

**APPLICATIONS**

- Laser entertainment (light show) displays
- Optical Coherence Tomography
- Optical Layout Templates
- Raster Image Projection
- Confocal Microscopy
- Laser Marking

**UNIQUE ScannerMAX FEATURES**

- Stronger magnetic field
- Stronger rotor and shafts
- Stronger, integrated back-supporting mirror mount
- Stronger SV30/silicon dioxide ceramic hybrid bearings
- Stronger position feedback with low noise
- Cooler-running motor magnetic design



**BENEFITS**

- Extremely high speed mirror positioning
- Wide-angle scanning, up to 80 degrees optical
- Convenient package size, compatible with many existing X-Y mounts
- Low coil resistance for low heat generation during scanning
- Low thermal resistance for enhanced heat removal
- Low wobble and jitter

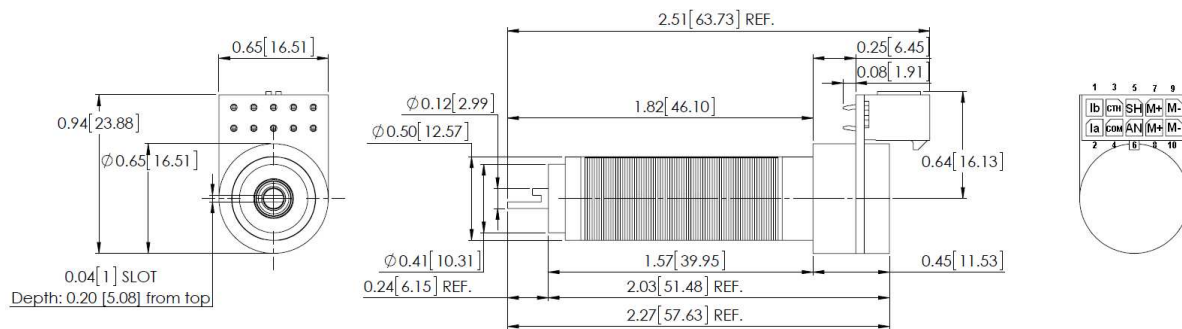
**GENERAL DESCRIPTION**

The *Saturn 5* optical scanner is specifically designed to meet the high acceleration and high RMS duty cycle demands of projection and imaging applications such as laser entertainment displays, raster imaging, Confocal Microscopy and Optical Coherence Tomography. The *Saturn 5* is capable of moving a 3mm beam through an optical angle of 30° at a frequency of over 1,600 Hz with a sinusoidal drive. Step response times can be as low as 100 microseconds for a 5° optical step and under 500 microseconds for an 80° optical step.

