

微型渦輪熱電共生系統開發計畫

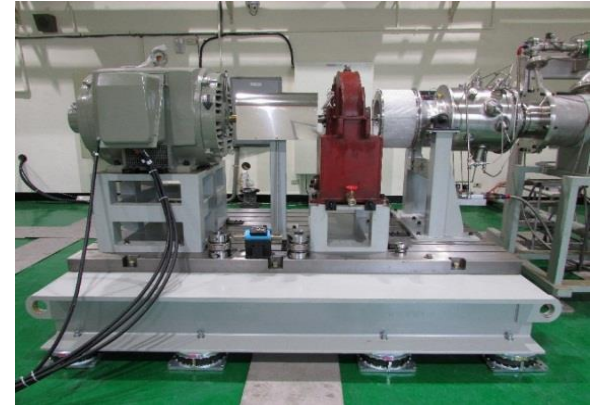
執行單位

國家中山科學研究院

計畫主持人

李基銓

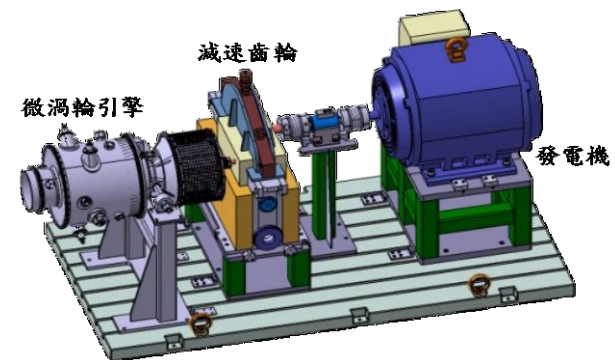
- 專利為一種模組化微渦輪發電機裝置，採用模組化設計的理念，將微渦輪發電機區分為發電機、氣渦輪、複熱器與熱回收等四個模組，各模組可分開組裝，測試與儲運，且相同模組間具有互換性，可大幅增加機組的維修性；並且因具模組化的特性，客戶可依需求選配複熱器模組與熱回收模組，組成以發電功能為主的電能構型或以產熱製冷功能為主的熱能構型，增加產品的應用性。



專利名稱：一種模組化微渦輪發電機裝置

專利證號：M500146

本專利特點在於提出一種模組化微渦輪發電機裝置，採用模組化設計的理念，將發電機與氣渦輪各自具有獨立轉軸，兩軸間再以栓槽耦合齒相互套接傳動，使得發電機可以獨立模組方式完整拆換，專利運用至屬民生用發電系統中動力來源的渦輪引擎技術。



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- 開發200 kW等級微型渦輪熱電共生系統，由國內自行設計製造，具成本競爭優勢。
- 本系統主要運用於工業節能領域，在電力需求日增下提供穩定基載電力，並可配合鍋爐回收廢熱，提供乾淨的蒸汽，做為產線製程殺菌及加熱需求，未來運用多機組可併聯產生MW等級電力。未來可配合政府政策，應用於沼氣/天然氣發電，做為再生能源的發電機。
- 系統由渦輪引擎系統以及高轉速發電機系統組成。全系統主要規格如下：
 - 1.發電功率200 kW、轉速約45,000 rpm。
 - 2.整體熱效率 $\geq 70\%$ 。
 - 3.維修週期設計值約0.25年、壽期 10年。

Micro Gas Turbine Combined Heat and Power System Development Project

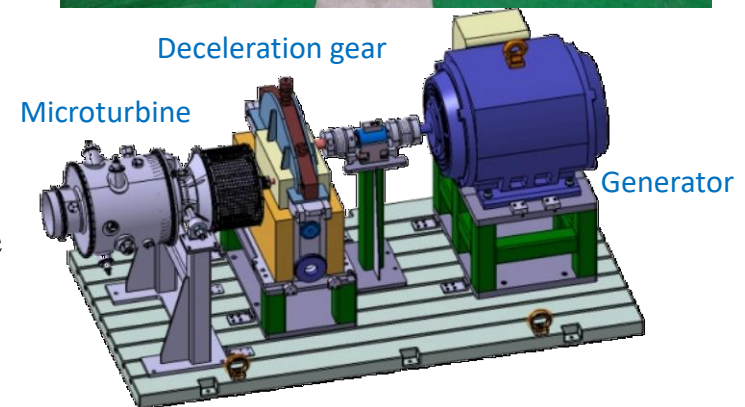
Execution Unit

National Chung-Shan Institute of Science and Technology

Project Director

Chih-Chuan Lee

- In view of the aforesaid drawbacks of the prior art, the objective of the present invention is to provide a modularized microturbine generator power device composed of four modules, namely a power generator unit, a gas turbine unit, a recuperator, and a heat recycling unit, which can be assembled, tested and transported individually and are interchangeable, thereby featuring ease of maintenance. Due to modular design, the recuperator modules and heat recycling modules are customized and optional. Therefore, the modularized microturbine generator power device can be used for generating electrical power and generating heating or refrigerating.



Micro Gas Turbine Combined Heat and Power System Development Project

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- The project is to develop a distributed gas turbine cogeneration system up to 200 kW. The system will be designed and manufactured domestically and accordingly has cost competitive advantage.
- The system, operated by gas and liquid fuels, is able to provide both electricity and heat for industrial, commercial and remote district uses, can be used for energy efficiency for industrial boilers, biogas-fueled renewable energy, and islanding energy, and can be integrated with microgrid systems.
- The system comprises a gas turbine engine, with speed of 45,000rpm, and a high speed generator to provide electricity up to 200 kW, and has overall energy efficiency $\geq 70\%$, a designed maintenance period of 3 months and 10 years of life.