

Vibration Calibrator VC21D

Model VC21D is a modified version of the VC21. It can calibrate, in addition to accelerometers and velocity transducers, non-contact displacement sensors, also called proximity or Eddy current probes. The instrument enables dynamic calibrations of such sensors.

The VC21D provides the same frequencies and amplitudes as Model VC21. The only differences are its detachable clamping device for proximity probes and a TTL clock output via a BNC socket. This clock output can be useful to simulate a Keyphasor signal in monitoring systems.

The clamping device has a movable, vibration isolated slider to adjust the height of the proximity probe above a vibrating disk made of 2CrMo4 reference steel. The probe is held by replaceable thread adapters which are available in the common probe sizes of M6x0.5, M8x1, M10x1, M14x1, M20x1 1/4"-28, 3/8"-24 and 1/2"-20. The clamping device was optimized for calibrations at 159.2 Hz.

The clamping device is held by two magnetic sockets. After removing it the VC21D can be used like the standard VC21.



Thread adapter and Eddy current probe



VC21D

Vibration Calibrator VC20

The basic model VC20 generates a fixed amplitude of 10 m/s² (RMS) at 159.2 Hz. This frequency was chosen because it corresponds to a radian frequency of 1000 s⁻¹ where the following relationship exists for sine-wave signals:

10 m/s² acceleration = 10 mm/s velocity = 10 µm displacement

The unit has just one on/off push-button. A bright OLED display shows frequency and amplitude, the amplitude error as a percentage and the battery condition.

Its powerful electrodynamic shaker allows the calibration of heavy test objects up to 600 grams.

The built-in NiMH accumulator lasts for approximately 5 hours of operation.

A cast aluminum enclosure protects the instrument under harsh field conditions.

Technical Data

Vibration frequency (RMS)	159.2 Hz $\omega = 1000 \text{ s}^{-1}$
Vibration amplitude	10 m/s ²
Weight of test object	600 g
Amplitude error	±3 % (0 to 40 °C) ±5 % (-10 to 55 °C)
Distortion	<1 %
Sensor mounting	M5 thread, magnet
Operating temperature	-10 to 55 °C
Dimensions	100 x 100 x 120 mm ³
Weight	2.2 kg
Accessories (included)	Plastic carrying case, mains adapter (100 to 240 VAC), thread adapters M3, M5, M8, 1/4"-28, UNF 10-32



VC20

Powerful Precision

Vibration calibrators are vibration exciters providing a sinusoidal mechanical output at constant frequency and magnitude. They are used to determine the sensitivity of vibration sensors and measuring chains.

Metra has been manufacturing vibration calibrators for more than 5 decades. Today we offer a series of devices covering most applications of field calibration.

Applications include

- Test and sensitivity measurement of accelerometers and velocity transducers
- Test and sensitivity measurement of Eddy current probes (VC21D)
- Measurement of frequency response (VC120)
- Function test and fault finding in measuring chains and sensor cable installations
- Evaluation of sensor coupling parts

The instruments are battery-powered making them suitable for both field and laboratory use.

Metra's vibration calibrators are known to be robust and powerful devices. Their outstandingly high payload makes them a good choice for the excitation of heavy objects.

Test objects are attached by an M5 threaded hole, by a magnet or adhesively.

Metra's vibration calibrators are supplied with a traceable calibration certificate. DKD calibration can be offered on demand.



VC20
VC21
VC21D
VC120

Vibration Calibrators

Please visit our web site www.MMF.de for further information material like data sheets, instruction manuals and trial software.

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Vibration Calibrating System VC120

The VC120 is a stand-alone calibration device including

- A piezoelectric vibration exciter with power amplifier
- Built-in reference accelerometer
- A signal conditioner for the sensor under test with inputs for charge, IEPE and AC voltage
- USB interface for PC controlled operation
- A rechargeable battery

The VC120 works at a constant amplitude of 1 m/s² (RMS). The frequency is adjustable in fine intervals from 70 Hz to 10 kHz. It can be adjusted by a shuttle wheel. Alternatively, all settings can be made by the supplied PC software via a USB interface. Thus the VC120 can also measure frequency sweep diagrams.

A backlit LCD shows the adjusted frequency and the measured transducer sensitivity either in metric or in imperial units.

The built-in NiMH accumulator lasts for 2 to 4 hours of calibration.

In spite of its compact design the instrument is portable and features a variety of functions, which are known only from more expensive systems.

