

Stages for Semiconductor Applications

To meet the ever increasing demands of the semiconductor industry, LEP has a full line of high accuracy, high performance stages. Designed to eliminate compromise, these stages offer the best performance available in a low profile microscope stage.

Attention to detail in design, manufacturing and components are keys to the quality of the final product. Each stage uses a highly refined, evolved design that is proven with every stage. All critical components are machined on state of the art machining centers in LEP's machine shop for the highest level of control. All components are inspected and measured to exacting specifications. Our ISO-9001 registered quality system ensures that only perfect parts are used.

We recognize that the wafer fab can be harsh environment. Stages need to be designed with this in mind to deliver the highest performance and availability in this environment. The LEP semiconductor stages are rugged and durable in production industrial environments. With minimal recommended maintenance, these stages will provide many years of performance meeting or exceeding specifications. All surfaces are anodized aluminum, no paint is used. The guide bearings are stainless steel for corrosion resistance.

Precision and repeatability is assured by the use of high resolution rotary encoders mounted to the leadscrew shaft. Zero backlash recirculating ball leadscrews ensure high accuracy and long life. Precision ground crossed roller bearing guideways enhance the performance of this stage.

- 203mm x 203mm (8" x 8") travel range
- Low profile, ergonomic design
- 4mm recirculating ball leadscrew
- High resolution rotary encoder with 0.4µm resolution
- Hardened, ground crossed roller bearing guide ways
- 10µm accuracy over full range of travel
- Solid aluminum insert plate standard



99S003-6 stage



8"x8" Semiconductor Stage

For 200mm wafer applications, the 8"x8" stage is the obvious choice. Its compact size and high performance can convert a routine microscope into a highly productive asset.

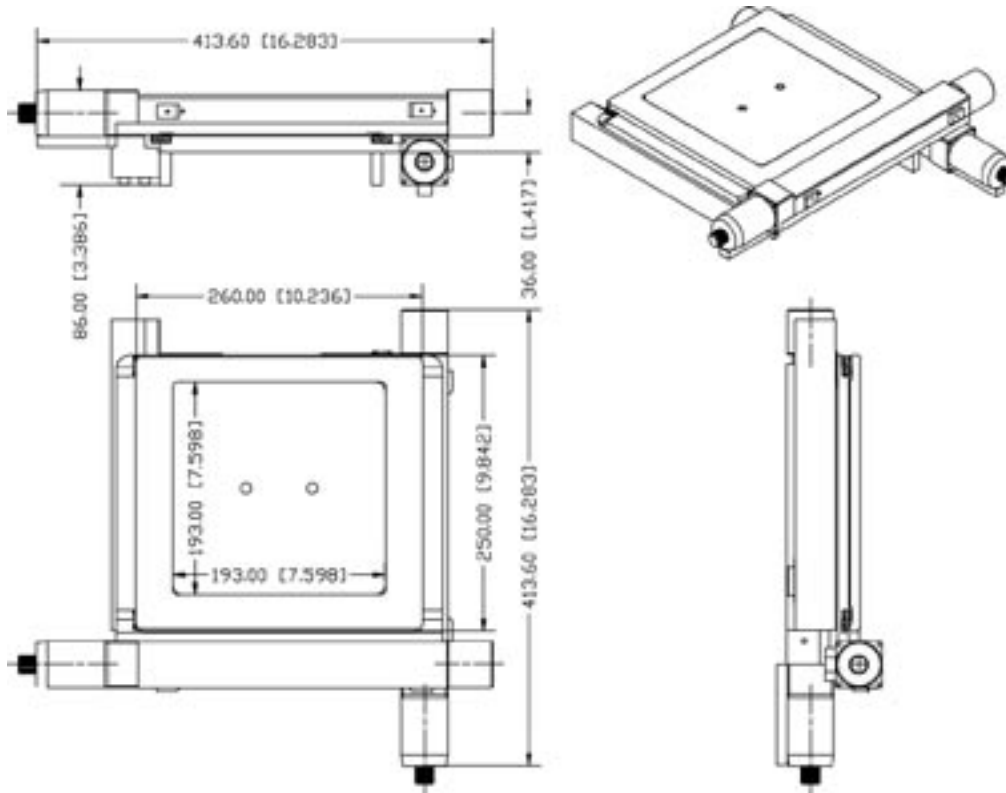
The 8"x8" stage is available in a compact envelope version that can be mounted on most smaller microscopes that were originally designed for 150mm wafer applications. With little compromise, the reduced envelope also makes integration with loaders easier. As a result of the compact envelope, the insert cutout is 193mm square. This is identical to the 6"x6" stage and only provides transmitted light capability over the center 150mm of travel.

