



ACR-01 Absolute Cavity Radiometer

Self-calibrating Pyrheliometer for measuring Direct Solar Irradiance



The Middleton Solar ACR-01 is a passive absolute pyrheliometer (ISO 9060 5.2.1) for measuring solar Direct Normal Irradiance. It is a modern affordable alternative to the unavailable H-F and TMI instruments.

UNCOMPLICATED, INNOVATIVE, DURABLE

- Self-calibration by substitution of SI traceable electrical power for solar power
- Continuous operation loop of self-calibration > solar measurement
- Precision aperture, 25 μ m thick
- Bi-stable rotary optical shutter

The ACR-01 consists of a Radiometer Head and associated Shutter/Heater Control Box with interface cables. It is configured to be controlled by a *Keysight Data Acquisition System*.

For additional information download the *ACR-01 User's Guide* from www.middletonsolar.com

¹ Image shows an ACR-01 Radiometer Head mounted to a Middleton Solar AST-02 Active Solar Tracker

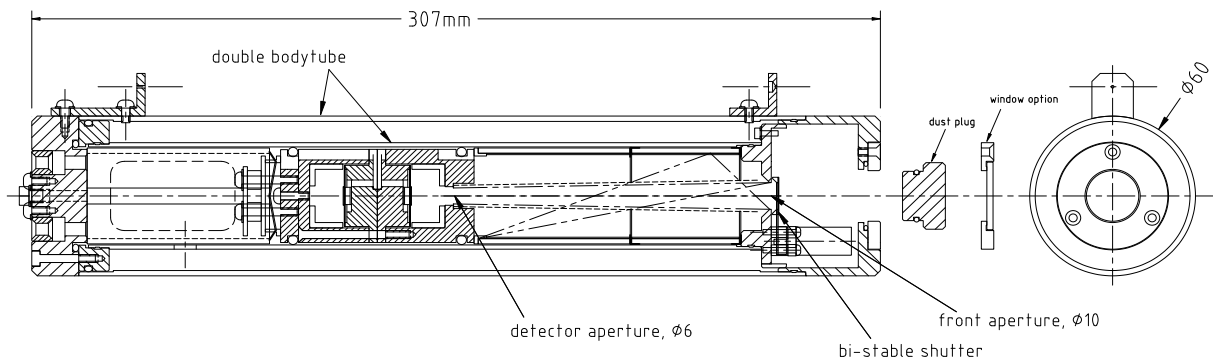
Middleton Solar ACR-01 Absolute Cavity Radiometer

| ACR-01 Radiometer Head | |
|--------------------------------|--|
| full opening angle | 5° |
| slope angle | 1° |
| limit angle | 4° |
| irradiance | 0 - 1,400 W/m ² |
| response time (95%) | 2.5 sec. |
| primary aperture (typical) | Ø6,000 ±0.5µm; 25µm thick; gold plated |
| detector surface black coating | carbon nanotube |
| absolute sensitivity (typical) | 2 - 3µV/W.m ⁻² , at 20°C |
| Correction Factor (CF) | 0.9980 (nominal) |
| operating temperature | -10 to +40°C |
| construction | aluminium & stainless steel |
| weight | 1.25kg (Radiometer Head) |

| ACR-01 Control (included) | |
|------------------------------------|---|
| Shutter/Heater Control Box | Configured for Keysight 34903A / DAQM903A |
| Power Supply | 12VDC, 2A, for Shutter/Heater Control Box |
| Heater cable (P/No 141.1113) | Configured for Keysight 34901A / DAQM901A |
| Signal cable (P/No 141.1114) | |
| Interface Leads | 6m, PU: Heater; Shutter; Signals |
| ACR-01 Configuration File template | to suit Keysight Benchlink Data Logger Pro software |

| Control Options (not included) | |
|---------------------------------------|------------------------------------|
| Data Acquisition Unit | Keysight 34972A or DAQ970A |
| Control Multiplexer Module | Keysight 34901A or DAQM901A |
| Control Switch Module | Keysight 34903A or DAQM903A |
| Control Software | Keysight Benchlink Data Logger Pro |
| USB Cable | USB type A to type B |
| Computer | PC; Windows 10 |

| Other Available Options | |
|--------------------------------|---------------------------------------|
| Solar Tracking System | Middleton Solar AST-02 or AST-03 |
| Window, optical sapphire | spectral range = 0.2 – 5.5µm; T = 86% |



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