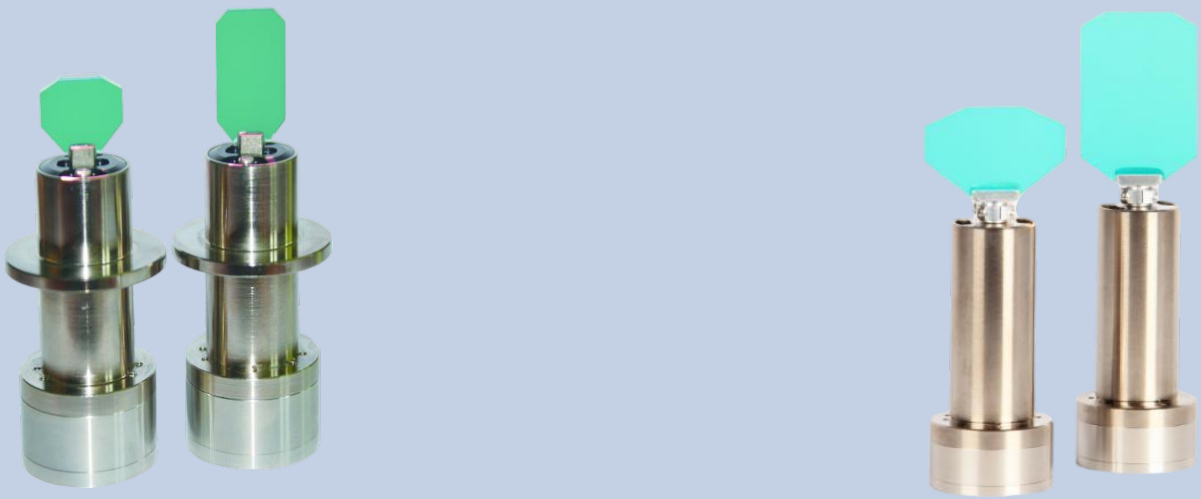
VENUSLAB
OPTOELECTRONICS

Precision
Meets
Simplicity

High-Performance Galvanometer Scanner



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VenusLab™Galvo Series: Setting New Standards for Precision Beam Steering

The VenusLab™High-Performance Galvo Series is engineered to meet the most demanding beam steering requirements.

The series is divided into two camps: **Type-S (Speed)** for 3-7mm small apertures, pursuing 0.1ms extreme speed, ideal for laser display and bio-imaging; **Type-P (Power)** for 10-20mm large apertures, optimized for motor torque and thermal design, capable of driving large mirrors under high-power laser loads while maintaining dynamic performance.

Core Highlights & Positioning

A universal galvanometer scanner series covering scenarios from microscopic imaging to high-power welding. Offers a full range of aperture options from 3mm to 20mm, combining rapid response with industrial-grade load stability.

- **Full Range Coverage:** Apertures support 3mm - 20mm, perfectly matching Confocal, OCT, and Laser Cutting systems.
- **Micro-Radian Precision:** Utilizing high-precision photoelectric sensors, achieving linearity of 99.90% and repeatability <8 µRad.
- **Ultra-Low Drift Technology:** Scale drift <50 PPM/°C ensures the reliability of long-term experimental data.
- **Rapid Response:** Imaging-grade models feature step response as fast as 0.13ms; heavy-duty models offer superior torque capacity.

Applications in Detail

1.Laser Scanning Confocal Microscopy (LSCM): With VenusLab-9215's 0.13ms ultra-fast response, the system supports high-frame-rate real-time cell imaging. High linearity (99.90%) ensures distortion-free edges in scanned images, perfectly reconstructing the microstructure of biological samples.

2.OCT & Ophthalmic Diagnosis: Designed with low-drift characteristics for fundus scanning. During long-duration retinal tomography, the zero drift of <10 µRad/°C ensures absolute stability of the imaging
beam, eliminating image artifacts caused by thermal effects.

3.Optogenetics & Optical Tweezers: Leveraging the galvanometer's precise positioning, researchers can accurately direct laser beams to stimulate specific neurons with millisecond precision, or non-contact capture and manipulate single cells/particles at the microscopic scale.

4.Laser Cleaning & Rust Removal: The powerful motor torque of VenusLab-9230 drives large mirrors for high-speed raster scanning. It rapidly strips oxidation layers, paint, or contaminants from metal surfaces while maintaining high energy density, without damaging the substrate.

5.Precision Laser Welding: Supports complex Wobble welding paths (e.g., spiral, sine wave). The highly dynamic oscillating beam stirs the molten pool, significantly reducing porosity and spatter, making it ideal for EV battery busbars or sealing precision electronic components.

