PROJECT

EE&SM(E)-I
CPWD
WING
ORGANISATION
LOCATION

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Elements

A1 - Assembly

Sl.No.	Description	Value	Unit
1	Reference	A1	
2	Name	ASSEMBLY	
3	Text 1		
4	Text 2		
5	Text 3		
6	Sub-elements	A1-Q1, A1-B1, A1-Q2, A1-Q3, A1-Q4	

A1-B1 - Bus Bar

Sl.No.	Description	Value	Unit
1	Reference	A1-B1	
2	In	630	A
3	Isc	25.0	kA
4	#P(T)	1	
5	#P(B)	3	
6	Bay Width	16	pt
7	DF	0.8	
8	Earthing resistance	0	
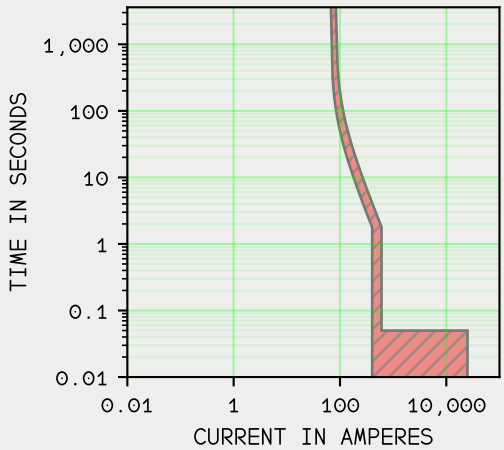
A1-Q1 - Circuit Breaker

Sl.No.	Description	Value	Unit
1	Reference	A1-Q1	
2	Name		
3	Closed ?	True	
4	Type	LV breakers	
5	Sub Type	ACB	
6	Line Protection curve	EM Trip	
7	Ground Protection curve	None	
8	Poles	TPN	
9	Un	0.415	kV
10	In	630	A
11	In_set	1	xIn
12	Isc	100.0	kA
13	Line Protection		

SL.No.	Description	Value	Unit
		A1-Q1 - L Instantaneous pickup current : 8 xIn Conventional fusing current : 1.3 xIr Conventional non fusing current : 1.05 xIr Time multiplier setting : 1 Line fault delay : 0 s Convensional time : 2 Hrs Instantaneous trip time (min) : 0.001 s Instantaneous trip time (max) : 0.05 s k : 80 c : 0 alpha : 2 Current pickup tolerance : 20 % Time delay tolerance : 20 %	
14	Drawout type ?	False	

A1-Q2 - Circuit Breaker

SL.No.	Description	Value	Unit
1	Reference	A1-Q2	
2	Name		
3	Closed ?	True	
4	Type	LV breakers	
5	Sub Type	MCCB	
6	Line Protection curve	EM Trip	
7	Ground Protection curve	None	
8	Poles	TPN	
9	Un	0.415	kV
10	In	63	A
11	In_set	1	xIn
12	Isc	25.0	kA
13	Line Protection		

SL.No.	Description	Value	Unit
		A1-Q2 - L Instantaneous pickup current : 8 xIn Conventional fusing current : 1.3 xIr Conventional non fusing current : 1.05 xIr Time multiplier setting : 1 Line fault delay : 0 s Convensional time : 2 Hrs Instantaneous trip time (min) : 0.001 s Instantaneous trip time (max) : 0.05 s k : 80 c : 0 alpha : 2 Current pickup tolerance : 20 % Time delay tolerance : 20 %	
14	Drawout type ?	False	

A1-Q3 - Circuit Breaker

SL.No.	Description	Value	Unit
1	Reference	A1-Q3	
2	Name		
3	Closed ?	True	
4	Type	LV breakers	
5	Sub Type	MCCB	
6	Line Protection curve	EM Trip	
7	Ground Protection curve	None	
8	Poles	TPN	
9	Un	0.415	kV
10	In	63	A
11	In_set	1	xIn
12	Isc	25.0	kA
13	Line Protection		

SL.No.	Description	Value	Unit
		A1-Q3 - L Instantaneous pickup current : 8 xIn Conventional fusing current : 1.3 xIr Conventional non fusing current : 1.05 xIr Time multiplier setting : 1 Line fault delay : 0 s Convensional time : 2 Hrs Instantaneous trip time (min) : 0.001 s Instantaneous trip time (max) : 0.05 s k : 80 c : 0 alpha : 2 Current pickup tolerance : 20 % Time delay tolerance : 20 %	
14	Drawout type ?	False	

A1-Q4 - Circuit Breaker

SL.No.	Description	Value	Unit
1	Reference	A1-Q4	
2	Name		
3	Closed ?	True	
4	Type	LV breakers	
5	Sub Type	MCCB	
6	Line Protection curve	EM Trip	
7	Ground Protection curve	None	
8	Poles	DP	
9	Un	0.415	kV
10	In	63	A
11	In_set	1	xIn
12	Isc	25.0	kA
13	Line Protection		

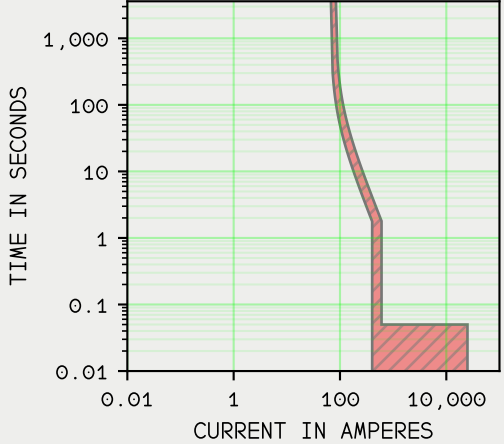| Sl.No.	Description	Value	Unit
		A1-Q4 - L Instantaneous pickup current : 8 xIn Conventional fusing current : 1.3 xIr Conventional non fusing current : 1.05 xIr Time multiplier setting : 1 Line fault delay : 0 s Convensional time : 2 Hrs Instantaneous trip time (min) : 0.001 s Instantaneous trip time (max) : 0.05 s k : 80 c : 0 alpha : 2 Current pickup tolerance : 20 % Time delay tolerance : 20 %	
14	Drawout type ?	False	
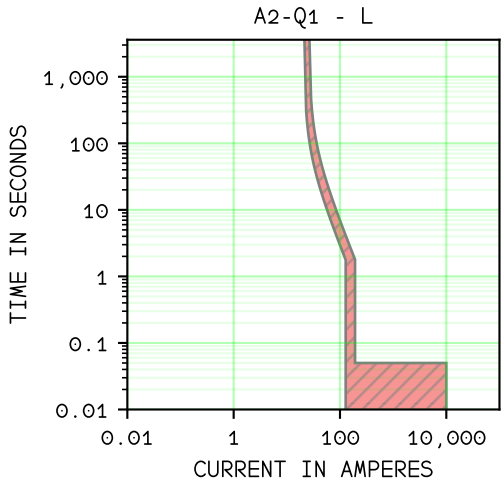
A2 - Assembly

Sl.No.	Description	Value	Unit
1	Reference	A2	
2	Name	ASSEMBLY	
3	Text 1		
4	Text 2		
5	Text 3		
6	Sub-elements	A2-Q1, A2-K1	

A2-K1 - Contactor

Sl.No.	Description	Value	Unit
1	Reference	A2-K1	
2	Name		
3	Type	AC-3	
4	Poles	TP	
5	Un	0.415	kV
6	In	20.0	A
7	Closed ?	True	

A2-Q1 - Circuit Breaker

Sl.No.	Description	Value	Unit
1	Reference	A2-Q1	
2	Name		
3	Closed ?	True	
4	Type	LV breakers	
5	Sub Type	MPCB	
6	Line Protection curve	EM Trip	
7	Poles	TPN	
8	Un	0.415	kV
9	In	20.0	A
10	In_set	1	xIn
11	Isc	10	kA
12	Line Protection	Instantaneous pickup current : 8 xIn Conventional fusing current : 1.3 xIr Conventional non fusing current : 1.05 xIr Time multiplier setting : 1 Line fault delay : 0 s Convensional time : 2 Hrs Instantaneous trip time (min) : 0.001 s Instantaneous trip time (max) : 0.05 s k : 80 c : 0 alpha : 2 Current pickup tolerance : 20 % Time delay tolerance : 20 %	
13	Drawout type ?	False	

