2 INSTRUMENT OVERVIEW AND INSTALLATION

This chapter provides information on the following:

- Instrument features
- Operating environment and site requirements
- Procedures for installing the instrument and software
- Procedures for installing upgrades to the software

2.1 INSTRUMENT OVERVIEW

2.1.1 FEATURES

The Tencor FLX-2320 is a thin-film stress measurement instrument. It accurately measures the changes in the radius of curvature of the substrate caused by the deposition of a stressed thin film on the substrate. Some of the features include

- Laser scanning technology to accurately measure stress on all reflecting films. You can also measure stress as a function of time or temperature (standard temperature range from room temperature to 500° C; optional temperature range -65° C to 500° C). The software displays regular and time-dependent stress measurements in graph form automatically.
- An optional inert atmosphere capability that allows measurements to be made in a controlled atmosphere of nitrogen or argon.
- Only one moving element in the optical components ensures low vibration and high accuracy.
- Ability to customize parameters such as number of scan points, elastic modulus, substrate thickness, and wafer diameter in the process programs. You can specify heating and cooling cycles in the recipe for stress-temperature measurements.
- Ability to edit data records, plot graphs, and trend charts. You can also automatically recalculate the stress for a saved data file by changing the elastic modulus, wafer, or film thickness.
- Comprehensive data analysis capabilities that include calculating the biaxial modulus of elasticity and linear expansion coefficient, displaying thermal stress superimposed on stress-temperature measurement data, stress uniformity, file subtraction, trend plotting for statistical process control (SPC), calculating the water diffusion coefficient in dielectric films, and displaying a 3-D map of the deflection over the wafer.
- Menus, screens, and windows that are simple and easy to use. Key operation for each field is usually displayed at the bottom of the screen.

2.1.2 SYSTEM COMPONENTS

The Tencor FLX-2320 system consists of a computer, computer keyboard with a built-in trackball, and a measurement unit. Figure 2-1 shows the measurement unit with its door open. Inside the cabinet you can see the hot plate, dial indicator, and the four thumbscrews that hold down the hot plate cover.

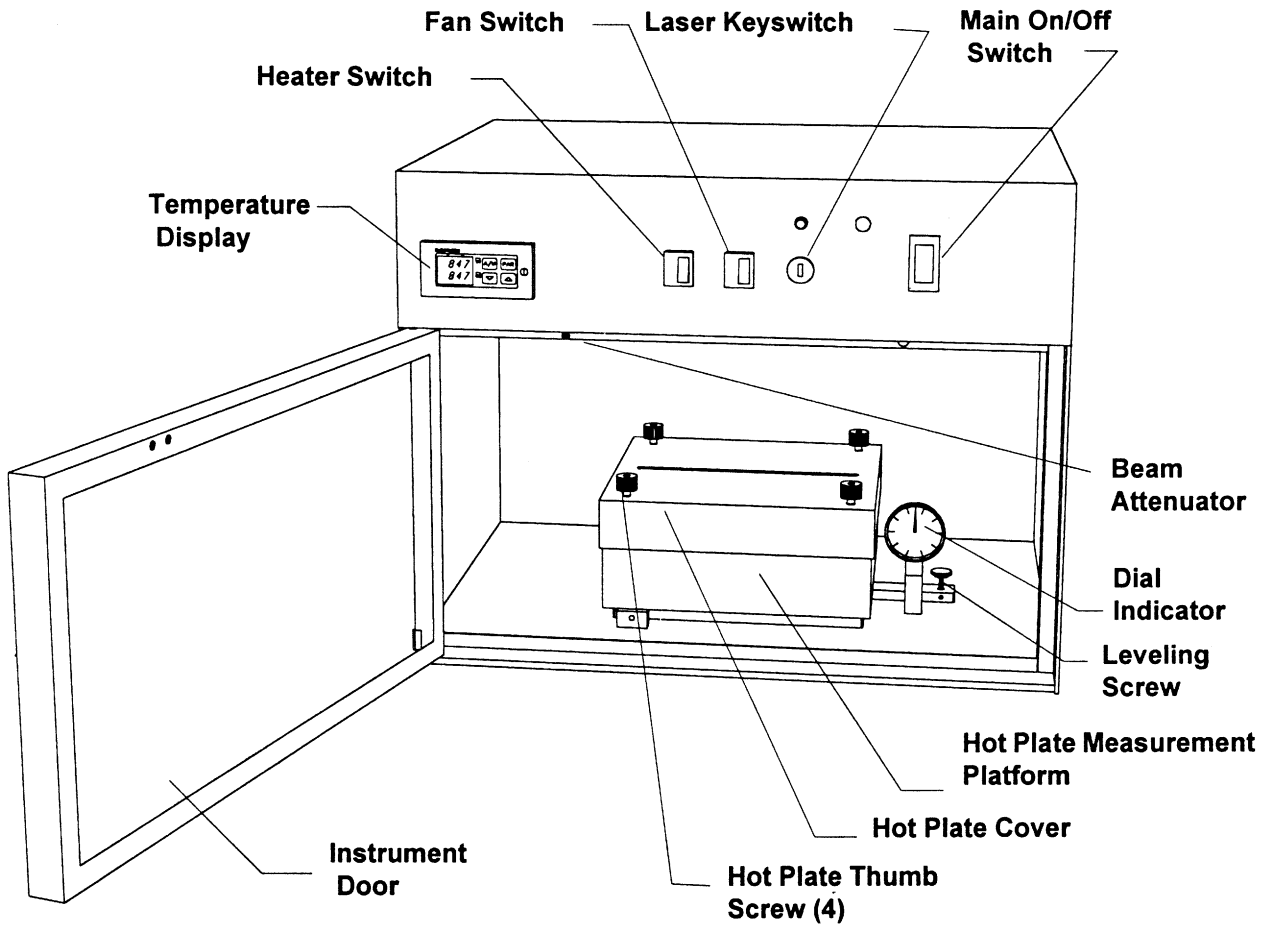

Figure 2-1 Tencor FLX-2320 (Front View)

The temperature display, heater switch, fan switch, laser keyswitch, and the main On/Off switch are located along the top front of the cabinet. For a detailed explanation of the instrument components and controls, refer to Section 3.1, "System Components."