

Supplementary S1:

Reactances and time constants of alternator (Pichacay)					
Parameter	Denomination	P.U.	%	OHM	ms
Direct axisSynchronous Reactance Saturated	Xd Sat	3.509	360.9	0.534	
Direct axisSynchronous Reactance Unsaturated	Xd Unsat.	4.0729771	407.3	0.602	
Quadrature Axis Synchronous Reactance Unsaturated	Xq Unsat.	2.444	244.4	0.361	
Direct axis transient reactance saturated	X'd Sat	0.202	20.2	0.03	
Direct axis transient reactance unsaturated	X'd Unsat	0.237	23.7	0.035	
Quadrature axis transient reactance unsaturated	X'q Unsat	2.444	244.4	0.361	
Direct axis subtransient reactance saturated	X''d Sat	0.17148179	17.1	0.025	
Direct axis subtransient reactance unsaturated	X''d Unsat	0.202	20.2	0.03	
Quadrature axis subtransient reactance saturated	X''q Sat	0.18012097	18	0.027	
Negative Sequence Saturated Reactance	X2	0.17580138	17.6	0.026	
Zero Sequence Reactance Unsaturated	Xo	4.905992E-03	0.5	0.001	
Main Field Resistance	rf			0.43408036	
Stator One Phase Resistance	ra	0.0108	1.1	1.59489E-03	
Positive sequence resistance	r1	0.022	2.152	0.003	
Positive sequence reactance	x1	0.17148179	17.1	0.025	
Negative sequence Resistance	r2	0.054	5.406	0.008	
Zero Sequence Resistance	ro	0.007	0.721	0.001	
Armature Short Circuit: Time Constant	Ta				27
Direct axis transient open circuit time constant	T'do				3634
Direct axis transient short circuit time constant	T'd				180
Quadrature axis transient Open circuit time constant	T'qo				3245
Quadrature axis transient Short-circuit time constant	T'q				161
Direct Axis Subtransient Open Circuit Time Constant	T''do				21
Direct Axis Subtransient Short Circuit Time Constant	T''d				18
1Quadrature Axis Subtransient Open Circuit Time Constant	T''qo				3245
Quadrature Axis Subtransient Short Circuit Time Constant	T''q				18
Typical excitation rise time	Tf				1440
Acceleration Time	TA				3684
Short circuit ratio	S.C.R.	0.27705572			
Armature leakage resistance	Xl	0.101	10.087	0.0149	
Potier resistance	Xp	0.2017	20.174	0.0298	
Inertia Constant	H	0.135			
Resistance according to IEC	RG	0.0257	2.57	0.0038	