

SINFONIA

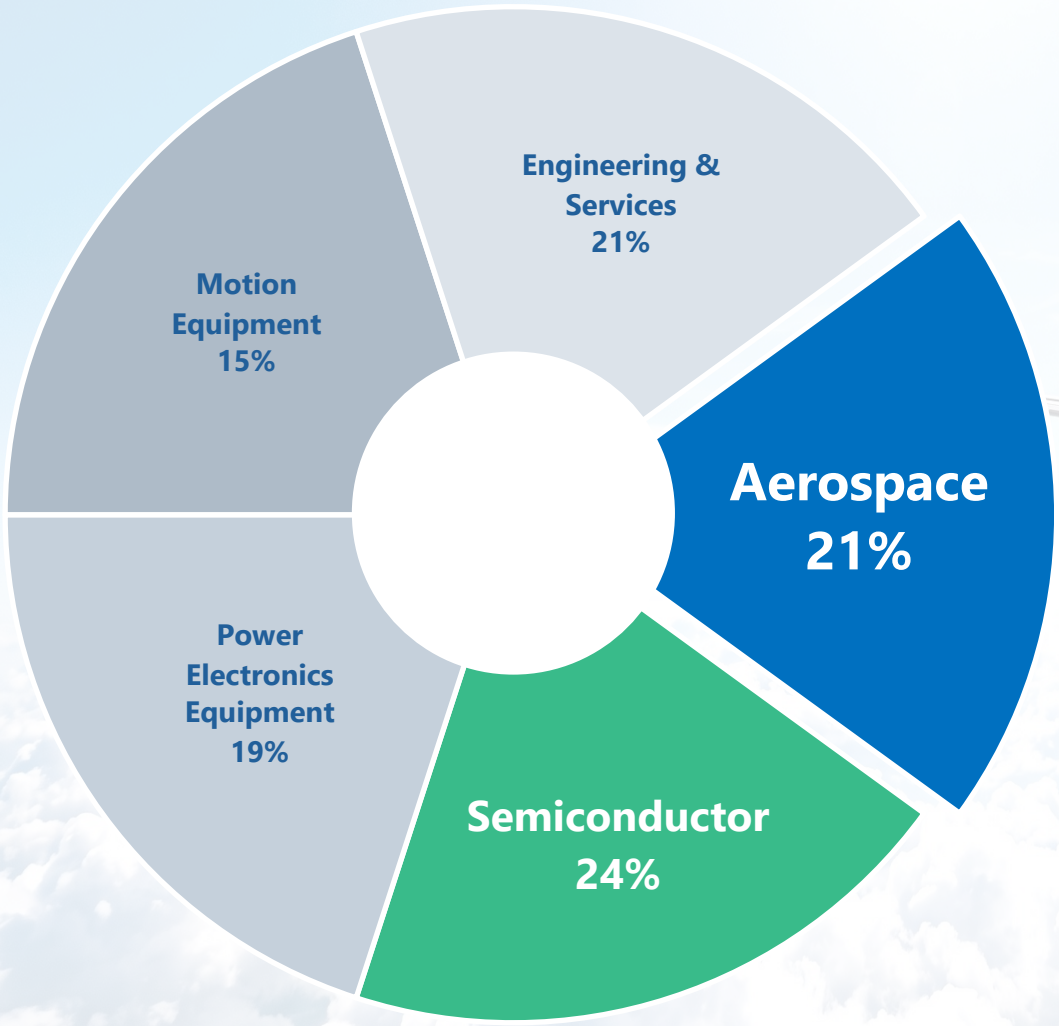
Aerospace Systems Division

SINFONIA TECHNOLOGY CO., LTD.



COMPANYPROFILE

Revenue by Segment



Pick Up: Aerospace

21.0%

of total revenue

- Electrical components for aviation and aerospace
- Designed and built at the Ise Plant – today's venue

Semiconductor 24% – Growth strategy on next page

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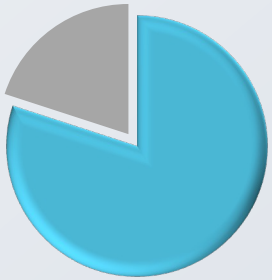
ABOUT US : CORE BUSINESS FIELD



80%

DEFENSE Our sales

- ELECTRICAL POWER SYSTEMS
- CONVERTER & INVERTER
- ELECTRO-MECHANICAL ACTUATION SYSTEMS
- OTHERS

Dominant source of electrical generation, distribution and conversion equipment for Japanese military aircraft





