



## ViPen – Vibrometer with Temperature Measurement, Rolling Bearing Diagnostics and Bluetooth Interface



The ViPen device is for vibration and temperature measurement and rolling bearing condition monitoring.

The ViPen device goes readily into the pocket, so it refers to the vibration devices called "pen-type".

### The ViPen Device Features

- The device has an in-built sensor for vibration and temperature sensor, which adds to the equipment condition evaluation precision.
- The device has a bright and contrast OLED screen, suitable for operation at the temperatures as low as 20°C below zero.
- ViPen has an ergonomic plastic body, the screen is covered with impact-resistant glass, turning on and off is done with one touch button.
- Operation from the in-built battery without recharging is not less than 8 hours. One charge is enough for measuring during one working shift.
- ViPen has Bluetooth interface for communication and data transfer to a smartphone or a tablet.

### Vibration Measurement



Vibration measurement with the ViPen device is carried out using a contact probe or a magnetic fastening block designed for use on flat and curved surfaces. The probe and the magnetic fastening block are fixed on the device body using a threaded hole.

To turn on the device, press and hold the touch button on the vibrometer body. The device will turn off automatically 60 seconds after the last press on the touch button. This feature is required to conserve battery power.

In the measurement mode, the double “~” symbol is on the screen and the readings change periodically. If you remove your finger from the touch button, the “=” symbol will be displayed and the change of readings will stop. The screen will show the last values on vibration, temperature and the monitored bearing condition in the form of a bearing symbol.

### The Parameters Measured by ViPen

The ViPen vibrometer simultaneously measures three important diagnostic parameters of rotating equipment:

- RMS in the band of 10 ÷ 1000 Hz
- Vibration acceleration amplitude (peak) in the range of up to 1.5 kHz
- Temperature



This information is sufficient to quickly assess the compliance of the equipment condition with the standard values on-sight.

To assess the condition by vibration, use the norms for the measured parameters adopted for this equipment by the standards of the enterprise.

If such a document is not available at the enterprise, then to assess the condition of rotating equipment, use the universal vibration standards that are specified in the passport for the unit or in general vibration normative.

The measured data can be processed on a PC with the Aurora-2000 expert software, available at vibrocenter.ru website for free. The software automatically generates reports that include:

- the equipment condition assessment
- defect presence assessment
- forecast on equipment condition for repair planning

### Roller Bearing Condition Assessment

The automatic roller bearing condition assessment by ViPen is based on the vibration acceleration kurtosis calculation. In the device screen the bearing condition is indicated by the graphical symbol of a bearing.

Vibration acceleration kurtosis is the ratio of the shocks caused by the bearing defects against the general vibration background. The more considerable the defects in the



bearing are the bigger is the vibration acceleration kurtosis value.

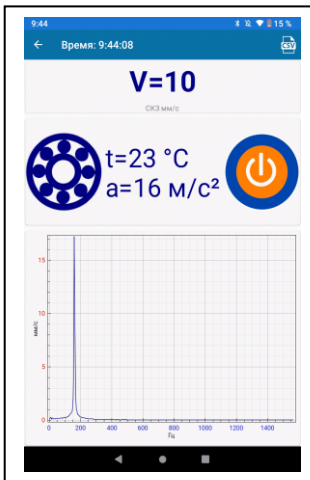
There are three levels of bearing condition assessment:

- Normal. The graphical symbol of the bearing rotates quickly.
- Warning. There are some defects, the graphical symbol rotates slowly.
- Alarm. The graphical symbol doesn't rotate and blinks.

The results of the rolling bearing vibration diagnostics in the ViPen device are supplemented by the built-in pyrometer data. An increase in bearing temperature is almost always associated with lubrication problems or serious defects on the rolling surfaces inside the bearing.

### Using the ViPen Device as an Intelligent Sensor for Equipment Operation and Maintenance Management

The ViPen device has a Bluetooth wireless interface to transmit the measured data to a smartphone, tablet or laptop at a distance of up to 3 meters.



The way the data is displayed in the smartphone screen is the same as in the ViPen device screen; the device can be controlled from the smartphone.

In addition to the RMS, you can view the vibration signal spectrum, which expands the capabilities of the device, turning it from a vibrometer into an entry-level vibration signal analyzer.

All data from the ViPen can be stored in the smartphone memory and

(or) transferred to the server of the operation and maintenance managing system using the telephone channel available in the smartphone.

To automatically identify the data being sent and its correct entry into the database, before saving, use your smartphone to read the pre-installed QR tag of the unit.

### The ViPen Device Design

The device is maximally adapted for use in difficult operating conditions, with high dust content, the presence of aggressive factors.

The plastic device case has sealing gaskets and a specialized protective glass on the pyrometer. To charge the built-in battery, a standard wireless smartphone charger is used. There are no connectors or technological holes in the device case. The device is marked IEx ib IIA T3 Gb X and can be used in severe environment.

### The ViPen Specifications

Vibration RMS in the range of 10÷1000 Hz, mm/s	1 ÷ 70
Vibration acceleration range, peak m/s <sup>2</sup>	1 ÷ 50
Temperature measurement range, °C	-70 ÷ 380
Operation temperature range, °C	-20 ÷ 50
Operation from battery, hours	8
Dimensions, mm	43*150*16
Weight, g	140

Due to the ease of use, ViPen can be operated by personnel without special training to quickly measure vibration, temperature, and also to monitor the rolling bearings condition.

ViPen devices are most effective as part of the operation and maintenance managing systems for rotary equipment. With them parameter measurements are carried out, and the data is transmitted via GSM smartfon channels to the operation and maintenance managing systems servers.