

UAV WHEEL

RW1-79P

Rotary (Wankel type) engine for UAV planes and VTOLs



Key Features

Engine Design

Air-cooled hybrid rotary engine with an integrated starter-generator for enhanced performance and reliability.

Air Intake

Innovative fuel mixture intake via the rotor, utilizing centrifugal acceleration for optimal pre-atomization.

Fuel System

Advanced electronic fuel injection paired with electric supercharging ensures efficient fuel usage and powerful engine output.

Electronic Control

FADEC system over twisted-pair CAN bus for precise electronic control.

Construction

Aluminum housing with a CNC-machined white cast-iron sleeve, alongside an aluminum rotor with DLC-reinforced seal channels and gear. Tungsten carbide hollow apex seals and titanium seal springs.

Cooling System

Forced-air cooling with separate airflow paths for the generator rotor and stator, complemented by intake air and cooling system air filters.

Electrical Output

Electric output voltage: 48/96/144/192/400 VDC to accommodate various operational requirements.



More details

Advantages

⚙️ Efficiency

Distinguished by its ultra-lightweight design and low fuel consumption, making it both efficient and economical.

⚙️ User-Friendly

Easy configuration and management, significantly enhancing operational efficiency and workflow, thus ensuring a smoother and more effective user experience.

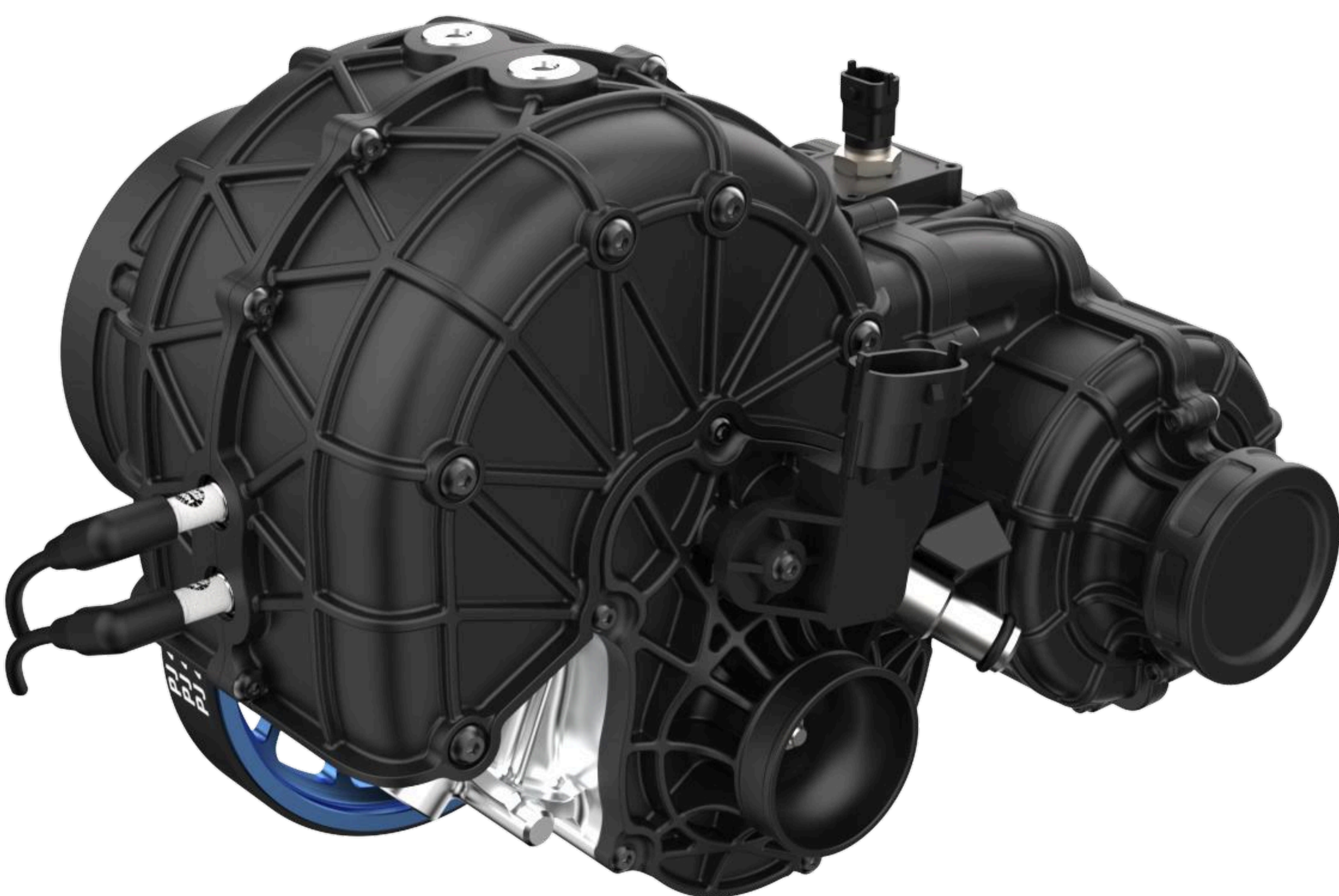
Application

⚙️ Reliability

Designed for high reliability and stable performance, the RW1-79P is ideal as a primary or backup power source for flight systems.

