Fixed Multi-element Lens Holders | LHF-UDL/LHF-M RoHS







Used to mount multi-element focusing lenses in optical experiments.

• Female threads fit a wide range of OptoSigma threads. See the compatibility table for appropriate combinations.

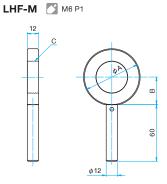


Guide

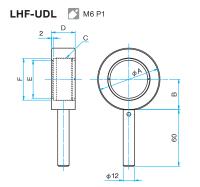
- ▶ The focusing lenses family is ATL/NADL, etc. WEB Reference Catalog Code W3078
- ▶ For cover glass and cover glass holders, refer to Protective Windows / Protective Window Holders. > WEB Reference Catalog Code W3081
- ▶ Post length can be changed by specifying the post length when you place an order. We may charge the difference in price depending on the length. Contact our Sales Division for more information.



Outline Drawing



Eccusing Lone Catalog Cover Cover Glass



Example of Use

Specifications							Primary mate Finish: Black	erial: Aluminum Anodized
Part Number	Options specified*	φA [mm]	B [mm]	С	D [mm]	E [mm]	F [mm]	Weight [kg]
LHF-M29-25	N/UU	φ56	27	M29 P0.75	_	_	_	0.11
LHF-M34-30	N/UU	φ60	29	M34 P0.75	-	-	-	0.11
LHF-M50.9-50	N/UU	φ70	34	M50.9 P0.75	_	-	_	0.11
LHF-UDL-30	N/UU	φ56	27	M34.85 P0.75	23	30	34	0.15
LHF-UDL-40	N/UU	φ66	32	M44.85 P0.75	25	40	44	0.18
LHF-UDL-50	N/UU	φ76	37	M54.85 P0.75	28	50	54	0.22

^{*} For specifying options, please refer to "Conversion of Posts, Post Holders and Pedestal Bases of Holders". Reference CO07

Compatibility Table for Focusing Lenses

Part Number	Catalog	Glass	Holder	Compatible Holders							
Visible Spectrum Achi	Visible Spectrum Achromats										
ATL-30-40PY2											
ATL-30-50PY2	1										
ATL-30-60PY2	WEB Reference										
NADL-30-80PY2	Catalog Code	PG-33	PGH-36	LHF-M34-30							
NADL-30-100PY2	W3078										
NADL-30-150PY2]										
NADL-30-200PY2											
YAG Laser Focusing L	enses										
NYTL-25-20PY1]	PG-21	PGH-24	LHF-M29-25							
NYTL-30-30PY1											
NYTL-30-40PY1	WEB Reference	PG-27	PGH-30								
NYTL-30-50PY1	Catalog Code										
NYDL-30-60PY1	W3079	PG-33	PGH-36	LHF-M34-30							
NYDL-30-80PY1	W3079										
NYDL-30-100PY1		1 G-55	1 011-30								
NYDL-30-150PY1											
Focusing Lenses for F	iber Laser										
HFTLSQ-15-20PF1		PG-21	PGH-24	Special adapter + LHF-M29-25							
HFTLSQ-20-30PF1]			Special adapter + LHF-M34-30							
HFTLSQ-30-40PF1]	PG-27	PGH-30								
HFTLSQ-30-50PF1											
HFTLSQ-30-60PF1	WEB Reference			LHF-M34-30							
HFTLSQ-30-80PF1	Catalog Code	PG-33	PGH-36	EI II -1010-1-00							
HFTLSQ-30-100PF1	W3080		1 311 00								
HFDLSQ-30-150PF1	ļ										
HFTLSQ-50-100PF1											
HFDLSQ-50-200PF1			\times	LHF-M50.9-50							
HFDLSQ-50-300PF1											

Focusing Lens Part Number	Catalog Code	Cover Glass	Cover Glass Holder	Compatible Holders
Excimer Laser Focusion	ng Lenses			
ETL-30-40P				
ETL-30-50P				
ETL-30-60P				
ETL-30-80P		PG-33	PGH-36	LHF-M34-30
NEDL-30-100P	WEB Reference			
NEDL-30-150P	Catalog Code			
NEDL-30-200P				
EDL-50-100P	W3082			
EDL-50-150P				
EDL-50-200P			\times	LHF-M50,9-50
EDL-50-250P				
EDL-50-300P				
Ultraviolet Achromats				
UDL-30-50P		\setminus	/	
UDL-30-80P			/	
UDL-30-100P			/	LHF-UDL-30
NUDL-30-150P			/	
NUDL-30-200P			/	
UDL-40-80P		\	/	
NUDL-40-100P	WEB Reference	`	\ /	
NUDL-40-150P	Catalog Code		Χ	LHF-UDL-40
NUDL-40-200P	W3083	,	/ \	
NUDL-40-250P		/		
UDL-50-100P		/	\	
NUDL-50-150P		/		
NUDL-50-200P		/	\	LHF-UDL-50
NUDL-50-250P		/		
NUDL-50-300P		V		

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Used to objective lenses in optical experiments.

• Female threads fit a wide range of OptoSigma threads. See the compatibility table for appropriate combinations.

• There are two styles of objective holder mounts. Both have M20.32 threads. Ane is the standard type (LHO-20.32) that allows placement of targets in close proximity to lenses, and the other is the hooded type (LHO-20.32A) that blocks stray

The images from the objectives will be stable due to the rigidity of the mount.



Guide

- ▶ Post length can be changed by specifying the post length when you place an order. We may charge the difference in price depending on the length. Contact our Sales Division for more information.
- Adapters ,TAT-18OA, adjust the center of objective lenses. A twoaxis pinhole/objective holder (TAT) is also available. Reference C062

Attention

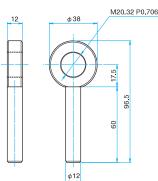
- $\blacktriangleright \mbox{Thread compatibility with non OptoSigma threads is not guaranteed.}$
- A translation stage can be used under the objective holder for fine focus adjustment.



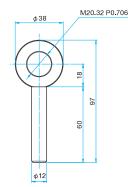


Outline Drawing

LHO-20.32 M6 P1

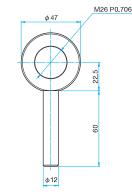


LHO-20.32A M6 P1





LHO-26 M6 P1



Specifications	Primary material: Aluminum Finish: Black Anodized						
Part Number	Options specified*	Weight [kg]					
LHO-20.32	N/EE/UU	0.08					
LHO-20.32A	N/UU	0.13					
LHO-26	N/UU 0.09						

For specifying options, please refer to "Conversion of Posts, Post Holders and Pedestal Bases of Holders".

Example of Use





Designed to hole cubed optics or right angle prismms.

All four polished surfaces of a cubed prism can be used with these mounts.

- The KKD series has tip, tilt and yaw rotation for fine adjustment of reflected beams.
- The clamp screw will not rotate the prism when clamping.



Guide

- ► θαβ axis stages without prism retainer and strut (KKD-C) are also available. ► WEE Reference Catalog Code W7111
- ▶ Post length can be changed by specifying the post length when you place an order. We may charge the difference in price depending on the length. Contact our Sales Division for more information.

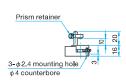
Attention

- ▶ KKD-25PH and PLH-25 might not exert sufficient pressure to retain a prism, and there is a risk that optics might fall out. Use after making sure that the prism is fixed.
- After adjusting the KKD series, if the prism retainer is lifted, the prism table sometimes moves, throwing off adjustment of tilt and rotation. Use without touching the prism retainer after adjustment.

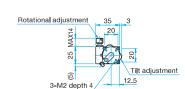


Rotational adjustment 35 3 Rotational adjustment 35 3 Tilt adjustment 12.5 P.C.D.20

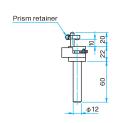
Outline Drawing

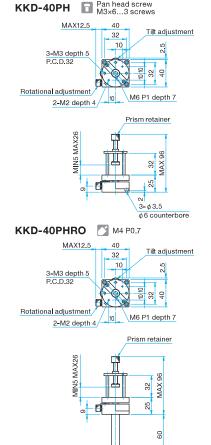


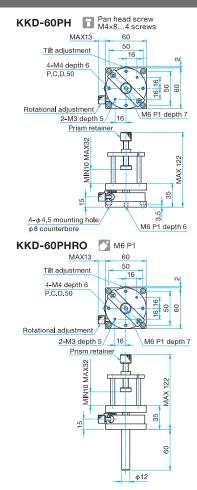
M6 P1



KKD-25PHRO







With Tilt and Rota	tional Adjustment					naterial: Aluminum ack Anodized
Part Number	Compatible Optics Dimensions [mm]	Adjustment Range Rotation [°]	Adjustment Range Tilt [°]	Reso Rotation [°/rotation]	lution Tilt [°/rotation]	Weight [kg]
KKD-25PH	- □10	±3	±3	about 0.9	about 2.2	0.05
KKD-25PHRO	– □10	±3	±3	about 0.9	about 2.2	0.11
KKD-40PH	□5 – □26	±3	±3	about 2.0	about 1.5	0.20
KKD-40PHRO	□5 – □26	±3	±3	about 2.0	about 1.5	0.25
KKD-60PH	□10 – □32	±3	±3	about 1.7	about 1.0	0.40
KKD-60PHRO	□10 – □32	±3	±3	about 1.7	about 1.0	0.45

φ12

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Prism retainer

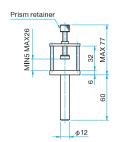
PLH-25 M4 P0.7





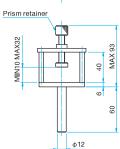


PLH-40 M6 P1



PLH-60 M6 P1





Specifications			Primary material: Aluminum Finish: Black Anodized
Part Number	Options specified*	Compatible Optics Dimensions [mm]	Weight [kg]
PLH-25	N	- □10	0.08
PLH-40	N	□5 – □26	0.14
PLH-60	N	□10 – □32	0.29

^{*} For specifying options, please refer to "Conversion of Posts, Post Holders and Pedestal Bases of Holders". Reference) C007

Prism Holder

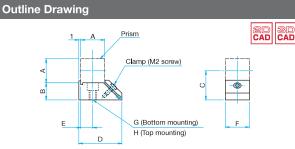






Compact Mount for cube beamsplitters. By clamping on the lower edges of the cube more of the prism faces are available for use.

• It is possible to put close to other optical elements because the holder shapes match to the width of the prism.



Part Number	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G	Н
PAD-10	10	10	15	20	5	10	M4	МЗ
PAD-12.7	12.7	8.65	15	22.7	6.35	12.7	M4	МЗ
PAD-15	15	12.5	20	25	7.5	15	M4	М3
PAD-20	20	15	25	35	10	20	M6	M4
PAD-25.4	25.4	12.3	25	39	12.5	25.4	M6	M4

Guide

Can be mounted on posts, pillars or directly on a baseplate or stage with an M4 thread.

Attention

- Over tightening the clamp may break glass. Please tighten with the minimum necessary force to insure the cube does not move.
- Recommended for use with prisms with outer dimension tolerance of ±0.2mm.

		material: Aluminum lack Anodized
Part Number	Compatible Optics Dimensions [mm]	Weight [kg]
PAD-10	□10	0.005
PAD-12.7	□12.7	0.006
PAD-15	□15	0.01
PAD-20	□20	0.022
PAD-25.4	□25.4	0.026



Used to adjust the direction of polarization of waveplates and polarizer optics. The mount has 360 degrees of smooth rotation.

