

MODEL

# LTW80

500 | 800 | 1,000 kW



## LTW80 500 | 800 | 1,000 kW

### DESIGN DATA

Rated power	500   800   1,000 kW
Hub height	60 / 65 / 80 m
Tip height max (upper end)	100 / 105 / 120 m
Wind class	IIA / IIIA+
Cut-in wind speed	3 m/s
Cut-out wind speed	25 m/s
Concept	Direct Drive 3-bladed upwind turbine with horizontal axis

### TOWER

	Segmented tubular steel tower
	Transformer and converter station in tower bottom

### ROTOR

Rotor diameter	80 m
Swept area	5,064 m <sup>2</sup>
Rotational speed	17.5 rpm
Tip speed	74 m/s
Blade material	GFRP-EP
Power and rotor speed control	Active pitch control

### GENERATOR Direct Drive

Type	Permanent Magnet Direct Drive Synchronous Machine
Stator Winding	Modular coils with tooth concentrated winding, exchangeable
Rotor Topology	Modular Permanent Magnets with flux concentration, exchangeable
Cooling	Air cooled rotor, air cooled stator
Speed Range	Variable Low Speed Machine

### CONTROL & SAFETY SYSTEM

Pitch and yaw control	Active electrical LeitPitch system and active electrical yaw system
Remote control	Leitwind integrated SCADA
Safety system	Hardwired safety loop
Main brake	Aerodynamic, independent pitch control
Service brake	Electrical
Rotor lock	Hydraulic

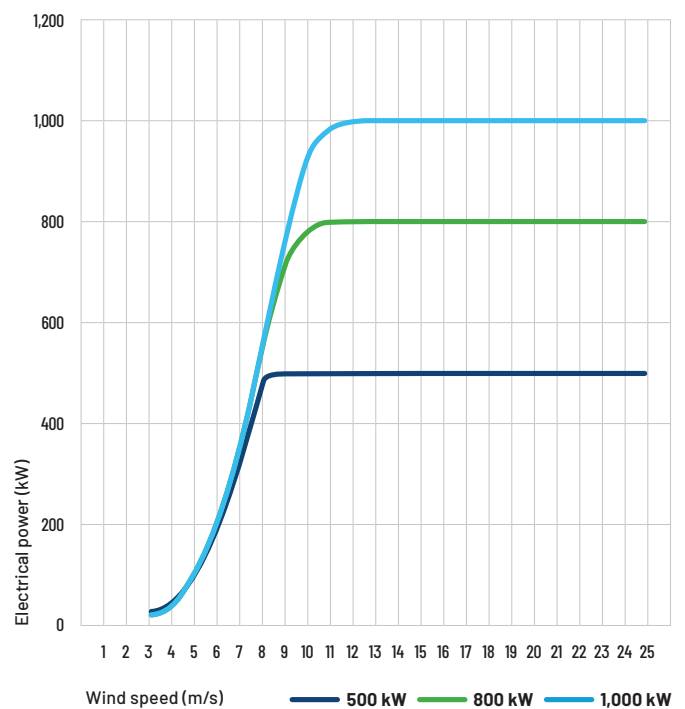
### POWER ELECTRONIC LeitDrive

Converter type	4Q full power - 3 phase IGBT
Arrangement	Multiple modular LeitDrive converter - increase of technical availability - partial load operation
Converter rated voltage and frequency (grid-side)	690 V ±10%, 50-60 Hz ±5%
Converter power factor (grid-side)	0.95 ind - 1 - 0.95 cap for reactive power compensation control, grid voltage control capability
Power quality and Grid codes	High quality output power in accordance with major grid code requirements. Integration into various grid systems worldwide.  - Grid code compliance e.g. CEI 0-16, TERNA (incl. LVRT) and many other countries - Power quality according to IEC 61400-21 - Emission limits according to IEC 61800-3

## AEP - ESTIMATED ANNUAL ELECTRICAL PRODUCTION

	LTW80 500 kW	LTW80 800 kW	LTW80 1,000 kW
m/s	MWh/y	MWh/y	MWh/y
5.5	1,937	2,946	2,733
6.0	2,192	2,892	3,215
6.5	2,414	3,255	3,666
7.0	2,609	3,581	4,078
7.5	2,777	3,867	4,446
8.0	2,917	4,111	4,765
8.5	3,030	4,313	5,034

### POWER CURVE



	LTW80 500 kW	LTW80 800 kW	LTW80 1,000 kW
Wind speed (m/s)	Electrical power (kW)	Electrical power (kW)	Electrical power (kW)
3.0	26	19	19
4.0	66	70	70
5.0	141	157	157
6.0	263	286	286
7.0	424	459	462
8.0	500	650	681
9.0	500	764	876
10.0	500	796	972
11.0	500	800	996
12.0	500	800	1,000
13.0	500	800	1,000
14.0	500	800	1,000
15.0	500	800	1,000
16.0 - 25.0	500	800	1,000

