

- ***Ideal for all single LEDs, high-power LEDs and small LED modules***
- ***Accessories for partial luminous flux measurement***
- ***Conforms to current CIE requirements for accurate luminous flux measurements***
- ***250 mm diameter, integrated auxiliary light source***
- ***75 mm port for mounting various adapter plates***



**WE BRING QUALITY TO LIGHT**

# ISP 250

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

The ISP 250 integrating sphere from Instrument Systems features a diameter of 250 mm and fulfills the current requirements for accurate luminous flux measurements laid down by the CIE.

It represents an ideal compromise between size and accuracy and is particularly suitable for measuring single LEDs, high-power LEDs, small LED clusters, and LED modules.



All spectrometers from Instrument Systems can be interfaced with the ISP 250 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

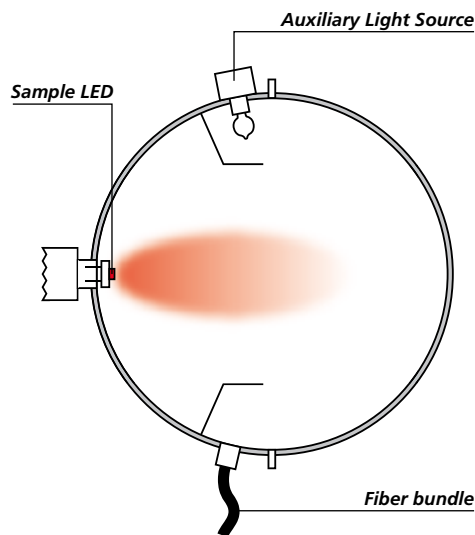
light radiation into the sphere. The universal, 75 mm diameter entrance port of the ISP 250 can be used to test larger samples. Any self-absorption effects of the sample that arise are compensated by the integrated auxiliary light source.

## Side-mounted input port for $2\pi$ test setup

A special feature available is an accessory for measuring partial LED flux in accordance with the latest CIE recommendations. Different solid angles between  $30^\circ$  and  $120^\circ$  can be set by means of a rail with notched raster scale.

Measuring the total radiant power and luminous flux of light sources with the

aid of integrating spheres is one of the most important procedures in the field of photometry. An integrating sphere is made up of a hollow sphere whose inner surface is coated with an almost perfectly diffuse reflecting material. It therefore integrates and mixes the radiation, which is then coupled out at a detector port for measurement.



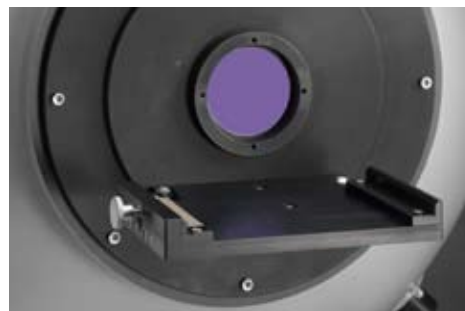
The ISP 250 has been designed for measuring the total radiant power and luminous flux of light sources in the  $2\pi$  configuration. For this purpose, the test sample is positioned at an opening in the wall of the sphere so that only the light radiated into the front hemisphere is captured during measurement. This configuration is particularly suitable for LED light sources, whose radiation pattern is usually in the forward direction.

## Adapter plates for different applications

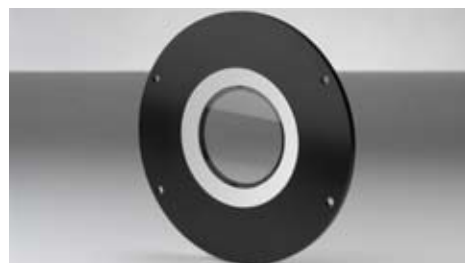
*The body of the ISP 250 integrating sphere has a universal input port with 75 mm diameter to which different and easily interchangeable adapter plates can be flanged.*



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.



