



TL-395

Test Report issued under the responsibility of:



TEST REPORT CEI 0-21:2022 Reference technical rules for connection of active and passive users to the LV electrical Utilities	
Report Reference No.....	220916017GZU-001
Date of issue.....	24 Nov 2022
Total number of pages.....	118 pages
Testing Laboratory	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
Address.....	Room 02, & 101/E201/E301/E401/E501/E601/E701/E801 of Room 01 1-8/F., No. 7-2. Caipin Road, Science City, CETDD, Guangzhou, Guangdong, China
Tested by (name + signature)	Gaison Li Engineer
Approved by (+ signature).....	Jason Fu Supervisor
Applicant's name	INVT Solar Technology (Shenzhen) Co., Ltd.
Address.....	6th Floor, Block A, INVT Guangming Technology Building, Kejie Fourth Road, Shutianpu Community, Matian Guangming District, 518000 Shenzhen, PEOPLE'S REPUBLIC OF CHINA
Test specification:	
Standard	CEI 0-21: 2022
Test procedure	Type approval for Type B
Non-standard test method.....	N/A
Test Report Form No.	CEI 0-21 B
Test Report Form(s) Originator	Intertek Guangzhou
Master TRF.....	Dated 2019-04
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Test item description	Grid-tied Solar inverter
Trade Mark	invt
Manufacturer	Same as applicant
Model/Type reference.....	iMars XG100KTR, iMars XG100KTR-F, iMars XG110KTR, iMars XG110KTR-F, iMars XG136KTR-L, iMars XG136KTR-LF, iMars XG136KTR-X, iMars XG136KTR-XF

Ratings	Model	iMars XG100KTR	iMars XG100KTR-F
	Max.PV voltage	1100Vdc	
	MPPT voltage range	180V – 1000Vdc	
	Max.input current	26A*9	30A*9
	PV Isc	40A*9	
	Nominal output voltage	3/N/PE, 230/400Vac	
	Nominal output Frequency	50Hz	
	Max.output current	158.8A	
	Rated output power	100KW	
	Max.apparent power	110KVA	
	Power factor range	0.8Leading – 0.8 lagging	
	Safety level	Class I	
	Ingress Protection	IP 66	
	Operation Ambient Temperature	-30°C - +60°C	
	Software version	V1.1	
	Model	iMars XG110KTR	iMars XG110KTR-F
	Max.PV voltage	1100Vdc	
	MPPT voltage range	180V – 1000Vdc	
	Max.input current	26A*10	30A*10
	PV Isc	40A*10	
	Nominal output voltage	3/N/PE, 230/400Vac	
	Nominal output Frequency	50Hz	
	Max.output current	174.6A	
	Rated output power	110KW	
	Max.apparent power	121KVA	
Power factor range	0.8Leading – 0.8 lagging		
Safety level	Class I		
Ingress Protection	IP 66		
Operation Ambient Temperature	-30°C - +60°C		
Software version	V1.1		
Model	iMars XG136KTR-L	iMars XG136KTR-LF	
Max.PV voltage	1100Vdc		
MPPT voltage range	180V – 1000Vdc		

Max.input current	26A*12	30A*12
PV Isc	40A*12	
Nominal output voltage	3/N/PE, 277/480Vac	
Nominal output Frequency	50Hz	
Max.output current	174.6A	
Rated output power	136KW	
Max.apparent power	150KVA	
Power factor range	0.8Leading – 0.8 lagging	
Safety level	Class I	
Ingress Protection	IP 66	
Operation Ambient Temperature	-30°C - +60°C	
Software version	V1.1	
Model	iMars XG136KTR-X	iMars XG136KTR-XF
Max.PV voltage	1100Vdc	
MPPT voltage range	180V – 1000Vdc	
Max.input current	26A*12	30A*12
PV Isc	40A*12	
Nominal output voltage	3/N/PE, 311/540Vac	
Nominal output Frequency	50Hz	
Max.output current	160.4A	
Rated output power	136KW	
Max.apparent power	150KVA	
Power factor range	0.8Leading – 0.8 lagging	
Safety level	Class I	
Ingress Protection	IP 66	
Operation Ambient Temperature	-30°C - +60°C	
Software version	V1.1	

Summary of testing:


Tests performed (name of test and test clause):


See following page 9 -15 for details


Testing location:


Intertek Testing Services Shenzhen Ltd.
Guangzhou Branch
Room 02, &
101/E201/E301/E401/E501/E601/E701/E801 of
Room 01 1-8/F., No. 7-2. Caipin Road, Science
City, CETDD, Guangzhou, Guangdong, China





Marking plate

invt Grid-tied Solar Inverter	
iMars XG100KTR	
DC Input	
Vmax. PV	1100V
MPPT Range	180V-1000V
Max. Current	26AX9
Isc PV	40AX9
AC Output	
Nominal Voltage	3/N/PE,230/400V
Max. Current	158.8A
Rated Power	100000W
Max. Output Power	110000VA
Frequency	50Hz/60Hz
Power factor range	0.80un - 0.80ov
Environment	
Temperature	-30°C ~ +60°C
Protective Class	I
Inverter topology	Non-isolated
Ingress protection	IP66
	
Made in China	
INVT Solar Technology (Shenzhen) Co., Ltd.	

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Isc PV	40AX9
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DC Input	
Vmax. PV	1100V
MPPT Range	180V-1000V
Max. Current	26AX10
Isc PV	40AX10
AC Output	
Nominal Voltage	3/N/PE,230/400V
Max. Current	174.6A
Rated Power	110000W
Max. Output Power	121000VA
Frequency	50Hz/60Hz
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Made in China	
INVT Solar Technology (Shenzhen) Co., Ltd.	

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Test item particulars:	
Temperature range	-30°C - 60 °C
AC Overvoltage category.....:	<input type="checkbox"/> OVC I <input type="checkbox"/> OVC II <input checked="" type="checkbox"/> OVC III <input type="checkbox"/> OVC IV
DC Overvoltage category	<input type="checkbox"/> OVC I <input checked="" type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV
IP protection class	IP 66
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A (Not applicable)
- test object does meet the requirement	P (Pass)
- test object does not meet the requirement	F (Fail)
Testing:	
Date of receipt of test item.....:	08 Oct 2022
Date (s) of performance of tests.....:	08 Oct 2022 – 23 Nov 2022
General remarks:	
<p>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 Issuing testing laboratory. "(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report.</p> <p>Throughout this report a point is used as the decimal separator.</p> <p><i>This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.</i></p>	

General product information:

The control system is divided into DC and AC control. AC-DSP and CPLD on the AC side mainly monitors the voltage, current, frequency and GFCI on the grid side, and participates in the inverter control.

The DC-DSP monitors the voltage, current, and ISO on the PV input side, and participates in the BOOS booster circuit and maximum power MPPT point tracking.

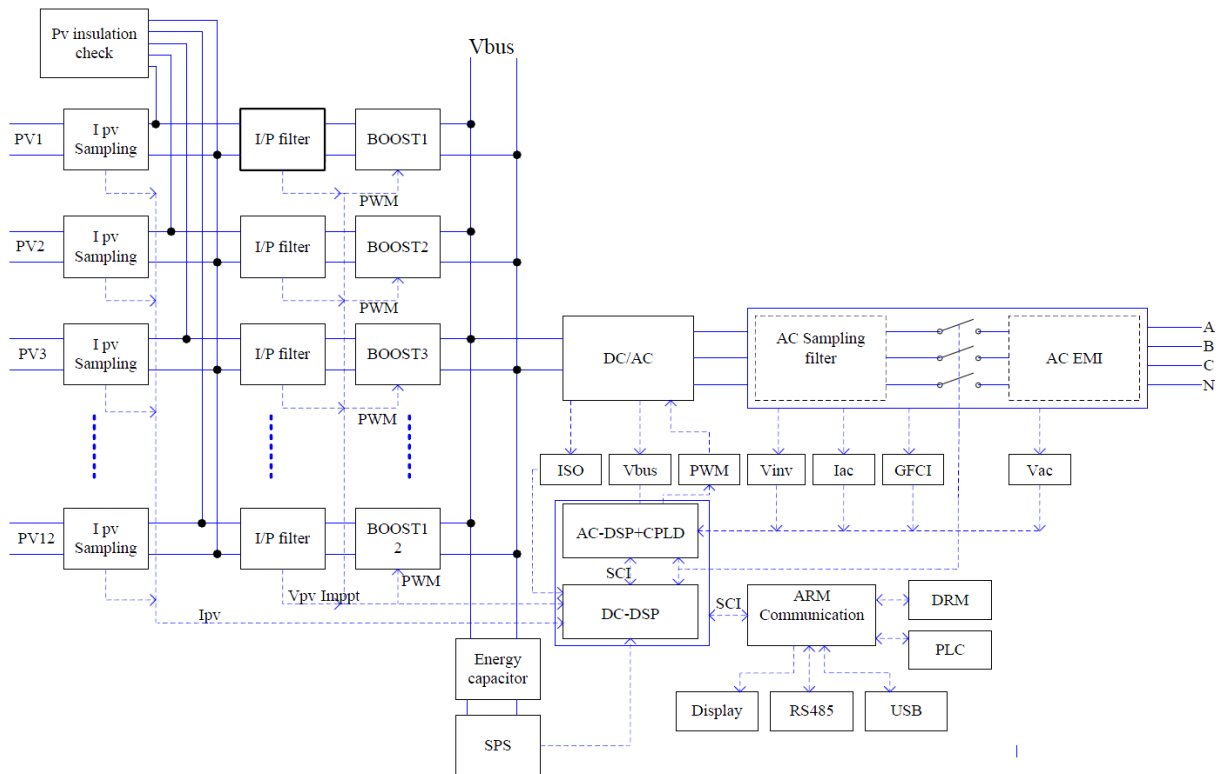
There is an internal communication circuit between the two DSP to coordinate with each other to complete the software function of the whole machine.

The ARM monitoring board does not participate in the control of the whole system. It communicates with the DC-SPS to collect the data of the whole system.

The relays (K3, K4, K5, K6) are designed on redundant structure where K4, K6 are controlled by DC-DSP and K5, K6 are controlled by AC-DSP.

The AC-DSP and DC-DSP are used together to control relay open or close, if the single fault on one controller, the other controller can be capable of opening the relay, so that still providing safety means.

Block diagram:



Model difference:

All models are identical, except the output power derating in software.

The detailed difference as following:

Model	iMars XG100KTR, iMars XG100KTR-F	iMars XG110KTR, iMars XG110KTR-F	iMars XG136KTR-L, iMars XG136KTR-LF	iMars XG136KTR-X, iMars XG136KTR-XF
PV input	9 strings MPPT Each MPPT: two string input	10 strings MPPT Each MPPT: two string input	12 strings MPPT Each MPPT: two string input	
AC output voltage	230/400Vac		277/480Vac	311/540Vac

Factory:
Shenzhen INVT Electric Co., Ltd. (Baoan Factory)
4th to 1st floors of Emerson Industrial Park, No. 3, Fengtang Avenue, Tangwei Community, Fuhai Street, Baoan District, Shenzhen, CHINA.

Topology of the device, which this certificate is based on
(The static converters in systems with capacity more than 11.08 kW)

Disconnection Device	Interface Protection Device	Device for Static Conversion	Rotating Generator Device
		<input checked="" type="checkbox"/>	

Tests performed (name of test and test clause):

Annex A: Requirements and test for Interface Protection System (SPI)
 Interface protection System (SPI) can be integrated to inverter with output power up to 11.08KW.

A.4 Verifiche e prove sul SPI /test and inspection on SPI				
Test	Ref. CEI 0-21	Ref. standard	Result	Sample
Prove funzionali sull'SPI <i>/Functional test on SPI</i>	A.4.3 A.4.3.1 A.4.3.2 A.4.7 (limit conditions)	Condizioni di riferimento / Reference conditions (20 °C) – Tab.9	N/A	--
		Caldo secco / Dry heat test CEI EN 60068-2-2 (Test B) - Tab.12	N/A	--
		Umidità / Humidity test CEI EN 60068-2-78 (Test Cab) - Tab.12	N/A	--
		Freddo / Cold test CEI EN 60068-2-1 (Test A) - Tab.12	N/A	--

A.4.3.3 Prescrizioni aggiuntive per le prove funzionali <i>/Additional requirements of the functional test</i>				
Test	Ref. CEI 0-21	Ref. standard	Result	Sample
Insensibilità delle armoniche del relè di frequenza <i>Insensitivity to harmonics of the frequency relay</i>	A.4.3.3.1	CEI 0-21:2022	N/A	--
Segnale di teleseccato <i>Remote trip signal</i>	A.4.3.3.2	CEI 0-21:2022	N/A	--
Segnale di telecomunicazione <i>Communication signal</i>	A.4.3.3.3	CEI 0-21:2022	N/A	--
Verifica di insensibilità alla derivata di frequenza <i>Verification of insensitivity to the derivative of frequency</i>	A.4.3.4	CEI 0-21:2022	N/A	--
Autotest	A.4.4	CEI 0-21:2022	N/A	--
Single Fault tolerance	A.4.5	CEI 0-21:2022	N/A	--

A.4.6: Prove di compatibilità EMC				
Test	Ref. CEI 0-21	Ref. standard	Result	Sample
Compatibilità elettromagnetica /Electromagnetic compatibility	A.4.6	CEI EN 60255-26 CEI EN 60263 (Severità classe 2 – Livello industriale) – Tab.11	N/A	--
Note:				

A.4.7 Compatibilità Climatica / Climatic compatibility				
Test	Ref. CEI 0-21	Ref. standard	Result	Sample
Compatibilità Climatica /Climatic compatibility Storage conditions	A.4.7 (limit conditions)	Caldo secco / Dry heat test CEI EN 60068-2-2 (Test B) - Tab.12	N/A	--
		Umidità / Humidity test CEI EN 60068-2-78 (Test Cab) - Tab.12	N/A	--
		Freddo / Cold test CEI EN 60068-2-1 (Test A) - Tab.12	N/A	--
		Ciclo termico /changing temperature CEI EN 60068-2-14 - Tab.12	N/A	--
Compatibilità Climatica /Climatic compatibility Inverter in working conditions	A.4.7 (limit conditions)	Caldo secco / Dry heat test CEI EN 60068-2-2 (Test B) - Tab.12	N/A	--
		Umidità / Humidity test CEI EN 60068-2-78 (Test Cab) - Tab.12	N/A	--
		Freddo / Cold test CEI EN 60068-2-1 (Test A) - Tab.12	N/A	--
		Ciclo termico /changing temperature CEI EN 60068-2-14 - Tab.12	N/A	--

A.4.8 Prove di isolamento /Insulating test				
Test	Ref. CEI 0-21	Ref. standard	Result	Sample
Tenuta ad impulso /Pulse test	A.4.8	CEI EN 60146-1-1	N/A	--
Rigidità Dielettrica /Dielectric Strength		CEI EN 60255-5	N/A	--
Resistenza di Isolamento /insulation resistance		CEI EN 60255-5	N/A	--

A.4.9 Prove di sovraccaricabilità dei circuiti di misura / Measurement circuits Overload				
Test	Ref. CEI 0-21	Ref. standard	Result	Sample
Prove di sovraccaricabilità dei circuiti di misura <i>/ Measurement circuits Overload</i>	A.4.9	CEI 0-21:2022	N/A	--

Annex B: Tests on inverters for indirectly connected systems
B.1 Prove sull'inverter / inverter tests

Test	Ref. CEI 0-21	Ref. standard	Result	Sample
Armoniche di corrente /Harmonics measurement (full power, 66% and 33% of max. power) <input type="checkbox"/> CEI EN 61000-3-2 <input checked="" type="checkbox"/> CEI EN 61000-3-12	B.1 Tab. 14 Tab. 15	Condizioni di riferimento / Reference conditions (20 °C) – Tab.14	PASS	iMars XG110KTR iMars XG136KTR-L iMars XG136KTR-X
		Caldo secco / Dry heat test CEI EN 60068-2-2 (Test B) - Tab.15	PASS	iMars XG110KTR iMars XG136KTR-L iMars XG136KTR-X
		Freddo / Cold test CEI EN 60068-2-1 (Test A) - Tab.15	PASS	iMars XG110KTR iMars XG136KTR-L iMars XG136KTR-X
Fluttuazioni di tensione /Flicker measurement (full power, 66% and 33% of max. power) <input type="checkbox"/> CEI EN 61000-3-3 <input checked="" type="checkbox"/> CEI EN 61000-3-11	B.1 Tab. 14 Tab. 15	Condizioni di riferimento / Reference conditions (20 °C) – Tab.14	PASS	iMars XG110KTR iMars XG136KTR-L iMars XG136KTR-X
		Caldo secco / Dry heat test CEI EN 60068-2-2 (Test B) - Tab.15	PASS	iMars XG110KTR iMars XG136KTR-L iMars XG136KTR-X
		Freddo / Cold test CEI EN 60068-2-1 (Test A) - Tab.15	PASS	iMars XG110KTR iMars XG136KTR-L iMars XG136KTR-X

B.1.1 Condizioni di connessione, riconnessione ed erogazione graduale della potenza
Connection, re-connection conditions, and gradual increase of the power production

Test	Ref. CEI 0-21	Ref. standard	Result	Sample
Verifica delle condizioni di connessione e riconnessione /Check of the connection and re-connection conditions	8.4.1.3 B.1.1.1	CEI 0-21:2022	PASS	iMars XG110KTR iMars XG136KTR-L iMars XG136KTR-X
Verifica della erogazione graduale della potenza attiva /Check of the gradual increase of the power production	8.4.1.3 B.1.1.2	CEI 0-21:2022	PASS	iMars XG110KTR iMars XG136KTR-L iMars XG136KTR-X

B.1.2 Erogazione della potenza reattiva /Reactive power production (or adsorbtion)				
Test	Ref. CEI 0-21	Ref. standard	Result	Sample
Verifica dei requisiti costruttivi: capability erogazione della potenza reattiva <i>/ Check of the constructive requirements: reactive power production capability</i>	B.1.2.2	CEI 0-21:2022	PASS	iMars XG110KTR iMars XG136KTR-L iMars XG136KTR-X
Erogazione di potenza reattiva secondo un livello assegnato <i>/ Reactive power production according to an assigned level</i> <i>Applicable for plant with power >11.08KW.</i>	B.1.2.3	CEI 0-21:2022	PASS	iMars XG110KTR
Tempo di risposta ad una variazione a gradino del livello assegnato <i>/Reaction time after a step variation of the assigned level.</i> <i>Applicable for plant with power >11.08KW.</i>	B.1.2.4	CEI 0-21:2022	PASS	iMars XG110KTR
Erogazione automatica di potenza reattiva secondo una curva caratteristica $\cos\phi = f(P)$ <i>/ Automatic reactive power production according to a characteristic curve $\cos(\phi)$</i>	B.1.2.5 <i>Annex E E.2</i>	CEI 0-21:2022	PASS	iMars XG110KTR iMars XG136KTR-L iMars XG136KTR-X
Erogazione automatica di potenza reattiva secondo una curva caratteristica $Q=f(V)$ <i>/ Automatic reactive power production according to a characteristic curve $Q=f(V)$</i> <i>Applicable for plant with power >11.08KW.</i>	B.1.2.6 <i>Annex E E.2.1</i>	CEI 0-21:2022	PASS	iMars XG110KTR

B.1.3 Limitazione della potenza attiva <i>/ Active power limitation</i>				
Test	Ref. CEI 0-21	Ref. standard	Result	Sample
Limitazione automatica della potenza attiva per valori di tensioni prossimi al 110% della tensione nominale / <i>Automatic limitation of active power for voltage values close to 110% of the rated voltage</i>	8.5.3.1 B.1.3.1	CEI 0-21:2022	PASS	iMars XG110KTR
Regolazione della potenza attiva in presenza di transitori di sovralfrequenza sulla rete di trasmissione / <i>Regulation of active power in the presence of over-frequency transients on the transmission network</i>	8.5.3.2 B.1.3.2	CEI 0-21:2022	PASS	iMars XG110KTR
Verifica del campo di funzionamento in tensione e frequenza / <i>Verification of the operating range in voltage and frequency</i>	8.4.4 B.1.3.3	CEI 0-21:2022	PASS	iMars XG110KTR
Limitazione della potenza attiva su comando esterno roveniente dal Distributore <i>/ Restriction of active power on the external command by the Distributor</i>	8.5.3.3 B.1.3.4 Annex F	CEI 0-21:2022	PASS	iMars XG110KTR iMars XG136KTR-L iMars XG136KTR-X

B.1.4 Emissione di componente continua nella corrente di uscita <i>/ DC current injection on the output</i>				
Test	Ref. CEI 0-21	Ref. standard	Result	Sample
Verifica della emissione di componente continua <i>/Check of DC current injection</i>	B.1.4.1	Condizioni di riferimento / Reference conditions (20 °C)	PASS	iMars XG110KTR
		Caldo secco / Dry heat test CEI EN 60068-2-2 (Test B)	PASS	iMars XG110KTR
		Freddo / Cold test CEI EN 60068-2-1 (Test A)	PASS	iMars XG110KTR
Verifica delle protezioni contro l'immissione di componente continua <i>/ Check of protections against the DC current injection.</i>	B.1.4.2	Condizioni di riferimento / Reference conditions (20 °C)	PASS	iMars XG110KTR
		Caldo secco / Dry heat test CEI EN 60068-2-2 (Test B)	PASS	iMars XG110KTR
		Freddo / Cold test CEI EN 60068-2-1 (Test A)	PASS	iMars XG110KTR

B.1.5 Verifica della insensibilità agli abbassamenti di tensione (LVFRT capability) <i>/ Check of the LVFRT capability</i>				
Test	Ref. CEI 0-21	Ref. standard	Result	Sample

LVFRT Capability <i>Applicable for plant with power >11.08KW.</i>	8.5.1 B.1.5	CEI 0-21:2022	PASS	iMars XG110KTR
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B.1.6 Verifica della insensibilità alle richiuse automatiche in discordanza di fase / Check of the insensibility to the re-closures when phases are in discordanza				
Test	Ref. CEI 0-21	Ref. standard	Result	Sample
Verifica della insensibilità alle richiuse automatiche in discordanza di fase <i>/ Check of the insensibility to the re-closures when phases are in discordanza</i>	8.4.4.3 8.6.2.1 B.1.6 B.1.6.1 or B.1.6.2 (or B.1.6.3)	CEI 0-21:2022	PASS	iMars XG110KTR

Allegato B: Prove di compatibilità EMC				
Test	Ref. CEI 0-21	Ref. standard	Result	Sample
Compatibilità elettromagnetica / Electromagnetic compatibility	Annex B	CEI EN 61000-6-1 CEI EN 61000-6-3	PASS	Note
Note: Refer to EMC report No. 210623184GZU-001, which is issued by Intertek Testing Services Shenzhen Ltd. Guangzhou Branch.				

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict
A.3	Adjustment ranges for the interface protection system (SPI)		N/A
A.3.1	Under voltage protection 27.S1		N/A
A.3.1	Under voltage protection 27.S2		N/A
A.3.2	Over voltage protection 59.S1		N/A
A.3.2	Over voltage protection 59.S2		N/A
A.3.3	Under frequency protection 81<S1		N/A
A.3.3	Under frequency protection 81<S2		N/A
A.3.4	Over frequency protection 81>S1		N/A
A.3.4	Over frequency protection 81>S2		N/A
A.4	Checks and tests on the interface protection system SPI		N/A
A.4.3	Functional tests on the interface protection system (SPI)		N/A
A.4.3.3.1	Frequency relay insensitivity to harmonics		N/A
A.4.3.3.2	Remote trip signal		N/A
A.4.3.3.3	Communication Signal		N/A
A.4.3.4	Verification of insensitivity to the derivative of frequency		N/A
A.4.4	Autotest		N/A
A.4.5	Single fault tolerance		N/A
A.4.6	EMC compatibility tests		N/A
A.4.7	Climatic compatibility tests		N/A
A.4.8	Insulation tests		N/A
A.4.9	Tests for the overload capacity of measuring circuits		N/A
A.4.10	Compliance of equipment		N/A
A.4.11	Automatic mechanism to prevent current imbalance during production		N/A
B.1	Test on the inverter		P
B.1.1	Conditions of connection, reconnection and gradual power supply		P
B.1.1.1	Checking the connection and reconnection conditions		P
B.1.1.2	Checking gradual supply of active power		P
B.1.2	Reactive power exchange		P
B.1.2.2	Test performance and recording mode		P

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict
B.1.2.2.1	Inverters in systems with total capacity up to 11.08 kW		N/A
B.1.2.2.2	Inverters in systems with total capacity greater than 11.08 kW		P
B.1.2.3	Reactive power exchange at a given level		P
B.1.2.4	Response time to an assigned step level change		P
B.1.2.5	Automatic supply of reactive power according to a characteristic curve $\cos\phi = f(P)$		P
B1.2.6	Automatic exchange of reactive power according to a characteristic curve $Q=f(V)$		P
B.1.3	Limitation of active power		P
B.1.3.1	Automatic limitation of active power for voltage values close to 110% of the rated voltage		P
B.1.3.2	Regulation of active power in the presence of over-frequency transients on the transmission network		P
B1.3.3	Verification of the operating range in voltage and frequency		P
B.1.3.4	Limitation of active power to external command from the Distributor		P
B.1.4	Output of DC component in the output current		P
B.1.4.1	Checking the DC component output		P
B.1.4.2	Checking the protection against DC input		P
B.1.5	Checking insensitivity to voltage dips (LVRT capability)		P
B.1.6	Checking the insensitivity to automatic reclosing during phase accordance		P
B.1.6.1	Tests on the simulated network		P
B.1.6.2	Tests on the distribution network using a coupling transformer		N/A
B.1.6.3	Tests on the distribution network, simulation of frequency drift		N/A

Appended Table - Testing Result

B.1	TABLE: Test on the inverter	P
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Current harmonics emission test for class A limit (According to CEI EN 61000-3-12)

Test was performed under the condition of table 14 and table 15

Tabella 14 – Condizioni di riferimento

Grandezza di influenza	Valore di riferimento
Temperatura ambiente	20 °C ± 2 °C
Pressione atmosferica	96 ± 10 kPa
Umidità relativa	65 %
Posizione apparecchiatura	Secondo quanto dichiarato del costruttore
Frequenza	50 Hz
Forma d'onda della tensione di riferimento	Conforme alla CEI EN 50160

Tabella 15 – Condizioni di riferimento

Grandezza di influenza	Valore di riferimento
Temperatura ambiente	-10 °C e +55 °C
Pressione atmosferica	96 ± 10 kPa
Umidità relativa	65 % (per temperature maggiori di 0°C)
Posizione apparecchiatura	Secondo quanto dichiarato dal costruttore
Frequenza	50 Hz
Forma d'onda della tensione di riferimento	Conforme alla CEI EN 50160

Harmonics measurement under ambient condition 55°C

33% Pn

Harmonic	iMars XG110KTR			iMars XG136KTR-L			iMars XG136KTR-X			Limit (%)
	L1	L2	L3	L1	L2	L3	L1	L2	L3	
2nd	0.365	0.394	0.320	0.370	0.402	0.321	0.193	0.225	0.145	8.00
3rd	0.071	0.065	0.027	0.076	0.068	0.027	0.072	0.064	0.027	21.60
4th	0.264	0.232	0.240	0.267	0.234	0.244	0.150	0.114	0.120	4.00
5th	1.199	1.205	1.188	1.239	1.246	1.230	1.210	1.215	1.195	10.70
6th	0.021	0.018	0.015	0.020	0.018	0.016	0.022	0.015	0.019	2.67
7th	0.230	0.237	0.234	0.238	0.245	0.243	0.232	0.237	0.234	7.20
8th	0.024	0.018	0.022	0.025	0.018	0.022	0.015	0.011	0.013	2.00
9th	0.009	0.008	0.009	0.009	0.008	0.009	0.009	0.008	0.008	3.80
10th	0.009	0.010	0.007	0.009	0.009	0.007	0.008	0.008	0.006	1.60
11th	0.037	0.039	0.041	0.038	0.041	0.041	0.038	0.040	0.041	3.10
12th	0.011	0.007	0.010	0.011	0.007	0.011	0.011	0.007	0.010	1.33
13th	0.028	0.030	0.031	0.028	0.031	0.031	0.029	0.031	0.031	2.00
PWHD	5.026	4.954	5.002	4.835	4.927	4.905	4.818	4.894	5.037	23
THD	3.960	3.988	3.867	3.973	4.003	3.879	3.824	3.844	3.735	23

Harmonics measurement under ambient condition 55°C										
66% Pn										
Harmonic	iMars XG110KTR			iMars XG136KTR-L			iMars XG136KTR-X			Limit (%)
	L1	L2	L3	L1	L2	L3	L1	L2	L3	
2nd	0.665	0.714	0.601	0.671	0.725	0.612	0.321	0.366	0.259	8.00
3rd	0.070	0.058	0.033	0.079	0.062	0.034	0.066	0.062	0.024	21.60
4th	0.484	0.445	0.446	0.490	0.448	0.450	0.249	0.200	0.203	4.00
5th	1.237	1.249	1.243	1.278	1.292	1.289	1.250	1.254	1.250	10.70
6th	0.026	0.016	0.023	0.025	0.016	0.025	0.023	0.017	0.022	2.67
7th	0.223	0.231	0.226	0.233	0.240	0.233	0.225	0.233	0.231	7.20
8th	0.047	0.041	0.042	0.047	0.042	0.043	0.024	0.019	0.021	2.00
9th	0.009	0.009	0.009	0.010	0.010	0.010	0.010	0.011	0.009	3.80
10th	0.009	0.012	0.008	0.009	0.012	0.009	0.009	0.010	0.008	1.60
11th	0.059	0.059	0.059	0.060	0.061	0.059	0.061	0.064	0.061	3.10
12th	0.012	0.008	0.010	0.011	0.008	0.011	0.011	0.007	0.011	1.33
13th	0.041	0.043	0.043	0.041	0.044	0.044	0.042	0.045	0.042	2.00
PWHD	3.847	3.739	3.641	3.589	3.627	3.716	3.278	3.186	3.125	23
THD	2.285	2.313	2.229	2.287	2.317	2.238	2.028	2.037	1.990	23

Harmonics measurement under ambient condition 55°C										
100% Pn										
Harmonic	iMars XG110KTR			iMars XG136KTR-L			iMars XG136KTR-X			Limit (%)
	L1	L2	L3	L1	L2	L3	L1	L2	L3	
2nd	0.962	1.004	0.854	0.962	1.028	0.874	0.357	0.424	0.307	8.00
3rd	0.082	0.073	0.035	0.093	0.080	0.042	0.081	0.070	0.042	21.60
4th	0.686	0.622	0.640	0.691	0.625	0.644	0.294	0.218	0.233	4.00
5th	1.283	1.301	1.295	1.327	1.345	1.341	1.303	1.311	1.297	10.70
6th	0.033	0.022	0.031	0.034	0.021	0.033	0.033	0.020	0.031	2.67
7th	0.200	0.202	0.202	0.207	0.210	0.209	0.200	0.207	0.205	7.20
8th	0.066	0.061	0.060	0.067	0.064	0.061	0.027	0.026	0.021	2.00
9th	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.011	3.80
10th	0.010	0.013	0.010	0.010	0.012	0.010	0.009	0.011	0.009	1.60
11th	0.077	0.079	0.077	0.078	0.080	0.078	0.079	0.083	0.078	3.10
12th	0.012	0.009	0.010	0.012	0.009	0.011	0.011	0.008	0.010	1.33
13th	0.045	0.048	0.049	0.046	0.049	0.049	0.048	0.050	0.049	2.00
PWHD	3.268	2.964	3.167	2.846	2.918	2.897	2.943	2.903	2.870	23
THD	1.755	1.764	1.685	1.750	1.770	1.692	1.403	1.413	1.369	23

Harmonics measurement under ambient condition -10°C										
33% Pn										
Harmonic	iMars XG110KTR			iMars XG136KTR-L			iMars XG136KTR-X			Limit (%)
	L1	L2	L3	L1	L2	L3	L1	L2	L3	
2nd	0.365	0.394	0.318	0.369	0.403	0.322	0.196	0.226	0.144	8.00
3rd	0.071	0.065	0.026	0.076	0.067	0.028	0.070	0.067	0.025	21.60
4th	0.264	0.232	0.240	0.267	0.233	0.243	0.150	0.113	0.120	4.00
5th	1.199	1.206	1.189	1.240	1.246	1.230	1.210	1.215	1.195	10.70
6th	0.020	0.018	0.015	0.021	0.018	0.016	0.022	0.016	0.019	2.67
7th	0.230	0.238	0.234	0.238	0.245	0.243	0.232	0.237	0.234	7.20
8th	0.024	0.016	0.022	0.024	0.018	0.022	0.016	0.011	0.013	2.00
9th	0.009	0.008	0.008	0.009	0.009	0.009	0.010	0.008	0.008	3.80
10th	0.008	0.010	0.007	0.009	0.010	0.007	0.008	0.008	0.006	1.60
11th	0.037	0.039	0.041	0.038	0.039	0.042	0.038	0.040	0.041	3.10
12th	0.011	0.007	0.010	0.011	0.007	0.011	0.012	0.007	0.010	1.33
13th	0.028	0.030	0.031	0.028	0.031	0.031	0.029	0.031	0.031	2.00
PWHD	5.324	5.128	4.982	5.176	5.035	5.086	4.982	4.845	4.938	23
THD	3.962	3.989	3.867	3.974	4.005	3.881	3.822	3.844	3.734	23

Harmonics measurement under ambient condition -10°C										
66% Pn										
Harmonic	iMars XG110KTR			iMars XG136KTR-L			iMars XG136KTR-X			Limit (%)
	L1	L2	L3	L1	L2	L3	L1	L2	L3	
2nd	0.668	0.712	0.596	0.668	0.725	0.611	0.319	0.364	0.260	8.00
3rd	0.070	0.061	0.030	0.073	0.059	0.034	0.064	0.061	0.023	21.60
4th	0.483	0.442	0.446	0.491	0.449	0.452	0.248	0.199	0.204	4.00
5th	1.235	1.249	1.244	1.277	1.292	1.287	1.251	1.253	1.250	10.70
6th	0.025	0.016	0.024	0.026	0.018	0.025	0.023	0.017	0.022	2.67
7th	0.225	0.231	0.226	0.232	0.240	0.234	0.225	0.233	0.231	7.20
8th	0.047	0.041	0.043	0.047	0.042	0.042	0.024	0.019	0.021	2.00
9th	0.009	0.010	0.010	0.009	0.010	0.010	0.010	0.010	0.009	3.80
10th	0.010	0.012	0.008	0.009	0.012	0.008	0.009	0.010	0.008	1.60
11th	0.060	0.060	0.059	0.061	0.061	0.060	0.061	0.064	0.062	3.10
12th	0.012	0.008	0.011	0.011	0.008	0.011	0.012	0.007	0.011	1.33
13th	0.041	0.044	0.043	0.042	0.045	0.044	0.044	0.045	0.044	2.00
PWHD	3.525	3.476	3.376	3.476	3.564	3.518	3.174	3.057	2.856	23
THD	2.285	2.311	2.226	2.283	2.318	2.235	2.028	2.035	1.990	23

Harmonics measurement under ambient condition -10°C										
100% Pn										
Harmonic	iMars XG110KTR			iMars XG136KTR-L			iMars XG136KTR-X			Limit (%)
	L1	L2	L3	L1	L2	L3	L1	L2	L3	
2nd	0.959	1.004	0.853	0.954	1.032	0.876	0.360	0.432	0.320	8.00
3rd	0.080	0.071	0.034	0.088	0.080	0.038	0.073	0.072	0.034	21.60
4th	0.687	0.623	0.640	0.691	0.624	0.644	0.300	0.224	0.238	4.00
5th	1.281	1.300	1.290	1.325	1.344	1.337	1.300	1.309	1.294	10.70
6th	0.034	0.023	0.030	0.034	0.021	0.033	0.033	0.021	0.031	2.67
7th	0.200	0.203	0.202	0.208	0.209	0.209	0.201	0.207	0.204	7.20
8th	0.066	0.061	0.060	0.067	0.062	0.061	0.027	0.026	0.021	2.00
9th	0.011	0.013	0.012	0.012	0.012	0.012	0.011	0.012	0.011	3.80
10th	0.010	0.013	0.010	0.010	0.012	0.011	0.009	0.011	0.009	1.60
11th	0.077	0.079	0.078	0.079	0.081	0.079	0.080	0.084	0.079	3.10
12th	0.012	0.009	0.011	0.012	0.009	0.010	0.011	0.008	0.010	1.33
13th	0.046	0.049	0.050	0.046	0.050	0.050	0.049	0.051	0.050	2.00
PWHD	2.845	2.935	2.836	2.734	2.567	2.589	2.318	2.453	2.275	23
THD	1.754	1.764	1.682	1.744	1.771	1.691	1.402	1.415	1.371	23

Harmonics measurement under ambient condition 22°C										
33% Pn										
Harmonic	iMars XG110KTR			iMars XG136KTR-L			iMars XG136KTR-X			Limit (%)
	L1	L2	L3	L1	L2	L3	L1	L2	L3	
2nd	0.365	0.394	0.318	0.368	0.402	0.321	0.192	0.226	0.146	8.00
3rd	0.070	0.062	0.028	0.076	0.068	0.027	0.072	0.066	0.025	21.60
4th	0.264	0.232	0.240	0.267	0.234	0.244	0.150	0.114	0.121	4.00
5th	1.199	1.206	1.188	1.240	1.246	1.230	1.210	1.215	1.195	10.70
6th	0.021	0.018	0.015	0.020	0.018	0.016	0.022	0.015	0.019	2.67
7th	0.231	0.238	0.234	0.238	0.245	0.242	0.232	0.237	0.234	7.20
8th	0.024	0.016	0.022	0.024	0.018	0.022	0.015	0.011	0.013	2.00
9th	0.009	0.008	0.009	0.009	0.008	0.009	0.009	0.008	0.008	3.80
10th	0.009	0.009	0.007	0.008	0.009	0.007	0.008	0.008	0.006	1.60
11th	0.038	0.039	0.041	0.037	0.039	0.041	0.039	0.040	0.041	3.10
12th	0.012	0.007	0.011	0.011	0.007	0.011	0.012	0.007	0.010	1.33
13th	0.028	0.031	0.031	0.028	0.031	0.031	0.029	0.031	0.031	2.00
PWHD	5.034	4.843	4.739	4.893	4.936	4.736	4.681	4.752	4.728	23
THD	3.963	3.990	3.866	3.972	4.004	3.879	3.822	3.846	3.736	23

Harmonics measurement under ambient condition 22°C										
66% Pn										
Harmonic	iMars XG110KTR			iMars XG136KTR-L			iMars XG136KTR-X			Limit (%)
	L1	L2	L3	L1	L2	L3	L1	L2	L3	
2nd	0.669	0.713	0.598	0.669	0.727	0.612	0.320	0.368	0.260	8.00
3rd	0.069	0.059	0.031	0.074	0.064	0.032	0.067	0.063	0.023	21.60
4th	0.483	0.441	0.446	0.488	0.448	0.451	0.248	0.200	0.203	4.00
5th	1.235	1.249	1.243	1.278	1.292	1.288	1.252	1.254	1.250	10.70
6th	0.025	0.016	0.024	0.025	0.016	0.024	0.023	0.017	0.022	2.67
7th	0.226	0.232	0.226	0.232	0.240	0.233	0.224	0.233	0.231	7.20
8th	0.047	0.039	0.043	0.047	0.041	0.043	0.024	0.019	0.021	2.00
9th	0.009	0.010	0.010	0.010	0.010	0.010	0.010	0.011	0.009	3.80
10th	0.009	0.012	0.008	0.009	0.012	0.009	0.009	0.010	0.008	1.60
11th	0.059	0.060	0.059	0.060	0.061	0.060	0.061	0.064	0.061	3.10
12th	0.012	0.008	0.010	0.012	0.008	0.010	0.011	0.007	0.011	1.33
13th	0.041	0.044	0.043	0.041	0.045	0.044	0.043	0.045	0.043	2.00
PWHD	3.187	3.286	3.110	3.169	3.250	3.311	2.935	2.849	2.752	23
THD	2.286	2.310	2.227	2.283	2.318	2.236	2.029	2.038	1.990	23

Harmonics measurement under ambient condition 22°C										
100% Pn										
Harmonic	iMars XG110KTR			iMars XG136KTR-L			iMars XG136KTR-X			Limit (%)
	L1	L2	L3	L1	L2	L3	L1	L2	L3	
2nd	0.954	1.003	0.858	0.954	1.030	0.875	0.355	0.424	0.309	8.00
3rd	0.079	0.070	0.033	0.091	0.080	0.038	0.074	0.068	0.037	21.60
4th	0.686	0.622	0.640	0.691	0.625	0.644	0.293	0.217	0.232	4.00
5th	1.283	1.300	1.292	1.326	1.344	1.338	1.302	1.309	1.295	10.70
6th	0.034	0.022	0.031	0.034	0.021	0.033	0.033	0.020	0.031	2.67
7th	0.199	0.202	0.202	0.208	0.210	0.209	0.201	0.208	0.205	7.20
8th	0.066	0.061	0.060	0.067	0.062	0.060	0.026	0.026	0.021	2.00
9th	0.011	0.012	0.012	0.011	0.012	0.012	0.011	0.012	0.011	3.80
10th	0.010	0.012	0.010	0.010	0.012	0.011	0.009	0.011	0.009	1.60
11th	0.077	0.079	0.077	0.079	0.081	0.079	0.080	0.083	0.078	3.10
12th	0.012	0.009	0.011	0.012	0.008	0.010	0.011	0.008	0.010	1.33
13th	0.046	0.049	0.049	0.046	0.049	0.049	0.048	0.050	0.049	2.00
PWHD	2.632	2.715	2.639	2.597	2.618	2.649	2.286	2.317	2.302	23
THD	1.751	1.763	1.686	1.745	1.770	1.692	1.402	1.411	1.368	23

