

GP YONVAL

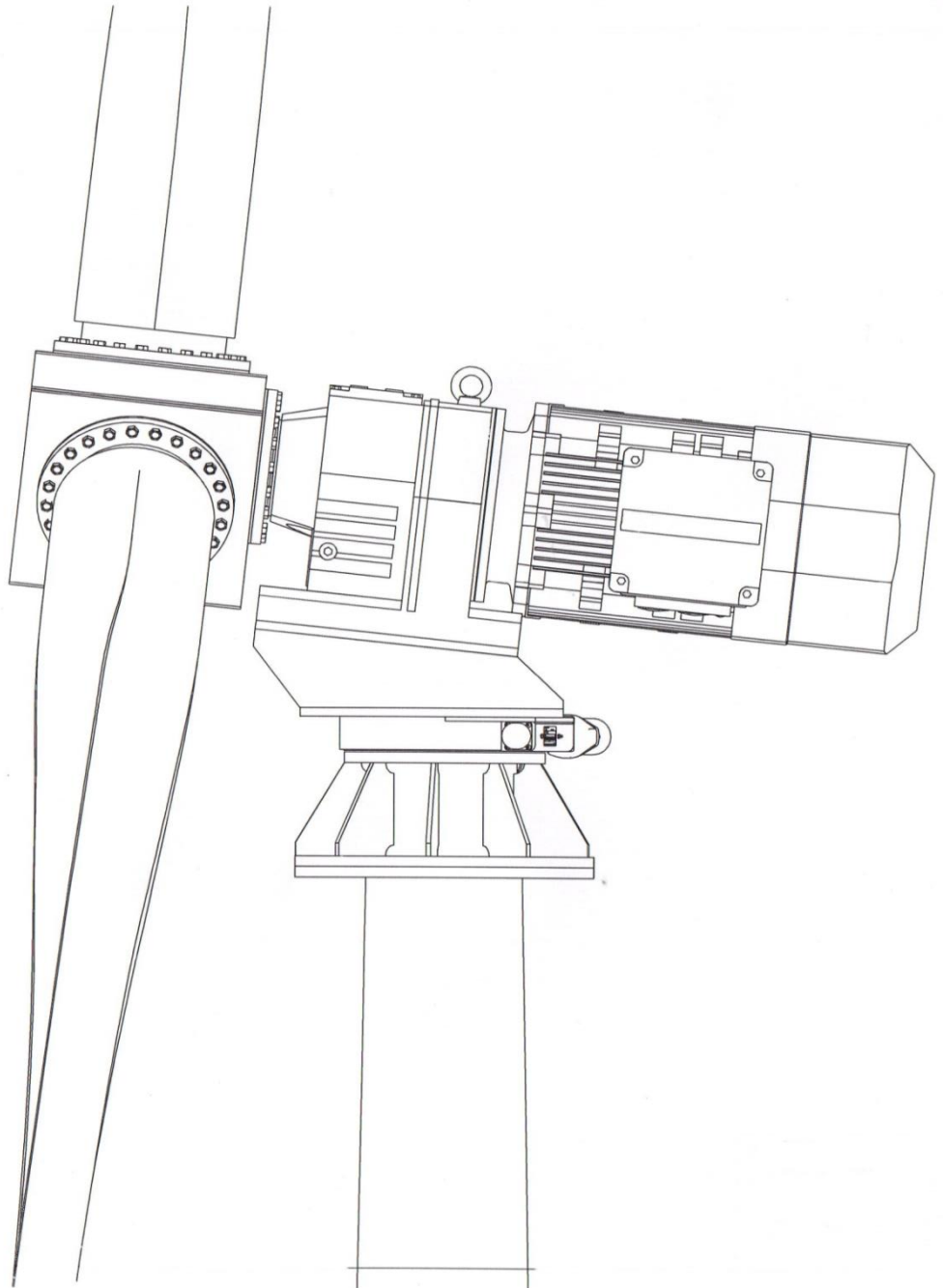
40 kW

GENERAL SPECIFICATIONS

The GP Yonval 40-16 is designed to generate high levels of energy, in accordance with the IEC 61400-2 standards and manufactured with reliable European components.

The variable speed active stall control system maximizes the power production for below rated wind speed and ensures a safe power limitation above rated wind speed.

This three bladed wind turbine is a reliable 40 kW small wind turbine with a high performance.