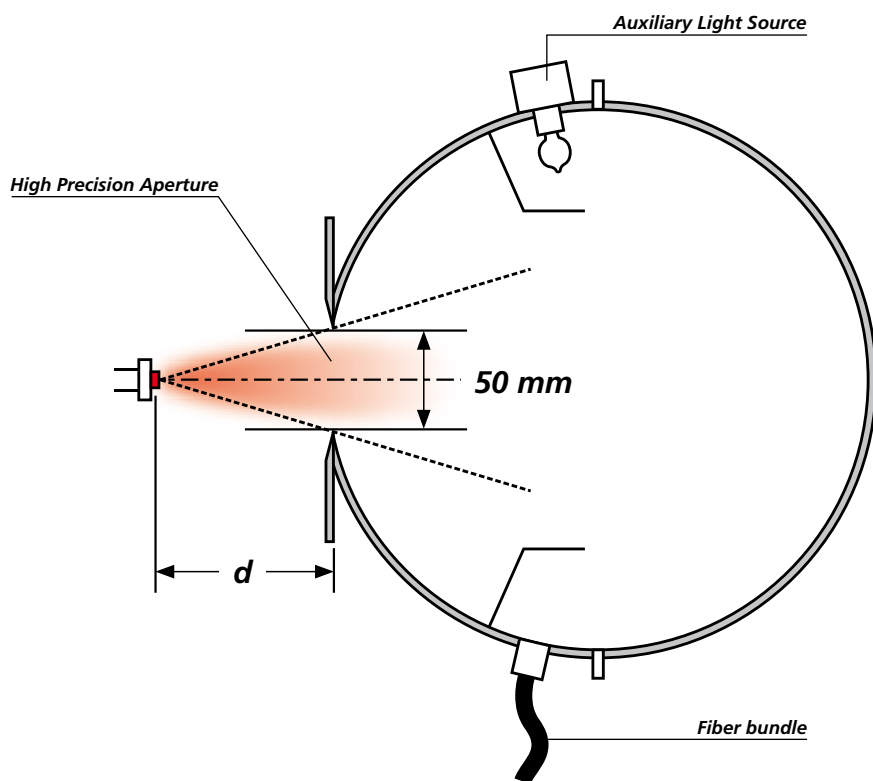
Another adapter plate with a 50 mm measurement port and a protective window made of quartz glass is available for applications in production. This window effectively prevents contamination of and potential damage to the sensitive BaSO<sub>4</sub> coating inside the ISP 250.

## CIE-compliant partial LED flux measurement

Certain applications demand measurement of the partial luminous flux. With this method, only part of the radiation is measured. The solid angle is defined by means of the diameter of the measurement port and the distance of the light source. The CIE has introduced the new optical quantity of 'partial LED flux' specifically for LEDs.

Instrument Systems has developed a unit for measuring the partial LED flux,

which is flanged to the input port of the ISP 250. In accordance with the CIE recommendation, the diameter of the measurement port is always 50 mm, so that different solid angles can be obtained by adjusting the distance between the tip of the LED and the measuring plane. A rail with raster scale facilitates reproducible setting of fixed solid angles in the following increments: 30°, 40°, 60°, 90°, and 120°.



## Auxiliary light source compensates self-absorption



Even if the innovative design of the ISP 250 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 250 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 250 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

	ISP250-110
Inside diameter	250 mm
Inner coating	Barium sulfate (BaSO <sub>4</sub> )
Spectral range	240 – 2600 nm
Measurement aperture diameter	75 mm
Spectrometer connection	Via fiber bundle
Outside dimensions (H, W, D)	360 x 324 x 362 mm
Auxiliary light source operating voltage	6 V / 10 W
Weight	3.6 kg
Ambient temperature range	+15°C to +35°C
Maximum humidity	70% non-condensing

## Ordering information

Order No.	Description
<b>ISP 250 Integrating Sphere</b>	
ISP250-110	Integrating sphere with 250 mm diameter; for measuring the luminous flux and total radiant power of lamps, LEDs and small LED clusters; non-opening type; BaSO <sub>4</sub> coating; 75 mm diameter measurement port; halogen auxiliary lamp with mount; adapter for fiber bundle (excl. fiber bundle).
ISP250-250	250 mm integrating sphere; complete for luminous flux measurements on LEDs; external connection with fiber bundle; includes ISP 250-110, ISP 250-211, OFG-415, and PLG-410; spectral range 380 – 1600 nm
ISP250-251	250 mm integrating sphere; complete for luminous flux measurements on LEDs; external connection with fiber bundle; includes ISP 250-110, ISP 250-211, OFG-424, and PLG-420; spectral range 240 – 1350 nm
<b>Options</b>	
ISP250-211	Adapter plate for the 75 mm measurement port with flange for LED test sockets with 25 mm diameter, incl. set of apertures with 7, 10, 15, and 20 mm
ISP250-220	Adapter plate for the 75 mm measurement port with flange for LED test sockets with 50 mm diameter and 25 mm aperture
ISP250-260	Adapter plate for the 75 mm measurement port with 50 mm aperture diameter; incl. protective glass window
ISP250-270	Cover plate for 75 mm measurement port
<b>Accessories</b>	
PS-100	Stabilized power supply for tungsten halogen lamp 0-16 V, 0-5 A

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