

ALIO's Hybrid Hexapod® provides a revolutionary approach to 6D Motion with more than an order of magnitude higher precision, longer travel, higher speed and greater stiffness than traditional hexapod designs.



ALIO's approach combines a precision XY stage, Tripod, and continuous rotation theta axis (rather than 6 independent legs) to provide the 6 axes of motion. This is a different approach to 6 DOF devices producing far higher performance at competitive prices. Features and Benefits Include:

- Sub-micron positioning repeatability
- Tool Center Point "TCP" stability during translation FAR superior to any
- Rectangular-Prism-Shaped Working Envelopes >10x Larger Than The Umbrella-Shaped Volumes of Legacy Hexapods

Comparison of Hybrid Hexapod® Benefits

Hexapod Weakness:

- Any move requires 6-Axes to move ALL legs
- Any move other than Z will put all legs in a combination of tension / compression
- Direct & Indirect backlash on all legs
- Kinematic Equations more complex
- Unpredictable Travel Limitations, limited working volume
- No linear guide results in links' lost motion
- No Encoders -OR- Rotary Encoder behind motor
- Move and correct for error approach, Point cloud instead of smooth, predictable motion
- Speed Limitations
- Diminished path accuracy
- MTTF ~10,000 – 30,000 Hours

Hybrid Hexapod® Strength:

- + As few as 1 axis can produce same move at higher precision
- + Tripod legs are always in compression with centered load
- + Preloaded design, no backlash resulting in higher precision
- + Kinematics simpler = Faster processing & better accuracy
- + XY Stage determines XY travel, Tripod determines Z & Pitch/Roll Working volume is cubic shape 4-12x larger for comparable size
- + Each link has linear guides for more precision and repeatability
- + Each Link of the tripod has linear encoders incorporated
- + Move and sensing for external forces allows operator to know where payload is rather than rely on calculations only
- + Higher Speed Capability Linear Motor or Spindle (Spindle) Drive
- + VERY accurate motion path due to direct feedback of location
- + MTTF ~200,000 – 300,000 Hours

At a similar price, why wouldn't you choose Performance, Precision, and Reliability over the competition with an ALIO cost value in 10 to 100x the life expectancy?

Standard Parameters	Value	
Rotary Travel (Yaw) Ang. Velocity:	Unlimited 180 deg./s	
Vertical Travel (Max. / Min.) Max. Linear, Ang. Velocity: Linear Resolution: Bi-Directional Repeatability: Displacement Accuracy:	200mm/6mm 0.5m/s, 180 deg./s < 5nm < +/- 80nm < 1.0um	
XY Travel (Max. / Min.) Max. Linear, Ang. Velocity: Linear Resolution: Bi-Directional Repeatability: Displacement Accuracy:	unlimited/60mm 0.5m/s, 180 deg./s < 5nm < +/- 80nm < 1.0um	

Nothing compares to this speed with this precision.

Begin to specify your Hybrid Hexapod® with three simple questions:

1. What is your desired working volume XYZ?
2. What is your desired angular travel Pitch/Roll?
3. What is your distance to Tool Center Point "TCP" from center of Hybrid Hexapod® worst case?

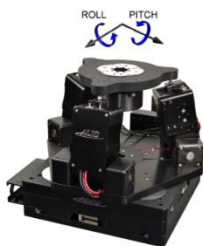


Linear Travel:

X-Axis Travel: ____ mm

Y-Axis Travel: ____ mm

Z-Axis Travel: ____ mm

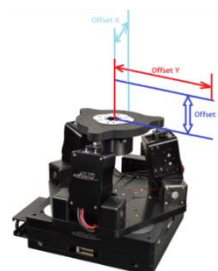


Rotary Travel:

X-Axis Roll: ____ °

Y-Axis Pitch: ____ °

Z-Axis Yaw: Infinite °



TCP Offset:

X-Axis Offset: ____ mm

Y-Axis Offset: ____ mm

Z-Axis Offset: ____ mm

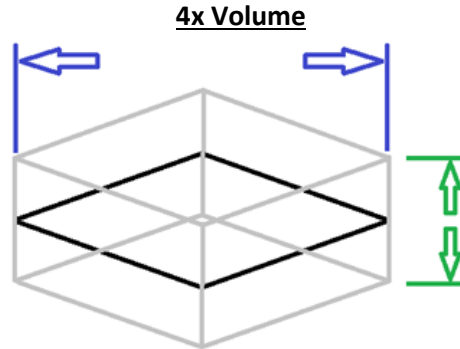
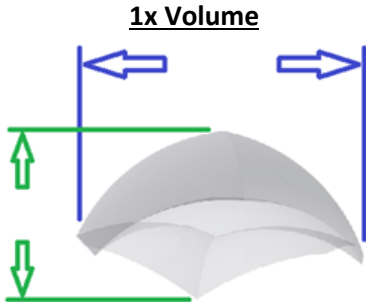


Image complements of ABB robotics.



Refer to this video regarding working volume of a Stewart Platform:

https://www.youtube.com/watch?v=gMG_1905sPs

Easily Configurable Work Volume

60x60mm XY; 15mm Z

200x200mm XY; 15mm Z