⚙️ Flexibility

Multiple RW79 units can operate in parallel or hot-swap mode, seamlessly integrating with batteries, supercapacitors and additional generators through a power balance controller.



Reliability and Redundancy

- ⚙️ Features like the dual ignition system, duplicated fuel supply/control systems and robust design underscores the engine's reliability and safety.

Technology

- ⚙️ Highlights include state-of-the-art electronic fuel injection, forced electric supercharging and precision-engineered components contributing to the engine's superior performance.

Control and Monitoring

- ⚙️ Advanced electronic control (FADEC) via twisted-pair CAN bus, with comprehensive monitoring systems for thorough operational oversight.

Performance

⚙️ Versatility

Delivers consistent performance across diverse altitudes and temperatures.

⚙️ Fuel Efficiency

Low fuel consumption and capability to operate on a range of heavy fuel, kerosene and SAF.

⚙️ SFC

Typical SFC: 265 g/kWh

Recommended cruise RPM: 9500–10500 rpm

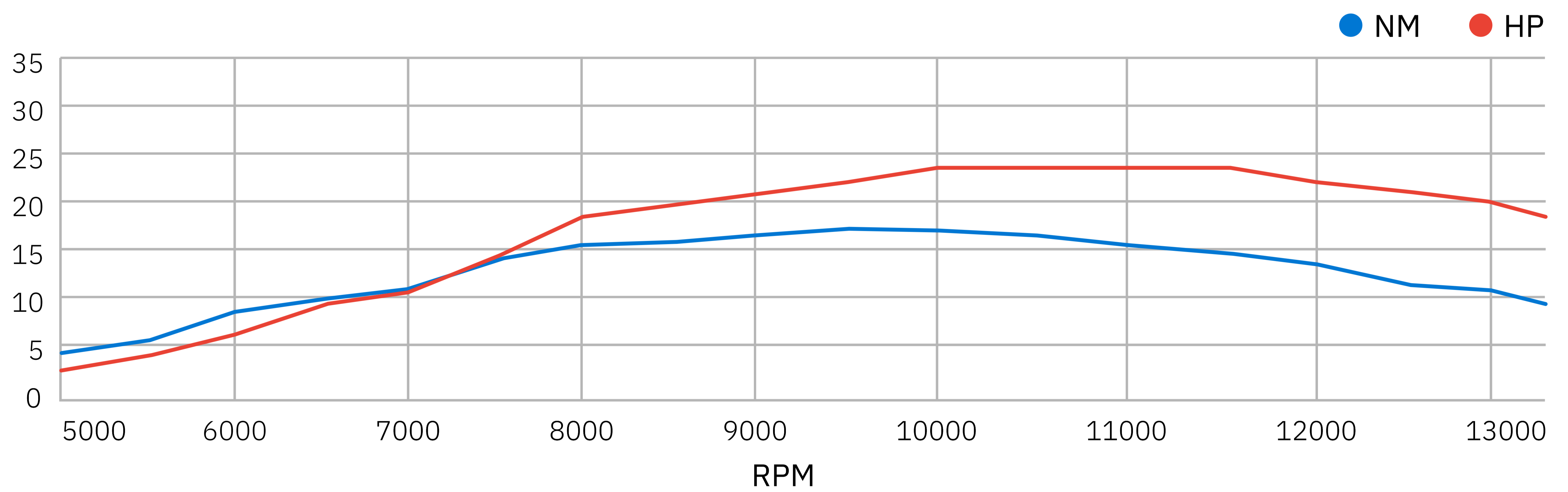
Technical specifications

Power	24 hp (17.9 kW) @ 10,000–11,500 rpm
Torque	17 Nm @ 9,000–10,500 rpm
Weight	5.45 kg (engine only); < 8 kg (complete system)
Dimensions (L × H × W)	175 × 202 × 162 mm
Fuel type	Aviation kerosene (Jet A-1, JP-8, SAF)
Specific Fuel consumption	265–310 g/kWh
Fuel consumption @max load	6.1–6.4 L/h
Cooling	Forced air
Intake	Electronic fuel injection with e-supercharger
