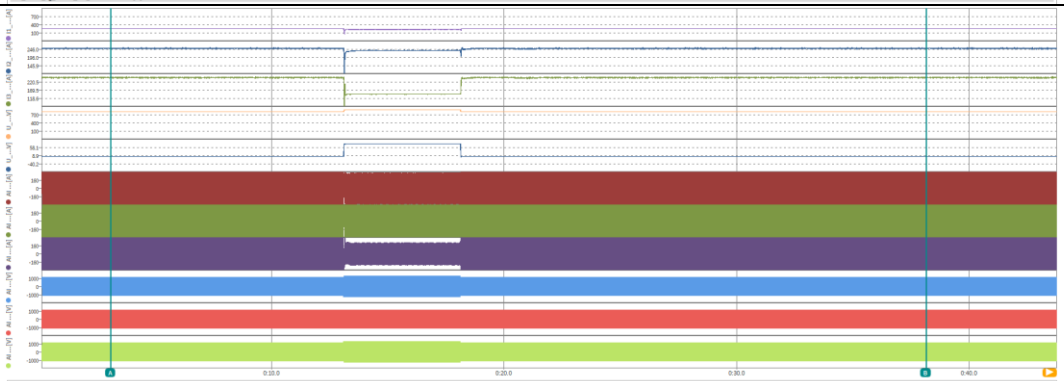
VS4.1-1 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	3.09104	0:38.18621	0:35.09517
U_fund_SYM+_rc@POWER-AC [V]	804.2479	804.1521	-0.095764
U_fund_SYM-_rc@POWER-AC [V]	2.053982	2.070159	0.016177
P_fund_SYM+_rc@POWER-AC [W]	347764.3	345526.9	-2237.313
P_fund_SYM-_rc@POWER-AC [W]	-2.344526	0.969189	3.313715
Q_fund_SYM+_rc@POWER-AC [var]	189.1611	571.7921	382.6310
Q_fund_SYM-_rc@POWER-AC [var]	1.641551	1.086073	-0.555478
I_fund_P_SYM+_rc@POWER-AC [A]	249.6516	248.0750	-1.576584
I_fund_P_SYM-_rc@POWER-AC [A]	-0.659019	0.270299	0.929317
I_fund_Q_SYM+_rc@POWER-AC [A]	0.135794	0.410525	0.274730
I_fund_Q_SYM-_rc@POWER-AC [A]	0.461421	0.302897	-0.158524



	A	B	Delta
Time [s]	3.09104	0:38.13865	0:35.04761
I1_tRMS_rc@POWER-AC [A]	249.9100	249.8454	-0.064545
I2_tRMS_rc@POWER-AC [A]	250.3043	251.5576	1.253326
I3_tRMS_rc@POWER-AC [A]	248.8863	249.3395	0.453125
U_fund_SYM+_rc@POWER-AC [V]	804.2479	804.2870	0.039185
U_fund_SYM-_rc@POWER-AC [V]	2.053982	2.073531	0.019548
AI 1/I1@TRIONet3_1674 [A]	64.67104	-283.3307	-348.0017
AI 1/I2@TRIONet3_1674 [A]	277.0126	-42.61732	-319.6299
AI 1/I3@TRIONet3_1674 [A]	-341.2366	326.0076	667.2442
AI 1/U1@TRIONet3_1674 [V]	-380.3833	-444.4506	-64.06737
AI 1/U2@TRIONet3_1674 [V]	1121.517	-685.6089	-1807.126
AI 1/U3@TRIONet3_1674 [V]	-741.3364	1130.181	1871.517

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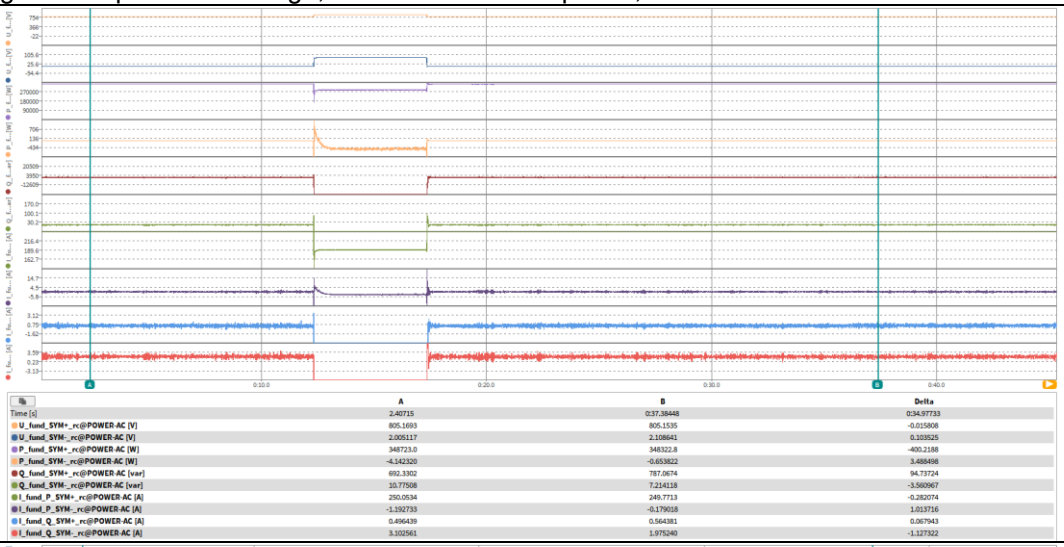
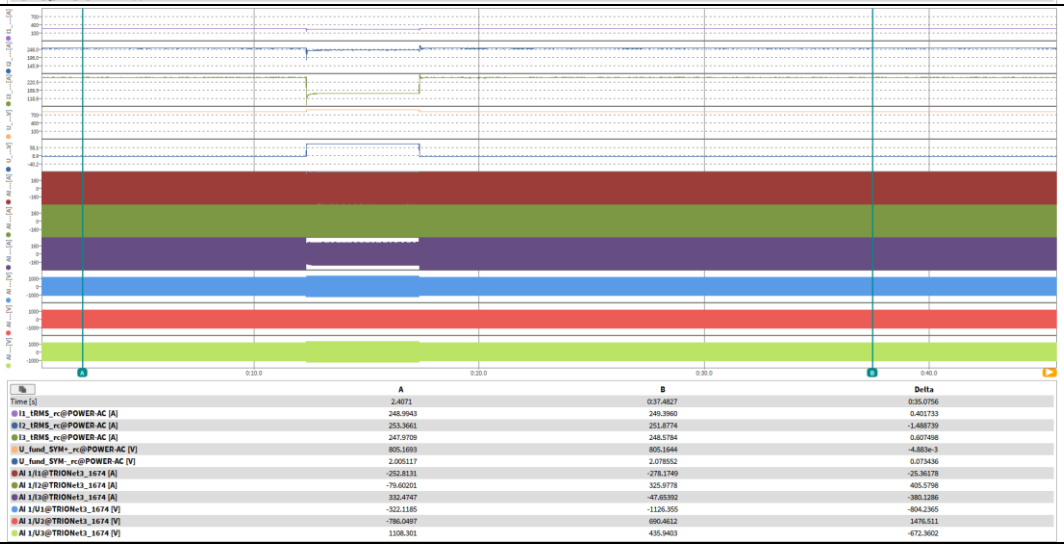
VS4.1-2 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.40715	0:37.38448	0:34.97733
U_fund_SYM+_rc@POWER-AC [V]	805.1693	805.1535	-0.015808
U_fund_SYM-_rc@POWER-AC [V]	2.005117	2.108641	0.103525
P_fund_SYM+_rc@POWER-AC [W]	348723.0	348322.8	-400.2188
P_fund_SYM-_rc@POWER-AC [W]	-4.142320	-0.653822	3.488498
Q_fund_SYM+_rc@POWER-AC [var]	692.3302	787.0674	94.73724
Q_fund_SYM-_rc@POWER-AC [var]	10.77508	7.214118	-3.560967
I_fund_P_SYM+_rc@POWER-AC [A]	250.0534	249.7713	-0.282074
I_fund_P_SYM-_rc@POWER-AC [A]	-1.192733	-0.179018	1.013716
I_fund_Q_SYM+_rc@POWER-AC [A]	0.496439	0.564381	0.067943
I_fund_Q_SYM-_rc@POWER-AC [A]	3.102561	1.975240	-1.127322



	A	B	Delta
Time [s]	2.4071	0:37.4827	0:35.0756
I1_tRMS_rc@POWER-AC [A]	248.9943	249.3960	0.401733
I2_tRMS_rc@POWER-AC [A]	253.3661	251.8774	-1.488739
I3_tRMS_rc@POWER-AC [A]	247.9709	248.5784	0.607498
U_fund_SYM+_rc@POWER-AC [V]	805.1693	805.1644	-4.883e-3
U_fund_SYM-_rc@POWER-AC [V]	2.005117	2.078552	0.073436
AI 1/I1@TRIONet3_1674 [A]	-252.8131	-278.1749	-25.36178
AI 1/I2@TRIONet3_1674 [A]	-79.60201	325.9778	405.5798
AI 1/I3@TRIONet3_1674 [A]	332.4747	-47.65392	-380.1286
AI 1/U1@TRIONet3_1674 [V]	-322.1185	-1126.355	-804.2365
AI 1/U2@TRIONet3_1674 [V]	-786.0497	690.4612	1476.511
AI 1/U3@TRIONet3_1674 [V]	1108.301	435.9403	-672.3602

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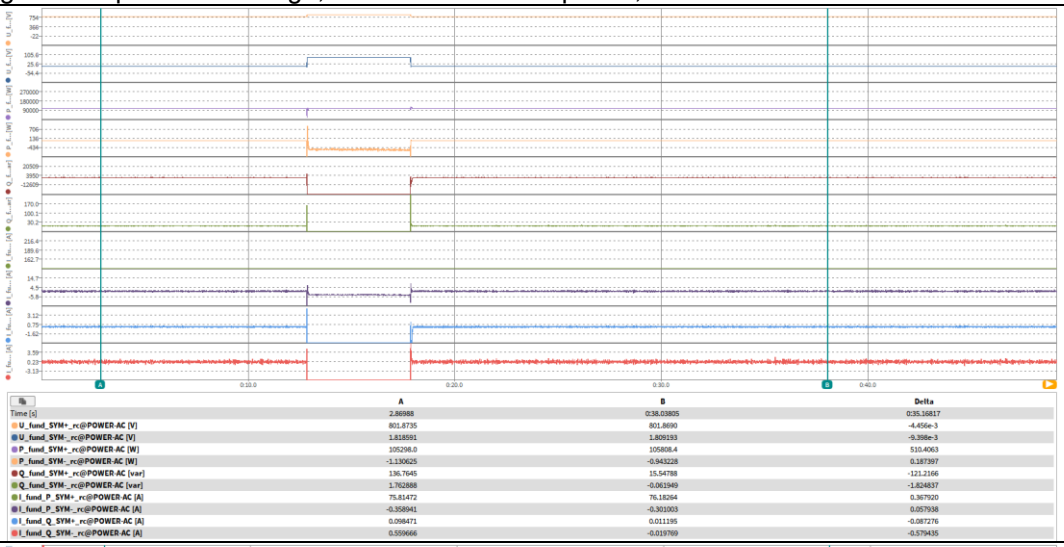
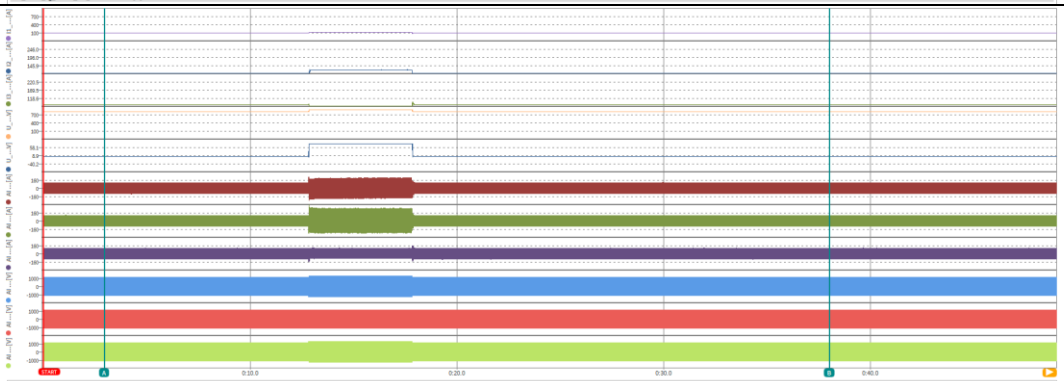
Building A, No. 15 Factory, Jintong International Industrial Park, No. 8 Xihu Road, Wujin National Hi-tech Industrial Development Zone, Changzhou City, Jiangsu Province, P. R. China

VS4.1-3 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.86988	0:38.03805	0:35.16817
U_fund_SYM+_rc@POWER-AC [V]	801.8735	801.8690	-4.456e-3
U_fund_SYM-_rc@POWER-AC [V]	1.818591	1.809193	-9.398e-3
P_fund_SYM+_rc@POWER-AC [W]	105298.0	105808.4	510.4063
P_fund_SYM-_rc@POWER-AC [W]	-1.130625	-0.943228	0.187397
Q_fund_SYM+_rc@POWER-AC [var]	136.7645	15.54788	-121.2166
Q_fund_SYM-_rc@POWER-AC [var]	1.762888	-0.061949	-1.824837
I_fund_P_SYM+_rc@POWER-AC [A]	75.81472	76.18264	0.367920
I_fund_P_SYM-_rc@POWER-AC [A]	-0.358941	-0.301003	0.057938
I_fund_Q_SYM+_rc@POWER-AC [A]	0.098471	0.011195	-0.087276
I_fund_Q_SYM-_rc@POWER-AC [A]	0.559666	-0.019769	-0.579435



	A	B	Delta
Time [s]	2.9672	0:38.0380	0:35.0709
I1_tRMS_rc@POWER-AC [A]	75.96919	76.48393	0.514740
I2_tRMS_rc@POWER-AC [A]	75.31339	76.29392	0.980530
I3_tRMS_rc@POWER-AC [A]	75.31216	75.93793	0.625771
U_fund_SYM+_rc@POWER-AC [V]	801.8317	801.8690	0.037354
U_fund_SYM-_rc@POWER-AC [V]	1.808488	1.809193	7.052e-4
AI 1/I1@TRIONet3_1674 [A]	-61.03516	29.44470	90.47986
AI 1/I2@TRIONet3_1674 [A]	-47.41550	73.19451	120.6100
AI 1/I3@TRIONet3_1674 [A]	108.5103	-102.4902	-211.0005
AI 1/U1@TRIONet3_1674 [V]	-70.97507	-273.2647	-202.2896
AI 1/U2@TRIONet3_1674 [V]	-946.4748	1091.571	2038.046
AI 1/U3@TRIONet3_1674 [V]	1017.551	-818.5602	-1836.111

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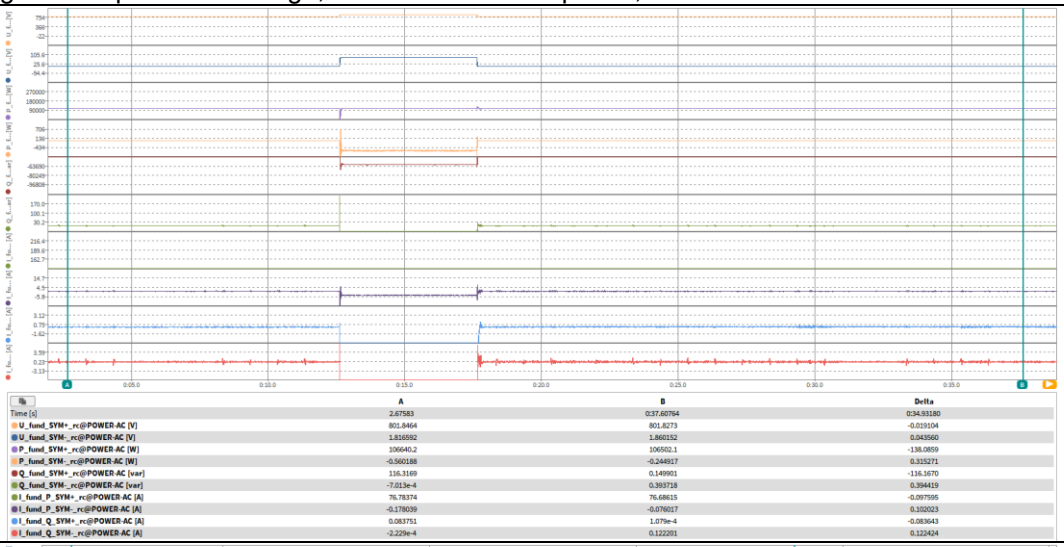
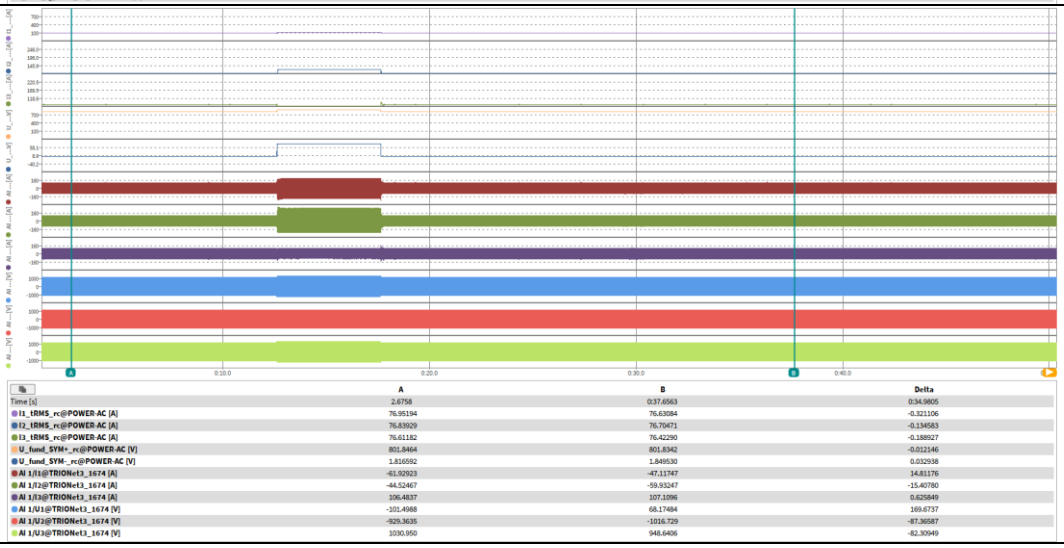
VS4.1-4 (load test)

b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.67583	0:37.60764	0:34.93180
U_fund_SYM+_rc@POWER-AC [V]	801.8464	801.8273	-0.019104
U_fund_SYM-_rc@POWER-AC [V]	1.816592	1.860152	0.043560
P_fund_SYM+_rc@POWER-AC [W]	106640.2	106502.1	-138.0859
P_fund_SYM-_rc@POWER-AC [W]	-0.560188	-0.244917	0.315271
Q_fund_SYM+_rc@POWER-AC [var]	116.3169	0.149901	-116.1670
Q_fund_SYM-_rc@POWER-AC [var]	-7.013e-4	0.393718	0.394419
I_fund_P_SYM+_rc@POWER-AC [A]	76.78374	76.68615	-0.097595
I_fund_P_SYM-_rc@POWER-AC [A]	-0.178039	-0.076017	0.102023
I_fund_Q_SYM+_rc@POWER-AC [A]	0.083751	1.079e-4	-0.083643
I_fund_Q_SYM-_rc@POWER-AC [A]	-2.229e-4	0.122201	0.122424



	A	B	Delta
Time [s]	2.6758	0:37.6563	0:34.9805
I1_tRMS_rc@POWER-AC [A]	76.95194	76.63084	-0.321106
I2_tRMS_rc@POWER-AC [A]	76.83929	76.70471	-0.134583
I3_tRMS_rc@POWER-AC [A]	76.61182	76.42290	-0.188927
U_fund_SYM+_rc@POWER-AC [V]	801.8464	801.8342	-0.012146
U_fund_SYM-_rc@POWER-AC [V]	1.816592	1.849530	0.032938
AI 1/I1@TRIONet3_1674 [A]	-61.92923	-47.11747	14.81176
AI 1/I2@TRIONet3_1674 [A]	-44.52467	-59.93247	-15.40780
AI 1/I3@TRIONet3_1674 [A]	106.4837	107.1096	0.625849
AI 1/U1@TRIONet3_1674 [V]	-101.4988	68.17484	169.6737
AI 1/U2@TRIONet3_1674 [V]	-929.3635	-1016.729	-87.36587
AI 1/U3@TRIONet3_1674 [V]	1030.950	948.6406	-82.30949

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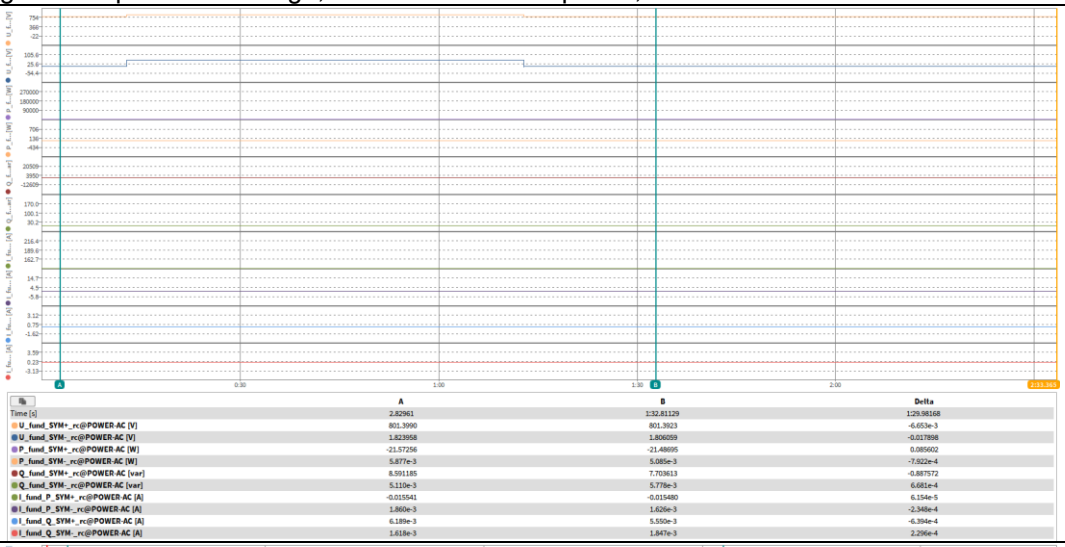
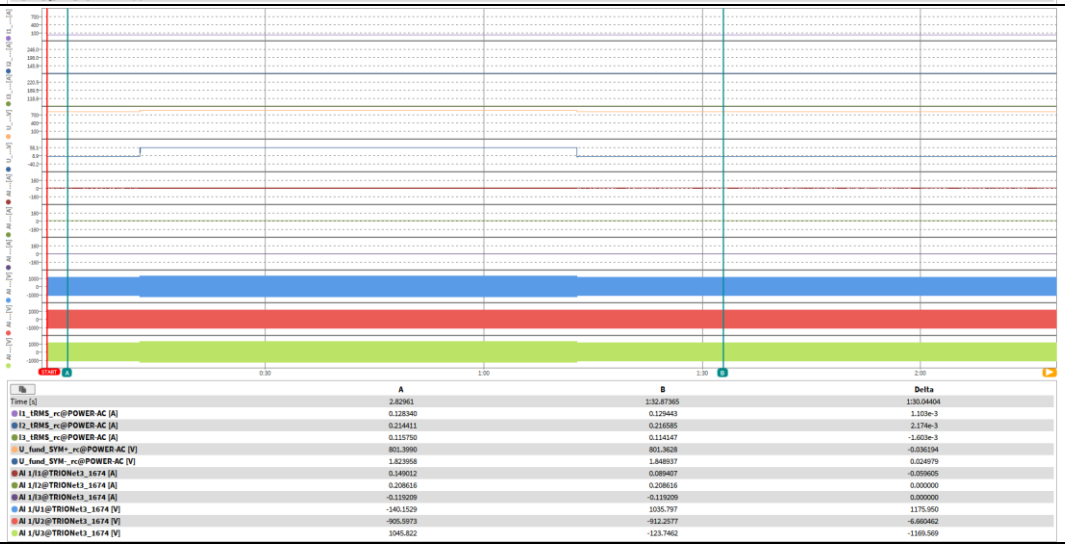
VS4.2 (no-load test)

a) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.82961	1:32.81129	1:29.98168
U_fund_SYM+_rc@POWER-AC [V]	801.3990	801.3923	-6.653e-3
U_fund_SYM-_rc@POWER-AC [V]	1.823958	1.806059	-0.017898
P_fund_SYM+_rc@POWER-AC [W]	-21.57256	-21.48695	0.085602
P_fund_SYM-_rc@POWER-AC [W]	5.877e-3	5.085e-3	-7.922e-4
Q_fund_SYM+_rc@POWER-AC [var]	8.591185	7.703613	-0.887572
Q_fund_SYM-_rc@POWER-AC [var]	5.110e-3	5.778e-3	6.681e-4
I_fund_P_SYM+_rc@POWER-AC [A]	-0.015541	-0.015480	6.154e-5
I_fund_P_SYM-_rc@POWER-AC [A]	1.860e-3	1.626e-3	-2.348e-4
I_fund_Q_SYM+_rc@POWER-AC [A]	6.189e-3	5.550e-3	-6.394e-4
I_fund_Q_SYM-_rc@POWER-AC [A]	1.618e-3	1.847e-3	2.296e-4



	A	B	Delta
Time [s]	2.82961	1:32.87365	1:30.04404
I1_tRMS_rc@POWER-AC [A]	0.128340	0.129443	1.103e-3
I2_tRMS_rc@POWER-AC [A]	0.214411	0.216585	2.174e-3
I3_tRMS_rc@POWER-AC [A]	0.115750	0.114147	-1.603e-3
U_fund_SYM+_rc@POWER-AC [V]	801.3990	801.3628	-0.036194
U_fund_SYM-_rc@POWER-AC [V]	1.823958	1.848937	0.024979
AI 1/I1@TRIONet3_1674 [A]	0.149012	0.089407	-0.059605
AI 1/I2@TRIONet3_1674 [A]	0.208616	0.208616	0.000000
AI 1/I3@TRIONet3_1674 [A]	-0.119209	-0.119209	0.000000
AI 1/U1@TRIONet3_1674 [V]	-140.1529	1035.797	1175.950
AI 1/U2@TRIONet3_1674 [V]	-905.5973	-912.2577	-6.660462
AI 1/U3@TRIONet3_1674 [V]	1045.822	-123.7462	-1169.569

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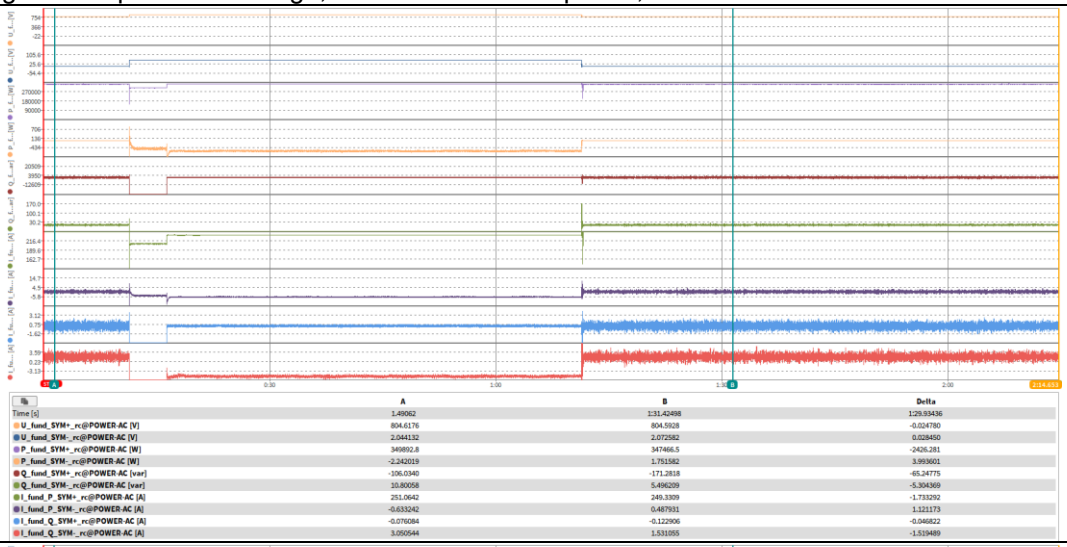
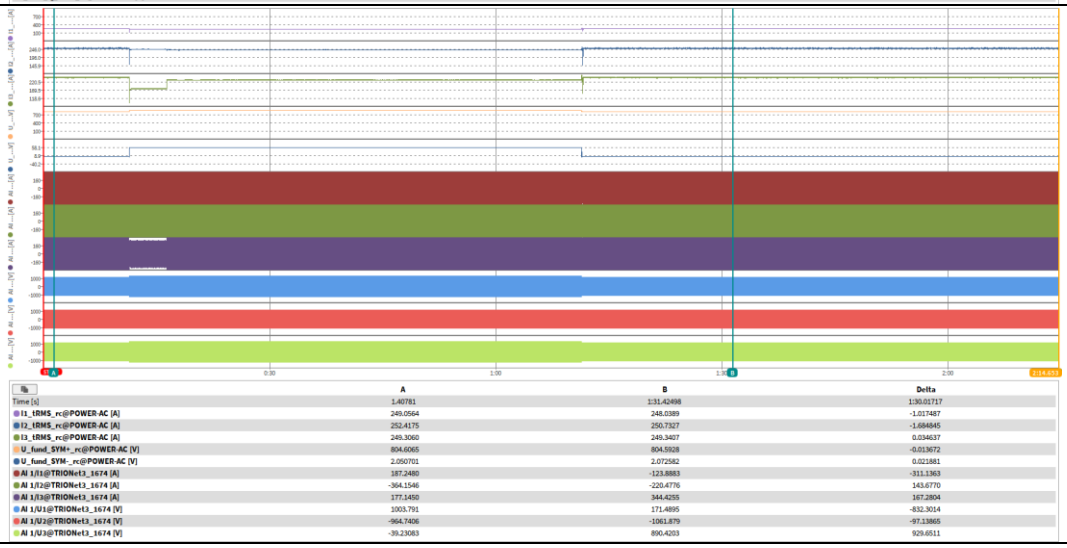
VS4.2-1 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	1.49062	1:31.42498	1:29.93436
U_fund_SYM+_rc@POWER-AC [V]	804.6176	804.5928	-0.024780
U_fund_SYM-_rc@POWER-AC [V]	2.044132	2.072582	0.028450
P_fund_SYM+_rc@POWER-AC [W]	349892.8	347466.5	-2426.281
P_fund_SYM-_rc@POWER-AC [W]	-2.242019	1.751582	3.993601
Q_fund_SYM+_rc@POWER-AC [var]	-106.0340	-171.2818	-65.24775
Q_fund_SYM-_rc@POWER-AC [var]	10.80058	5.496209	-5.304369
I_fund_P_SYM+_rc@POWER-AC [A]	251.0642	249.3309	-1.733292
I_fund_P_SYM-_rc@POWER-AC [A]	-0.633242	0.487931	1.121173
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.076084	-0.122906	-0.046822
I_fund_Q_SYM-_rc@POWER-AC [A]	3.050544	1.531055	-1.519489



	A	B	Delta
Time [s]	1.40781	1:31.42498	1:30.01717
I1_tRMS_rc@POWER-AC [A]	249.0564	248.0389	-1.017487
I2_tRMS_rc@POWER-AC [A]	252.4175	250.7327	-1.684845
I3_tRMS_rc@POWER-AC [A]	249.3060	249.3407	0.034637
U_fund_SYM+_rc@POWER-AC [V]	804.6065	804.5928	-0.013672
U_fund_SYM-_rc@POWER-AC [V]	2.050701	2.072582	0.021881
AI 1/I1@TRIONet3_1674 [A]	187.2480	-123.8883	-311.1363
AI 1/I2@TRIONet3_1674 [A]	-364.1546	-220.4776	143.6770
AI 1/I3@TRIONet3_1674 [A]	177.1450	344.4255	167.2804
AI 1/U1@TRIONet3_1674 [V]	1003.791	171.4895	-832.3014
AI 1/U2@TRIONet3_1674 [V]	-964.7406	-1061.879	-97.13865
AI 1/U3@TRIONet3_1674 [V]	-39.23083	890.4203	929.6511

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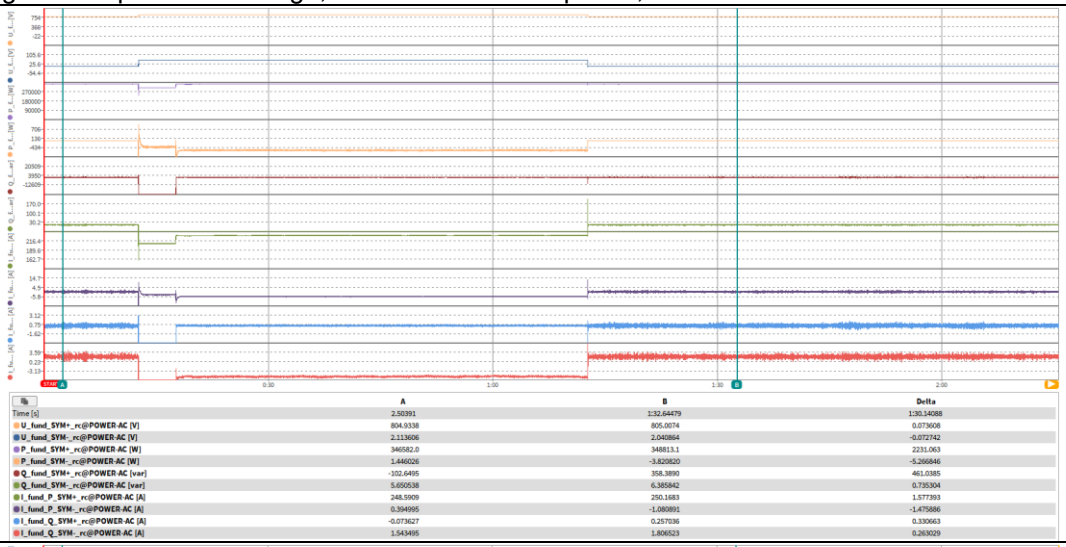
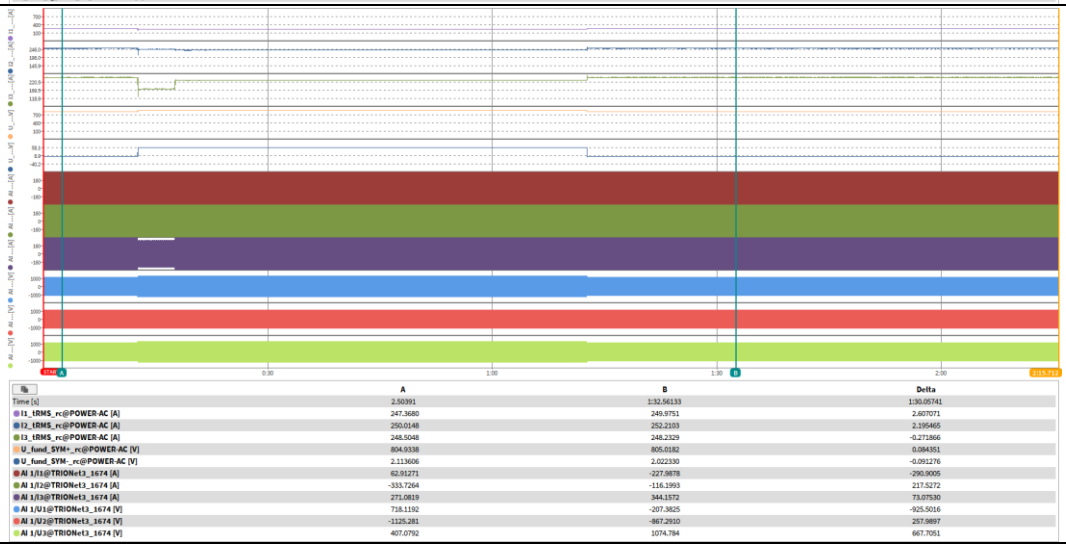
VS4.2-2 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.50391	1:32.64479	1:30.14088
U_fund_SYM+_rc@POWER-AC [V]	804.9338	805.0074	0.073608
U_fund_SYM-_rc@POWER-AC [V]	2.113606	2.040864	-0.072742
P_fund_SYM+_rc@POWER-AC [W]	346582.0	348813.1	2231.063
P_fund_SYM-_rc@POWER-AC [W]	1.446026	-3.820820	-5.266846
Q_fund_SYM+_rc@POWER-AC [var]	-102.6495	358.3890	461.0385
Q_fund_SYM-_rc@POWER-AC [var]	5.650538	6.365842	0.715304
I_fund_P_SYM+_rc@POWER-AC [A]	248.5909	250.1683	1.577393
I_fund_P_SYM-_rc@POWER-AC [A]	0.394995	-1.080891	-1.475886
I_fund_Q_SYM+_rc@POWER-AC [A]	-0.073627	0.257036	0.330663
I_fund_Q_SYM-_rc@POWER-AC [A]	1.543495	1.806523	0.263029



	A	B	Delta
Time [s]	2.50391	1:32.56133	1:30.05741
I1_tRMS_rc@POWER-AC [A]	247.3680	249.9751	2.607071
I2_tRMS_rc@POWER-AC [A]	250.0148	252.2103	2.195465
I3_tRMS_rc@POWER-AC [A]	248.5048	248.2329	-0.271866
U_fund_SYM+_rc@POWER-AC [V]	804.9338	805.0182	0.084351
U_fund_SYM-_rc@POWER-AC [V]	2.113606	2.022330	-0.091276
AI 1/I1@TRIONet3_1674 [A]	62.91271	-227.9878	-290.9005
AI 1/I2@TRIONet3_1674 [A]	-333.7264	-116.1993	217.5272
AI 1/I3@TRIONet3_1674 [A]	271.0819	344.1572	73.07530
AI 1/U1@TRIONet3_1674 [V]	718.1192	-207.3825	-925.5016
AI 1/U2@TRIONet3_1674 [V]	-1125.281	-867.2910	257.9897
AI 1/U3@TRIONet3_1674 [V]	407.0792	1074.784	667.7051

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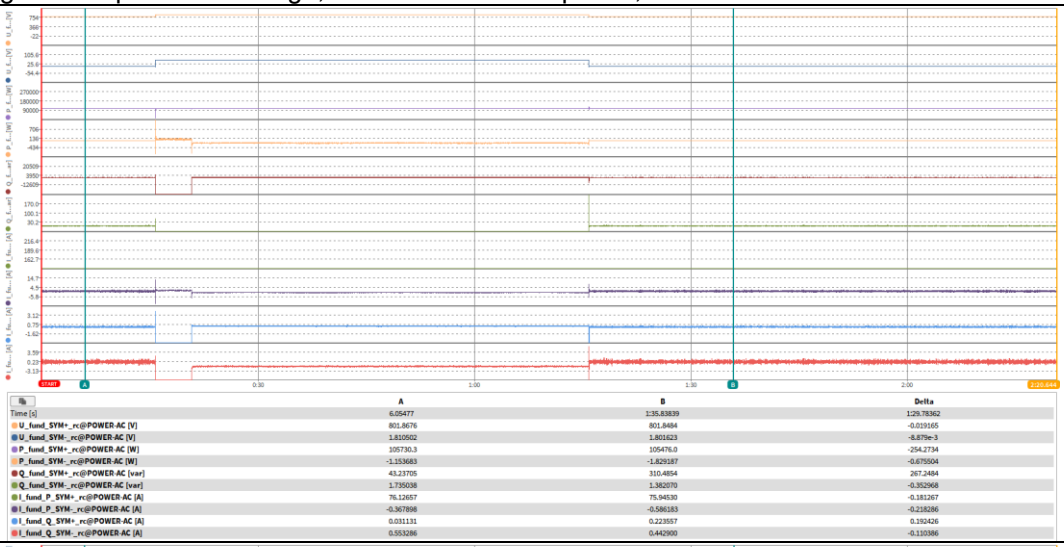
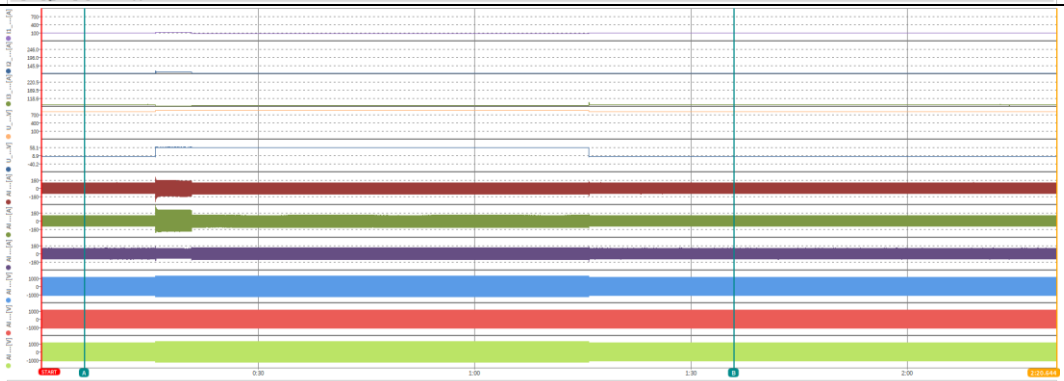
VS4.2-3 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	6.05477	1:35.83839	1:29.78362
U_fund_SYM+_rc@POWER-AC [V]	801.8676	801.8484	-0.019165
U_fund_SYM-_rc@POWER-AC [V]	1.810502	1.801623	-8.879e-3
P_fund_SYM+_rc@POWER-AC [W]	105730.3	105476.0	-254.2734
P_fund_SYM-_rc@POWER-AC [W]	-1.153683	-1.829187	-0.675504
Q_fund_SYM+_rc@POWER-AC [var]	43.23705	310.4854	267.2484
Q_fund_SYM-_rc@POWER-AC [var]	1.735038	1.382070	-0.352968
I_fund_P_SYM+_rc@POWER-AC [A]	76.12657	75.94530	-0.181267
I_fund_P_SYM-_rc@POWER-AC [A]	-0.367898	-0.586183	-0.218286
I_fund_Q_SYM+_rc@POWER-AC [A]	0.031131	0.223557	0.192426
I_fund_Q_SYM-_rc@POWER-AC [A]	0.553286	0.442900	-0.110386



	A	B	Delta
Time [s]	5.96828	1:35.92489	1:29.95661
I1_tRMS_rc@POWER-AC [A]	76.01250	76.27141	0.258904
I2_tRMS_rc@POWER-AC [A]	76.52663	75.31858	-1.208054
I3_tRMS_rc@POWER-AC [A]	75.68286	75.82497	0.142113
U_fund_SYM+_rc@POWER-AC [V]	801.8583	801.8370	-0.021301
U_fund_SYM-_rc@POWER-AC [V]	1.826128	1.827887	1.759e-3
AI 1/I1@TRIONet3_1674 [A]	11.11627	99.27154	88.15527
AI 1/I2@TRIONet3_1674 [A]	88.72152	-7.331372	-96.05289
AI 1/I3@TRIONet3_1674 [A]	-99.68877	-91.67195	8.016825
AI 1/U1@TRIONet3_1674 [V]	-418.7403	663.3702	1082.110
AI 1/U2@TRIONet3_1674 [V]	1123.987	465.7502	-658.2368
AI 1/U3@TRIONet3_1674 [V]	-705.4601	-1129.500	-424.0394

