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ORIEL INSTRUMENTS
A Newport Corporation Brand

# 1600 W Solar Simulators



92193 Solar Simulator

- **Highest intensity Oriel® Solar Simulators**
- **Highly collimated, large area output beam (up to 12 x 12 inches)**
- **Optional air mass filters shape the output spectra**
- **Various beam configurations are possible**

These are our highest intensity solar simulators. They produce a highly collimated, very uniform output beam in various sizes from 2 x 2 to 10 x 10 inches. They deliver a close match to solar radiation. Add an air mass filter (see page 58) to these sources and you can simulate a variety of solar conditions. We offer full spectrum and UV Solar Simulators. Fig. 1 shows the spectral output of both types.

## Full Spectrum Solar Simulators

We offer 6 models of full spectrum 1600 W Solar Simulators: 5 produce collimated output beams and 1 produces a diverging beam up to 12 x 12 inches (305 x 305 mm). For this model, we replaced the collimating lens with a window. Table 1 shows the typical output, in the design-irradiated plane, for our collimated models.

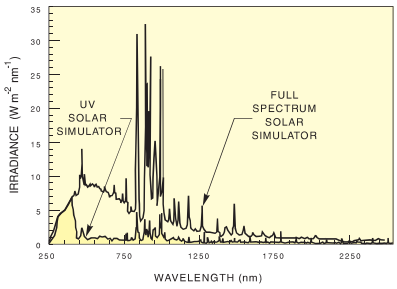



Fig. 1 Spectral output of a full spectrum 1600 W Solar Simulator, compared to the output of a 1600 W UV Solar Simulator.

### Table 1 Typical Output of 2 x 2 to 8 x 8 Inch Full Spectrum Solar Simulators

| With This Optional Air Mass Filter | Typical Output (W m$^{-2}$) 2 x 2 Inch | | 4 x 4 Inch | | 6 x 6 Inch | | 8 x 8 Inch | |
|---|---|---|---|---|---|---|---|---|
| | 250 - 2500 nm | 250 - 1100 nm | 250 - 2500 nm | 250 - 1100 nm | 250 - 2500 nm | 250 - 1100 nm | 250 - 2500 nm | 250 - 1100 nm |
| AM 1 Direct | 14917 | 10608 | 3978 | 2825 | 1820 | 1300 | 1105 | 780 |
| AM 1.5 Direct | 13470 | 9555 | 3595 | 2548 | 1650 | 1170 | 985 | 702 |
| AM 2 Direct | 12675 | 8840 | 3380 | 2365 | 1560 | 1092 | 936 | 650 |
| AM 1.5 Global | 9295 | 7940 | 2485 | 2120 | 1138 | 975 | 683 | 585 |
| AM 0 | 17428 | 12740 | 4645 | 3430 | 2130 | 1560 | 1275 | 930 |
| Unfiltered Irradiance | 22256 | 17810 | 5935 | 4745 | 2730 | 2185 | 1625 | 1300 |

## UV Solar Simulators

These models produce very high intensity UV, and little VIS and IR. Take extreme caution when working with these sources. Table 2 shows the typical output (W m$^{-2}$) of the 92291, 2 x 2 Inch UV Solar Simulator.

### Table 2 Typical Output of 92291 UV Solar Simulator

| With These Optional UV Filters | Typical Output (W m$^{-2}$) UVC, Below 280 nm | UVB, 280 - 320 nm | UVA, 320 - 400 nm |
|---|---|---|---|
| Atmospheric Attenuation Filter | 0 | 48 | 1040 |
| Atmospheric Attenuation Filter + VIS-IR Bandpass Blocking Filter | 0 | 40 | 660 |
| UVC Blocking Filter | 0 | 142 | 1063 |
| UVB/C Blocking Filter | 0 | 0.43 | 836 |
| Unfiltered Irradiance | 70 | 369 | 1150 |



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## What Makes up a Solar Simulator?
### The Illuminator Housing

The illuminator housing is a temperature-controlled enclosure equipped with a safety interlock and a thermal interlock system to ensure operator and system safety. An integral fan and filter blower provides forced air-cooling to maintain the lamp, optics and housing at a safe operating temperature.

### 1600 W Xenon Arc Lamp

Both families of Solar Simulators use an ozone free lamp, which has negligible output below 260 nm. Even without the DUV output, these sources emit dangerous levels of UV radiation.

### Power Supply

The 69922 Power Supply is highly regulated and maintains a very stable light output. For long-term stability-critical applications (>8 hours), order the 68951 Digital Exposure Controller (see page 54). The 69922 has an RS-232 computer interface (and optional IEEE-488); you can set the lamp parameters, monitor the light output, and turn power on/off remotely. Because of the extremely high intensity of these sources, we suggest operating the lamps remotely.

### UVB/UVA Dichroic Mirror (For UV Solar Simulators Only)

For the UV Solar Simulators we replace the aluminized mirror with a dichroic, which passes 280 to 400 nm and greatly reduces the VIS and IR. You can further shape the simulator's output by using UV blocking filters after the dichroic.

## Electronic Shutter

Our Solar Simulators include an electronic shutter. You can externally control this shutter from the Digital Control Panel on the Illuminator housing, or via a hand held switch, contact closure, or logic level input. For automated exposure control, order the 68945 Digital Timer (see page 54).

## Certification

These systems meet Class B IEC 904-9 requirements, but do not come certified.

## Safety Considerations

These sources emit dangerous levels of UV radiation, harmful to the eyes and skin. Personnel working near these sources must wear a UV protective facemask, and gloves (see page 169). All exposed areas of skin must be covered.

# Ordering Information
## Solar Simulators

For upward, downward or sideways beam configuration, please contact Newport for pricing.

| Model | Description |
|---|---|
| 92191 | Full Spectrum Solar Simulator, 1600 W, 2 x 2 in. Collimated Output |
| 92192 | Full Spectrum Solar Simulator, 1600 W, 4 x 4 in. Collimated Output |
| 92193 | Full Spectrum Solar Simulator, 1600 W, 6 x 6 in. Collimated Output |
| 92194 | Full Spectrum Solar Simulator, 1600 W, 8 x 8 in. Collimated Output |
| 92190 | Full Spectrum Solar Simulator, 1600 W, up to 12 x 12 in. Diverging Output |
| 92291 | UV Solar Simulator, 1600 W, 2 x 2 in. Collimated Output |
| 92292 | UV Solar Simulator, 1600 W, 4 x 4 in. Collimated Output |
| 92293 | UV Solar Simulator, 1600 W, 6 x 6 in. Collimated Output |
| 92294 | UV Solar Simulator, 1600 W, 8 x 8 in. Collimated Output |

## Specifications

| | |
|---|---|
| Wattage | 1600 W |
| Lamp Type | Xenon |
| Beam Uniformity | ±5% |
| Light Ripple | <1% rms |
| Solar Simulator Input | 220 V AC 50/60 Hz, 15 A |
| Line Regulation | 0.01% |

## Accessories

| Model | Description |
|---|---|
| 62713 | Replacement Lamp, 1600 Watt Xenon, Ozone Free |
| 68955 | Remote Switch, Push Button |

WEB *See our website for more info*





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