Ignition	CDI, twin spark plugs
Starter	Integrated electric starter
Lubrication	Automix oil system / 1% premix (API TC oil)
Control	FADEC with integrated support for UAVCAN/Cyphal, SAE J1939, RS-485/Modbus, and MAVLink telemetry protocols
Control interface	CAN Bus (UAVCAN/J1939), RS-485, Ethernet (RJ45), UART (MAVLink)
Integrated generator output	3 kW (RW1-79P configuration) 11 kW (APU configuration)
Electric output voltage	48/96/144/192/400 VDC
Operational altitude	Less than 5% performance drop up to 4500 m Practical ceiling: 7500 m Altitude-related power loss compensated by electric supercharging
Cold start	down to -35°C
Continuous operation	-45°C to +55°C No power derating within the specified temperature range
Power deviation under adverse conditions	≤5%
TBO	1000 h
Service intervals	100 h

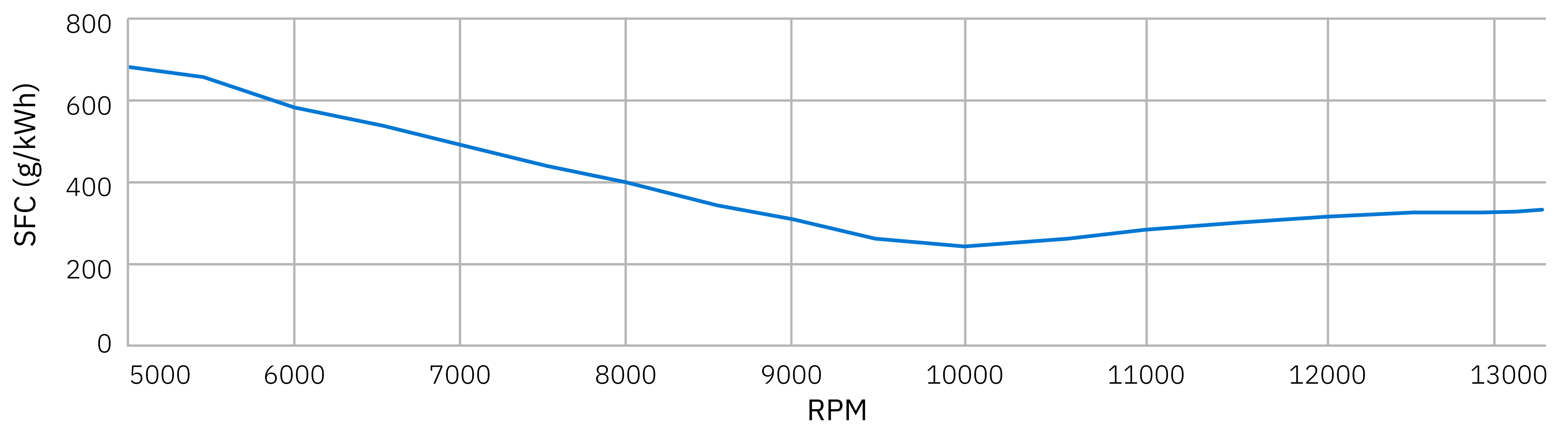
Performance Data

<i>RPM</i>	<i>HP</i>	<i>kW</i>	<i>Nm</i>	<i>SFC g/kWh</i>	<i>L/h (JET-A1,JP-8)</i>
5000	3.0	2.2	4.3	690	1.9
5500	4.0	3.3	5.7	643	2.6
6000	7.0	4.9	7.8	598	3.7
6500	9.0	6.7	9.9	553	4.6
7000	11.0	8.4	11.4	505	5.3
7500	14.0	10.4	13.3	455	5.9
8000	17.0	12.7	15.1	398	6.3
8500	19.0	14.2	15.9	347	6.1
9000	21.0	15.7	16.7	310	6.1
9500	23.0	17.1	17.2	285	6.1
10000	24.0	17.9	17.1	265	5.9
10500	24.0	18.2	16.5	270	6.1
11000	24.0	17.9	15.6	278	6.2
11500	24.0	17.8	14.8	290	6.4
12000	23.0	17.2	13.7	308	6.6
12500	21.0	16.0	12.2	314	6.3
13000	20.0	14.9	11.0	329	6.1
13500	18.0	13.4	9.5	335	5.6