Production Facilities

SINFONIA

Machining Shop



Complex NC Lathes



Machining Center (horizontal)

Assembly Shop (Wire Winding)



Edgewise Coil Winding Machine



Stator Coil Winding Machine (fine-pitch winding)

Assembly Shop



Temperature and Humidity Controlled Room



Clean Room

Others

- Swaging
- NC milling
- NC lathe
- Laser marking
- Plating



3D Printer (Aluminum and Titanium)

Test Facility

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To meet the requirements of highly accurate performance for aerospace electrical components, Sinfonia is equipped with a wide range of testing equipment.



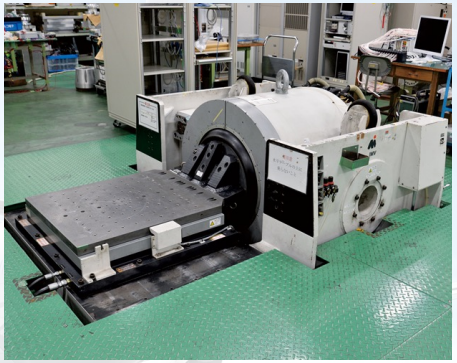
Vacuum Tolerance Testing



AGREE Chamber
(vibration + temperature)



Temperature Altitude Testing Tank



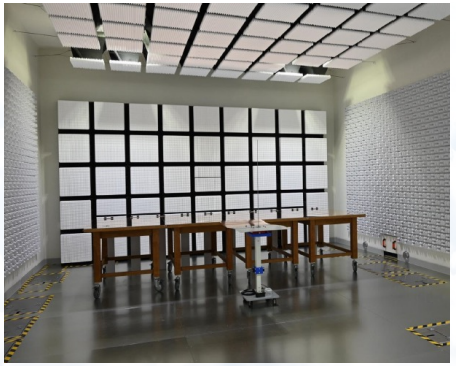
Vibration and Shock Tolerance Testing



Walk-in Temperature and Humidity Chamber



EMI (1st)



EMI (2nd)
Correspond to MIL-STD-461F/G

Others

- Accelerated Life Testing
- Salt Spray Testing
- High Frequency Shock Testing
- Temperature Shock Testing

Core Competence

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Power Management



Motion Control



Avionics



Space Products



Power Management

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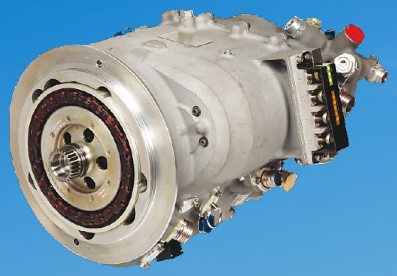
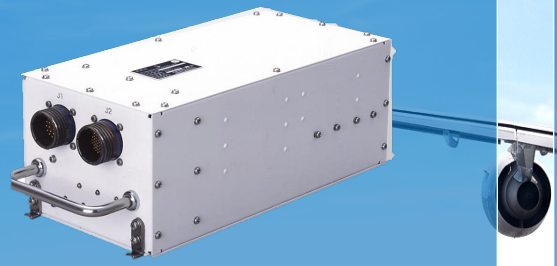
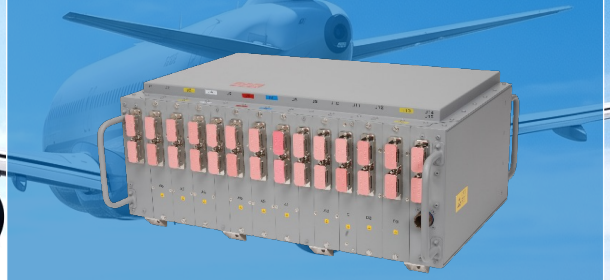
Generator



