

General operational limits for rotor blade type: OLW 340Basic & OLW 340Tip-Brake

Rotor configuration:

| | | |
|---------------------------|---|--------------------|
| Number of blades in rotor | : | 2 or 3 |
| Placement of rotor | : | upwind or downwind |
| Power regulation | : | stall or pitch |
| Yaw system | : | forced or free |
| Hub design | : | rigid or teeter |

Operational limits: (max. values)

| | | | |
|---------------------------------------|-------------------|---|---------------------|
| Rotor diameter | D | : | 7,133 m |
| Tip speed (operation) | V _{tip} | : | 45 m/s |
| Generator power | P _{el} | : | 6 kW 1) |
| Yaw error (operation) | sw | : | 20° 2) |
| Cut out wind | V _o | : | 25 m/s 1) |
| Survival wind | V _e | : | 70 m/s 3) |
| Tip speed for release of tip spoiler | n _e | : | 1.1V _{tip} |
| Brake torque (nominal on rotor shaft) | M _{br} | : | x Nm |
| Brake torque (emergency) | M _{br,e} | : | x Nm |
| Time for activation of tipspoiler | t | : | 1<t sec 4) |



Operation temperature : Min -20°C – max 55°C
OAT : (Outside Ambient Temperature)
: Otherwise ask Olsen Wings

Operation under icing conditions: Under extreme climatic conditions where icing has added an unbalance, the operation must stop until a deicing has taken place.

All wind speeds stated are measured in hub height.

1) 10 min. mean values

2) At a max. Yaw error of 20° is understood.

The angle between the wind direction and the axis of the turbine systematically has a mean values greater than 20°

3) 2 sec. mean values.

4)

The tip brake release system must be dampened in order to prevent damage on the tip mechanism from inertia forces on the tip spoiler.

5) Blades balanced set wise to 10 grams at tip and 50 grams at root.

6) Aero dynamic tip-brake

Tip-brakes are **emergency** brakes, and can not be used as speed control.

Dimensions:

| | | | |
|--|--------|---|----------------------|
| Blade length | 1 | : | 3400 mm \pm 5 mm |
| Max. root chord | Croot | : | 352 mm \pm 5 mm |
| Tip chord | Ctip | : | 80 mm \pm 2 mm |
| Blade area | A | : | 0,79m ² |
| Twist | | : | 11.8° \pm 0,5° |
| Airfoil section | | : | xxxx |
| Natural frequency flapwise | | : | Hz |
| Natural frequency edgewise | | : | Hz |
| Blade weight OLW 340Basic | m | : | 20,0 kg \pm 0,5 kg |
| Blade weight OLW 340Tip-brake | m | : | 23,3 kg \pm 0,5 kg |
| C of G distance from root base OLW340Basic | C.o.G. | : | 1000mm \pm 5mm |
| C of G distance from root base OLW340Tip | C.o.G. | : | 1020 mm \pm 5mm |
| Direction of rotation (downwind) | | : | Clockwise |
| Selfstarting | | : | Yes |

Installation dimensions:

| | | | |
|------------------------------|-----|---|-----------------------|
| Root flange outside diameter | Du | : | 195 mm |
| Bolt Circle diameter | BCD | : | 155mm \pm 1 mm |
| Number of bolts | n | : | 12 |
| Bolt size | M | : | 10 mm (8.8 grade) |
| Torque tightening | | : | 8.8 steel requirement |
| Tip to tower distance (min.) | | : | 750 mm |

GRP/steel connection:

Embedded high strength steel bolts, with internal threads.

Aerodynamic brake: : 6)

| | |
|----------------------------------|--|
| Type | : Tip spoiler |
| Length | : 530 mm \pm 5 mm |
| Movement approx. | : 90° |
| Activation | : Hydraulic and mechanical. <i>(Not included from factory)</i> |
| Deploy length | : 50 mm. |
| Tip shaft threads | : Internal M8 |
| Weight | : 1,920 kg \pm 0.1 kg |
| Center of Gravity for tip weight | : 2927 mm \pm 5 mm measured from root base |

Materials used:

| | |
|----------------------------|-------------------------|
| Shell, spar and root | : Fiber glass/polyester |
| Embedded nuts for mounting | : Steel 8.8 |
| Spoiler mechanism | : Stainless steel |

The Olsen Wings reserves the right to amend specifications without prior notice.