

## Vestas V80 Byggeår 2004

2 stk. Vestas V80 særdeles god stand med nye Gearkasser.

Transformatorstation	Inklusiv
Effektregulering	Pitch
Antal/stk.	2
Model	Vestas V80
Årgang	2004
Leveringstid	På Lager
Nominel effekt	2000kW
Navhøjde (m)	60m
Rotordiameter (m)	80m
Spænding/frekvens	20000V/50Hz



# Technical Specifications/Main Components

## History of this Document

Changes in this document:

Rev. no.:	Date:	Description of change
1	2002-01-17	(adapting the document for V80 1,8 MW) Section 2.3: 60Hz added. 215 bar changed to 200 bar. "Weight with oil cooler - 525 kg (1.8MW)" added. Section 4: 50/60Hz types added. Section 5.1: 117 l/min changed to 100 l/min. Section 5.4: "HDU 15/25 PM-690V (60Hz)" added. Section 5.2, 5.6, 5.7 and 5.9 specified for L&S and Hansen gearboxes. Section 5.5: 60Hz type added. Section 6.3: 800 and $\varnothing$ 108 changed to 950 and $\varnothing$ 109. Section 8: New types added. Updating of section 8. Section 10: New types added. Updating of section 10.
2	2005-03-11	Section 1: "thread" added to "Stainless steel inserts" To "Colour" "custom-designed" has been added Section 2.3: Pressure, brake system: 50Hz and 60 Hz added Section 9.1: Weight for ABB generator changed Leroy Somer removed; Table added Section 10.1: V80 VRCC added; Table added Section 13.1: FT sensor added Drawing 950645 updated to revision 2 Drawing 950646 updated to revision 1

## Related Documentation

Item no.	Title
947905	V80 1,8/2,0MW, Klasse II, Tekniske specifikationer for hovedkomponenter

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## 1. Rotor

### 1.1 Blade

Manufacturer:	Vestas
Type no.:	VESTAS 39 m
Material:	Glass fibre reinforced epoxy (blade shells) Glass fibre reinforced epoxy (blade spar) Stainless steel thread inserts (root attachment)
Surface:	Epoxy gelcoat
Colour:	RAL 9010, RAL 7035 and custom-designed
Overall length:	39 m
Max. Chord:	3357 mm
Weight:	6500 kg

### 1.2 Blade Bearing

Manufacturer:	ROLLIX/ HOESCH ROETHE ERDE
Type:	Double row, 4 point contact ball bearing
Lubrication:	Grease: Aeroshell 14
Dimension:	ø2120/ ø1700 x 192 mm
Weight:	1475 kg

### 1.3 Nose Cone

Manufacturer:	Vestas
Form:	Length 4.14 m, diameter 3.46 m.
Material:	Glass fibre reinforced polyester coated with polyester gelcoat
Weight:	Approx. 600 kg

### 1.4 Blade Hub

Manufacturer:	Vestas
Material:	EN-GJSF400-18U-LT-D
Weight:	8463 kg

## 2. Pitch System

### 2.1 Hydraulic Cylinder

Manufacturer:	LJM
Type:	021 VD 125/80 x 760 – 808-g-T
Dimension:	305 x 178 x 1352 mm

### 2.2 Linear Transducer in Cylinder

Manufacturer:	Balluff
Type:	BTL5-A11-M0800-B-SA56-S32

### 2.3 Hydraulic Power Unit

Manufacturer:	PMC Technology
Pump motor:	18,5 kW, 690 V, 50/60 Hz, and 4 poles
Proportional valve:	NG10
Pump flow:	46,2 - 49 l/min - 50 Hz 40,8 - 44,9 l/min - 60 Hz
Pressure, pitch system:	180 - 200 bar
Pressure, pitch system, return:	Min. 6 bar
Pressure, brake system:	50Hz: 40 bar 60Hz: 34 bar
Size of oil reservoir:	300 l (gross volume)
Oil quantity (system):	320 l
Weight (without oil)	475 kg
Weight with oil cooler	525 kg (1.8 MW)