Conversion



Distribution



Aircraft Electrification Through High Density, High Reliability Technology

Motion Control

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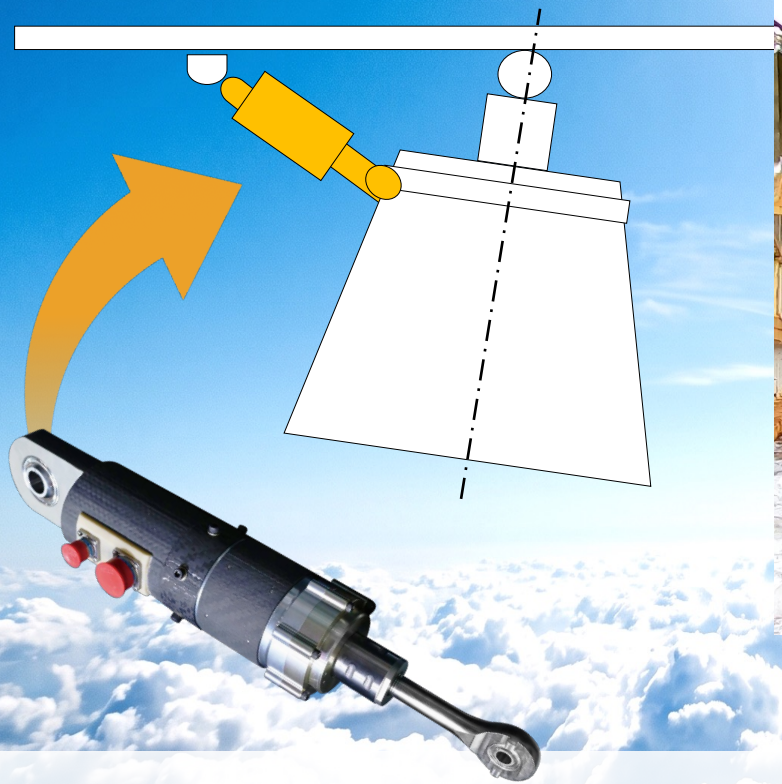

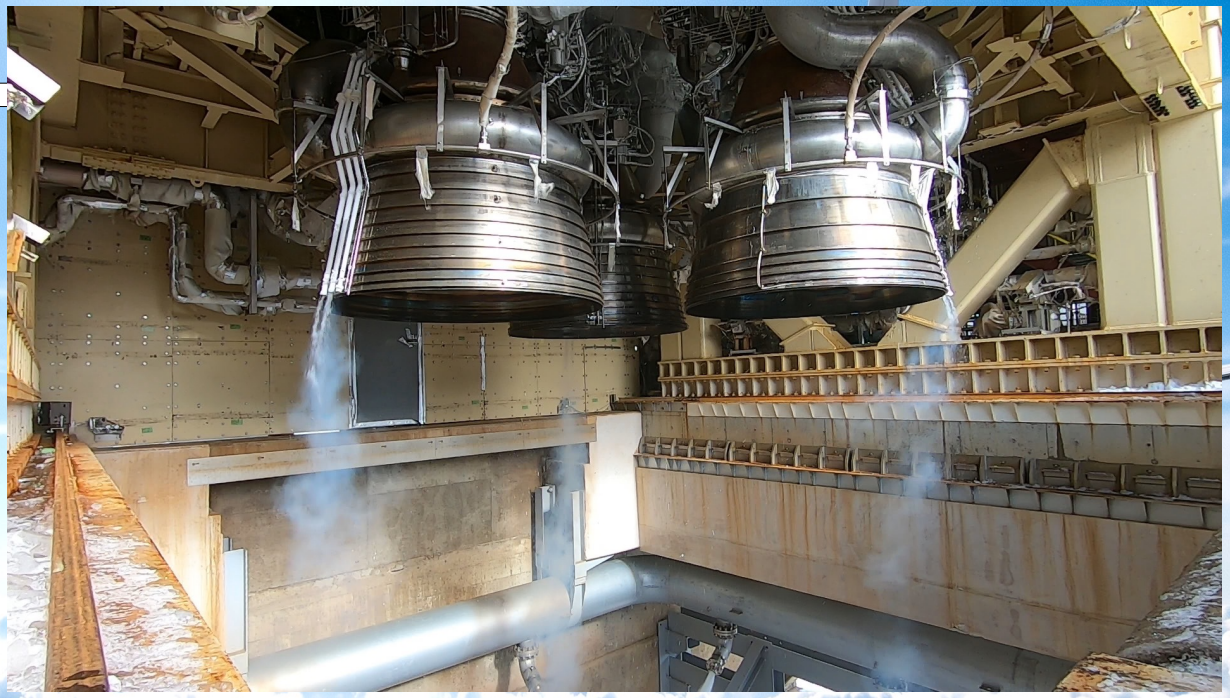

Thrust Vector Control Actuator

Drive motors with electrical power to control motion

Quality & Certification

ISO14001, JIS Q 9100* and ISO27001

*JIS Q 9100 is equivalent to AS9100

Civil Aircraft

In process for:
RTCA DO-178C
RTCA DO-254

Capability:

- Quality assurance system
- Traceability
- Aeronautical Quality Standards
- Test and inspection

Qualified Supplier for

Japan Ministry of Defense (JMoD)
JMoD's Prime Contractors
Major Aircraft and Engine OEMs





Aerospace Facility in Ise Plant SINFONIA



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Engineering Capabilities

SINFONIA TECHNOLOGY CO., LTD.

COMPANYPROFILE

Power Generation System Applications Overview

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Military(Fighter)



Military(Patrol)



Military(Cargo)



Helicopter(Patrol)



AC Generators & Power Conversion
Constant & Variable Frequency

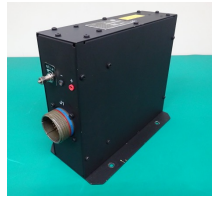






DC Generators & Power Conversion
Brush & Brushless

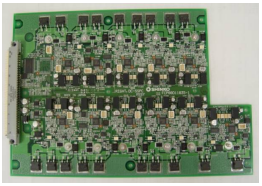






Power Distribution





History of Generator Systems

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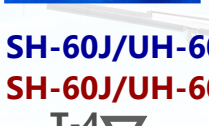

APPLICATIONS

X-2
C-X / P-X
C-2/ P-1
C-X / P-X
C-2/ P-1
F-15
T-7
US-1A KAI
US-2
UH-60JA
UH-60JA
OHX
OH-1
OHX
OH-1
FSX
F-2
FSX
F-2
SH-60J/UH-60J
SH-60J/UH-60J
T-4
CH-47J
CH-47J
AH-1S
P-3C
F-15J/DJ
MU-300
T-2/F-1
F-4EJ
PS-1
PS-1 / US-1
P-2J
F-104J
T-1B

TECHNOLOGIES

- Oil Spray Cooling AC Generator
- Oil Conduction Cooling AC Generator
- Air Cooling AC Generator
- DC Generator / Starter Generator

since 1935

Engine-Driven Generator

(1920) Windmill Generator

(1935) Engine Driven Generator

1920 1930 1940 1950 1960 1970 1980 1990 2000 2010 2020

For Aircraft AC Generator

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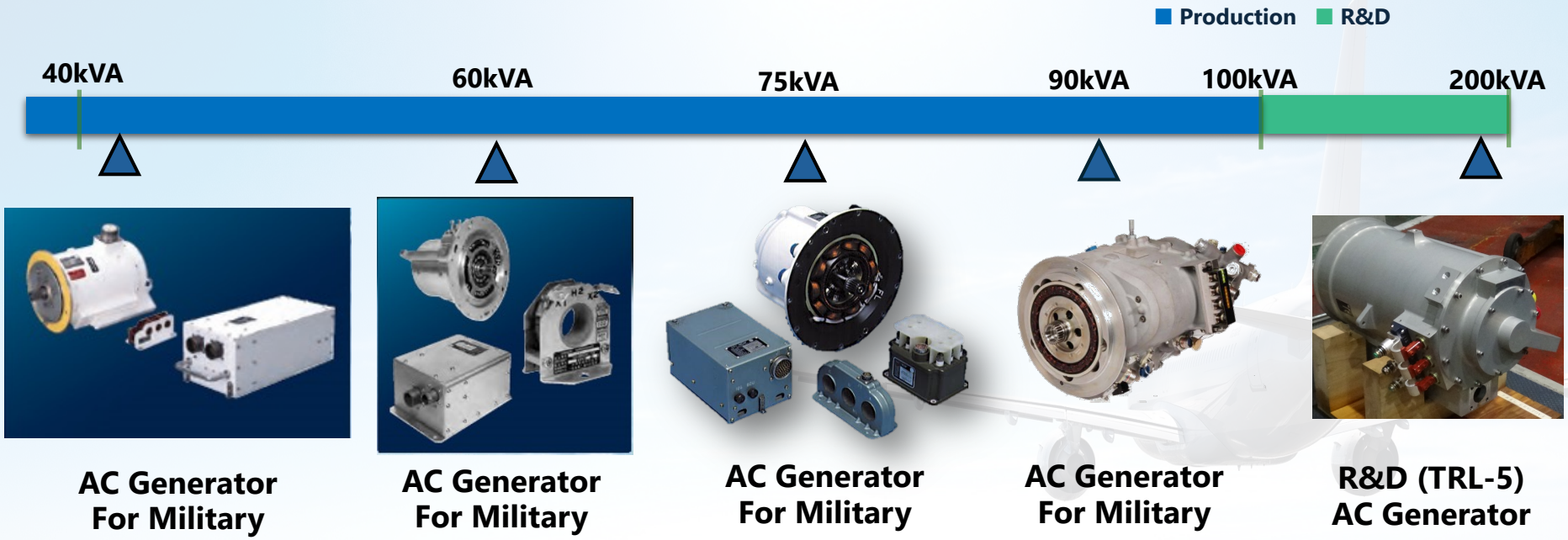

