

Barium Sulfate Coated Integrating Spheres

UMBB Base Integrating Spheres
UMTB Base Integrating Spheres
UMSS Stands for Integrating Spheres
UMPF Port Frames
UMPP Port Plugs
UMPR Port Reducers
UMDP Detector Ports
UMPB Port Baffles



UMBB Integrating Spheres in Custom Design Set-up

Base Integrating Spheres

UMBB and UMTB integrating spheres form the basis of the modular construction system of Gigahertz-Optik's modular integrating spheres. The sphere inner surface is coated with barium sulfate a highly diffuse reflective coating. The spheres are stocked in semi-finished form in different sizes.

Sphere Diameters from 100 (4") to 1000mm (20")

Gigahertz-Optik supplies the UM base integrating spheres from 100mm up to 1000mm in diameter.

Barium Sulfate Coating

For larger size integrating spheres Barium Sulfate is the most cost effective coating. Gigahertz-Optik manufactures it's own ODP97 coating which is characterized by wide angle diffuse reflection, uniform spectral reflection and high reflectivity. The coating is applied in a process with several thin layers air sprayed. The ODP97 coating is also available as stand alone product described in [Optical Diffuse Material](#).

Wide Range of Integrating Sphere Components for Integrating Sphere Configuration

Gigahertz-Optik stocks a wide range of sphere components for assembly onto the base integrating sphere. Sphere components supplied include post mount sockets, flange mounts, stands, port frames, port frame accessories, detector ports and port baffles.

Once the sphere layout is finalized it can be configured with additional accessories to complete the measurement system. Port adapters, light sources, sample holder and other accessories are described in [Light Measurement System Components](#).

Integrating Sphere Detectors and Light Meters

One of the most common use of integrating spheres is in light measurement application. With Gigahertz-Optik's lightmeters integrating sphere detectors can be individually formed. Standard integrating sphere detectors and light meters are described in [Measurement of Light](#).

Integrating Sphere Light Sources

The second common use of integrating sphere is as integrating sphere light sources for uniformity calibration and comparison of imaging systems. Gigahertz-Optik's integrating sphere sources are described in [Light Measurement Standards and Services](#).

Calibration Service

Complete calibration service is supplied by Gigahertz-Optik calibration laboratory for optical radiation measurement quantities. Please check [Light Measurement Standard and Services](#) for more information.

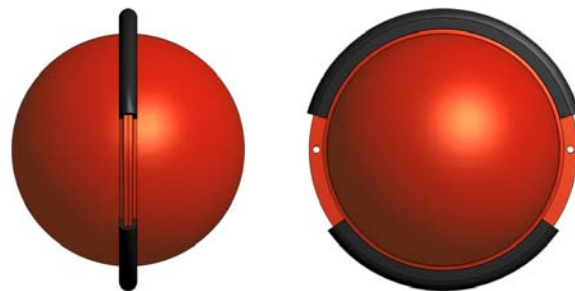
UMBB-100:100mm / 4" diameter Integrating Sphere

UMBB-100 Base Integrating Sphere

100mm / 4" diameter ODP97 coated basic sphere for use with optional post mount socket, stand and other Gigahertz-Optik accessory components.

Configuration Remarks:

Max port frame size: UMPF-1.5 (38.1mm dia)
Max machined port size: UMMP-75 (75mm dia)



Specifications: [101146_UMBB-100.pdf](#)

UMBB-100 Base Integrating Sphere

Purchasing Information:

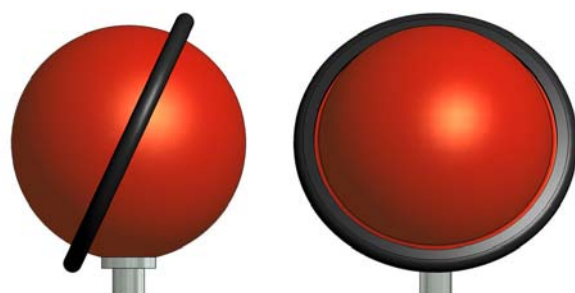
Model	Item No.:	Description
UMBB-100	101146	Integrating sphere base model with 100mm diameter
Options		
UMSS-SM-14/M6	100891	Socket with M6 threaded hole
UMSS-SMT	100939	Mount set for integrating sphere (2 pieces)
UMSS-BT-100	101158	Bench-top Stand f UMBB-100

UMBB-100-S25 Base Integrating Sphere with Post Socket

100mm / 4" diameter ODP97 coated basic sphere with UMSS-SM-14/M6 post mount socket fixed at 25° on the sphere frame (other positions can be specified)

Configuration Remarks:

Max port frame size: UMPF-1.5 (38.1mm dia)
Max machined port size: UMMP-75 (75mm dia)



Specifications: [101146-1_UMBB-100-S25.pdf](#)

UMBB-100-S25 Base Integrating Sphere with Socket

Purchasing Information:

Model	Item No.:	Description
UMBB-100-S25	101146-1	Integrating sphere base model with 100mm diameter plus post mount socket at 25°

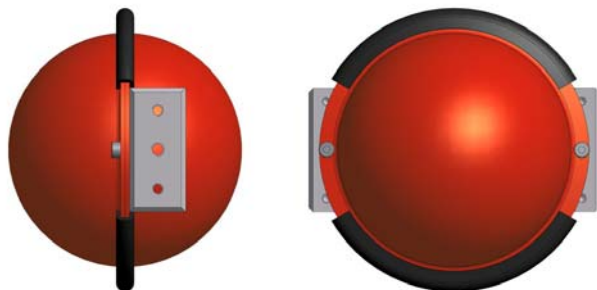
Base Integrating Sphere with Flange Mount

100mm / 4" diameter ODP97 coated base sphere with assembled UMSS-SMT flange mount set

Configuration Remarks:

Max port frame size: UMPF-1.5 (38.1mm dia)
 Max machined port size: UMMP-75 (75mm dia)

Specifications: [101146-2_UMBB-100-M.pdf](#)



UMBB-100-M Base Integrating Sphere with Mount

Purchasing Information:

Model	Item No.:	Description
UMBB-100-M	101146-2	Integrating sphere base model with 100mm diameter plus UMSS-SMT sphere mount set

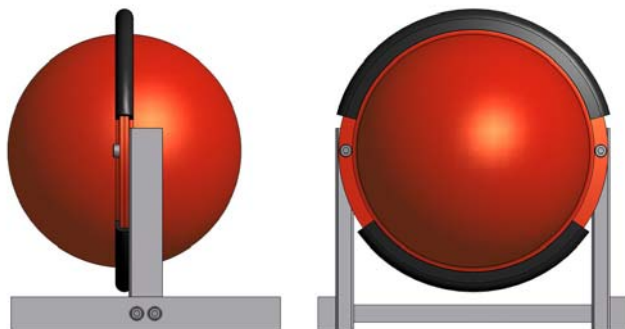
UMBB-100-BT Base Integrating Sphere with Stand

100mm / 4" diameter ODP97 coated Base sphere with UMSS-BT-100 bench top stand

Configuration Remarks:

Max port frame size: UMPF-1.5 (38.1mm dia)
 Max machined port size: UMMP-75 (75mm dia)

Specifications: [101146-3_UMBB-100-BT.pdf](#)



UMBB-100-BT Base Integrating Sphere with Stand

Purchasing Information:

Model	Item No.:	Description
UMBB-100-BT	101146-3	Integrating sphere base model with 100mm diameter and UMSS-BT-100 stand

UMBB-150: 150mm / 6" diameter Integrating Sphere

UMBB-150 Base Integrating Sphere

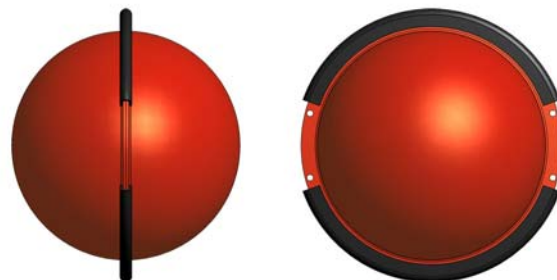
150mm / 6" diameter ODP97 coated basic sphere for use with optional post mount socket, stand and other Gigahertz-Optik accessory components.

