

1.1.1.5 Integrating Spheres

1.1.1.5.2 Large Dimensions 5.3"

Features

- 4 port Integrating spheres for collimated and divergent beams
- Up to 170° acceptance angle
- Ø63.5mm (2.5") aperture
- Fiber or free space input
- Can be ordered with or without detectors

| Model | IS6 | | |
|---|---|-------------------|-------------------|
| Use | For use with customer detector or as light source | | |
| Detector | None – see below for detector versions | | |
| Spectral Range μm | 0.2 – 2.2 | | |
| Source Geometry ^(a) (see introduction) | Divergent | Collimated | |
| Input Port Aperture mm | Ø63.5 ^(b) | Ø25 | |
| Maximum Beam Divergence deg° | ±60 ^(d) | ±15 | |
| Sensitivity to Beam Divergence ±% | 3 ^(c) | 1 | |
| Power Range | Depends on detector – see below | | |
| Damage Threshold kW/cm^2 | 1 on integrating sphere surface | | |
| Cooling | Convection | | |
| Weight kg | 1.4 | | |
| Type | P/N | Version | Compliance |
| IS6-D For divergent beams (input from 2.5" side) | 7Z02487 | V1 | CE, China RoHS |
| IS6-C For collimated beams (input from 1" side) | 7Z02474 | | CE, China RoHS |
| Supplied Port Accessories (see page 36) | IS6-D: 2.5" to 1" reducer w/cover + 1" port plug + 2 ea. 1" port covers IS6-C: 2.5" port plug + 3 ea. 1" port covers | | |

Notes: (a) In each configuration, the opposing port is closed with a port plug. See diagram in introduction page 32.
 (b) The sphere is supplied with the 2.5" to 1" reducer.
 (c) For beams up to 30deg divergence, variation with beam size is ±1%.
 (d) For central 5mm of aperture, for 10mm aperture maximum beam divergence is ±5°.

IS6 with Detectors for Collimated Beams - calibrated - VIS, UV & IR types

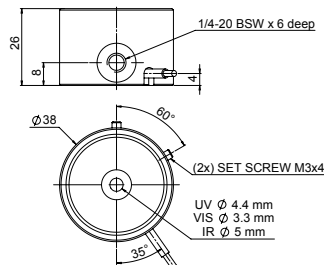
-Recommended for beam divergence <15°

-Comes with calibrated wavelength curve

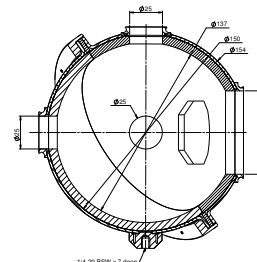
| Model | IS6-C-VIS | | IS6-C-UV | | IS6-C-IR | | IS6-C-UV-2.5" | |
|--|---|-----|--|-----|--------------------------|----|-----------------------|-----|
| Detector type | VIS | | UV | | IR | | UV | |
| Use | High powers | | Low powers | | Low powers | | Large beams | |
| Type | Si with filter | | Si | | Germanium | | Si | |
| Spectral Range μm | 0.4 – 1.1 | | 0.2 – 1.1 | | 0.7 – 1.8 | | 0.2 – 1.1 | |
| Power Range (approx.) | 20 μW to 30W | | 300nW to 1W | | 20 μW to 30W | | 300nW to 2W | |
| Power Scales | 30W to 300 μW | | 1W to 3 μW | | 30W to 300 μW | | 2W to 3 μW | |
| Linearity with Power ±% | | | 1 | | | | 1 | |
| Power Noise Level | 1 μW | | 15nW | | 1 μW | | 15nW | |
| Maximum Pulse Energy mJ | 2 | | 0.05 | | 0.1 | | 0.1 | |
| Input Port Aperture mm | | | Ø25 | | | | Ø63.5 | |
| Sensitivity to Beam Size % | | | ±1 | | | | ±1 ^(a) | |
| Maximum Power vs. Wavelength | nm | W | nm | W | nm | W | nm | W |
| | <670 | 30 | <600 | 0.7 | <1400 | 30 | <600 | 1.5 |
| | 790 | 20 | 800-1000 | 0.3 | 1400-1650 | 15 | 800-1000 | 1 |
| | 904 | 15 | 1064 | 0.5 | >1650 | 30 | 1064 | 2 |
| | 1064 | 25 | | | | | | |
| Accuracy vs Wavelength | nm | % | nm | % | nm | % | nm | % |
| | 360 - 410 | ±10 | 200 - 270 | ±10 | 700-1650 | ±5 | 200 - 270 | ±10 |
| | 410 - 950 | ±5 | 270 - 950 | ±5 | 1650-1800 | ±7 | 270 - 950 | ±5 |
| | 950 - 1100 | ±7 | 950 - 1100 | ±7 | | | 950 - 1100 | ±7 |
| Compliance | CE, China RoHS | | CE, China RoHS | | CE, China RoHS | | CE, China RoHS | |
| Part Number | 7Z02470 | | 7Z02472 | | 7Z02476 | | 7Z02485 | |
| Supplied Port Accessories (see page 36) | IS6-C-XXX: 2.5" port plug + 2 ea. 1" port covers | | IS6-C-UV-2.5": 2.5" port cover + 1" port plug + 1" port cover | | | | | |

Note: (a) Over central 40mm, ±2% over central 50mm.