### 2.4 Hydraulic Block on Cylinder

Manufacturer:	PMC Technology
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### 2.5 Plain Bearing on Cylinder

Manufacturer:	SKF
Type:	PWM 809060
Dimension:	ø90/ ø60 x 40 mm

### 2.6 Spherical Plain Bearing on Cylinder Rod

Manufacturer:	SKF
Type:	GE100TG 3A-2RS
Dimension:	ø150/ ø100 x 70 mm

## 3. Main Shaft Arrangement

### 3.1 Main Shaft

Manufacturer:	Vestas
Material:	42CrMo4 / V / EN 10083
Size:	ø630/ flange ø1500/ length 2690 mm
Weight:	6078 kg

### 3.2 Front Main Bearing (nearest to the rotor)

Manufacturer:	SKF/FAG/Koyo
Type:	230/630 CA/W33
Dimension:	ø920 mm/ ø630 mm x 212 mm
Weight:	485 kg

### 3.3 Rear Main Bearing (furthest from the rotor)

Manufacturer: SKF/FAG/Koyo  
Type: 24188 CA/W33  
Dimension:  $\varnothing 720$  mm/  $\varnothing 440$  mm x 280 mm  
Weight: 460 kg

### 3.4 Front Main Bearing Seal

Manufacturer: Seal Pool  
Type:  $\varnothing 660$ /  $\varnothing 700$  x 20 mm GVP

### 3.5 Rear Main Bearing Seal

Manufacturer: Seal Pool  
Type:  $\varnothing 500$ /  $\varnothing 540$  x 20 mm CB

### 3.6 Hydraulic Cylinder for Rotor Locking

Manufacturer: LJM  
Type: SNH30 FD 63/30x60-360-G  
Dimension:  $\varnothing 169$  x 625 mm

### 3.7 Manuel Hydraulic Pump for Rotor Locking

Manufacturer: LJM  
Type: HANSA TMP/GLDE20/I  
Dimension: 100 x 290 x 700 mm

## 4. Main Gearbox Arrangement

### 4.1 Gearbox

Manufacturer: Lohmann & Stolterfoht  
Type: GPV 440  
Shaft displacement: 948 mm (horizontal)  
Total length: 2689 mm  
Weight: 14500 kg  
Ratio: 50 Hz: 1:100,845  
Ratio: 60 Hz: 1:121,28

Manufacturer: Lohmann & Stolterfoht  
Type: GPV 441  
Shaft displacement: 948 mm (horizontal)  
Total length: 2689 mm  
Weight: 14500 kg  
Ratio: 50 Hz: 1:100,33 (Onshore)  
Ratio: 60 Hz: 1:120,099

Manufacturer: Hansen Transmissions  
Type: EH802N21 (Onshore)  
Shaft displacement: 948 mm (horizontal)  
Total length: 2689 mm

Weight: 14000 kg  
 Ratio: 60 Hz: 1:120,515  
 Ratio: 60 Hz: 1:111,36  
 Ratio: 50 Hz: 1:101,02 (Onshore)

#### 4.2 Shrink Disc

Manufacturer: Stüwe  
 Type: HSD 530-23  
 Dimension: ø980/ ø530 x 338 mm  
 Weight: 1200 kg

Manufacturer: Ovako  
 Type: OKCK 530  
 Dimension: ø950/ ø530 x 364 mm  
 Weight: 1225 kg

#### 4.3 Torque Arm Rubber Spring

Manufacturer: EFFBE-Werk  
 Type: Elastomer spring/ Urelast 90 h.A  
 Dimension: ø200/ ø44 x 40 mm

#### 4.4 Brake Calibre

Manufacturer: BREMBO  
 Type: PZ.I.4420.2802.10  
 STILFRENI  
 PR771401000  
 PR771301000