Configuration Remarks:

Max port frame size: UMPF-2.5 (63.5mm dia)

Max machined port size: UMMP-100 (100mm dia)

Specifications: [100926_UMBB-150.pdf](#)



UMBB-150 Base Integrating Sphere

Purchasing Information:

Model	Item No.:	Description
UMBB-150	100926	Integrating sphere base model with 150mm diameter
Options		
UMSS-SM-14/M6	100891	Socket with M6 threaded hole
UMSS-SMT	100939	Mount set for integrating sphere (2 pieces)
UMSS-BT-150	101001	Bench-top Stand for UMBB-150-M

UMBB-150-S20 Base Integrating Sphere with Post Socket

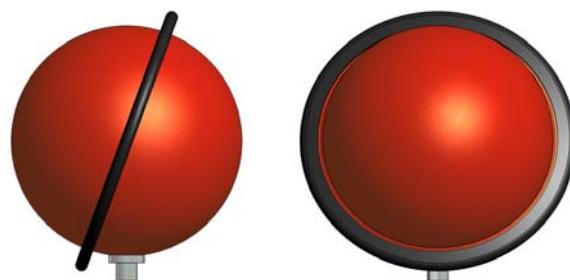
150mm / 6" diameter ODP97 coated basic sphere with UMSS-SM-14/M6 post mount socket fixed at 20° on the sphere frame (other positions can be specified)

Configuration Remarks:

Max port frame size: UMPF-2.5 (63.5mm dia)

Max machined port size: UMMP-100 (100mm dia)

Specifications: [100926-1_UMBB-150-S20.pdf](#)



UMBB-150-S20 Base Integrating Sphere with Socket

Purchasing Information:

Model	Item No.:	Description
UMBB-100-S20	100926-1	Integrating sphere base model with 150mm diameter plus post mount socket at 20°

UMBB-150-M Base Integrating Sphere with Flange Mount

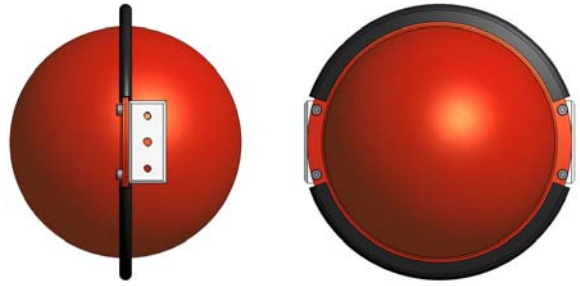
150mm / 6" diameter ODP97 coated base sphere with assembled UMSS-SMT flange mount set

Configuration Remarks:

Max port frame size: UMPF-2.5 (63.5mm dia)

Max machined port size: UMMP-100 (100mm dia)

Specifications: [100926-1_UMBB-150-M.pdf](#)



UMBB-150-M Base Integrating Sphere with Mount

Purchasing Information:

Model	Item No.:	Description
UMBB-150-M	100926-2	Integrating sphere base model with 150mm diameter plus UMSS-SMT sphere mount set

UMBB-150-BT Base Integrating Sphere with Stand

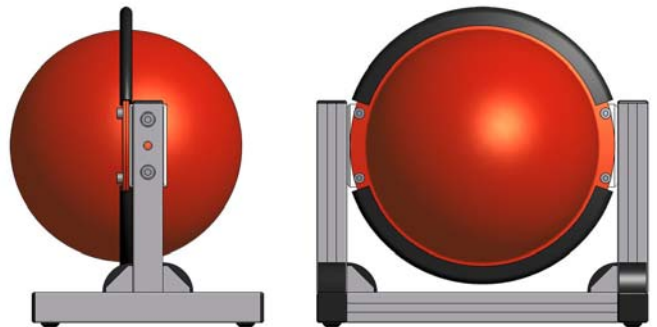
150mm / 6" diameter ODP97 coated Base sphere with UMSS-BT-150 bench top stand

Configuration Remarks:

Max port frame size: UMPF-2.5 (63.5mm dia)

Max machined port size: UMMP-100 (100mm dia)

Specifications: [100926-3_UMBB-150-BT.pdf](#)



UMBB-150-BT Base Integrating Sphere with Stand

Purchasing Information:

Model	Item No.:	Description
UMBB-150-BT	100926-3	Integrating sphere base model with 150mm diameter and UMSS-BT-150 stand

UMTB-170: 150mm / 43.2" Diameter Integrating Sphere

UMTB-170 Base Integrating Sphere

170mm / 6.7" inner diameter ODP97 coated basic integrating sphere with stand for use with optional accessory components.

Configuration Remarks:

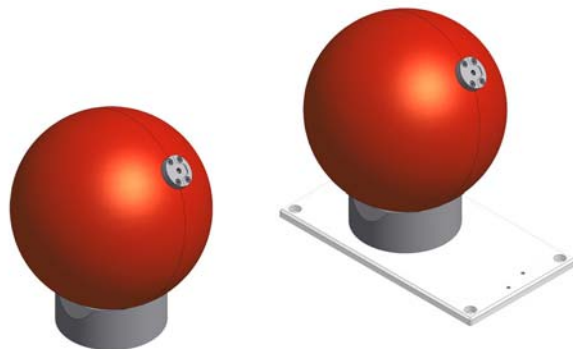
Max port frame size: UMPF-2.5 (63.5mm dia)

Max machined port size: UMMP-100 (100mm dia)

Specifications:

[102231_UMTB-170.pdf](#)

[101945_UMTB-Z01](#)



UMTB-170 Base Integrating Sphere with and without UMTB-Z01 base plate

Purchasing Information:

Model	Item No.:	Description
UMTB-170	102231	Integrating sphere base model with 150mm diameter
Options		
UMTB-Z01	101945	Bottom plate for use with UMTB-170.

UMBB-210: 210mm / 8.2" diameter Integrating Sphere

UMBB-210 Base Integrating Sphere

210mm / 8.2" diameter ODP97 coated basic sphere for use with optional post mount socket, stand and other Gigahertz-Optik accessory components.