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	GP-YONVAL 40-16	Doc. No. GSI40-16 14.10 En
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Manufacturer GREEN POWER SARL
Lieu-dit Yonval
51330 Possesse
France

Model GP YONVAL 40-16

Design lifetime 20 years

Standards

40-16 small wind turbine IEC 61400-2
Generator IEC 60034-1

IEC 61400-2 Wind Conditions

Annual average wind speed at hub height, Vave	7.5 m/s
Reference wind speed, Vref	37.5 m/s
Extreme wind speed, Ve50	52.5 m/s
Characteristic value of hub-height turbulence intensity, I15	0.18

General Specifications

Design class	III
Nominal power	40 kW
Nominal wind speed	11 m/s
Cut-in wind speed	3.5 m/s
Cut-out wind speed	24 m/s
Power regulation	Active stall – active generator torque control
Noise emission @ 11 m/s	51 dBA @ 100 m
Operating temperature range	-10°C to +40°C
Storage temperature range	-20°C to +50°C

Rotor

Number of blades	3
Configuration	Upwind
Diameter	15.95 m
Swept area	199.8 m²
Nominal speed	50.1 rpm
Normal operation speed range	29.4 to 54.5 rpm
Maximum speed	74 rpm

Gearbox

Manufacturer	SEW
Type	3 stages
Rated power	45 kW
Ratio	1 :29.95
Weight	460 kg
Oil capacity	15.4 l

Generator

Manufacturer	CELMA CANTONI
Type	Induction
Number of poles	4
Rated power	45 kW
Rated speed	1480 rpm
Rated voltage	400 V
Rated current	79 A
Frequency	50 Hz
Wiring connection	Delta connection
Insulation class	F
Protection rating	IP 55
Weight	345 kg

Brake system

Manufacturer	ELMA ELFA
Type	Electromagnetic fail safe brake
Torque	600 Nm
Voltage	180 VDC
Weight	90 kg

Yaw System

Manufacturer	IMO
Type	Single row slew bearing
Yawing	Active
Source of signal	Ultrasonic wind speed and direction sensor
Speed	Variable speed for maximum safety
Weight	68 kg

Yaw Motor

Manufacturer	TRANSTECNO
Type	Worm Gear DC Motor
Rated power	0.6 kW
Voltage	24 Vdc
Rated speed	3000 rpm
Gear Ratio	1 :15
Weight	7.1 kg

Blades

Blade length	7.8 m
Weight	160 kg
Design	Naca aerofoils – Stall design
Material	Fiberglass – reinforced epoxy
Mounting	Fixed

Tower

Type	Hexagonal – Free standing
Height	20, 24 and 30 m (at hub height)
Number of sections	<ul style="list-style-type: none"> - 20 and 24 m : 2 sections - 30 m : 3 sections
Safe climbing system	Yes – External – Soll type
Material	Galvanised steel
Accessories	<ul style="list-style-type: none"> - Foundation bolts - Anchor rods foundation
Colour	Optional

Electrical output specifications

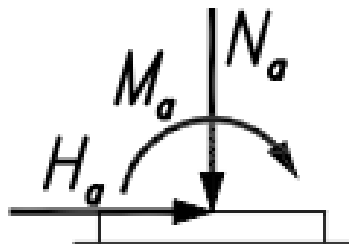
Phases	3 phases and neutral
Output voltage	400 V (± 20 V)
Output current	57.8 A (± 3.1 A)
Frequency	50 Hz (+1 Hz / - 2.5 Hz)
Rated output power	40 kW
Maximum reactive power	2.5 kVAR (for active power less than 0.5 kW)
Power converter	Yes (integrated into the controller for easy grid-connection)

Weights

Nacelle	2500 kg (rotor and cables included)
Controller	250 kg
Tower	<ul style="list-style-type: none"> - 20 m : 3750 kg - 24 m : 4890 kg - 30 m : 7590 kg

Efforts at the tower base

Height	20 m	24 m	30 m
Ha	129 kN	150 kN	174 kN
Na	68 kN	80 kN	105 kN
Ma	1868 kNm	2541 kNm	3389 kNm



Safety systems

First level	Aerodynamic stall of blades
Second level	Active stall power regulation with active generator torque control
Third level	Yaw system turn the nacelle out of the wind
Fourth level	Electromagnetic fail-safe brake
Safety systems activated by	<ul style="list-style-type: none"> - At high wind speed the nacelle is yawed out of the wind - Stall regulated blades - Rotor over speed - Generator over temperature - Generator over current - Power converter radiators over temperature - Grid over voltage - Grid failure - Wind sensor failure - Controller failure - Emergency button pressed - Low temperature into the controller

Controller

- Intelligent controller with integrated power converter
- RS 485 for remote monitoring and control
- User-friendly touch screen control

