

## MM-3M-R

Rotary Motorized  
MicroMini™ Stages  
(For lighter loads)



### Specifications:

	MM-3M-R	MM-3M-RA	MM-3M-RA+
<b>Repeatability:</b>	15 arc-second*	same	same
<b>Homing Repeatability:</b>	60 arc-second*	same	same
<b>Accuracy: (linearity)</b>	80 arc-second*	same	same
<b>A. Axial Wobble</b> (axial angular long range repeatability)	60 arc-second	2 arc-second	2 arc-second
<b>B. Axial angular deviation, total</b>	60 arc-second	60 arc-second	2 arc-second
<b>C. Planar shift, total</b>	1.2 μm	0	0
<b>D. Eccentricity</b> (runout, including bearing mount)	3μm	3μm	3μm
(See diagram on reverse of this sheet for an illustration of A.,B.,C.,D.)			
<b>Direct top load:</b>	2 kg axial	0.5 kg axial	0.5 kg axial
<b>Tilt Load</b>	5 kg-cm (70 inch-ounce)	1.0 kg-cm (14 inch-ounce)	1.0 kg-cm (14 inch-ounce)
<b>Torque load</b>	850 g-cm (12 inch-ounce)	425g-cm (6 inch-ounce)	425g-cm (6 inch-ounce)
<b>Gearhead Ratio:</b> (see "Resolution Data Sheet")	<b>64:1</b> (standard)	<b>16:1</b>	same
<b>Speed: (low load)</b>	4 RPM	15 RPM**	same
<b>Encoder Conversion: (arc-second/count)</b>	6.3281	25.3124	same
(see gearhead ratios, "Resolution Data Sheet")			
<b>Gearhead Backlash:</b>	~1 mrad†	~4 mrad†	same
<b>Rotor Stall Torque:</b>	200 inch-ounce††	50 inch-ounce††	same
<b>Rotor Backlash: (preloaded)</b>	0	same	same
<b>Weight:</b>	76g	same	same
<b>Vacuum compatibility:</b>	10 <sup>-3</sup> Torr, higher per request	same	same
<b>Travel Range:</b>	unlimited	same	same
<b>Worm Ratio:</b>	80:1	same	same
<b>Stage Body Dimensions: (L x W x H)</b>	2.86 x 1.43 x 0.59 (inch), 72.64 x 36.32 x 14.99 (mm)		
<b>Motor:</b>	10 mm diameter, 6-12 VDC servo, brush type (see motor specifications)		

\*Encoder resolution must be added based on the gearhead: 64:1 add ±12 arc-sec 256:1 add ±3 arc-sec, 1024:1 add ±0.75 arc-sec (all approximated)

\*\*A higher gear reduction means a slower speed. Higher speeds (lower ratio) can be used, but at the expense of resolution and load/torque capacity.

†Dependent upon gear ratio, and can be compensated in software without overshoot.

††Dependent upon gear ratio and worm ratio.

Note: The MM-3M stages are designed for peak performance at low loads: ex; 60g, less than 2 inch (50.8mm) off axis.

- Special Features:**
- Dual class 7 custom bearings for MM-3M-R
  - Single class 7 custom bearing for MM-3M-RA & RA Plus
  - Multi-faceted connection interface
  - Many other gearhead options
  - Homing Switch