B.1	TABLE: Test on the inverter				P
Flicker measurement					
CEI EN 61000-3-3					
Test was performed under the condition of table 14 and table 15					
Tabella 14 – Condizioni di riferimento					
Grandezza di influenza		Valore di riferimento			
Temperatura ambiente		20 °C ± 2 °C			
Pressione atmosferica		96 ± 10 kPa			
Umidità relativa		85 %			
Posizione apparecchiatura		Secondo quanto dichiarato del costruttore			
Frequenza		50 Hz			
Forma d'onda della tensione di riferimento		Conforme alla CEI EN 50160			
Tabella 15 – Condizioni di riferimento					
Grandezza di influenza		Valore di riferimento			
Temperatura ambiente		-10 °C e +55 °C			
Pressione atmosferica		96 ± 10 kPa			
Umidità relativa		85 % (per temperature maggiori di 0°C)			
Posizione apparecchiatura		Secondo quanto dichiarato dal costruttore			
Frequenza		50 Hz			
Forma d'onda della tensione di riferimento		Conforme alla CEI EN 50160			
Flicker measurement under ambient condition 20° C					
Model: iMars XG110KTR					
100% rating power condition:					
P_{bin}(%)	Limit	L1 Phase	L2 Phase	L3 Phase	
PST	≤ 1	0.348	0.359	0.346	
PLT	≤ 0.65	0.339	0.350	0.332	
dc	≤ 3.30%	0%	0%	0%	
dmax	4%	0.563%	0.553%	0.555%	
66% rating power condition:					
P_{bin}(%)	Limit	L1 Phase	L2 Phase	L3 Phase	
PST	≤ 1	0.347	0.370	0.359	
PLT	≤ 0.65	0.339	0.357	0.340	
dc	≤ 3.30%	0%	0%	0%	
dmax	4%	0.407	0.396%	0.397%	
33% rating power condition:					
P_{bin}(%)	Limit	L1 Phase	L2 Phase	L3 Phase	
PST	≤ 1	0.353	0.377	0.362	
PLT	≤ 0.65	0.344	0.360	0.350	
dc	≤ 3.30%	0%	0%	0%	
dmax	4%	0.208%	0.197%	0.201%	

Flicker measurement under ambient condition 20° C

100% rating power condition:

L1 Phase

Element	1		Element	1		Judgement	Pass	
Volt Range	600V/50Hz		Total	(1 2 3)		Judgement	Pass	
Un(Set)	230.00V							
Freq(1):	50.00Hz							

Limit	dc[%]		dmax[%]		d(t)[ms,%]		Pst		Pit
	3.30000		4.00000		500.000		1.00000		0.65000
					3.30000				N:12
1	0.00000	Pass	560.755 m	Pass	0.00000	Pass	337.808 m	Pass	
2	0.00000	Pass	563.174 m	Pass	0.00000	Pass	342.929 m	Pass	
3	0.00000	Pass	563.347 m	Pass	0.00000	Pass	336.031 m	Pass	
4	0.00000	Pass	562.048 m	Pass	0.00000	Pass	342.846 m	Pass	
5	0.00000	Pass	559.860 m	Pass	0.00000	Pass	333.299 m	Pass	
6	0.00000	Pass	562.948 m	Pass	0.00000	Pass	325.902 m	Pass	
7	0.00000	Pass	564.378 m	Pass	0.00000	Pass	335.518 m	Pass	
8	0.00000	Pass	559.920 m	Pass	0.00000	Pass	343.704 m	Pass	
9	0.00000	Pass	559.705 m	Pass	0.00000	Pass	348.718 m	Pass	
10	0.00000	Pass	560.504 m	Pass	0.00000	Pass	346.341 m	Pass	
11	0.00000	Pass	560.510 m	Pass	0.00000	Pass	343.402 m	Pass	
12	0.00000	Pass	560.856 m	Pass	0.00000	Pass	337.719 m	Pass	
Result		Pass		Pass		Pass		Pass	339.627 m Pass

L2 Phase

Element	2		Element	2		Judgement	Pass	
Volt Range	600V/50Hz		Total	(1 2 3)		Judgement	Pass	
Un(Set)	230.00V							
Freq(2):	50.00Hz							

Limit	dc[%]		dmax[%]		d(t)[ms,%]		Pst		Pit
	3.30000		4.00000		500.000		1.00000		0.65000
					3.30000				N:12
1	0.00000	Pass	548.697 m	Pass	0.00000	Pass	359.041 m	Pass	
2	0.00000	Pass	546.569 m	Pass	0.00000	Pass	356.423 m	Pass	
3	0.00000	Pass	547.683 m	Pass	0.00000	Pass	355.411 m	Pass	
4	0.00000	Pass	553.286 m	Pass	0.00000	Pass	354.490 m	Pass	
5	0.00000	Pass	551.397 m	Pass	0.00000	Pass	352.026 m	Pass	
6	0.00000	Pass	548.017 m	Pass	0.00000	Pass	347.001 m	Pass	
7	0.00000	Pass	550.330 m	Pass	0.00000	Pass	339.358 m	Pass	
8	0.00000	Pass	549.763 m	Pass	0.00000	Pass	337.975 m	Pass	
9	0.00000	Pass	549.221 m	Pass	0.00000	Pass	348.134 m	Pass	
10	0.00000	Pass	547.093 m	Pass	0.00000	Pass	349.743 m	Pass	
11	0.00000	Pass	548.637 m	Pass	0.00000	Pass	349.310 m	Pass	
12	0.00000	Pass	548.136 m	Pass	0.00000	Pass	354.542 m	Pass	
Result		Pass		Pass		Pass		Pass	350.398 m Pass

L3 Phase

Element	3		Element	3		Judgement	Pass	
Volt Range	600V/50Hz		Total	(1 2 3)		Judgement	Pass	
Un(Set)	230.00V							
Freq(3):	50.00Hz							

Limit	dc[%]		dmax[%]		d(t)[ms,%]		Pst		Pit
	3.30000		4.00000		500.000		1.00000		0.65000
					3.30000				N:12
1	0.00000	Pass	549.316 m	Pass	0.00000	Pass	328.401 m	Pass	
2	0.00000	Pass	550.216 m	Pass	0.00000	Pass	329.979 m	Pass	
3	0.00000	Pass	551.921 m	Pass	0.00000	Pass	334.246 m	Pass	
4	0.00000	Pass	554.174 m	Pass	0.00000	Pass	331.985 m	Pass	
5	0.00000	Pass	550.550 m	Pass	0.00000	Pass	334.149 m	Pass	
6	0.00000	Pass	549.906 m	Pass	0.00000	Pass	330.371 m	Pass	
7	0.00000	Pass	550.950 m	Pass	0.00000	Pass	346.250 m	Pass	
8	0.00000	Pass	554.925 m	Pass	0.00000	Pass	329.269 m	Pass	
9	0.00000	Pass	551.116 m	Pass	0.00000	Pass	332.990 m	Pass	
10	0.00000	Pass	552.779 m	Pass	0.00000	Pass	326.978 m	Pass	
11	0.00000	Pass	554.246 m	Pass	0.00000	Pass	335.878 m	Pass	
12	0.00000	Pass	553.685 m	Pass	0.00000	Pass	333.187 m	Pass	
Result		Pass		Pass		Pass		Pass	332.876 m Pass

Flicker measurement under ambient condition -10° C				
Model: iMars XG110KTR				
100% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.343	0.360	0.343
PLT	≤ 0.65	0.338	0.351	0.333
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.562%	0.549%	0.553%
66% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.348	0.363	0.343
PLT	≤ 0.65	0.335	0.351	0.335
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.406%	0.396%	0.401%
33% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.343	0.354	0.365
PLT	≤ 0.65	0.334	0.337	0.344
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.208%	0.197%	0.202%

Flicker measurement under ambient condition -10° C

100% rating power condition:

L1 Phase

Element	1		Element	1		Judgement	Pass	
Volt Range	600V/50Hz		Total	(1 2 3)		Judgement	Pass	
Un(Set)	230.00V							
Freq(1):	50.00Hz							
Limit	dc[%]		dmax[%]		d(t)[ms.%]		Pst	Pit
	3.30000		4.00000		500.000		1.00000	0.65000
					3.30000			N:12
1	0.00000	Pass	553.954 m	Pass	0.00000	Pass	330.004 m	Pass
2	0.00000	Pass	561.357 m	Pass	0.00000	Pass	341.806 m	Pass
3	0.00000	Pass	562.477 m	Pass	0.00000	Pass	334.701 m	Pass
4	0.00000	Pass	558.299 m	Pass	0.00000	Pass	341.040 m	Pass
5	0.00000	Pass	559.270 m	Pass	0.00000	Pass	341.135 m	Pass
6	0.00000	Pass	558.376 m	Pass	0.00000	Pass	338.422 m	Pass
7	0.00000	Pass	558.829 m	Pass	0.00000	Pass	335.818 m	Pass
8	0.00000	Pass	559.974 m	Pass	0.00000	Pass	343.469 m	Pass
9	0.00000	Pass	560.939 m	Pass	0.00000	Pass	343.698 m	Pass
10	0.00000	Pass	557.238 m	Pass	0.00000	Pass	336.535 m	Pass
11	0.00000	Pass	558.466 m	Pass	0.00000	Pass	337.643 m	Pass
12	0.00000	Pass	561.833 m	Pass	0.00000	Pass	339.446 m	Pass
Result		Pass		Pass		Pass		338.686 m Pass

L2 Phase

Element	2		Element	2		Judgement	Pass	
Volt Range	600V/50Hz		Total	(1 2 3)		Judgement	Pass	
Un(Set)	230.00V							
Freq(2):	50.00Hz							
Limit	dc[%]		dmax[%]		d(t)[ms.%]		Pst	Pit
	3.30000		4.00000		500.000		1.00000	0.65000
					3.30000			N:12
1	0.00000	Pass	544.858 m	Pass	0.00000	Pass	340.034 m	Pass
2	0.00000	Pass	546.545 m	Pass	0.00000	Pass	358.930 m	Pass
3	0.00000	Pass	548.226 m	Pass	0.00000	Pass	353.713 m	Pass
4	0.00000	Pass	545.841 m	Pass	0.00000	Pass	358.415 m	Pass
5	0.00000	Pass	548.202 m	Pass	0.00000	Pass	356.802 m	Pass
6	0.00000	Pass	546.712 m	Pass	0.00000	Pass	356.970 m	Pass
7	0.00000	Pass	547.558 m	Pass	0.00000	Pass	344.763 m	Pass
8	0.00000	Pass	548.011 m	Pass	0.00000	Pass	351.201 m	Pass
9	0.00000	Pass	548.697 m	Pass	0.00000	Pass	352.900 m	Pass
10	0.00000	Pass	547.093 m	Pass	0.00000	Pass	340.877 m	Pass
11	0.00000	Pass	549.847 m	Pass	0.00000	Pass	345.813 m	Pass
12	0.00000	Pass	548.965 m	Pass	0.00000	Pass	360.588 m	Pass
Result		Pass		Pass		Pass		351.884 m Pass

L3 Phase

Element	3		Element	3		Judgement	Pass	
Volt Range	600V/50Hz		Total	(1 2 3)		Judgement	Pass	
Un(Set)	230.00V							
Freq(3):	50.00Hz							
Limit	dc[%]		dmax[%]		d(t)[ms.%]		Pst	Pit
	3.30000		4.00000		500.000		1.00000	0.65000
					3.30000			N:12
1	0.00000	Pass	549.948 m	Pass	0.00000	Pass	333.828 m	Pass
2	0.00000	Pass	552.237 m	Pass	0.00000	Pass	333.800 m	Pass
3	0.00000	Pass	553.942 m	Pass	0.00000	Pass	335.409 m	Pass
4	0.00000	Pass	548.166 m	Pass	0.00000	Pass	323.019 m	Pass
5	0.00000	Pass	551.373 m	Pass	0.00000	Pass	321.727 m	Pass
6	0.00000	Pass	552.410 m	Pass	0.00000	Pass	332.674 m	Pass
7	0.00000	Pass	551.331 m	Pass	0.00000	Pass	333.702 m	Pass
8	0.00000	Pass	552.583 m	Pass	0.00000	Pass	343.890 m	Pass
9	0.00000	Pass	551.587 m	Pass	0.00000	Pass	340.933 m	Pass
10	0.00000	Pass	551.981 m	Pass	0.00000	Pass	337.632 m	Pass
11	0.00000	Pass	551.659 m	Pass	0.00000	Pass	327.332 m	Pass
12	0.00000	Pass	552.803 m	Pass	0.00000	Pass	333.132 m	Pass
Result		Pass		Pass		Pass		333.207 m Pass

Flicker measurement under ambient condition 55° C				
Model: iMars XG110KTR				
100% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.352	0.359	0.341
PLT	≤ 0.65	0.339	0.348	0.331
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.563%	0.551%	0.554%
66% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.349	0.359	0.344
PLT	≤ 0.65	0.337	0.353	0.336
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.406%	0.398%	0.400%
33% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.349	0.364	0.362
PLT	≤ 0.65	0.334	0.353	0.346
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.207%	0.199%	0.200%

Flicker measurement under ambient condition 55° C

100% rating power condition:

L1 Phase

Element	1		Element	1		Judgement	Pass	
Volt Range	600V/50Hz		Total	(1 2 3)		Judgement	Pass	
Un(Set)	230.00V							
Freq(1):	50.00Hz							
	dc[%]	dmax[%]	d(t)[ms.%]	Pst	Pit			
Limit	3.30000	4.00000	500.000	1.00000	0.65000			
			3.30000		N:12			
1	0.00000	Pass	561.655 m	Pass	0.00000	Pass	349.060 m	Pass
2	0.00000	Pass	559.843 m	Pass	0.00000	Pass	341.600 m	Pass
3	0.00000	Pass	558.233 m	Pass	0.00000	Pass	338.116 m	Pass
4	0.00000	Pass	561.541 m	Pass	0.00000	Pass	332.890 m	Pass
5	0.00000	Pass	563.455 m	Pass	0.00000	Pass	352.127 m	Pass
6	0.00000	Pass	561.863 m	Pass	0.00000	Pass	340.010 m	Pass
7	0.00000	Pass	563.538 m	Pass	0.00000	Pass	327.061 m	Pass
8	0.00000	Pass	561.893 m	Pass	0.00000	Pass	336.467 m	Pass
9	0.00000	Pass	559.175 m	Pass	0.00000	Pass	335.387 m	Pass
10	0.00000	Pass	561.482 m	Pass	0.00000	Pass	344.519 m	Pass
11	0.00000	Pass	559.455 m	Pass	0.00000	Pass	335.679 m	Pass
12	0.00000	Pass	562.078 m	Pass	0.00000	Pass	336.047 m	Pass
Result	Pass	Pass	Pass	Pass	Pass	Pass	339.211 m	Pass

L2 Phase

Element	2		Element	2		Judgement	Pass	
Volt Range	600V/50Hz		Total	(1 2 3)		Judgement	Pass	
Un(Set)	230.00V							
Freq(2):	50.00Hz							
	dc[%]	dmax[%]	d(t)[ms.%]	Pst	Pit			
Limit	3.30000	4.00000	500.000	1.00000	0.65000			
			3.30000		N:12			
1	0.00000	Pass	549.197 m	Pass	0.00000	Pass	341.177 m	Pass
2	0.00000	Pass	546.229 m	Pass	0.00000	Pass	348.666 m	Pass
3	0.00000	Pass	549.084 m	Pass	0.00000	Pass	349.158 m	Pass
4	0.00000	Pass	549.358 m	Pass	0.00000	Pass	348.288 m	Pass
5	0.00000	Pass	546.545 m	Pass	0.00000	Pass	355.636 m	Pass
6	0.00000	Pass	548.804 m	Pass	0.00000	Pass	349.227 m	Pass
7	0.00000	Pass	546.283 m	Pass	0.00000	Pass	354.655 m	Pass
8	0.00000	Pass	551.176 m	Pass	0.00000	Pass	353.527 m	Pass
9	0.00000	Pass	548.178 m	Pass	0.00000	Pass	348.255 m	Pass
10	0.00000	Pass	548.768 m	Pass	0.00000	Pass	340.352 m	Pass
11	0.00000	Pass	546.795 m	Pass	0.00000	Pass	337.763 m	Pass
12	0.00000	Pass	546.885 m	Pass	0.00000	Pass	359.840 m	Pass
Result	Pass	Pass	Pass	Pass	Pass	Pass	348.993 m	Pass

L3 Phase

Element	3		Element	3		Judgement	Pass	
Volt Range	600V/50Hz		Total	(1 2 3)		Judgement	Pass	
Un(Set)	230.00V							
Freq(3):	50.00Hz							
	dc[%]	dmax[%]	d(t)[ms.%]	Pst	Pit			
Limit	3.30000	4.00000	500.000	1.00000	0.65000			
			3.30000		N:12			
1	0.00000	Pass	551.373 m	Pass	0.00000	Pass	338.085 m	Pass
2	0.00000	Pass	552.672 m	Pass	0.00000	Pass	331.155 m	Pass
3	0.00000	Pass	552.726 m	Pass	0.00000	Pass	333.602 m	Pass
4	0.00000	Pass	551.039 m	Pass	0.00000	Pass	334.036 m	Pass
5	0.00000	Pass	550.997 m	Pass	0.00000	Pass	341.823 m	Pass
6	0.00000	Pass	554.234 m	Pass	0.00000	Pass	326.201 m	Pass
7	0.00000	Pass	553.006 m	Pass	0.00000	Pass	337.053 m	Pass
8	0.00000	Pass	552.762 m	Pass	0.00000	Pass	314.866 m	Pass
9	0.00000	Pass	552.386 m	Pass	0.00000	Pass	324.722 m	Pass
10	0.00000	Pass	553.370 m	Pass	0.00000	Pass	331.775 m	Pass
11	0.00000	Pass	552.070 m	Pass	0.00000	Pass	333.718 m	Pass
12	0.00000	Pass	551.414 m	Pass	0.00000	Pass	329.975 m	Pass
Result	Pass	Pass	Pass	Pass	Pass	Pass	331.555 m	Pass

Flicker measurement under ambient condition 20° C				
Model: iMars XG136KTR-L				
100% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.347	0.349	0.338
PLT	≤ 0.65	0.338	0.341	0.327
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.595%	0.579%	0.580%
66% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.355	0.392	0.356
PLT	≤ 0.65	0.345	0.379	0.349
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.417%	0.408%	0.405%
33% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.349	0.367	0.356
PLT	≤ 0.65	0.342	0.353	0.348
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.219%	0.209%	0.211%

Flicker measurement under ambient condition 20° C

100% rating power condition:

L1 Phase

Element: 1

Volt Range: 600V/50Hz

Un(Set): 277.00V

Freq(1): 50.00Hz

Element: 1

Total: (1 2 3)

Judgement: Pass

Judgement: Pass

Limit	dc[%]	dmax[%]	d(t)[ms.%]	Pst	Pit			
	3.30000	4.00000	500.000	1.00000	0.65000			
			3.30000		N:12			
1	0.00000	Pass	589.174 m	Pass	0.00000	Pass	325.727 m	Pass
2	0.00000	Pass	588.536 m	Pass	0.00000	Pass	333.908 m	Pass
3	0.00000	Pass	592.291 m	Pass	0.00000	Pass	340.028 m	Pass
4	0.00000	Pass	590.080 m	Pass	0.00000	Pass	339.108 m	Pass
5	0.00000	Pass	594.121 m	Pass	0.00000	Pass	338.831 m	Pass
6	0.00000	Pass	591.224 m	Pass	0.00000	Pass	343.130 m	Pass
7	0.00000	Pass	590.950 m	Pass	0.00000	Pass	335.128 m	Pass
8	0.00000	Pass	588.131 m	Pass	0.00000	Pass	327.036 m	Pass
9	0.00000	Pass	591.284 m	Pass	0.00000	Pass	338.575 m	Pass
10	0.00000	Pass	595.194 m	Pass	0.00000	Pass	341.787 m	Pass
11	0.00000	Pass	591.695 m	Pass	0.00000	Pass	346.684 m	Pass
12	0.00000	Pass	591.624 m	Pass	0.00000	Pass	347.033 m	Pass
Result		Pass		Pass			338.204 m	Pass

L2 Phase

Element: 2

Volt Range: 600V/50Hz

Un(Set): 277.00V

Freq(2): 50.00Hz

Element: 2

Total: (1 2 3)

Judgement: Pass

Judgement: Pass

Limit	dc[%]	dmax[%]	d(t)[ms.%]	Pst	Pit			
	3.30000	4.00000	500.000	1.00000	0.65000			
			3.30000		N:12			
1	0.00000	Pass	577.676 m	Pass	0.00000	Pass	349.615 m	Pass
2	0.00000	Pass	574.720 m	Pass	0.00000	Pass	325.927 m	Pass
3	0.00000	Pass	575.137 m	Pass	0.00000	Pass	343.218 m	Pass
4	0.00000	Pass	577.408 m	Pass	0.00000	Pass	341.734 m	Pass
5	0.00000	Pass	579.339 m	Pass	0.00000	Pass	347.656 m	Pass
6	0.00000	Pass	577.265 m	Pass	0.00000	Pass	345.100 m	Pass
7	0.00000	Pass	576.347 m	Pass	0.00000	Pass	346.896 m	Pass
8	0.00000	Pass	574.422 m	Pass	0.00000	Pass	340.683 m	Pass
9	0.00000	Pass	575.465 m	Pass	0.00000	Pass	348.121 m	Pass
10	0.00000	Pass	577.980 m	Pass	0.00000	Pass	326.386 m	Pass
11	0.00000	Pass	577.277 m	Pass	0.00000	Pass	347.027 m	Pass
12	0.00000	Pass	579.184 m	Pass	0.00000	Pass	331.881 m	Pass
Result		Pass		Pass			341.377 m	Pass

L3 Phase

Element: 3

Volt Range: 600V/50Hz

Un(Set): 277.00V

Freq(3): 50.00Hz

Element: 3

Total: (1 2 3)

Judgement: Pass

Judgement: Pass

Limit	dc[%]	dmax[%]	d(t)[ms.%]	Pst	Pit			
	3.30000	4.00000	500.000	1.00000	0.65000			
			3.30000		N:12			
1	0.00000	Pass	579.309 m	Pass	0.00000	Pass	322.944 m	Pass
2	0.00000	Pass	575.835 m	Pass	0.00000	Pass	333.609 m	Pass
3	0.00000	Pass	576.001 m	Pass	0.00000	Pass	321.709 m	Pass
4	0.00000	Pass	580.734 m	Pass	0.00000	Pass	318.398 m	Pass
5	0.00000	Pass	578.052 m	Pass	0.00000	Pass	330.061 m	Pass
6	0.00000	Pass	577.861 m	Pass	0.00000	Pass	326.882 m	Pass
7	0.00000	Pass	576.061 m	Pass	0.00000	Pass	326.542 m	Pass
8	0.00000	Pass	575.465 m	Pass	0.00000	Pass	336.093 m	Pass
9	0.00000	Pass	579.721 m	Pass	0.00000	Pass	330.001 m	Pass
10	0.00000	Pass	577.432 m	Pass	0.00000	Pass	338.134 m	Pass
11	0.00000	Pass	576.603 m	Pass	0.00000	Pass	326.777 m	Pass
12	0.00000	Pass	577.754 m	Pass	0.00000	Pass	322.719 m	Pass
Result		Pass		Pass			327.924 m	Pass

Flicker measurement under ambient condition -10° C				
Model: iMars XG136KTR-L				
100% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.376	0.367	0.343
PLT	≤ 0.65	0.345	0.352	0.333
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.590%	0.578%	0.579%
66% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.336	0.351	0.329
PLT	≤ 0.65	0.326	0.341	0.325
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.421%	0.408%	0.411%
33% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.350	0.371	0.361
PLT	≤ 0.65	0.340	0.356	0.350
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.219%	0.210%	0.210%

Flicker measurement under ambient condition -10° C

100% rating power condition:

L1 Phase

Element	1		Element	1		Judgement	Pass	
Volt Range	600V/50Hz		Total	(1 2 3)		Judgement	Pass	
Un(Set)	277.00V							
Freq(1):	50.00Hz							

	dc[%]		dmax[%]		d(t)[ms.%]		Pst		Pit
Limit	3.30000		4.00000		500.000		1.00000		0.65000
					3.30000				N:12
1	0.00000	Pass	589.561 m	Pass	0.00000	Pass	346.516 m	Pass	
2	0.00000	Pass	585.878 m	Pass	0.00000	Pass	339.460 m	Pass	
3	0.00000	Pass	586.998 m	Pass	0.00000	Pass	342.766 m	Pass	
4	0.00000	Pass	588.644 m	Pass	0.00000	Pass	348.815 m	Pass	
5	0.00000	Pass	589.716 m	Pass	0.00000	Pass	349.207 m	Pass	
6	0.00000	Pass	589.877 m	Pass	0.00000	Pass	340.263 m	Pass	
7	0.00000	Pass	588.566 m	Pass	0.00000	Pass	339.499 m	Pass	
8	0.00000	Pass	590.295 m	Pass	0.00000	Pass	337.687 m	Pass	
9	0.00000	Pass	590.205 m	Pass	0.00000	Pass	324.615 m	Pass	
10	0.00000	Pass	586.301 m	Pass	0.00000	Pass	346.624 m	Pass	
11	0.00000	Pass	586.134 m	Pass	0.00000	Pass	347.724 m	Pass	
12	0.00000	Pass	593.138 m	Pass	0.00000	Pass	376.857 m	Pass	
Result		Pass		Pass		Pass		Pass	345.398 m

L2 Phase

Element	2		Element	2		Judgement	Pass	
Volt Range	600V/50Hz		Total	(1 2 3)		Judgement	Pass	
Un(Set)	277.00V							
Freq(2):	50.00Hz							

	dc[%]		dmax[%]		d(t)[ms.%]		Pst		Pit
Limit	3.30000		4.00000		500.000		1.00000		0.65000
					3.30000				N:12
1	0.00000	Pass	574.911 m	Pass	0.00000	Pass	355.750 m	Pass	
2	0.00000	Pass	577.325 m	Pass	0.00000	Pass	352.859 m	Pass	
3	0.00000	Pass	575.328 m	Pass	0.00000	Pass	353.741 m	Pass	
4	0.00000	Pass	574.428 m	Pass	0.00000	Pass	355.297 m	Pass	
5	0.00000	Pass	576.526 m	Pass	0.00000	Pass	358.739 m	Pass	
6	0.00000	Pass	578.773 m	Pass	0.00000	Pass	362.049 m	Pass	
7	0.00000	Pass	575.823 m	Pass	0.00000	Pass	363.916 m	Pass	
8	0.00000	Pass	576.741 m	Pass	0.00000	Pass	367.379 m	Pass	
9	0.00000	Pass	575.966 m	Pass	0.00000	Pass	360.980 m	Pass	
10	0.00000	Pass	576.532 m	Pass	0.00000	Pass	344.575 m	Pass	
11	0.00000	Pass	575.387 m	Pass	0.00000	Pass	333.355 m	Pass	
12	0.00000	Pass	577.128 m	Pass	0.00000	Pass	312.202 m	Pass	
Result		Pass		Pass		Pass		Pass	352.343 m

L3 Phase

Element	3		Element	3		Judgement	Pass	
Volt Range	600V/50Hz		Total	(1 2 3)		Judgement	Pass	
Un(Set)	277.00V							
Freq(3):	50.00Hz							

	dc[%]		dmax[%]		d(t)[ms.%]		Pst		Pit
Limit	3.30000		4.00000		500.000		1.00000		0.65000
					3.30000				N:12
1	0.00000	Pass	574.511 m	Pass	0.00000	Pass	343.186 m	Pass	
2	0.00000	Pass	573.224 m	Pass	0.00000	Pass	334.653 m	Pass	
3	0.00000	Pass	576.347 m	Pass	0.00000	Pass	330.428 m	Pass	
4	0.00000	Pass	574.481 m	Pass	0.00000	Pass	329.687 m	Pass	
5	0.00000	Pass	574.100 m	Pass	0.00000	Pass	321.362 m	Pass	
6	0.00000	Pass	578.189 m	Pass	0.00000	Pass	326.380 m	Pass	
7	0.00000	Pass	579.703 m	Pass	0.00000	Pass	343.711 m	Pass	
8	0.00000	Pass	577.325 m	Pass	0.00000	Pass	327.266 m	Pass	
9	0.00000	Pass	579.935 m	Pass	0.00000	Pass	333.785 m	Pass	
10	0.00000	Pass	575.209 m	Pass	0.00000	Pass	337.449 m	Pass	
11	0.00000	Pass	575.209 m	Pass	0.00000	Pass	340.345 m	Pass	
12	0.00000	Pass	578.505 m	Pass	0.00000	Pass	332.972 m	Pass	
Result		Pass		Pass		Pass		Pass	333.566 m

Flicker measurement under ambient condition 55° C				
Model: iMars XG136KTR-L				
100% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.358	0.351	0.357
PLT	≤ 0.65	0.334	0.336	0.333
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.596%	0.580%	0.580%
66% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.360	0.398	0.369
PLT	≤ 0.65	0.351	0.388	0.355
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.417%	0.403%	0.407%
33% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.349	0.358	0.359
PLT	≤ 0.65	0.338	0.350	0.348
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.220%	0.211%	0.212%

Flicker measurement under ambient condition 55° C

100% rating power condition:

L1 Phase

Element	1		Element	1		Judgement	Pass	
Volt Range	600V/50Hz		Total	(1 2 3)		Judgement	Pass	
Un(Set)	277.00V							
Freq(1):	50.00Hz							
	dc[%]	dmax[%]	d(t)[ms,%]	Pst	Pit			
Limit	3.30000	4.00000	500.000 3.30000	1.00000	0.65000 N:12			
1	0.00000	Pass	590.801 m	Pass	0.00000	Pass	330.029 m	Pass
2	0.00000	Pass	592.381 m	Pass	0.00000	Pass	331.416 m	Pass
3	0.00000	Pass	596.744 m	Pass	0.00000	Pass	315.536 m	Pass
4	0.00000	Pass	593.847 m	Pass	0.00000	Pass	329.016 m	Pass
5	0.00000	Pass	592.476 m	Pass	0.00000	Pass	320.753 m	Pass
6	0.00000	Pass	593.328 m	Pass	0.00000	Pass	341.347 m	Pass
7	0.00000	Pass	590.849 m	Pass	0.00000	Pass	341.576 m	Pass
8	0.00000	Pass	596.136 m	Pass	0.00000	Pass	358.609 m	Pass
9	0.00000	Pass	594.926 m	Pass	0.00000	Pass	329.983 m	Pass
10	0.00000	Pass	589.794 m	Pass	0.00000	Pass	332.564 m	Pass
11	0.00000	Pass	595.158 m	Pass	0.00000	Pass	338.731 m	Pass
12	0.00000	Pass	594.336 m	Pass	0.00000	Pass	339.865 m	Pass
Result		Pass	Pass	Pass	Pass	Pass	334.458 m	Pass

L2 Phase

Element	2		Element	2		Judgement	Pass	
Volt Range	600V/50Hz		Total	(1 2 3)		Judgement	Pass	
Un(Set)	277.00V							
Freq(2):	50.00Hz							
	dc[%]	dmax[%]	d(t)[ms,%]	Pst	Pit			
Limit	3.30000	4.00000	500.000 3.30000	1.00000	0.65000 N:12			
1	0.00000	Pass	578.415 m	Pass	0.00000	Pass	327.885 m	Pass
2	0.00000	Pass	577.879 m	Pass	0.00000	Pass	338.466 m	Pass
3	0.00000	Pass	580.621 m	Pass	0.00000	Pass	322.486 m	Pass
4	0.00000	Pass	580.955 m	Pass	0.00000	Pass	325.233 m	Pass
5	0.00000	Pass	577.539 m	Pass	0.00000	Pass	326.624 m	Pass
6	0.00000	Pass	577.593 m	Pass	0.00000	Pass	338.287 m	Pass
7	0.00000	Pass	578.129 m	Pass	0.00000	Pass	340.415 m	Pass
8	0.00000	Pass	580.311 m	Pass	0.00000	Pass	325.257 m	Pass
9	0.00000	Pass	578.469 m	Pass	0.00000	Pass	351.371 m	Pass
10	0.00000	Pass	580.829 m	Pass	0.00000	Pass	350.352 m	Pass
11	0.00000	Pass	579.000 m	Pass	0.00000	Pass	348.158 m	Pass
12	0.00000	Pass	580.192 m	Pass	0.00000	Pass	336.131 m	Pass
Result		Pass	Pass	Pass	Pass	Pass	336.184 m	Pass

L3 Phase

Element	3		Element	3		Judgement	Pass	
Volt Range	600V/50Hz		Total	(1 2 3)		Judgement	Pass	
Un(Set)	277.00V							
Freq(3):	50.00Hz							
	dc[%]	dmax[%]	d(t)[ms,%]	Pst	Pit			
Limit	3.30000	4.00000	500.000 3.30000	1.00000	0.65000 N:12			
1	0.00000	Pass	577.539 m	Pass	0.00000	Pass	332.913 m	Pass
2	0.00000	Pass	578.505 m	Pass	0.00000	Pass	337.510 m	Pass
3	0.00000	Pass	579.119 m	Pass	0.00000	Pass	326.850 m	Pass
4	0.00000	Pass	579.965 m	Pass	0.00000	Pass	323.928 m	Pass
5	0.00000	Pass	579.518 m	Pass	0.00000	Pass	318.159 m	Pass
6	0.00000	Pass	579.399 m	Pass	0.00000	Pass	316.986 m	Pass
7	0.00000	Pass	575.113 m	Pass	0.00000	Pass	333.244 m	Pass
8	0.00000	Pass	578.552 m	Pass	0.00000	Pass	352.782 m	Pass
9	0.00000	Pass	579.387 m	Pass	0.00000	Pass	357.657 m	Pass
10	0.00000	Pass	580.424 m	Pass	0.00000	Pass	332.842 m	Pass
11	0.00000	Pass	578.988 m	Pass	0.00000	Pass	332.242 m	Pass
12	0.00000	Pass	580.609 m	Pass	0.00000	Pass	326.025 m	Pass
Result		Pass	Pass	Pass	Pass	Pass	333.015 m	Pass

Flicker measurement under ambient condition 20° C				
Model: iMars XG136KTR-X				
100% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.363	0.378	0.352
PLT	≤ 0.65	0.351	0.362	0.338
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.611%	0.593%	0.594%
66% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.347	0.452	0.346
PLT	≤ 0.65	0.334	0.342	0.332
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.443%	0.432%	0.434%
33% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.349	0.367	0.367
PLT	≤ 0.65	0.340	0.358	0.351
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.234%	0.228%	0.226%

Flicker measurement under ambient condition 20° C

100% rating power condition:

L1 Phase

Element	1		Element	1		Judgement	Pass	
Volt Range	600V/50Hz		Total	(1 2 3)		Judgement	Pass	
Un(Set)	311.00V							
Freq(1):	50.00Hz							

Limit	dc[%]	dmax[%]	d(t)[ms.%]	Pst	Pit			
	3.30000	4.00000	500.000	1.00000	0.65000			
			3.30000		N:12			
1	0.00000	Pass	603.139 m	Pass	0.00000	Pass	348.225 m	Pass
2	0.00000	Pass	597.554 m	Pass	0.00000	Pass	341.116 m	Pass
3	0.00000	Pass	604.177 m	Pass	0.00000	Pass	351.106 m	Pass
4	0.00000	Pass	601.000 m	Pass	0.00000	Pass	340.025 m	Pass
5	0.00000	Pass	599.194 m	Pass	0.00000	Pass	342.628 m	Pass
6	0.00000	Pass	601.900 m	Pass	0.00000	Pass	349.638 m	Pass
7	0.00000	Pass	604.475 m	Pass	0.00000	Pass	347.803 m	Pass
8	0.00000	Pass	608.397 m	Pass	0.00000	Pass	357.303 m	Pass
9	0.00000	Pass	599.462 m	Pass	0.00000	Pass	357.068 m	Pass
10	0.00000	Pass	611.007 m	Pass	0.00000	Pass	357.788 m	Pass
11	0.00000	Pass	604.427 m	Pass	0.00000	Pass	363.526 m	Pass
12	0.00000	Pass	603.473 m	Pass	0.00000	Pass	360.871 m	Pass
Result	Pass	Pass	Pass	Pass	Pass	351.586 m	Pass	

L2 Phase

Element	2		Element	2		Judgement	Pass	
Volt Range	600V/50Hz		Total	(1 2 3)		Judgement	Pass	
Un(Set)	311.00V							
Freq(2):	50.00Hz							

Limit	dc[%]	dmax[%]	d(t)[ms.%]	Pst	Pit			
	3.30000	4.00000	500.000	1.00000	0.65000			
			3.30000		N:12			
1	0.00000	Pass	591.087 m	Pass	0.00000	Pass	349.216 m	Pass
2	0.00000	Pass	587.833 m	Pass	0.00000	Pass	353.627 m	Pass
3	0.00000	Pass	589.478 m	Pass	0.00000	Pass	352.296 m	Pass
4	0.00000	Pass	593.096 m	Pass	0.00000	Pass	363.456 m	Pass
5	0.00000	Pass	592.399 m	Pass	0.00000	Pass	360.575 m	Pass
6	0.00000	Pass	591.564 m	Pass	0.00000	Pass	369.067 m	Pass
7	0.00000	Pass	590.765 m	Pass	0.00000	Pass	339.068 m	Pass
8	0.00000	Pass	591.111 m	Pass	0.00000	Pass	378.289 m	Pass
9	0.00000	Pass	590.879 m	Pass	0.00000	Pass	363.688 m	Pass
10	0.00000	Pass	590.050 m	Pass	0.00000	Pass	369.623 m	Pass
11	0.00000	Pass	592.136 m	Pass	0.00000	Pass	371.409 m	Pass
12	0.00000	Pass	591.445 m	Pass	0.00000	Pass	378.346 m	Pass
Result	Pass	Pass	Pass	Pass	Pass	362.751 m	Pass	

L3 Phase

Element	3		Element	3		Judgement	Pass	
Volt Range	600V/50Hz		Total	(1 2 3)		Judgement	Pass	
Un(Set)	311.00V							
Freq(3):	50.00Hz							

Limit	dc[%]	dmax[%]	d(t)[ms.%]	Pst	Pit			
	3.30000	4.00000	500.000	1.00000	0.65000			
			3.30000		N:12			
1	0.00000	Pass	592.977 m	Pass	0.00000	Pass	328.278 m	Pass
2	0.00000	Pass	586.677 m	Pass	0.00000	Pass	343.298 m	Pass
3	0.00000	Pass	588.596 m	Pass	0.00000	Pass	334.493 m	Pass
4	0.00000	Pass	587.440 m	Pass	0.00000	Pass	338.349 m	Pass
5	0.00000	Pass	587.130 m	Pass	0.00000	Pass	324.541 m	Pass
6	0.00000	Pass	590.640 m	Pass	0.00000	Pass	338.178 m	Pass
7	0.00000	Pass	588.733 m	Pass	0.00000	Pass	338.592 m	Pass
8	0.00000	Pass	590.652 m	Pass	0.00000	Pass	338.201 m	Pass
9	0.00000	Pass	587.821 m	Pass	0.00000	Pass	336.932 m	Pass
10	0.00000	Pass	589.824 m	Pass	0.00000	Pass	339.031 m	Pass
11	0.00000	Pass	594.139 m	Pass	0.00000	Pass	352.598 m	Pass
12	0.00000	Pass	590.205 m	Pass	0.00000	Pass	348.743 m	Pass
Result	Pass	Pass	Pass	Pass	Pass	338.595 m	Pass	

Flicker measurement under ambient condition -10° C				
Model: iMars XG136KTR-X				
100% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.341	0.353	0.339
PLT	≤ 0.65	0.333	0.338	0.329
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.607%	0.594%	0.595%
66% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.337	0.353	0.339
PLT	≤ 0.65	0.330	0.342	0.329
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.444%	0.432%	0.431%
33% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.346	0.360	0.352
PLT	≤ 0.65	0.339	0.349	0.345
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.238%	0.227%	0.225%

Flicker measurement under ambient condition -10° C

100% rating power condition:

L1 Phase

Element	1		Element	1		Judgement	Pass	
Volt Range	600V/50Hz		Total	(1 2 3)		Judgement	Pass	
Un(Set)	311.00V							
Freq(1):	50.00Hz							
	dc[%]	dmax[%]	d(t)[ms.%]	Pst	Pit			
Limit	3.30000	4.00000	500.000 3.30000	1.00000	0.65000			
					N:12			
1	0.00000	Pass	603.068 m	Pass	0.00000	Pass	326.352 m	Pass
2	0.00000	Pass	604.963 m	Pass	0.00000	Pass	339.905 m	Pass
3	0.00000	Pass	603.741 m	Pass	0.00000	Pass	332.449 m	Pass
4	0.00000	Pass	609.171 m	Pass	0.00000	Pass	341.308 m	Pass
5	0.00000	Pass	601.214 m	Pass	0.00000	Pass	336.449 m	Pass
6	0.00000	Pass	605.005 m	Pass	0.00000	Pass	336.663 m	Pass
7	0.00000	Pass	607.926 m	Pass	0.00000	Pass	333.780 m	Pass
8	0.00000	Pass	603.783 m	Pass	0.00000	Pass	328.439 m	Pass
9	0.00000	Pass	604.349 m	Pass	0.00000	Pass	333.686 m	Pass
10	0.00000	Pass	603.998 m	Pass	0.00000	Pass	333.149 m	Pass
11	0.00000	Pass	604.534 m	Pass	0.00000	Pass	329.681 m	Pass
12	0.00000	Pass	604.403 m	Pass	0.00000	Pass	332.002 m	Pass
Result		Pass		Pass		Pass	333.709 m	Pass

