

## NEW GONIOPHOTOMETERS FOR LIGHTING-ENGINEERING LABORATORIES\*

P. Marx

Technische Fachhochschule Berlin, FB 12 – Elektotechnik,  
Haus Gauß, Luxemburger Str. 10 - 13353 Berlin, Germany

The most important trends in the development of artificial lighting systems are as follows:

- miniaturization of many types of light sources and increase in their luminous efficacy and working life;
- expanded use of energy-saving high-quality electronic control gear (ECG) for linear fluorescent tubes and compact fluorescent tubes;
- reduction in size of the luminaire;
- the use of new materials with high reflectance for mirror reflectors and screens;
- the use of fiber-optic systems and hollow lightguides in indoor and outdoor lighting systems;
- optimization of the control systems for indoor light units with fluorescent tubes and ECG by dimmers, in response to variation in the intensity of natural light, the time of day, and the presence of staff at the work station (by means of the Bus-System, a modern digital two-way transmission system for information and control signals).

Such new technology permits electrical-energy savings of up to 75% in indoor lighting systems and also reduces the atmospheric pollution associated with carbon-dioxide emission by thermal power stations (and thereby reduces the greenhouse effect).

In order to develop energy-saving light sources and luminaires, designers and manufacturers require precision measuring equipment with photometers of appropriate size and accuracy for measuring the intensity distribution curves (IDC) and other characteristics. Two goniophotometric systems that meet these requirements are described in the present work.

### ECCENTRIC GONIOPHOTOMETER WITH ROTATING MIRROR

This goniophotometer, for measuring the IDC and luminous flux of lamps and luminaires (Fig. 1) [1, 2], may be used in relatively low laboratory buildings (about 5 m), is relatively inexpensive, and rules out perceptible

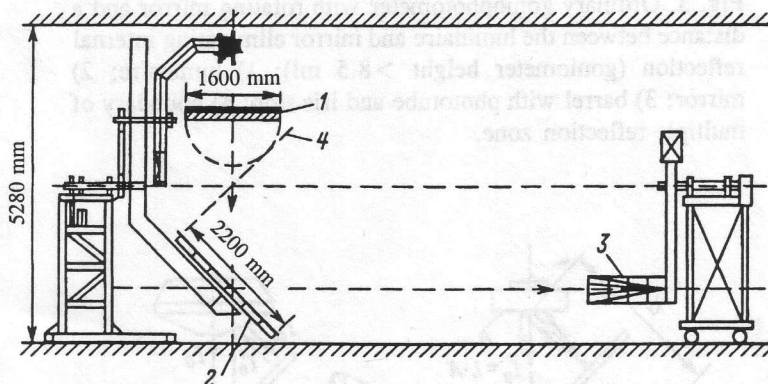


Fig. 1. Eccentric goniophotometer with rotating mirror and reduced height (~5 m): 1) luminaire; 2) mirror; 3) synchronously rotating tube with phototube and iris stop; 4) boundary of multiple-internal-reflection zone.

\*This article was originally written in German.