

## The 6200H Series Scanners

### Moving Magnet Series with Advanced Optical Position Detector



**The 6200H Series of closed loop galvanometer based optical scanners** combines our new moving magnet actuator technology with our innovative patented advanced optical position detector design. This combination offers the highest torque per watt and closed loop bandwidths, resulting in the highest positioning speed, precision and reliability available in any compact closed loop galvanometer in today's market.

**The 6200H Series compact design and material selection deliver the fastest step response times and high RMS speeds.** The neodymium-iron boron rotor material allows for exceptional flux densities in the air gap. The intense magnetic field strength combined with the highest rotor and mounted mirror resonant frequencies give the 6200H Series products superior peak accelerations and the fastest step response times possible in galvo technology.

**Instrumentation level accuracy and stability.** Exceptional closed loop positioning accuracy and stability are achieved through Cambridge Technology's patented advanced optical position detector providing instrumentation level accuracy and stability at a very cost effective price.

**The fastest step response times.** Sized for the fastest step response times, high RMS speeds at wide angles and for a broad range of apertures with single and dual axis solutions from 3 to 25mm, the 6200H series provides the broadest range of choices to optimize your system price/performance for any application. It is available in several different connector and cable options to meet specific system requirements.

**Designed for a wide variety of applications.** The 6200H Series is the optimal choice in for laser marking and material processing, biomedical systems, imaging and printing, semiconductor processing, laser projection or any application where speed, size and accuracy are critical to system performance.

**Cambridge Technology, Inc. also offers a variety of integral supporting products for the 6200H Series, including servo electronics, mirrors sets with coating options and X/Y system mounts. Custom single and dual axis optical apertures can be supported, consult the factory for more details.**

# Mechanical and Electrical Specifications

## The 6200H Series Scanners

|   | <u>6200H</u>  | <u>6210H</u> | <u>6215H</u> | <u>6220H</u> | <b>Units and Tolerances</b>               |
|---|---------------|--------------|--------------|--------------|---|
| Optical Apertures Supported, Two Axis               | 3, 5, 6       | 3, 5, 6      | 3, 5, 6      | 5, 8, 10     | MM  |
| Maximum Recommended Inertial Load                   | 0.13          | 0.2          | 0.28         | 1.25         | gm*cm <sup>2</sup> , +/-10%               |
| <b>Mechanical Specifications</b>                    |               |              |              |              |   |
| Rated Angular Excursions                            | ± 20          | ± 20         | ± 20         | ±20          | Degrees                                   |
| Rotor Inertia                                       | 0.013         | 0.018        | 0.028        | 0.125        | gm*cm <sup>2</sup> , +/-10%               |
| Torque Constant                                     | 1.2           | 2.79         | 3.78         | 6.17         | 10 <sup>4</sup> Dyne-cm/Amp, +/-10%       |
| Coil Temperature                                    | 110           | 110          | 110          | 110          | °C, Maximum                               |
| Thermal Resistance, Coil to Case                    | 3.8           | 2            | 1            | 1            | °C/Watt, Maximum                          |
| <b>Electrical Specifications, Drive Armature</b>    |               |              |              |              |   |
| Coil Resistance                                     | 2.1           | 3.72         | 2.53         | 2.79         | Ohms, +/-10%                              |
| Coil Inductance                                     | 52            | 109          | 94           | 180          | μH, +/-10%                                |
| Back EMF Voltage                                    | 20.9          | 48.7         | 66           | 108          | μV/Degree/Second, +/-10%                  |
| Current, RMS  | 2.3           | 2.4          | 4.1          | 3.9          | A, Maximum                                |
| Current, Peak                                       | 6             | 8            | 20           | 20           | A, Maximum                                |
| Small Angle Step Response                           | 130           | 100          | 130          | 200          | μs, with appropriate CTI Y mirror         |
| <b>Electrical Specifications, Position Detector</b> |               |              |              |              |   |
| Linearity   | 99.9          | 99.9         | 99.9         | 99.9         | %, minimum, over 40° optical              |
| Scale Drift   | 50            | 50           | 50           | 50           | PPM/°C, Maximum                           |
| Zero Drift  | 15            | 15           | 15           | 15           | Microradians/°C, Maximum                  |
| Repeatability                                       | 8             | 8            | 8            | 8            | Microradians, Maximum                     |
| Output Signal, Common Mode                          | 155           | 155          | 155          | 155          | μA, with AGC Voltage of 30mA, +/-20%      |
| Output Signal, Differential Mode                    | 12            | 12           | 12           | 12           | μA/Deg., with Common Mode of 155μA, ± 20% |
| <b>The 6230H Series Scanners</b>                    |               |              |              |              |   |
|   | <u>6231HC</u> | <u>6230H</u> | <u>6240H</u> |              | <b>Units and Tolerances</b>               |
| Optical Apertures Supported, Two Axis               | 8,10,12,15    | 8,10,12,15   | 12,15,20,25  |              | MM  |
| Maximum Recommended Inertial Load                   | 8             | 10           | 24           |              | gm*cm <sup>2</sup> , +/- 10%              |
| <b>Mechanical Specifications</b>                    |               |              |              |              |   |
| Rated Angular Excursions                            | ±20           | ±20          | ±20          |              | Degrees                                   |
| Rotor Inertia                                       | 0.82          | 0.97         | 2.4          |              | gm*cm <sup>2</sup> , +/-10%               |
| Torque Constant                                     | 1.11          | 1.31         | 2.00         |              | 10 <sup>5</sup> Dyne-cm/Amp, +/-10%       |
| Coil Temperature                                    | 110           | 110          | 110          |              | °C, Maximum                               |
| Thermal Resistance, Coil to Case                    | 1             | 0.80         | 0.62         |              | °C/Watt, Maximum                          |
| <b>Electrical Specifications, Drive Armature</b>    |               |              |              |              |   |
| Coil Resistance                                     | 1.2           | 1.07         | 1.03         |              | Ohms, +/-10%                              |
| Coil Inductance                                     | 176           | 173          | 350          |              | μH, +/-10%                                |
| Back EMF Voltage                                    | 195           | 229          | 346          |              | μV/Degree/Second, +/-10%                  |
| Current, RMS  | 5.8           | 7.1          | 8.2          |              | A, Maximum                                |
| Current, Peak                                       | 25            | 25           | 25           |              | A, Maximum                                |
| Small Angle Step Response                           | 250           | 250          | 350          |              | μs, with appropriate CTI Y mirror         |
| <b>Electrical Specifications, Position Detector</b> |               |              |              |              |   |
| Linearity   | 99.9          | 99.9         | 99.9         |              | %, minimum, over 40° optical              |
| Scale Drift   | 50            | 50           | 50           |              | PPM/°C, Maximum                           |
| Zero Drift  | 15            | 15           | 15           |              | Microradians/°C, Maximum                  |
| Repeatability                                       | 8             | 8            | 8            |              | Microradians, Maximum                     |
| Output Signal, Common Mode                          | 155           | 155          | 155          |              | μA, with AGC Voltage of 30mA, +/-20%      |
| Output Signal, Differential Mode                    | 12            | 12           | 12           |              | μA/Deg., with Common Mode of 155μA, ±20%  |