- The SPH series uses a microemter for fine adjustment.
- The scale plate on the PH and SPH series can be positioned to provide a convenient reference to the polarizer or crystal axis.
- The SPH can be post mounted with the micrometer at the top or at the side for convenient operation in a variety of environments.
- The SPH includes a locking mechanism to prevent accidental adjustments.
- Optics are held in place with retaining rings and resin rings.
- The MPH series is designed for use in small systems and narrow spaces.





- ▶ Holders for optics sizes not listed in the catalog can be made to order
- ▶ Adapters for polarizing prisms are available for both the PH and SPH holders. Reference C055
- ▶ Post length can be changed by specifying the post length when you place an order. We may charge the difference in price depending on the length. Contact our Sales Division for more information.



Attention

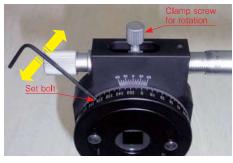
► M6 screws should not go deeper than 5 mm into the mounts. Longer screws will prevent the mount from rotating.

Variable Scale Plate

The angle scale position of PH-ARS, SPH-ARS, GTPC-PH and GTPC-SPH can be freely adjusted.

The scale is easily adjusted to the polarizing axis or the crystal axis of a waveplate by changing the position of this scale plate.

This scale plate enables customers to change the scale position during an experiment, or to adjust the scale to the polarizing axis or the crystal axis precisely. (The default direction is aligned to the vertical axis, within ±1 degree.)







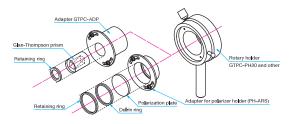
[How to adjust scale plate]

- (1) Mount a polarizing optic in the polarizer holder, and set the direction of the polarizing axis and crystal axis to the polarization reference coordinate.
- (2) Tighten the clamp screw for rotation, loosen the set bolt that secures the scale plate, and rotate the scale plate.
- (3) Set the scale mark to the required scale position, and tighten the scale plate with the set bolt.

Mounting Compatibility of Polarizer Holders and Polarizing Prism Holders

Polarizer holders (PH-ARS, SPH-ARS) can be used as polarizing prism holders by purchasing an adapter (GTPC-ADP) additionally. Also, by purchasing the adapter (GTPC-ADP), a polarizing prism holder for either of the three diameter sizes, ϕ 15, ϕ 25.4 or ϕ 30mm, can be used for the other two sizes. However, the adapter is not compatible with the old type prism holders of custom orders (GTPC-PH-**, GTPC-SPH-**).

Adapters (for optic diameter of ϕ 30 and ϕ 50mm) for polarizer holders (PH-ARS) are also available as a single item. Contact our International Sales Division for more information.



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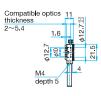
Others

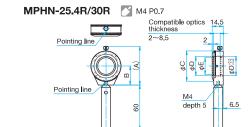
Others

Outline Drawing

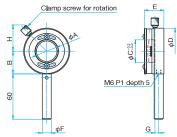
MPHN-12.7R M4 P0.7







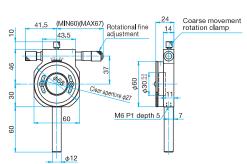
PH-ARS M6 P1 (Only PH-100 with taper)



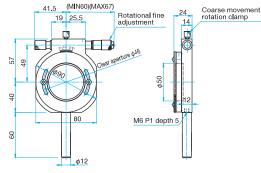
Part Number	φA (mm)	B (mm)	φC (mm)	φD (mm)	E (mm)	φF (mm)	G (mm)	H (mm)
PH-20-ARS	φ17	25	φ20	φ51	23	φ12	3.5	29
PH-25.4-ARS	φ22	30	φ25.4	φ61	26	φ12	4	35
PH-30-ARS	φ27	30	φ30	φ61	26	φ12	4	35
PH-50-ARS	φ46	40	φ50	φ81	26	φ12	5	42
PH-50.8-ARS	φ47	40	φ50.8	φ81	26	φ12	5	42
PH-100-ARS	φ95	73	φ100	φ148	30	φ20	4	66

φ12









Thin Type								mary material ish: Black An	
Part Number	Options specified*	Compatible Optics Diameter ϕ D [mm]	Compatible Optics Thickness [mm]	Scale MIN Reading [°]	Clear Aperture \$\phi E\$ [mm]	Optical Axis Height B [mm]	A (MAX) [mm]	φC [mm]	Weight [kg]
MPHN-12.7R	N	φ12.7	2 – 5.4	2.5	φ10	15	32	φ22	0.07
MPHN-25.4R	N	φ25.4	2 - 8.5	2	φ22	25	51	φ40	0.083
MPHN-30R	N	φ30	2 – 8.5	2	φ27	27.5	56	φ45	0.09

^{*} For specifying options, please refer to "Conversion of Posts, Post Holders and Pedestal Bases of Holders". Reference CO07

Simple Type						Primary material: Aluminum Finish: Black Anodized
Part Number	Options specified*	Compatible Optics Diameter [mm]	Compatible Optics Thickness [mm]	Clear Aperture φA [mm]	Scale MIN Reading [°]	Weight [kg]
PH-20-ARS	N/UU	φ20	2 – 10	φ17	1	0.14
PH-25.4-ARS	N/UU	φ25.4	2 – 10	φ22	1	0.19
PH-30-ARS	N/UU	φ30	2 – 10	φ27	1	0.19
PH-50-ARS	N/UU	φ50	2 – 10	φ46	1	0.25
PH-50.8-ARS	N/UU	φ50.8	2 – 10	φ47	1	0.25
PH-100-ARS	N/UU	φ100	2 – 10	φ95	1	0,81

^{*} For specifying options, please refer to "Conversion of Posts, Post Holders and Pedestal Bases of Holders". [Interestal Post Holders and Pedestal Bases of Holders and Pedestal Bases of

Precision Type Primary material: Finish: Black Ano										
	Part Number	Options specified*	Compatible Optics Diameter [mm]	Compatible Optics Thickness [mm]	Clear Aperture [mm]	Fine Adjustment Range [°]	Vernier MIN Reading [']	Micro Indicator Conversion [°/DIV]	Weight [kg]	
	SPH-30-ARS	N/UU	φ30	2 – 10	φ27	±5	5	about 0.014	0.32	
	SPH-50-ARS	N/UU	φ50	2 – 10	φ46	±3	5	about 0.012	0.46	

^{*} For specifying options, please refer to "Conversion of Posts, Post Holders and Pedestal Bases of Holders". [Editorials 2007]

Polarizing Prism Holders

GTPC-PH/GTPC-SPH/GTPC-ADP







Used to adjust polarizing prisms such as Glan-Thompson prisms. Best used for precision alignment of Glan-Thompson prisms or for polarimetery devices.

- The fine adjustment mechanism in the SPH can be used to detect an extinction ratio of 10⁻⁵ or less.
- The scale plate on the PH and SPH series can be positioned to provide a convenient reference to the polarizing axis. Reference C053
- The SPH can be post mounted with the micrometer at the top or at the side for convenient operation in a variety or environments.
- The SPH includes a locking mechanism to prevent accidental adjustments.
- Polarizing prisms are held in place with retaining rings.



Rotary holder

В

30

 ϕ 60

φ60

φ80

(mm) (mm) (mm) (mm)

φ60 30 34.3 17.5

φ60 30 34.3 31.5

30 34.3 7.5

40 41.3 27.5

34.3 16.5

Guide

- ▶ Post length can be changed by specifying the post length when you place an order. We may charge the difference in price depending on the length. Contact our Sales Division for more information
- ▶ Holders for polarizing prisms of diameters or thickness not in the specifications listed in the catalog can be made to order.

Attention

- ▶ These holders are sold seperately from the corresponding optics. WEB Reference Catalog Code W3450
- ▶ Rotary holders and adapters (GTPC-ADP) are also sold separately. Purchase the combination of three items, a Glan-Thompson prism, adapter and rotary holder, by checking the combinations listed in the following specification table.

GTPC-ADP

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Clamp screw for rotation

Adapte

Part Number

GTPC-ADP15-29

GTPC-ADP30-39

GTPC-ADP30-53

GTPC-ADP38-49

GTPC-ADP25.4-38

M6 P1

φ12

Holder

Part Numbe

GTPC-PH30

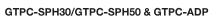
GTPC-PH30

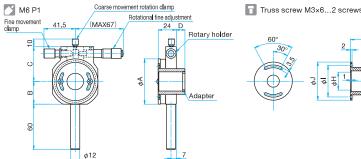
GTPC-PH30

GTPC-PH30

GTPC-PH50

GTPC-PH30/GTPC-PH50 & GTPC-ADP





Holder	Adapter	φΑ	В	С	D
Part Number	Part Number	(mm)	(mm)	(mm)	(mm)
GTPC-SPH30	GTPC-ADP15-29	ϕ 60	30	46	9.5
GTPC-SPH30	GTPC-ADP25.4-38	ϕ 60	30	46	18.5
GTPC-SPH30	GTPC-ADP30-39	ϕ 60	30	46	19.5
GTPC-SPH30	GTPC-ADP30-53	ϕ 60	30	46	33.5
GTPC-SPH50	GTPC-ADP38-49	φ80	40	57	29.5

Adapter Part Number	φF (mm)	φG (mm)	φH (mm)	φ I (mm)	φJ (mm)	K (mm)	L (mm)
GTPC-ADP15-29	φ15	φ34	φ12	φ39	φ47	33.5	19
GTPC-ADP25.4-38	φ25.4	φ34	φ22	φ39	φ47	42.5	20
GTPC-ADP30-39	φ30	φ34	φ27	φ39	φ47	43.5	21
GTPC-ADP30-53	φ30	φ34	φ27	φ39	φ47	57.5	19
GTPC-ADP38-49	φ38.1	φ54	φ35	φ60	φ67	53.5	26

Simple Type					y material: Aluminum Black Anodized
Holder Part Number	Adapter Part Number	Compatible Optics Diameter [mm]	Compatible Optics Thickness [mm]	Scale MIN Reading [°]	Total Weight [kg]
GTPC-PH30 GTPC-ADP15-29		φ15	15 – 29	1	0.25
GTPC-PH30	GTPC-ADP25.4-38	φ25.4	16 – 38	1	0.22
GTPC-PH30	GTPC-ADP30-39	φ30	23 – 39	1	0.21
GTPC-PH30	GTPC-ADP30-53	φ30	39 – 53	1	0.22
GTPC-PH50	GTPC-ADP38-49	φ38	28 – 48.9	1	0.41

Precision Type	Primary material: Aluminu Finish: Black Anodized						
Holder Part Number	Adapter Part Number	Compatible Optics Diameter [mm]	Compatible Optics Thickness [mm]	Fine Adjustment Range [°]	Vernier MIN Reading [']	Micro Indicator Conversion [°/DIV]	Total Weight [kg]
GTPC-SPH30	GTPC-ADP15-29	φ15	15 – 29	±5	5	about 0.014	0.33
GTPC-SPH30	GTPC-ADP25.4-38	φ25.4	16 – 38	±5	5	about 0.014	0.30
GTPC-SPH30	GTPC-ADP30-39	φ30	23 – 39	±5	5	about 0.014	0.29
GTPC-SPH30	GTPC-ADP30-53	φ30	39 – 53	±5	5	about 0 . 014	0.30
GTPC-SPH50	GTPC-ADP38-49	φ38	28 - 48.9	±3	5	about 0.012	0.62



Rod Form Laser Mounts Adjustable Laser Holders (with a stand)

LAHU/LAHU-A

LAH



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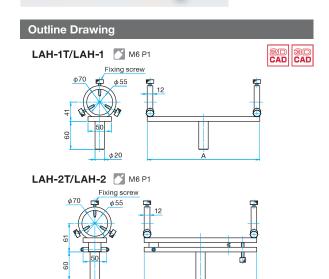
Fiber



Holders for He-Ne lasers.