G1 - External Grid

Sl.No.	Description	Value	Unit
1	Reference	G1	
2	Name	EXTERNAL GRID	
3	Vm	1	pu
4	Vm<	0	degree
5	Vn	11	kV
6	Ssc_max	500	MVA

Sl.No.	Description	Value	Unit
7	Ssc_min	100	MVA
8	R/X max	0.2	
9	R/X min	0.05	
10	R0/X0 max	0.2	
11	R0/X0 min	0.1	
12	X0/X max	3	
13	X0/X min	1	
14	In Service ?	True	

M1 - Motor 3ph

Sl.No.	Description	Value	Unit
1	Reference	M1	
2	Name		
3	PF	0.85	
4	DF	1	
5	In Service ?	True	
6	Load Profile	Midrise Apartment - Building - Elevator	
7	Mechanical rated power	7.5	kW
8	Efficiency at operating point	88.1	%
9	Isc/In	7.0	
10	R/X	0.42	
11	Damage curve	Acceleration time : 5 s Safe stall time : 20 s	
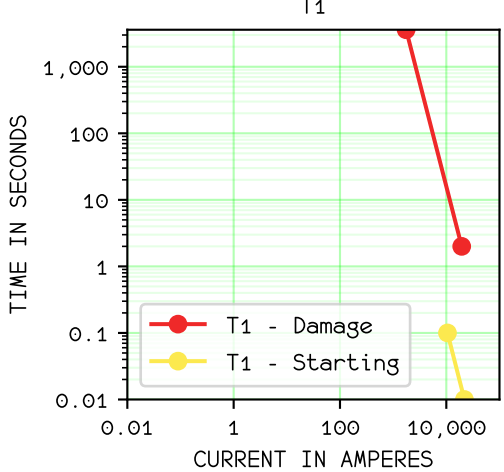
Q1 - Fuse

Sl.No.	Description	Value	Unit
1	Reference	Q1	
2	Name		
3	Closed ?	True	
4	Type	MV HRC	
5	Poles	TP	

SL.No.	Description	Value	Unit
6	Un	0.415	kV
7	In	80.0	A
8	In_set	1.0	xIn
9	Isc	63.0	kA
10	Line Protection		
11	Switch Disconnector ?	True	

Q1 - L

T1 - Transformer

SL.No.	Description	Value	Unit
1	Reference	T1	
2	Name	IS1180, EEL2	
3	Sn	0.63	MVA
4	Un (HV)	11.0	kV
5	Un (LV)	0.415	kV
6	Usc (Real)	0.7	%
7	Usc	4.5	%
8	U0sc (Real)	0.7	%
9	U0sc	4.5	%
10	Zm0/Z0	10.0	
11	R0m/X0m	0.0	
12	Fraction of U0 on HV side	0.1	
13	Shift Degree	30.0	deg
14	Vector Group	Dyn	
15	Pfe	0.713	kW
16	Io	2.5	%
17	HV Symbol	D	
18	LV Symbol	Yn	
19	Tap side	hv	
20	Minimum tap position	-2	
21	Maximum tap position	4	
22	Current tap position	0	
23	Tap step size	2.5	%
24	OLTC provided ?	False	

Sl.No.	Description	Value	Unit
25	Impedance of the grounding reactor	0	Ohm
26	Damage curve

Short time emergency Load : 2 xIn
Short circuit withstand time : 2 s
Inrush current @ 0.1 s : 12 s
Inrush current @ 0.01 s : 25 s | |

W1 - Line (Custom Geometry)

Sl.No.	Description	Value	Unit
1	Reference	W1	
2	Name	OH FEEDER	
3	Length	1	km
4	Conductor material	Aluminium	
5	R	0.448	Ohm/km
6	X	0.322	Ohm/km
7	C	11.431	nF/km
8	R0n	0.596	Ohm/km
9	X0n	1.653	Ohm/km
10	R0g	0.596	Ohm/km
11	X0g	1.653	Ohm/km
12	Tf	250	degC
13	Imax	0.3	kA
14	Isc phase (1s)	8.145	kA
15	Isc cpe (1s)	0.0	kA
16	DF	1	
17	Designation	ACSR Raccoon (80)	
18	# Parallel Lines	1	
19	Damage curve		

Sl.No.	Description	Value	Unit
		W1 - Damage curve	
20	In Service ?	True	
21	Line type	OH Line - 3 phase with earth return Triangular arrangement	
2	Phase nominal cross-sectional area	80.0	sq.mm.
3	Conductor Diameter	12.27	mm
4	D1	0.9	m
5	D2	0.6	m
6	Soil resistivity	100	Ohm.m
7	Line Working Temperature	70	degC
8	Additional DF	1	

W2 - LV Cable (IEC)

Sl.No.	Description	Value	Unit
1	Reference	W2	
2	Name		
3	Length	0.3	km
4	Conductor material	Aluminium	
5	Insulation	XLPE/EPR	
6	R	0.32	Ohm/km
7	X	0.08	Ohm/km
8	C	290.0	nF/km
9	R0n	1.969	Ohm/km
10	X0n	0.32	Ohm/km
11	R0g	6.986	Ohm/km
12	X0g	0.74	Ohm/km
13	Tf	250	degC
14	Imax	0.192	kA
15	Isc phase (1s)	11.346	kA
16	Isc cpe (1s)	4.755	kA
17	DF	0.75	
18	Designation	3.5x120 A2XFY	

SL.No.	Description	Value	Unit
19	# Parallel Lines	2	
20	Damage curve		
21	In Service ?	True	
22	Phase nominal cross-sectional area	120.0	sq.mm.
23	Neutral cross-sectional area	0.583	xSph
24	Type	3ph	
25	CPE Conductor	Cable armour	
26	Armour material	Steel	
27	Armour nominal cross-sectional area	92.0	sq.mm.
28	Laying type	Reference method D2 - Multi-core cable in the ground	
7	Laying arrangement	Cables touching	
8	# of cables in group	2	
9	# of layers	1	
10	Ground temperature	20	degC
11	Soil thermal resistivity	2.5	K·m/W
12	Additional DF	1	
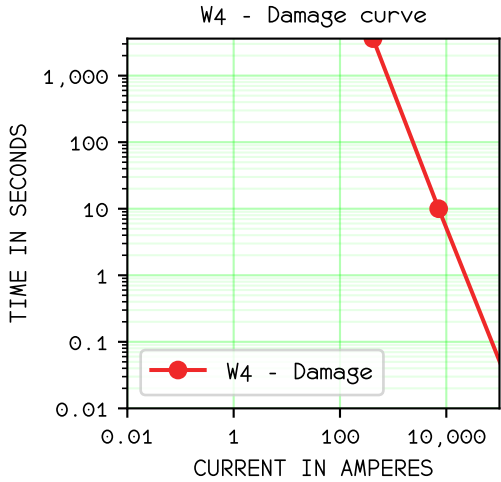
W3 - LV Cable (IEC)

SL.No.	Description	Value	Unit
1	Reference	W3	
2	Name		
3	Length	0.3	km
4	Conductor material	Aluminium	
5	Insulation	XLPE/EPR	
6	R	0.32	Ohm/km
7	X	0.08	Ohm/km
8	C	290.0	nF/km
9	R0n	1.969	Ohm/km
10	X0n	0.32	Ohm/km