L2 Phase

Element	2		Element	2		Judgement	Pass	
Volt Range	600V/50Hz		Total	(1 2 3)		Judgement	Pass	
Un(Set)	311.00V							
Freq(2):	50.00Hz							
	dc[%]	dmax[%]	d(t)[ms.%]	Pst	Pit			
Limit	3.30000	4.00000	500.000 3.30000	1.00000	0.65000			
					N:12			
1	0.00000	Pass	587.815 m	Pass	0.00000	Pass	346.561 m	Pass
2	0.00000	Pass	593.561 m	Pass	0.00000	Pass	329.640 m	Pass
3	0.00000	Pass	591.159 m	Pass	0.00000	Pass	328.311 m	Pass
4	0.00000	Pass	592.494 m	Pass	0.00000	Pass	336.171 m	Pass
5	0.00000	Pass	591.087 m	Pass	0.00000	Pass	339.941 m	Pass
6	0.00000	Pass	591.975 m	Pass	0.00000	Pass	353.840 m	Pass
7	0.00000	Pass	591.880 m	Pass	0.00000	Pass	341.900 m	Pass
8	0.00000	Pass	590.944 m	Pass	0.00000	Pass	332.743 m	Pass
9	0.00000	Pass	591.272 m	Pass	0.00000	Pass	341.081 m	Pass
10	0.00000	Pass	589.889 m	Pass	0.00000	Pass	348.145 m	Pass
11	0.00000	Pass	593.740 m	Pass	0.00000	Pass	340.214 m	Pass
12	0.00000	Pass	594.014 m	Pass	0.00000	Pass	319.756 m	Pass
Result		Pass		Pass		Pass	338.434 m	Pass

L3 Phase

Element	3		Element	3		Judgement	Pass	
Volt Range	600V/50Hz		Total	(1 2 3)		Judgement	Pass	
Un(Set)	311.00V							
Freq(3):	50.00Hz							
	dc[%]	dmax[%]	d(t)[ms.%]	Pst	Pit			
Limit	3.30000	4.00000	500.000 3.30000	1.00000	0.65000			
					N:12			
1	0.00000	Pass	590.932 m	Pass	0.00000	Pass	326.310 m	Pass
2	0.00000	Pass	593.913 m	Pass	0.00000	Pass	325.886 m	Pass
3	0.00000	Pass	593.001 m	Pass	0.00000	Pass	333.943 m	Pass
4	0.00000	Pass	595.486 m	Pass	0.00000	Pass	327.228 m	Pass
5	0.00000	Pass	591.087 m	Pass	0.00000	Pass	320.144 m	Pass
6	0.00000	Pass	588.691 m	Pass	0.00000	Pass	323.125 m	Pass
7	0.00000	Pass	595.552 m	Pass	0.00000	Pass	334.930 m	Pass
8	0.00000	Pass	589.514 m	Pass	0.00000	Pass	330.568 m	Pass
9	0.00000	Pass	589.377 m	Pass	0.00000	Pass	329.878 m	Pass
10	0.00000	Pass	590.760 m	Pass	0.00000	Pass	339.494 m	Pass
11	0.00000	Pass	593.555 m	Pass	0.00000	Pass	339.240 m	Pass
12	0.00000	Pass	589.067 m	Pass	0.00000	Pass	326.514 m	Pass
Result		Pass		Pass		Pass	329.875 m	Pass

Flicker measurement under ambient condition 55° C				
Model: iMars XG136KTR-X				
100% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.367	0.389	0.357
PLT	≤ 0.65	0.351	0.373	0.345
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.607%	0.594%	0.592%
66% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.345	0.347	0.338
PLT	≤ 0.65	0.335	0.341	0.330
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.445%	0.433%	0.433%
33% rating power condition:				
P _{bin} (%)	Limit	L1 Phase	L2 Phase	L3 Phase
PST	≤ 1	0.346	0.368	0.356
PLT	≤ 0.65	0.342	0.359	0.347
dc	≤ 3.30%	0%	0%	0%
dmax	4%	0.235%	0.228%	0.229%

Flicker measurement under ambient condition 55° C

100% rating power condition:

L1 Phase

Element: 1

Volt Range: 600V/50Hz

Un(Set): 311.00V

Freq(1): 50.00Hz

Element: 1

Total: (1 2 3)

Judgement: Pass

Judgement: Pass

Limit	dc[%]	dmax[%]	d(t)[ms.%]	Pst	PIt
	3.30000	4.00000	500.000	1.00000	0.65000
			3.30000		N:12
1	0.00000	602.466 m	0.00000	340.999 m	
2	0.00000	600.570 m	0.00000	352.167 m	
3	0.00000	603.592 m	0.00000	353.710 m	
4	0.00000	603.467 m	0.00000	367.013 m	
5	0.00000	607.467 m	0.00000	356.454 m	
6	0.00000	602.531 m	0.00000	349.189 m	
7	0.00000	604.534 m	0.00000	361.499 m	
8	0.00000	607.669 m	0.00000	355.321 m	
9	0.00000	600.547 m	0.00000	342.837 m	
10	0.00000	602.186 m	0.00000	338.815 m	
11	0.00000	607.985 m	0.00000	347.303 m	
12	0.00000	603.324 m	0.00000	355.645 m	
Result	Pass	Pass	Pass	Pass	351.929 m Pass

L2 Phase

Element: 2

Volt Range: 600V/50Hz

Un(Set): 311.00V

Freq(2): 50.00Hz

Element: 2

Total: (1 2 3)

Judgement: Pass

Judgement: Pass

Limit	dc[%]	dmax[%]	d(t)[ms.%]	Pst	PIt
	3.30000	4.00000	500.000	1.00000	0.65000
			3.30000		N:12
1	0.00000	593.990 m	0.00000	376.874 m	
2	0.00000	590.295 m	0.00000	366.128 m	
3	0.00000	596.350 m	0.00000	352.954 m	
4	0.00000	591.046 m	0.00000	369.862 m	
5	0.00000	593.525 m	0.00000	364.839 m	
6	0.00000	591.689 m	0.00000	385.053 m	
7	0.00000	594.503 m	0.00000	389.547 m	
8	0.00000	591.654 m	0.00000	387.657 m	
9	0.00000	592.756 m	0.00000	379.618 m	
10	0.00000	591.117 m	0.00000	373.918 m	
11	0.00000	589.180 m	0.00000	373.894 m	
12	0.00000	591.707 m	0.00000	360.475 m	
Result	Pass	Pass	Pass	Pass	373.708 m Pass

L3 Phase

Element: 3

Volt Range: 600V/50Hz

Un(Set): 311.00V

Freq(3): 50.00Hz

Element: 3

Total: (1 2 3)

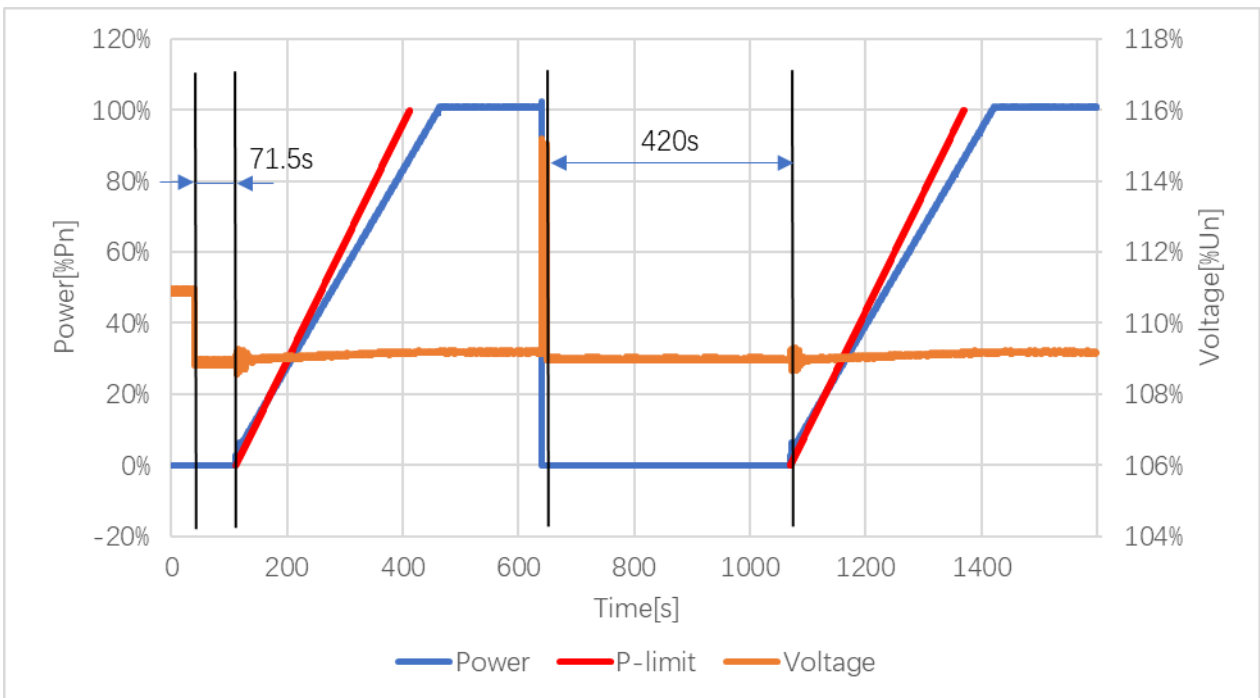
Judgement: Pass

Judgement: Pass

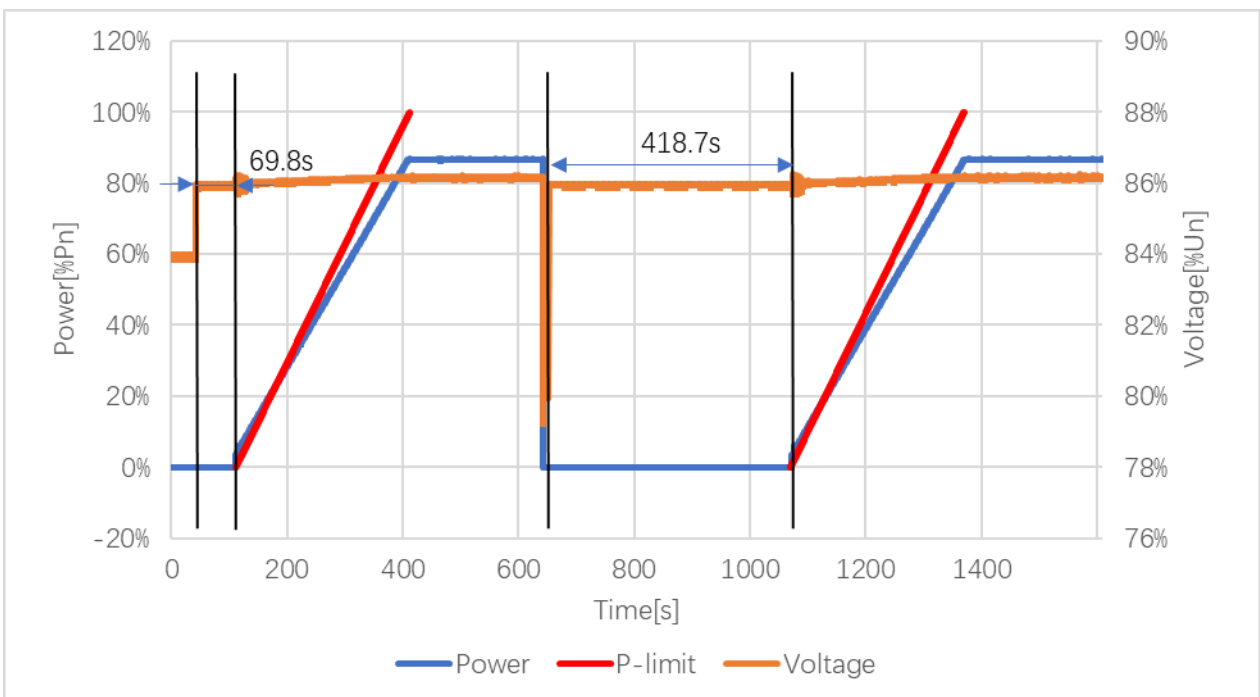
Limit	dc[%]	dmax[%]	d(t)[ms.%]	Pst	PIt
	3.30000	4.00000	500.000	1.00000	0.65000
			3.30000		N:12
1	0.00000	590.748 m	0.00000	337.994 m	
2	0.00000	591.093 m	0.00000	353.514 m	
3	0.00000	591.409 m	0.00000	341.147 m	
4	0.00000	591.338 m	0.00000	357.228 m	
5	0.00000	588.220 m	0.00000	342.912 m	
6	0.00000	592.679 m	0.00000	339.952 m	
7	0.00000	592.625 m	0.00000	348.414 m	
8	0.00000	588.816 m	0.00000	340.539 m	
9	0.00000	591.177 m	0.00000	357.022 m	
10	0.00000	589.675 m	0.00000	339.192 m	
11	0.00000	589.752 m	0.00000	346.214 m	
12	0.00000	589.764 m	0.00000	345.340 m	
Result	Pass	Pass	Pass	Pass	345.915 m Pass

B.1.1.1 and B.1.1.2	TABLE: Checking the connection and reconnection conditions			P
	Checking gradual supply of active power			
Model: iMars XG110KTR				
No connection in less than 30 sec		Connection after 30 sec		Rising curve of 20%Pn/min
U > 110% Un	Yes	85% < U < 110 % Un	Yes (71.5s)	17.14%Pn/min
U < 85% Un	Yes	85% < U < 110 % Un	Yes (69.8s)	17.03%Pn/min
f > 50.10 Hz	Yes	49,90 < f < 50.10 Hz	Yes (70.1s)	17.11%Pn/min
f < 49.90 Hz	Yes	49,90 < f < 50.10 Hz	Yes (68.7s)	17.04%Pn/min
Disconnection		Connection after 300 sec		Rising curve of 20%Pn/min
U > 110% Un	Yes	85% < U < 110 % Un	Yes (420.0s)	17.19%Pn/min
U < 85% Un	Yes	85% < U < 110 % Un	Yes (418.7s)	17.06%Pn/min
f > 51.50 Hz	Yes	49,90 < f < 50.10 Hz	Yes (381.3s)	17.12%Pn/min
f < 47.50 Hz	Yes	49,90 < f < 50.10 Hz	Yes (372.6s)	17.01%Pn/min

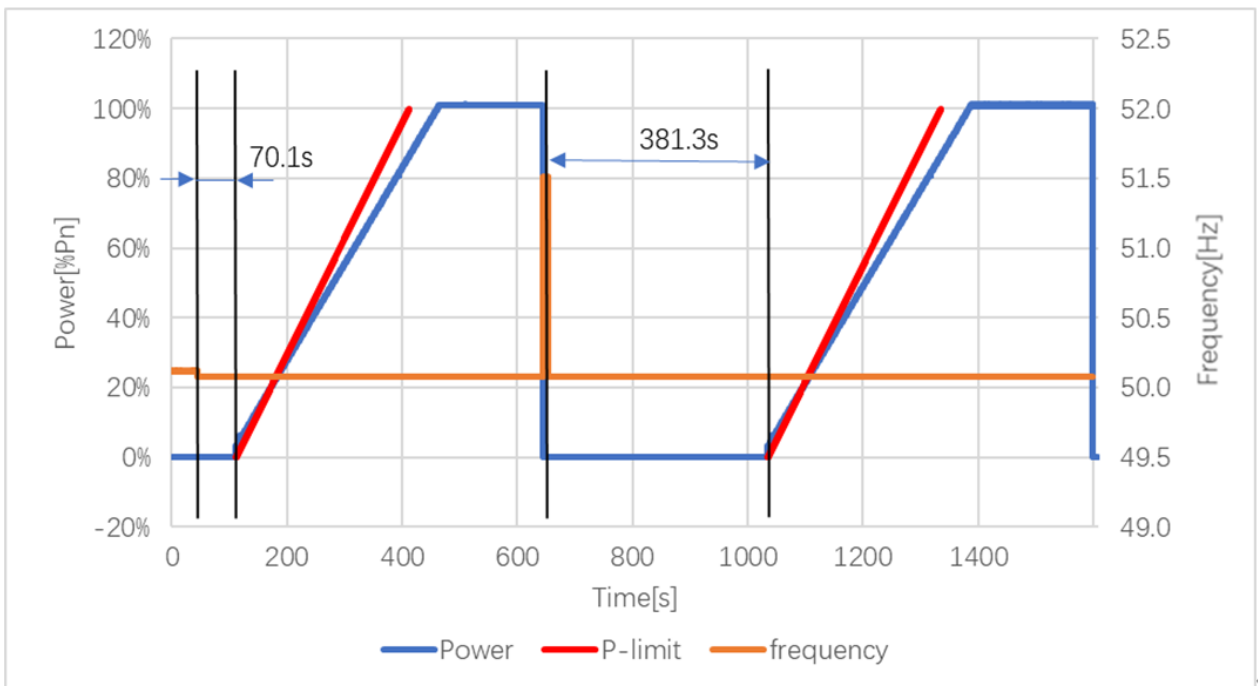
Overvoltage conditions



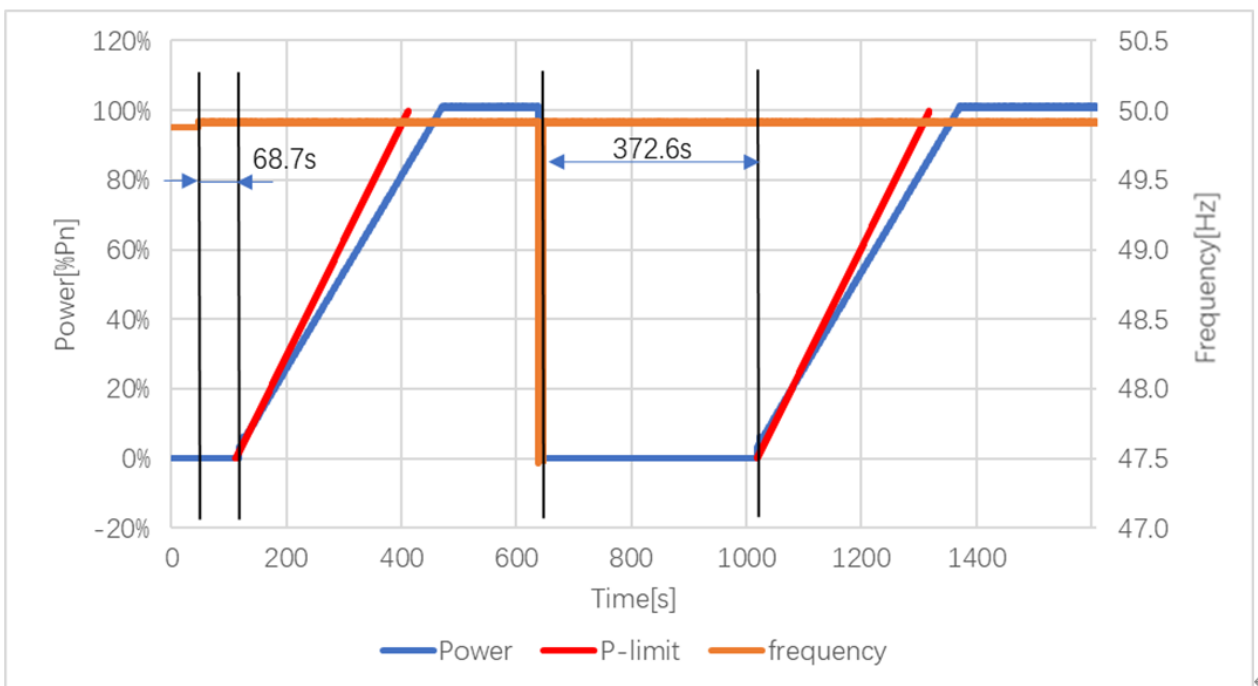
Undervoltage conditions



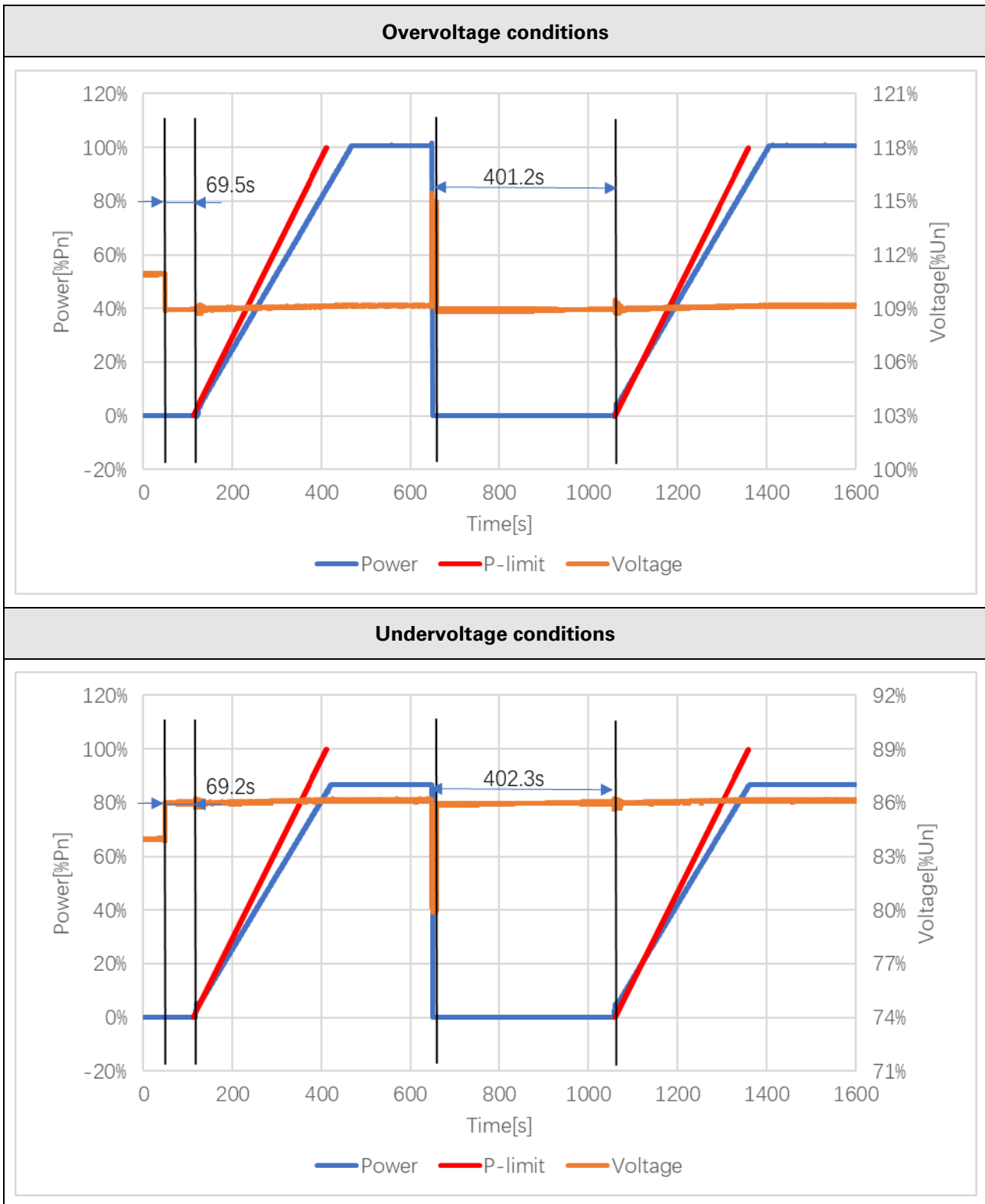
Overfrequency conditions



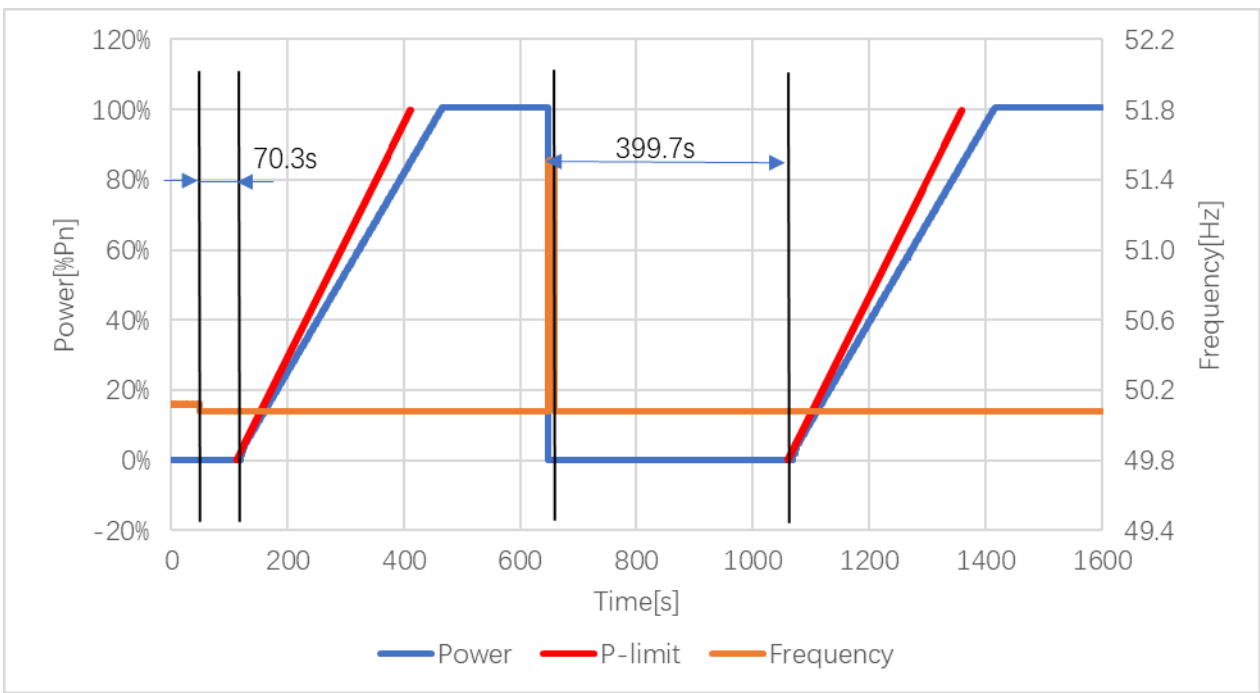
Underfrequency conditions



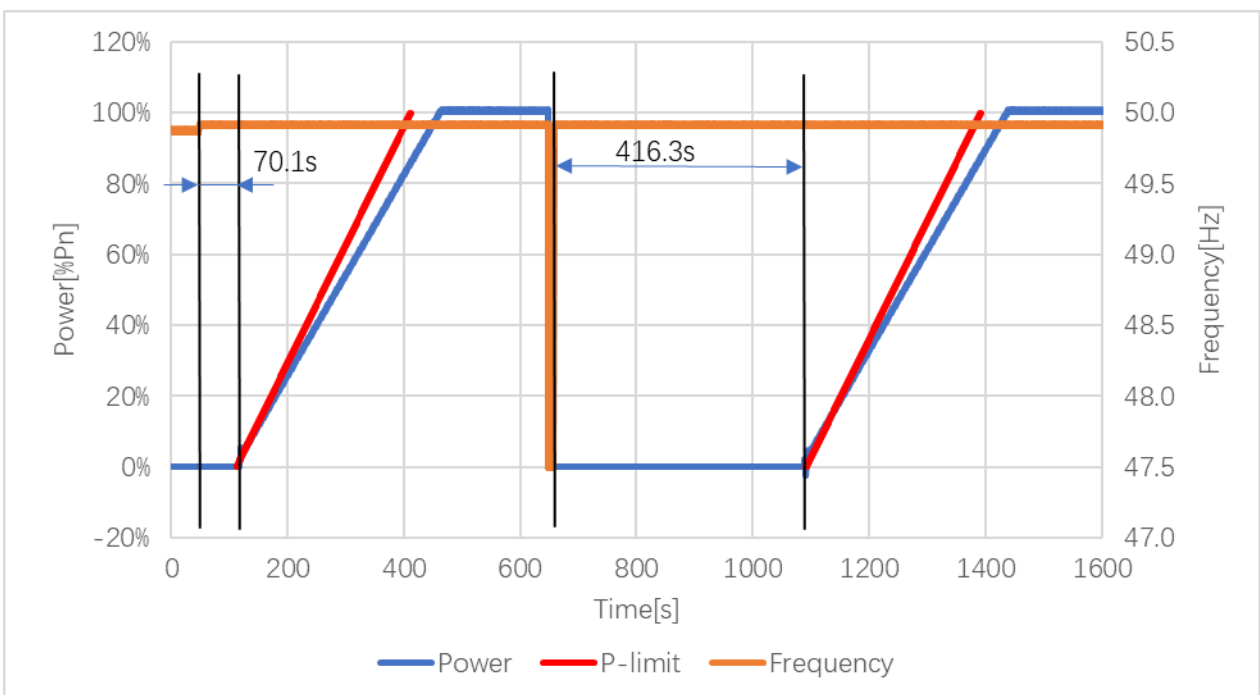
B.1.1.1 and B.1.1.2	TABLE: Checking the connection and reconnection conditions			P
	Checking gradual supply of active power			
Model: iMars XG136KTR-L				
No connection in less than 30 sec		Connection after 30 sec		Rising curve of 20%Pn/min
U > 110% Un	Yes	85% < U < 110 % Un	Yes (69.5s)	16.93%Pn/min
U < 85% Un	Yes	85% < U < 110 % Un	Yes (69.2s)	17.11%Pn/min
f > 50.10 Hz	Yes	49,90 < f < 50.10 Hz	Yes (70.3s)	17.01%Pn/min
f < 49.90 Hz	Yes	49,90 < f < 50.10 Hz	Yes (70.1s)	16.95%Pn/min
Disconnection		Connection after 300 sec		Rising curve of 20%Pn/min
U > 110% Un	Yes	85% < U < 110 % Un	Yes (401.2s)	17.02%Pn/min
U < 85% Un	Yes	85% < U < 110 % Un	Yes (402.3s)	17.08%Pn/min
f > 51.50 Hz	Yes	49,90 < f < 50.10 Hz	Yes (399.7s)	17.08%Pn/min
f < 47.50 Hz	Yes	49,90 < f < 50.10 Hz	Yes (416.3s)	16.97%Pn/min



Overfrequency conditions

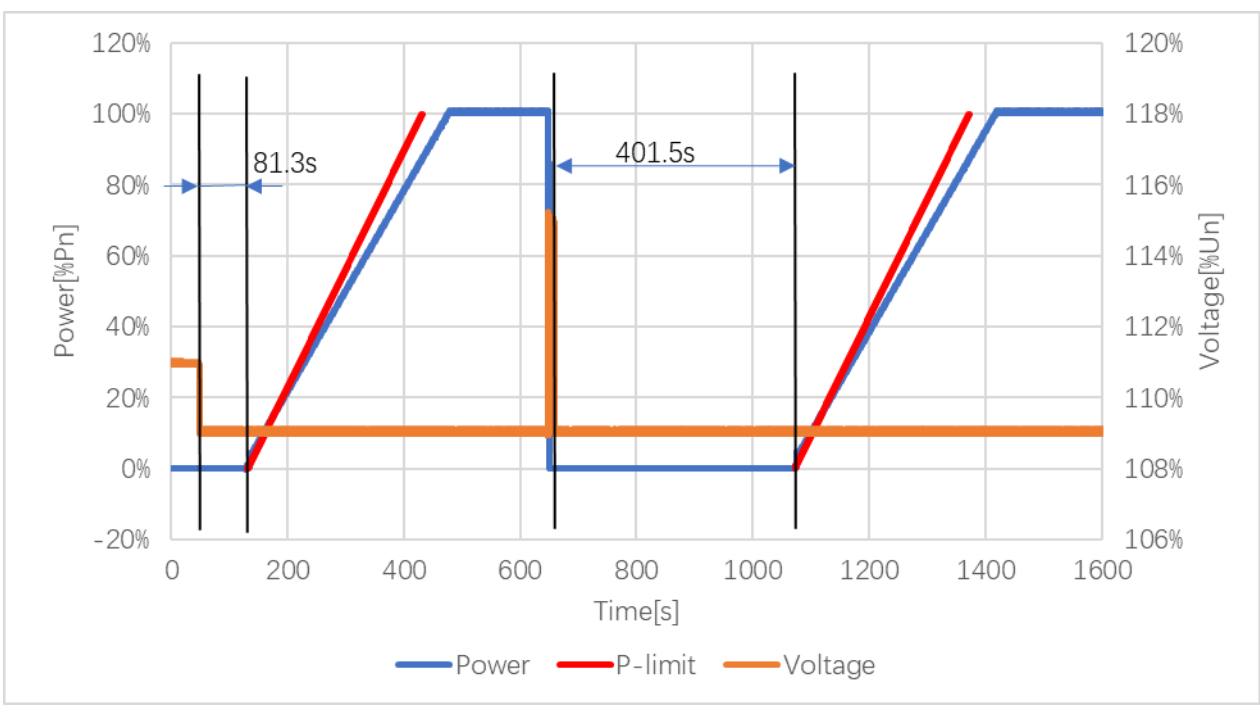


Underfrequency conditions

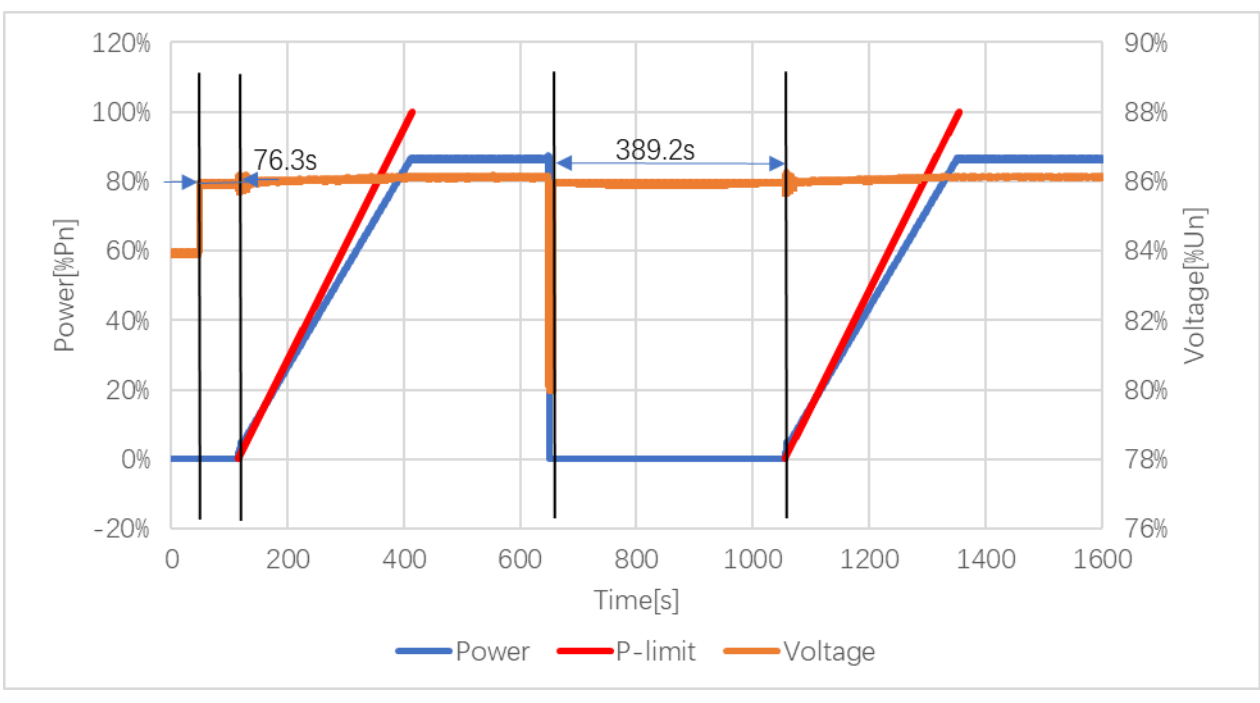


B.1.1.1 and B.1.1.2	TABLE: Checking the connection and reconnection conditions				P
Checking gradual supply of active power					
Model: iMars XG136KTR-X					
No connection in less than 30 sec		Connection after 30 sec		Rising curve of 20%Pn/min	
$U > 110\% U_n$	Yes	$85\% < U < 110\% U_n$	Yes (81.3s)	16.81 %Pn/min	
$U < 85\% U_n$	Yes	$85\% < U < 110\% U_n$	Yes (76.3s)	17.04%Pn/min	
$f > 50.10 \text{ Hz}$	Yes	$49,90 < f < 50.10 \text{ Hz}$	Yes (75.8s)	17.14%Pn/min	
$f < 49.90 \text{ Hz}$	Yes	$49,90 < f < 50.10 \text{ Hz}$	Yes (88.3s)	16.89%Pn/min	
Disconnection		Connection after 300 sec		Rising curve of 20%Pn/min	
$U > 110\% U_n$	Yes	$85\% < U < 110\% U_n$	Yes (401.5s)	16.87 %Pn/min	
$U < 85\% U_n$	Yes	$85\% < U < 110\% U_n$	Yes (389.2s)	16.93%Pn/min	
$f > 51.50 \text{ Hz}$	Yes	$49,90 < f < 50.10 \text{ Hz}$	Yes (405.0s)	16.78%Pn/min	
$f < 47.50 \text{ Hz}$	Yes	$49,90 < f < 50.10 \text{ Hz}$	Yes (400.7s)	16.83%Pn/min	

