

BAP-20-600

Rev 1, 01.2015

Platform Performance (In-stock):

Operational altitude (with stock material):

- 170m @ $V_{wind} = 0\text{m/s}$
- 600m @ $V_{wind} > 4\text{m/s}$

Max Payload Capability: 30kg

Max wind speed: 12m/s

Continuous operation time:

- 7 days (present)
- Months (under development)

Cable System:

- 600m in stock
- Up to 4000m under development

Main Cylinder (top):

Dimensions: $L=17\text{m}$ $\phi=3.8\text{m}$

Mass: 130kg

Volume: 220m^3

Operating Gas: Helium

Internal Overpressure: 2kPa-20kPa

Airborne Module Rotation System:

2 x 2kW Permanent Magnet Motors

Voltage: 600vDC

Power consumption avg @ 60RPM: 1kW

Maximum Cylinder Rotation: 60RPM

Power Supply system:

Through the cable @ 600vDC

Maximum power: 6kW (including payload)

Communications:

Ground to Airborne Module: Wireless 5.0GHz

Optional: Fiber Optic through the cable

@ Airborne Module: CAN-BUS

@ Ground Station: CAN-BUS

Ground Station System:

1 x 50kW Induction Motor

Operational voltage: 3-phase 380vAC

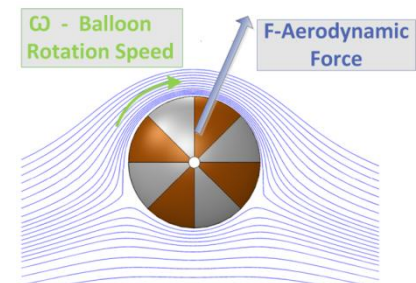
Cable Speed (max): 6m/s

Description:

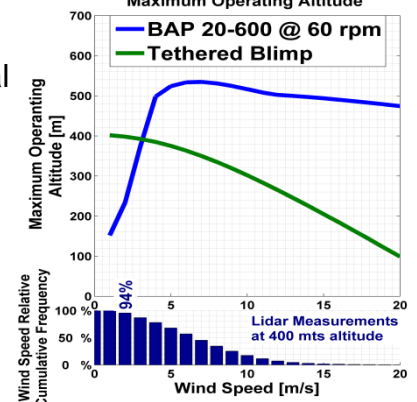
The BOREAS Aerial platform is an innovative way to have a payload up to 1000m in the sky for very long periods of time. It achieves its goals with a hybrid lifting propulsion system using helium hydrostatic buoyancy (up to 10%) and aerodynamic lift through the Magnus effect rotating cylinder, (up to 90%) and a tether always connected to the ground providing the power and data communications (optional Fiber-optic if required).

The current BOREAS Aerial Platform (which is a non-optimized system for this particular payload and altitude) achieves its nominal altitude of 500m for wind speeds higher than 4m/s. This happens because the initial remaining buoyancy is not enough to support all the cable weight.

When comparing the BAP-20-600 with a tether blimp with the same total volume ($V=260\text{m}^3$) the altitudes achieved by the BAP-20-600 are higher from 3m/s onwards which represent better performance 88% of time. The BOREAS Aerial Platforms are particularly suitable to maintain the altitude for high wind conditions.



Tethered Blimp vs BAP 20-600 (volume = 260m^3) Maximum Operating Altitude



Renewable Energy Production on-site:

With an upgraded ground station, cable and control system the BOREAS Aerial Platform has the ability to produce its own energy onsite using a pumping cycle, at the expense of a lower maximum altitude.



BAP-20-600

Rev 1, 01.2015

Payload Interface:

Bottom Fixed Cylinder

Dimensions: $L=17m$ $\phi=2.5m$

Mass: 63kg

Volume: $80m^3$

Operating Gas: Helium

Internal Overpressure: 2kPa-20kPa

Individual Payload – with gimbal

Weight: 5kg in gimbal + 2kg of gimbal

Dimensions: 330x330x200mm.

A maximum of 3 of these individual payloads can be carried by this system.

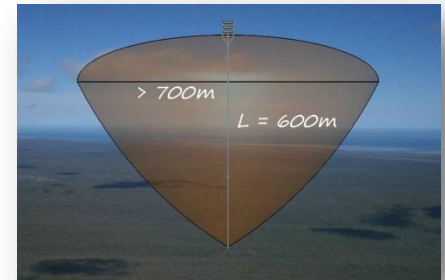
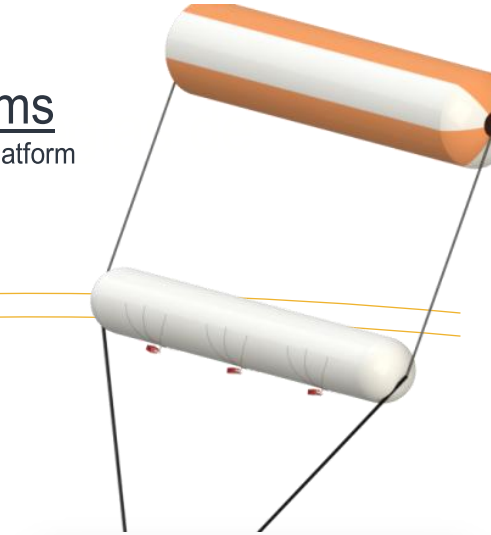
Individual Payload – without gimbal

Total Maximum Weight: 30kg

Maximum number of payloads : 3

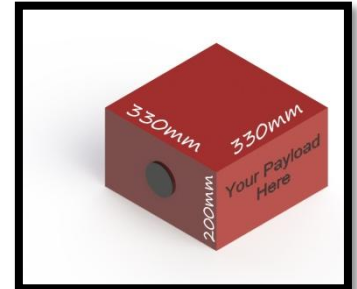
Dimensions without gimbal: to be discussed

For additional information please contact:
pedro.silva@omnidea.net



The BOREAS Aerial Platform drifts with the wind direction; this means it has a maximum free movement within a 350m radius from the ground anchor point (for 600m of cable @ 12m/s wind speed).

To keep track of one specific point in the ground the system requires a 3 axis stabilized gimbal. Due to this limitation the maximum payload dimension with a 3 axis gimbal is: 330x330x200mm and the maximum weight is 5kg. Different gimbal models can be used.



Suitable missions:

- Surveillance
- Communications
- Earth Observation
- Satellite Data Validation
- Payload Testing