SL.No.	Description	Value	Unit
11	R0g	6.986	Ohm/km
12	X0g	0.74	Ohm/km
13	Tf	250	degC
14	Imax	0.174	kA
15	Isc phase (1s)	11.346	kA
16	Isc cpe (1s)	4.755	kA
17	DF	1	
18	Designation	3.5x120 A2XFY	
19	# Parallel Lines	2	
20	Damage curve		
21	In Service ?	True	
22	Phase nominal cross-sectional area	120.0	sq.mm.
23	Neutral cross-sectional area	0.583	xSph
24	Type	3ph	
25	CPE Conductor	Cable armour	
26	Armour material	Steel	
27	Armour nominal cross-sectional area	92.0	sq.mm.
28	Laying type	Reference method D1 - Multi-core cable in ducts in the ground	
6	Laying arrangement	Ducts touching	
7	# of cables in group	1	
8	# of Layers	1	
9	Ground temperature	20	degC
10	Soil thermal resistivity	2.5	K·m/W
11	Additional DF	1	

W4 - LV Cable (IEC)

SL.No.	Description	Value	Unit
1	Reference	W4	
2	Name		

SL.No.	Description	Value	Unit
3	Length	0.05	km
4	Conductor material	Aluminium	
5	Insulation	XLPE/EPR	
6	R	0.32	Ohm/km
7	X	0.08	Ohm/km
8	C	290.0	nF/km
9	R0n	1.969	Ohm/km
10	X0n	0.32	Ohm/km
11	R0g	6.986	Ohm/km
12	X0g	0.74	Ohm/km
13	Tf	250	degC
14	Imax	0.192	kA
15	Isc phase (1s)	11.346	kA
16	Isc cpe (1s)	4.755	kA
17	DF	0.75	
18	Designation	3.5x120 A2XFY	
19	# Parallel Lines	2	
20	Damage curve		
21	In Service ?	True	
22	Phase nominal cross-sectional area	120.0	sq.mm.
23	Neutral cross-sectional area	0.583	xSph
24	Type	3ph	
25	CPE Conductor	Cable armour	
26	Armour material	Steel	
27	Armour nominal cross-sectional area	92.0	sq.mm.
28	Laying type	Reference method D2 - Multi-core cable in the ground	
7	Laying arrangement	Cables touching	
8	# of cables in group	2	
9	# of layers	1	
10	Ground temperature	20	degC

Sl.No.	Description	Value	Unit
11	Soil thermal resistivity	2.5	K·m/W
12	Additional DF	1	

W5 - Bus Trunking

Sl.No.	Description	Value	Unit
1	Reference	W5	
2	Name		
3	Length	0.015	km
4	R	0.068	Ohm/km
5	X	0.017	Ohm/km
6	R0n	0.239	Ohm/km
7	X0n	0.068	Ohm/km
8	R0g	0.443	Ohm/km
9	X0g	0.266	Ohm/km
10	Tf	155	degC
11	Imax	1.0	kA
12	DF	1	
13	Designation	1000A-SCP-AL	
14	Damage curve		
15	In Service ?	True	
16	Rn	0.057	Ohm/km
17	Xn	0.017	Ohm/km
18	Rpe	0.125	Ohm/km
19	Xp-pe	0.1	Ohm/km
20	Icw (1s)	30.0	kA
21	Ipk	66.0	kA

X1 - Load 3ph

Sl.No.	Description	Value	Unit
1	Reference	X1	
2	Name		
3	Rated power	100.0	kVA
4	PF	0.8	

SL.No.	Description	Value	Unit
5	DF	1	
6	Inductive ?	True	
7	In Service ?	True	
8	Load Profile	Large Office - Building - Equipment	

X2 - Load 1ph

SL.No.	Description	Value	Unit
1	Reference	X2	
2	Name		
3	Rated power	25.0	kVA
4	PF	0.8	
5	DF	1	
6	Phase	A	
7	Inductive ?	True	
8	In Service ?	True	
9	Load Profile	Midrise Apartment - Apartment - Equipment	

Bill of Quantities

Lines

SL.No.	Reference	Name	Designation	Type	# Parallel Lines	Length	Imax	Derating Factor	In Service?	% Loading	P Loss	% P Loss	Item Class
						km	kA			%	MW	%	
1	W1	OH FEEDER	ACSR Raccoon (80)	Over Head	1	1	0.3	1	True	2.6	6e-05	0.06	Line (Custom Geometry)
2	W2		3.5x120 A2XFY	Under Ground	2	0.3	0.192	0.75	True	1.9	0.0	0.13	LV Cable (IEC)
3	W3		3.5x120 A2XFY	Under Ground	2	0.3	0.174	1	True	37.5	0.00243	3.25	LV Cable (IEC)
4	W4		3.5x120 A2XFY	Under Ground	2	0.05	0.192	0.75	True	45.3	0.00041	0.56	LV Cable (IEC)
5	W5		1000A-SCP-AL	Under Ground	1	0.015	1.0	1	True	22.6	9e-05	0.1	Bus Trunking
Σ											0.00299		

Loads

SL.No.	Reference	Name	Rated power	PF	Sa	Sb	Sc	In Service?	Load Profile	Item Class
			kVA		kVA	kVA	kVA			
1	X1		100.0	0.8 Lag				True	Large Office - Building - Equipment	Load 3ph
2	X2		25.0	0.8 Lag	20.0+j15.0	0+j0	0+j0	True	Midrise Apartment - Apartment - Equipment	Load 1ph
3	M1		7.7735	0.85 Lag				True	Midrise Apartment - Building - Elevator	Motor 3ph

SL.No.	Reference	Name	Rated power	PF	Sa	Sb	Sc	In Service?	Load Profile	Item Class
Σ			132.7735							

Switches

SL.No.	Reference	Type	Poles	Un	In	Closed
				kV	A	
1	Q1	MV HRC	TP	0.415	80.0	True
2	A1-Q1	LV breakers	TPN	0.415	630	True
3	A1-Q2	LV breakers	TPN	0.415	63	True
4	A1-Q3	LV breakers	TPN	0.415	63	True
5	A1-Q4	LV breakers	DP	0.415	63	True
6	A2-Q1	LV breakers	TPN	0.415	20.0	True
7	A2-K1	AC-3	TP	0.415	20.0	True

Nodes

Node ID	Vn	ΔV	Isc (sym, max)	Isc (sym, min)	Isc (pk, max)	Isc (L-G, max)	Isc (L-G, min)
	kV	%	kA	kA	kA	kA	kA
1	11.0	0.07	9.1	3.56	14.08	5.23	2.85
2	11.0	0.01	26.25	5.25	57.82	15.75	5.24
3	11.0	0.07	9.1	3.56	14.08	5.23	2.85
4	0.415	3.54	4.41	2.28	6.37	0.64	0.31
5	0.415	3.96	3.86	1.98	5.58	0.55	0.26
6	0.415	0.96	19.58	15.95	42.93	20.0	16.81
7	0.415	1.09	18.87	15.24	38.52	16.98	13.86
8	0.415	1.19	4.47	2.34	6.45	0.64	0.31
9	0.415	1.19	4.47	2.34	6.45	0.64	0.31
10	0.415	1.09	18.87	15.24	38.52	16.98	13.86
11	0.415	1.09	18.87	15.24	38.52	16.98	13.86

Node ID	Vn	ΔV	Isc (sym, max)	Isc (sym, min)	Isc (pk, max)	Isc (L-G, max)	Isc (L-G, min)
12	0.415	1.19	4.47	2.34	6.45	0.64	0.31
13	0.415	1.09	18.87	15.24	38.52	16.98	13.86
14	0.415	1.09	18.87	15.24	38.52	16.98	13.86
15							