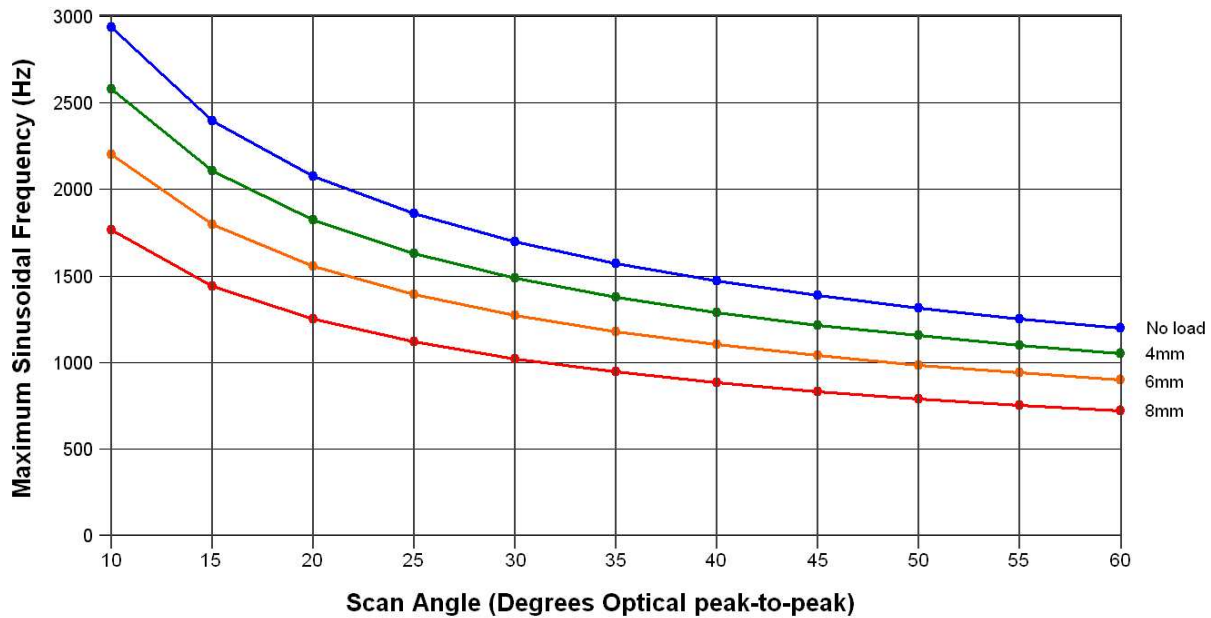
In addition to its high-speed capabilities, the *Saturn 5* incorporates several very desirable design features. First, because of its half-inch-round body dimensions, the *Saturn 5* is easily retrofitable into many existing systems. Second, the integral back-supporting mirror mount virtually eliminates “diving board” bending-mode mirror resonances while also easing field replacement of mirrors. And finally, the high-output, low-noise position detector enhances short-term repeatability and minimizes dither.

The newly-developed X3 magnetic circuit boasts air gap flux densities of over 14,000 Gauss. The intense magnetic field strength, combined with the very low coil resistance and low rotor inertia, gives the *Saturn 5* the highest peak- and RMS-torque-to-inertia ratio of any commercially-available optical scanner.

**OUTLINE DRAWING**



Performance with various ScannerMAX mirror sets



**SPECIFICATIONS**

| Parameter                            | Value  | Units                                   |
|--------------------------------------|--------|---|
| Optimal Mirror Size                  | 3 - 8  | Millimeters, clear aperture             |
| Rotation Angle                       | +/- 20 | Mechanical degrees                      |
| Rotor Inertia                        | 0.028  | Gram • Centimeters <sup>2</sup>         |
| Torque Constant                      | 35,000 | Dyne • Centimeters per Ampere           |
| Maximum Rotor Temperature            | 110    | °C                                      |
| Thermal Resistance (Rotor to Case)   | 0.64   | °C per Watt                             |
| Coil Resistance                      | 1.0    | Ohms                                    |
| Coil Inductance                      | 95     | µh                                      |
| Back EMF Voltage                     | 61.1   | µV per degree per second                |
| RMS Current                          | 8.4    | Amperes at Tcase of 50°C, Maximum       |
| Peak Current                         | 40     | Amperes, Maximum                        |
| Small Angle Step Response            | 100    | µS with ScannerMAX 3mm mirror set       |
| PD Linearity over 20 degrees         | 99.8   | % Minimum                               |
| PD Linearity over 40 degrees         | 99.4   | % Typical                               |
| PD Scale Drift                       | 50     | PPM / °C, Maximum                       |
| PD Offset Drift                      | 15     | µRad / °C, Maximum                      |
| PD Short-term Repeatability          | 8      | µRad                                    |
| PD Output Signal (Common Mode)       | 900    | µA with LED current of 60mA             |
| PD Output Signal (Differential Mode) | 60     | µA per degree, with LED current of 60mA |
| Mass                                 | 36     | Grams                                   |

Specifications are at a temperature of 25° C. All mechanical and electrical specifications are +/-10%.