![AVANTES — MEMBER OF THE NYNOMIC GROUP]

AVASPHERE
ACCESSORIES
Operation and Installation Manual

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1. AvaSphere

Parts included
1. AvaSphere-IRRAD or AvaSphere-REFL
2. The AvaSphere Operating manual

Unpacking Instructions:
1. Unpack your Sphere carefully.
2. Do not touch the inside or let dust or moisture get into the sphere, this may affect the reflection properties.
3. Use this Sphere in a clean laboratory environment.

The AvaSphere integrating sphere family can be delivered with an active diameter of 30, 50 or 80 mm (XX means the active diameter) and an SMA port at 90 degrees for both irradiance and reflection measurements, the reflection sphere has an additional SMA- connector port at 8 degrees. Both versions have a sample port diameter of 6 mm for the 30 mm diameter sphere, 10 mm for the 50 mm diameter sphere and 15 mm for the 80 mm diameter sphere. The irradiance version of the integrating sphere can be used to measure light sources (Laser, LED, and Halogen Lamps). The reflection version is used to measure reflective surfaces, as well as for color measurement and fluorescence spectroscopy. A light source may be connected to SMA-connector port through a fiber optic bundle to make the integrating sphere an ideal uniform light source. The integrating sphere is made out of highly reflective diffuse material, its surface is reflecting the light diffuse with more then 95% in the spectral range from 250-2500 nm.

1.1 Operating instructions for the irradiance spheres
1. Connect an optical fiber between the SMA terminated measurement port of the sphere and the spectrometer.
2. Insert your emission source (Laser, LED, and Halogen Lamps, or light fiber) into the sphere sample port .
3. To collect diffuse radiation (light) from a 180° field of view, eliminating direct light collection by the detection fiber a baffle is installed in the sphere.
4. Measurements should be done in AvaSoft's relative or absolute irradiance mode, see the appropriate documentation.
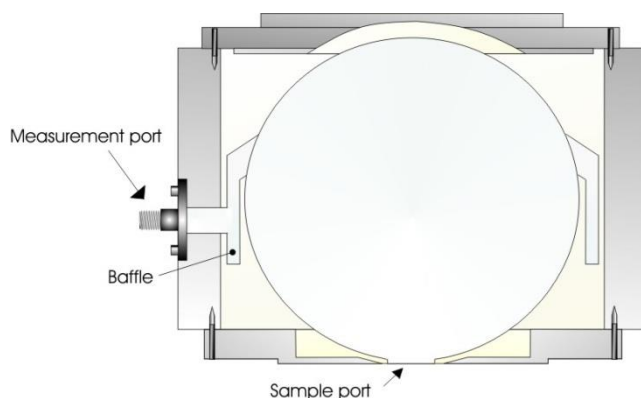
1.2 Operating instructions for the reflection spheres

Since the reflection sphere has 2 SMA ports, one under 8˚ and one under 90˚, the sphere can be connected for reflection measurements in 2 ways:

1. Direct illumination, indirect measurement or
2. Indirect illumination and direct measurement

We always recommend to use the first method of directly illuminating and indirect measurement. This method has the advantage that the white light of the source directly illuminates the object. The diffuse and specular reflection is indirectly measured by the sample port. In the second method the illumination is indirect and therefore the object surface becomes a part of the sphere, so the illumination of the object is actually not white light anymore, depending on the color of the object. Such method requires a second spectrometer channel to measure the illumination in the sphere.

The operating instructions refer to the first method of direct illumination and indirect measurement:

1. Connect an optical read fiber between the SMA terminated measurement port on the side of the sphere and the spectrometer.
2. Connect an optical illumination fiber or bundle between the SMA terminated illumination port on the top of the sphere and the light source. We recommend a 600um fiber or a bundle of 7 fibers of 200um. A bigger bundle will result in a collimated measurement spot, which is bigger than the sample port and will therefore make the measurement less accurate.
3. Loosen the set screw of the collimating lens with the Allen Wrench key 1,27 mm on the barrel and slide the inner barrel until you see a sharp focused spot without light intensity and color variations across the beam spot. Focus the illumination spot on the sample port, the optimal focusing point diameter is ca. 80% of the sample port diameter. The best way to see the spot is to put a white paper on the sample port and hold the sphere upside down.
4. Now you can put your AvaSphere on the object you would like to measure, do not forget to take dark and reference (on a WS-2 white tile) first.
5. The maximum angle of diffuse reflection is 120˚ field of view.
6. Measurements should be done in AvaSoft's reflectance or color parameter mode, see the appropriate documentation.
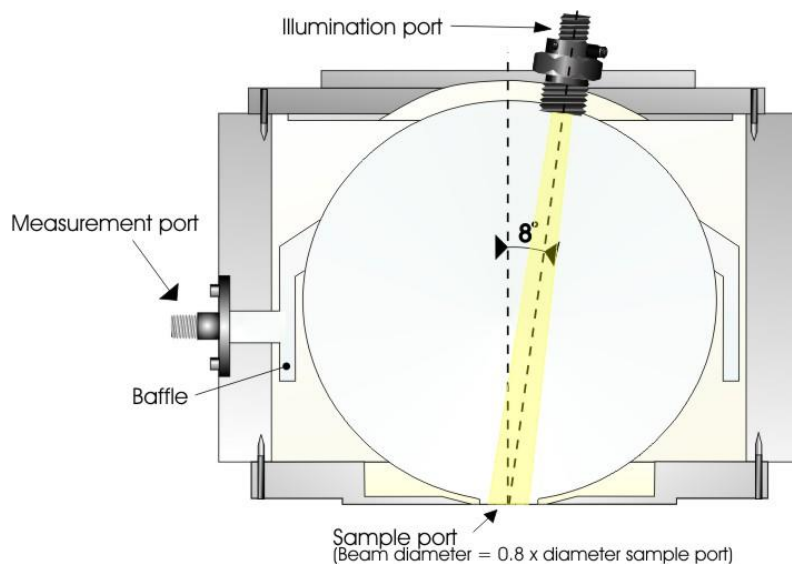
1.2.1 Technical Data

	AvaSphere-30	AvaSphere-50	AvaSphere-80
Internal diameter (mm)	30	50	80
Sample port diameter (mm)	6	10	15
External Housing dimensions	59.5 mm diameter 40 mm height	69.5 mm diameter 60 mm height	109 mm diameter 95 mm height

1.2.2 Ordering info for accessories

AvaSphere-LED-ADR Cylindrical Adapter to hold 3, 5, 8 mm LED's inside the AvaSphere-50-IRRAD

AvaSphere-LED-ADR-80 Cylindrical Adapter to hold 3, 5, 8 mm LED's inside the AvaSphere-80-IRRAD

AvaSphere-GT50 Optional Gloss Trap for AvaSphere-50-REFL, coated with black absorbing material. Only in combination with AvaSphere-50-REFL.

AvaSphere-GT50-W Gloss Trap coated with white material to include specular reflection. Standard included in the AvaSphere-50-REFL

AvaSphere-50-HOLD WS-2 Tile holder for AvaSphere-50-REFL