

Piezo Stages

VenusLab Sensing & Control Series

Nano Closed-loop Control & Precision Feedback Hub

- Digital Intelligence: 24-bit DSP with linearization/waveform algorithms – eliminates piezo hysteresis/nonlinearity.
- Extreme Sensing: $\leq 0.1\text{nm}$ capacitive sensors (ultra-slim probes) – solves narrow-gap measurements.



One Platform Many Possibilities

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Get a Quote



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Overview

Smart Drive, Nano Perception

The VL-S/C series is the core component that endows precision machinery with "intelligence" and "vision". This series perfectly integrates high-bandwidth digital piezoelectric controllers with sub-nanometer non-contact sensors, constructing a complete closed-loop ecosystem ranging from microvolt-level voltage driving to picometer-level displacement detection. Whether it is high-speed dynamic scanning or long-term static holding, VL-S/C can ensure the system's precision remains consistent.

Applications

- Leveling of lithography machine workpiece stage and detection of wafer surface profile.
- AFM/STM probe scanning control and image reconstruction.
- Analysis of rotational error of air spindle and testing of hard disk head flying height.
- Providing real-time position monitoring for various types of piezoelectric nano-displacement stages.

Technical Specifications

VenusLab Sensing & Control (VL-S/C) Product Detailed Parameter Summary Table

| Model | Product Name | Core Specs / Remarks |
|-------------------------------|------------------------------|--|
| Controller Series | | |
| VL-Pzo-Amp-2B | Bipolar Piezo Amplifier | 1-Ch, Open-Loop Amplification, -20V~120V Output |
| VL-Pzo-Ctrl-Ana-1Ch | Analog Piezo Controller | 1-Ch, PID Closed-Loop Control, Analog Interface |
| VL-Pzo-Ctrl-Dig-3Ch | Digital Piezo Controller | 3-Ch, 24-bit Precision, USB/RS232, Waveform Generation |
| VL-IM-Ctrl-1Ch | Inertial Motor Controller | 1-Ch, Stick-Slip Drive (Sawtooth Wave), Joystick Support |
| VL-Pzo-Ctrl-DSP-3Ch | DSP Piezo Controller | 3-Ch, High-Speed DSP Processing, Real-time Trajectory Tracking |
| VL-Pzo-Ctrl-DS-3Ch | Digital Servo Controller | 3-Ch, Digital Servo Algorithm, High Dynamic Response |
| Industrial Capacitive Sensors | (Ind Series) | Standard Package, High Cost-Performance |
| VL-Cap-Ind-D08-20 | Industrial Capacitive Sensor | 8mm Cylindrical Probe, Range 20μm |
| VL-Cap-Ind-D08-100 | Industrial Capacitive Sensor | 8mm Cylindrical Probe, Range 100μm |
| VL-Cap-Ind-D08-200 | Industrial Capacitive Sensor | 8mm Cylindrical Probe, Range 200μm |
| VL-Cap-Ind-D10-20 | Industrial Capacitive Sensor | 10mm Cylindrical Probe, Range 20μm |
| VL-Cap-Ind-D10-100 | Industrial Capacitive Sensor | 10mm Cylindrical Probe, Range 100μm |
| VL-Cap-Ind-D10-200 | Industrial Capacitive Sensor | 10mm Cylindrical Probe, Range 200μm |
| VL-Cap-Ind-D10-400 | Industrial Capacitive Sensor | 10mm Cylindrical Probe, Range 400μm |
| VL-Cap-Ind-D06L-20 | Industrial Capacitive Sensor | 6mm Flat Probe, Range 20μm |
| VL-Cap-Ind-D06L-100 | Industrial Capacitive Sensor | 6mm Flat Probe, Range 100μm |
| VL-Cap-Ind-D06L-200 | Industrial Capacitive Sensor | 6mm Flat Probe, Range 200μm |
| VL-Cap-Ind-D14-20 | Industrial Capacitive Sensor | 14mm Cylindrical Probe, Range 20μm |
| VL-Cap-Ind-D14-100 | Industrial Capacitive Sensor | 14mm Cylindrical Probe, Range 100μm |
| VL-Cap-Ind-D14-200 | Industrial Capacitive Sensor | 14mm Cylindrical Probe, Range 200μm |
| VL-Cap-Ind-D14-400 | Industrial Capacitive Sensor | 14mm Cylindrical Probe, Range 400μm |
| VL-Cap-Ind-D10L-20 | Industrial Capacitive Sensor | 10mm Flat Probe, Range 20μm |
| VL-Cap-Ind-D10L-100 | Industrial Capacitive Sensor | 10mm Flat Probe, Range 100μm |
| VL-Cap-Ind-D10L-200 | Industrial Capacitive Sensor | 10mm Flat Probe, Range 200μm |
| VL-Cap-Ind-D10L-400 | Industrial Capacitive Sensor | 10mm Flat Probe, Range 400μm |
| VL-Cap-Ind-D20L-20 | Industrial Capacitive Sensor | 20mm Flat Probe, Range 20μm |
| VL-Cap-Ind-D20L-100 | Industrial Capacitive Sensor | 20mm Flat Probe, Range 100μm |
| VL-Cap-Ind-D20L-200 | Industrial Capacitive Sensor | 20mm Flat Probe, Range 200μm |
| VL-Cap-Ind-D20L-400 | Industrial Capacitive Sensor | 20mm Flat Probe, Range 400μm |