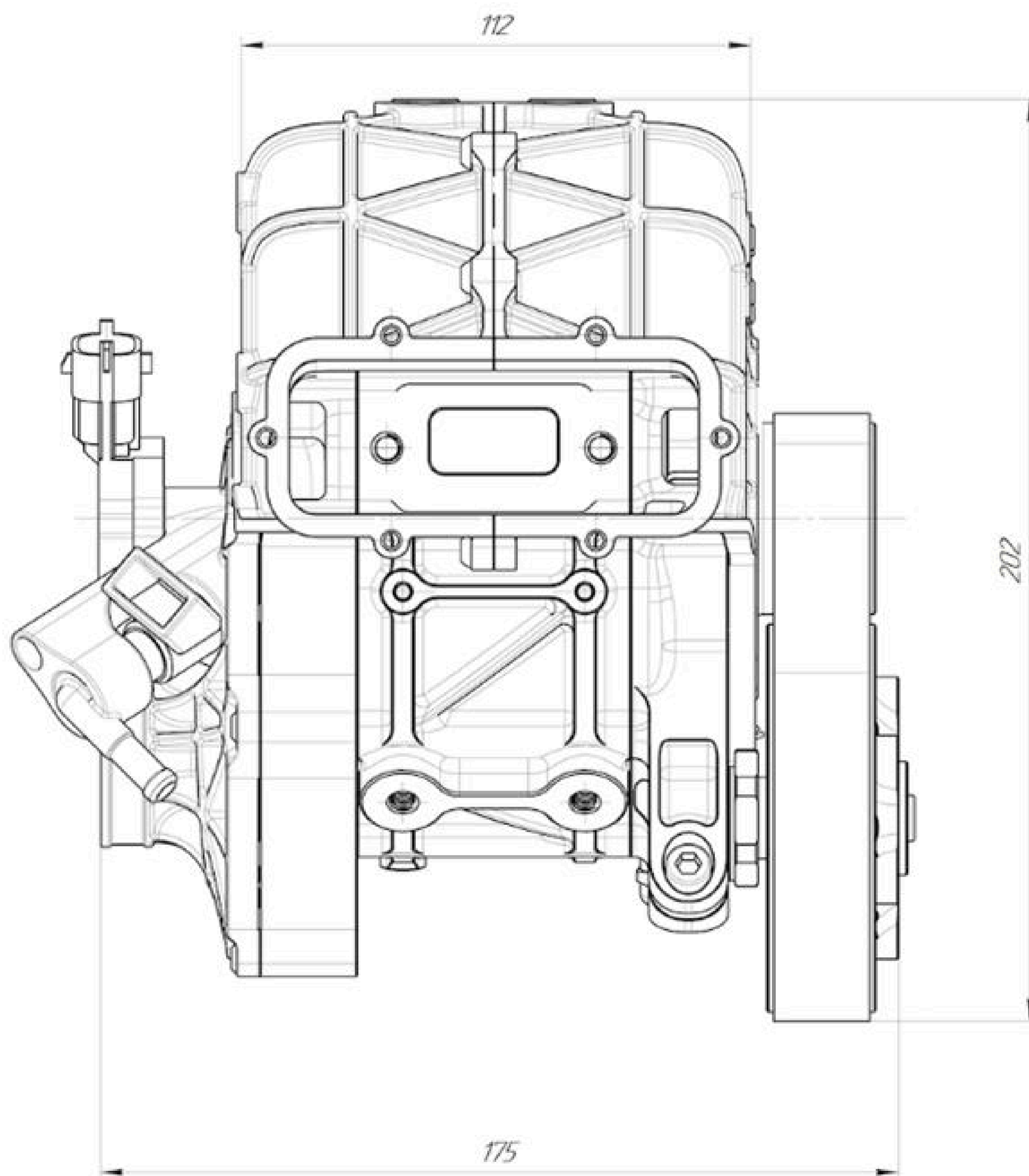
