

2.5 MW Doubly Fed Induction Generator

Table C.1: Data of a 2 MW doubly fed induction machine driven by a 2.5 MW Turbine [25]

	Actual value	per unit (p.u.) value
Rated mechanical power (P_m)	2.5 MW	1.0
Grid frequency	50 Hz	
Rated stator voltage	690 V	1.0
Rated stator power	2.0 MW	0.8
Stator resistance (R_s)	$2.6 \times 10^{-3} \Omega$	1.365×10^{-2}
Stator leakage inductance ($L_{\sigma s}$)	$0.087 \times 10^{-3} \text{ H}$	0.144
Rotor resistance (R_r)	$2.9 \times 10^{-3} \Omega$	1.523×10^{-2}
Rotor leakage inductance ($L_{\sigma r}$)	$0.087 \times 10^{-3} \text{ H}$	0.144
Mutual inductance (L_m)	$2.5 \times 10^{-3} \text{ H}$	4.124
Rated stator current (I_s^{\max})	1760 A	0.841
Rated rotor current (I_r^{\max})	1893 A	0.904

Table C.2: Data of a 2.5 MW Turbine

	value
Rated Capacity	2.5 MW
Cut in speed	3.5 m/s
Cut out speed	20 m/s
Gear box ratio	1 : 100
Radius	90 m
Performance coefficient	$C_p(\lambda, \beta_t) = 0.73 \left(\frac{151}{\lambda_i} - 0.58\beta_t - 0.002\beta_t^{2.14} - 13.2 \right) e^{-\left(\frac{-18.4}{\lambda_i}\right)}$ $\text{where } \lambda_i = \left[\frac{1}{\lambda - 0.02\beta_t} - \frac{-0.003}{\beta_t^3 + 1} \right]^{-1}$