Load Profiles

Large Office - Building - Equipment
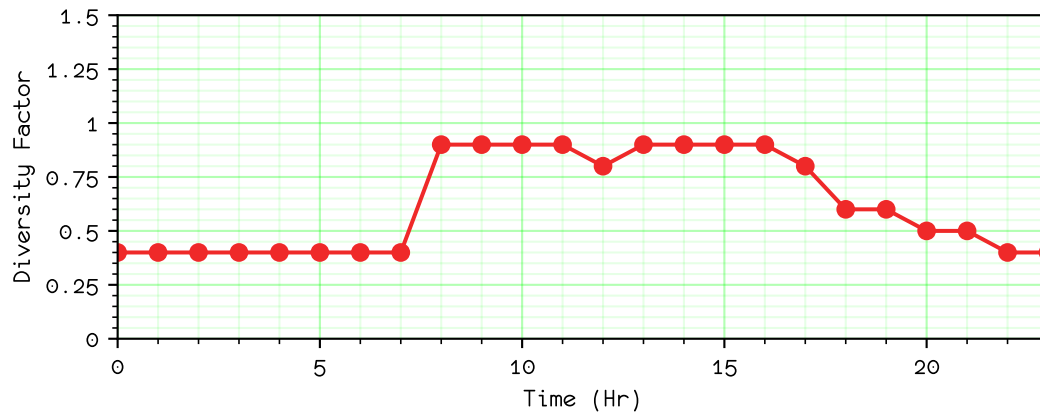
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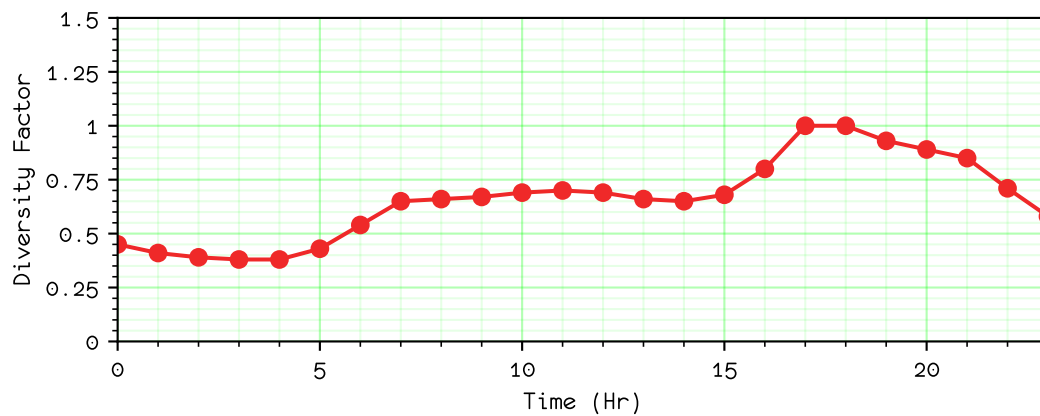
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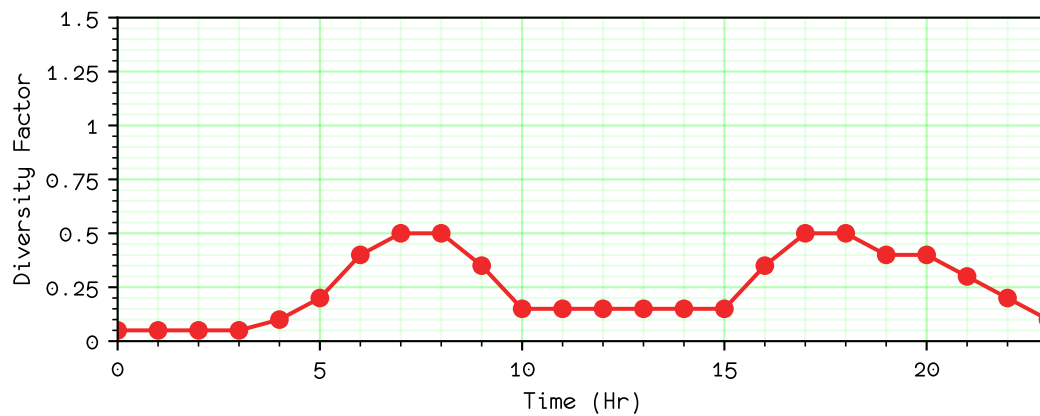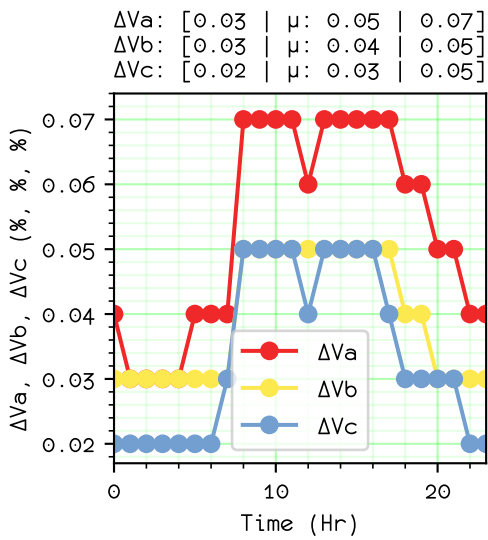
Analysis

Analysis options

SL.No.	Description	Value	Unit
1	Run diagnostics	True	
2	Enable assymetric power flow calculation	True	
3	Run time series power flow	True	
4	Run symmetric short circuit calculation	True	
5	Run line to ground short circuit calculation	True	
6	Export results of simulation	True	
7	Include graphs in report	True	
8	Power flow method	Time series	
9	Grid voltage tolerance	6.0	%
10	Grid Frequency	50	Hz
11	Fault resistance	0.0	Ohm
12	Fault reactance	0.0	Ohm

Analysis results

1 - Network Node

SL.No.	Description	Value	Unit
1	Vn	11.0	kV
2	ΔVa, ΔVb, ΔVc		%, %, %
3	ΔV		%

ΔVa: [0.03 | μ: 0.05 | 0.07]
ΔVb: [0.03 | μ: 0.04 | 0.05]
ΔVc: [0.02 | μ: 0.03 | 0.05]

SL.No.	Description	Value	Unit
		[0.03 | µ: 0.05 | 0.07]	
4	ΔV (max)	0.07	%
5	Z12 (sym, max)	0.5002 + j0.583	Ohm
6	Z12 (sym, min)	0.9206 + j1.5305	Ohm
7	Isc (sym, max)	9.1	kA
8	Isc (sym, min)	3.56	kA
9	Isc (pk, max)	14.08	kA
10	Z12 (L-G, max)	0.5002 + j0.583	Ohm
11	Z12 (L-G, min)	0.9206 + j1.5305	Ohm
12	Z0 (L-G, max)	0.7526 + j2.4361	Ohm
13	Z0 (L-G, min)	1.2652 + j2.8615	Ohm
14	Isc (L-G, max)	5.23	kA
15	Isc (L-G, min)	2.85	kA

10 - Network Node

SL.No.	Description	Value	Unit
1	Vn	0.415	kV
2	ΔVa, ΔVb, ΔVc	ΔVa: [0.5 | µ: 0.79 | 1.09] ΔVb: [0.31 | µ: 0.46 | 0.65] ΔVc: [0.3 | µ: 0.44 | 0.63] 	%, %, %
3	ΔV		%

Sl.No.	Description	Value	Unit
		[0.5 | μ: 0.79 | 1.09] ΔV (%) plot vs Time (Hr)	
4	ΔV (max)	1.09	%
5	Z12 (sym, max)	0.0036 + j0.0129	Ohm
6	Z12 (sym, min)	0.0047 + j0.0142	Ohm
7	Isc (sym, max)	18.87	kA
8	Isc (sym, min)	15.24	kA
9	Isc (pk, max)	38.52	kA
10	Z12 (L-G, max)	0.0036 + j0.0129	Ohm
11	Z12 (L-G, min)	0.0047 + j0.0142	Ohm
12	Z0 (L-G, max)	0.0085 + j0.0158	Ohm
13	Z0 (L-G, min)	0.0121 + j0.0158	Ohm
14	Isc (L-G, max)	16.98	kA
15	Isc (L-G, min)	13.86	kA