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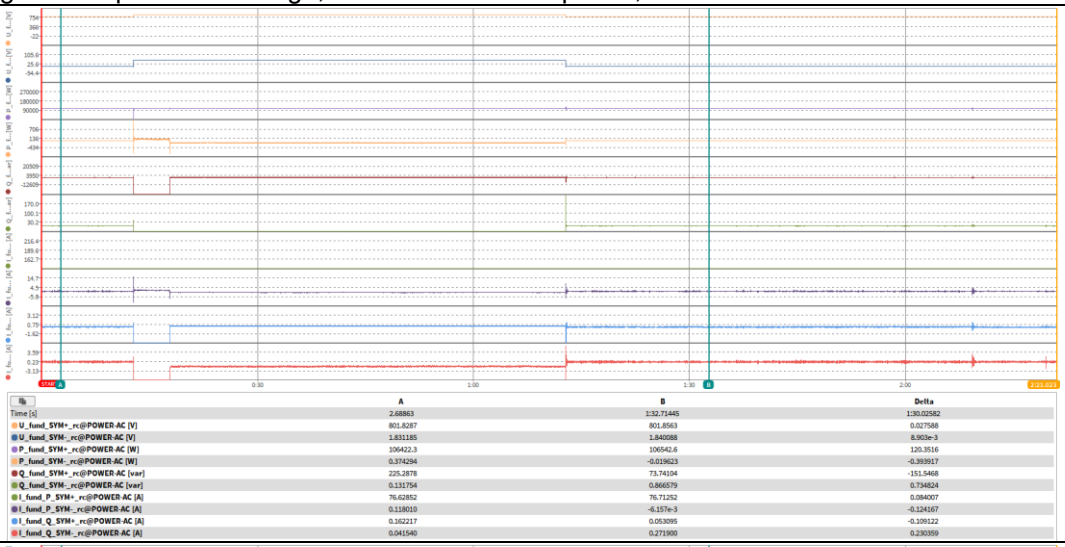
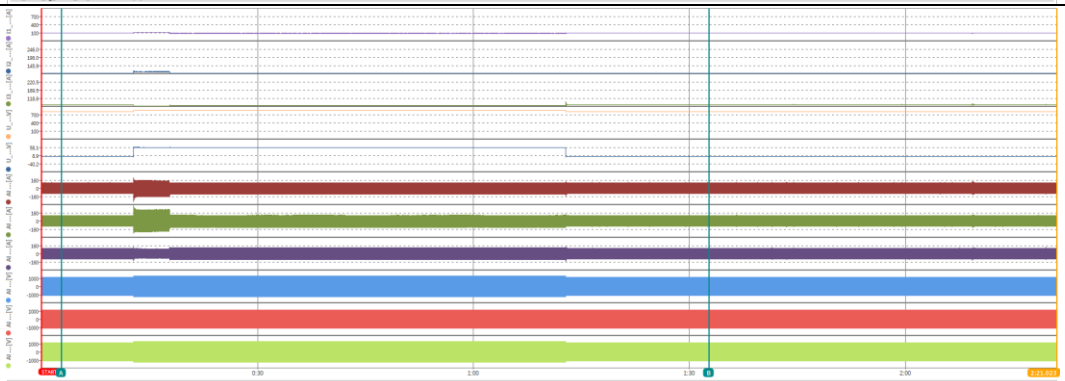
VS4.2-4 (load test)
b) time-series of instantaneous voltage, instantaneous current, RMS current, positive and negative sequence of voltage, active and reactive power, active and reactive current



	A	B	Delta
Time [s]	2.68863	1:32.71445	1:30.02582
U_fund_SYM+_rc@POWER-AC [V]	801.8287	801.8563	0.027588
U_fund_SYM-_rc@POWER-AC [V]	1.831185	1.840088	8.903e-3
P_fund_SYM+_rc@POWER-AC [W]	106422.3	106542.6	120.3516
P_fund_SYM-_rc@POWER-AC [W]	0.374294	-0.019623	-0.393917
Q_fund_SYM+_rc@POWER-AC [var]	225.2878	73.74104	-151.5468
Q_fund_SYM-_rc@POWER-AC [var]	0.131754	0.866579	0.734824
I_fund_P_SYM+_rc@POWER-AC [A]	76.62852	76.71252	0.084007
I_fund_P_SYM-_rc@POWER-AC [A]	0.118010	-6.157e-3	-0.124167
I_fund_Q_SYM+_rc@POWER-AC [A]	0.162217	0.053095	-0.109122
I_fund_Q_SYM-_rc@POWER-AC [A]	0.041540	0.271900	0.230359



	A	B	Delta
Time [s]	2.77536	1:32.71445	1:29.93909
I1_tRMS_rc@POWER-AC [A]	76.90206	76.57140	-0.330658
I2_tRMS_rc@POWER-AC [A]	76.64741	76.98591	0.338501
I3_tRMS_rc@POWER-AC [A]	76.52306	76.63760	0.114548
U_fund_SYM+_rc@POWER-AC [V]	801.8491	801.8563	7.202e-3
U_fund_SYM-_rc@POWER-AC [V]	1.851036	1.840088	-0.010948
AI 1/I1@TRIONet3_1674 [A]	101.4471	91.46333	-9.983779
AI 1/I2@TRIONet3_1674 [A]	-84.16176	-90.24144	-6.079674
AI 1/I3@TRIONet3_1674 [A]	-17.10653	-0.894070	16.21246
AI 1/U1@TRIONet3_1674 [V]	1105.554	1129.526	23.97156
AI 1/U2@TRIONet3_1674 [V]	-347.1244	-571.8215	-224.6971
AI 1/U3@TRIONet3_1674 [V]	-758.8203	-557.9543	200.8660

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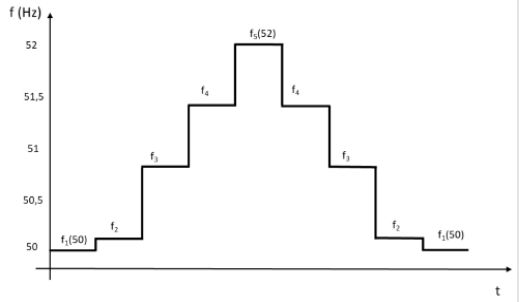
<table>
<tr><td>5.4.3.2</td><td colspan="3">Test for power response to over-frequency</td><td>P</td></tr>
<tr><td>Test at</td><td>Temperature (°C):</td><td>25</td><td>Humidity (%)</td><td>45</td></tr>
<tr><td colspan="2">ROCOF used during the test
Remark: In case of fast acting response relative to the increase/decrease of the frequency this procedure might result in negative response time and settling time. If this occurs, a faster rate of change of frequency up to the maximum ride through capability of the generating unit should be applied or the response time and settling time shall be stated as zero.</td><td colspan="3">2 Hz/s</td></tr>
<tr><td colspan="2">Means for the settings of the function or enabling and disabling of the function</td><td colspan="3">password</td></tr>
<tr><td colspan="2">Function deactivated during the testing</td><td colspan="3">Interface protection</td></tr>
<tr><td colspan="2">Selection of frequency threshold and droop</td><td colspan="3">☒ EN 50549-10:2022 (settings a, b, c in Table 6)
Table 6 — Frequency threshold and droop
<table><tr><th></th><th>Setting (a)</th><th>Setting (b)</th><th>Setting (c)</th></tr><tr><td>frequency threshold f_{th} [Hz]</td><td>50,2</td><td>50,5</td><td>50,2</td></tr><tr><td>droop [%]</td><td>5</td><td>2</td><td>12</td></tr><tr><td>power level at start of test [% P_n]</td><td>100 / 50 [a] / –50 [d]</td><td>60 [b]</td><td>40 [c]</td></tr><tr><td>Intentional delay [s]</td><td>0</td><td>0</td><td>2</td></tr><tr><td>Configured deactivation threshold and time f_{stop} [Hz] / t_{stop} [s]</td><td>n.a.</td><td>50,5 / 1</td><td>50,05 / 600</td></tr></table>☐ specific grid code_____</td></tr>
<tr><td colspan="2">Selection of frequency points</td><td colspan="3"><table><tr><td>Frequency point</td><td>Value [Hz]</td></tr><tr><td>f1</td><td>50</td></tr><tr><td>f2</td><td>50 < fstop < f2 < fth</td></tr><tr><td>f3</td><td>fth < f3 < f4</td></tr><tr><td>f4</td><td>f3 < f4 < fmax</td></tr><tr><td>f5</td><td>fmax</td></tr></table> 
</td></tr>
<tr><td colspan="5">Testing procedure
This procedure applies to generating units different from those disconnecting at randomized frequencies. With the settings (a), (b) and (c) defined in 5.4.3.2.1, or the setting for a specific grid code, the tests are performed according to the following procedure:
1) set the parameters of the EUT as required for the sequence tested;
2) set the input frequency of the EUT to the frequency point f1;
3) connect the EUT according to the instructions provided by the manufacturer;</td></tr>
</table>

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4) adjust the power level such that the power generated from the unit (AC output) is equal to the power level at start of test required for the verification of the sequence tested;
5) perform measurements of active power, dead time, step response time and settling time according to 5.4.3.2.2 on the frequency points f2, f3, f4 and f5, for the verification of the conditions for the reduction of the output power;
6) perform measurements of active power, dead time, step response time and settling time according to 5.4.3.2.2 on the frequency points in reverse order f5, f4, f3, f2and f1, for the verification of the conditions for the restoration of the output power;
During the procedure for setting (a) or the setting for a specific grid code with power level at start of the test in partial load, the down regulation of the generating system (derating or curtailed) or where applicable the limiting of the available power shall be released once frequency point f3 is reached. During the procedure for EES in setting (a) in charging mode a feed-in set point shall be issued to the EUT once frequency point f3 is reached.
During the procedure for setting (a) with power level at start of the test in partial load, of Figure 13, Figure 16 and Figure 19, after the activation of the function, the down regulation is released. Then as a result of decreasing the frequency, once the frequency threshold is achieved (point fth), the generator shall increase gradually the power to the maximum or available active power, following a linear ramp with a slope not exceeding the gradient defined in 4.10.2 of EN 50549-1:2019 and EN 50549-2:2019.

1) Testing for non-synchronous generating technology

Test setting (a) @ start power of 100%Pn

Test conditions		Measurements	Target	Tolerance	Limit
f [Hz]	P_{ACset} [%P_n]	P_{60}/P_n [%]	P/P_n [%]	$\Delta P/P_n$ [%]	$\Delta P/P_n$ [%]
50 (f1)	100	99.61	100	-0.39	±10
50.1 (f2)	100	99.63	100	-0.37	
50.8 (f3)	100	75.5	76	-0.50	
51.4 (f4)	100	51.67	52	-0.33	
52.0 (f5)	100	27.9	28	-0.10	
51.4 (f4)	100	51.67	52	-0.33	
50.8 (f3)	100	75.5	76	-0.50	
50.1 (f2)	100	99.62	100	-0.38	
50 (f1)	100	99.61	100	-0.39	

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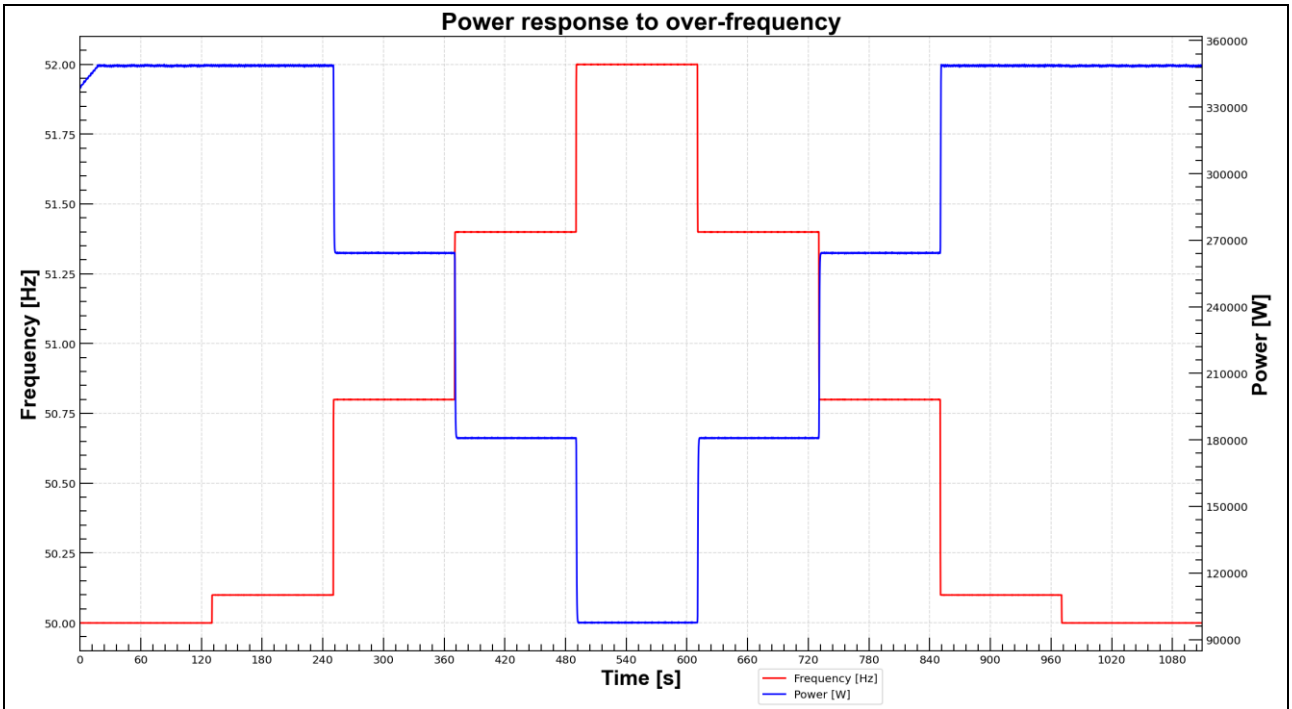

Test conditions		Measurements	Target	Tolerance	Limit
f [Hz]	P_{ACset} [%P_n]	P_{60}/P_n [%]	P/P_n [%]	$\Delta P/P_n$ [%]	$\Delta P/P_n$ [%]
50 (f1)	50	49.77	50	-0.23	±10
50.1 (f2)	50	49.77	50	-0.23	
50.8 (f3)	50 → 100	37.71	38	-0.29	
51.4 (f4)	100	25.85	26	-0.15	
52.0 (f5)	100	14	14	0.00	
51.4 (f4)	100	25.86	26	-0.14	
50.8 (f3)	100	37.7	38	-0.30	
50.1 (f2)	100	99.31	100	-0.69	
50 (f1)	100	98.82	100	-1.18	

f condition step [Hz]	Measured power gradient [%Pn / min]	Power gradient [%Pn / min]

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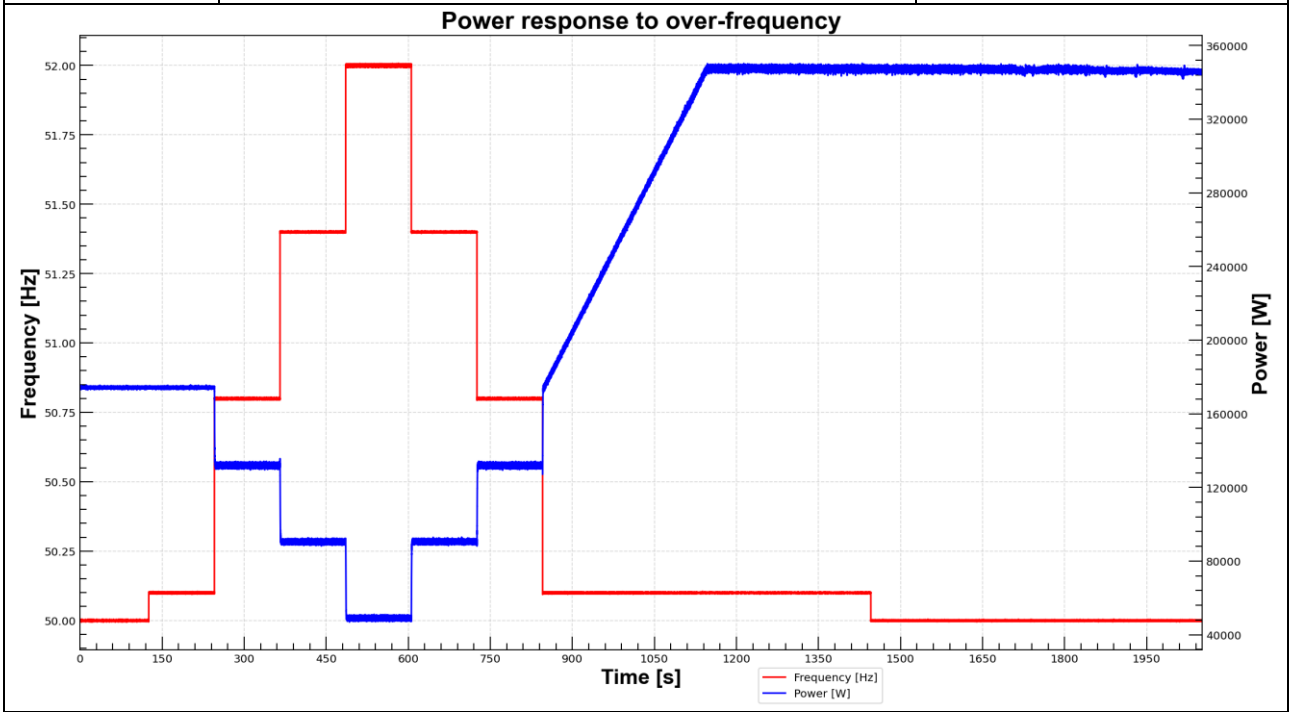
50.8 → 50.1	9.16	10



Test setting (b) @ start power of 60%Pn

Test conditions		Measurements				Target	Tolerance	Limit			
f [Hz]	P_{ACset} [%P_n]	P_{60}/P_n [%]	T_d [s]	T_{sr} [s]	T_s [s]	P/P_n [%]	$\Delta P/P_n$ [%]	$\Delta P/P_n$ [%]	T_d [s]	T_{sr} [s]	T_s [s]
50 (f1)	60	59.59	---	---	---	60	-0.41	±10	2	1	30
50.3 (f2)	60	59.59	---	---	---	60	-0.41				
50.8 (f3)	60	41.82	0.5	0.56	0.56	42	-0.18				
51.4 (f4)	60	6.11	---	0.61	0.61	6	0.11				
52.0 (f5)	60	0.37	---	0.38	0.38	0	0.37				
51.4 (f4)	60	0.37	---	---	---	0	0.37				
50.8 (f3)	60	0.37	---	---	---	0	0.37				
50.3 (f2)	60	59.59	---	---	---	60	-0.41				
50 (f1)	60	59.59	---	---	---	60	-0.41				
f condition step		Measured power gradient [%Pn / min]						Power gradient [%Pn / min]			

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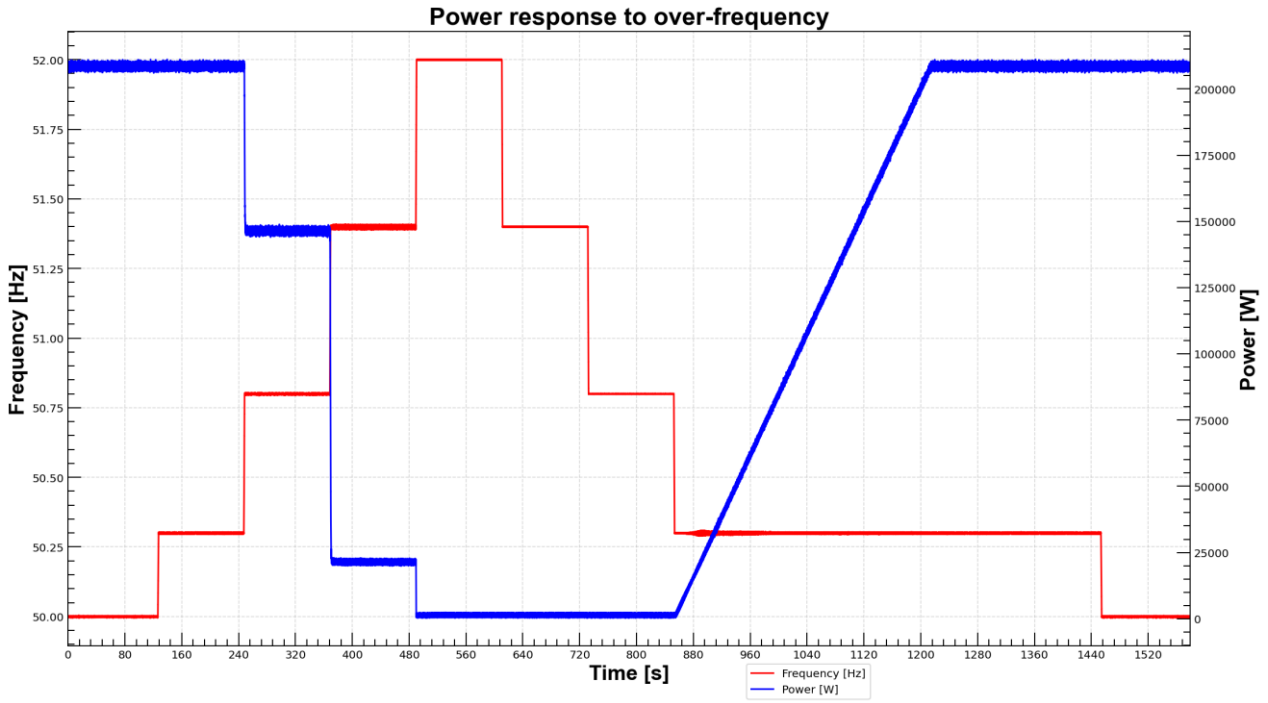
[Hz]		
50.8 → 50.3	9.15	10



Test setting (c) @ start power of 40%Pn

Test conditions		Measurements				Target	Tolerance	Limit			
f [Hz]	P_{ACset} [%P_n]	P_{60}/P_n [%]	T_d [s]	T_{sr} [s]	T_s [s]	P/P_n [%]	$\Delta P/P_n$ [%]	$\Delta P/P_n$ [%]	T_d [s]	T_{sr} [s]	T_s [s]
50 (f1)	40	39.78	---	---	---	40	-0.22	±10	1.75-2.25	1	30
50.1 (f2)	40	39.78	---	---	---	40	-0.22				
50.8 (f3) [a]	40	35.70	1.8	0.4	0.4	36	-0.30				
51.4 (f4)	40	31.75	---	0.4	0.4	32	-0.25				
52.0 (f5)	40	27.80	---	0.4	0.4	28	-0.20				
51.4 (f4)	40	27.81	---	---	---	28	-0.19				
50.8 (f3)	40	27.81	---	---	---	28	-0.19				
50.1 (f2)	40	27.79	---	---	---	28	-0.21				

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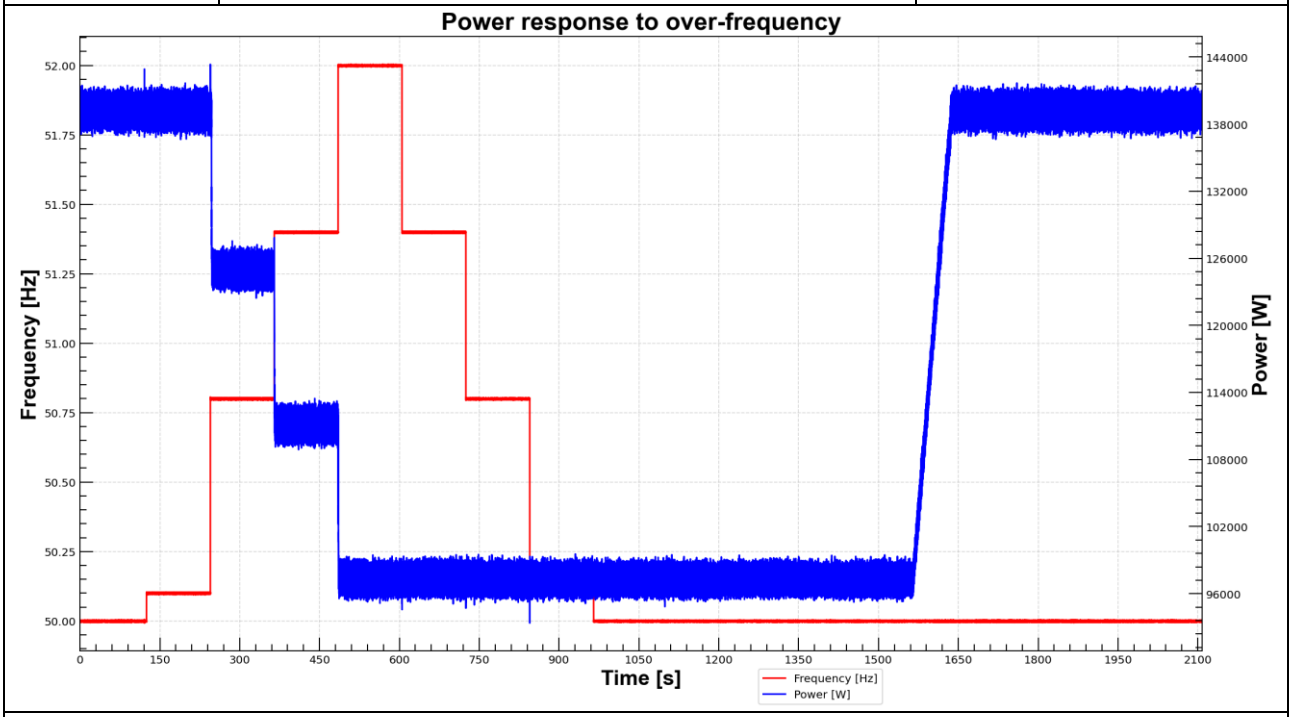
50 (f1)	40	39.78	---	---	---	40	-0.22				
f condition step [Hz]		Measured power gradient [%Pn / min]						Power gradient [%Pn / min]			
50.1 → 50.0		8.15						10			



Remark:

5.5.1	Test for power capabilities assessment - voltage support by reactive power			P
Test at	Temperature (°C):	25	Humidity (%)	45
Capability curve at nominal voltage provided by manufacturer (similar to below)				

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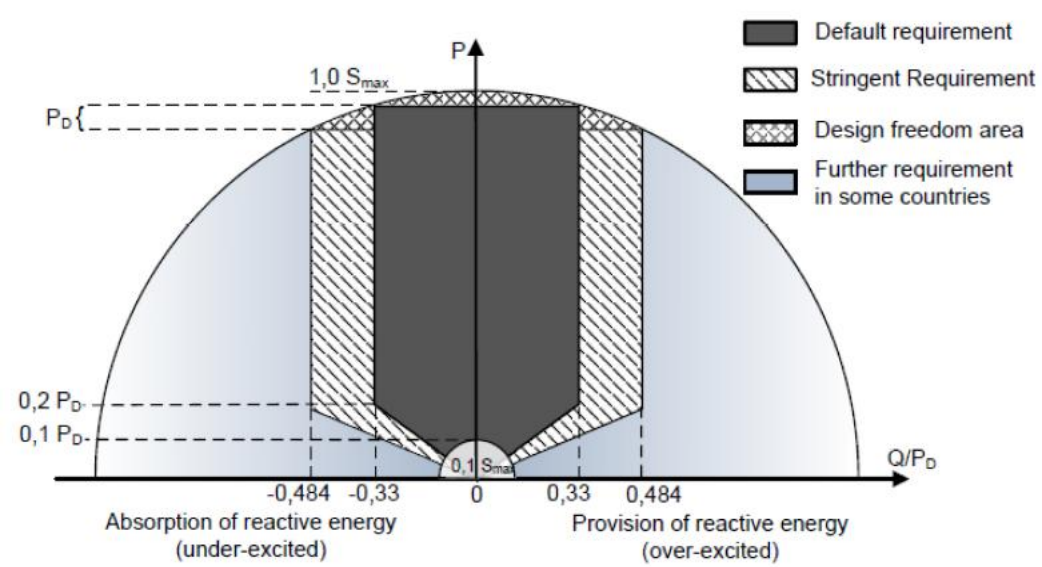

Figure 26 — reactive power capability at nominal voltage

Pmax	350	kW
Smax	350	kVA
Qmax over	210	kVAr
Qmax under	-210	kVAr

Test procedure:

a) Verification procedure to determine the power capability (active. reactive. apparent) at nominal voltage

The verification shall be conducted operating the EUT at nominal voltage and frequency and different active power levels as follows:

The generating unit manufacturer shall provide the capability curve (Figure 26 gives a graphical representation of the minimum and optional capabilities at nominal voltage).

The maximum underexcited and overexcited reactive power shall be measured over a period of 1 min for each 10 % of Pn from 0 % to maximum active power as declared by manufacturer.

The values P_{max}. S_{max} and $Q_{max\ over}$ and $Q_{max\ under}$ shall be measured over a period of 10 min.

If the generating unit has a minimum regulating level. this shall be indicated by the manufacturer and it shall be used as the minimum active power value for the test. The test will start with zero active power or the minimum regulating level and follow with the next level in power multiple of the 10 % P_n.

If the generating unit has a technical restriction to maximum active power due to ambient conditions (e.g. temperature. air pressure. humidity. etc) associated with the test condition. this shall be indicated by the manufacturer and shall be considered the maximum active power level to be used for the test.

The test procedure may either

– conduct all active power levels for one reactive power set point and repeat the process for each reactive power set point $Q_{max\ over}$. $Q_{max\ under}$. Q = 0; or

– conduct all reactive power set points $Q_{max\ over}$. $Q_{max\ under}$. Q = 0 for one active power level and repeat the process for each active power level to be tested.

Once the procedure is completed. the operating points with the highest measured value for active power. reactive power and apparent power respectively shall be adjusted once more and maintained for 10 min for the evaluation of P_{max}. S_{max} and $Q_{max\ over}$ and $Q_{max\ under}$.

Values at set point Q = 0

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Pn [%]	P_{60} [W]	$P_{0.2max}$ [W]	Q_{60} [VAr]	$Q_{0.2max}$ [VAr]	S_{60} [VA]	$S_{0.2max}$ [VA]	cos φ	$\underline{U}_1$ [p.u.]
0	1401	1584	3098	3200	3401	3560	0.397	1.00
10	34603	35502	4373	4678	34879	35775	0.992	1.00
20	69873	70077	4261	4452	70002	70206	0.998	1.00
30	104543	104791	3862	4286	104615	104874	0.999	1.00
40	139189	139438	4150	4421	139251	139501	1.000	1.00
50	173900	174189	4458	4760	173957	174243	1.000	1.00
60	208589	208860	4980	5338	208649	208920	1.000	1.00
70	243338	243664	5486	5826	243400	243726	1.000	1.00
80	278141	278521	5817	6172	278202	278581	1.000	1.00
90	313002	313474	6300	6670	313065	313534	1.000	1.00
100	348552	349053	6935	7347	348621	349126	1.000	1.00
Values at set point Q = Qmax under								
Pn [%]	P_{60} [W]	$P_{0.2max}$ [W]	Q_{60} [VAr]	$Q_{0.2max}$ [VAr]	S_{60} [VA]	$S_{0.2max}$ [VA]	cos φ	$\underline{U}_1$ [p.u.]
0	2278	2576	-209366	-210097	209378	210111	0.011	1.00
10	34915	35641	-209486	-210187	212376	213128	0.164	1.00
20	69608	70366	-209568	-210224	220827	221568	0.315	1.00
30	104335	105110	-209755	-210456	234272	235096	0.445	1.00
40	139228	140000	-210517	-211090	252393	253190	0.552	1.00
50	174159	174960	-210937	-211548	273544	274351	0.637	1.00
60	208965	209808	-210946	-211731	296925	297705	0.704	1.00
70	243805	244675	-210889	-211770	322359	323156	0.756	1.00
80	275898	276765	-211327	-212277	347533	348242	0.794	1.00
90	313969	314830	-149558	-150913	347772	348359	0.903	1.00
100	347679	348048	-353	-1397	347694	348061	1.000	1.00
Values at set point Q = Qmax over								
Pn [%]	P_{60} [W]	$P_{0.2max}$ [W]	Q_{60} [VAr]	$Q_{0.2max}$ [VAr]	S_{60} [VA]	$S_{0.2max}$ [VA]	cos φ	$\underline{U}_1$ [p.u.]
0	2053	2913	211189	212683	211199	212693	0.010	1.00
10	35144	36052	211143	212626	214048	215551	0.164	1.00

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20	69836	70653	210801	212363	222068	223545	0.315	1.00
30	104350	105137	210231	211360	234704	235753	0.445	1.00
40	139115	139822	210465	211638	252287	253263	0.552	1.00
50	173829	174509	212470	213517	274518	275463	0.633	1.00
60	208608	209328	213216	214569	298292	299398	0.699	1.00
70	243482	244279	214187	216018	324284	325541	0.751	1.00
80	278835	279827	216520	218428	353030	354361	0.790	1.00
90	314451	315462	154368	155745	350278	351118	0.898	1.00
100	347696	348026	-361	-1387	347711	348041	1.000	1.00

Measured results
(operating points with the highest measured value once more for 10 min)

Pn [%]	P_{600} [W]	Q_{600} [VAr]	S_{600} [VA]	cos φ	U_1 [p.u.]
Q = Qmax under (Qmin 80%Pn)	275645	-210933	347103	0.794	1.00
Q = Qmax over (Qmax 80%Pn)	279062	212058	350466	0.796	1.00
Pmax (Q=0 100%Pn)	347762	-309	347777	1.000	1.00
Smax (Q=0 100%Pn)	347432	-372	347447	1.000	1.00

Remark:

Test procedure:

b) Verification procedure for reactive power capability considering voltage range

The voltage dependency of PQ-characteristic shall be evaluated according to the following procedures:

Non-synchronous generating units:

– The manufacturer shall provide a characteristic or model of the voltage dependency of the reactive power capability represented in a P-Q diagram at different voltage values (e.g. 110 % Un. 100 %U_n and 90 % Un); the voltage dependency can be also represented in the form of a U-Q/P diagram.

For the verification the following applies:

– two tests shall be conducted at the maximum power as verified according to 5.5.1.3. and for each $Q_{max\ over}$ and $Q_{max\ under}$. In case of generating units operating in a Q-priority mode. the test shall be conducted with an active factor not below 0.9.

– The tests shall be conducted for under voltage and over voltage. The voltage level shall be chosen to show the declared characteristic. If the declared characteristic does not show a voltage dependency. the voltage deviation shall be at least 5 % of nominal voltage.

– In case of field measurements. the voltage variation recorded during the test shall be evaluated to validate the characteristic.

Synchronous generating units:

– the P-Q diagram at different voltage levels (e.g. 110 % U_n. 100 % U_n and 90 % U_n) and U-Q characteristic shall be provided by the generator manufacturer based on calculation from the data collected during the generator factory tests carried out according to the EN IEC 60034 series. After validation of the characteristic or model. the characteristic or model is used to evaluate the voltage dependency of PQ characteristic.

– If relevant the P-Q diagram shall be provided for different ambient conditions.

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– If applicable the UEL and OEL settings shall be documented					
Values at set point Q = Qmax under					
Pn [%]	P_{60} [W]	Q_{60} [VAr]	S_{60} [VA]	cos φ	$\underline{U}_1$ [p.u.]
0	2237	-209007	209019	0.011	1.10
10	34994	-209069	211978	0.165	1.10
20	69695	-209166	220472	0.316	1.10
30	104427	-209354	233954	0.446	1.10
40	139365	-210154	252165	0.553	1.10
50	174284	-210664	273413	0.637	1.10
60	209115	-210689	296849	0.704	1.10
70	243962	-210530	322243	0.757	1.10
80	278896	-210688	349532	0.798	1.10
90	313592	-152614	348753	0.899	1.10
100	345388	-217	345403	1.000	1.10
Values at set point Q = Qmax over					
Pn [%]	P_{60} [W]	Q_{60} [VAr]	S_{60} [VA]	cos φ	$\underline{U}_1$ [p.u.]
0	2033	212684	212694	0.010	1.10
10	35182	212564	215456	0.164	1.10
20	69884	211954	223178	0.313	1.10
30	104321	211139	235505	0.443	1.10
40	138981	211562	253129	0.549	1.10
50	173854	213483	275319	0.632	1.10
60	208800	213524	298648	0.699	1.10
70	243609	214802	324786	0.750	1.10
80	278560	217102	353171	0.789	1.10
90	313829	154198	349627	0.897	1.10
100	347615	188	347628	1.000	1.10
Values at set point Q = Qmax under					

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Pn [%]	P_{60} [W]	Q_{60} [VAr]	S_{60} [VA]	cos φ	U_1 [p.u.]
0	2366	-210046	210060	0.011	0.90
10	34787	-210103	212964	0.163	0.90
20	69556	-210192	221402	0.314	0.90
30	104406	-210360	234845	0.445	0.90
40	139354	-211146	252987	0.551	0.90
50	174254	-211926	274367	0.635	0.90
60	209132	-212193	297930	0.702	0.90
70	231024	-212473	313875	0.736	0.90
80	228426	-212466	311970	0.732	0.90
90	313516	-7108	313653	1.000	0.90
100	313884	-3393	313917	1.000	0.90
Due to the limitation of the maximum current, the active power cannot reach Smax.					
Values at set point Q = Qmax over					
Pn [%]	P_{60} [W]	Q_{60} [VAr]	S_{60} [VA]	cos φ	U_1 [p.u.]
0	2051	210676	210686	0.010	0.90
10	35030	210517	213412	0.164	0.90
20	69762	210373	221639	0.315	0.90
30	104519	209402	234038	0.447	0.90
40	138829	210443	252111	0.551	0.90
50	173230	212310	274015	0.632	0.90
60	208219	212165	297270	0.700	0.90
70	238673	212263	319407	0.747	0.90
80	238655	212291	319412	0.747	0.90
90	313639	13313	313994	0.999	0.90
100	313547	3432	313580	1.000	0.90
Due to the limitation of the maximum current, the active power cannot reach Smax.					
U-Q/P diagram at different voltage levels					

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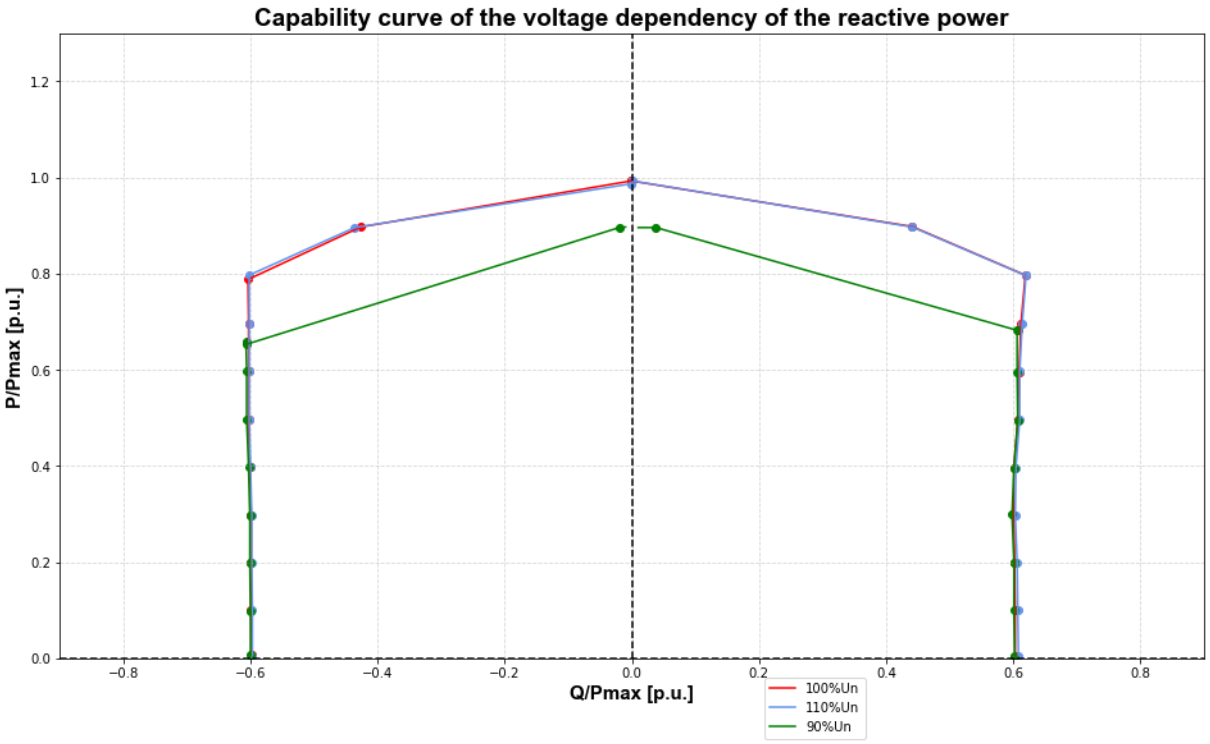

☒ **[EN 50549-2] Reactive power capability at active power P_{max} in the voltage range**

Test conditions		Measurements					
$\underline{U}_1/U_n$	Cos φ	P_{60}/P_n [%]	Q_{60}/P_n [%]	S_{60}/P_n [%]	I_1/I_{max} [%]	$\underline{U}_1/U_n$ [%]	cos φ
90%	0.8 (max. under-excited)	0.713	-0.543	0.896	0.996	0.900	0.796
95%		0.752	-0.571	0.944	0.994	0.950	0.797
100%		0.792	-0.600	0.993	0.993	1.000	0.797
105%		0.797	-0.603	0.999	0.952	1.049	0.798
110%		0.796	-0.602	0.998	0.908	1.099	0.798
90%	0.8 (max. over-excited)	0.726	0.554	0.913	1.013	0.901	0.795
95%		0.766	0.592	0.968	1.017	0.951	0.791
100%		0.797	0.618	1.009	1.008	1.001	0.791
105%		0.796	0.619	1.008	0.960	1.050	0.790
110%		0.796	0.619	1.009	0.917	1.100	0.789

U-Q diagram at P_{max}

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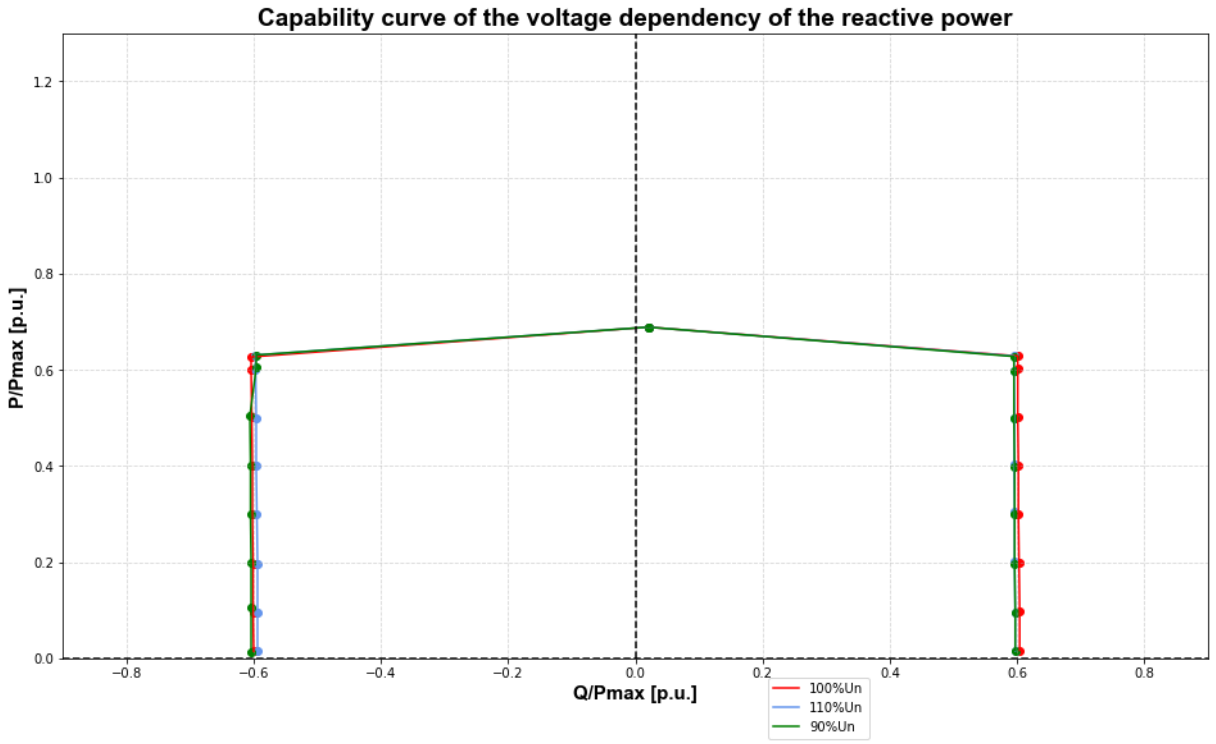

