

275kW WIND TURBINE



Bringing Possibility of Wind Power to Remote Islands

Okinawa Prefecture of Japan is a region consisting of 49 inhabited and countless uninhabited islands. The set of islands are located in the subtropical zone, characterized by maritime climate and very frequent typhoons. Introducing wind power in this area means a struggle with harsh environmental conditions such as salinity and typhoons. Progressive Energy Corporation (PEC) has successfully installed wind turbines that can withstand the harshest conditions. We made it possible to introduce the most optimal wind turbines for Okinawa by collaborating with Vergnet, a French wind power pioneer, manufacturing towers with in Japan while utilizing Vergnet's GEV-MP-C nacelle. PEC has installed two tiltable wind turbines on Hateruma Island in Okinawa, for the first time in Japan, followed by two more on Minamidaito Island. Thanks to the guyed tower, all the maintenance operations can be done at the ground level. This unique system largely reduced maintenance cost and dramatically shortened stopping time of wind turbines. In case of a typhoon or a Cyclone, the turbine can be secured to the ground and protected from violent winds.

275kW Wind Turbine

- Maximum Output: 275kW
- Rotor Diameter: 32m
- Tower Length: 38-m



Manoeuvring unit



Grid Connection



Lowering the Turbine



Protected from Typhoons

A Light, Compact And Versatile Design



2-Blade Rotor

This design enables the turbines to be lowered down to the ground for maintenance operations.

Compact Nacelle

Two nacelles can fit in a standard 20ft. container.

Light Guy-wired Tower

All the components for the tower can be contained in a 20 ft. container.

Easy to Install

The whole structure can be erected on the ground and tilted up using a hydraulic winch. All you need is a fork lift and a 30t crane.

Typhoon or a Cyclone-Proof

In case of a typhoon or a cyclone, the wind turbine can be tilted down and secured to the ground. Lowering operation takes only about an hour. Once it's secured to the ground, it can sustain up to 300km/h wind gusts (a category 5 Typhoon or a Cyclone).

Reduced Foundation

The light guyed tower requires a very small foundation. Therefore, the amount of concrete can be largely reduced comparing to typical wind turbines in the market.

Earthquake-proof

The guyed tower's adaptable architecture also proves efficient in areas prone to seismic activity.



Easy to Transport

The turbine with PEC specification can fit in a 20ft. container (excluding blades). It can be transported easily and at low cost.



Ground-level Maintenance

Thanks to the guyed tower, all the maintenance operations can be done at the ground level. This unique system largely reduced maintenance cost and dramatically shortened stopping time of wind turbines.



Suited for the Harshest Conditions

The turbine is completely protected from harmful elements including the harshest climate conditions, and provides high production volume through its life time.



High Performance

GEV MP is designed to make the most of wind potential. The 32-meter rotor at 38m in height allows the maximum use of wind power. The pitch control, together with the regulation of torque variations, ensures high quality power production.



Easy to Install

Installation can be done only with a fork lift and 30t crane.



Typhoon or a Cyclone-Proof

The GEV MP can sustain up to Category 5 Typhoon or a Cyclone winds.



Robustness and Reliability

A wind turbine must withstand unequalled loads and stresses, and endure even more hardships in hurricane-prone areas. Equipped with heavy-duty parts and efficient damper technologies, GEV MP is astonishingly reliable even in the windiest areas.



Remote Supervision

As it is designed to be installed anywhere in the world, it can be monitored and controlled remotely using any telecommunications system available locally, even the lightest ones.

Achievement of PEC (assembly and maintenance)



HATERUMA island



MINAMI DAITO island



Erecting the Tower



Assemble of the nacelle



Maintenance



Repair on Nacelle cover

TECHNICAL DESCRIPTION

TURBINE CONCEPT

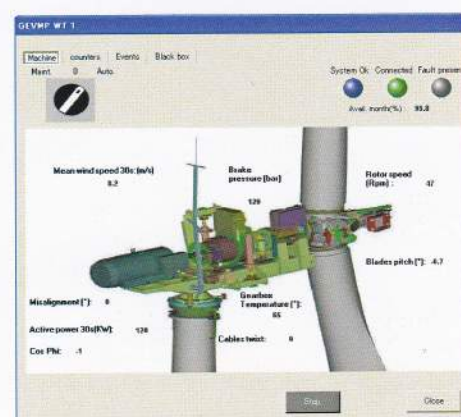
- Output power 200/225/250/275kW
 - 2 - blade down wind rotor,two-speed generator
 - Teetering hub with rubber/metal dampening
 - Hydraulic pitch control
-
- Cut in wind speed 3.6m/ s
 - Cut out wind speed 20.0m/ s
 - Output Voltage & Frequency(3-Phase) 400V-50Hz or 460V-60Hz
or 480V-60Hz
 - Class(as per IEC 61400-1):1999 From classIII to classIV
 - Hub height 38m
 - Rotor diameter 32m
 - Rotation speed(50 & 60 Hz) 31 to 46 min⁻¹
 - Max. wind speed - m/s
 - Operating position 30-42.5m/s
 - Lowered position 85m/s



Electrical cabinet

EXTREME CONDITION PROTECTION

- Corrosion-nacele Marine anti-corrosion protection(C4)
(ISO 12944-5)
- Corrosion-Towers Galvanized (JIS H8641 55HDZ 55)
- Generator tightness/insulation IP55/Class F (IEC60529/IEC60085)
- Hurricane resistance Lowering system
- Earthquake resistance Flexible architecture(guyed lower)
Multi-pole, shock-absorbent anchors
- Lightning protection Fully-integrated lightning protection(IEC-61400-24)
Lightning arrester on nacelle(IEC 62305/61643-12)
- Operating limits Temperature: -5°C to +40°C (23°F to 104°F)



Remote supervision

PERFORMANCE DETAILS

- Gearbox 2-stage planetary gearbox
- Generator 2-speed, asynchronous, squirrel cage generator
- Grid connection Power factor compensation
Electrical cabinet including by capacitor bank and transformer at tower base
- Emergency and parking brake Aerodynamic and disc on high speed shaft
- Yaw Hydraulic active yaw, automatic cable untwisting

TOWERS

- Type Guyed : Lattice
- Minimum comprised 6m (MAX)
- Material Galvanized steel
- Construction machinery Fork Lift and 30t crane
- Anchors Boreholes with steel rods cast in concrete

BLADES

- Material Twisted vinylester reinforced with fiber glass

CONTROL COMMAND SYSTEM

- Automation control Industrial automation Siemens through profibus
- UPS(voltage outage) 56Ah
- Remote supervision V-SCADA™ / through RTC, radio, internet...

WEIGHT-DIMENSIONS(CLASS III)

- Nacelle with rotor 7800kg (17196 lb)
- Wind turbine towers 20000kg (44092 lb)
- Transport packing 7×20ft containers. + blades (1 load) (minimum)

MANUFACTURERS

- Blades ACO(VERGNET)
- Blade design AERODYN
- Gearbox BONFIGLOLI or Equivalent
- Generator ABB or Equivalent

POWER CURVE

Wind speed (m/s) d=1.225kg/m ³	Power curve (kW) 32m blades
2.5	0
3.0	0
3.5	0
4.0	3
4.5	10
5.0	18
5.5	27
6.0	36
6.5	47
7.0	58
7.5	78
8.0	98
8.5	119
9.0	141
9.5	164
10.0	189
10.5	215
11.0	243
11.5	262
12.0	275
Up to 20	275