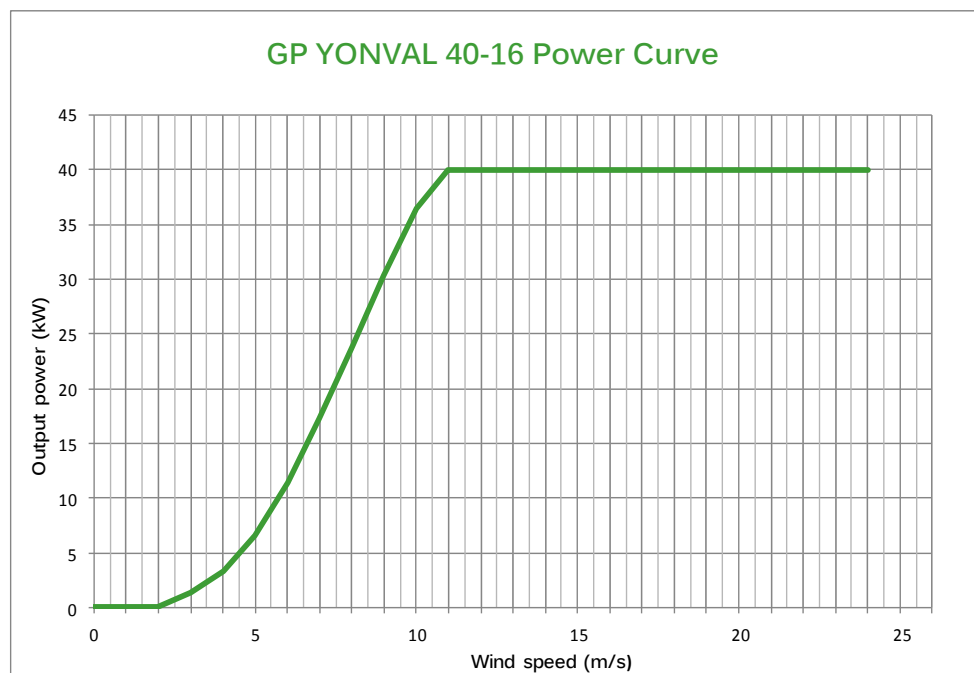
The GP YONVAL 40-16 controller with its integrated power convert provides a simple “plug and play” connection to the grid, providing clean power at a low cost.

Wind Sensor

Manufacturer	Gill Instruments
Type	Ultrasonic
Protection class	IP66
Accuracy wind speed	± 2% @ 12 m/s
Accuracy wind direction	± 2% @ 12 m/s
Response time	0.25 s
External material	Luran – Corrosion free

Power curve

Wind Speed [m/s]	Output Power [kW]
1	0
2	0
3	1,41
4	3,35
5	6,54
6	11,34
7	17,29
8	23,79
9	30,35
10	36,44
11	40
12	40
13	40
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15	40
16	40
17	40
18	40
19	40
20	40
21	40
22	40
23	40
24	40

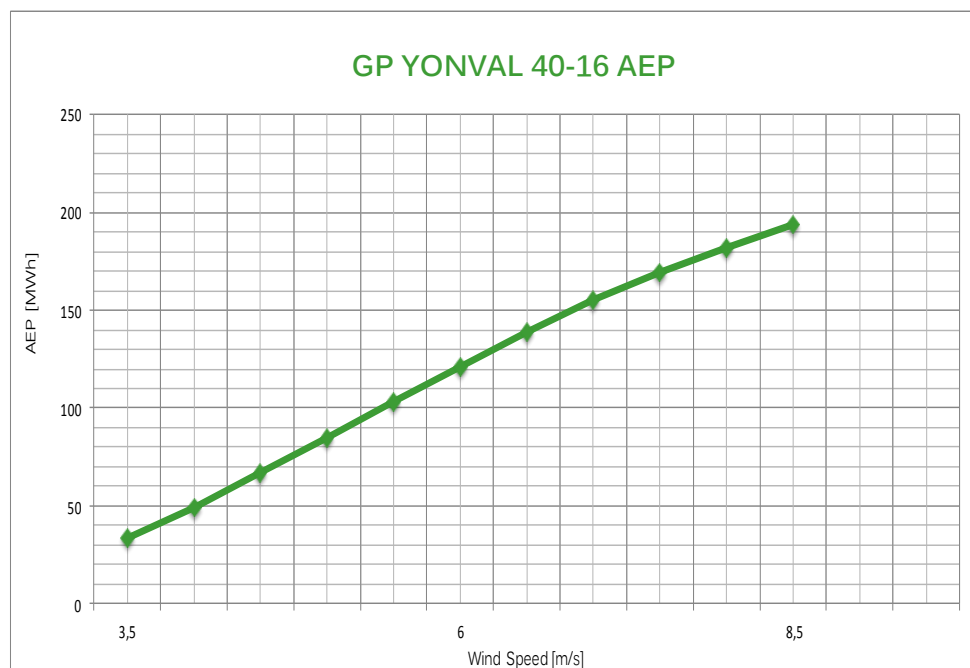


The power curve figures assume an elevation at sea level, a temperature of 15°C, an air density of 1.225 kg/m³ and a constant air flow.

Wind speed at hub height.

Annual Energy Production

Wind Speed [m/s]	AEP [MWh]
3.5	34
4	49
4.5	67
5	85
5.5	103
6	121
6.5	139
7	155
7.5	169
8	182
8.5	194



The annual energy production of a Wind Turbine cannot be predicted with certainty, as it depends on many factors like the location, the site wind resource, the hub height and many other factors. Any estimation given by us will not constitute any form of warranty.

The AEP is based on standard atmospheric conditions, average wind speed at hub height, a Weibull distribution $k=2$ and 100% availability.

Specifications in this technical brochure may be modified without prior notice.

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