

# CS18 LMS

## Calibration System Low-Medium-Shock



Sensor Calibration  
Crash Test

### Applications

- **Secondary calibration** of shock-sensors as well as complete measuring instruments in form of a measuring chain, with very high precision and efficiency, according to **ISO 16063-22** (calibration by the comparison method)
- Secondary calibration of **accelerometer standards**
- **Testing** of small parts (e.g. MEMS)

### Range of Use

- **Certified calibration laboratories**
- Departments of **measuring instrument verification** in research and industry, particular in **automotive crash test laboratories**
- **Quality assurance** in sensor manufacturing

### Features

- **Traceable** to Physikalisch-Technische Bundesanstalt (**PTB**) Braunschweig by the SPEKTRA Calibration-Laboratory D-K-15183-01-00 (**DAkkS Calibration Certificate**)
- **Pneumatic shock exciter** with integrated reference standard; **Air Bearing** for Anvil
- **Broad amplitude range** from **5 g<sub>n</sub> ... 10,000 g<sub>n</sub>**
- **Type of excitation:** shock half sine
- **Pulse duration** up to 5 ms
- Sensor (DUT) mass up to **50 gram** (can be higher for testing applications)
- Excitation axis: **vertical**
- **Good repeatability** of shock
- Realization of **all automatic calibrations** according to own test regime (up to 1 shock/s)
- **Calibration** of **sensors** with / without signal conditioner
- **Direct connection** of **piezo-resistive sensors** by means of integrated **PR signal conditioner**
- Determination of **aptitude for calibration** (bridge resistance, offset, drift) of PR sensors in conjunction with software **PR measurement**
- **Upgradeable** to a combined calibration systems, e.g. type CS18 LF / LMS
- Automated regulation of amplitudes up to **600 g<sub>n</sub>** is possible

# CS18 LMS

## Calibration System Low-Medium-Shock



### Components

- Control system **SRS-35** by SPEKTRA with integrated PR signal conditioner
- Shock exciter **SE-201 PN-LMS** by SPEKTRA with **Control box**
- Reference standard transducer **BN-02**
- Standard PC

### Performance specification of CS18 LMS with reference standard BN-02

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

<b>Shock Acceleration</b>		5 $g_n$ ... 10,000 $g_n$
<b>Pulse Width</b>		0.1 ms ... 5 ms
<b>Sensor Mass (DUT)</b>		max. 50 gram
<b>Expanded Uncertainty <sup>1)</sup></b>	5 $g_n$ ... 20 $g_n$	< 2,0 %
	> 20 $g_n$ ... 200 $g_n$	< 1,5 %
	> 200 $g_n$ ... 4,000 $g_n$	< 1.8 %
	> 4,000 $g_n$ ... 10,000 $g_n$	< 3,0 %

<sup>1)</sup> Determined according to GUM (ISO Guide to the expression of uncertainty in measurement, 1995) with  $k = 2$  (coverage factor)

### Specification of integrated PR module

Module for supplying power to piezo-resistive sensors or for supplying DC power to sensors (e.g. VC types)

#### Components of the integrated PR module

- Plug-in module to CS18 electronic unit SRS-35
- External connecting box for individual sensor adaptation
- Software for determining the electrical aptitude for calibration of PR sensors (measurement of bridge resistance, offset and offset drift, offset compensation, shunt calibration, insulations test)

#### Options for the PR module

- Individual external connection boxes
- TEDS for PR sensors

#### Technical Data PR module

<b>Bridge Power Supply</b>	4-lead or 6-lead configuration selectable, power will be measured and controlled
Voltage Range	-10 V ... 0 V ... +10 V
Current	maximum 100 mA
<b>Bridge Completion</b>	resistors for completing single-arm and two-arm partial bridges can be integrated in a connecting box (dimensioning according to specific sensor)
<b>Shunt Resistors</b>	2 units can be integrated in a connecting box, resistance values can be stored in an EEPROM
<b>Amplifier</b>	0 ... 42 dB
Gain Steps (DC)	factors to be set by software: 1, 2, 4, 8, 16, 32, 64, 128
Offset	offset measurement and offset compensation can be performed

**Options for calibration systems:** see leaflet CS18-extras

All data are subject to change without notice

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