The six screws can be used to adjust the height and angle of the mounted laser tube.

- Laser tube diameters from ϕ 18 to ϕ 54mm can fit in this holder by adjusting the three screws on both sides.
- The angle of beam tilt can also be changed by adjusting the six screws.
- The LAH-2 also includes an adjustment mechanism for changing the beam



Guide

▶ Post length can be changed by specifying the post length when you place an order. We may charge the difference in price depending on the length. Contact our Sales Division for more information.

Attention

▶ After beam adjustment, make sure that the laser is fixed securely with the six fixing screws. Looseness in one screw will cause displacement in the optical axis or vibration.

Three-F	Point Suppo	ort Type	Primary material: Aluminum Finish: Black Anodized				
Part Number	Compatible Laser Diameter [mm]	Length A [mm]	Adjustment Range Tilt [°]	Resolution Tilt [°/rotation]	Weight [kg]		
LAH-1T	φ18 – φ54	140	-	_	0.31		
LAH-1	φ18 – φ54	240	_	-	0.51		
LAH-2T	φ18 – φ54	140	±4	about 0.5	0.45		
LAH-2	φ18 – φ54	240	±2.4	about 0.3	0.91		

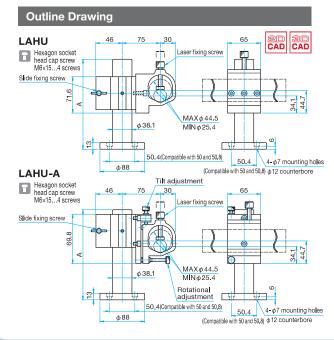






Cylindrical Laser mounts for use with vibration isolated Rod Mount system. The dampened structure makes the holders ideal or use in holograms or interferometry.

- Cylindrical lasers of ϕ 25.4 to ϕ 44.5mm diameter fit in the V-grooved section and are held in place by a single clamping screw.
- Holders can be mounted at any position by sliding along the damped rod.
- Can be directly mounted on a vibration isolator or optical breadboard with 50×50mm matrix M6 screw holes or 1/4-20 UNC holes on 2" spacing.
- LAHU-A mounts can adjust beam tilt and rotation.



Guide

▶ Consult our Sales Division if holders with an optical axis height of 300mm or higher is necessary.

Attention

- ▶ The holder may slide due to its weight when changing the height. Be careful not to drop the holder when adjusting.
- Lasers are very delicate instruments. Pushing in a fixing screw with excessive force sometimes deteriorates the laser performance.

Stand Type		Strut: Stainless steel Finish: None Holder material: Aluminum Finish: Black Anodize						
Part Number	Strut Length A [mm]	Compatible Laser Diameter [mm]	Adjustment Range Tilt Rotation [°] [°]		Weight [kg]			
LAHU-45-POS177	177.8	φ25 . 4 - φ44.5	_	_	2.6			
LAHU-45-POS355	355.6	φ25.4 – φ44.5	_	_	3.9			
LAHU-45A-POS177	177.8	φ25.4 – φ44.5	±2	±2	2.7			
LAHU-45A-POS355	355.6	φ25.4 – φ44.5	±2	±2	4.0			



LAH-4 is a high stability laser holder for He-Ne laser. Easy to use, two axis thumbscrews with locks.

- High stability kinematic mechanism suitable even for large He-Ne lasers. As it is easy to adjust angle of output beam, this holder can also be used for alignment of a guide laser for an invisible laser.
- Compatible with a variety of laser diameters: 31.8 mm, 35.1 mm, 44.5 mm, and 45mm.



Guide

▶ Can be mounted on a post or baseplate. Posts (RO) and Post Holders (PST).

bread board. Reference C029

ce Catalog Code W6052, WEB Refer Baseplate, MHL-50BP, for directly mounting on the optical table/

▶ Replacement for discontinued item LAH-3T.

Attention

- ▶ Overtightening setscrews that hold the laser tube may cause the degradation of laser quality.
- For best performance, center the tube in the holder.

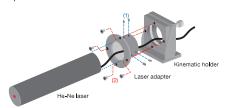
Example of use



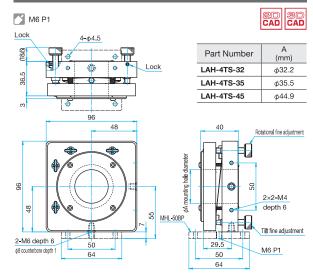
How to Mount He-Ne Lasers

Remove the laser adapter from the kinematic (tilt adjustment) holder first by removing the four pan head screws. If the cable of a He-Ne laser cannot be pulled out, put the He-Ne laser through the hole of the kinematic holder first. (1) Insert the He-Ne laser in the laser adapter half way, and fix with four set

(2) Mount the adapter in which the laser is mounted in the kinematic holder with four pan head screws.



Outline Drawing



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Specifications Programme P										
	Compatible Laser	Optical Axis Height	Adjustm	ent Range	Reso	Resolution				
Part Number	Diameter ϕ A [mm]	[mm]	Tilt [°]	Rotation [°]	Tilt [°/rotation]	Rotation [°/rotation]	Weight [kg]			
LAH-4TS-32	φ31.8	48*	±2	±2	0.2	0.2	0.63			
LAH-4TS-35	φ35.1	48*	±2	±2	0.2	0.2	0.63			
LAH-4TS-45	φ44.5	48*	±2	±2	0.2	0.2	0.63			

*With MHL-50BP, 7mm thick baseplate, the height of optical path would be 55mm, the same height as LAH-3T Series.



Holders for Laser Beam Expanders | KLH-BE





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Four axis adjustable mount for Laser Beam Expanders BE and LBED. Tip, Tilt and centering can be adjusted.

- Stable design for large size laser beam expanders .
- KLH-BE is equipped with lock mechanism for angle and centering. These locking mechanism enable to keep the orientation after adjustment.
- Mountable on posts or posts holders.

WEB Reference Catalog Code W6052. WEB Reference Catalog Code W6039



Attention

▶ Baseplate for mounting on the optical table or bread board is available (MHL-BP). Reference C029

Guide

- ▶If the centering mechanism clamp is not sufficiently loosened, the range of movement of the centering mechanism will be narrow.
- ▶ Changing focus after the adjustment of tilt, rotation and centering may cause the deviation of output beam angle and centering.

Example of Use

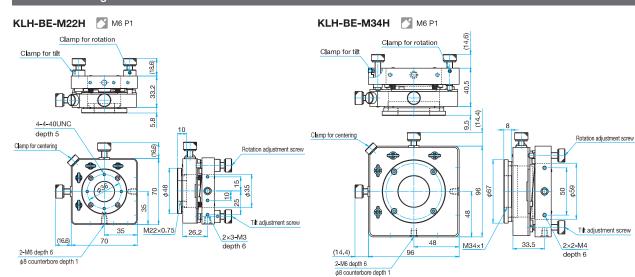


Assembled with the KLH-BE-M22H and LBED10





Outline Drawing



Specifications	Primary materia Finish: Black An							
Part Number	Compatible Mounting Centering Screw Size adjustment range [mm] [mm]		Centering Adjustment Resolution [mm/rotation]	Angle Adjustment Range Tilt Rotation [°] [°]		Angle Adjustment Resolution Tilt Rotation [°/rotation] [°/rotation]		Weight [kg]
KLH-BE-M22H	M22 P0 . 75 φ2		0.25	±2	±2	0.3	0.3	0.38
KLH-BE-M34H	M34 P1	φ2	0.25	±3	±3	0.2	0.2	0.68

Technical Note

Spacial Filters

The wavefront of a laser beam can be distorted as it goes through an optical system. Fine dust particles can create disturbing diffraction patterns. Spacial filters provide a method to remove many of these disturbances, leaving a clean spherical wavefront.

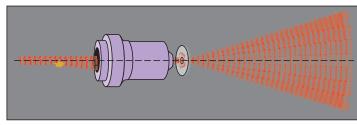
Principles

Focusing plane waves with an ideal lens concentrates light at a small spot. In the case of a typical laser beam, where the beam diameter is less than the diameter of the lens, the intensity distribution at the focus spot will have the same gaussian distribution that the incoming laser beam had. If the planar wavefront is disturbed, the intensity distribution at the focus spot will not be the same as the incoming beam anymore.

Instead, the disturbances will alter the intensity distribution such that it has additional spots and rings separate from the central spot. By placing a pinhole at the central spot, the extra spots and rings can be blocked, allowing only the undisturbed wavefront to continue. To use a spatial filter, you need to match the hole size to the size of focus point (focus spot) of the objective lens.

A hole diameter much larger than the focus spot diameter may not block all of the distortion and noise.

On the other hand, a hole diameter much smaller than the focus spot diameter may produce diffraction rings of concentric circles around a dispersed beam and reduce the total amount of light passed by an unacceptable amount.







Diffraction rings produced when the focus spot is smaller than the pinhole diameter

Intensity distribution when the pinhole diameter matches the focus spot

Configuration

A spatial filter consists of a microscope objective lens and a pinhole. The objective lens is fitted with a linear motion stage for changing the distance to the pinhole and a two-axis pinhole holder that positions the pinhole in a plane perpendicular to the optical axis.

To align the spatial filter holder, refer to the chapter on interferometers. Dues note that Interferometers Guide

Pinhole Selection

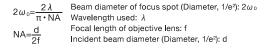
To use a spatial filter, the pinhole diameter needs to match the focus spot diameter.

Calculate the focus spot diameter from the diameter of incident beam and the focal length of the objective lens.

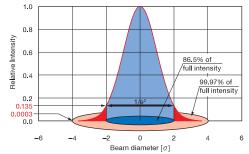
Since the beam spot diameter $(2\omega_0)$ is defined to be where the intensity falls to $1/e^2=0.135$ times the peak value, 15% of incident light intensity will be lost if the pinhole is the same diameter. Moreover, diffraction rings will be generated when the laser beam irradiates the edge of the pinhole. For this reason, select a pinhole twice as large as the spot diameter $(1/e^2)$.

If the pinhole is twice the diameter of the spot, the loss of incident light intensity will be 0.03%, and there will be no need to worry about laser light irradiating on the edge of the pinhole.

Pinhole diameter $A=4\omega_0$



Intensity Distribution of Beam Spot



Example of Use

Case (A) He-Ne laser 05-LHP-111 Beam diameter (1/e²) 0.59mm Objective lens OBL-20 focal length 9mm

⇒ Pinhole of choice is PA-25 (25µm) Appropriate product: SFB-16RO-OBL20-25 DWES Reference Catalog Code W3085

Case (B) He-Ne laser 05-LHP-171 Beam diameter (1/e²) 1.02mm Objective lens OBL-10 focal length 16.56mm

⇒ Pinhole of choice is PA-25 (25µm) Appropriate product: SFB-16RO-OBL10-25 > ™EB Recorded | Catalog Code W3085

Results

	Laser Incident	Objective Lens	Calculation Results	Pinhole
	Beam Diameter d	Focal Length f	A	Diameter (selected)
	[mm]	[mm]	[µm]	[µm]
Case (A)	0.6	9.00	24.2	25
Case (B)	1,0	16.56	26.7	25

Wavelength used 632.8nm

Notes

The above calculation results are for when the distance between the laser and the objective lens is short. The longer the distance between the laser and the objective lens, the larger the incident beam diameter becomes due to divergence of the laser beam.

