Photometric Solutions International®

THE NEW GENERATION IN PHOTOMETRIC TECHNOLOGY

RR-5.0 Reflex Reflector Measurement System

Theory of Operation

Reflex reflectors are devices that direct light back to the source. In the case of automotive reflex reflectors, light from a vehicle's headlights is reflected back into a driver's eyes, to alert the driver to a parked car, a roadside marker, a traffic hazard, etc.

The measurement system for reflex reflectors reflects this. A projector is used to simulate a vehicle's headlight, and a photocell measures the amount of light that is reflected back towards the driver. The photocell is positioned vertically above the projector in a manner similar to that of a driver above the vehicle's headlights.

The unit of measurement is the Coefficient of Luminous Intensity, or CIL. This is a ratio of the luminous intensity (in a given direction) of light emitted by the reflex reflector to the illuminance of the light incident on it.

Hardware

The RR-5.0 consists of the following items:

- A projector, stabilised with a distribution temperature of 2856K and uniformity better than 5% over a diameter of 260mm.
- A photocell or photocells, V (lambda) corrected with $f_1' < 1.50\%$ and thermally stabilised at 35.0 degrees Celsius.
- We can use one photocell on a motorised stage to move the it to the required observation angle; or two or three photocells permanently fixed at the required observation angles (see inset picture).
- A test item roll rotation attachment (optional) to spin the sample about its surface normal.
- A chopper (optional) to phase-lock the signal, for minimising noise and drift).
- Photocurrent preamplifier to accompany each photocell, stabilised for low-light-level measurement, to amplify and measure the photocell signal.

The RR-5.0 has a resolution of 0.01 mcd/lx and can measure samples of greater than 200 cd/lx.

Because reflex reflector measurement is a relative measurement (reflected light per unit incident light), the same photocell that measures the reflected light is used to measure the illuminance on the sample. This has the major advantage that the photocell does not require ongoing calibration.

By using the test item roll rotation attachment, the operator can test samples such as microprismatic sheeting and post-mounted delineators that require testing at different rotations about their surface normal axes.

The reflex reflectors that are being measured are required to be tilted and rotated to various measurement angles and have their chromaticity coordinates measured according to the Regulation that is being followed (ECE, SAE, etc.). A goniometer and spectroradiometer are required to provide these facilities. We recommend the ASG-3.0 or ASG-5.0 goniometer and the SP-3C real-time spectro-radiometer as the perfect companions to the RR-5.0 for a professional laboratory solution.

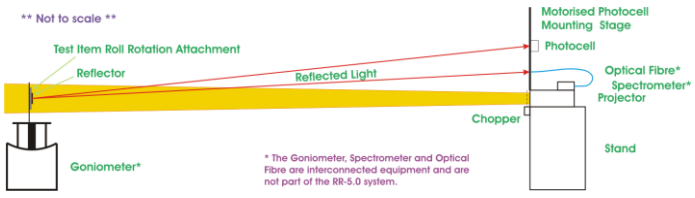
For fluorescent colour measurement of advanced warning triangles, we recommend adding on our LF-3C Luminance Factor and Fluorescent Colour Measurement System.

Software

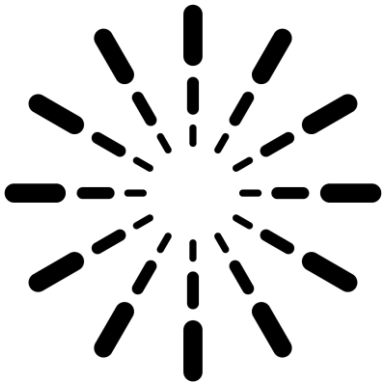
The software that comes with the RR-5.0 provides all of the requirements for reflex reflector measurement. The software will read the data acquisition card and perform digital signal processing routines to minimise the noise levels.

The software will display the CIL value on the screen. You can enter in the entrance angle components (the tilt, rotation and roll angles of the sample) and the observation angle (the angular distance of the photocell from the projector subtended from the test item) for each measurement and either save the data or print a test report.

When combined with a goniometer and/or spectrometer, the measurement at each observation angle becomes fully automated. Routines to test to the common Rules (ECE, SAE, JIS, ADR, IS, etc.) are provided with the software, and pass/fail information shown in the test reports.



For more information on the RR-5.0, please contact one of our representatives or sales/applications engineers.



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