Built to exact standards, this stage has specifications that meet or exceed the requirements of routine semiconductor microscopy. Compatible with reflected and transmitted light applications, the standard insert plate can accept a variety of options including motorized rotating vacuum wafer chuck, fixed vacuum chuck, glass plate and other custom holders.

Other features such as adjustable end-limits, anti-creep roller cages, fixed cable connecting and universal mounting make this stage an excellent choice for metrology and inspection applications.

Ordering Information

99S003-6... 8"x8" (203mm x 203mm) stepper motor stage with compact travel envelope
 99D003-6 8"x8" (203mm x 203mm) DC servo motor stage with compact travel envelope
 99S0038"x8" (203mm x 203mm) stepper motor stage
 99D0038"x8" (203mm x 203mm) DC servo motor stage



99S003-6 stage
metric dimensions

Specifications	Stepper Motor	DC Servo Motor
Speed Max.	120mm/sec.	250mm/sec.
Resolution	0.1µm	0.4µm
Repeatability	2µm	
Accuracy	10µm/200mm	
Straightness	1µm/25mm	
Flatness	1µm/25m	
Height	33mm at object plane	
Weight	7.7kg	

* applicable when used with LEP MAC 5000/2002 controller

- 203mm x 203mm (8" x 8") travel range
- 4mm recirculating ball leadscrew
- High resolution rotary encoder with 0.4µm resolution
- Optional XY grid scale for the highest accuracy
- Hardened, ground crossed roller bearing guide ways
- 8µm accuracy over full range of travel



99D022 stage with optional 73000902 motorized theta insert



High Accuracy 8"x8" Stage

Shrinking geometries and tighter process controls demand the highest precision for positioning. This stage offers accuracy never before possible in a low profile stage. Even though this is a low profile stage, it is still a very substantial construction.

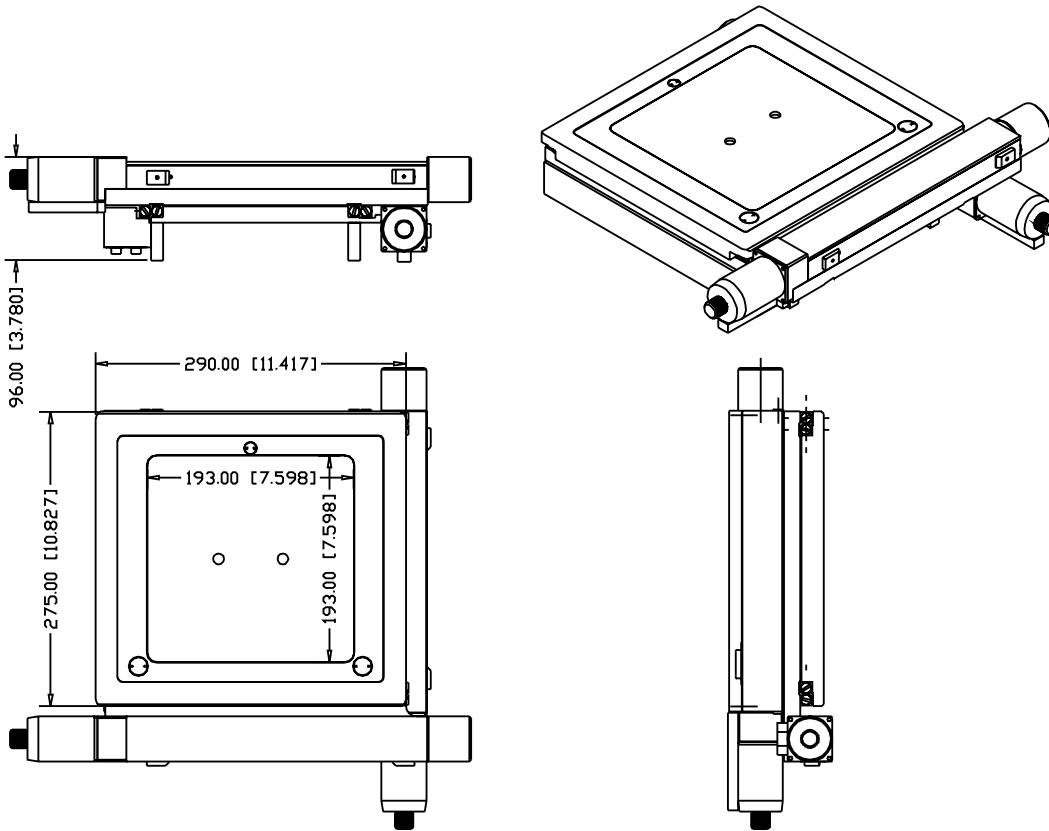
This stage is available with either high performance DC servo motors or ultra-reliable stepper motors to suit you application and preference.

