POWER ELECTRONICS®

TECHNICAL REPORT

Factory Acceptance Test
RESULTS REPORT
IN FREESUN HEMK ACCIONA INVERTERS

Nov 2019

POWER ELECTRONICS
PURE ENERGY

SUBJECT	FAT RESULTS REPORT in FREESUN HEMK ACCIONA INVERTERS		
REVIEW	B	**DOCUMENT**	FAT310519BI_LVRT_analysis
DATE OF TEST	23.05.2019 24.05.2019 31.05.2019	**DOCUMENT DATE**	06.11.2019
AUTHOR	S. Benavent	**S/N OF DUT**	30157312
APPROVED	A. Fernández	**PAGES**	18

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1. AIM

The scope of this report is to communicate the results obtained in Voltage Ride Through test in Factory Acceptance Tests on one unit of Acciona Energía Freesun HEMK inverter according to the Acciona Energía Procedure "F03_GAE07019 r01"

The inverter under test included in this report is:

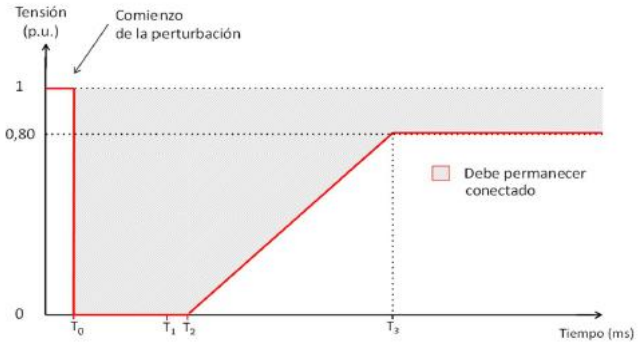
- MODEL: FS3300K
- PROJECT: ALMEYDA

TECHNICAL CHARACTERISTICS — HEMK 660V

		FRAME 1	FRAME 2
REFERENCE		**FS2200K**	**FS3300K**
OUTPUT	AC Output Power(kVA/kW) @50°C [1]	2200	3300
	AC Output Power(kVA/kW) @25°C [1]	2420	3630
	Max. AC Output Current (A) @25°C	2120	3175
	Operating Grid Voltage(VAC) [2]	660V ±10%	
	Operating Grid Frequency(Hz)	50Hz/60Hz	
	Current Harmonic Distortion (THDi)	< 3% per IEEE519	
	Power Factor (cosine phi) [3]	0.5 leading ... 0.5 lagging adjustable / Reactive Power injection at night	
INPUT	MPPt @full power (VDC)	934V-1310V	
	Maximum DC voltage	1500V	
	Number of inputs [2]	Up to 36	
	Number of MPPts	Up to 4	Up to 6
	Max. DC continuous current (A)	2645	3970
	Max. DC short circuit current (A)	4000	6000
EFFICIENCY & AUXILIARY SUPPLY	Max. Efficiency PAC, nom (η)	98.5% (preliminary)	
	Max. Power Consumption (KVA)	8	10

2. VOLTAGE RIDE THROUGH TEST

According to article 3-7 of the NTSyCS, inverter must to remain connected to the grid during and following faults. Must survive to zero voltage dips of at least the depth shown in next figure:

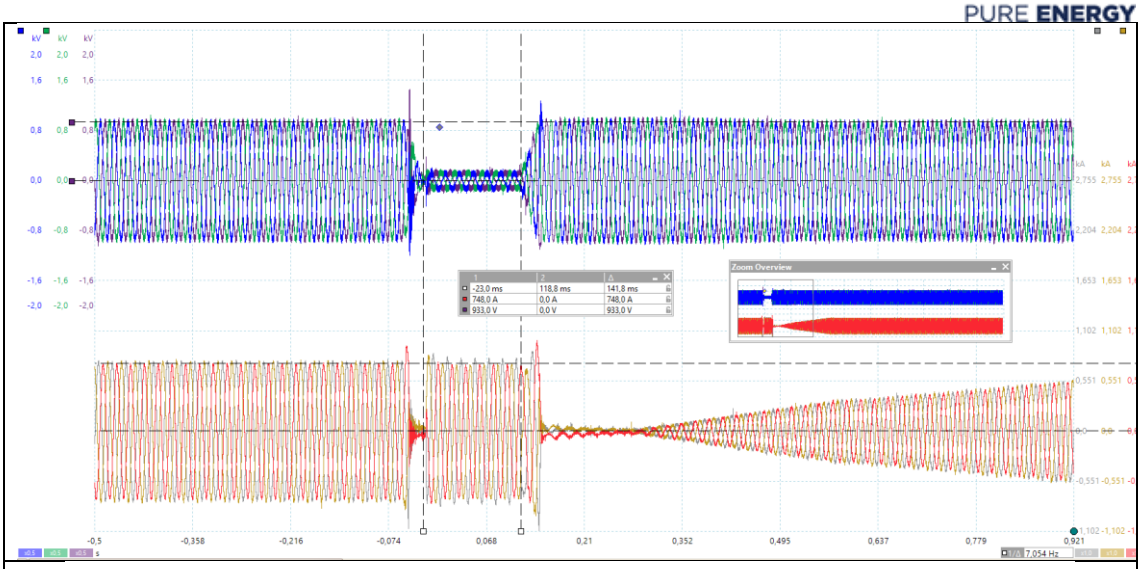


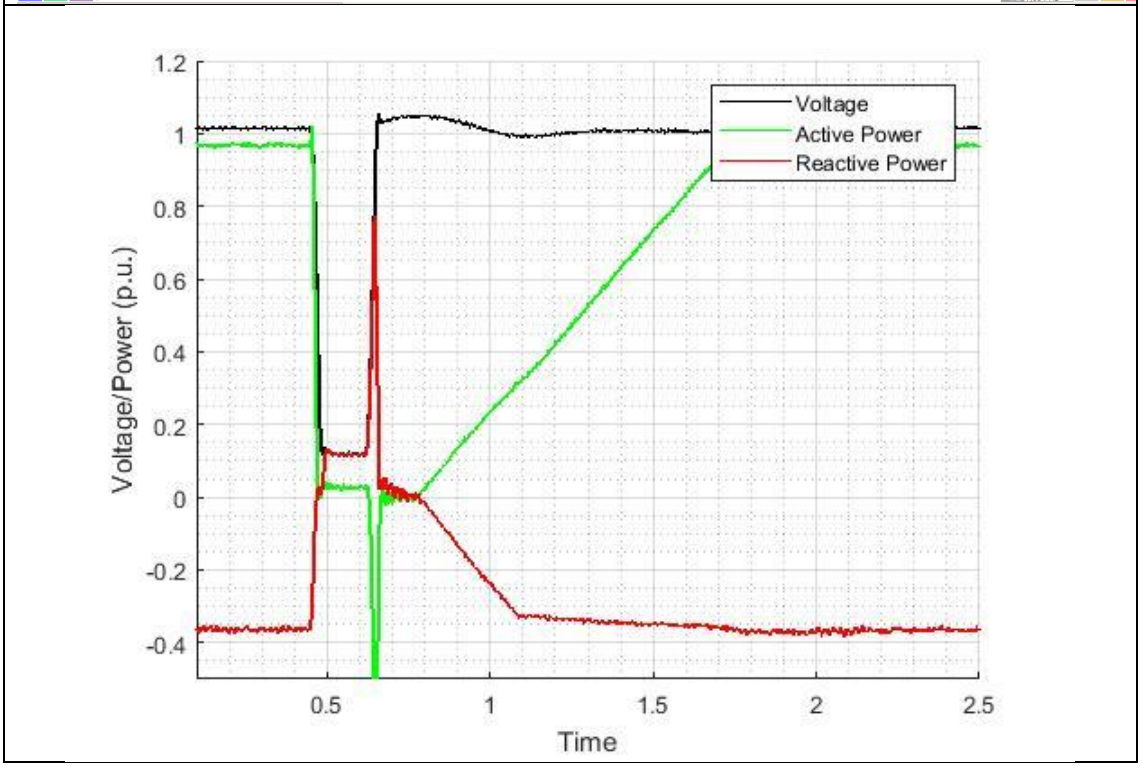
Conditions of the test:

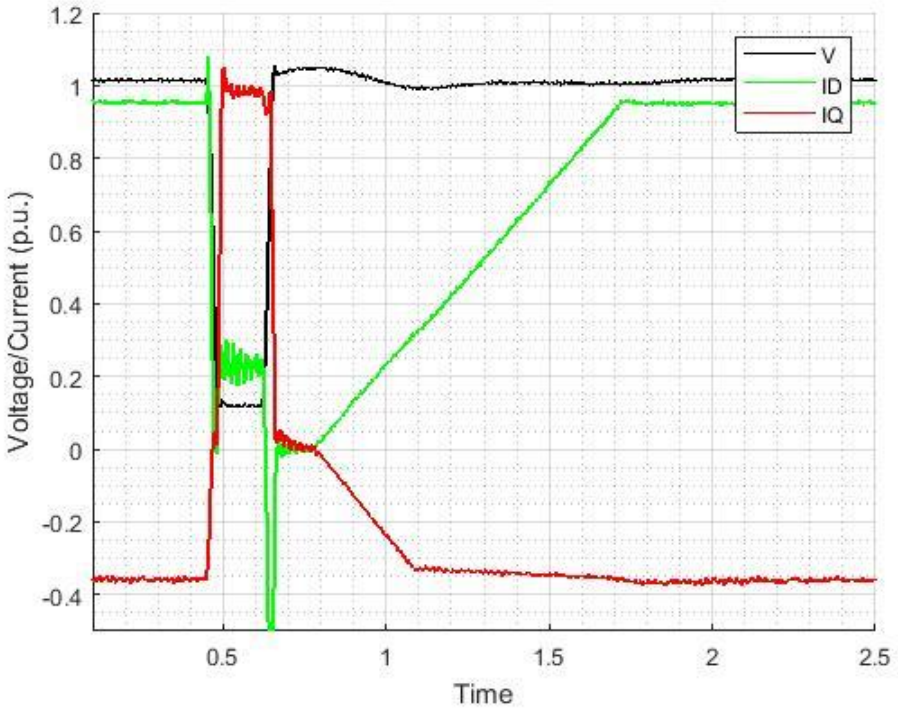
Fault type	Power condition		Response
LVRT	Active Power	P = cos (0.95) * Sn	K=2.0
	Reactive Power	Q = -sin (0.95) * Sn	
HVRT	Active Power	P = Sn	
	Reactive Power	Q = 0	

Tests performed:

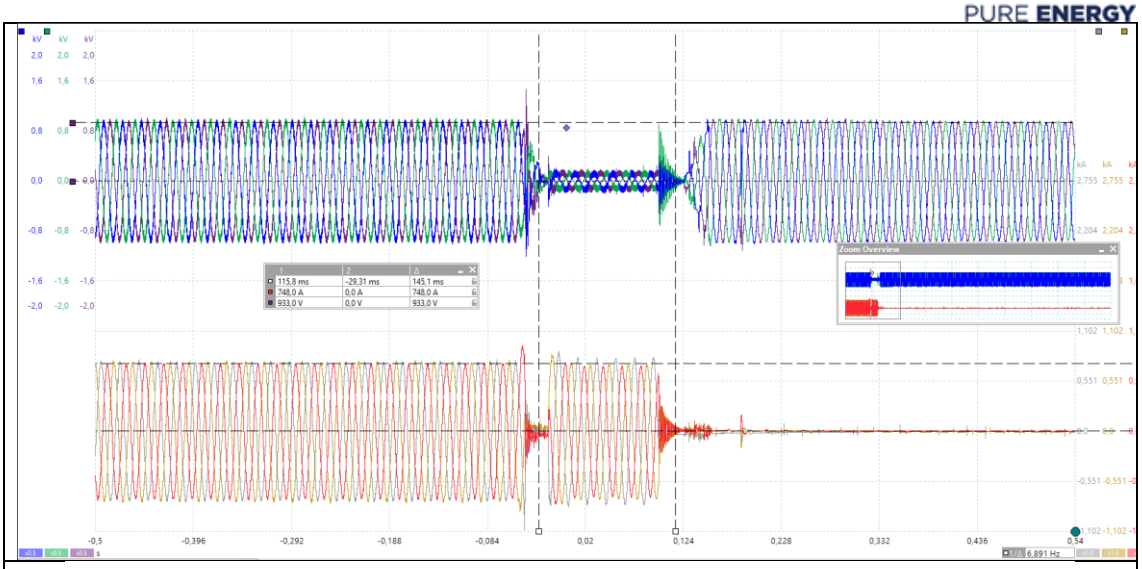
Phase Output Power	Residual voltage (% Un)		Time (ms)		Reactive Current (%In)		Graph
	Desired	Measured	Desired	Measured	Desired	Measured	
Symetric 3 phases RST	0	2	140	142	100.0	99.80	2.1
	0	2	145	145	100.0	99.7	2.2
	80	79	1000	1001	8.8	9.0	2.3
	80	79	1005	1008	8.8	8.9	2.4
Asymetric 2 phases RS	0	2	140	140	100.0	101.1	2.5
	0	2	145	147	100.0	101.2	2.6
	80	82	1000	1000	8.8	9.0	2.7
	80	82	1005	1007	8.8	9.1	2.8
Symetric RST	115	115	1100	1106	10.0	9.8	2.9

