

APPLICATIONS

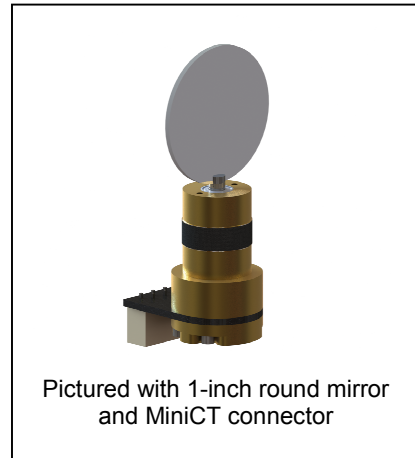
- Compact, portable displays
- Hand-held medical instruments

UNIQUE ScannerMAX FEATURES

- Stronger magnetic field
- Stronger rotor and shafts
- Stronger, integrated back-supporting mirror mount
- Stronger 6mm precision bearings
- Stronger position feedback with low noise
- Cooler-running motor magnetic design

BENEFITS

- Very compact, low-cost and lightweight design
- Wide-angle scanning, beyond 60 degrees optical
- Can be mounted from the front using two screws, or around the body



GENERAL DESCRIPTION

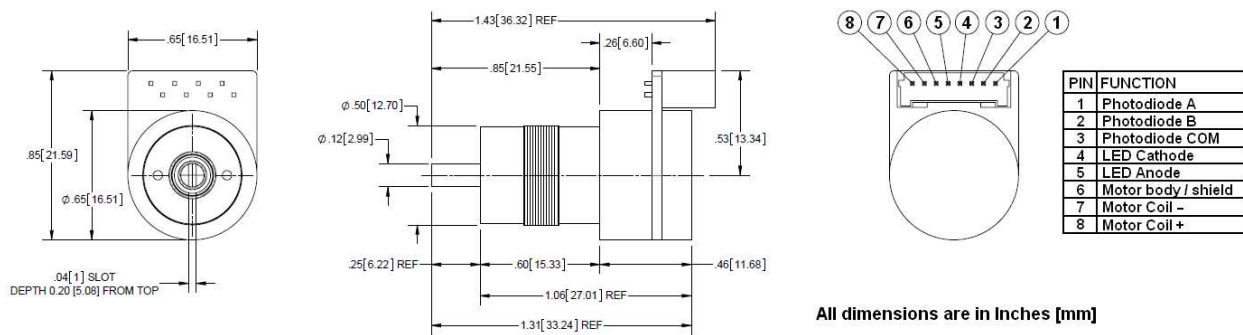
The ScannerMAX model “Compact 506” is the smallest, lowest-cost, lightest-weight, and most versatile galvo scanner ever made by ScannerMAX. It is particularly well suited for applications where size, cost and weight are paramount concerns, such as compact portable displays and handheld medical instruments.

Although the *Compact 506* is very small, it is built upon the *VRAD-506* actuator platform, which features very strong rotor construction and 6mm OD bearings. This construction allows the *Compact 506* optical scanner to move small mirrors as well as unusually large mirrors up to 1 inch in diameter, and do so without a notch filter in the servo loop. Moreover, torque-per-watt is unsurpassed for this package size, allowing this galvo to run cool in most applications.

The *Compact 506* optical scanner is available in two separate position sensor configurations: one with a polarity that is compatible with conventional galvanometer servo drivers, and one with a polarity compatible with the Mach-DSP digital servo driver. Several connector options are also available including 8-pin Mini-CT (shown on this datasheet), as well as 10-pin Micromatch and 10-pin Molex/TE Mini-Fit Jr.

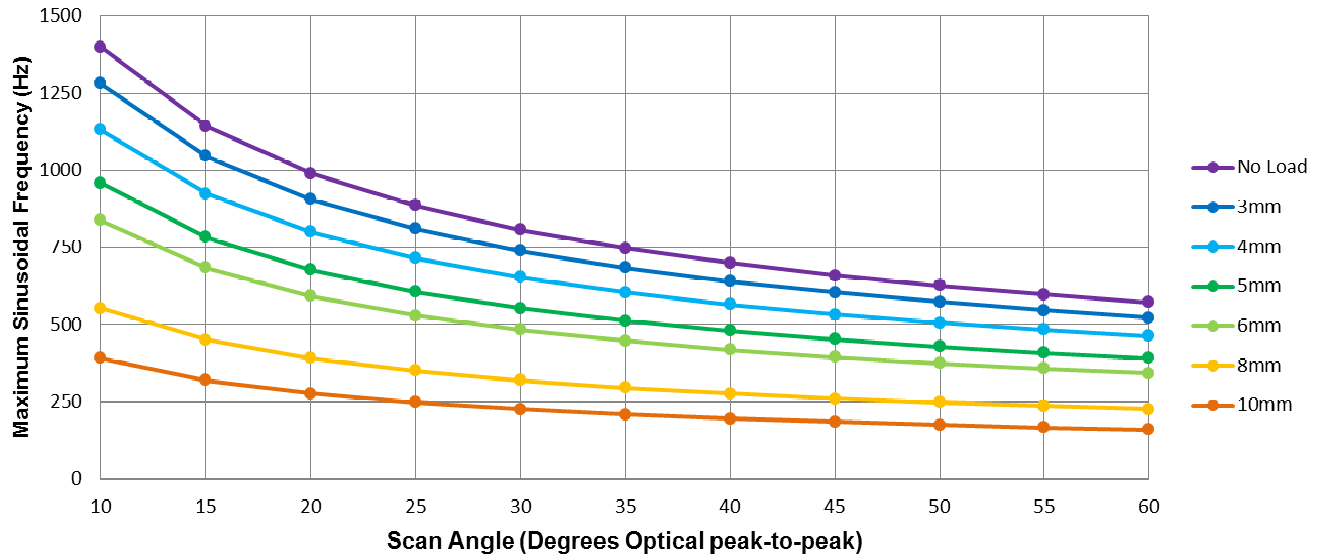
Given that the body parts are made from aircraft aluminum, this allows us to deliver an optical scanner whose weight is among the lightest of all galvanometer scanners ever made. Moreover, being based on the *VRAD-506* actuator, the mirror position is restored to a central rotation angle when power is removed, due to magnetic-spring-return action.

