



E-3120-4 Specifications | E-Series



endurancewindpower.com

green energy that works™

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Overview

The Endurance Wind Power (EWP) E-3120-4 wind turbine is a mains-connected 50 kW wind turbine intended for installation in the United Kingdom. The E-3120-4 wind turbine consists of the following components:

- Three-bladed, stall-controlled, downwind rotor with a rigid hub and passive-pitched blades for over-speed protection
- Drive train consisting of a low-speed shaft (LSS), gearbox, high speed shaft (HSS) with a fail-safe mechanical brake, and induction generator
- Control system in main control cabinet (MCC) at the tower base
- Passive yaw system with damper and automated drop cable unwinding system
- Free-standing monopole tower

General Specifications

General Data	
Configuration	Horizontal axis; 3 bladed downwind rotor
IEC 61400-1 Turbine Class	IIIA except annual average wind speed can be up to 8.5 m/s
Rated Power	50 kW at 9.5 m/s
Cut-In Wind Speed	3.5 m/s
Cut-Out Wind Speed	25 m/s
Electrical Configuration	Grid connected, induction generator
CE Compliant	Yes
MCS Certified	Not applicable

Mechanical Specifications

Rotor	
Number of Blades	3
Rotor Diameter	19.2 m
Swept Area	290 m ²
Rotor Speed	43 RPM
Tip Speed	42 m/s
Power Regulation	Passive stall

Blades	
Length	9 m
Material	Fiberglass/polyester
Airfoil	SG 60XX
Color	RAL 9003: Signal White, semi-gloss

Nacelle Base Frame	
Type	Welded structure
Finish	Primer and paint

Fairing	
Nacelle	6 parts—fiberglass
Spinner	1 part—fiberglass
Color	RAL 9003: Signal White, semi-gloss

Low Speed Shaft Assembly	
Shaft Material	AISI 4340, heat treated
Bearing Housing Type	Ductile cast iron
Bearing Type	Dual spherical roller bearing
Bearing Lubrication	Grease

Gearbox	
Manufacturer	Siemens
Type	3 parallel stages
Ratio	34.940:1
Configuration	Shaft mounted with reaction arm
Lubrication	Splash, synthetic lubricant

Gearbox	
Shaft Seal Type	Taconite
Oil Sump Capacity	32 L
Heater	900 W–230 V (immersion type)
Coupling (LSS)	Shrink disk
Coupling (HSS)	Flexible (steel disk type)

Brake Systems	
Primary System	2 pneumatically-released, spring-applied calipers with brake disk on HSS
Backup Brake System	Full blade pitching (spring pre-loaded, centrifugally activated)
Primary Brake Compressor	Piston type–DC motor
Primary Brake Working Pressure	7.2 bar (104 psi)

Yaw System	
Type	Free yawing with electromechanical damper
Yaw Slewing Ring	4-point ball bearing
Yaw Drive Type	Single DC motor with planetary gearbox
Gearbox Manufacturer	Bonfiglioli Riduttori
Damping Device	Resistors
Electrical Connection	Twist cable
Yaw Locking Device	Manual locking pin

Electrical and Control System Specifications

Generator	
Manufacturer	ABB
Type	4-pole squirrel-cage asynchronous induction generator with aluminum frame
Voltage	400 V
Frequency	50 Hz
Winding	Delta
Rated Power	73 kW
Rated Current	133 A
Synchronous Rotation Speed	1500 RPM
Enclosure	TEFC (IP55)
Frame size	IEC 250

Interconnection	
Mains Connection System	Soft-connection, thyristor controlled
Mains Protection Device	ComAp MainsPro G59/2 relay located in main control cabinet (MCC)

Electrical Output	
Rated Turbine Output	50 kW, 53 kVa in 9.5 m/s wind
Maximum Continuous Turbine Output	80 kW, 85 kVa
Maximum 1 min Turbine Output	90 kW, 95 kVa
Maximum 1 min Reactive Power Requirement	30 kVARS
Maximum Feeder Current	138 A
Design Power Factor	0.95
Ofgem Total Installed Capacity	80 kW
Ofgem Declared Net Capacity	79.5 kW

Control System	
Controller	Phoenix Contact PLC
Control System Scope	PLC automatically controls turbine based on sensor inputs. Operator interface through the Web-based HMI.
PLC Sensor Inputs	Wind speed and relative direction Rotor and generator speed Generator electrical output values Brake pressure Mains status Yaw turn counter Temperatures: ambient, nacelle, gearbox, generator
Turbine Operation Sequence	Rotor is motored when wind reaches cut-in speed, using soft-start system. Rotor freewheels until wind is sufficient for generation. Mains are soft-connected when generation starts. Sensors are monitored for normal readings. Alarms are generated for unusual operation. In case of out-of-bounds operation, shutdown requiring service attention is automatic. Maintenance mode is available for service.

Remote Connection and Monitoring	
PLC Connectivity	Ethernet through cable or Wi-Fi bridge to local network. 3G or GPRS modem possible.
HMI	Web browser with network access (LAN or VPN through Internet) to web page served by PLC, no custom software required
HMI Capability	Turbine monitoring, configuration, and control Multi-level login access
Alarm/Shutdown Notification	HMI and email

Data Collection	
Data Collected	Instantaneous and average values of sensor inputs and turbine operating parameters collected at 5 min intervals.
Storage Medium	SD card on PLC
Storage Capacity	Typical 15 years
Data Download Protocol	FTP
Data Format	Comma Separated Values (CSV)

Tower Specifications

General Data	
Type	Monopole, welded steel tube with access door
Hub Heights	24.6 m, 36.4 m
Blade Tip Heights	34.2 m, 46.0 m
Turbine Access	External ladder with fall arrest system and work platform
Color	RAL 9016: Traffic White, semi-gloss
Foundation	Typical ground conditions: standard design, reinforced concrete Soft ground conditions: custom design

Weights (Approximate)		
Blade Assembly	Includes single blade with holder	410 kg
Nacelle	Includes rotor	4,000 kg
24 m Monopole Tower	Complete tower (excludes foundation)	8,200 kg
	Base section assembly (heaviest section)	5,000 kg
36 m Monopole Tower	Complete tower (excludes foundation)	15,400 kg
	Base section assembly (heaviest section)	7,500 kg

Environmental Specifications

Temperature Range	
Working Ambient	-30 °C to 40 °C
Standstill Ambient	-40 °C to 50 °C

Lightning	
Lightning Protection	Lightning rod on nacelle, internal surge protection

Acoustics

Noise Level	
Sound Pressure Level	93 m for 40 dBA sound pressure in 5 m/s wind

Options

Options	
Obstruction Lighting	Red LED light on nacelle