Date: 2012-04-19 Class: 1 Page 76 of 79

Document no.: 0004-6207 V10 Issued by: Technology R&D Type: T05 - General Description

General Specification Appendices

12.2.3 V90-2.0 MW Sound Power Level at Hub Height V90-2.0 MW Sound Power Level at Hub Height, Noise Mode 0

V90-2.0 MW Sound Power Level at Hub Height, Noise Mode 0				
Conditions for Sound Power Level:	Measurement standard IEC 61400-11 ed. 2 2002			
	Wind shear			
		urbulence at	•	jht: 16%
	Inflow angle (vertical): 0 ±2° Air density: 1.225 kg/m ₃			
Hub Height	80 m	95 m	105 m	125 m
L _{WA} @ 3 m/s (10 m above ground) [dBA]	92.6	92.8	92.9	93.0
Wind speed at hub height [m/s]	4.2	4.3	4.4	4.5
L _{wA} @ 4 m/s (10 m above ground) [dBA]	95.6	96.1	96.4	96.9
Wind speed at hub height [m/s]	5.6	5.7	5.8	6.0
L _{wA} @ 5 m/s (10 m above ground) [dBA]	99.8	100.3	100.6	101.2
Wind speed at hub height [m/s]	7.0	7.2	7.3	7.5
L _{wA} @ 6 m/s (10 m above ground) [dBA]	102.8	103.0	103.1	103.3
Wind speed at hub height [m/s]	8.4	8.6	8.7	9.0
LwA @ 7 m/s (10 m above ground) [dBA]	103.7	103.8	103.8	103.8
Wind speed at hub height [m/s]	9.8	10.0	10.2	10.5
LwA @ 8 m/s (10 m above ground) [dBA]	104.0	104.0	104.0	104.0
Wind speed at hub height [m/s]	11.2	11.5	11.7	12.0
LwA @ 9 m/s (10 m above ground) [dBA]	104.0	104.0	104.0	104.0
Wind speed at hub height [m/s]	12.6	12.9	13.1	13.5
LwA @ 10 m/s (10 m above ground) [dBA]	104.0	104.0	104.0	104.0
Wind speed at hub height [m/s]	13.9	14.3	14.6	15.0
LwA @ 11 m/s (10 m above ground) [dBA]	104.0	104.0	104.0	104.0
Wind speed at hub height [m/s]	15.3	15.8	16.0	16.5
LwA @ 12 m/s (10 m above ground) [dBA]	104.0	104.0	104.0	104.0
Wind speed at hub height [m/s]	16.7	17.2	17.5	18.0
L _{WA} @ 13 m/s (10 m above ground) [dBA]	104.0	104.0	104.0	104.0
Wind speed at hub height [m/s]	18.1	18.6	18.9	19.5

Table 12-21: V90-2.0 MW sound power level at hub height, noise mode 0.



Document no.: 0004-6207 V10 Issued by: Technology R&D Type: T05 - General Description