| | | |
|-------------------------------|------------------------------|---|
| Scientific Capacitive Sensors | (Sci Series) | Ultra-Low Drift, Vacuum Compatible, High Resolution |
| VL-Cap-Sci-D08-20 | Scientific Capacitive Sensor | 8mm High-Precision Cylindrical, Range 20 μ m |
| VL-Cap-Sci-D08-100 | Scientific Capacitive Sensor | 8mm High-Precision Cylindrical, Range 100 μ m |
| VL-Cap-Sci-D08-200 | Scientific Capacitive Sensor | 8mm High-Precision Cylindrical, Range 200 μ m |
| VL-Cap-Sci-D10-20 | Scientific Capacitive Sensor | 10mm High-Precision Cylindrical, Range 20 μ m |
| VL-Cap-Sci-D10-100 | Scientific Capacitive Sensor | 10mm High-Precision Cylindrical, Range 100 μ m |
| VL-Cap-Sci-D10-200 | Scientific Capacitive Sensor | 10mm High-Precision Cylindrical, Range 200 μ m |
| VL-Cap-Sci-D10-400 | Scientific Capacitive Sensor | 10mm High-Precision Cylindrical, Range 400 μ m |
| VL-Cap-Sci-D14-20 | Scientific Capacitive Sensor | 14mm High-Precision Cylindrical, Range 20 μ m |
| VL-Cap-Sci-D14-100 | Scientific Capacitive Sensor | 14mm High-Precision Cylindrical, Range 100 μ m |
| VL-Cap-Sci-D14-200 | Scientific Capacitive Sensor | 14mm High-Precision Cylindrical, Range 200 μ m |
| VL-Cap-Sci-D14-400 | Scientific Capacitive Sensor | 14mm High-Precision Cylindrical, Range 400 μ m |
| VL-Cap-Sci-D06L-20 | Scientific Capacitive Sensor | 6mm High-Precision Flat, Range 20 μ m |
| VL-Cap-Sci-D06L-100 | Scientific Capacitive Sensor | 6mm High-Precision Flat, Range 100 μ m |
| VL-Cap-Sci-D06L-200 | Scientific Capacitive Sensor | 6mm High-Precision Flat, Range 200 μ m |
| VL-Cap-Sci-D10L-20 | Scientific Capacitive Sensor | 10mm High-Precision Flat, Range 20 μ m |
| VL-Cap-Sci-D10L-100 | Scientific Capacitive Sensor | 10mm High-Precision Flat, Range 100 μ m |
| VL-Cap-Sci-D10L-200 | Scientific Capacitive Sensor | 10mm High-Precision Flat, Range 200 μ m |
| VL-Cap-Sci-D10L-400 | Scientific Capacitive Sensor | 10mm High-Precision Flat, Range 400 μ m |
| VL-Cap-Sci-D20L-20 | Scientific Capacitive Sensor | 20mm High-Precision Flat, Range 20 μ m |
| VL-Cap-Sci-D20L-100 | Scientific Capacitive Sensor | 20mm High-Precision Flat, Range 100 μ m |
| VL-Cap-Sci-D20L-200 | Scientific Capacitive Sensor | 20mm High-Precision Flat, Range 200 μ m |
| VL-Cap-Sci-D20L-400 | Scientific Capacitive Sensor | 20mm High-Precision Flat, Range 400 μ m |
| Other Measuring Instruments | | |
| VL-LVDT-D1 | Inductive Micrometer (LVDT) | Contact Measurement, \pm 1mm Range, High Repeatability |
| VL-Laser-D1 | Laser Displacement Sensor | Non-Contact, 2/10/50mm, Spectral Confocal/ Triangulation |
| VL-Strain-Gauge | Piezo Strain Sensor | Integrated Resistive Strain Gauge, for Feedback |