Configuration Remarks:

Max port frame size: UMPF-3.0 (76.2mm dia)

Max machined port size: UMMP-150 (150mm dia)

Specifications: [100922_UMBB-210.pdf](#)



UMBB-210 Base Integrating Sphere

Purchasing Information:

Model	Item No.:	Description
UMBB-210	100922	Integrating sphere base model with 210mm diameter
Options		
UMSS-SM-14/M6	100891	Socket with M6 threaded hole
UMSS-SMT	100939	Mount set for integrating sphere (2 pieces)
UMSS-BT-210	100923	Bench-top Stand for UMBB-210-M

UMBB-210-S15 Base Integrating Sphere with Post Socket

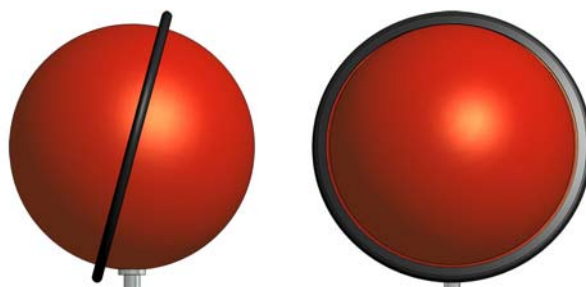
210mm / 8.2" diameter ODP97 coated basic sphere with UMSS-SM-14/M6 post mount socket fixed at 15° on the sphere frame (other positions can be specified)

Configuration Remarks:

Max port frame size: UMPF-3.0 (76.2mm dia)

Max machined port size: UMMP-150 (150mm dia)

Specifications: [100922-1_UMBB-210-S15.pdf](#)



UMBB-210-S15 Base Integrating Sphere with Socket

Purchasing Information:

Model	Item No.:	Description
UMBB-210-S15	100922-1	Integrating sphere base model with 210mm diameter plus post mount socket at 15°

UMBB-210-M Base Integrating Sphere with Flange Mount

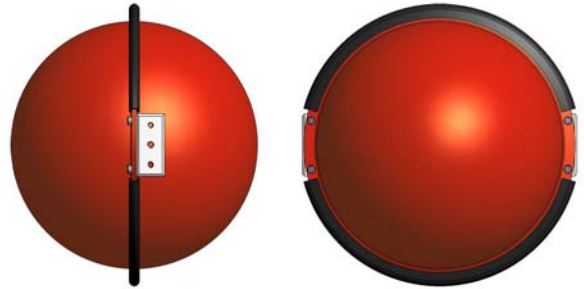
210mm / 8.2" diameter ODP97 coated base sphere with assembled UMSS-SMT flange mount set

Configuration Remarks:

Max port frame size: UMPF-3.0 (76.2mm dia)

Max machined port size: UMMP-150 (150mm dia)

Specifications: [100922-2_UMBB-210-M.pdf](#)



UMBB-210-M Base Integrating Sphere with Mount

Purchasing Information:

Model	Item No.:	Description
UMBB-210-M	100922-2	Integrating sphere base model with 210mm diameter plus UMSS-SMT sphere mount set

UMBB-210-BT Base Integrating Sphere with Stand

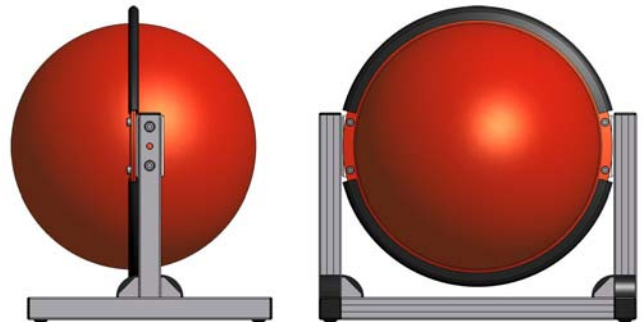
210mm / 8.2" diameter ODP97 coated Base sphere with UMSS-BT-210 bench top stand

Configuration Remarks:

Max port frame size: UMPF-3.0 (76.2mm dia)

Max machined port size: UMMP-150 (150mm dia)

Specifications: [100922-3_UMBB-210-BT.pdf](#)



UMBB-210-BT Base Integrating Sphere with Stand

Purchasing Information:

Model	Item No.:	Description
UMBB-210-BT	100922-3	Integrating sphere base model with 210mm diameter and UMSS-BT-210 stand

UMBB-300: 300mm / 12" diameter Integrating Sphere

UMBB-300 Base Sphere

300mm / 12" diameter ODP97 coated basic sphere for use with optional post mount socket, stand and other Gigahertz-Optik accessory components.

Configuration Remarks:

Max port frame size: UMPF-5.0 (127mm dia)

Max machined port size: UMMP-200 (200mm dia)

Specifications: [100930_UMBB-300.pdf](#)



UMBB-300 Base Integrating Sphere

Purchasing Information:

Model	Item No.:	Description
UMBB-300	100930	Integrating sphere base model with 300mm diameter
Options		
UMSS-SM-14/M6	100891	Socket with M6 threaded hole
UMSS-SMT	100939	Mount set for integrating sphere (2 pieces)
UMSS-BT-300	100977	Bench-top Stand for UMBB-300-M

UMBB-300-S10 Base Sphere with Post Socket

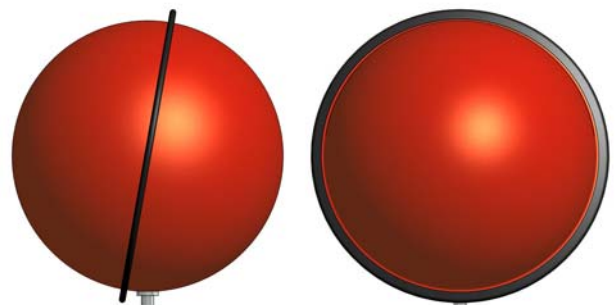
300mm / 12" diameter ODP97 coated basic sphere with UMSS-SM-14/M6 post mount socket fixed at 10° on the sphere frame (other positions can be specified)

Configuration Remarks:

Max port frame size: UMPF-5.0 (127mm dia)

Max machined port size: UMMP-200 (200mm dia)

Specifications: [100930-1_UMBB-300-S10.pdf](#)



UMBB-300-S10 Base Integrating Sphere with Socket

Purchasing Information:

Model	Item No.:	Description
UMBB-300-S10	100930-1	Integrating sphere base model with 300mm diameter plus post mount socket at 10°

UMBB-300-M Base Sphere with Flange Mount

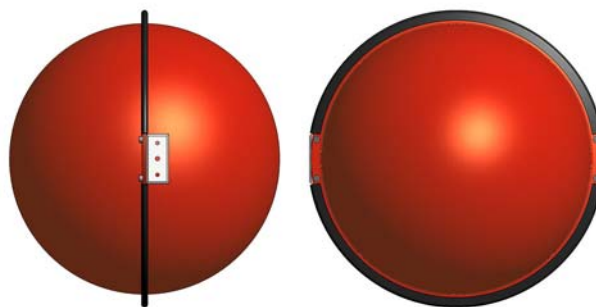
300mm / 12" diameter ODP97 coated base sphere with assembled UMSS-SMT flange mount set

Configuration Remarks:

Max port frame size: UMPF-5.0 (127mm dia)

Max machined port size: UMMP-200 (200mm dia)

Specifications: [100930-2_UMBB-300-M.pdf](#)



UMBB-300-M Base Integrating Sphere with Mount

Purchasing Information:

Model	Item No.:	Description
UMBB-300-M	100930-2	Integrating sphere base model with 300mm diameter plus UMSS-SMT sphere mount set

UMBB-300-BT Base Sphere with Stand

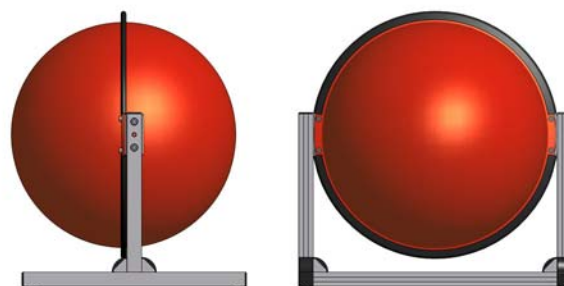
300mm / 12" diameter ODP97 coated Base sphere with UMSS-BT-300 bench top stand

Configuration Remarks:

Max port frame size: UMPF-5.0 (127mm dia)

Max machined port size: UMMP-200 (200mm dia)

Specifications: [100930-3_UMBB-300-BT.pdf](#)



UMBB-300-BT Base Integrating Sphere with Stand

Purchasing Information:

Model	Item No.:	Description
UMBB-300-BT	100930-3	Integrating sphere base model with 300mm diameter and UMSS-BT-300 stand

UMBB-300-HF Base Integrating Sphere with Hinge Frame Stand

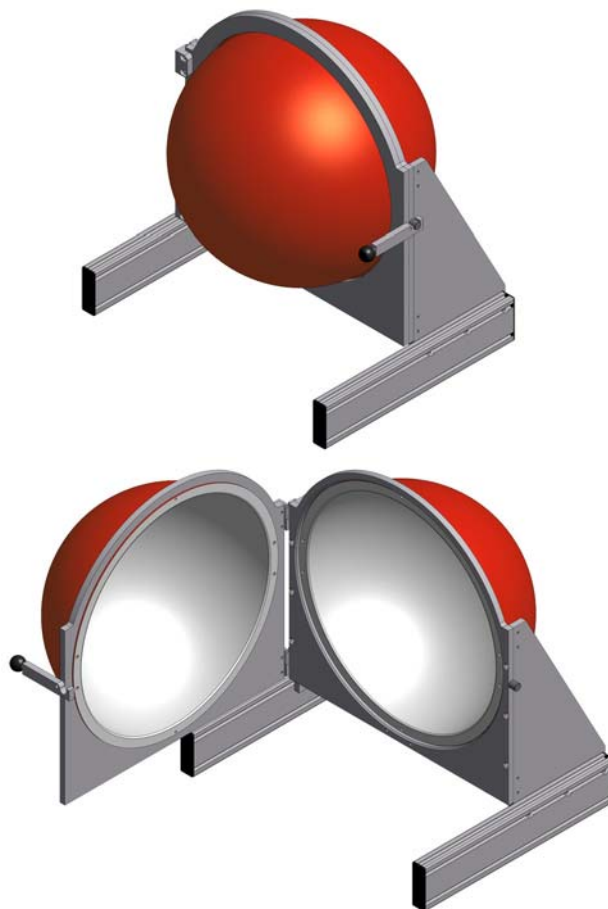
300mm / 12" diameter ODP97 coated base sphere
with assembled UMSS-HF-300 hinge frame

Configuration Remarks:

Max port frame size: UMPF-5.0 (127mm dia)

Max machined port size: UMMP-200 (200mm dia)

Specifications: [100930-4_UMBB-300-HF.pdf](#)



UMBB-300-HF Base Integrating Sphere with Stand.
One Hemisphere to open.

Purchasing Information:

Model	Item No.:	Description
UMBB-300-HF	100930-4	Integrating sphere base model with 300mm diameter plus UMSS-HF-300 hinge frame

UMBB-500: 500mm / 20" diameter Integrating Sphere

UMBB-500 Base Sphere

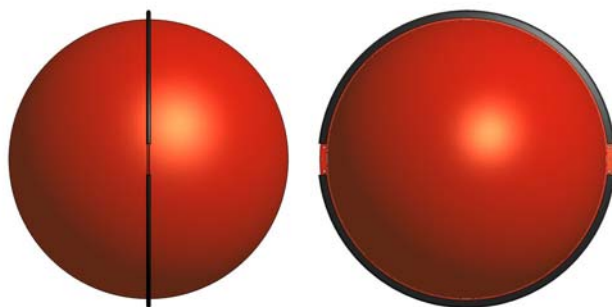
500mm / 20" diameter ODP97 coated basic sphere for use with optional flange mount, stand and other Gigahertz-Optik accessory components.

Configuration Remarks:

Max port frame size: UMPF-6.0 (152.4mm dia)

Max machined port size: UMMP-300 (300mm dia)

Specifications: [100920_UMBB-500.pdf](#)



UMBB-500 Base Integrating Sphere

Purchasing Information:

Model	Item No.:	Description
UMBB-500	100920	Integrating sphere base model with 500mm diameter
Options		
UMSS-SMT	100939	Mount set for integrating sphere (2 pieces)
UMSS-BT-500	100954	Bench-top Stand for UMBB-500-M

UMBB-500-M Base Sphere with Flange Mount

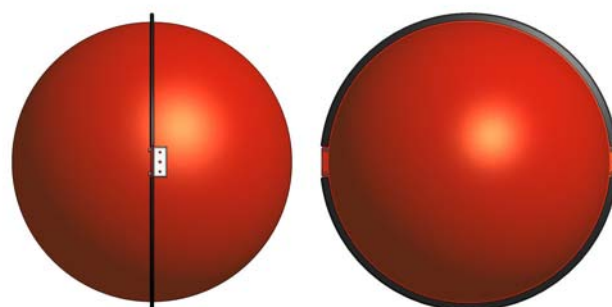
500mm / 20" diameter ODP97 coated base sphere with assembled UMSS-SMT flange mount set

Configuration Remarks:

Max port frame size: UMPF-6.0 (152.4mm dia)

Max machined port size: UMMP-300 (300mm dia)

Specifications: [100920-1_UMBB-500-M.pdf](#)



UMBB-500-M Base Integrating Sphere with Mount

Purchasing Information:

Model	Item No.:	Description
UMBB-500-M	100920-1	Integrating sphere base model with 500mm diameter plus UMSS-SMT sphere mount set

UMBB-500-BT Base Sphere with Stand

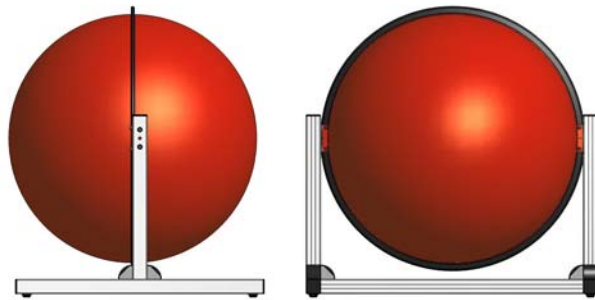
500mm / 20" diameter ODP97 coated Base sphere with UMSS-BT-500 bench top stand

Configuration Remarks:

Max port frame size: UMPF-6.0 (152.4mm dia)

Max machined port size: UMMP-300 (300mm dia)

Specifications: [100920-2_UMBB-500-BT.pdf](#)



UMBB-500-BT Base Integrating Sphere with Stand

Purchasing Information:

Model	Item No.:	Description
UMBB-500-BT	100920-2	Integrating sphere base model with 500mm diameter and UMSS-BT-500 stand

UMTB-500: 500mm / 20" diameter Integrating Sphere

UMTB-500-HF Base Sphere with Hinge Frame Stand

500mm / 20" diameter ODP97 coated base sphere with hinge frame stand.