The focus spot diameter decreases in inverse proportion to the increase in the incident beam diameter.

Thus a pinhole of smaller size needs to be selected. Incident beam diameter can be calculated with the formula shown on the right.

$d=d_h+\alpha \times L$

Laser output beam diameter (Diameter, $1/e^2$): d_h Laser beam divergence (full angle): α Distance from laser to objective lens: L

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Others Fiber Spatial filters eliminate distorted laser wavefronts and noise to emit clean spherical waves for beams. Used in optical systems such as interferometers and holograms where wavefront quality is critical.



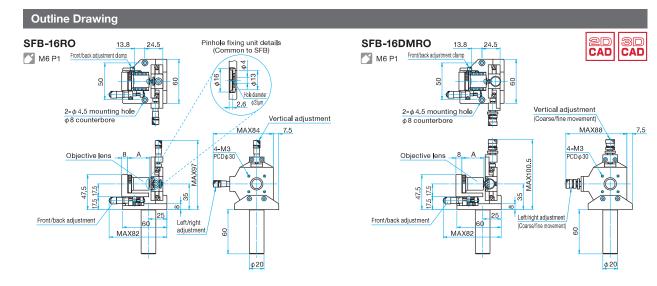
- A well corrected achromat in the output beam of the spatial filter can be used to collimate the filtered beam.
- The translation stage and two-axis pinhole allows the light through the objective lens to have good reproducibility..
- Designed with an emphasis on stability, beam movement during adjustment is minimal.
- A PA-25 (hole diameter 25µm) pinhole is included. Pinholes can be changed to match the diameter of the laser spot.
- A Coarse/fine pinhole adjustment (SFB-16DMRO) is also available.
- To meet a variety of requirements, the mounting position of the objective lens can be changed, allowing objective lenses with different magnifications to be used.

Guide

- SFB-16RO-N and SFB-16DMRO-N, which are postless spatial filters are also available.
- ▶ Pinholes can be replaced with different diameter pinholes.Pinhole diameters can be specified at the time of purchase. When changing pinhole diameter, change the number "-25" at the end of the part number to the desired pinhole size in microns.
- ▶ Post length can be changed by specifying the post length when you place an order. We may charge the difference in price depending on the length. Contact our Sales Division for more information.

Attention

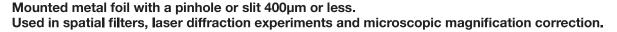
- ► The type of objective lens and pin hole diameter depends on laser wavelength and incident beam diameter. Reference C059
- Our Sales Division will glady help you choose the correct combina-
- ▶The unstamped side of the pinhole should touch the retaining ring side. The pinhole wmaybe not work correctly if mounted incorrectly.
- We do not recommend using spatial filters for high-power lasers, pulsed lasers, or ultraviolet lasers.Lasers in the near infrared region will have poor transmittance.
- ▶ Objectives should be unscrewed before swapping out pinholes.



Micrometer		l: Steel, Aluminum ack Chrome, Blac							
Part Number	Objective Lens		s Compatible Incidence Beam diameter (1/e²) [mm]	Pinhole Diameter [µm]	Pinho l e XY Adjustment Range [mm]	Objective Lens Front and Back Adjustment Range [mm]	Pinhole XY Scale MIN Reading [mm/DIV]	Objective Lens Front and Back Scale MIN Reading [mm/DIV]	Weight [kg]
SFB-16RO-OBL10-25	OBL-10	30.5	φ1.0	φ25	±2	±3	0.01	0.01	0.56
SFB-16RO-OBL20-25	OBL-20	35.2	ϕ 0.6	φ25	±2	±3	0.01	0.01	0.56
SFB-16RO-OBL40-25	OBL-40	36.4	φ0 . 3	φ25	±2	±3	0.01	0.01	0.56

Coarse/Fine Movement Primary material: Ste										: Anodized
Part Number	Objective Lens		s Compatible Incidence Beam Diameter (1/e²) [mm]	Pinhole Diameter [µm]	Pinhole XY Adjustment Range [mm]	Objective Lens Front and Back Adjustment Range [mm]	Pinhole XY Coarse Resolution [mm/rotation]	Pinhole XY Scale MIN Reading [mm/DIV]	Objective Lens Front and Back Scale MIN Reading [mm/DIV]	Weight [kg]
SFB-16DMRO-OBL10-25	OBL-10	30.5	φ1.0	φ25	±2	±3	0.5	0,0025	0.01	0.6
SFB-16DMRO-OBL20-25	OBL-20	35.2	φ0.6	φ25	±2	±3	0.5	0.0025	0.01	0.6
SFB-16DMRO-OBL40-25	OBL-40	36.4	φ0.3	φ25	±2	±3	0.5	0.0025	0.01	0.6





- A precision etching process creates holes with high circularity and slits with high parallelism.
- For YAG lasers (1064nm) and CO₂ lasers (10.6µm), pinholes made of high copper coated with gold should be used.
- Pinholes and slits are pre-mounted in aluminum frames for ease of handling and mounting.



Guid	e
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- Contact our Sales Division to purchase unmounted pinholes or slits.
- \blacktriangleright When an aperture ϕ 1mm or above is required, use an iris diaphragm (IH). Reference C063
- ▶ Custom pinholes can be made to order.

Common Specifications							
Part Number	PA	PA-HEL	FSL				
Hole Geometry	Perfect circle	Perfect circle	Slit				
Pinhole Material	Nickel	Copper	Nickel				
Foil Thickness [µm]	20±5	20±5	20±5				
Pinhole Finish	None	Gold coat (both faces)	None				
Damage Threshold (reference)	_	50MW/cm ² (@700nm)	_				
Wavelength Used	Any	700nm – 10 . 6μm	Any				
Frame Material	Aluminum						
Frame Finish	Black Anodized						

Attention

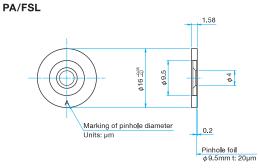
- ▶ Dust can obstruct the light through a pinhole. Use and optic bulb blower to remove the dust. Canned air may break tear the foil.
- ▶ Take care when handling unmounted pinholes. The foil is thin and fragile.
- The holes and slits are only visible under high magnification.
- For fixed slits, when the number that represents the width of the slit is at the bottom, the long side of the slit is oriented in the horizontal direction.
- ▶ Pinholes can be damaged if the laser power is higher than the laser damage threshold.



Perfect circle		
Part Number	Pinhole Diameter [µm]	Weight [kg]
PA-1	φ1 ⁺¹ ₋₀	0.001
PA-2	φ2±1	0.001
PA-5	φ5±2	0.001
PA-10	φ10±2	0.001
PA-15	φ15±2	0.001
PA-20	φ20±2	0.001
PA-25	φ25±3	0.001
PA-30	φ30±3	0.001
PA-40	φ40±3	0.001
PA-50	φ50±4	0.001
PA-100	φ100±5	0.001
PA-200	φ200±6	0.001
PA-400	φ400±8	0.001

Perfect Circle for High Energy Laser						
Part Number	Pinhole Diameter [µm]	Weight [kg]				
PA-5HEL	φ5±2	0.001				
PA-10HEL	φ10±2	0.001				
PA-15HEL	φ15±2	0.001				
PA-25HEL	φ25±3	0.001				
PA-50HEL	φ50±4	0.001				
PA-100HEL	φ100±4	0.001				
PA-200HEL	φ200±6	0.001				

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Slit			
Part Number	Slit Width [µm]	Length [mm]	Weight [kg]
FSL-5	5±2	3	0.001
FSL-10	10±2	3	0.001
FSL-25	25±3	3	0.001
FSL-50	50±4	3	0.001
FSL-100	100±5	3	0.001
FSL-150	150±5	3	0.001
FSL-200	200±6	3	0.001

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Two-axis Pinhole/Objective Holders

TAT



Two-axis mounts for precision pinholes (PA) or precision air slits (FSL). Microscope objectives can be mounted when the TAT-18OA adapters are used.

- The ball guide design allows for fine adjustment and travel.
- Two types of adjusters are available. The standard micrometer (TAT-16, TAT-16RO) allows smooth adjustment down to a few microns. The differential micrometer (TAT-16DM, TAT-16DMRO) has submicron resolution.
- A unique two-axis integrated guide makes the body only 16mm thick. Lenses can be placed close to the front and back for the pinholes.
- Two-axis pinhole/objective holders have φ9mm transmission diameter. Contact our Sales Division if you need custom pinhole mounts.



Guide

- ▶ Fiber optics holders (FOP) with integrated optical fiber receptacles (FC connector, SMA connector) are also available.

 Reference CO76
- ► TAT-30 has a large transmission diameter. Simplified pinhole holders (AH-1) are also available. ► WEB Reference Catalog Code W4514

Attention

- ▶ Pinholes (PA) are sold seperately from TAT holders. Reference C061
- ▶ Retaining rings are included with TAT holders .Adapters for pinholes are not required.
- ▶ If you need a post, purchase a part that ends in -RO.

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Outline Drawing TAT-16 Hexagon socket head cap screw M6x12...1 screw Hexagonal socket head cap screw M4x10...2 screws, Accessory: Retaining ring TAT-16DM Hexagon socket head cap screw M6x12...1 screw Hexagonal socket head cap screw M4x10...2 screws, Accessory: Retaining ring CAD Pinhole mount enlarged view (Common to TAT) 4 Pinhole φ13 PCDa 30 4-M3 depth ■TAT-16 Series Objective Lens Adapters TAT-18OA Hexagon socket head cap screw M3×8...4 screws TAT-16RO M6 P1, Accessory: Retaining ring TAT-16DMRO M6 P1, Accessory: Retaining ring 4-φ3.5 φ6 counterb PCDφ30 P0 706

Specifications					y material: Iron Super Black Chrome
Part Number	Pinhole XY Adjustment Range [mm]	Coarse Resolution [mm/Rotation]	Fine Resolution [mm/Rotation]	Scale MIN Reading [mm/DIV]	Weight [kg]
TAT-16	±2	0.5	_	0.01	0.26
TAT-16RO	±2	0.5	–	0.01	0.32
TAT-16DM	±2	0.5	0.05	0.0025	0.30
TAT-16DMRO	±2	0.5	0.05	0.0025	0.36

Objective Lens Adapt	ers		Primary material: Aluminum Finish: Black Anodized
Part Number	Compatible Holders	Compatible Objective Lenses	Weight [kg]
TAT-18OA	TAT-16 series	OBL, EPL, EPLE	0.02

Catalog W4039

Iris diaphragm holders that can change the aperture size without changing the center of the aperture. Can be used to change the depth of field in imaging systems.

And passing necessary laser beam while blocking optical feedback or stray light in laser experiments.

- You can change the aperture diameter by loosening the adjustment lever and moving it from side to side.
- The scale provides an estimate on the aperture diameter.



Guide

- ▶Unmounted iris diaphragms (IDC/IH) can be purchased. C064
- Post length can be changed by specifying the post length when you place an order. We may charge the difference in price depending on the length. Contact our Sales Division for more information.

