



## High Accuracy PV Soiling Measurement with Virtually No Sensor Maintenance

Automated clean reference technology to preserve the IEC 61724-1 preferred measurement method while eliminating routine manual cleaning and calibration effort

### Resumen

The DustVue™10 directly measures photovoltaic (PV) soiling losses using collocated clean and naturally soiled PV reference cells—the preferred methodology defined by IEC 61724-1. Unlike traditional implementations that require frequent manual cleaning to remain accurate, the DustVue 10 protects the clean reference automatically and only exposes it when environmental conditions are suitable for reliable comparison.

The result is a measurement that operators can trust continuously, without the labor or cost burden normally required to maintain it, including routine manual cleaning or water-spray reference systems. The standard Modbus communications protocol allows the instrument to integrate directly into existing plant monitoring systems.

### Ventajas y características

- ▶ True IEC-Preferred Measurement Method – Side-by-side PV reference cells measuring actual module soiling behavior rather than estimating it
- ▶ Automated Clean Reference Protection – Motorized cover to prevent contamination and preserve measurement stability without daily manual cleaning
- ▶ Reduced O&M Maintenance Burden – Maintains measurement accuracy without daily cleaning, calibration routines, or water-spray reference systems
- ▶ Confidence in Cleaning Decisions – Provides reliable loss data to support wash scheduling and performance evaluation
- ▶ Bifacial Monitoring in One Instrument – Simultaneous front and rear soiling measurements without installing duplicate sensors
- ▶ Built for Long-Term Field Deployment – Industrial mechanical design and environmental controls to support continuous outdoor operation
- ▶ Open SCADA Integration – Standard Modbus RS-485 output to integrate with virtually any data logger, SCADA, or monitoring platform

### Descripción detallada

Accurately quantifying soiling losses requires comparing a naturally soiled PV surface to an identical clean reference. For

this reason, IEC 61724-1 identifies collocated PV reference devices as the preferred measurement approach. The



challenge has never been the method, but rather, it has been maintaining the clean reference.

Traditional approaches attempt to preserve a clean reference through frequent manual cleaning or automated washing systems. Both introduce operational challenges: scheduled site visits, water logistics in remote locations, nozzle maintenance, and uncertainty about whether the reference surface has actually returned to a true clean state after each cycle.

The DustVue 10 instead prevents contamination rather than repeatedly trying to remove it. An automated sliding protective cover shields the clean reference cell from contamination and only exposes it briefly during stable irradiance conditions, preserving a consistent comparison baseline.

Because the clean reference condition is preserved automatically, operators can rely on the measurement as a decision-making input rather than a periodically validated instrument. Instead of questioning whether the sensor is still clean, teams can focus on what the data indicate, without

managing cleaning schedules, wash systems, or calibration cycles.

The DustVue 10 is installed in the plane of array so the soiled reference experiences the same environment as production modules. A bifacial configuration monitors front and rear soiling simultaneously, eliminating the need for separate upward- and downward-facing instruments. Environmental sealing, integrated heating, and mechanical reliability testing support continuous outdoor operation across harsh climates.

The DustVue 10 outputs measurements over standard Modbus RS-485, allowing a connection to virtually any SCADA platform, data logger, or performance monitoring system capable of reading Modbus registers. This allows projects to adopt accurate soiling measurements without redesigning their communications infrastructure or standardizing on a specific vendor ecosystem.

The purpose of soiling measurements is not simply to record a number; it is to remove uncertainty. The DustVue 10 preserves the trusted measurement approach while removing the ongoing effort traditionally required to maintain it, supporting confident operational and financial decisions throughout the life of the plant.

## Especificaciones

Operating Temperature Range	-40° to +70°C
Soiling Ratio Uncertainty	±1%
Input Power	12 to 32 Vdc
Power Consumption - Idle	<ul style="list-style-type: none"> <li>› ~13 W below 5°C (when heater active)</li> <li>› &lt; 1 W above 5°C</li> </ul>
Power Consumption - Active	<ul style="list-style-type: none"> <li>› ~1.0 A at 24 V (during measurement) below 5°C (when heater active)</li> <li>› 0.5 A at 24 V (during measurement) above 5°C</li> </ul>
Power Consumption - Active with Heater Full on	~24 W

-NOTE-

*A small heater prevents the cover gasket from freezing shut, which could interfere with measurements or damage the gasket. The heater can be active when the ambient temperature is below 5°C and when humidity and temperature conditions could cause frost.*

Communications	Modbus RTU over RS-485
IP Rating	IP65
Shipping Dimensions	27.94 x 58.42 x 11.43 cm (11 x 23 x 4.5 in.)
Shipping Weight	3.54 kg (7.8 lb)

