

USER'S MANUAL

UV - J1002

ENTRANCE OPTIC FOR GLOBAL IRRADIANCE
MEASUREMENTS

Calibration • Measurement • Softwaresolution

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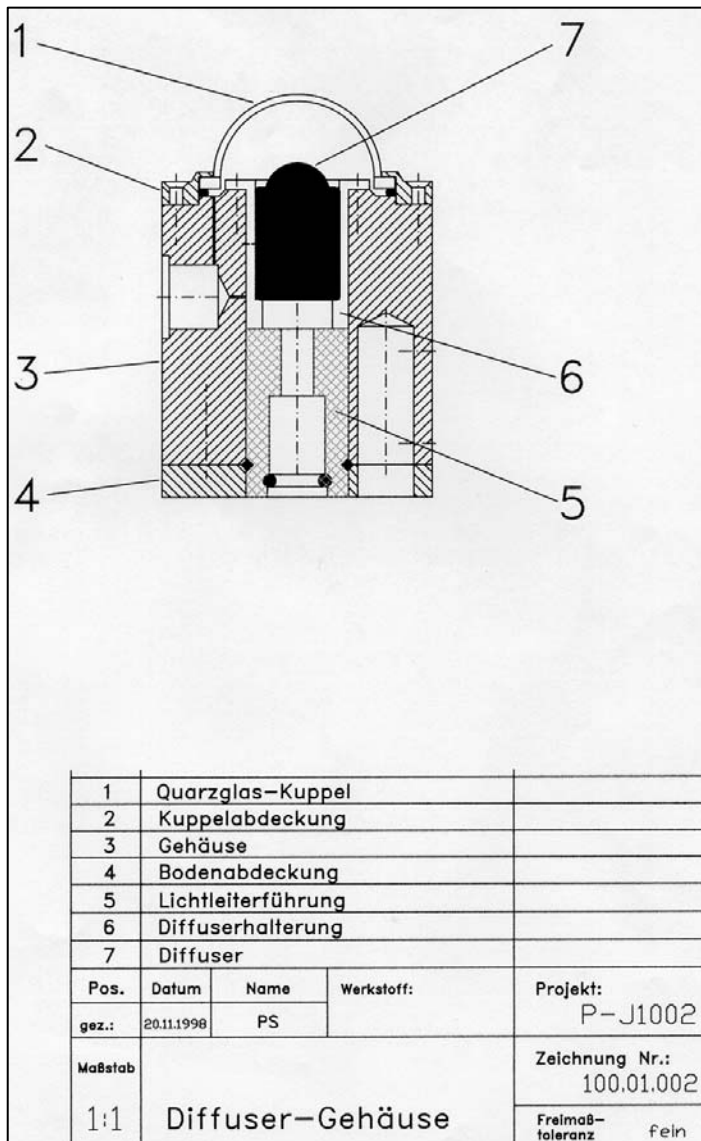
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Technical specifications:



1 QUARTZ DOME

2 HOLDER QUARTZ DOME

3 HOUSING

Diameter 58mm

4 GROUND COVERING

5 FLANGE for FIBRE

The fibre is fixed in a flange with 3 screws. The fibre is tilted in the flange to guarantee that the optical axis of the fibre is the same as its mechanical axis. If the optical axis deviates from the mechanical axis, an azimuthal error (of about 10%) may appear. By tilting the fibre the error in the azimuth disappears (< 1.5%).