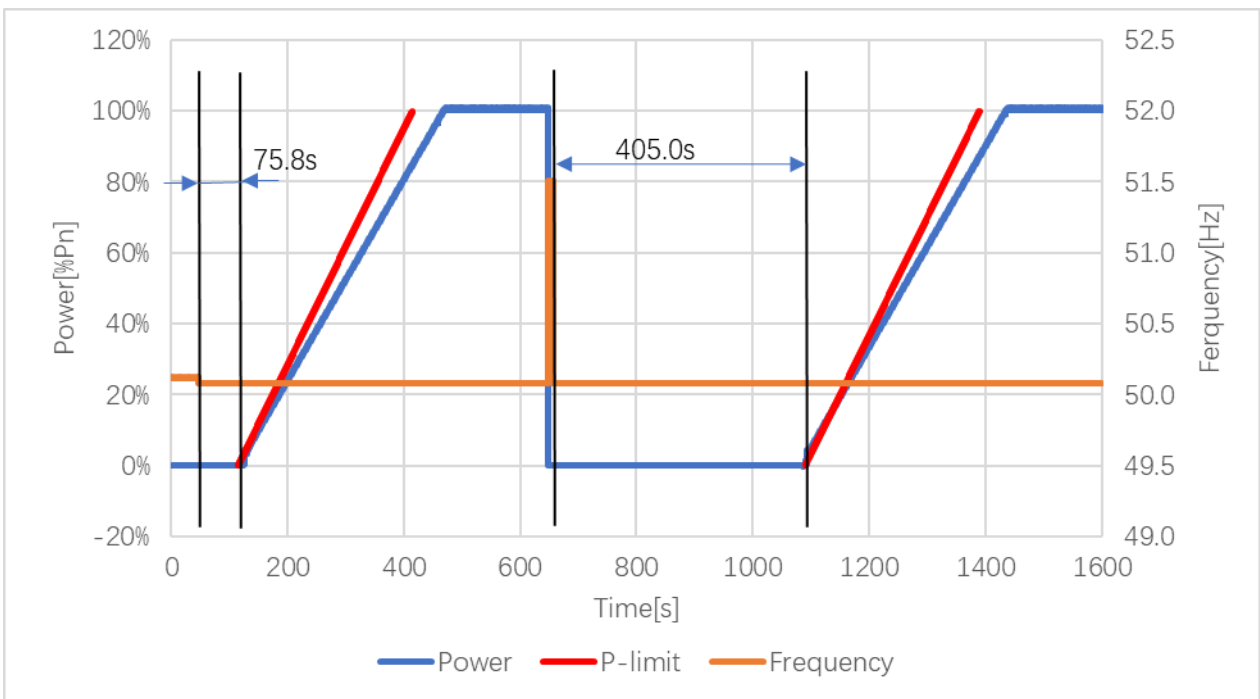
Overvoltage conditions



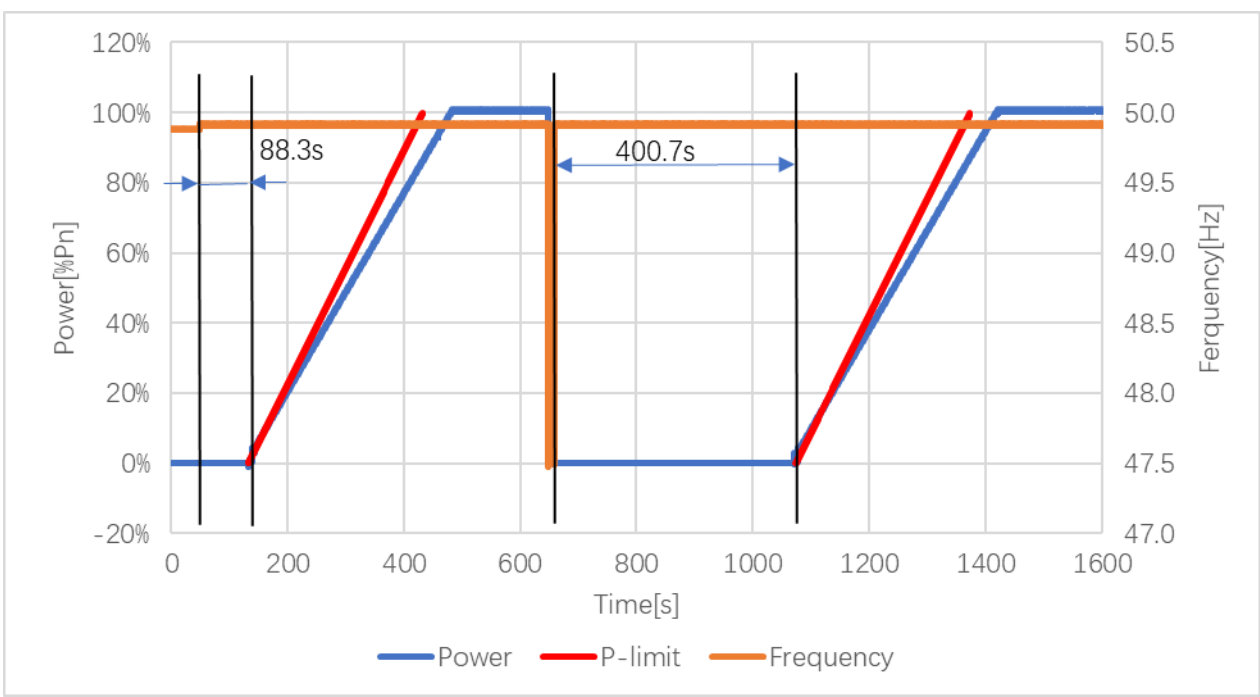
Undervoltage conditions



Overfrequency conditions



Underfrequency conditions



B.1.2.2	Table: Verification of reactive power supply capability	P
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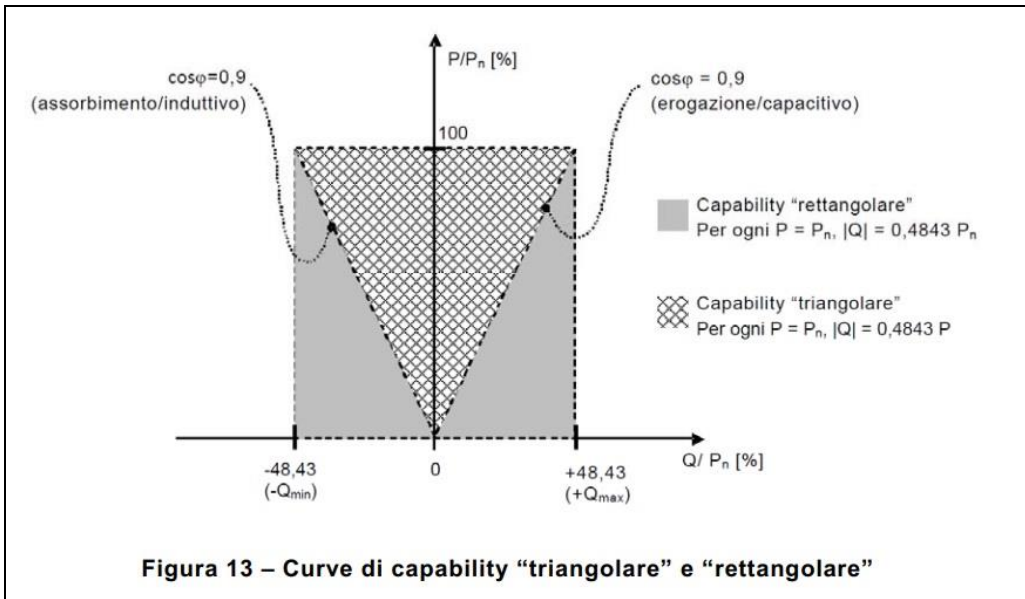
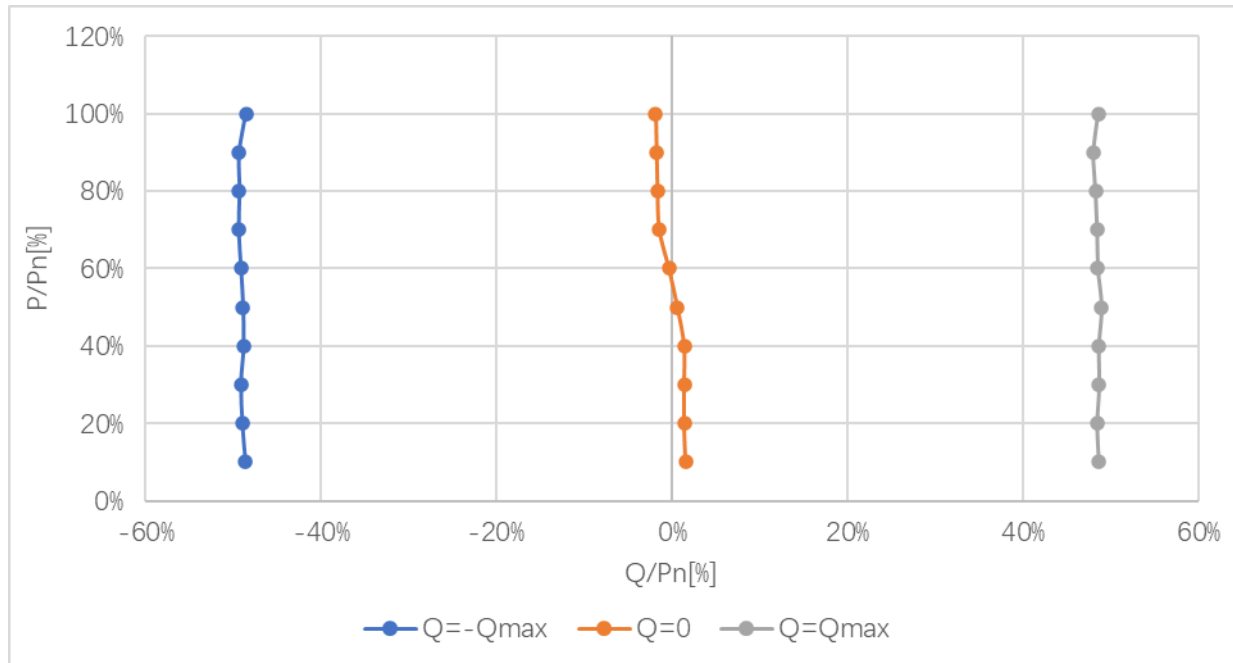


Figura 13 – Curve di capability “triangolare” e “rettangolare”

For each of the 10 levels of active power, 3 values of inductive reactive power and 3 values of conductive reactive power must be registered as average values in 1 min, based on the measurements at the fundamental in a window of 200ms.

P/Q_ Graph

Maximum reactive power adsorbed (Qmin) and produced (Qmax) as a function of the active power fed into the grid.



Model: iMars XG110KTR							
TABLE_ Reactive power production with set point Q = 0							
Power	Active Power		Reactive Power		DC Power		Power Factor
	W	%Pn	VAr	%Pn	W	%Pn	cosφ
0% - 10%	5821.6	5.29	1756.6	1.60	6201.6	5.64	0.9584
	5793.7	5.27	1683.7	1.53	6196.4	5.63	0.9546
	5831.9	5.30	1703.9	1.55	6207.4	5.64	0.9593
10% - 20%	16710.6	15.19	1587.4	1.44	17272.0	15.70	0.9872
	16853.7	15.32	1563.8	1.42	17328.6	15.75	0.9923
	16893.5	15.81	1486.8	1.35	17184.8	15.62	0.9936
20% - 30%	27667.6	25.15	1584.4	1.44	28493.4	25.90	0.9958
	27589.4	25.08	1572.7	1.43	28511.8	25.92	0.9972
	27599.0	25.09	1582.5	1.44	28637.9	26.03	0.9937
30% - 40%	38604.8	35.10	1591.9	1.45	39682.7	36.08	0.9933
	38578.7	35.07	1469.2	1.34	39672.6	36.07	0.9923
	38461.8	34.97	1537.9	1.40	39574.3	35.98	0.9928
40% - 50%	49788.6	45.26	735.9	0.67	51160.9	46.51	0.9994
	49842.1	45.31	863.5	0.79	51263.8	46.60	0.9988
	48953.8	44.50	803.0	0.73	50974.3	46.34	0.9989
50% - 60%	60884.0	55.35	-350.4	-0.32	62590.9	56.90	0.9996
	60482.6	54.98	-350.8	-0.32	62518.5	56.84	0.9994
	60782.5	55.26	-307.8	-0.28	62318.9	56.65	0.9993
60% - 70%	72027.0	65.48	-1588.4	-1.44	74171.9	67.43	0.9991
	72518.7	65.93	-1478.3	-1.34	74832.8	68.03	0.9995
	72482.7	65.89	-1504.1	-1.37	74528.6	67.75	0.9996
70% - 80%	83155.7	75.60	-1805.8	-1.64	85696.9	77.91	0.9993
	83279.5	75.71	-1794.3	-1.63	85538.3	77.76	0.9997
	83317.3	75.74	-1802.8	-1.64	85387.0	77.62	0.9994
80% - 90%	94285.9	85.71	-1900.7	-1.73	97266.5	88.42	0.9995
	94386.4	85.81	-1867.3	-1.70	97472.8	88.61	0.9995
	94418.2	85.83	-1879.5	-1.71	97402.5	88.55	0.9993
90%-100%	105420.3	95.84	-2011.7	-1.83	108966.8	99.06	0.9992
	105296.7	95.72	-2008.4	-1.83	108684.3	98.80	0.9994
	105189.5	95.63	-1996.2	-1.81	108583.5	98.71	0.9994

TABLE_ Reactive power production with set point Q = -Qmax							
Power	Active Power		Reactive Power		DC Power		Power Factor
	W	%Pn	VAr	%Pn	W	%Pn	cosφ
0% - 10%	6139.6	5.58	-53400.7	-48.55	7908.3	7.19	0.1142
	6173.6	5.61	-53709.3	-48.83	7983.5	7.26	0.1139
	6181.8	5.62	-53687.8	-48.81	7972.8	7.25	0.1141
10% - 20%	16677.6	15.16	-53819.2	-48.93	18668.7	16.97	0.2960
	16583.5	15.08	-53884.2	-48.99	18417.4	16.74	0.2952
	16724.1	15.20	-53902.3	-49.00	18376.3	16.71	0.2963
20% - 30%	27812.1	25.28	-54024.1	-49.11	30044.2	27.31	0.4577
	27548.7	25.04	-53863.7	-48.97	29767.1	27.06	0.4604
	27618.3	25.11	-53839.7	-48.95	29732.0	27.03	0.4602
30% - 40%	38937.6	35.40	-53655.1	-48.78	41475.6	37.71	0.5873
	38608.1	35.10	-53230.4	-48.39	40905.2	37.19	0.5783
	38582.5	35.08	-54045.2	-49.13	41783.7	37.99	0.5824
40% - 50%	50071.8	45.52	-53714.5	-48.83	53053.6	48.23	0.6818
	49884.2	45.35	-53571.5	-48.70	52574.7	47.80	0.6805
	49853.7	45.32	-53486.9	-48.62	52863.7	48.06	0.6806
50% - 60%	61225.8	55.66	-54011.1	-49.10	64539.9	58.67	0.7499
	61371.5	55.79	-54528.4	-49.57	63945.1	58.13	0.7502
	60526.4	55.02	-53731.8	-48.85	63169.4	57.43	0.7503
60% - 70%	71912.7	65.38	-54313.5	-49.38	75590.3	68.72	0.7979
	72095.2	65.54	-54138.4	-49.22	75285.8	68.44	0.8000
	72162.7	65.60	-54185.2	-49.26	74827.4	68.02	0.8001
70% - 80%	83224.1	75.66	-54209.3	-49.28	87325.7	79.39	0.8379
	83374.6	75.80	-54825.1	-49.84	87011.0	79.10	0.8413
	83592.0	75.99	-54027.5	-49.12	86897.3	79.00	0.8393
80% - 90%	94047.7	85.50	-54263.7	-49.33	98793.3	89.81	0.8662
	94185.3	85.62	-54002.6	-49.09	98268.3	89.33	0.8673
	94093.2	85.54	-53869.2	-48.97	98174.8	89.25	0.8662
90%-100%	104644.9	95.13	-53364.0	-48.51	108561.7	98.69	0.8908
	104644.9	95.13	-53336.9	-48.49	108561.7	98.69	0.8904
	104587.3	95.08	-53231.2	-48.39	108825.0	98.93	0.8901

TABLE_ Reactive power production with set point Q = +Qmax							
Power	Active Power		Reactive Power		DC Power		Power Factor
	W	%Pn	VAr	%Pn	W	%Pn	cosφ
0% - 10%	5738.2	5.22	53509.7	48.65	6603.3	6.00	0.1035
	5782.6	5.26	53574.5	48.70	6575.7	5.98	0.1027
	5780.3	5.25	53353.5	48.50	6586.0	5.99	0.1033
10% - 20%	16815.8	15.29	53344.2	48.49	17810.6	16.19	0.2988
	16847.9	15.32	53466.8	48.61	17880.0	16.25	0.2982
	16864.9	15.33	53378.1	48.53	17925.9	16.30	0.2984
20% - 30%	27933.5	25.39	53570.9	48.70	29246.9	26.59	0.4574
	27985.7	25.44	54063.1	49.15	29149.1	26.50	0.4587
	27865.2	25.33	53825.9	48.93	29250.7	26.59	0.4604
30% - 40%	38947.5	35.41	53522.2	48.66	40678.8	36.98	0.5868
	38939.5	35.40	53409.3	48.55	40606.7	36.92	0.5870
	39027.1	35.48	53521.3	48.66	40794.6	37.09	0.5863
40% - 50%	50202.9	45.64	53847.2	48.95	52406.9	47.64	0.6824
	50066.5	45.52	53631.1	48.76	52313.9	47.56	0.6799
	49952.9	45.41	53647.3	48.77	52095.8	47.36	0.6763
50% - 60%	61253.4	55.68	53418.2	48.56	63537.3	57.76	0.7501
	61366.2	55.79	53296.6	48.45	63523.3	57.75	0.7522
	61542.6	55.95	53743.8	48.86	63436.3	57.67	0.7543
60% - 70%	72627.0	66.02	53331.8	48.48	75363.3	68.51	0.8016
	72268.9	65.70	53168.5	48.34	75290.7	68.45	0.7976
	72739.0	66.13	53568.2	48.70	75243.5	68.40	0.8010
70% - 80%	84218.5	76.56	53131.9	48.30	86979.6	79.07	0.8365
	84127.0	76.48	53104.8	48.28	87423.8	79.48	0.8382
	83713.1	76.10	53036.9	48.22	87592.8	79.63	0.8438
80% - 90%	95620.9	86.93	52902.3	48.09	99215.9	90.20	0.8721
	95217.5	86.56	53263.7	48.42	99282.8	90.26	0.8650
	95105.4	86.46	53412.7	48.56	99346.8	90.32	0.8682
90%-100%	105192.9	95.63	53440.9	48.58	109178.3	99.25	0.8946
	105065.9	95.51	53381.1	48.53	108652.5	98.78	0.8937
	104794.7	95.27	53616.1	48.74	108805.2	98.91	0.8901

Model: iMars XG136KTR-L							
TABLE_ Reactive power production with set point Q = 0							
Power	Active Power		Reactive Power		DC Power		Power Factor
	W	%Pn	VAr	%Pn	W	%Pn	cosφ
0% - 10%	6901.6	5.07	3811.3	2.80	7421.7	5.46	0.8754
	6937.2	5.10	3647.2	2.68	7523.8	5.53	0.8824
	7003.7	5.15	3728.5	2.74	7472.8	5.49	0.8793
10% - 20%	20450.6	15.04	2233.2	1.64	21175.2	15.57	0.9942
	20372.4	14.98	2201.5	1.62	21258.9	15.63	0.9951
	20417.5	15.01	2159.4	1.59	21186.7	15.58	0.9937
20% - 30%	34191.4	25.14	3551.2	2.61	35115.7	25.82	0.9945
	34073.5	25.05	4002.5	2.94	35074.1	25.79	0.9952
	33874.6	24.91	3851.5	2.83	35082.4	25.80	0.9947
30% - 40%	47609.4	35.01	3431.7	2.52	48820.1	35.90	0.9973
	47397.9	34.85	3627.6	2.67	48728.4	35.83	0.9974
	47476.1	34.91	3728.4	2.74	48629.4	35.76	0.9981
40% - 50%	61427.1	45.17	3404.0	2.50	62961.7	46.30	0.9984
	61286.8	45.06	3528.4	2.59	62738.2	46.13	0.9986
	61538.4	45.25	3275.9	2.41	62848.1	46.21	0.9988
50% - 60%	75148.5	55.26	3404.8	2.50	77126.4	56.71	0.9993
	75385.2	55.43	3328.9	2.45	77275.9	56.82	0.9994
	75184.5	55.28	3275.0	2.41	77375.8	56.89	0.9993
60% - 70%	88945.2	65.40	3351.3	2.46	91318.1	67.15	0.9992
	88846.3	65.33	3127.4	2.30	91275.8	67.11	0.9995
	89042.8	65.47	3265.9	2.40	91473.6	67.26	0.9991
70% - 80%	101648.3	74.74	1175.8	0.86	104376.3	76.75	0.9996
	102740.5	75.54	1281.2	0.94	105646.4	77.68	0.9994
	102396.5	75.29	1264.9	0.93	105275.5	77.41	0.9993
80% - 90%	116583.5	85.72	-274.9	-0.20	119911.9	88.17	0.9995
	115835.7	85.17	-186.4	-0.14	118967.6	87.48	0.9996
	116286.6	85.50	-247.9	-0.18	119566.6	87.92	0.9993
90%-100%	130307.2	95.81	-3195.6	-2.35	134185.4	98.67	0.9996
	130084.0	95.65	-3072.1	-2.26	134728.4	99.07	0.9992
	130428.9	95.90	-3085.3	-2.27	133987.6	98.52	0.9995

TABLE_ Reactive power production with set point Q = -Qmax							
Power	Active Power		Reactive Power		DC Power		Power Factor
	W	%Pn	VAr	%Pn	W	%Pn	cosφ
0% - 10%	6843.6	5.03	-66135.4	-48.63	8751.3	6.43	0.1032
	6845.3	5.03	-65637.1	-48.26	8690.3	6.39	0.1031
	6847.3	5.03	-66150.9	-48.64	8696.8	6.39	0.1034
10% - 20%	20738.8	15.25	-66080.2	-48.59	22915.7	16.85	0.2989
	20647.4	15.18	-66034.9	-48.56	22907.6	16.84	0.2971
	20631.2	15.17	-66479.7	-48.88	22749.2	16.73	0.2995
20% - 30%	34209.3	25.15	-65896.1	-48.45	36456.0	26.81	0.4559
	34194.6	25.14	-65932.8	-48.48	36438.4	26.79	0.4586
	34388.7	25.29	-66008.0	-48.54	36775.2	27.04	0.4614
30% - 40%	48067.9	35.34	-66349.7	-48.79	50728.5	37.30	0.5844
	47934.3	35.25	-66165.4	-48.65	50767.2	37.33	0.5870
	47931.2	35.24	-66337.3	-48.78	50664.0	37.25	0.5873
40% - 50%	61535.6	45.25	-66630.8	-48.99	64262.7	47.25	0.6826
	61485.5	45.21	-66519.5	-48.91	64413.8	47.36	0.6770
	61253.1	45.04	-66505.5	-48.90	64668.8	47.55	0.6794
50% - 60%	74874.2	55.05	-65969.6	-48.51	78570.3	57.77	0.7512
	75196.2	55.29	-65969.6	-48.51	78978.0	58.07	0.7500
	75260.7	55.34	-66059.5	-48.57	78480.0	57.71	0.7562
60% - 70%	88804.1	65.30	-66644.2	-49.00	92532.7	68.04	0.8054
	89204.8	65.59	-66302.3	-48.75	92811.6	68.24	0.7982
	88836.1	65.32	-66422.4	-48.84	92786.5	68.23	0.8036
70% - 80%	102574.1	75.42	-66117.6	-48.62	107732.3	79.21	0.8341
	102757.0	75.56	-66095.8	-48.60	107242.3	78.85	0.8385
	102623.1	75.46	-66429.3	-48.85	107516.7	79.06	0.8476
80% - 90%	116846.5	85.92	-66424.5	-48.84	120739.4	88.78	0.8720
	116130.2	85.39	-65969.5	-48.51	121445.3	89.30	0.8683
	116568.0	85.71	-66033.8	-48.55	121144.7	89.08	0.8674
90%-100%	129076.4	94.91	-65922.6	-48.47	133447.5	98.12	0.8979
	128644.7	94.59	-66157.7	-48.65	133513.0	98.17	0.8904
	128805.1	94.71	-66150.3	-48.64	134200.9	98.68	0.8917

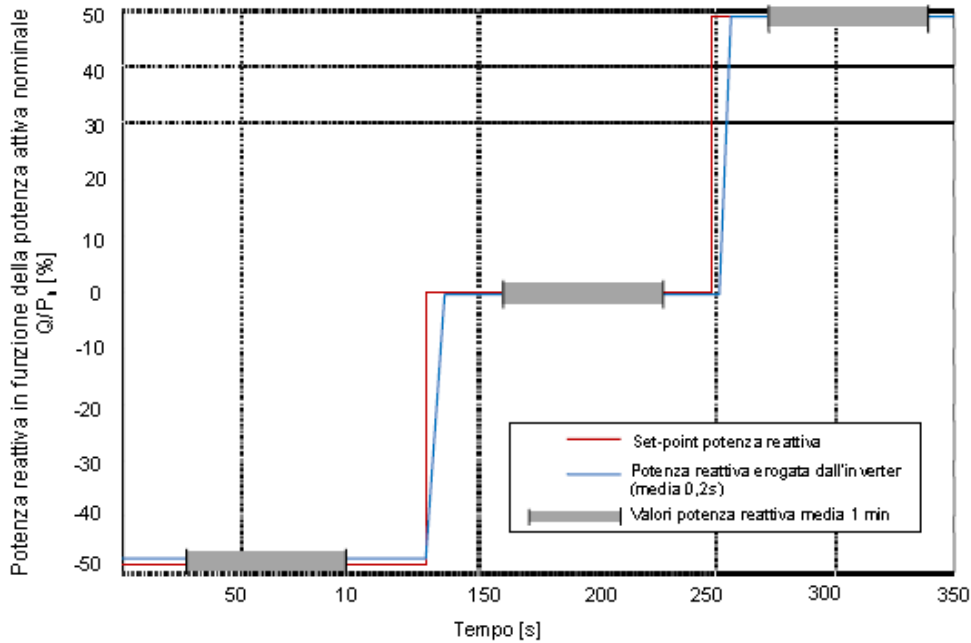
TABLE_ Reactive power production with set point Q = +Qmax							
Power	Active Power		Reactive Power		DC Power		Power Factor
	W	%Pn	VAr	%Pn	W	%Pn	cosφ
0% - 10%	6979.5	5.13	66325.4	48.77	7958.8	5.85	0.1060
	7018.9	5.16	65701.5	48.31	7987.9	5.87	0.1058
	6998.3	5.15	66130.5	48.63	8007.4	5.89	0.1055
10% - 20%	20585.3	15.14	65795.5	48.38	21898.1	16.10	0.2970
	20455.4	15.04	65941.4	48.49	21815.1	16.04	0.2984
	20528.5	15.09	65745.6	48.34	21850.1	16.07	0.2986
20% - 30%	34278.4	25.20	66498.9	48.90	35739.1	26.28	0.4581
	34100.5	25.07	66484.3	48.89	35476.4	26.09	0.4562
	34168.0	25.12	66583.2	48.96	35587.9	26.17	0.4594
30% - 40%	47679.7	35.06	66183.0	48.66	49458.8	36.37	0.5852
	47846.8	35.18	66202.6	48.68	49610.3	36.48	0.5849
	47653.9	35.04	66147.3	48.64	49303.2	36.25	0.5864
40% - 50%	61107.1	44.93	66127.0	48.62	63511.5	46.70	0.6783
	61126.3	44.95	66100.3	48.60	63551.1	46.73	0.6820
	61325.3	45.09	66033.3	48.55	63571.9	46.74	0.6779
50% - 60%	75019.0	55.16	66035.1	48.56	77635.8	57.09	0.7485
	74954.5	55.11	65922.0	48.47	77935.2	57.31	0.7524
	75193.0	55.29	65595.6	48.23	77759.5	57.18	0.7537
60% - 70%	91723.0	67.44	65496.0	48.16	92009.6	67.65	0.8030
	91704.0	67.43	65853.0	48.42	91356.2	67.17	0.8017
	91715.9	67.44	65677.1	48.29	91886.0	67.56	0.8031
70% - 80%	102682.1	75.50	65853.9	48.42	106298.4	78.16	0.8394
	102376.2	75.28	65957.6	48.50	105559.9	77.62	0.8454
	102246.7	75.18	65900.9	48.46	105714.7	77.73	0.8443
80% - 90%	116538.8	85.69	65704.2	48.31	120366.5	88.50	0.8741
	116768.4	85.86	65924.2	48.47	120610.9	88.68	0.8682
	115950.6	85.26	65929.5	48.48	120870.6	88.88	0.8741
90%-100%	129846.4	95.48	66634.7	49.00	134537.6	98.92	0.8908
	129899.0	95.51	66445.6	48.86	133524.4	98.18	0.8929
	129893.0	95.51	66553.9	48.94	134273.8	98.73	0.8869

Model: iMars XG136KTR-X							
TABLE_ Reactive power production with set point Q = 0							
Power	Active Power		Reactive Power		DC Power		Power Factor
	W	%Pn	VAr	%Pn	W	%Pn	cosφ
0% - 10%	6919.4	5.09	4430.5	3.26	7392.1	5.44	0.8418
	6936.2	5.10	4275.8	3.14	7462.5	5.49	0.8462
	6942.7	5.10	4386.2	3.23	7507.3	5.52	0.8448
10% - 20%	20445.1	15.03	2642.1	1.94	21147.5	15.55	0.9915
	20475.8	15.06	2584.7	1.90	21004.7	15.44	0.9921
	20399.5	15.00	2486.7	1.83	21264.0	15.64	0.9918
20% - 30%	34110.9	25.08	2618.6	1.93	35075.7	25.79	0.9969
	34275.8	25.20	2549.7	1.87	35134.2	25.83	0.9973
	34371.4	25.27	2641.8	1.94	34976.5	25.72	0.9974
30% - 40%	47624.4	35.02	2621.6	1.93	48899.6	35.96	0.9984
	47372.8	34.83	2583.4	1.90	49675.3	36.53	0.9982
	47428.5	34.87	2681.8	1.97	49075.1	36.08	0.9984
40% - 50%	61270.3	45.05	2593.1	1.91	62851.6	46.21	0.9991
	61027.5	44.87	2599.0	1.91	63186.3	46.46	0.9992
	61149.6	44.96	2639.3	1.94	62947.8	46.29	0.9990
50% - 60%	74957.1	55.12	2671.2	1.96	76980.3	56.60	0.9994
	74853.8	55.04	2743.8	2.02	76285.7	56.09	0.9991
	74903.5	55.08	2618.5	1.93	76373.6	56.16	0.9992
60% - 70%	88721.8	65.24	2689.2	1.98	91117.5	67.00	0.9995
	88638.5	65.18	2731.8	2.01	90738.6	66.72	0.9994
	88583.9	65.14	2684.9	1.97	91027.8	66.93	0.9992
70% - 80%	102487.1	75.36	2751.8	2.02	105404.2	77.50	0.9996
	102178.4	75.13	2694.3	1.98	105042.7	77.24	0.9994
	102347.8	75.26	2749.6	2.02	105247.3	77.39	0.9995
80% - 90%	116190.8	85.43	2835.9	2.09	119599.0	87.94	0.9997
	115684.3	85.06	2785.4	2.05	119647.3	87.98	0.9996
	116238.4	85.47	2894.3	2.13	118994.2	87.50	0.9994
90%-100%	129924.9	95.53	2460.8	1.81	133844.8	98.42	0.9997
	129368.5	95.12	2375.7	1.75	134175.8	98.66	0.9996
	130037.8	95.62	2471.5	1.82	134026.0	98.55	0.9995

TABLE_ Reactive power production with set point Q = -Qmax							
Power	Active Power		Reactive Power		DC Power		Power Factor
	W	%Pn	VAr	%Pn	W	%Pn	cosφ
0% - 10%	6830.8	5.02	-65633.0	-48.26	8699.1	6.40	0.1033
	6822.7	5.02	-65594.6	-48.23	8677.8	6.38	0.1027
	6814.0	5.01	-66167.0	-48.65	8690.1	6.39	0.1035
10% - 20%	20401.0	15.00	-65877.6	-48.44	22586.4	16.61	0.2968
	20481.8	15.06	-66119.6	-48.62	22637.4	16.65	0.2949
	20474.3	15.05	-66143.5	-48.63	22580.7	16.60	0.2952
20% - 30%	33872.4	24.91	-66088.6	-48.59	36372.1	26.74	0.4551
	34185.2	25.14	-66459.2	-48.87	36405.7	26.77	0.4583
	34014.0	25.01	-66043.2	-48.56	36437.4	26.79	0.4557
30% - 40%	47553.7	34.97	-66547.0	-48.93	50538.3	37.16	0.5824
	47499.6	34.93	-66344.0	-48.78	50366.3	37.03	0.5859
	47442.4	34.88	-66104.2	-48.61	50579.3	37.19	0.5857
40% - 50%	61034.6	44.88	-66007.4	-48.53	64494.4	47.42	0.6794
	61008.8	44.86	-65853.7	-48.42	64364.9	47.33	0.6811
	61509.3	45.23	-66215.2	-48.69	64642.4	47.53	0.6811
50% - 60%	75019.9	55.16	-66283.0	-48.74	78601.2	57.80	0.7498
	74649.0	54.89	-65826.9	-48.40	78396.0	57.64	0.7507
	74677.2	54.91	-65891.3	-48.45	78217.4	57.51	0.7470
60% - 70%	88915.9	65.38	-66463.7	-48.87	92066.0	67.70	0.8037
	88991.3	65.43	-66182.4	-48.66	92546.6	68.05	0.7993
	88935.4	65.39	-65993.3	-48.52	92495.1	68.01	0.8023
70% - 80%	102651.8	75.48	-66286.7	-48.74	106820.3	78.54	0.8390
	102142.7	75.10	-66085.3	-48.59	107142.0	78.78	0.8367
	102658.0	75.48	-65919.7	-48.47	106518.3	78.32	0.8416
80% - 90%	116434.5	85.61	-66497.9	-48.90	121688.9	89.48	0.8716
	117009.9	86.04	-66015.5	-48.54	121572.4	89.39	0.8723
	116572.9	85.72	-66098.2	-48.60	122016.8	89.72	0.8650
90%-100%	128715.5	94.64	-65675.2	-48.29	133328.3	98.04	0.8891
	128671.1	94.61	-65865.7	-48.43	133947.4	98.49	0.8936
	128821.0	94.72	-65715.7	-48.32	133802.7	98.38	0.8934

TABLE_ Reactive power production with set point Q = +Qmax							
Power	Active Power		Reactive Power		DC Power		Power Factor
	W	%Pn	VAr	%Pn	W	%Pn	cosφ
0% - 10%	7049.5	5.18	65721.4	48.32	7858.5	5.78	0.1057
	7023.0	5.16	66239.3	48.71	7923.4	5.83	0.1055
	7022.9	5.16	65668.8	48.29	7902.0	5.81	0.1059
10% - 20%	20659.4	15.19	65977.0	48.51	21766.9	16.01	0.2966
	20496.2	15.07	65879.6	48.44	21796.6	16.03	0.2956
	20564.9	15.12	66416.6	48.84	21754.5	16.00	0.2968
20% - 30%	34177.4	25.13	66051.4	48.57	35483.3	26.09	0.4599
	34329.4	25.24	65967.4	48.51	35559.4	26.15	0.4602
	34346.4	25.25	66081.0	48.59	35714.3	26.26	0.4592
30% - 40%	47718.7	35.09	65840.7	48.41	49663.2	36.52	0.5881
	47725.1	35.09	65946.6	48.49	49333.9	36.27	0.5873
	47595.4	35.00	65717.1	48.32	49342.2	36.28	0.5849
40% - 50%	61682.0	45.35	65477.4	48.15	63742.1	46.87	0.6822
	61518.2	45.23	65915.3	48.47	63553.4	46.73	0.6811
	61726.8	45.39	65897.3	48.45	63344.0	46.58	0.6819
50% - 60%	74792.3	54.99	65804.3	48.39	77397.6	56.91	0.7554
	74815.0	55.01	65844.4	48.42	77597.4	57.06	0.7533
	75243.8	55.33	65397.1	48.09	77750.1	57.17	0.7562
60% - 70%	88739.5	65.25	65390.4	48.08	91956.1	67.61	0.8052
	89246.1	65.62	65438.7	48.12	91575.9	67.34	0.8051
	89266.8	65.64	65468.5	48.14	91783.8	67.49	0.8019
70% - 80%	103194.1	75.88	65713.9	48.32	106642.0	78.41	0.8396
	102900.0	75.66	65291.3	48.01	106472.9	78.29	0.8425
	102227.1	75.17	65489.8	48.15	106018.4	77.95	0.8452
80% - 90%	116918.6	85.97	65412.8	48.10	120663.2	88.72	0.8750
	117070.0	86.08	65488.7	48.15	121223.7	89.14	0.8695
	117030.9	86.05	65457.1	48.13	120306.2	88.46	0.8673
90%-100%	129597.1	95.29	66636.0	49.00	134350.5	98.79	0.8918
	130096.8	95.66	66596.2	48.97	133789.7	98.37	0.8940
	129405.8	95.15	66107.9	48.61	133449.7	98.12	0.8869

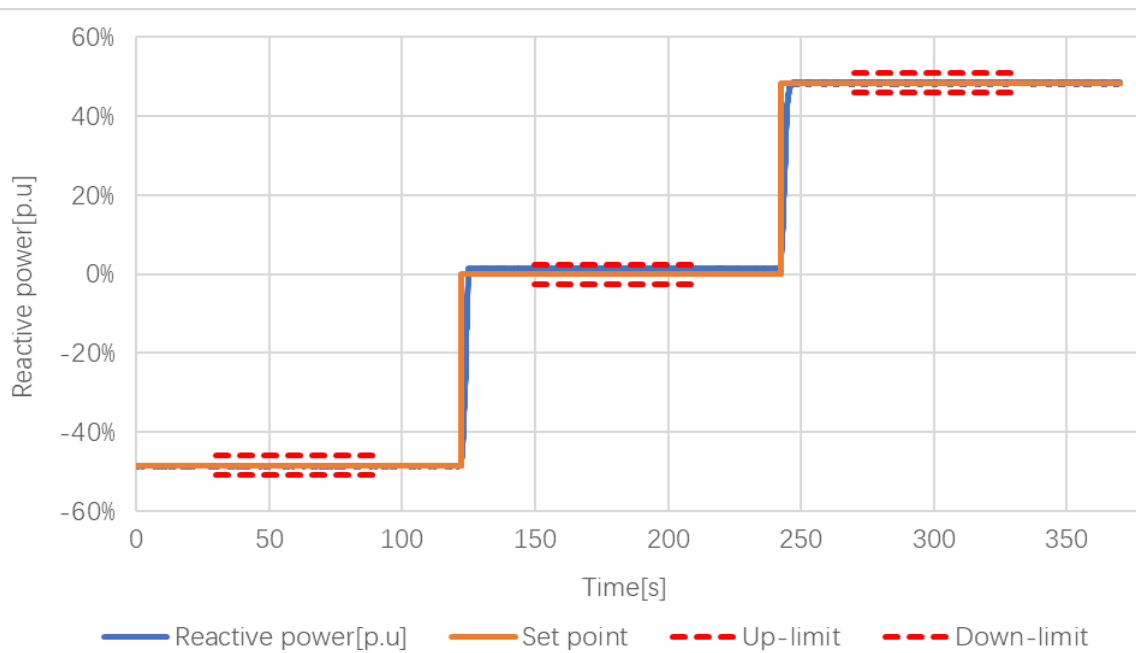
B.1.2.3 Table: Reactive power exchange at a given level P



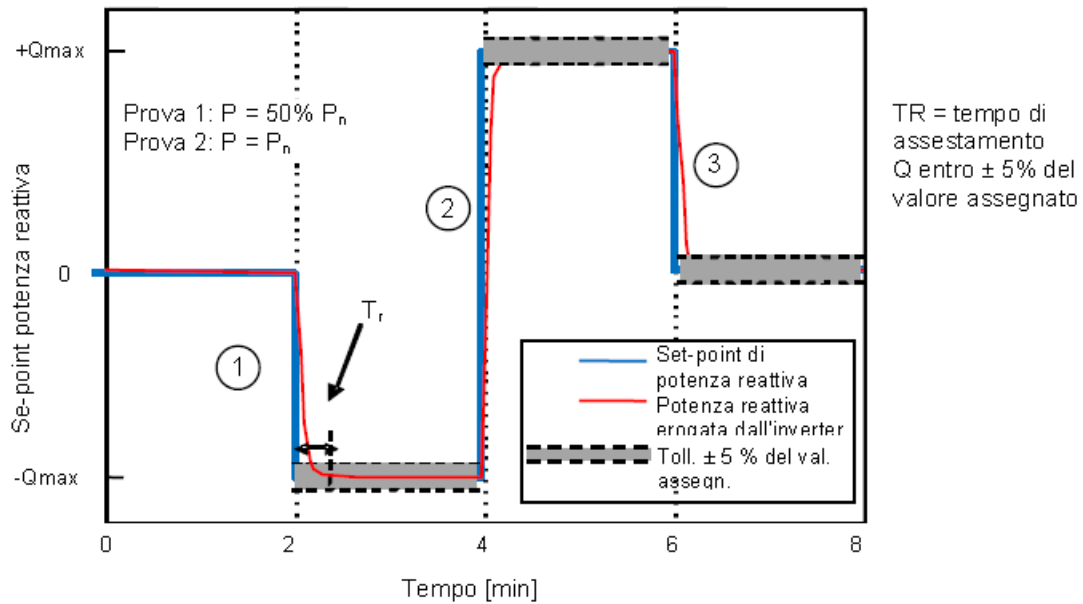
Model: iMars XG110KTR

50% P _n	Set point Reactive power Q/P _n [%]	Reactive power measured Q/P _n [%]	Deviation from set point ΔQ/P _n [%]	Limit [%]
-Q _{min}	-48.43	-48.76	-0.33	ΔQ ≤ ±2.5%P _n
0	0	1.99	1.99	ΔQ ≤ ±2.5%P _n
+Q _{max}	+ 48.43	48.95	0.52	ΔQ ≤ ±2.5%P _n

Graph



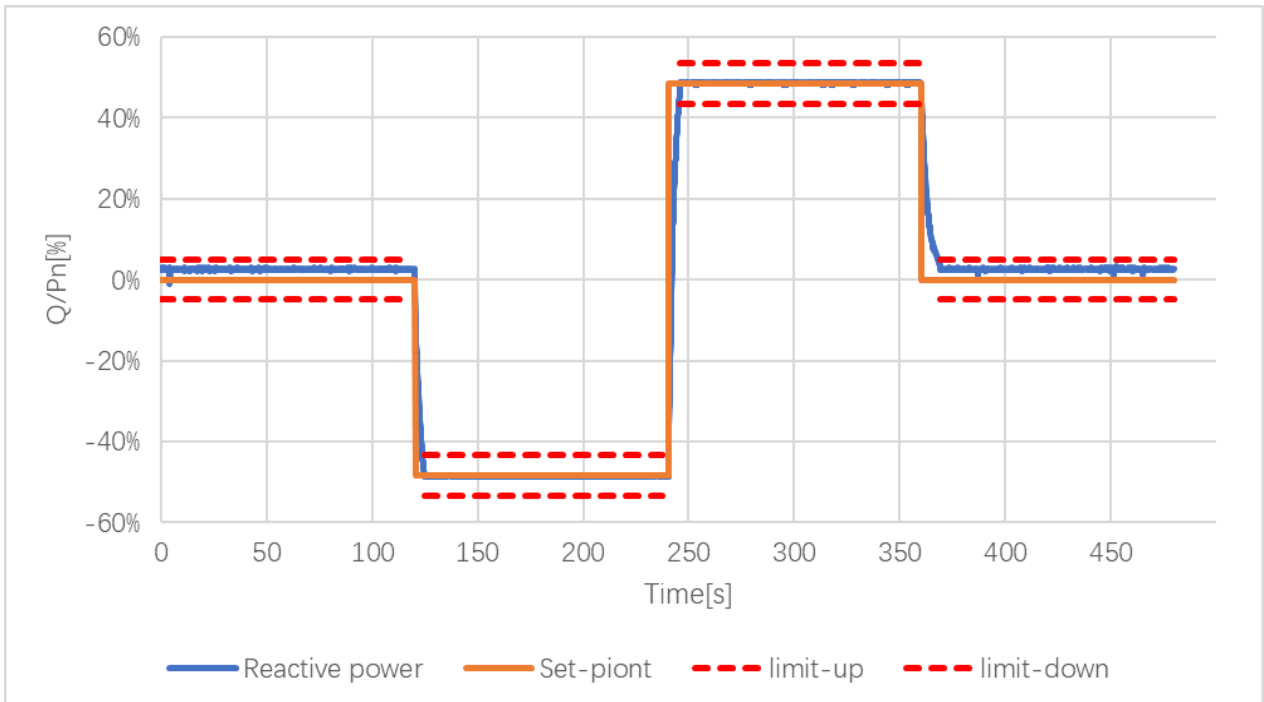
B.1.2.4 Table: Response time to an assigned step level change P



