



## RK TECHNOLOGIES

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# RK-VC-501

High Precision | Portable | Multi-Sensor Compatible

◆ NEW ◆  
Field &  
Lab Ready

## Vibration Calibrator



### 1. PRECAUTIONS

1. Please read this manual carefully before use.
2. When calibrating the sensor, follow the steps required in the manual according to the different types of sensors.
3. Before turning on power, the "Gain Adjustment" potentiometer should be adjusted to minimum in the counterclockwise direction to prevent excessive vibration.
4. Parameters defined — Acceleration ( $m/S^2$ ): peak value | Velocity (mm/S): RMS | Displacement ( $\mu m$ ): peak-to-peak
5. When calibrating the sensor, the instrument should be placed as smoothly as possible.
6. For velocity sensors: horizontal sensor → calibrator placed horizontally; vertical sensor → placed vertically; general-purpose → either direction.
7. **If you encounter any problems or have suggestions during use, please contact RK Technologies immediately.**

### 2. OVERVIEW

The RK-VC-501 Vibration Sensor Calibration Instrument can calibrate various types of vibration sensors, including piezoelectric acceleration sensors, magnetolectric velocity sensors, and eddy current sensors, as well as various vibration test instruments, vibration monitoring systems, and data acquisition systems. The instrument internally produces standard sinusoidal signals at eight frequencies: 10, 20, 40, 80, 160, 320, 640, and 1280 Hz. The magnitudes of output acceleration, velocity, and displacement can be changed by potentiometer and displayed numerically. It combines a sinusoidal signal generator, power amplifier, standard



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sensor, and vibrating table. Features small size, high precision, simple operation — ideal for both field and laboratory use.

### 3. MAIN SPECIFICATIONS — OUTPUT VIBRATION INDICATION ERROR

Parameter	Range / Condition	Accuracy
Acceleration	40 Hz – 320 Hz	± 0.3 dB + 1 word
	640 Hz, 1280 Hz	± 0.6 dB + 1 word
Velocity	40 Hz – 320 Hz	± 0.5 dB + 1 word
	640 Hz	± 1 dB + 1 word
Displacement	40 Hz – 160 Hz	± 0.5 dB + 1 word
	320 Hz	± 1 dB + 1 word
Frequency Accuracy	10, 20, 40, 80, 160, 320, 640, 1280 Hz	≤ ± 0.01%

\* Note: 10 Hz and 20 Hz values are not assessed — provided for reference only.

### 4. MAXIMUM VIBRATION AMPLITUDE & LOAD TABLE

Units: a = m/S<sup>2</sup> | v = mm/S | d = μm | \* = no vibration signal output at this point

Freq.	a ≤100g	v ≤100g	d ≤100g	a ≤250g	v ≤250g	d ≤250g	a ≤650g	v ≤650g	d ≤650g
10 Hz	2.5	28	1300	3.5	40	1800	4	45	2000
20 Hz	15	85	1900	10	60	1300	5	28	640
40 Hz	60	170	2000	35	100	1100	12	35	380
80 Hz	100	141	800	40	60	320	14	20	110
160 Hz	75	53	150	35	25	70	12	8.5	24
320 Hz	50	18	25	30	10	15	10	3.5	5
640 Hz	30	5	3	20	3.5	2	6	1	*
1280 Hz	23	2	*	10	0.9	*	5	0.4	*

\* At high frequencies, vibration displacement value is very small — no vibration signal output at these points.



**5. CONTROL PANEL DESCRIPTION**

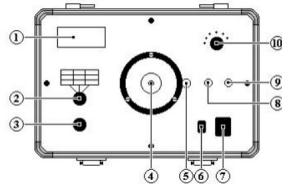
For the specific index, please refer to the following table.

Weight	≤100g			≤250g			≤650g		
	a (m/S <sup>2</sup> )	v (mm/S)	d (μm)	a (m/S <sup>2</sup> )	v (mm/S)	d (μm)	a (m/S <sup>2</sup> )	v (mm/S)	d (μm)
10Hz	2.5	28	1300	3.5	40	<b>1800</b>	4	<b>45</b>	<b>2000</b>
20Hz	15	85	1900	10	60	1300	5	28	640
40Hz	60	<b>170</b>	<b>2000</b>	<b>35</b>	<b>100</b>	1100	12	35	380
80Hz	<b>100</b>	141	800	<b>40</b>	60	320	<b>14</b>	20	110
160Hz	75	53	150	35	25	70	12	8.5	24
320Hz	50	18	25	30	10	15	10	3.5	5
640Hz	30	5	3	20	3.5	2	6	1	*
1280Hz	23	2	*	10	0.9	*	5	0.4	*

\* When the frequency is high, the vibration displacement value is small, so at these points, the calibrator has no vibration signal output.

