Questar Translation Stages

3-Axis Stage Part #53875
2-Axis Stage Part #53850
1-Axis Stage Part #53800

All stages are engineered, machined and manufactured in the USA. They are designed and developed for use with the Questar Long Distance Microscope series of optical instruments and an integral part of the Questar Remote Measuring System. While simple in concept, this application provided particular design challenges. Due to target distances of 6inches to 6 feet, rigidity of the stage is crucial. Over the entire range of stage motions, we keep the center of gravity of the system over the stage base, eliminating inaccuracy from mechanical deflections. The linear bearings are arranged to minimize yaw and pitch effects. The large mass ratio of the stage to microscope provides additional vibration stability. Measurements are taken from linear encoders, which indicate only actual stage movement, eliminating errors from lead screws or motor steps. The stage is available in one, two or three axis versions. The third axis is typically used as a focus axis to maintain image scale or make depth measurements. Movement can be either manual or motorized. Manual versions can be easily upgraded. They can also be adapted to be used with non-Questar equipment. The precision components, extremely high tolerance machining and drive mechanisms combine to provide the user the ultimate motion platform for critical measurements and alignment.

The Questar 0-backlash stage utilizes precision spring loaded ball nut and lead screws to minimize the backlash of typical stages. The direct drive system incorporated into the Questar stage reduces errors, which occur with gear drive systems. The Questar stage has no belts, pulleys or gears. The stepper motor is coupled directly to the lead-screw drive shaft with a high torque flexi-coupling to minimize any motor misalignment shaft run out or vibration. Each lead-screw shaft has a precision sealed ball bearing and a thrust bearing on the motor side to minimize any axial shaft play typical with most drive systems. Each axis has two matched linear ball bearing guide rails with two self-aligning compact radial load pillow block bearings on each rail. The low profile and wide stance increase the load bearing capacity and accuracy in all axis's to insure smooth accurate transit across the specified travel. Differential slip or spin does not occur even with application of heavy pre-loads, smooth rolling movement is obtained, so that the wear resistance is excellent and accurate movement is obtained for extended of years of operation. The cast aluminum plate used in each axis is stress relieved and final machined using a CNC milling machined to extreme tolerances to ensure linear and height alignments of guide rails and bearings.

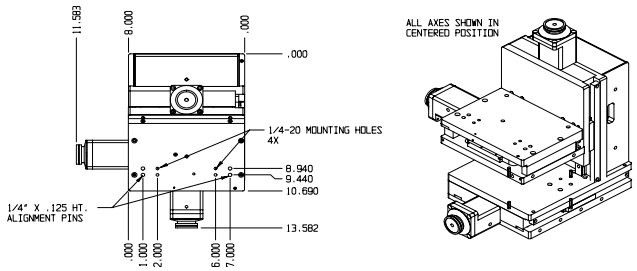
Pictured #53875ME

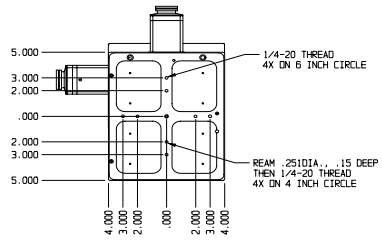
The Questar stage position readout and motorization is optional. The Questar ME stage includes both. The closed loop encoder feed back system incorporated into the Questar 0-backlash stage utilizes a 1-micron accuracy linear glass scale and square wave output reader head to a quadrapature electronic interface. This encoder unit is attached to each axis and is parallel to the axis motion to minimize any on axis cumulative error typical with most linear transiting stages. The external position reading gives a more precise position indication for high precision placement. This combined with the micro stepping motor and stepper driver increase the accuracy of the Questar 0-baclash stage.

Translation Stage

Material	6061 T-6 Cast Aluminum /Anodized
Weight	
1 axis	15 lb./6.8 kg
2 axis	30 lb./13.6 kg
3 axis	40 lb/18.14 kg
Travels	
X-axis	4 in/10.16 cm
Y-axis	4 in/10.16 cm
Z-axis	2 in/ 5.08 cm
Positioning Accuracy	.0001in/.0025mm
Backlash	.00004 in/ .001mm
Bi-Directional Repeatability	.00004 in/.001mm
Designed Linear Accuracy (encoder)	1 micron +/- 2 over 4 inch
On-Axis encoder alignment	10 micron in 4 in
Absolute Accuracy	10 microns in 4 inches
Minimum Incremental Motion	.00004 in/ .001 mm
Squareness of axes	.0001 in per 4 in/.0025 mm per 10.16 cm
Drive System	Precision Ball screw and anti backlash nut
Motors system	High torque Stepper and micro stepping driver
Bearings	Precision matched dual rail and 4 blocks/axis

Options: manual or motorized movement, position indicators, linear encoders, table clamps





Manual 3-Axis Stage Dimensions

Questar Corporation
6204 Ingham Road
New Hope, PA 18938
USA

Phone 215-862-5277 or 800-247-9607
Fax 215-862-0512
Email Questar@QuestarCorporation.com
Web www.QuestarCorporation.com