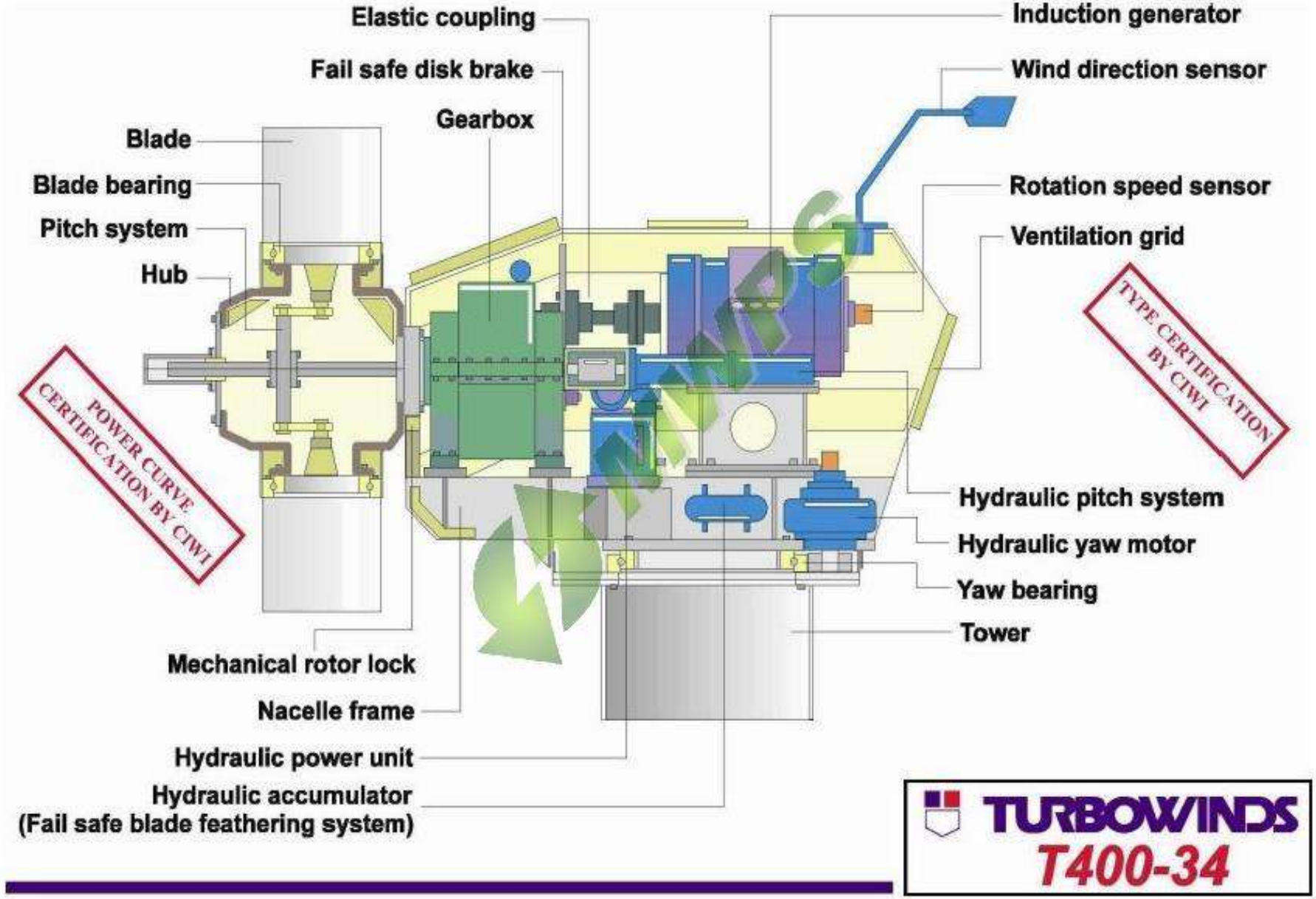
TURBOWINDS
T400-34


Elastic coupling
Fail safe disk brake
Gearbox
Blade
Blade bearing
Pitch system
Hub
Induction generator
Wind direction sensor
Rotation speed sensor
Ventilation grid
POWER CURVE CERTIFICATION BY CIWI
TYPE CERTIFICATION BY CIWI
Hydraulic pitch system
Hydraulic yaw motor
Yaw bearing
Tower
Mechanical rotor lock
Nacelle frame
Hydraulic power unit
Hydraulic accumulator
(Fail safe blade feathering system)
TURBOWINDS
T400-34

TECHNICAL SPECIFICATION

Turbine type: **T400-34 Dual Speed**

General:

Rated Power:	400 kW
Rotor Diameter:	34 m
Hub height:	30 / 34 / 50 m

Rotor:

Number of blades:	3
Rotor speed:	22 / 33 rpm
Blade construction:	Wood-epoxy
Aerofoil:	NASA LS1 (mod)04XX
Control:	Active stall
Pitch actuation:	Hydraulic
Hub Type:	Rigid
Cone angle:	0°
Tilt angle:	4°

Transmission: (Gearbox)

Type:	3-stage parallel

Brake:

Type:	Hydraulic disk brake
Position:	High speed shaft

Generator:

Type:	Induction generator
Voltage:	690 Volt
Rotation speed:	1000 / 1500 rpm

Nacelle:

Frame:	Welded steel structure
Housing:	Steel or fiberglass

Tower:

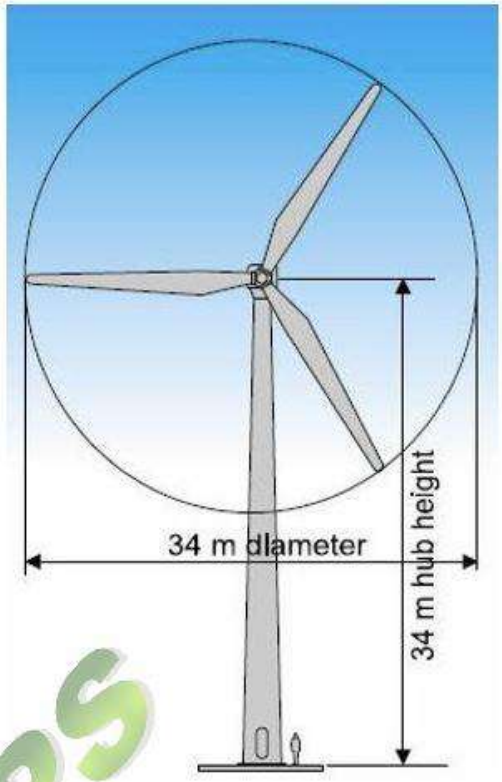
Material:	Welded steel
Type:	Polygonal / tapered
Conservation:	Galvanisation / metalisation / paint

Performance:

Rated power:	400 kW
Rated windspeed:	13,5 m/s
Cut-in:	3 m/s
Cut-out:	25 m/s
Survival:	60 m/s

Weights:

Nacelle including rotor:	18 ton
Tower:	16 / 24 / 36 ton
Total turbine:	34 / 42 / 54 ton



FEATURES

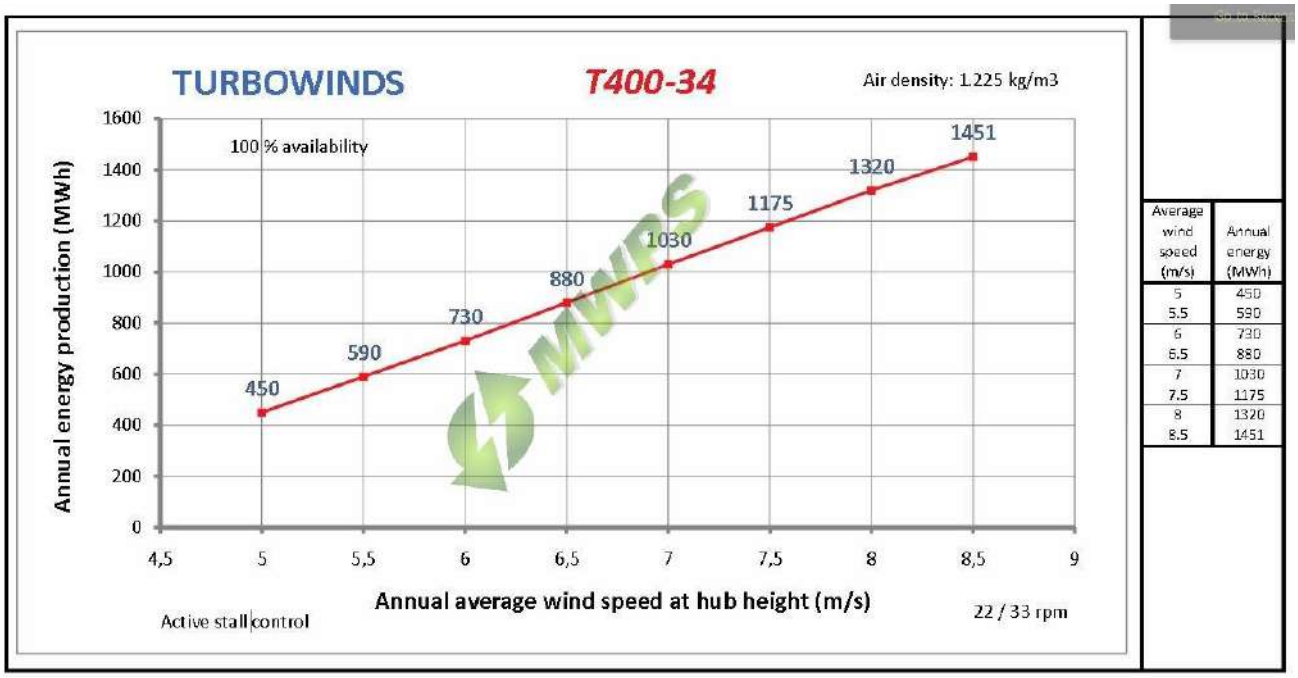
Design
- ECN certified following IEC 61400-1 class II
- Active stall power control
- "Utility standard" wind turbine
- Designed and engineered by professionals
- All components designed for a service life of at least 20 years