MODEL

# LTW80

1,500 | 1,650 | 1,800 kW



## LTW80 1,500 | 1,650 | 1,800 kW

### DESIGN DATA

Rated power	1,500   1,650*   1,800 kW
Hub height	48 / 50 / 60 / 65 / 80 m
Tip height max (upper end)	88 / 90 / 100 / 105 / 120 m
Wind class	IIA / IIIA+ / WTC S (IIIA + Tropical Cyclone Class 1)
Cut-in wind speed	3 m/s
Cut-out wind speed	25 m/s
Concept	Direct Drive 3-bladed upwind turbine with horizontal axis, variable speed and automatic pitch and yaw regulation

### TOWER

	Segmented tubular steel tower
	Transformer and converter station in tower bottom

### ROTOR

Rotor diameter	80 m
Swept area	5,064 m <sup>2</sup>
Rotational speed	17.8 rpm
Tip speed	75 m/s
Blade material	GFRP-EP
Power and rotor speed control	Active pitch control

### GENERATOR Direct Drive

Type	Permanent Magnet Direct Drive Synchronous Machine
Stator Winding	Modular coils with tooth concentrated winding, exchangeable
Rotor Topology	Modular Permanent Magnets with flux concentration, exchangeable
Cooling	Air cooled rotor and water cooled stator
Speed Range	Variable Low Speed Machine

### CONTROL & SAFETY SYSTEM

Pitch and yaw control	Active electrical LeitPitch system and active electrical yaw system
Remote control	Leitwind integrated SCADA
Safety system	Hardwired safety loop
Main brake	Aerodynamic, independent pitch control
Service brake	Electrical
Rotor lock	Hydraulic

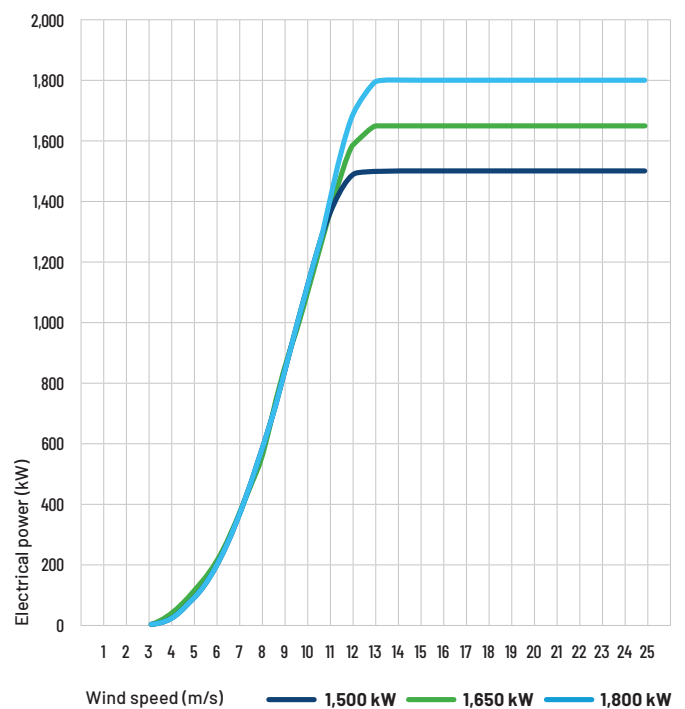
### POWER ELECTRONIC LeitDrive

Converter type	4Q full power - 3 phase IGBT
Arrangement	Multiple modular LeitDrive converter - increase of technical availability - partial load operation
Converter rated voltage and frequency (grid-side)	690 V ±10%, 50-60 Hz ±5%
Converter power factor (grid-side)	0.95 ind - 1 - 0.95 cap for reactive power compensation control, grid voltage control capability
Power quality and Grid codes	High quality output power in accordance with major grid code requirements. Integration into various grid systems worldwide. - Grid code compliance e.g. CEI 0-16, TERNA (incl. LVRT) and many other countries - Power quality according to IEC 61400-21 - Emission limits according to IEC 61800-3

## AEP - ESTIMATED ANNUAL ELECTRICAL PRODUCTION

	LTW80 1,500 kW	LTW80 1,650 kW	LTW80 1,800 kW
m/s	MWh/y	MWh/y	MWh/y
5.5	3,094	3,147	3,119
6.0	3,752	3,839	3,847
6.5	4,400	4,529	4,581
7.0	5,023	5,199	5,303
7.5	5,611	5,838	5,997
8.0	6,157	6,438	6,653
8.5	6,658	6,991	7,264

### POWER CURVE



	LTW80 1,500 kW	LTW80 1,650 kW	LTW80 1,800 kW
Wind speed (m/s)	Electrical power (kW)	Electrical power (kW)	Electrical power (kW)
3.5	33	33	23
4.0	73	73	59
5.0	151	151	145
6.0	278	278	263
7.0	455	455	440
8.0	694	694	677
9.0	954	954	946
10.0	1,222	1,239	1,256
11.0	1,478	1,516	1,555
12.0	1,500	1,638	1,775
13.0	1,500	1,650	1,800
14.0	1,500	1,650	1,800
15.0	1,500	1,650	1,800
16.0 - 25.0	1,500	1,650	1,800

\*LTW80 1,650 kW is also available in the Typhoon version