Configuration Remarks:

Max port frame size: UMPF-6.0 (152.4mm dia)
 Max machined port size: UMMP-300 (300mm dia)
 Optional UMSH-AP500 all purpose sample holder

Specifications: [102717_UMTB-500-HF.pdf](#)



UMTB-500-HF Base Integrating Sphere with Stand.
 One Hemisphere to open.

Purchasing Information:

Model	Item No.:	Description
UMTB-500-HF	102717	Integrating sphere base model with 500mm diameter with hinge frame stand
UMSH-AP-500	102487	Height adjustable sample holder

UMTB-1000: 1000mm / 40" diameter Integrating Sphere**UMTB-1000 Base Sphere**

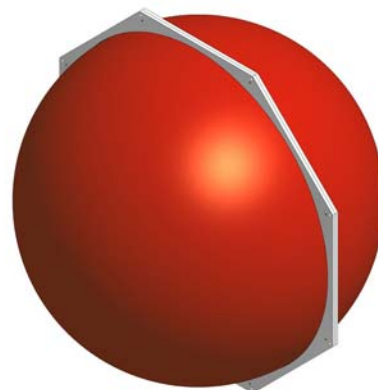
1000mm / 40" diameter ODP97 coated basic sphere in auxiliary frame

Configuration Remarks:

Max port frame size: UMPF-10 (254mm dia)

Max machined port size: UMMP-600 (600mm dia)

Specifications: [102578_UMTB-1000.pdf](#)



UMTB-1000 Base Integrating Sphere

Purchasing Information:

Model	Item No.:	Description
UMTB-1000	102578	Integrating sphere base model with 1000mm diameter with auxiliary frame

UMTB-1000-HF Base Sphere with Hinge Frame Stand

1000mm / 40" diameter ODP97 coated base sphere with hinge frame stand.

Configuration Remarks:

Max port frame size: UMPF-10 (254mm dia)

Max machined port size: UMMP-600 (600mm dia)

Specifications: [102721_UMTB-1000-HF.pdf](#)



UMTB-1000-HF Base Integrating Sphere with Stand.
One Hemisphere to open

Purchasing Information:

Model	Item No.:	Description
UMTB-1000-HF	102721	Integrating sphere base model with 1000mm diameter with hinge frame stand
UMSH-AP-1000	102499	Height adjustable sample holder

UMSS Sphere Stands

For the integration of UMB type integrating spheres into measurement set-ups or for bench-top use Gigahertz-Optik GmbH supplies mounts and stands for its UM series integrating spheres.

Sphere Socket for Post Mount

The UMSS-SM14/M6 socket enables Gigahertz-Optik integrating spheres to mount onto post type stands with M6 threaded stud, for example Gigahertz-Optik's PMS series. The post mount socket is not recommended for use with large size and heavy weighed spheres.



UMSS-SM14/M6 Post Socket

Sphere Flange Set for Sphere Integration

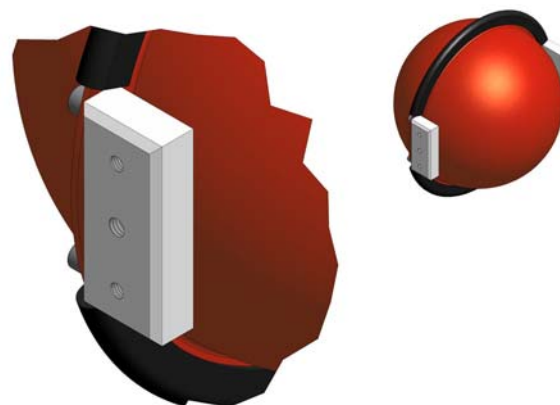
For mounting UM type integrating spheres into a custom set-up or onto Gigahertz-Optik GmbH UMSS-BT stands the UMSS-SMT flange set is available.

Bench-top Stand

In applications where the integrating sphere is used free standing on a bench the UMSS-BT bench-top stands are the best solution.

Custom made Stand Solution

Custom design stands can be supplied on request.



UMSS-SMT Flange Mount



UMSS-BT Bench-top Stand

Specifications and Purchasing Information:

Model	Item No.	Description	For Use With	Specification
UMBB-SM14/M6	100891	Socket with M6 threaded hole for use with post mount stands	UMBB-100 UMBB-150 UMBB-210 UMBB-300*	100891_UMSS-SM14-M6.pdf
		*) Limited use in applications with heavy load port adapters		
UMSS-SMT	100939	Flange mount	UMBB-100 UMBB-150 UMBB-210 UMBB-300 UMBB-500	100939_UMSS-SMT.pdf
UMSS-BT-100	101158	Bench-top stand	UMBB-100	101158_UMSS-BT-100.pdf
UMSS-BT-150	101001	Bench-top stand**	UMBB-150	101001_UMSS-BT-150.pdf
UMSS-BT-210	100923	Bench-top stand**	UMBB-210	100923_UMSS-BT-210.pdf
UMSS-BT-300	100977	Bench-top stand**	UMBB-300	100977_UMSS-BT-300.pdf
UMSS-BT-500	100954	Bench-top stand**	UMBB-500	100954_UMSS-BT-500.pdf
		** UMSS-SMT necessary		

UMPF and UMPF-HL Port Frames

Port frames enable the assembly of port frame accessories such as port plugs and port adapters as well as port adapters and light sources.

Port Frame with V-Groove Interface

The UMPF and UMPF-HL port frames feature a machined V-Groove to mount accessory parts to the frame using set-screws.

Lightweight Port Frames

The UMPF port frame series is designed for mounting of lightweight accessory parts with low moment of torque onto the frame.

Heavyweight HL Port Frames

The UMPF-HL heavy load port frame series is designed for mounting heavier accessory parts onto the frame.

Port Frames with Sample Holder

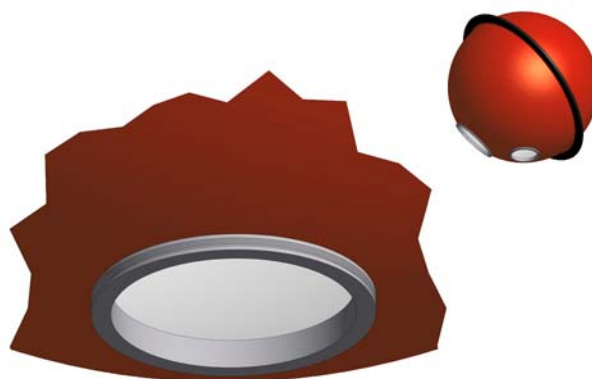
The UMPF-SH port frame series provides threaded holes or set-screws on the front side for direct mounting of sample holder or adapters.

Custom Design Port Frames

Custom designed parts can be supplied on request.



