

- **Universal for all high-power LEDs, medium-sized LED modules and small lamps**
- **Non-opening and opening version with internal lamp post available**
- **Conforms to current CIE requirements for accurate luminous flux measurements**
- **500 mm diameter, integrated auxiliary light source**
- **150 mm port for mounting various adapter plates**



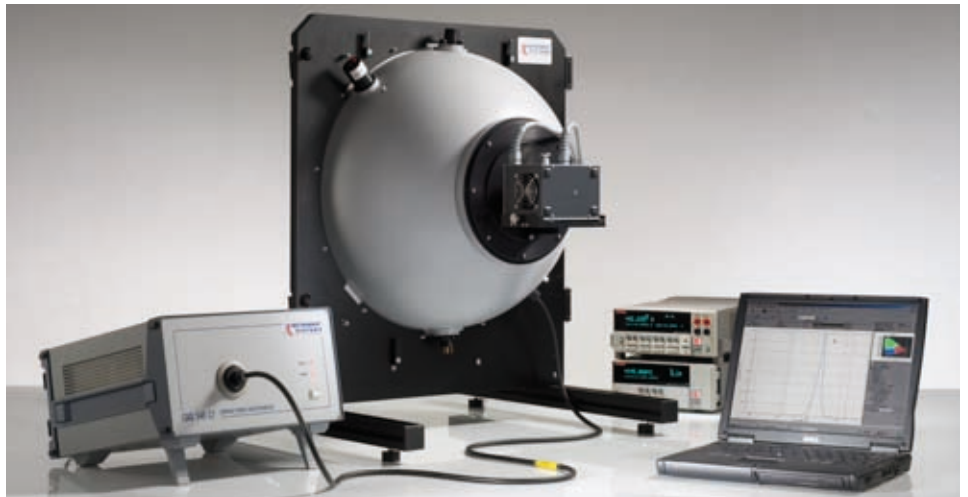
WE BRING QUALITY TO LIGHT

# ISP 500

## Integrating Sphere for Measuring Total Radiant Power and Luminous Flux

The ISP 500 integrating sphere from Instrument Systems features a diameter of 500 mm and has been designed for accurate measurement of the total radiant power and luminous flux of small lamps, high-power LEDs, and medium-sized LED modules.

There are two variants of the ISP 500 available: a non-opening model in which the light radiation enters via a port on the side and an opening version that also enables measurements to be carried out inside the sphere. The optical coating of the ISP 500 consists of BaSO<sub>4</sub> with approx. 97% reflection.



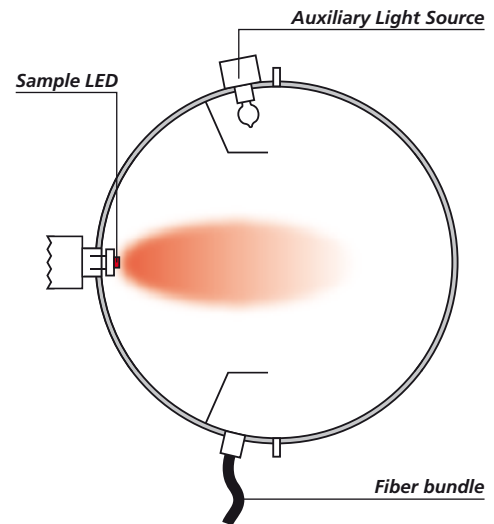
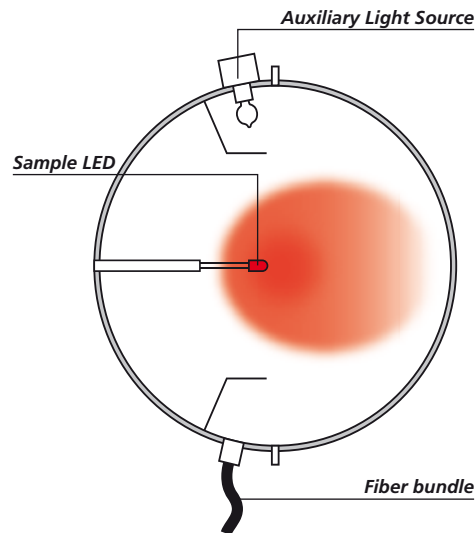
All spectrometers from Instrument Systems can be interfaced with the ISP 500 by means of their fiber-optic connection on the detector port. Special adapter plates and proven LED test sockets are used to mount LEDs and launch the light

radiation into the sphere. The universal, 150-mm diameter entrance port of the ISP 500 can be used to test larger samples. Any self-absorption effects, which are caused by the sample itself, are compensated by the integrated auxiliary light source.

## Measurement in $2\pi$ and $4\pi$ configuration

A distinction is made between two different measurement geometries when measuring with integrating spheres. With the  $4\pi$  configuration, the light source to be investigated is positioned at the center of the sphere in order to measure the light radiation emitted in all directions (total luminous flux). With

the  $2\pi$  configuration, the test sample is positioned at an opening in the wall of the sphere so that only the light radiated into the front hemisphere is captured during measurement. This configuration is particularly suitable for LED light sources, whose radiation pattern is usually in the forward direction.

