



ACR-01 Absolute Cavity Radiometer

Self-calibrating Pyrheliometer for measuring Direct Solar Irradiance



The Middleton Solar ACR-01 is an affordable Absolute Cavity Radiometer for measuring the solar Direct Normal Irradiance (DNI) when aimed at the sun. It has traceability to SI-units by using electrical power substitution to self-calibrate the solar sensitivity. It is suitable for use as a primary reference radiometer.

EXCELLENT PERFORMANCE, USER FRIENDLY, DURABLE

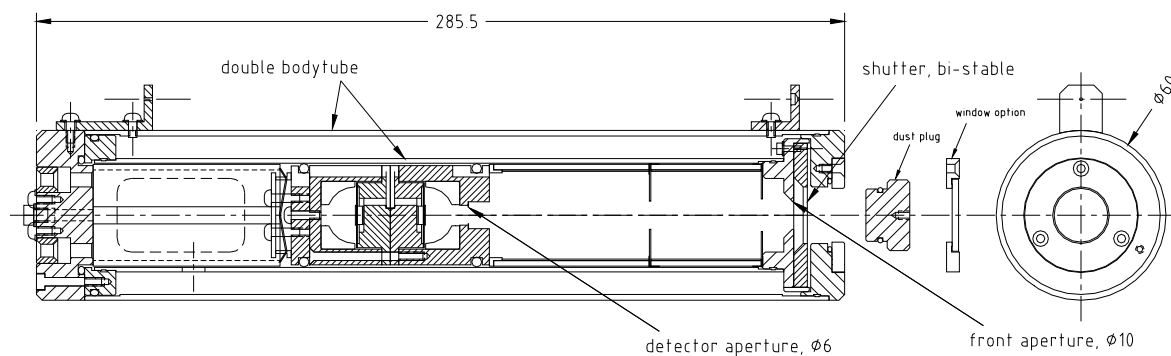
- Self-calibration by substitution of known electrical power for solar power
- Passive operation cycle of 24 min solar measurement, 6 min self-calibration
- Precision aperture diameter, $\pm 0.5 \mu\text{m}$ diameter tolerance
- Compact electronic shutter

The ACR-01 consists of a Radiometer Head, and Control Box with interface cables.

The ACR-01 is configured for use with a *Keysight 34972A Data Acquisition / Switch Unit* (not included).

¹ Image shows an ACR-01 Radiometer Head mounted to a Solar Tracker

Middleton Solar ACR-01 Absolute Cavity Radiometer



| ACR-01 Radiometer Head | |
|--------------------------------|--|
| full opening angle | 5° |
| slope angle | 1° |
| limit angle | 4° |
| irradiance | 0 - 1,400 W/m ² |
| time constant (63%) | < 2 sec |
| primary aperture (typical) | Ø6,000 ±0.5µm; 25µm thick; gold plated |
| absolute sensitivity (typical) | 1.5µV/ W.m ⁻² , at 20°C |
| Correction Factor (CF) | > 0.99 |
| operating temperature | -10 to +40°C |
| construction | aluminium & stainless steel |
| weight | 1.25kg |

| ACR-01 Control (included) | |
|----------------------------------|--|
| Shutter/Heater Control Box | Configured for Keysight 34903A |
| Power Supply | 12VDC, 2A, for Shutter/Heater Control Box |
| Heater cable (P/No 141.1113) | Configured for Keysight 34901A |
| Signal cable (P/No 141.1114) | |
| Interface Leads | 6m, PU: Heater; Shutter; Signals |
| ACR-01 Configuration File | to suit Keysight 34830A Benchlink Data Logger Pro software |

| Required Options (not included) | |
|--|---|
| Data Acquisition / Switch | Keysight 34972A |
| Control Multiplexer Module | Keysight 34901A |
| Control Switch Module | Keysight 34903A |
| Control Software | Keysight 34830A Benchlink Data Logger Pro |
| USB Cable | USB type A to type B |
| Computer | Notebook PC; Windows 10 |

| Available Options | |
|--------------------------|---------------------------------------|
| Solar Tracking System | Middleton Solar AST-02 or AST-02 |
| Window, optical sapphire | spectral range = 0.2 – 5.5µm; T = 86% |

Middleton Solar, made in Australia

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