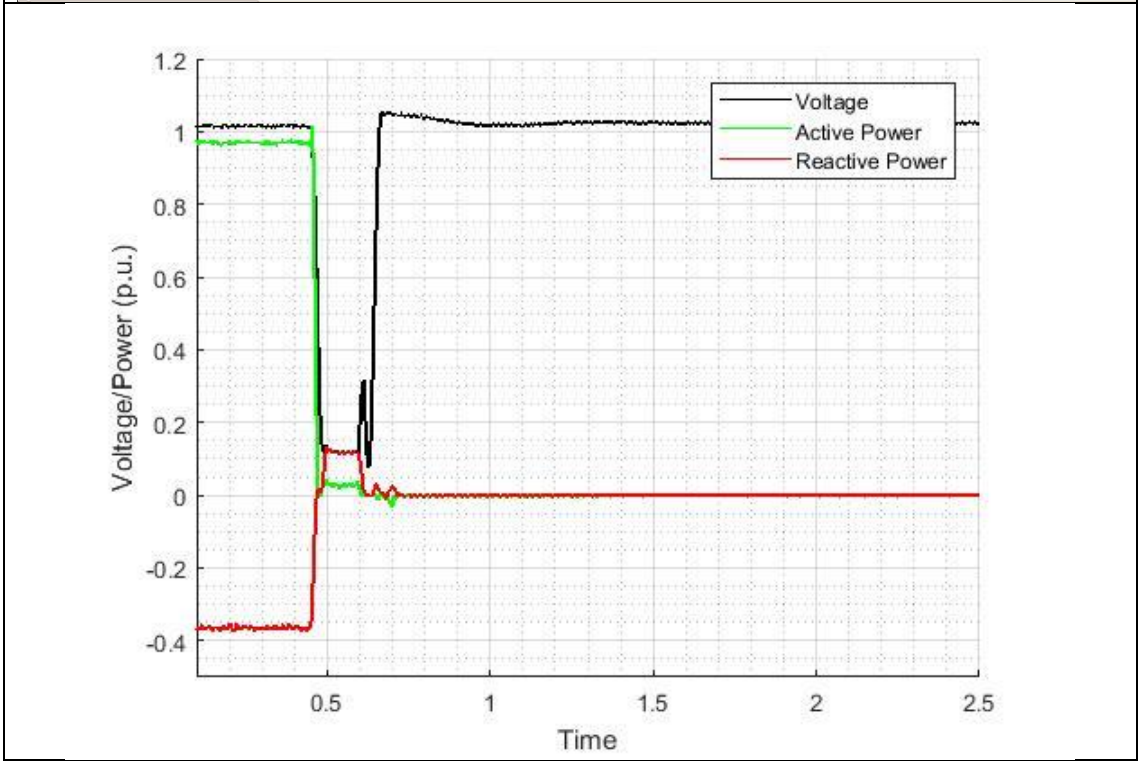


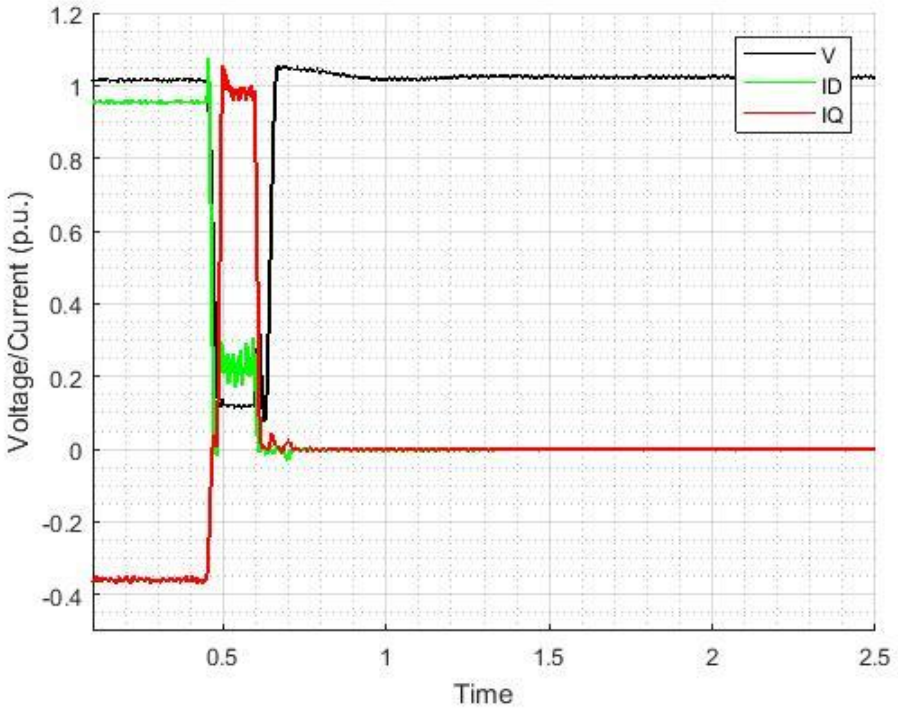




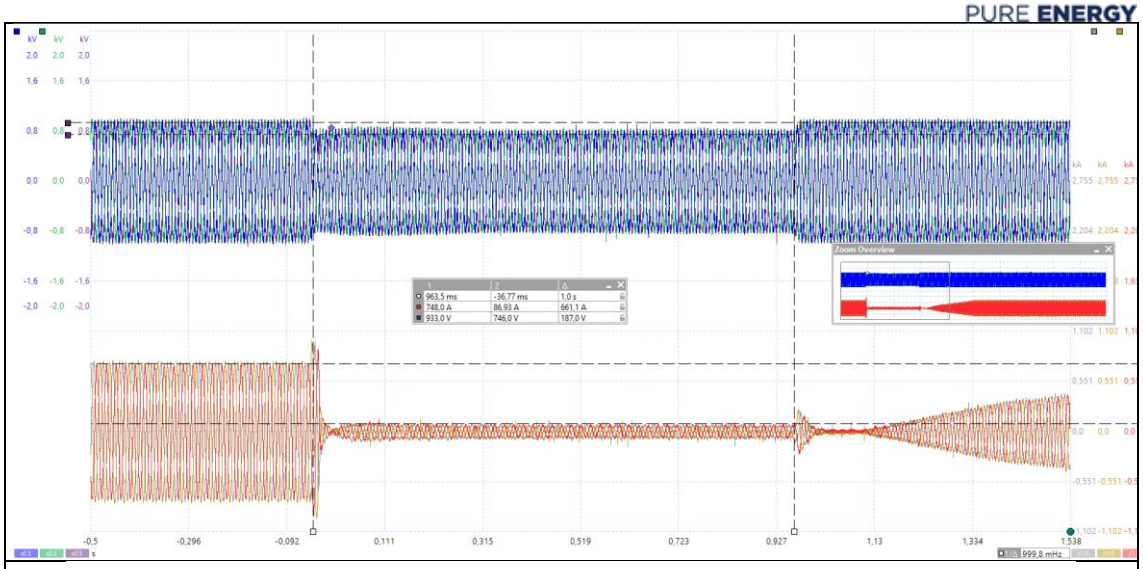
Graph 2.1

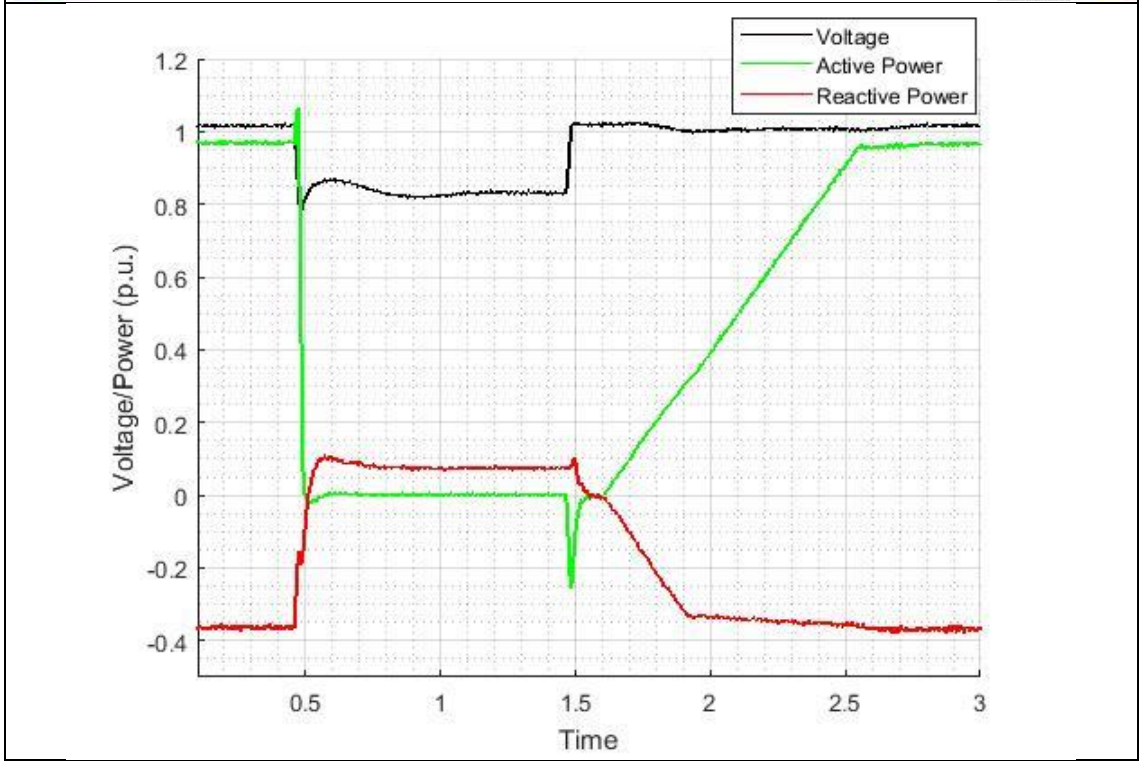