The optional two dimensional grid encoder offers high resolution, high accuracy performance. By mounting the grid directly under the wafer chuck the encoder reads actual wafer position independent of hysteresis and backlash. This is the most accurate low profile stage available.

Of course, the standard LEP features are included; strain-free cabling, anti-creep bearing cages and universal mounting. Adjustable end-limits are available but not standard.

Ordering Information

99S022	High accuracy 8x8 stepper motor stage with XY grid encoder
99S023	High accuracy 8x8 stepper motor stage with rotary encoder
99D022	High accuracy 8x8 DC servo motor stage with XY grid encoder
99D023	High accuracy 8x8 DC servo motor stage with rotary encoder



99S022 stage
metric dimensions

Specifications	Stepper Motor	DC Servo Motor	Grid Encoder
Speed Max.	120mm/sec.	250mm/sec.	
Resolution	0.1µm	0.4µm	0.1µm
Repeatability	2µm		0.2µm
Accuracy	10µm/200mm		2µm/200mm
Straightness	1µm/25mm		1µm/200mm
Flatness	1µm/25mm		1µm/200mm
Height	53mm at object plane		
Weight	8.9kg		

* applicable when used with LEP MAC 5000/2002 controller

- 305mm x 305mm (12" x 12") travel range
- 4mm recirculating ball leadscrew
- High resolution rotary encoder with 0.4µm resolution
- Optional XY grid scale for the highest accuracy
- Hardened, ground crossed roller bearing guide-ways
- Very stable design for long-term repeatable performance
- Solid aluminum insert plate standard



99D024 stage with standard solid alum. insert



High Accuracy 12"x12" Stage

The demands of 300mm microelectronic technology requires a stage that has both extended travel range in addition to the highest positioning performance. The LEP 12"x12" stage is designed to meet or exceed those requirements.

The stable design employs oversized stainless steel crossed roller bearing guideways. Heavy components assure the long-term stability. Without compromise, this stage minimizes its three dimensional envelope with clever design and strict manufacturing processes.

The stage is available with either stepper motors or DC servo motors. Coupled with precision recirculating ball leadscrews, performance is maintained at all speeds. Maintenance is minimal. Standard on all stages are high resolution rotary encoders which provide position feedback.

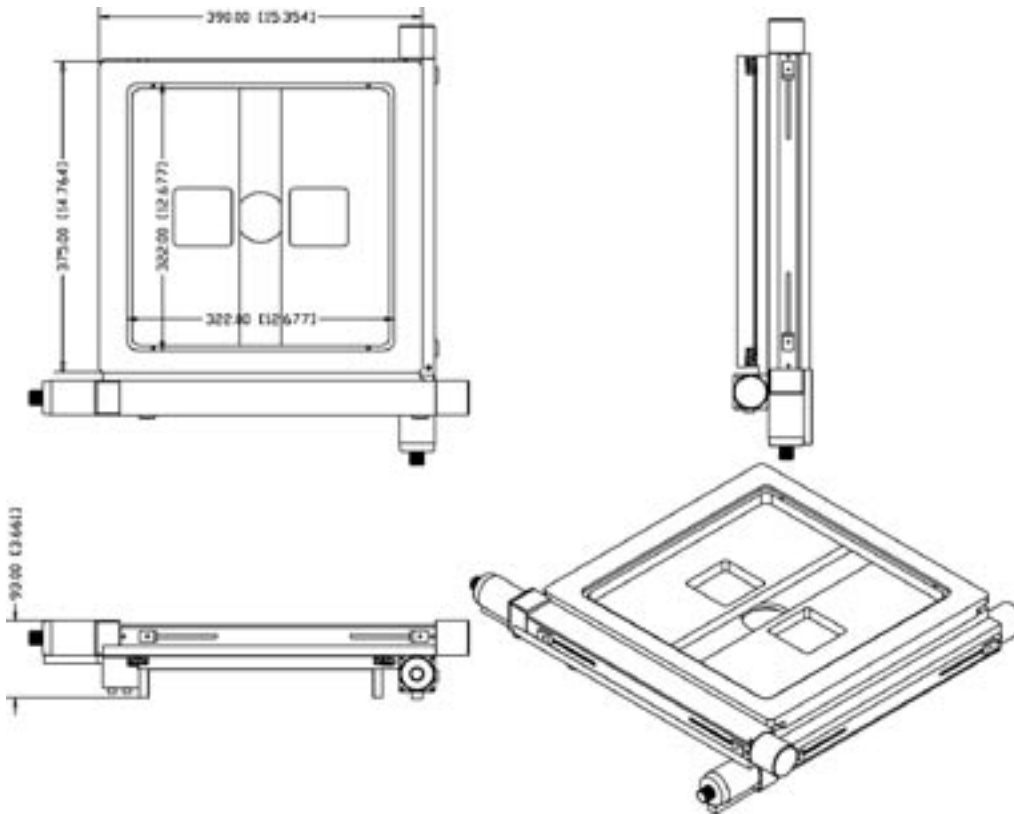
The optional XY grid encoder adds increased performance for the most demanding applications. With 0.4 micron repeatability and very high accuracies this stage is suited for applications such as defect review and bit mapping.