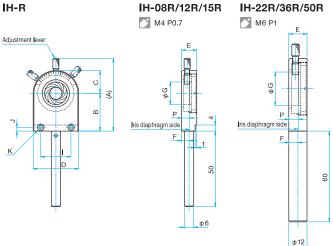
Attention

- ▶ Take care when adjusting the lever and handling the iris diaph-
- These parts are not recommended for high power lasers. The heat from the lasers may cause the blades to seize. (recommended max power: CW 500mW or less, pulse 30mJ or less).
- ▶ The scale is only a rough guide. There is considerable backlash due to the structure of the iris diaphragm. There may be a difference between the hole diameter of iris diaphragm and the scale.
- ▶The iris diaphragm is a very delicate mechanism.Do not push or pull





Outline Drawing

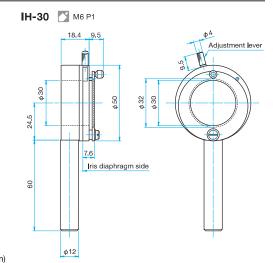


Part Number	А	В	С	D	Е	F	MAX Aperture Diameter φG	1	J	К	Р
IH-08R	38.5	20	10	20	10	4.7	φ8	15	2.5	2-φ2.4 mounting hole, φ4.2 counterbore	4.9
IH-12R	41	20	12.5	25	10	5.3	φ12	20	2.5	2-φ2.4 mounting hole, φ4.2 counterbore	5.2
IH-15R	48	25	15	30	10	5	φ15	20	2.5	2-φ2.4 mounting hole, φ4.2 counterbore	5.2
IH-22R	57.5	30	19	38	12	6	φ22	28	10	2-φ4.5 mounting hole, φ8 counterbore	6.2
IH-36R	75	35	30	60	12	6.4	φ36	44	10	2-φ4.5 mounting hole, φ8 counterbore	6.9
IH-50R	95	45	40	80	14	7.4	φ50	60	10	2-φ4.5 mounting hole, φ8 counterbore	7.9

φ6											
										φ12 (Units:	mm)
Part Number	А	В	С	D	Е	F	MAX Aperture Diameter φG	1	J	К	Р
IH-08R	38.5	20	10	20	10	4.7	φ8	15	2.5	2-φ2.4 mounting hole, φ4.2 counterbore	4.9
IH-12R	41	20	12.5	25	10	5.3	φ12	20	2.5	2-φ2.4 mounting hole, φ4.2 counterbore	5.2
IH-15R	48	25	15	30	10	5	φ15	20	2.5	2-φ2.4 mounting hole, φ4.2 counterbore	5.2
IH-22R	57.5	30	19	38	12	6	φ22	28	10	2-φ4.5 mounting hole, φ8 counterbore	6.2
IH-36R	75	35	30	60	12	6.4	φ36	44	10	2-φ4.5 mounting hole, φ8 counterbore	6.9
IH-50R	95	45	40	80	14	7.4	φ50	60	10	2-φ4.5 mounting hole, φ8 counterbore	7.9

φ8 – φ50			Primary material: Aluminum Finish: Black Anodized		
Part Number	Options specified*	Aperture MAX [mm]	Diameter MIN [mm]	Weight [kg]	
IH-08R	N	φ8	ϕ 0.7	0.03	
IH-12R	N	φ12	ϕ 0.8	0.03	
IH-15R	N	φ15	ϕ 0.9	0.09	
IH-22R	N/EE/UU	φ22	ϕ 0.9	0.10	
IH-36R	N/EE/UU	φ36	φ1.3	0.15	
IH-50R	N/EE/UU	φ50	φ1.5	0.20	

For specifying options, please refer to "Conversion of Posts, Post Holders and Pedestal Bases of Holders". Reference C007



φ30		Primary material: Aluminum Finish: Black Anodized		
	Aperture	Diameter	Weight	
Part Number	MAX [mm]	MIN [mm]	[kg]	
IH-30	φ30	φ1	0.12	

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Iris Diaphragm

IDC/IH-30N



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Iris diaphragm holders that can change the aperture size without changing the center of the aperture. Primarily used in the limited spaces of optical instruments to set an aperture size.

- Unmounted iris diaphgrams are ideal for OEM applications or for use when space is a premium.
- The IDC series's thinness allows optics to be placed closed to each other..
- The adjustment lever also functions as a lock to fix the aperture diameter.



Guide

- ▶Iris diaphragm holders (IH-30/IH-R) which can be fixed to the post holder are also available. Reference C063
- Fixed pinholes (PA) with hole diameter 400µm or less are also available.

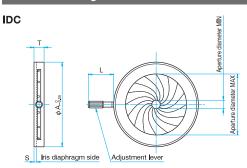
Attention

- ▶ Take care when adjusting the lever and handling the iris diaphgragms.
- ▶ The iris diaphragm is a very delicate mechanism. Do not push or pull on the blades.
- ▶ These parts are not recommended for high power lasers. The heat from the lasers may cause the blades to seize. (recommended max power: CW 500mW or less, pulse 30mJ or less).
- The iris diaphragm does not have a scale. Use the iris diaphragm holder when a scale is needed.



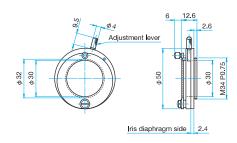


Outline Drawing



Part Number	φA [mm]	T [mm]	L [mm]	S [mm]
IDC-000	φ14.8	4.5	11	1.30
IDC-001	φ19.8	5	11	1.25
IDC-003	φ24	5	11	1.45
IDC-009	φ33	5.5	11	1.43
IDC-017	φ50	6	15	1.60
IDC-025	φ70	7.5	15	2.05

IH-30N



φ8 – φ50			Primary mate Finish: B l ack	erial: Aluminum Anodized
Part Number	Aperture MAX [mm]	Diameter MIN [mm]	Number of Blades [blades]	Weight [kg]
IDC-000	φ8	ϕ 0.7	9	0.003
IDC-001	φ12	φ0 . 8	11	0.005
IDC-003	φ15	φ0 . 9	12	0.007
IDC-009	φ22	φ0.9	14	0.012
IDC-017	φ36	φ1.3	16	0.024
IDC-025	φ50	φ1.5	16	0.062

φ30			Primary mate Finish: B l ack	erial: Aluminum Anodized
Part Number	Aperture MAX [mm]	Diameter MIN [mm]	Number of Blades [blades]	Weight [kg]
IH-30N	ϕ 30	φ1	10	0.03



Typical uses include spectrophotometers, Schlieren optical systems and diffraction experiments.

- A precision positioning mechanism keeps the blades straight and parallel with minimum incremental motion on the order of tens of microns.
- Two types are available. The PSL-0 is intended for ultraviolet, visible and infrared radiation. The SLX-1 is intended for use with X-rays and has tantalum blades to efficiently block X-rays.
- The PSL-0 moves the blades left and right simultaneously, enabling adjustment of slit width without changing the center position of the slit.
- The SLX-1 moves the blades independently, left and right, or up and down, thus enabling change of slit position and rectangular shape.

The slit length on the PSL-0 is adjusted by sliding the adjustment plate.



Guide

- A micrometer version (PSL-2) that allows adjustment of slit width in increments of less than 10 microns is also available. WEB Reference Catalog Code W4515
- ▶ Post length can be changed by specifying the post length when you place an order. We may charge the difference in price depending on the length. Contact our Sales Division for more information.

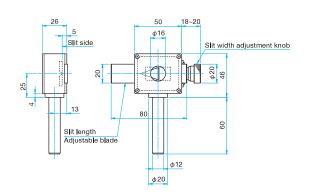
Attention

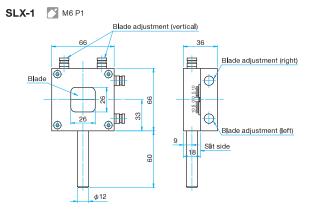
▶ High power lasers may damage the blades. Contact our sales team for custom applications.



Outline Drawing

PSL-0 M6 P1





For UV/Visible	/IR				Primary materia l : A Finish: B l ack Anod	luminum, Brass ized, Chrome Plated
Part Number	Options specified*	Blade Material	Slit Width Variable Range [mm]	Slit Width Scale MIN Reading [µm/DIV]	Slit Length Variable Range [mm]	Weight [kg]
PSL-0	EE/UU	Stainless steel (No Finish)	0 – 4	20	0 – 12	0.24

^{*} For specifying options, please refer to "Conversion of Posts, Post Holders and Pedestal Bases of Holders". Reference C007

For X-ray						materia : A uminum Vhite A umite
Part Number	Options specified*	Blade Material	X-ray Resistance [keV/cm²]	Blade Variable Range [mm]	Blade Position Scale MIN Reading [µm/DIV]	Weight [kg]
SLX-1	UU	Tantalum (No Finish)	300	0 – 10	10	0.52

^{*} For specifying options, please refer to "Conversion of Posts, Post Holders and Pedestal Bases of Holders". Reference 2007

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ing color filters.



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This holder mounts several filters in a turret allowing different filters to be placed into the optical path by rotating the turret. It can also be used for adjusting the transmitted light intensity by switching ND filters of different transmittance, or for switching transmitted wavelength by mount-

- Two types are available. The NDWH-15S has a single turret that holds six filters. The NDWH-15W has two turrets that hold six filters each.
- ◆ Each type is also available with either a fixed base (NDWH-15S/NDWH-15W) or mounted on a post (NDWH-15SRO/ NDWH-15WRO).
- The turret has an index every 30 degrees (point where rotation stops). Using this index, the filter can be located at the positions 0 degrees, 30 degrees, 60 degrees, and 90 degrees.



Guide

- ▶ The filter wheels do not include ND filters. Select from among the ND filters (AND-15C/FND-15C02).
- WEB Reference Catalog Code W3093, WEB Ref rence Catalog Code W3098
- Rotating Variable Reflective ND Filter Holders (NDHN) to continuously change transmitted light intensity are also available. ence Catalog Code W3101
- Post length can be changed for NDWH-15SRO and NDWH-15WRO. If the length of post is specified at the time of purchase, this product will be delivered with the specified length post.
- We may charge the difference in price depending on the length. Contact our Sales Division for more information
- Filter wheels for 25.4mm diameter filters are also available. WEB Reference Catalog Code W4042

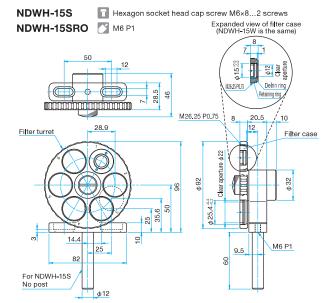
Attention

- ▶In the case of the lowest filter of the lens turret, the strut of the holder interferes and light cannot pass through. Except for this position, all the indexes let light pass through.
- Special tools are required when removing the filter case. When using a ϕ 25.4mm filter after removing the filter case, a retaining ring (NR-25.4) is required. Please contact our International Sales Division for more information.
- It is necessary to mount post types with offset for the optical axis. The amount of offset will vary depending on the position of lens turret

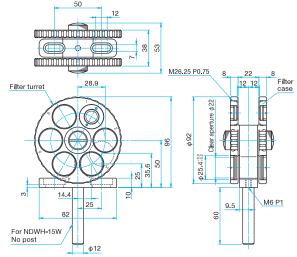




Outline Drawing



NDWH-15W Hexagon socket head cap screw M6×8...2 screws NDWH-15WRO M6 P1



Specifications				Primary material: Aluminum Finish: Black Anodized
Part Number	Compatible Optics Diameter [mm]	Compatible Optics Max Thickness [mm]	Max Number of Mounts [Units]	Weight [kg]
NDWH-15S	φ15	3	6	0.2
NDWH-15SRO	φ15	3	6	0,26
NDWH-15W	φ15	3	12	0.34
NDWH-15WRO	φ15	3	12	0.4





Holders for transmissive optics that do not require optical alignment such as ND filters and color filters. Designed to accommodate different thicknesses and make it easy to change filters.

