

# RITESINE LAB

## IEEE 519 - 1992 & IEEE 519 - 2014 COMPLIANCE REPORT

Name: ESP demo  
Project:  
Customer:  
Prepared by:

Date: 02.24.2025

### 1. REPORT SUMMARY:

RSL Compliance Report describes expected performance of a selected application under chosen work conditions. Calculations represent approximate values. System performance may vary due to parameter differences and actual conditions.

RSL Compliance Report includes a summary of chosen applications ability to meet IEEE Std 519-1992 and IEEE Std 519-2014 harmonic limits at the Point of Common Coupling (PCC) and other recommendations.

In the unlikely event that a particular combination of types of drives and filters does not meet the IEEE Std 519 harmonic limits at the PCC - please contact Sentinel Power Quality representative or send an e-mail to discuss this report.

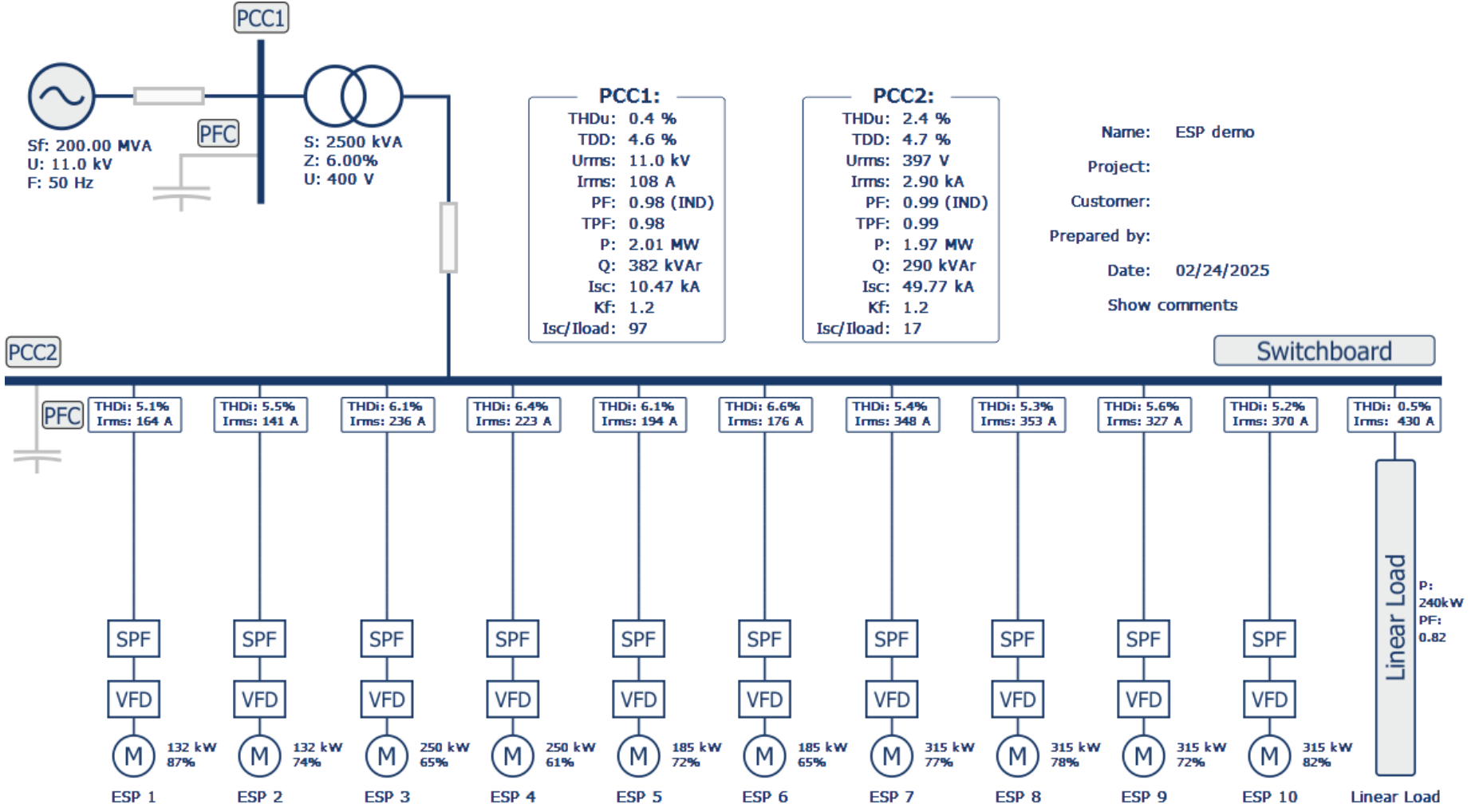
Information presented in this report is for estimating purposes only and Sentinel Power Quality FZE does not guarantee actual system performance due too many external variables.

