

M	Mutual inductance.
Ps,Qs	Active reactive stator power respectively
p	Number of pole pairs.
Cem	Electromagnetic torque
Pm	Echanical power
S	Section of blade
Cp	The aerodynamic coefficient of power.
R	Radius of the wind turbine
f	Friction coefficient
Ω_1 :	Speed of rotation before the gear box
Ω_2	rotational speed after the gear box
J	Inertia moment

Greek symbols

ρ	Density of the air
λ	The tip speed ratio
β	The blade pitch angle
φ	flux
Θ_0	Rotor angle

APPENDIX

System settings

Rated power: $P_n = 4 \text{ kW}$

Rated voltage: $v / U = 220/380 \text{ V} - 50 \text{ Hz}$

The nominal speed: $\Omega_n = 1440 \text{ tr} / \text{min}$.

Number of pole pairs: $P = 2$

The parameters of the wind turbine used:

Number of blades: $N_p = 3$

Diameter of a blade: $RT = 3 \text{ m}$

Inertia: $J = 315 \text{ Kg. m}^2$

Number of blades: $N_p = 3$

Stator resistance: $R_s = 1.2 \Omega$

Rotor resistance: $R_r = 1.8 \Omega$

Stator inductance: $L_s = 0.1554 \text{ H}$

Rotor inductance: $L_r = 0.1568 \text{ H}$

Mutual inductance: $M = 0.15 \text{ H}$

Mechanical constants:

Moment Inertia: $J = 0.2 \text{ Kg. m}^2$

Coefficient of friction: $f = 0.001 \text{ N. m. S} / \text{rad}$