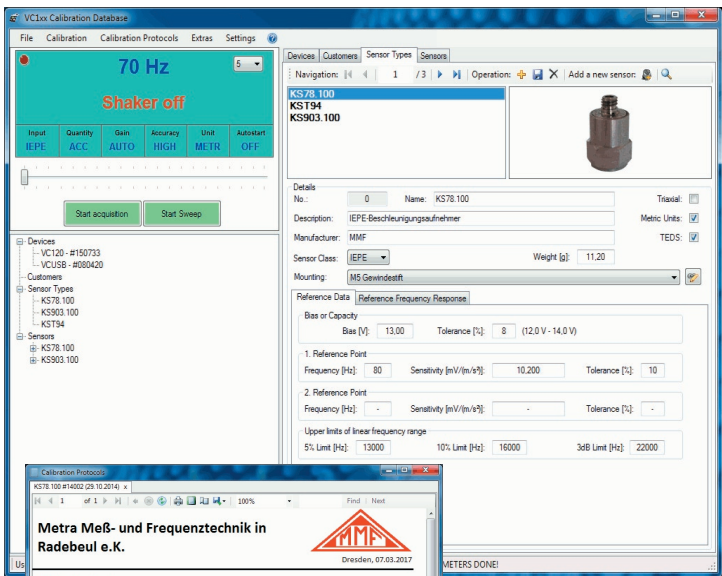
Technical Data	
Vibration acceleration	1 m/s² (RMS)
Vibration frequency	70 to 10,000 Hz
Weight of test object	max. 400 g
Basic accuracy of shaker	at 23 °C ±10 %
80, 160, 315, 630 Hz	±2 % calibrated
70 to 1000 Hz	±2 % typical
1000 to 10,000 Hz	±5 % typical
Distortion	< 2 % (70 to 3000 Hz)
Sensor mounting	M5 thread, magnet
Charge input	BNC, single-ended
Voltage / IEPE input	BNC, single-ended, 100 MΩ
IEPE sensor supply	3.8 to 5.6 mA / 22 V
Transducer sensitivity range	0.12 to 1200 mV/ms⁻² 0.12 to 1200 pC/ms⁻²
Accuracy of sensitivity	Charge: ±0.6 % Voltage / IEPE: ±0.3 %
Operating temperature	-10 to 55 °C
Dimensions	205 x 105 x 90 mm³
Weight	3 kg
Accessories (included)	Plastic carrying case, mains adapter (100 to 240 VAC), PC software, USB cable, thread adapters M3, M5, M8, 1/4"-28, UNF 10-32, plug adapter BNC / UNF 10-32
PC software VC1xxCDB	Windows Vista to Windows 10, 32 and 64 bit



Rear panel

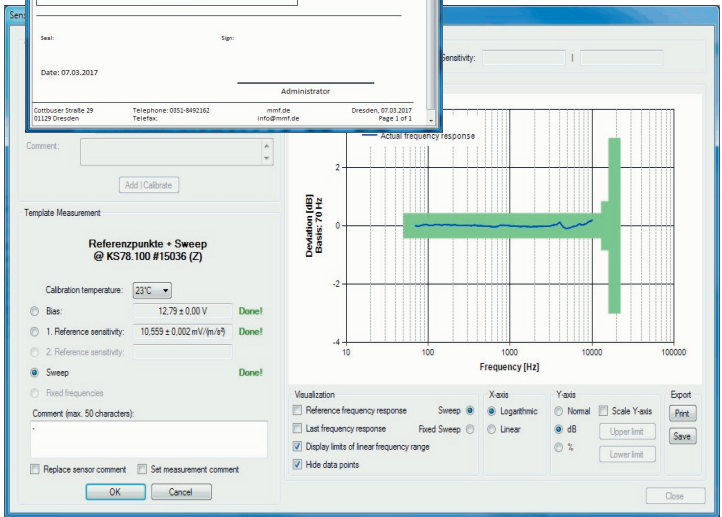


The supplied PC software *VC1xxCDB* serves as a calibration database. It manages sensor data and calibration results. It helps to archive calibrations and to compare the results of previous calibrations. The results can be printed as report.



Sensor database

Calibration report



Calibration screen with sweep diagram

Vibration Calibrator VC21

The VC21 is a multi-frequency and multi-amplitude reference shaker. The microprocessor based unit contains an amplitude control loop with a reference accelerometer built into the shaker head.

Its lowest frequency of 15.92 Hz makes it suitable for the calibration of whole-body human vibration meters to ISO 8041 and other low frequency applications like measuring equipment for building vibration.

Operation is very simple by four push-buttons, two for amplitude and two for frequency. A bright OLED display shows frequency and amplitude, the amplitude error in percent and the battery condition.

The strong electrodynamic shaker allows heavy test objects up to 500 grams.

The built-in NiMH accumulator lasts for approximately 5 hours of operation.

A cast aluminum enclosure protects the instrument under harsh field conditions.

Technical Data	
Vibration frequencies and accelerations (RMS)	15.92 Hz 1 / 2 m/s² 40 Hz 1 / 2 / 5 m/s² 80 Hz 1 / 2 / 5 / 10 m/s² 159.2 Hz 1 / 2 / 5 / 10 / 20 m/s² 320 Hz 1 / 2 / 5 / 10 / 20 m/s² 640 Hz 1 / 2 / 5 / 10 / 20 m/s² 1280 Hz 1 / 2 / 5 / 10 / 20 m/s²
Weight of test object	15.92 Hz 500 g at 1 - 20 m/s² 40 Hz 500 g at 1 - 20 m/s² 80 Hz 500 g at 1 - 20 m/s² 159.2 Hz 500 g at 1 - 10 m/s² 250 g at 20 m/s² 320 Hz 500 g at 1 - 10 m/s² 200 g at 20 m/s² 640 Hz 500 g at 1 - 5 m/s² 400 g at 10 m/s² 100 g at 20 m/s² 1280 Hz 500 g at 1 - 5 m/s² 200 g at 10 m/s² 50 g at 20 m/s²
Amplitude accuracy	±3 % (0 to 40 °C) ±5 % (-10 to 55 °C)
Distortion	<1 % (<5 % at 15.92 Hz)
Sensor mounting	M5 thread, magnet
Operating temperature	-10 to 55 °C
Dimensions	100 x 100 x 120 mm³
Weight	2.2 kg
Accessories (included)	Plastic carrying case, mains adapter (100 to 240 VAC), thread adapters M3, M5, M8, 1/4"-28, UNF 10-32



VC21



Carrying case of VC20 / VC21 / VC21D