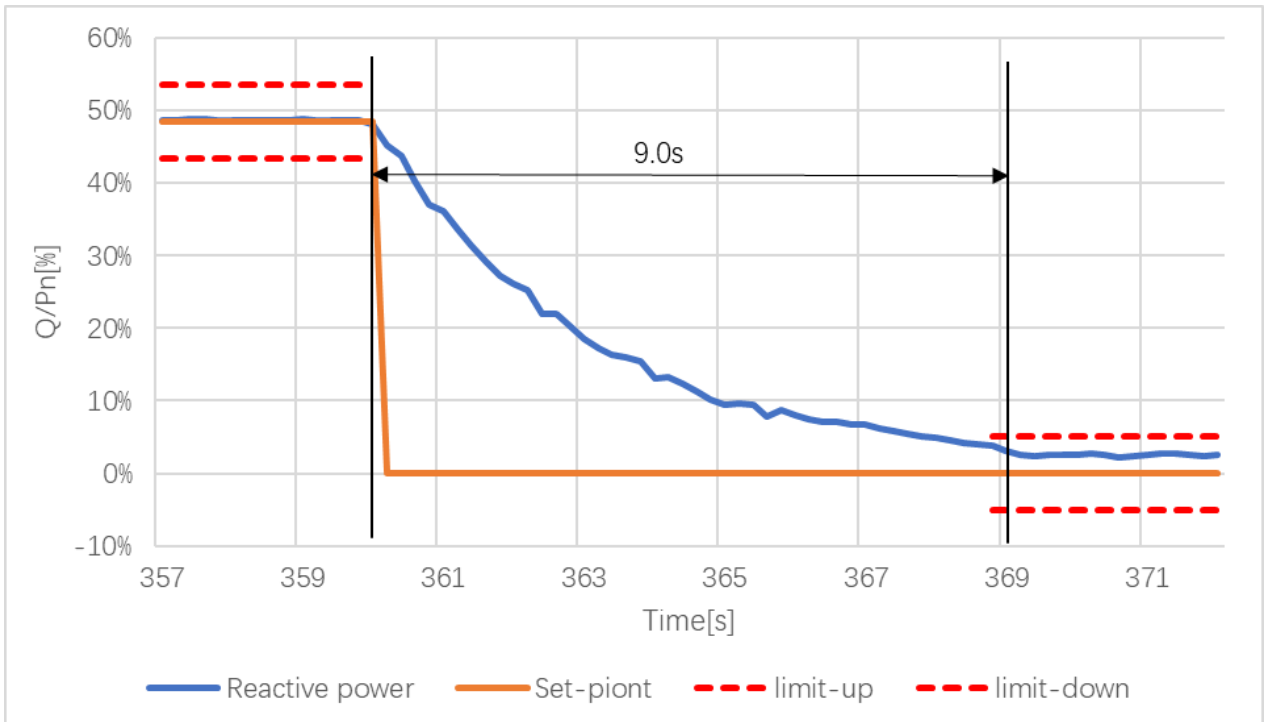
Model: iMars XG110KTR

Test 1			Test 2			
Output power [%]	$Q_{max ind}$ [VA]	$Q_{max cap}$ [VA]	Output power [%]	$Q_{max ind}$ [VA]	$Q_{max cap}$ [VA]	
100% P_n	-53365.0	53551.1	50% P_n	-53362.0	53546.2	
Test 1 (see Graph 1): 100%P_n						
Point	Output power	transient	Vac	Q_{E60} [VA]	Tr [s]	limit [s]
1	110230.7	0 → $Q_{max ind}$	230.7	-53365.0	4.8	10
2	109040.5	$Q_{max ind}$ → $Q_{max cap}$	230.7	53551.1	5.4	10
3	110408.3	$Q_{max cap}$ → 0	230.7	2836.8	9.0	10
Test 2 (see Graph 2): 50% P_n						
Point	Output power	transient	Vac	Q_{E60} [VA]	Tr [s]	limit [s]
1	55947.3	0 → $Q_{max ind}$	230.2	-53362.0	4.8	10
2	56093.4	$Q_{max ind}$ → $Q_{max cap}$	230.1	53546.2	6.4	10
3	56082.6	$Q_{max cap}$ → 0	230.2	2217.2	7.6	10

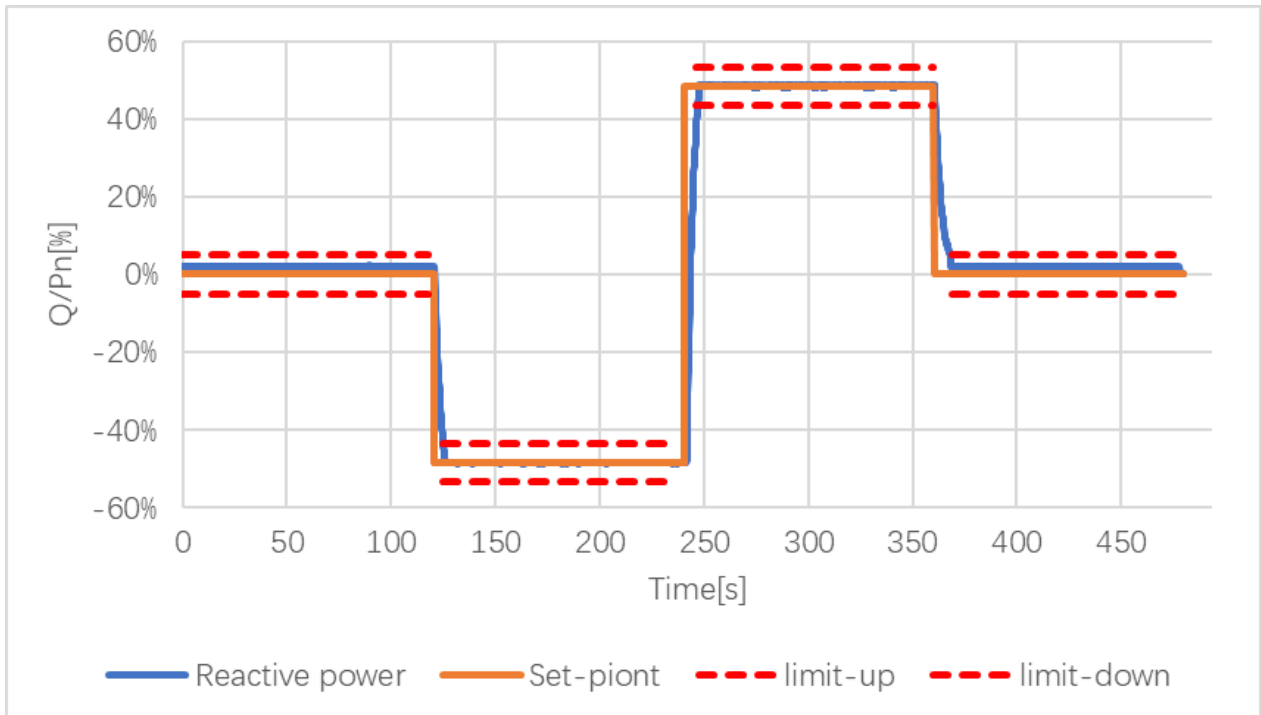
Graph-Test 1



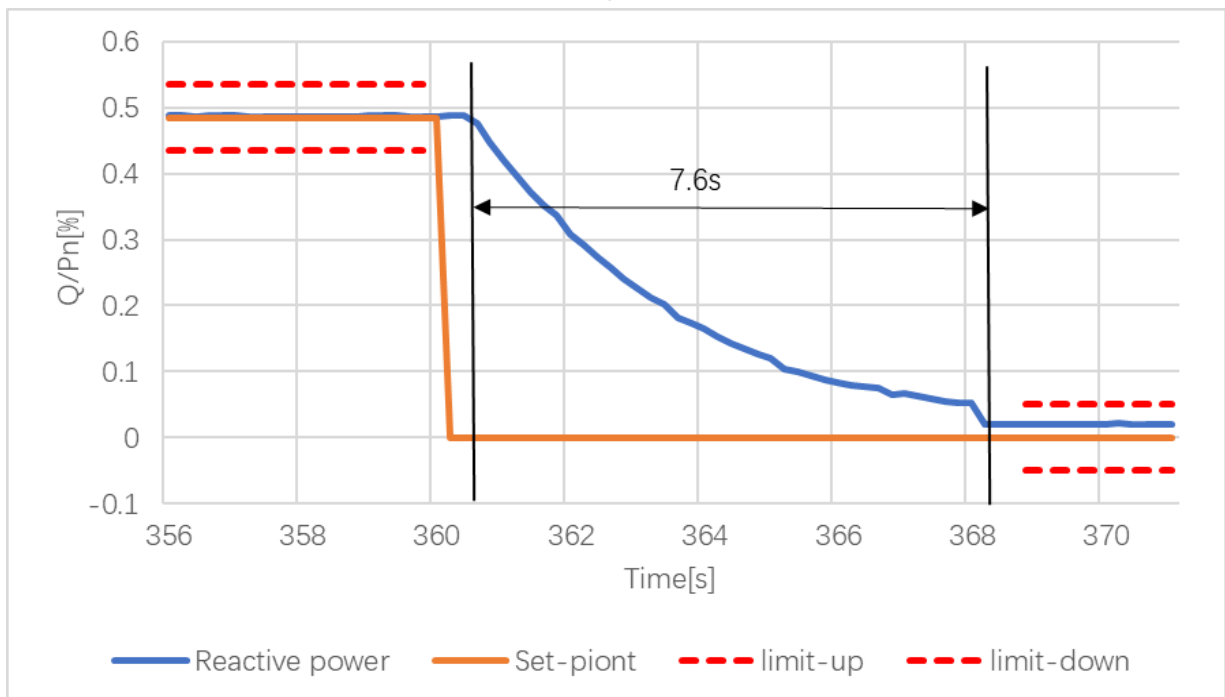
Graph-Tr



Graph -Test 2



Graph-Tr



B.1.2.5	Table: Automatic supply of reactive power according to a characteristic curve $\cos\phi = f(P)$	P
Model: iMars XG110KTR		
Max. cos declared..... :		cos : 0.9
Set value..... :		Lock-in: 1.05 Vn (Vn and 1.1 Vn with steps of 0.01) Lock-out: 230 V (0.9 Vn and Vn with steps of 0.01)

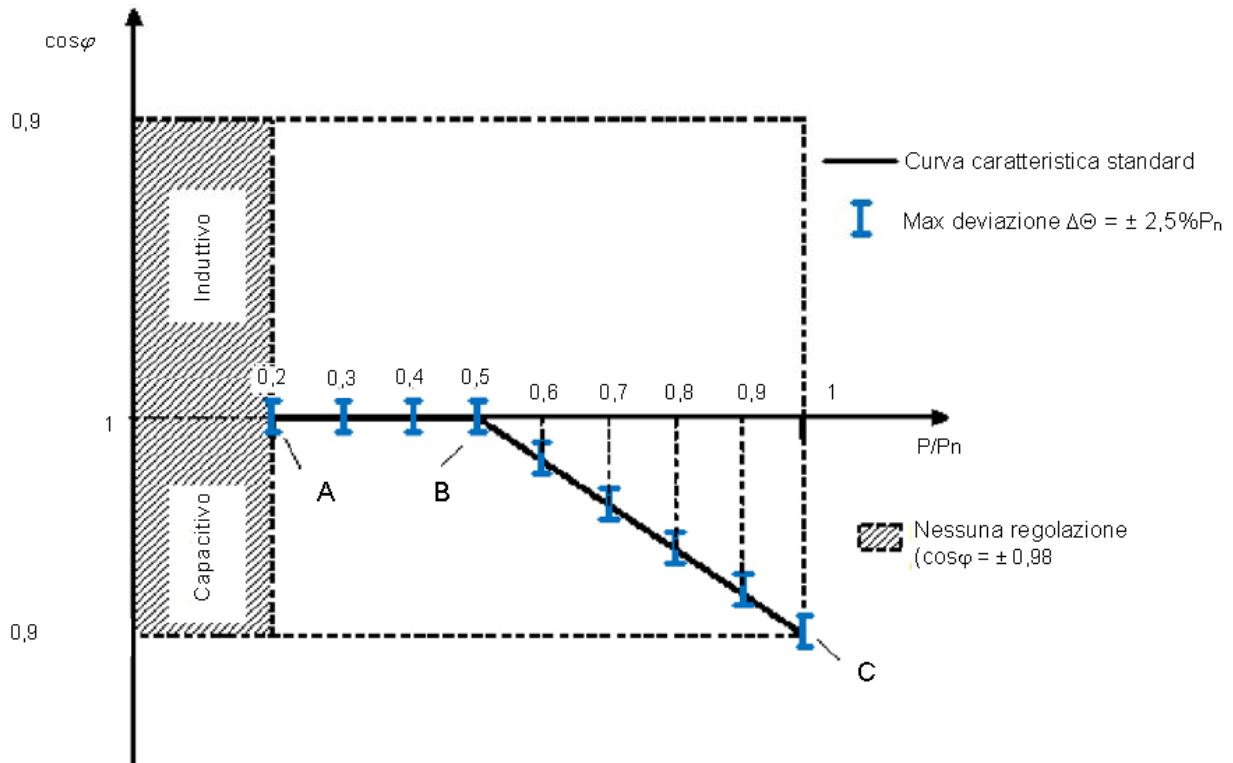
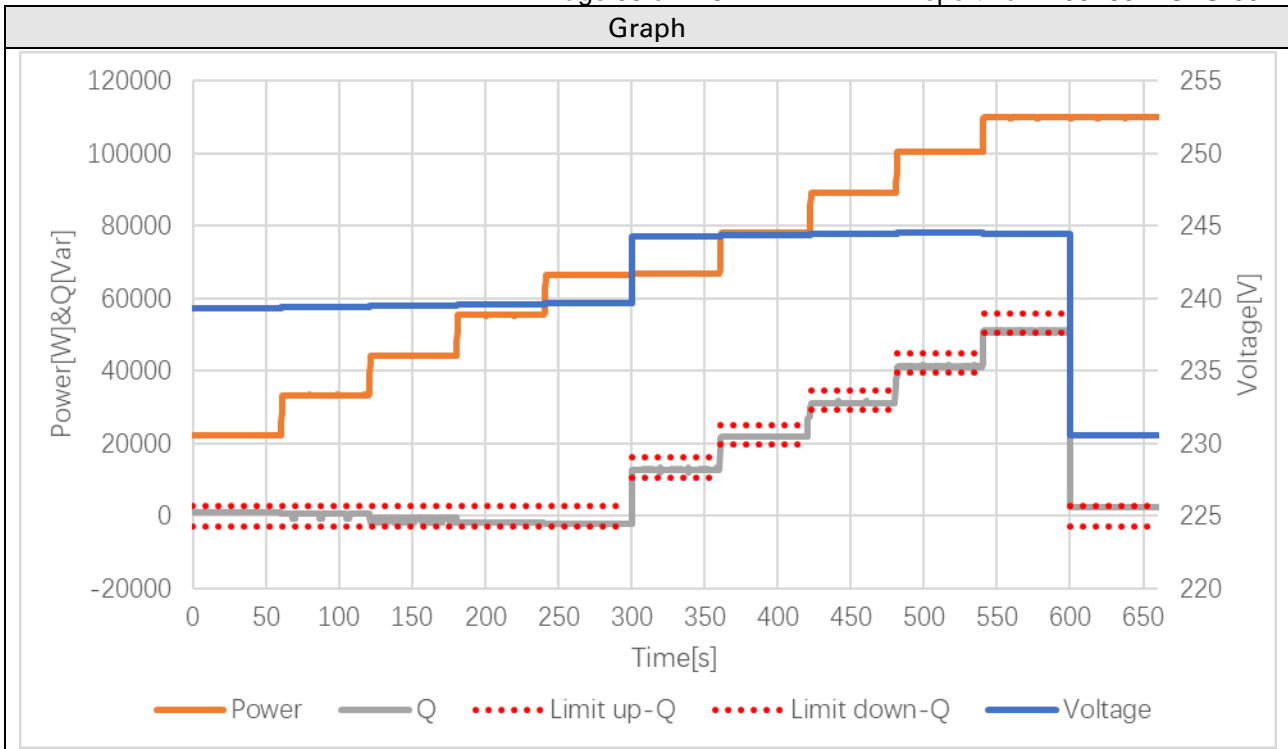
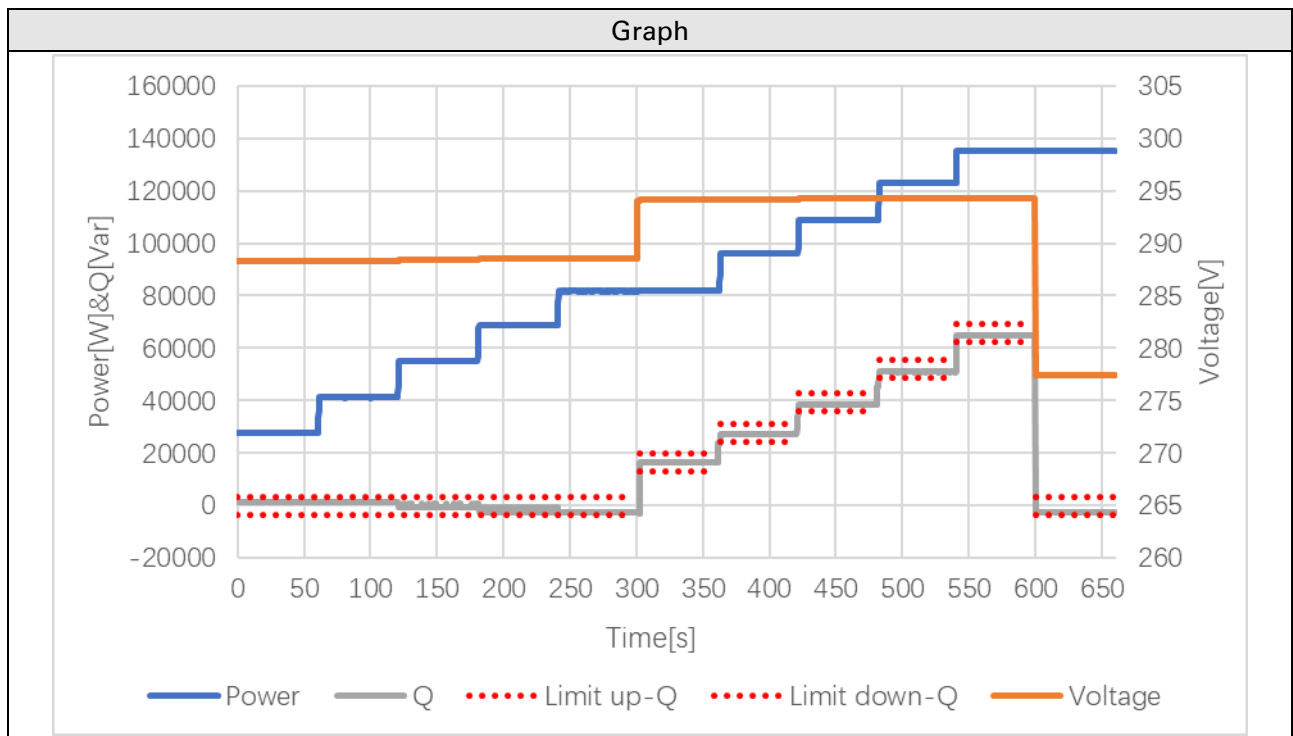


Figura 27 – Curva caratteristica standard $\cos\phi = f(P)$

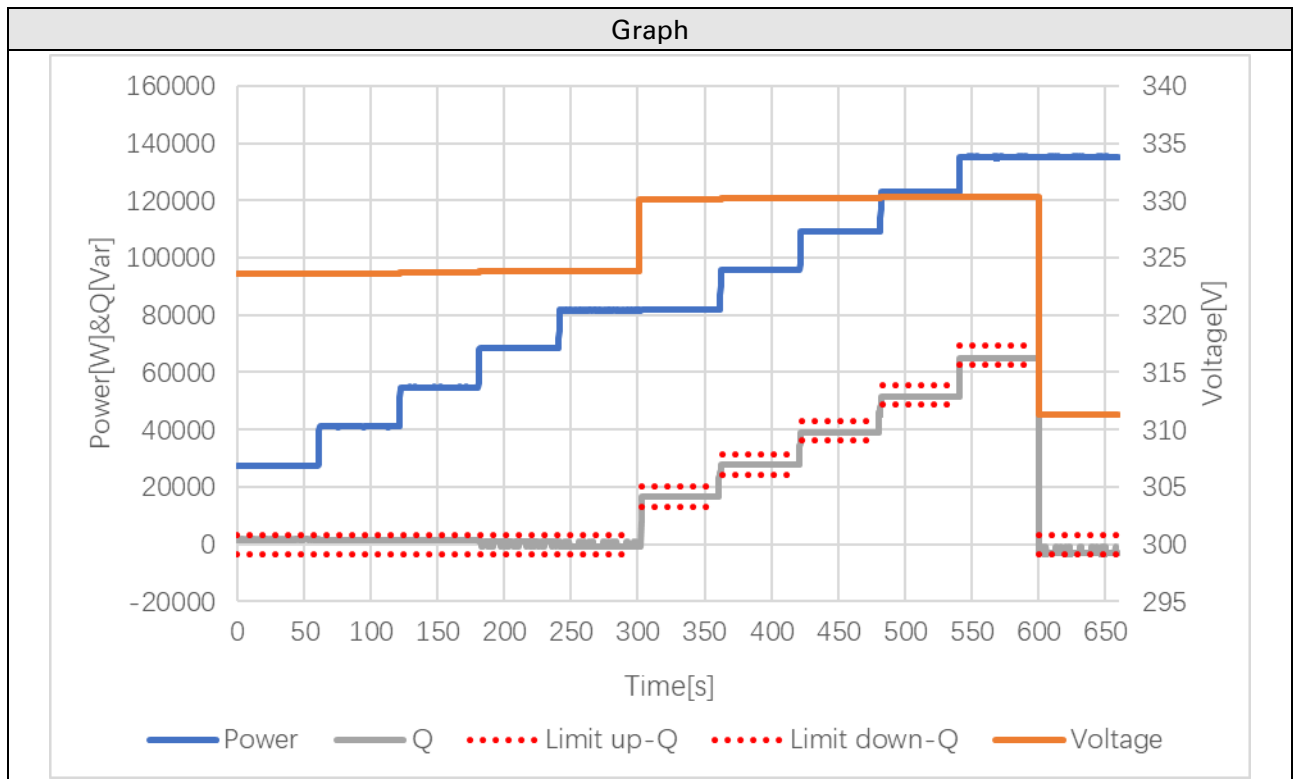
P/Pn (%)	P (W)	Voltage(V)	Q (Var)	Measured cos φ	Desired cos φ	Δ Q	Limit
20%	22102.41	239.35	887.01	0.9939	1	887.01	±2.5%Pn
30%	33314.03	239.43	622.19	0.9983	1	622.19	±2.5%Pn
40%	44138.72	239.50	-994.90	0.9991	1	-994.90	±2.5%Pn
50%	55345.48	239.57	-1928.85	0.9994	1	-1928.85	±2.5%Pn
60%	66541.74	239.66	-2070.29	0.9995	1	-2070.29	±2.5%Pn
60%	66800.04	244.28	12875.05	0.9818	0.98	-526.95	±2.5%Pn
70%	77994.06	244.35	21916.88	0.9626	0.96	-541.12	±2.5%Pn
80%	89140.46	244.43	31177.26	0.9439	0.94	-761.74	±2.5%Pn
90%	100369.70	244.50	41195.71	0.9251	0.92	-977.29	±2.5%Pn
100%	109937.10	244.42	51061.09	0.9069	0.9	-2213.91	±2.5%Pn
100%	109920.70	230.53	2293.99	0.9987	1	2293.99	±2.5%Pn



Model: iMars XG136KTR-L							
Max. cos declared..... :					cos : 0.9		
Set value..... :					Lock-in: 1.05 Vn (Vn and 1.1 Vn with steps of 0.01) Lock-out: 277 V (0.9 Vn and Vn with steps of 0.01)		
P/Pn (%)	P (W)	Voltage(V)	Q (Var)	Measured cos φ	Desired cos φ	Δ Q	Limit
20%	27438.5	288.2	1240.9	0.9928	1	1240.9	±2.5%Pn
30%	41121.6	288.3	1029.4	0.9978	1	1029.4	±2.5%Pn
40%	54891.1	288.4	-619.5	0.9989	1	-619.5	±2.5%Pn
50%	68680.6	288.4	-1960.4	0.9993	1	-1960.4	±2.5%Pn
60%	81682.3	288.5	-2608.2	0.9995	1	-2608.2	±2.5%Pn
60%	81984.1	294.1	16388.5	0.9805	0.98	-181.5	±2.5%Pn
70%	95914.7	294.2	27311.3	0.9617	0.96	-454.7	±2.5%Pn
80%	108858.7	294.2	38602.2	0.9424	0.94	-885.8	±2.5%Pn
90%	123044.1	294.3	50937.3	0.9239	0.92	-1203.7	±2.5%Pn
100%	135275.4	294.3	64895.5	0.9016	0.9	-971.5	±2.5%Pn
100%	135753.7	277.2	-2845.3	0.9994	1	-2845.3	±2.5%Pn



Model: iMars XG136KTR-X							
Max. cos declared..... :					cos : 0.9		
Set value..... :					Lock-in: 1.05 Vn (Vn and 1.1 Vn with steps of 0.01) Lock-out: 311 V (0.9 Vn and Vn with steps of 0.01)		
P/Pn (%)	P (W)	Voltage(V)	Q (Var)	Measured cos φ	Desired cos φ	Δ Q	Limit
20%	27245.9	323.6	1681.2	0.9898	1	1681.2	±2.5%Pn
30%	40988.2	323.6	1368.6	0.9963	1	1368.6	±2.5%Pn
40%	54795.2	323.7	1216.9	0.9983	1	1216.9	±2.5%Pn
50%	68576.4	323.8	923.9	0.9990	1	923.9	±2.5%Pn
60%	81660.6	323.8	-701.6	0.9993	1	-701.6	±2.5%Pn
60%	81942.5	330.0	16292.2	0.9801	0.98	-277.8	±2.5%Pn
70%	95819.1	330.2	27740.6	0.9605	0.96	-25.4	±2.5%Pn
80%	109169.9	330.2	39166.5	0.9412	0.94	-321.5	±2.5%Pn
90%	122883.6	330.3	51360.4	0.9226	0.92	-780.6	±2.5%Pn
100%	135275.7	330.3	64894.9	0.9016	0.9	-972.1	±2.5%Pn
100%	135737.5	311.3	-2875.2	0.9996	1	-2875.2	±2.5%Pn

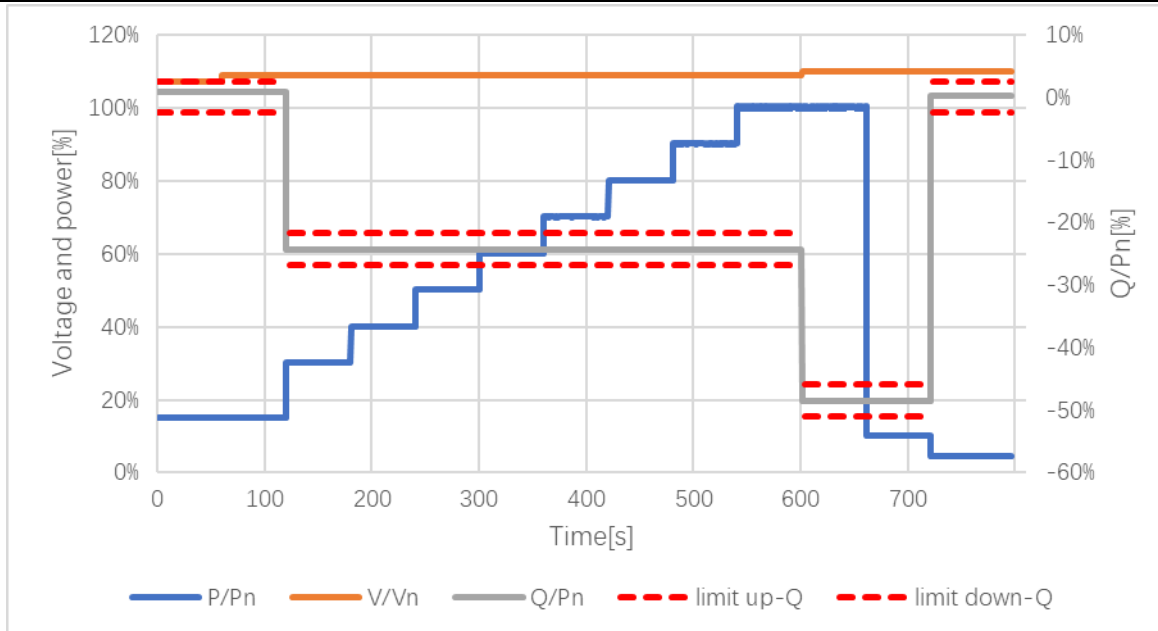


B.1.2.6	Table: Automatic exchange of reactive power according to a characteristic curve $Q=f(V)$	P
Sampling:	Measure the active and reactive power as a 0.2 s average	
Set value:	Lock in: 0.2Pn (default value: 0.2Pn) (0.1Pn and Pn with steps of 0.1 Pn) Lock-out: 0.05Pn	
<p style="text-align: center;"> $V_{2s} = 1,1 V_n$ $V_{1s} = 1,08 V_n$ $V_{1i} = 0,92 V_n$ $V_{2i} = 0,9 V_n$ </p>		
<p>Curve settings: $V_{1s} = 1,08V_n$; $V_{2s} = 1,1V_n$; $V_{1i} = 0,92V_n$; $V_{2i} = 0,9V_n$ <i>(V_{1i}, V_{2i}, V_{1s} and V_{2s} must be programmable in a range 0,9-1,1 Vn with steps 0,01Vn,)</i></p>		
V1i, V2i, V1s and V2s programmable value:	Range: 0,9 to 1,1Vn Step: 0,01Vn V1i, V2i: 0- Q_{max} adjustable V1s, V2s: 0- Q_{min} adjustable	

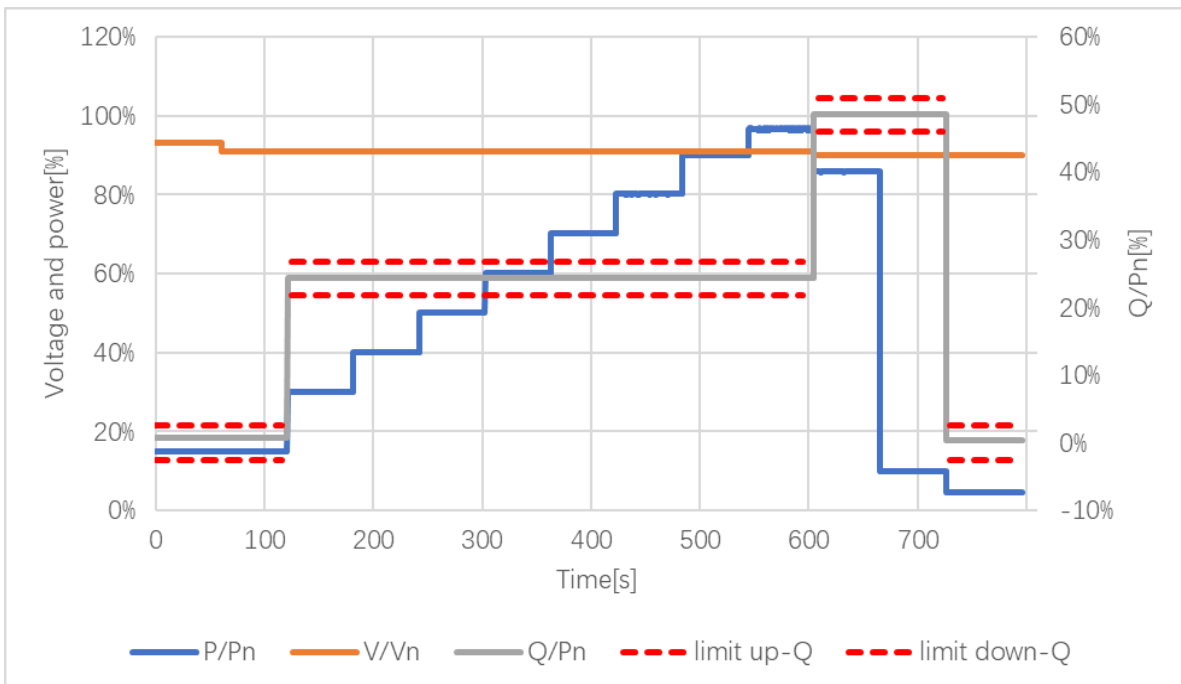
Model: iMars XG110KTR						
P/P _n [%] Set-point	Vac [V] Set-point	P/P _n [%] Measured	Vac [V] Measured	Q/Pn[%]	Q [Var] expected	Δ Q (± 2,5 % P _n)
< 20 %	1.07V _n	15.02	246.1	0.77	≈0 (< ± 2,5 % P _n)	0.77
< 20 %	1.09V _n	15.02	250.7	0.77	≈0 (< ± 2,5 % P _n)	0.77
<20 % → 30 %	1.09V _n	30.04	250.7	-24.30	-0,5 Qmin (within 10sec)	-0.085
40 %	1.09V _n	40.06	250.7	-24.30	-0,5 Qmin	-0.085
50 %	1.09V _n	50.06	250.7	-24.30	-0,5 Qmin	-0.085
60 %	1.09V _n	60.11	250.7	-24.30	-0,5 Qmin	-0.085
70 %	1.09V _n	70.09	250.7	-24.30	-0,5 Qmin	-0.085
80 %	1.09V _n	80.10	250.7	-24.30	-0,5 Qmin	-0.085
90 %	1.09V _n	90.12	250.7	-24.30	-0,5 Qmin	-0.085
100 %	1.09V _n	100.28	250.7	-24.30	-0,5 Qmin	-0.085
100 %	1.1V _n	100.28	253.0	-48.59	-Qmin	-0.16
100 % → 10 %	1.1V _n	10.02	253.0	-48.59	-Qmin	-0.16
10 % → ≤ 5 %	1.1V _n	4.51	253.0	0.31	≈0 (< ± 2,5 % P _n)	0.31

P/P _n [%] Set-point	Vac [V] Set- point	P/P _n [%] measured	Vac [V] Measured	Q/Pn[%]	Q [Var] expected	Δ Q (± 2,5 % P _n)
< 20 %	0.93V _n	15.02	213.9	0.77	≈0 (< ± 2,5 % P _n)	0.77
< 20 %	0.91V _n	15.02	209.3	0.77	≈0 (< ± 2,5 % P _n)	0.77
<20 % → 30 %	0.91V _n	30.04	209.3	24.30	0,5 Qmax (within 10sec)	0.085
40 %	0.91V _n	40.06	209.3	24.30	0,5 Qmax	0.085
50 %	0.91V _n	50.06	209.3	24.30	0,5 Qmax	0.085
60 %	0.91V _n	60.11	209.3	24.30	0,5 Qmax	0.085
70 %	0.91V _n	70.09	209.3	24.30	0,5 Qmax	0.085
80 %	0.91V _n	80.10	209.3	24.30	0,5 Qmax	0.085
90 %	0.91V _n	90.12	209.3	24.30	0,5 Qmax	0.085
100 %	0.91V _n	96.70	209.3	24.30	0,5 Qmax	0.085
100 %	0.90V _n	85.80	207.0	48.59	Qmax	0.16
100 % → 10 %	0.90V _n	10.02	207.0	48.59	Qmax	0.16
10 % → ≤ 5 %	0.90V _n	4.51	207.0	0.31	≈0 (< ± 2,5 % P _n)	0.31

Graph

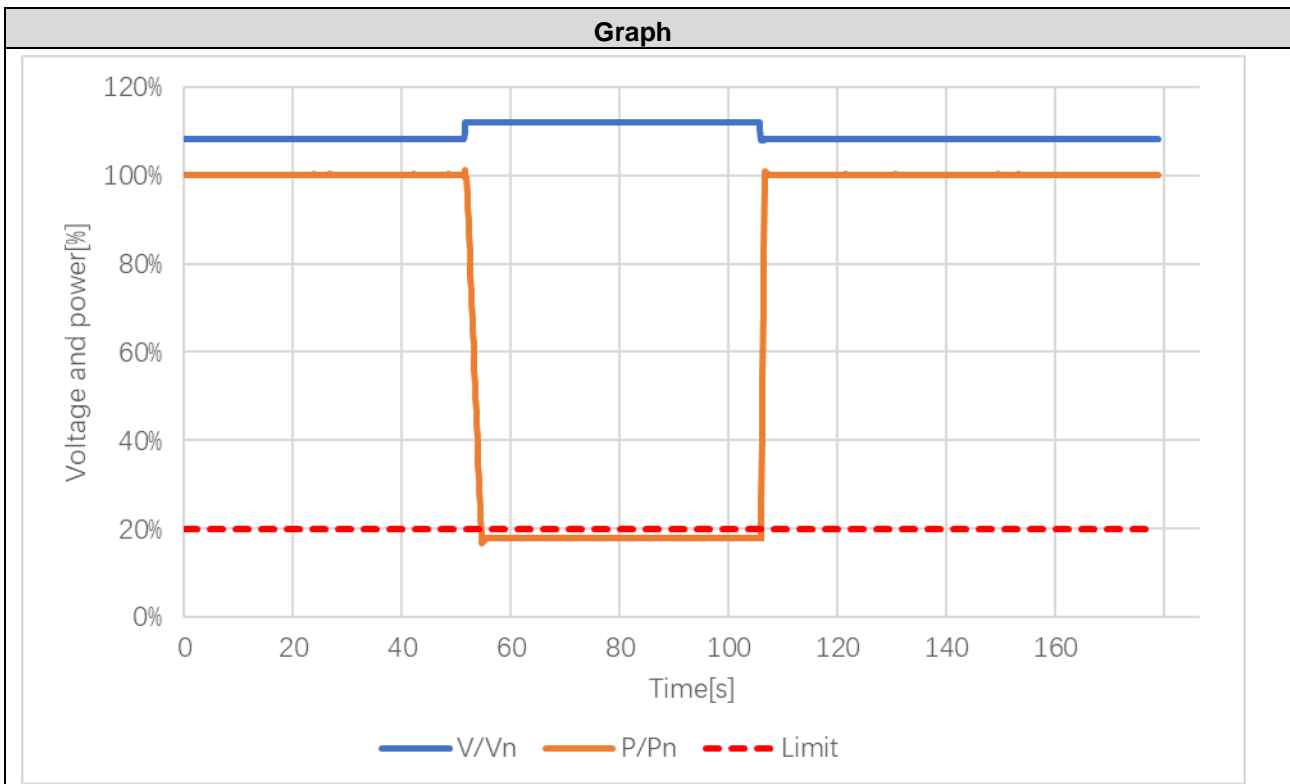


V1s = 1,08Vn; V2s = 1,1Vn



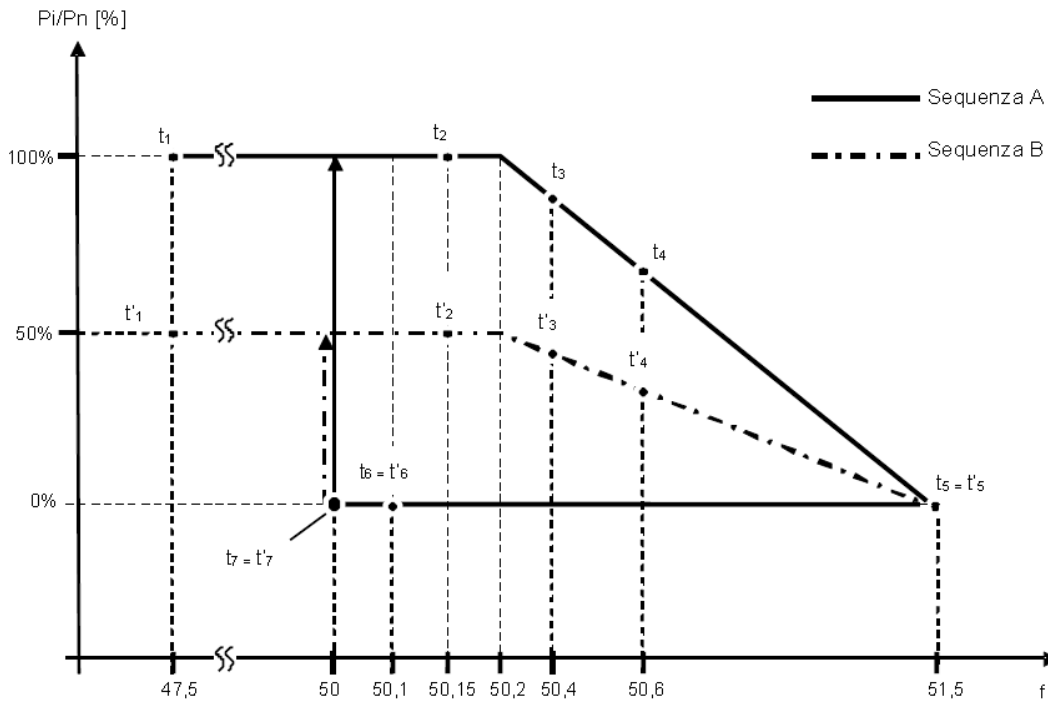
V1i = 0,92Vn; V2i = 0,9Vn

B.1.3.1	Table: Automatic limitation of active power for voltage values close to 110% of the rated voltage					P
Model: iMars XG110KTR						
Step #	Set voltage vaule [V/Vn]	Voltage [V/Vn]	Measured power values [W]	Measured power [%]	Limit	RESULT
1	1,08	1.08	110072.3	100.06	--	PASS
2	1,12	1.12	19577.2	17.80	P <20%Pn	PASS
3	1,08	1.08	110095.5	100.08	--	PASS