Incorporated Detectors: IS6-C-VIS / IS6-C-UV IS6-C-IR / IS6-C-UV-2.5"



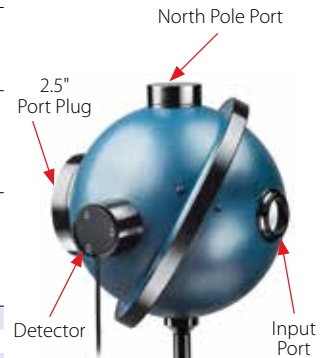
IS6



IS6-D without detector



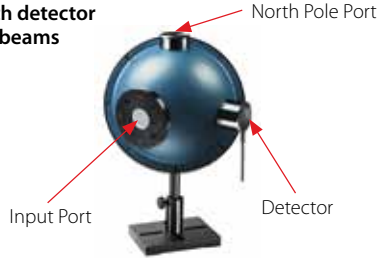
IS6-C-XXX with detector for collimated beams



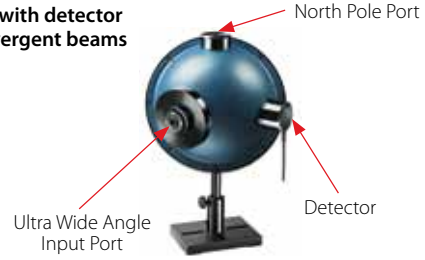
IS6-C-UV-2.5" with detector for large collimated beams



IS6-D-XXX with detector for divergent beams



IS6-D-IR-170 with detector for highly divergent beams up to 170°



IS6 with Detectors for Divergent Beams– calibrated – VIS, UV & IR types

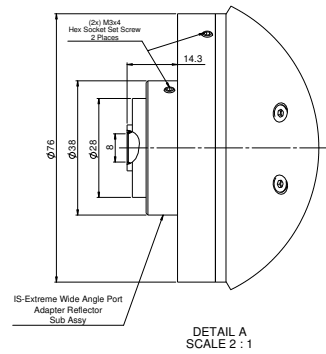
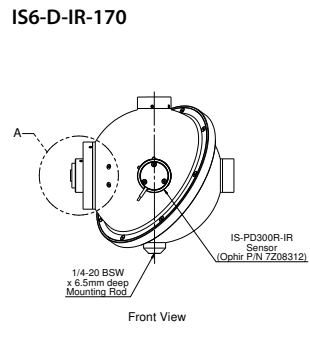
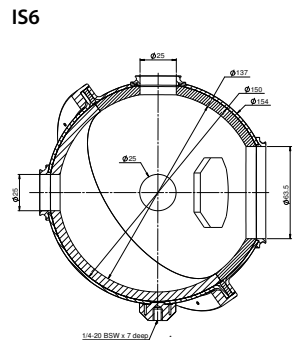
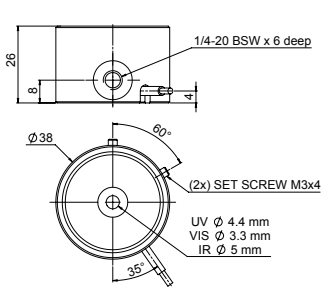
- Recommended for beam divergence 15° to 120°
- High divergence model for large angles up to 170°
- Comes with calibrated wavelength curve