Piston diameter: ø75 mm  
 Weight: 16 kg  
 Max. pressure: 150 bar

#### 4.5 Brake Pad

Manufacturer: Micke  
 Type: MPM 030

#### 4.6 Transmission Shaft

Manufacturer: Vestas  
 Size: ø480 x 410 mm  
 Weight: 15 kg

## 5. Gearbox Oil System

### 5.1 Electrical Pump

Manufacturer: Settima  
Type: GR45 210 SMT 16B-2.2 kW-690 V (50 Hz)  
GR45 180 SMT 16B-2.2 kW-690 V (60 Hz)  
Capacity: 100l/min. (50/60 Hz).  
Pressure: Max. 15 bar

### 5.2 Shaft Driven Pump

Lohmann & Stolterfoht.  
Manufacturer: Rickmeier  
Type: R 4.5/45 FL-Z-UNI-SO  
Capacity: 65 l/min. at 1500 RPM  
Pressure: Max. 8 bar

Hansen Transmissions.  
Manufacturer: SHW  
Type: SHW40  
Capacity: 45 l/min. at 1500 RPM  
Pressure: Max. 15 bar

### 5.3 Oil Filter

Manufacturer: Mahle  
Type: HC35 SM-X 1511  
Filtration: 10 µm ABS.

### 5.4 Off-line Filter

Manufacturer: C.C. Jensen  
Type: HDU 15/25 PM - 1x230 V (50 Hz)  
HDU 15/25 PU - 690 V (60 HZ)  
Filtration: 3 µm

### 5.5 Oil Coolers

Manufacturer: Nissen Cooler  
Size: 502 x 620 mm, fan ø456 mm  
10 blades 25°, type 3HL  
Fan motors 50 Hz: 90S B14, 2 pole 1,5 kW/ 690 V  
Fan motors 60 Hz: 90L B14, 2 pole 3,0 kW/ 690 V

### 5.6 Oil Heating Elements

Lohmann & Stolterfoht.  
Manufacturer: Helios  
Connection: 2" BSPP  
Size: 2 x 980 W + 1 x 650 W



Hansen Transmissions.

Manufacturer:

Helios

Connection:

2" BSPP

Size:

1 x 1500 W + 1 x 750 W

### 5.7 Oil Level Switch

Lohmann & Stolterfoht.

Manufacturer:

Barksdale

Type:

UNS 1000-MS/T2-ST1

Voltage:

Voltage: 24 V DC

Hansen Transmissions.

Manufacturer:

KOBOLT

Type:

320-NBA1000

Voltage:

Voltage: 24 V DC

### 5.8 Oil Sump Temperature Sensor

Manufacturer:

Danfoss

Type:

MBT 5250

### 5.9 Bearing Temperature Sensor

Lohmann & Stolterfoht.

Manufacturer:

Bühler

Type:

TF-M-PT 100-VAL

Hansen Transmissions.

Manufacturer:

SENSYCON GmbH

Type:

WM60F

## 6. Rotating Transference

### 6.1 Rotating Trafo

Manufacturer:

Weier

Type:

ETK160

Dimension:

ø360 x 405 mm

Weight: 147 kg

### 6.2 Rotating ARC-net

Manufacturer:

Vestas

Dimension:

ø280 mm

### 6.3 Rotating Hydraulic Union

Manufacturer: Deublin  
Type: 9110-950  
Dimension:  $\varnothing$ 109 x 203 mm

## 7. Machinery Foundation

### 7.1 Main beam (left & right)

Manufacturer: Vestas  
Material: EN-GJSF400-18U-LT-D / EN 1560  
Size: 4590 x 1200 x 1280 mm each  
Weight: 4526 kg each

### 7.2 Generator Foundation

Manufacturer: Vestas  
Material: S 355 J2H (EN 10025)  
Size: 3560 x 2300 x 660 mm  
Weight: 2500 kg

## 8. Yaw System

### 8.1 Yaw Ring

Manufacturer: Niebuhr Tandhjulsfabrik + Hoesch Rothe Erde  
Material: 34CrNiMo 6 / V / 42CrMo 4 / V (EN 10083)  
Normal module: 16  
Number of teeth: 143  
Tooth width: 96 mm  
Weight: 767 kg