- Available in a variety of sizes and clamping methods.
- Filter holders can be used with both round filters and rectangular filters. (Note, the FH-10 can only be used with round filters.)
- FH-25 and FH-50 are ideally suited for fine intensity adjustment and transmitted wavelength adjustment because these can hold several filters simultaneously.



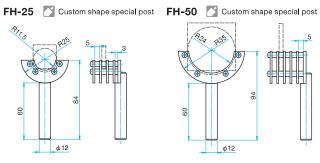
Guide

- ▶ The FH-10 utilizes two spring loaded knobs to hold the filter. This maximizes the clear aperture available while providing a secure clamping force.
- ▶ The FHS-25 and FHS-50 have spring clips to make changing the filter easy while still holding the filter securely.
- ▶ The FH-25 and FH-50 have no clamping mechanism, but provide a rack to hold multiple filters, making it easy to combine multiple filters and quickly change them. Contact our sales team regarding increasing the capacity of these filter racks.
- ▶ The supplied post length can be changed. If the length of post is specified at the time of purchase, this product will be delivered after replacing posts.
- ▶ To insure that the filters remain square to the optical axis in the FH-25 and FH-50 mounts, we recommend framed ND filters (MAN, MFND) which are ND filters of various transmittances fitted with filter adapters (FAD) are also available.

WEB Reference Catalog Code W3094, WEB Reference Catalog Code W3098

Attention

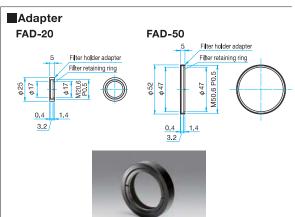
▶ Because the posts for FH-25 and FH-50 have a special shape, they cannot be replaced with standard posts (RO-**-**). Contact our International Sales Division regarding different length posts.



Filter Holders					
Part Number	Options specified*	Dimensions	ible Optics Thickness	MAX Number of filter [Units]	Weight [kg]
FHS-25	N/EE/UU	[mm] φ25, □25	[mm] 0 – 5	1	0.06
FHS-50	N/EE/UU	φ50, <u>□</u> 50	0 – 5	1	0.08
FH-10	N	φ10 – φ20	0 – 3	2	0.02
FH-25	_	φ25, □25	0 - 3 (MAX three units) 0- 5	4	0.10
FH-50	_	φ50 – φ52 □50	0 – 5	5	0.11

^{*} For specifying options, please refer to "Conversion of Posts, Post Holders and Pedestal Bases of Holders".

Golderons CO07



Adapter			Primary material: Aluminum Finish: Black Anodized		
	Compatil	Compatible Optics			
Part Number	Diameter [mm]	Thickness [mm]	Weight [kg]		
FAD-20	φ20	0 – 3	0.01		
FAD-50	φ50	0 – 3	0.01		

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SSH-CRA



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SSH RoHS Catalog W4045



These electromagnetic shutters are intended for applications including remote on/off of laser light and for timed exposures.

Requires dedicated shutter controller (SSH-C2B) and cable (SSH-CA2-LOAA) for operation.

- ullet SSH-S is intended for small diameter laser beams (ϕ 4mm or less) while SSH-25RA is intended for use with large diameter imaging lens systems (ϕ 24mm or less).
- Typical applications include holography, exposure of photosensitive materials and as safety measures of laser optical systems.
- By removing the post, the shutters can be installed directly on a baseplate with M3 threads.
- Shutters can be operated with a PC via the two-axis shutter controller (SSH-C2B).

Guide

▶ Post length can be changed by specifying the post length when you place an order. We may charge the difference in price depending on the length. Contact our Sales Division for more information.

Attention

- Automatic shutters cannot be used with high power lasers or high power pulse lasers. Please use high power laser shutters (SHPS).
- ▶ Please always use these automatic shutters with the dedicated controller. Otherwise, these shutters may not operate properly.
- ▶SSH-25RA cannot operate with the old type shutter controllers (SSH-C4B, SSH-C1R). SSH-S can operate with SSH-C4B.
- ▶ These shutters and controllers do not come with cables.
- ▶ Please order the dedicated cables along with them.

Outline Drawing	
41 SSH-S M6 P1 70 42-\$\phi 32\$ Mounting hole with the second	SSH-25RA 40 4-03.5 mounting hole get counterbore (2) 80 33.5 Cable insertion & 40 4-03.5 (2) 80 4-03.5 (2) 80 4-03.5 (2) 80 4-03.5 (3) 4-03.5 (4) 4-03.5 (5) 4-03.5 (6) counterbore
\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Caple insertion of the control of th

Specifications			Primary material: Alu Finish: Black anodize	minum ed (Finish of blades of SSH-25l	RA-W Shutter : None)
Part Number	Shutter Type	Aperture Diameter [mm]	Compatible Controller	Shutter Speed [s]	Weight [kg]
SSH-S	Solenoid	φ8	SSH-C2B	about 0.7 -	0.28
SSH-25RA	Blades type (Black)	105	SSH-C2B	0.1 –	0.5
SSH-25RA-W	Blades type (Black)	φ25	SSH-C1RA, SSH-C4RA	0.1 -	0.5

SSH-CRA

RoHS Catalog W4120



Controller for driving the SSH-RA series electromagnetic shutters.

- Shutters can be manually opened and closed using the shutter buttons on the controller body.
- Shutters can also be opened and closed using a TTL signal from an external controller.
- 4-axis shutter controller (SSH-C4RA) can independently control up to four shutters.

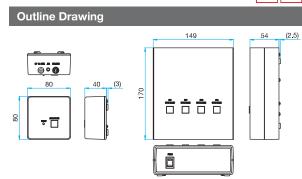
2D CAD

Guide

- Controller does not include a shutter. Compatible only with SSH-RA series auto-blade shutters.
- ▶ Cable to connect the controller and the shutter is not included. Use the dedicated cable (SSH-CA2-LORA). Reference C069
- ▶ If timer functions are required, we recommend using the SSH-C2B shutter controller. Reference C069
- controllers come with AC adapter(DC5V) and 3.5mm Stereo mini plug (for TTL)

Attention

- ▶ This shutter controller is only compatible with the SSH-RA series.
- ▶ Please do not connect to any electromagnetic shutter other than SSH-RA series.
 - Due to differences in the electrical driving characteristics, other shutters can be damaged.
- ▶ Please contact our sales team for TTL cable to be connected to an external device.
- In SSH-C1RA and SSH-C1RA-H, the logic of TTL connecting to external equipment is inverted. If you need the shutter controller SSH-C4RA with TTL logic inverted, please contact our Sales Division.



Specification	Specifications			Primary material: Aluminum Finish: Black anodized		
Part Number	Controllable Number of Units [unit]	Compatible Shutters	External input Signal (TTL)	Power Source [V]	Power consumption [VA]	Weight [kg]
SSH-C4RA	4	SSH-RA	Open/Close:0/5V	DC5	1	0.45
SSH-C1RA	1	SSH-RA	Open/Close:0/5V	DC5	0.25	0.07
SSH-C1RA-H	1	BSH2	Open/Close:5/0V	DC5	0.25	0.07







Controllers for driving SSH electromagnetic shutters. Can operate two electromagnetic shutters of different types concurrently.

- Controller can control the SSH-R (old blade type), SHPS (for high-power laser), and BSH2 (for bio) shutters in addition to SSH-25RA and SSH-S.
- Shutter speed, delay time, and repeat count is set using the front panel control knob.
- Sample software is available for shutter control and changing various settings using a PC.
- Controller allows registration of control signals (up to three types) for unknown mechanical electromagnetic shutters (only those for which control signal formats are released), and can close and open the shutters according to their performance. (Please check the instruction manual and make sure that setting of control signals is possible before use.)



Guide

▶USB cables (USB-2) and RS232C cables (RS232C/STR-3) are available to connect to a PC. WEB Reference Catalog Code W9053

Attention

- ▶ This shutter controller does not come with cables. Check the shutter specification and select the appropriate cable.
- If the shutter connected to the controller is different from the shutter type selected on the controller, shutter will not operate
- To use a shutter other than Opto Sigma shutters, please set the appropriate voltage and pulse time. Incorrect settings may damage



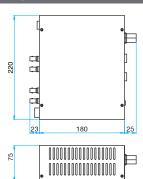


Shutter Controller	
Part Number	SSH-C2B
Controllable Number of Units	2ch
Power Source	DC24V
Power consumption	120VA
Operating temperature	5 – 40°C
Functions	Shutter type switching TIMER/BULB mode switching External signal polarity switching Timer setting Number of times of opening and closing integration
Shutter Control Voltage *1	5V – 24V
Shutter control current *2	each CH 0.5A (current limit 1A)
Shutter Speed	0.2ms - 99990s
Delay Time	0.1ms - 999.9ms
External input	0 - 5V Input 2ch, Interlock contact input
External output	0 - 5V Output 2ch
Interface	RS232C (D-sub 9 pin female), USB, (TTL)
Display	LCD (with white backlight)
Accessories	AC Adapter (DC24V), Interlock connector

¹ The voltage range of control signals that can be set when an unknown shutter is used.

Outline Drawing







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Shutter Cable			
Product Name	Shutter Cable for SSH-25RA	Shutter Cable for SSH-S	Extension cable for shutter
Part Number	SSH-CA2-LORA	SSH-CA2-LOAA	SSH-CA2-LOAB
Cable Length [m]	2	2	2
Connector (controller side)	One-touch lock type plug (4-pin male)	One-touch lock type plug (4-pin male)	One-touch lock type plug (4-pin male)
Connector (shutter side)	One-touch lock type Round plug (4-pin male)	One-touch lock type plug (4-pin male)	One-touch lock type Cable with socket (4-pin female)

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^{*2} The current is determined depending on the resistance value of the electromagnetic shutter to be connected.



Square Plate Holders Camera Holders

KMH CMH

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RoHS Catalog W4047

Holders for square plates such as flare plates (BBP), test targets and square filters.

• Designed to gently hold glass plates, the holder include a soft cork lined back plate and resin tipped clamping screws.



Specifica	tions		Primary material: Aluminum Finish: Black Anodized		
Part Number	Options specified*	Compatible Optics Dimensions [mm]	Compatible Optics Thickness [mm]	Weight [kg]	
KMH-30	N/EE/UU	□10 – □45	3 – 5	0.08	
KMH-80	N/EE/UU	□45 – □100	1 – 7	0.11	
KMH-150	N	□100 – □180	6 – 17	0.38	

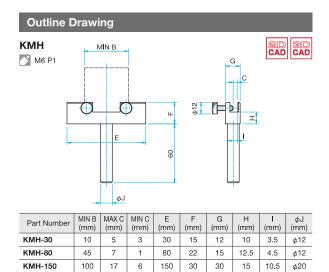
^{*} For specifying options, please refer to "Conversion of Posts, Post Holders and Pedestal Bases of Holders". Gerence C007

Guide

- ▶ Use the sliding cylindrical lens holder (CHA) to hold rectangular lenses. Reference CO48
- ▶ Post length can be changed by specifying the post length when you place an order. We may charge the difference in price depending on the length. Contact our Sales Division for more information.

Attention

▶ Glass can break if screws are over tightened.



CMH



Post mounted ball head camera mount. Allows cameras with standard 1/4-20 mounting holes to be used on an optical breadboard.