11 - Network Node

Sl.No.	Description	Value	Unit
1	Vn	0.415	kV
2	ΔVa, ΔVb, ΔVc	ΔVa: [0.5 | μ: 0.79 | 1.09] ΔVb: [0.31 | μ: 0.46 | 0.65] ΔVc: [0.3 | μ: 0.44 | 0.63] ΔVa, ΔVb, ΔVc (%, %, %) plot vs Time (Hr)	%, %, %
3	ΔV		%

Sl.No.	Description	Value	Unit
		[0.5 | μ: 0.79 | 1.09] ΔV (%) vs Time (Hr) chart	
4	ΔV (max)	1.09	%
5	Z12 (sym, max)	0.0036 + j0.0129	Ohm
6	Z12 (sym, min)	0.0047 + j0.0142	Ohm
7	Isc (sym, max)	18.87	kA
8	Isc (sym, min)	15.24	kA
9	Isc (pk, max)	38.52	kA
10	Z12 (L-G, max)	0.0036 + j0.0129	Ohm
11	Z12 (L-G, min)	0.0047 + j0.0142	Ohm
12	Z0 (L-G, max)	0.0085 + j0.0158	Ohm
13	Z0 (L-G, min)	0.0121 + j0.0158	Ohm
14	Isc (L-G, max)	16.98	kA
15	Isc (L-G, min)	13.86	kA

12 - Network Node

Sl.No.	Description	Value	Unit
1	Vn	0.415	kV
2	ΔVa, ΔVb, ΔVc	ΔVa: [0.51 | μ: 0.84 | 1.19] ΔVb: [0.32 | μ: 0.52 | 0.76] ΔVc: [0.31 | μ: 0.5 | 0.74] ΔVa, ΔVb, ΔVc (%, %, %) vs Time (Hr) chart	%, %, %
3	ΔV		%

Sl.No.	Description	Value	Unit
		[0.51	μ: 0.84	1.19] ΔV (%) vs Time (Hr) chart	
4	ΔV (max)	1.19	%
5	Z12 (sym, max)	0.0516 + j0.0249	Ohm
6	Z12 (sym, min)	0.0969 + j0.0262	Ohm
7	Isc (sym, max)	4.47	kA
8	Isc (sym, min)	2.34	kA
9	Isc (pk, max)	6.45	kA
10	Z12 (L-G, max)	0.0516 + j0.0249	Ohm
11	Z12 (L-G, min)	0.0969 + j0.0262	Ohm
12	Z0 (L-G, max)	1.0564 + j0.1268	Ohm
13	Z0 (L-G, min)	2.0241 + j0.1268	Ohm
14	Isc (L-G, max)	0.64	kA
15	Isc (L-G, min)	0.31	kA

12 - Network Node

Sl.No.	Description	Value	Unit
1	Vn	0.415	kV
2	ΔVa, ΔVb, ΔVc	ΔVa: [0.51	μ: 0.84	1.19] ΔVb: [0.32	μ: 0.52	0.76] ΔVc: [0.31	μ: 0.5	0.74] ΔVa, ΔVb, ΔVc (%, %, %) vs Time (Hr) chart	%, %, %
3	ΔV		%

Sl.No.	Description	Value	Unit
		[0.51 | μ: 0.84 | 1.19]	
4	ΔV (max)	1.19	%
5	Z12 (sym, max)	0.0516 + j0.0249	Ohm
6	Z12 (sym, min)	0.0969 + j0.0262	Ohm
7	Isc (sym, max)	4.47	kA
8	Isc (sym, min)	2.34	kA
9	Isc (pk, max)	6.45	kA
10	Z12 (L-G, max)	0.0516 + j0.0249	Ohm
11	Z12 (L-G, min)	0.0969 + j0.0262	Ohm
12	Z0 (L-G, max)	1.0564 + j0.1268	Ohm
13	Z0 (L-G, min)	2.0241 + j0.1268	Ohm
14	Isc (L-G, max)	0.64	kA
15	Isc (L-G, min)	0.31	kA

13 - Network Node

Sl.No.	Description	Value	Unit
1	Vn	0.415	kV
2	ΔVa, ΔVb, ΔVc	ΔVa: [0.5 | μ: 0.79 | 1.09] ΔVb: [0.31 | μ: 0.46 | 0.65] ΔVc: [0.3 | μ: 0.44 | 0.63]	%, %, %
3	ΔV		%
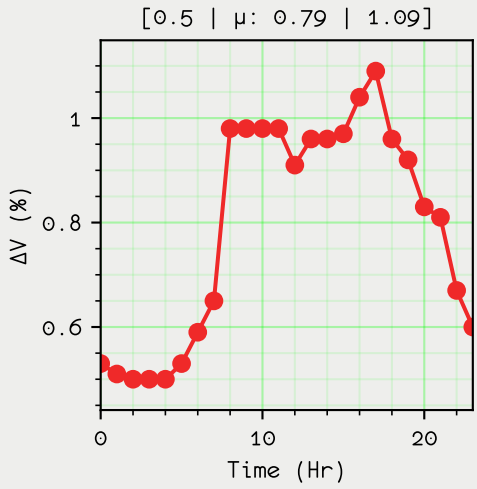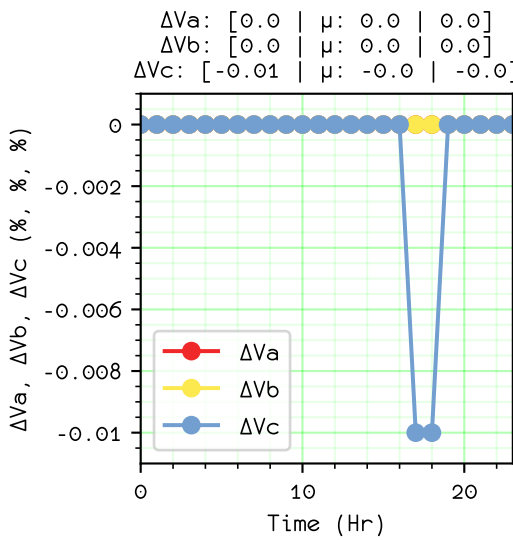
Sl.No.	Description	Value	Unit
		[0.5 | μ: 0.79 | 1.09] 	
4	ΔV (max)	1.09	%
5	Z12 (sym, max)	0.0036 + j0.0129	Ohm
6	Z12 (sym, min)	0.0047 + j0.0142	Ohm
7	Isc (sym, max)	18.87	kA
8	Isc (sym, min)	15.24	kA
9	Isc (pk, max)	38.52	kA
10	Z12 (L-G, max)	0.0036 + j0.0129	Ohm
11	Z12 (L-G, min)	0.0047 + j0.0142	Ohm
12	Z0 (L-G, max)	0.0085 + j0.0158	Ohm
13	Z0 (L-G, min)	0.0121 + j0.0158	Ohm
14	Isc (L-G, max)	16.98	kA
15	Isc (L-G, min)	13.86	kA

14 - Network Node

Sl.No.	Description	Value	Unit
1	Vn	0.415	kV
2	ΔVa, ΔVb, ΔVc	ΔVa: [0.5 | μ: 0.79 | 1.09] ΔVb: [0.31 | μ: 0.46 | 0.65] ΔVc: [0.3 | μ: 0.44 | 0.63] 	%, %, %
3	ΔV		%

SL.No.	Description	Value	Unit
		[0.5 | μ: 0.79 | 1.09] 	
4	ΔV (max)	1.09	%
5	Z12 (sym, max)	0.0036 + j0.0129	Ohm
6	Z12 (sym, min)	0.0047 + j0.0142	Ohm
7	Isc (sym, max)	18.87	kA
8	Isc (sym, min)	15.24	kA
9	Isc (pk, max)	38.52	kA
10	Z12 (L-G, max)	0.0036 + j0.0129	Ohm
11	Z12 (L-G, min)	0.0047 + j0.0142	Ohm
12	Z0 (L-G, max)	0.0085 + j0.0158	Ohm
13	Z0 (L-G, min)	0.0121 + j0.0158	Ohm
14	Isc (L-G, max)	16.98	kA
15	Isc (L-G, min)	13.86	kA

