

# ECO115SL Series

## Mechanical Bearing, Ball-Screw Stage

High-performance in a cost-effective, economic package

Rugged mechanical design

Available with servomotor or stepping motor

Nine models with travels from 50 mm to 600 mm

Vacuum and cleanroom versions available



*The ECO115SL-300 is one of nine models in the ECO115SL series.*

The ECO115SL is part of the ECO linear stage family, building upon Aerotech's long tradition of producing low total cost of ownership motion designs. Excellent positioning specifications, high stiffness, and a variety of options and features combined with economic pricing make the ECO115SL stage ideal for medium-performance production applications requiring ball-screw stage actuation.

### Quality Mechanical Construction

A long-life recirculating linear guide bearing system and quality construction make the ECO115SL an attractive solution for applications where up-time is critical. Unlike low-cost competitive motion stages, the ECO115SL can be integrated into complex machines with the assurance it will perform at a high level and outlast other machine components.

### Stepper Motor Option

For cost sensitive applications, the ECO115SL series includes several NEMA 23 stepper motor options. With the ability to run on standard wall voltages, the ECO115SL provides plug-and-play capability with a minimal amount of supporting electrical equipment.

### Design and Integration Flexibility

The ECO115SL is designed with many standard features and options that make the design adaptable to specific applications. It is available in nine different models with travels ranging from 50 mm to 600 mm and speeds up to 300 mm/s.

The base mounting holes are accessible from the outside of the stage for easy mounting. Standard mounting holes for both English and metric optical tables are present in all travels. Each stage also mounts to another ECO115SL or ECO165SL for easy integration of multi-axis systems.

Optional tabletops are available with either English or metric mounting patterns. A third tabletop option features hole patterns to allow the direct attachment of several types of Aerotech rotary stages.

Aerotech BM or BMS series brushless servomotors are available with a variety of encoder options providing net resolutions ranging from 0.5  $\mu\text{m}$  down to sub-nm. A holding brake can be added to the motor for vertical applications. A motor fold-back kit is available for space-constrained applications to reduce the overall stage length.

The ECO115SL stage series offers many options to fit the exact requirements of numerous applications. Its flexible, cost-effective design easily makes it one of the best value linear ball-screw stage series available today.

# ECO115SL Series SPECIFICATIONS

Mechanical Specifications		ECO115SL									
Travel		50	100	150	200	250	300	400	500	600	
Accuracy <sup>(1)</sup>	Standard	±18 µm	±23 µm	±27 µm	±30 µm	±34 µm	±38 µm	±43 µm	±45 µm	±48 µm	
	Calibrated	±5 µm	±5 µm	±5 µm	±5.5 µm	±5.5 µm	±5.5 µm	±6 µm	±6 µm	±7 µm	
Resolution (Min. Incremental Motion)		0.2 µm <sub>(2)</sub> , 0.75 µm <sub>(3)</sub>									
Bidirectional Repeatability <sup>(1)</sup>		±4 µm	±4 µm	±4 µm	±4.5 µm	±4.5 µm	±4.5 µm	±5 µm	±5 µm	±5 µm	
Straightness <sup>(4)</sup>		±2 µm	±3 µm	±4 µm	±5 µm	±6 µm	±7 µm	±9 µm	±11 µm	±13 µm	
Flatness <sup>(4)</sup>		±2 µm	±3 µm	±4 µm	±5 µm	±6 µm	±7 µm	±9 µm	±11 µm	±13 µm	
Pitch		35 µrad (7.2 arc sec)	40 µrad (8.3 arc sec)	40 µrad (8.3 arc sec)	50 µrad (10.3 arc sec)	60 µrad (12.4 arc sec)	70 µrad (14.4 arc sec)	90 µrad (18.6 arc sec)	110 µrad (22.7 arc sec)	130 µrad (26.8 arc sec)	
Roll		35 µrad (7.2 arc sec)	40 µrad (8.3 arc sec)	40 µrad (8.3 arc sec)	50 µrad (10.3 arc sec)	60 µrad (12.4 arc sec)	70 µrad (14.4 arc sec)	90 µrad (18.6 arc sec)	110 µrad (22.7 arc sec)	130 µrad (26.8 arc sec)	
Yaw		35 µrad (7.2 arc sec)	40 µrad (8.3 arc sec)	40 µrad (8.3 arc sec)	50 µrad (10.3 arc sec)	60 µrad (12.4 arc sec)	70 µrad (14.4 arc sec)	90 µrad (18.6 arc sec)	110 µrad (22.7 arc sec)	130 µrad (26.8 arc sec)	
Maximum Speed <sup>(4)</sup>		300 mm/s									
Maximum Acceleration <sup>(4)</sup>		Function of motor, amplifier selection, payload, and maximum axial load									
Load Capacity <sup>(4)</sup>	Horizontal	40 kg									
	Vertical (Axial)	18 kg									
	Side	40 kg									
Moving Mass (w/tabletop)		1.7 kg									
Stage Mass (no motor)		3.8 kg	4.1 kg	4.5 kg	4.9 kg	5.3 kg	5.7 kg	6.4 kg	7.2 kg	8.0 kg	
Material		Anodized Aluminum									
MTBF (Mean Time Between Failure)		20,000 Hours									