UMPF Port frames are available in different sizes



UMPF Assembled on Integrating Sphere

Specifications and Purchasing Information:

Model	Item No.	Description	Free Aperture	Specification
UMPF-0.5	100886	Port Frame	12.7mmØ/0.5inØ	100886_UMPF-0.5.pdf
UMPF-1.0	100887	Port Frame	25.4mmØ/1.0inØ	100887_UMPF-1.0.pdf
UMPF-1.0-HL	tbc.	Port Frame Heavy Load	25.4mmØ/1.0inØ	tbc.
UMPF-1.5	100881	Port Frame	38.1mmØ/1.5inØ	100881_UMPF-1.5.pdf
UMPF-1.5-HL	101693	Port Frame Heavy Load	38.1mmØ/1.5inØ	101693_UMPF-1.5-HL.pdf
UMPF-1.5-SH	tbc.	Port Frame Sample Holder	38.1mmØ/1.5inØ	tbc.
UMPF-2.0	100888	Port Frame	50.8mmØ/2.0inØ	100888_UMPF-2.0.pdf
UMPF-2.0-HL	102283	Port Frame Heavy Load	50.8mmØ/2.0inØ	tbc.
UMPF-2.0-SH	tbc.	Port Frame Sample Holder	50.8mmØ/2.0inØ	tbc.
UMPF-2.0/3.5	100890	Port Frame with Wide Ring	50.8mmØ/2.0inØ	tbc.
UMPF-2.5	100889	Port Frame	63.5mmØ/2.5inØ	100889_UMPF-2.5.pdf
UMPF-3.0	101292	Port Frame	76.2mmØ/3.0inØ	101292_UMPF-3.0.pdf
UMPF-3.0-SH	102433	Port Frame Sample Holder	76.2mmØ/3.0inØ	tbc.
UMPF-4.0	100938	Port Frame	101.6mmØ/4.0inØ	100938_UMPF-4.0.pdf
UMPF-5.0	100917	Port Frame	127mmØ/5.0inØ	100917_UMPF-5.0.pdf
UMPF-5.0-HL	102014	Port Frame Heavy Load	127mmØ/5.0inØ	tbc.
UMPF-5.0-SH	102539	Port Frame Sample Holder	127mmØ/5.0inØ	tbc.
UMPF-6.0	101173	Port Frame	152,4mmØ/6.0inØ	101173_UMPF-6.0.pdf
UMPF-6.0-SH	102500	Port Frame Sample Holder	152,4mmØ/6.0inØ	tbc.
UMPF-10.0	101132	Port Frame	254mmØ/10.0inØ	101132_UMPF-10.0.pdf
UMPF-12.0	tbc.	Port Frame	300mmØ/12.0inØ	tbc.

UMPF-C Port Frame Caps

Port Frame Caps

Port frame caps are used to cover sphere ports during transportation or while sphere is not in use. Port frame caps are made by plastic material.



UMPF-C Port Frame Cap

Specifications and Purchasing Information:

Model	Item No.	Description	Inner Cap Dia
UMPF-0.5-C	102870	Port Frame Cap for UMPF-0.5	xx mm
UMPF-1.0-C	102871	Port Frame Cap for UMPF-1.0 and UMPF-1.0-HL	xx mm
UMPF-1.5-C	102872	Port Frame Cap for UMPF-1.5 and UMPF-1.5-HL	xx mm
UMPF-1.5-SH-C	102873	Port Frame Cap for UMPF-1.5-SH	xx mm
UMPF-2.0-C	102874	Port Frame Cap for UMPF-2.0 and UMPF-2.0-HL	xx mm
UMPF-2.0-SH-C	102875	Port Frame Cap for UMPF-2.0-SH	xx mm
UMPF-2.0/3.5-C	102876	Port Frame Cap for UMPF-2.0/3.5	xx mm
UMPF-2.5-C	102877	Port Frame Cap for UMPF-2.5	xx mm
UMPF-3.0-C	102878	Port Frame Cap for UMPF-3.0	xx mm
UMPF-3.0-SH-C	102879	Port Frame Cap for UMPF-3.0-SH	xx mm
UMPF-4.0-C	102880	Port Frame Cap for UMPF-4.0	xx mm
UMPF-5.0-C	102881	Port Frame Cap for UMPF-5.0 and UMPF-5.0-HL	xx mm
UMPF-5.0-SH-C	102882	Port Frame Cap for UMPF-5.0-SH	xx mm
UMPF-6.0-C	102883	Port Frame Cap for UMPF-6.0	xx mm
UMPF-6.0-SH-C	102884	Port Frame Cap for UMPF-6.0-SH	xx mm
UMPF-10.0-C	102885	Port Frame Cap for UMPF-10.0	xx mm
UMPF-12.0-C	102886	Port Frame Cap for UMPF-12.0	xx mm

UMPP and UMPP-HL Port Plugs

Port Plugs

Port plugs are used to close unused sphere ports. The inner surface of UMPP ports plugs is coated with barium sulfate ODP97 coating. Port plugs are fasten to port frames.

Sphere Surface Level Port Plug

Port plugs supplied by Gigahertz-Optik GmbH close the port at the surface level of the sphere to reduce shadow effects.

Port Plugs for UMPF Port Frames

UMPP port plugs are designed for use with UMPF Port Frames. They mount onto the frame with three set-screws.

Port Plugs for UMPF-HL Port Frames

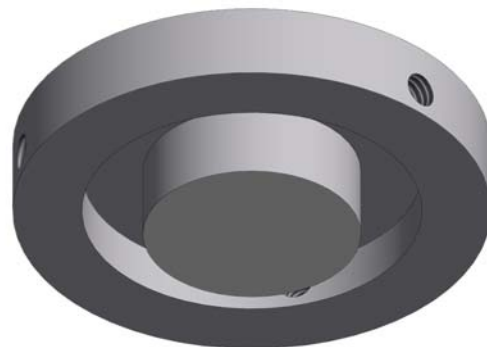
UMPP-HL port plugs are designed for use with UMPF-HL Port Frames. They mount onto the frame with three set-screws.

Barium Sulfate Coating

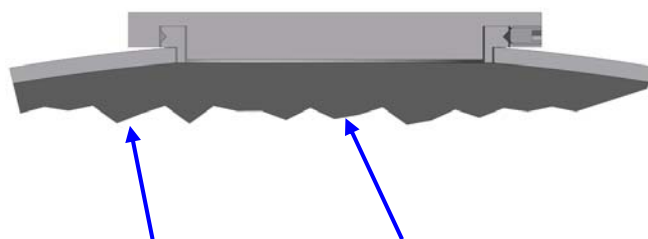
The inner surface of the Port Plugs is coated with Gigahertz-Optik's ODP97 barium sulfate coating featuring high level diffuse reflection.

Custom Port-adapters

Port plugs can be machined to make custom design port reducers or port adapters then coated with barium sulfate.



