

Product Information

LASER FLASH METHOD THERMAL CONSTANT MEASURING UNIT

Recently, with a rapid progress in the development of new materials such as ceramics and semiconductor materials, it has become very important to examine their thermal properties. The required work involved is measurement of the three thermal constants: specific heat, thermal diffusivity and thermal conductivity.

The thermal constant measuring unit by the laser flash method features high-precision measurement in a short time, using tiny samples and allowing measurement over a wide temperature range.

This unit has been specifically designed as a system appropriate for the computer age, aimed at unattended operation throughout once the sample setting is done.

1. Features

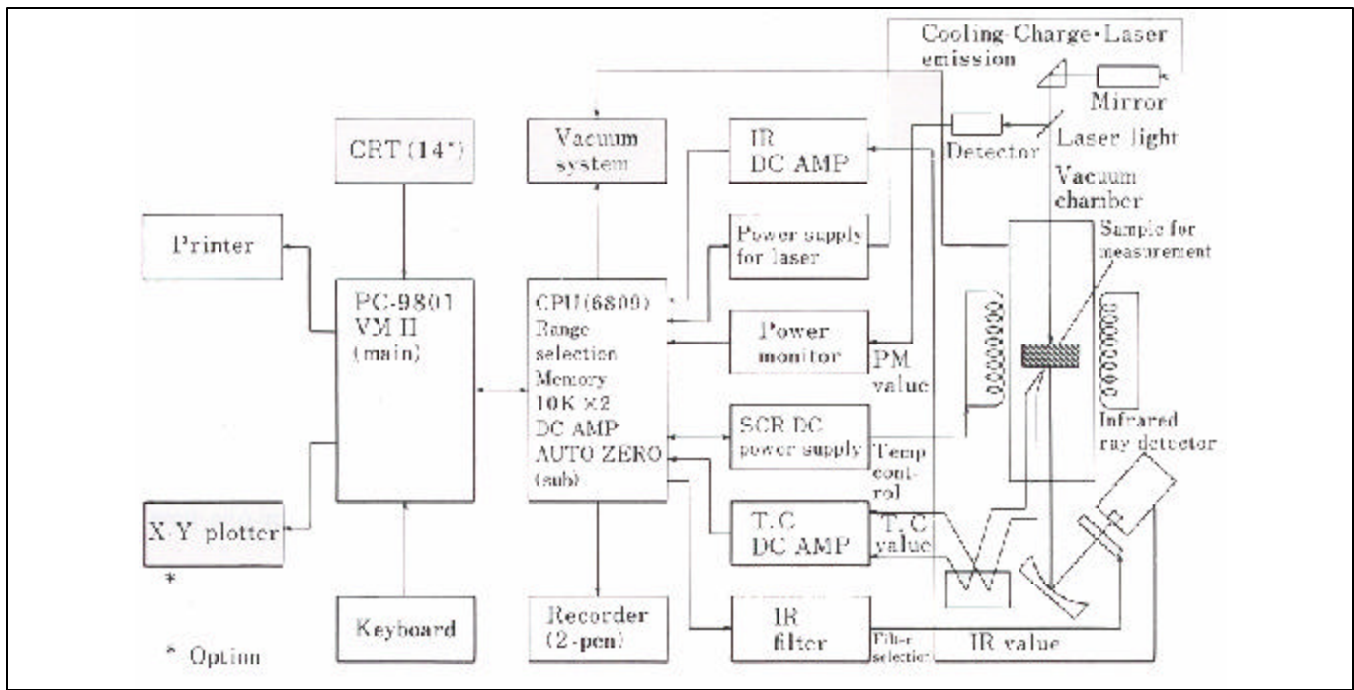
- (1) Fully automated measurement enabled by a combination of 16-bit CPU and microcomputer.

The selection of optimum measurement conditions is wholly made by the computer. With the start of the system, entire measurement is carried out by no-man operation, and thereby the thermal diffusivity α specific heat C_p and thermal conductivity λ are plotted as thermal functions for subsequent print-out.

- (2) Simultaneous measurement of the specific heat and thermal diffusivity by one-time laser flash.
- (3) Adoption of the zero extrapolation method, aimed at precise specific measurement, through approximation of the logarithmic function by the least squares method.
- (4) High sampling rates at 5 $\mu\text{sec}/\text{word}$ in maximum in thermal diffusivity measurement.

This high-speed sampling is effective for measurement of thin plates and the like having high thermal diffusivity.





(5) Introduction of a turbomolecular pump developed by Rigaku in the vacuum system to perform measurement in a clean atmosphere.

2. Major Specifications

(1) Measurable temp. range

: Ambient - 1500°C

(2) Atmosphere for measurement

: Vacuum, inert gas

(3) Sample size: : $\phi 8, \phi 9,$

: $\phi 10 \times 0.8 \sim 3 \text{ mm}$

(4) Sample kind : Solid (metal, ceramics, polymer)

(5) Temp. detection

Contact method : Thermocouple (platinel, Pt-Rh)

Non-contact

Method : Infrared ray detector (InSb)

(6) Data processing:

Measurement curve at the specified temperature, CRT display of thermal diffusivity, specific heat and thermal conductivity.

output through hard copy, print-out and X-Y plotter.

