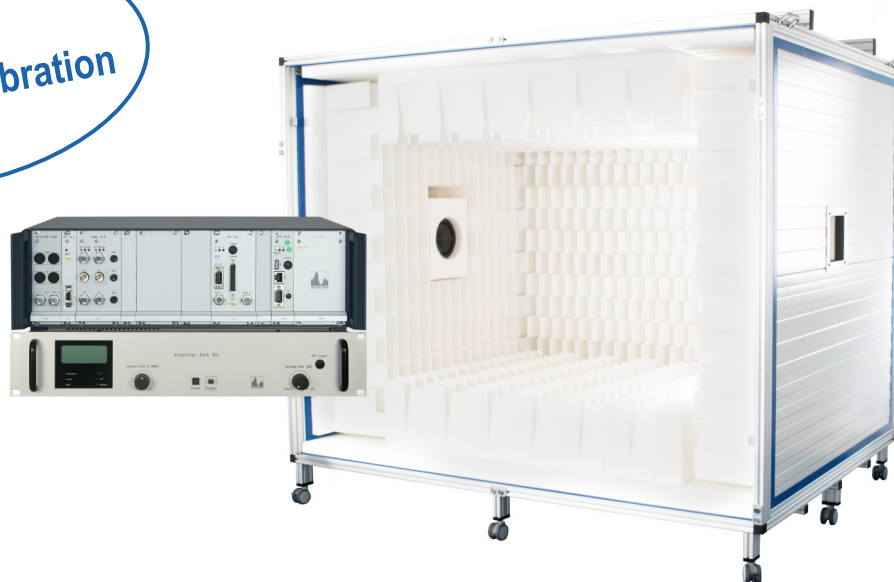


# CS18 FF

## Calibration System Free Field



True  
Free Field Calibration



### Application

- **Secondary calibration** of measuring microphones, sound level meters and other acoustic sensors according to **IEC 61094-8** and **IEC 61672**
- **Periodic single qualification** according to **IEC 61672-3**
- **Calibration of calibrators** according to **IEC 60942**
- **Acoustical measurements** like:
  - Measurement of directivity characteristic
  - Determination of diffuse-field sensitivity
  - Measurement of acoustic emission of small objects
- **Calibration** of constructively mechanically **non-standard microphones**, e.g. external microphone units, optionally in axial and radial direction of measurement

### Range of Use

- **Certified calibration laboratories**
- **Measuring instrument verification** in research and industry, for example civil engineering, aviation and automotive engineering
- **Quality assurance** in manufacturing of microphones and sound level meters

### Features

- Reference standards **traceable** to Physikalisch Technische **Bundesanstalt (PTB)** Braunschweig by the SPEKTRA Calibration Laboratory D-K-15183-01-00 (DAkkS-calibration certificate)
- True **free-field calibration** in acoustically dead (anechoic) chamber
- **Calibration** of any measuring microphone (condenser, electrets, electro-dynamic etc.) with any construction with / without protection grid
- **Supply** of a defined free-field sound pressure level for the calibration of sound level meters
- **Calibration** of acoustic calibrators
- **Upgradable** to other calibration systems, e.g. CS18 FF / SPL or CS18 FF / SPL-VLF

# CS18 FF

## Calibration System Free Field



### Components:

- Vibration control system **SRS-35** by SPEKTRA
- Power amplifier **PA 14-80** by SPEKTRA
- **Reference standards**
  - ½" condenser microphone cartridge class **LS2P** with ½" VIC (Voltage Insert Calibration) preamplifier
  - Sound acoustic calibrator class **LS**, (94 dB / 1,000 Hz and 114 dB / 1,000 Hz)
- **Working standards**
  - ½" condenser microphone cartridge class **WS2F** with preamplifier
- Microphone fixture, accessories, cables
- Standard-PC
- Dedicated transportable **acoustically dead (anechoic) chamber** by SPEKTRA, completely lined with wedge-shaped absorbers, with loudspeaker, for alternately holding the reference standard and test object, with small window for reading off the indications of compact sound level meters without electrical output channel

### Specification of CS18 FF with reference standard microphones listed above

for environmental conditions: temperature 23°C (± 2°C) and relative humidity 30 % ... 75 % and environmental noise of the laboratory: **LZeq < 60 dB**

Anechoic Chamber	Outside Dimensions	2.00 m x 2.00 m x 2.40 m	
	Inside Dimensions	1.25 m x 1.25 m x 1.65 m	
Type of the Sound Field		<b>Free field</b> of plane progressive waves	
Calibration Method		Comparison with reference standard, <b>substitution method</b>	
Recommended Sound Pressure Level for calibration of microphones <sup>2)</sup>		<b>84.0 dB</b> in the range of 125 Hz - 20 kHz at the calibration point (84 cm distance)	
Frequency Range and Expanded Uncertainty <sup>1)</sup>	Measuring Microphones with Different Diameter Measuring Chains with Separate Microphones	125 Hz ... < 250 Hz	0.35 dB
		250 Hz ... 8,000 Hz	0.30 dB
		> 8,000 Hz ... 10,000 Hz	0.40 dB
		> 10,000 Hz ... 20,000 Hz	0.45 dB
Recommended Sound Pressure Level for calibration of sound level meters <sup>2)</sup>		<b>84,0 dB</b> in the range of 125 Hz - 200 Hz <b>94,0 dB</b> in the range of 200 Hz - 10 kHz <b>84,0 dB</b> in the range of 10 kHz - 20 kHz at the calibration point (84 cm distance)	
Frequency Range and Expanded Uncertainty <sup>1)</sup>	Sound Level Meters with Microphone Mounted Directly to the Body of the Sound Level Meter	125 Hz ... < 250 Hz	0.50 dB
		250 Hz ... 8,000 Hz	0.40 dB
		> 8,000 Hz ... 10,000 Hz	0.50 dB
		> 10,000 Hz ... 20,000 Hz	0.60 dB

### Electrical calibration of sound level meter:

Electrical Tests		Supply of electrical input signal for the electrical tests according to IEC 61672-3, ED1	
Input Signal and Expanded Uncertainty <sup>1)</sup>	Sound Level Meters, Measuring Systems	4 kHz tone burst (0.25 ms ... 1 s)	0.20 dB
		C-weighted peak level	0.20 dB
		Level linearity, Frequency weighting, overload indication	0.20 dB

<sup>1)</sup> Determined according to GUM (ISO Guide to the expression of uncertainty in measurement) with k = 2 (coverage factor)

<sup>2)</sup> Recommended sound pressure level for best stability and lowest uncertainty. Higher sound pressure levels are possible (not included in table).