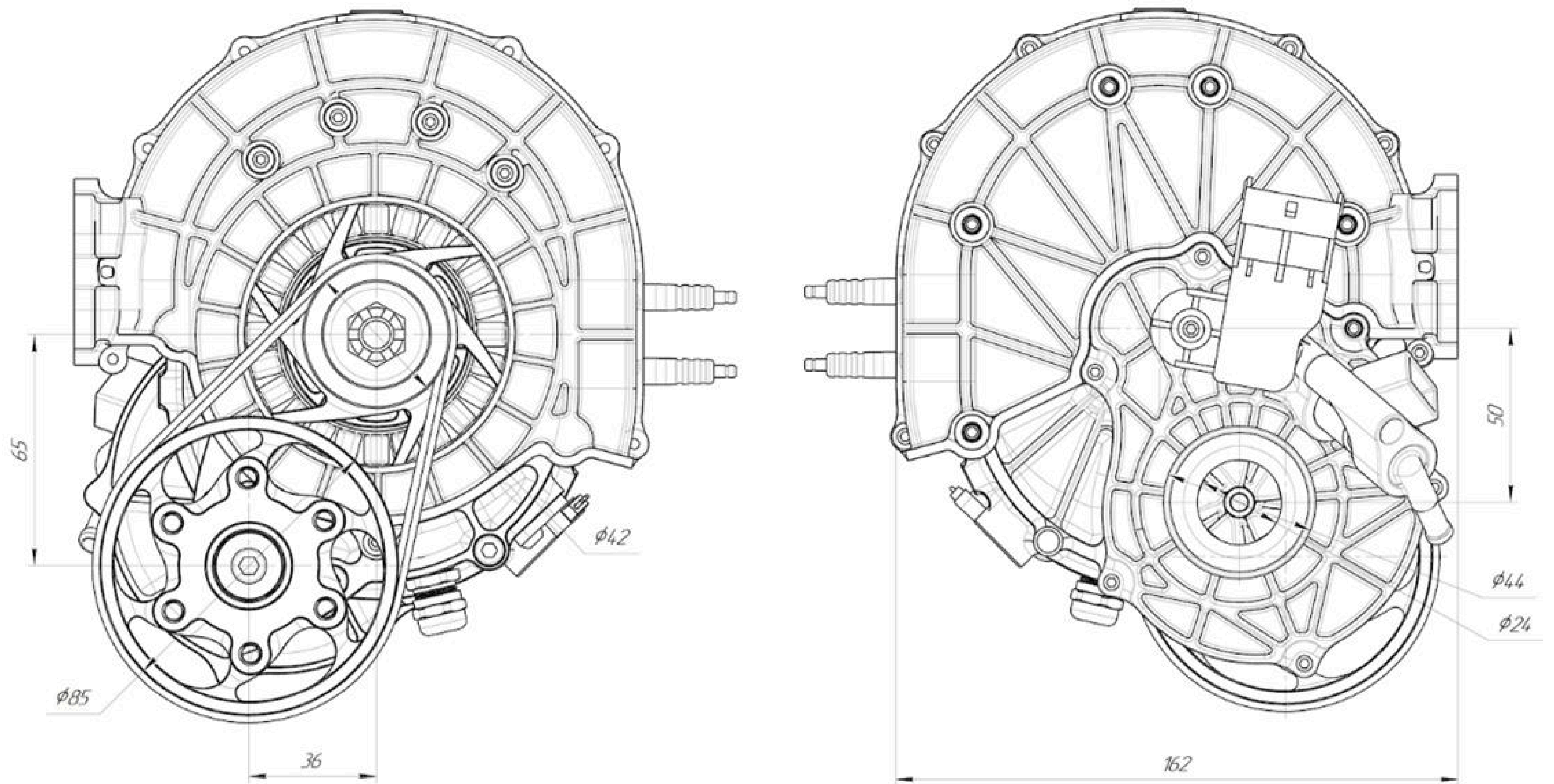
NM and HP