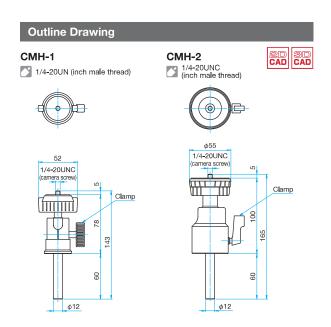
- Loosen the clamp to freely position the camera, and tighten the clamp to lock in place.
- These platforms can mount any camera because they use the mounting screw standard commonly used for cameras.
- Posts with 1/4-20 screws can be directly attached to cameras for applications where tilt adjustment is not needed.

 WEB Reference GRADOS GOOD W6052



Specification	าร	Primary material: Aluminun Finish: Black Anodized		
Part Number	Options specified*	MAX Load Capacity [N]	Weight [kg]	
CMH-1	N	29.5 (about 3kgf)	0.17	
CMH-2	N	40 (about 4kgf)	0.34	

^{*} For specifying options, please refer to "Conversion of Posts, Post Holders and Pedestal Bases of Holders". Reference C007





Light shields can be used to block stray light in laser experiments and can also be used as viewing screens for interferometers or other setups requiring a projection screen.

- BBP-2505B includes a measurment scale to allow easy adjustment of the height of the optical axis of laser beam.
- BBP-3130B can block light in a wide area.
- BBP-2505B and BBP-3130B include magnet bases.
- BBP-200 has a white matte finish for use as a viewing screen.





Guide

▶ The Square Optics Holder (KMH-80) can be used to hold the BBP-200.

Attention

BBP-200

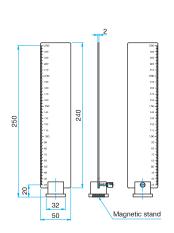
▶ Be sure to wear laser safety goggles. When high-power laser or high energy pulsed laser strike these surfaces, there is a potential for scattered light to be directed to the



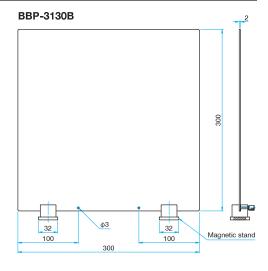
Outline Drawing

200

200



BBP-2505B



Specifications		Primary materia l : A l ur Finish: Clear anodize	Primary material: Aluminum Finish: Clear anodize (BBP-200 only), Black anodize		
Part Number	Accessory	Scale	Weight [kg]		
BBP-200	_	_	0.32		
BBP-2505B	Magnetic stand (1pc)	Both sides	0.18		
BBP-3130B	Magnetic stand (2pcs)	_	0.70		

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Fiber

RoHS Catalog W4049

Fixtures used for optical axis adjustment of non-visible lasers. Insert IR sensor cards or van paper in the path using the spring clips, rotate cross wires into the laser light to confirm the positional relationship of the shadow of beam and cross wire.

- The cross wires are retractable and are placed in the center of posts to enable good repeatability.
- If two target holders are placed leaving an interval, they can be used as a laser beam tilt adjustment jig.



Specifica	ations	Primary material: Aluminum Finish: Black Anodized		
Part Number	Options specified*	Clear Aperture [mm]	MAX Holding Thickness [mm]	Weight [kg]
TGH-30	N/UU	φ30	3	0.09

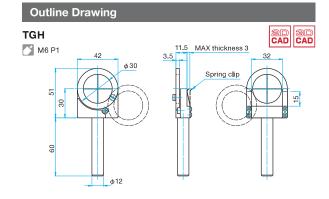
^{*} For specifying options, please refer to "Conversion of Posts, Post Holders and Pedestal Bases of Holders". [Glaceroto] C007

Guide

▶ Iris diaphragm (IH) convenient for visible light lasers is also available. rence C063

Attention

▶ Use IR sensor cards with large light receiving surface. Card type IR/UV sensors (SIRC-1 or SUVC-1) cannot be used.



BD

RoHS Catalog W4050

Beam Dumps safely terminate the beam of high-power lasers and high energy pulse lasers. The laser light is scattered and absorbed in the beam dump and converted into heat.

- Because the incident laser beam is scattered onto a conical surface, the light scatter back to the incident side can be greatly attenuated.
- BD-40 for small beam diameter (φ5mm or less) and BD-80 for large diameter beams (φ30mm or less) are available.

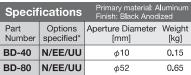


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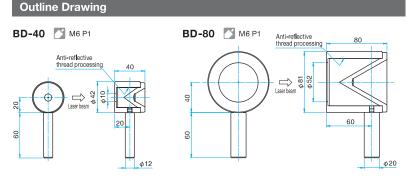
▶ High-power laser shutters (SHPS) combining optical path switching shutter and beam diffuser are available. Catalog Code W4110

Attention

- ▶When used with a high-power laser, the beam diffuser might become quite warm. Be careful not to touch the beam diffuser directly.
- ▶ When used with a high energy pulse laser, the finish of the conical surface may be lost. The volume of scattering will increase somewhat, but as long as the conical shape is not changed, the beam diffuser will maintain performance.
- ▶ When a repeatedly oscillating high energy pulse laser irradiates the beam diffuser, the beam diffuser sometimes makes a sound like it is striking metal. This is due to the shock wave produced when the laser changes to heat on a metallic surface, not damage on the beam diffuser.



For specifying options, please refer to "Conversion of Posts, Post Holders and Pedestal Bases C007



Fiber Optics Mounts | FOM



Fiber holders equipped with an adjustment mechanism for three axes including vertical, horizontal and focus direction. These holders can handle fibers with various connectors by replacing adapters.

- The large slit on the adapter cylinder enables connection of various fiber connectors inside the adapter cylinder.
- It is capable of rotating the polarizing axis of a polarization-preserving fiber for 360 degrees. (See Attention)
- The focus adjustment lever of the 3-axis holder can move the tip of a fiber in the optical axis direction.
- Each adjustment mechanism of the 3-axis holder has a clamp mechanism to fix adjustment positions.
- Adapters compatible with the FC, SMA, and ST connectors of various fibers are available.



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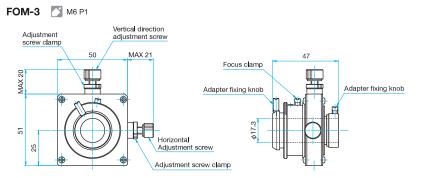
Fiber holders equipped with tilt and rotational adjustment mechanisms (FOP-2, FOP-2-SMA) are also available.

Attention

- ▶ Rotating the fiber chuck can cause displacement of the fiber core in the \boldsymbol{X} and \boldsymbol{Y} directions. When turning the chuck, fine adjustment of the XY axes of the holder may be required.
- ▶ Pulling a fiber cord hard may cause misalignment of the holder.
- ▶ Readjustment is necessary when the chuck is removed and reinstalled
- ▶ For post mounting please purchase a post (PO) separately.

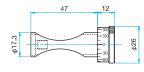


Outline Drawing

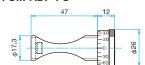




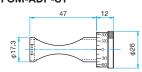
FOM-ADP-SMA



FOM-ADP-FC



FOM-ADP-ST

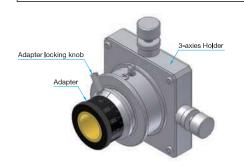


	3-axis Holder	r			Primary material: A Finish: Black Anoc			
	Part Number	Options	Centering Adjustment		Focus Adjustment	Weight		
		specified*	Range [mm]	Resolution [mm/rotation]	Range [mm]	[kg]		
	FOM-3	UU	□2	0.25	±3	0.14		
	* F							

For specifying options, please refer to "Conversion of Posts, Post Holders and Pedestal Bases of Holders" Reference C007

Adapter	Primary material: Brass Finish: None	
Part Number	Compatible Fiber Connecter	Weight [kg]
FOM-ADP-FC	FC	0.05
FOM-ADP-SMA	SMA	0.05
FOM-ADP-ST	ST	0.044

Attaching the adapter



- ①Please connect a fiber connector into the adapter cylinder.
- 2Please insert the adapter into the 3-axis holder, and secure it by using the adapter locking knobs located on both ends of the 3-axis holder.

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Mini-Fiber Optics Holders Adapter for Mini-Fiber Optic

MFH-ADP



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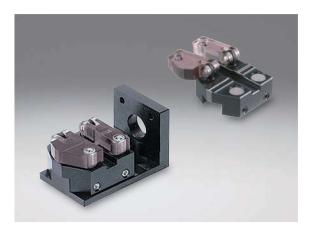
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Fiber

Holders used for holding optical fiber strands of various jacket diameters (coating diameters). By replacing the mounting adapters (MFH-ADP), these holders can mount on various stages in addition to two-axis pinholes/objective holders.

- Using the V groove and the resin clamps, these holders hold the tip of an optical fiber where the coating is removed for approximately 15mm. The V groove and the resin clamps also fix the 900µm jacket right next to the portion to immobilize the optical fiber.
- The resin clamps have built-in magnetizable set bolts, and gently fasten an optical fiber by the magnetic force of the magnets of these fiber holders.
- There is a keyway on the bottom of these holders. The keyway can be installed on the keys of various mounting adapters (MFH-ADP) to slide back and forth. The holders are securely fastened on the mounting adapters with set bolts.



Attention

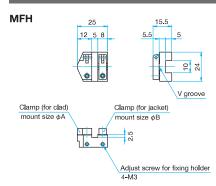
▶ These holders cannot be installed in the fiber alignment systems (DAU). Please contact our International Sales Division for holders for the fiber alignment systems.

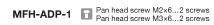


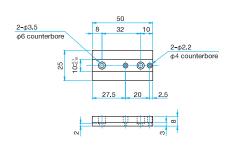




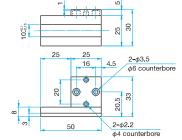
Outline Drawing



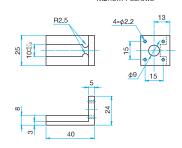








MFH-ADP-3



Holder		Primary material: Aluminum Finish: Black Anodized		
Part Number	Jacket diameter φB [μm]	Cladding diameter φA [μm]	Weight [kg]	
MFH-250	φ150 – φ250	φ60 – φ130	0.03	
MFH-500	φ500	ϕ 125 – ϕ 250	0.03	
MFH-900	φ900	φ125 – φ250	0.03	

Adapter	Primary material: Finish: Black Anc	
Part Number	Overview	Weight [kg]
MFH-ADP-1	For fixing flat surface (M2, M3 counterbored)	0.02
MFH-ADP-2	For fixing perpendicular (M2, M3 counterbored) to convert the 90 ° orientation	0.03
MFH-ADP-3	For fixing perpendicular (M2 counterbored)	0.03



Holders used for securing and adjusting optical fibers with ferrules (fibers before connectors are attached). When used in combination with the adapter for fiber optics holders (OFH-ADP), these holders can hold ϕ 0.3mm to ϕ 4mm ferrules.



Guide

- ▶ Fiber optics holders for FC connectors (FOP) and for SMA connectors (FOP-SMA) are also available. Refere ce C076
- ▶ Post length can be modified for an additional charge. Contact our Sales Division for more information.

- Focus adjustment knob enables collimation adjustment in combination with the lens.
- The OFH-1 two-axis holder allows positioning of optical fibers.
- The OFH-2 four-axis holder adds tip and tilt capability.
- Both OFH-1 and OFH-2 are available with high precision differntial adjusters for more demanding applications.
- Custom sleeves (OFH-ADP) are available to hold ferrules from 0.3mm to 4.0mm diameters.

Two setscrews in the body of the holder clamp the sleeve tight and hold the fiber and sleeve in place.