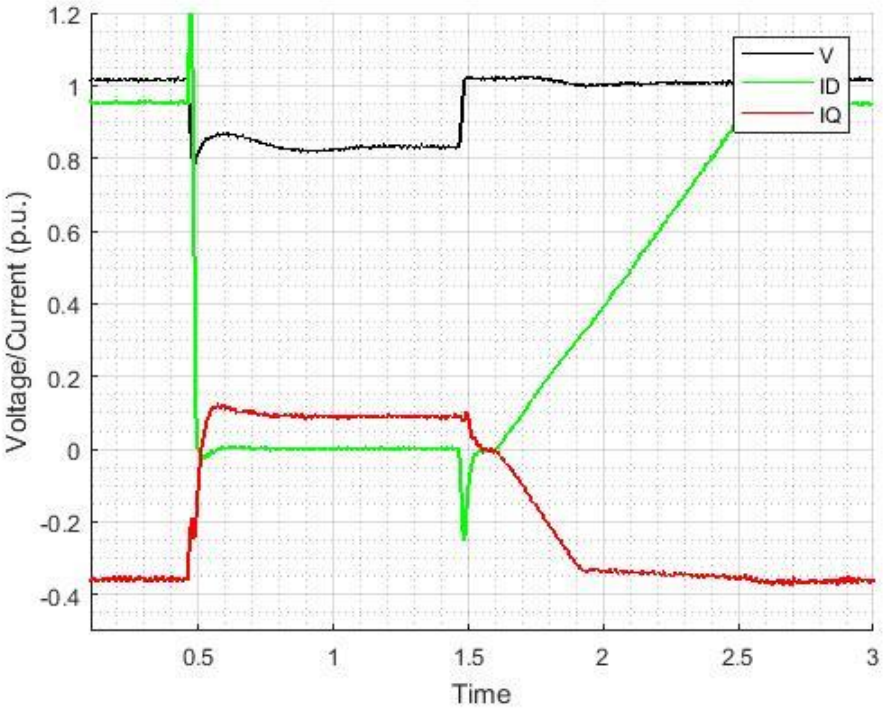




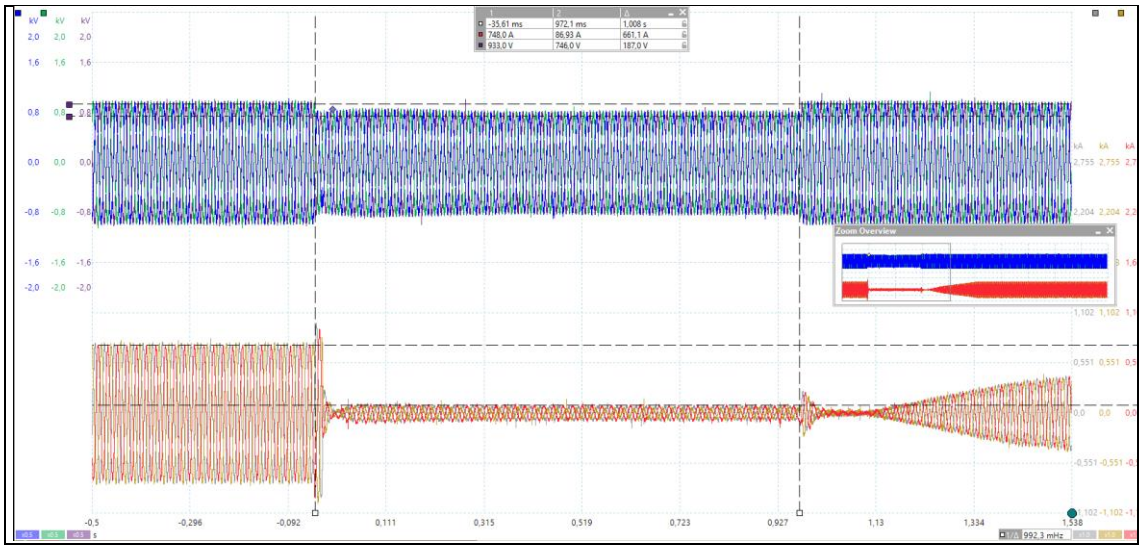
Graph 2.2

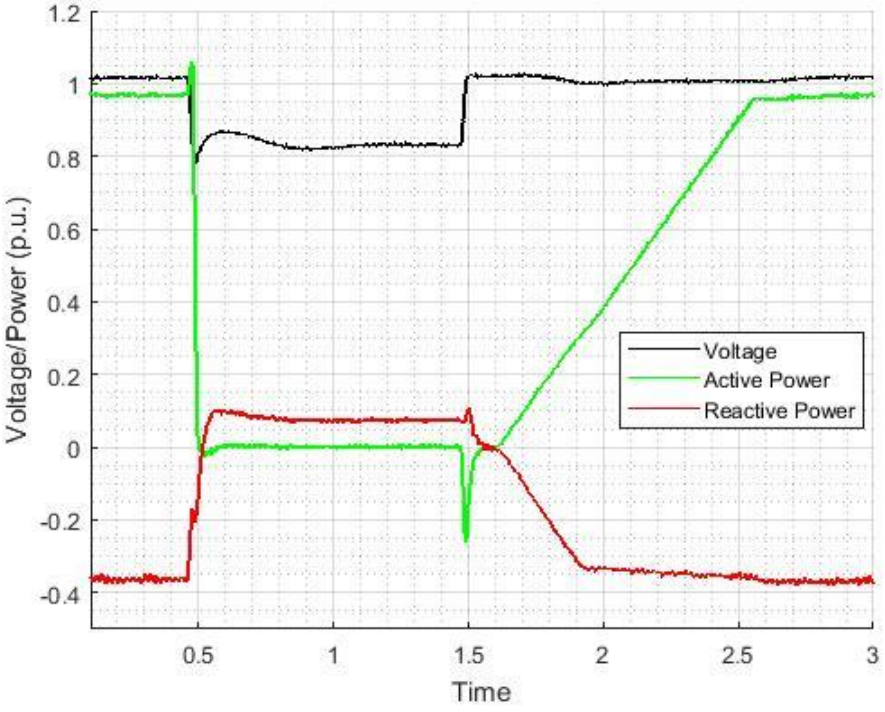


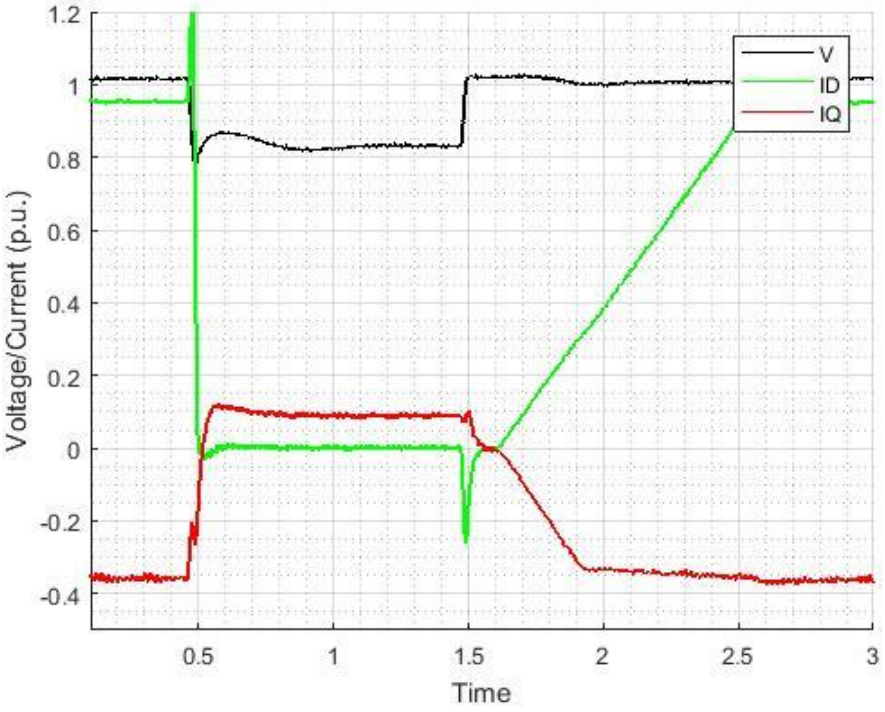




