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Find the *Newport 860A-05* at our website: *Click HERE*

Section 2.0
Linear Motorizer

860A Motorizers can be used wherever heavy or light loads must be pushed with a minimum of acoustic and mechanical noise when position information is not required. Their small size allows fitting into cramped spaces as is usually necessary when using gimbaled mirror mounts.

1. Pointing mirrors.
2. Positioning off-axis parabolic mirrors.
3. Actuating rotary table with prism.
4. Positioning translation stages.

The nose button of the 860A Motorizer does not connect or join with the load it is pushing; it merely presses against the surface of the load. For the load to follow the retracting leadscrew, there must be an external return force such as a spring.

Features

1. Small body size
   860A-05 = 1"×3.0"
   860A-1 = 1"×3.6"
   860A-2 = 1"×4.7"
   860A-4 = 1"×6.8"
2. Large load-carrying capacity

   Up to 30 lbs. of vertical lift.
3. Large speed range
4. Built-in limits
5. Engraved spindle position indicators in metric and English units.
6. Rotating spindle suppresses starting friction.
7. Vacuum compatibility option.

Construction and Performance

1. Ultra-quiet, smooth operation
2. Low-inertia DC motor with gearhead with all-steel gears
3. Black-anodized grained aluminum body
4. Phosphor-bronze nosepiece with standard 3/8-40 mounting thread.
5. Precision stainless-steel leadscrew with carbide ball tip.
6. Designed for long life (>50,000 cycles with 20 lb. load)

Specifications

+/−12volts, 120mA max current

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2.1 860A Series Motorizer Load/Speed Chart

Model	Jog Mode					Slew Mode				Load	
	Resolution			Velocity		1616 or 1516 Motor		1624 Motor			
(Gear head)	Spc L-S µM	Std µM	Spc H S µM	Min µM/sec	Max µM/sec	Min µM/sec	Max µM/sec	Min µM/sec	Max µM/sec	-16 lbs.	-24 lbs.
–6.3	—	—	10	21	84	—	—	1.1	10	—	4
–11.8	—	—	5.7	11	44	—	—	.59	5.9	—	9
–22	—	—	3.1	6.0	24	—	—	.32	3.2	—	15
–41	—	—	1.6	3.2	12	—	—	.16	1.6	—	28
–76	—	—	.90	1.7	6.8	—	—	.11	1.1	—	48
–141	—	—	.48	.95	3.8	—	—	.05	.53	—	89
–262	—	**.07**	—	**.51**	**2.0**	**.040**	**.40**	—	—	**37**	—
–485	.02	—	—	.28	1.1	.024	.24	—	—	69	—
–900	.01	—	—	.15	.60	.011	.11	—	—	100*	—
–1670	.005	—	—	.080	.32	.0063	.06	—	—	100*	—
–3101	.003	—	—	.043	.17	.0034	.034	—	—	100*	—
–5752	.001	—	—	.023	.092	.0018	.016	—	—	100*	—
–10683	.0007	—	—	.013	.052	.0010	.008	—	—	100*	—

Note: All values nominal

* = Load carrying capacity limited to 100 lbs. to protect the gearhead.
µM = Micrometer, µin = Microinch
L-S = Low Speed Options
H-S = High Speed Options

2.2 Motor Size and Gearhead Ratio Options

Three different sizes of motors are available with the 860A Series Motorizers: the 1616, the 1516 and the 1624. The 1624 is the most powerful of the three, and causes a higher velocity and can handle a heavier load.

There are thirteen different gearhead ratios available, ranging from 6:3:1 to 10683:1. The 262:1 gearhead ratio is standard while other ratios are available at an additional charge. The complete list of gearhead ratio options is as follows:

Nominal	Actual	
6.3:1	6.3968254	Custom only; 1624
11.8:1	11.8641975	Custom only; 1624
22:1	22.0335093	Catalog items for 1 & 2 inch; Special order for other travels; 1624
41:1	40.8655693	Custom only; 1624
76:1	75.8932002	Custom only; 1624
141:1	140.759183	Custom only; 1624
262:1	261.409912	**Standard; 1616**
485:1	484.837188	Custom only; 1516 or 1616
900:1	900.41 1920	Custom only; 1516
1670:1	1669.99476	Special order; 1516
3101:1	3101.41884	Custom only; 1516
5752:1	5752.20417	Custom only; 1516
10683:1	10682.66483	Custom only; 1516

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When choosing a gearhead ratio for the 860A Series Motorizer, three considerations come into play: speed, load capacity and resolution. The higher gearhead ratios have lower speeds, higher load capacities and higher resolution. The lower gearhead ratios have higher speeds, lower load capacities and lower resolution. For more exact information, see Section 2.1 for the load/speed chart.

2.3 Motorizers with High-Ratio Gearheads

Motorizers with gearhead ratios greater than 1670:1 and smaller than 141:1 necessitate special handling by the user. These gearheads generate unusually high thrusts, or high velocities that may damage the gearhead/motor if the motorizers are allowed to run into their limits of travel at speeds greater than 50% of full scale. Our method of limit indication is to sense that the motor is producing high thrust but at a velocity lower than commanded. This indicates operation outside of the designed velocity servo window. Both limits have a rubber cushion to absorb the mechanical shock and momentum. However, for these non-standard gearhead ratios, the motor's momentum will be extremely high when moving at full speed and the cushions are not sufficient.

To help protect the high gear ratio gearhead/motor (LOW SPEED), the normal velocity servo electronics have been modified to limit the current into the motor to approximately 60% of its normal possible value. This limitation serves to prohibit the Motorizers from simultaneously exerting maximum thrust and maximum velocity (maximum momentum). This current limit attempts to protect the gearhead from damage if it runs into the limit of travel at maximum speed.

Extensive tests have not been made on the high gearhead-ratio units to determine their mechanical lifetimes. Caution should be used when operating near the limits with high gearhead ratio units as their gearheads can be easily damaged when run into a limit at maximum speed.

The low gear ratio (HIGH SPEED) motorizer may lock its output shaft if a high velocity was used to drive the shaft into its travel limits. Under these conditions the controller sensing circuit may not have enough time to recognize that the velocity/thrust window has been exceeded.

Therefore, we can only offer a limited warranty on Motorizers with the below gearhead ratios. See the warranty at the beginning of the manual for details.

Gearhead Ratio	Nominal Thrust(lbs)
6.3:1	4
11.8:1	9
22:1	15
41:1	28
76:1	48
3101:1	285
5752:1	529
10683:1	882

Caution

When operating near limits of travel, do not move at velocities greater than 50% of full-scale. Motorizers equipped with special gearhead ratios will not be guaranteed against drive-train failures.

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