Service & Support

We are dedicated to delivering exceptional optoelectronic solutions to every client. From precision manufacturing and secure delivery to full-lifecycle technical support, we are here to ensure a seamless and reliable experience at every step.

1. Warranty Policy

Quality First, Worry-Free Operation

Warranty Period: We offer a **two-year** warranty service for all of our core optoelectronic products, effective from the date of shipment.

Coverage: We provide free repair or replacement services for malfunctions caused by material defects or workmanship errors under normal operating conditions.

Rapid Response: Upon receiving a warranty claim, we guarantee to initiate the assessment process within **24 hours** to minimize your equipment downtime.

2. Technical Support

Expert Team, Full-Process Guidance

Technical Consultation: Our team of senior optical engineers provides **24/7 online support** to assist with installation, commissioning, optical path alignment, and parameter optimization.

Scheduled Maintenance: We offer full-lifecycle maintenance recommendations, including firmware upgrades, optical component cleaning guidelines, and precision calibration services.

Training Services: We provide customized remote or on-site operational and safety training to ensure your team can operate the equipment efficiently and safely.

3. Logistics & Delivery

Precision Packaging, Global Reach

Professional Packaging: Given the fragile nature of optical instruments, we utilize industrial-grade shockproof, anti-static, and moisture-proof vacuum packaging to ensure zero damage during transit.

Logistics Partners: We partner with top-tier global logistics providers (**DHL / FedEx / UPS / SF Express**) to offer reliable shipping with real-time tracking.

Shipping Insurance: All shipments are fully insured to eliminate logistics risks.

4. Compliance & Certification


Strict Standards, Total Compliance

Quality Certification: Our manufacturing process is **ISO 9001 certified**, and our products comply with international standards such as **CE** and **RoHS**.

Export Compliance: "Committed to environmental responsibility, all our products comply with **RoHS 2.0** and **REACH** standards, ensuring safety and global compliance."

Explore Series

| Model | Channel Count | Core Spec |
|---------------------|--------------------------|---------------------------|
| VL-Pzo-Ctrl-Dig-3Ch | 3 Channels (XYZ Sync) | 24-bit Resolution |
| VL-Cap-Sci-D06L | 1 Channel (Single Probe) | <0.1nm Resolution |
| VL-IM-Ctrl-1Ch | 1 Channel (Single Axis) | Adjustable Frequency/Step |

 Get in touch with our team to explore configurations, request a quote, or learn more about customized solutions tailored to your needs.

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