B.1.3.2 **Table: Adjustment of the active power in the presence of overfrequency transients on the transmission network** **P**

Activation settings.....: Settable delay from 0s to 1s with step of 50ms (default value: no intentional delay)



Model: iMars XG110KTR

EUT working at 100% of nominal power, over frequency

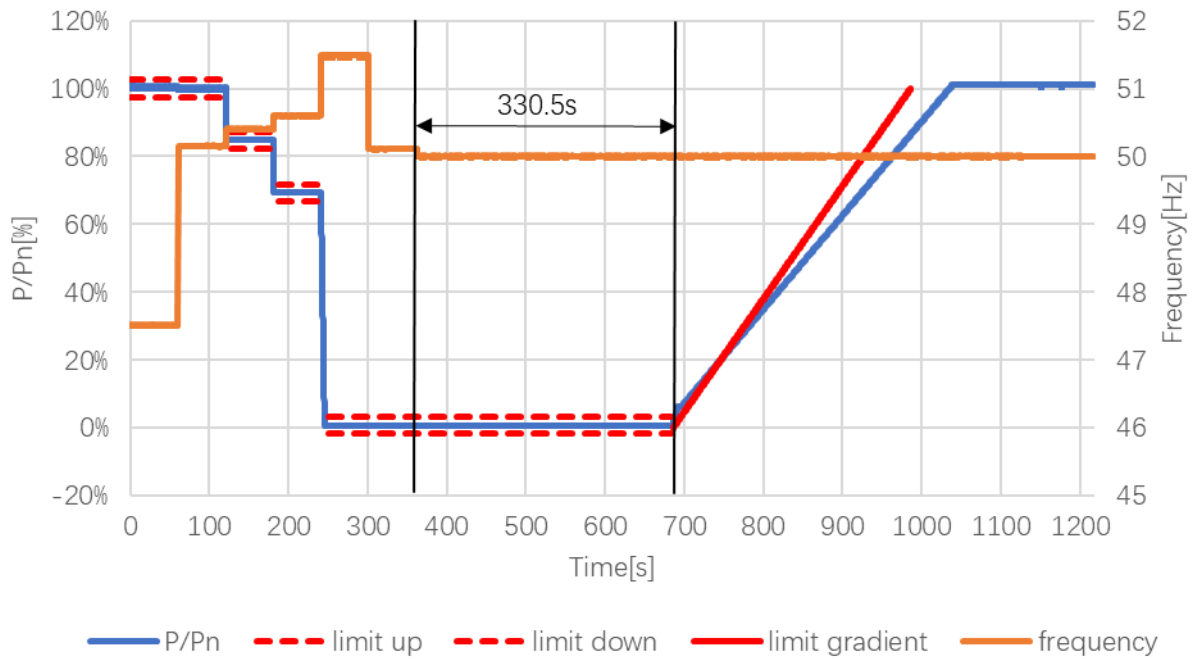
Set Frequency (Hz)	Measured Frequency (Hz)	Active Power desired (%P _n)	Active Power measured (%P _n)	Deviation (%P _n)	Limit (%P _n)
47.51Hz±0.01Hz	47.51	100	100.58	0.58	± 2.5
50.15Hz±0.01Hz	50.15	100	100.19	0.19	± 2.5
50.40Hz±0.01Hz	50.40	84.62	84.92	0.30	± 2.5
50.60Hz±0.01Hz	50.60	69.23	69.43	0.20	± 2.5
51.49Hz±0.01Hz	51.49	0.77	0.63	-0.14	± 2.5
50.11Hz±0.01Hz	50.11	0.77	0.63	-0.14	± 2.5
50.00Hz±0.01Hz	50.00	100	101.15	1.15	± 2.5

Delay to reconnection Desired (s)	Delay to reconnection Measured (s)	Decrease of Active Power Desired %*Pref/min	Increase of Active Power Measured %*Pref/min
≥300	330.5	≤20%	17.24

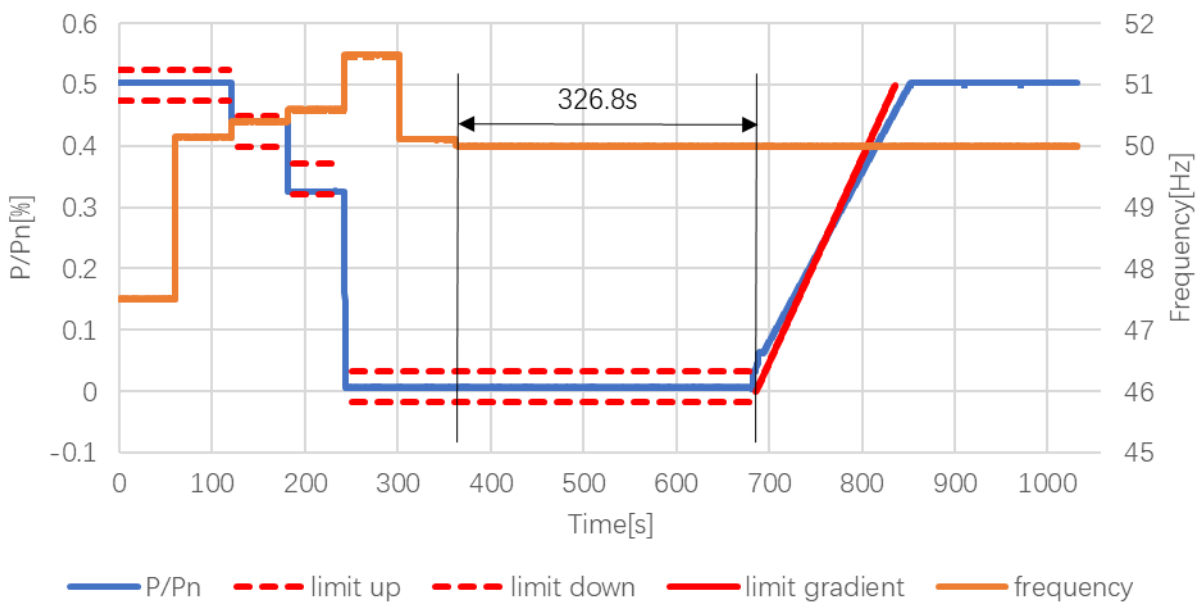
EUT working at 50% of nominal power, over frequency					
Set Frequency (Hz)	Measured Frequency (Hz)	Active Power desired (%P _n)	Active Power measured (%P _n)	Deviation (%P _n)	Limit (%P _n)
47.51Hz±0.01Hz	47.51	50	50.31	0.31	± 2.5
50.15Hz±0.01Hz	50.15	50	50.31	0.31	± 2.5
50.40Hz±0.01Hz	50.40	42.31	44.02	1.71	± 2.5
50.60Hz±0.01Hz	50.60	34.61	32.60	-2.01	± 2.5
51.49Hz±0.01Hz	51.49	0.39	0.63	0.24	± 2.5
50.11Hz±0.01Hz	50.12	0.39	0.63	0.24	± 2.5
50.00Hz±0.01Hz	50.00	50	50.30	0.30	± 2.5

Delay to reconnection Desired (s)	Delay to reconnection Measured (s)	Decrease of Active Power Desired %*Pref/min	Increase of Active Power Measured %*Pref/min
≥300	326.8	≤20%	18.05

EUT working at ≈100% of nominal power, over frequency

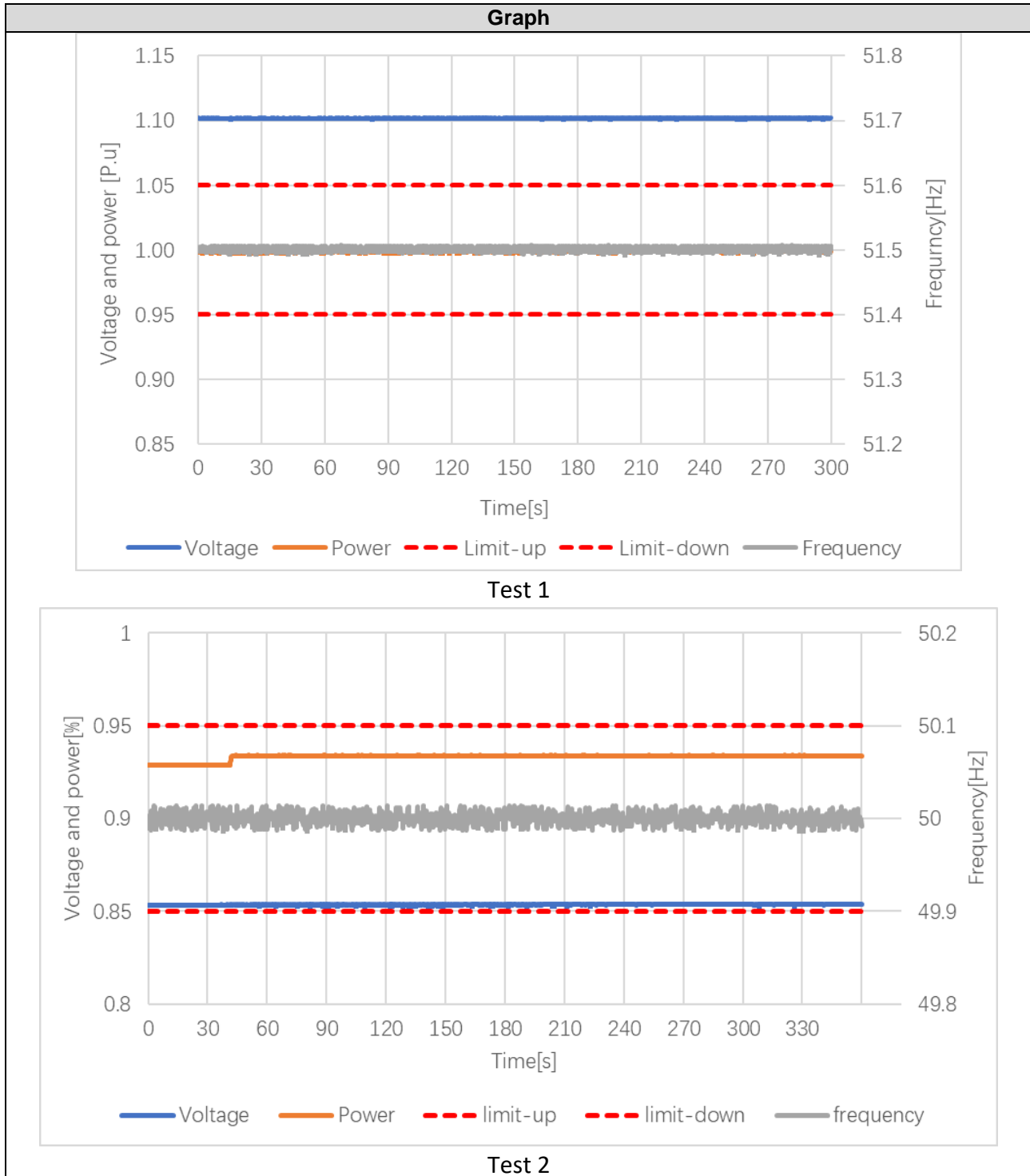


UT working at 50% of nominal power, overfrequency

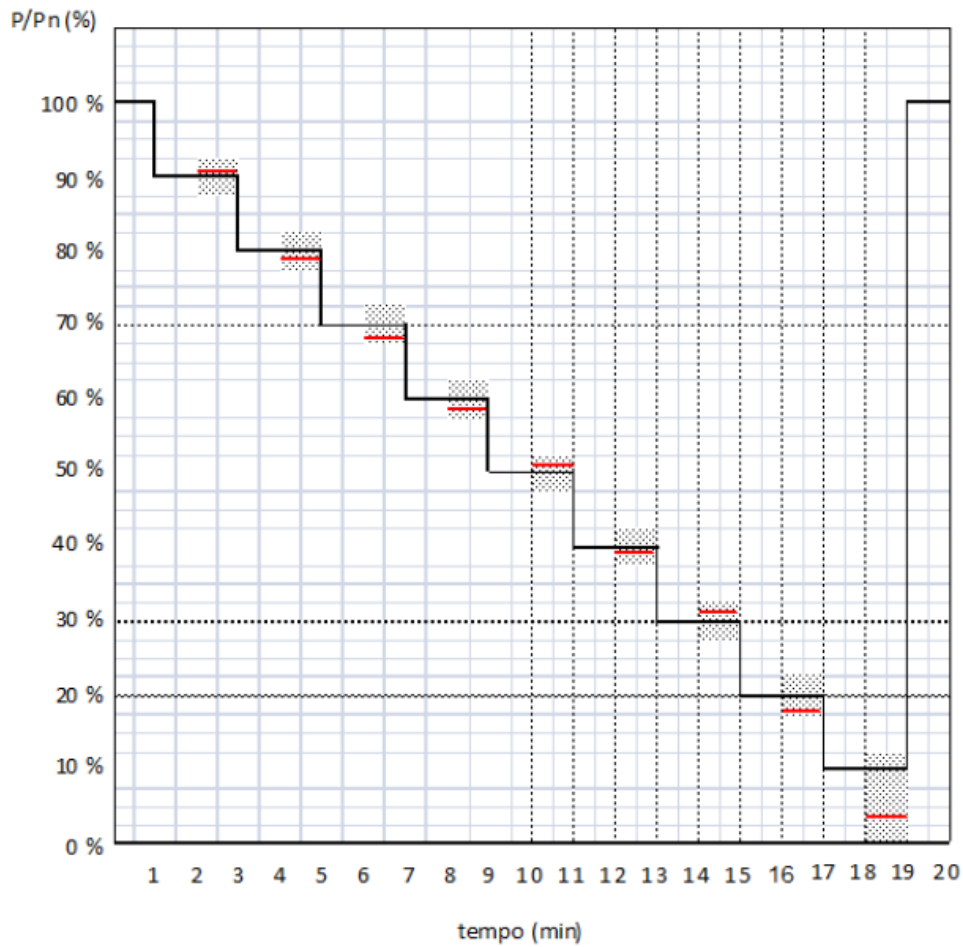


B.1.3.3	Table: Verification of the operating range in voltage and frequency					P
#	Voltage (%)	Frequency (Hz)	P (%)	P meas. (%)	Time (s)	Limit (%Pn)
Test 1	110	51.5	100	100.28	≥5min	± 5
Test 2	85	50.0	90	93.32	≥5min	± 5

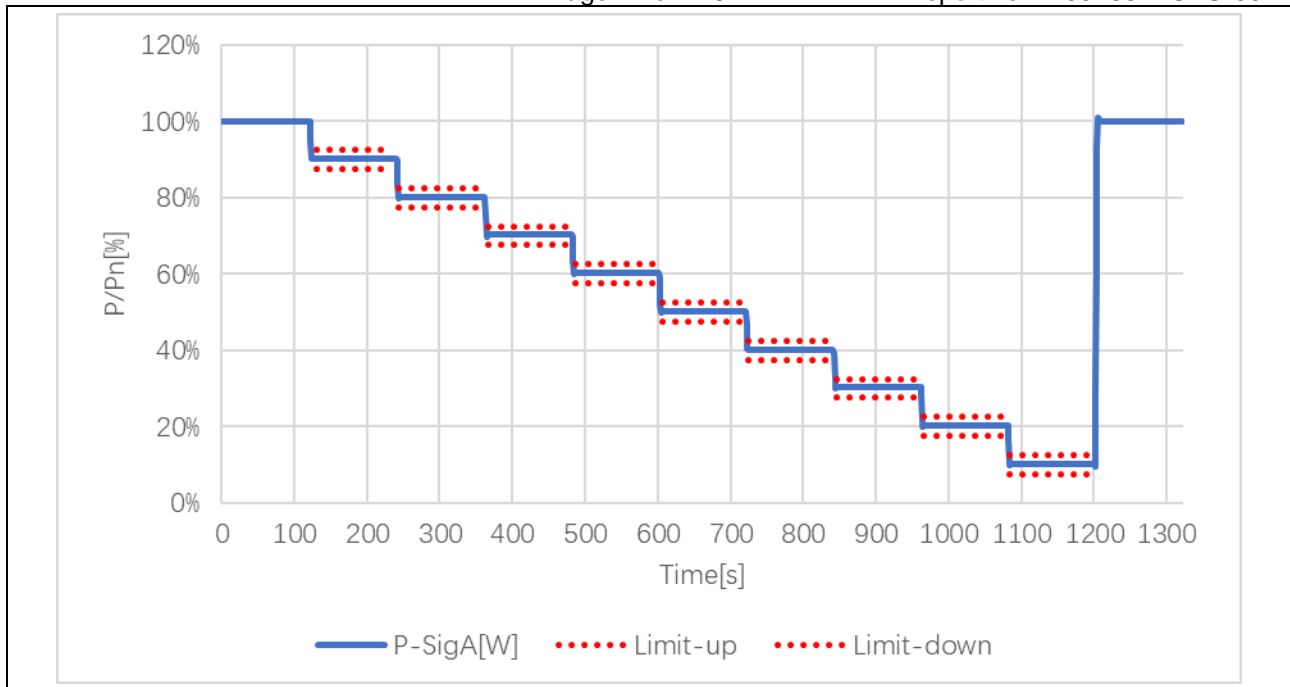
* it is possible to operate at reduced power, equal to the maximum power that can be supplied for the maximum output current Limit ($P \geq 85\% * P_n$).



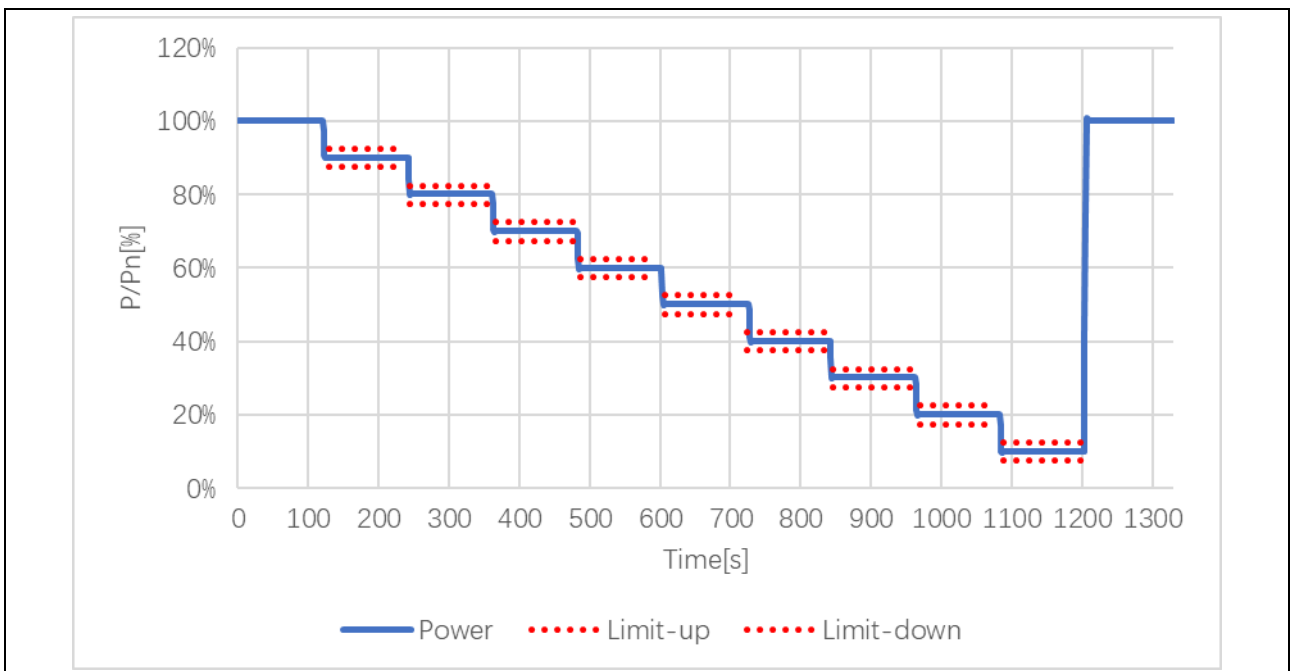
B.1.3.4	Table: Verification of active power limitation on external command from the Distributor	P
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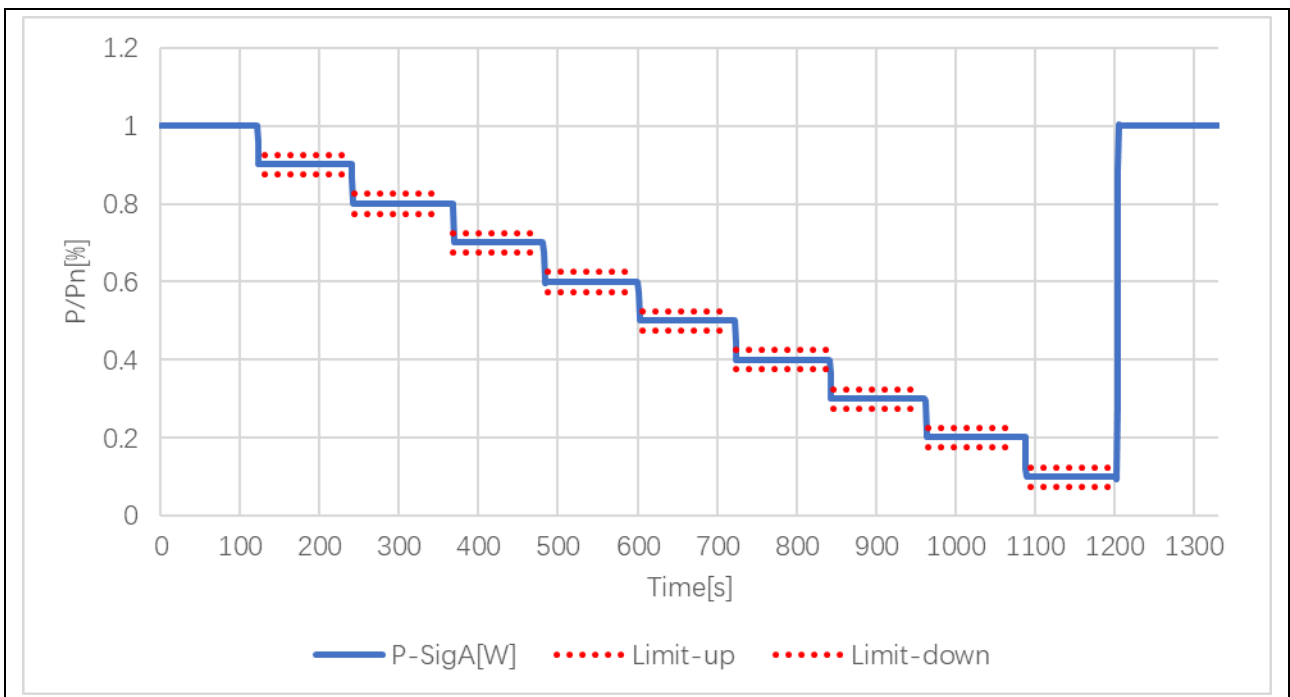
Model: iMars XG110KTR				
Output Power %	P measured (%)	P set point (%)	Deviation (%)	Limit(%Pn)
100	99.95	100	-0.05	--
90	90.15	90	0.15	± 2.5
80	80.21	80	0.21	± 2.5
70	70.04	70	0.04	± 2.5
60	60.23	60	0.23	± 2.5
50	50.11	50	0.11	± 2.5
40	39.99	40	-0.01	± 2.5
30	30.20	30	0.20	± 2.5
20	20.04	20	0.04	± 2.5
10	10.25	10	0.25	± 2.5
100	100.22	100	0.22	--



Model: iMars XG136KTR-L				
Output Power %	P measured (%)	P set point (%)	Deviation (%)	Limit(%Pn)
100	100.18	100	0.18	--
90	90.17	90	0.17	± 2.5
80	80.14	80	0.14	± 2.5
70	70.11	70	0.11	± 2.5
60	60.09	60	0.09	± 2.5
50	50.18	50	0.18	± 2.5
40	40.04	40	0.04	± 2.5
30	30.13	30	0.13	± 2.5
20	20.19	20	0.19	± 2.5
10	10.04	10	0.04	± 2.5
100	100.16	100	0.16	--

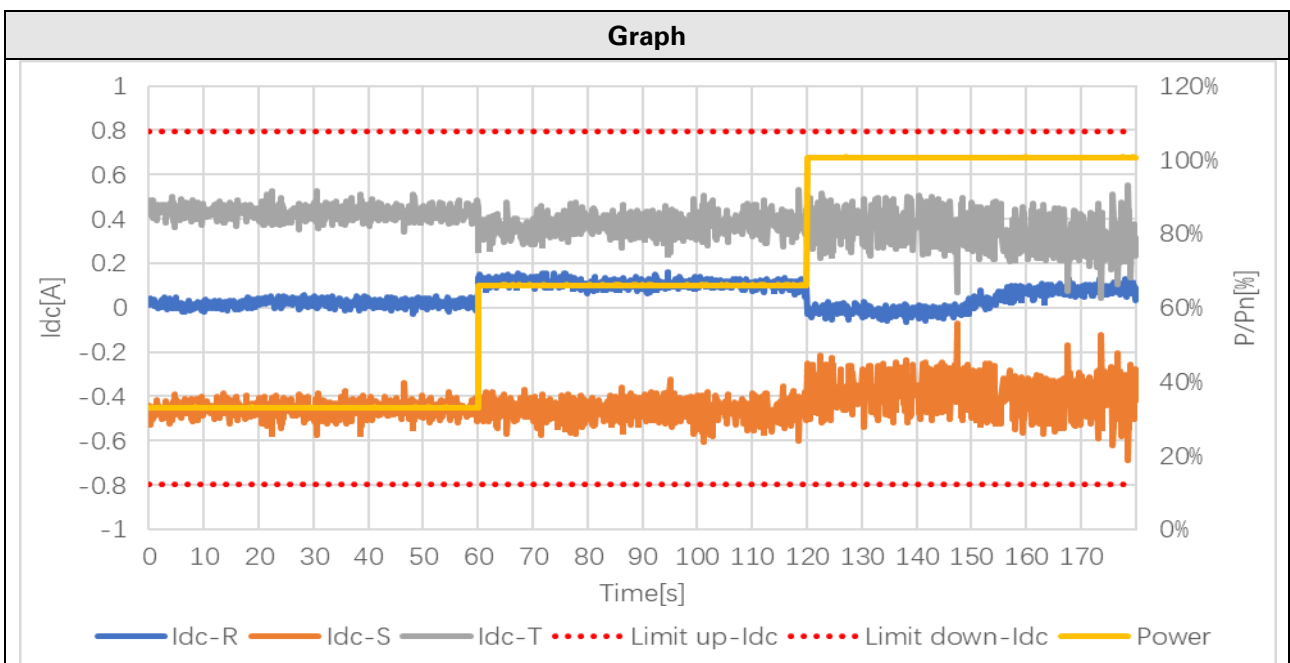


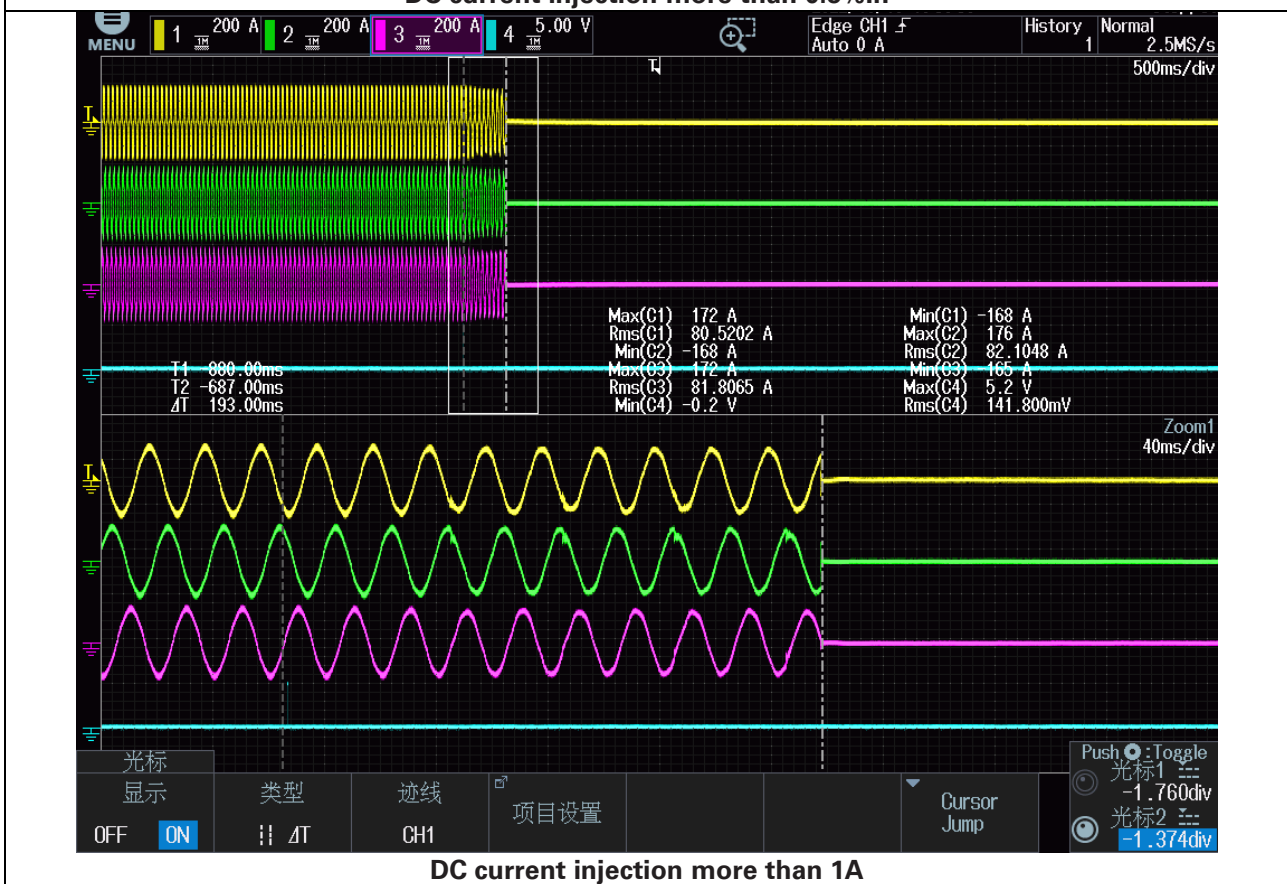
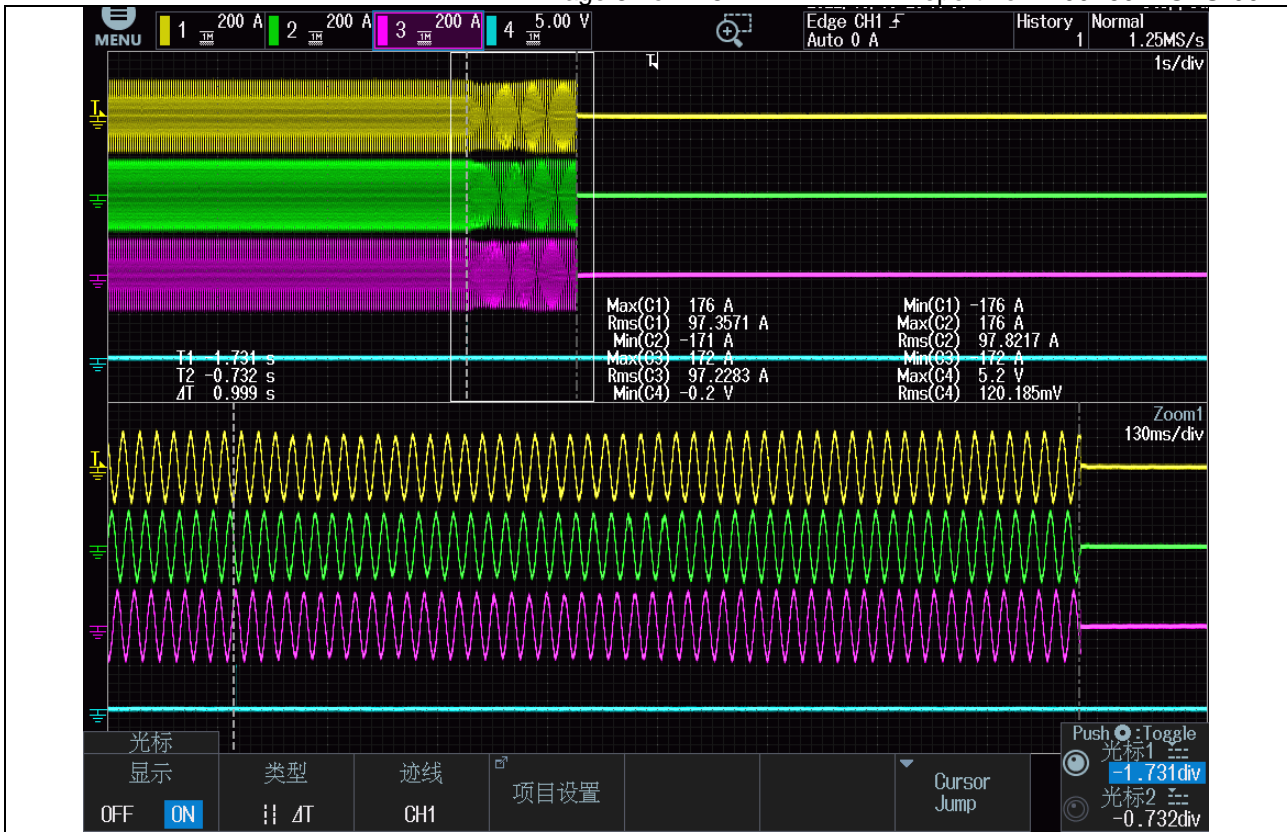
Model: iMars XG136KTR-X				
Output Power %	P measured (%)	P set point (%)	Deviation (%)	Limit(%Pn)
100	100.19	100	0.19	--
90	90.15	90	0.15	± 2.5
80	80.21	80	0.21	± 2.5
70	70.04	70	0.04	± 2.5
60	60.25	60	0.25	± 2.5
50	50.11	50	0.11	± 2.5
40	39.96	40	-0.04	± 2.5
30	30.20	30	0.20	± 2.5
20	20.04	20	0.04	± 2.5
10	10.25	10	0.25	± 2.5
100	100.25	100	0.25	--



B.1.4.1	Table: Checking the DC component output										P
Model: iMars XG110KTR											
Temperature: 20°C											
Power [%Nominal I VA]	Rated Current [Arms]			D.C component. Value [A]			D.C component. Value [%In]			Limit [%In]	
	R	S	T	R	S	T	R	S	T		
33± 5	159.4	159.4	159.4	0.05	0.57	0.52	0.03	0.36	0.33	0.5%	
66± 5	159.4	159.4	159.4	0.16	0.60	0.53	0.10	0.38	0.33	0.5%	
100 ± 5	159.4	159.4	159.4	0.13	0.68	0.55	0.08	0.43	0.35	0.5%	

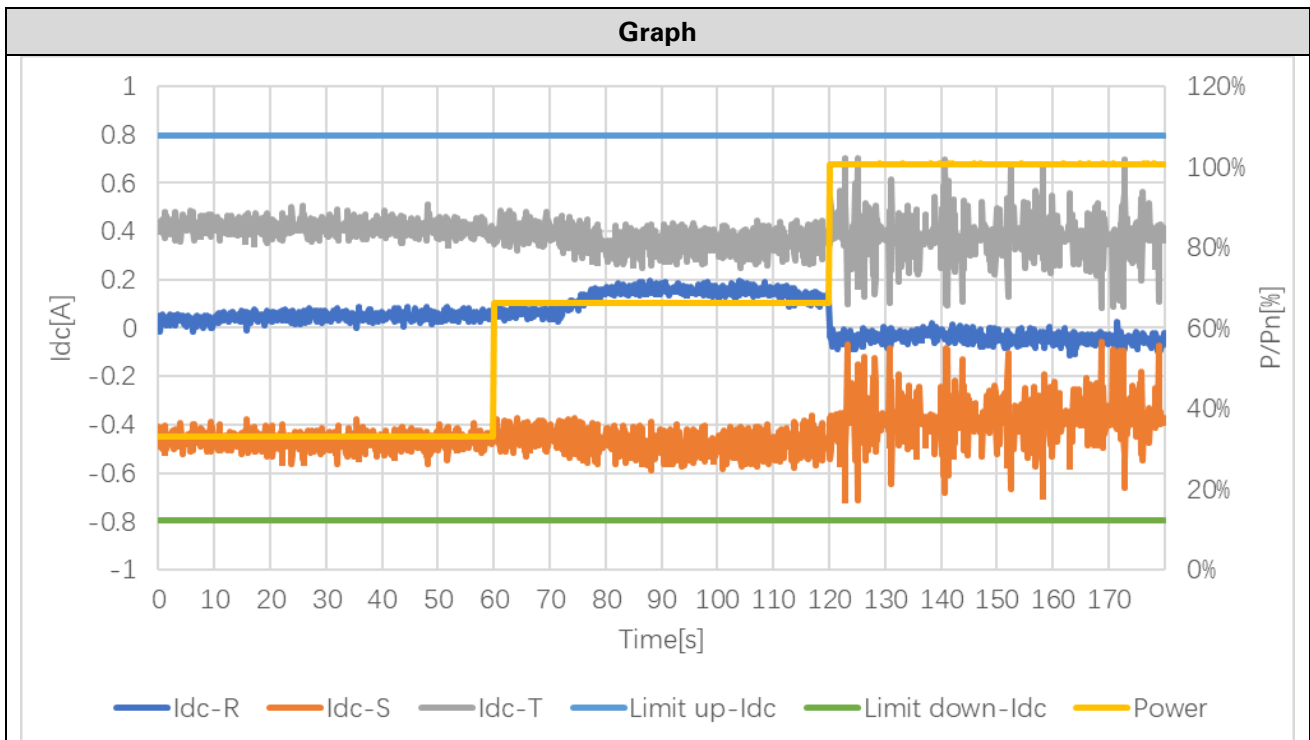
B.1.4.2	TABLE: Check of protections against the DC current injection.										P
Power [%nominal VA]	Power [W]	Rated Voltage [Vrms]	cos	Rated Current [Arms]			Intervention value D.C.			Trip Time [ms]	Limit [s]
				R	S	T	[A]	[%In]	$I_{dc} >$		
33± 5	36300	230	1.00	159.4	159.4	159.4	0.867	0.54	0.5% In	996	1
66± 5	72600	230	1.00	159.4	159.4	159.4	0.836	0.52	0.5% In	999	1
100 ± 5	110000	230	1.00	159.4	159.4	159.4	0.854	0.54	0.5% In	993	1
Power [%nominal VA]	Power [W]	Rated Voltage [Vrms]	cos	Rated Current [Arms]			Intervention value D.C.			Trip Time [ms]	Limit [s]
				R	S	T	[A]	[%In]	$I_{dc} >>$		
33± 5	36300	230	1.00	159.4	159.4	159.4	1.35	0.85	1A	193	0.2
66± 5	72600	230	1.00	159.4	159.4	159.4	1.39	0.87	1A	193	0.2
100 ± 5	110000	230	1.00	159.4	159.4	159.4	1.52	0.95	1A	192	0.2

