

# 1.5 MW Doubly Fed Induction Generator

Table D.1: Data of a 1.3 MW doubly fed induction machine driven by a 1.5 MW Turbine [47]

	Actual value		per unit (p.u.) value
Rated mechanical power ( $P_m$ )	1.5	MW	1.0
Grid frequency	50	Hz	
Rated stator voltage	690	V	1.0
Rated stator power	1.3	MW	0.866
Stator resistance ( $R_s$ )	$2.65 \times 10^{-3}$	$\Omega$	$8.349 \times 10^{-3}$
Stator leakage inductance ( $L_{\sigma s}$ )	$0.1687 \times 10^{-3}$	H	0.167
Rotor resistance ( $R_r$ )	$2.63 \times 10^{-3}$	$\Omega$	$8.286 \times 10^{-3}$
Rotor leakage inductance ( $L_{\sigma r}$ )	$0.1337 \times 10^{-3}$	H	0.132
Mutual inductance ( $L_m$ )	$5.48 \times 10^{-3}$	H	5.419
Rated stator current ( $I_s^{\max}$ )	1068.2	A	0.851
Rated rotor current ( $I_r^{\max}$ )	1125.6	A	0.897

Table D.2: Data of a 1.5 MW Turbine

	value
Rated Capacity	1.5 MW
Cut in speed	3.5 m/s
Cut out speed	20 m/s
Gear box ratio	1 : 80
Radius	77 m
Performance coefficient	$C_p(\lambda, \beta_t) = 0.71 \left( \frac{150}{\lambda_i} - 0.6\beta_t - 0.002\beta_t^{0.14} - 13.2 \right) e^{-\left(\frac{-18.4}{\lambda_i}\right)}$ where $\lambda_i = \left[ \frac{1}{\lambda - 0.002\beta_t} - \frac{-0.01}{\beta_t^3 + 1} \right]^{-1}$