6.Marking-on-the-Fly: For assembly line production, VenusLab-9310 offers exceptional dynamic tracking performance. Even with high-speed conveyor movement, it performs synchronized vector marking of QR codes and serial numbers with sharp, clear character edges.

Interfaces & Compatibility

Driver Protocol: All series support analog ± 5V or ± 10V input, compatible with standard XY2-100 protocol.
Power Requirements: Recommended ± 15V for Type-S, and ± 24V for Type-P for optimal torque output.

Technical Specifications

Group A: High-Speed Imaging Models (3mm - 7mm)

Parameter	VenusLab-8107	VenusLab-9215
Best For	Cost-Effective Imaging	High-End Scanning
Aperture	3 / 5 / 7 mm	3 / 5 / 7 mm
Step Response (0.1°)	≤ 0.14 ms	**< 0.13 ms (Faster)**
Tracking Error	0.1 ms	**0.09 ms**
Linearity	99.90%	99.90%
Repeatability	< 8 µRad	< 8 µRad
Operating Voltage	±15V / ±24V	±15V / ±24V
Average Current	2.0 A (Max)	3.4 A (Max)
Scan Angle	± 20°	± 20°

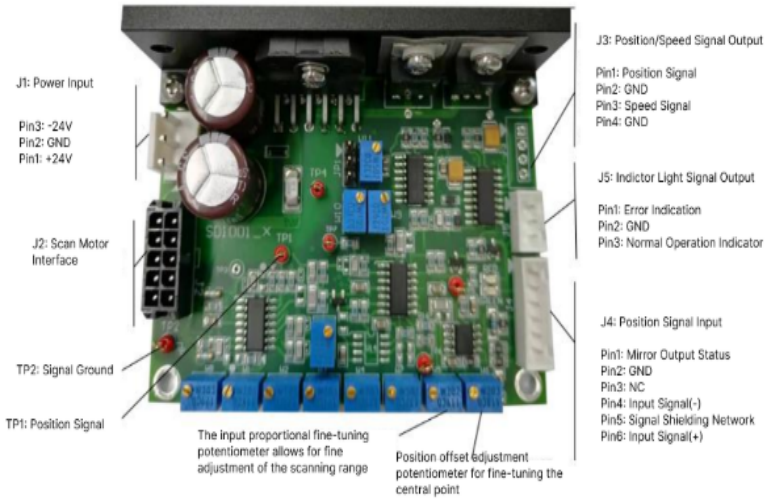
Group B: High-Load Industrial Models (10mm - 20mm)

Parameter	VenusLab-9310	VenusLab-9230
Best For	Precision Marking	Welding & Cleaning
Aperture	**10 mm**	**15 / 20 mm**
Step Response (0.1°)	< 0.2 ms	< 0.35 ms
Torque Constant	-	**High Torque Optimized**
Linearity	99.90%	99.90%
Scale Drift	< 50 PPM/°C	< 50 PPM/°C
Signal Scale Factor	0.5 V/°	**5.5 V/° (Special)**
Peak Current	20 A	20 A
Operating Voltage	±15V / ±24V	**±24V Recommended**

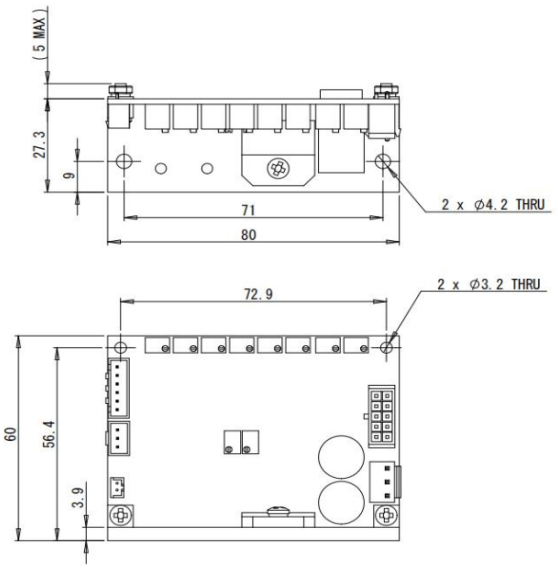
Mechanical Dimensions

Electrical connection diagram for the drive board

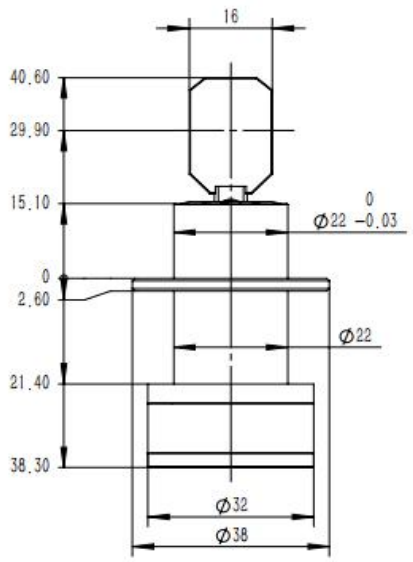
Diagram of the mounting dimensions for the drive board