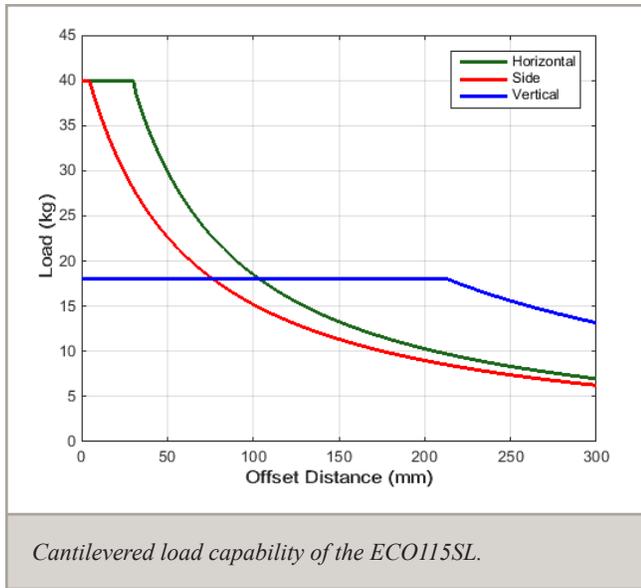
Notes:

1. Certified with -PL1 option
2. Achieved with Aerotech rotary motor with amplified sine encoder
3. Achieved with Aerotech rotary motor with 2500 cnts/rev digital encoder
4. Requires the selection of an appropriate amplifier with sufficient voltage and current
5. Axis-orientation for on-axis loading is listed
6. Specifications are for single-axis systems measured 25 mm above the tabletop. Performance of multi-axis systems is payload and workpoint dependent. Contact factory for multi-axis applications.
7. Specifications listed are non-foldback kit options. Contact factory for specifications when a foldback kit (-FBX) is used.