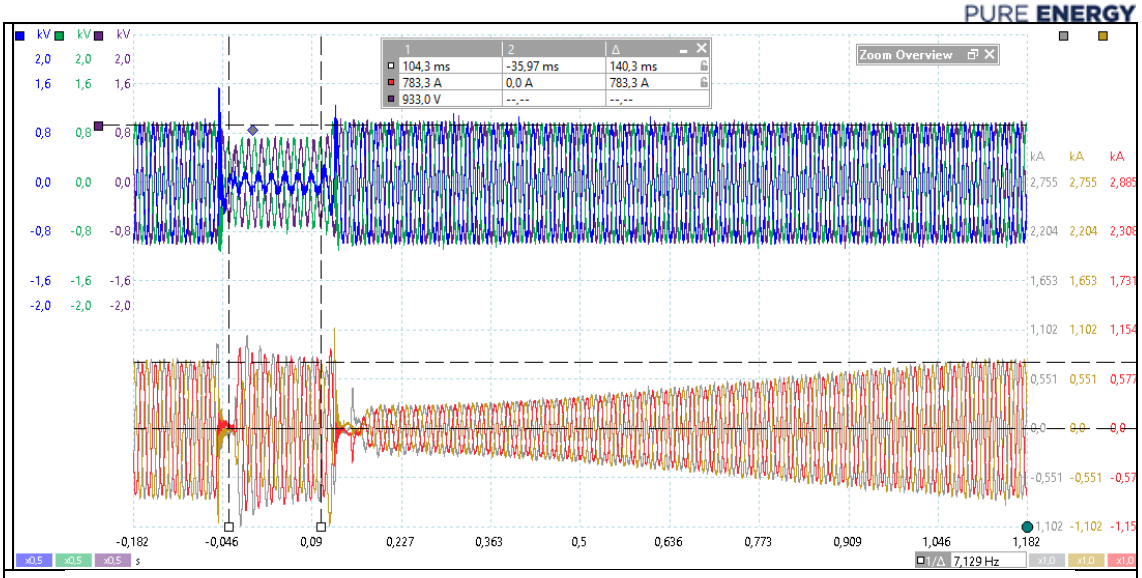
Graph 2.3

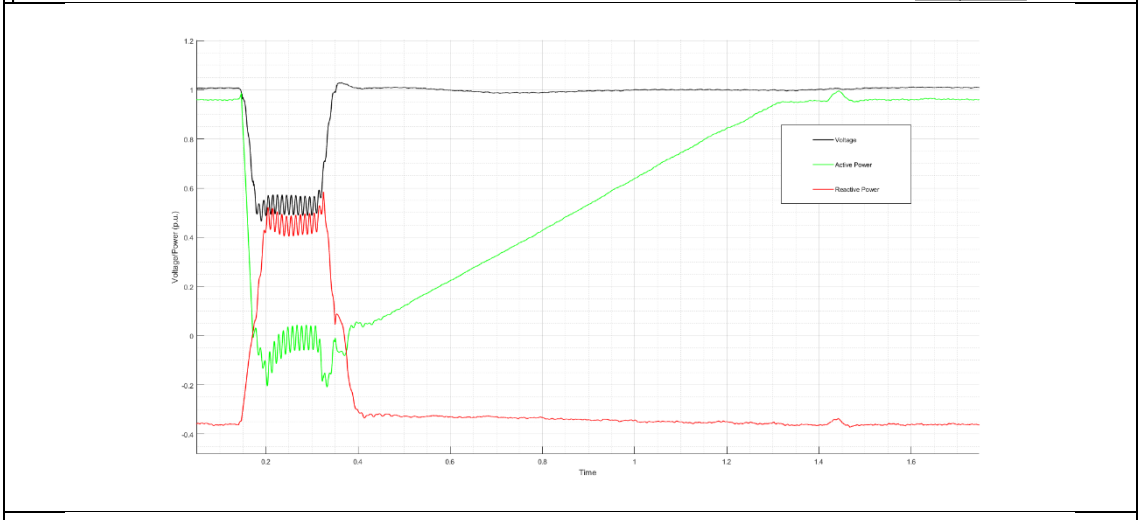


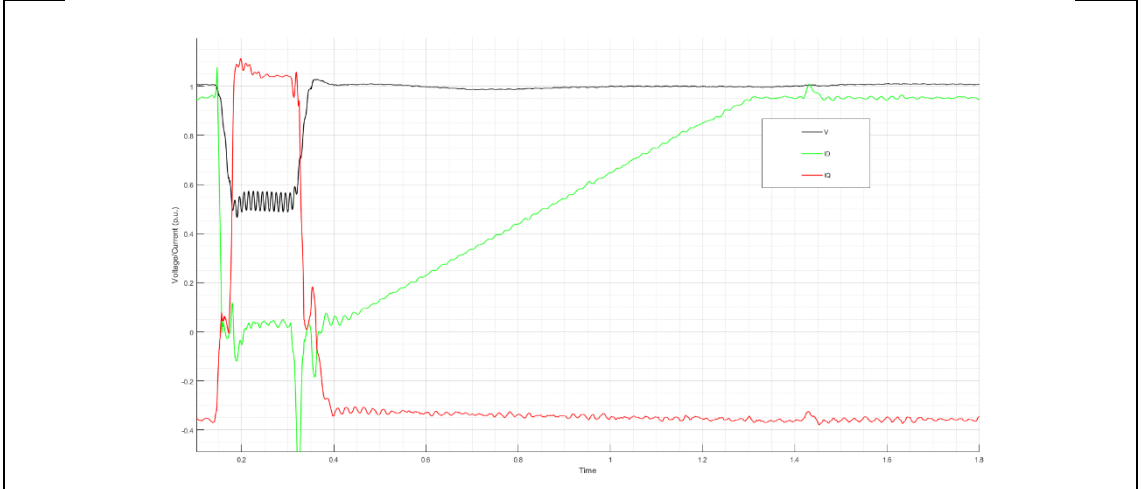




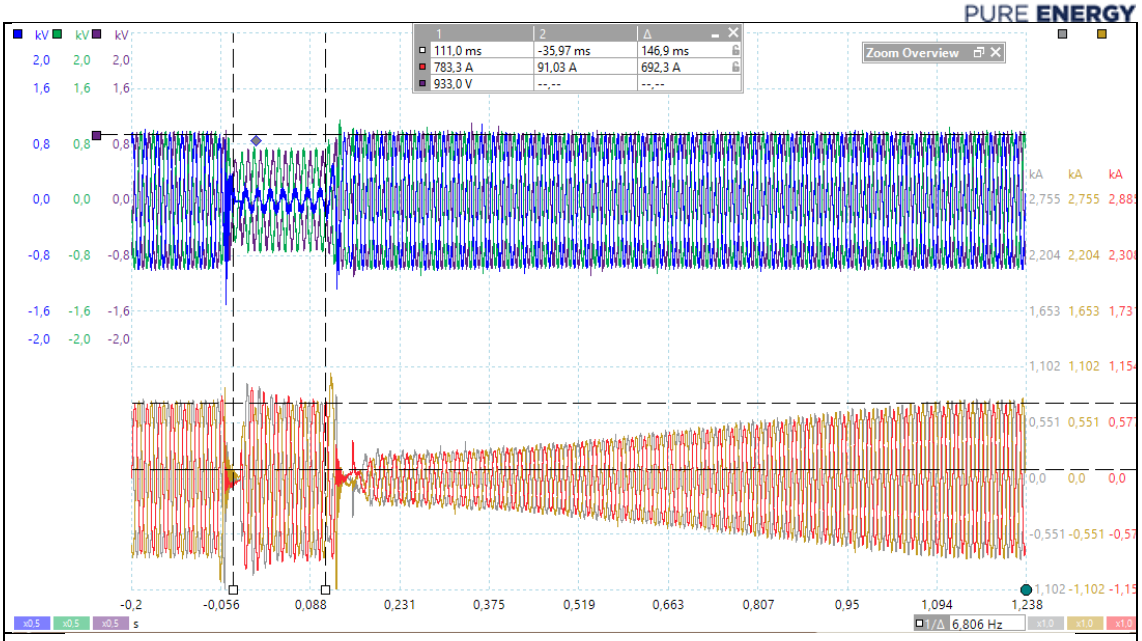