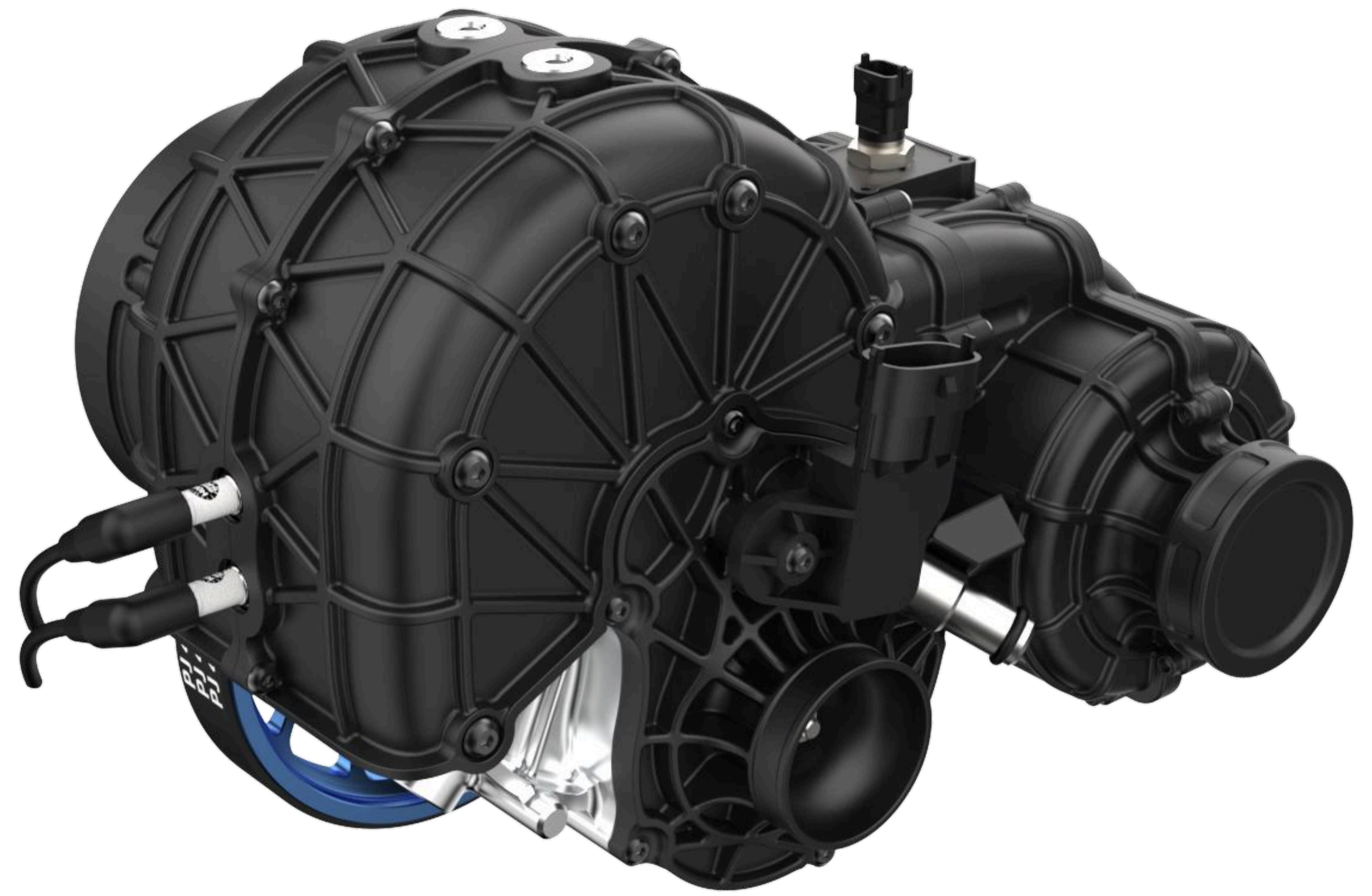
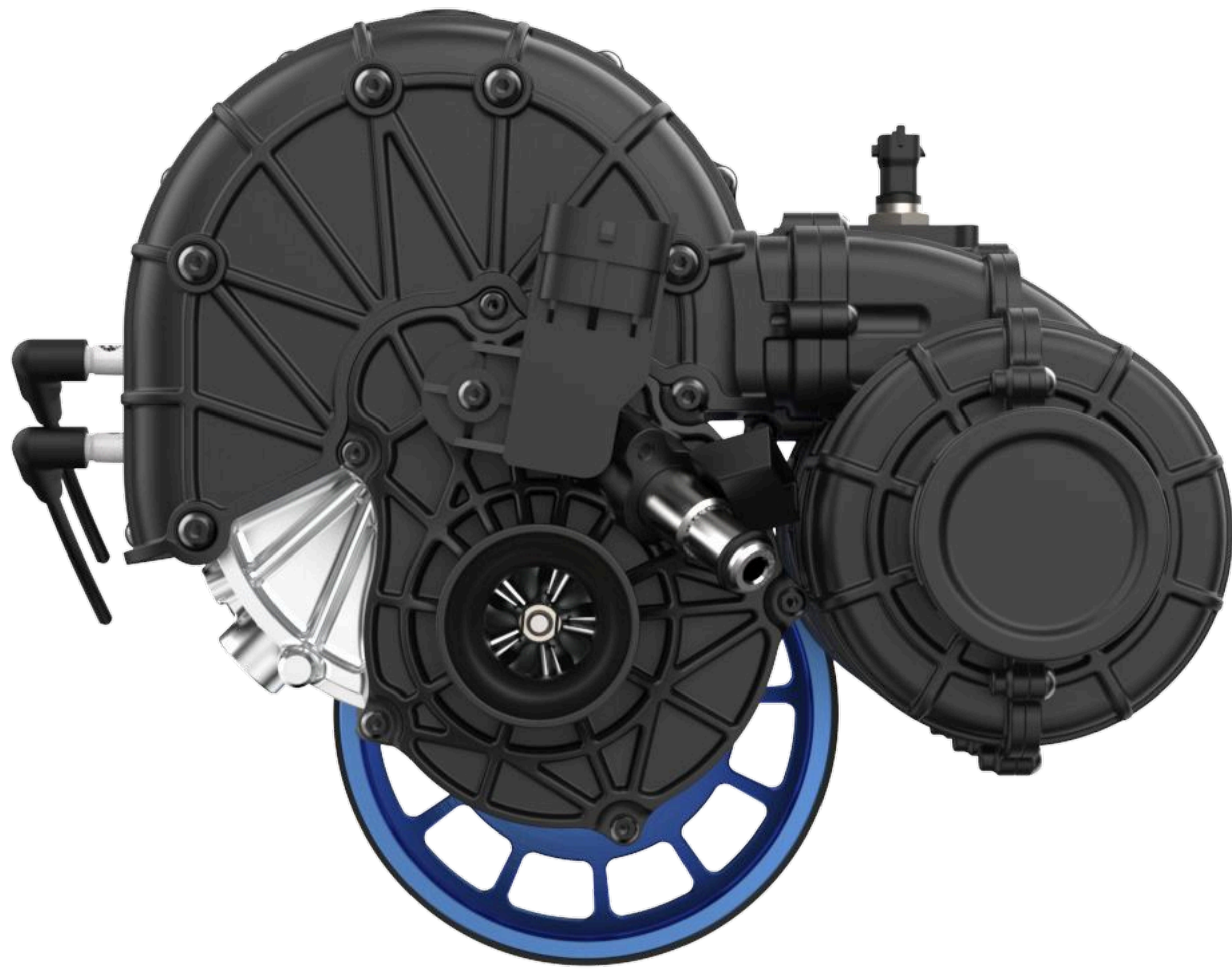
SFC (g/kWh) vs RPM



