Behaviour of resistivity of substarte such as polymer sheets/ films at higher temperatures is an important area of investigation due to their variety of applications. Two Probe Method is one of the standard and most commonly used method for the measurement of resistivity of very high resistivity samples like sheets/films of polymers. The resistivity measurement of such samples is beyond the range of Four Probe Method.

Description of the experimental set-up

1.Two Probes Arrangement
It has two individually spring loaded probes. The probes arrangement is mounted in a suitable stand of high quality alumina which also holds the sample plate. To ensure the correct measurement of sample temperature, the thermocouple junction is embedded in the sample plate just below the sample. This stand also serves as the lid of temperature controlled oven. Proper leads are provided for connection to Capacitance Meter and Temperature Controller.

2.High Temperature Oven
This is a high quality temperature controlled oven. The heating element used is a high grade Kanthal-D. It is mounted on a custom made groved, sintered alumina fixture to avoid any slippage of heating wire.

Heat shield is also provided to reduce the excessive heating of outer cover. Further the top portion is also suitably covered to meet the safety standard. The oven has been designed for fast heating and cooling rates, which enhances the effectiveness of the controller.

3.PID Temperature Controller
The unit is a high quality PID controller wherein the temperatures can be set and controlled easily. The P, I and D parameters are factory set for immediate use however the user may adjust these for specific applications as well as auto-tune the oven whenever required. The steps for these are given in the user manual. Although the controller may be used either for our small oven, up to 200°C or a larger oven up to 600°C, however, in the present setup only large oven is to be used. The controller uses thermocouple as temperature sensor.

Specifications

Temperature Range	:	Ambient to 600°C
Power Supply	:	100-240VAC; 50/60Hz
Display	:	Method 7 Segment LED display [Processing value (PV):Red, Setting value (SV):Green]
Input Sensor	:	Thermocouple (Chromel – Alumel)
Control Method	:	PID, ON/OFF Control, P, PI, PD, PIDF, PIDS
Display Accuracy	:	± 0.3%
Setting Type	:	Setting by front push buttons
Proportional Band (P)	:	0 to 100.0%

Note: Specifications are subject to change.

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Integral Time (I)	:	0 to 3600 Sec
Derivative Time (D)	:	0 to 3600 Sec
Control Time (T)	:	1 to 120 Sec
Sampling Time	:	0.5 Sec
Setting (P, I & D)	:	Manual / Auto
Interfacing	:	USB connection through SES-CAMM

4. High Voltage Power Supply
Specifications as per datasheet attached

5. Digital Picoammeter
Specifications as per datasheet attached

6. Computer Interface

An interface (SES-CAMM) provides the option to the user to interface it with the computer for acquiring and storing the data (temperature, current and voltage) and plotting in real time. The data is also stored in an excel file which can be used for further analysis. The software is menu driven and can be operated very easily.

Interfacing	:	PC connectivity through USB. Individual unit connectivity through BNC connector
Software	:	Fully integrated software capable of display and storing data in different configuration . Compatible with Window XP/ 7/ 8.

The experimental set-up is complete in all respect

Note: Specifications are subject to change.

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