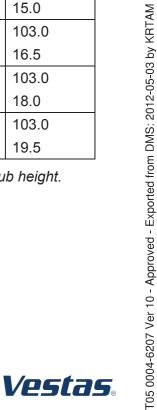
General Specification Appendices

Date: 2012-04-19 Class: 1 Page 77 of 79

V90-2.0 MW Sound Power Level at Hub Height, Noise Mode 1

V90-2.0 MW Sound Power Level at Hub Height, Noise Mode 1					
Conditions for Sound Power Level:	Measurement standard IEC 61400-11 ed. 2 2002				
	Wind shear	Wind shear: 0.16			
		Maximum turbulence at 10 metre height: 16%			
	Inflow angle (vertical): 0 ±2°				
		1.225 kg/m₃			
Hub Height	80 m	95 m	105 m	125 m	
L _{wA} @ 3 m/s (10 m above ground) [dBA]	92.6	92.8	92.9	93.0	
Wind speed at hub height [m/s]	4.2	4.3	4.4	4.5	
LwA @ 4 m/s (10 m above ground) [dBA]	95.6	96.1	96.4	96.9	
Wind speed at hub height [m/s]	5.6	5.7	5.8	6.0	
LwA @ 5 m/s (10 m above ground) [dBA]	99.8	100.3	100.6	101.1	
Wind speed at hub height [m/s]	7.0	7.2	7.3	7.5	
LwA @ 6 m/s (10 m above ground) [dBA]	102.7	102.9	103.0	103.0	
Wind speed at hub height [m/s]	8.4	8.6	8.7	9.0	
LwA @ 7 m/s (10 m above ground) [dBA]	103.0	103.0	103.0	103.0	
Wind speed at hub height [m/s]	9.8	10.0	10.2	10.5	
LwA @ 8 m/s (10 m above ground) [dBA]	103.0	103.0	103.0	103.0	
Wind speed at hub height [m/s]	11.2	11.5	11.7	12.0	
LwA @ 9 m/s (10 m above ground) [dBA]	103.0	103.0	103.0	103.0	
Wind speed at hub height [m/s]	12.6	12.9	13.1	13.5	
LwA @ 10 m/s (10 m above ground) [dBA]	103.0	103.0	103.0	103.0	
Wind speed at hub height [m/s]	13.9	14.3	14.6	15.0	
L _{wA} @ 11 m/s (10 m above ground) [dBA]	103.0	103.0	103.0	103.0	
Wind speed at hub height [m/s]	15.3	15.8	16.0	16.5	
L _{wA} @ 12 m/s (10 m above ground) [dBA]	103.0	103.0	103.0	103.0	
Wind speed at hub height [m/s]	16.7	17.2	17.5	18.0	
L _{wA} @ 13 m/s (10 m above ground) [dBA]	103.0	103.0	103.0	103.0	
Wind speed at hub height [m/s]	18.1	18.6	18.9	19.5	

Table 12-22: V90-2.0 MW noise mode 1, sound power level at hub height.



Document no.: 0004-6207 V10 Issued by: Technology R&D Type: T05 - General Description

General Specification Appendices

Date: 2012-04-19 Class: 1 Page 78 of 79

V90-2.0 MW Sound Power Level at Hub Height, Noise Mode 2

V90-2.0 MW Sound Power Level at Hub Height, Noise Mode 2					
Conditions for Sound Power Level:	Measureme	Measurement standard IEC 61400-11 ed. 2 2002			
	Wind shear	Wind shear: 0.16			
		Maximum turbulence at 10 metre height: 16%			
	Inflow angle (vertical): 0 ±2°				
Hode Heiselet		Air density: 1.225 kg/m ₃			
Hub Height	80 m	95 m	105 m	125 m	
L _{wA} @ 3 m/s (10 m above ground) [dBA]	92.6	92.8	92.9	93.0	
Wind speed at hub height [m/s]	4.2	4.3	4.4	4.5	
L _{WA} @ 4 m/s (10 m above ground) [dBA]	95.6	96.1	96.4	96.9	
Wind speed at hub height [m/s]	5.6	5.7	5.8	6.0	
LwA @ 5 m/s (10 m above ground) [dBA]	99.8	100.1	100.2	100.5	
Wind speed at hub height [m/s]	7.0	7.2	7.3	7.5	
LwA @ 6 m/s (10 m above ground) [dBA]	101.0	101.0	101.0	101.0	
Wind speed at hub height [m/s]	8.4	8.6	8.7	9.0	
LwA @ 7 m/s (10 m above ground) [dBA]	101.0	101.0	101.0	101.0	
Wind speed at hub height [m/s]	9.8	10.0	10.2	10.5	
LwA @ 8 m/s (10 m above ground) [dBA]	101.0	101.0	101.0	101.0	
Wind speed at hub height [m/s]	11.2	11.5	11.7	12.0	
LwA @ 9 m/s (10 m above ground) [dBA]	101.0	101.0	101.0	101.0	
Wind speed at hub height [m/s]	12.6	12.9	13.1	13.5	
LwA @ 10 m/s (10 m above ground) [dBA]	101.0	101.0	101.0	101.0	
Wind speed at hub height [m/s]	13.9	14.3	14.6	15.0	
L _{wA} @ 11 m/s (10 m above ground) [dBA]	101.0	101.0	101.0	101.0	
Wind speed at hub height [m/s]	15.3	15.8	16.0	16.5	
L _{wA} @ 12 m/s (10 m above ground) [dBA]	101.0	101.0	101.0	101.0	
Wind speed at hub height [m/s]	16.7	17.2	17.5	18.0	
L _{wA} @ 13 m/s (10 m above ground) [dBA]	101.0	101.0	101.0	101.0	
Wind speed at hub height [m/s]	18.1	18.6	18.9	19.5	