Dimensions and Layout



Visual References



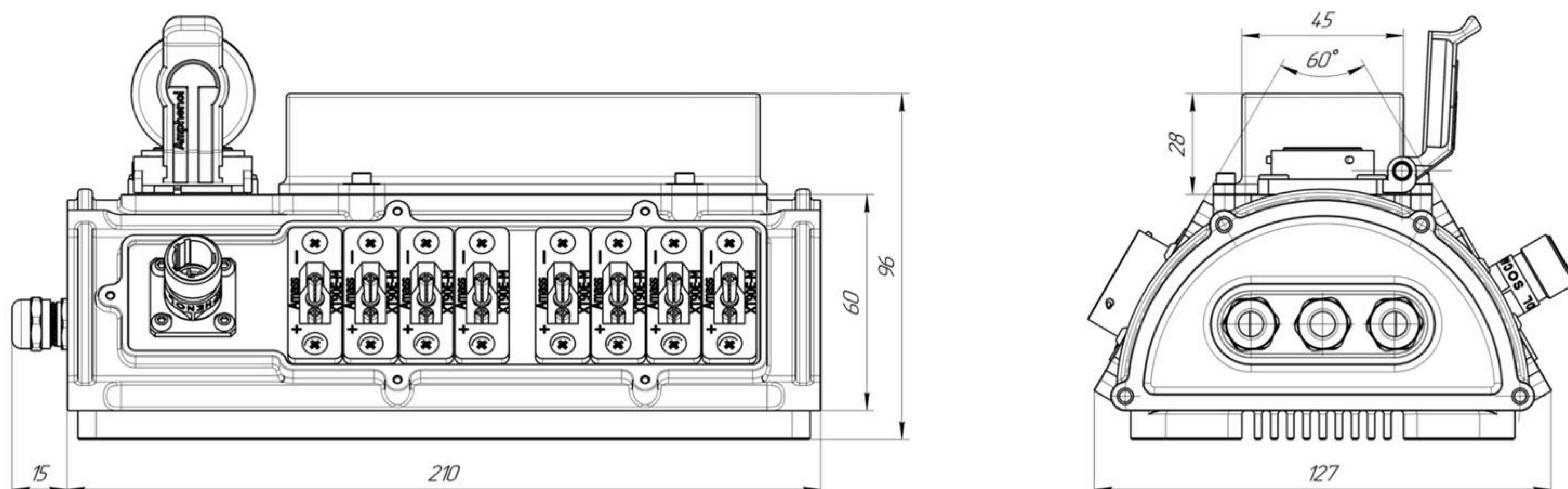
ECU / Generator Rectifier / Power Distribution Unit