2 - Network Node

SL.No.	Description	Value	Unit
1	Vn	11.0	kV
2	ΔVa, ΔVb, ΔVc	ΔVa: [0.0 | μ: 0.0 | 0.0] ΔVb: [0.0 | μ: 0.0 | 0.0] ΔVc: [-0.01 | μ: -0.0 | -0.0] 	%, %, %
3	ΔV		%

SL.No.	Description	Value	Unit
		[0.0 | μ: 0.0 | 0.01]	
4	ΔV (max)	0.01	%
5	Z12 (sym, max)	0.0522 + j0.261	Ohm
6	Z12 (sym, min)	0.0604 + j1.2085	Ohm
7	Isc (sym, max)	26.25	kA
8	Isc (sym, min)	5.25	kA
9	Isc (pk, max)	57.82	kA
10	Z12 (L-G, max)	0.0522 + j0.261	Ohm
11	Z12 (L-G, min)	0.0604 + j1.2085	Ohm
12	Zo (L-G, max)	0.1566 + j0.7831	Ohm
13	Zo (L-G, min)	0.1208 + j1.2085	Ohm
14	Isc (L-G, max)	15.75	kA
15	Isc (L-G, min)	5.24	kA

3 - Network Node

SL.No.	Description	Value	Unit
1	Vn	11.0	kV
2	ΔVa, ΔVb, ΔVc	ΔVa: [0.03 | μ: 0.05 | 0.07] ΔVb: [0.03 | μ: 0.04 | 0.05] ΔVc: [0.02 | μ: 0.03 | 0.05]	%, %, %
3	ΔV		%

SL.No.	Description	Value	Unit
		[0.03 | μ: 0.05 | 0.07] ΔV (%) vs Time (Hr) plot	
4	ΔV (max)	0.07	%
5	Z12 (sym, max)	0.5002 + j0.583	Ohm
6	Z12 (sym, min)	0.9206 + j1.5305	Ohm
7	Isc (sym, max)	9.1	kA
8	Isc (sym, min)	3.56	kA
9	Isc (pk, max)	14.08	kA
10	Z12 (L-G, max)	0.5002 + j0.583	Ohm
11	Z12 (L-G, min)	0.9206 + j1.5305	Ohm
12	Zo (L-G, max)	0.7526 + j2.4361	Ohm
13	Zo (L-G, min)	1.2652 + j2.8615	Ohm
14	Isc (L-G, max)	5.23	kA
15	Isc (L-G, min)	2.85	kA

4 - Network Node

SL.No.	Description	Value	Unit
1	Vn	0.415	kV
2	ΔVa, ΔVb, ΔVc	ΔVa: [1.58 | μ: 2.51 | 3.54] ΔVb: [1.39 | μ: 2.18 | 3.14] ΔVc: [1.37 | μ: 2.13 | 3.09] ΔVa, ΔVb, ΔVc (%, %, %) vs Time (Hr) plot	%, %, %
3	ΔV		%

Sl.No.	Description	Value	Unit
		[1.58 | μ: 2.51 | 3.54] ΔV (%) vs Time (Hr) chart	
4	ΔV (max)	3.54	%
5	Z12 (sym, max)	0.0516 + j0.0249	Ohm
6	Z12 (sym, min)	0.0969 + j0.0262	Ohm
7	Isc (sym, max)	4.41	kA
8	Isc (sym, min)	2.28	kA
9	Isc (pk, max)	6.37	kA
10	Z12 (L-G, max)	0.0516 + j0.0249	Ohm
11	Z12 (L-G, min)	0.0969 + j0.0262	Ohm
12	Z0 (L-G, max)	1.0564 + j0.1268	Ohm
13	Z0 (L-G, min)	2.0241 + j0.1268	Ohm
14	Isc (L-G, max)	0.64	kA
15	Isc (L-G, min)	0.31	kA

5 - Network Node

Sl.No.	Description	Value	Unit
1	Vn	0.415	kV
2	ΔVa, ΔVb, ΔVc	ΔVa: [1.76 | μ: 2.8 | 3.96] ΔVb: [1.57 | μ: 2.46 | 3.55] ΔVc: [1.54 | μ: 2.42 | 3.5] ΔVa, ΔVb, ΔVc (%, %, %) vs Time (Hr) chart	%, %, %
3	ΔV		%

Sl.No.	Description	Value	Unit
		[1.76 | μ: 2.8 | 3.96] ΔV (%) vs Time (Hr) graph	
4	ΔV (max)	3.96	%
5	Z12 (sym, max)	0.0596 + j0.0269	Ohm
6	Z12 (sym, min)	0.1123 + j0.0282	Ohm
7	Isc (sym, max)	3.86	kA
8	Isc (sym, min)	1.98	kA
9	Isc (pk, max)	5.58	kA
10	Z12 (L-G, max)	0.0596 + j0.0269	Ohm
11	Z12 (L-G, min)	0.1123 + j0.0282	Ohm
12	Zo (L-G, max)	1.2311 + j0.1453	Ohm
13	Zo (L-G, min)	2.3594 + j0.1453	Ohm
14	Isc (L-G, max)	0.55	kA
15	Isc (L-G, min)	0.26	kA

6 - Network Node

Sl.No.	Description	Value	Unit
1	Vn	0.415	kV
2	ΔVa, ΔVb, ΔVc	ΔVa: [0.45 | μ: 0.7 | 0.96] ΔVb: [0.29 | μ: 0.43 | 0.6] ΔVc: [0.29 | μ: 0.43 | 0.6] ΔVa, ΔVb, ΔVc (%, %, %) vs Time (Hr) graph	%, %, %
3	ΔV		%

Sl.No.	Description	Value	Unit
		[0.45 | μ: 0.7 | 0.96]	
4	ΔV (max)	0.96	%
5	Z12 (sym, max)	0.0026 + j0.0126	Ohm
6	Z12 (sym, min)	0.0032 + j0.014	Ohm
7	Isc (sym, max)	19.58	kA
8	Isc (sym, min)	15.95	kA
9	Isc (pk, max)	42.93	kA
10	Z12 (L-G, max)	0.0026 + j0.0126	Ohm
11	Z12 (L-G, min)	0.0032 + j0.014	Ohm
12	Z0 (L-G, max)	0.0019 + j0.0118	Ohm
13	Z0 (L-G, min)	0.0019 + j0.0118	Ohm
14	Isc (L-G, max)	20.0	kA
15	Isc (L-G, min)	16.81	kA

7 - Network Node

Sl.No.	Description	Value	Unit
1	Vn	0.415	kV
2	ΔVa, ΔVb, ΔVc	ΔVa: [0.5 | μ: 0.79 | 1.09] ΔVb: [0.31 | μ: 0.46 | 0.65] ΔVc: [0.3 | μ: 0.44 | 0.63]	%, %, %
3	ΔV		%

Sl.No.	Description	Value	Unit
		[0.5 | µ: 0.79 | 1.09] ΔV (%) vs Time (Hr)	
4	ΔV (max)	1.09	%
5	Z12 (sym, max)	0.0036 + j0.0129	Ohm
6	Z12 (sym, min)	0.0047 + j0.0142	Ohm
7	Isc (sym, max)	18.87	kA
8	Isc (sym, min)	15.24	kA
9	Isc (pk, max)	38.52	kA
10	Z12 (L-G, max)	0.0036 + j0.0129	Ohm
11	Z12 (L-G, min)	0.0047 + j0.0142	Ohm
12	Zo (L-G, max)	0.0085 + j0.0158	Ohm
13	Zo (L-G, min)	0.0121 + j0.0158	Ohm
14	Isc (L-G, max)	16.98	kA
15	Isc (L-G, min)	13.86	kA

8 - Network Node

Sl.No.	Description	Value	Unit
1	Vn	0.415	kV
2	ΔVa, ΔVb, ΔVc	ΔVa: [0.51 | µ: 0.84 | 1.19] ΔVb: [0.32 | µ: 0.52 | 0.76] ΔVc: [0.31 | µ: 0.5 | 0.74] ΔVa, ΔVb, ΔVc (%, %, %) vs Time (Hr)	%, %, %
3	ΔV		%