Test at	Temperature (°C):	60	Humidity (%)	45

Capability curve at nominal voltage
(similar to below)

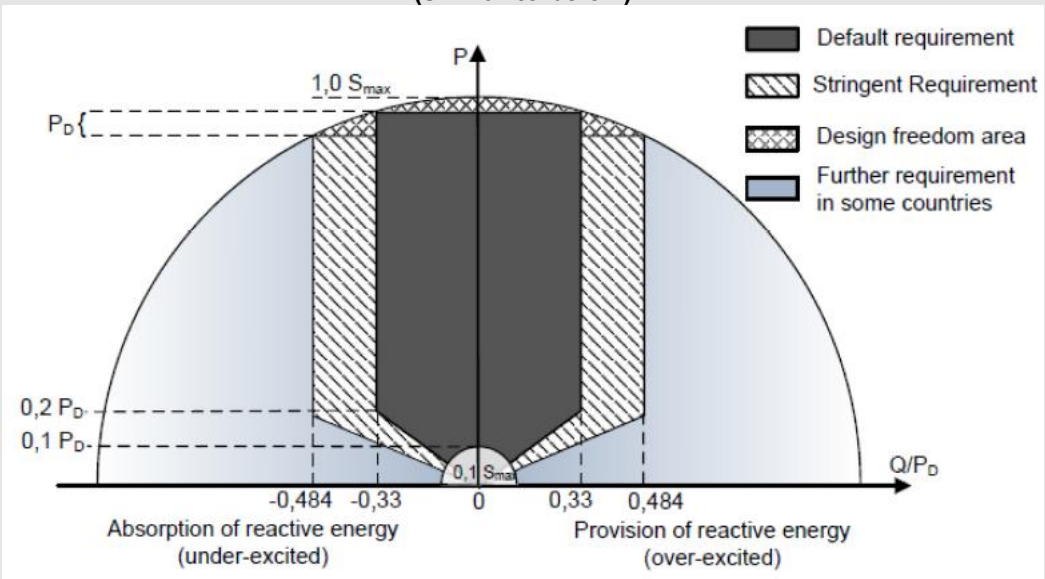

Figure 26 — reactive power capability at nominal voltage

Pmax	245	kW
Smax	304	kVA

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Qmax over	210	kVAr
Qmax under	-210	kVAr

Values at set point Q = 0								
Pn [%]	P_{60} [W]	$P_{0.2max}$ [W]	Q_{60} [VAr]	$Q_{0.2max}$ [VAr]	S_{60} [VA]	$S_{0.2max}$ [VA]	cos φ	$\underline{U}_1$ [p.u.]
0	8615	8949	-5045	-5171	10029	10361	0.859	1.00
10	35597	36518	5237	5437	35996	36914	0.989	1.00
20	71813	72194	5394	5726	72025	72387	0.997	1.00
30	104360	104700	5531	5982	104514	104836	0.999	1.00
40	139605	139897	5815	6379	139733	140025	0.999	1.00
50	174686	175000	6122	6738	174801	175094	0.999	1.00
60	209734	210062	6460	7215	209841	210147	0.999	1.00
max	241153	241527	6833	7684	241259	241604	1.000	1.00
80	--	--	--	--	--	--	--	--
90	--	--	--	--	--	--	--	--
100	--	--	--	--	--	--	--	--

Values at set point Q = Qmax under								
Pn [%]	P_{60} [W]	$P_{0.2max}$ [W]	Q_{60} [VAr]	$Q_{0.2max}$ [VAr]	S_{60} [VA]	$S_{0.2max}$ [VA]	cos φ	$\underline{U}_1$ [p.u.]
0	5196	5456	-210136	-210235	210201	210298	0.025	1.00
10	33668	34047	-210279	-210509	212958	213199	0.158	1.00
20	69178	69487	-210466	-210921	221544	221990	0.312	1.00
30	104652	105103	-210659	-211277	235223	235793	0.445	1.00
40	140007	140292	-210865	-211678	253114	253833	0.553	1.00
50	175184	175522	-211091	-212034	274316	275135	0.639	1.00
60	210373	210721	-211288	-212446	298161	298988	0.706	1.00
max	219475	219774	-211350	-212586	304695	305639	0.720	1.00
80	--	--	--	--	--	--	--	--
90	--	--	--	--	--	--	--	--
100	--	--	--	--	--	--	--	--

Values at set point Q = Qmax over

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Pn [%]	P_{60} [W]	$P_{0.2max}$ [W]	Q_{60} [VAr]	$Q_{0.2max}$ [VAr]	S_{60} [VA]	$S_{0.2max}$ [VA]	cos φ	$\underline{U}_1$ [p.u.]
0	5799	6037	211531	211605	211611	211691	0.027	1.00
10	34537	34767	211341	211549	214145	214351	0.161	1.00
20	69992	70346	211112	211516	222413	222835	0.315	1.00
30	105393	105647	210874	211499	235745	236324	0.447	1.00
40	140871	141125	210673	211466	253432	254231	0.556	1.00
50	176020	176392	210503	211451	274399	275262	0.641	1.00
60	211119	211340	210341	211481	298019	298921	0.708	1.00
max	220231	220399	210316	211532	304524	305428	0.723	1.00
80	--	--	--	--	--	--	--	--
90	--	--	--	--	--	--	--	--
100	--	--	--	--	--	--	--	--

Measured results
(operating points with the highest measured value once more for 10 min)

Pn [%]	P_{600} [W]	Q_{600} [VAr]	S_{600} [VA]	cos φ	$\underline{U}_1$ [p.u.]
Qmax under (Qmin max%Pn)	220676	-210772	305161	0.723	1.00
Qmax over (Qmax 0%Pn)	5758	211920	212000	0.027	1.00
Pmax (Q=0 max%Pn)	241509	5384	241571	1.000	1.00
Smax (Qmin max%Pn)	219479	-211354	304701	0.720	1.00

Remark:

Values at set point Q = Qmax under

Pn [%]	P_{60} [W]	Q_{60} [VAr]	S_{60} [VA]	cos φ	$\underline{U}_1$ [p.u.]
0	5141	-207736	207800	0.025	1.10
10	33719	-207886	210603	0.160	1.10
20	69094	-208070	219242	0.315	1.10
30	104626	-208278	233080	0.449	1.10
40	139884	-208483	251063	0.557	1.10
50	175156	-208719	272477	0.643	1.10
60	210294	-208936	296443	0.709	1.10

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max	220822	-209003	304048	0.726	1.10
80	--	--	--	--	--
90	--	--	--	--	--
100	--	--	--	--	--
Values at set point Q = Qmax over					
Pn [%]	P_{60} [W]	Q_{60} [VAr]	S_{60} [VA]	cos φ	$\underline{U}_1$ [p.u.]
0	5453	209120	209192	0.026	1.10
10	34073	208945	211705	0.161	1.10
20	70787	208696	220375	0.321	1.10
30	106742	208455	234196	0.456	1.10
40	141609	208245	251833	0.562	1.10
50	174801	208426	272025	0.643	1.10
60	209613	208316	295523	0.709	1.10
max	220079	208266	303002	0.726	1.10
80	--	--	--	--	--
90	--	--	--	--	--
100	--	--	--	--	--
Values at set point Q = Qmax under					
Pn [%]	P_{60} [W]	Q_{60} [VAr]	S_{60} [VA]	cos φ	$\underline{U}_1$ [p.u.]
0	4675	-211251	211303	0.022	0.90
10	36735	-211369	214538	0.171	0.90
20	69617	-211499	222662	0.313	0.90
30	105232	-211647	236365	0.445	0.90
40	140857	-211805	254366	0.554	0.90
50	176283	-211969	275694	0.639	0.90
60	211739	-208532	297186	0.712	0.90
max	220897	-208574	303808	0.727	0.90
80	--	--	--	--	--
90	--	--	--	--	--

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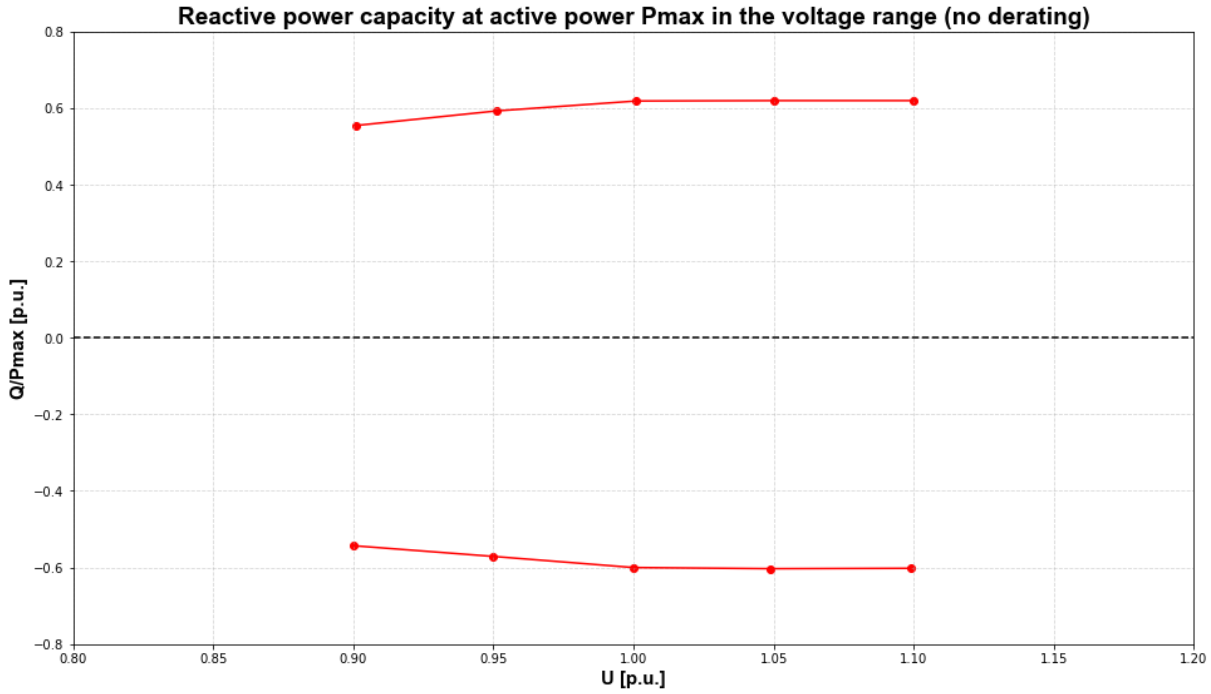
100	--	--	--	--	--
Values at set point Q = Qmax over					
Pn [%]	P_{60} [W]	Q_{60} [VAr]	S_{60} [VA]	cos φ	$\underline{U}_1$ [p.u.]
0	5843	209057	209139	0.028	0.90
10	34058	208933	211691	0.161	0.90
20	69399	208762	219996	0.315	0.90
30	104621	208588	233356	0.448	0.90
40	139688	208444	250922	0.557	0.90
50	174573	208329	271804	0.642	0.90
60	209494	208230	295378	0.709	0.90
max	219928	208192	302841	0.726	0.90
80	--	--	--	--	--
90	--	--	--	--	--
100	--	--	--	--	--

U-Q/P diagram at different voltage levels



☒ **[EN 50549-2] Reactive power capability at active power P_{max} in the voltage range**

Test conditions	Measurements

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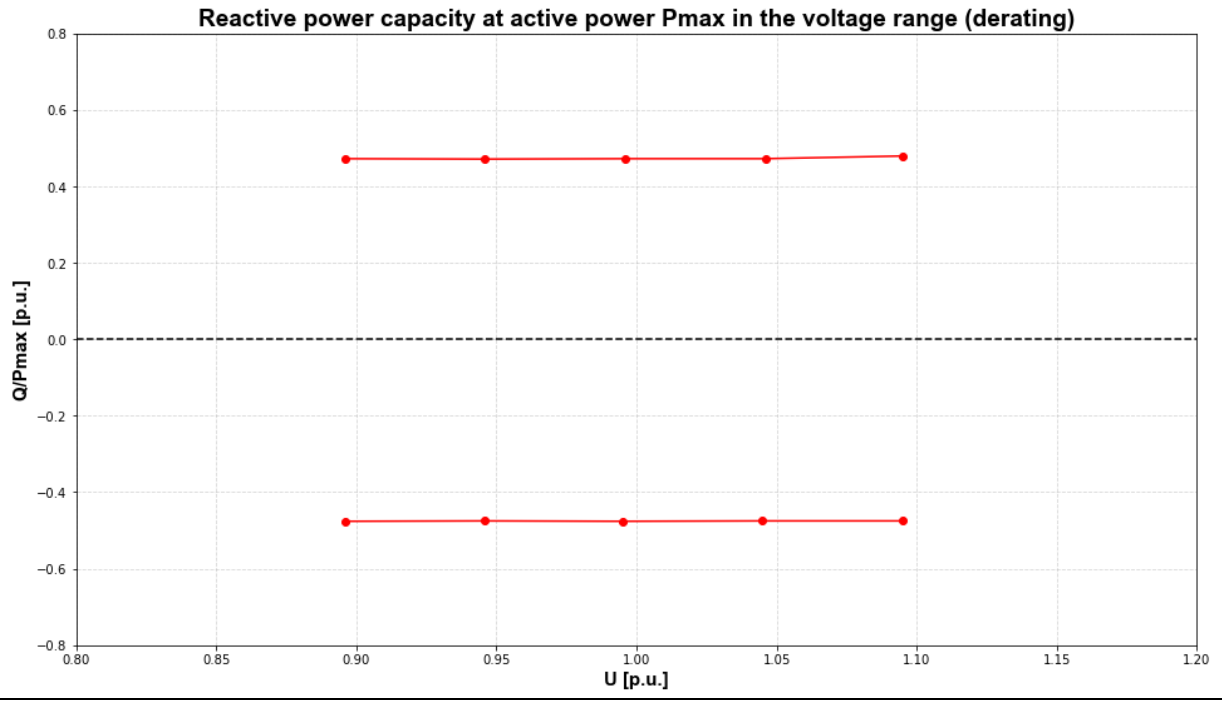
U_1/U_n	Cos φ	P_{60}/P_n [%]	Q_{60}/P_n [%]	S_{60}/P_n [%]	I_1/I_{max} [%]	U_1/U_n [%]	cos φ
90%	≤ 0.8 (max. under-excited)	0.630	-0.476	0.790	0.880	0.896	0.798
95%		0.629	-0.475	0.788	0.832	0.946	0.798
100%		0.631	-0.476	0.791	0.793	0.995	0.798
105%		0.631	-0.475	0.790	0.755	1.045	0.798
110%		0.631	-0.475	0.790	0.720	1.095	0.798
90%	≤ 0.8 (max. over-excited)	0.631	0.472	0.788	0.882	0.896	0.797
95%		0.629	0.471	0.786	0.834	0.946	0.797
100%		0.630	0.472	0.787	0.792	0.996	0.797
105%		0.631	0.472	0.788	0.755	1.046	0.798
110%		0.631	0.479	0.792	0.724	1.095	0.794

U-Q diagram at P_{max}



5.5.2.3	**Test for reactive power for set point control**			**P**
Test at	**Temperature (°C):**	25	**Humidity (%)**	45
Test power (50% ±10 % Pn)			175	kW
Time constant setting range			3-60	s

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Dead time setting	0	s
Qmax over	210	kVAr
Qmax under	-210	kVAr
Active factor / cos φ setting range	-0. 8, …, 1, …, +0.8	
EUT control system specified by the manufacturer for testing	APP	

Test procedure:

a) Reactive power set point control accuracy:

The test shall be performed according to what is stipulated below:

- Active power equal to 50 % ± 10 % P_n.
- If the maximum reactive power operating range according to the measured P-Q diagram (see 5.5.1) can be achieved at different load conditions, the test shall be repeated at that active power conditions.

To determine the set point accuracy, the following steps shall be performed:

1) Operate the EUT at a set point of Q = 0 (or active factor = 1), wait for EUT active and reactive power to stabilize. Record reactive power, active power, active factor and grid voltage.

2) Adjust set point of EUT to Q = 50 % $Q_{max\ over}$ or maximum overexcited reactive power possible at this active power operating point (whatever is the smaller), wait for reactive power to stabilize. Record reactive power, active power, active factor and grid voltage.

3) Adjust set point of EUT to Q = 50 % $Q_{max\ under}$ or maximum underexcited reactive power possible at this active power operating point (whatever is the smaller), wait for reactive power to stabilize. Record reactive power, active power, active factor and grid voltage.

4) Adjust set point of EUT to Q = 0, wait for reactive power to stabilize. Record reactive power, active power, active factor and grid voltage.

b) Reactive power dynamic behaviour

The test shall be performed for an active power level, at which at least 90 % of the maximum reactive power operating range according to the measured P-Q diagram (see 5.5.1) can be achieved.

If the time constant of the Q-control can be adjusted, the tests shall be performed with the shortest possible time constant (not longer than 3 s) and the longest possible time constant. If the time constant is adjustable to values above 60s, it is considered acceptable to test with a time constant of 60s instead of the longest possible setting.

To determine the dynamic response, the following steps shall be performed:

1) Operate the EUT at a set point of Q = 0 (or active factor = 1), wait for EUT active and reactive power to stabilize.

2) Adjust set point of EUT to Q = 80 % $Q_{max\ over}$. Measure dead time, step response time and settling time according 5.5.2.3.1 as well as reactive power, active power, active factor and grid voltage.

3) Adjust set point of EUT to Q = 80 % $Q_{max\ under}$. Measure dead time, step response time and settling time according 5.5.2.3.1 as well as reactive power, active power, active factor and grid voltage.

4) Adjust set point of EUT to Q = 0, Measure dead time, step response time and settling time according 5.5.2.3.1 as well as reactive power, active power, active factor and grid voltage.

Reactive power setpoint control mode

a) set point control accuracy

Reactive power step Q/Pn [p.u.]	Voltage	Set point value		Measured value (1-min average)		Deviation (Measure value – Set point)		Active factor	Q deviation limit
	[p.u.]	kVAr	Q/P_n [p.u.]	kVAr	Q_{60}/P_n [p.u.]	kVAr	Q/P_n [p.u.]	cos φ	Q/P_n [p.u.]

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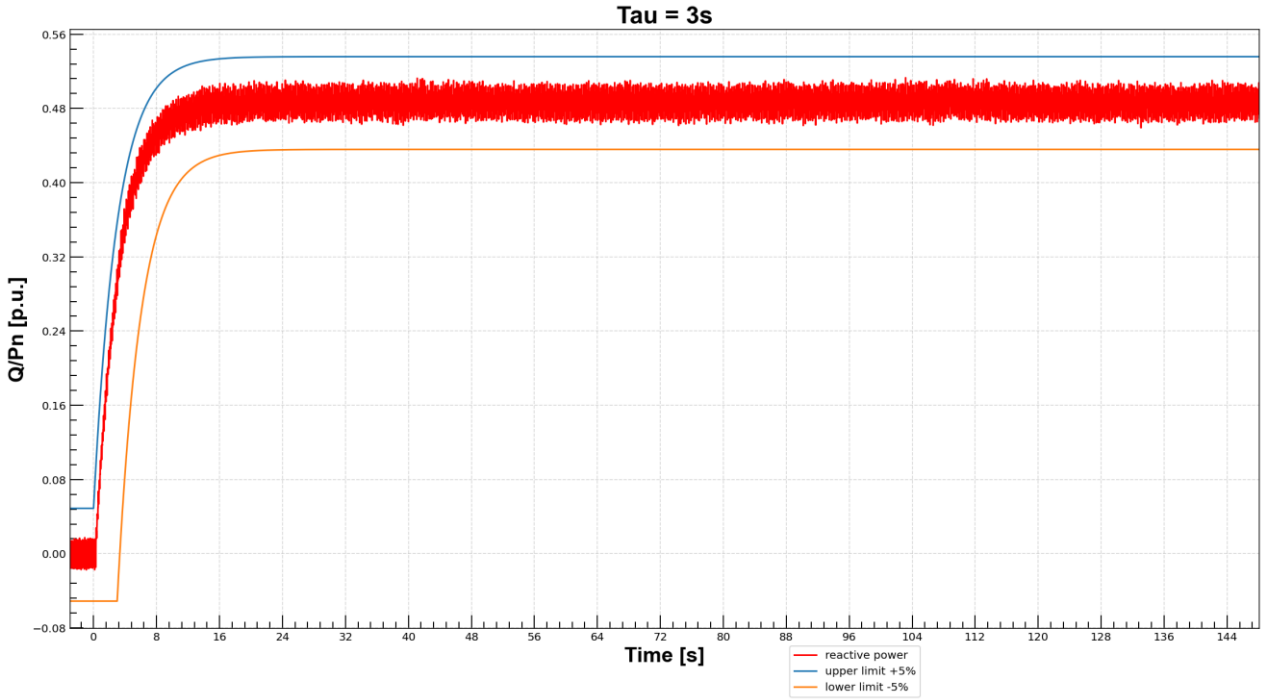
Q=0	1.00	0.00	0.000	-0.32	-0.001	-0.32	-0.001	1.000	0.02
50% Q max (over excited)	1.00	105.00	0.300	106.95	0.306	1.95	0.006	0.855	0.02
50% Q max (under excited)	1.00	-105.00	-0.300	-104.7	-0.299	0.3	0.001	0.858	0.02
Q=0	1.00	0.00	0.000	-0.34	-0.001	-0.34	-0.001	1.000	0.02

b) dynamic behaviour

Reactive power set point step [p.u.]	Generating unit response time setting [s]	Measured response behaviour [s]		
		Dead time	Response time	settling time
Q=0 → Q= Q max over	9	0.1	7.2	7.2
Q= Q max over → Q= Q max under	9	0.2	6.5	6.5
Q= Q max under → Q=0	9	0.1	7.9	7.9



cos φ=1 → cos φ=0.8 over

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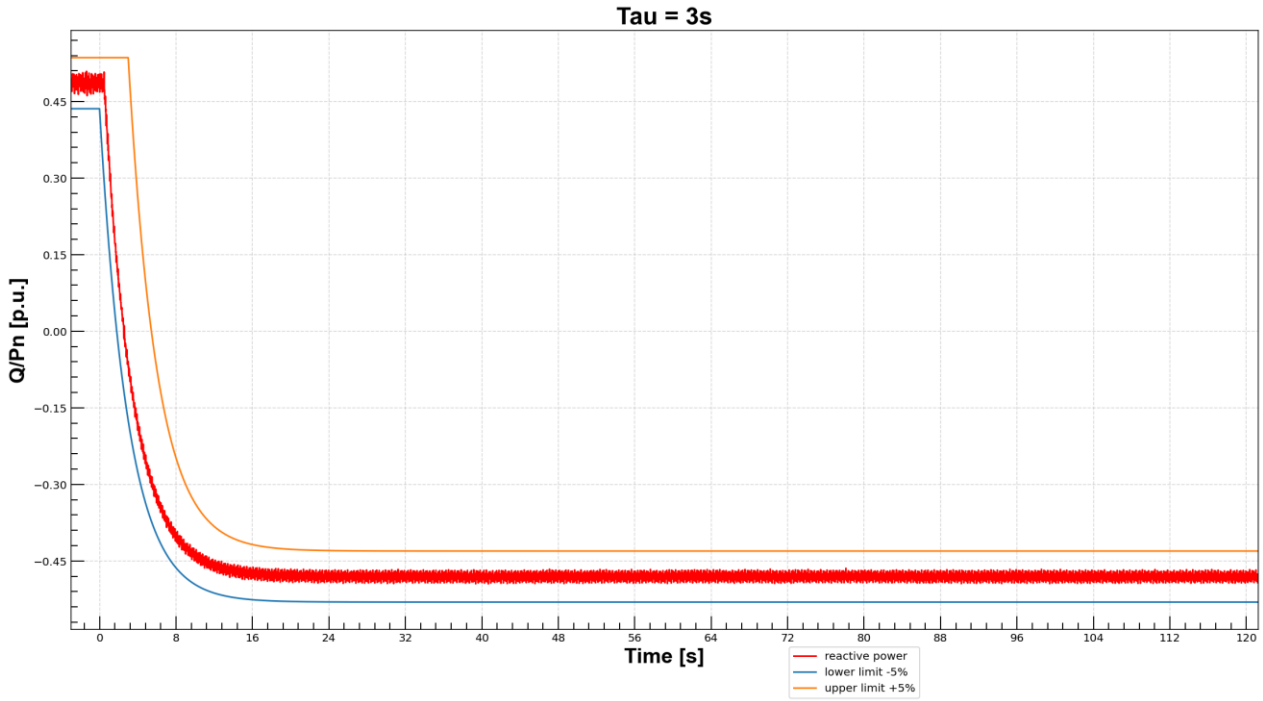
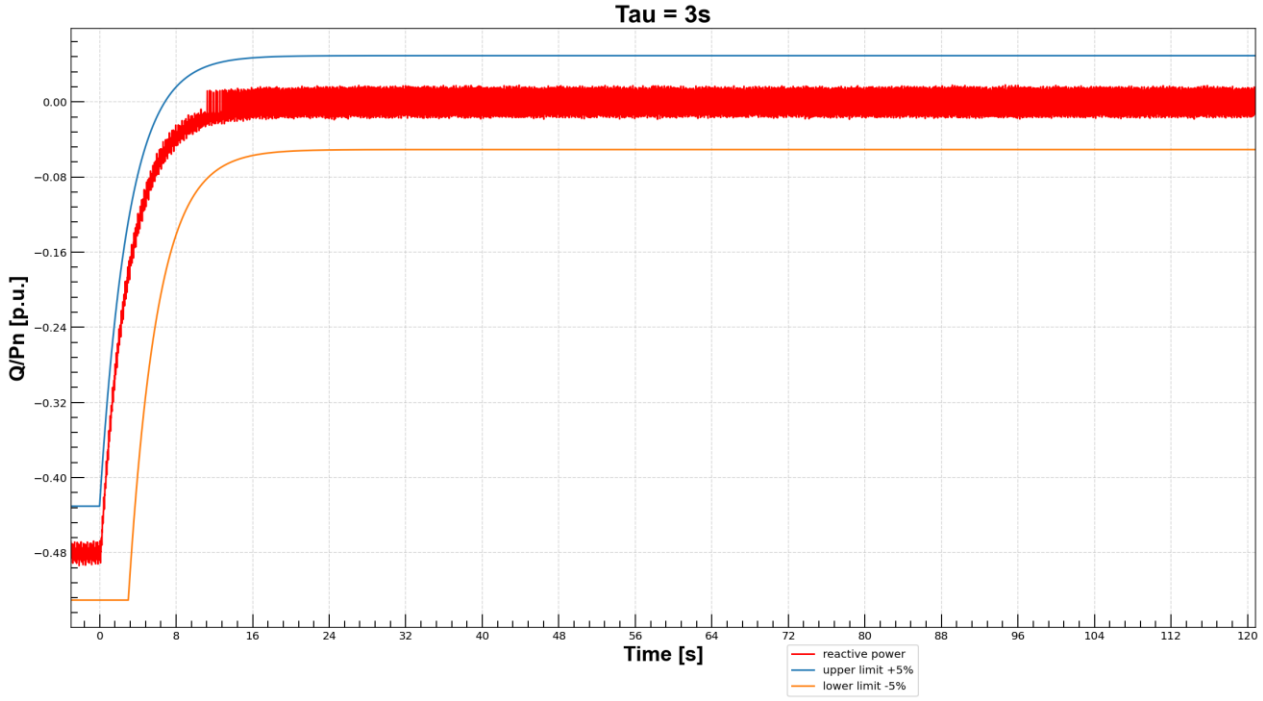


cos φ=0.8 over → cos φ=0.8 under



cos φ=0.8 under → cos φ=1

Remark: Tau= shortest time constant (not longer than 3s) 3s

Reactive power set point step [p.u.]	Generating unit response time setting	Measured response behaviour [s]

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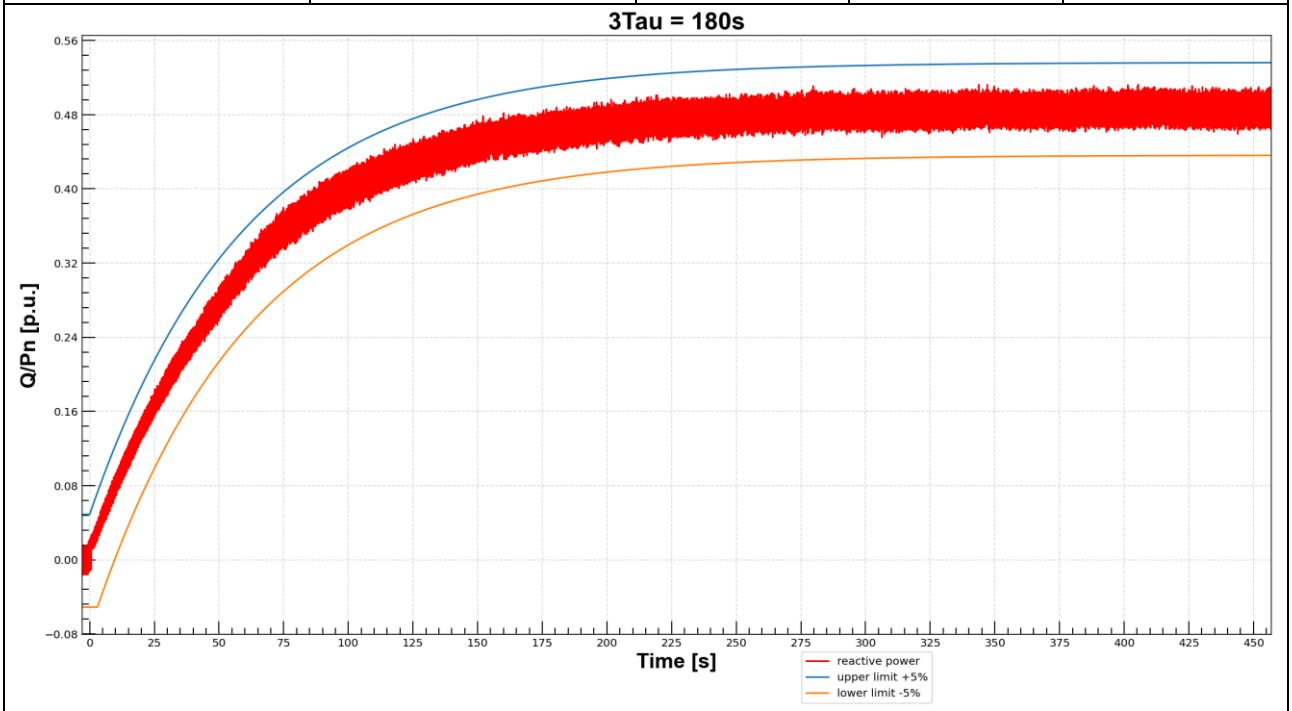
	[s]	Dead time	Response time	settling time
Q=0 → Q= Q max over	180	0.3	125.0	125.0
Q= Q max over → Q= Q max under	180	0.3	148.3	148.3
Q= Q max under → Q=0	180	0.3	133.4	133.4



cos φ=1 → cos φ=0.8 over

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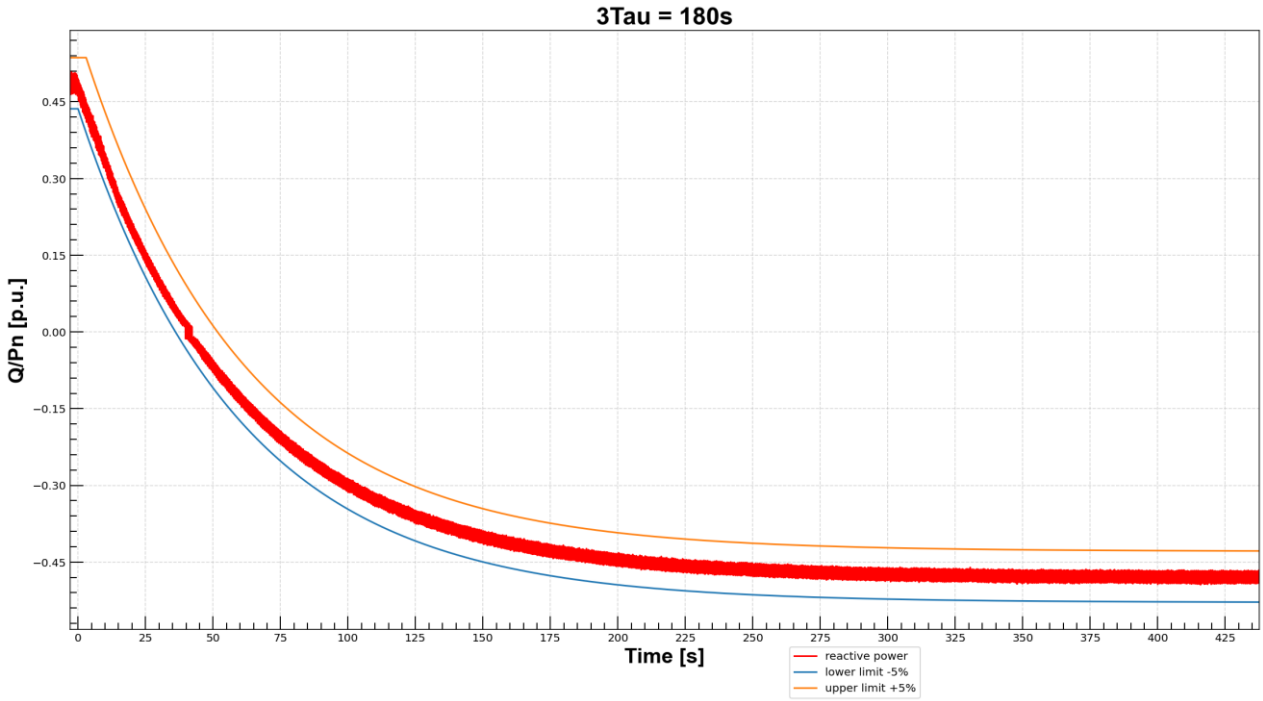
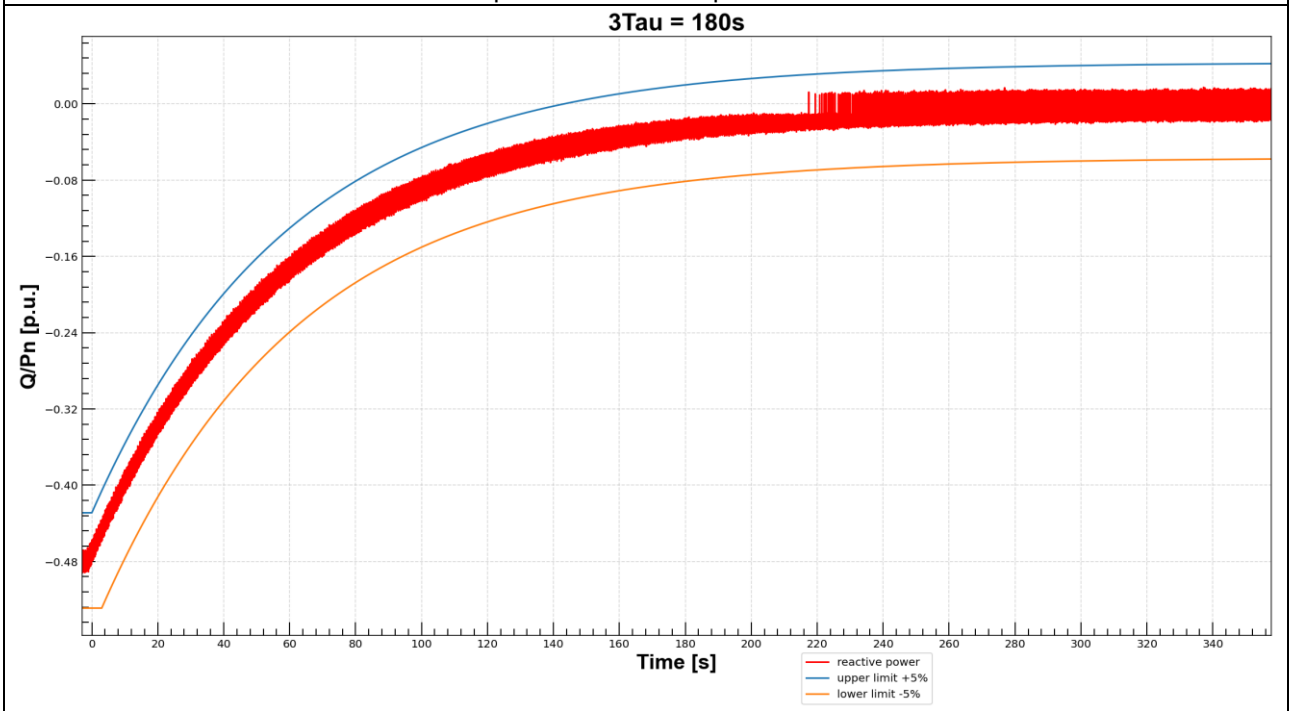


cos φ=0.8 over → cos φ=0.8 under



cos φ=0.8 under → cos φ=1

Remark: Tau= longest time (if longest time>60s, then test 60s) 60s

Active factor/ cos φ setpoint control mode

a) set point control accuracy

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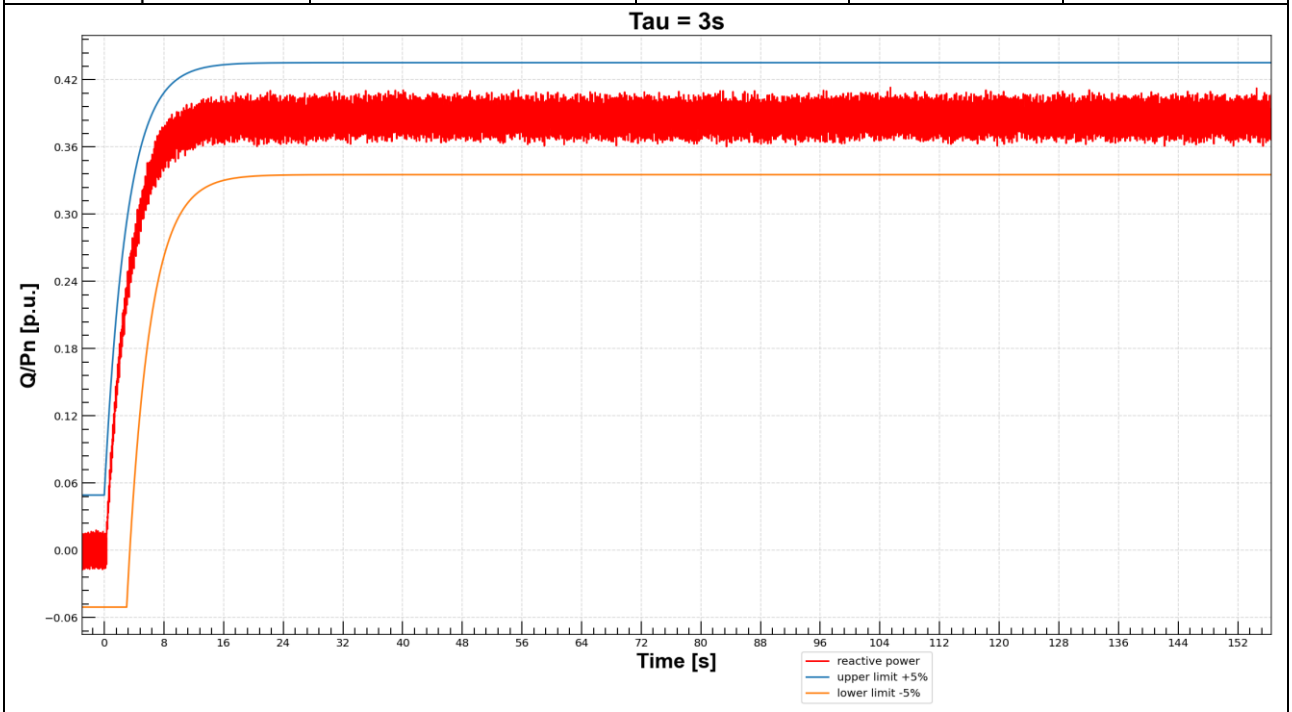
Reactive power step Q/Pn [p.u.]	Voltage	Set point value		Measured value (1-min average)		Deviation (Measure value – Set point)		Active factor	Q_{60} deviation limit
	[p.u.]	kVAr	Q/Pn [p.u.]	kVAr	Q_{60}/P_n [p.u.]	kVAr	Q/P_n [p.u.]	cos φ	Q/P_n [p.u.]
cos φ=1	1.002	0.00	0.000	-0.37	0.000	-0.37	-0.001	1.000	0.02
cos φ=0.8 (over)	1.003	131.25	0.375	135.01	0.390	3.76	0.011	0.795	0.02
cos φ=0.8 (under)	1.001	-131.25	-0.375	-131.27	-0.380	-0.02	0.000	0.799	0.02
cos φ=1	1.002	0.00	0.000	-0.33	0.000	-0.33	-0.001	1.000	0.02

b) dynamic behaviour @ reactive power setpoint

Reactive power set point step [p.u.]	Generating unit response time setting [s]	Measured response behaviour [s]		
		Dead time	Response time	settling time
cos φ=1 → cos φ=0.8 over	9	0.2	6.8	6.8
cos φ=0.8 over → cos φ=0.8 under	9	0.2	8.1	8.1
cos φ=0.8 under → cos φ=1	9	0.2	7.8	7.8



cos φ=1 → cos φ=0.8 over

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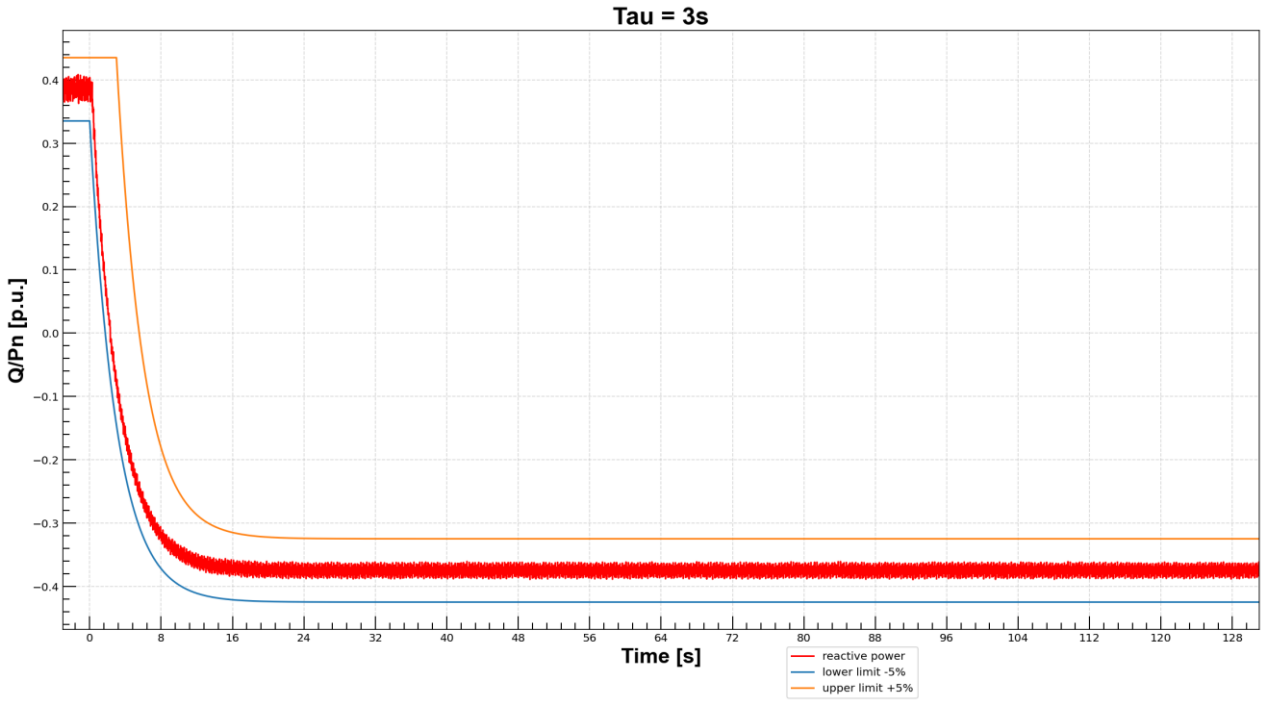
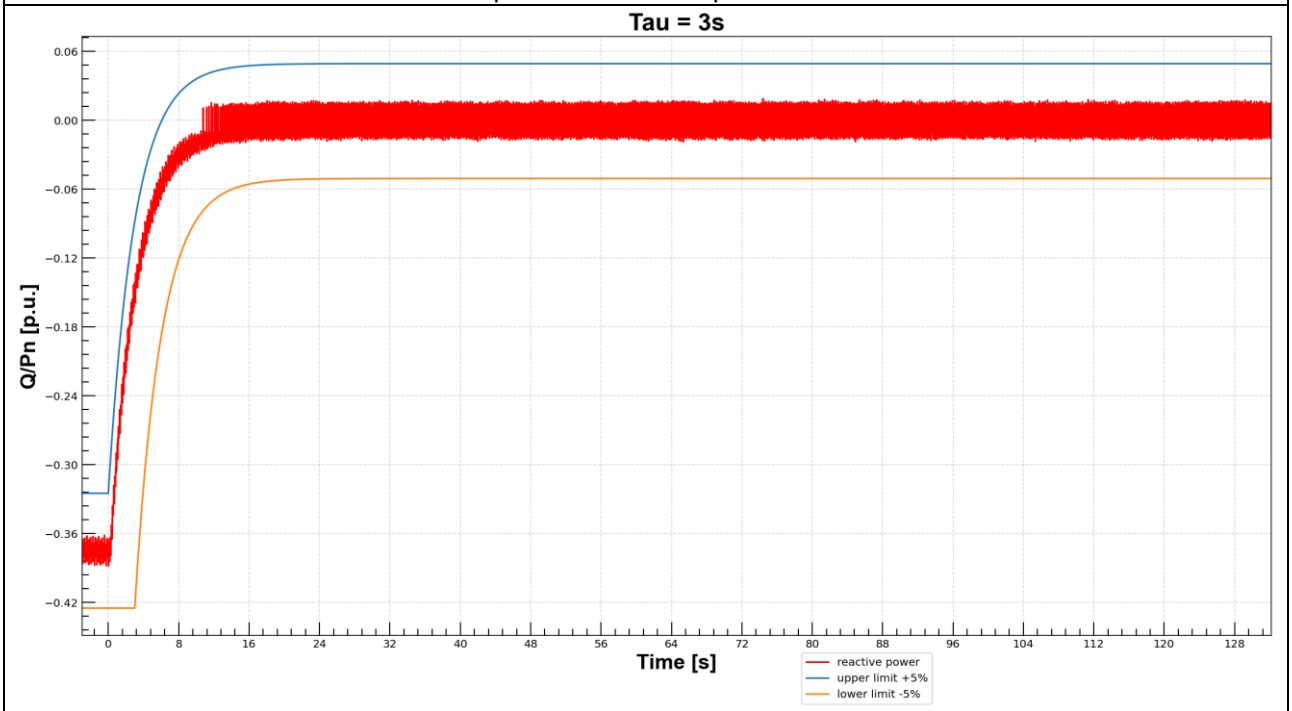


cos φ=0.8 over → cos φ=0.8 under



cos φ=0.8 under → cos φ=1

Remark: Tau= shortest time constant (not longer than 3s) 3s

Reactive power set point step [p.u.]	Generating unit response time setting	Measured response behaviour [s]

