

CS18 VLF

Calibration System Very-Low-Frequency



Application

- Secondary calibration according to **ISO 16063-21** (comparison method) of charge type, ICP[®], voltage, capacitive and piezo-resistive sensors for acceleration, velocity and distance, with Sine excitation with high accuracy
- Secondary calibration of **reference standards**
- **Resonant frequency search** from 10 to 200 Hz
- Calibration of **vibration meters**
- Calibration of **vibration calibrators**
- Calibration of **seismic sensors**

Range of Use

- **Certified calibration laboratories**
- Departments for the **supervision of measuring instruments** in research and industries (automotive, aviation, space, military)
- **Quality assurance** in sensor production
- **National metrology laboratories**, with optional extra 'Primus' as a CS18P VLF primary calibration system)

Features

- **Traceable** to Physikalisch Technische Bundes-anstalt (**PTB**) Braunschweig by the SPEKTRA Calibration Laboratory D-K-15183-01-00 (**DAKKS Calibration Certificate**)
- **Calibration of sensors** with / without amplifiers, measurement instruments with indication of their own by applying of determinate acceleration signals
- **Calibration of calibrators** by exact measurement of vibration quantities
- **Frequency range 0.2 Hz ... 160 Hz**, optional frequency range 0.1 Hz ... 160 Hz
- **Sensor mass (DUT) up to 900 gram**, at horizontal / vertical excitation, **optional 3 kilogram**
- **Air-bearing long stroke vibration exciter** with electrical zero-positioning-controller (vibration displacement 100 mm)
- **Repeatability** under identical conditions less to 63 Hz < 0.1 %, otherwise less than 0.5 %
- **Upgradeable** to a combined Sine calibration system, e.g. type CS18 VLF / HF, CS18P VLF



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Components

- Vibration control system **SRS-35**, SPEKTRA with electronic zero position controller **APS 0109**
- Software CS18 VLF with operation modes: sensor calibration, measurement, supply, sweep
- Power amplifier **APS 125**
- Air-bearing long-stroke vibration exciter **APS 113-AB** for up to 100 mm vibration displacement
- Electronic zero position control **APS 0109**
- **Vertical Mounting Kit** for vertical excitation
- Horizontal excitation on foundation (foundation not supplied)
- Reference standard accelerometer **BN-07** or **BN-21**
- **Single-ended reference standard** for the calibration of calibrators
- Standard PC

Specification CS18 VLF with air bearing vibration exciter APS 113-AB in the frequency range 0.2 Hz ... 160 Hz for sensor mass up to 900 gram (DUT)

for environmental conditions: temperature 23°C (± 2°C) and relative humidity 30 % ... 75 %

Frequency Range		Sensor Mass DUT horizontal / vertical	Expanded Measurement Uncertainty ²⁾ Amount ³⁾ / Phase ¹⁾	Working Range (peak value)			
from	to			Minimum	Maximum ⁴⁾ (Displacement, Velocity, Acceleration)	Maximum ⁵⁾ (Displacement, Velocity, Acceleration)	
0.2 Hz	< 0.4 Hz	900 gram	1.5 % / 1.5°	0.2 Hz .. 1.0 Hz: 0.04 m/s²	0.2 Hz .. 1.25 Hz: 50 mm	0.2 Hz .. 1.25 Hz: 50 mm	
0.4 Hz	< 1 Hz		1.0 % / 1.5°		1.25 Hz .. 8.0 Hz: 0.4 m/s	1.25 Hz .. 8.0 Hz: 0.4 m/s	
1 Hz	63 Hz		0.5 % / 0.7°		1.0 Hz .. 160 Hz: 0.1 m/s²	8 Hz .. 63 Hz: 10 m/s²	8 Hz .. 63 Hz: 20 m/s²
> 63 Hz	160 Hz		1.0 % / 1.0°			63 Hz .. 160 Hz: 5 m/s²	63 Hz .. 160 Hz: 10 m/s²
Reference-Frequency 8 Hz, 16 Hz			0.5 % / 0.7°				

¹⁾ Only in combination with optional extra PHASE

²⁾ Determined according to GUM (ISO Guide to the expression of uncertainty in measurement, 1995) with k = 2 (coverage factor) for the best possible DUT (other devices that are not as ideal have to be evaluated with individual additions)

³⁾ Values only valid for electrical sensor signals ≥ (1 mV or 1 pC)

⁴⁾ Maximum acceleration for maximum payload (DUT); higher excitations possible according to datasheet APS 113-AB

⁵⁾ Maximum acceleration without any payload (DUT); higher excitations possible according to datasheet APS 113-AB

Options for calibration systems CS18 VLF:

- EF Extended frequency range from 0.1 Hz
- HL High Masses horizontally up to 5 kg and vertically up to 3 kg with the additional vibration exciter APS 129; e.g. for calibration of seismometers and geophones
- TABLE granite plate on block of sandstone to mount and use the system properly