SEKIDENKO OR400M—PRECISION OPTICAL IR PYROMETERS

3.3 AND 5.2 µM MEASUREMENT WAVELENGTHS PRECISION TEMPERATURE MEASUREMENT FOR THIN-FILM SOLAR, GLASS, AND ADVANCED SEMICONDUCTOR PROCESSES PRECISION

Advanced Energy®'s OR400M optical pyrometer extends the flexibility of the Sekidenko product family into the mid-IR wavelengths at 3.3 and 5.2 µm. The OR400M unit offers single-channel temperature measurement, supports RS-232 and analog data interfaces, and, because of its compact design, can be easily integrated to meet the unique requirements of many process applications.

PRODUCT HIGHLIGHTS

- Improved substrate uniformity
- Integrated measurement
- High-speed, solid-state detectors
- Configurable filter, detector, and optical delivery system
- In-situ measurement of thin-film PV manufacturing steps

北京宇冠世纪

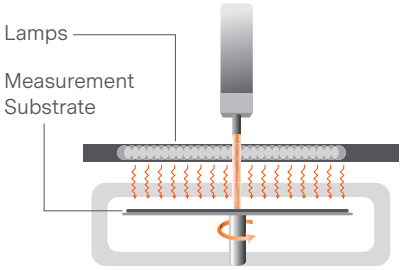
北京宇冠世纪科技有限公司
地址：北京市昌平区文华东路8号紫晶七星广场334室
电话：010-50845669　手机：18910232138
网址：https://beijinginfrared.com

SEKIDENKO OR400M

ADVANCED MEASUREMENT FOR ADVANCED SEMICONDUCTOR APPLICATIONS

The OR400M optical pyrometer is an ideal single-point measurement tool for semiconductor applications that require longer wavelengths, such as measurement of quartz within a vacuum chamber. It can be installed outside the chamber, through a viewport, for non-contact measurement.

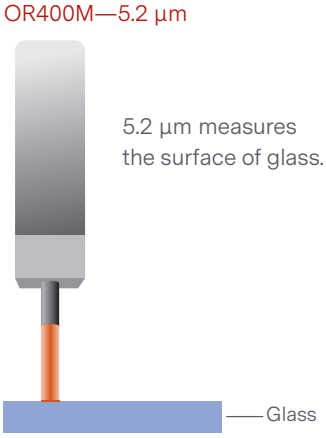
It also provides a cost-competitive alternative to thermocouple-based measurements with the added benefit of non-contact, in-situ temperature measurement and immunity from RF noise. Because of its compact design, the OR400M optical pyrometer can be easily integrated into your system to meet the unique requirements of your process application.



Measurement in Lamp Heated Reactor

DIRECT MEASUREMENT OF GLASS

Due to the unique transmission properties of glass, temperature must be measured at longer wavelengths, usually above 5 µm. These wavelengths allow the pyrometer to "see" the glass substrate, rather than looking through the glass and measuring the emission of an object or film on the opposite side. The OR400M design takes accurate measurements at 5.2 µm for glass-based applications, including difficult applications with high stray-light backgrounds.



SELECTIVE WAVELENGTH MONITORING

Within a single manufacturing line, such as a CdTe solar PV glass cell, each deposition layer in the stack will have changing transmission properties based on film composition and thickness. To ensure correct measurement of a specific deposition layer, a new wavelength may be required to ensure correct measurements as you move from one manufacturing step to another.

The OR400M optical pyrometer is designed for this unique challenge and can be customized for each manufacturing step with the choice of a different wavelength and working distance for each process step. A complete manufacturing cell may employ multiple OR400M units set at process-step-specific wavelengths for accurate and timely temperature measurement.

Some points may require a longer wavelength to measure the substrate itself, such as glass, while other manufacturing steps should be measured by looking through the glass to monitor a specific layer of the stack. Because glass is insulating, large temperature gradients are possible. Using the OR400M optical pyrometer provides a more accurate temperature reading and ensures measurement of the correct layer.

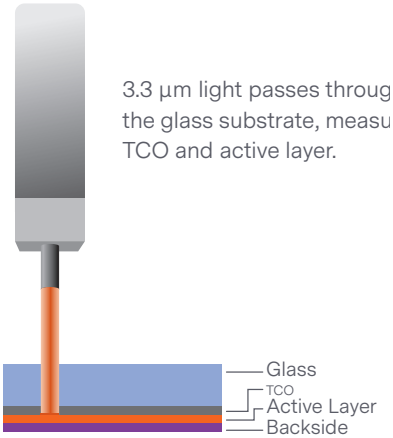
EXTENDED WAVELENGTH MEASUREMENT RANGE FOR SOLAR APPLICATIONS

The OR400M optical pyrometer measures temperature from the near-IR to the mid-IR wavelengths at 3.3 µm and 5.2 µm. For photovoltaic (PV) solar applications, the unit's range of wavelengths is perfectly suited to measure specific layers within a PV stack. PV cell layers require in-situ measurement, including TCO (transparent conductive oxide) layers, molybdenum backside contact layers, as well as CIGS (copper indium gallium selenide) or CdTe (cadmium telluride) deposition layers. To choose the correct wavelength to measure each of these layers, the following must be considered:

- Transmission properties
- Thickness
- Emissivity
- Effects of stray light within the measurement background

The OR400M can be customized for individual applications, making it ideally suited for PV cell layer measurement.

OR400M—3.3 µm



Typical CdTe & a-Si Stack

SPECIFICATIONS

Description	Specification
Channel Configuration	Single-channel temperature measurement capability with selectable/fixed emissivity
Temperature Range(s)	50 to 1300°C
Measurement Wavelengths[1]	3.3 and 5.2 µm
Read Rate	Up to 250 Hz
Accuracy	±3°C
Resolution	Up to 0.01°C
Repeatability	±0.1°C typical
Display	None; set up via RS-232
Data I/O	RS-232 at up to 115 kB
Analog Output	0 to 10 V or 4 to 20 mA
Power Requirements	AC: 90 to 263 VAC, 47 to 63 Hz
	DC: +24 VDC
Environmental	Operational: 15 to 40°C (59 to 104°F)
Physical Dimensions	32 mm (H) x 57 mm (W) x 235 mm (D)
	1.26" (H) x 2.30" (W) x 9.26" (D)
Weight	0.39 kg (0.87 lb)
Mounting	Frame mount, mounting holes on mounting block; Consult manual for more information.
Power Supply Line Current	< 0.7 A at 100 VAC

1 Customized wavelengths available