

# L136 4.5MW

## The ultimate onshore wind turbine



The L136 is a 4.5 MW wind turbine based upon the same design principle as our successful L100 platform. The L136-4.5MW was designed for IEC class IIa locations and thus distinguishes itself from other wind turbines of this size that usually fall within the IEC-III class. The robust design makes the L136-4.5MW suitable for locations with high turbulence and significant differences in vertical *wind shear*. This makes the L136 the best wind turbine for coastal locations with severe wind conditions, but also for inland locations where buildings or forestation create a great difference between wind speeds at maximum and minimum tip height.

### Experience

Lagerwey is a Dutch manufacturer of direct drive wind turbines. We are building on 37 years of experience in the development of innovative wind turbines. More than 1,200 Lagerwey turbines have been installed world-wide and various technological spin-offs can be found in other products on the market. Our objective is to continuously reduce the cost price per kWh of wind energy.

### Tower/crane - combination

The L136-4.5MW can be built at great height (166+m) by using our smart modular tower, the Modular Steel Tower (MST). This system consisting of steel plates that are assembled on site, makes it possible to create ever higher towers against low additional costs. The modular tower is also installed with a unique crane. This Lagerwey crane will simplify the wind turbine's installation and reduce the cost price per kilowatt hour even more.

### Generator – high torque, little noise

Thanks to smart design, our Direct Drive Permanent Magnet (DDPM) generator does not require a cooling system or gear box. The efficiency of the generator is very high, approximately 97% at both full and partial load. As our DDPM generator contains few moving parts, significantly less wear takes place in comparison to other wind turbines. This will make the generator very robust and highly suitable for demanding circumstances in both warm and cold climates.

### We unburden our customers

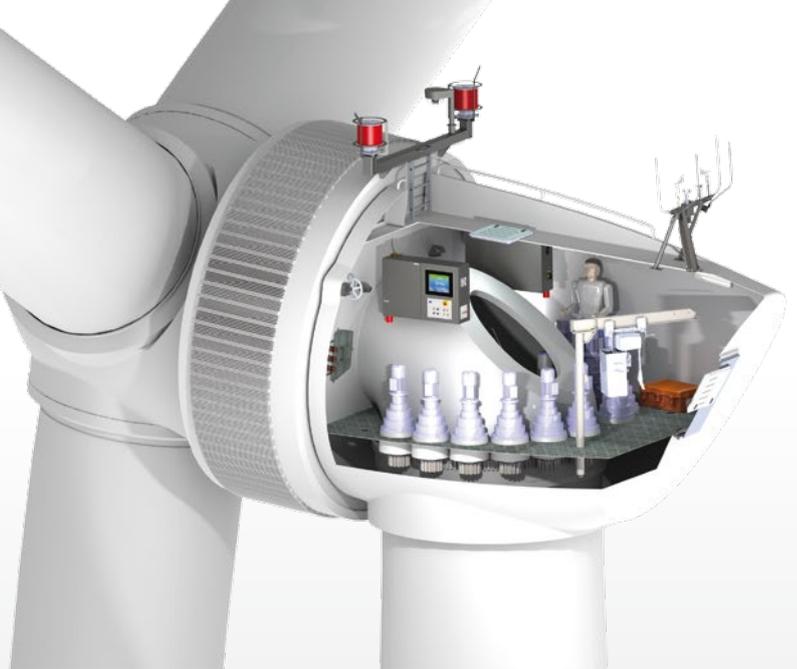
Our wind turbines are delivered turn-key and are manufactured at our own factory in the Netherlands. Our engineering, production and service departments ensure high quality in design and production, great reliability and optimum performance. We unburden our customers and will offer you a unique approach in which we will work together at a successful wind energy project.

**ADVANTAGE** THROUGH SIMPLICITY



# L136 4.5MW

## Technical data



### GENERAL

Nominal power	4.5 MW
Rotor diameter	136 m
IEC class	IIA
Turbine concept	Direct drive, variable speed, variable pitch, full power converter

### ROTOR

Type	3 blades, upwind rotor
Rotor surface	14,584 m <sup>2</sup>
Power control	Electric pitch control
Blade material	Glassfiber reinforced polyester
Lightning protection	Integrated in the blade, in direct contact with construction

### GENERATOR

Type	Lagerwey multi-pole synchronous
Field generation	Permanent magnet
Main bearing	Double row of conical bearings
Cooling	Based on air flow around the outside of generator (cooling fins)

### SAFETY SYSTEM

Type	3 independent systems with emergency power provision
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### CONVERTER

Type	Full power AC-DC-AC
Control system	IGBT-Control
Cooling	Water-cooled

### OPERATIONAL DATA

Cut in wind speed	2.5 m/s
Cut out wind speed	25 m/s
Power factor	Regulated

### OTHER

Service brake system	Standard
Safeguard	Rotor blade, yaw motor and drive
Lubrication system	Automatically controlled bearing and gear lubrication

### TOWER

Type	MST - Modular Steel Tower
Shaft height	120 / 132 / 144 / 166 m (alternative hub height on request)

### OPTIONS

Service lift	Standard
Rescue module gondola	Standard
Noise reduction	Standard
Obstacle light/markings	Optional
Ice management system	Optional
Cast shade regulation	Optional