OUTLINE DRAWING



(Connector shown above is TE Connectivity part number 292207-8. Mating connector is 353908-8, using 353907-1 pins.)

Compact 506 performance with selected ScannerMAX mirror sets ⁽¹⁾



SPECIFICATIONS

Parameter	Value	Units
Optimal Mirror Size	up to 1 inch	Diameter
Rotation Angle ⁽²⁾	+/- 20	Degrees
Rotor Inertia	0.014	Gram • Centimeters ²
Torque Constant ⁽³⁾	18400	Dyne • Centimeters per Ampere
Maximum Coil Temperature	100	degrees Celsius
Thermal Resistance, Coil to Mount	5.6	degrees Celsius per Watt, typical
Coil Resistance ⁽³⁾	1.8	Ohms
Coil Inductance ⁽³⁾	280	µh
Back EMF Voltage ^(2, 3)	32.1	µV per degree per second
Peak Current ⁽³⁾	10	Amperes, Maximum
RMS Current ⁽³⁾	1.85	Amperes at Tmount of 50°C
Power Handling Capacity ⁽³⁾	8	Watts at Tmount of 50°C
Small Angle Step Response ⁽³⁾	150	µS with ScannerMAX 3mm mirror set
PD Linearity over 20 degrees ⁽²⁾	99	% Minimum
PD Output Signal (Common Mode) ⁽²⁾	300	µA (at 20mA LED current)
PD Output Signal (Differential Mode) ⁽²⁾	20	µA per degree (at 20mA LED current)
Mass	12.8	Grams

NOTES

1. Graph denotes theoretical maximum performance of the scanner due to thermal limitations, with case at 50°C.
2. Angular specifications are in mechanical degrees. For most applications, optical angle = 2x mechanical angle.
3. Compact 506 can easily be fabricated with alternative coil configurations to achieve different specifications. Please contact us if you have different coil resistance, inductance, torque, current or connector requirements.

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



“Compact 506” Optical Scanner
for low-cost and light-weight applications

MORE INFORMATION

More information about the Compact and Saturn series of optical scanners and VRAD series of actuators, including additional application hints and tips, can be found at www.ScannerMAX.com.

OEMs are strongly encouraged to work with us to make sure that the most appropriate scanner or actuator is chosen and designed-in.

LASER SCANNING BOOK AVAILABLE

Detailed information about galvanometer scanners, servo driver techniques, and scanner applications can be found in the #1 best-selling book *LASER SCANNERS: Technologies and Applications*, written by Pangolin’s President William R. Benner, Jr. The book can be found at www.LaserScanningBook.com.

SCANNERS AND ACTUATORS AVAILABLE FROM SCANNERMAX

- *VRAD 506*: a low-cost, open-loop rotary actuator capable of wide-angle rotation – perfect for shutters
- *Compact 506*: the lowest-cost, lightest-weight, and most versatile galvo scanner for 3mm to 1-inch beams
- *Saturn 1B*: providing the highest-speed vector scanning available, for 1mm to 4mm beams
- *Saturn 2B*: a resonant-scanner substitute for high-frequency sinusoidal scanning of 1mm to 4mm beams
- *Saturn 5B*: for both vector and raster scanning of 5mm and 6mm beams
- *Saturn 9B*: providing the best large-signal vector scanning performance for 8mm to 10mm beams
- *Saturn 9B Plus*: for 10mm raster scanning with 40% less heat generation

PATENT AND TRADEMARK INFORMATION

US Utility Patent Number: 8,508,726
US Utility Patent Number: 8,963,396
US Utility Patent Number: 9,077,219
US Utility Patent Number: 9,195,061
US Utility Patent Number: 9,366,860
German Patent (Utility Model) Number: 20 2013 003 263.4
German Patent (Utility Model) Number: 20 2012 009 275.8
Chinese Application for Invention No. 201210363949.9
Chinese Application for Invention No. 201210363955.4
Chinese Application for Invention No. 201310151544.3
Other US and International Patents Pending.

ScannerMAX, Compact 506 and VRAD are trademarks of Pangolin Laser Systems, Inc.

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