SL.No.	Description	Value	Unit
		[0.51 | μ: 0.84 | 1.19] 	
4	ΔV (max)	1.19	%
5	Z12 (sym, max)	0.0516 + j0.0249	Ohm
6	Z12 (sym, min)	0.0969 + j0.0262	Ohm
7	Isc (sym, max)	4.47	kA
8	Isc (sym, min)	2.34	kA
9	Isc (pk, max)	6.45	kA
10	Z12 (L-G, max)	0.0516 + j0.0249	Ohm
11	Z12 (L-G, min)	0.0969 + j0.0262	Ohm
12	Z0 (L-G, max)	1.0564 + j0.1268	Ohm
13	Z0 (L-G, min)	2.0241 + j0.1268	Ohm
14	Isc (L-G, max)	0.64	kA
15	Isc (L-G, min)	0.31	kA

9 - Network Node

SL.No.	Description	Value	Unit
1	Vn	0.415	kV
2	ΔVa, ΔVb, ΔVc	ΔVa: [0.51 | μ: 0.84 | 1.19] ΔVb: [0.32 | μ: 0.52 | 0.76] ΔVc: [0.31 | μ: 0.5 | 0.74] 	%, %, %
3	ΔV		%

Sl.No.	Description	Value	Unit
		[0.51 | μ: 0.84 | 1.19] ΔV (%) vs Time (Hr)	
4	ΔV (max)	1.19	%
5	Z12 (sym, max)	0.0516 + j0.0249	Ohm
6	Z12 (sym, min)	0.0969 + j0.0262	Ohm
7	Isc (sym, max)	4.47	kA
8	Isc (sym, min)	2.34	kA
9	Isc (pk, max)	6.45	kA
10	Z12 (L-G, max)	0.0516 + j0.0249	Ohm
11	Z12 (L-G, min)	0.0969 + j0.0262	Ohm
12	Z0 (L-G, max)	1.0564 + j0.1268	Ohm
13	Z0 (L-G, min)	2.0241 + j0.1268	Ohm
14	Isc (L-G, max)	0.64	kA
15	Isc (L-G, min)	0.31	kA

A1-B1 - Bus Bar

Sl.No.	Description	Value	Unit
1	Vn	0.415	kV
2	ΔVa, ΔVb, ΔVc	ΔVa: [0.5 | μ: 0.79 | 1.09] ΔVb: [0.31 | μ: 0.46 | 0.65] ΔVc: [0.3 | μ: 0.44 | 0.63] ΔVa, ΔVb, ΔVc (%, %, %) vs Time (Hr)	%, %, %
3	ΔV		%

SL.No.	Description	Value	Unit
		[0.5 | μ: 0.79 | 1.09]	
4	ΔV (max)	1.09	%
5	Z12 (sym, max)	0.0036 + j0.0129	Ohm
6	Z12 (sym, min)	0.0047 + j0.0142	Ohm
7	Isc (sym, max)	18.87	kA
8	Isc (sym, min)	15.24	kA
9	Isc (pk, max)	38.52	kA
10	Z12 (L-G, max)	0.0036 + j0.0129	Ohm
11	Z12 (L-G, min)	0.0047 + j0.0142	Ohm
12	Z0 (L-G, max)	0.0085 + j0.0158	Ohm
13	Z0 (L-G, min)	0.0121 + j0.0158	Ohm
14	Isc (L-G, max)	16.98	kA
15	Isc (L-G, min)	13.86	kA

A1-Q1 - Circuit Breaker

SL.No.	Description	Value	Unit
1	Vn	0.415	kV

A1-Q2 - Circuit Breaker

SL.No.	Description	Value	Unit
1	Vn	0.415	kV

A1-Q3 - Circuit Breaker

SL.No.	Description	Value	Unit
1	Vn	0.415	kV

A1-Q4 - Circuit Breaker

SL.No.	Description	Value	Unit
1	Vn	0.415	kV

A2-Q1 - Circuit Breaker

Sl.No.	Description	Value	Unit
1	Vn	0.415	kV

G1 - External Grid

Sl.No.	Description	Value	Unit
1	P	[0.0412 | μ: 0.0672 | 0.0942] P (MW) vs Time (Hr)	MW
2	P (max)	0.0942	MW
3	PF	[0.67 | μ: 0.71 | 0.74] PF ( ) vs Time (Hr)	
4	PF (min)	0.67	
5	Pa, Pb, Pc		MW, MW, MW

SL.No.	Description	Value	Unit
		Pa: [0.0163 | μ: 0.0268 | 0.0369] Pb: [0.0107 | μ: 0.0173 | 0.0256] Pc: [0.0141 | μ: 0.0231 | 0.0323] *(plot of Pa, Pb, Pc vs Time (Hr))*	

M1 - Motor 3ph

SL.No.	Description	Value	Unit
1	P, Q	P: [0.0003 | μ: 0.0016 | 0.0033] Q: [0.0002 | μ: 0.001 | 0.002] *(plot of P, Q vs Time (Hr))*	MW, MVAr
2	PF		

SL.No.	Description	Value	Unit
		[0.85 | μ: 0.85 | 0.85] PF () vs Time (Hr)	
3	Vn	0.415	kV

Q1 - Fuse

SL.No.	Description	Value	Unit
1	Vn	11.0	kV

T1 - Transformer

SL.No.	Description	Value	Unit
1	P	[0.0412 | μ: 0.0672 | 0.0941] P (MW) vs Time (Hr)	MW
2	P (max)	0.0941	MW
3	PF		

SL.No.	Description	Value	Unit
		[0.67 | μ: 0.71 | 0.74]	
4	PF (min)	0.67	
5	Pa, Pb, Pc	Pa: [0.0163 | μ: 0.0268 | 0.0369] Pb: [0.0107 | μ: 0.0173 | 0.0256] Pc: [0.0141 | μ: 0.0231 | 0.0323]	MW, MW, MW
6	% Loading	[11.3 | μ: 17.5 | 23.5]	%
7	% Loading (max)	23.5	%
8	P Loss		MW

SL.No.	Description	Value	Unit
		[0.00075 | µ: 0.00081 | 0.00088]	
9	P Loss (max)	0.00088	MW

W1 - Line (Custom Geometry)

SL.No.	Description	Value	Unit
1	P	[0.0412 | µ: 0.0672 | 0.0942]	MW
2	P (max)	0.0942	MW
3	PF		

SL.No.	Description	Value	Unit
		[0.67 | μ: 0.71 | 0.74]	
4	PF (min)	0.67	
5	Pa, Pb, Pc	Pa: [0.0163 | μ: 0.0268 | 0.0369] Pb: [0.0107 | μ: 0.0173 | 0.0256] Pc: [0.0141 | μ: 0.0231 | 0.0323]	MW, MW, MW
6	% Loading	[1.2 | μ: 1.9 | 2.6]	%
7	% Loading (max)	2.6	%
8	P Loss		MW