### 8.2 Yaw Gear

Before 01.10.01  
Manufacturer: Bonfiglioli/Transmittal SOM  
Type: 709T2M PG1802  
Type Worm gear: W110 MNRV110  
Ratio/Planetary stages: 1:28 1:22,1  
Ratio/Worm gear: 1:40 1:50  
Ratio total: 1:112 1:1105  
Electric motor spec.: 2.2 kW/6 pole/690 V  
Weight: 190 kg

After.01.10.01

Manufacturer:	Bonfiglioli/Transmittal	SOM	Brevini
Type:	709T3M	PG1603	RPR3140
Type Worm gear:	W75	MNRV075	FRS85
Ratio/Planetary stages:	1: 110,17	1:149,5	1:131,8
Ratio/Worm gear:	1:10	1:7,5	1:8,5
Ratio total:	1:1101,7	1:1121	1:1119,9
Electric motor spec.:	2.2 kW/6 pole/690 V		
Weight:	190 kg		

### 8.3 Yaw Gear Pinion

Before 01.10.01

Manufacturer:	Bonfiglioli/SOM
Material:	18NiCrMo5 (UNI 8550)
Normal module:	16
Number of teeth:	11
Tooth width:	100 mm
Weight:	Included in yaw gear weight

After 01.10.01: All yaw gears are delivered with integrated pinion.

### 8.4 Yawing Plain Bearings

Manufacturer:	Vestas
Material:	PETP

## 9. Generator

### 9.1 Generator

Manufacturer:	ABB
Type:	AMK 500L4A BAYH
Poles:	4
Building size:	500
Degree of protection:	IP55
Insulation class:	H
Weight cooler:	430 kg
Weight generator:	5700 kg
Bearing drive end (DE):	6330M C3
Bearing non-drive end (NDE):	6330M C3

Manufacturer:	WEIER
Type:	DVSG500/4Msp
Poles:	4
Building size:	500
Degree of protection:	IP54
Insulation class:	F/H
Weight cooler:	650 kg
Weight generator:	5500 kg
Bearing drive end (DE):	6330M C4
Bearing non-drive end (NDE):	6330M C4

For both bearings the following applies:  
 Level of insulation: 1000 V DC  
 Max. radial run-out inner ring: 15 µm radial  
 10 µm axial

	V80 VCS 50Hz	V80 VCS 60Hz	V80 VRCC 60Hz
Generator supplier	ABB / Weier	ABB	ABB

## 10. Trafo Arrangement

### 10.1 Trafo

Standard: IEC 60076-11 2004  
 Manufacturer: SIEMENS/SGB/ABB/France TRANSFO  
 Type: CAST-RESIN  
 Rated power: 2100 kVA  
 Rated HV: 6-34.5 kV  
 Highest equipment voltage: 36 kV (U<sub>m</sub>)  
 Highest power frequency withstand voltage (IEC): 70 kV  
 Highest impulse withstand voltage (IEC): 170 kV  
 HV tap changer: ±2x2.5%  
 Rated LV: 0.48/0.69 kV  
 Max. size: 2100 x 920 x 2150 mm  
 Max. weight: 5500 kg

Standard: IEC 60076-11 2004  
 Manufacturer: SIEMENS  
 Type: CAST-RESIN  
 Rated power: 1850 kVA  
 Rated HV: 6-34.5 kV  
 Highest equipment voltage: 36 kV (U<sub>m</sub>)  
 Highest power frequency withstand voltage (IEC): 70 kV  
 Highest impulse withstand voltage (IEC): 170 kV  
 HV tap changer: ±2x2.5%  
 Rated LV: 0.69 kV  
 Max. size: 2100 x 920 x 2150 mm  
 Max. weight: 5500 kg

	V80 VCS	V80 VRCC
Trafo supplier	SIEMENS/SGB/ABB/France TRANSFO	SIEMENS

## 11. Crane

### 11.1 Service Crane

Manufacturer:	ABB
Type:	B 4.2 500/1-12 690V, BAU-LIFTKET
Lifting capacity (max.):	800 kg
Lifting speed:	12 m/min.