➢ OVERVIEW

- Constant Frequency / Variable Frequency
- Power Range: **5-180kVA**
- Input Speed Range @rotor: **6,000-24,000rpm**

For Aircraft DC Generator

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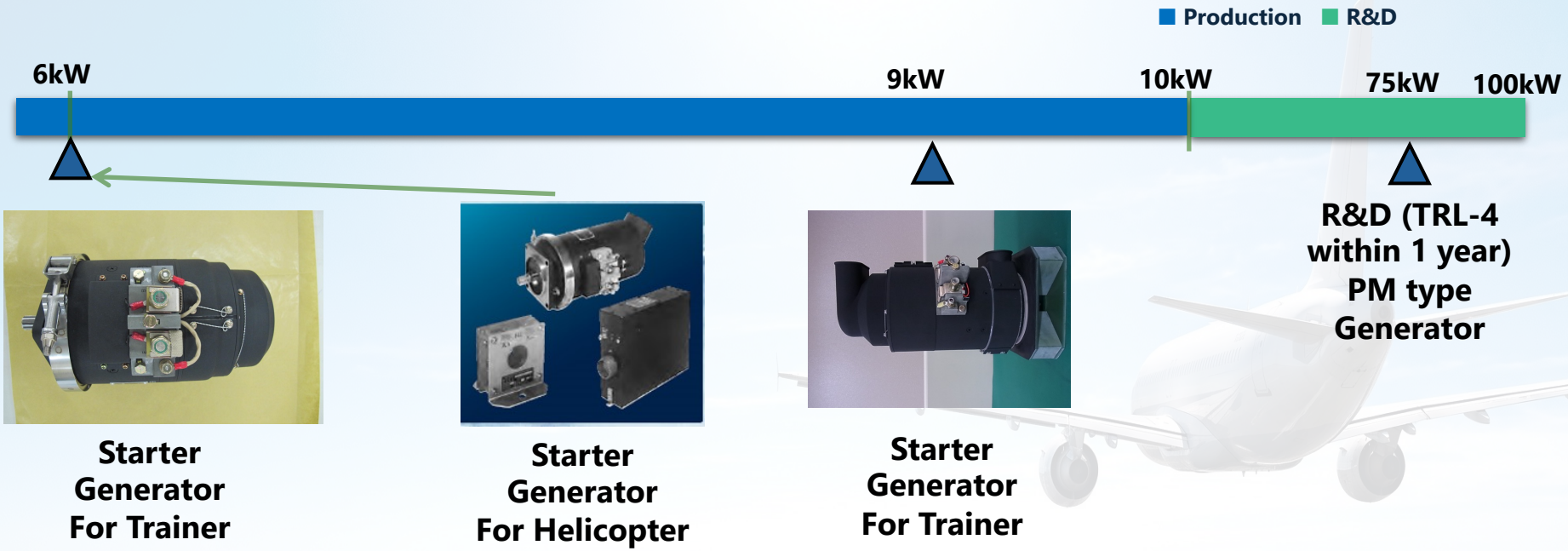

➢ OVERVIEW

- Starter Generator (Brush Type)
- R&D: PM type generator with converter: 270Vdc
- Power Range: **4.5 – 9.0kW**
- Input Speed Range: **4,000-12,000rpm**

For Aircraft Power Conversion

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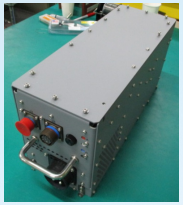
3kVA 4.4kVA 15kVA 60kVA 180kVA 500kVA



