

UAVHE RW79

Rotary (Wankel type) Hybrid APU

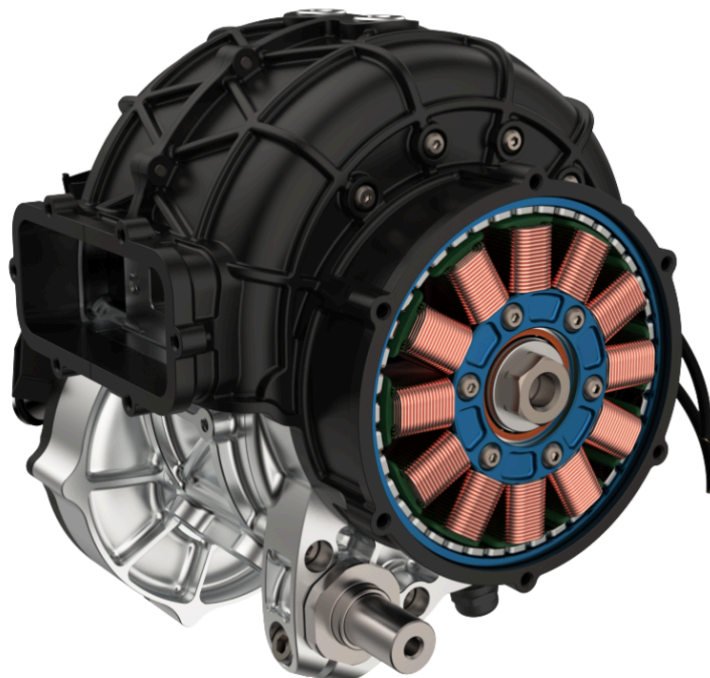


Purpose

- Designed for use as a power source for
- Output power of 16kW.
- Output voltage 28VDC, 270VDC (MIL-STD-704).

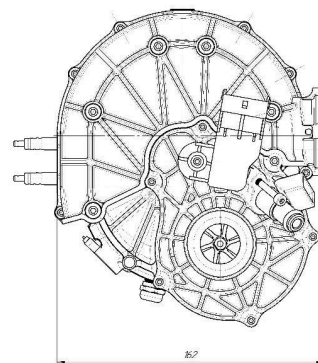
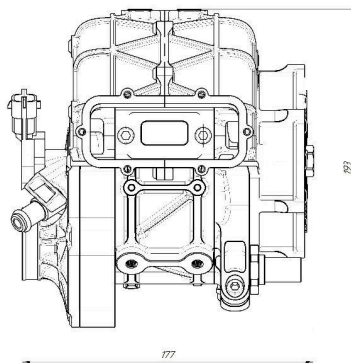
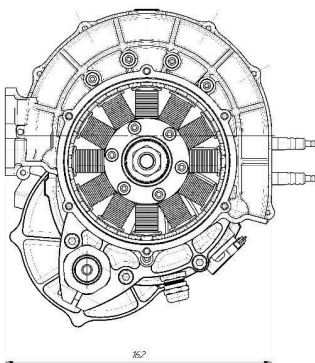
Advantages:

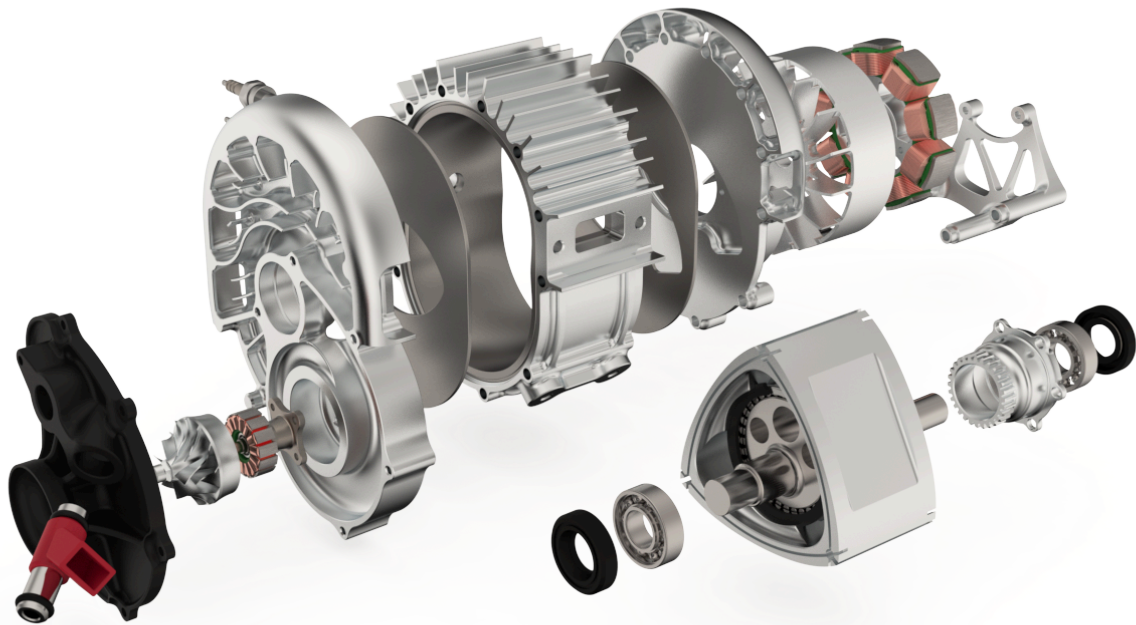
- Low fuel consumption. Ultra-lightweight. Easy to configure and manage.
- Consistent performance over a wide range of altitudes and temperatures.
- Operates on Heavy Fuel, including most common civil and military jet fuel grades such as Jet A, Jet A-1, JP-5, JP-8, and Sustainable Aviation Fuel (SAF).
- Multiple RW79 units can work in parallel or in hot-swap mode. A power balance controller can integrate batteries, supercapacitors, and one or more generators into a common bus.
- Flexibility of Possible Installation
- Ducted Air Intake and Exhaust for Cooling System Cooling of the Exhaust System Path Forced Cooling with Pre-filtered Air for All Heat-emitting Components. Ability to Operate in Any Position and with Accelerations up to +6G



Technical specifications:

- Power: 22hp @13500rpm
- Electric power output: 16kW
- Electric output: 14.4V, 28V, 48V, 270V
- Engine Weight: 4705g
- Controller Weight: 3370g
- Dimensions: 177(L) x 197 (H) x 162 (W) mm
- Fuel type: Aviation Kerosine (Jet A-1, JP8, SAF)
- Specific Fuel consumption: 255gr/kWh
- Fuel consumption @max load: 4.2 L/h
- Cooling: Forced Air cooling
- Intake: Electronic Fuel Injection, e-Supercharger
- Ignition: CDI
- Starter: Electric, Integrated
- Lubrication: Automix oil lubrication system / or 1% Premix API TC Oil
- Control: FADEC, CAN Bus 2.0, J1939
- Control interface: CANBus (twisted pair), Ethernet RJ45
- Operation altitude: Up to 6100m (FL200, 20000ft)
- Operational temperature range (cold start): -45C to +55C
- Operational temperature (full load): -45C to +55
- Relative humidity 0-95% (MIL-STD-810E, Method 507, Procedure III)
- Functional in various weather conditions including dust, rain, snow, fog, and exposure to saltwater spray
- Temperature Shock: MIL-STD-810E, Method 503.3
- Power deviations under adverse conditions: >5%
- MTBO: 1000H
- Service intervals: 200H





Design:

- Air-cooled rotary engine with direct drive generator on permanent magnets.
- Electronic fuel injection with forced electric supercharging.
- e-Supercharged fuel intake through the rotor with centrifugal acceleration of the pre-atomized mixture.

