

Made in Russia 

# Explosion-proof shaker TIK-VV



## Approval documents

Certificate of type Approval of Measuring Instruments for explosion-proof shaker TIK VV №56857-14



Certificate of conformity for explosion-proof shaker TIK VV № EAЭС RU C-RU.MF07.B.00373/24



Statement of compliance TP TC 020/2011 electromagnetic compatibility for explosion-proof shaker TIK VV № EAЭС N RU Д-RU.PA10.B.50881/23





**TIK-VV shaker** is a product that have been designed based on many years experience in verification and calibration of vibration transducers. When designing this product we have accomodated an experience gained by domestic and foreign manufacturers, as well as current demands of operators for such equipment.

Explosion protection shaker TIK-VV certified in accordance with MI 2070-90 as 2nd echelon verification unit. It can be used as basic reference standard while certification is valid.

**Organizer and carry bag**

All accessories and fixtures are gathered in one place. Adapter kit for the mostly used types of sensors.

**Uniform input signal**

The shakers has four inputs (ICP, by voltage, by current, charge) to connect vibration transducers

**Metrologist's automated work station (WKS)**

Automatic check of the amplitude and amplitude- response curves of different vibration transducers, and their operability reports generation.

**USB interface**

Options to control the shaker via PC, set patterns for automatic test, and print calibration certificates

**Explosion-proof design**

Type of explosion protection: intrinsically-safe circuit, product is **1Ex ib IIB T4 Gb X** marked

**Graphical display**

Contrast LED-dislpay makes it possible to work in bright sunlight conditions



**Wide temperature range**

Operating temperature range -10...+40 °C

**Device to check eddy-current sensor**

The shaker can be equipped with a device to check eddy-current probes, if required



**Automatic thermal compensation**

Thermal drift compensations of reference vibration transducer owing to built-in temperature sensor. The set vibration level is sustained within the whole operating temperature range



**Strong metal case**

IP54 protection, impact-and load-proof

**Wide frequency range**

Shaker simulates vibrations as frequency of 5 Hz to 5 kHz (2 Hz to 10 kHz)

**Mobility**

The shaker can be used both as portable or permanently installed equipment due to specially designed frame; Battery running time is 8 hours, 10 kg weight

**Three control options**

Using membrane keyboard, encoders and PC



## Explosion-proof shaker TIK-VV

Designed to adjust, calibrate and verify vibration measurement instruments and can be used in the field or in the laboratory

### High measurement accuracy

In order to achieve high-quality sine-wave oscillations at low frequencies of high amplitude an electromechanical velocity feedback (EMVF) was developed

Standard of the second category



### Self-test

The shaker has an indicator of longitudinal and traverse oscillations

## Specifications

### Metrological parameters

Operating frequency range, Hz	5-5000 2-10 000
The range of reproducible vibration accelerations (peak value) with a load on the vibration table of 0.25 kg at a frequency of 80 Hz, $m/s^2$	0.5-30
The range of reproducible vibration velocity (RMS) with a load on the vibration table of 0.25 kg at a frequency of 80 Hz, mm/s	1-40
The range of reproducible vibration displacements (swing) at a load on the vibration table of 0.25 kg at a frequency of 30 Hz, $\mu m$	5-2500
The maximum value of the reproducible vibration acceleration (peak value) at a load of 10 g at a frequency of 80 Hz, $m/s^2$	75
The maximum value of the reproducible vibration velocity (RMS) at a load of 10 g at a frequency of 80 Hz, mm/s	100
The maximum value of the reproducible vibration displacement (swing) at a load of 10 g at a frequency of 30 Hz, $\mu m$	4000
Limits of the basic relative error of the frequency of vibration reproduction, %	$\pm 1$
Limits of the basic relative error of reproduction of vibration parameters at base frequencies of 80 Hz for vibration acceleration and vibration velocity and 30 Hz for vibration displacement, %	$\pm 2$
The harmonic coefficient of vibration acceleration of the vibration table, %, not more	10
Relative coefficient of transverse motion of the vibrating table, %, not more	15
Normal measurement conditions: ambient temperature, °C	from +17 to +27

### Interface

Device power supply:	
• include explosive area	rechargeable battery;
• outside explosive area	18 V, 1 A through network adapter 220 V, 50 Hz
Input signal type	“current loop” 4-20 mA; “by voltage” =12V, ~2V; built-in charge amplifier for piezoelectric transducers
OLED-display resolution	128x64

### Explosion protection

Type	intrinsically-safe circuit
Marking	1Ex ib IIB T4 Gb X

### Design features

Overall dimensions, mm, no more than	315x220x140
Weight, kg, no more than	10
Maximum weight of the sensor, g	800
Protection class	IP54

### Performance

Operating temperature range, °C	-10...+40
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### Reliability and manufacturer’s warranties