SL.No.	Description	Value	Unit
		[1e-05 | μ: 4e-05 | 6e-05] P Loss (MW) vs Time (Hr)	
9	P Loss (max)	6e-05	MW
10	% P Loss	[0.03 | μ: 0.05 | 0.06] % P Loss (%) vs Time (Hr)	%
11	% P Loss (max)	0.06	%
12	Vn	11.0	kV
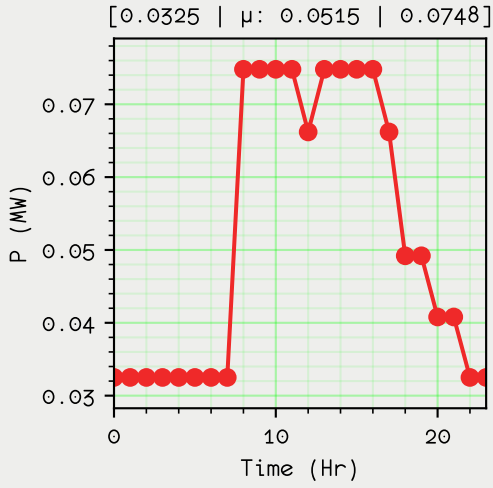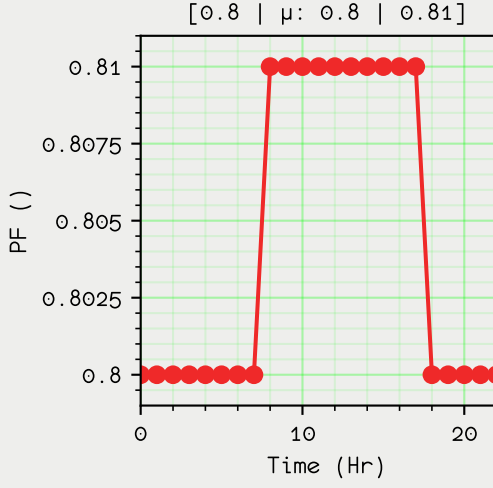
W2 - LV Cable (IEC)

SL.No.	Description	Value	Unit
1	P		MW
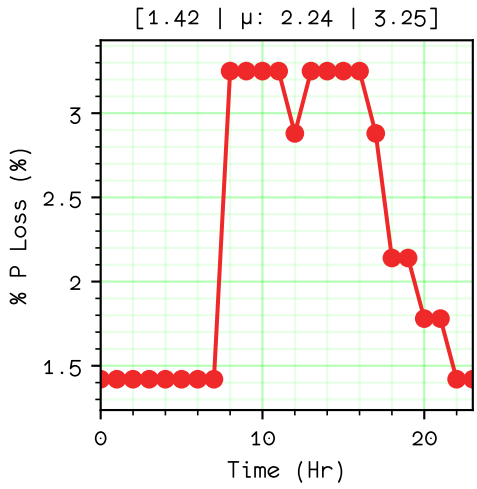
SL.No.	Description	Value	Unit
		[0.0003 | μ: 0.0016 | 0.0033]	
2	P (max)	0.0033	MW
3	PF	[0.85 | μ: 0.85 | 0.86]	
4	PF (min)	0.85	
5	Pa, Pb, Pc	Pa: [0.0001 | μ: 0.0005 | 0.0011] Pb: [0.0001 | μ: 0.0005 | 0.0011] Pc: [0.0001 | μ: 0.0005 | 0.0011]	MW, MW, MW
6	% Loading		%

SL.No.	Description	Value	Unit
		[0.2 | μ: 0.9 | 1.9]	
7	% Loading (max)	1.9	%
8	P Loss	[0.0 | μ: 0.0 | 0.0]	MW
9	P Loss (max)	0.0	MW
10	% P Loss	[0.01 | μ: 0.06 | 0.13]	%
11	% P Loss (max)	0.13	%
12	Vn	0.415	kV
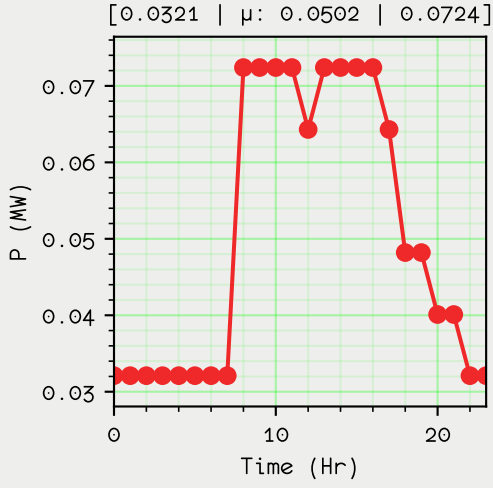
W3 - LV Cable (IEC)

Sl.No.	Description	Value	Unit
1	P	[0.0325 | μ: 0.0515 | 0.0748]	MW
2	P (max)	0.0748	MW
3	PF	[0.8 | μ: 0.8 | 0.81]	
4	PF (min)	0.8	
5	Pa, Pb, Pc		MW, MW, MW

SL.No.	Description	Value	Unit
		Pa: [0.0108 | μ: 0.0172 | 0.025] Pb: [0.0108 | μ: 0.0171 | 0.0249] Pc: [0.0108 | μ: 0.0171 | 0.0249] _(plot: Pa, Pb, Pc (MW, MW, MW) vs Time (Hr))_	
6	% Loading	[16.3 | μ: 25.8 | 37.5] _(plot: % Loading (%) vs Time (Hr))_	%
7	% Loading (max)	37.5	%
8	P Loss	[0.00046 | μ: 0.00131 | 0.00243] _(plot: P Loss (MW) vs Time (Hr))_	MW
9	P Loss (max)	0.00243	MW
10	% P Loss		%

SL.No.	Description	Value	Unit
		[1.42 | μ: 2.24 | 3.25]	
11	% P Loss (max)	3.25	%
12	Vn	0.415	kV

W4 - LV Cable (IEC)

SL.No.	Description	Value	Unit
		[0.0321 | μ: 0.0502 | 0.0724]	
1	P		MW
2	P (max)	0.0724	MW
3	PF		

SL.No.	Description	Value	Unit
4	PF (min)	0.8	
5	Pa, Pb, Pc		MW, MW, MW
6	% Loading		%
7	% Loading (max)	45.3	%
8	P Loss		MW

SL.No.	Description	Value	Unit
		[8e-05 | μ: 0.00022 | 0.00041] 	
9	P Loss (max)	0.00041	MW
10	% P Loss	[0.24 | μ: 0.38 | 0.56] 	%
11	% P Loss (max)	0.56	%
12	Vn	0.415	kV

W5 - Bus Trunking

SL.No.	Description	Value	Unit
1	P		MW

SL.No.	Description	Value	Unit
		[0.0405 | μ: 0.0664 | 0.0932] 	
2	P (max)	0.0932	MW
3	PF	[0.8 | μ: 0.81 | 0.81] 	
4	PF (min)	0.8	
5	Pa, Pb, Pc	Pa: [0.0186 | μ: 0.0309 | 0.0433] Pb: [0.011 | μ: 0.0177 | 0.0261] Pc: [0.011 | μ: 0.0177 | 0.0261] 	MW, MW, MW
6	% Loading		%

SL.No.	Description	Value	Unit
		[9.7 | μ: 16.2 | 22.6] % Loading (%) vs Time (Hr) plot	
7	% Loading (max)	22.6	%
8	P Loss	[2e-05 | μ: 5e-05 | 9e-05] P Loss (MW) vs Time (Hr) plot	MW
9	P Loss (max)	9e-05	MW
10	% P Loss	[0.04 | μ: 0.07 | 0.1] % P Loss (%) vs Time (Hr) plot	%
11	% P Loss (max)	0.1	%
12	Vn	0.415	kV

X1 - Load 3ph

Sl.No.	Description	Value	Unit
1	P, Q	P: [0.032 | μ: 0.05 | 0.072] Q: [0.024 | μ: 0.0375 | 0.054] *(graph: P, Q (MW, MVAr) vs Time (Hr), P in red, Q in yellow)*	MW, MVAr
2	PF	[0.8 | μ: 0.8 | 0.8] *(graph: PF () vs Time (Hr), constant at 0.8)*	

X2 - Load 1ph

Sl.No.	Description	Value	Unit
1	P		MW

SL.No.	Description	Value	Unit
		[0.0076 | μ: 0.0132 | 0.02] 	
2	P (max)	0.02	MW
3	PF	[0.8 | μ: 0.8 | 0.8] 	
4	PF (min)	0.8	
5	Pa, Pb, Pc	Pa: [0.0076 | μ: 0.0132 | 0.02] Pb: [0.0 | μ: 0.0 | 0.0] Pc: [0.0 | μ: 0.0 | 0.0] 	MW, MW, MW