ADVANCE RIKO

Atmospheric Thermoelectric Module Evaluation System

F-PEM

Conversion Efficiency Measurement in the Atmosphere

This system has been produced based on the patent of
the National Institute of Advanced Industrial Science and Technology (AIST).

Capable of durability test of thermoelectric modules under actual use environments

◆ General Description

The system can evaluate the power generation and heat flow that can be gathered when the temperature difference is given to thermoelectric module in the environment (in atmosphere and under load) and conversion efficiency that can be calculated from maximum power generation and heat flow.
In addition, this system can conduct long-hours operation and heat cycle tests of thermoelectric modules and can be used for testing newly developed models as well as for durability tests under load and temperature in which commercially available modules are actually incorporated.

◆ Features

1. The output characteristics of the module can be evaluated by continuous loading at a high temperature in air.
2. Repeated measurement of Pmax is possible at constant intervals while continuing to apply load for a long time.
3. Measurement can be performed while applying a constant load in accordance with the actual module build-in environment.

◆ Applications

1. Evaluation of maximum power generation and heat flow of thermoelectric modules in air and under load.
2. Evaluation of conversion efficiency of module calculated from maximum power generation and heat flow.
3. Evaluation of durability of thermoelectric modules by long-hours measurement.

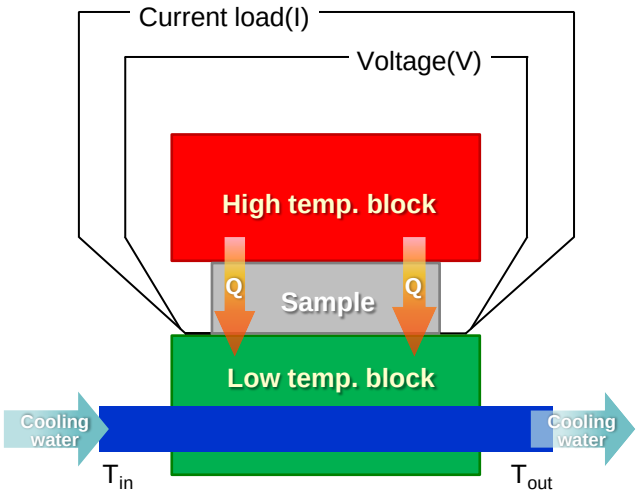
ADVANCE RIKO, Inc.

Atmospheric Thermoelectric Module Evaluation System F-PEM

◆ Specifications

1.	Measurement properties	Power generation, Heat flow, Conversion efficiency
2.	Temperature range	Room temperature to 600°C (heater setting value)
3.	Sample size	40mm-square (Standard)
4.	Measurement atmosphere	In air

◆ Sample system chart



Power generation(P) = IV

Heat flow(Q) = Cv (T_{out} - T_{in})

Conversion efficiency(η) = P / (P + Q)

I	: Current load
V	: Voltage
C	: Heat capacity of cooling water
v	: Flow rate of cooling water
T_{out}	: Outlet temperature of cooling water
T_{in}	: Inlet temperature of cooling water

◆ Utility

1. Outside dimensions:
   Approx. W600 x D500 x H900(mm)
2. Weight: Approx. 60kg
3. Power

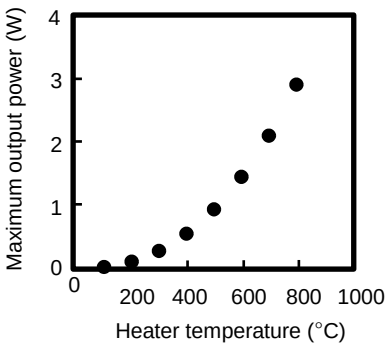
Main body: AC100V, single phase, 3kW

Water circulator for constant temperature:
AC100V, single phase, 1kW

Cooling water circulator:
AC200V, three phase, 2.1kW*

*Power requirement of our standard cooling water circulator (option).

◆ Example of measurement data



R. Funahashi, T. Barbier, E. Combe, Journal of Materials Research, Vol. 30, No. 17, pp. 2544-2557 (2015)

※Specification and appearance are subject to change without notice for performance improvement.

ADVANCE RIKO, Inc.

HEAD OFFICE

4388 IKONOBE-CHO, TSUZUKI-KU, YOKOHAMA, 224-0053 JAPAN

TEL : +81-45-931-2285 FAX : +81-45-933-9973

URL http://www.advance-riko.com/en/