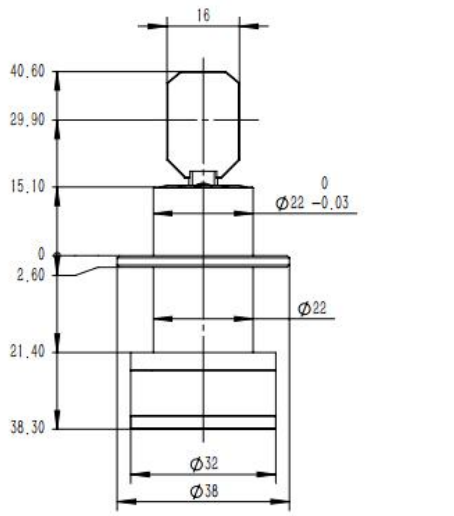
9310X motor dimensions diagram



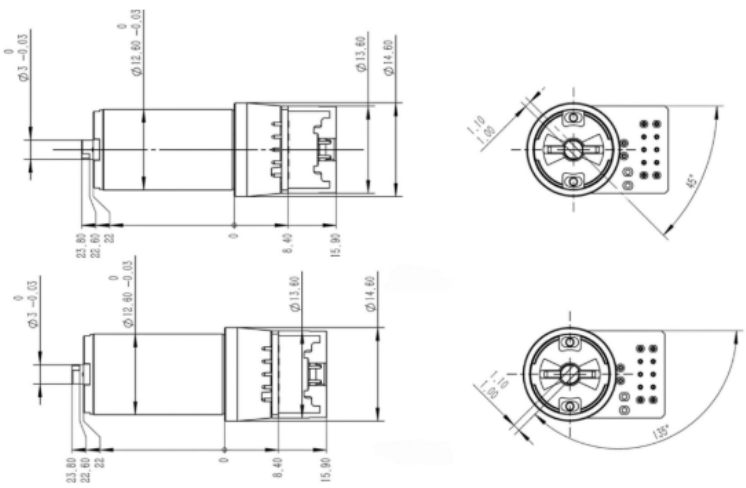
9310Y motor dimensions diagram

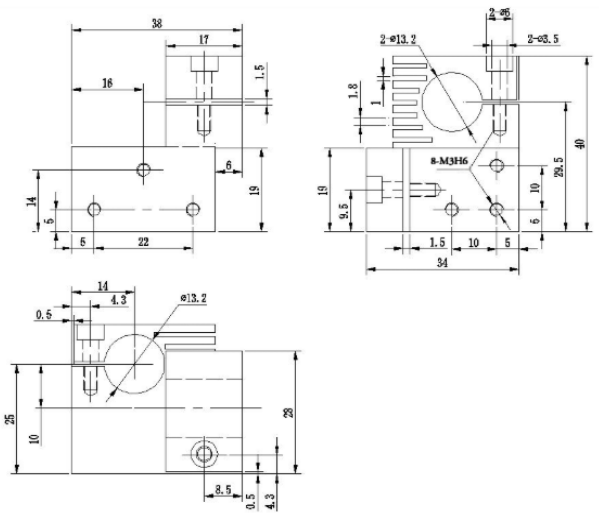


8107Motor dimensions diagram