### 2. SYSTEM SUMMARY:

POWER SUPPLY	
System Frequency, Hz	50
Fault Level, MVA	200.0
Short-Circuit Current, kA	10.5
Power Rating, MVA	-
Impedance, %	-
Nominal Voltage, kV	11.00
Background Voltage Distortion, %	-
System Voltage Unbalance, %	-
System Angle Unbalance, deg	-
TRANSFORMER	
Power Rating, kVA	2500.0
Primary Voltage, kV	11.00
Secondary Voltage, V	400
Impedance, %	6.00
Active Losses, %	2.00

### 3. POINTS OF COMMON COUPLING:

Point of common coupling	PCC 1	PCC 2
Voltage Total Harmonic Distortion, %	0.4	2.4
Current Total Harmonic Distortion, %	4.6	4.7
Total Current RMS, A	108	2.9
Short-Circuit Current, kA	10.5	49.8
Short Circuit to Load Current Ratio I <sub>sc</sub> /I <sub>L</sub>	97	17
Apparent Power, kVA	2047	1993
Active Power, kW	2011	1972
Reactive Power, kVA <sub>r</sub>	382	290
Displacement PF	0.98	0.99
True PF	0.98	0.99
K-Factor	1.2	1.2



5. IEEE 519-1992 and IEEE 519-2014 COMPLIANCE REPORT:

Point of Coupling: PCC1  
 Voltage of PCC: 11.00 kV  
 Short-Circuit Ratio: 97  
 Summary Table of Compliance with IEEE 519 Harmonic Limits:

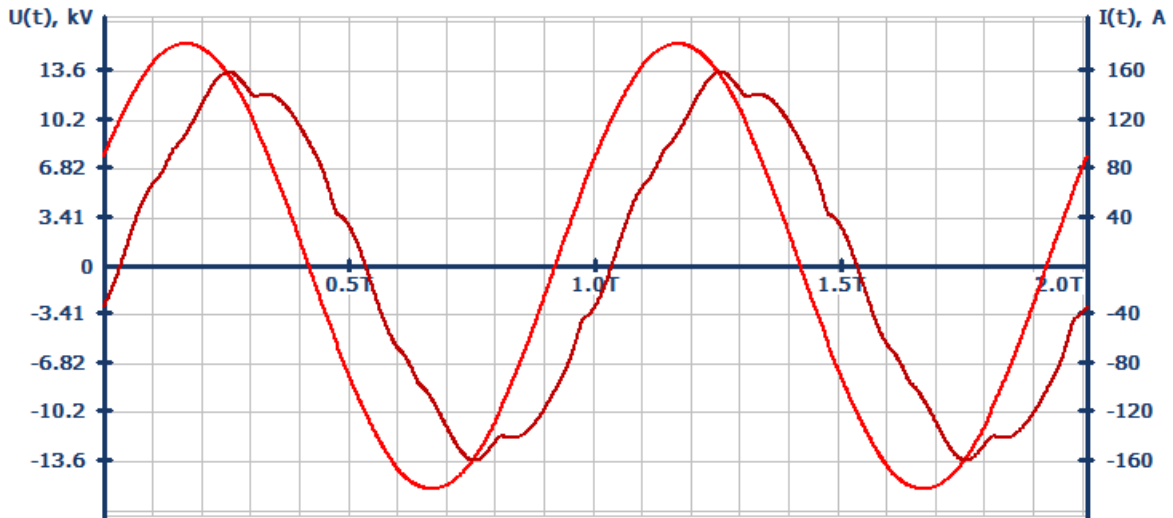
Harmonic Range	Results, %	IEEE 519-1992 Limits, %	IEEE 519-2014 Limits, %
Line Voltage Harmonic Distortion: THDu, %			
Total	0.40	5.00	PASS
Maximum Individual Voltage Harmonic, %			
1-50	0.26 (7h)	3.00	PASS
Current Total Demand Distortion: TDDi, %			
Total	4.65	12.00	PASS
Maximum Individual Current Harmonic, %			
2-10	3.64 (7h)	10.00	PASS
11-16	1.67 (11h)	4.50	PASS
17-22	0.70 (17h)	4.00	PASS
23-34	0.29 (23h)	1.50	PASS
35-50	0.10 (35h)	0.70	PASS