UMPP-0.5 Port-plug



Sphere Surface

Port Plug Surface

UMPP Close the Ports at Sphere Surface Level

Specifications and Purchasing Information:

Model	Item No.	Description	Plug-Size	Specification
UMPP-0.5	100932	Port Plug for UMPF-0.5	12.7mmØ/0.5inØ	100932_UMPP-0.5.pdf
UMPP-1.0	100933	Port Plug for UMPF-1.0	25.4mmØ/1.0inØ	100933_UMPP-1.0.pdf
UMPP-1.0-HL	tbc.	Port Plug for UMPF-1.0-HL	25.4mmØ/1.0inØ	tbc.
UMPP-1.5	100934	Port Plug for UMPF-1.5	38.1mmØ/1.5inØ	100934_UMPP-1.5.pdf
UMPP-1.5-HL	102481	Port Plug for UMPF-1.5-HL	38.1mmØ/1.5inØ	tbc.
UMPP-1.5-SH	tbc.	Port Plug for UMPF-1.5-SH	38.1mmØ/1.5inØ	tbc.
UMPP-2.0	100935	Port Plug for UMPF-2.0	50.8mmØ/2.0inØ	100935_UMPP-2.0.pdf
UMPP-2.0-HL	102557	Port Plug for UMPF-2.0-HL	50.8mmØ/2.0inØ	tbc.
UMPP-2.0-SH	tbc.	Port Plug for UMPF-2.0-SH	50.8mmØ/2.0inØ	tbc.
UMPP-2.0/3.5	100951	Port Plug for UMPF-2.0/3.5	50.8mmØ/2.0inØ	tbc.
UMPP-2.5	100936	Port Plug for UMPF-2.5	63.5mmØ/2.5inØ	100936_UMPP-2.5.pdf
UMPP-3.0	101293	Port Plug for UMPF-3.0	76.2mmØ/3.0inØ	101936_UMPP-3.0.pdf
UMPP-3.0-SH	102434	Port Plug for UMPF-3.0-SH	76.2mmØ/3.0inØ	tbc.
UMPP-4.0	100937	Port Plug for UMPF-4.0	101.6mmØ/4.0inØ	100937_UMPP-4.0.pdf
UMPP-5.0	100896	Port Plug for UMPF-5.0	127mmØ/5.0inØ	tbc.
UMPP-5.0-HL	102815	Port Plug for UMPF-5.0-HL	127mmØ/5.0inØ	tbc.
UMPP-5.0-SH	102538	Port Plug for UMPF-5.0-SH	127mmØ/5.0inØ	tbc.
UMPP-6.0	101447	Port Plug for UMPF-6.0	152,4mmØ/6.0inØ	101447_UMPP-6.0.pdf
UMPP-6.0-SH	102501	Port Plug for UMPF-6.0-SH	152,4mmØ/6.0inØ	tbc.
UMPP-10.0	101133	Port Plug for UMPF-10.0	254mmØ/10.0inØ	101133_UMPF-10.0.pdf

UMPR Port Reducers

Port Reducers Reduce Port Aperture Size

Port Reducers are used to reduce port size to smaller diameters than the free port.

Port Reducers Change Aperture Edge

Port Reducers aperture edge can be specified with straight or knife edge.

Port Reducers Change Port Aperture Shape

Port Reducers are also used to change the port shape. Most common are rectangular shapes but in principal any machine able shape can be offered.

Port Reducers for UMPF Port Frames

UMPR Port Reducers are designed for use with UMPF port frames. They mount onto the frame with three set-screws. The reducers are machined out of UMPP Port Plugs and are available for all port frame sizes.

Sphere Surface Level Port Reduction

The reflecting surface of the Port Reducers supplied by Gigahertz-Optik GmbH reduce the port opening at the surface level of the inner sphere to reduce shadow effects.

Barium Sulfate ODP97 Coating

The inner surface of the Port Reducer is coated with Gigahertz-Optik's Barium Sulfate ODP97 coating featuring the same reflection characteristic than the OD-P97 sphere coating.

Custom Size Aperture

Customers can specify the hole diameter in mm in 0.5 mm steps and the edge design. Different aperture shapes than circular can be offered on request.



ISS-15 Integrating Sphere Source with UMPR Port Reducer mount to Standard Port Frame.



ISS Light Source with Rectangular Aperture Reducer



Knife Edge Style



Straight Edge Style

Two edge versions are offered for UMPR

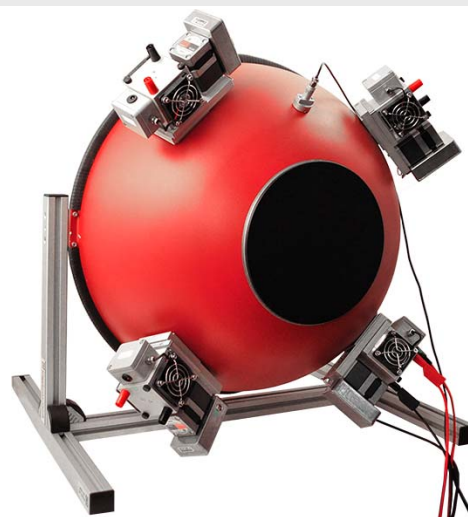
Specifications and Purchasing Information:

Model	Item No.	Description	Max Aperture Diameter	Specification
UMPR-0.5	100944	Port Reducer for UMPF-0.5	18mm	100932_UMPP-0.5-K.pdf
UMPR-1.0	100945	Port Reducer for UMPF-1.0	21mm	100933_UMPP-1.0.pdf
UMPR-1.0-HL	tbc.	Port Reducer for UMPF-1.0-HL	21mm	tbc.
UMPR-1.5	100946	Port Reducer for UMPF-1.5	34mm	100934_UMPP-1.5.pdf
UMPR-1.5-HL	102555	Port Reducer for UMPF-1.5-HL	34mm	tbc.
UMPR-1.5-SH	tbc.	Port Reducer for UMPF-1.5-SH	34mm	tbc.
UMPR-2.0	100947	Port Reducer for UMPF-2.0	46mm	100935_UMPP-2.0.pdf
UMPR-2.0-HL	102554	Port Reducer for UMPF-2.0-HL	46mm	tbc.
UMPR-2.0-SH	tbc.	Port Reducer for UMPF-2.0-SH	46mm	tbc.
UMPR-2.0/3.5	100951	Port Reducer for UMPF-2.0/3.5	46mm	tbc.
UMPR-2.5	100948	Port Reducer for UMPF-2.5	59mm	100936_UMPP-2.5.pdf
UMPR-3.0	101294	Port Reducer for UMPF-3.0	72mm	101293_UMPP-3.0.pdf
UMPR-3.0-SH	102435	Port Reducer for UMPF-3.0-SH	72mm	tbc.
UMPR-3.0-SH-50-CIE127	102436	Port Reducer for UMPF-3.0. 50mm diameter CIE127 conform aperture for effective flux measurements	-	102436_UMPR-3.0-SH-50-CIE127
UMPR-4.0	100949	Port Reducer for UMPF-4.0	97mm	100937_UMPP-4.0.pdf
UMPR-5.0	100895	Port Reducer for UMPF-5.0	123mm	100896_UMPP-5.0.pdf
UMPR-5.0-HL	102816	Port Reducer for UMPF-5.0-HL	123mm	tbc.
UMPR-5.0-SH	102537	Port Reducer for UMPF-5.0-SH	123mm	tbc.
UMPR-6.0	101446	Port Reducer for UMPF-6.0	148mm	101447_UMPP-6.0.pdf
UMPR-6.0-SH	102502	Port Reducer for UMPF-6.0-SH	148mm	tbc.
UMPR-10.0	101134	Port Reducer for UMPF-10.0	250mm	101133_UMPF-10.0.pdf

UMPR-C Port Reducer Caps

Port Reducer Caps

Port reducer caps are used to cover sphere ports with mounted port reducer during transportation or while sphere is not in use. Port reducer caps are made by plastic material.