### 11.2 Component Crane (not included)

Manufacturer:	Secalt/Tractel
Type:	T 1000 P, 690V, Tirak
Lifting capacity:	6400 kg
Lifting speed:	4.5/18 m/min.
Length of wire:	500 m

## 12. Machine Cover

### 12.1 Cover Parts

Manufacturer:	Vestas
Material:	Reinforced glass fibre

### 12.2 Cover Support

Manufacturer:	Vestas
Vibration dampers:	IKAS Novibra RA 800 EMB

## 13. Wind Sensor

### 13.1 FT Sensor/Ultrasonic Sensor

Manufacturer:	FT Technologies Ltd
Type:	FT702LT
Size:	ø50 x 160 mm
Weight:	0.3 kg

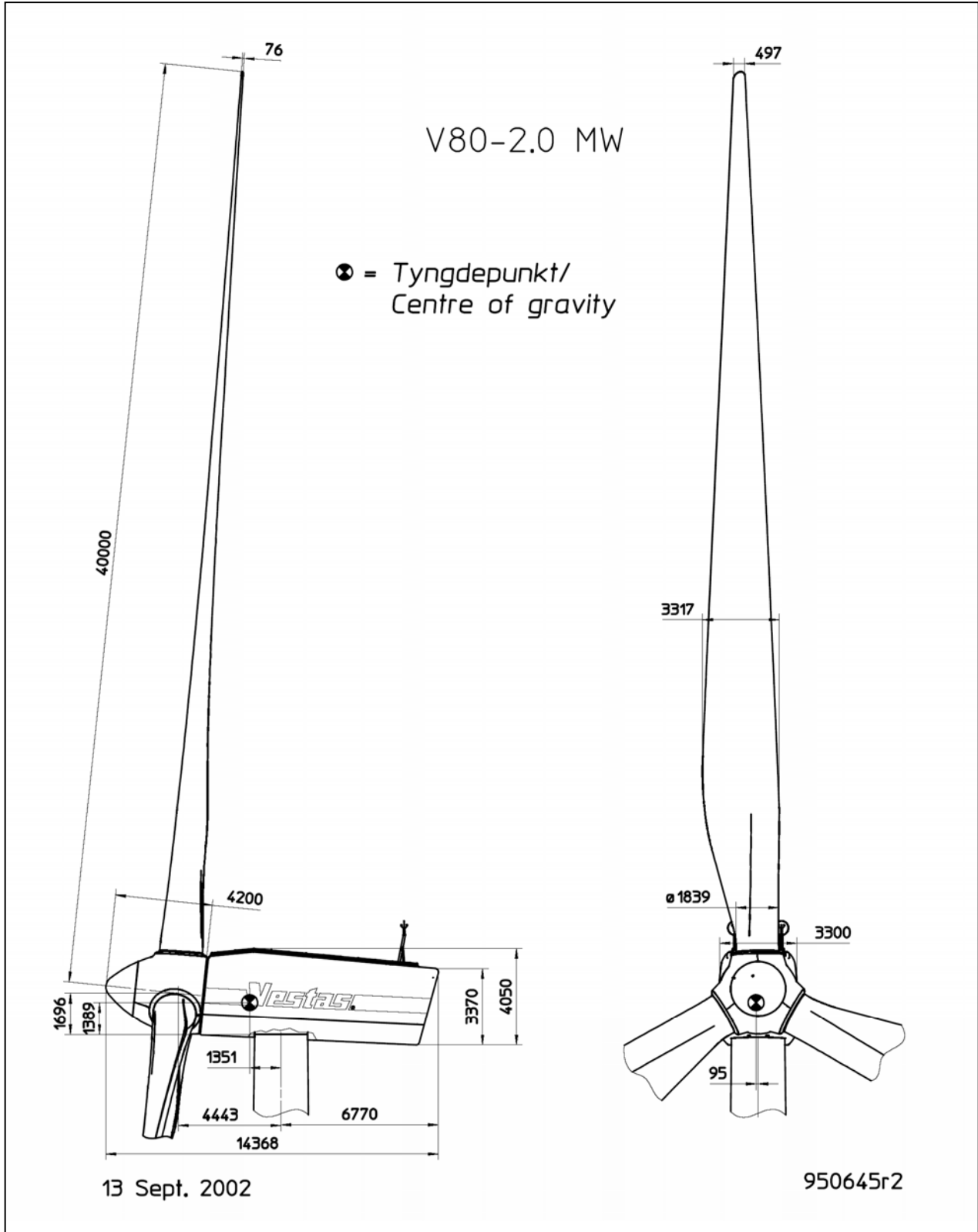
Manufacturer:	Vestas
Type:	VUS2D 2.0
Size:	ø70/ ø275 x 422 mm
Weight:	2.5 kg