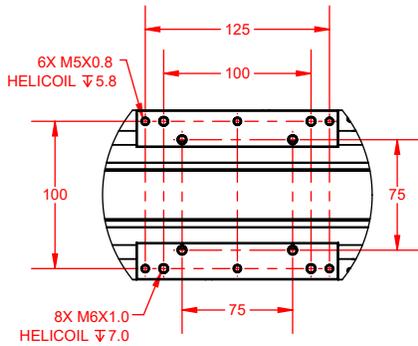
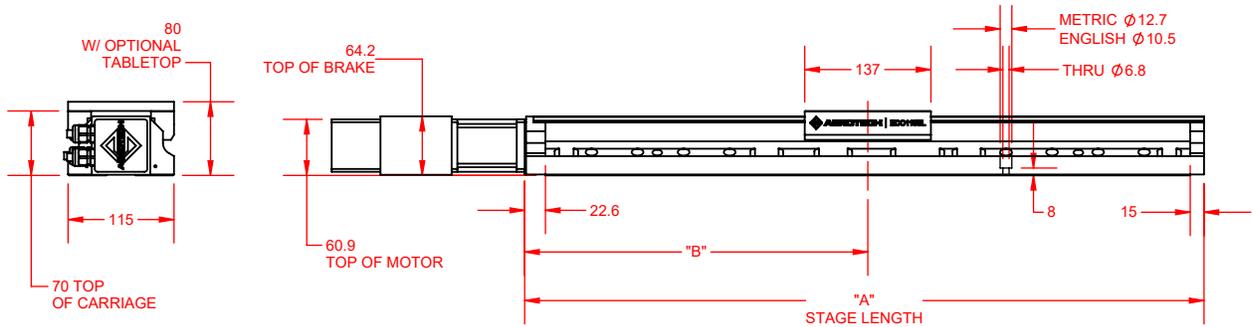
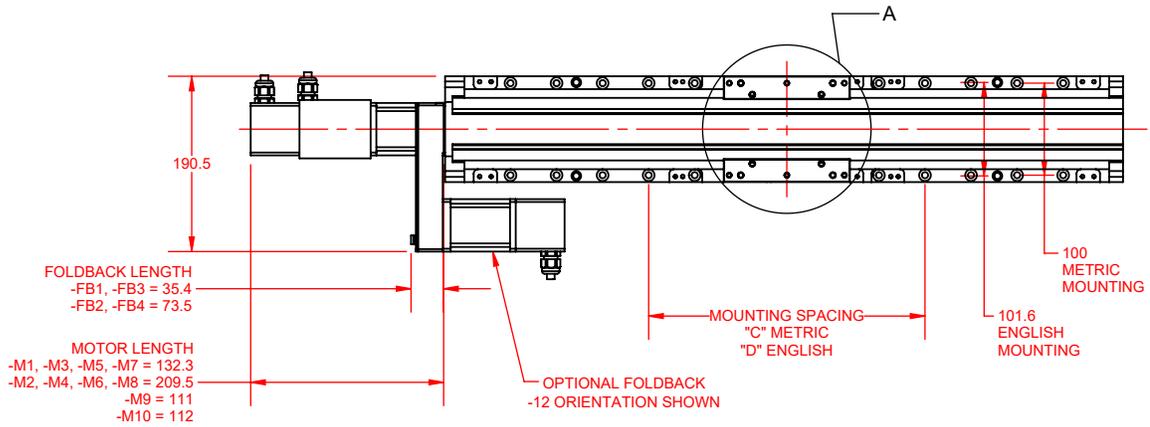
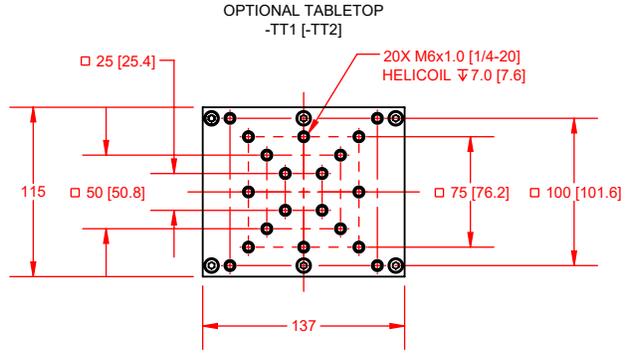
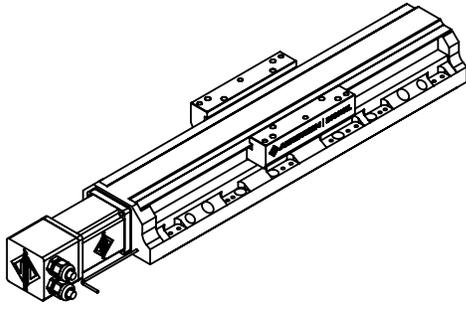
Electrical Specifications	
Drive System	Brushless Rotary Servomotor or Stepper Motor
Feedback	Incremental - 1000 lines/rev (-AS) and 2500 lines/rev (TTL)
Maximum Bus Voltage	340 VDC
Limit Switches	5 V, Normally-Closed

Recommended Controller		
Multi-Axis	A3200	Ndrive HLe/Ndrive CP/Ndrive HPe/Npaq
	Ensemble	Ensemble HLe/Ensemble CP/Ensemble HPe
Single Axis	Soloist	Soloist CP/Soloist HPe