UMPR-C Port Frame Cap

Specifications and Purchasing Information:

Model	Item No.	Description	Inner Cap Dia
UMPR-0.5-C	102887	Port Reducer Cap for UMPR-0.5	xx mm
UMPR-1.0-C	102888	Port Reducer Cap for UMPR-1.0 and UMPF-1.0-HL	xx mm
UMPR-1.5-C	102889	Port Reducer Cap for UMPR-1.5 and UMPF-1.5-HL	xx mm
UMPR-1.5-SH-C	102890	Port Reducer Cap for UMPR-1.5-SH	xx mm
UMPR-2.0-C	102891	Port Reducer Cap for UMPR-2.0 and UMPF-2.0-HL	xx mm
UMPR-2.0-SH-C	102892	Port Reducer Cap for UMPR-2.0-SH	xx mm
UMPR-2.0/3.5-C	102893	Port Reducer Cap for UMPR-2.0/3.5	xx mm
UMPR-2.5-C	102894	Port Reducer Cap for UMPR-2.5	xx mm
UMPR-3.0-C	102895	Port Reducer Cap for UMPR-3.0	xx mm
UMPR-3.0-SH-C	102896	Port Reducer Cap for UMPR-3.0-SH	xx mm
UMPR-4.0-C	102897	Port Reducer Cap for UMPR-4.0	xx mm
UMPR-5.0-C	102898	Port Reducer Cap for UMPR-5.0 and UMPF-5.0-HL	xx mm
UMPR-5.0-SH-C	102899	Port Reducer Cap for UMPR-5.0-SH	xx mm
UMPR-6.0-C	102900	Port Reducer Cap for UMPF-6.0	xx mm
UMPR-6.0-SH-C	102901	Port Reducer Cap for UMPF-6.0-SH	xx mm
UMPR-10.0-C	102902	Port Reducer Cap for UMPF-10.0	xx mm

UMMP Machined Ports

Low Profile Machined Ports

For applications where a standard port frame is not useful because the height of the port frame is too high machined ports may be an alternative. These ports are machined directly into the UMB or UMT sphere housing forming a low profile stepped lip around the port hole. Machined ports are custom made. Please contact the factory for personal assistance.

Machined Ports with Protective Cap

The machined port is designed with a internal step which accepts a plastic cap to close the port when the sphere is not in use.

Machined Ports with Knife Edge

Knife edge design ports prevent stray light from bouncing off the port edge and entering the sphere. The sharpest knife edge is achieved using machined ports without an internal step. For shipment the port is covered with a thin plate taped onto it.



Machining of UMMP Port for use with Protection Cap



UMMP with step for protection cap



UMMP with knife edge

Purchasing Information:

Model	Item No.	Description	Specification
UMMP-xx	102036	Machined Port with Protection Cap. Diameter xx needs to be specified	tbc.
UMMP-KE-xx	102903	Machined Port with Knife Edge. Without Protection Cap. Diameter xx needs to be specified	tbc.

UMDP Detector Ports

Detector Ports to Mount Light Detectors to the Integrating Sphere

Gigahertz-Optik GmbH supplies detector ports to hold the many different kinds of light detectors and light meters it manufactures.

Detector Port for 11 type Detectors

Series 11 type detectors such as the PD-11, VL-11 and TD-11 are most commonly used on integrating spheres for measurement and reference. The complete detector-port consists of a UMPF-0.5 port frame and UMPA-0.5/11 port adapter. The port adapter can be used with and without the UMPA-0.5/11-DR diffuser window (RADIN - RADiation INtegrator).



UMPF-0.5 plus UMPA-0.5/11

Detector Ports for 37 and 45 type Detectors

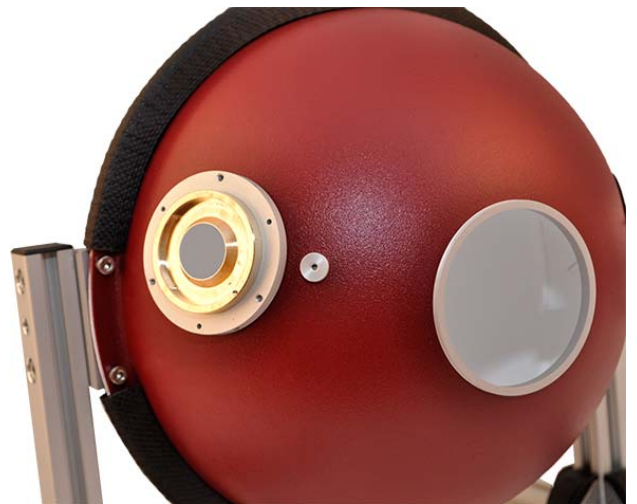
Gigahertz-Optik's light detectors in 37 and 45 type housing can be mounted to integrating spheres using the UMDP-37 and UMDP-45 detector-ports.

Detector Port for BTS256-LED Tester

The UMDP-BTS256LED Detector Port offers a bayonet style mount for fast and simple mounting and removal of the BTS256-LED tester on the sphere.

Detector Port for Fiber Light Guides and Other Detectors

Adapters are available to mount light guides or other detector types to integrating spheres. These can be found under "Port Adapter". Please contact the factory for personal assistance.



UMDP-BTS256 Detector Port

Specifications and Purchasing Information:

Model	Item No.	Description	Specification	For Use With
UMPF-0.5	100886	Detector port configuration Port Frame	tbc.	PD-11 VL-11
UMPA-0.5/11	100924	Port Adapter		TD-11
UMPA-0.5/11-RD	101291	Optional Diffuser		UFC-11
UMDP-37	100919	Detector Port	tbc.	37 type detectors
UMDP-45	100953	Detector Port	tbc.	45 type detectors
UMDP-BTS256LED	102684	Detector Port	tbc.	BTS256-LED

Port Baffles Prohibit Direct Port Irradiation

Integrating spheres work through multiple internal diffuse reflection of the incoming light signal. The ports should be arranged so that no light from any other port or light source inside the sphere can reach the port directly without multiple reflections. In practice this is not always possible so baffles between ports and between light sources and ports are used to avoid direct illumination.

Sphere Mount Baffles

Sphere mount baffles are thin coated plates directly mounted to the sphere housing. They are typically used between two ports or to block a port from direct view of a light source.

Post Mount Baffles

Post mount baffles are thin coated plates mounted on a post to the sphere housing. They are typically used to baffle center mounted lamps, light emitting or reflecting samples from directly irradiating a port.

In-Line Baffle

In-line baffles are thin coated plates fixed onto posts located between two ports that are 180 degrees opposite each other.

Custom Baffle Design & Fabrication

UM series integrating spheres offer a lot of freedom in configuration. Custom made baffles are available designed and fabricated based on end-user specifications assuming standard sphere principle guidelines are followed.



UMPB-SM Sphere Mount Baffle



UMPB-PM Post Mount Baffle



UMPB-TD Two Directional Baffle



UMPB-IL In-Line Baffle

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