IGEN 430: Fan Life
Solar powered fully portable Air Conditioner

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Our Mission

Fan Life provides efficient off-grid cooling for small spaces. Our goal is to encourage adventure in a safe way.

Who is Fan Life for?

Van Lifers during a hot summer when running their van in not practical, pets alone in cars for short durations, campers who need cooling in their tents during hot conditions

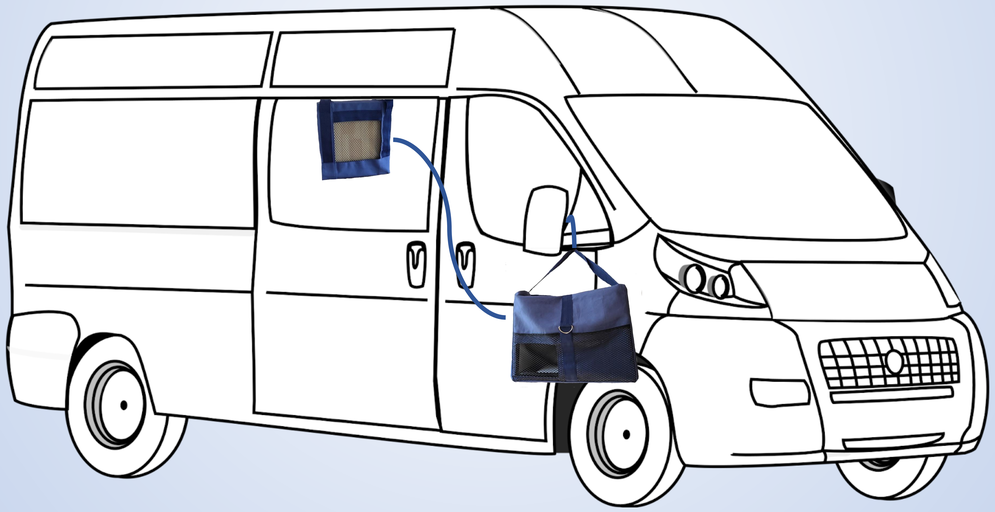
App

App connects via mobile hotspot or Wi-Fi. User can set the temperature and control the fan. The app displays temperature, remaining battery power and refrigerant flow rate. After setting the temperature, it will automatically adjust to user's setpoint.

Indoor Unit

The Indoor Unit provides cooling to the space (van). The components inside consist of fan, evaporator, and electrical components. The indoor unit can be mounted to the upper hand rests inside the van. It can also be rested an any desired surface.

A breathable fabric cover allows for easy mounting. The internal skeleton is made of PLA.

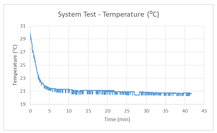


What Make Fan Life Unique?

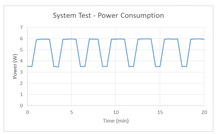
Lightweight (7 kg)
Two separate units that pack into one
Able to disassemble
Compact
Controllable through App
Utilizes solar power

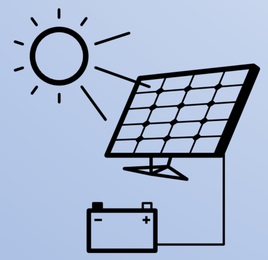
Testing

A cooling capacity test showed after running for 42 mins, a 9-degree Celsius drop occurred in a volume of 6 cubic ft.



A power consumption test revealed that the system was consuming an average of 5.1 Watts.





Solar Power

The power monitoring and control unit makes use of a solar charge controller to charge the battery through solar power. The circuit also communicates with the Arduino UNO which helps in safely charging and discharging the battery. Based on the information from the current and voltage sensors on the circuit, the Arduino calculates the power consumed and relays that to the ESP board which relays the information to the app.

Outdoor Unit

The outdoor condensing unit holds the compressor, condenser, plate heat exchanger, water pump and reservoir. The outdoor unit's main purpose is to reject heat outside. The system utilizes a two circuit refrigeration system, primary (R134a) and secondary (Water) refrigerant circuits enables complete disconnection between the indoor and outdoor units as only water is circulated in the indoor unit. The insulated cold water reservoir acts as a thermal battery, increasing unit capacity.