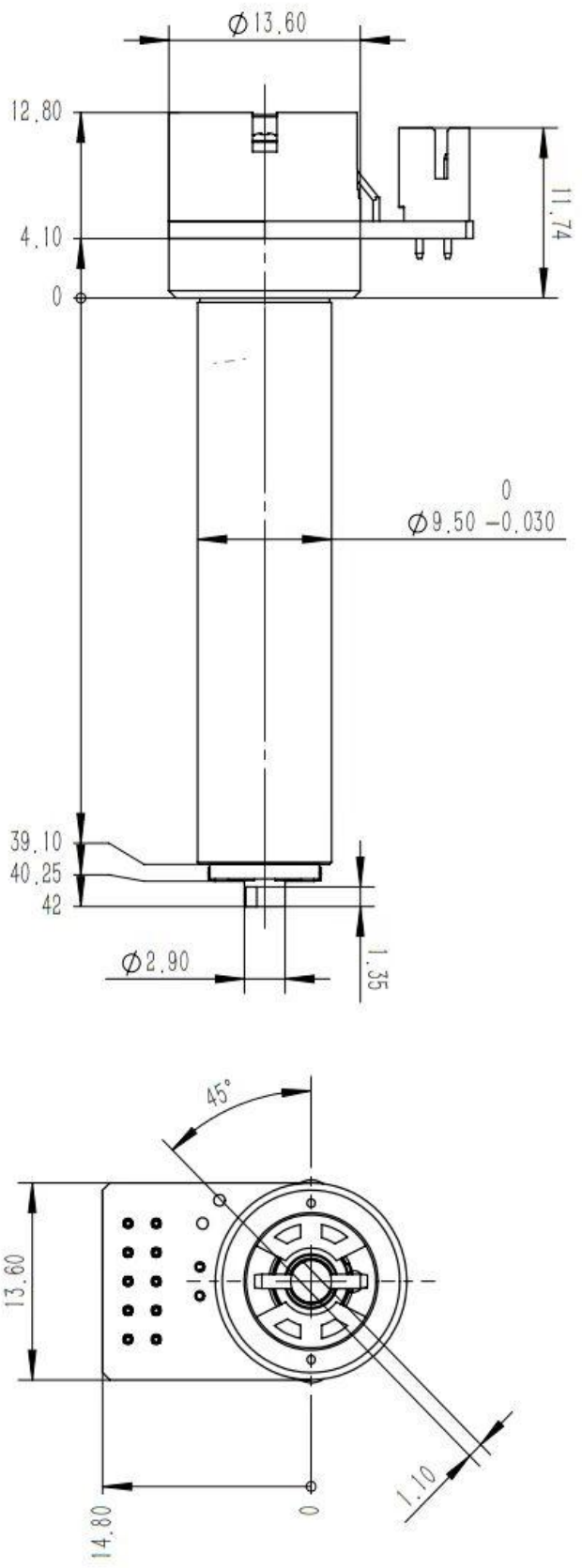


5mm/7mm bracket size diagram

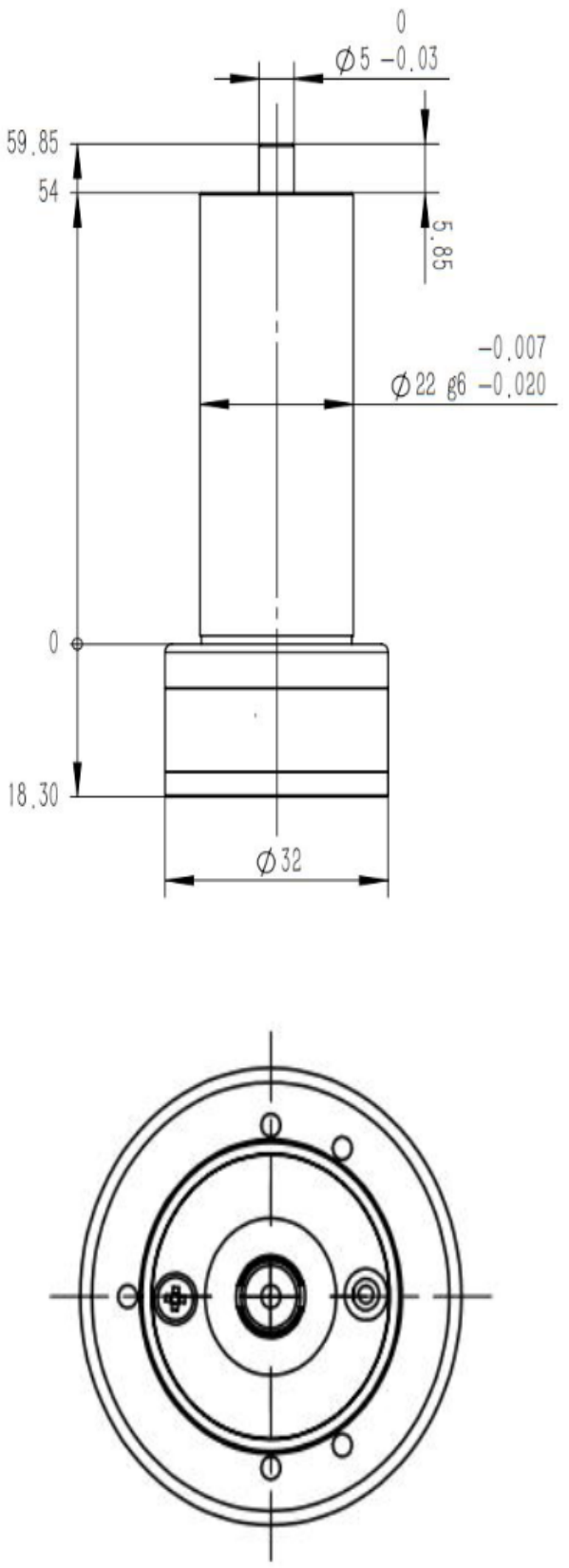




9215Motor dimensions diagram



9230Motor dimensions diagram



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