Inverter
For Trainer



AC/DC
Converter
For Helicopter



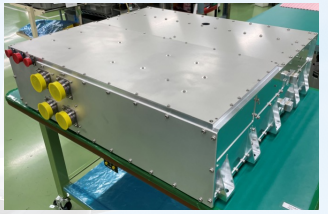
Inverter
For Military



R&D (TRL-6)
AC/DC
Converter



R&D (TRL-4)
AC/DC
Converter



R&D (TRL-6)
Motor
Controller

Military Aircraft/Helicopter – Power Distribution



28DC SSPC(20Amax)
270VDC SSPC(4Amax)
115VAC SSPC (7.5Amax)



28DC SSPC(5A,10A,15A)
115VAC SSPC (5A,10A,15A)



R&D (TRL-6)
270VDC SSPC(40A,90A)

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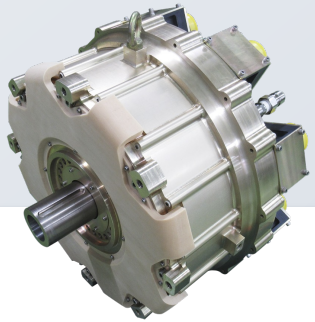
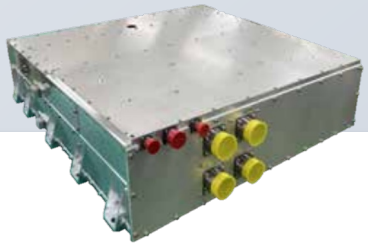
R&D: HIGH POWER & HIGH POWER-DENSITY MOTOR

- 500kW-1MW Motor & Controller for **Electrified Aircraft Propulsion**
- Sinfonia 500kW-1MW motor is designed to **directly drive the propeller without gearbox.**



MOTOR



CONTROLLER

Aeronautical Environmental Specifications

500kW-1MW	5-10kW/kg	750 to 1000V	1,900rpm	2,513-5,026Nm
High Power	High Powe Density	High Voltage Design	Low Speed	High Torque

AC Generator System — Features

AC Generator

- Constant Frequency / Variable Frequency
- Brushless Starter Generator (R&D)
- Power Range: **5–250kW**
- Input Speed Range: **6,000–24,000rpm**
- High power density **by using optimized materials**

AC Generator Controller

- High-performance voltage regulation and protection by analog / digital control
- Starter generator controller with **bidirectional power conversion (AC to DC / DC to AC)**
- Built-in test function (Power-on, Initiated, Continuous)
- Network: MIL-STD-1553 / RS-422 / ARINC 429, etc.

For Aircraft AC Generator

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AC Generator System — Technical View

01
High-Density Winding

Compact and lightweight equipment using high-density winding technology

02
Magnetic & Cooling Design

Optimal magnetic and cooling design for each application

03
High-Voltage Insulation

Insulation design for high-voltage systems

DC Generator System — Features

DC Generator

- Starter Generator (Brush Type)
- Power Range: **4.5–9kW**
- Input Speed Range: **4,000–12,000rpm**
- R&D: Brushless Starter Generator, 28Vdc
- High power density **by using optimized materials**

DC Generator Controller

- High-reliability voltage regulation
- Soft-start control **by field-weakening control**
- Parallel operation (load sharing between 2 generators) **by equalizing function**
- Built-in test function (Power-on, Initiated, Continuous)

Power Conversion System — Features

Power Device

- For high efficiency, Sinfonia uses **the latest power devices**
- IGBT (decades ago) → Si FET (10 years ago) → SiC FET (a few years ago) → **GaN FET (in development)**

High Power Density

- Circuit / thermal / structural analysis
- **Low-loss switching** technology
- **Low-noise switching** technology **with academia**
- Compact and lightweight equipment **using new materials**
- Insulation design **for high voltage**
- **Optimal cooling design** for each application

Power Distribution System (SSPC) — Features

Technical View

- **Low-loss** device
- **I^2t** trip curve
- **Arc fault detection** (optional)
- Easy change of rated current

Power Device

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- Si FET (10 years ago) → SiC FET (a few years ago) → **GaN FET (in development)**

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- Circuit / thermal / structural analysis
- **Low-loss switching** technology
- Compact and lightweight equipment **using new materials**
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Thank You

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COMPANYPROFILE

2026