

Description	Symbol	Value	Unit
Wind speed	$\bar{U}$	10.6–11.8	$\text{m s}^{-1}$
Rotor speed set point	$\bar{\omega}_r$	27.0	RPM
Water flow	$\bar{Q}_w$	2965	$\text{L min}^{-1}$
Water pressure	$\bar{p}_{w,l}$	51.4–62.4	bar
Oil flow	$\bar{Q}_o$	1354	$\text{L min}^{-1}$
Oil pressure	$\Delta \bar{p}_h$	166–201	bar
Rotor torque	$\bar{\tau}_r$	163.8–198.7	kNm
Rotor inertia	$J_r$	$6.6 \times 10^5$	$\text{kg m}^2$
Nozzle diameter	$D_{nz}$	38	mm
Spear coning angle	$\alpha$	50	$^\circ$
Number of spear valves	$N_s$	2	–
Discharge coefficient	$C_d$	1.0	–
Effective nozzle area	$A_{nz}$	486.9–442	$\text{mm}^2$
Spear position	$\bar{s}$	4.64–4.18	mm
Density of air	$\rho_a$	1.225	$\text{kg m}^{-3}$
Density of oil	$\rho_o$	900	$\text{kg m}^{-3}$
Density of water	$\rho_w$	998	$\text{kg m}^{-3}$
Component mechanical efficiency	$\eta_{m,x}$	0.85	–
Component volumetric efficiency	$\eta_{v,x}$	0.95	–
Hydraulic line radius	$r_l$	43.3	mm
Hydraulic line length	$L_l$	50.0	m
Hydraulic line volume	$V_H$	295	L
Hydraulic induction, oil	$L_H$	$7.64 \times 10^6$	$\text{kg m}^{-4}$
Hydraulic resistance, oil	$R_H$	$8.69 \times 10^6$	$\text{kg m}^{-4} \text{s}^{-1}$
Equivalent bulk modulus, oil and line	$K_e$	0.52	GPa
Dynamic viscosity, oil	$\mu_o$	0.240	Pa s
Spear valve actuator time constant	$t_s$	1.69	s
Pitch actuator time constant	$t_s$	0.5	s