



MIRROR MOUNT

High quality metal mirrors, require mounts that have matching performance and the ability to hold the weight, prevent warping the mirror, and provide good adjustment range, resolution, and stability. Metal mirrors are typically heavier than glass mirrors, and are sometimes not as stiff. Mounts for these mirrors must hold the extra weight without introducing stresses. Also, metal mirrors are often water-cooled. This requires the mount to allow for attaching water lines with free, unrestricted movements of both mirror and water lines without stressing the mirror. Mount designs using metal flexures support the heavy weight of these mirrors and provide the necessary range of motion. A flexure is simply a piece of semi-rigid metal used in a bending mode. It is a virtually frictionless hinge joint. This approach provides much greater mechanical and shock stability than relatively fragile bearing loaded gimbal mounts. Two flexures mounted at right angles to each other allow two-axis rotation over a range of several degrees, and crosstalk and backlash are virtually nonexistent. The standard range of motion is 5°. Custom mounts provide up to 30° range. Simple and reliable threaded push rods, levers and cam arrangements provide resolutions of 0.01 microns (<0.4 microinch), corresponding to 0.1 microradians, or 0.02 arc seconds, in larger mounts.

Range is the angle that the mirror is tilted. The incident beam is deflected by twice this angle because the angle of reflection from a mirror surface is equal to the angle of incidence. As an example, if the mirror is tilted with respect to the incident beam, by 1°, the reflected beam also has an angle of 1° with respect to the mirror, and the result is a 2° total deflection of the beam. The mounts can be used in vacuum environments or inside laser cavities, and they can also be mounted in any position. All models are available with custom mounting configurations for ease of inclusion into the customer's system designs.

The following table lists standard mounts, standard resolution, maximum mirror thickness and weight, and the weight of the mount.

TABLE 1
STANDARD MIRROR MOUNTS
 Range = 5 "

MOUNT	MIRROR	MIRROR RESOLUTION/5"	MIRROR	MIRROR	MOUNT
MODEL	DIA.	Turn (μ RADIANS)	MAX. THK.	MAX. WT.	WEIGHT
MM001	1"	120	0.5"	120gm; 4 oz	200gm; 7 oz
MM-015	1.5"	120	0.5"	280gm; 10 oz	370gm; 13 oz
MM-021	2"	120	0.75"	680gm; 24 oz	566gm; 20 oz
MM-041	3"	79	1.25"	2.3kg; 5 lb	900gm; 2 lb
MM-061	4"	130	2.0"	7.3kg; 16 lb	1.4Kg; 3 lb
MM-081	5"	100	2.0"	10kg; 22 lb	2.3Kg; 5 lb
MM-101	6"	81	2.0"	11kg; 24 lb	4.5Kg; 10 lb
MM-121	8"	40	3.0"	22kg; 48 lb	9Kg; 20 lb
MM-141	10"	30	3.0"	70kg; 154 lb	16Kg; 35 lb
MM-161	12"	25	4.0"	70kg; 154 lb	25Kg; 55 lb
MM-201	16"	15	4.0"	110kg; 240 lb	59Kg; 130 lb