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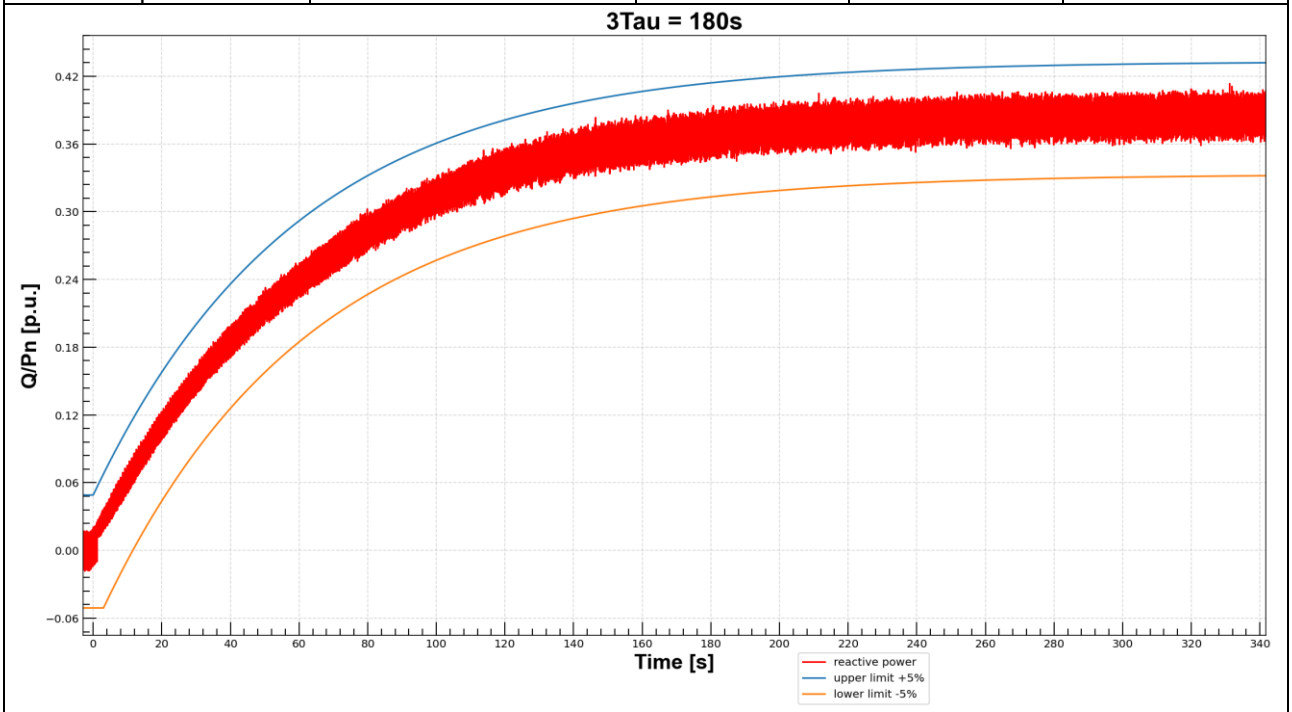
	[s]	Dead time	Response time	settling time
cos φ=1 → cos φ=0.8 over	180	0.3	120.4	120.4
cos φ=0.8 over → cos φ=0.8 under	180	0.3	133.1	133.1
cos φ=0.8 under → cos φ=1	180	0.3	100.9	100.9



cos φ=1 → cos φ=0.8 over

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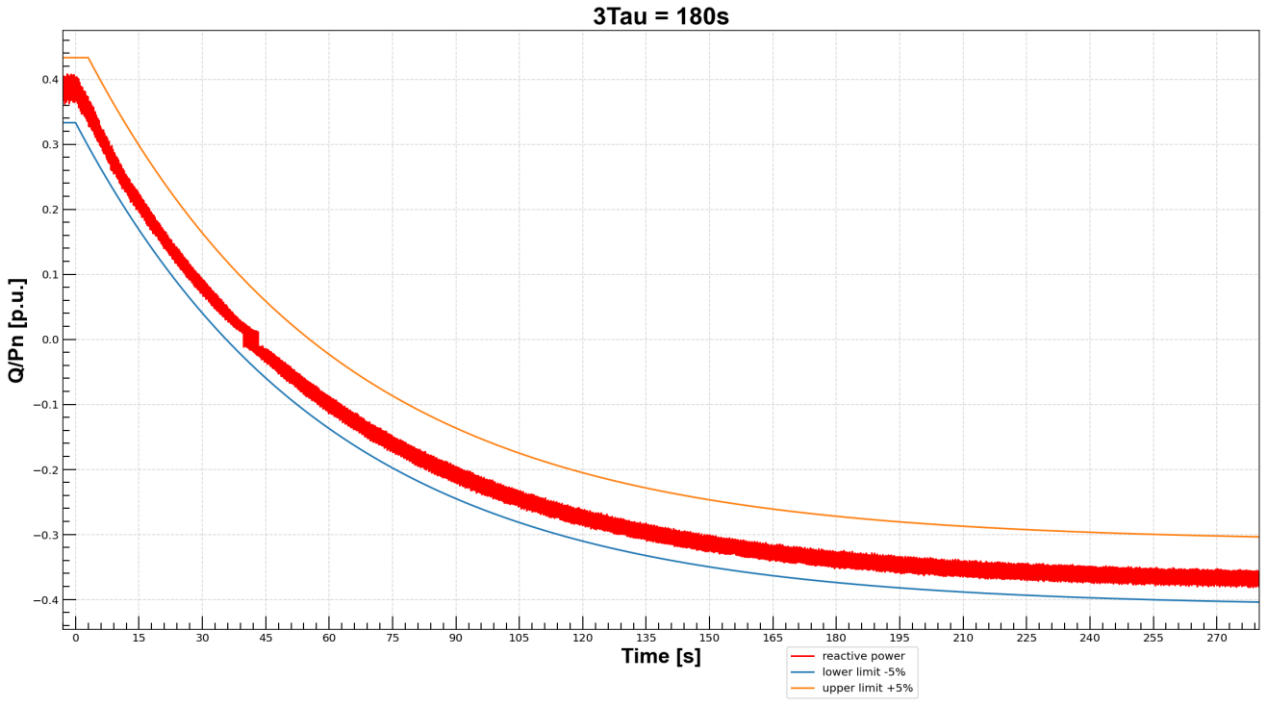
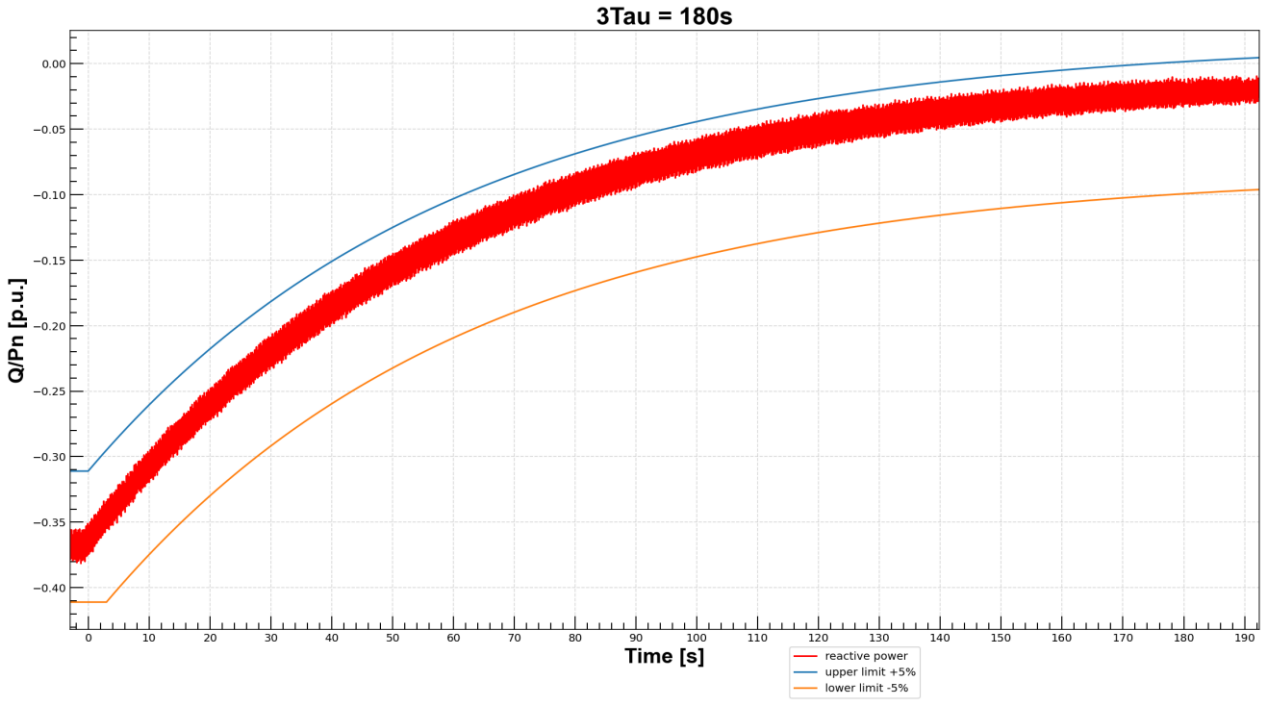


cos φ=0.8 over → cos φ=0.8 under



cos φ=0.8 under → cos φ=1

Remark: Tau= longest time (if longest time>60s, then test 60s) 60s

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5.5.2.4	Test for steady-state behaviour for voltage related control mode for reactive power Q(U)		P
Test at	Temperature (°C):	25	Humidity (%)	45
Means for the settings of the function or enabling and disabling of the function		password	
Function deactivated during the testing		Interface protection	
Characteristic configuration		☒ EN 50549-10:2022 (settings a, b in Table 17 and 18)	

Table 17 — Q(U) characteristic configuration

parameter of characteristic	Setting (a)	Setting (b)
dead band (horizontal section of the characteristic curve around U_n) db_{char}	as wide as possible but extending not more than from −6 %U_n to +6 %U_n.	0
minimum and maximum reactive power of the characteristic $Q_{max\ char}$ [a]	≥ 95 % of $Q_{max\ over}$ and $Q_{max\ under}$ respectively [b]	10 % of $Q_{max\ over}$ and $Q_{max\ under}$ respectively
Slope of the steepest section of the characteristic curve [a]	as steep as configurable, [c]	as flat as configurable [d]

Table 18 — Q(U) additional parameter configuration

parameter	Setting (a)	Setting (b)
Time constant	as fast as possible but not slower than 3 s	as slow as possible but not slower than 20 s
Min cos φ	0,4	deactivated
Lock-in power	deactivated	20 %P_n [a]
Lock-out power	deactivated	5 %P_n [b]

☐ specific grid code_____

Conformity to	☐ EN 50549-1:2019 ☒ EN 50549-2:2019 ☐ specific grid code_____

Test procedure for steady-state behaviour:

1) Operate the EUT at > 90 % Pn at a grid voltage of 100 %Un.
2) Increase the voltage (not more than 3 %Un) and wait for EUT active and reactive power to stabilize. Record reactive power, active power, active factor and grid voltage.
3) Repeat step 2) in a way that at least two measurements are taken for each linear section of the characteristic curve until grid voltage has reached 115 %Un or maximum continuous operating voltage according 5.2.2 whatever is the lower value.
4) Decrease the voltage (not more than 3 %Un) and wait for EUT active and reactive power to stabilize. Record reactive power, active power, active factor and grid voltage.
5) Repeat step 4) in a way that at least two measurements are taken for each linear section of the characteristic curve until grid voltage has reached 85 %Un or maximum continuous operating voltage according 5.2.2 whatever is the higher value.
6) Increase the voltage (not more than 3 %Un) and wait for EUT active and reactive power to stabilize. Record reactive power, active power, active factor and grid voltage.
7) Repeat step 6) in a way that at least two measurements are taken for each linear section of the characteristic curve until grid voltage has reached 100 %Un.
8) Repeat steps 2) to 7) with active power set to 20 %Pn or minimum regulating level, whatever is the higher.

Test procedure for dynamic behaviour

With the settings (a) and (b) defined in 5.5.2.4.1, or with the setting for a specific grid code, the tests are performed according to the following procedure:
1) Operate the EUT at > 90 % Pn at a grid voltage of 100 % Un.

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2) Increase voltage to a voltage value approximately centred in a sloped linear section of the characteristic curve and keep the voltage stable and wait for EUT active and reactive power to stabilize.
3) In case of multiple sloped linear sections in the characteristic curve above Un repeat step 2) for each linear section.
4) Increase voltage to a voltage value for which the characteristic curve requires Qmax char to be delivered and keep the voltage stable and wait for EUT active and reactive power to stabilize.
5) Reduce active power 2 %Pn below the configured Lock-in power but above the configured Lock-out power; keep voltage and power stable and wait for EUT active and reactive power to stabilize.
6) Reduce active power 2 %Pn below the configured Lock-out power and keep voltage and power stable and wait for EUT active and reactive power to stabilize.
7) Increase active power 2 %Pn above the configured Lock-in power and keep voltage and power stable and wait for EUT active and reactive power to stabilize.
8) Increase active power to > 90 %Pn and keep voltage and power stable and wait for EUT active and reactive power to stabilize.
9) Decrease grid voltage to Un, keep voltage and power stable and wait for EUT active and reactive power to stabilize.
10) Decrease voltage to a voltage value for which the characteristic curve requires Qmax char to be delivered and keep the voltage stable; wait for EUT active and reactive power to stabilize.
11) Reduce active power 2 %Pn below the configured Lock-in power but above the configured Lock-out power; keep voltage and power stable and wait for EUT active and reactive power to stabilize.
12) Reduce active power 2 %Pn below the configured Lock-out power and keep voltage and power stable and wait for EUT active and reactive power to stabilize.
13) Increase active power 2 %Pn above the configured Lock-in power and keep voltage and power stable and wait for EUT active and reactive power to stabilize.
14) Increase active power to > 90 %Pn and keep voltage and power stable and wait for EUT active and reactive power to stabilize.
15) Increase voltage to a voltage value approximately centred in a sloped linear section of the characteristic curve and keep the voltage stable and wait for EUT active and reactive power to stabilize.
16) In case of multiple sloped linear sections in the characteristic curve below Un repeat step 15) for each linear section.
17) Increase grid voltage to Un; keep voltage and power stable and wait for EUT active and reactive power to stabilize.
If for setting (a) Lock-In and Lock-out power level are not configured, the active power in steps 5), 6), 7), 11), 12) and 13) shall be configured as for the Lock-In and Lock-out power levels in setting (b).

Reactive power Q(U) for steady-state behaviour

Test Q(U) characteristic configuration setting (a) with additional parameter configuration setting (a)

Q(U) settings	**Setpoints**	P1	P2	P3	P4
	U/Un [%]	93	94	106	108
	Q/Qmax [p.u.]	1	0	0	-1
	Qmax over on characteristic curve	0.6			Q/Pn [p.u.]
	Qmax under on characteristic curve	0.6			Q/Pn [p.u.]
	Time constant	3 s			[s]

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	Min. Cos φ	0.4	--
	Lock-in power	deactivated	--
	Lock-out power	deactivated	--
	Slope of the steepest section of the characteristic curve		100 %Q_{max} / 1 %U_n (Under voltage); 50 %Q_{max} / 1 %U_n (Over voltage);

Test conditions		Voltage	Set point value		Measured value (30s average)		Deviation (Measure value – Set point)		Active factor	Q deviation limit
U/Un [%]	P/Pn [p.u.]	[p.u.]	kVAr	Q/Pn [p.u.]	kVAr	Q_{30}/Pn [p.u.]	kVAr	Q/Pn [p.u.]	cos φ	Q/Pn [p.u.]
100	1	1.000	0	0	-6.93	-0.020	-6.93	-0.020	1.000	0.02
103	1	1.030	0	0	-6.94	-0.020	-6.94	-0.020	1.000	0.02
105	1	1.050	0	0	-6.97	-0.020	-6.97	-0.020	1.000	0.02
107	1	1.070	-105	-0.3	-105.81	-0.302	-0.81	-0.002	0.953	0.02
109	1	1.090	-210	-0.6	-210.64	-0.602	-0.64	-0.002	0.798	0.02
111	1	1.109	-210	-0.6	-208.75	-0.596	1.25	0.004	0.497	0.02
113	1	1.129	-210	-0.6	-209.23	-0.598	0.77	0.002	0.484	0.02
115	1	1.149	-210	-0.6	-209.14	-0.598	0.86	0.002	0.484	0.02
113	1	1.129	-210	-0.6	-209.23	-0.598	0.77	0.002	0.484	0.02
111	1	1.109	-210	-0.6	-208.54	-0.596	1.46	0.004	0.522	0.02
109	1	1.090	-210	-0.6	-210.72	-0.602	-0.72	-0.002	0.798	0.02
107	1	1.070	-105	-0.3	-105.96	-0.303	-0.96	-0.003	0.953	0.02
105	1	1.050	0	0	-6.97	-0.020	-6.97	-0.020	1.000	0.02
103	1	1.030	0	0	-6.94	-0.020	-6.94	-0.020	1.000	0.02
100	1	1.000	0	0	6.89	0.020	6.89	0.020	1.000	0.02
97	1	0.970	0	0	6.79	0.019	6.79	0.019	1.000	0.02

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95	1	0.950	0	0	6.64	0.019	6.64	0.019	1.000	0.02
93	1	0.931	189	0.54	195.75	0.559	6.75	0.019	0.806	0.02
91	1	0.911	210	0.6	212.56	0.607	2.56	0.007	0.753	0.02
93	1	0.931	189	0.54	193.50	0.553	4.5	0.013	0.811	0.02
95	1	0.950	0	0	6.64	0.019	6.64	0.019	1.000	0.02
97	1	0.970	0	0	6.80	0.019	6.8	0.019	1.000	0.02
100	1	1.000	0	0	6.96	0.020	6.96	0.020	1.000	0.02
100	0.2	0.997	0	0	-0.01	0.000	-0.01	0.000	1.000	0.02
103	0.2	1.027	0	0	0.15	0.000	0.15	0.000	1.000	0.02
105	0.2	1.047	0	0	0.25	0.001	0.25	0.001	1.000	0.02
107	0.2	1.067	-152.95	-0.437	-151.55	-0.433	1.4	0.004	0.399	0.02
109	0.2	1.087	-152.95	-0.437	-151.50	-0.433	1.45	0.004	0.399	0.02
111	0.2	1.106	-152.95	-0.437	-151.38	-0.433	1.57	0.004	0.399	0.02
113	0.2	1.126	-152.95	-0.437	-151.61	-0.433	1.34	0.004	0.401	0.02
115	0.2	1.145	-152.95	-0.437	-151.45	-0.433	1.5	0.004	0.401	0.02
113	0.2	1.126	-152.95	-0.437	-151.53	-0.433	1.42	0.004	0.401	0.02
111	0.2	1.106	-152.95	-0.437	-151.59	-0.433	1.36	0.004	0.401	0.02
109	0.2	1.087	-152.95	-0.437	-151.62	-0.433	1.33	0.004	0.402	0.02
107	0.2	1.067	-152.95	-0.437	-151.80	-0.434	1.15	0.003	0.402	0.02
105	0.2	1.047	0	0	0.24	0.001	0.24	0.001	1.000	0.02
103	0.2	1.027	0	0	0.15	0.000	0.15	0.000	1.000	0.02
100	0.2	0.997	0	0	-0.01	0.000	-0.01	0.000	1.000	0.02
97	0.2	0.969	0	0	-0.18	-0.001	-0.18	-0.001	1.000	0.02
95	0.2	0.948	0	0	-0.30	-0.001	-0.3	-0.001	1.000	0.02
93	0.2	0.929	152.95	0.437	151.55	0.433	-1.4	-0.004	0.399	0.02

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91	0.2	0.910	152.95	0.437	151.35	0.432	-1.6	-0.005	0.400	0.02
93	0.2	0.929	152.95	0.437	151.68	0.433	-1.27	-0.004	0.399	0.02
95	0.2	0.948	0	0	-0.31	-0.001	-0.31	-0.001	1.000	0.02
97	0.2	0.969	0	0	-0.19	-0.001	-0.19	-0.001	1.000	0.02
100	0.2	0.997	0	0	-0.02	0.000	-0.02	0.000	1.000	0.02

Test Q(U) characteristic configuration setting (b) with additional parameter configuration setting (b)

Q(U) settings	**Setpoints**	P1	P2	P3	P4
	U/Un [%]	90	100	110	--
	Q/Qmax [p.u.]	0.1	0	0.1	--
	Qmax over on characteristic curve	0.06			Q/Pn [p.u.]
	Qmax under on characteristic curve	-0.06			Q/Pn [p.u.]
	Time constant	20			[s]
	Min. Cos φ	deactivated			--
	Lock-in power	20			[%Pn]
	Lock-out power	5			[%Pn]
	Slope of the steepest section of the characteristic curve				1 %Q_{max} / 1 %U_n

Test conditions		Voltage	Set point value		Measured value (30s average)		Deviation (Measure value – Set point)		Active factor	Q deviation limit
U/Un [%]	P/Pn [p.u.]	[p.u.]	kVAr	Q/Pn [p.u.]	kVAr	Q_{30}/Pn [p.u.]	kVAr	Q/Pn [p.u.]	cos φ	Q/Pn [p.u.]
100	1	1.000	0.000	0.000	-1.30	-0.004	-1.30	-0.004	1.000	0.02
102	1	1.020	-4.200	-0.012	-5.39	-0.015	-1.19	-0.003	1.000	0.02
104	1	1.040	-8.400	-0.024	-9.47	-0.027	-1.07	-0.003	1.000	0.02

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106	1	1.060	-12.600	-0.036	-13.54	-0.039	-0.94	-0.003	0.999	0.02
108	1	1.080	-16.800	-0.048	-17.58	-0.05	-0.78	-0.002	0.999	0.02
110	1	1.100	-21.000	-0.060	-20.81	-0.059	0.19	0.001	0.998	0.02
112	1	1.120	-21.000	-0.060	-20.71	-0.059	0.29	0.001	0.998	0.02
114	1	1.140	-21.000	-0.060	-20.55	-0.059	0.45	0.001	0.998	0.02
115	1	1.150	-21.000	-0.060	-20.46	-0.058	0.54	0.002	0.998	0.02
114	1	1.140	-21.000	-0.060	-20.56	-0.059	0.44	0.001	0.998	0.02
112	1	1.120	-21.000	-0.060	-20.71	-0.059	0.29	0.001	0.998	0.02
110	1	1.100	-21.000	-0.060	-20.83	-0.06	0.17	0.000	0.998	0.02
108	1	1.080	-16.800	-0.048	-17.62	-0.05	-0.82	-0.002	0.999	0.02
106	1	1.060	-12.600	-0.036	-13.55	-0.039	-0.95	-0.003	0.999	0.02
104	1	1.040	-8.400	-0.024	-9.55	-0.027	-1.15	-0.003	1.000	0.02
102	1	1.020	-4.200	-0.012	-5.46	-0.016	-1.26	-0.004	1.000	0.02
100	1	1.000	0.000	0.000	-1.35	-0.004	-1.35	-0.004	1.000	0.02
98	1	0.972	4.200	0.012	4.38	0.013	0.18	0.001	1.000	0.02
96	1	0.950	8.400	0.024	8.83	0.025	0.43	0.001	1.000	0.02
94	1	0.933	12.600	0.036	12.38	0.035	-0.22	-0.001	0.999	0.02
92	1	0.909	16.800	0.048	17.34	0.05	0.54	0.002	0.998	0.02
90	1	0.901	21.000	0.060	19.00	0.054	-2.00	-0.006	0.998	0.02
88	1	0.881	21.000	0.060	19.99	0.057	-1.01	-0.003	0.998	0.02
86	1	0.860	21.000	0.060	19.93	0.057	-1.07	-0.003	0.998	0.02
85	1	0.851	21.000	0.060	19.89	0.057	-1.11	-0.003	0.998	0.02
86	1	0.860	21.000	0.060	19.92	0.057	-1.08	-0.003	0.998	0.02
88	1	0.881	21.000	0.060	20.00	0.057	-1.00	-0.003	0.998	0.02
90	1	0.901	21.000	0.060	19.20	0.055	-1.80	-0.005	0.998	0.02

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92	1	0.909	16.800	0.048	17.48	0.05	0.68	0.002	0.998	0.02
94	1	0.933	12.600	0.036	12.55	0.036	-0.05	0.000	0.999	0.02
96	1	0.950	8.400	0.024	9.00	0.026	0.60	0.002	1.000	0.02
98	1	0.972	4.200	0.012	4.50	0.013	0.30	0.001	1.000	0.02
100	1	1.000	0.000	0.000	-1.28	-0.004	-1.28	-0.004	1.000	0.02
100	0.2	1.000	0.000	0.000	-0.63	-0.002	-0.63	-0.002	1.000	0.02
102	0.2	1.020	-4.200	-0.012	-4.63	-0.013	-0.43	-0.001	0.998	0.02
104	0.2	1.040	-8.400	-0.024	-8.70	-0.025	-0.30	-0.001	0.992	0.02
106	0.2	1.060	-12.600	-0.036	-12.70	-0.036	-0.10	0.000	0.984	0.02
108	0.2	1.080	-16.800	-0.048	-16.85	-0.048	-0.05	0.000	0.972	0.02
110	0.2	1.100	-21.000	-0.060	-20.31	-0.058	0.69	0.002	0.960	0.02
112	0.2	1.120	-21.000	-0.060	-20.24	-0.058	0.76	0.002	0.960	0.02
114	0.2	1.140	-21.000	-0.060	-20.13	-0.058	0.87	0.002	0.961	0.02
115	0.2	1.150	-21.000	-0.060	-20.06	-0.057	0.94	0.003	0.961	0.02
114	0.2	1.140	-21.000	-0.060	-20.11	-0.057	0.89	0.003	0.961	0.02
112	0.2	1.120	-21.000	-0.060	-20.23	-0.058	0.77	0.002	0.960	0.02
110	0.2	1.100	-21.000	-0.060	-20.37	-0.058	0.63	0.002	0.960	0.02
108	0.2	1.080	-16.800	-0.048	-16.85	-0.048	-0.05	0.000	0.972	0.02
106	0.2	1.060	-12.600	-0.036	-12.78	-0.037	-0.18	-0.001	0.983	0.02
104	0.2	1.040	-8.400	-0.024	-8.71	-0.025	-0.31	-0.001	0.992	0.02
102	0.2	1.020	-4.200	-0.012	-4.65	-0.013	-0.45	-0.001	0.997	0.02
100	0.2	1.000	0.000	0.000	-0.58	-0.002	-0.58	-0.002	1.000	0.02
98	0.2	0.972	4.200	0.012	5.25	0.015	1.05	0.003	0.997	0.02
96	0.2	0.950	8.400	0.024	9.70	0.028	1.30	0.004	0.990	0.02
94	0.2	0.933	12.600	0.036	13.33	0.038	0.73	0.002	0.982	0.02

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92	0.2	0.909	16.800	0.048	18.23	0.052	1.43	0.004	0.967	0.02
90	0.2	0.900	21.000	0.060	20.00	0.057	-1.00	-0.003	0.961	0.02
88	0.2	0.881	21.000	0.060	20.44	0.058	-0.56	-0.002	0.959	0.02
86	0.2	0.859	21.000	0.060	20.36	0.058	-0.64	-0.002	0.960	0.02
85	0.2	0.850	21.000	0.060	20.33	0.058	-0.67	-0.002	0.960	0.02
86	0.2	0.859	21.000	0.060	20.35	0.058	-0.65	-0.002	0.960	0.02
88	0.2	0.881	21.000	0.060	20.42	0.058	-0.58	-0.002	0.959	0.02
90	0.2	0.900	21.000	0.060	20.08	0.057	-0.92	-0.003	0.961	0.02
92	0.2	0.909	16.800	0.048	18.25	0.052	1.45	0.004	0.967	0.02
94	0.2	0.933	12.600	0.036	13.40	0.038	0.80	0.002	0.982	0.02
96	0.2	0.950	8.400	0.024	9.77	0.028	1.37	0.004	0.990	0.02
98	0.2	0.972	4.200	0.012	5.38	0.015	1.18	0.003	0.997	0.02
100	0.2	1.000	0.000	0.000	-0.39	-0.001	-0.39	-0.001	1.000	0.02

Reactive power Q(U) for dynamic behaviour

Test Q(U) characteristic configuration setting (a) with additional parameter configuration setting (a)

Q(U) settings	**Setpoints**	P1	P2	P3	P4
	U/Un [%]	93	94	106	108
	Q/Qmax [p.u.]	1	0	0	-1
	Qmax over on characteristic curve	0.6			Q/Pn [p.u.]
	Qmax under on characteristic curve	0.6			Q/Pn [p.u.]
	Time constant	3			[s]
	Cos φ	0.4			--
	Lock-in power	deactivated			-

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		Lock-out power		deactivated					-		
		Slope of the steepest section of the characteristic curve							100 %Q_{max} / 1 %U_n (Under voltage); 50 %Q_{max} / 1 %U_n (Over voltage);		
Test conditions		Voltage	Set point value		Measured value (30s average)		Deviation (Measure value – Set point)		T_d	T_{sr}	T_s
U/Un [%]	P/Pn [p.u.]	[p.u.]	VAr	Q/Pn [p.u.]	VAr	Q_{30}/Pn [p.u.]	VAr	Q_{30}/Pn [p.u.]	[s]	[s]	[s]
100	1	1.002	0.000	0.000	-1.020	-0.009	-1.020	-0.009	-	-	-
107	1	1.070	-33.000	-0.300	-34.600	-0.315	-1.600	-0.015	0.2	9.4	9.4
109	1	1.090	-66.000	-0.600	-66.200	-0.602	-0.200	-0.002	0.2	9.0	9.0
109	0.18	1.088	-45.100	-0.410	-49.430	-0.449	-4.330	-0.039	0.8	7.6	7.6
109	0.03	1.089	-7.700	-0.070	0.870	0.008	8.570	0.078	0.2	9.2	9.2
109	0.22	1.090	-66.000	-0.600	-66.140	-0.601	-0.140	-0.001	0.2	9.6	9.6
109	1	1.090	-66.000	-0.600	-66.130	-0.601	-0.130	-0.001	-	-	-
100	1	1.003	0.000	0.000	-1.120	-0.010	-1.120	-0.010	0.2	9.0	9.0
92	1	0.921	66.000	0.600	64.780	0.589	-1.220	-0.011	0.2	9.6	9.6
92	0.18	0.918	45.100	0.410	50.170	0.456	5.070	0.046	0.8	9.6	9.6
92	0.03	0.917	7.700	0.070	0.490	0.004	-7.210	-0.066	1.0	9.2	9.2
92	0.22	0.918	66.000	0.600	61.280	0.557	-4.720	-0.043	1.0	10.6	10.6
92	1	0.922	66.000	0.600	64.820	0.589	-1.180	-0.011	-	-	-
93.5	1	0.935	33.000	0.300	35.620	0.324	2.620	0.024	0.6	5.2	5.2
100	1	1.003	0.000	0.000	-0.980	-0.009	-0.980	-0.009	0.4	9.2	9.2

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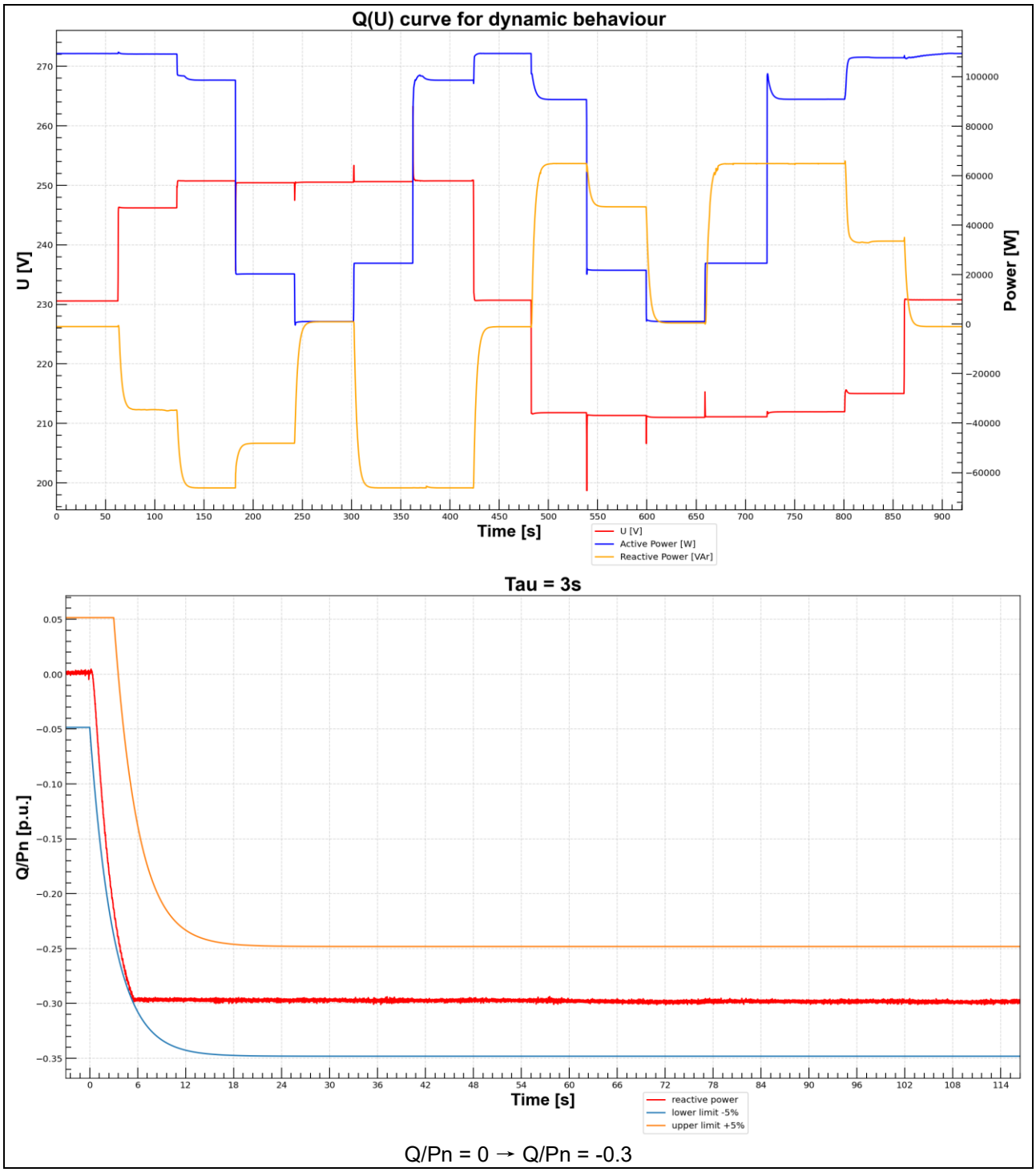

Q/Pn = 0 → Q/Pn = -0.3

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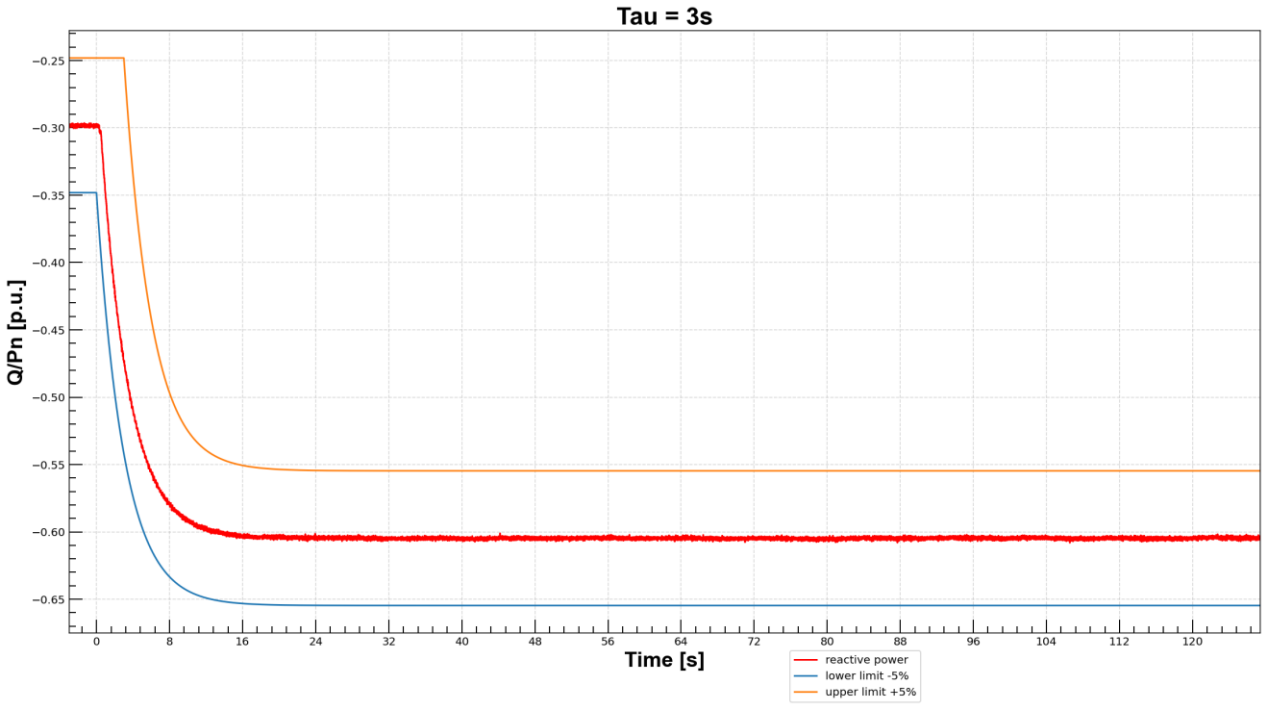
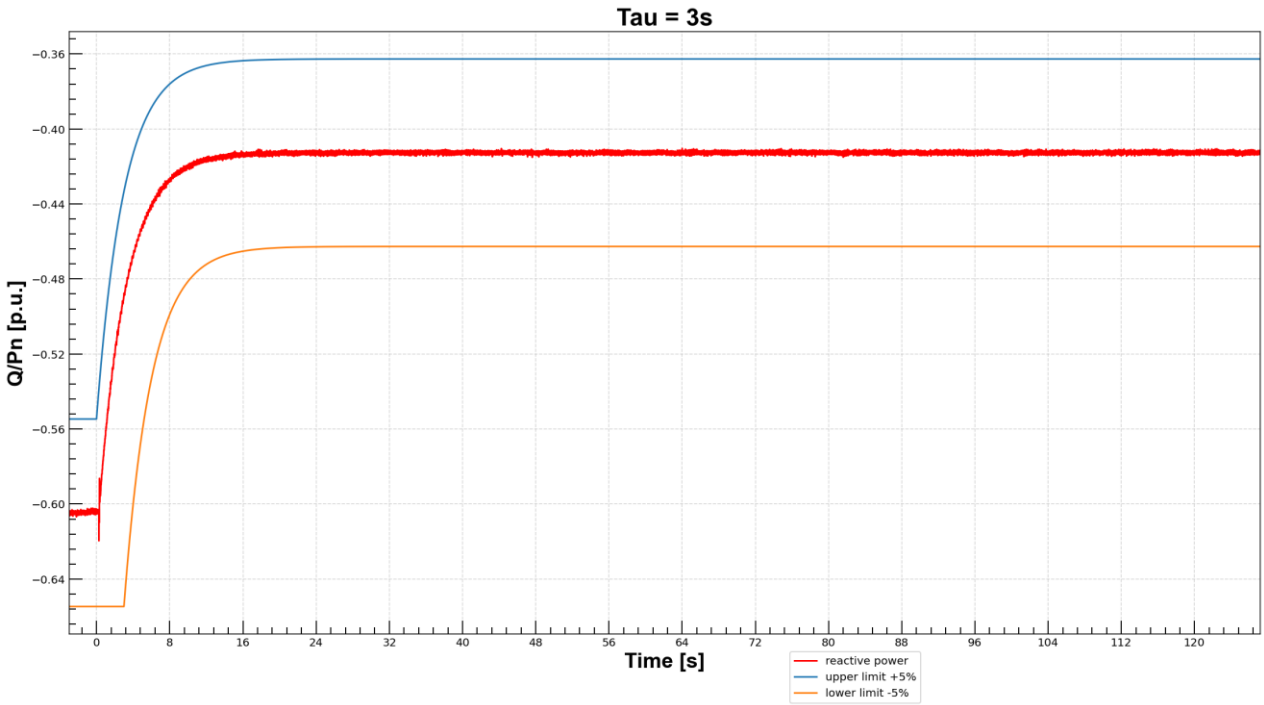