## 14. Tubular Tower

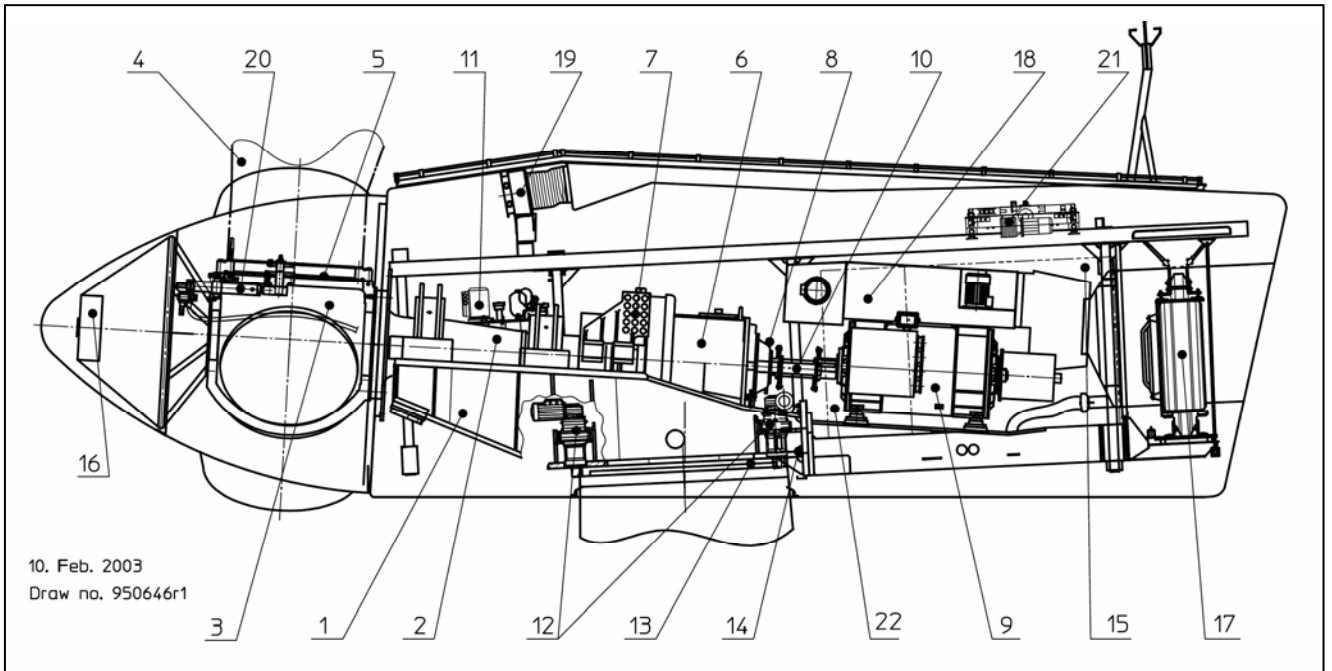
Manufacturer:	Vestas
Material:	S235 J0/JR
Heights:	60 m, 67 m, 78 m, 100 m
Top diameter:	2.3 m
Bottom diameter:	4.0 m

# 15. Dimension Drawings

## 15.1 Nacelle Cover and Blade, Overall Dimensions



### 15.2 Nacelle, Side View



Please disregard the position numbers.

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