6 FLANGE for DIFFUSER

7 DIFFUSER

SILICA

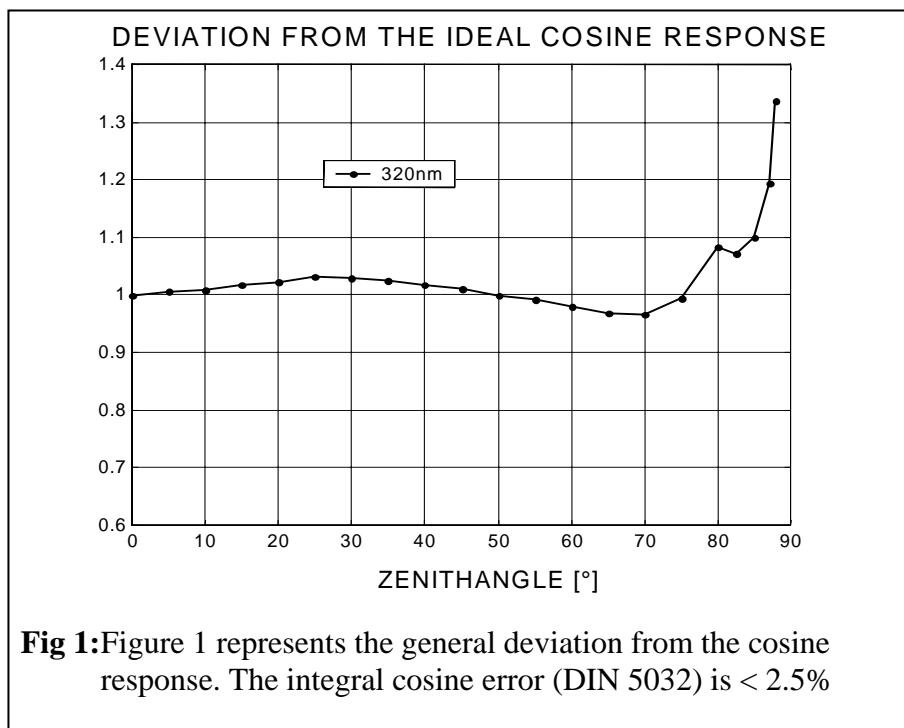
blue =< 8% relative humidity

slight red = silica is out of order, replace the cartridge

MONTAGE BAR

A standard opening for a standard bar allows an easy positioning of the housing with the spirit level. A bar with a diameter of 12mm has to be fixed in the hole of the housing with 2 screws.

General measurement data entrance optic J1002:

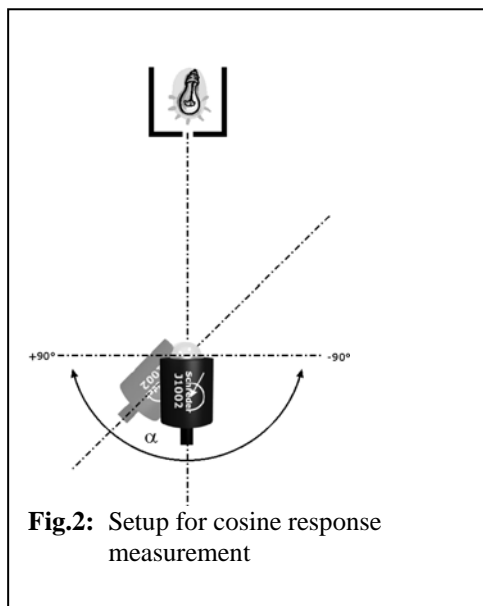


Uncertainty estimation COS-Justage:

General Method: Gaußian – propagation of error

$$\overline{\Delta f(x_0, y_0)} = \sqrt{\left(\left. \frac{\partial f(x, y)}{\partial x} \right|_{x_0, y_0} \right)^2 \cdot (\Delta x)^2 + \left(\left. \frac{\partial f(x, y)}{\partial y} \right|_{x_0, y_0} \right)^2 \cdot (\Delta y)^2}$$

Application:



$$CF(I, I_0, \alpha) = \frac{I}{I_0 \cos(\alpha)}$$

ΔCF ... cosine uncertainty

α ... Zenith angle

I ... Signal measured at zenith angle α

I_0 ... Signal measured at vertical incidence
(zenith angle $\alpha = 0^\circ$)

$$(\Delta CF)^2 = \left(\frac{\delta CF}{\delta I} \right)^2 \cdot (\Delta I)^2 + \left(\frac{\delta CF}{\delta I_0} \right)^2 \cdot (\Delta I_0)^2 + \left(\frac{\delta CF}{\delta \alpha} \right)^2 \cdot (\Delta \alpha)^2$$

$$\Delta CF = \sqrt{\left(\frac{1}{I_0 \cdot \cos(\alpha)} \right)^2 \cdot (\Delta I)^2 + \left(\frac{I_0}{I_0^2 \cdot \cos(\alpha)} \right)^2 \cdot (\Delta I_0)^2 + \left(\frac{I \cdot \sin(\alpha)}{I_0^2 \cdot \cos^2(\alpha)} \right)^2 \cdot (\Delta \alpha)^2}$$

Example:

Figures 3 and 4 show the measured cosine response of a typical cosine diffuser J1002 with fixed ΔI , ΔI_0 and $\Delta \alpha$. Fig.4 clarifies the influence of a growing $\Delta \alpha$.

