

Appendix A
Turbine Coordinates and Specifications

SWT-2.3-101 Technical Specifications

Rotor	
Type	3-bladed, horizontal axis
Position	Upwind
Diameter	101 m
Swept area	8000 m ²
Synchronous rotor speed	6-16 rpm
Power regulation	Pitch regulation with variable speed
Rotor tilt	6 degrees

Blade	
Type	Self-supporting
Blade length	49 m
Tip chord	0.63 m
Root chord	3.4 m
Aerodynamic profile	NACA63.xxx, FFAxxx, SWPxxx
Material	GRE
Surface gloss	Semi-mat, < 30 / ISO2813
Surface colour	Light grey, RAL 7035

Aerodynamic Brake	
Type	Full span pitching
Activation	Active, hydraulic

Load-Supporting Parts	
Hub	Nodular cast iron
Main bearing	Spherical roller bearing
Main shaft	Alloy steel
Nacelle bed plate	Steel

Transmission System	
Coupling hub - shaft	Flange
Coupling shaft – gearbox	Shrink disc
Gearbox type	3-stage planetary/helical
Gearbox ratio	1 : 91
Gearbox lubrication	Splash / forced lubrication
Oil volume	Approx. 400 l
Gearbox oil filtering	Inline and offline
Gearbox cooling	Separate oil cooler
Gearbox designation	PEAB 4456 (Winergy) or EH851 (Hansen)
Coupling gear - generator	Double flexible coupling

Mechanical Brake	
Type	Hydraulic disc brake
Position	High speed shaft
Number of callipers	2

Canopy	
Type	Totally enclosed
Material	Steel
Surface gloss	Silk mat, 30-40 / ISO2813
Colour	Light grey, RAL 7035

Generator	
Type	Asynchronous
Nominal power	2300 kW
Protection	IP 54
Cooling	Integrated heat exchanger
Insulation class	F

Grid Terminals (LV)	
Nominal power	2300 kW
Voltage	690 V
Frequency	50 Hz or 60 Hz

Yaw System	
Type	Active
Yaw bearing	Externally geared slewing
Yaw drive	Eight electric gear motors with frequency converter
Yaw brake	Passive friction brake

Controller	
Type	Microprocessor
SCADA system	WPS via modem
Controller designation	KK WTC 3.0
Controller manufacturer	KK Electronic A/S

Tower	
Type	Cylindrical and/or tapered tubular
Hub height	80 m or site specific
Corrosion protection	Painted
Surface gloss	Silk mat, 30-40 / ISO2813
Colour	Light grey, RAL 7035

Operational Data	
Cut-in wind speed	4 m/s
Nominal power at	12-13 m/s
Cut-out wind speed	25 m/s
Maximum 2 s gust	55 m/s (standard version) 60 m/s (special version)