## ECO115SL Series SPECIFICATIONS



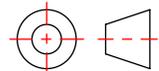
# ECO115SL Series DIMENSIONS



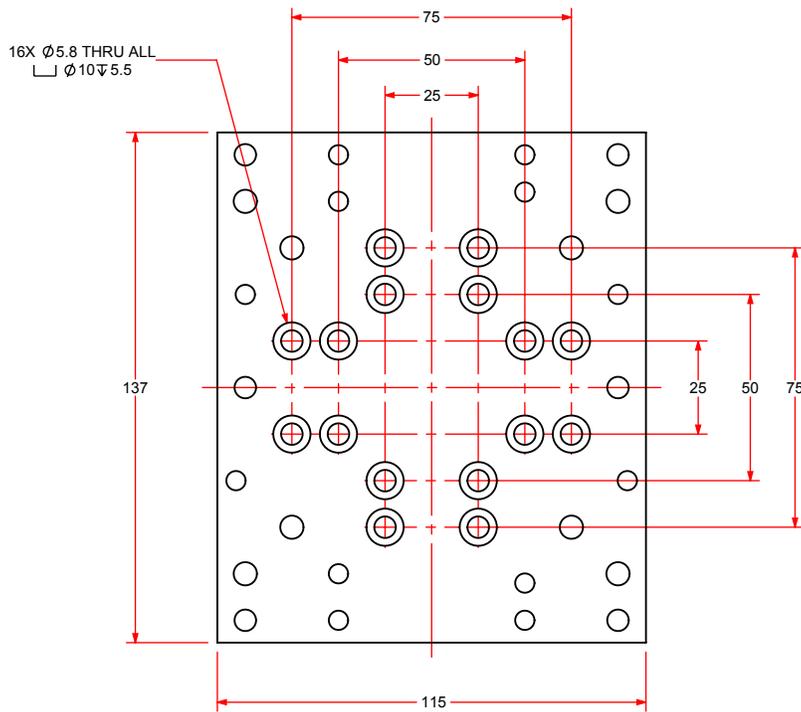
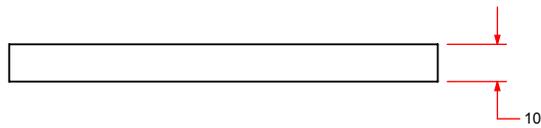
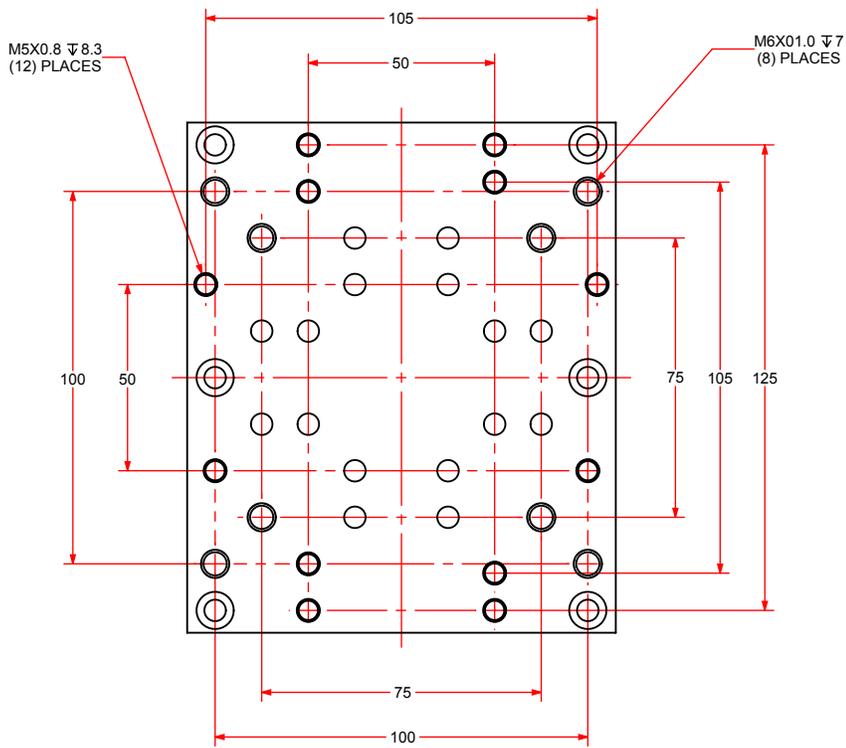
DETAIL A  
CARRIAGE MOUNTING HOLES

BASIC MODEL	NOMINAL TRAVEL	ELEC LIMIT TRAVEL	MECH LIMIT TRAVEL	A	B	C	D
ECO115SL-050	50	58.4-63.2	75	287.6	147.6	100	101.6
ECO115SL-100	100	109.2-114	125	337.6	172.6	100, 200	101.6
ECO115SL-150	150	160-164.8	175	387.6	197.6	100, 200	101.6
ECO115SL-200	200	210.8-215.6	225	437.6	222.6	100, 200, 300	101.6
ECO115SL-250	250	261.8-266.4	275	487.6	247.6	100, 200, 300	101.6, 355.6
ECO115SL-300	300	312.4-317.2	325	537.6	272.6	100, 200, 300, 400	101.6, 355.6
ECO115SL-400	400	414-418.8	425	637.6	322.6	100, 200, 300, 400, 500	101.6, 457.2
ECO115SL-500	500	515.6-519	525	737.6	372.6	100, 200, 300, 400, 500, 600	101.6, 457.2
ECO115SL-600	600	617.2-619	625	837.6	422.6	100, 200, 300, 400, 500, 600, 700	101.6, 457.2, 660.4