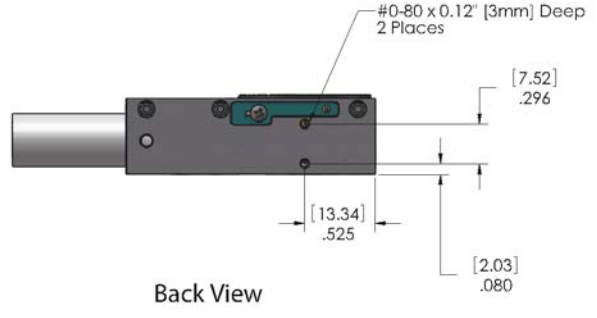
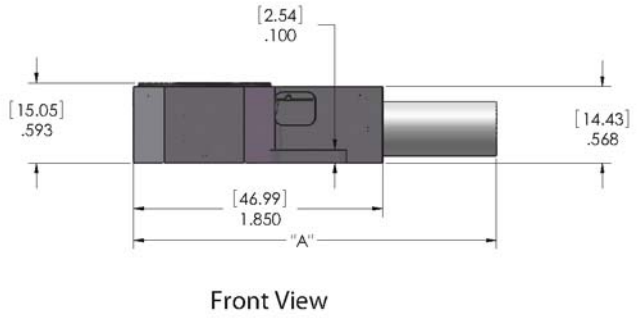
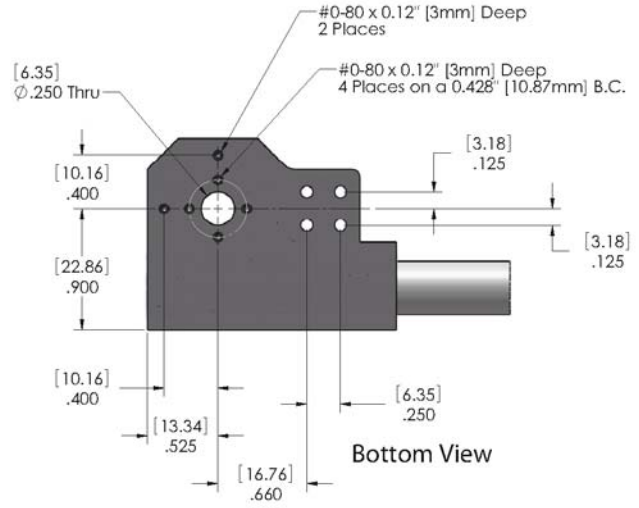
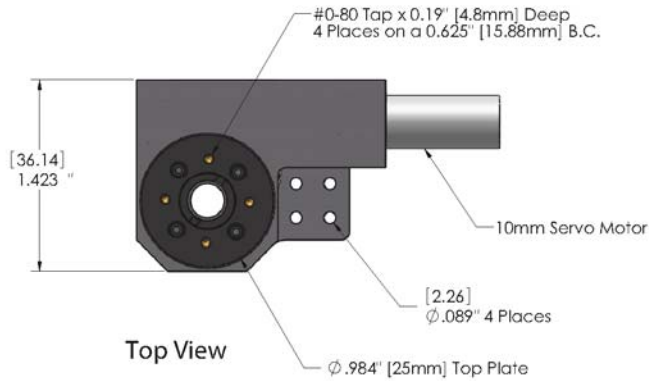
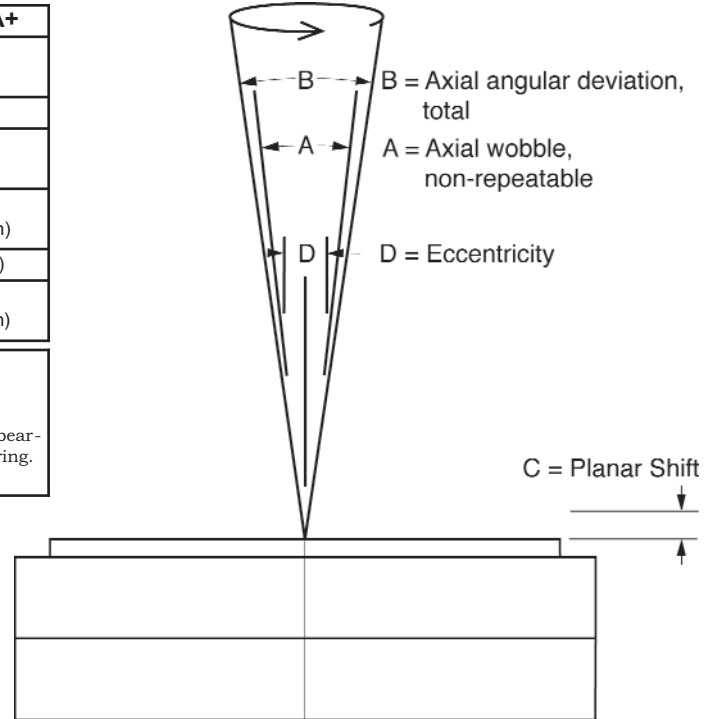
The information contained in this data sheet is subject to change without notice. Critical dimensions or specifications should be verified with our technical support staff.

# MM-3M-R Rotary Stage

## Dimensional Data

Description	MM-3M-R	MM-3M-RA	MM-3M-RA+
A. Axial wobble, (axial angular repeatability)	60 arc-second	2 arc-second	2 arc-second
B. Axial angular deviation, total	60 arc-second	60 arc-second	2 arc-second
C. Planar shift, total	1.2 $\mu\text{m}$ (0.00005 inch)	0	0
D. Eccentricity (runout)	3.0 $\mu\text{m}$ (0.000012 inch)	3.0 $\mu\text{m}$ (0.000012 inch)	3.0 $\mu\text{m}$ (0.000012 inch)
Direct Top Load, maximum:	2.0 kg (4.4 lbs)	0.5 kg (1.1 lbs)	0.5 kg (1.1 lbs)
Moment load, maximum:	28 N-cm (40 ounce-inch)	9.8 N-cm (14 ounce-inch)	9.8 N-cm (14 ounce-inch)

Note: The above specifications apply to horizontal mounting (load vertical).  
 For vertical mounting (load horizontal), the top load and moment load values are 1/2 the above.  
 Specifications apply to internal bearing. Rotary table is not aligned perfectly with bearing. Mounting of customer components will require adjustments to align with bearing.



Gear Ratio	16:1	64:1	256:1	1024:1
Dimension A	2.76" (70.1mm)	2.84" (72.1mm)	2.96" (75.2mm)	3.08" (78.2mm)
Resolution/Count	0.0070 degree	0.0017 degree	0.00044 degree	0.00011 degree

The information contained in this data sheet is subject to change without notice. Critical dimensions or specifications should be verified with our technical support staff.

National Aperture, Inc. - 16 Northwestern Dr. - Salem, N.H. 03079-4810 - Tel. (800) 360-4598 - (603) 893-7393 - FAX (603) 893-7857 - [www.nationalaperture.com/www.naimotion.com](http://www.nationalaperture.com/www.naimotion.com)