**Control panel description**

The BYD-JZY02AJ vibration sensor calibrator control panel is shown below:



① Output vibration amplitude display window

**Control Panel & Amplitude Table**

**Control Panel Functions**

- ① Output vibration amplitude display window
- ② Function selection switch (Acceleration / Velocity / Displacement)
- ③ Output amplitude adjustment potentiometer (Gain Adjust)
- ④ Sensor fixed table
- ⑤ Eddy current sensor bracket fixing screw hole
- ⑥ AC 220V power switch
- ⑦ AC 220V power input socket
- ⑧ Power output socket — monitors waveform of power amplifier output
- ⑨ -24V voltage output socket (for eddy current sensor preamplifier)
- ⑩ Frequency selection switch (10–1280 Hz)



## 6. SENSOR ACCESSORIES & INSTALLATION

### Sensor Installation

#### ► Acceleration Sensor

Fix the M5 screw and acceleration sensor to the fixed surface of the calibrator sensor table.

#### ► Velocity Sensor

Fix the M5-M8 or M5-M10 adapter screw (depending on sensor) and velocity sensor sequentially to the calibrator sensor fixed table.

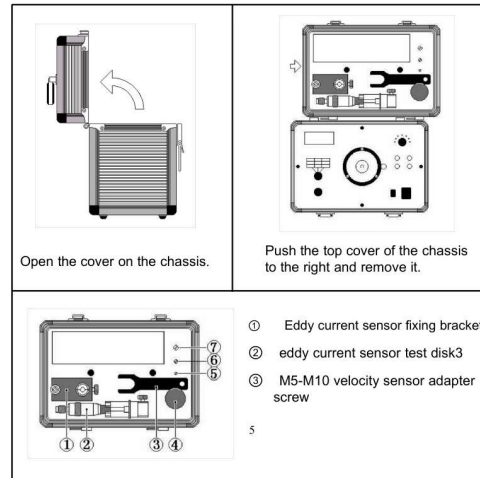
#### ► Eddy Current Sensor

Fix the test bench, eddy current sensor fixing bracket, sensor fixing sleeve and eddy current transmitter sequentially on the calibrator control panel.

#### Sensor accessories and installation

- The BYD-JZY02AJ vibration sensor calibrator can calibrate many different types of sensors, including piezoelectric accelerometers, magnetolectric velocity sensors, and eddy current sensors. When installing an accelerometer or speed sensor, use different fixing screws. When installing the eddy current sensor, use the sensor mounting bracket.
- BYD-JZY02AJ vibration sensor calibrator accessories include:
  - M5 screws for fixed acceleration sensors;
  - M5-M8 and M5-M10 adapter screws for fixed velocity sensors;
  - fix brackets and test benches for fixed eddy current sensors .
- Various accessories of the BYD-JZY02AJ vibration sensor calibrator are installed in the cover.

#### Accessories



Sensor Installation Diagrams



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### 7. ACCELERATION SENSOR CALIBRATION — STEP-BY-STEP

**Step 1:** Connect the calibrated accelerometer to the charge amplifier input. Connect the voltage output of the charge amplifier to the digital voltmeter.

**Step 2:** Set the Frequency Select switch to "80 Hz". (Frequency can be changed as needed for calibration at other points.)

**Step 3:** Set the Function Select switch to the Acceleration position.

**Step 4:** Set the "Gain Adjust" potentiometer to minimum, then turn the power switch ON.

**Step 5:** Adjust the "Gain Adjust" potentiometer to set calibrator vibration acceleration output to 10 m/S<sup>2</sup>. Display shows: 10.0

**Step 6:** Measure the output voltage of the charge amplifier using a digital voltmeter.

**Step 7:** Calculate deviation: Deviation = (Standard value – Measured value) / Standard value

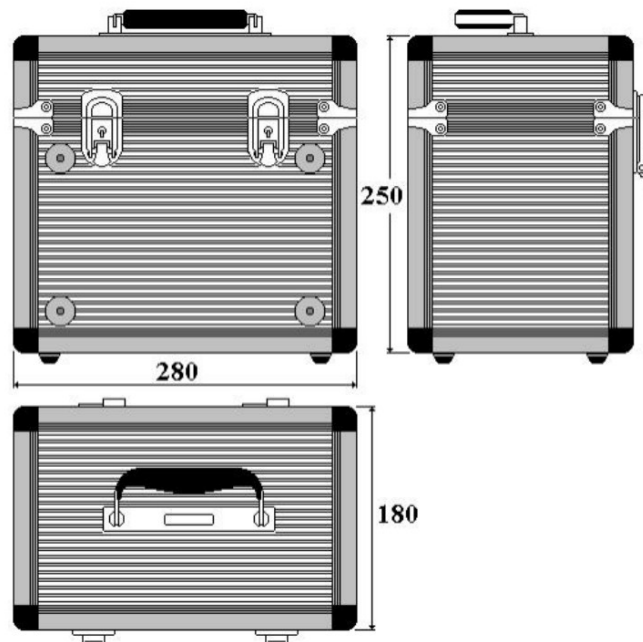
*Standard Value Note: If charge amplifier output is set to 1V (peak) at 10 m/S<sup>2</sup>, the effective value = 707.00 mV. Velocity and eddy current sensor calibration follows the same principle with respective Function Select settings.*



**8. DIMENSIONS (280 W × 250 H × 180 D — MM)**

V.

**Dimensions**



Appendix: About the calibration problem of this machine:  
(Non-metering calibration professionals must not operate!)  
In the lower left corner of the instrument panel, on the left side of the