Q/Pn = -0.3 → Q/Pn = -0.6



Q/Pn = -0.6 → Q/Pn = -0.41

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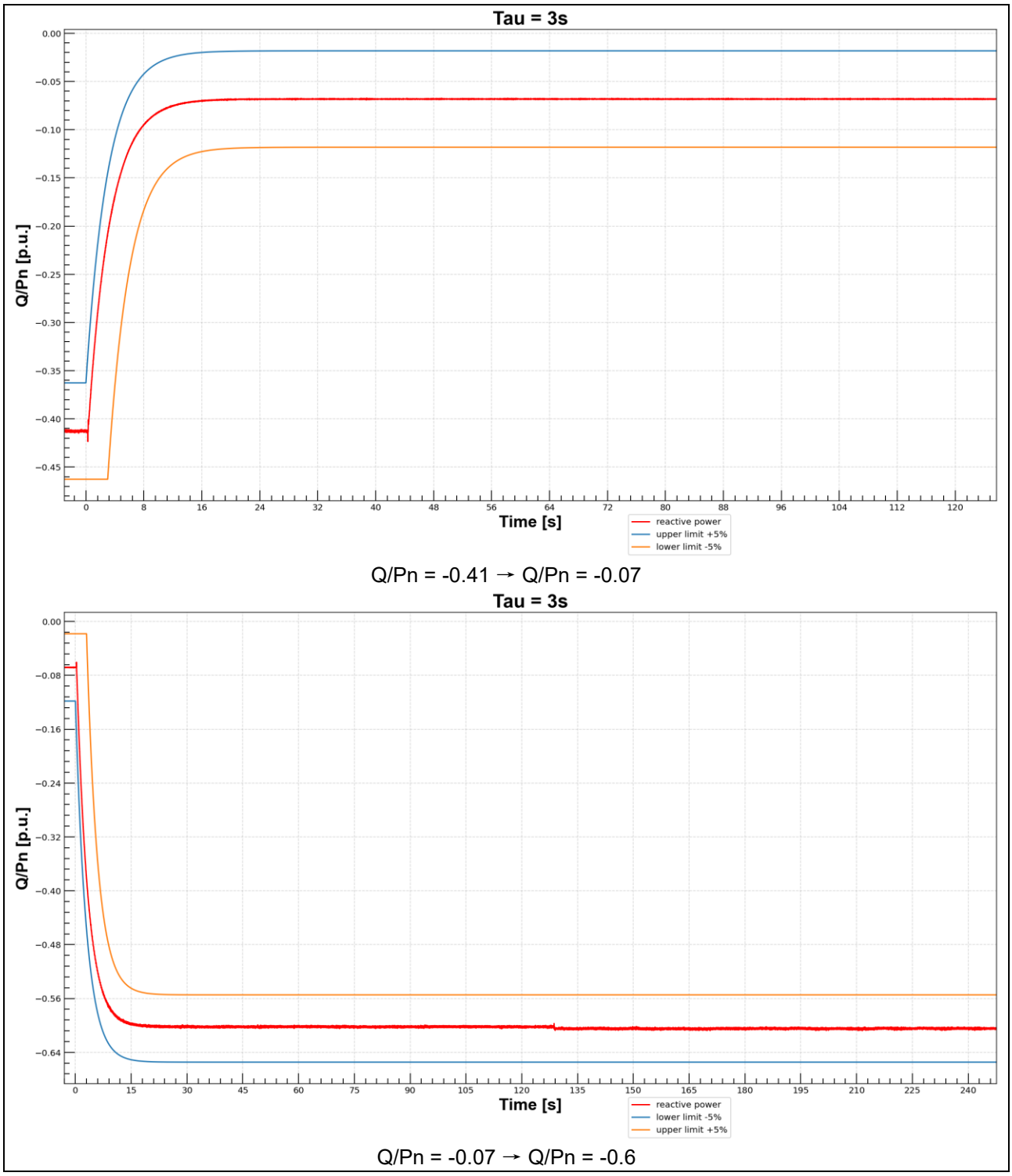

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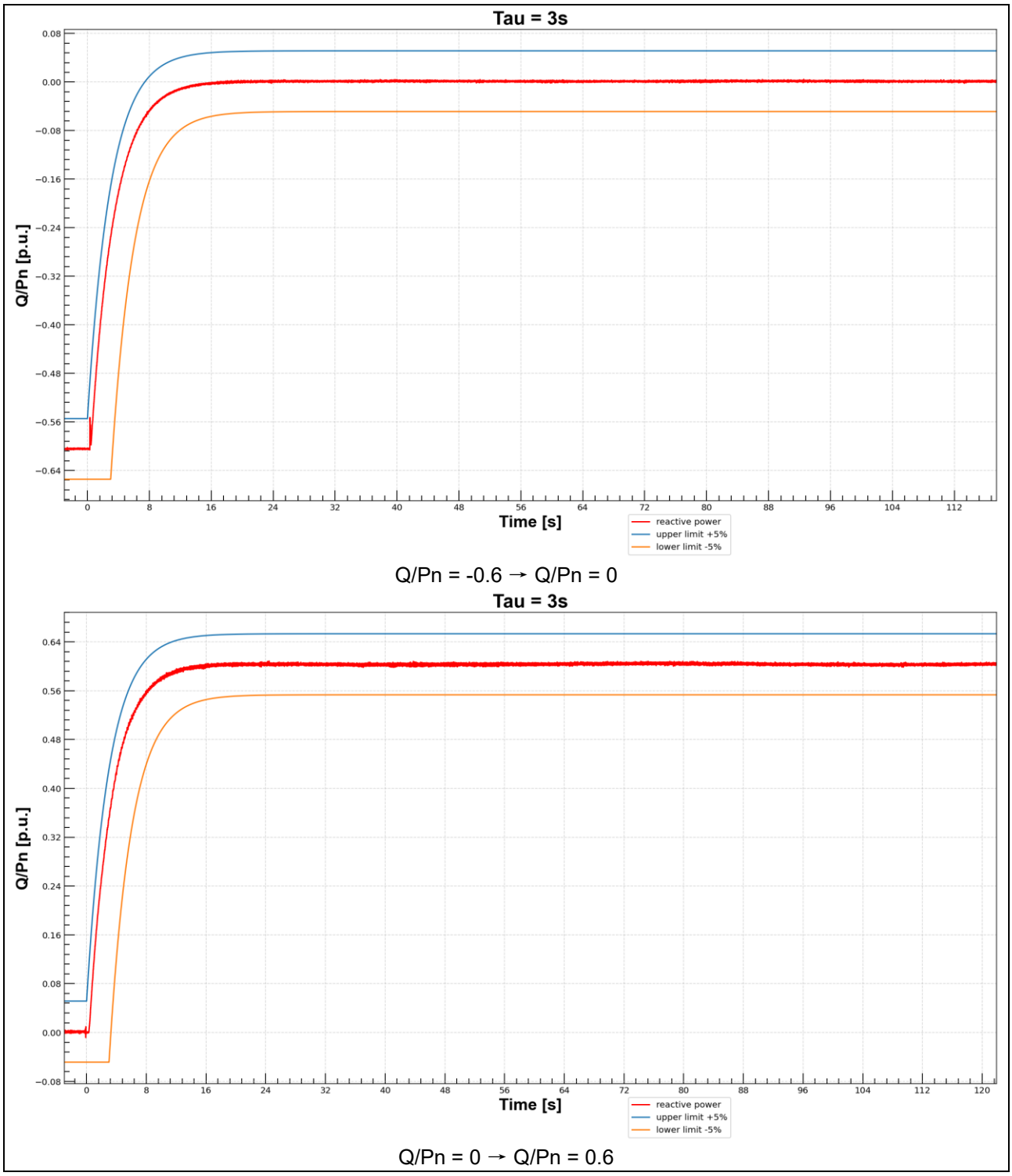

Q/Pn = -0.6 → Q/Pn = 0

Q/Pn = 0 → Q/Pn = 0.6

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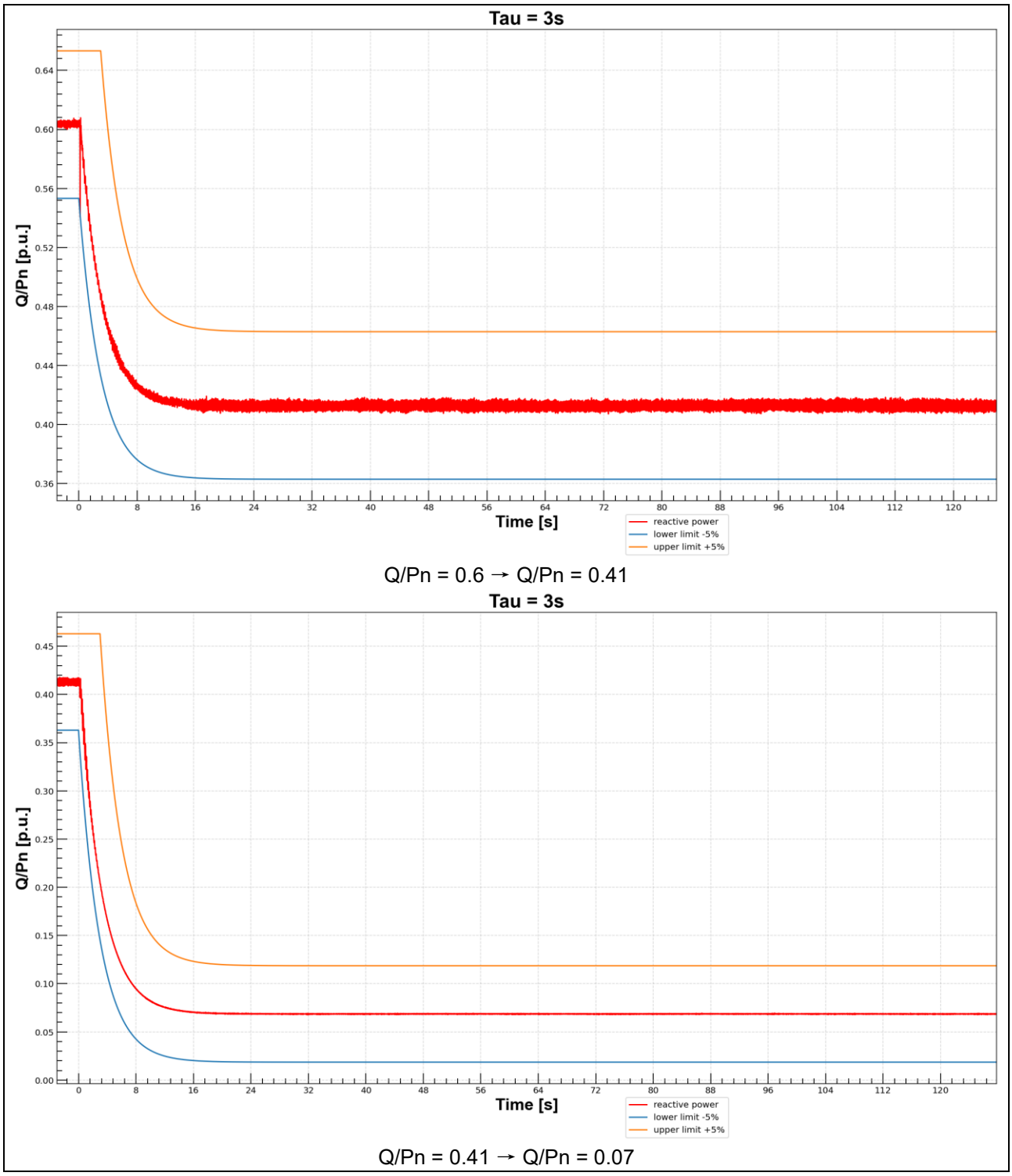

Q/Pn = 0.6 → Q/Pn = 0.41

Q/Pn = 0.41 → Q/Pn = 0.07

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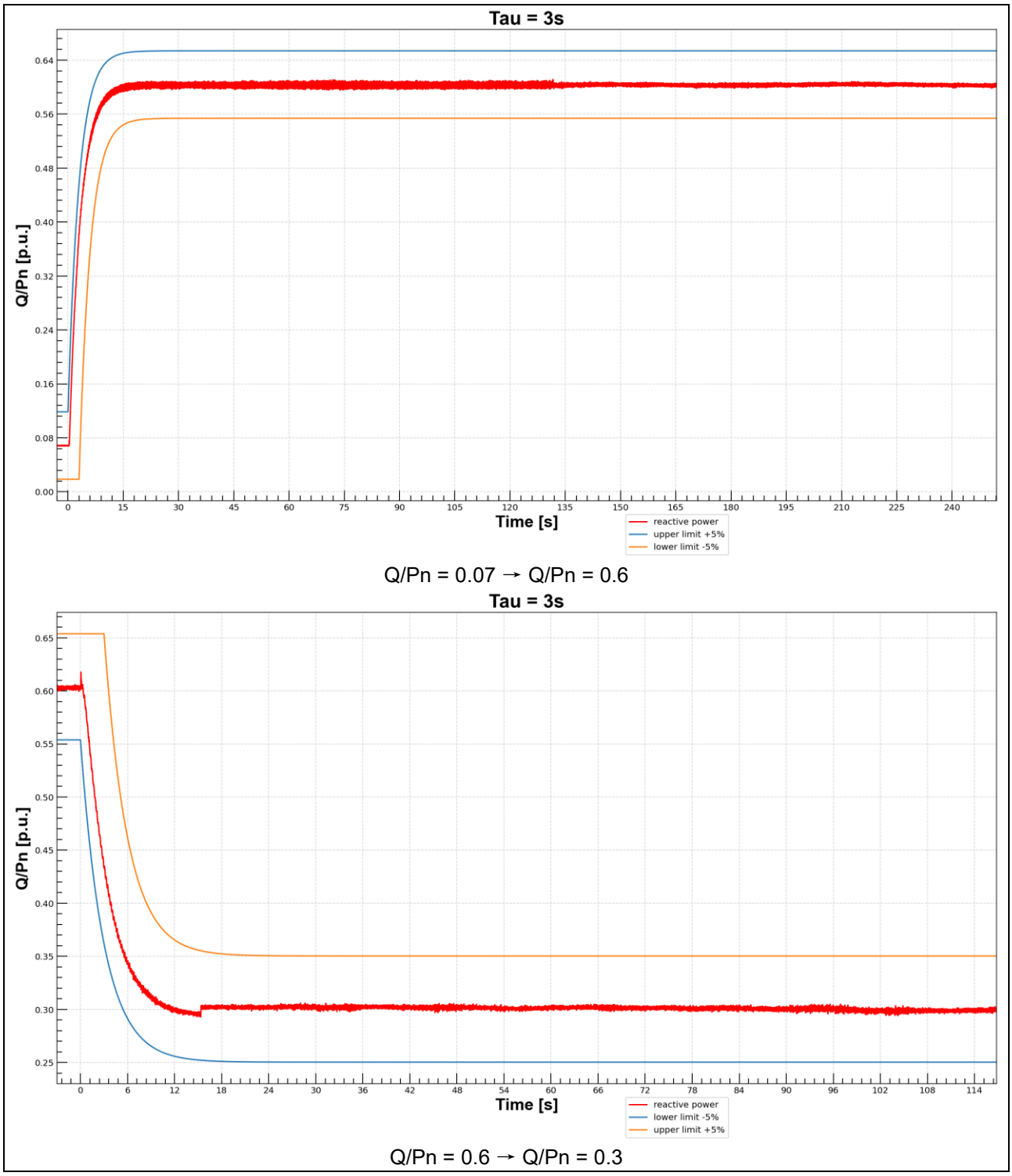

Q/Pn = 0.07 → Q/Pn = 0.6

Q/Pn = 0.6 → Q/Pn = 0.3

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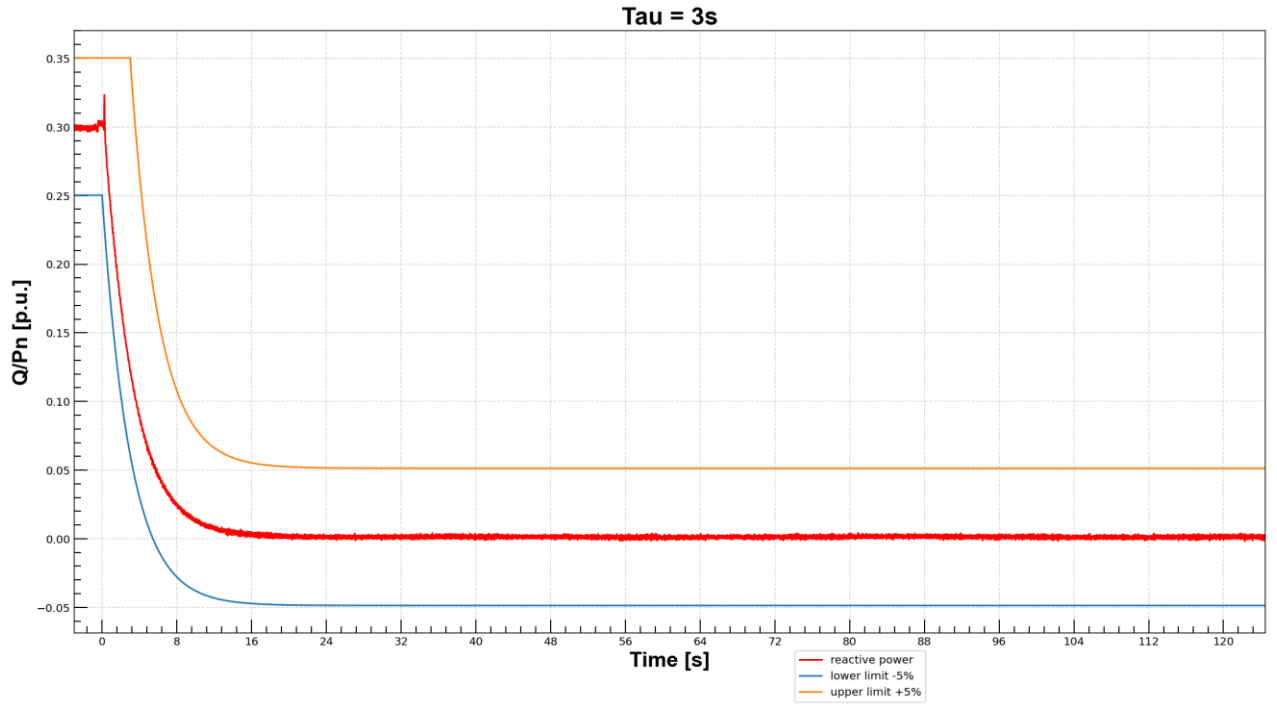

Q/Pn = 0.3 → Q/Pn = 0

Test Q(U) characteristic configuration setting (b) with additional parameter configuration setting (b)

Q(U) settings	**Setpoints**	P1	P2	P3	P4
	U/Un [%]	90	100	110	--
	Q/Qmax [p.u.]	0.1	0	0.1	--
	Qmax over on characteristic curve	0.06			Q/Pn [p.u.]
	Qmax under on characteristic curve	-0.06			Q/Pn [p.u.]
	Time constant	20			[s]
	Min. Cos φ	deactivated			--
	Lock-in power	20			[%Pn]
	Lock-out power	5			[%Pn]

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		Slope of the steepest section of the characteristic curve								1 %Q_{max} /1 %U_n	
Test conditions		Voltage	Set point value		Measured value (30s average)		Deviation (Measure value – Set point)		T_d	T_{sr}	T_s
U/Un [%]	P/Pn [p.u.]	[p.u.]	kVAr	Q/Pn [p.u.]	kVAr	Q_{30}/Pn [p.u.]	kVAr	Q_{30}/Pn [p.u.]	[s]	[s]	[s]
100	1	1	0.00	0	-0.38	-0.001	-0.38	-0.001	-	-	-
105	1	1.05	-10.50	-0.030	-10.32	-0.029	0.18	0.001	0.63	26.74	26.74
111	1	1.11	-21.00	-0.060	-20.35	-0.058	0.65	0.002	0.11	26.48	26.48
111	0.18	1.11	-21.00	-0.060	-20.26	-0.058	0.74	0.002	-	-	-
111	0.03	1.11	0.00	0	0.06	0	0.06	0	0.63	25.70	25.70
111	0.22	1.11	-21.00	-0.060	-19.79	-0.057	1.21	0.003	0.61	34.86	34.86
111	1	1.111	-21.00	-0.060	-20.68	-0.059	0.32	0.001	-	-	-
100	1	1	0.00	0	-1.05	-0.003	-1.05	-0.003	0.21	20.62	20.62
89	1	0.89	21.00	0.060	19.67	0.056	-1.33	-0.004	0.95	19.76	19.76
89	0.18	0.889	21.00	0.060	20.42	0.058	-0.58	-0.002	-	-	-
89	0.03	0.889	0.00	0	0.1	0	0.1	0	0.75	29.42	29.42
89	0.22	0.89	21.00	0.060	20.12	0.057	-0.88	-0.003	0.69	26.60	26.60
89	1	0.89	21.00	0.060	20.2	0.058	-0.8	-0.002	-	-	-
95	1	0.95	10.50	0.030	10.1	0.029	-0.4	-0.001	0.97	18.30	18.30
100	1	1	0.00	0	-0.21	-0.001	-0.21	-0.001	0.67	26.98	26.98

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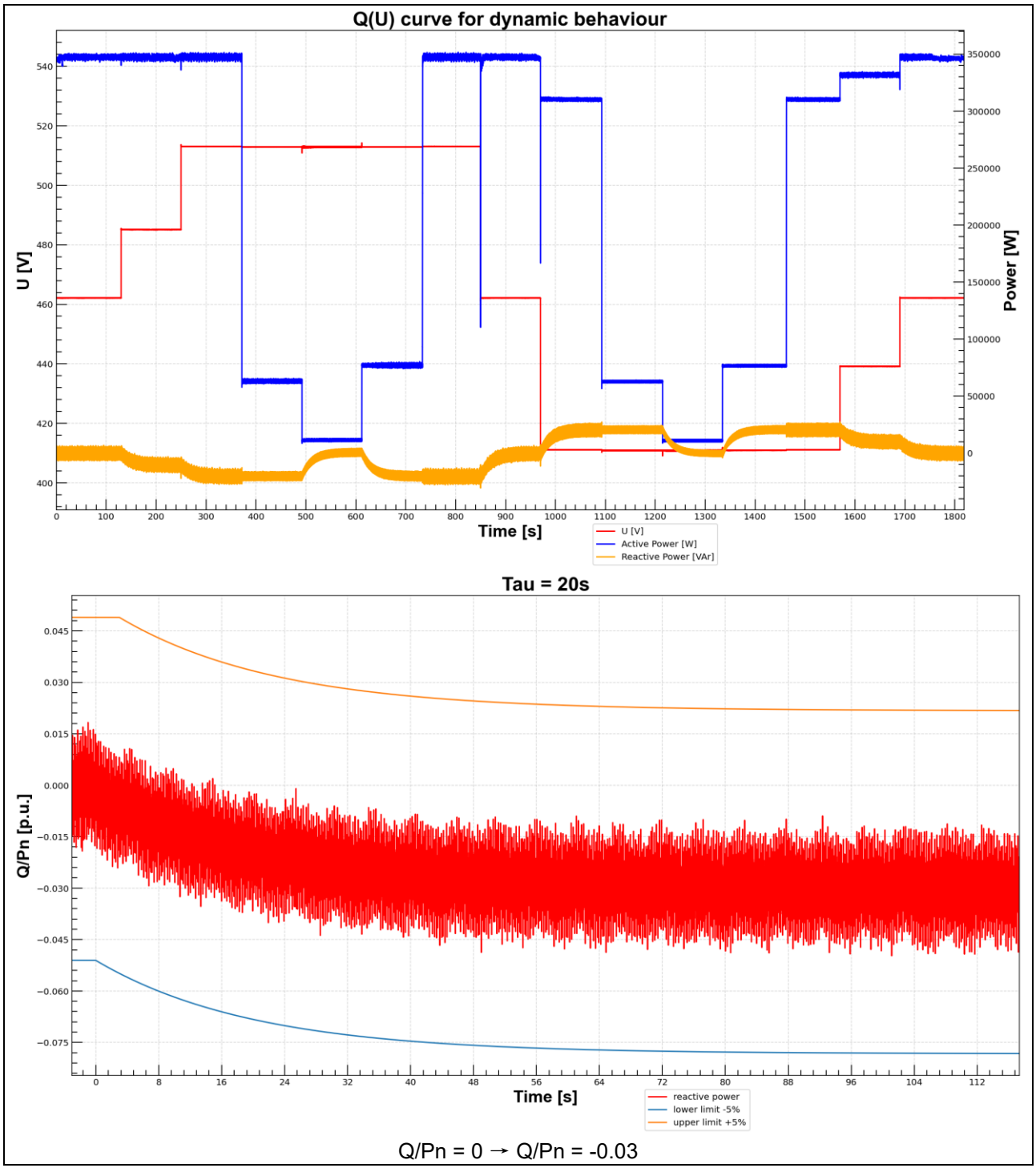

Q/Pn = 0 → Q/Pn = -0.03

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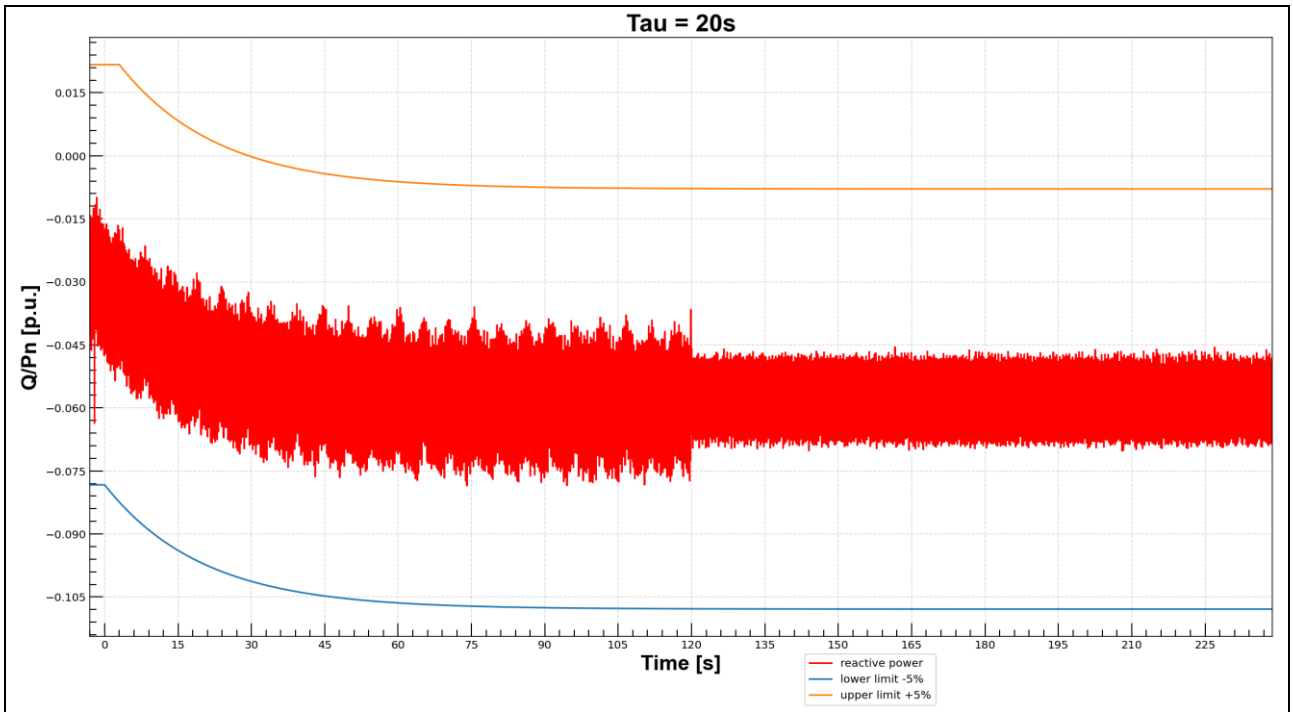
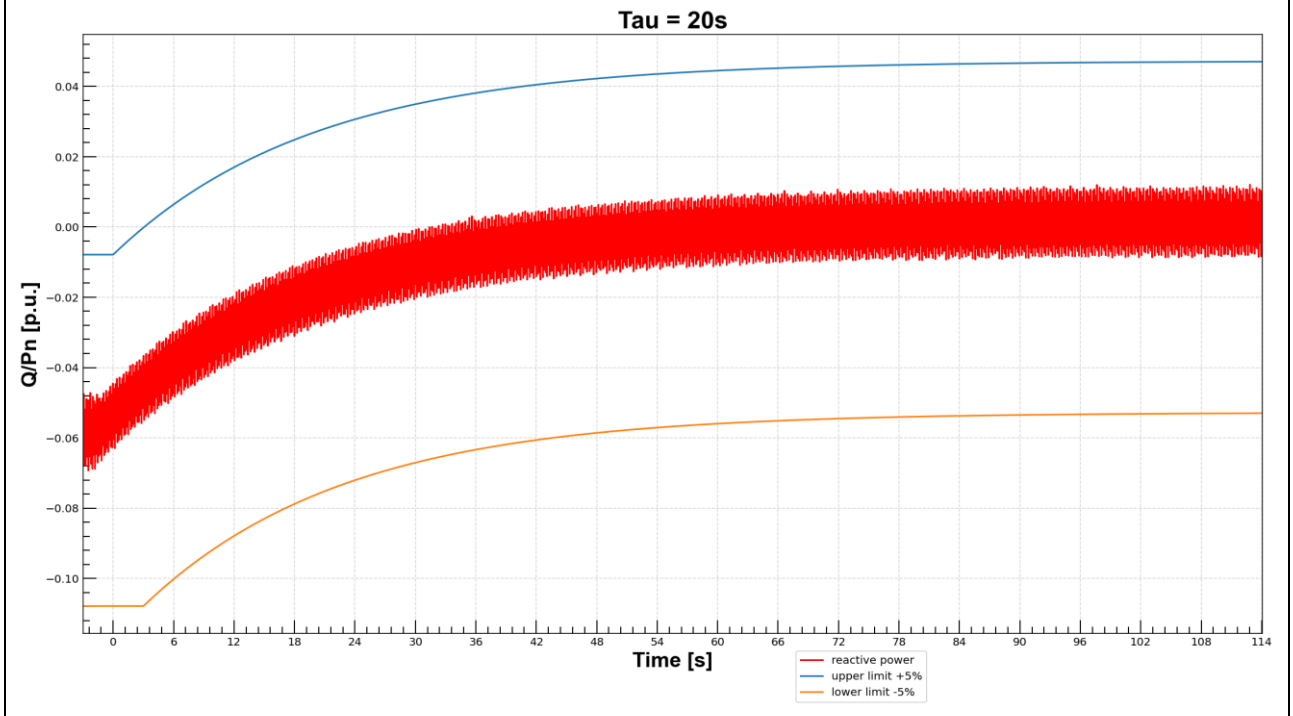


Q/Pn = -0.03 → Q/Pn = -0.06



Q/Pn = -0.06 → Q/Pn = 0

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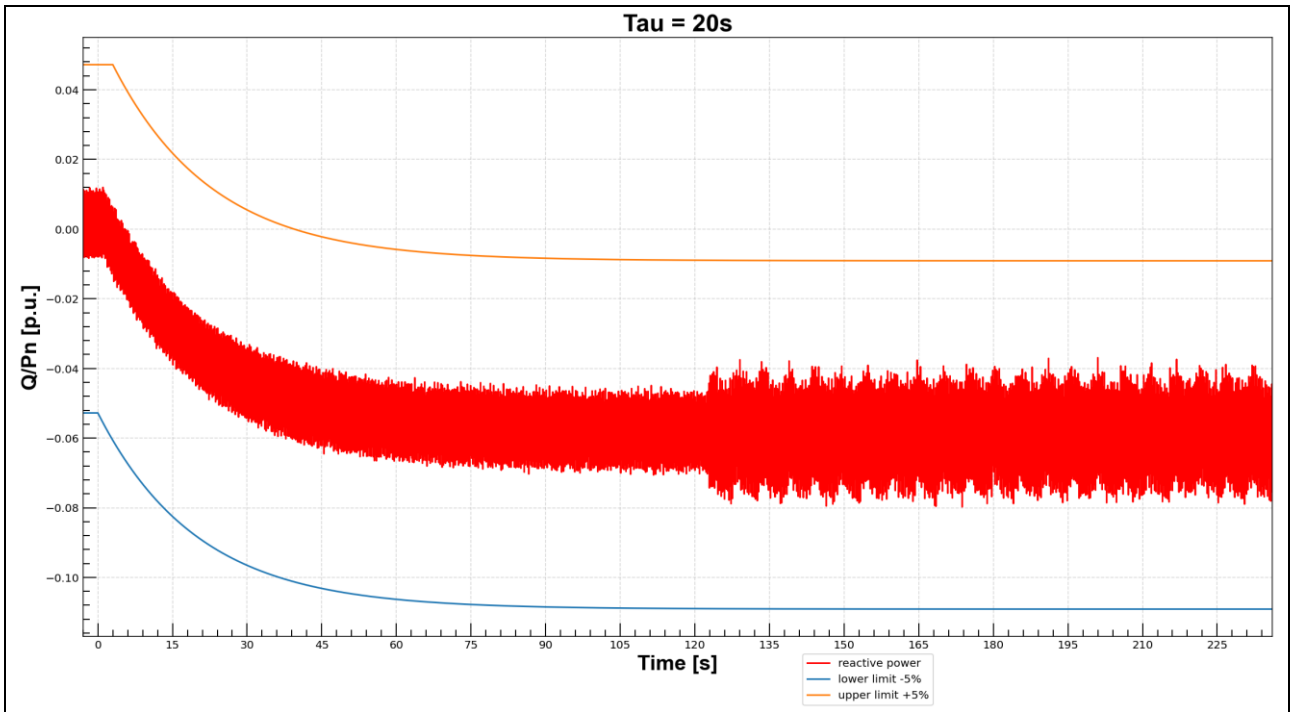
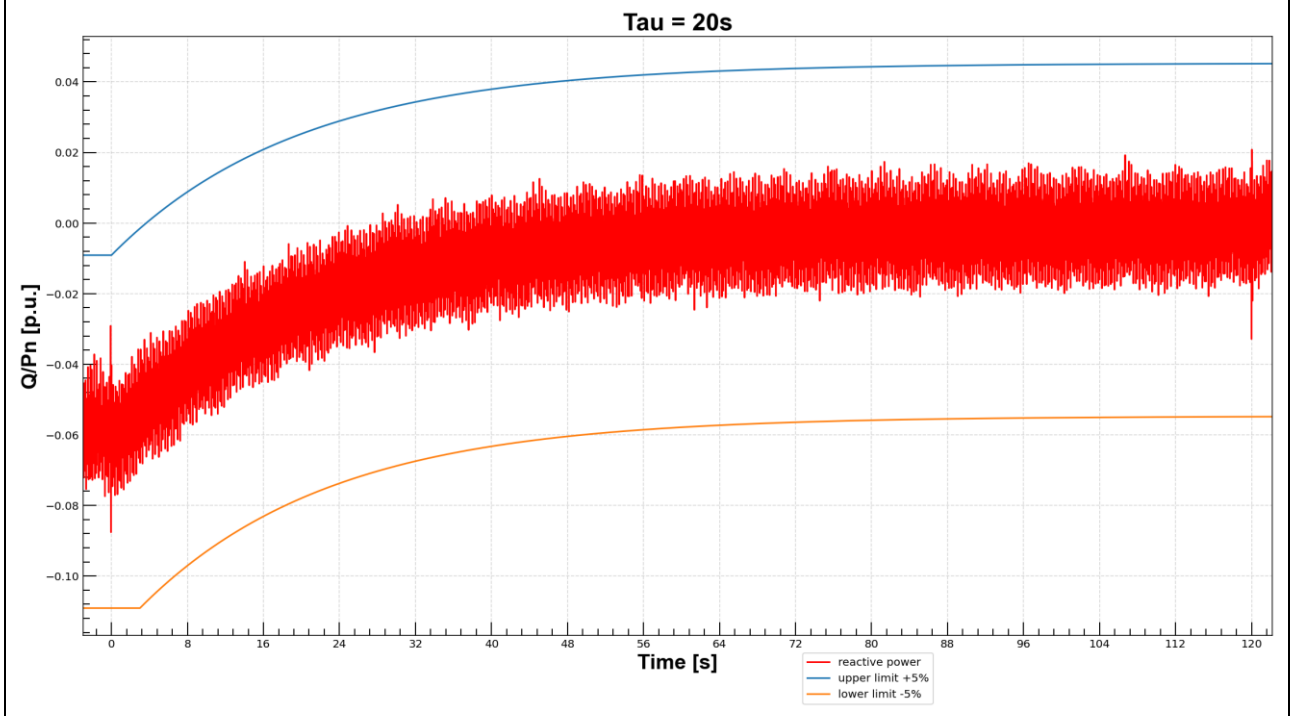


Q/Pn = 0 → Q/Pn = -0.06



Q/Pn = -0.06 → Q/Pn = 0

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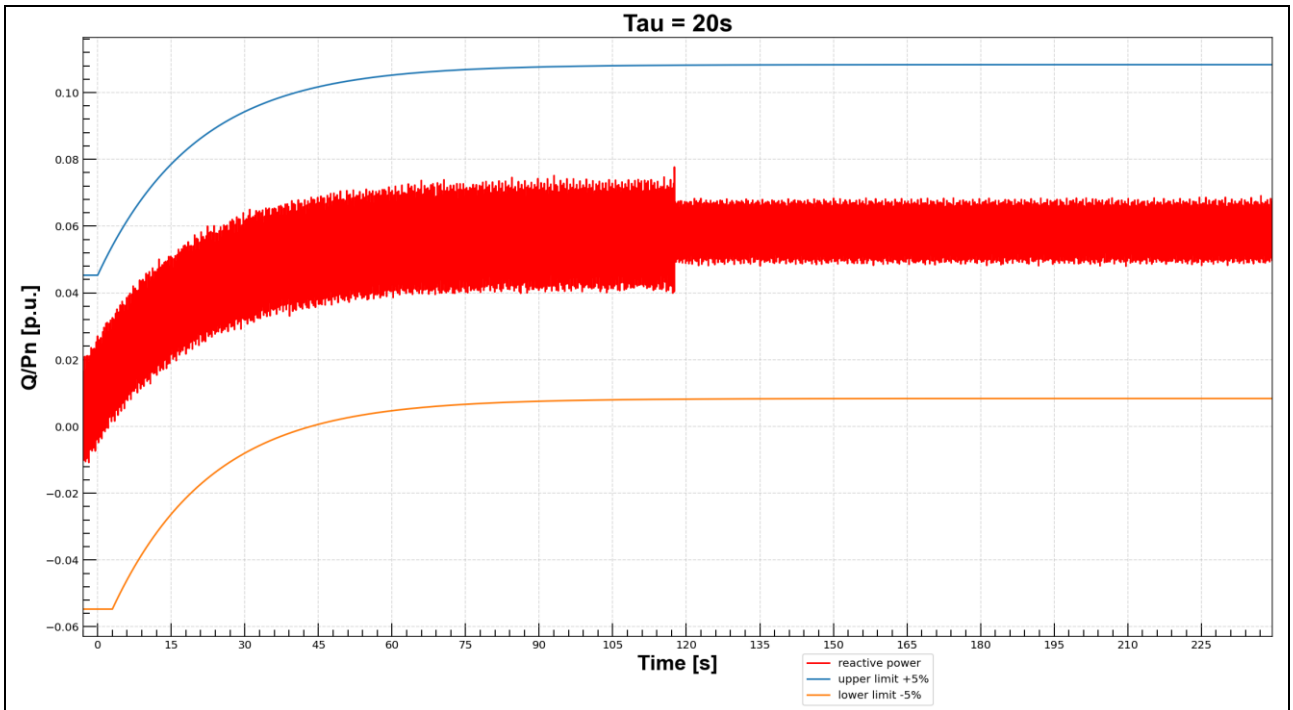
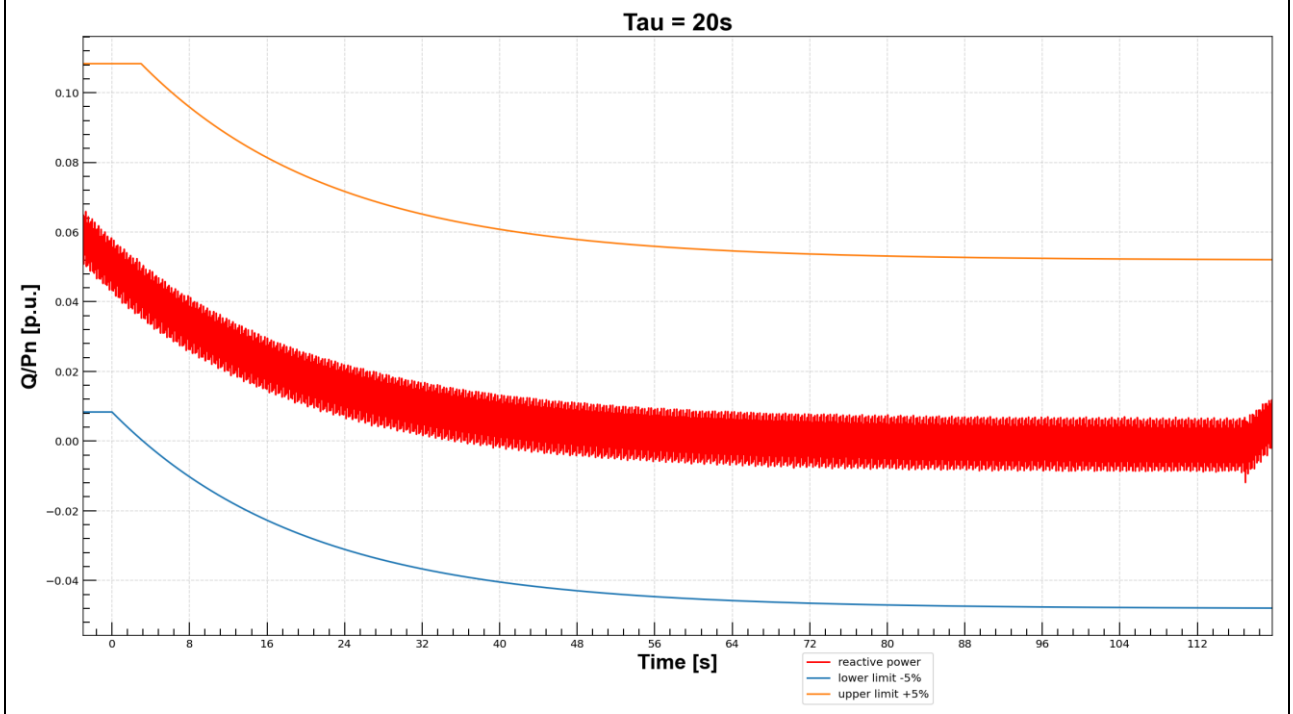