| Model | IS6-D-VIS | IS6-D-UV | IS6-D-IR | IS6-D-IR-170 |
|--|---------------------------------|--------------------------------|--------------------------------|--|
| Detector type | VIS | UV | IR | IR |
| Use | High powers for divergent beams | Low powers for divergent beams | Low powers for divergent beams | Low powers for highly divergent beams (up to 170°) |
| Type | Si with filter | Si | Germanium | Germanium |
| Spectral Range μm | 0.4 – 1.1 | 0.2 – 1.1 | 0.7 – 1.8 | 0.7 – 1.8 |
| Power Range (approx.) | 20 μW to 30W | 300nW to 1W | 20 μW to 30W | 20 μW to 30W |
| Power Scales | 30W to 300 μW | 1W to 3 μW | 30W to 300 μW | 30W to 300 μW |
| Linearity with Power $\pm\%$ | 1 | 1 | 1 | 1 |
| Power Noise Level | 1 μW | 15nW | 1 μW | 1 μW |
| Maximum Pulse Energy mJ | 2 | 0.05 | 0.1 | 0.1 |
| Maximum Beam Divergence deg ^o | | ± 60 ^(b) | | $> \pm 85$ |
| Input Port Aperture mm | | $\varnothing 26$ | | $\varnothing 8$ |
| Sensitivity to Beam Divergence $\pm\%$ | | 3 ^(a) | | 1.5 |
| Maximum Power vs. Wavelength | nm W | nm W | nm W | nm W |
| | <670 30 | <600 1 | <1400 30 | 700-1800 30 |
| | 790 30 | 800-1000 0.5 | 1400-1650 15 | |
| | 904 20 | 1064 1 | >1650 30 | |
| | 1064 30 | | | |
| Accuracy vs Wavelength | nm % | nm % | nm % | nm % |
| | 360 - 410 ± 10 | 200 - 270 ± 10 | 700-1650 ± 5 | 700-1650 ± 5 |
| | 410 - 950 ± 5 | 270 - 950 ± 5 | 1650-1800 ± 7 | 1650-1800 ± 7 |
| | 950 - 1100 ± 7 | 950 - 1100 ± 7 | | |
| Compliance | CE, China RoHS | CE, China RoHS | CE, China RoHS | CE, China RoHS |
| Version | V1 | V1 | V1 | |
| Part Number | 7Z02488 | 7Z02489 | 7Z02490 | 7Z02486 |

Supplied Port Accessories (see page 36) **IS6-D (with detector):** 2.5" to 1" reducer w/cover + 1" port plug + 1" port cover
IS6-D-IR-170: 2.5" to 1" reducer with 170° attachment and cover + 1" port plug + 1" port cover

Notes: (a) For beams up to 30° divergence, variation is $\pm 1\%$
 (b) For central 6mm of aperture, for 12mm aperture maximum beam divergence is $\pm 50^\circ$

Incorporated Detectors:
IS6-D-VIS / IS6-D-UV / IS6-D-IR



FPD Detector Mounted on IS6-D-IR-170

Ophir FPD fast photodiode detectors (see page 106) interface with all IS6 integrating spheres, facilitating temporal characterization of laser pulses in parallel with other measurements.



1.1.1.5.3 Accessories for IS6

All accessories attach to 1" ports unless otherwise noted.

| Accessory | Description | Part number |
|--|--|-------------|
| Port plugs | | |
| IS-1" Port plug | Port plugs close ports with white sphere material, eliminating the port from the sphere geometry White reflectance material, PTFE, Ø25.4mm plug | 7Z08280A |
| IS-2.5" Port plug | White reflectance material, PTFE, Ø63.5mm plug, for 2.5" port | 7Z08283A |
| Port Covers | | |
| Port Covers close ports with a black matte surface. They prevent extraneous light from entering the sphere without changing the sphere configuration. These covers can also be used as blanks for making specialized port adapters | | |
| IS-1" Port cover | Matte black coated Ø25.4mm cover | 7Z08282A |
| IS-2.5" Port cover | Matte black coated Ø63.5mm cover, for 2.5" port | 7Z08281A |
| Adapters and Reducers | | |
| The adapters are black coated and the reducers white coated | | |
| 1" SMA fiber adapter | SMA fiber input/output | 7Z08285 |
| 1" FC fiber adapter | FC fiber input/output | 7Z08286 |
| FPD (except FPS-1) to IS6 adapter | For mounting FPD sensor series to North Pole port of IS6 series | 7Z08350 |
| 1" to SM1 adapter | Female SM1 thread, used for attaching FPS-1 detector to IS6 | 7Z08289 |
| 1" to C-mount adapter | Female C-mount thread | 7Z08290 |
| 1" to C-mount port reducer | Male C-mount thread with 11 mm aperture | 7Z08288 |
| 2.5" to 1" port reducer | Convert the 2.5" port into a 1" port PTFE | 7Z08305A |
| Set of aperture masks | Ø5, Ø7, Ø10mm apertures, for use with 2.5" to 1" port reducer P/N 7Z08305A ^{(a) (c)} | 7Z08307 |
| Flange attachment | Dovetail flange for use with 2.5" to 1" port reducer P/N 7Z08305A ^{(b) (c)} | 7Z08306 |

Notes: (a) This accessory is held on to port reducer 7Z08305A magnetically.

(b) This accessory is mounted to port reducer 7Z08305A with the included screws.

(c) IS6 P/N's 7Z02471, 7Z02473, 7Z02475, 7Z02477 incorporate an earlier version of the 2.5" to 1" port reducer that is not compatible with this accessory. That port reducer can be replaced with the current version, P/N 7Z08305A, in order to use the new accessories.

IS-2.5" Port Plug



IS-1" Port Plug



IS-2.5" Port Cover



IS-1" Port Cover



FPD to IS6 Adapter



2.5" to 1" Port Reducer



Aperture Mask



Flange Attachment



1" FC Fiber Adapter



1" to SM1 Adapter

