DET NORSKE VERITAS

TYPE CERTIFICATE

Norwin 750 kW

Approval class:
B

B-DNV-218101-0
Type Certificate number

2008-07-04
Date of issue

Manufacturer:
Norwin A/S
Industrileddet 13
Svogerslev
4000 Roskilde

Valid until: 2009-07-04

This certificate attests compliance with IEC 61400-1 ed. 3: 2005 concerning the design and manufacture except for outstanding issues listed in Appendix 2. The conformity evaluation was carried out according to IEC WT 01: 2001 "IEC system for conformity testing and certification of wind turbines - Rules and procedures."

Reference documents:
Technical Report: WTDK-6189

Wind Turbine specification and outstanding issues:
IEC WTGS class: IB & IIA. For further information see Appendices 1 and 2 of this Certificate.

Date: 2008-07-04
Tove Feld
Management Representative
Det Norske Veritas, Danmark A/S

PRODUCTS
RvA C257

Date: 2008-07-04
Bente Vestergaard
Project Manager
Det Norske Veritas, Danmark A/S

DET NORSKE VERITAS, DANMARK A/S

APPENDIX 1 WIND TURBINE SPECIFICATION

General:

IEC WT class acc. to IEC 61400-1 ed. 3: 2005:	IB & IIA
Rotor diameter:	47 m
Rated power:	170 / 750 kW
Rated wind speed V_r:	14 m/s
Hub height(s):	65 m
Operating wind speed range V_{in}-V_{out}:	4 – 25 m/s
Design life time:	20 years

Wind conditions:	IB	IIA
V_{ref} (hub height):	50 m/s	42.5 m/s
V_{ave} (hub height):	10 m/s	8.5 m/s
I_{ref} (V_{hub}=15 m/s) acc. to IEC 61400-1 ed. 3: 2005:	0.14	0.16
Mean flow inclination:	8°	

Electrical network conditions:

Normal supply voltage and range:	360 V to 460 V
Normal supply frequency and range:	47 Hz to 51 Hz
Number of annual electrical network outages:	360

Other environmental conditions (where taken into account):

Air density:	1.25 kg/m^3
Normal and extreme temperature ranges:	Normal: -10°C to +40°C Extreme: -20°C to +50°C
Earthquake model and parameters:	None taken into account

Main components:

Blade type:	LM 21.0 P
Gear box type:	Winergy PEAS 4290.4
Generator type:	ABB M2LG 400 LKD 4/6 B3
Tower type:	Tubular steel tower
Service lift:	Not present
Crane:	Not present