



## CLOSE - U P L E N S E S

for the Hagner Universal Photometer, model S3

### Measuring the luminance of small surfaces

The Hagner Universal Photometer can be provided with close-up lenses for measuring the luminance of small surfaces at short distances, for example text on data terminal screens, without troublesome light loss.

The close-up lenses are available in sets of 3:

- A. Focal length 500 mm (2 dioptries)
- B. Focal length 250 mm (4 dioptries)
- C. Focal length 125 mm (8 dioptries)

The lenses can be used separately or in combination with each other

The following table applies when using close-up lenses with the Hagner Universal Photometer, model S3.

Lens combination	Focal length (mm)	Measuring distance* object-lens approx mm	Correction factor (F)
A	500	500	1.11
B	250	250	1.11
C	125	130	1.11
A+B	167	170	1.23
A+C	100	100	1.23
B+C	83	85	1.23

\*The measuring distance is equal to the distance when the object is seen sharply through the view-finder.

Lense combination is counted from the instrument and outwards.

When close-up lenses are used, the luminance (L) of the object is obtained from the following equation:

$L = F \times L_M$  where F is the correction factor from the above table and  $L_M$  is the luminance measured with the close-up lens mounted.

It should be noted that the luminance (L) is the average luminance of a cone with the object on the "top" and the surface of the outermost lens as a base.

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