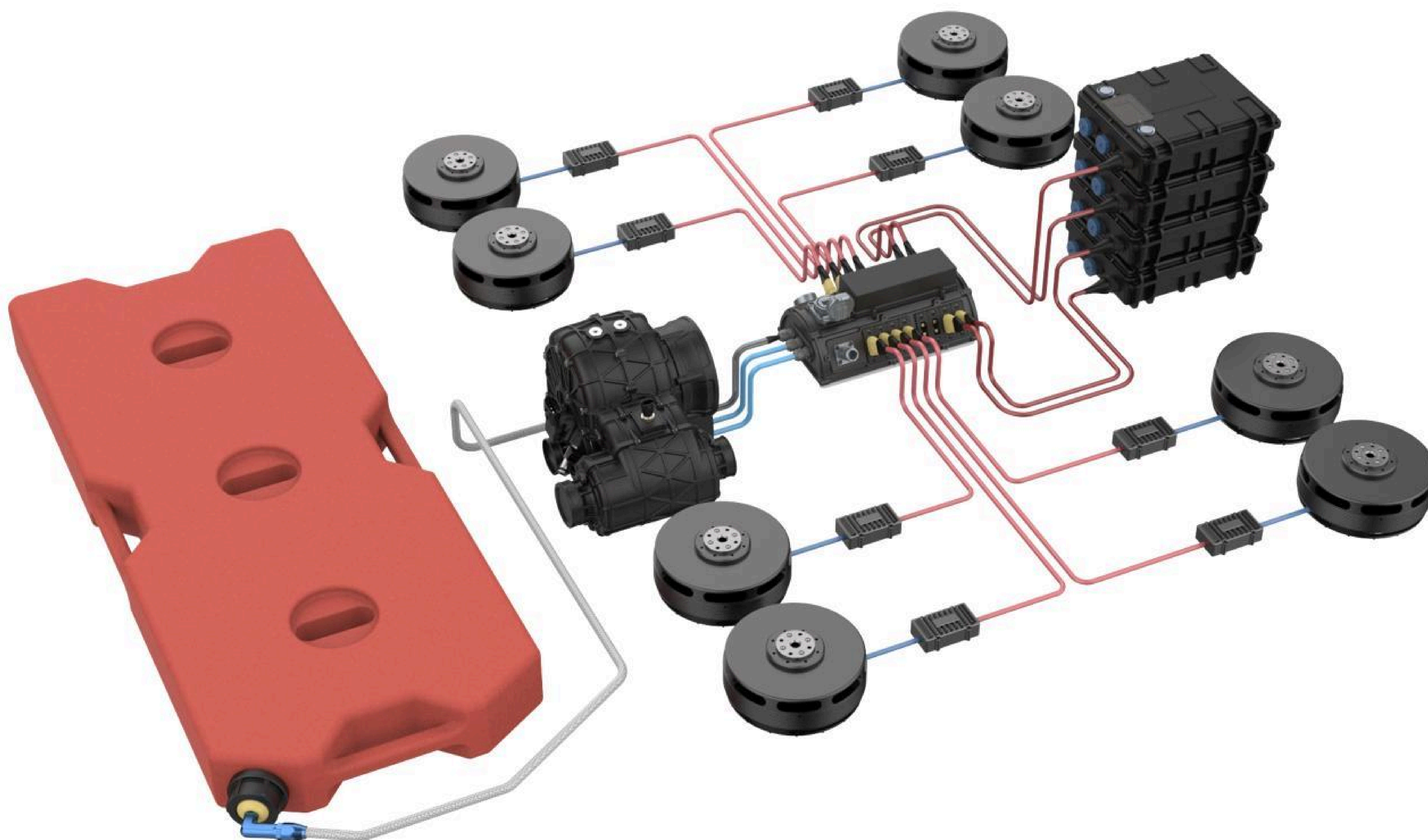
Key Features

- ✿ All engine electronic systems in one compact case
- ✿ Capability to configure hot-swap of multiple controllers and combine/balance multiple generators
- ✿ Ability to configure individual 48VDC channels into groups of 96VDC/144VDC/192VDC
- ✿ Integrated starter battery. Automatically recharges from the generator. Electrically isolated from other onboard systems
- ✿ Integrated supercapacitor-based energy buffer for torque fluctuation compensation
- ✿ Several independent channels for control and telemetry
- ✿ Priority system for responding to generator overload, separate profiles for each group of consumers
- ✿ Software configuration of protection/shutdown levels, resettable fuses
- ✿ 16 connectors for connecting the engine wiring, control interface and four groups (four channels each) of connectors for connecting electrical consumers and external batteries

Dimensions



Connection diagram



Price

Price: 15,500 EUR (Ex-Works Barcelona)

The Engineering Evaluation "Developer's Kit" includes an engine mounted on a subframe for easy installation on a dyno or prototype.

The kit comes with radiators, pumps, a complete fuel system, an Engine Control Unit (ECU) and a wiring kit.

We also provide software control documentation, including an API and source codes, to support integration and customization.