Graph 2.4

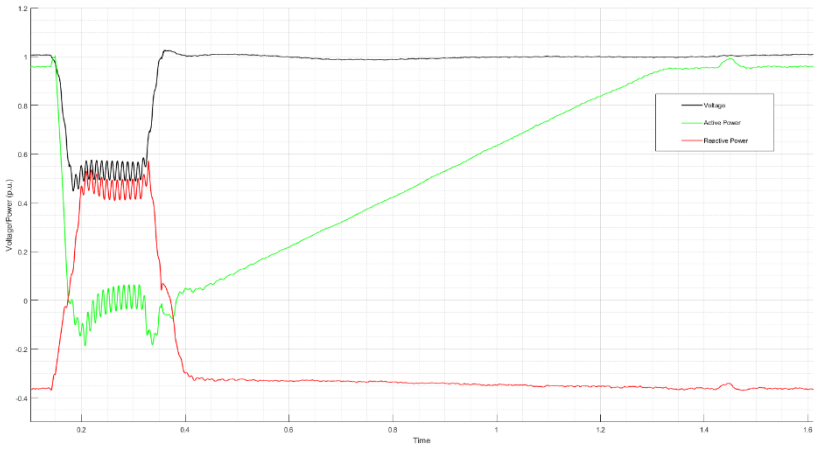


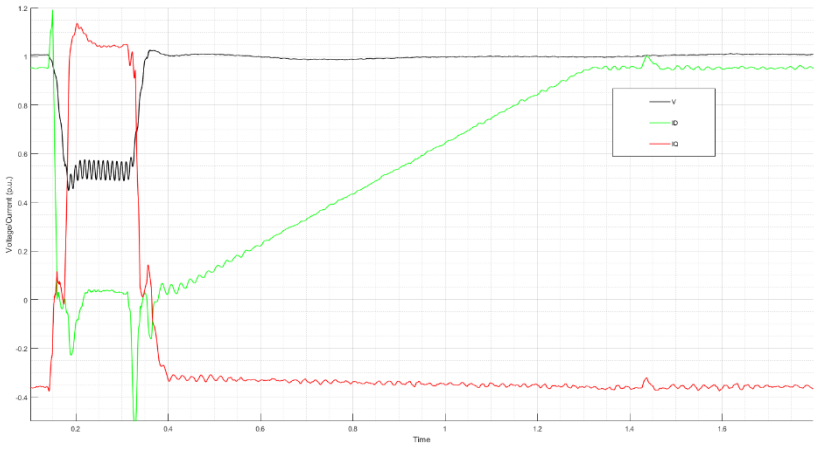




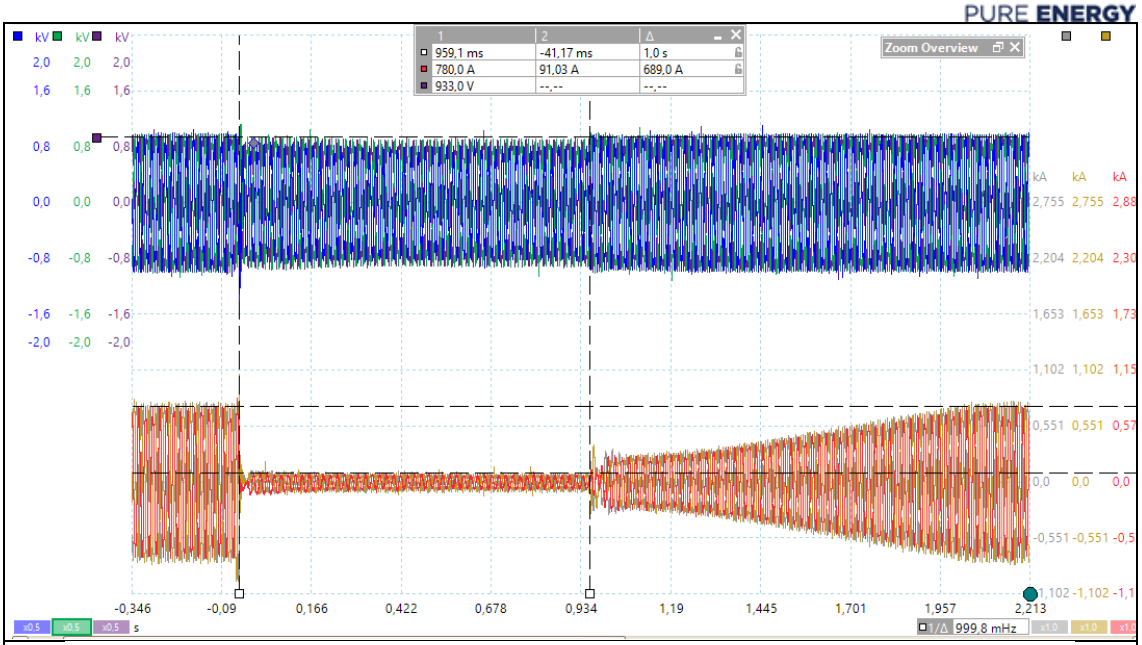
Graph 2.5

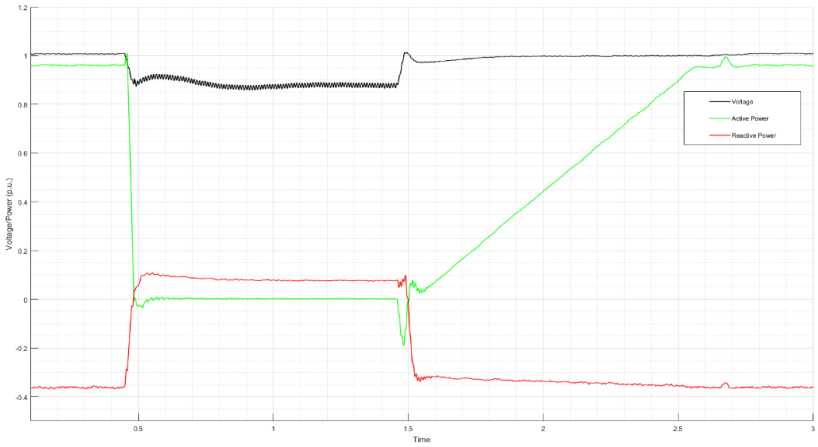