Point of Coupling: PCC2  
 Voltage of PCC: 400 V  
 Short-Circuit Ratio: 17  
 Summary Table of Compliance with IEEE 519 Harmonic Limits:

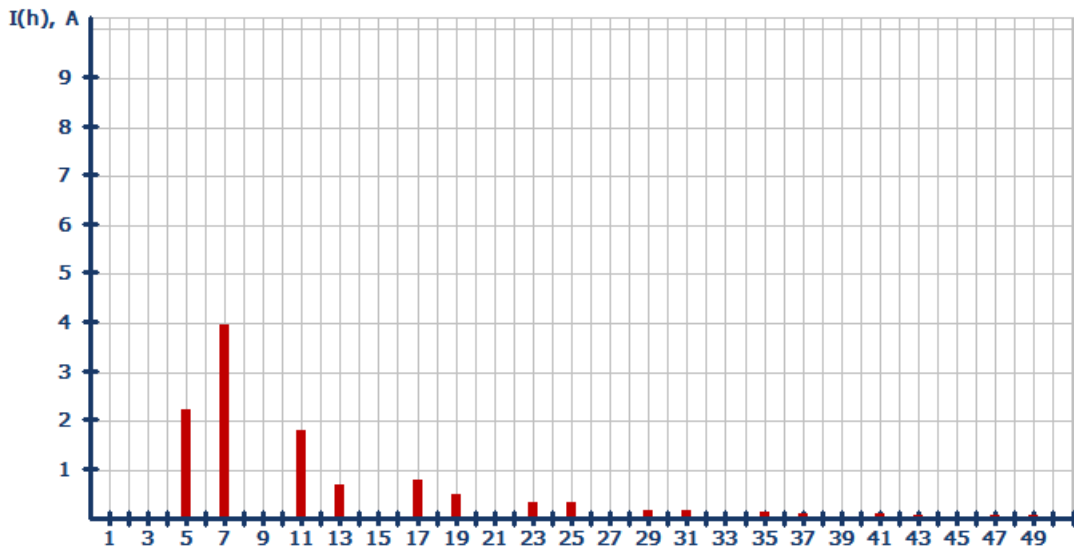
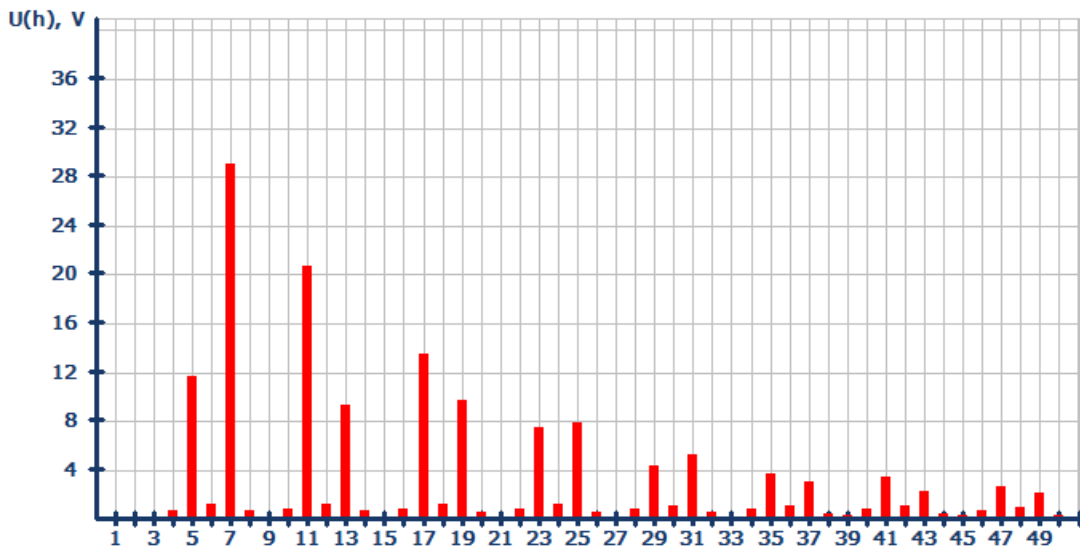
Harmonic Range	Results, %	IEEE 519-1992 Limits, %	IEEE 519-2014 Limits, %
Line Voltage Harmonic Distortion: THDu, %			
Total	2.34	5.00	PASS
Maximum Individual Voltage Harmonic, %			
1-50	1.53 (7h)	3.00	PASS
Current Total Demand Distortion: TDDi, %			
Total	4.74	5.00	PASS
Maximum Individual Current Harmonic, %			
2-10	3.72 (7h)	4.00	PASS
11-16	1.69 (11h)	2.00	PASS
17-22	0.71 (17h)	1.50	PASS
23-34	0.29 (23h)	0.60	PASS
35-50	0.09 (35h)	0.30	PASS

