

Pyranometer Classification

WMO Classification of Hemispherical Solar Instruments

SR5 conforms to “Secondary Standard”—“High Quality”.

SR4 conforms to “First Class”—“Good Quality”.

The accepted categorisations of pyranometer quality are defined differently by International Standard ISO 9060:1990(E) and the “World Meteorological Organisation Guide 6th Edition”. This table is derived from all comparable data from both sources.

ISO Specification	Secondary Standard	First Class
WMO Characteristics	High Quality	Good Quality
Response time (to 95% of final value) ISO & WMO	< 15 s	< 30 s
Zero off-set response: to 200 W/m ² net radiant loss to sky (ventilated) ISO & WMO	7 W/m ²	15 W/m ²
Zero off-set response: to 5°C/hr change in ambient temperature ISO & WMO	±2 W/m ²	±4 W/m ²
Resolution (smallest detectable change) WMO	±1 W/m ²	±5 W/m ²
Non-stability (change in sensitivity per year) ISO & WMO	±0.8%	±1.5%
Non-linearity (deviation from sensitivity at 500 W/m ² over 100 to 1000 W/m ² range) ISO & WMO	±0.5%	±1%
Directional response for beam radiation (error due to assuming that the normal incidence response at 1000 W/m ² is valid for all directions) ISO & WMO	±10 W/m ²	±20 W/m ²
Spectral selectivity (deviation of the product of spectral absorptance and transmittance from the mean) ISO (0.35–1.5 µm) WMO (0.3–3 µm)	±3% ±2%	±5% ±5%
Temperature response (error due to 50°C ambient temperature change) ISO & WMO	±2%	±4%
Tilt response (deviation from horizontal responsivity due to tilt from horizontal to vertical at 1000 W/m ²) ISO & WMO	±0.5%	±2%
Achievable uncertainty, 95% confidence level WMO hourly totals WMO daily totals	3% 2%	8% 5%
Suitable applications	Working standard	Network operations



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