Custom Integrating Sphere with 4 Modular Faces

4P4-CUSTOM

Description

The 4P4-CUSTOM Integrating Sphere is a general purpose sphere manufactured from PTFE high reflectance bulk material. This makes the 4P4-CUSTOM sphere resistant to heat, humidity and high levels of radiation and covers a large wavelength range. The 4P4-CUSTOM sphere can be configured by the customer as described in the *Configuration Options* section below.

The sphere has 4 modular square faces, while the two remaining square faces are closed with tapped plates for mounting. Up to 8 additional Ø5 mm ports can be added to attach detectors, spectrometers, or light sources.

Possible applications include light measurements of lasers and LEDs, direct and indirect reflectance measurements, or using the 4P4-CUSTOM as homogeneous illumination for camera calibration.

Configuration Options

4 Modular Faces: Choose between four different inserts on the four modular faces of the sphere:

- Port Plug Insert (Item # 4P10)
- Ø1" Port Insert with SM1 Internal Threading (Item # 4P11)
- Ø2" Port Insert with SM2 Internal Threading (Item # 4P12)
- Dual Ø14 mm Ports Insert with SM1 Internal Threading and 8° Geometry (Item # 4P13)

For a more detailed list, please see the *Inserts for Ports* section, the web drawings of the individual inserts, and the web drawings for the 4P4-CUSTOM sphere.

Up to 8 Additional Fixed Ports: Choose to open up to eight additional Ø5 mm ports (SM1 threaded) on triangular faces for input or output of optical signals.

Mounting: The 4P4-CUSTOM sphere can be ordered with or without a 25 mm rail system stand.
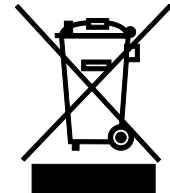
To configure and order the configurable 4P4-CUSTOM sphere, please use the integrating sphere configurator on the Thorlabs website:
https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=13414#13416

An integrating sphere with four modular faces pre-configured for reflection measurement (with one dual Ø14 mm port insert, one Ø1" port insert, two port plugs, and two Ø5 mm fixed ports) is available from stock as item # 4P4.

Specifications

4P4-CUSTOM	
Inner Sphere Diameter	100 mm (3.94")
# of Modular Square Faces	4
Available Interchangeable Square Port Inserts	Port Plug (4P10) Ø1" Port (4P11) Ø2" Port (4P12) Dual Ø14 mm Ports (4P13)
Optional Fixed Ports	Up to Eight Ø5 mm Ports (SM1 Threaded)
Maximum Reflectance	>95% @ 250 nm – 2500 nm >99% @ 350 nm – 1500 nm
Wavelength Range	250 nm to 2500 nm
Operating Temperature	-20 °C to 60 °C
Operating Humidity	5% - 95%
Laser Damage Threshold	Pulsed: 7 J/cm^2 CW: 10 W/cm^2
Weight of Unmounted Integrating Sphere without Inserts	2170 g
Dimensions of Unmounted Integrating Sphere (L x W x H)	134.2 mm x 150.0 mm x 134.2 mm (5.28" x 5.91" x 5.28")
Weight of Rail System	880 g
Outer Dimensions of Rail System	163.0 mm x 205.4 mm x 184.2 mm (6.42" x 8.09" x 7.25")

Inserts for Ports

The four modular faces of the 4P4-CUSTOM sphere can be configured with different adapters for Ø1" or Ø2" optics or a dual port with two Ø14 mm apertures, as well as a port plug to close the port.

Any of the inserts in the four modular faces can be swapped for other interchangeable port inserts, including additional inserts sold separately. Please wait until the integrating sphere has reached a temperature lower than 26 °C to change inserts. Each port insert is fastened to the modular face with two M3 screws. The inserts can be exchanged by loosening the screws with a 2 mm (5/64") balldriver or hex key.

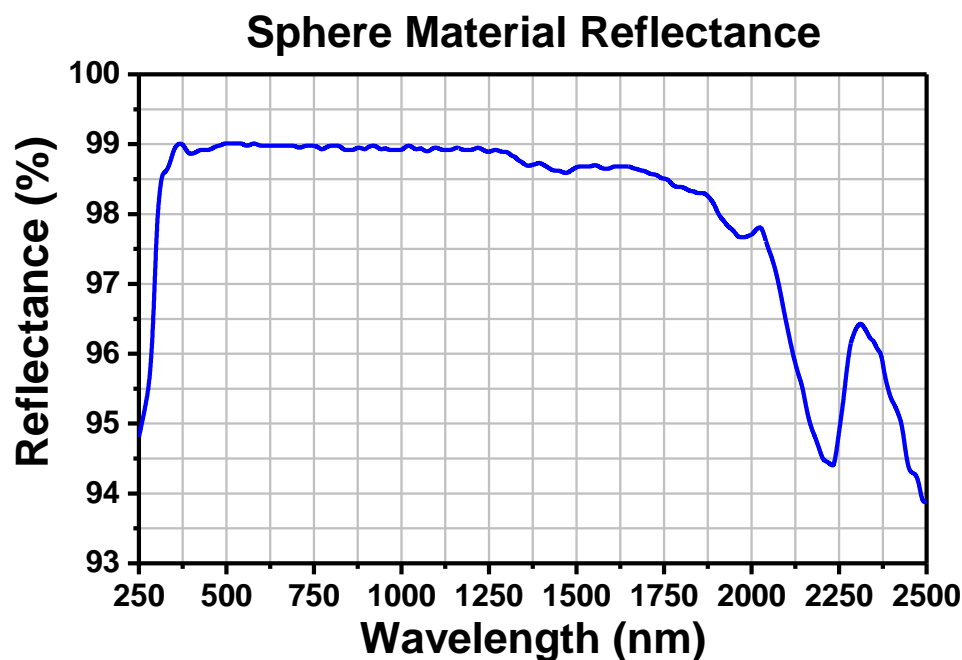| 4P10	4P11	4P12	4P13
Port Plug with Matched Radius of Curvature	Ø1" Port, SM1 Internal Threads, 30 mm Cage System Compatible	Ø2" Port, SM2 Internal Threads, 60 mm Cage System Compatible	Dual Ø14 mm Ports, SM1 Internal Threads, 8° Geometry

Mounting

The 4P3-CUSTOM sphere can be ordered with or without a 25 mm rail system stand. Integrating spheres ordered without the stand can be mounted to a Ø1" post using the universal 8-32 / M4 tap on either square mounting plate.

Calibration

Upon request, Thorlabs offers calibration of each 4P4-CUSTOM integrating sphere with the individual sensors of choice. Thorlabs then provides NIST and/or PTB-traceable certificates of calibration.

Typical Performance Plot

Sphere Material Reflectance

Maintenance and Safety

There are no serviceable parts in the 4P4-CUSTOM integrating sphere. The housing may be cleaned by wiping with a soft damp cloth. The integrating sphere inner surface cannot be cleaned; do not touch this surface. Gently blow off any debris using compressed air. If you suspect there is a problem with your 4P4-CUSTOM integrating sphere, please contact Thorlabs and an engineer will be happy to assist you.