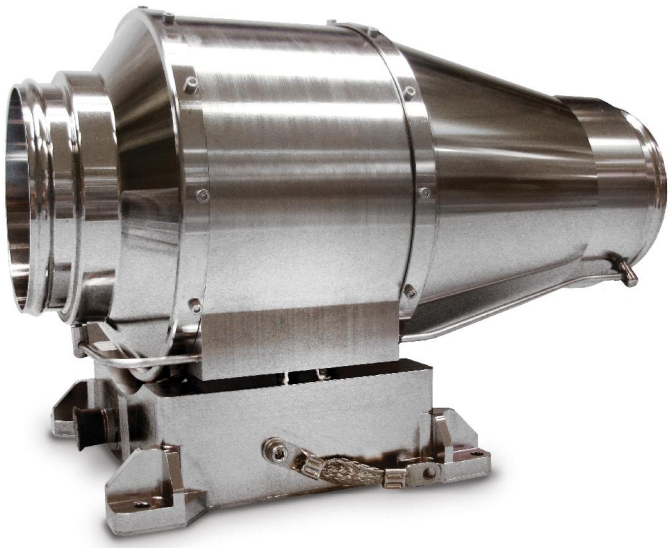
CABIN FAN ASSEMBLY



The Cabin Fan Assembly (CFA) ensures that the cabin air inside the pressurised compartment of the Automated Transfer Vehicle (ATV) is circulated. Because of the absence of natural convection in the microgravity environment air (re-) circulation has to be forced to prevent adverse effects on crew members (i.e. shortage of oxygen and build-up of carbon monoxide).

The Cabin Fan Assembly (CFA) is designed as an axial fan unit. The propeller is mounted directly on the rotor axis of the brushed DC motor. The required electronics for motor operation and sensor signal processing are housed inside a dedicated E-Box. Fan operation can be monitored through a series of sensors:

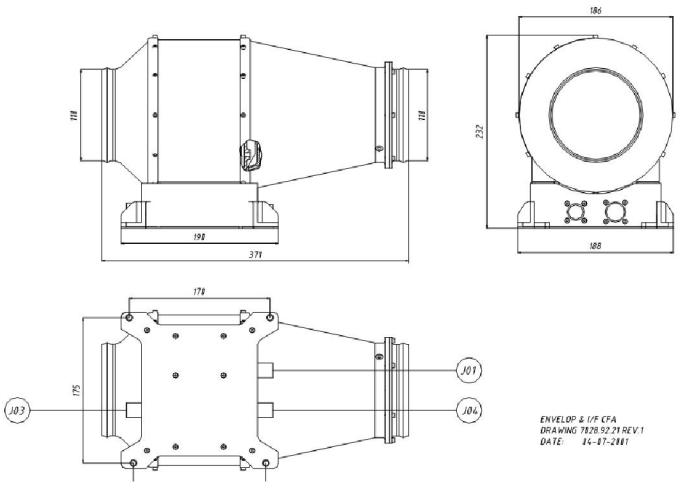
- Motor temperature sensor
- Delta-pressure sensor
- Motor speed sensor

The CFA is supplied with an input voltage between 24 and 32 Vdc. Furthermore, a dedicated connector, on which a bridged connector plug is mounted, is available for speed setting purposes. This allows the end user to alter the fan working point, should the need arise. The CFA is designed as an On-orbit Replaceable Unit (ORU). The Cabin Fan Assembly first took flight on the Ariane V165 mission on December 18, 2004. The CFA, installed on the ASAP-5 satellite dispenser ring, provided the required flow of air inside the battery compartment until 90 seconds prior to lift-off.

Cabin Fan Assembly

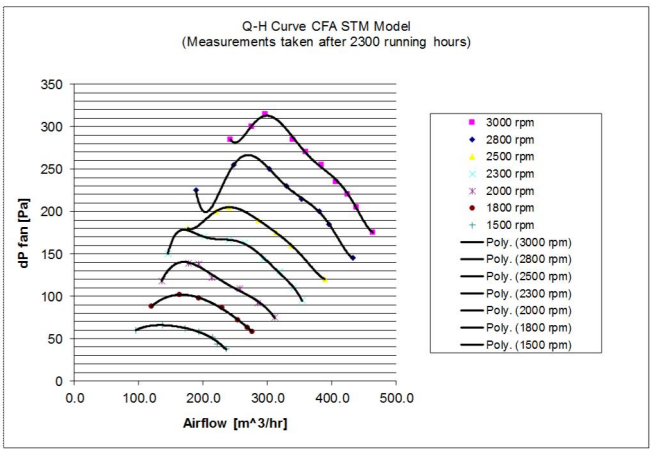
Characteristic	Performance / Interfaces Budget
Air flow rate	264 (+15/-5%) m³/h
Pressure rise	90 … 200 Pa
Nominal working point	264 (+15/-5%) m³/h @ 121 Pa
Power supply voltage	28 ± 4 Vdc
Power demand	< 50 W (incl. electronics)
Operational temperature range	+5 … +50°C
Audible Noise	NC50 (worst case without ducting
Mass	< 6 kg
Operational hours	> 30 on-ground cycles with total duration of 200 hours > 800 on-ground cycles with total duration of 4500 hours
Emergency, Warning & Caution (EW&C)	Delta-pressure sensor, temperature sensor and motor speed sensor
EMC requirements	According MIL-STD-461E

ATV Cabin Fan Assembly Interfaces



Performance Characteristics

A full performance mapping has been performed as part of the development and qualification test programme, of which the results are depicted below:



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ABOUT

Bradford is a high-tech European developer and manufacturer of satellite control sub-systems and components.

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