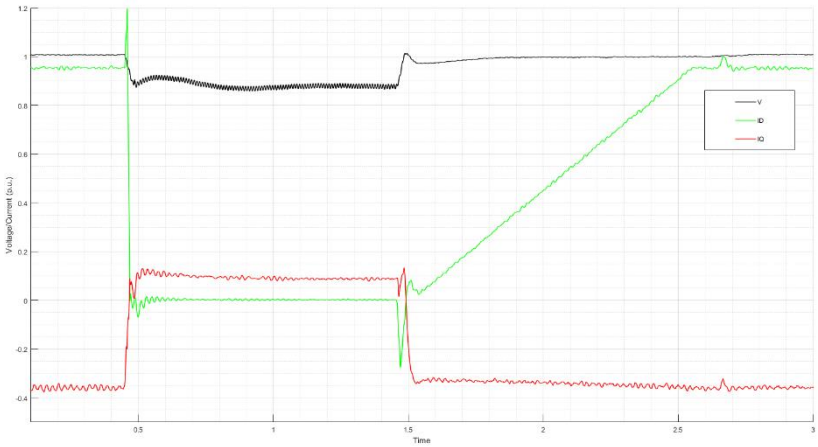




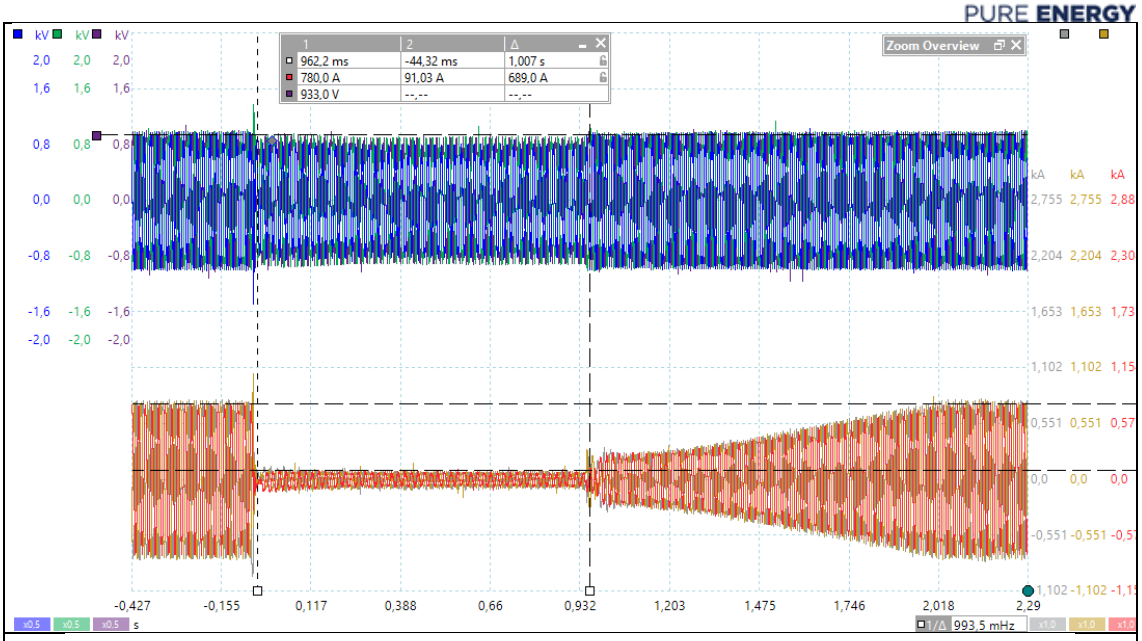
Graph 2.6

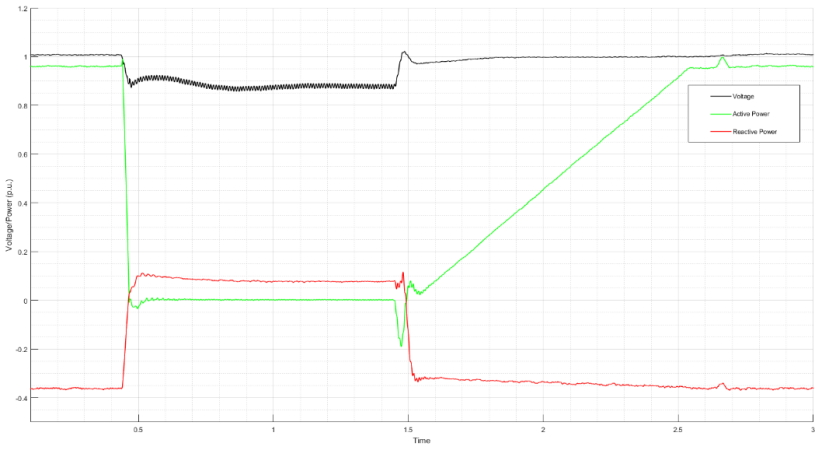


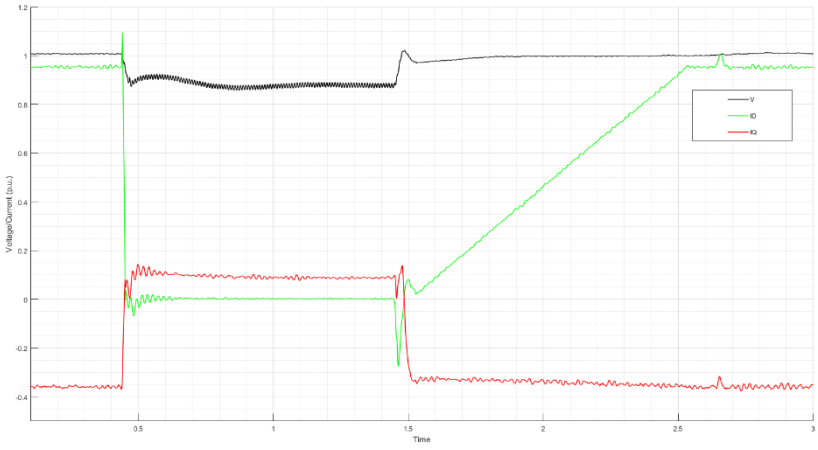