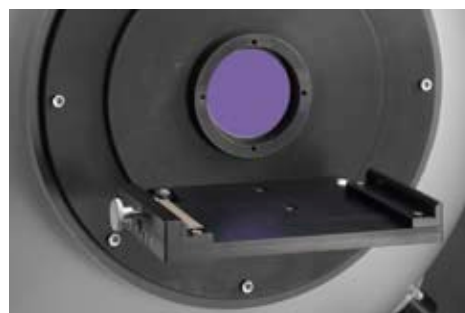


## Adapter plates for different applications

*Both versions of the ISP 500 integrating sphere feature a universal input port with 150 mm diameter to which different and easily interchangeable adapter plates can be flanged.*



An adapter plate is available for LED test sockets with a diameter of 25 mm to which all LED test sockets of the LED-5xx, LED-6xx and LED-81x series can be attached by means of a clamping ring. The 25 mm measurement port can be adapted to the size of the test LED with the aid of a set of apertures in the sizes 7, 10, 15, and 20 mm.



An adapter plate with an aperture flange 50 mm in diameter has been developed for the LED-850 High-Power LED Test Adapter with TEC temperature control. A solid base plate with clamping jaws provides for reliable positioning of the LED-850 LED test adapter. The measurement port is defined by a 25 mm aperture.



Instrument Systems also offers a third option: universal adapter plates designed for measuring small to medium-sized LED clusters and modules. These adapter plates incorporate several threaded holes for mounting the test sample. Easily interchangeable apertures with diameters of 25, 50, 75, and 100 mm can also be used to adapt the size of the measurement port.

## Internal sample mount for $4\pi$ test setup

In addition to the side-mounted radiation input port, the easy-to-open hinged version of the ISP 500 is equipped with an internal sample post positioned at the center of the sphere. The sample post is used to hold the test specimen when measuring with the  $4\pi$  configuration. It is equipped with 4 externally supplied connectors used to supply

power to the sample and for measuring the voltage. Special receptacles for radial LEDs with a raster size of 2.54 mm or for Type G4, GX5.3 and G6.35 halogen lamps can also be supplied for the sample post. The complete sample post can be installed in the ISP 500 either standing upright or suspended.



## Auxiliary light source compensates self-absorption



Even if the innovative design of the ISP 500 keeps interfering defects in the sphere to a minimum, it may still be necessary to take the influence of the test sample itself into account during measurement. This effect, known as 'self-absorption', is dependent on the size and darkness of the test object. The light radiated by the test object is reflected several times on the inner

surface of the sphere and actually strikes the test object again indirectly. This self-absorption then leads to attenuation of the light radiation and therefore to a reduction in the measurement signal. This reduction can be considerable, especially with dark-colored LEDs and LED modules.

To compensate this effect, the ISP 500 is equipped with an auxiliary light source. This light source is used to define the spectral absorption characteristics of the test sample. These characteristics are then set against the actual measurement results. The auxiliary light source of the ISP 500 comprises a 10 W halogen lamp that is connected to a power supply unit from outside. The power supply unit must be very stable in order to ensure the auxiliary light source operates reliably.

## Data and specifications

	ISP500-100	ISP500-110
Inside diameter	500 mm	500 mm
Inner coating	Barium sulfate (BaSO <sub>4</sub> )	Barium sulfate (BaSO <sub>4</sub> )
Spectral range	240 – 2600 nm	240 – 2600 nm
Measurement port diameter	150 mm	150 mm
Spectrometer connection	Via fiber bundle	Via fiber bundle
Internal sample post	Yes	No
Outside dimensions (H, W, D), closed	725 x 608 x 619.5 mm	725 x 608 x 600 mm
Outside dimensions (H, W, D), open	725 x 715 x 850 mm	–
Auxiliary light source operating voltage	6 V / 10 W	6 V / 10 W
Weight	19.8 kg	14.5 kg

## Ordering information

Order No.	Description
<b>ISP 500 Integrating Sphere</b>	
ISP500-100	Integrating sphere with 500 mm diameter; for measuring luminous flux and total radiant power of lamps, LEDs and LED clusters; hinges for opening and closing sphere; teflon lamp post in the center of the sphere; entrance port with 150 mm diameter; halogen auxiliary lamp; adapter for fiber bundle.
ISP500-110	Integrating sphere with 500 mm diameter for measuring luminous flux and total radiant power of lamps, LEDs and LED clusters; non-opening version of sphere; entrance port with 150 mm diameter; halogen auxiliary lamp; adapter for fiber bundle.
<b>Options</b>	
ISP500-211	Adapter plate for the 150 mm measurement port; includes flange for LED test sockets with 25 mm diameter and set of apertures for diameters of 7, 10, 15, and 20 mm
ISP500-220	Adapter plate for the 150 mm measurement port; includes flange for LED test sockets with 50 mm diameter and 25 mm measurement aperture
ISP500-231	Adapter plate for the 150 mm measurement port, reduction of aperture size to 50 and 25 mm diameter
ISP500-233	Adapter plate for the 150 mm measurement port, reduction of aperture size to 100, 75, and 50 mm diameter
ISP500-270	Cover plate for 150 mm measurement port
ISP500-300	Adapter for type G4/GX5.3/G6.35 halogen lamps; for mounting on the internal lamp post of the ISP500-100
ISP500-310	Adapter for radial LEDs with 2.54 mm leads; for mounting on the internal lamp post of the ISP500-100
<b>Accessories</b>	
PS-100	Stabilized power supply for tungsten halogen lamp 0 -16 V, 0-5 A

### INSTRUMENT SYSTEMS GmbH

Neumarkter Str. 83  
D-81673 Munich, Germany  
Tel.: +49 89 454943-0  
Fax: +49 89 454943-11  
e-mail: [info@instrumentsystems.de](mailto:info@instrumentsystems.de)  
[www.instrumentsystems.de](http://www.instrumentsystems.de)