\*Notes: Based on provided information, this application **PASSES** IEEE Std 519 harmonic limits

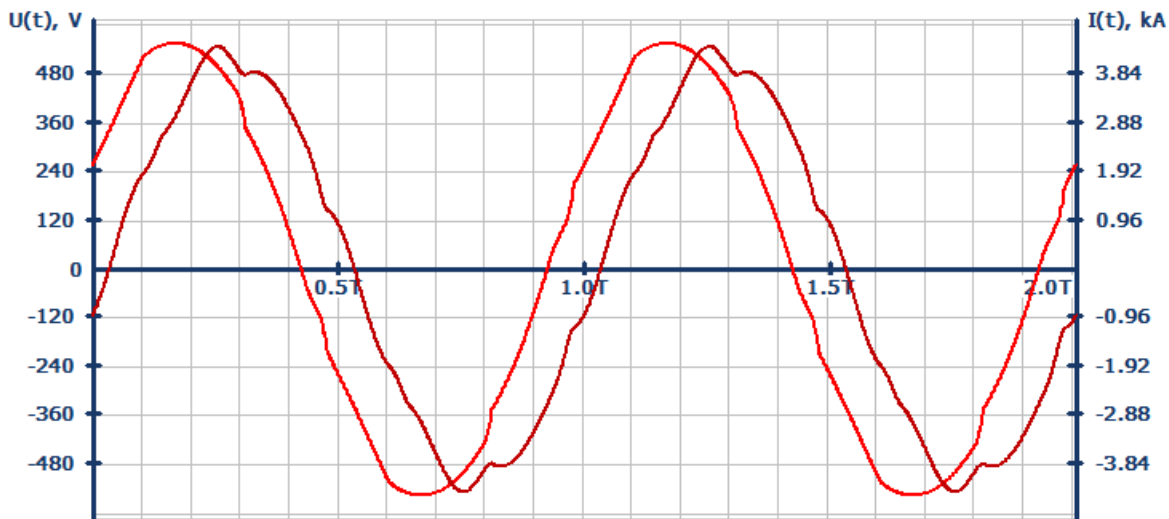
6. VOLTAGE AND CURRENT WAVEFORMS AT PCC1:



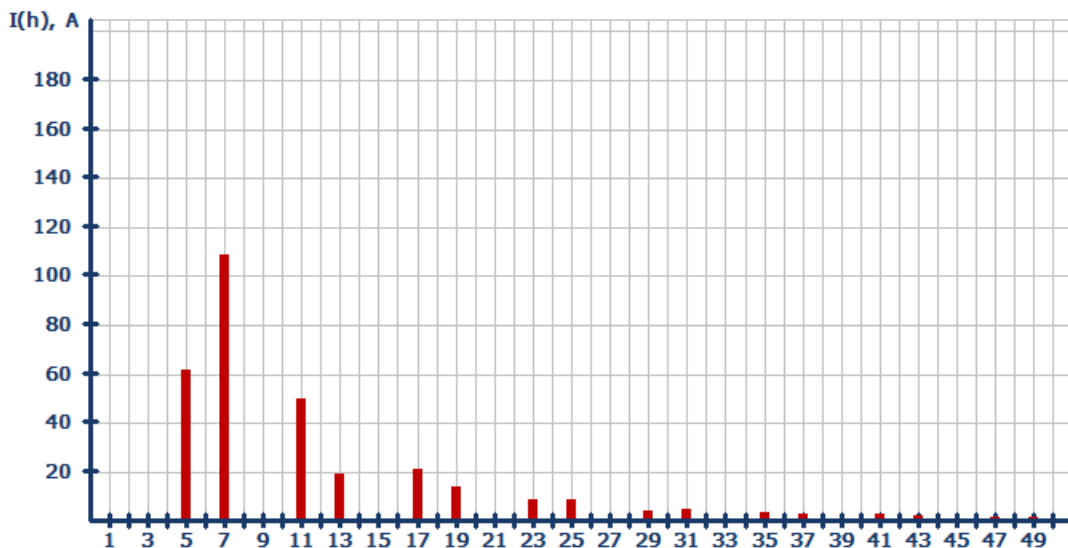
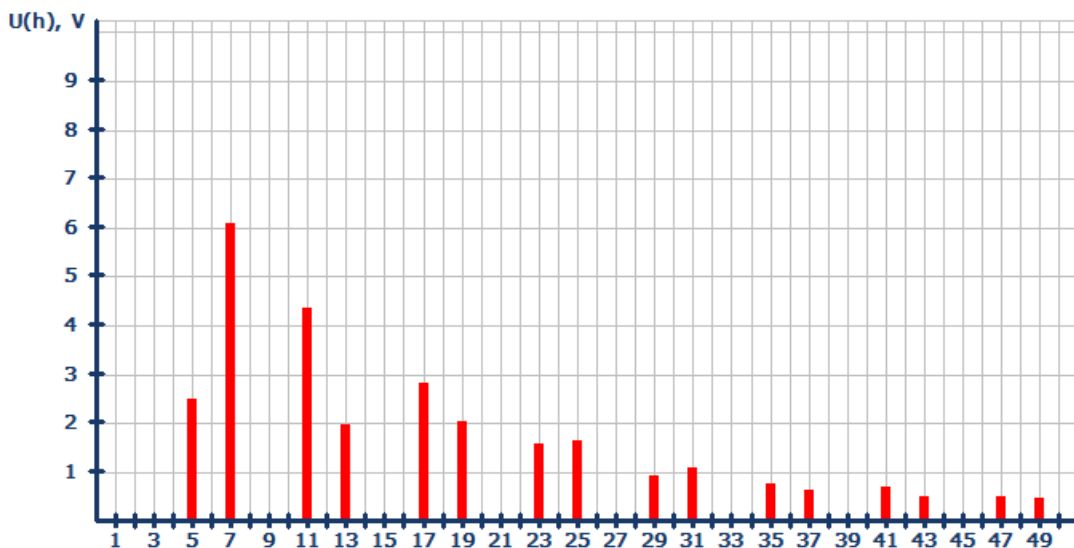
7. VOLTAGE AND CURRENT HARMONIC SPECTRUM AT PCC1:



8. VOLTAGE AND CURRENT WAVEFORMS AT PCC2:



9. VOLTAGE AND CURRENT HARMONIC SPECTRUM AT PCC2:



10. TABLE OF INDIVIDUAL HARMONIC DISTORTION RESULTS AT PCC1:

Harmonic	Voltage $U_{L1L2}$ , %	Voltage $U_{L1L2}$ , kV	Current $I_{L1}$ , %	Current $I_{L1}$ , A	Phase, °
1	100.0	10.99	100.0	107.7	-11
2	0.0	0.0	0.0	0.0	0
3	0.0	0.0	0.0	0.0	0
4	0.0	0.0	0.0	0.0	0
5	0.1	0.01	2.1	2.2	23
6	0.0	0.0	0.0	0.0	0
7	0.3	0.03	3.6	3.9	211
8	0.0	0.0	0.0	0.0	0
9	0.0	0.0	0.0	0.0	0
10	0.0	0.0	0.0	0.0	0
11	0.2	0.02	1.7	1.8	181
12	0.0	0.0	0.0	0.0	0
13	0.1	0.01	0.6	0.7	212
14	0.0	0.0	0.0	0.0	0
15	0.0	0.0	0.0	0.0	0
16	0.0	0.0	0.0	0.0	0
17	0.1	0.01	0.7	0.8	262
18	0.0	0.0	0.0	0.0	0
19	0.1	0.01	0.5	0.5	266
20	0.0	0.0	0.0	0.0	0
21	0.0	0.0	0.0	0.0	0
22	0.0	0.0	0.0	0.0	0
23	0.1	0.01	0.3	0.3	-28
24	0.0	0.0	0.0	0.0	0
25	0.1	0.01	0.3	0.3	-22
26	0.0	0.0	0.0	0.0	0
27	0.0	0.0	0.0	0.0	0
28	0.0	0.0	0.0	0.0	0
29	0.0	0.00	0.1	0.1	21
30	0.0	0.0	0.0	0.0	0
31	0.0	0.01	0.1	0.2	46
32	0.0	0.0	0.0	0.0	0
33	0.0	0.0	0.0	0.0	0
34	0.0	0.0	0.0	0.0	0
35	0.0	0.0	0.0	0.0	0
36	0.0	0.0	0.0	0.0	0
37	0.0	0.0	0.0	0.0	0
38	0.0	0.0	0.0	0.0	0
39	0.0	0.0	0.0	0.0	0
40	0.0	0.0	0.0	0.0	0
41	0.0	0.0	0.0	0.0	0
42	0.0	0.0	0.0	0.0	0
43	0.0	0.0	0.0	0.0	0
44	0.0	0.0	0.0	0.0	0
45	0.0	0.0	0.0	0.0	0
46	0.0	0.0	0.0	0.0	0
47	0.0	0.0	0.0	0.0	0
48	0.0	0.0	0.0	0.0	0
49	0.0	0.0	0.0	0.0	0
50	0.0	0.0	0.0	0.0	0

11. TABLE OF INDIVIDUAL HARMONIC DISTORTION RESULTS AT PCC2:

Harmonic	Voltage $U_{L1L2}$ , %	Voltage $U_{L1L2}$ , V	Current $I_{L1}$ , %	Current $I_{L1}$ , kA	Phase, °
1	100.0	396.6	100.0	2.90	-11
2	0.0	0.0	0.0	0.0	0
3	0.0	0.0	0.0	0.0	0
4	0.0	0.0	0.0	0.0	0
5	0.6	2.5	2.1	0.06	24
6	0.0	0.0	0.0	0.0	0
7	1.5	6.1	3.7	0.11	212
8	0.0	0.0	0.0	0.0	0
9	0.0	0.0	0.0	0.0	0
10	0.0	0.0	0.0	0.0	0
11	1.1	4.3	1.7	0.05	182
12	0.0	0.0	0.0	0.0	0
13	0.5	1.9	0.6	0.02	213
14	0.0	0.0	0.0	0.0	0
15	0.0	0.0	0.0	0.0	0
16	0.0	0.0	0.0	0.0	0
17	0.7	2.8	0.7	0.02	262
18	0.0	0.0	0.0	0.0	0
19	0.5	2.0	0.5	0.01	266
20	0.0	0.0	0.0	0.0	0
21	0.0	0.0	0.0	0.0	0
22	0.0	0.0	0.0	0.0	0
23	0.4	1.6	0.3	0.01	-28
24	0.0	0.0	0.0	0.0	0
25	0.4	1.6	0.3	0.01	-21
26	0.0	0.0	0.0	0.0	0
27	0.0	0.0	0.0	0.0	0
28	0.0	0.0	0.0	0.0	0
29	0.2	0.9	0.1	0.00	23
30	0.0	0.0	0.0	0.0	0
31	0.3	1.1	0.1	0.00	49
32	0.0	0.0	0.0	0.0	0
33	0.0	0.0	0.0	0.0	0
34	0.0	0.0	0.0	0.0	0
35	0.0	0.0	0.0	0.0	0
36	0.0	0.0	0.0	0.0	0
37	0.0	0.0	0.0	0.0	0
38	0.0	0.0	0.0	0.0	0
39	0.0	0.0	0.0	0.0	0
40	0.0	0.0	0.0	0.0	0
41	0.0	0.0	0.0	0.0	0
42	0.0	0.0	0.0	0.0	0
43	0.0	0.0	0.0	0.0	0
44	0.0	0.0	0.0	0.0	0
45	0.0	0.0	0.0	0.0	0
46	0.0	0.0	0.0	0.0	0
47	0.0	0.0	0.0	0.0	0
48	0.0	0.0	0.0	0.0	0
49	0.0	0.0	0.0	0.0	0
50	0.0	0.0	0.0	0.0	0