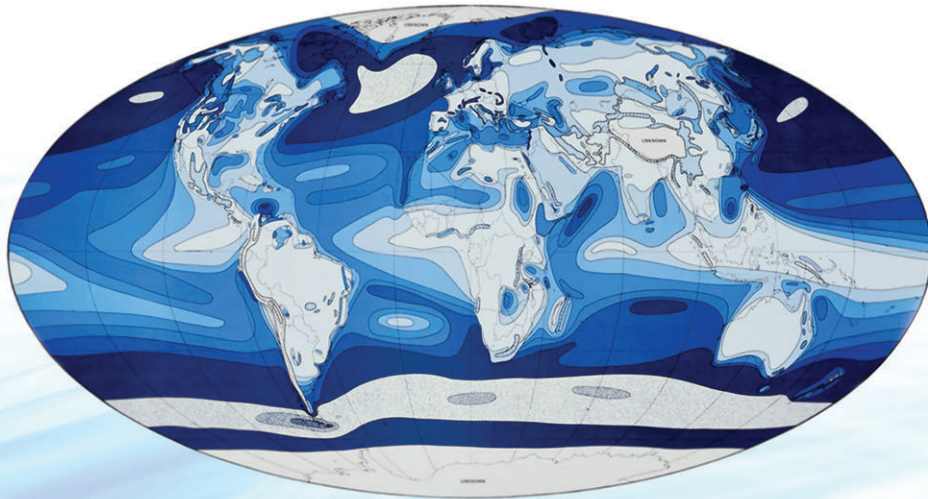


WORLD-WIDE WIND ENERGY RESOURCE DISTRIBUTION ESTIMATES



Classes of wind power density at 10 m and 50 m

Wind Power Class*	10 m (33 ft)		50 m (164 ft)	
	Wind Power Density (W/m ²)	Speed m/s mph	Wind Power Density (W/m ²)	Speed m/s mph
1	0	0	0	0
2	100	4.4 – 9.8	200	5.6 – 12.5
3	150	5.1 – 11.5	300	6.4 – 14.3
4	200	5.6 – 12.5	400	7.0 – 15.7
5	250	6.0 – 13.4	500	7.5 – 16.8
6	300	6.4 – 13.4	600	8.0 – 17.9
7	400	7.0 – 13.4	800	11.9 – 26.6
8	1,000	9.4 – 21.1	2,000	11.9 – 26.6
9	1,200	10.1 – 22.6	2,400	12.7 – 28.0
10	1,600	11.1 – 24.9	3,200	14.0 – 31.3
	> 1,600	> 11.1	> 3,200	> 14.0



Motor Sich JSC

WINDMILL-ELECTRIC VES-5



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154.01.02.004.01.12.03

10.2011 АО «МОТОР СИЧ» зак. 4803 стр. 50

Wind power plant is an installation that converts wind energy into electricity. It is intended to provide uninterrupted automated power supply for individual consumers such as farmers, horticulturists, summer visitors, rotation workers, hunters, anglers, geologic expeditions, as well as navigation, meteorological, radio relay stations, etc, in the regions long-distanced from power transmission lines, and in field conditions. It is manufactured in two configurations:

- 1) manually controlled free-standing plant;
- 2) automatic free-standing plant with manual control function.



Generator is a low-speed multi-pole device based on permanent magnets and ensures generation of alternating current without intensifying unit with maximum efficiency.



Charger-rectifier shapes optimal voltage for charging storage batteries by means of pulse-duration modulation. Control is effected by means of microcontroller.



Inverter-converter of DC to single-phase 220 VAC, 50 Hz, 5 kW with minimum nonsine coefficient makes it possible to connect any load: electric motors, digital equipment, TV receivers, etc.



Use of closed maintenance-free and (or) low-maintenance batteries featuring service life from 6 to 10 years requires minimum attention on behalf of a customer.



WEGP automatic control system accomplishes orientation of the windwheel down the wind, protection against the wind overloads and optimizes unattended WEGP operation by means of microprocessor control.

The system used for mast lifting and descending does not require any specialized equipment and makes it possible to carry out the whole scope of WEGP installation and maintenance with a participation of 2 to 3 persons.

Main parameters		VES -5	
Rotor diameter, m		7.0	
Rotational speed, rpm		60 thru 220	
Working range of wind speeds, m/s		3.5 to 16	
Control system		automatic microprocessor provided with manual control function	
Generator power, kW		5	
Mast height, m		12	
Weight, kg		1,350	
Battery voltage, V		96	
Output voltage V/ Hz		220/50	
Output power, kW		5	
Service life, years		10	
Generated electric power per month, kW·h	Wind speed, m/s	4	270
		5	520
		6	950
		7	1,500
		8	2,300
		9	3,300
		10	4,500

Time of batteries discharge

Loading	Time of storage, h	Capacity of storage battery A* h				
		150	450	900	1,350	1,800
1 kW		15	45	90	135	180
2 kW		7.5	22.5	45	67.5	90
5 kW*		3	9	18	27	36

*In case of absence of wind it is recommended to restrict the power consumption down to 2 kW