Q/Pn = 0 → Q/Pn = 0.06



Q/Pn = 0.06 → Q/Pn = 0

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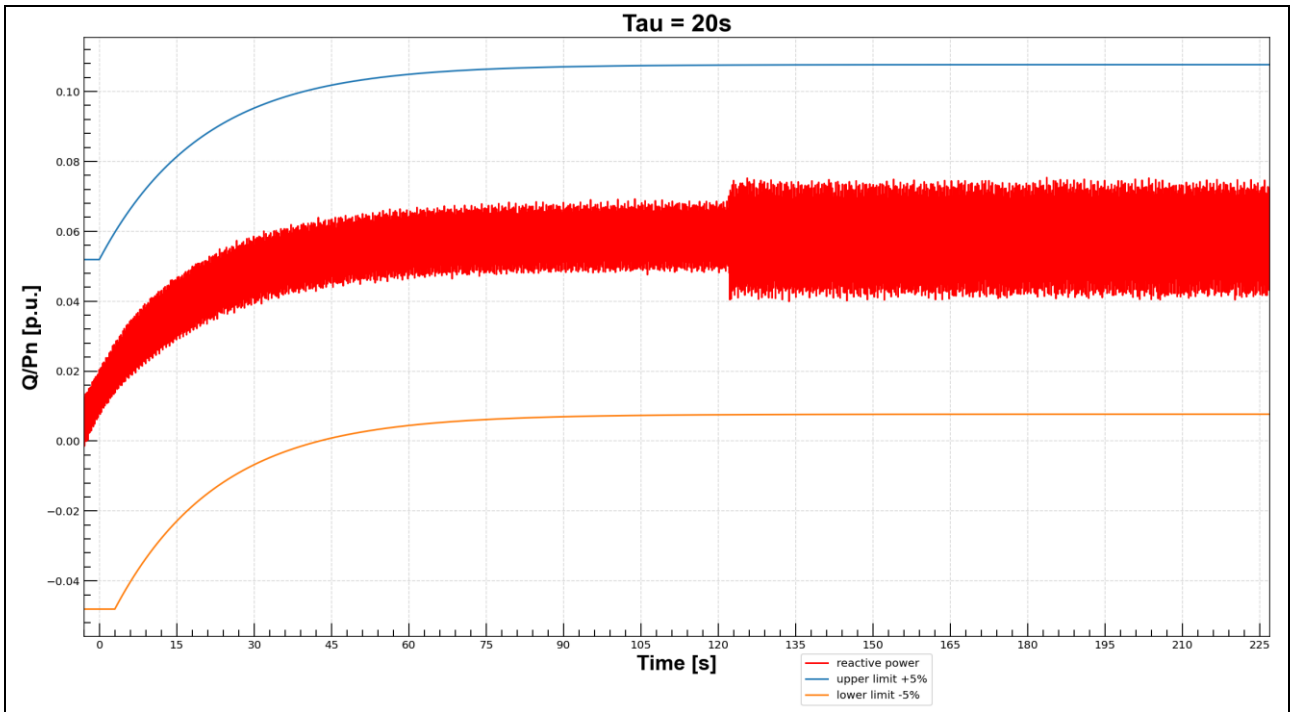
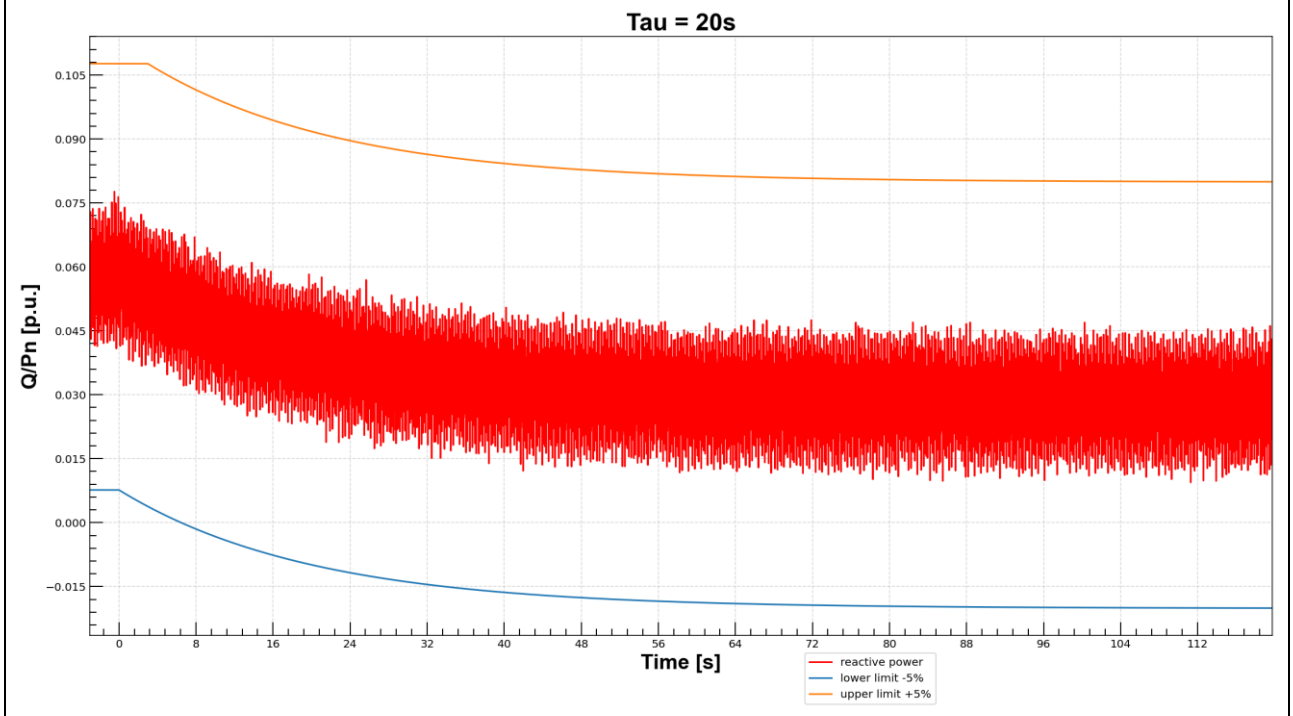


Q/Pn = 0 → Q/Pn = 0.06



Q/Pn = 0.06 → Q/Pn = 0.03

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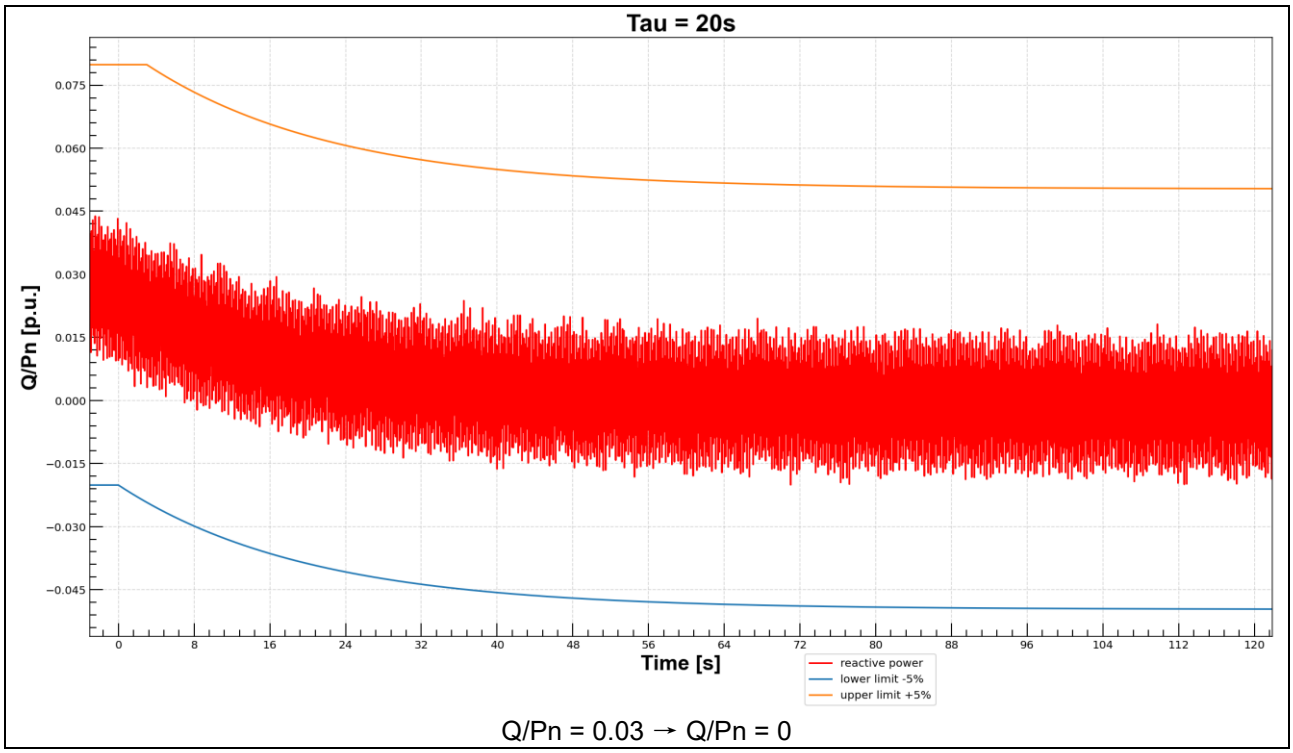

Q/Pn = 0.03 → Q/Pn = 0

5.5.2.5	Test for power related control modes for reactive power			P
Test at	Temperature (°C):	25	Humidity (%)	45
Means for the settings of the function or enabling and disabling of the function	password			
Characteristic configuration	☒ EN 50549-10:2022 (settings a, b, c in Table 19 and 20)			
Conformity to	☐ EN 50549-1:2019 ☒ EN 50549-2:2019 ☐ specific grid code_____			

Table 19 — Q (P) or cos φ (P) characteristic configuration

parameter of characteristic	Setting (a)	Setting (b)	Setting (c)
minimum and maximum reactive power (Cos Φ [b]) of the characteristic $Q_{max\ char}$ [a]	≥ 95 % of $Q_{max\ over}$ and $Q_{max\ under}$ respectively but not more than 60 % P_n	10 % of $Q_{max\ over}$ and $Q_{max\ under}$ respectively	$Q_{max\ char\ over}$ = 0 %P_n $Q_{max\ char\ over}$ = 33 %P_n
Slope of the steepest section of the characteristic curve [a]	as steep as configurable, but not more than 200 %Q_{max} / 10 %P_n	as flat as configurable, but not less than 2 %Q_{max} / 10 %P_n	0 below 50 %P_n; 20 %Q_{max}/10 %P_n above 50 %P_n
Time constant	as fast as possible but not slower than 3 s	as slow as possible but not slower than 20 s [c]	3,33 s

Table 20 — cos φ (P) optional additional parameter configuration if applicable

parameter	Setting (a)	Setting (b)	
Lock-in voltage	deactivated	105 %U_n	
Lock-out voltage	deactivated	100 %U_n	

☐ specific grid code_____

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Test procedure for quasi-stationary behaviour

1) Operate the EUT at 10 % P_n or minimum regulating level, whichever is the higher, at a grid voltage of 100 % U_n. Record reactive power, active power, active factor and grid voltage.
2) Increase the active power (not more than 10 % P_n) and wait for EUT active and reactive power to stabilize. Record reactive power, active power, active factor and grid voltage.
3) Repeat step 2) in a way that at least two measurements are taken for each linear section of the characteristic curve until S_{max} is reached.
4) Decrease the power (not more than 10 % P_n) and wait for EUT active and reactive power to stabilize. Record reactive power, active power, active factor and grid voltage.
5) Repeat step 4) in a way that at least two measurements are taken for each linear section of the characteristic curve down to 10 % P_n or minimum regulating level, whichever is the higher.

Test procedure for dynamic behaviour:

1) Operate the EUT at an active power of 20 % P_n. Record reactive power, active power, active factor and grid voltage.
2) Increase active power to 50 %P_n ± 10 %P_n and record active power, reactive power, active factor.
3) Increase active power to 90 %P_n ± 10 %P_n and record active power, reactive power, active factor.

If an optional Lock-in and Lock-Out voltage level is configured, this may be tested by adding additional steps.

a) Reduce voltage 2 %Un below the configured Lock-in voltage level but above the configured Lock-out power; keep voltage and power stable until reactive power has stabilized.
b) Reduce active power 2 %Un below the configured Lock-out voltage level and keep voltage and power stable until reactive power has stabilized.
c) Increase voltage 2 %Pn above the configured Lock-in voltage level and keep voltage and power stable until reactive power has stabilized.
d) Increase voltage to Un and keep voltage and power stable until reactive power has stabilized.

4) Decrease active power to 50 %P_n ± 10 % P_n and record active power, reactive power, active factor.
5) Decrease active power to 20 %P_n ± 10 % P_n and record active power, reactive power, active factor.

Cos ϕ (P) curve for steady-state behaviour

Test characteristic configuration setting (a) with additional parameter setting (a)

Cos ϕ (P) settings	**Setpoints**	P1	P2	P3	P4
	P/Pn [%]	15	20	80	90
	Cos ϕ	0.8	1.0	1.0	0.8
	Qmax over on characteristic curve	0.6			Q/Pn [p.u.]
	Qmax under on characteristic curve	0.6			Q/Pn [p.u.]
	Time constant	3			[s]
	Lock-in voltage	deactivated			[V]
	Lock-out voltage	deactivated			[V]

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		Slope of the steepest section of the characteristic curve								200 %Q_{max} / 10 %P_n (<20%Pn); 100 %Q_{max} / 10 %P_n (>80%Pn);	
Test conditions		Voltage	Set point value	Measured value (30s average)				Deviation (Measure value – Set point)		Active factor	Deviation limit
U/Un [%]	P/Pn [p.u.]	[p.u.]	Cos φ	W	P_{30}/Pn [p.u.]	VAr	Q_{30}/Pn [p.u.]	VAr	Q/Pn [p.u.]	Cos φ	Q/Pn [p.u.]
100	0.1	1.00	0.8	35289	0.101	26183	0.075	-417	-0.001	0.803	0.02
100	0.15	1.00	0.8	52588	0.15	39037	0.112	-513	-0.001	0.803	0.02
100	0.2	1.00	1	69854	0.2	1675	0.005	1675	0.005	0.999	0.02
100	0.3	1.00	1	104545	0.299	-140	0	-140	0.000	1.000	0.02
100	0.4	1.00	1	139229	0.398	-173	0	-173	0.000	1.000	0.02
100	0.5	1.00	1	173942	0.497	-169	0	-169	0.000	1.000	0.02
100	0.6	1.00	1	208649	0.596	-176	-0.001	-176	-0.001	1.000	0.02
100	0.7	1.00	1	243426	0.696	-200	-0.001	-200	-0.001	1.000	0.02
100	0.8	1.00	1	278271	0.795	-6853	-0.02	-6853	-0.020	1.000	0.02
100	0.9	1.00	0.8	301684	0.862	-172071	-0.492	-5821	-0.017	0.869	0.02
100	1.0	1.00	0.8	301698	0.862	-172112	-0.492	-5862	-0.017	0.869	0.02
100	0.9	1.00	0.8	301715	0.862	-172117	-0.492	-5867	-0.017	0.869	0.02
100	0.8	1.00	1	278238	0.795	-7114	-0.02	-7114	-0.020	1.000	0.02
100	0.7	1.00	1	243369	0.695	-199	-0.001	-199	-0.001	1.000	0.02
100	0.6	1.00	1	208592	0.596	-177	-0.001	-177	-0.001	1.000	0.02
100	0.5	1.00	1	173886	0.497	-177	-0.001	-177	-0.001	1.000	0.02
100	0.4	1.00	1	139193	0.398	-183	-0.001	-183	-0.001	1.000	0.02
100	0.3	1.00	1	104525	0.299	-148	0	-148	0.000	1.000	0.02
100	0.2	1.00	1	69850	0.2	1922	0.005	1922	0.005	0.999	0.02
100	0.15	1.00	0.8	52542	0.15	39029	0.112	-521	-0.001	0.803	0.02
100	0.1	1.00	0.8	35239	0.101	26156	0.075	-444	-0.001	0.803	0.02

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Test characteristic configuration setting (c) with additional parameter setting (a)											
Cos ϕ (P) settings	**Setpoints**	P1	P2	P3	P4						
	P/Pn [%]	0	50	100	100						
	Cos ϕ	1.0	1.0	0.95	0.95						
	Qmax over on characteristic curve	0.3			Q/Pn [p.u.]						
	Qmax under on characteristic curve	0.3			Q/Pn [p.u.]						
	Time constant	3.33			[s]						
	Lock-in voltage	deactivated			[%Un]						
	Lock-out voltage	deactivated			[%Un]						
	Slope of the steepest section of the characteristic curve				20 %Q_{max} / 10 %P_n (>50%Pn)						

Test conditions		Voltage	Set point value	Measured value (30s average)				Deviation (Measure value – Set point)		Active factor	Deviation limit
U/Un [%]	P/Pn [p.u.]	[p.u.]	Cos φ	W	P_{30}/Pn [p.u.]	Q/Pn [p.u.]	Q_{30}/Pn [p.u.]	VAr	Q/Pn [p.u.]	Cos φ	Q/Pn [p.u.]
100	0.1	1.00	1	35197	0.101	-58	0.000	-58	0.000	1.000	0.02
100	0.2	1.00	1	69911	0.200	-82	0.000	-82	0	1.000	0.02
100	0.3	1.00	1	104589	0.299	-164	0.000	-164	0	1.000	0.02
100	0.4	1.00	1	139207	0.398	-183	-0.001	-183	-0.001	1.000	0.02
100	0.5	1.00	1	173908	0.497	-1137	-0.003	-1137	-0.003	1.000	0.02
100	0.6	1.00	0.99	208612	0.596	-29948	-0.086	-898	-0.003	0.990	0.02
100	0.7	1.00	0.98	243408	0.695	-49766	-0.142	-1116	-0.003	0.980	0.02
100	0.8	1.00	0.97	278283	0.795	-70273	-0.201	-973	-0.003	0.970	0.02
100	0.9	1.00	0.96	313260	0.895	-92183	-0.263	-1533	-0.004	0.959	0.02
100	1.0	1.00	0.95	331787	0.948	-104288	-0.298	-1388	-0.004	0.954	0.02

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100	0.9	1.00	0.96	313249	0.895	-92212	-0.263	-1562	-0.004	0.959	0.02
100	0.8	1.00	0.97	278260	0.795	-70276	-0.201	-976	-0.003	0.970	0.02
100	0.7	1.00	0.98	243355	0.695	-49759	-0.142	-1109	-0.003	0.980	0.02
100	0.6	1.00	0.99	208563	0.596	-29950	-0.086	-900	-0.003	0.990	0.02
100	0.5	1.00	1	173865	0.497	-1173	-0.003	-1173	-0.003	1.000	0.02
100	0.4	1.00	1	139184	0.398	-184	-0.001	-184	-0.001	1.000	0.02
100	0.3	1.00	1	104519	0.299	-152	0.000	-152	0	1.000	0.02
100	0.2	1.00	1	69844	0.200	-71	0.000	-71	0	1.000	0.02
100	0.1	1.00	1	35195	0.101	-64	0.000	-64	0.000	1.000	0.02

Test characteristic configuration setting (c) with additional parameter setting (b)

Cos ϕ (P) settings	**Setpoints**	P1	P2	P3	P4
	P/Pn [%]	0	50	100	100
	Cos ϕ	1.0	1.0	0.95	0.95
	Qmax over on characteristic curve	0.3			Q/Pn [p.u.]
	Qmax under on characteristic curve	0.3			Q/Pn [p.u.]
	Time constant	3.33			[s]
	Lock-in voltage	105			[%Un]
	Lock-out voltage	100			[%Un]
	Slope of the steepest section of the characteristic curve				20 %Q_{max} / 10 %P_n (>50%Pn)

Test conditions		Voltage	Set point value	Measured value (30s average)				Deviation (Measure value – Set point)		Active factor	Deviation limit
U/Un [%]	P/Pn [p.u.]	[p.u.]	Cos φ	W	P_{30}/Pn [p.u.]	VAr	Q_{30}/Pn [p.u.]	VAr	Q/Pn [p.u.]	Cos φ	Q_{30}/Pn [p.u.]
100	0.1	1.00	1	35234	0.101	-62	0.000	-62	0	0.999	0.02

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100	0.2	1.00	1	69913	0.200	-73	0.000	-73	0	1.000	0.02
100	0.3	1.00	1	104544	0.299	-144	0.000	-144	0	1.000	0.02
100	0.4	1.00	1	139220	0.398	-172	0.000	-172	0	1.000	0.02
100	0.5	1.00	1	173911	0.497	-1091	-0.003	-1091	-0.003	1.000	0.02
103	0.6	1.03	1	207730	0.594	149	0.000	149	0	1.000	0.02
107	0.6	1.07	0.99	208723	0.596	-29581	-0.085	-531	-0.002	0.990	0.02
107	0.7	1.07	0.98	243511	0.696	-49396	-0.141	-396	-0.001	0.980	0.02
107	0.8	1.07	0.97	278385	0.795	-69911	-0.200	-611	-0.002	0.970	0.02
107	0.9	1.07	0.96	313350	0.895	-91791	-0.262	-1141	-0.003	0.960	0.02
107	1.0	1.07	0.95	332451	0.950	-104410	-0.298	-1160	-0.003	0.954	0.02
102	1.0	1.02	0.95	332638	0.950	-104781	-0.299	-1531	-0.004	0.954	0.02
98	1.0	0.98	1	341991	0.977	-522	-0.001	-522	-0.001	1.000	0.02
102	1.0	1.02	1	347332	0.992	-281	-0.001	-281	-0.001	1.000	0.02
107	1.0	1.07	0.95	332452	0.950	-104402	-0.298	-1152	-0.003	0.954	0.02
107	0.9	1.07	0.96	313310	0.895	-91750	-0.262	-1100	-0.003	0.960	0.02
107	0.8	1.07	0.97	278273	0.795	-69860	-0.200	-560	-0.002	0.970	0.02
107	0.7	1.07	0.98	243380	0.695	-49366	-0.141	-716	-0.002	0.980	0.02
107	0.6	1.07	0.99	208606	0.596	-29559	-0.084	-509	-0.001	0.990	0.02
103	0.6	1.03	0.99	208564	0.596	-29762	-0.085	-712	-0.002	0.990	0.02
100	0.5	1.00	1	173842	0.497	-899	-0.003	-899	-0.003	1.000	0.02
100	0.4	1.00	1	139165	0.398	-188	-0.001	-188	-0.001	1.000	0.02
100	0.3	1.00	1	104502	0.299	-157	0.000	-157	0	1.000	0.02
100	0.2	1.00	1	69838	0.200	-74	0.000	-74	0	1.000	0.02
100	0.1	1.00	1	35191	0.101	-66	0.000	-66	0	0.999	0.02

Q (P) curve for steady-state behaviour

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Test characteristic configuration setting (a)												
Q (P) settings	**Setpoints**	P1	P2	P3	P4							
	P/Pn [%]	15	20	80	90							
	Q/Pn [%]	0.6	0	0	0.6							
	Qmax over on characteristic curve	0.6			Q/Pn [p.u.]							
	Qmax under on characteristic curve	0.6			Q/Pn [p.u.]							
	Time constant	3 s			[s]							
	Slope of the steepest section of the characteristic curve				200 %Q_{max} / 10 %P_n (<20%Pn); 100 %Q_{max} / 10 %P_n (>80%Pn);							

Test conditions		Voltage	Set point value		Measured value (30s average)				Deviation (Measure value – Set point)		Active factor	Deviation limit
U/Un [%]	P/Pn [p.u.]	[p.u.]	VAr	Q/Pn [p.u.]	W	P_{30}/Pn [p.u.]	VAr	Q_{30}/Pn [p.u.]	VAr	Q_{30}/Pn [p.u.]	Cos φ	kVAr
100	0.1	1.0	210000	0.6	35275	0.101	211236	0.604	1236	0.004	0.165	0.02
100	0.15	1.0	210000	0.6	52630	0.15	209038	0.597	-962	-0.003	0.244	0.02
100	0.2	1.0	0	0	69870	0.2	4439	0.013	4439	0.013	0.998	0.02
100	0.3	1.0	0	0	104556	0.299	3551	0.01	3551	0.010	0.999	0.02
100	0.4	1.0	0	0	139242	0.398	4004	0.011	4004	0.011	1.000	0.02
100	0.5	1.0	0	0	173947	0.497	4376	0.013	4376	0.013	1.000	0.02
100	0.6	1.0	0	0	208639	0.596	4920	0.014	4920	0.014	1.000	0.02
100	0.7	1.0	0	0	243416	0.695	5389	0.015	5389	0.015	1.000	0.02
100	0.8	1.0	0	0	278251	0.795	5838	0.017	5838	0.017	1.000	0.02
100	0.9	1.0	-169167	-0.483	306129	0.875	-164186	-0.469	4981	0.014	0.881	0.02
100	1.0	1.0	-169167	-0.483	306152	0.875	-163685	-0.468	5482	0.016	0.881	0.02

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100	0.9	1.0	-169167	-0.483	306209	0.875	-164265	-0.469	4902	0.014	0.881	0.02
100	0.8	1.0	0	0	278222	0.795	5793	0.017	5793	0.017	1.000	0.02
100	0.7	1.0	0	0	243345	0.695	5336	0.015	5336	0.015	1.000	0.02
100	0.6	1.0	0	0	208572	0.596	4909	0.014	4909	0.014	1.000	0.02
100	0.5	1.0	0	0	173874	0.497	4367	0.012	4367	0.012	1.000	0.02
100	0.4	1.0	0	0	139185	0.398	4031	0.012	4031	0.012	1.000	0.02
100	0.3	1.0	0	0	104519	0.299	3517	0.01	3517	0.010	0.999	0.02
100	0.2	1.0	0	0	69850	0.2	4311	0.012	4311	0.012	0.998	0.02
100	0.15	1.0	210000	0.6	52624	0.15	208776	0.597	-1224	-0.003	0.245	0.02
100	0.1	1.0	210000	0.6	35262	0.101	211245	0.604	1245	0.004	0.165	0.02

Test characteristic configuration setting (c)

Q (P) settings	**Setpoints**	P1	P2	P3	P4
	P/Pn [%]	0	50	100	100
	Q/Pn [%]	0	0	33	33
	Qmax over on characteristic curve	0.33			Q/Pn [p.u.]
	Qmax under on characteristic curve	0.33			Q/Pn [p.u.]
	Time constant	3.33			[s]
	Slope of the steepest section of the characteristic curve				20 %Q_{max} / 10 %P_n (>50%Pn)

Test conditions		Voltage	Set point value		Measured value (30s average)				Deviation (Measure value – Set point)		Active factor	Deviation limit
U/Un [%]	P/Pn [p.u.]	[p.u.]	VAr	Q/Pn [p.u.]	W	P_{30}/Pn [p.u.]	VAr	Q_{30}/Pn [p.u.]	VAr	Q_{30}/Pn [p.u.]	Cos φ	VAr
100	0.1	1.0	0	0	35258	0.101	-4344	-0.012	-4344	-0.012	0.992	0.02
100	0.2	1.0	0	0	69919	0.2	-4209	-0.012	-4209	-0.012	0.998	0.02

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100	0.3	1.0	0	0	104540	0.299	-3927	-0.011	-3927	-0.011	0.999	0.02
100	0.4	1.0	0	0	139208	0.398	-4109	-0.012	-4109	-0.012	1.000	0.02
100	0.5	1.0	0	0	173918	0.497	-4439	-0.013	-4439	-0.013	1.000	0.02
100	0.6	1.0	-0.066	-23100	208616	0.596	-23654	-0.068	-554	-0.002	0.994	0.02
100	0.7	1.0	-0.132	-46200	243397	0.695	-46495	-0.133	-295	-0.001	0.982	0.02
100	0.8	1.0	-0.198	-69300	278255	0.795	-69600	-0.199	-300	-0.001	0.970	0.02
100	0.9	1.0	-0.264	-92400	313190	0.895	-92872	-0.265	-472	-0.001	0.959	0.02
100	1.0	1.0	-0.3	-105000	331666	0.948	-105124	-0.30	-124	0.000	0.953	0.02
100	0.9	1.0	-0.264	-92400	313172	0.895	-92867	-0.265	-467	-0.001	0.959	0.02
100	0.8	1.0	-0.198	-69300	278224	0.795	-69602	-0.199	-302	-0.001	0.970	0.02
100	0.7	1.0	-0.132	-46200	243333	0.695	-46519	-0.133	-319	-0.001	0.982	0.02
100	0.6	1.0	-0.066	-23100	208554	0.596	-23684	-0.068	-584	-0.002	0.994	0.02
100	0.5	1.0	0	0	173871	0.497	-4417	-0.013	-4417	-0.013	1.000	0.02
100	0.4	1.0	0	0	139187	0.398	-4071	-0.012	-4071	-0.012	1.000	0.02
100	0.3	1.0	0	0	104520	0.299	-3887	-0.011	-3887	-0.011	0.999	0.02
100	0.2	1.0	0	0	69855	0.2	-4267	-0.012	-4267	-0.012	0.998	0.02
100	0.1	1.0	0	0	35207	0.101	-4366	-0.012	-4366	-0.012	0.992	0.02

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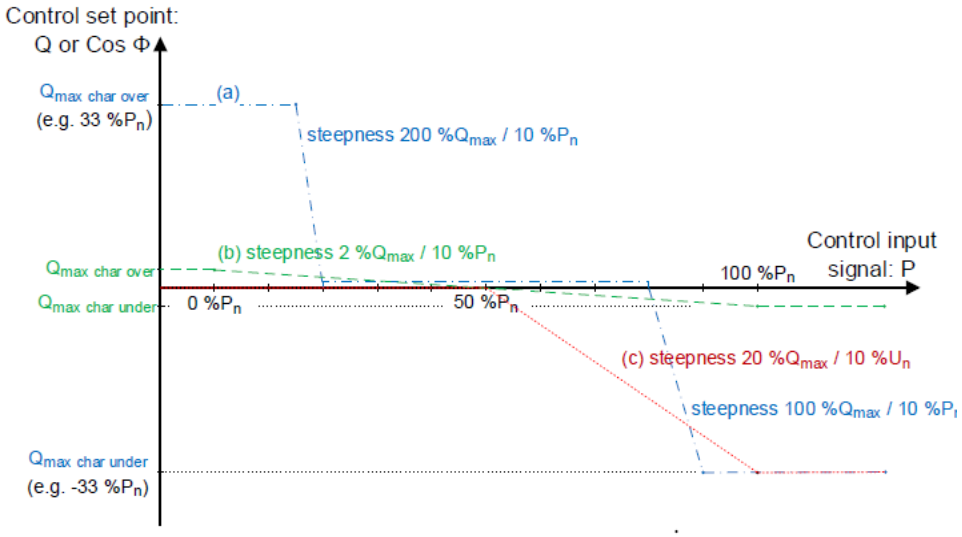

Figure 36 — Q (P) and cos φ (P) and example characteristics for setting (a), (b) and (c) for the test

Cos φ (P) curve for dynamic behaviour									
Test characteristic configuration setting (a) with additional parameter setting (a)									
Cosφ (P) settings	**Setpoints**	P1	P2	P3	P4				
	P/Pn [%]	15	20	80	90				
	Cos ϕ	0.8	1	1	0.8				
	Qmax over on characteristic curve	0.6			Q/Pn [p.u.]				
	Qmax under on characteristic curve	0.6			Q/Pn [p.u.]				
	Time constant	3			[s]				
	Lock-in voltage	deactivated			[V]				
	Lock-out voltage	deactivated			[V]				
	Slope of the steepest section of the characteristic curve				200 %Q_{max} / 10 %P_n (<20%Pn); 100 %Q_{max} / 10 %P_n (>80%Pn);				

Test conditions		Voltage	Set point value	Measured value (30s average)				T_d	T_{sr}	T_s
U/Un [%]	P/Pn [p.u.]	[p.u.]	Cos φ	W	P_{30}/Pn [p.u.]	VAr	Q_{30}/Pn [p.u.]	[s]	[s]	[s]

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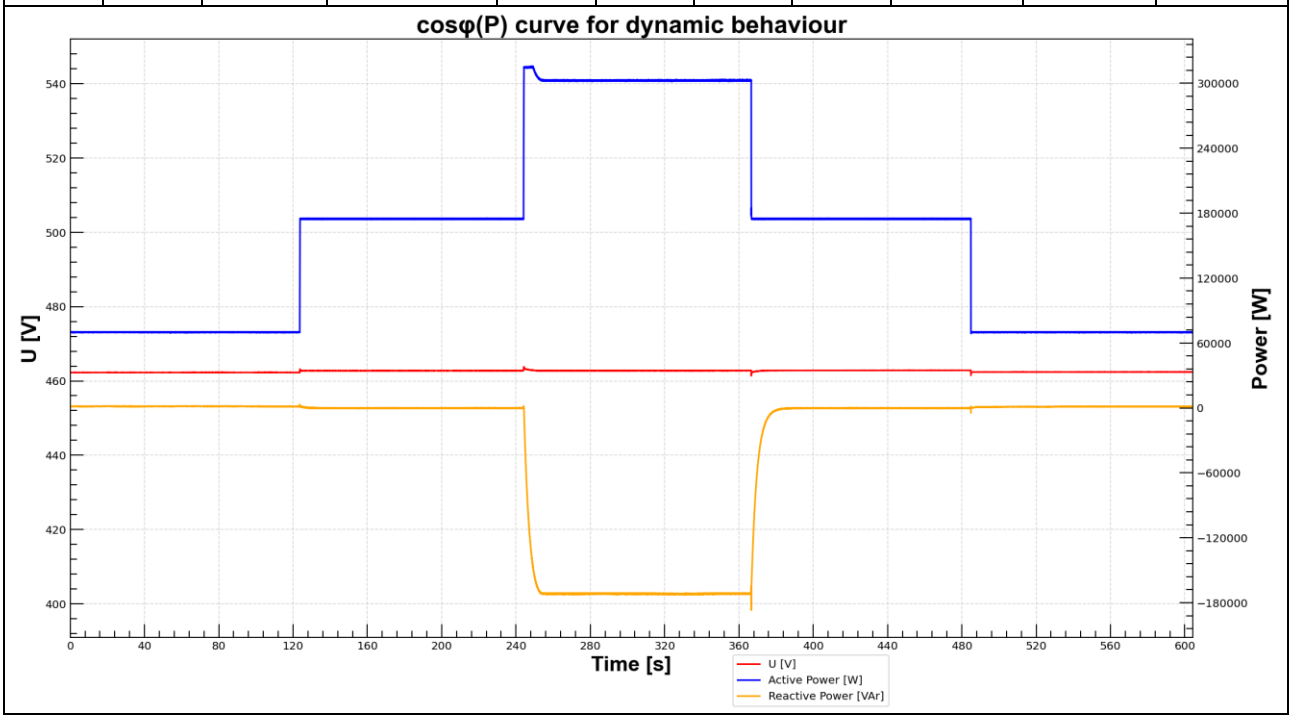
100	0.2	1.00	1	69664	0.199	-77	0	-	-	-
100	0.5	1.00	1	174235	0.498	-260	-0.001	-	-	-
100	0.9	1.00	0.8	302704	0.865	-175116	-0.5	0.8	5.0	5.0
100	0.5	1.00	1	174230	0.498	-252	-0.001	0.4	7.2	7.2
100	0.2	1.00	1	69664	0.199	-49	0	-	-	-



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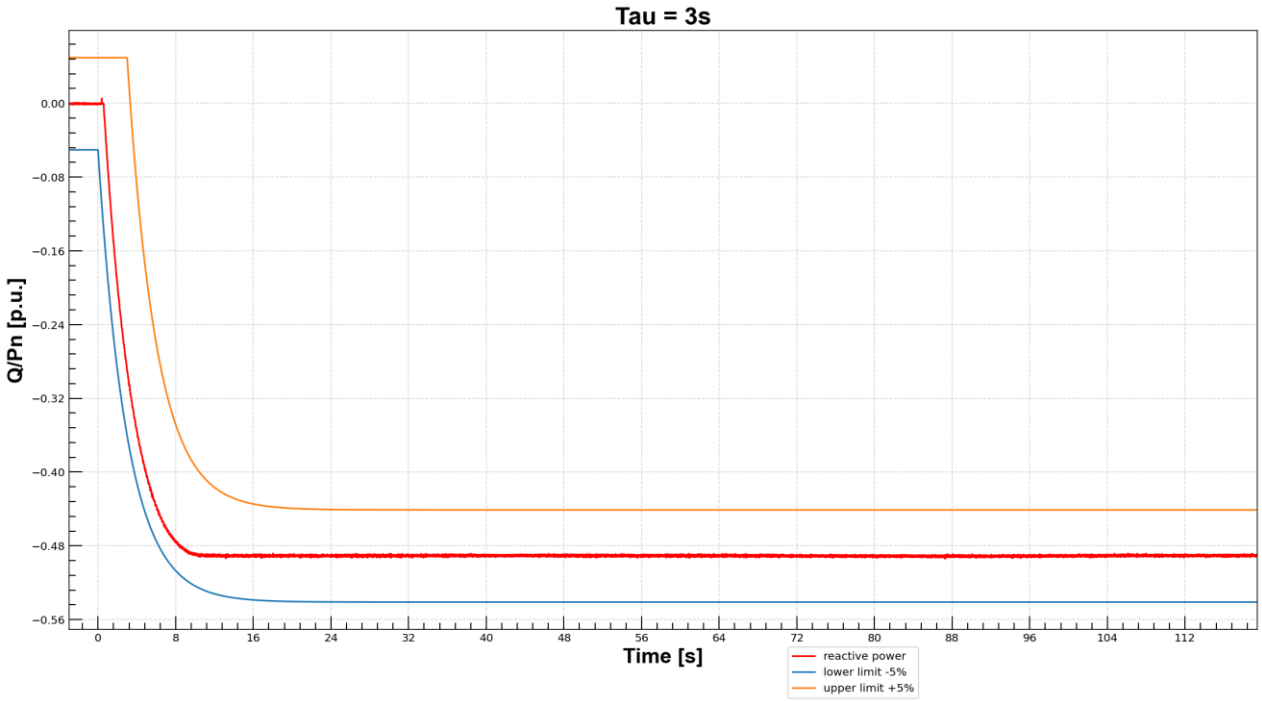
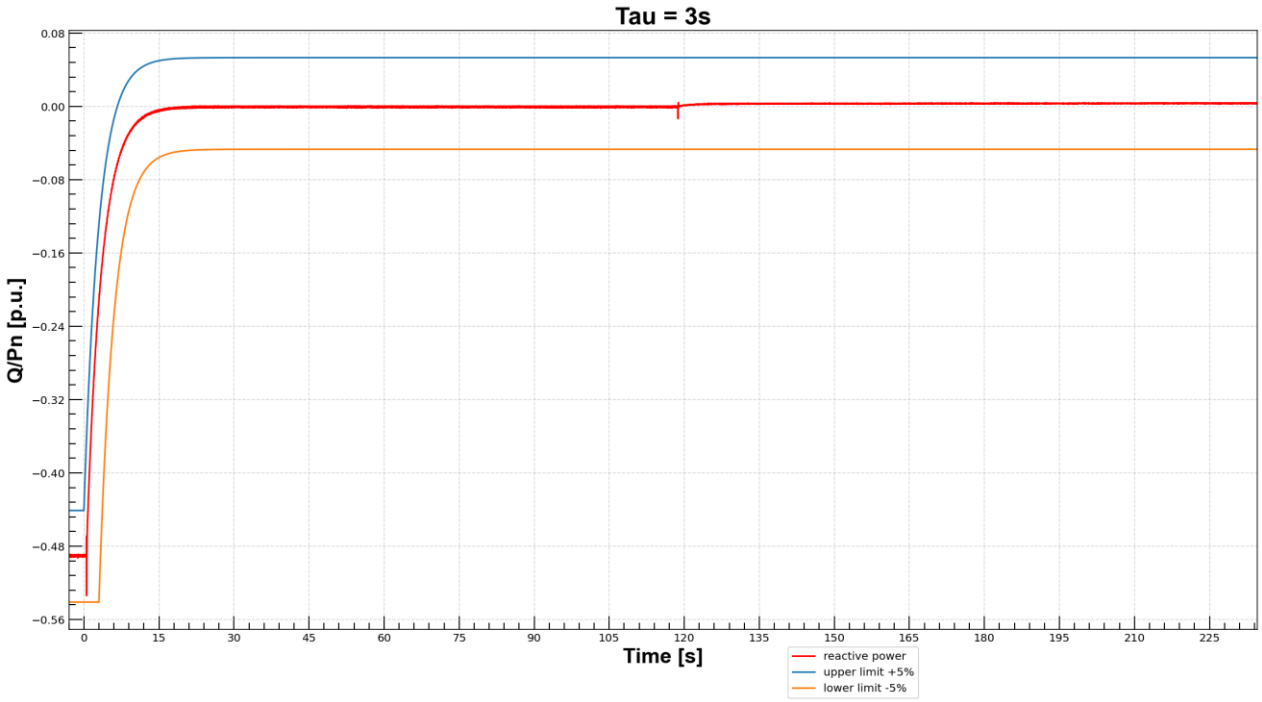


cos φ=1 → cos φ=0.8 under



cos φ=0.8 under → cos φ=1

Test characteristic configuration setting (c) with additional parameter setting (a)

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Cosφ (P) settings	**Setpoints**	P1	P2	P3	P4
	P/Pn [%]	0	50	100	100
	Cos φ	1.0	1.0	0.95	0.95
	Qmax over on characteristic curve	0.33			Q/Pn [p.u.]
	Qmax under on characteristic curve	0.33			Q/Pn [p.u.]
	Time constant	3.33			[s]
	Lock-in voltage	deactivated			[%Un]
	Lock-out voltage	deactivated			[%Un]
	Slope of the steepest section of the characteristic curve				20 %Q_{max} / 10 %P_n (>50%Pn)

Test conditions		Voltage	Set point value	Measured value (30s average)				T_d	T_{sr}	T_s
U/Un [%]	P/Pn [p.u.]	[p.u.]	Cos φ	W	P_{30}/Pn [p.u.]	VAr	Q_{30}/Pn [p.u.]	[s]	[s]	[s]
100	0.2	1.00	1	69855	0.200	-67	0	-	-	-
100	0.5	1.00	1	173919	0.497	-925	-0.003	-	-	-
100	0.9	1.00	0.96	313237	0.895	-92131	-0.263	0.28	7.57	7.57
100	0.5	1.00	1	173905	0.497	-958	-0.003	0.16	8.23	8.23
100	0.2	1.00	1	69854	0.200	-72	0	-	-	-