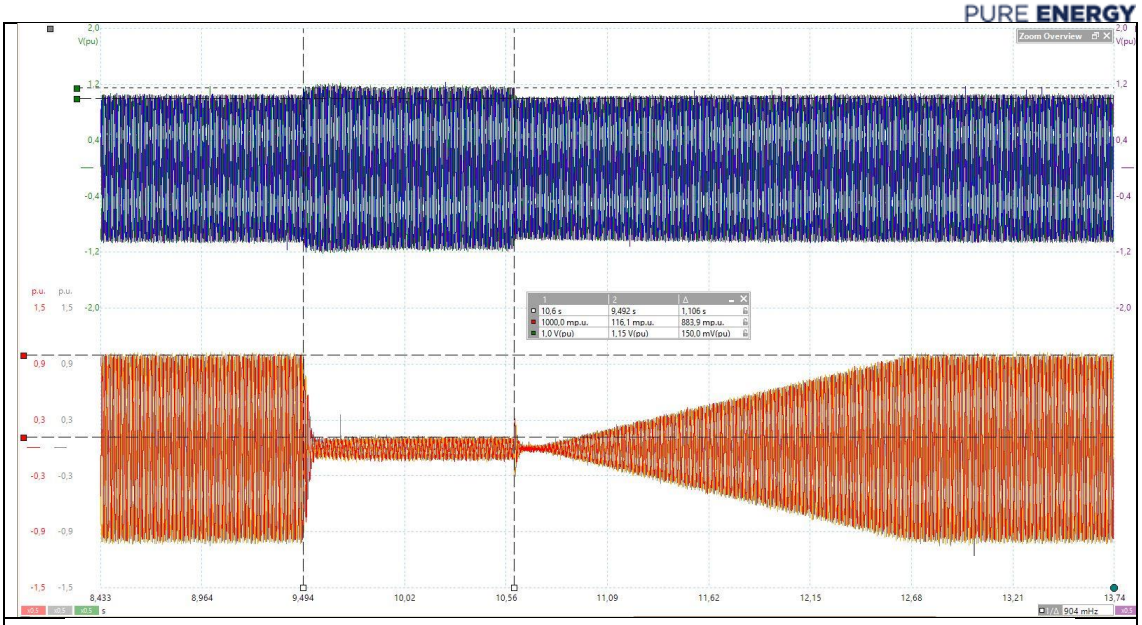
Graph 2.7

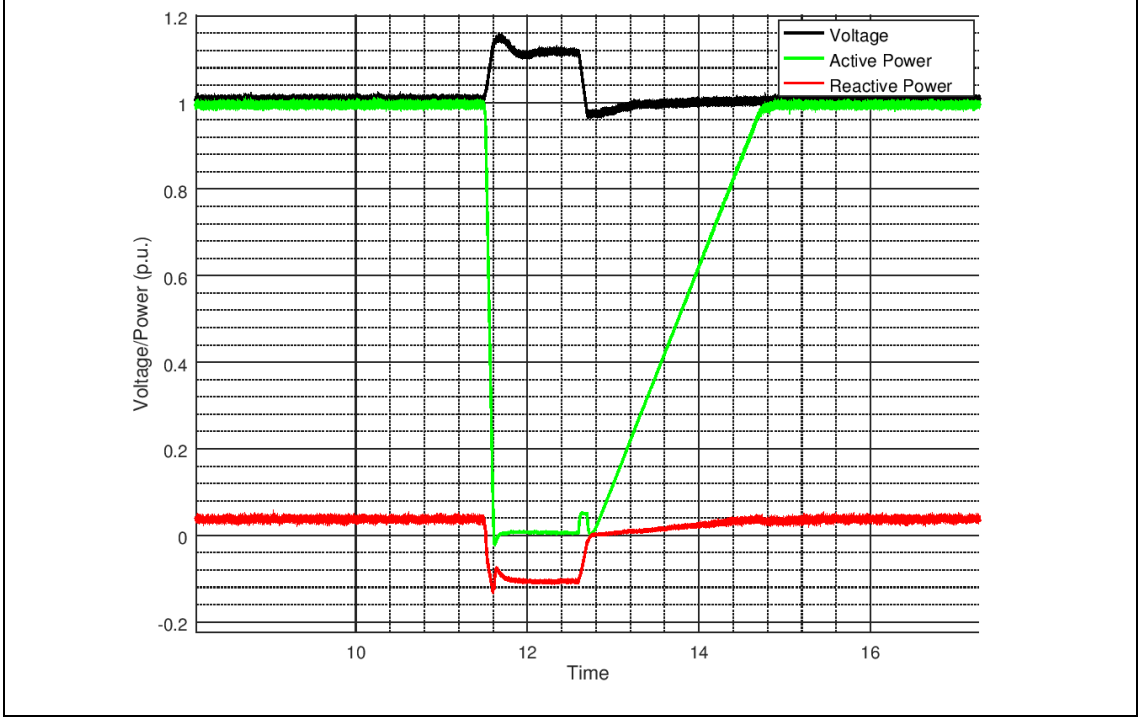


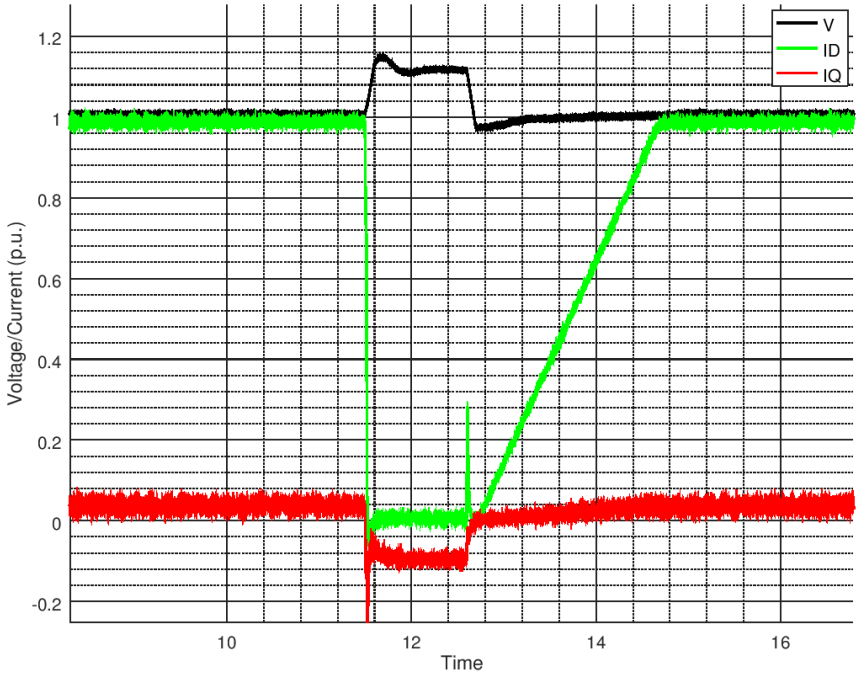




Graph 2.8







Graph 2.9