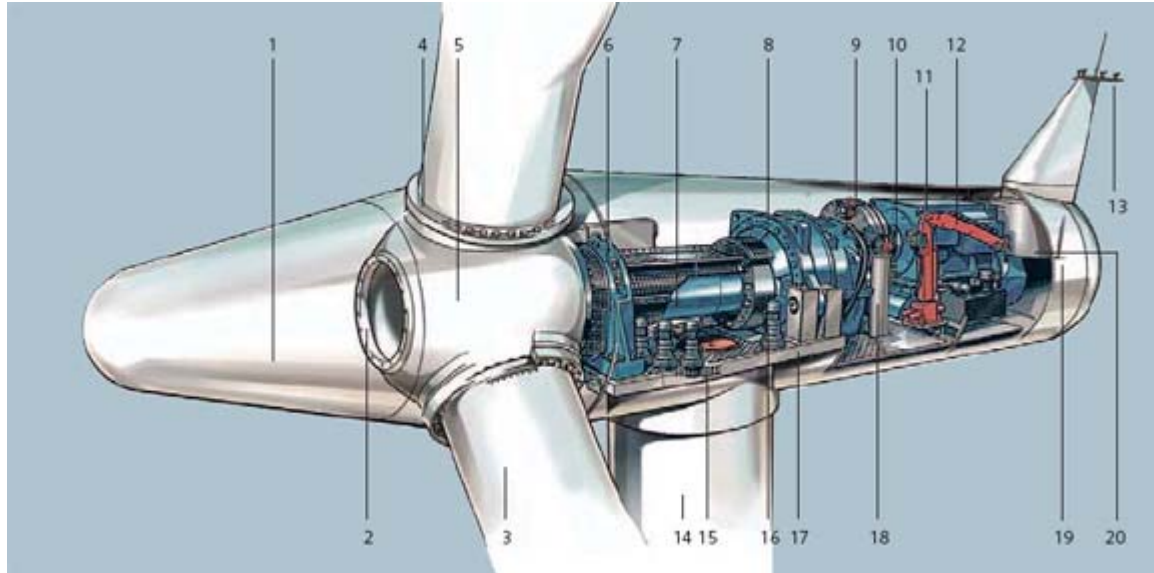
Weights (approximately)	
Rotor	62,000 kg
Nacelle	82,000 kg
Tower for 80 m hub height	162,000 kg

Siemens Wind Power A/S reserves the right to change the above specifications without previous notice.

Wind Turbine Coordinates					
Turbine Number	LAT dd mm ss.ss	LONG -ddd mm ss.ss	Ground Elevation (Feet)	Structure Height (Feet)	Total Height (Feet)
E100	48 50 14.07	-88 50 41.7	1574.54	428.15	2003
E101	48 50 23.74	-88 50 21.99	1569.49	428.15	1998
E102	48 49 46.79	-88 50 25.89	1583.07	428.15	2012
E103	48 49 55.24	-88 50 3.88	1576.18	428.15	2005
E104	48 48 59.95	-88 50 48.74	1512.99	428.15	1942
E105	48 49 6.47	-88 50 31.72	1564.96	428.15	1994
E106	48 49 13.78	-88 50 11.88	1574.67	428.15	2003
E107	48 49 25.21	-88 49 54.25	1574.61	428.15	2003
E108	48 49 30.51	-88 49 30.06	1545.28	428.15	1974
E109	48 49 38.72	-88 49 8.63	1551.38	428.15	1980
E110	48 49 31.71	-88 48 20.26	1474.80	428.15	1903
E111	48 49 38.26	-88 48 3.18	1427.82	428.15	1856
E112	48 49 50.85	-88 47 47.34	1380.51	428.15	1809
E113	48 48 19.74	-88 50 27.26	1574.80	428.15	2003
E114	48 48 27.11	-88 50 8.06	1619.16	428.15	2048
E115	48 48 33.66	-88 49 50.99	1578.67	428.15	2007
E116	48 48 40.21	-88 49 24.41	1565.62	428.15	1994
E117	48 48 47.57	-88 49 5.16	1566.67	428.15	1995
E118	48 48 54.97	-88 48 45.86	1523.29	428.15	1952
E119	48 49 1.52	-88 48 28.73	1469.88	428.15	1899
E120	48 49 13.02	-88 47 32.4	1417.32	428.15	1846
E121	48 49 18.76	-88 47 17.4	1388.32	428.15	1817
S51	48 47 52.78	-88 47 25.18	1537.07	428.15	1966
S52	48 48 2.49	-88 47 8.95	1519.03	428.15	1948
S53	48 44 37.26	-88 43 29.34	1506.04	428.15	1935
S54	48 44 57.72	-88 41 19.03	1365.62	428.15	1794
S55	48 45 3.48	-88 41 4.04	1363.65	428.15	1792
S56	48 45 9.17	-88 40 49.04	1352.36	428.15	1781
S57	48 45 14.89	-88 40 34.05	1317.72	428.15	1746
T1	48 44 5.6	-88 50 27.18	1714.96	428.15	2144
T2	48 44 18.07	-88 50 16.57	1738.85	428.15	2167
T3	48 44 25.41	-88 50 1.21	1708.40	428.15	2137
T4	48 44 22.39	-88 49 37.21	1703.41	428.15	2132
T5	48 45 3.91	-88 49 33.62	1692.39	428.15	2121
T6	48 45 9.65	-88 49 18.64	1746.46	428.15	2175
T7	48 45 15.39	-88 49 3.67	1756.43	428.15	2185
T8	48 45 21.55	-88 48 49.1	1707.55	428.15	2136
T9	48 45 43.13	-88 49 51.75	1680.71	428.15	2109
T10	48 45 49.01	-88 49 36.43	1674.02	428.15	2103
T11	48 45 55.02	-88 49 20.78	1675.72	428.15	2104
T12	48 45 44.56	-88 48 35.72	1741.40	428.15	2170
T13	48 45 50.84	-88 48 21.25	1732.28	428.15	2161
T14	48 45 48.86	-88 47 42.57	1675.07	428.15	2104
T15	48 45 55.84	-88 47 1.91	1680.77	428.15	2109
T16	48 46 3.78	-88 46 48.48	1674.08	428.15	2103