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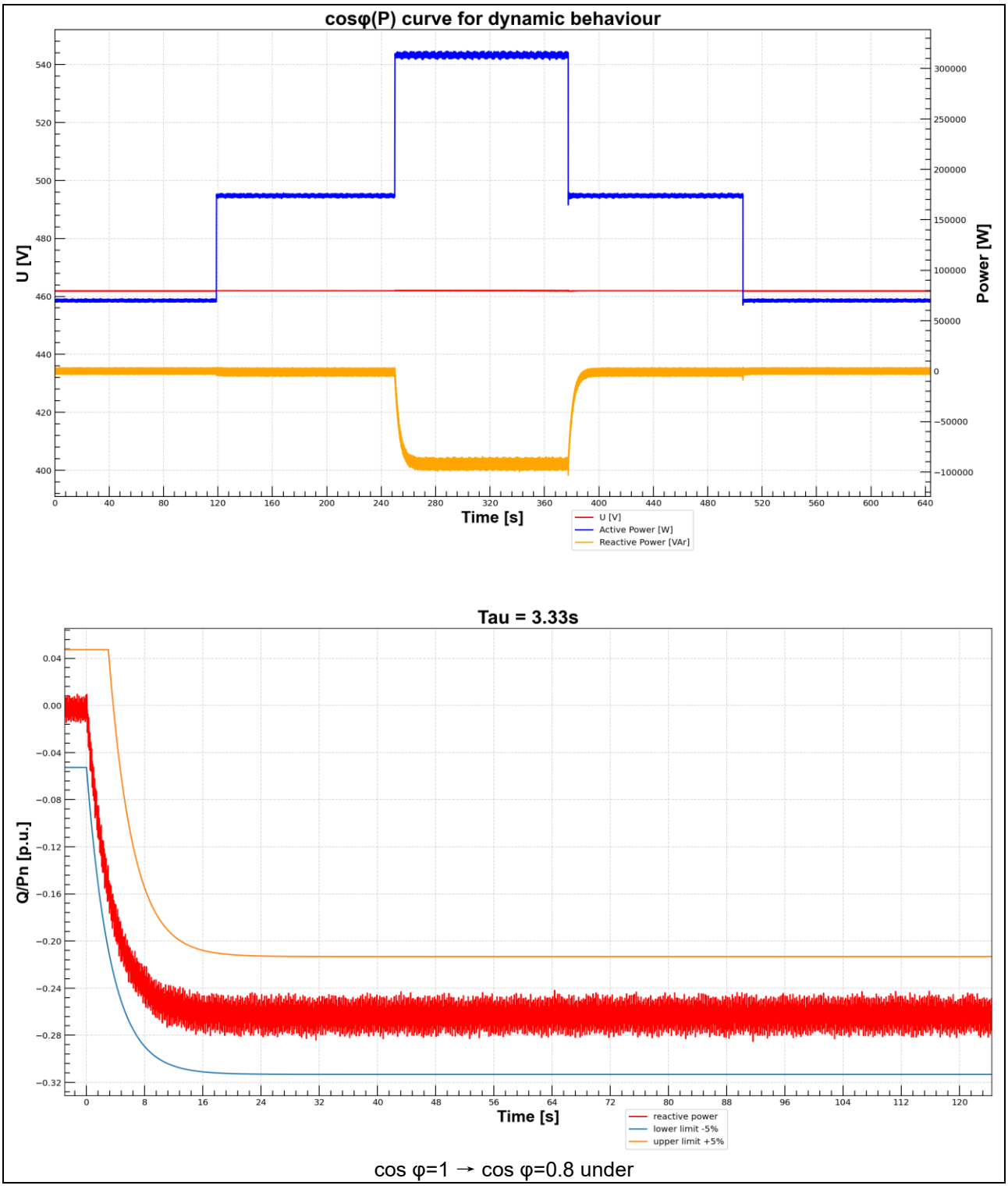

cos φ=1 → cos φ=0.8 under

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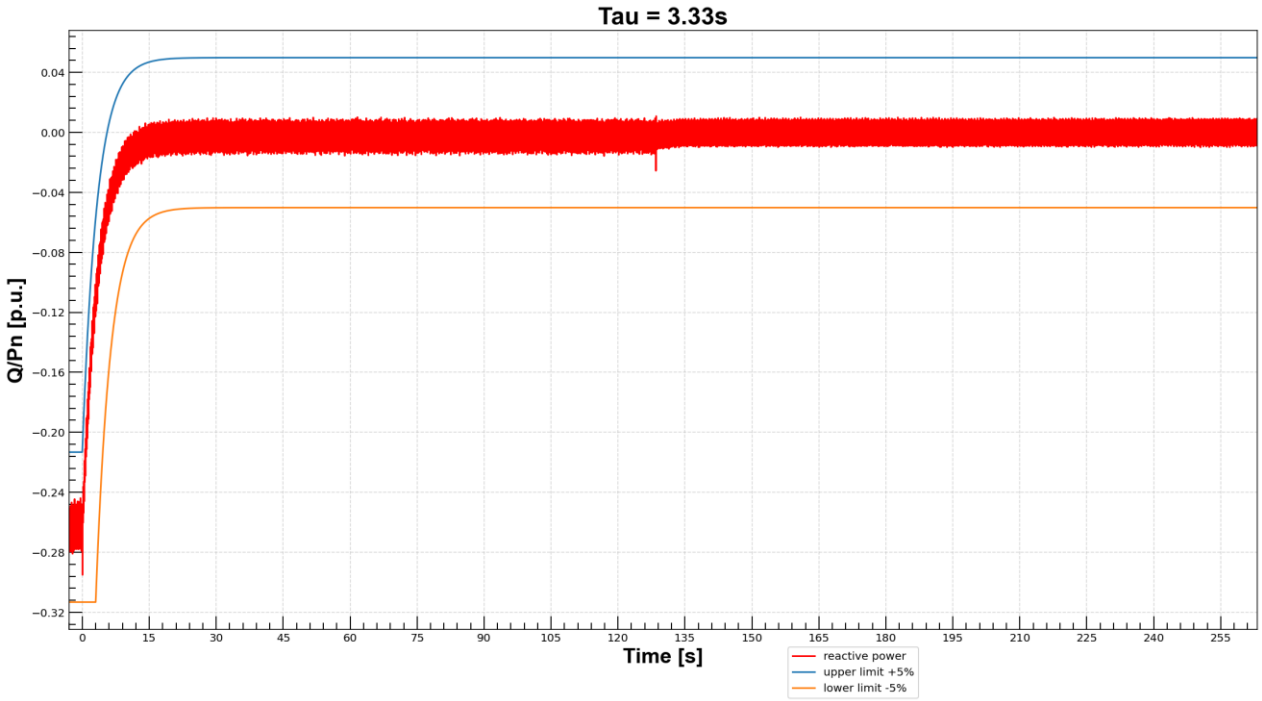

cos φ=0.8 under → cos φ=1

Test characteristic configuration setting (c) with additional parameter setting (b)					
Cosφ (P) settings	**Setpoints**	P1	P2	P3	P4
	P/Pn [%]	0	50	100	100
	Cos φ	1.0	1.0	0.95	0.95
	Qmax over on characteristic curve	0.33			Q/Pn [p.u.]
	Qmax under on characteristic curve	0.33			Q/Pn [p.u.]
	Time constant	3.33			[s]
	Lock-in voltage	105			[%Un]
	Lock-out voltage	100			[%Un]
	Slope of the steepest section of the characteristic curve				20 %Q_{max} / 10 %P_n (>50%Pn)

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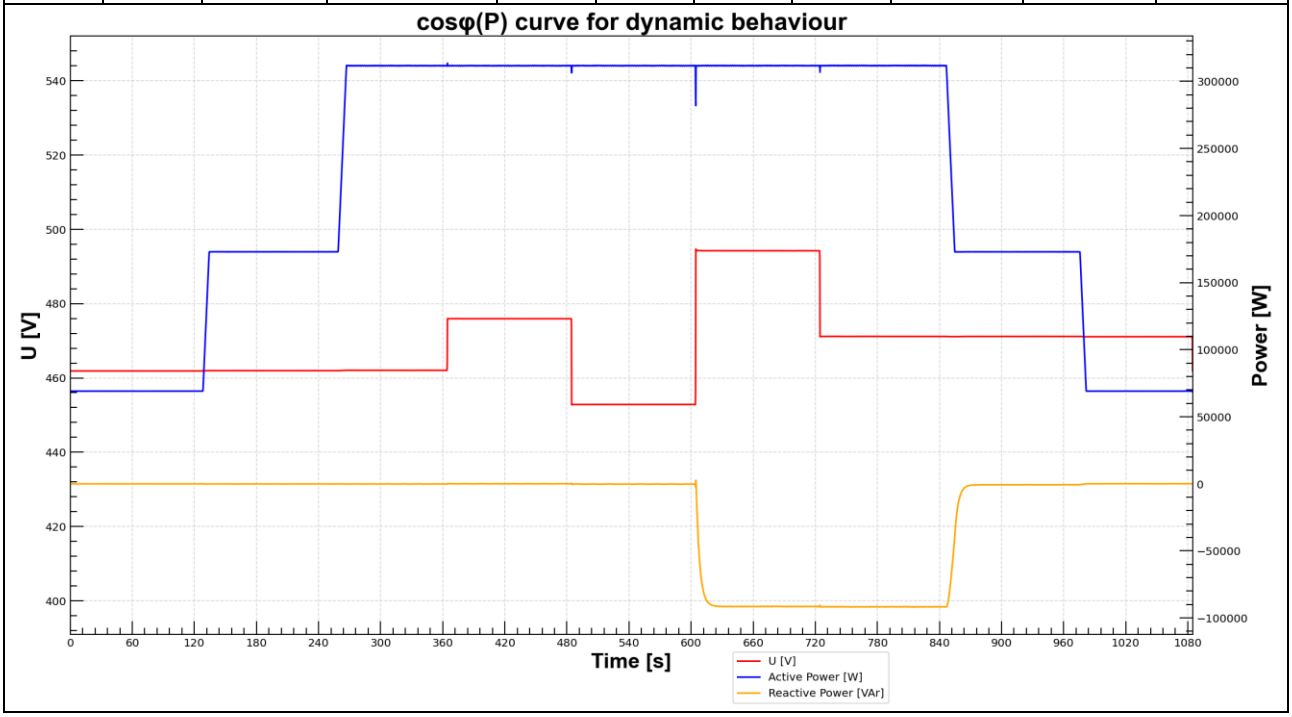
Test conditions		Voltage	Set point value	Measured value (30s average)				T_d	T_{sr}	T_s
U/Un [%]	P/Pn [p.u.]	[p.u.]	Cos φ	W	P_{30}/Pn [p.u.]	VAr	Q_{30}/Pn [p.u.]	[s]	[s]	[s]
100	0.2	1.00	1	69086	0.197	-61	0	-	-	-
100	0.5	1.00	1	172941	0.494	-127	0	-	-	-
100	0.9	1.00	1	311695	0.891	-139	0	-	-	-
103	0.9	1.03	1	311676	0.891	27	0	-	-	-
98	0.9	0.98	1	311701	0.891	-241	-0.001	-	-	-
107	0.9	1.07	0.96	311733	0.891	-91453	-0.261	0.2	8.0	8.0
102	0.9	1.02	0.96	311770	0.891	-91723	-0.262	-	--	--
102	0.5	1.02	1	172914	0.494	-700	-0.002	0.2	12.2	12.2
102	0.2	1.02	1	69077	0.197	49	0	-	-	-



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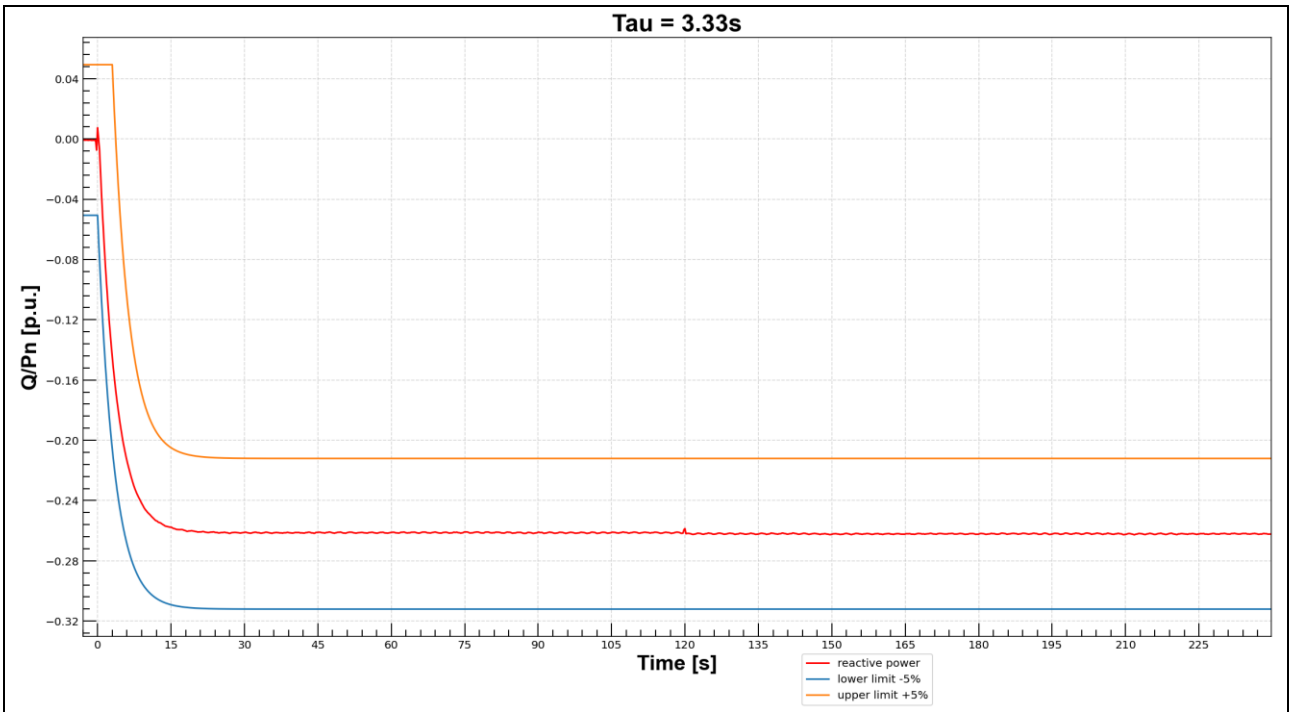
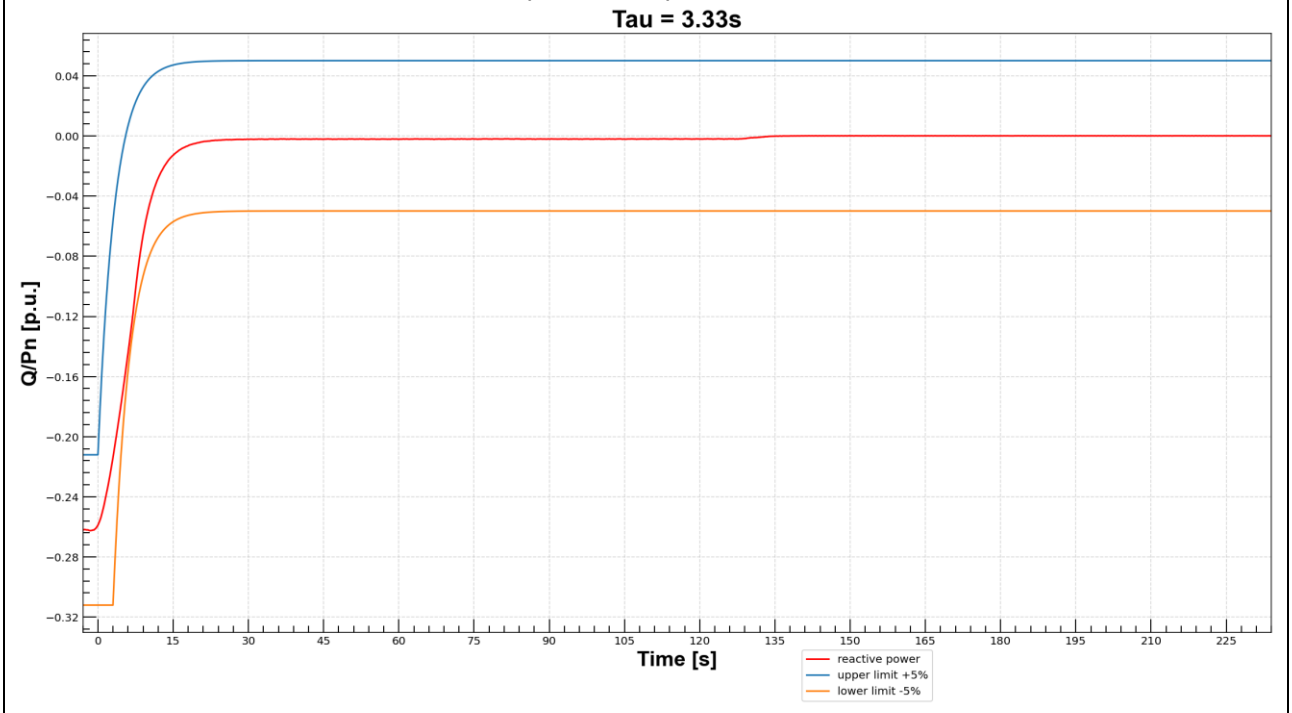


cos φ=1 → cos φ=0.96 under



cos φ=0.96 under → cos φ=1

5.6	**Test for voltage related active power reduction - P(U)**	**P**

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Test at	Temperature (°C):	25	Humidity (%)	45
Means for the settings of the function or enabling and disabling of the function		password		
Function enabled during the testing		Q(U) setting (a) with additional parameter configuration setting (a)		
Conformity to		☐ EN 50549-1:2019 ☒ EN 50549-2:2019 ☐ specific grid code_____		

P (U) settings	**Setpoints**	P1	P2	P3	P4
	P/Pn [%]	100	100	0	--
	U/Un [%]	100	110	115	--
	Time constant	3.33			[s]

Test procedure for steady-state behaviour

1) Operate the EUT at > 90 % P_n at a grid voltage of 100 %U_n.
2) Increase the voltage (not more than 3 %U_n) and wait for EUT active and reactive power to stabilize. Record reactive power, active power, active factor and grid voltage.
3) Repeat step 2) in a way that at least two measurements are taken for each linear section of the characteristic curve until grid voltage has reached 115 %U_n or maximum continuous operating voltage according 5.2.2 whatever is the lower value.
4) Decrease the voltage (not more than 3 %U_n) and wait for EUT active and reactive power to stabilize. Record reactive power, active power, active factor and grid voltage.
5) Repeat step 4) in a way that at least two measurements are taken for each linear section of the characteristic curve until grid voltage has reached 100 %U_n.

Test procedure for dynamic behaviour

1) Operate the EUT at > 90 % P_n at a grid voltage of 100 % U_n.
2) Increase voltage to a voltage value approximately centred in a sloped linear section of the characteristic curve and keep the voltage stable and wait for EUT active and reactive power to stabilize.
3) In case of multiple sloped linear sections in the characteristic curve above U_n repeat step 2) for each linear section.
4) Increase voltage to a voltage value for which the characteristic curve requires the minimum active power of this characteristic curve to be delivered and keep the voltage stable and wait for EUT active and reactive power to stabilize.
5) decrease voltage to a voltage value approximately centred in a sloped linear section of the characteristic curve and keep the voltage stable and wait for EUT active and reactive power to stabilize.
6) In case of multiple sloped linear sections in the characteristic curve above U_n repeat step 2) for each linear section.
7) decrease voltage to U_n and wait for EUT active and reactive power to stabilize.

P (U) curve for steady-state behaviour

Test voltage condition		Voltage	Set point value		Measured value (30-s average)				Deviation (Measure value – Set point)		Deviation limit
U/Un [p.u.]	P/Pn [p.u.]	[p.u.]	W	P/Pn [p.u.]	W	P_{30}/Pn [p.u.]	VAr	Q_{30}/Pn [p.u.]	W	P_{30}/Pn [p.u.]	P/Pn [p.u.]

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1.0	1.0	1.000	350000	1	344450	0.984	-339	-0.001	-5550	-0.016	0.02
1.03	1.0	1.030	350000	1	343639	0.982	-164	0.000	-6361	-0.018	0.02
1.06	1.0	1.061	350000	1	343756	0.982	-17726	-0.051	-6244	-0.018	0.02
1.09	1.0	1.088	280000	0.8	278662	0.796	-210375	-0.601	-1338	-0.004	0.02
1.125	1.0	1.123	189000	0.54	184002	0.526	-211747	-0.605	-4998	-0.014	0.02
1.16	1.0	1.148	0	0	822	0.002	-579	-0.002	822	0.002	0.02
1.125	1.0	1.123	189000	0.54	183794	0.525	-211406	-0.604	-5206	-0.015	0.02
1.09	1.0	1.088	280000	0.8	278720	0.796	-210431	-0.601	-1280	-0.004	0.02
1.06	1.0	1.061	350000	1	344423	0.984	-16702	-0.048	-5577	-0.016	0.02
1.03	1.0	1.030	350000	1	345690	0.988	-168	0.000	-4310	-0.012	0.02
1.00	1.0	1.000	350000	1	344697	0.985	-350	-0.001	-5303	-0.015	0.02

P (U) curve for dynamic behaviour

Test conditions		Measured response behaviour [s]			PT1 response and no discontinuities or oscillations
P/Pn [p.u.]	U/Un [p.u.]	Dead time_ T_d [s]	Response time_ T_{sr} [s]	settling time_ T_s [s]	
1	1	--	--	--	Yes
1	1.125	0.5	7.1	7.1	Yes
1	1.16	0.2	7.6	7.6	Yes
1	1.125	0.2	7.1	7.1	Yes
1	1	0.1	7.7	7.7	Yes

Remark: Graph showing the measured active power, reactive power and grid voltage as 10-period averages, together with the calculated dynamic tolerance bands (see e.g. Figure 32) for each step.

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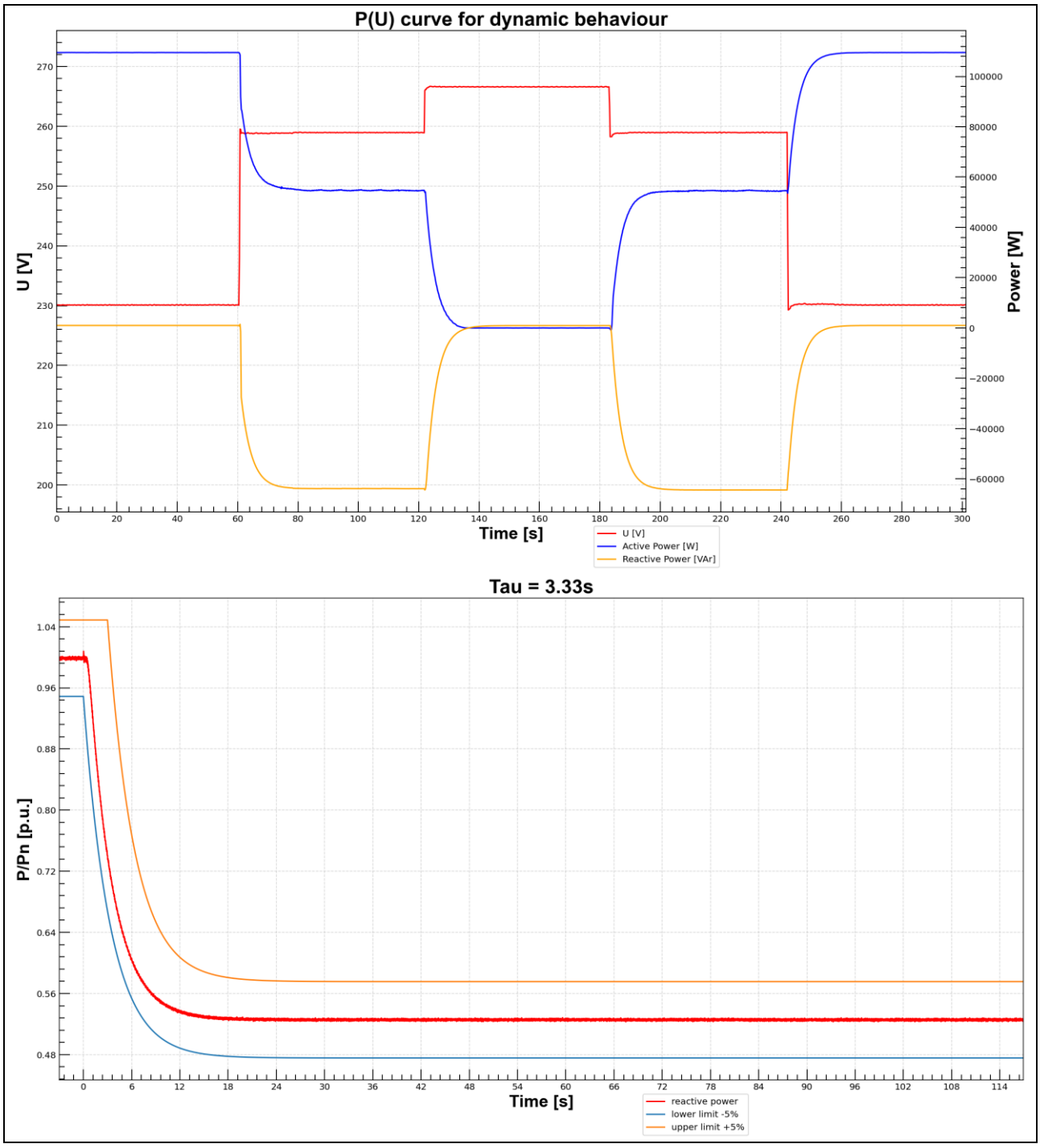

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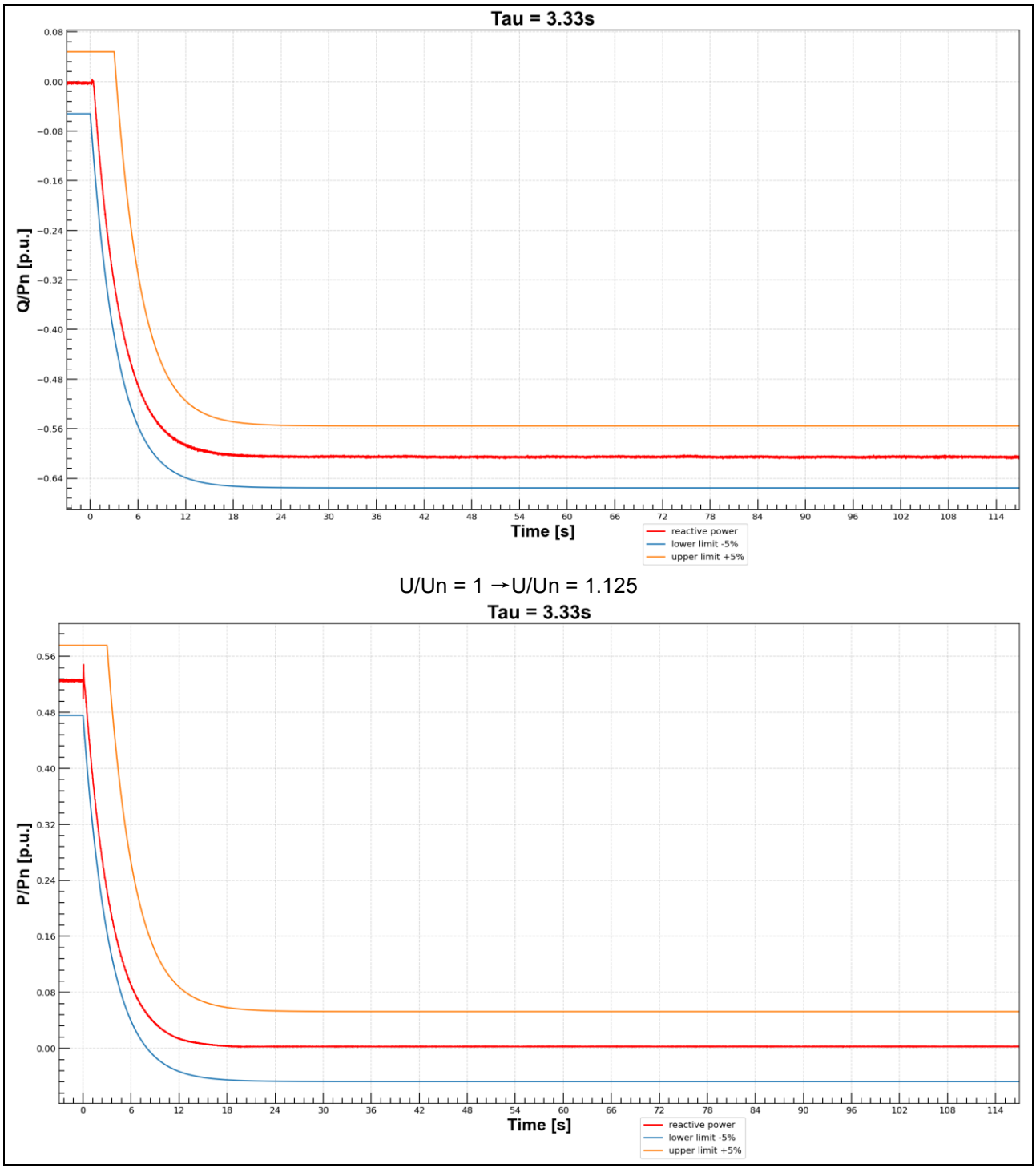

U/Un = 1 →U/Un = 1.125

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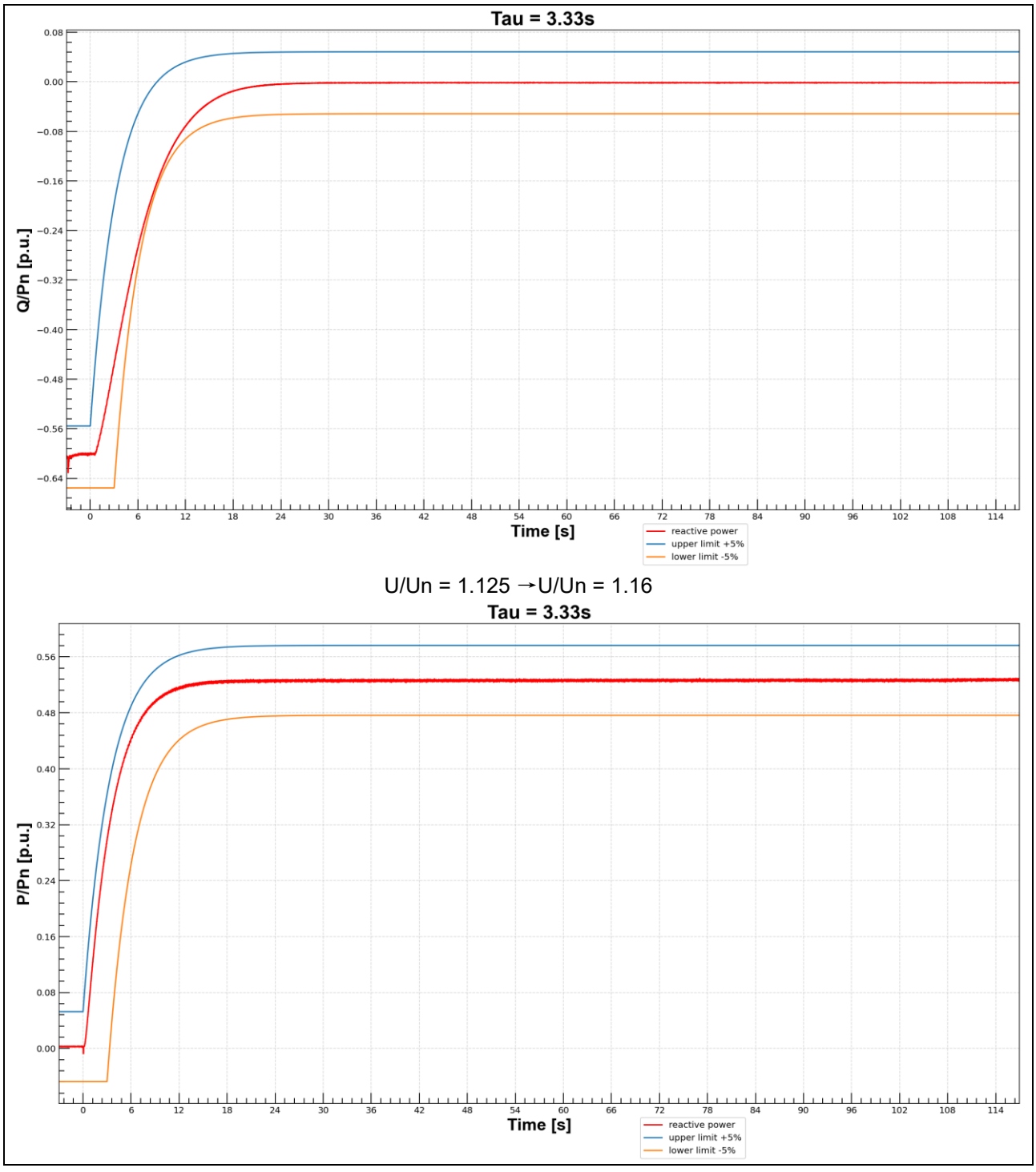

U/Un = 1.125 →U/Un = 1.16

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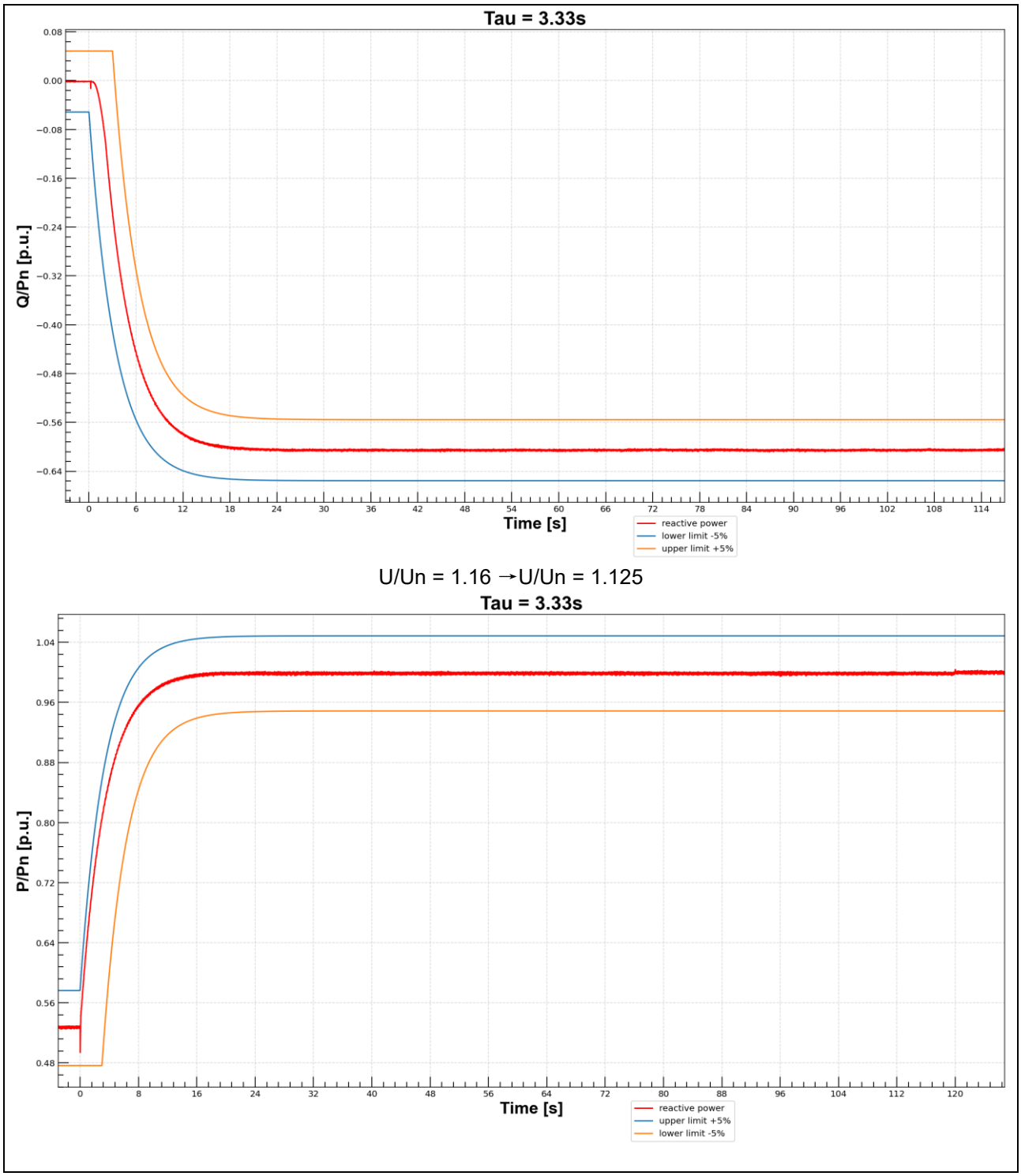

U/Un = 1.16 →U/Un = 1.125

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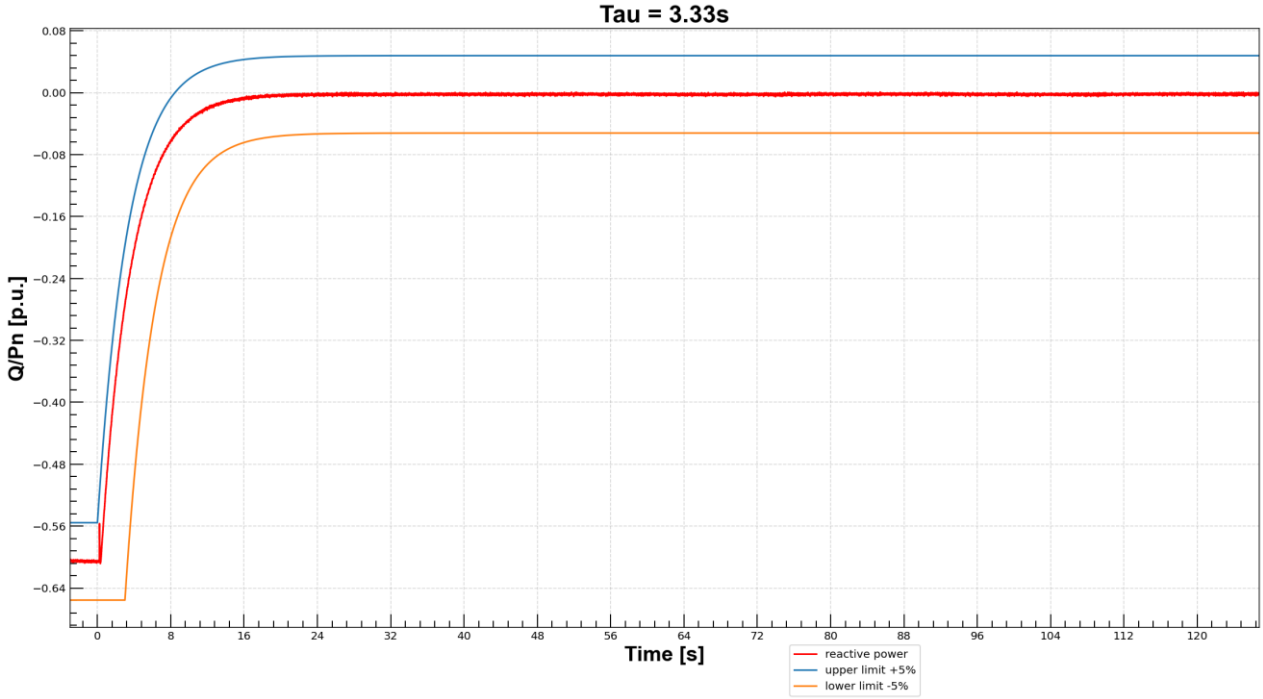

U/Un = 1.125 →U/Un = 1.0

5.7.2.2	Test for harmonics, interharmonics and higher frequencies up to 9 kHz		P
Test at	**Temperature (°C):**	25	**Humidity (%)** 45
Conformity to	☐ EN 61000-3-2 (⩽ 16A) ☐ EN 61000-3-12 (> 16A and ⩽ 75A) ☒ EN 61000-4-7 (> 75A)		

Harmonics (≥75A, IEC 61400-21)

Power P/Pn[%]	0-5	10	20	30	40	50	60	70	80	90	100
Ordinal number	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]
2	0.035	0.044	0.042	0.045	0.049	0.050	0.058	0.066	0.071	0.081	0.104
3	0.072	0.068	0.059	0.058	0.056	0.057	0.058	0.058	0.054	0.053	0.297
4	0.021	0.019	0.024	0.025	0.028	0.027	0.028	0.028	0.030	0.030	0.057
5	0.396	0.822	0.711	0.351	0.161	0.081	0.118	0.173	0.245	0.317	0.413
6	0.014	0.025	0.018	0.021	0.022	0.023	0.022	0.023	0.026	0.028	0.034
7	0.219	0.254	0.279	0.144	0.068	0.214	0.289	0.331	0.358	0.377	0.412

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8	0.013	0.019	0.016	0.015	0.017	0.019	0.022	0.025	0.026	0.030	0.040
9	0.020	0.034	0.033	0.032	0.035	0.037	0.030	0.034	0.041	0.046	0.121
10	0.013	0.014	0.016	0.016	0.017	0.018	0.020	0.022	0.024	0.025	0.027
11	0.228	0.183	0.290	0.054	0.056	0.045	0.128	0.177	0.210	0.232	0.302
12	0.009	0.014	0.016	0.016	0.017	0.015	0.019	0.020	0.022	0.022	0.025
13	0.143	0.067	0.338	0.179	0.104	0.068	0.100	0.144	0.177	0.203	0.210
14	0.007	0.017	0.015	0.015	0.015	0.014	0.018	0.019	0.022	0.022	0.021
15	0.026	0.023	0.036	0.045	0.059	0.070	0.085	0.099	0.114	0.132	0.142
16	0.009	0.014	0.015	0.014	0.015	0.015	0.017	0.017	0.019	0.020	0.020
17	0.147	0.254	0.082	0.208	0.134	0.060	0.064	0.088	0.111	0.134	0.102
18	0.007	0.014	0.014	0.016	0.015	0.014	0.017	0.018	0.019	0.020	0.021
19	0.084	0.155	0.095	0.131	0.099	0.087	0.088	0.101	0.119	0.135	0.169
20	0.007	0.016	0.015	0.014	0.014	0.016	0.015	0.016	0.018	0.020	0.024
21	0.018	0.022	0.035	0.040	0.050	0.061	0.071	0.082	0.096	0.106	0.112
22	0.007	0.014	0.017	0.016	0.016	0.016	0.015	0.018	0.020	0.021	0.022
23	0.106	0.074	0.128	0.097	0.125	0.100	0.070	0.070	0.079	0.080	0.056
24	0.006	0.013	0.012	0.013	0.016	0.015	0.016	0.017	0.021	0.022	0.020
25	0.039	0.062	0.081	0.080	0.058	0.080	0.083	0.076	0.083	0.096	0.136
26	0.007	0.012	0.012	0.013	0.014	0.013	0.014	0.016	0.018	0.019	0.021
27	0.011	0.020	0.021	0.032	0.022	0.026	0.023	0.023	0.024	0.026	0.044
28	0.005	0.014	0.016	0.016	0.016	0.015	0.017	0.019	0.021	0.022	0.020
29	0.072	0.055	0.026	0.079	0.019	0.062	0.042	0.035	0.039	0.036	0.047
30	0.005	0.013	0.013	0.013	0.013	0.014	0.016	0.017	0.019	0.021	0.020
31	0.017	0.078	0.092	0.068	0.064	0.075	0.094	0.086	0.075	0.087	0.084
32	0.006	0.014	0.012	0.013	0.013	0.014	0.015	0.017	0.019	0.020	0.018

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33	0.010	0.019	0.024	0.022	0.022	0.019	0.025	0.024	0.022	0.022	0.025
34	0.004	0.012	0.012	0.014	0.013	0.014	0.014	0.015	0.016	0.017	0.015
35	0.045	0.037	0.043	0.044	0.065	0.039	0.048	0.054	0.057	0.060	0.086
36	0.004	0.014	0.012	0.012	0.012	0.012	0.014	0.016	0.015	0.016	0.016
37	0.023	0.038	0.071	0.043	0.093	0.079	0.108	0.093	0.086	0.096	0.037
38	0.005	0.013	0.012	0.013	0.012	0.012	0.014	0.015	0.016	0.016	0.014
39	0.009	0.019	0.019	0.024	0.029	0.032	0.039	0.044	0.051	0.057	0.058
40	0.004	0.010	0.010	0.011	0.011	0.011	0.012	0.013	0.013	0.014	0.015
41	0.025	0.064	0.066	0.064	0.047	0.061	0.052	0.052	0.058	0.063	0.063
42	0.004	0.012	0.011	0.011	0.011	0.011	0.013	0.013	0.013	0.014	0.012
43	0.033	0.069	0.089	0.097	0.089	0.062	0.072	0.070	0.061	0.056	0.037
44	0.004	0.012	0.011	0.012	0.012	0.011	0.012	0.014	0.013	0.013	0.011
45	0.012	0.018	0.020	0.022	0.022	0.026	0.033	0.038	0.042	0.046	0.048
46	0.005	0.010	0.010	0.012	0.012	0.010	0.012	0.013	0.012	0.013	0.013
47	0.014	0.065	0.064	0.056	0.051	0.058	0.038	0.046	0.048	0.050	0.030
48	0.004	0.011	0.011	0.012	0.013	0.011	0.013	0.013	0.013	0.013	0.011
49	0.035	0.091	0.041	0.059	0.029	0.040	0.022	0.034	0.038	0.036	0.050
50	0.005	0.013	0.011	0.014	0.012	0.013	0.012	0.014	0.013	0.013	0.011
THC/I_{ref}	0.579	0.958	0.918	0.541	0.362	0.364	0.444	0.525	0.598	0.653	0.822

Inter-harmonics											
Power P/Pn[%]	0-5	10	20	30	40	50	60	70	80	90	100
Frequency [Hz]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]
75	0.427	0.432	0.432	0.432	0.428	0.423	0.406	0.464	0.464	0.464	0.742
125	0.480	0.555	0.555	0.555	0.554	0.547	0.550	0.574	0.574	0.574	0.629