Ordering Information

99S024	High accuracy 12x12 stepper motor stage with XY grid encoder
99S025	High accuracy 12x12 stepper motor stage with rotary encoder
99D024	High accuracy 12x12 DC servo motor stage with XY grid encoder
99D025	High accuracy 12x12 DC servo motor stage with rotary encoder

High Accuracy 12x12 Stage

Semiconductor



99S024 stage
metric dimensions

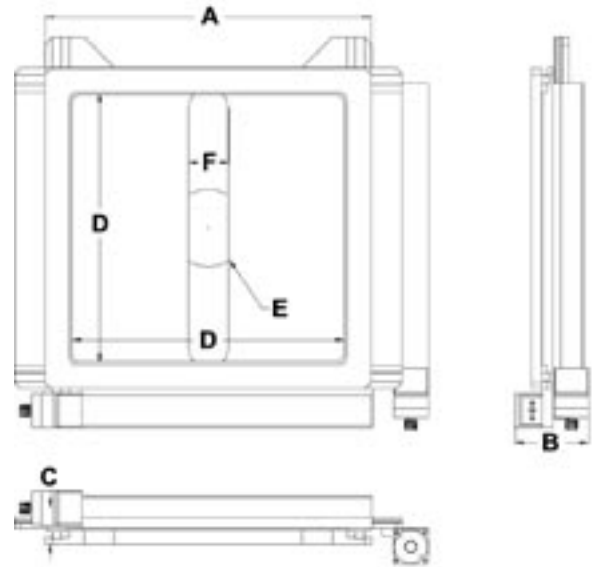
Specifications	Stepper Motor	DC Servo Motor	Grid Encoder
Speed Max.	120mm/sec.	250mm/sec.	
Resolution	0.1µm	0.4µm	0.2µm
Repeatability	2µm		0.4µm
Accuracy	12µm/300mm		3µm/300mm
Straightness	1µm/25mm		1.5µm/300mm
Flatness	1µm/25mm		1.5µm/300mm
Height	53mm at object plane		
Weight	18.6kg		

* applicable when used with LEP MAC 5000/2002 controller

- **Open frame design**
- **Recirculating ball guides for compact envelope**
- **Low profile**
- **Stepper or DC servo motor drive**
- **Precision recirculating ball leadscrews**
- **Linear/rotary encoder options**

The LEP large format stages are available in a range of sizes from 12"x12" (305mm x 305mm) up to 20" x 20" (508mm x 508mm). Larger sizes are available upon request. All are based on a similar design that features light weight and open frame design for maximum flexibility.

The stages all utilize pre-loaded recirculating ball linear slides for the X and Y axis guide-ways. This arrangement eliminates the requirement for cross loading of the stage as in normal roller bearing designs yielding a stable structure with a compact envelope.



Product	Working Envelope	Dimension Reference					
		A	B	C	D	E	F
99S016/99D016 16"x16" Travel (405x405mm)	945x1010mm	540	122	62	450	130	66
99S018/99D018 12"x12" Travel (305x305mm)	705x770mm	400	120	49	310	100	80
99S019/99D019 13"x13" Travel (335x335mm)	735x800mm	400	120	49	310	100	80
99S020/99D020 20"x20" Travel (508x508mm)	1148x1213mm	640	122	62	450	130	66

note: all dimensions shown in mm

Ordering Information

- 99S018 12"x12" stepper motor XY stage with rotary encoder
- 99D018 12"x12" DC servo motor XY stage with rotary encoder
- 99S019 13"x13" stepper motor XY stage with rotary encoder
- 99D019 13"x13" DC servo motor XY stage with rotary encoder
- 99S016 16"x16" stepper motor XY stage with rotary encoder
- 99D016 16"x16" DC servo motor XY stage with rotary encoder
- 99S020 20"x20" stepper motor XY stage with rotary encoder
- 99D020 20"x20" DC servo motor XY stage with rotary encoder

Please call for specifications and for more information on other sizes