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APPENDICES

APPENDIX (A)

Solar panel specification:

parameter	value
Maximum power*(Pm)*	225 (W)
Open circuit voltage	36.88 (V)
Voltage at *Pm* (*Vamp*)	29.76 (V)
Short circuit current (*Isc*)	8.27 (A)
Current at *Pm* (*Iamp*)	7.55 (A)
Temp coefficient for *Pm*	-0.46 (% / oC)
Temp coefficient for *Voc*	-0.129 (V / oC)
Temp coefficient for *Isc*	+ 0.052 (% / °C)
No. of cells and connections	60 in series

APPENDIX (B)

Dc /Dc converter model parameter:

Parameter	Value
Input port series resistance	0.5
Switching loss current	0.03
Capacitance	200 (μF)
Initial capacitor voltage	400 (V)

APPENDIX (C)

Wind Turbine Induction generator parameters:

Generator data	
Rotor type	Squirrel cage
Nominal power (*P*mechanic)	200 (HP)
Nominal voltage (line-to-line)	460 (V)
Nominal frequency	60 (Hz)
Nominal revolutions per minute	1785 (rpm)
Stator resistance	0.01282 (p.u.)
Stator inductance	0.05051 (p.u.)
Rotor resistance	0.00702 (p.u.)
Rotor inductance	0.05051 (p.u.)
Magnetizing inductance	6.77 (p.u)
Inertia constant	0.3096 (s)
Friction factor	0.0114 (p.u.)
Pairs of poles	2

APPENDIX (D)

Transformer parameters:

Parameter	Value
Nominal power	120 (kW)
Nominal frequency	60 (Hz)
Input winding parameters (Yg) [V1 R1 L1]	[460 (V) 0.00025 (p.u.) 0 (p.u.)]
Output winding parameters (Y) [V2 R2 L2]	[230 (V) 0.00025 (p.u.) 0.0024 (p.u.)]
Output winding parameters (Delta) [V3 R3 L3]	[230 (V) 0.00025 (p.u.) 0.0024 (p.u.)]
Magnetization resistance	368.62 (p.u.)
Magnetization inductance	368.62 (p.u.)

APPENDIX (E)

Double-bridge rectifier model parameters:

Parameter	Value
Pulse width of synchronized 12-pulse generator	80 (o)
Proportional gain of PI voltage control system	2
Integral gain of PI voltage control system	20
Snubber resistance of one thyristor	2 (kΩ)
Snubber capacitance of one thyristor	0.1 (μF)
Internal resistance of one thyristor	1 (mΩ)
Filter inductance	66 (mH)
Filter capacitance	3300 (μF)
Reference voltage	400 (V)