DIMENSIONS: MILLIMETERS

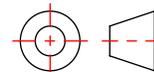


# EC0115SL Series Accessory Tabletop DIMENSIONS

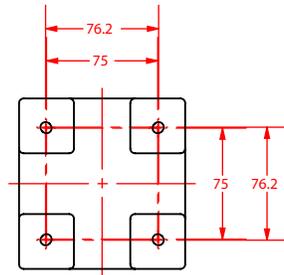
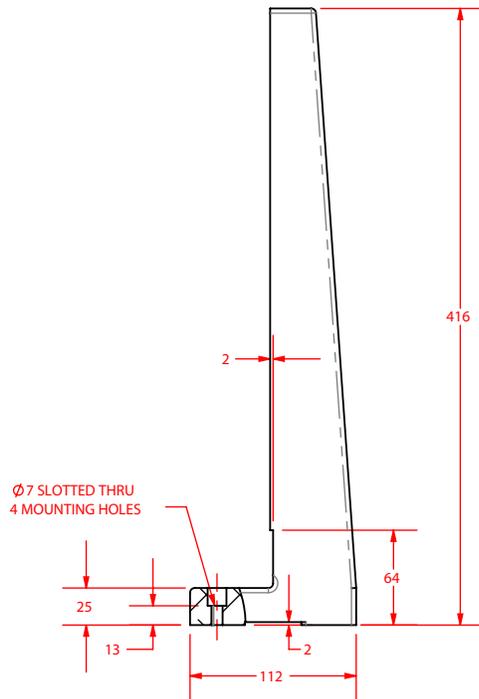
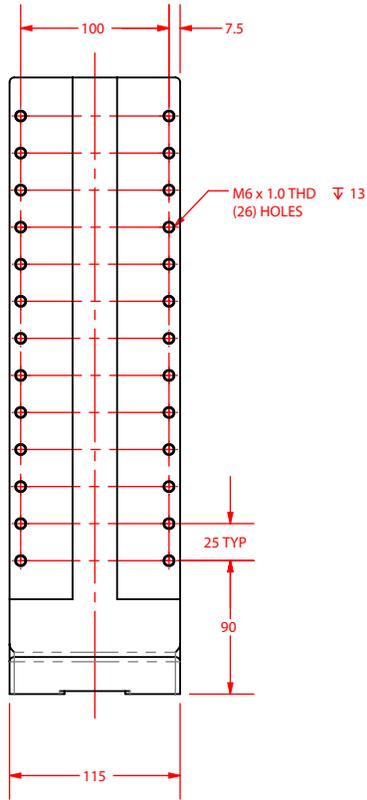
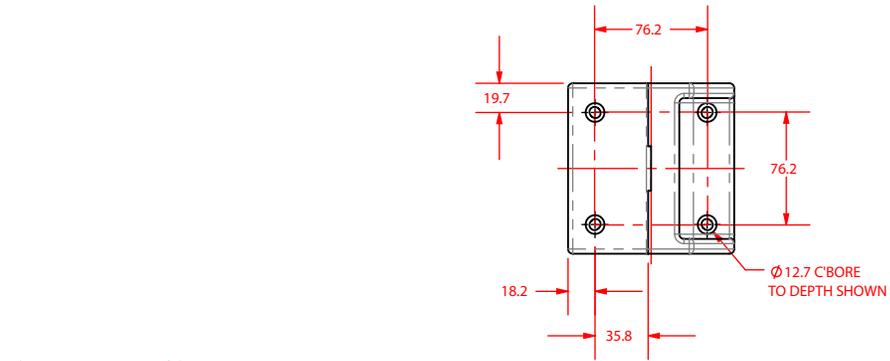


-TT3 MOUNTS THE FOLLOWING	
ADRS	AGR
-100	50
	75

DIMENSIONS: MILLIMETERS

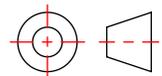


# ECO115SL Series HDZ Bracket DIMENSIONS



BASIC MODEL	RECOMMENDED FOR	MASS [kg]
HDZ115	PRO115SL-050, PRO115SL-100, PRO115SL-150, ECO115SL-050, ECO115SL-100, ECO115SL-150	3.7

