

ACCELEROMETER CALIBRATION WORKSTATION LASER PRIMARY OPTION



9155D system shown with Rack Integration option (9155D-100), Signal Conditioning options (9155D-443, -445 and -478) and Air-bearing Shaker System option (9155D-831)

The Accelerometer Calibration Workstation with Model 9155D-575 Laser Primary option allows the metrologist to perform primary calibration of vibration sensors with extremely low measurement uncertainty, meeting the performance requirements specified in ISO 16063-11. The system seamlessly integrates with the Model 9155D Accelerometer Calibration Workstation, allowing for both primary calibrations using laser interferometer and secondary calibrations using the system's reference standard accelerometer in a back-to-back comparison configuration, as specified in ISO 16063-21.

The system employs a Michelson interferometer to measure the displacement of the calibration platform. The signal is directly demodulated from the in-phase and quadrature-phase components of the laser doppler signal. The result is a primary calibration based upon a physical constant, the wavelength of a He-Ne laser.

When selecting the 9155D-575 Laser Primary option, the 9155D-831 air bearing shaker option is required. This option configures the 9155 system to include the K394B31 air bearing shaker system, providing superior calibration performance compared to traditional flexure-based electromechanical calibration shakers. Using this air bearing shaker, calibrations can be performed up to 20kHz and transverse motion can be effectively eliminated meeting the recommendations specified in ISO 16063-11 and 16063-21, greatly reducing measurement uncertainties.

SYSTEM BENEFITS:

- Provides both primary and secondary calibrations, for accurate NIST and/or PTB traceable calibrations
- Direct demodulation of doppler laser signal assures low measurement uncertainty
- Dual beam, dual pass laser allows for increased efficiency and accuracy
- Setup tests, acquire data, save results, and print reports quickly with precision and automation
- Define multiple pass/fail criteria for each test and automatically recall them from the internal database
- Printed certificates comply with ISO 17025
- Automates calibration procedures
- Customizable system fits any application or need
- Calibrates up to 200 frequencies

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MODEL 9155D-575

9155D-575 SPECIFICATIONS:

Frequency Range	0.1 Hz - 20 kHz
Expanded Measurement Uncertainty Using Low Frequency Shaker ^{2,3}	0.1 Hz $\leq f <$ 0.5 Hz 0.9% ¹
	0.5 Hz $\leq f \leq$ 10 Hz 0.3%
Expanded Measurement Uncertainty Using High Frequency Shaker ^{2,3}	5 Hz 1.0%
	(5 $< f <$ 100) Hz 0.5%
	100 Hz, 159 Hz 0.2%
	(159 $< f \leq$ 1000) Hz 0.5%
	(1000 $< f \leq$ 5000) Hz 0.7%
	(5000 $< f \leq$ 15 000) Hz 1.5%
Calibration Method	(15 000 $< f \leq$ 20 000) Hz 2.0%
	Primary, per ISO 16063-11 method 3 Secondary, back-to-back, per ISO 16063-21
Laser Interferometer	He-Ne, dual pass, homodyne plain mirror Michelson interferometer
Spot Diameter, approximate	3 mm
Measurements	Sensitivity magnitude, phase
Accelerometers Types Supported ⁴	ICP®, Charge, Voltage, Capacitive ⁴ , Piezoresistive ⁴
Sensors Types Supported	Acceleration, Velocity ⁵
Excitation Type	Sine, Stepped Sine
Acceleration Levels ⁶	0.1 to 10 g
Calibration Data Management	Yes
Automatic pass/fail Classification	Yes
Measurement Units	English, Metric
Main Voltage Supply	115 Volts - optional 220 Volts

¹ Unaudited

² Typical, determined using k=2 coverage factor for a 95% confidence interval.

³ Phase uncertainty available.

⁴ Optional features add dedicated signal conditioning units to support accelerometer type.

⁵ Optional software feature supports velocity units and constant velocity sweep.

⁶ Low frequency acceleration levels are stroke limited (10 mm for K394B31, 255 mm for 2129E025).

REQUIRED 9155D SYSTEM OPTIONS:

9155D	Base Accelerometer Calibration Workstation.
9155D-831	K394B31 Air-Bearing Shaker System, includes precision air-bearing shaker, integral Quartz reference accelerometer and power amplifier.

9155D SYSTEM SUPPLIED ACCESSORIES:

PC w/ keyboard, mouse and monitor	Microsoft Office Software Suite
Printer	Reference accelerometer with paired ICP® signal conditioner
9155D Calibration software	System verification sensor
Data acquisition hardware	Various mounting adapters & cables

OTHER OPTIONS AVAILABLE:

9155D-100	19" Rack Integration. Approx. 36.5"H x 21.75"W x 26"D [93cm x 55cm x 66cm]. Integrates components in 19" rack.
9155D-120	Shaker Mount. Provides wood pedestal to support calibration shaker. Requires user to fill with sand (not included).
9155D-160	Tool Kit. Includes torque wrench, screwdrivers, crescent wrenches, toolbox, etc.
9155D-350	Calibration Label Printing. Provides automatic calibration label printing using a Zebra thermal transfer label printer.
9155D-400	TEDS Sensor Support. Provides for automatic update of TEDS sensors. Requires 9155D-443 option.
9155D-442	Basic ICP Signal Conditioning. Adds signal conditioner for ICP and charge mode sensors.
9155D-443	Dual-mode Charge Amplifier. Computer control and automated switching between ICP and charge mode sensors.
9155D-445	Capacitive Sensor Signal Conditioning. Adds signal conditioner for capacitive sensors.
9155D-478	Piezoresistive Signal Conditioning. Adds support for piezoresistive sensors. Includes PCB 478A30 signal conditioner.
9155D-525	Shock calibration. Provides for verification of shock accelerometers from 20g to 10,000g.
9155D-501	Linearity. Provides for multipoint sensor linearity checks via sinusoidal vibration up to 40g.
9155D-550	Resonance Check. Provides for resonance check of accelerometers up to 50 kHz.
9155D-600	Velocity Sensor Calibration. Allows calibration of velocity sensors. Reports data in velocity units.
9155D-771	Low Frequency (0.5Hz-500Hz). Long stroke shaker with SmartStroke™ technology and accelerometer reference sensor.
9155D-779	Low Frequency (0.1Hz-500Hz). Long stroke shaker with SmartStroke™ technology, accelerometer and optical reference sensors.
9155D-830	K394B30 Air-Bearing Shaker. Adds precision air-bearing shaker 5 Hz - 15 kHz.
9155D-831	K394B31 Air-Bearing Shaker. Adds precision high-frequency air-bearing shaker 5 Hz - 20 kHz.
9155D-913	Impulse Calibration. Allows dynamic impulse calibration of pressure transducers from 200 to 20,000 psi.
9155D-961	Hammer Calibration. Allows calibration of instrumented impact hammers, includes 9961C cal fixture.

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DS-0050 rev H

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