Attention

- ▶ For information regarding use with single mode fibers, contact our Sales Division.
- ▶ OFH-ADP sleeves are made to order. Contact our Sales Division for delivery times
- ▶ To hold bare fibers without a ferrule, we recommend using the mini-fiber optics holders (MFH). Reference C074

Outline Drawing OFH-1 OFH-2 M4 P0.7 Tapered M4 P0.7 Tapered Horizontal direction adjustment Longitudinal direction adjustment Longitudinal direction $4-\phi 3.5$ Tilt direction adjustment φ12 φ12 Vertical direction OFH-2DM OFH-1DM Vertical directionadjustment M4 P0.7 Tapered Adjustment Rotation direction M4 P0.7 Tapered Horizontal directionadjustment 100 HUT Longitudinal direction Longitudinal direction adjustment 2-M3 Fixing set screw 4-φ3.5 Tilt direction adjustment 19.7 - 22.2 φ12 φ12

Specifications								Primary materi Finish: B l ack A	
Part Number	Centering Adjustment Range [mm]	Adjustm Tilt [°]	nent Range Rotation [°]	Focus Adjustment Range [mm]	Centering Adjustment Resolution [mm/rotation]	Centering Fine Adjustment Resolution [mm/rotation]	Adjustment Tilt [°/rotation]	Resolution Rotation [°/rotation]	Weight [kg]
OFH-1	±1.25			±1.25	0.5	_	_		0.12
OFH-2	±1.25	±2	±2	±1.25	0.5	_	about 0.7	about 0.7	0.15
OFH-1DM	±1.25	_	_	±1.25	0.5	0.05	_	_	0.14
OFH-2DM	±1.25	±2	±2	±1.25	0.5	0.05	about 0.7	about 0.7	0.17

Adapter Sleeve for Fiber Optics Holders | OFH-ADP





Made to order according to the ferrule diameter of your optical fiber. Available with inner diameter between ϕ 0.3 and ϕ 4.0 by 0.1mm increments.

Attention

These adapters are not standard ceramic split sleeve alignment sleeves for ferrules. They are a custom design for this application.

Specification	ns	Finish: None			
Part Number Outer Diameter [mm]		Inner Diameter Inner Diame [mm] MIN unit [mm] [mm]			
OFH-ADP	φ5	ϕ 0.3 – ϕ 4.0	0.1		

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FC Type Fiber Optics Holders | FOP/FOP-DM





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Fiber

Two-axis pinhole style holders for optical fibers with FC connector.

- Two types of actuators are available; the screw type (FOP) provides simple adjustment suitable to multimode fibers, and the coarse/fine screw type (FOP-DM) which is capable of fine adjustment required for single mode fibers.
- The FOP-1 has a two-axis adjustment mechanism.
- The FOP-2 has four axes of adjustment providing tip and tilt as well as Xand Y adjustments.
- The FC receptacles of FC type fiber optics holders can be replaced with the receptacles for SMA type fiber holders (FOP-ADP-SMA) or mini-fiber optics holders (MFH-ADP-3). Reference C074

Guide

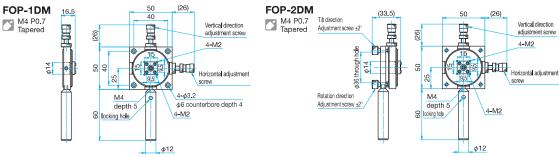
Outline Drawing

- ▶ Two-axis pinholes/objective holders for SMA connectors (FOP-SMA) are also available.
- ▶ We can change the post length. Please specify the post length when you place an order, then we will deliver the product after replacing the post with one with your specified length. Because those fiber optics holders use a special post, replacement of the post is at your expense.
- ▶ These holders will be delivered attached with dummy FC connector. This connector cannot be used for an optical fiber.

Attention

- ▶ The design of the standard FC receptacle includes a stop that the end of the fiber ferrule rests against. This positions the tip of the fiber 1.5mm from the end face of the receptacle. If it is necessary to align the end of the FC ferrule with the end face of the holder, use the connectors for FC type fiber optics (FLAD).
- Detaching and reattaching the fiber will likely result in the fiber needing realignment.

FOP-1 FOP-2 (12.5)M4 P0.7 Tapered Tilt direction M4 P0.7 Tapered (33.5)Adjustment screw ±2' Vertical direction adjustment screv Vertical direction adjustment screv 4-M2 Horizontal adjustment Horizontal adjustment 4-ø3.2 Rotation direction 16.5 φ6 counterbore depth 4 depth 5 depth 2 locking hole 4-M2 Cocking hole φ12 φ12



							Primary material: Aluminum Finish: Black Anodized	
Part Number	Centering Adjustment Range [mm]	Adjustment Range Tilt•Rotation [°]	Centering Adjustment Resolution [mm/rotation]	Centering Fine Adjustment Resolution [mm/rotation]	Micro Indicator Conversion [mm/DIV]	Adjustment Resolution Tilt•Rotation [°/rotation]	Weight [kg]	
FOP-1	±1	_	0.5	_		_	0.14	
FOP-2	±1	±2	0.5	-	_	about 0.7	0.22	
FOP-1DM	±1	_	0.5	0.05	0.0025	_	0.15	
FOP-2DM	±1	±2	0.5	0.05	0.0025	about 0.7	0.24	

Adapters for Ferrule | FOP-ADP/FLAD



FOP-ADP includes a standard FC receptacle and FC connector. FOP-ADP comes with an FC connector. Be aware that attaching the FC connector to a fiber requires special tools and skills to achieve a quality termination



FLAD is designed to hold a bare ferrule or the tip of a connectorized ferrule

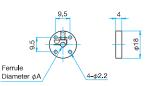
- Tightening the set screw located on the top of the adapter clamps the ferrule from the side.
- When using this adapter for a nonstandard ferrule or for something other than a ferrule, insure that the diameter of the part matches the diameter marked on the FLAD adapter.

Specification		Primary material: Aluminum (FLAD) Finish: Black Anodized (FLAD)					
Part Number	Ferrule Diameter φA [mm]	Weight [kg]					
FOP-ADP	_	_					
FLAD-2.5	φ2.5	0.003					
FLAD-3.05	φ3.05	0.003					



Outline Drawing

hexagon socket head cap screw M2×6...4 screws











Two-axis pinhole style holders for optical fibers with SMA connector.

- Two types of actuators are available; the screw type (FOP-SMA) provides simple adjustment suitable to multimode fibers, and the coarse/fine screw type (FOP-DM-SMA) which is capable of fine adjustment required for single mode fibers.
- The FOP-1-SMA has a two-axis adjustment mechanism.
- The FOP-2-SMA has four axes of adjustment providing tip and tilt as well as Xand Y adjustments.
- The SMA receptacles can be replaced with mini-fiber optics holders (MFH-ADP-3). Reference C074

Guide

- Two-axis pinholes/objective holders for FC connectors (FOP)are also available.
- ▶ We can change the post length. Please specify the post length when you place an order, then we will deliver the product after replacing the post with one with your specified length. Because those fiber optics holders use a special post, replacement of the post is at your expense.

Attention

- Detaching and reattaching the fiber will likely result in the fiber needing realignment.
- Due to SMA connectors having short nuts, it is hard to tighten them completely by hand.

To tighten them securely or to remove them, needle nose pliers are suggested.

Outline Drawing Vertical direction FOP-1-SMA FOP-2-SMA M4 P0.7 Tapered 1/4**-**36UNS 1/4-36UNS Horizontal adjustment screv Horizontal adjustment screw $4-\phi 3.2$ φ6 counterbore depth 4 4-M2 16 4-M2 90 φ12 φ12 FOP-1DM-SMA FOP-2DM-SMA M4 P0.7 Tapered M4 P0.7 Tapered Vertical direction Vertical direction adjustment screv 4-M2 4-M2 1/4**-**36UNS φ3.2 1/4-36UNS Horizontal adjustment screv Horizontal adjustment screw $4-\phi 3.2$ 10 φ6 counterbore depth 4 4-M2 30 16 4-M2 φ12 φ12

Specifications Primary material: Aluminum Finish: Black Anodized								
Part Number	Centering Adjustment Range [mm]			Centering Fine Adjustment Resolution [mm/rotation]	Micro Indicator Conversion [mm/DIV]	Adjustment Resolution Tilt•Rotation [°/rotation]	Weight [kg]	
FOP-1-SMA	±1	_	0.5	_		_	0.14	
FOP-2-SMA	±1	±2	0.5	_	_	about 0.7	0.22	
FOP-1DM-SMA	±1	_	0.5	0.05	0.0025	-	0.15	
FOP-2DM-SMA	±1	±2	0 . 5	0.05	0.0025	about 0.7	0.24	

Receptacle for SMA Type Fiber Holder | FOP-ADP-SMA



Adapter designed to mount to FOP style holders allow SMA fiber connectors to be used with existing FOP holders.



Attention

▶ The position of the tip of an optical fiber differs depending on the type of SMA connector. Please check the specifications of SMA connectors.

Specifications	Primary material: Aluminum Finish: Black Anodized
Part Number	Weight [kg]
FOP-ADP-SMA	<0.003

Outline Drawing Pan head screw M2×6...4 screws FOP-ADP-SMA 1/4-36UNS

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Fiber

The adjustable collimator holder can be used to collimate the output of an optical fiber of FC or SMA type connector.

- These holders can adjust the divergence, outgoing direction, and center position of the luminance distribution (fiber rotation and tilt) of a beam.
- The objective lens included with this holder has a short focal length (OBL-10) so that collimated light with small beam diameter can be obtained.
- The objective lenses used in these holders are standard microscope objectives so that high transmittance and high performance (spherical aberration) can be obtained in the visible light range.
- When used with a single-mode fiber, the output beam will have a Gaussian distribution.



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- Post length can be changed by specifying the post length when you place an order. We may charge the difference in price depending on the length. Contact our Sales Division for more information.
- A dummy FC connector is included, but should not be used for an optical fiber.

Attention

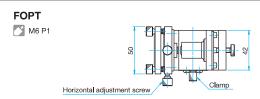
- ▶ To launch light into a single-mode fiber, a more precise adjustment mechanism is required. Contact our Sales Division for more information.
- Some types of connectors may be difficult to mount on the receptacles of two-axis pinholes/objective holders.
- The collimated beam diameter changes depending on the NA of the fiber. Generally, beam diameter D is found with the following formula.

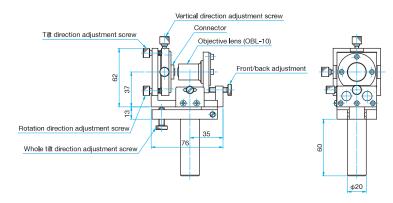
f: Focal length of objective lens, NA: Numerical aperture of fiber





Outline Drawing





Specifications Primary material: Aluminul Finish: Black Anodized											
Part Number	Compatible Connector	Focal length Objectives Lens [mm]	Centering Adjustment Range [mm]	Focus Adjustment Range [mm]	Fiber Adjustment Range Tilt•Rotation [°]	Holder Adjustment Range Tilt [°]	Centering Adjustment Resolution [mm/rotation]	Fiber Adjustment Resolution Tilt [°/rotation]	Fiber Adjustment Resolution Rotation [°/rotation]	Holder Adjustment Resolution Tilt [°/rotation]	Weight [kg]
FOPT-FC	FC	16.6	±1	±5	±2	±2.5	0.5	about 0.7	about 0.7	about 0.53	0.55
FOPT-SMA	SMA	16.6	±1	±5	±2	±2.5	0.5	about 0.7	about 0.7	about 0.53	0.55