DIMENSIONS: MILLIMETERS



## EC0115SL Series ORDERING INFORMATION

### EC0115SL Series Linear, Ball-Screw Stage

#### Travel (Required)

-050	50 mm travel stage
-100	100 mm travel stage
-150	150 mm travel stage
-200	200 mm travel stage
-250	250 mm travel stage
-300	300 mm travel stage
-400	400 mm travel stage
-500	500 mm travel stage
-600	600 mm travel stage

#### Tabletop (Optional)

-TT1	Tabletop with metric dimension mounting
-TT2	Tabletop with English dimension mounting
-TT3	Accessory tabletop with mounting for select rotary stages

#### Motor (Optional)

-M1	BMS60 brushless servomotor and 2500-line TTL encoder
-M2	BMS60 brushless servomotor, 2500-line TTL encoder, and brake
-M3	BMS60 brushless servomotor and 1000-line 1 Vpp encoder
-M4	BMS60 brushless servomotor, 1000-line 1 Vpp encoder, and brake
-M5	BM75 brushless servomotor and 2500-line TTL encoder
-M6	BM75 brushless servomotor, 2500-line TTL encoder, and brake
-M7	BM75 brushless servomotor and 1000-line 1 Vpp encoder
-M8	BM75 brushless servomotor, 1000-line 1 Vpp encoder, and brake
-M9	SM60 high voltage stepper motor
-M10	SM60 high voltage stepper motor and brake

#### Foldback Kit (Optional)

-FB1	Foldback kit for 0.250 inch diameter shaft NEMA 23 motor
-FB2	Foldback kit with brake for 0.250 inch diameter shaft NEMA 23 motor
-FB3	Foldback kit for 0.375 inch diameter shaft NEMA 23 motor
-FB4	Foldback kit with brake for 0.375 inch diameter shaft NEMA 23 motor

#### Motor Orientation (Optional)

-2	Bottom cable exit, optional orientation
-3	Left-side cable exit, standard orientation
-4	Top cable exit, optional orientation
-5	Right-side cable exit, optional orientation
-8	Right-side foldback, standard orientation
-12	Left-side foldback, optional orientation

#### Limits (Required)

-LI1	Normally-closed limit switches; 5 VDC with 9-Pin D connector
-LI2	Normally-open limit switches; 5 VDC with 9-Pin D connector

#### Coupling (Optional)

-CP1	Coupling for 0.250 inch diameter shaft
-CP2	Coupling for 0.375 inch diameter shaft

#### Metrology (Required)

-PL0	No metrology performance plots
-PL1	Metrology, uncalibrated with performance plots
-PL2	Metrology, calibrated (HALAR) with performance plots

## ECO115SL Series ORDERING INFORMATION

### Integration (Required)

Aerotech offers both standard and custom integration services to help you get your system fully operational as quickly as possible. The following standard integration options are available for this system. Please consult Aerotech if you are unsure what level of integration is required, or if you desire custom integration support with your system.

-TAS	Integration - Test as system Testing, integration, and documentation of a group of components as a complete system that will be used together (ex: drive, controller, and stage). This includes parameter file generation, system tuning, and documentation of the system configuration.
-TAC	Integration - Test as components Testing and integration of individual items as discrete components that ship together. This is typically used for spare parts, replacement parts, or items that will not be used together. These components may or may not be part of a larger system.

### Accessories (To Be Ordered As Separate Line Item)

ALIGN-NPA	Non-precision XY assembly
ALIGN-NPAZ	Non-precision XZ or YZ assembly
ALIGN-PA10	XY assembly; 10 arc sec orthogonality. Alignment to within 7 microns orthogonality for short travel stages.
ALIGN-PA10Z	XZ or YZ assembly with L-bracket; 10 arc second orthogonality. Alignment to within 10 microns orthogonality for short travel stages.
ALIGN-PA5	XY assembly; 5 arc sec orthogonality. Alignment to within 3 microns orthogonality for short travel stages.
ALIGN-PA5Z	XZ or YZ assembly with L-bracket; 5 arc second orthogonality. Alignment to within 5 microns orthogonality for short travel stages.
HDZ115	Right angle L-bracket for ECO115SL-050, ECO115SL-100, and ECO115SL-150 only.