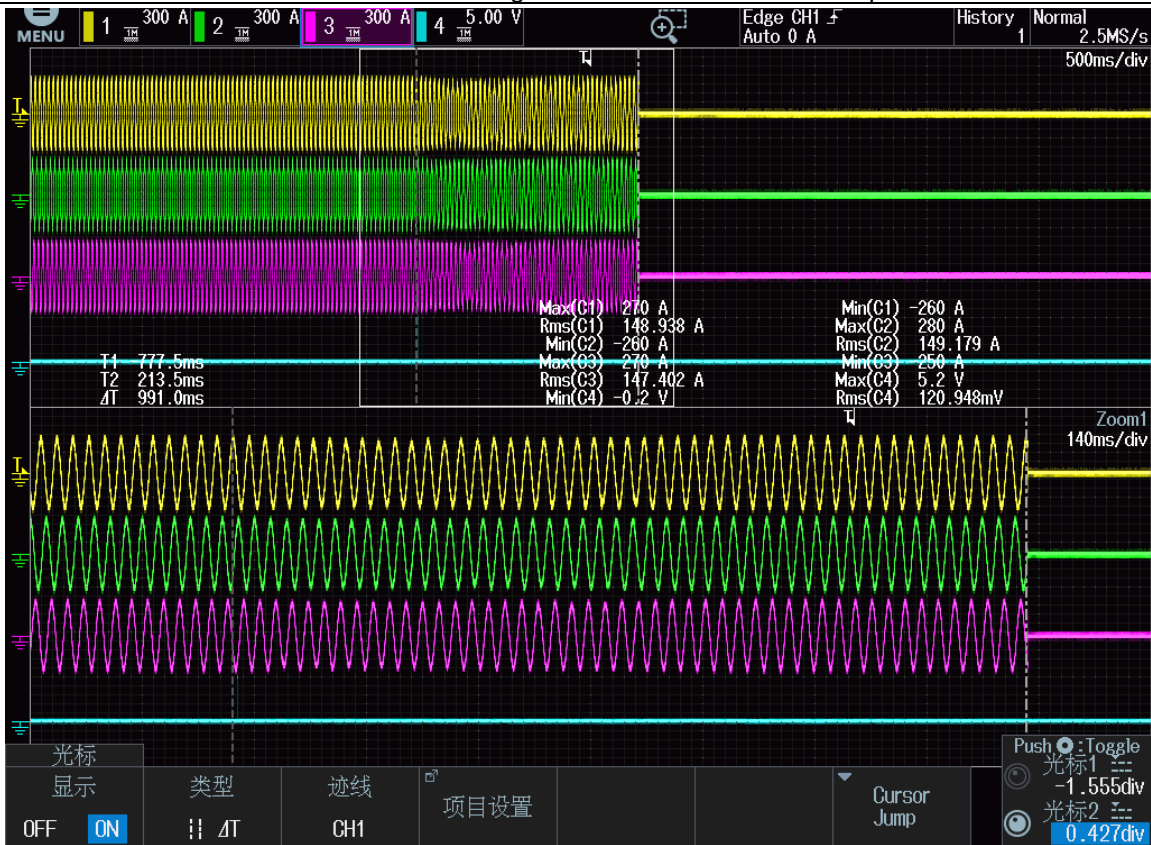




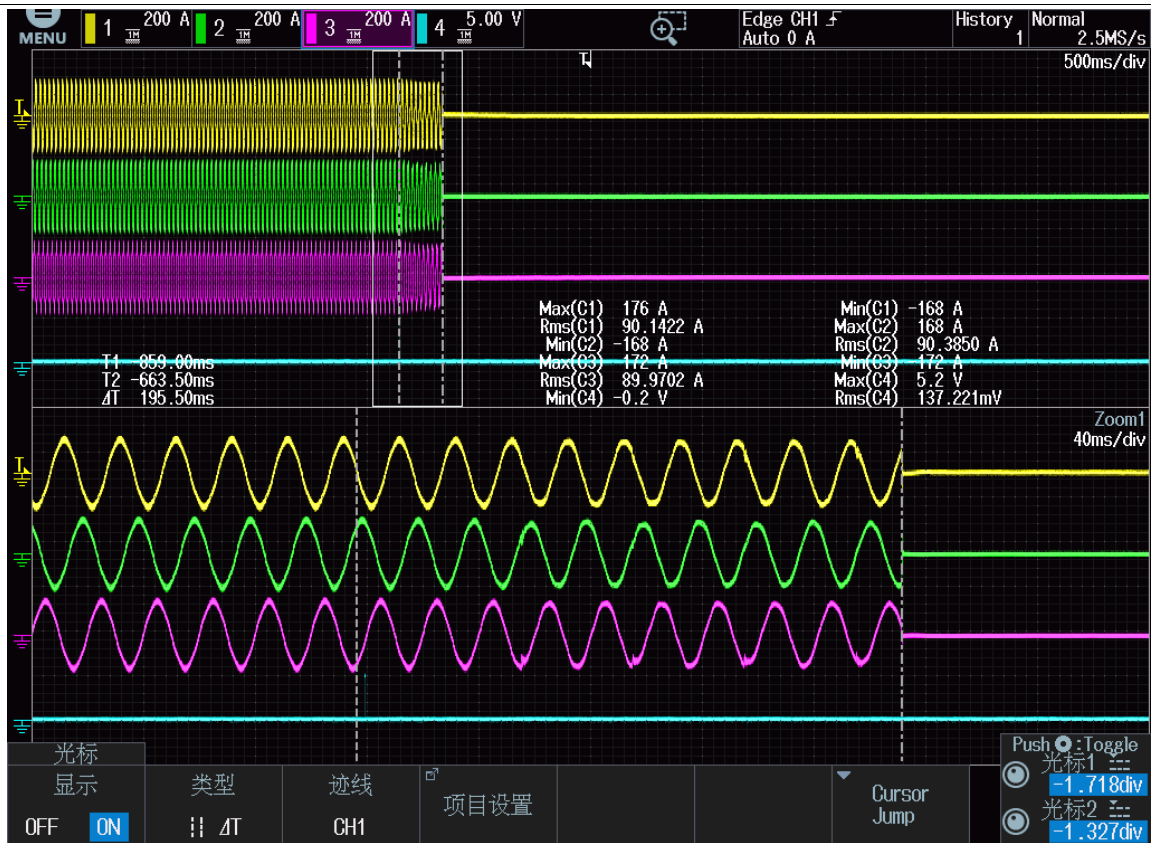
B.1.4.1	Table: Checking the DC component output									P
Temperature: 60°C										
Power [%Nominal I VA]	Rated Current [Arms]			D.C component. Value [A]			D.C component. Value [%In]			Limit [%In]
	R	S	T	R	S	T	R	S	T	
33± 5	159.4	159.4	159.4	0.09	0.56	0.51	0.06	0.35	0.32	0.5%
66± 5	159.4	159.4	159.4	0.19	0.59	0.48	0.12	0.37	0.30	0.5%
100 ± 5	159.4	159.4	159.4	0.11	0.71	0.70	0.07	0.45	0.44	0.5%

B.1.4.2	TABLE: Check of protections against the DC current injection.									P	
Power [%nominal VA]	Power [W]	Rated Voltage [Vrms]	cos	Rated Current [Arms]			Intervention value D.C.			Trip Time [ms]	Limit [s]
				R	S	T	[A]	[%In]	$I_{dc} >$		
33± 5	36300	230	1.00	159.4	159.4	159.4	0.867	0.54	0.5% In	982	1
66± 5	72600	230	1.00	159.4	159.4	159.4	0.836	0.52	0.5% In	976	1
100 ± 5	110000	230	1.00	159.4	159.4	159.4	0.854	0.54	0.5% In	991	1
Power [%nominal VA]	Power [W]	Rated Voltage [Vrms]	cos	Rated Current [Arms]			Intervention value D.C.			Trip Time [ms]	Limit [s]
				R	S	T	[A]	[%In]	$I_{dc} >>$		
33± 5	36300	230	1.00	159.4	159.4	159.4	1.35	0.85	1A	188	0.2
66± 5	72600	230	1.00	159.4	159.4	159.4	1.39	0.87	1A	195	0.2
100 ± 5	110000	230	1.00	159.4	159.4	159.4	1.52	0.95	1A	194	0.2





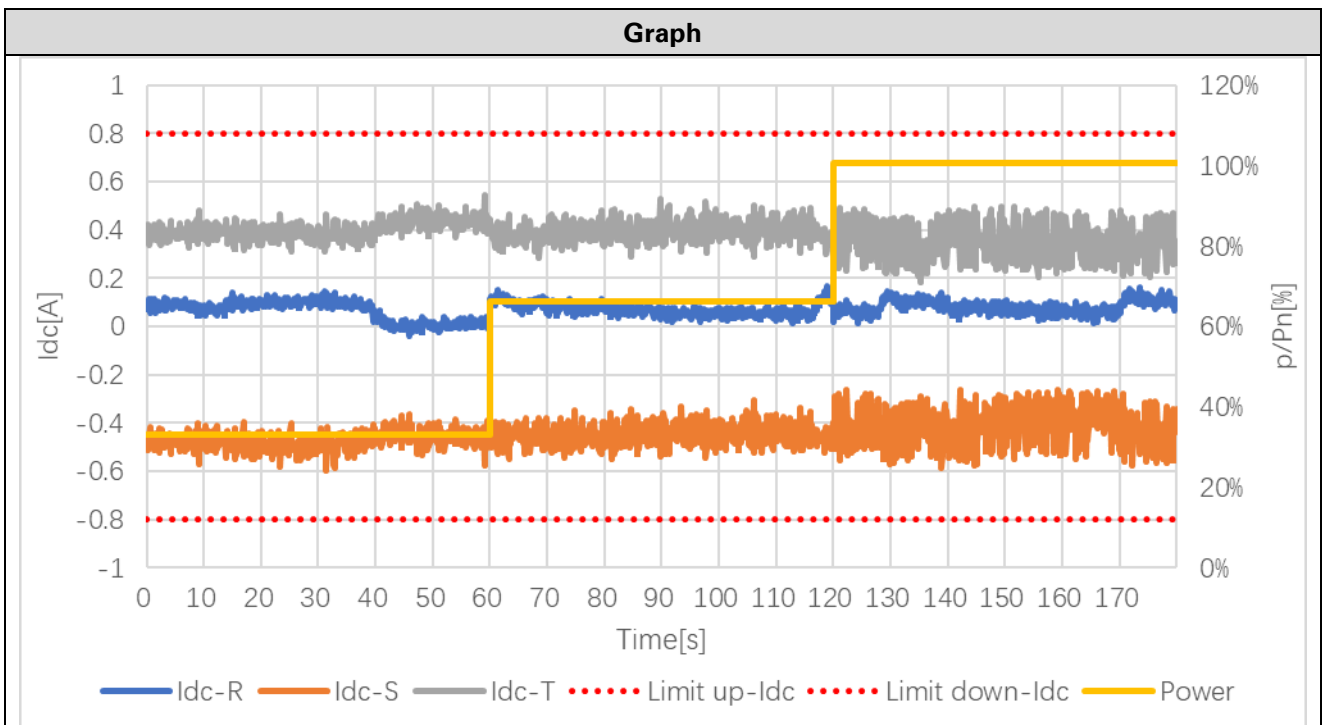
DC current injection more than 0.5%In

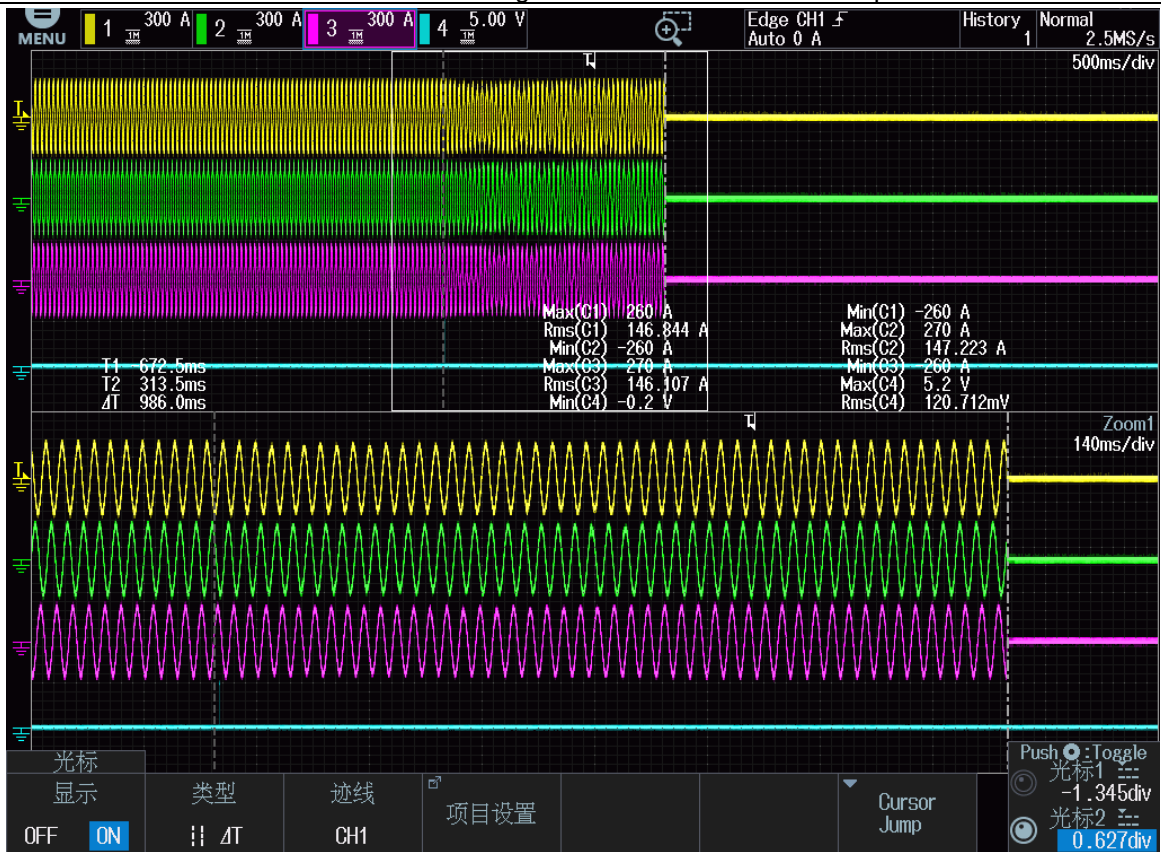


DC current injection more than 1A

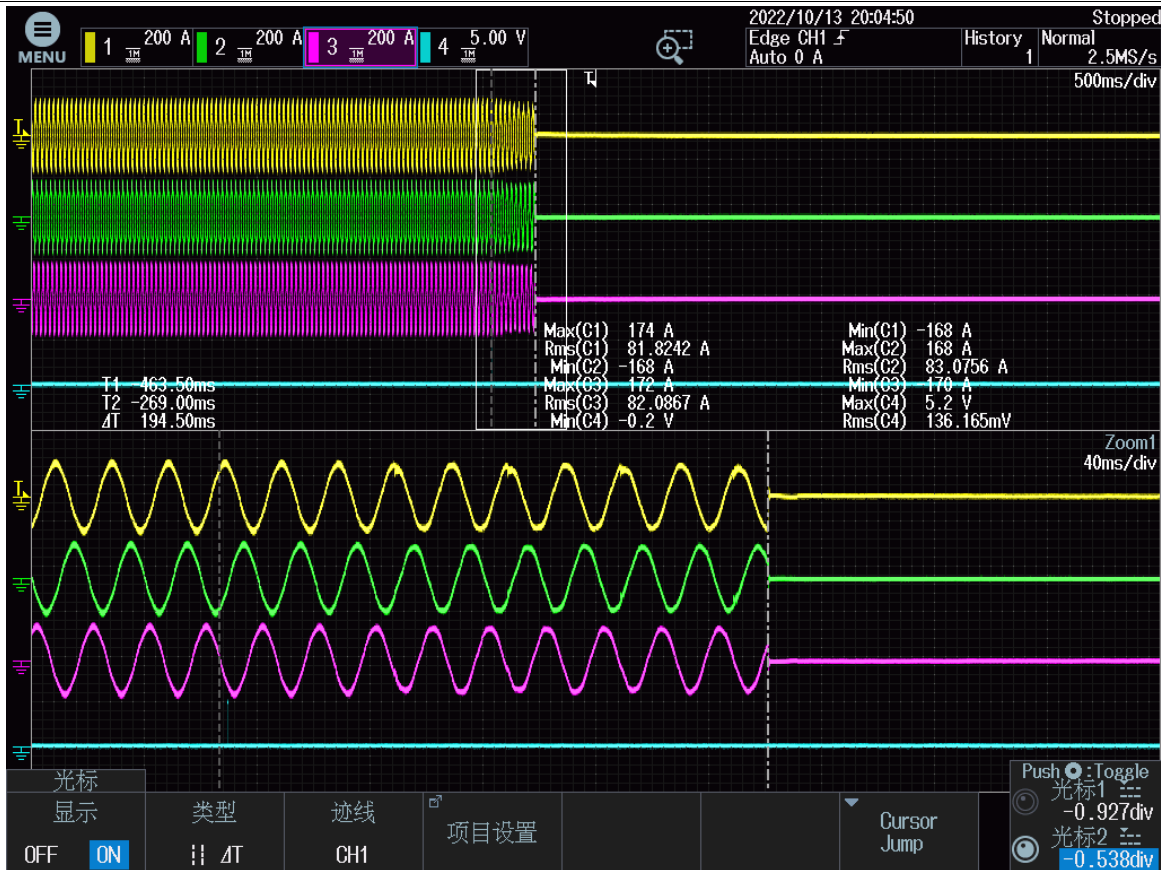
B.1.4.1	Table: Checking the DC component output									P
Temperature: -30°C										
Power [%Nominal I VA]	Rated Current [Arms]			D.C component. Value [A]			D.C component. Value [%In]			Limit [%In]
	R	S	T	R	S	T	R	S	T	
33± 5	159.4	159.4	159.4	0.14	0.60	0.54	0.09	0.38	0.34	0.5%
66± 5	159.4	159.4	159.4	0.17	0.55	0.52	0.11	0.35	0.33	0.5%
100 ± 5	159.4	159.4	159.4	0,16	0.59	0.49	0.10	0.37	0.31	0.5%

B.1.4.2	TABLE: Check of protections against the DC current injection.										P
Power [%nominal I VA]	Power [W]	Rated Voltage [Vrms]	cos	Rated Current [Arms]			Intervention value D.C.			Trip Time [ms]	Limit [s]
				R	S	T	[A]	[%In]	$I_{dc} >$		
33± 5	36300	230	1.00	159.4	159.4	159.4	0.867	0.54	0.5% In	973	1
66± 5	72600	230	1.00	159.4	159.4	159.4	0.836	0.52	0.5% In	983	1
100 ± 5	110000	230	1.00	159.4	159.4	159.4	0.854	0.54	0.5% In	986	1
Power [%nominal I VA]	Power [W]	Rated Voltage [Vrms]	cos	Rated Current [Arms]			Intervention value D.C.			Trip Time [ms]	Limit [s]
				R	S	T	[A]	[%In]	$I_{dc} >>$		
33± 5	36300	230	1.00	159.4	159.4	159.4	1.35	0.85	1A	184	0.2
66± 5	72600	230	1.00	159.4	159.4	159.4	1.39	0.87	1A	194	0.2
100 ± 5	110000	230	1.00	159.4	159.4	159.4	1.52	0.95	1A	189	0.2





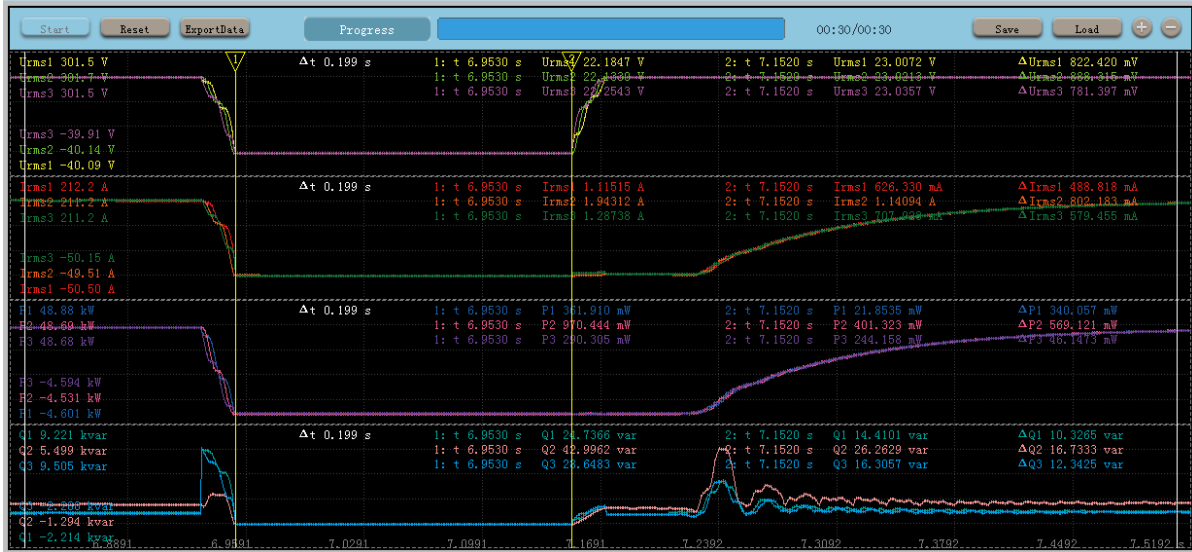
DC current injection more than 0.5%In



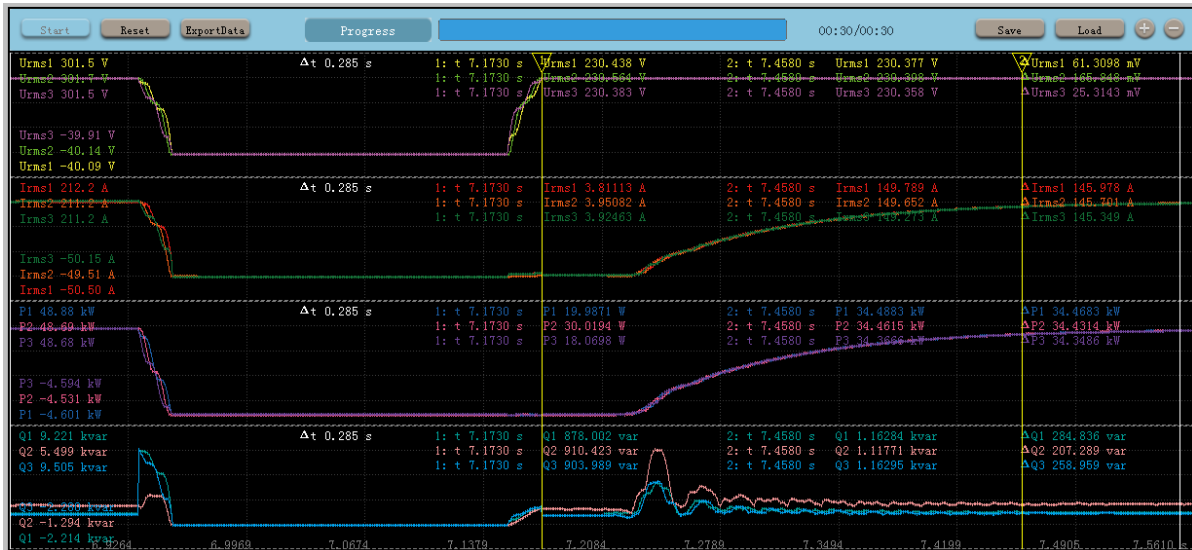
DC current injection more than 1A

B.1.5	Table: Checking insensitivity to voltage dips (LVFRT capability)								P
Model: iMars XG110KTR									
Output power: 110KW			Limits: >90% Pnom,						
	R	S	T	R	S	T	Duration	Recovery time	Limits of recovery time
	U/Unom	U/Unom	U/Unom	φ1	φ2	φ3	[ms]	[ms]	[ms]
1s - three-phase symmetrical fault	0.100	0.100	0.100	0°	-120°	120°	200± 20	285	<400
1a - two-phase asymmetric failure	0.866	0.866	0.100	27°	-147°	120°	200± 20	274	<400
2s - three-phase symmetrical failure	0.250	0.250	0.250	0°	-120°	120°	400± 20	269	<400
2nd - two-phase asymmetric failure	0.880	0.880	0.250	22°	-142°	120°	400± 20	256	<400
3s - three-phase symmetrical failure	0.500	0.500	0.500	0°	-120°	120°	850± 20	259	<400
3a - two-phase asymmetric failure	0.900	0.900	0.500	14°	-134°	120°	850± 20	241	<400
4s - three-phase symmetrical failure	0.747	0.747	0.747	0°	-120°	120°	1300± 20	238	<400
4th - two-phase asymmetric failure	0.940	0.940	0.747	7°	-127°	120°	1300± 20	247	<400
5 – asymmetric two-phase fault in LV	0.100	0.100	1.000	0°	-120°	120°	200 ± 20	257	<400
5 – asymmetric two-phase fault in LV	0.100	1.000	0.100	0°	-120°	120°	200 ± 20	260	<400
5 – asymmetric two-phase fault in LV	1.000	0.100	0.100	0°	-120°	120°	200 ± 20	242	<400
6 – asymmetric two-phase fault in LV	0.500	0.500	1.000	0°	-120°	120°	400 ± 20	259	<400
6 – asymmetric two-phase fault in LV	0.500	1.000	0.500	0°	-120°	120°	400 ± 20	250	<400
6 – asymmetric two-phase fault in LV	1.000	0.500	0.500	0°	-120°	120°	400 ± 20	242	<400

1s - three-phase symmetrical fault



During dip

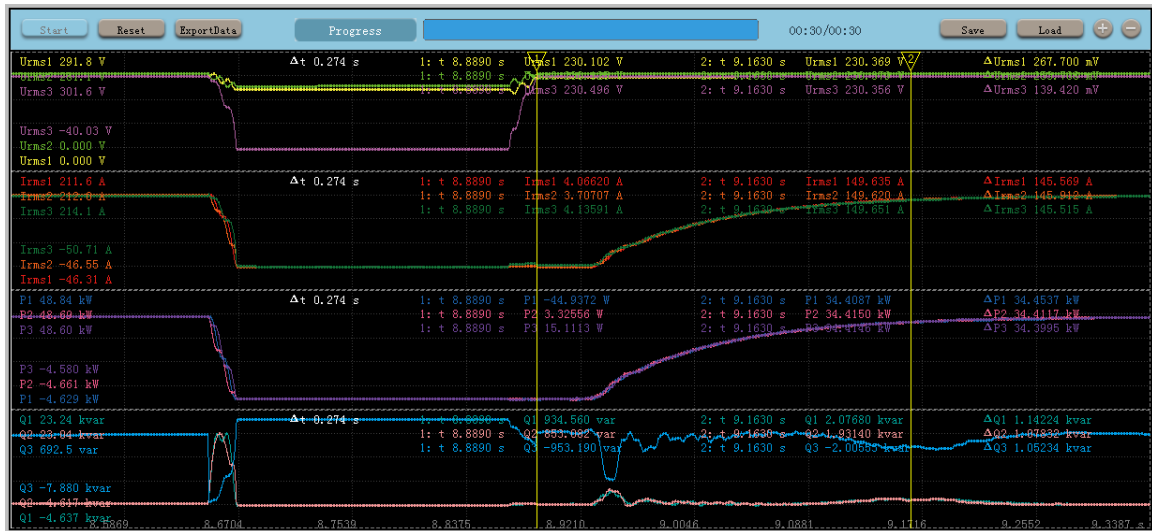


After dip

1a - two-phase asymmetric failure



During dip



After dip

2s - three-phase symmetrical failure



During dip



After dip

2nd - two-phase asymmetric failure

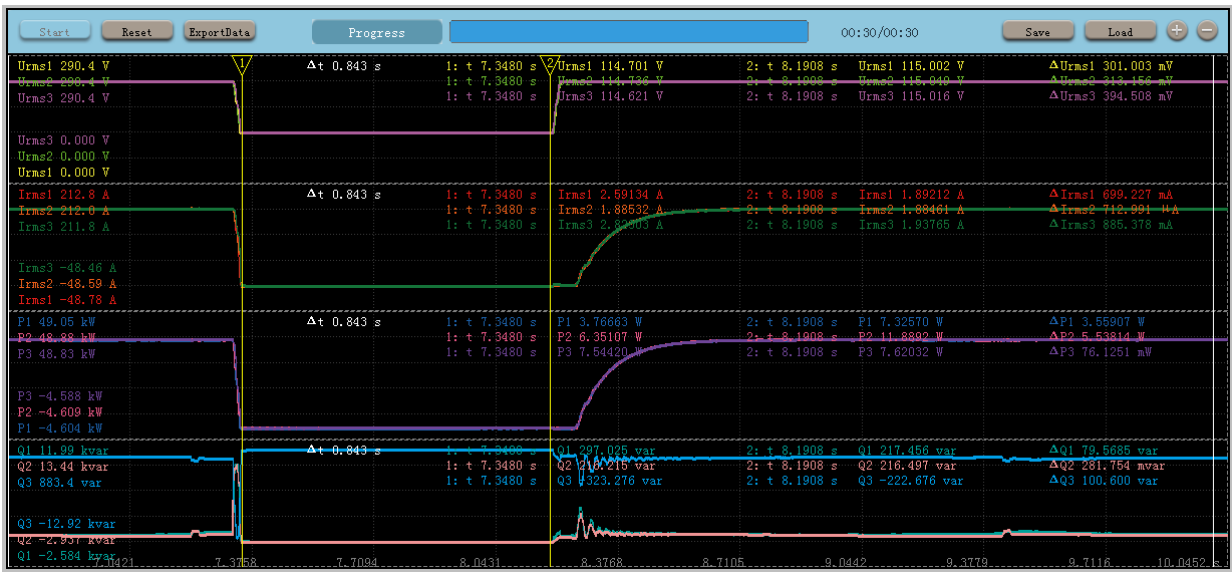


During dip

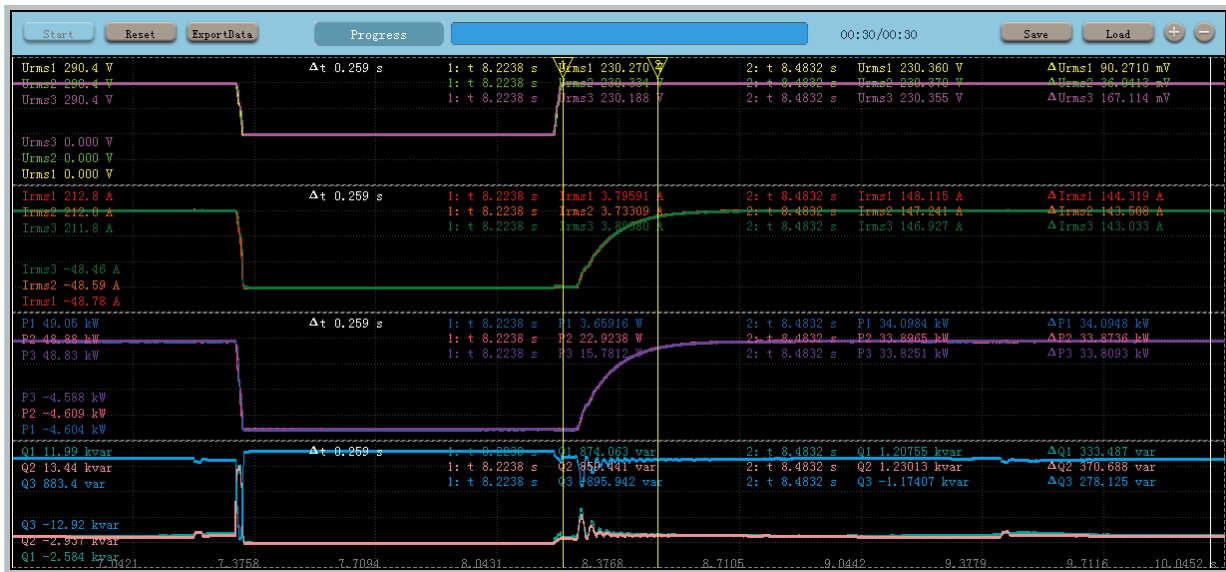


After dip

3s - three-phase symmetrical failure



During dip



After dip

3a - two-phase asymmetric failure

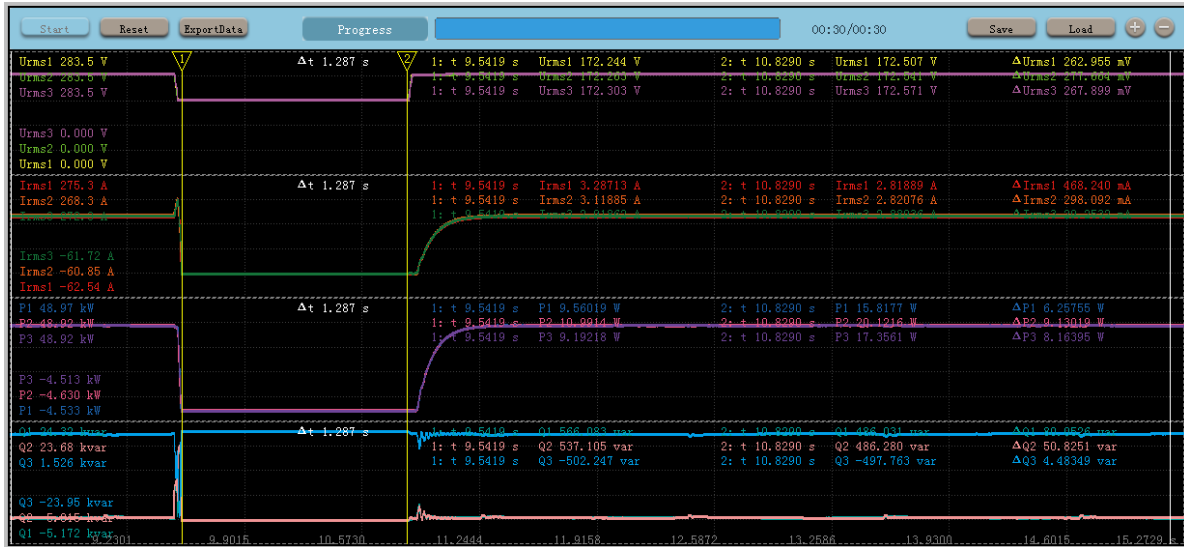


During dip

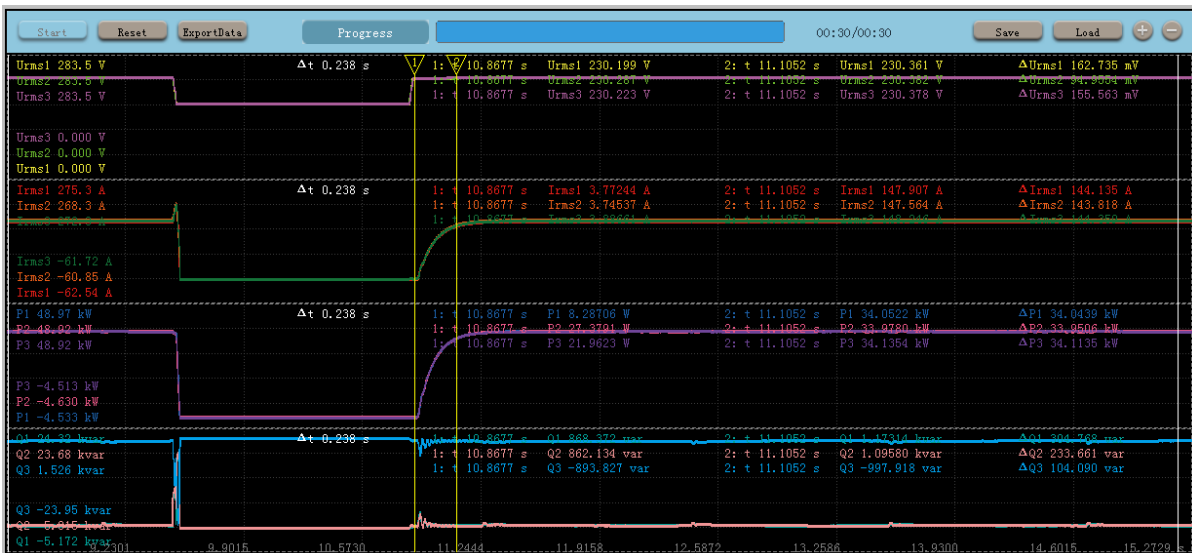


After dip

4s - three-phase symmetrical failure



During dip



After dip

4th - two-phase asymmetric failure

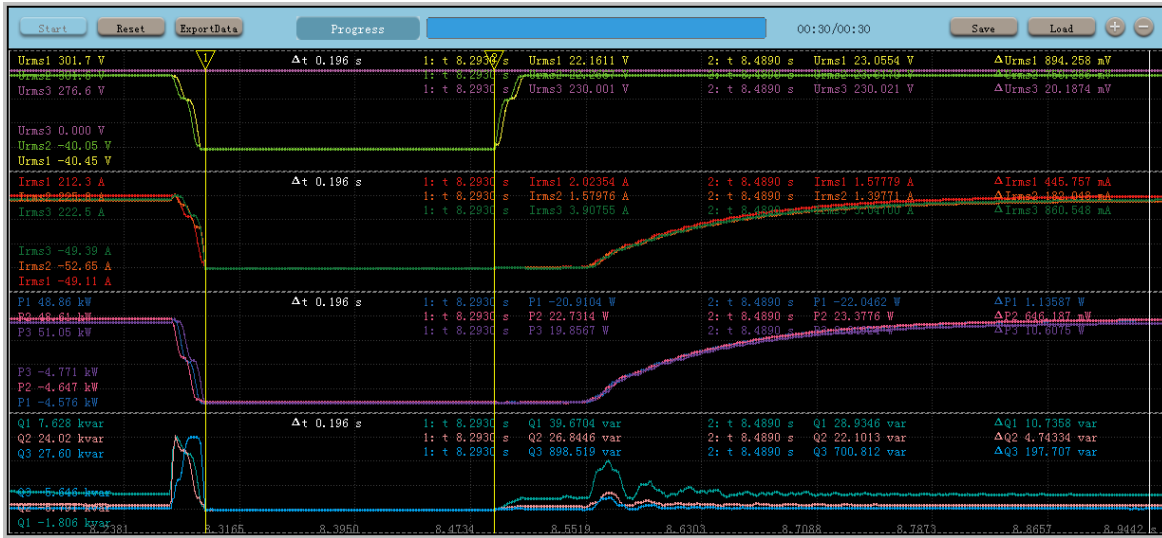


During dip

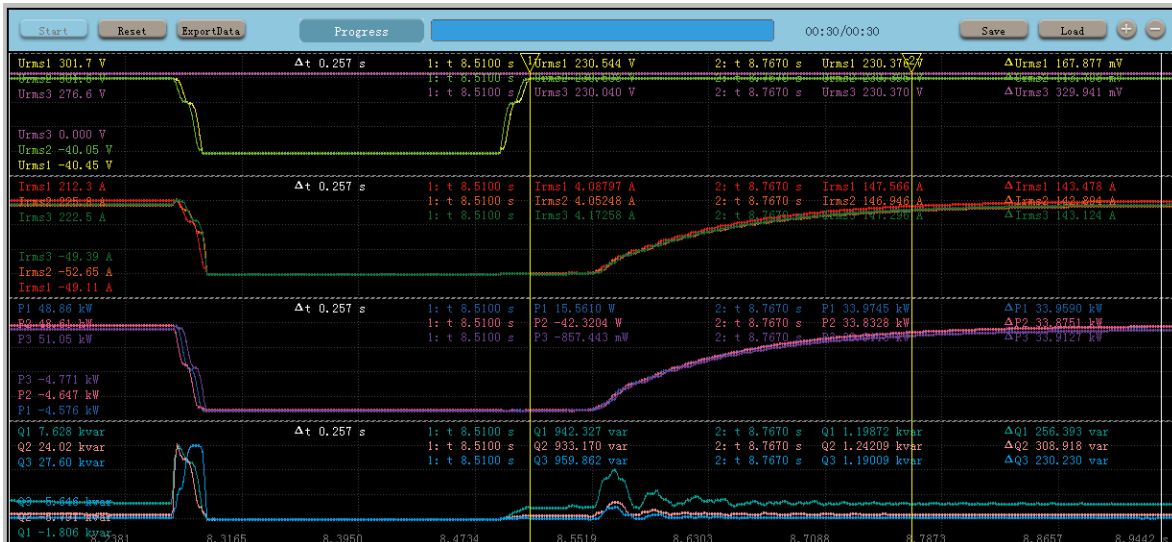


After dip

5 – asymmetric two-phase fault in LV



During dip



After dip

6 – asymmetric two-phase fault in LV



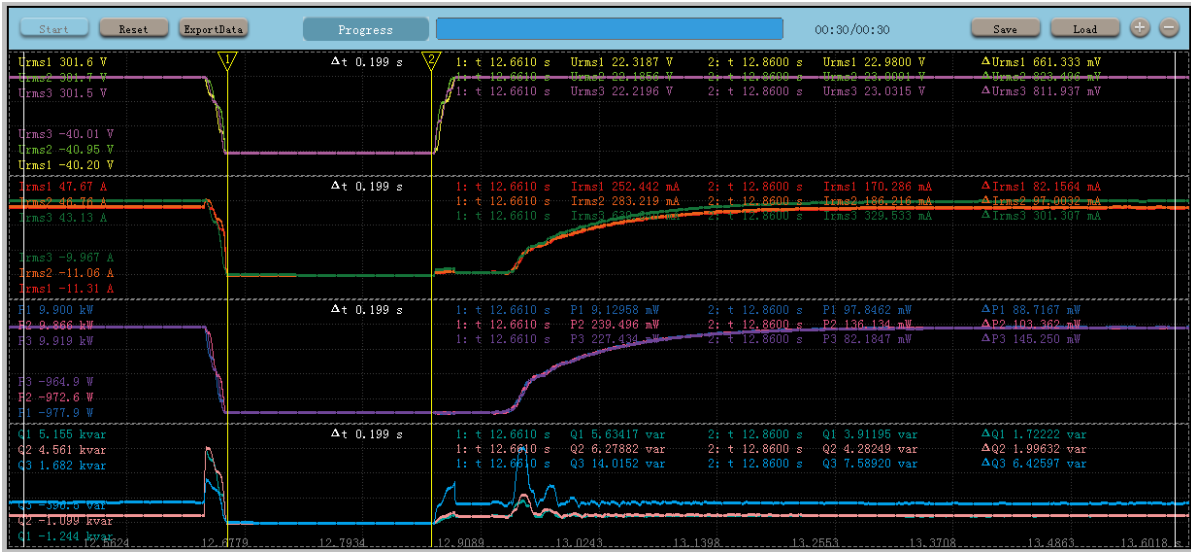
During dip



After dip

Model: iMars XG110KTR									
Output power: 22KW	Limits: 10%-30% Pnom,								
	R	S	T	R	S	T	Duration	Recovery time	Limits of recovery time
	U/U _{nom}	U/U _{nom}	U/U _{nom}	φ1	φ2	φ3	[ms]	[ms]	[ms]
1s - three-phase symmetrical failure	0.100	0.100	0.100	0°	-120°	120°	200± 20	240	<400
1a - two-phase asymmetric failure	0.870	0.870	0.100	27°	-147°	120°	200± 20	223	<400
2s - three-phase symmetrical failure	0.250	0.250	0.250	0°	-120°	120°	400± 20	223	<400
2nd - two-phase asymmetric failure	0.880	0.880	0.250	22°	-142°	120°	400± 20	232	<400
3s - three-phase symmetrical failure	0.500	0.500	0.500	0°	-120°	120°	850± 20	220	<400
3a - two-phase asymmetric failure	0.900	0.900	0.500	14°	-134°	120°	850± 20	236	<400
4s - three-phase symmetrical failure	0.750	0.750	0.750	0°	-120°	120°	1300± 20	219	<400
4th - two-phase asymmetric failure	0.94	0.94	0.750	7°	-127°	120°	1300± 20	232	<400

