***Figure 20.2***
A luminance meter

BS 7920: *Specification for luminance meters* discusses in detail the uncertainties that luminance meters may be subject to and specifies limits for the uncertainties for two classes of luminance meter. The two types of meter are type L, laboratory meters and type F, field meters. A meter that just meets the standard would have a best measurement capability of ±5% (Type L) or ±7% (Type F). The uncertainties for measurements of highly coloured light sources may be greater.

Luminance meters are available which provide measurements over a range of $10^{-4}$ to $10^{8}$ cd/m$^2$ for areas varying from a few seconds of arc to several degrees. It is important to use a luminance meter with appropriate sensitivity and measurement area for the application.

## 20.4 Methods of measurement

The lighting recommendations given in this *Handbook*, the SLL *Code for lighting* and the SLL Lighting Guides usually involve some combination of average illuminance; some measure of illuminance variation, either illuminance diversity or illuminance uniformity; some measure of glare limitation which can be a maximum luminance, a unified glare rating (UGR) for interior lighting or a glare rating (GR) for exterior lighting; and a colour rendering index (CRI). Of these, only the average illuminance, illuminance diversity, illuminance uniformity and surface luminance can be measured in a field survey. Both UGR and GR have to be calculated for given viewing positions and directions, and CRI is a property of the light source.

### 20.4.1 Average illuminance

The average illuminance over an interior is usually measured to check if an installation has achieved its design specification. For design calculations using computers it is practical to obtain a print-out of illuminance over a large number of closely spaced grid points. With site measurements, for logistical reasons the aim must be to obtain acceptably accurate results from a minimum number of points. To do this, the following procedures are recommended after the installation has been operating for an appropriate time at the design supply voltage. For discharge lamps this time is 100 hours, but it will be less for incandescent lamps.

### 20.4.2 Interior lighting

For interior lighting, there are two possible methods of measurement of average illuminance. The first is based on a full grid of measurement points over the working plane or specific task areas, as required. The same grid may be used in the measurement of illuminance variation. The second is a two-line method of measurement for average illuminance that may be used for a limited range of installations.