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175	0.071	0.116	0.121	0.122	0.124	0.124	0.130	0.139	0.139	0.146	0.155
225	0.044	0.087	0.091	0.091	0.093	0.093	0.099	0.099	0.099	0.105	0.105
275	0.073	0.110	0.114	0.114	0.145	0.145	0.146	0.146	0.146	0.120	0.130
325	0.091	0.108	0.108	0.108	0.116	0.116	0.118	0.118	0.118	0.119	0.128
375	0.066	0.151	0.151	0.151	0.149	0.145	0.112	0.106	0.105	0.107	0.107
425	0.073	0.112	0.112	0.112	0.116	0.116	0.116	0.112	0.109	0.108	0.108
475	0.032	0.098	0.098	0.098	0.096	0.095	0.079	0.079	0.079	0.080	0.085
525	0.028	0.072	0.072	0.074	0.075	0.075	0.076	0.076	0.076	0.079	0.079
575	0.053	0.091	0.091	0.091	0.091	0.091	0.090	0.094	0.094	0.097	0.097
625	0.053	0.110	0.110	0.116	0.116	0.116	0.085	0.096	0.096	0.102	0.102
675	0.052	0.084	0.084	0.084	0.111	0.112	0.112	0.112	0.109	0.084	0.089
725	0.053	0.082	0.082	0.082	0.101	0.106	0.106	0.106	0.104	0.083	0.090
775	0.018	0.070	0.070	0.070	0.074	0.074	0.074	0.073	0.073	0.071	0.074
825	0.018	0.063	0.063	0.066	0.069	0.069	0.071	0.071	0.071	0.072	0.076
875	0.032	0.097	0.097	0.099	0.099	0.099	0.076	0.094	0.094	0.099	0.099
925	0.032	0.086	0.086	0.086	0.086	0.086	0.075	0.089	0.089	0.092	0.092
975	0.038	0.089	0.089	0.089	0.084	0.082	0.072	0.100	0.100	0.106	0.106
1025	0.042	0.089	0.089	0.089	0.087	0.084	0.072	0.100	0.100	0.100	0.100
1075	0.019	0.057	0.057	0.057	0.064	0.064	0.064	0.068	0.068	0.068	0.070
1125	0.018	0.060	0.060	0.060	0.066	0.066	0.066	0.068	0.068	0.068	0.072
1175	0.026	0.066	0.066	0.067	0.089	0.089	0.089	0.088	0.088	0.075	0.100
1225	0.022	0.071	0.071	0.071	0.081	0.081	0.081	0.078	0.078	0.078	0.104
1275	0.029	0.073	0.073	0.073	0.079	0.079	0.079	0.075	0.072	0.070	0.112
1325	0.029	0.068	0.068	0.068	0.080	0.080	0.080	0.078	0.075	0.068	0.105
1375	0.016	0.055	0.055	0.055	0.063	0.063	0.063	0.064	0.064	0.064	0.071

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1425	0.016	0.057	0.057	0.057	0.064	0.064	0.064	0.063	0.063	0.063	0.069
1475	0.021	0.063	0.063	0.063	0.074	0.074	0.074	0.073	0.073	0.073	0.081
1525	0.019	0.065	0.065	0.065	0.071	0.071	0.071	0.071	0.071	0.071	0.081
1575	0.024	0.070	0.070	0.070	0.073	0.073	0.073	0.076	0.076	0.076	0.077
1625	0.021	0.063	0.063	0.063	0.072	0.072	0.072	0.082	0.082	0.082	0.075
1675	0.014	0.056	0.056	0.056	0.056	0.056	0.056	0.059	0.059	0.059	0.063
1725	0.013	0.052	0.052	0.052	0.053	0.053	0.053	0.057	0.057	0.057	0.059
Higher frequency											
Power P/Pn[%]	0-5	10	20	30	40	50	60	70	80	90	100
Frequency [kHz]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]
2.1	0.057	0.148	0.148	0.148	0.162	0.169	0.169	0.169	0.171	0.171	0.171
2.3	0.037	0.129	0.129	0.129	0.125	0.129	0.129	0.129	0.130	0.130	0.132
2.5	0.052	0.153	0.153	0.153	0.153	0.153	0.114	0.124	0.131	0.131	0.131
2.7	0.058	0.132	0.140	0.140	0.140	0.130	0.129	0.152	0.164	0.164	0.164
2.9	0.031	0.133	0.141	0.141	0.141	0.139	0.115	0.141	0.141	0.145	0.145
3.1	0.063	0.107	0.107	0.107	0.126	0.126	0.126	0.151	0.151	0.154	0.154
3.3	0.065	0.118	0.125	0.125	0.132	0.132	0.133	0.192	0.194	0.196	0.196
3.5	0.031	0.085	0.089	0.094	0.113	0.116	0.116	0.154	0.156	0.160	0.171
3.7	0.055	0.078	0.080	0.081	0.081	0.081	0.078	0.099	0.099	0.099	0.102
3.9	0.055	0.077	0.079	0.085	0.117	0.122	0.137	0.137	0.137	0.132	0.134
4.1	0.038	0.072	0.072	0.080	0.080	0.082	0.090	0.090	0.090	0.092	0.093
4.3	0.040	0.080	0.080	0.082	0.084	0.084	0.084	0.098	0.098	0.099	0.099
4.5	0.044	0.089	0.089	0.094	0.094	0.094	0.096	0.096	0.096	0.089	0.096
4.7	0.040	0.060	0.060	0.066	0.066	0.066	0.065	0.073	0.073	0.073	0.079

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4.9	0.034	0.070	0.070	0.072	0.072	0.072	0.068	0.096	0.099	0.100	0.100
5.1	0.049	0.067	0.067	0.068	0.092	0.095	0.095	0.111	0.111	0.111	0.112
5.3	0.049	0.064	0.069	0.070	0.083	0.083	0.083	0.095	0.100	0.100	0.100
5.5	0.032	0.059	0.060	0.062	0.072	0.081	0.081	0.081	0.080	0.079	0.081
5.7	0.056	0.078	0.085	0.085	0.109	0.123	0.123	0.123	0.127	0.127	0.127
5.9	0.056	0.079	0.084	0.084	0.115	0.127	0.127	0.127	0.127	0.116	0.116
6.1	0.037	0.078	0.084	0.084	0.086	0.091	0.091	0.103	0.104	0.104	0.104
6.3	0.058	0.096	0.106	0.106	0.118	0.131	0.131	0.131	0.126	0.118	0.118
6.5	0.060	0.104	0.118	0.118	0.118	0.108	0.105	0.105	0.100	0.100	0.100
6.7	0.047	0.091	0.104	0.104	0.104	0.108	0.108	0.108	0.115	0.115	0.115
6.9	0.093	0.142	0.152	0.152	0.152	0.143	0.143	0.145	0.152	0.152	0.152
7.1	0.085	0.103	0.132	0.132	0.132	0.129	0.129	0.129	0.126	0.126	0.126
7.3	0.083	0.129	0.169	0.169	0.169	0.188	0.188	0.188	0.193	0.193	0.193
7.5	0.175	0.175	0.229	0.229	0.229	0.265	0.265	0.265	0.234	0.234	0.234
7.7	0.245	0.245	0.343	0.343	0.343	0.287	0.287	0.287	0.267	0.267	0.267
7.9	0.227	0.227	0.379	0.379	0.379	0.432	0.432	0.432	0.382	0.382	0.382
8.1	0.265	0.265	0.267	0.280	0.280	0.342	0.342	0.342	0.399	0.399	0.399
8.3	0.226	0.315	0.315	0.318	0.318	0.318	0.320	0.320	0.320	0.315	0.315
8.5	0.203	0.329	0.329	0.329	0.394	0.394	0.394	0.380	0.380	0.380	0.403
8.7	0.137	0.237	0.237	0.237	0.287	0.287	0.287	0.385	0.385	0.385	0.460
8.9	0.069	0.145	0.145	0.145	0.215	0.215	0.215	0.263	0.263	0.263	0.453
Remark: Max. value for three phases are recorded in above table.											

5.7.2.3	**Test for flicker and rapid voltage change**			**P**
Test at	**Temperature (°C):**	25	**Humidity (%)**	45

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Conformity to	☐ EN 61000-3-3 (⩽ 16A) ☐ EN 61000-3-11 (> 16A and ⩽ 75A) ☒ EN 50549-10 (> 75A)

Flicker (EN 50549-10)												
Grid impedance phase angle. φ_k[°]	30°			50°			70°			85°		
Pbin/Pn [%]	Flicker coefficient. C(φ_k. P_a)											
	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
0% (or min. operating power)	0.068	0.068	0.066	0.122	0.122	0.118	0.162	0.162	0.160	0.180	0.182	0.180
10%	0.084	0.086	0.084	0.130	0.132	0.128	0.162	0.164	0.162	0.176	0.178	0.176
20%	0.088	0.088	0.090	0.128	0.130	0.130	0.158	0.158	0.160	0.168	0.168	0.170
30%	0.094	0.096	0.096	0.132	0.132	0.132	0.158	0.158	0.158	0.166	0.166	0.166
40%	0.100	0.102	0.102	0.136	0.138	0.138	0.162	0.162	0.162	0.168	0.170	0.170
50%	0.108	0.110	0.110	0.146	0.148	0.148	0.170	0.172	0.172	0.176	0.178	0.178
60%	0.116	0.118	0.118	0.156	0.158	0.160	0.184	0.184	0.186	0.190	0.192	0.192
70%	0.128	0.128	0.130	0.172	0.174	0.174	0.200	0.202	0.202	0.208	0.210	0.210
80%	0.142	0.142	0.144	0.192	0.192	0.194	0.222	0.222	0.224	0.230	0.230	0.232
90%	0.158	0.158	0.160	0.214	0.214	0.214	0.248	0.248	0.248	0.256	0.256	0.256
100%	0.180	0.176	0.178	0.236	0.234	0.232	0.272	0.272	0.266	0.280	0.282	0.274
100%	0.180	0.176	0.180	0.236	0.234	0.232	0.272	0.272	0.266	0.280	0.282	0.274
100%	0.178	0.178	0.178	0.236	0.236	0.232	0.272	0.272	0.266	0.280	0.282	0.274
	Short-term flicker. Pst. fic											
	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
0% (or min. operating power)	0.003	0.003	0.003	0.006	0.006	0.006	0.008	0.008	0.008	0.009	0.009	0.009
10%	0.004	0.004	0.004	0.007	0.007	0.006	0.008	0.008	0.008	0.009	0.009	0.009
20%	0.004	0.004	0.005	0.006	0.007	0.007	0.008	0.008	0.008	0.008	0.008	0.009
30%	0.005	0.005	0.005	0.007	0.007	0.007	0.008	0.008	0.008	0.008	0.008	0.008
40%	0.005	0.005	0.005	0.007	0.007	0.007	0.008	0.008	0.008	0.008	0.009	0.009
50%	0.005	0.006	0.006	0.007	0.007	0.007	0.009	0.009	0.009	0.009	0.009	0.009
60%	0.006	0.006	0.006	0.008	0.008	0.008	0.009	0.009	0.009	0.010	0.010	0.010
70%	0.006	0.006	0.007	0.009	0.009	0.009	0.010	0.010	0.010	0.010	0.011	0.011
80%	0.007	0.007	0.007	0.010	0.010	0.010	0.011	0.011	0.011	0.012	0.012	0.012

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90%	0.008	0.008	0.008	0.011	0.011	0.011	0.012	0.012	0.012	0.013	0.013	0.013
100%	0.009	0.009	0.009	0.012	0.012	0.012	0.014	0.014	0.013	0.014	0.014	0.014
100%	0.009	0.009	0.009	0.012	0.012	0.012	0.014	0.014	0.013	0.014	0.014	0.014
100%	0.009	0.009	0.009	0.012	0.012	0.012	0.014	0.014	0.013	0.014	0.014	0.014
Max. Short-term flicker. Pst. Fic Plt	0.009	0.009	0.009	0.012	0.012	0.012	0.014	0.014	0.013	0.014	0.014	0.014

Rapid voltage change (EN 50549-10)			
Case of switching operation	Cut-in at <10%Pn		
Test No.	Switching current factor (Ki)		
	L1	L2	L3
Switching operation test 1	0.10	0.10	0.10
Switching operation test 2	0.10	0.10	0.10
Switching operation test 3	0.10	0.10	0.10
Max. inrush current factor. Kimax	0.10		
Case of switching operation	Switching operation from 10%Pn to 100%Pn		
Test No.	Switching current factor (Ki)		
	L1	L2	L3
Switching operation test 1	0.98	1.00	0.98
Switching operation test 2	0.98	1.00	1.00
Switching operation test 3	0.98	1.00	1.00
Max. inrush current factor. Kimax	1.00		
Case of switching operation	Cut-in at 100%Pn		
Test No.	Switching current factor (Ki)		
	L1	L2	L3
Switching operation test 1	0.98	1.00	1.00
Switching operation test 2	0.98	1.00	1.00
Switching operation test 3	0.98	1.00	0.98
Max. inrush current factor. Kimax	1.00		
Case of switching operation	Switch off at rated power		
Test No.	Switching current factor (Ki)		

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	L1	L2	L3
Switching operation test 1	0.98	1.00	0.98
Switching operation test 2	0.98	1.00	1.00
Switching operation test 3	0.98	1.00	1.00
Max. inrush current factor. Kimax	1.00		
Max. Kimax for all tests	1.00		
Remark: Test at cos φ=1 or Q=0			

5.7.2.4	**Test for DC injection**			**P**
Test at	**Temperature (°C):**	25	**Humidity (%)**	45
Test DC voltage (nominal voltage)		1000 V		
Conformity to		☒ EN 50549-10 ☐ specific grid code_____		

Test conditions	Voltage [V]			Current [A]			DC current						limit
							mA			%Ir			
	L1-L2	L2-L3	L3-L1	L1	L2	L3	L1	L2	L3	L1	L2	L3	
Between 30 % P_{max} and 40 % P_{max}	462.0	461.7	462.0	82.83	83.03	82.94	110	0.04	119	0.05	113	0.04	0.5% or 20 mA
Between 60 % P_{max} and 70 % P_{max}	462.1	461.7	462.1	165.19	165.73	165.50	169	0.07	178	0.07	175	0.07	0.5% or 20 mA
> 95 % P_{max}	462.2	461.8	462.2	250.16	251.51	250.70	145	0.06	153	0.06	153	0.06	0.5% or 20 mA
Remark:													

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5.8.6	Test for active anti islanding detection			P
Test at	Temperature (°C):	25	Humidity (%)	45
Conformity to		☒ EN 62116 ☐ specific grid code_____		

No.	P_{EUT} (% of EUT rating)	Reactive Load (% of Q_L)	P_{AC} (% of nominal)	Q_{AC} (% of nominal)	Run on time (ms)	P_{EUT} (kW)	Actual Q_f	V_{DC}(V)	Remarks
1	100	100	0	0	317.50	350	1.03/1.04/1.04	1150	Test A, BL

Fundamental current of inverter AC output at balance load conditions:

Phase 1: 1.951 A and 0.772% of In
Phase 2: 1.850 A and 0.732% of In
Phase 3: 1.457 A and 0.577% of In

POWER/GRID

	相 1		相 2		相 3		三相总和	
U_tRMS	461.92	V	461.75	V	462.05	V	461.91	V
I_tRMS	5.9497	A	5.8670	A	6.3821	A	6.0662	A
P_t	49.447	W	362.84	W	240.03	W	652.31	W
Q_t	2.7442	kvar	2.4793	kvar	2.6889	kvar	8.3785	kvar
S_t	2.7483	kVA	2.7091	kVA	2.9489	kVA	8.4062	kVA
PF_t	0.0184		0.1310		0.0818		0.0776	
F_fund							49.999	Hz
U_fundRMS	461.91	V	461.75	V	462.05	V	461.90	V
I_fundRMS	1.9510	A	1.8508	A	1.4573	A	1.7530	A
P_fund	50.060	W	363.91	W	240.72	W	654.70	W
Q_fund	885.33	var	751.02	var	556.22	var	2.1926	kvar
S_fund	901.21	VA	854.65	VA	673.34	VA	2.4292	kVA

2	66	66	0	0	280.80	231	1.00/1.00/1.00	840	Test B, BL

Fundamental current of inverter AC output at balance load conditions:

Phase 1: 1.418 A and 0.561% of In
Phase 2: 1.573 A and 0.623% of In
Phase 3: 1.663 A and 0.658% of In

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POWER/GRID

	相 1		相 2		相 3		三相总和	
U_tRMS	462.01	V	461.81	V	462.09	V	461.97	V
I_tRMS	8.6953	A	8.0348	A	8.7413	A	8.4905	A
P_t	72.620	W	484.23	W	-517.26	W	39.588	W
Q_t	-1.7192	kvar	1.7389	kvar	-2.0154	kvar	-4.8593	kvar
S_t	4.0173	kVA	3.7106	kVA	4.0393	kVA	11.767	kVA
PF_t	0.0193		0.1294		-0.1255		0.0046	
F_fund							50.000	Hz
U_fundRMS	462.01	V	461.80	V	462.09	V	461.97	V
I_fundRMS	1.4179	A	1.5730	A	1.6632	A	1.5514	A
P_fund	76.941	W	488.86	W	-512.01	W	53.787	W
Q_fund	-359.95	var	269.92	var	-299.75	var	-389.79	var
S_fund	655.10	VA	726.45	VA	768.51	VA	2.1501	kVA

3	33	33	0	0	253.20	115.5	0.99/0.99/1.00	500	Test C, BL

Fundamental current of inverter AC output at balance load conditions:

Phase 1: 0.760 A and 0.301% of In
Phase 2: 1.008 A and 0.399% of In
Phase 3: 1.690 A and 0.669% of In

POWER/GRID

	相 1		相 2		相 3		三相总和	
U_tRMS	461.88	V	461.71	V	462.03	V	461.87	V
I_tRMS	4.2479	A	3.5602	A	3.6080	A	3.8053	A
P_t	-56.182	W	-60.775	W	-16.595	W	-133.55	W
Q_t	-1.6339	kvar	1.6221	kvar	876.43	var	2.7771	kvar
S_t	1.9620	kVA	1.6438	kVA	1.6670	kVA	5.2728	kVA
PF_t	-0.0283		-0.0427		-0.0094		-0.0262	
F_fund							49.999	Hz
U_fundRMS	461.87	V	461.70	V	462.03	V	461.87	V
I_fundRMS	760.14	mA	1.0077	A	689.79	mA	819.22	mA
P_fund	-58.145	W	-62.469	W	-17.911	W	-138.53	W
Q_fund	-258.60	var	372.24	var	183.44	var	297.08	var
S_fund	351.09	VA	465.29	VA	318.71	VA	1.1351	kVA

4	100	100	-5	-5	267.60	350	1.08/1.03/1.07	1150	Test A, IB
5	100	100	-5	0	267.60	350	1.07/1.01/1.04	1150	Test A, IB
6	100	100	-5	+5	266.20	350	1.10/1.02/1.06	1150	Test A, IB
7	100	100	0	-5	267.70	350	1.03/0.97/1.00	1150	Test A, IB
8	100	100	0	+5	283.50	350	1.03/0.97/1.00	1150	Test A, IB
9	100	100	+5	-5	264.90	350	0.98/0.92/0.95	1150	Test A, IB

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10	100	100	+5	0	250.20	350	0.97/0.90/0.94	1150	Test A, IB
11	100	100	+5	+5	251.80	350	0.95/0.93/0.93	1150	Test A, IB
12	66	66	0	-5	263.70	231	1.04/1.04/1.04	840	Test B, IB
13	66	66	0	-4	292.10	231	1.03/1.03/1.03	840	Test B, IB
14	66	66	0	-3	274.20	231	1.03/1.03/1.03	840	Test B, IB
15	66	66	0	-2	294.30	231	1.02/1.02/1.02	840	Test B, IB
16	66	66	0	-1	247.90	231	1.02/1.02/1.02	840	Test B, IB
17	66	66	0	1	274.80	231	1.01/1.00/1.00	840	Test B, IB
18	66	66	0	2	263.40	231	1.00/1.00/1.00	840	Test B, IB
19	66	66	0	3	271.70	231	1.00/1.00/1.00	840	Test B, IB
20	66	66	0	4	285.70	231	0.99/0.99/0.99	840	Test B, IB
21	66	66	0	5	337.00	231	0.98/0.99/0.98	840	Test B, IB
22	66	66	0	6	263.10	231	1.04/1.02/1.03	840	Test B, IB
23	33	33	0	-6	307.90	115.5	1.03/1.02/1.02	500	Test C, IB
24	33	33	0	-5	309.10	115.5	1.04/1.02/1.03	500	Test C, IB
25	33	33	0	-4	268.60	115.5	1.03/1.02/1.02	500	Test C, IB
26	33	33	0	-3	309.40	115.5	1.03/1.01/1.02	500	Test C, IB
27	33	33	0	-2	271.80	115.5	1.02/1.01/1.02	500	Test C, IB
28	33	33	0	-1	314.10	115.5	1.02/1.01/1.02	500	Test C, IB
29	33	33	0	1	312.10	115.5	1.01/0.99/1.00	500	Test C, IB
30	33	33	0	2	294.20	115.5	1.01/0.99/1.00	500	Test C, IB
31	33	33	0	3	284.30	115.5	1.00/0.98/0.99	500	Test C, IB
32	33	33	0	4	300.50	115.5	1.00/0.98/0.98	500	Test C, IB
33	33	33	0	5	317.00	115.5	0.99/0.97/0.98	500	Test C, IB
33	33	33	0	6	292.30	115.5	1.00/0.98/0.98	500	Test C, IB

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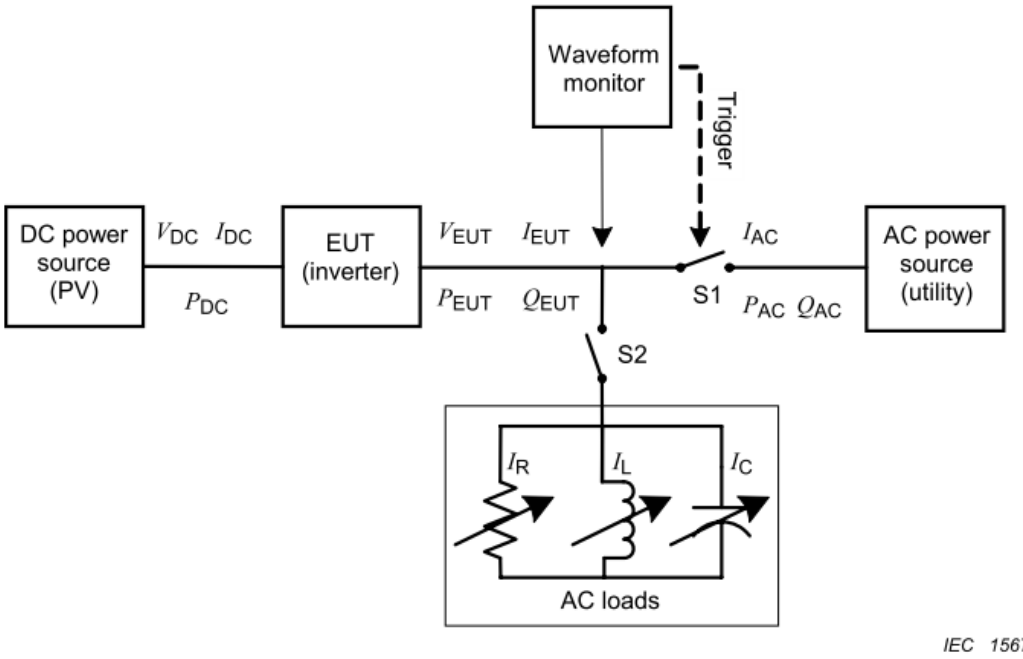
1. Test method is referring to IEC 62116:2014, with the following setup.



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5.9	Test for connection and starting			P
Test at	Temperature (°C):	25	Humidity (%)	45
Test DC voltage (nominal voltage)		1000 V		

Conformity to

☐ EN 50549-1

Table 3 — Automatic reconnection after tripping

Parameter	Range	Default setting
Lower frequency	47,0Hz – 50,0Hz	49,5Hz
Upper frequency	50,0Hz – 52,0Hz	50,2Hz
Lower voltage	50% – 100%U_n	85 % U_n
Upper voltage	100% – 120% U_n	110 % U_n
Observation time	10s – 600s	60s
Active power increase gradient	6% – 3000%/min	10%/min

Table 4 — Starting to generate electrical power

Parameter	Range	Default setting
Lower frequency	47,0Hz – 50,0Hz	49,5Hz
Upper frequency	50,0Hz – 52,0Hz	50,1Hz
Lower voltage	50% – 100% U_n	85 % U_n
Upper voltage	100% – 120% U_n	110 % U_n
Observation time	10s – 600s	60s
Active power increase gradient	6% – 3000%/min	disabled

☒ EN 50549-2

Table 3 — Automatic reconnection after tripping

Parameter	Range	Default setting
Lower frequency	47,0Hz – 50,0Hz	49,5Hz
Upper frequency	50,0Hz – 52,0Hz	50,2Hz
Lower voltage	50 % – 100 %U_c	90 % U_c
Upper voltage	100 % – 120 % U_c	110 % U_c
Observation time	10s – 600s	60s
Active power increase gradient	6 % – 3000 %/min	10 %/min

Table 4 — Starting to generate electrical power

Parameter	Range	Default setting
Lower frequency	47,0Hz – 50,0Hz	49,5Hz
Upper frequency	50,0Hz – 52,0Hz	50,1Hz
Lower voltage	50 % – 100 %Uc	90 % Uc
Upper voltage	100 % – 120 % Uc	110 % Uc
Observation time	10s – 600s	60s
Active power increase gradient	6 % – 3000 %/min	disabled

☐ specific grid code_____

Test procedure for automatic reconnection after tripping

The following Sequence shall be performed:
Initial Status for test: the generator is disconnected and ready to reconnect or offline with its system on and logics enabled. A trip of Interface Protection associated to voltage or frequency shall be simulated.

Frequency range verification:
The generating unit is provided with a voltage signal where the voltage value(s) is within the synchronizing band and the frequency inputs shall be as follows:
Underfrequency
a) The frequency shall be reduced from nominal to a value f < 49.45 Hz; this frequency value shall be

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maintained for at least 60 s and not less than the minimum defined observation time. No reconnection is allowed in this condition.
b) The frequency shall be Increased to f ⩾ 49.55 Hz; this signal shall be maintained at least for 20 s after the parallel sequence has been enabled. Reconnection is enabled after the minimum observation time.

Overfrequency

c) The frequency shall be increased from nominal to f > 50.10 Hz; this input shall be maintained for at least 60 s and not less than the minimum defined observation time. No reconnection is allowed in this condition.
d) The frequency shall be decreased to f ⩽ 50.00 Hz; this signal shall be maintained at least for 20 s after the parallel sequence has been enabled. Reconnection is allowed after the minimum observation time.

Voltage range verification:

The generating unit is provided with a voltage signal where the frequency value(s) is within the synchronizing band and the voltage inputs shall be as follows:

Undervoltage

e) The voltage shall be reduced from nominal to U < 84 %U_n (<89 % U_c in case of EN 50549-2:2019 default value); this input shall be maintained for at least 60 s and not less than the minimum defined observation time). No reconnection is allowed in this condition.
f) The voltage shall be Increased to U ⩾ 86 %U_n (⩾91 %U_c in case of EN 50549-2:2019 default value); this signal shall be maintained at least for 20 s after the parallel sequence has been enabled. Reconnection is allowed after the minimum observation time.

Overvoltage

g) The voltage shall be increased from nominal to U > 111 % U_n; this input shall be maintained for at least 60 s and not less than the minimum defined observation time. No reconnection is allowed in this condition.
h) The voltage shall be decreased to U ⩽ 109 % U_n; this signal shall be maintained at least for 20 s after the parallel sequence has been enabled. Reconnection is allowed after the minimum observation time.

The reconnection time, the duration from the adjustment of the voltage into the reconnection range until the instant the EUT reconnects, shall be recorded for each test sequence.
Reset of observation time:
i) *U* < 109 % U_n, keep for 30 s
j) *U* > 111 % U_n, keep for 10 s
k) *U* < 109 % U_n Reconnection permitted
The reconnection time for step k) shall be recorded.
At least one of the tests shall be conducted so that the output power after synchronization will reach a value equal to or above 80 % P_{max}; the grid simulator or test bench or laboratory shall permit to reach such power limit and the ramp to last at least 12 min (eventually reaching the upper limit and to keep the power) to demonstrate the ramp rate. The other tests, Step 2) shall be kept for at least 2 min.

Test procedure for starting to generate electrical power

The frequency values for the overfrequency test shall be adapted, considering a 50.10 Hz default value, as follows:
1) The frequency shall be increased from nominal to f > 50.15 Hz; this input shall be maintained for at least 60 s and not less than the minimum defined observation time. No connection is allowed in this condition.
2) The frequency shall be decreased to f ⩽ 50.05 Hz; this signal shall be maintained at least for 20 s after the parallel sequence has been enabled. Connection is allowed after the minimum delay time.

Automatic reconnection after tripping

Test sequence after trip	Reconnection allowed	Reconnection	Reconnection time	Reconnection time limit	Power gradient after reconnection	Power gradient after reconnection limit
Step a) – f_{ac}@49.44 Hz	No	☒ No	N/A	⩾ 60 s	N/A	N/A

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(f_{ac} < 49.45 Hz)		☐ Yes				
Step b) – f_{ac}@49.55 Hz (f_{ac} ⩾ 49.55 Hz)	Yes	☐ No ☒ Yes	118.4 s		No observed	--
Step c) – f_{ac}@50.11 Hz (f_{ac} > 50.10 Hz)	No	☒ No ☐ Yes	N/A		N/A	N/A
Step d) – f_{ac}@50.00 Hz (f_{ac} ⩽ 50.00 Hz)	Yes	☐ No ☒ Yes	113.4 s		No observed	--
Step e) – U_{ac}@0.83 Un /0.88Uc (U_{ac} < 0.84 U_n/0.89 Uc)	No	☒ No ☐ Yes	N/A		N/A	N/A
Step f) – U_{ac}@0.86 Un /0.91Uc (U_{ac} ⩾ 0.86 U_n/0.91Uc)	Yes	☐ No ☒ Yes	128.4 s		No observed	--
Step g) – U_{ac}@1.12 Un (U_{ac} > 1.11 U_n)	No	☒ No ☐ Yes	N/A		N/A	N/A
Step h) – U_{ac}@1.09 Un (U_{ac} ⩽ 1.09 U_n)	Yes	☐ No ☒ Yes	109.4 s		9.98 %	⩽11%P_n per minute

Reset of observation time test:

Test condition	**Voltage maintained in observation time**	**Reconnection**	**Reconnection time**	**Reconnection time limit**
Step i) – U_{ac}@1.08 Un (U_{ac} < 1.09 U_n)	30 s	☒ No ☐ Yes	N/A	--
Step j) – U_{ac}@1.12 Un (U_{ac} > 1.11 U_n)	10 s	☒ No ☐ Yes	N/A	--
Step k) – U_{ac}@1.08 Un (U_{ac} < 1.09 U_n)	-	☐ No ☒ Yes	104.8 s	⩾ 60 s

Starting to generate electrical power (in addition to a))

Test sequence at start operation	**Reconnection allowed**	**Reconnection**	**Reconnection time**	**Reconnection time limit**	**Power gradient after reconnection**	**Power gradient after reconnection limit**
Step c) – f_{ac}@50.16 Hz (f_{ac} > 50.15 Hz)	No	☒ No ☐ Yes	N/A	⩾ 60 s	N/A	N/A
Step d) – f_{ac}@50.05 Hz (f_{ac} ⩽ 50.05 Hz)	Yes	☐ No ☒ Yes	103.8 s		9.95 %	⩽11%P_n per minute

5.10	**Test for active power reduction on set point**	**P**

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Test at	Temperature (°C):	25	Humidity (%)	45
Slope defined by manufacturer		10		%Pn/s
Conformity to		☐ EN 50549-1 ☒ EN 50549-2 ☐ specific grid code_____		

Test procedure of the accuracy

The EUT is operated at active power above 0.9 p.u. and reactive power at zero. In case of a generating technology with fluctuating available power, the available power shall be kept above 0.9 p.u. for the complete duration of the test.
A set point signal shall request decreasing active power values, from 0.9 p.u. down to 0.1 p.u. of nominal power or minimum regulating power, whatever is the higher, in steps of 0.1 p.u. For each set point value, the calculation of the 1 min average active power shall be carried out after steady-state is reached. Steady-state shall be assumed to be reached 1 min after the set point value has been issued.
Once 0.1 p.u. of nominal power or minimum regulating power is reached, the active power set point shall be increased to 0.3 p.u. if above minimum regulating level, 0.6 p.u., 1 p.u..
For each set point value, the calculation of the 1 min average active power shall be carried out after steady state is reached.
The test shall be carried out continuously, i.e. it is not allowed to connect disjoint measurements. Ramp rate limitation shall be adjusted to the highest value (the one which causes the fastest reaction of the generating unit). The obtained ramp rate shall be documented.

Test procedure for dynamic behaviour

The test shall be carried out starting from an initial condition with the generating unit running at 0.9 p.u. active power and applying a step of the active power set point from 0.9 p.u. down to 0.1 p.u. of nominal power or minimum regulating power, whatever is the higher (see example in Figure 47).
If this is not compatible with the specific test conditions, active power set point shall be stepped from 0.7 p.u. down to 0.5 p.u. of nominal power (example in Figure 48).
The step response behaviour is measured starting from the instance the set point change is transmitted to the EUT. For the step response time and the settling time a tolerance band of ± 5 % Pn to the reactive power set point is considered.

Active power reduction on set point for the accuracy

Active power step [p.u. of Pn]	Requested set point value		Actual value		Accuracy Actual value - Setpoint	
	W	P/Pn [p.u.]	W	P_{60}/Pn [p.u.]	W	P/Pn [p.u.]
0.9	315000	0.9	313000	0.89	-2000	-0.01
0.8	280000	0.8	278133	0.79	-1867	-0.01
0.7	245000	0.7	243302	0.70	-1698	0.00
0.6	210000	0.6	208546	0.60	-1454	0.00
0.5	175000	0.5	173866	0.50	-1134	0.00
0.4	140000	0.4	139182	0.40	-818	0.00
0.3	105000	0.3	104516	0.30	-484	0.00

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0.2	70000	0.2	69852	0.20	-148	0.00
0.1	35000	0.1	35201	0.10	201	0.00
0.3	105000	0.3	104536	0.30	-464	0.00
0.6	210000	0.6	208584	0.60	-1416	0.00

Each step for 2 min as an example

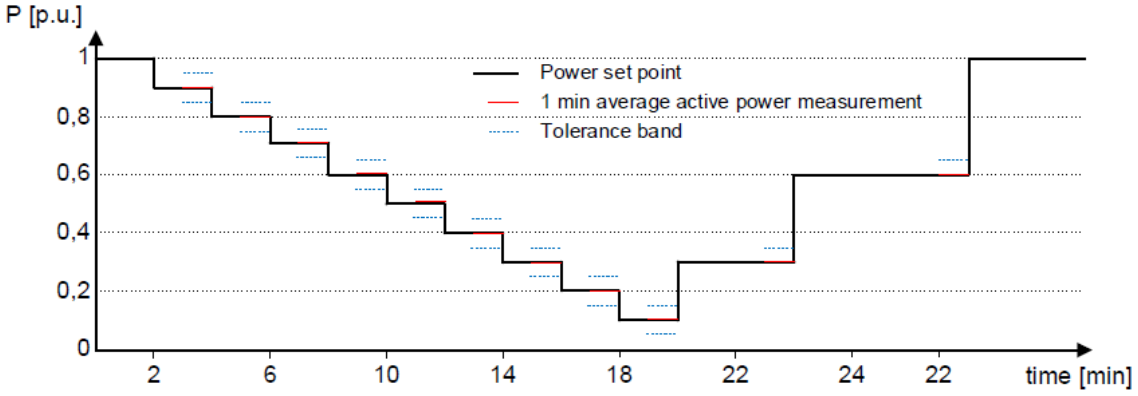
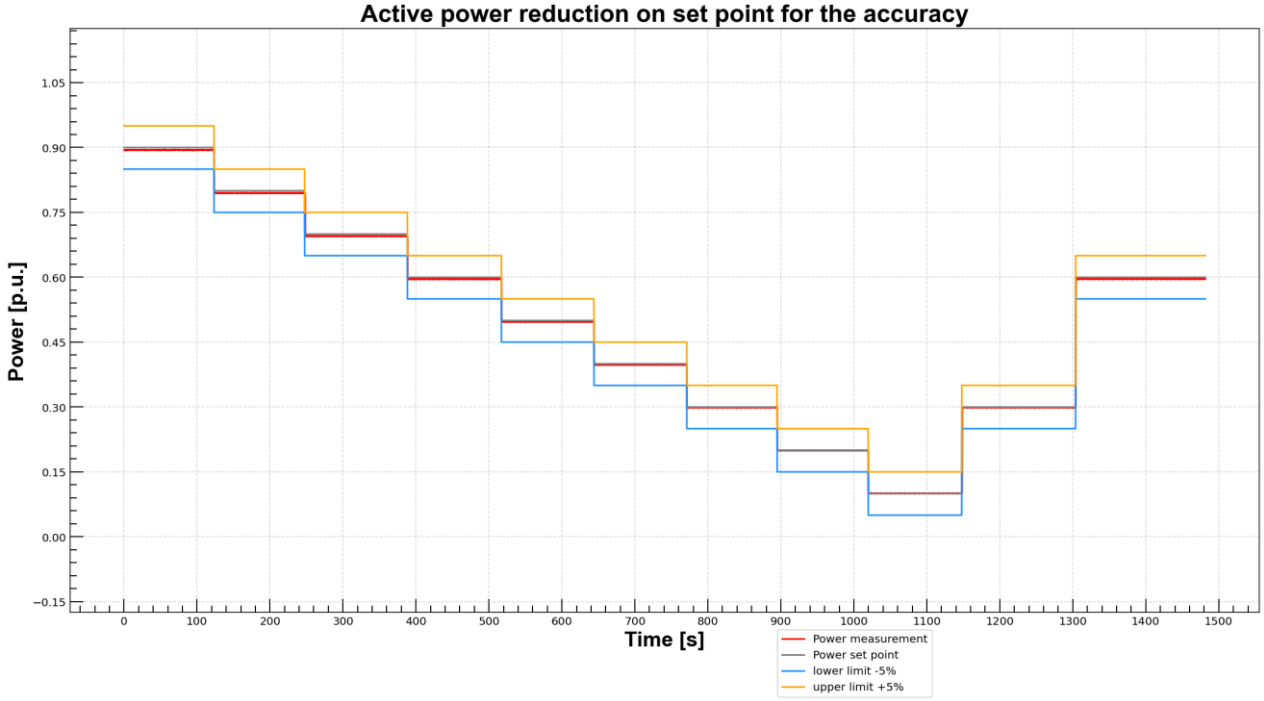


Figure 46 — Test results graph (example)
Active power reduction on set point for the accuracy



Active power reduction on set point for dynamic behaviour							
Active power step [p.u. of Pn]	Requested set point value		Actual value		Accuracy Actual value - Setpoint		Power ramp limit
	W	P/Pn [p.u.]	W	P_{60}/Pn	W	P/Pn [p.u.]	%Pn/s

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				[p.u.]			
0.9	315000	0.9	313035	0.89	-1965	-0.01	--
0.1	35000	0.1	35204	0.10	204	0.00	0.33 – 0.66

The reference values, the actual values and the difference between the reference values and the actual values as 1 min average data shall be represented in a graphical format for each of the tests carried out.

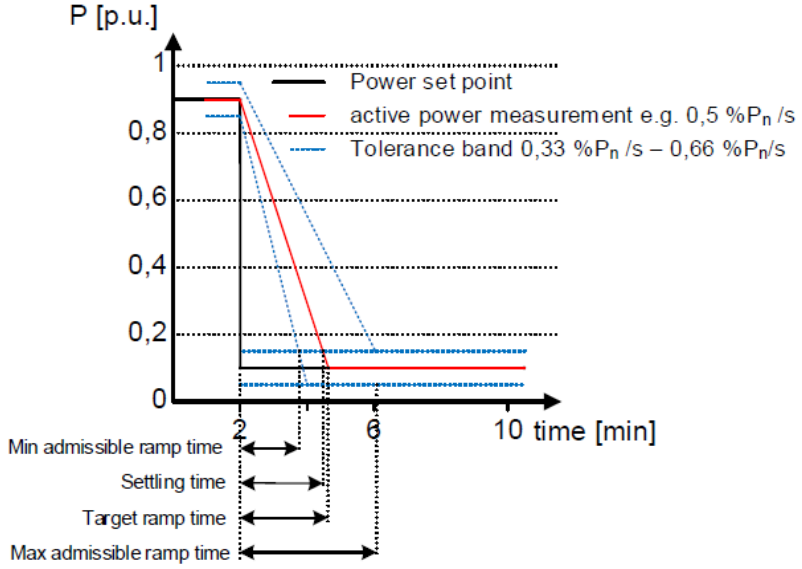
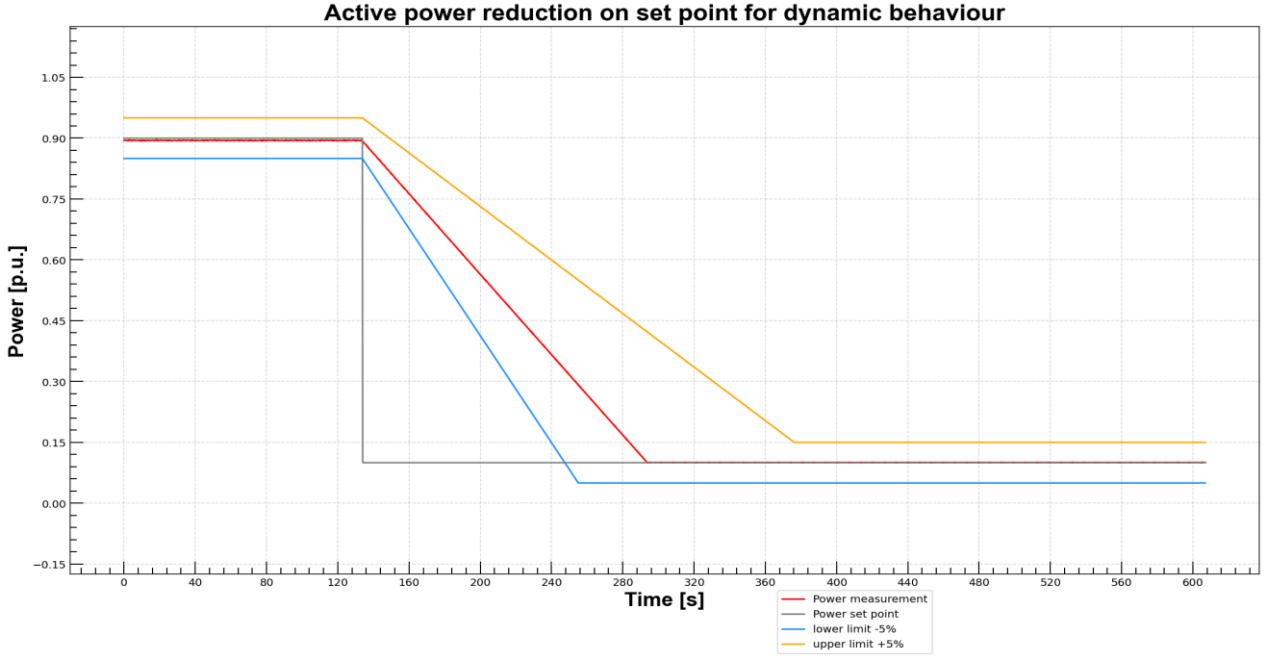


Figure 47 — Example of active power reduction and tolerance envelope for a step from $P = 0,9\ P_n$ to $P = 0,1 P_n$

Active power reduction on set point for dynamic behaviour



----------End of Test Report----------

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