

ATMX 6000

Stewart platform

Motion systems based on Stewart platforms (also known as: parallel robots/manipulators, hexapods) play a fundamental role in top-of-the-range vehicle simulators.

The motion system's task is to deliver motion cues during the simulation. This is achieved by an appropriate control of the actuators (linear actuators with ball screws), to ensure a dynamic motion in six degrees of freedom in the moving platform's motion envelope. The simulator cockpit mounted on the upper platform is being moved in such a way, as to provide realistic motion impressions, felt by the simulation participant. Quality of the motion cues generated during the simulation is determined by the size of the available motion envelope (the described system has a relatively long actuator stroke – 500mm), the power of the motors (this directly influences the available maximal linear and angular velocities and accelerations), as well as the level of sophistication and correctness of the motion cueing algorithms.



Ambulance simulator utilizing two ATMX6000 Stewart platforms

ATMX 6512 – Stewart platform – technical specification:



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|---|---|
| Nominal power: | 13,5 kW |
| Maximal load's weight: | 1200 kg |
| Maximal load's inertia: | $I_{xx}=600 \text{ kg m}^2$ $I_{yy}=600 \text{ kg m}^2$ $I_{zz}=600 \text{ kg m}^2$ |
| Maximal load's centre of gravity displacement in z axis: | 600 mm |
| Number of degrees of freedom: | 6 |
| Supply voltage: | 3x230 VAC |
| Platform's height in positions: | lowest: 900 mm middle: 1170 mm highest: 1440 mm |
| Linear motion range in x, y and z: | $\pm 270 \text{ mm}$ |
| Angular motion range about x, y and z: | $\pm 22 \text{ deg}$ |
| Maximal linear velocity in x, y and z: | 420 mm/s |
| Maximal angular velocity about x, y and z: | 35 deg/s |
| Maximal linear acceleration in x, y and z: | 6 m/s^2 |
| Maximal angular acceleration about x, y and z: | 430 deg/s^2 |
| Actuator stroke: | 500 mm |

The above specification is a characteristic of one particular 6DOF motion system designed and produced by ODIUT Automex. Should you require other characteristics for your project, please contact us. Thanks to our motion system design tool, we provide a wide range of flexibly designed 6DOF motion platforms available within short due dates.

Besides educational vehicle simulators for initial qualification in accordance to EU directives, Stewart platforms may be used in numerous other applications such as:

- civil, military and special task vehicles simulators,
- civil and military aircraft simulators,
- race car simulators,
- entertainment simulators,
- devices used for testing other equipment (generation of arbitrary trajectories in 6DOF),
- manipulators in CNC lathe centres,
- astronomy, for precise and highly robust positioning of measurement and observation equipment.

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