Table 12-23: V90-2.0 MW sound power level at hub height, noise mode 2.



Document no.: 0004-6207 V10 Issued by: Technology R&D Type: T05 - General Description

General Specification Appendices

Date: 2012-04-19 Class: 1 Page 79 of 79

V90-2.0 MW Sound Power Level at Hub Height, Noise Mode 3

V90-2.0 MW Sound Power Level at Hub Height, Noise Mode 3					
Conditions for Sound Power Level:	Measureme	Measurement standard IEC 61400-11 ed. 2 2002			
	Wind shear	: 0.16			
		Maximum turbulence at 10 metre height: 16%			
	Inflow angle (vertical): 0 ±2°				
		Air density: 1.225 kg/m ₃			
Hub Height	80 m	95 m	105 m	125 m	
LwA @ 3 m/s (10 m above ground) [dBA]	92.5	92.5	92.6	92.7	
Wind speed at hub height [m/s]	4.2	4.3	4.4	4.5	
LwA @ 4 m/s (10 m above ground) [dBA]	94.6	95.0	95.3	95.7	
Wind speed at hub height [m/s]	5.6	5.7	5.8	6.0	
LwA @ 5 m/s (10 m above ground) [dBA]	98.8	99.3	99.6	100.1	
Wind speed at hub height [m/s]	7.0	7.2	7.3	7.5	
LwA @ 6 m/s (10 m above ground) [dBA]	101.8	102.0	102.1	102.3	
Wind speed at hub height [m/s]	8.4	8.6	8.7	9.0	
LwA @ 7 m/s (10 m above ground) [dBA]	103.5	103.8	103.8	103.8	
Wind speed at hub height [m/s]	9.8	10.0	10.2	10.5	
LwA @ 8 m/s (10 m above ground) [dBA]	103.6	104.0	104.0	104.0	
Wind speed at hub height [m/s]	11.2	11.5	11.7	12.0	
LwA @ 9 m/s (10 m above ground) [dBA]	104.0	104.0	104.0	104.0	
Wind speed at hub height [m/s]	12.6	12.9	13.1	13.5	
LwA @ 10 m/s (10 m above ground) [dBA]	104.0	104.0	104.0	104.0	
Wind speed at hub height [m/s]	13.9	14.3	14.6	15.0	
LwA @ 11 m/s (10 m above ground) [dBA]	104.0	104.0	104.0	104.0	
Wind speed at hub height [m/s]	15.3	15.8	16.0	16.5	
LwA @ 12 m/s (10 m above ground) [dBA]	104.0	104.0	104.0	104.0	
Wind speed at hub height [m/s]	16.7	17.2	17.5	18.0	
LwA @ 13 m/s (10 m above ground) [dBA]	104.0	104.0	104.0	104.0	
Wind speed at hub height [m/s]	18.1	18.6	18.9	19.5	

Table 12-24: V90-2.0 MW sound power level at hub height, noise mode 3.