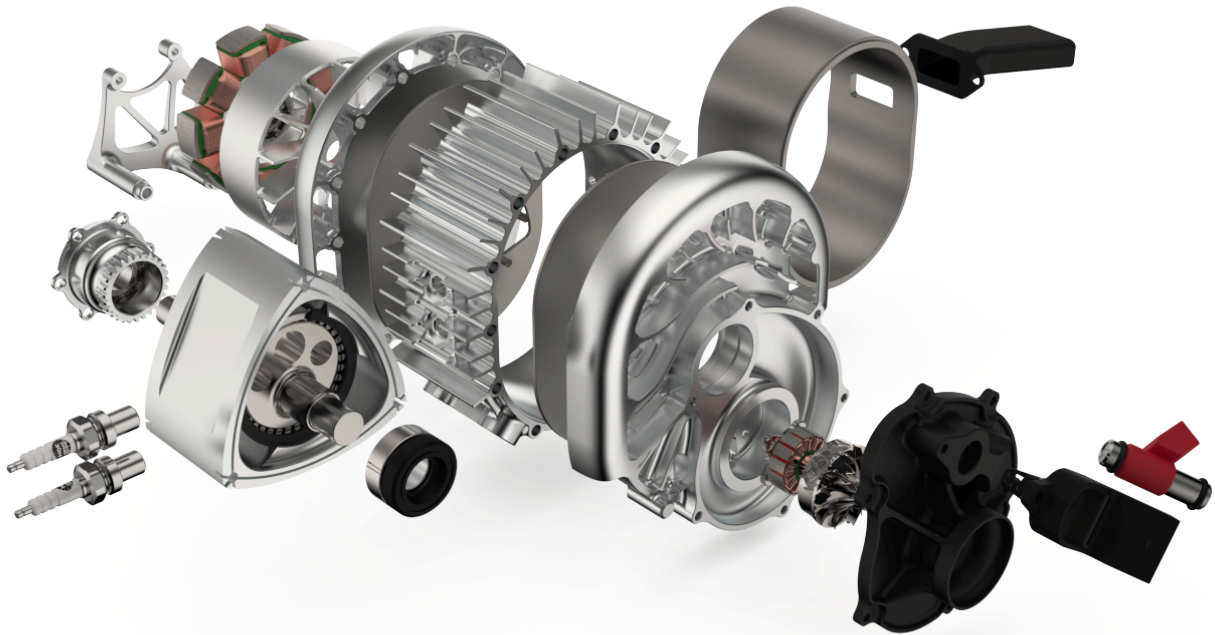
Materials:

- The stator is aluminum, CNC-milled from a forging with a thin sleeve of whitened cast iron.
- Rotor: Aluminum with DLC coatings in the seal channels.
- Apex seals - polished, Tungsten Carbide.
- All external surfaces have hard anodizing and protective coatings to meet MIL-STD-810
- The stator is made of a precision CNC-milled cast iron sleeve in an aluminum shell.
- The laminated stator of the generator.
- Neodymium magnets in a Halbach array on an aluminum rotor.

Fuel and Ignition System:

- A BLDC electric motor for precise maintenance of selected pressure in the intake tract drives a supercharger impeller.
- Submersible high-pressure fuel pump and pressure regulator.

- Electronically controlled piezo injector with ultrasonic control of counter-focus of the spray flame. Sub 5nm droplet size.
- Dual ignition with two spark plugs.
- Complies with MIL-STD-461/464. Insulated wires, connectors, and housings with EMI protection.



Cooling System:

- Forced air. Air intake through the generator stator for cooling. Air is discharged coaxially around the exhaust port.

Electric output:

- Meets and Exceeds MIL-STD-704F requirements
- 270 VDC @ 16.8 ADC - 16 kW
- 28 VDC @ 35 ADC x 16 Channels
- 48VDC @ 200ADC x 16 Channels split 16kW total.

Protection

- Limits short circuit current between 460-490 Amps for 2s
 - 125% for 6 seconds
 - 150% for 3 seconds
 - Recovery from 95% Step Load in 40 ms to 704F

Transient performance exceeds MIL-STD-704F

- Over/under voltage: Input and Output
- Overload
- Short circuit
- High temperature
- Internal system error

Pricing:

We offer a 'Developers Kit' – an engine on a subframe suitable for mounting on a dyno, including a kit of radiators, pumps, a fuel system, an ECU, and a wiring kit, with software control documentation (API, necessary source codes)

MSRP: 15500 Euro (FOB Barcelona)

Shipping from Barcelona, Spain. Brutto 20kg, 0,7m3.

More info:

<https://uavhe.eu/products/rw1-79/>

CAD (STEP) files: https://uavhe.eu/wp-content/uploads/2024/01/RW79.stp_.zip

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