T17	48 45 59.72	-88 46 9.72	1643.83	428.15	2072
T18	48 46 9.4	-88 45 56.98	1644.49	428.15	2073
T19	48 46 32.12	-88 45 15.78	1665.16	428.15	2094
T20	48 46 37.85	-88 45 0.79	1667.13	428.15	2096
T21	48 46 9.6	-88 44 38.15	1612.34	428.15	2041
T22	48 46 15.33	-88 44 23.16	1632.74	428.15	2061
T23	48 46 21.06	-88 44 8.17	1568.57	428.15	1997
T24	48 46 22.95	-88 43 37.42	1470.87	428.15	1900
T25	48 44 38.15	-88 44 22.4	1602.23	428.15	2031
T26	48 44 45.54	-88 44 9.24	1574.41	428.15	2003
T27	48 44 42.99	-88 43 14.4	1519.03	428.15	1948
T28	48 44 49.02	-88 42 58.59	1519.03	428.15	1948
T29	48 44 55.43	-88 42 24.53	1479.66	428.15	1908
T30	48 45 16.98	-88 42 16.88	1476.57	428.15	1905
T31	48 45 25.19	-88 42 2.91	1437.40	428.15	1866
T32	48 46 36.23	-88 46 42.57	1646.92	428.15	2076
T33	48 46 41.94	-88 46 27.63	1614.44	428.15	2043
T34	48 47 18.33	-88 46 34.5	1569.95	428.15	1999
T35	48 47 25.21	-88 46 21.21	1613.39	428.15	2042
T36	48 47 25.25	-88 50 17.91	1645.80	428.15	2074
T37	48 47 25.17	-88 50 0.61	1675.26	428.15	2104
T38	48 47 30.05	-88 49 45.35	1708.66	428.15	2137
T39	48 47 37.64	-88 49 32.39	1684.51	428.15	2113
T40	48 47 39.15	-88 49 2.49	1704.72	428.15	2133
T41	48 47 45.18	-88 48 47.76	1613.25	428.15	2042
T42	48 47 34.61	-88 48 11	1646.98	428.15	2076
T43	48 47 47.04	-88 47 40.17	1578.08	428.15	2007

Design



Nacelle Arrangement

- | | |
|--------------------------|----------------------------------|
| 1 Spinner | 11 Generator |
| 2 Spinner bracket | 12 Service crane |
| 3 Blade | 13 Meteorological sensors |
| 4 Pitch bearing | 14 Tower |
| 5 Rotor hub | 15 Yaw ring |
| 6 Main bearing | 16 Yaw gear |
| 7 Main shaft | 17 Nacelle bedplate |
| 8 Gearbox | 18 Oil filter |
| 9 Brake disc | 19 Canopy |
| 10 Coupling | 20 Generator fan |