1s - three-phase symmetrical fault



During dip

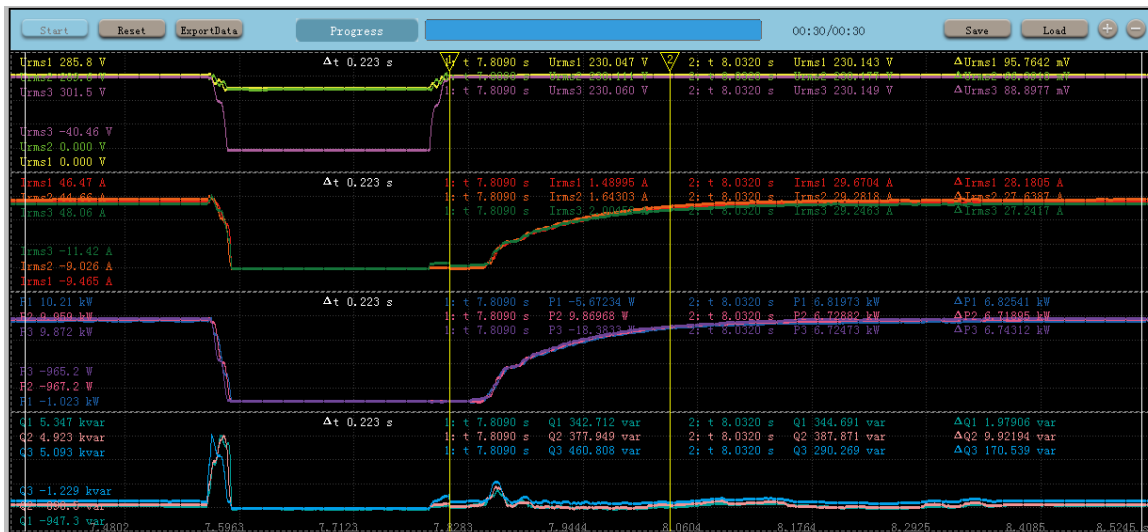


After dip

1a - two-phase asymmetric failure



During dip



After dip

2s - three-phase symmetrical failure



2nd - two-phase asymmetric failure



During dip



After dip

3s - three-phase symmetrical failure

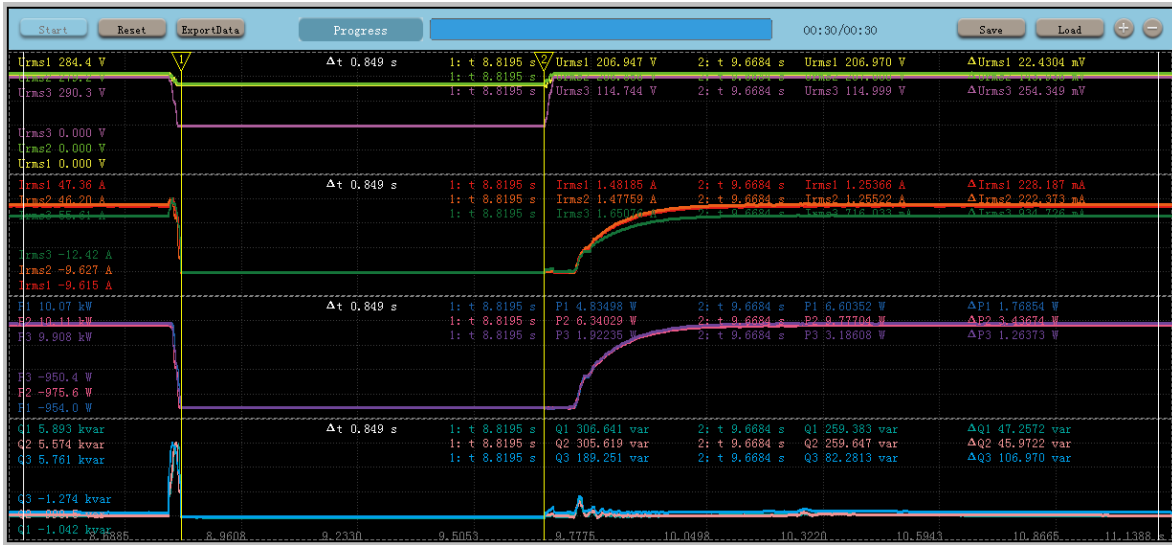


During dip



After dip

3a - two-phase asymmetric failure

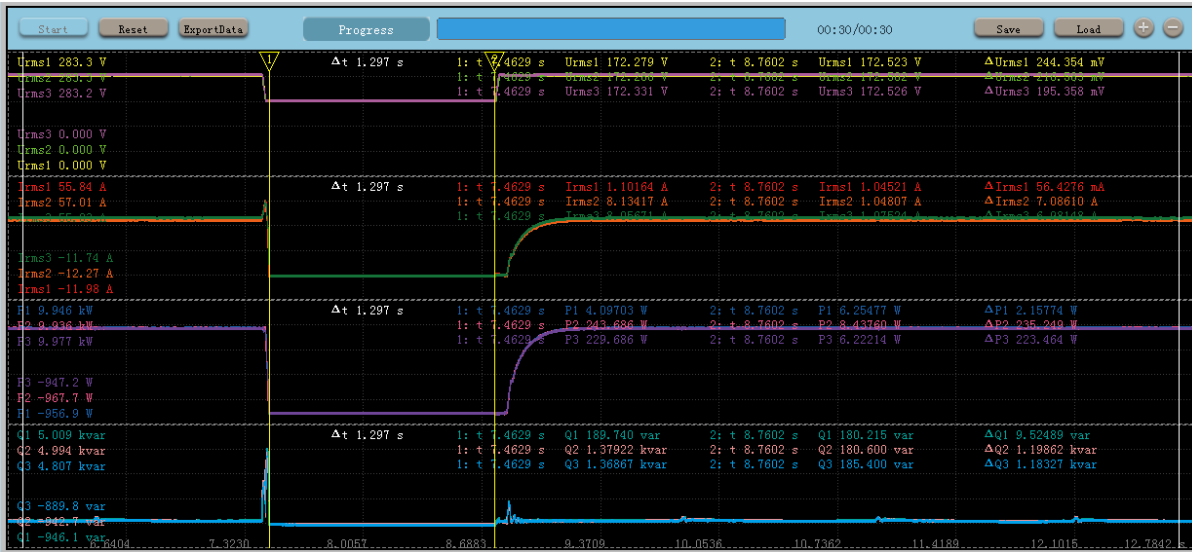


During dip

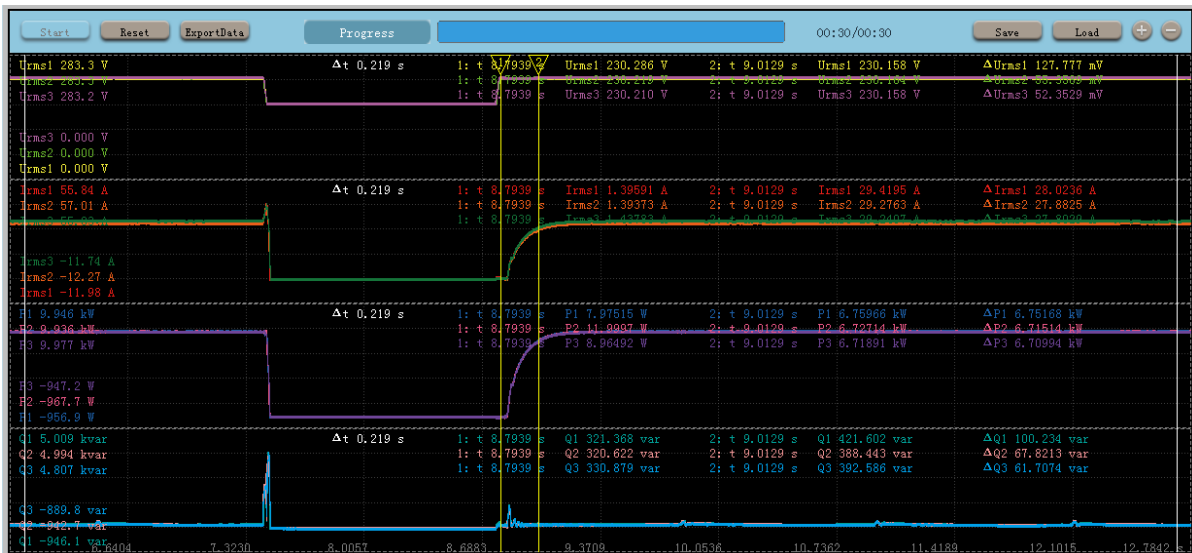


After dip

4s - three-phase symmetrical failure



During dip



After dip

4th - two-phase asymmetric failure



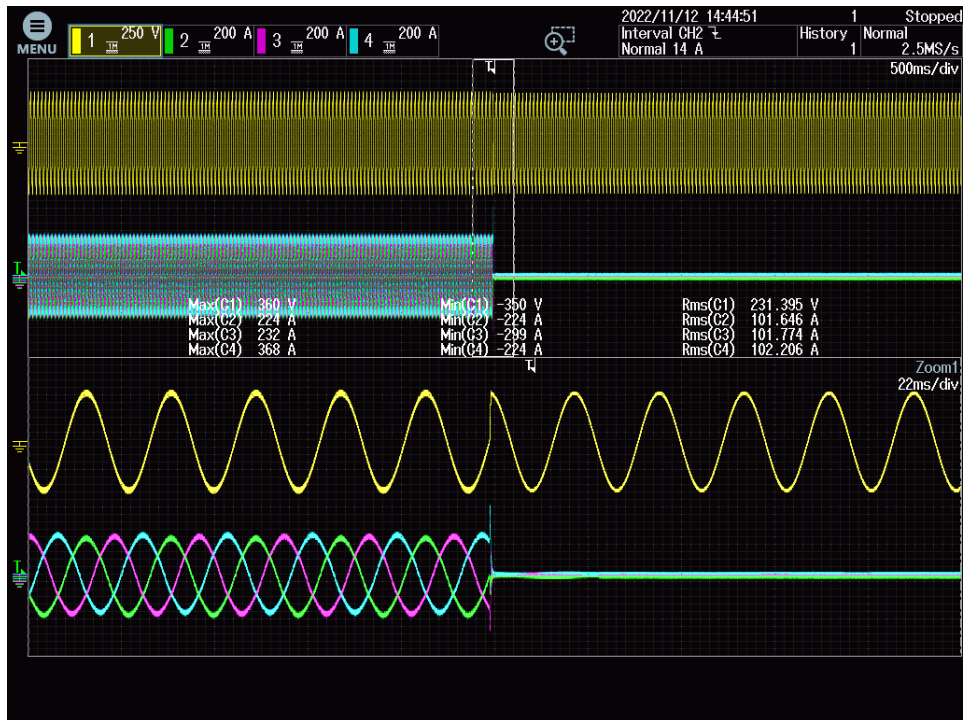
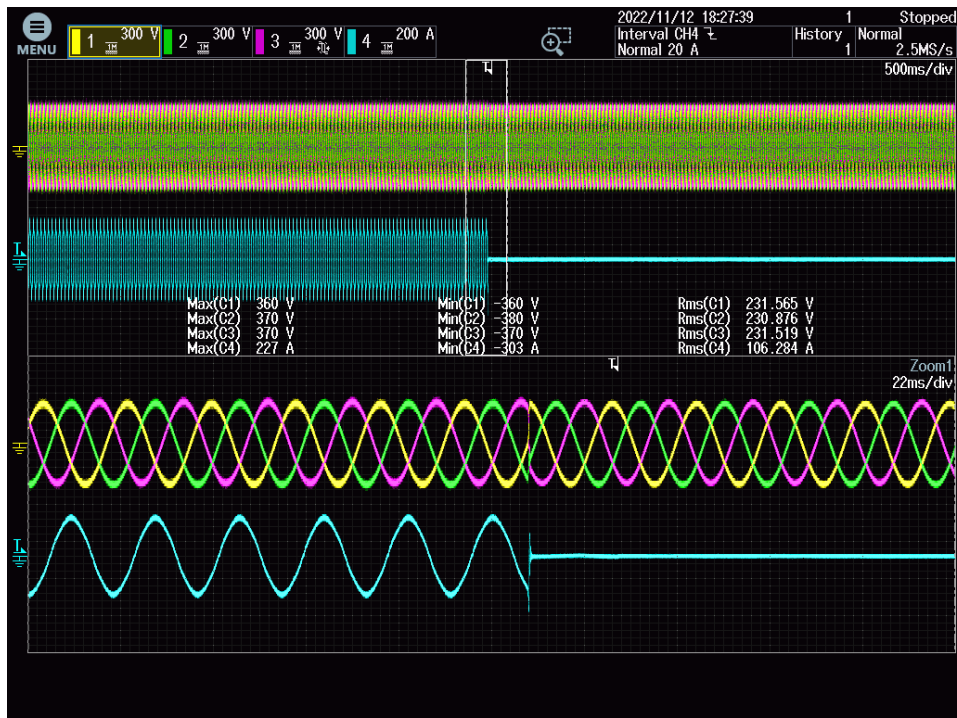
During dip



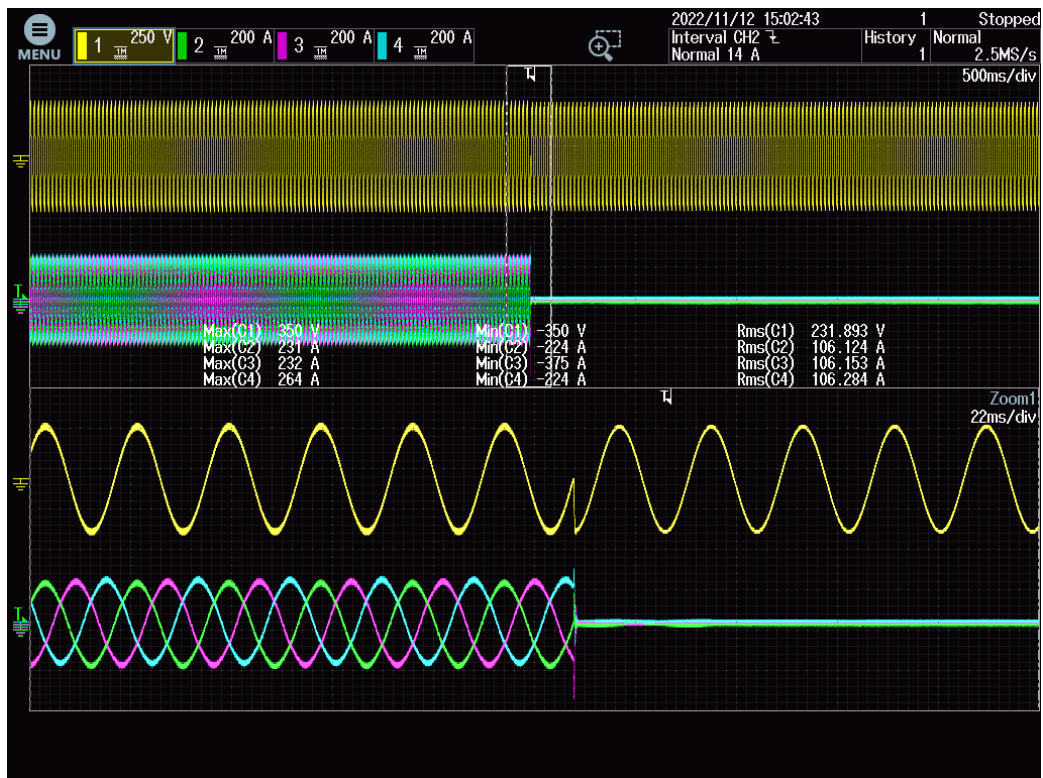
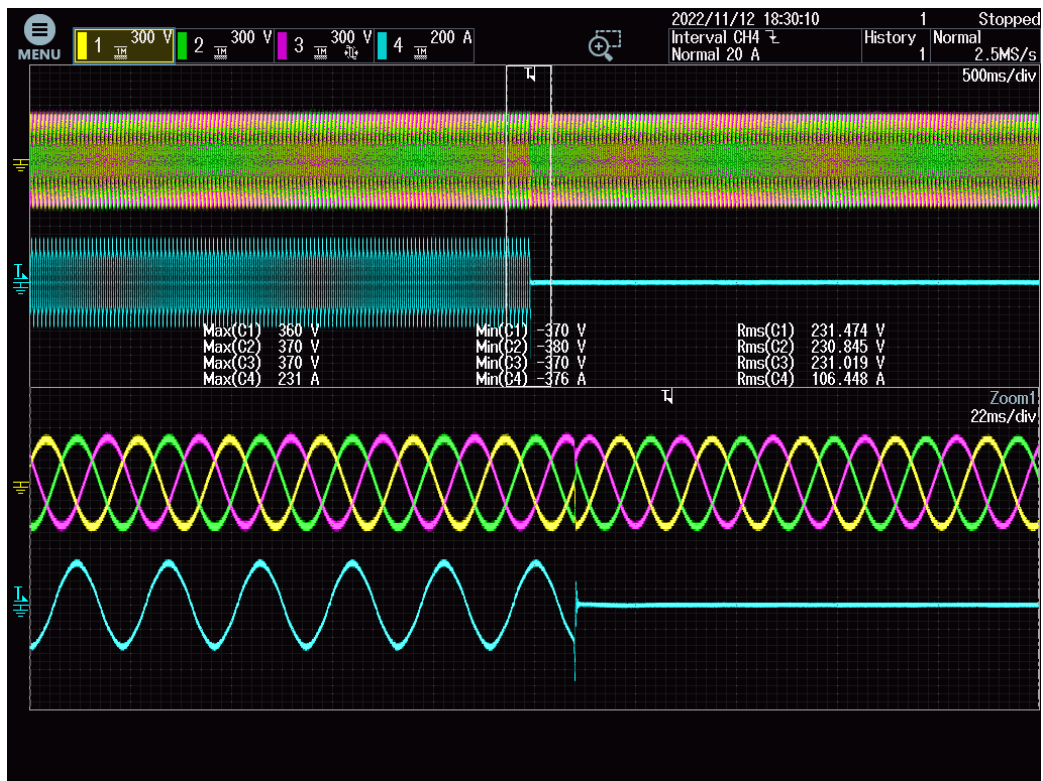
After dip

B.1.6	Table: Checking the insensitivity to automatic reclosing during phase accordance			P
Model: iMars XG110KTR				
Setoff	Angle before the setoff	Angle after the setoff	Current at 20 ms before to at least 200 ms after the setoff	Result
+90°	0°	90°	L1: 101.64A L2: 101.77A L3: 102.21A	No damage, Inverter disconnected
-90°	0°	-90°	L1: 106.12A L2: 106.15A L3: 106.28A	No damage, Inverter disconnected
180°	0°	180°	L1: 105.09A L2: 104.51A L3: 106.30A	No damage, Inverter disconnected
-180°	0°	-180°	L1: 106.37A L2: 106.89A L3: 106.59A	No damage, Inverter disconnected

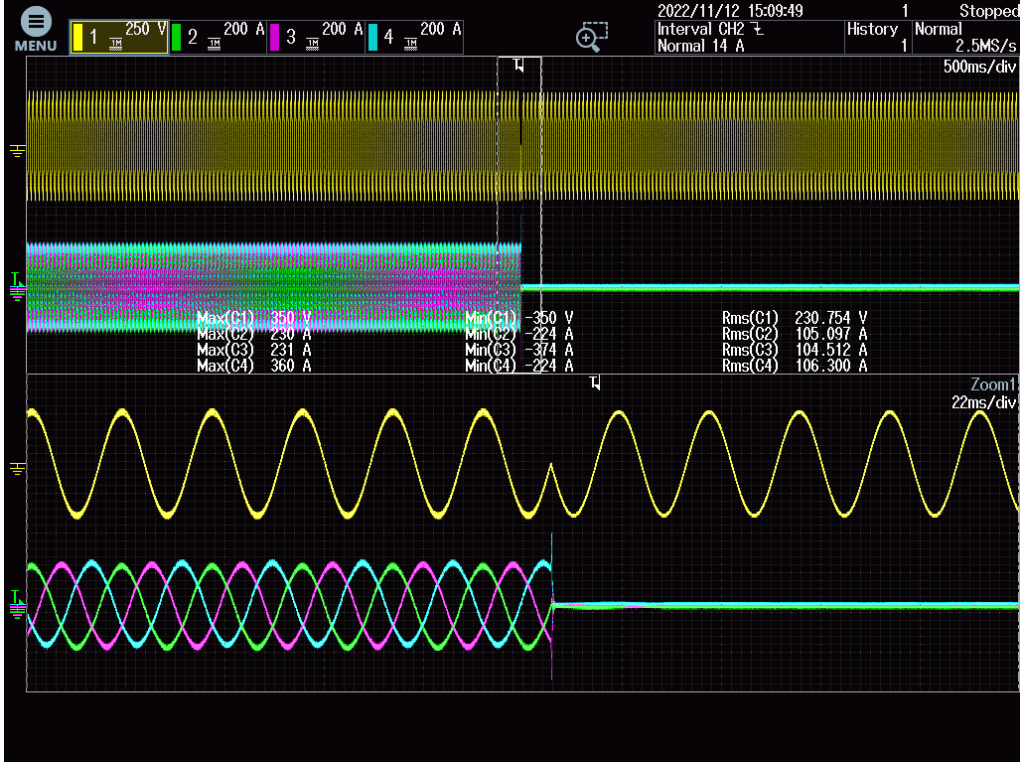
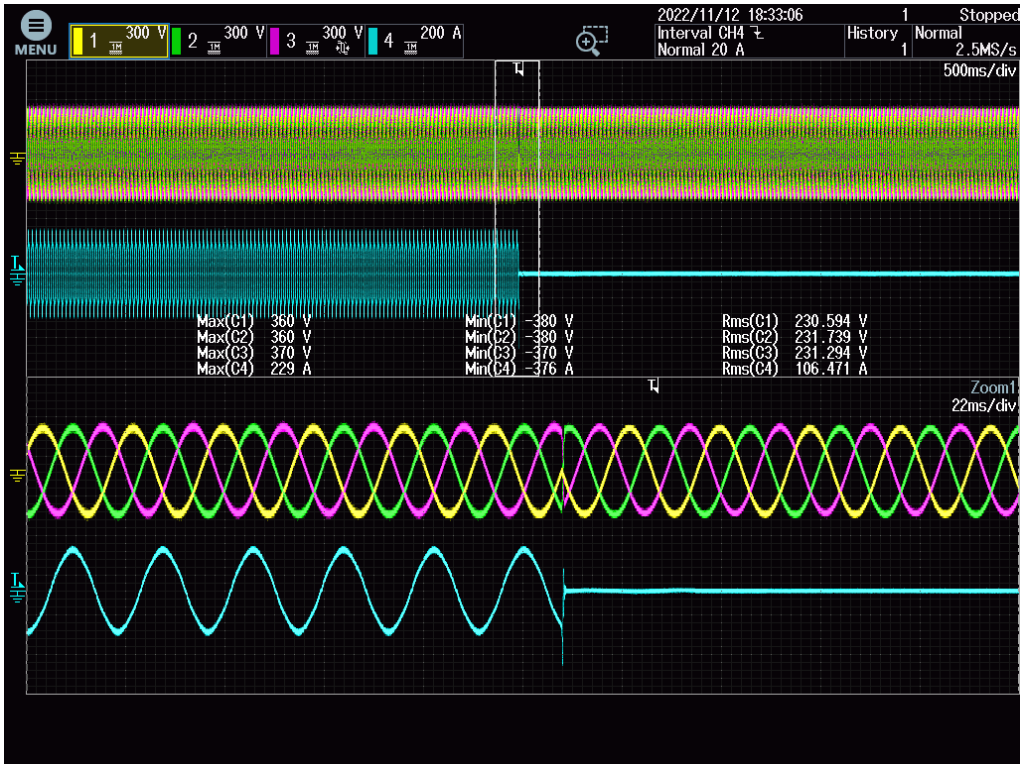
EUT with a setoff of 90°



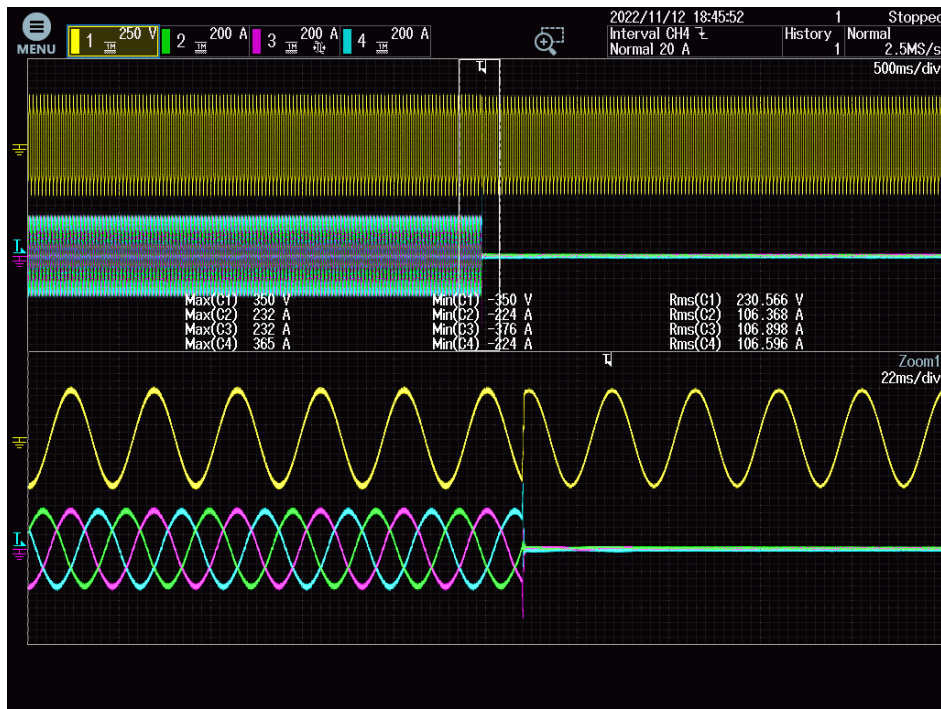
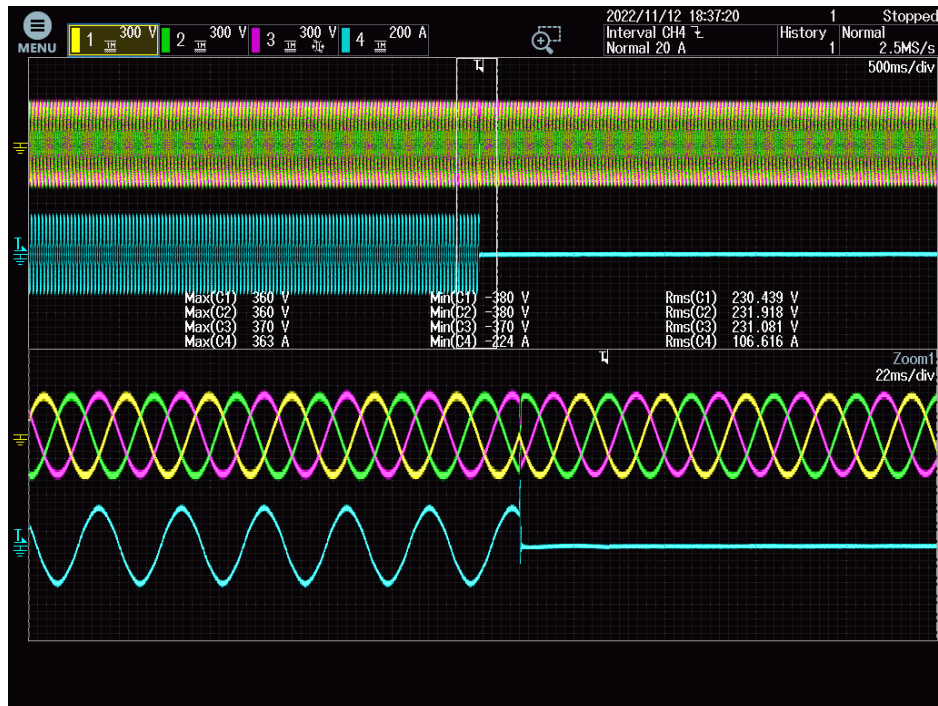
EUT with a setoff of -90°



EUT with a setoff of 180°



EUT with a setoff of -180°



Appendix 1: ISO 9001 certificate



Certificate of Registration

质量管理体系 - ISO 9001:2015

<p>兹证明： 91440300MA5FDH760L 中国 广东省 深圳市 光明区马田街道 薯田埔社区科杰四路 英威腾光明科技大厦A座 邮编：518106</p>	<p>Shenzhen INVT Electric Co., Ltd. Guangming Branch Building A INVT Guangming Technology Building Kejie Fourth Road, Shutianpu Community, Matian Street Guangming District Shenzhen Guangdong 518106 China</p>
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持有证书：**FM 741214**

并运行符合 ISO 9001:2015 要求的质量管理体系，认证范围如下：

变频器的设计、销售和服务。不间断电源、光伏逆变器、电动汽车电控产品和汽车电源转换器的制造。
 The design, sales and services of inverter. The manufacture of uninterruptible power supply, PV (photovoltaic) inverter, electric control products for electric automobile and power converters for automobile.

BSI代表：


 Chris Cheung, 亚太地区 合规风险主管

首次发证日期： 2009-01-25
最新发证日期： 2021-01-15

生效日期： 2021-01-25
有效期至： 2024-01-24

Page: 1 of 3

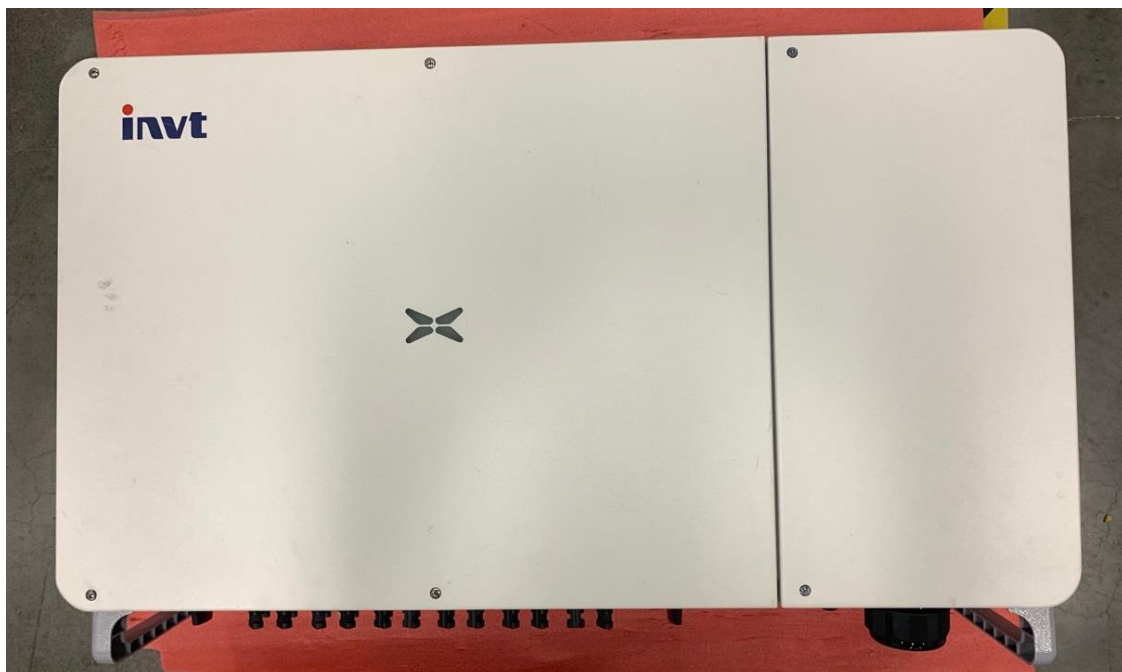


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 关于证书范围及 ISO 9001:2015 要求的适用性的进一步说明请咨询BSI。
 获证组织必须定期接受监督审核并经审核合格此证书方继续有效。
 此证书只在提供完整正本时才有效。

信息查询及联系方式：BSI, Kitemark Court, Davy Avenue, Knowlhill, Milton Keynes MK5 8PP. 电话：+44 345 080 9000
 BSI保证英国有限公司，注册地英国，注册号7805321，地址：389 Chiswick High Road, London W4 4AL, UK
 高标管理体系认证（北京）有限公司 北京市建国门外大街甲24号东海中心2008室 邮编：100004 电话：+86 10 85073000
 BSI集团成员。

Appendix 2: Photos



Overview 1



Overview 2



Overview 3



Side view



Connection view(for 9 strings)



Connection view (for 10 strings)



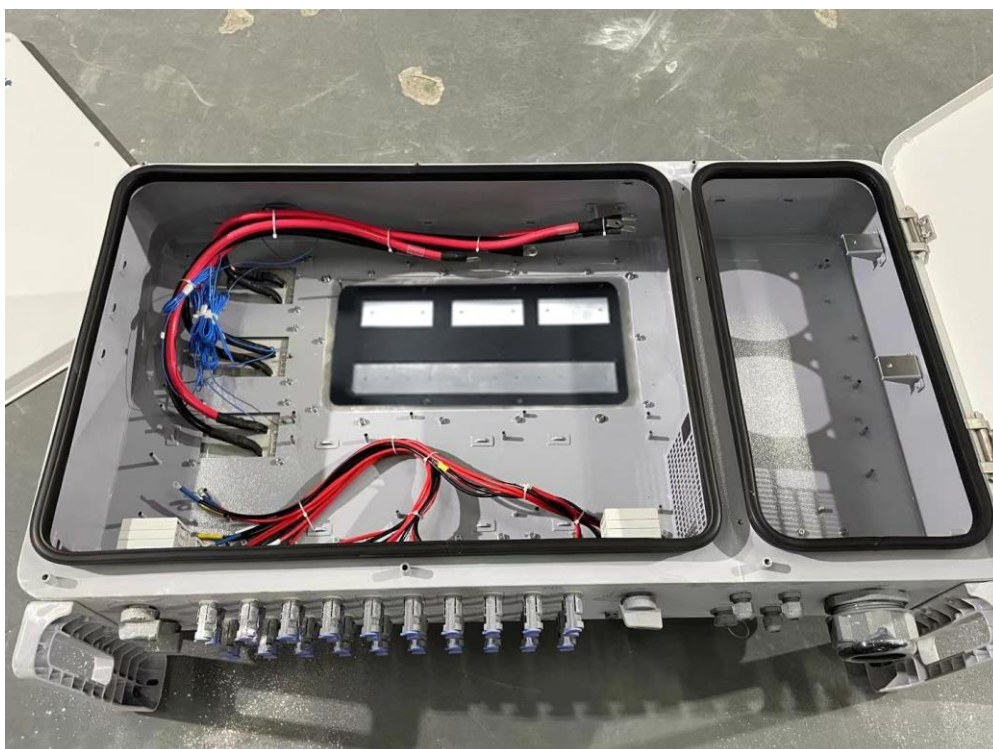
Connection view (for 12 strings)



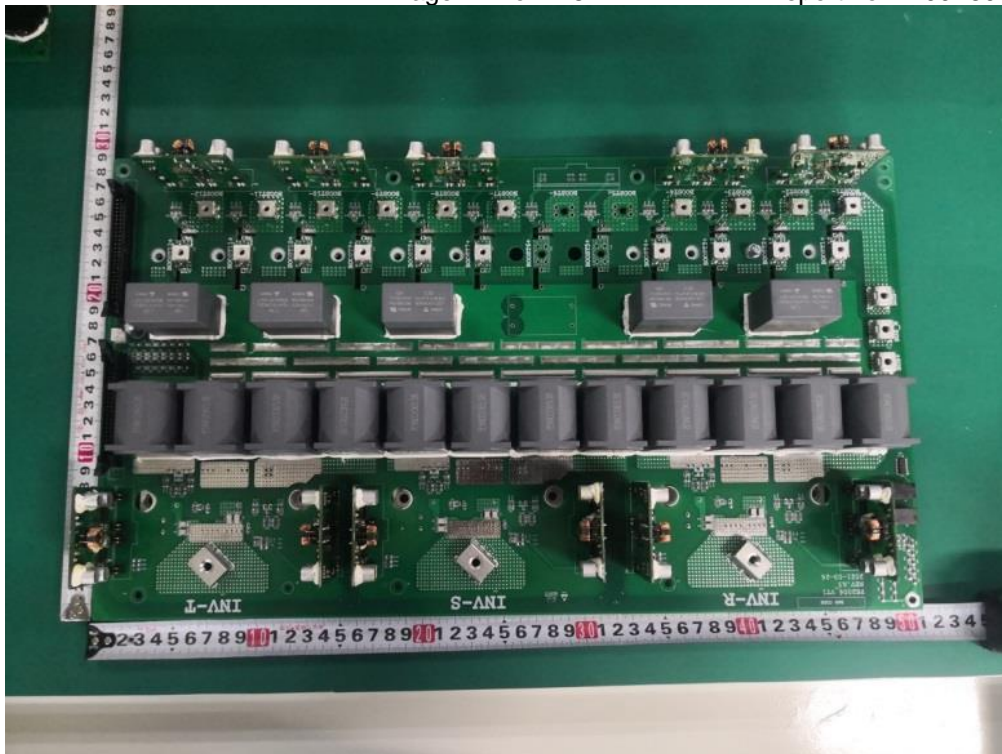
Grounded view



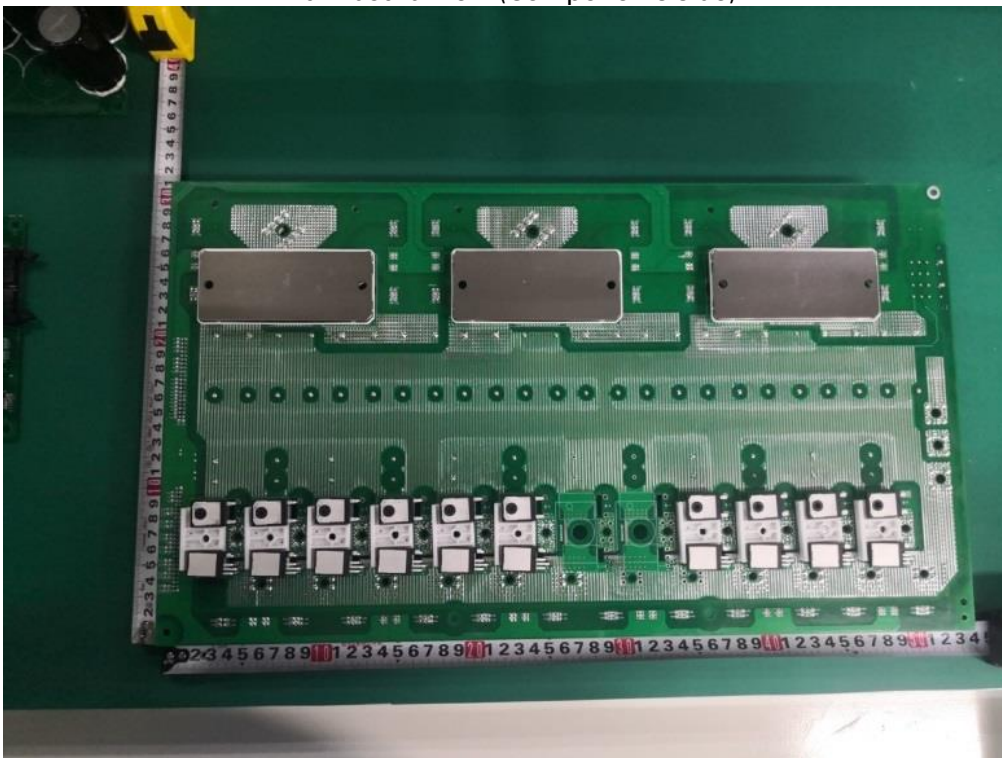
Internal view



Internal view (removed PCB board)



Main board view (Components side)



Main board view (Soldered side)

Appendix 3: Equipment

Asset	Description	Manufacturer	Model	Cal Date	Cal Due
SA200-16	Precision Power Analyzer	YOKOGAWA	WT3000	17 Aug 2022	16 Aug 2023
SA200-02	RLC load	Qunling	ACLT-4830H	/	/
SA200-52	AC power source	Chroma	61860	/	/
SA016-38	Programmable Temperature & Humidity Test Chambe	ESPEC	GPL-5	07 Mar 2022	06 Mar 2023
SA002-16	Impulse tester	Anwei	MegaPulse 10*700-7	09 Dec 2021	08 Dec 2022
SA002-35	Withstanding Voltage Tester	EEC	7480	16 May 2022	15 May 2023
SA050-33	Scope Corder	YOKOGAWA	DL 850E	06 Jan 2022	05 Jan 2023
SA200-22	Digital Insulation Tester	Fluke	Fluke1587C	02 Jun 2022	01 Jun 2023

(End of Report)