Safety
- Failsafe blade feathering in the event of grid loss
- Independent overspeed trips to activate the backup safety system.(Disk brake)

Electrical
- Utility standard electrical system
- Specially designed soft starter for smooth startup
- "Double speed" generator

Control
- Specially designed microprocessor unit with proven software
- Optional remote control and monitoring via modem link

Maintenance
- Enclosed tower and nacelle for safe and comfortable maintenance under any weather condition

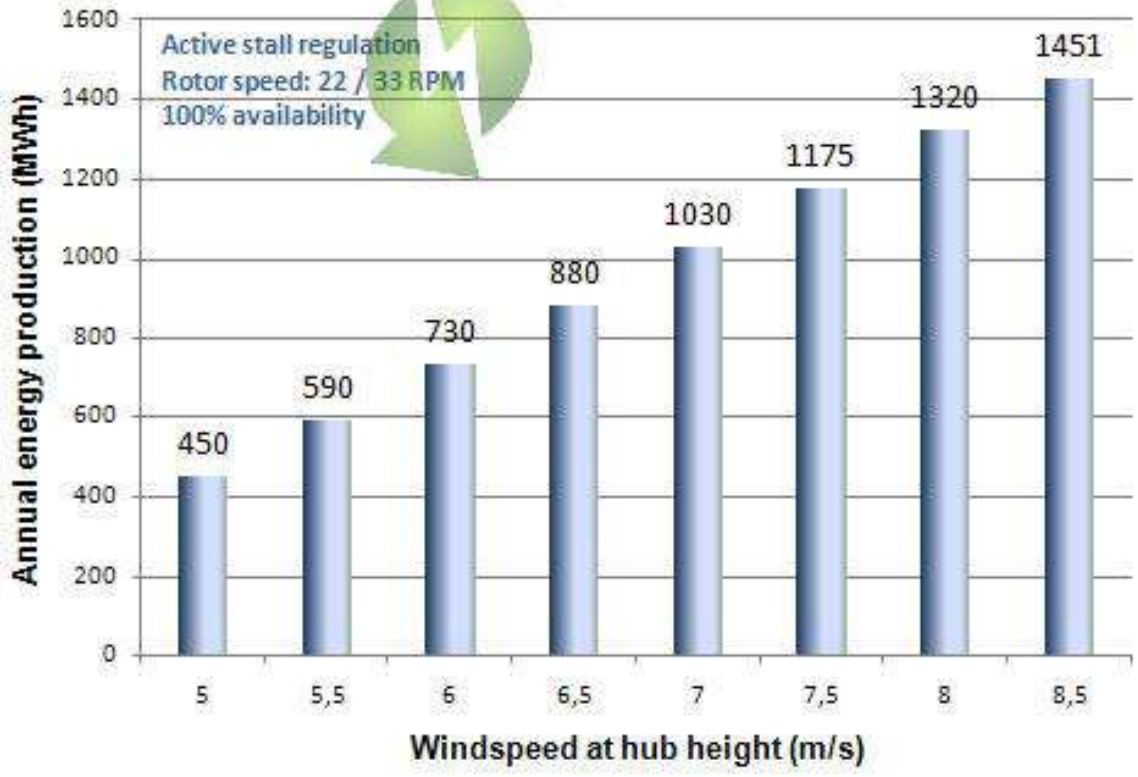


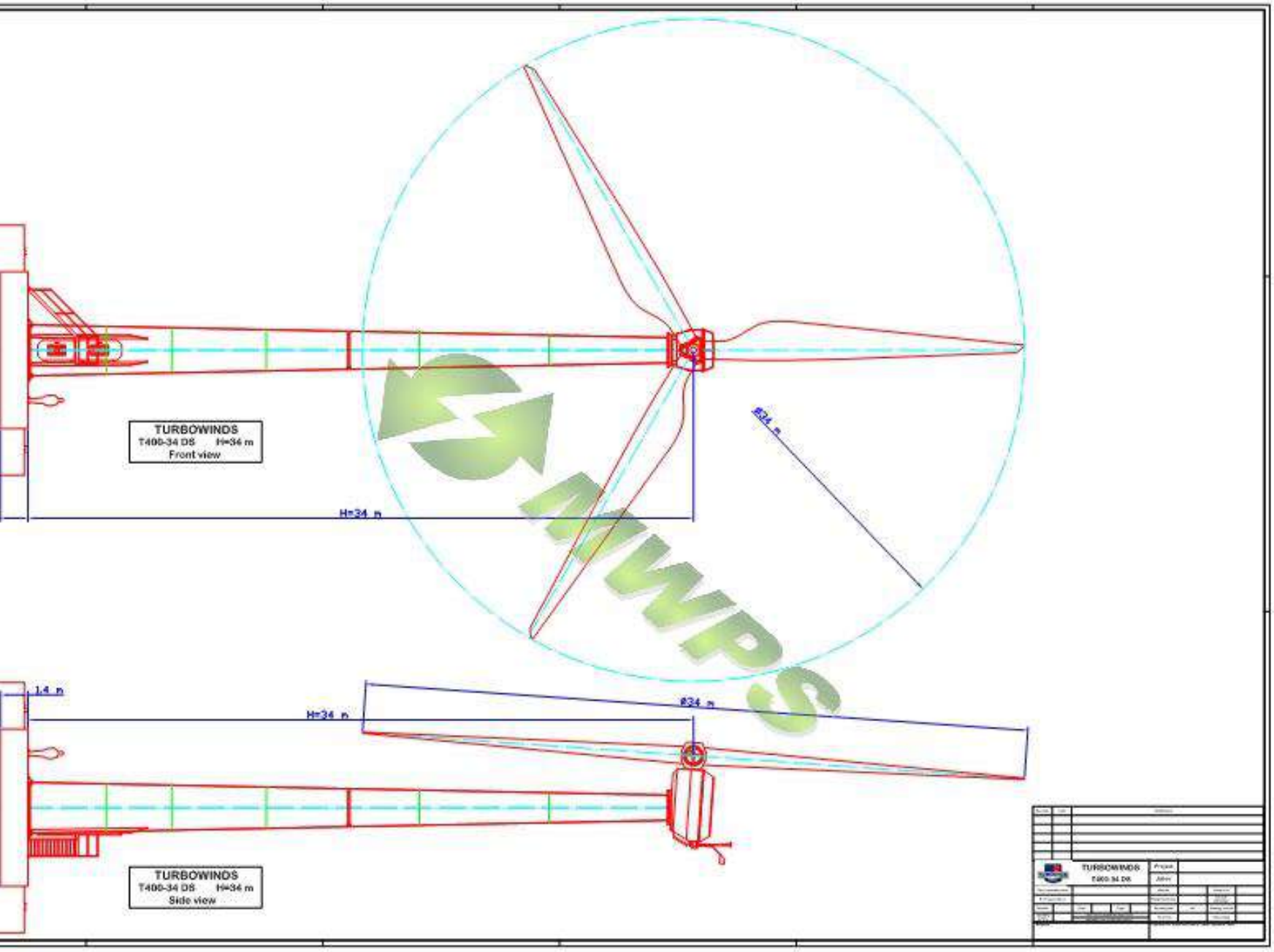
Average wind speed (m/s)	Annual energy (MWh)
5	450
5.5	590
6	730
6.5	880
7	1030
7.5	1175
8	1320
8.5	1451

Guaranteed power curve:
Power curves, measured on site, are considered to satisfy the power curve warranty condition when the corresponding yearly energy production exceeds 95 % of the yearly energy production corresponding to the power curve presented on this page. Comparison of energy levels is supposed to be done for the site characteristic wind distribution, and for a reference air density of 1.225 kg/m3.

Wind speed (m/s)	Electric power (kW)
0	0
1	0
2	0
3	3
4	11
5	26
6	50
7	75
8	118
9	177
10	240
11	296
12	343
13	385
14	400
15	400
16	400
17	400
18	400
19	400
20	400
21	400
22	400
23	400
24	400
25	400
26	0
27	0
28	0


Active stall regulation
Rotor speed: 22 / 33 RPM
Electric power (kW)
450
400
350
300
250
200
150
100
50
0
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30
Windspeed at hub height (m/s)


Active stall regulation
Rotor speed: 22 / 33 RPM
100% availability
Annual energy production (MWh)
1600
1400
1200
1000
800
600
400
200
0
450
590
730
880
1030
1175
1320
1451
5 5,5 6 6,5 7 7,5 8 8,5
Windspeed at hub height (m/s)


TURBOWINDS
T400-34 DS H=34 m
Front view
H=34 m
Ø34 m
1.4 m
H=34 m
Ø34 m
TURBOWINDS
T400-34 DS H=34 m
Side view
TURBOWINDS
T400-34 DS