

## Anti- and De-Ice Operating System - ADIOS

The retrofitable rotor blade heating system **ADIOS** is a complete system solution which allows an ice free and safe operation of the wind turbine during the winter.

For the retrofitting of **ADIOS** a modular heating system is mounted at the aerodynamically important rotor blade leading edge. The intelligent control management **ADIOS eco control** ensures a safe and energy efficient operation by means of integrated sensors. The integrated erosion protection increases the durability of the rotor blade.

The component certificate *CC-160301-R0* for the rotor blade heating system ensures you the acceptance in accordance to IEC 61400-1 by an accredited laboratory.

### Your Advantages at a Glance

- Avoidance of loss of revenues during winter
- Safe wind turbine operation
- Ice detection at rotor blade
- Energy-saving control
- Erosion protection
- Easy retrofitting
- Component certificate

### Technical Data

<b>Voltage</b>	230 VAC, 50/60 Hz
<b>Power max.</b>	3 – 6 kW
<b>Fuse</b>	16 A
<b>Heating panels per blade</b>	3
<b>Heating function</b>	Cyclically
<b>Operating temperature</b>	- 30 °C to + 60 °C (-22 °F to 140 °F)
<b>Weight</b>	250 to 450 g/m (2,68 to 4,83 oz./ft.)
<b>Heated length / blade</b>	Approx. 60 %
<b>ADIOS eco control</b>	
<b>Control unit</b>	Inside the hub
<b>Dimensions</b>	700 x 400 x 220 mm (27,55 x 15,74 x 8,66 in)
<b>Optional</b>	WLAN / camera / data logger
<b>Output signals</b>	System status, heating on/off, ice detection



## Operating Costs

The extreme low energy consumption is based on the fact that the heating exclusively takes place at the rotor blade leading edge where ice accretion occurs. In addition the periodic use of the heating panels ensures a maximum power consumption of just 3.000 to 6.000 Watt. This low power consumption is so far unrivaled in international comparison. This means in effect only 0,4% of the nominal power of a 1,5 MW wind turbine. As a maintenance-free system a review during normal inspection intervals is completely sufficient.

## Annual Energy Output

Based on normal downtimes of wind turbines during the winter the annual energy output can be increased significantly by use of the **Anti- and De-Ice Operating System - ADIOS**. This leads to an amortization period of about 2,5 years.

## Environment and Safety

Thanks to **ADIOS** your wind turbines can operate safely and constantly during winter. Aerodynamic imbalances based on ice are avoided as well as unbalance mass due to hazardous and irregular ice throw. This increases the operational life of your wind turbine and reduces maintenance costs.

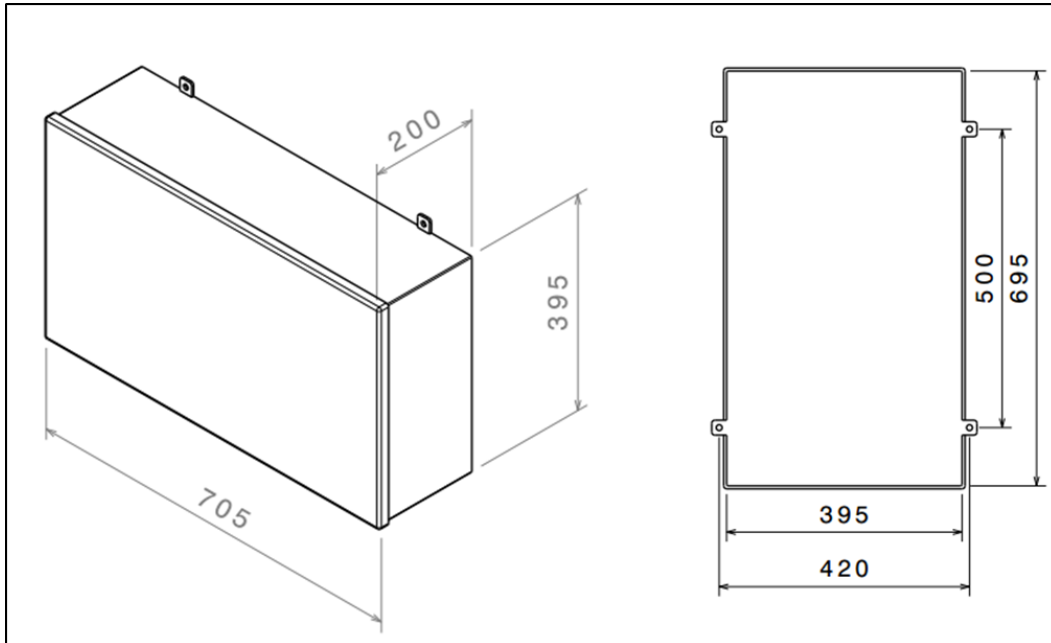
## Repair? No Problem!

If an unexpected repair happens to become necessary the modular design of the **ADIOS** heating system can be rebuild quickly. The fast response time concerning the delivery of spare parts guarantees a high availability of your wind turbine. Downtimes are no longer an issue.



## ADIOS eco control

### Technical drawing



### Specification Profile

#### Application

Assembly location

Ingress protection needed

Operation temperature range required

Site altitude (maximum)

Material

Onshore

Inside hub application

IP 54

Down to -25 °C up to 40 °C (- 13 °F to 104 °F)

Up to 2000 mts. (6561 ft.)

Stainless steel