



Universal photometer/radiometer

Model S4



**For measurement of luminance and illuminance.
Also, using special detectors, for measurement of
other photometric and radiometric quantities**

HAGNER UNIVERSAL PHOTOMETER/RADIOMETER

model S4

The Hagner Universal Photometer/Radiometer is a combined **luminance** and **illuminance** (illumination) meter which is designed for measurements in the field as well as in the laboratory. By application of the different functions of the meter it is also possible to determine such quantities as angles and solid angles (using scales in the viewing field), elevation angles (using optional pendulum), reflection factors (using optional reflection reference), contrasts, transmission and daylight factors, glare indices etc.

A number of other photometric quantities can be measured with the use of Hagner special detectors (see next page).

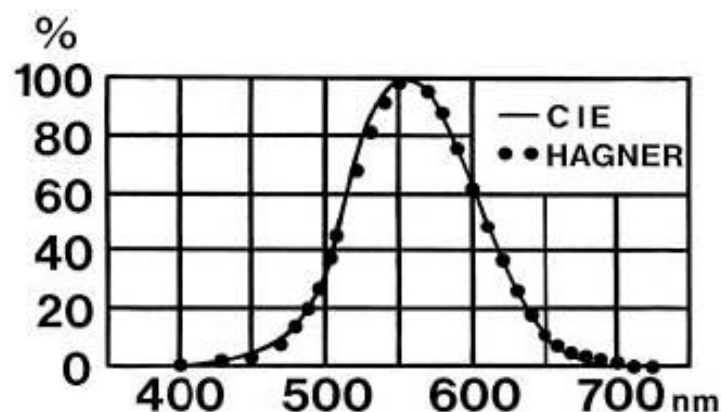
The basic light sensitive components of the photometer are two silicon diodes, filtered to give a spectral response close to that of the human eye, as defined in CIE standards.

One (internal) detector is built into the optical system for measuring luminance within 1° circular field (viewing field approx 11° circular).

The other (external) detector, which is well cosine corrected and connected to the instrument by an approx 2 metre flexible lead, is used for measuring illuminance.

The external detector is stored in the carrying case, when not in use.

Readings can be made between 0.01-200,000 cd/m² or lux in 5 ranges, with the standard detectors supplied.



The spectral sensitivity of the Hagner photometer closely relates to the visibility curve of the CIE standard observer.

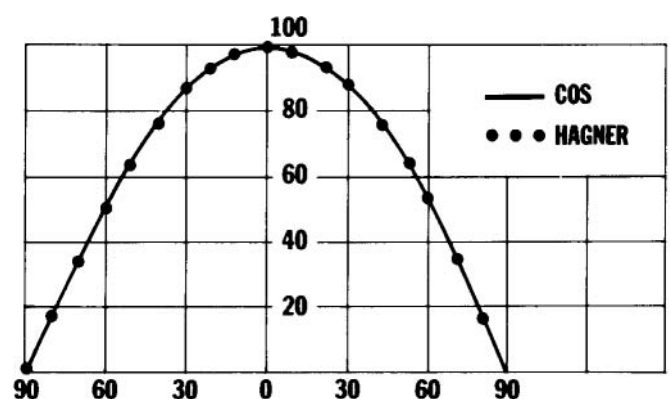
The S4 is provided with an analogue instrument as well as a digital display, (LCD $3\frac{1}{2}$ digit). The analogue instrument, which is visible from the outside of the meter and also through the viewfinder, is intended for approximative luminance readings. In order to facilitate readings under dark conditions, it is provided with a scale illumination. The digital display, visible from the outside, is intended for precise luminance and illuminance readings. The value shown can be locked by means of a hold button.

The analogue reading through the viewfinder facilitates scanning of an area or surface to find luminance variations, min or max values etc.

Readings can also be made on a separate instrument, such as a recorder or oscilloscope, which can be connected to the output terminal of the photometer. Slow or rapid light variations can thus be studied.

For long-time, stationary measurements the photometer is also provided with a connector for external voltage 9-12 V. Use of this function automatically disconnects the standard 9 V battery.

The optical viewing/measurement system of the meter can be focused on objects at distances from 0.5 meter to infinity without correction factors involved. Owing to the optical design, any polarized light will be measured correctly.



The cosine correction compensates for measuring errors owing to oblique incident light.

Instrument data in short

Measurement functions:

- Measurement of luminance 0-199,900 cd/m² in 5 ranges.
- Measurement of illuminance 0-199,900 lux in 5 ranges.
- Lowest detectable value is 0.01 cd/m² or lux (±1 digit).
- Determination of angles, solid angles etc.
- Measurement with special detectors.

Standard detectors:

Two silicon diodes filtered to close agreement with the spectral sensitivity of the human eye (CIE). Illuminance detector is cosine corrected, sensitive surface $\varnothing = 10$ mm.

Accuracy:

Better than $\pm 3\%$ for all common light sources and daylight (± 1 in last digit).

External instruments:

Minimum input resistance 1 k Ω .
Signal 0-2 V in steps of 1 mV per displayed unit.

Temperature range:

-5°C - +50°C.

Power source:

9 volt standard battery, type PP3, alkaline.
Lifetime approx 150 hours.
Battery eliminator 9-12 V.

Dimensions:

270 x 140 x 70 mm.

Weight:

1.2 kgs, 2.3 kgs with carrying case.

Special detectors and other accessories

The Hagner Universal

Photometer/Radiometer, model S4, can be seen as the principal part in a most versatile measuring system. By means of Hagner special external detectors and other accessories a number of different photometric quantities can be measured.

Special detectors are available for measurement of

- illuminance with hemi-cylindrical angular response
- illuminance with fully cylindrical angular response
- illuminance with hemispheric angular response
- UV-A radiation
- UV-B radiation
- UV-C radiation
- IR radiation
- bilirubin radiation

Other detectors are

- extra sensitive illuminance detectors
- low sensitive illuminance detectors
- fiber optic detectors (0.5-50 meters or more, the latter length for use e.g. in areas with high voltage switch gears)
- detectors with tailor made spectral and angular response

Some detectors can be delivered in water proof housings.

Other accessories available are

- reflection references
- special adaptors for measurement of light intensity, light distribution, control of image screens etc.
- pendulum
- close-up lenses
- extension cables



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