Device resource, hours	20 000
Service life, year	10
Warranty period, month	24





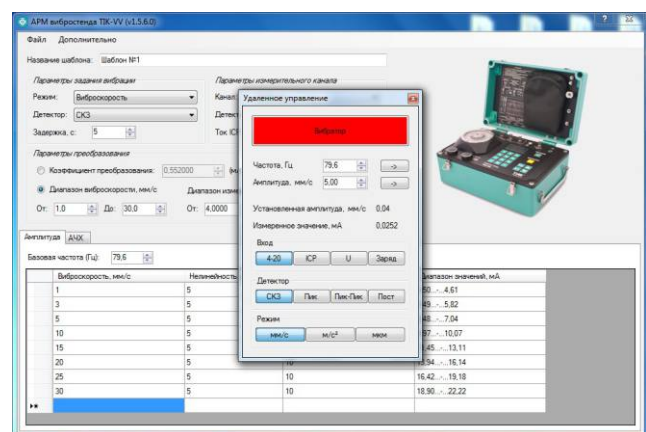
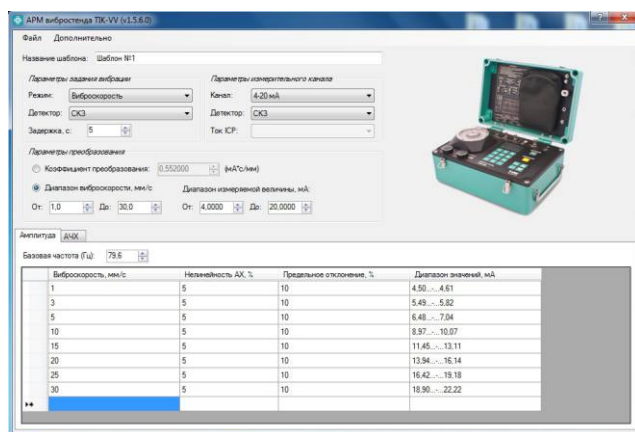
## Software

The **TIK-VV workstation (WKS) software** package will allow you to expand shaker's functionality.

This package provides means for the shaker remote control via PC, and allows to generate and load patterns in the shaker's memory for the automated vibration sensors test, read out calibration results and make up calibration certificates.

The TIK-VV WKS software provides advanced options for vibrator control either in user-defined mode (manual) or in functional mode. The functional mode is a powerful tool of the TIK-VV WKS software, providing not only automatic computer-controlled operation, but also a capability to program the instrument for the self-contained operation mode following the predetermined algorithm (sequence pattern). Functional control mode in the TIK-VV WKS software allows for controlling the vibrator output parameters (amplitude, frequency, time) automatically by the table editor-determined law. It is possible to test instruments in accordance with the patterns created and saved beforehand. This software enables data reading for a post-processing or calibration certificate printing.

The TIK-VV WKS software can be downloaded on the website <https://www.tik.perm.ru/> in the section "Products / Software".



TIK-VV WKS screenshots

Лист 1  
Листов 2

**Протокол № 111/265**  
поверки вибропреобразователя **DVA141**  
зав. № **8964**  
Дата поверки: 01.03.2028

Условия поверки:  
температура окружающего воздуха: 20 °C, влажность воздуха 55 %

Средства поверки:

Наименование	Тип прибора	Заводской №	Дата последней поверки	Дата очередной поверки
Поверочная виброустановка	TIK-VV	137	30.10.2015	30.10.2016

Заданный коэффициент преобразования: 0.533000 мА/с/мм  
Коэффициент преобразования на базовой частоте: 0.542775 мА/с/мм (10 мм/с, 80 Гц)

Определение коэффициента преобразования и нелинейности амплитудной характеристики на базовой частоте 80 Гц (Виброскорость, СКЗ)

Заданный уровень, мм/с	Номинальное значение, мА	Допустимое отклонение от номинального значения, мА	Измеренное значение, мА	Коэффициент преобразования, мА/с/мм	Нелинейность амплитудной характеристики, %
1.00	4.5330	0.0800	4.6053	0.605277	9.61
3.00	5.5990	0.2399	5.6241	0.541379	-1.96
6.00	7.1980	0.1599	7.2648	0.544129	-1.46
10.00	9.3300	0.2665	9.4380	0.543797	-1.52
20.00	14.6600	0.5330	14.8021	0.540104	-2.19
30.00	19.9900	0.7995	20.1583	0.538611	-2.46

**TIK** Национальный приборостроительный завод  
Пермь, (342) 213-55-01, <http://tik.perm.ru>

Лист 2  
Листов 2

**Протокол № 111/265**

Определение неравномерности амплитудно-частотной характеристики (Виброскорость, СКЗ)

Заданная частота, Гц	Заданный уровень, мм/с	Измеренное значение, мА	Коэффициент преобразования, мА/с/мм	Неравномерность АЧХ, %
2.0	0.30	4.0011	0.003810	-99.30
5.0	10.00	8.6151	0.461511	-14.97
10.0	10.00	9.4765	0.547655	0.90
20.0	10.00	9.4003	0.540026	-0.51
40.0	10.00	9.3807	0.538067	-0.67
80.0	10.00	9.4278	0.542775	0.00
160.0	10.00	9.4645	0.546449	0.68
320.0	10.00	9.5363	0.553626	2.00
640.0	5.00	6.7664	0.553270	1.93
1000.0	4.00	6.1146	0.528641	-2.60
2000.0	1.00	4.0065	0.006537	-96.80

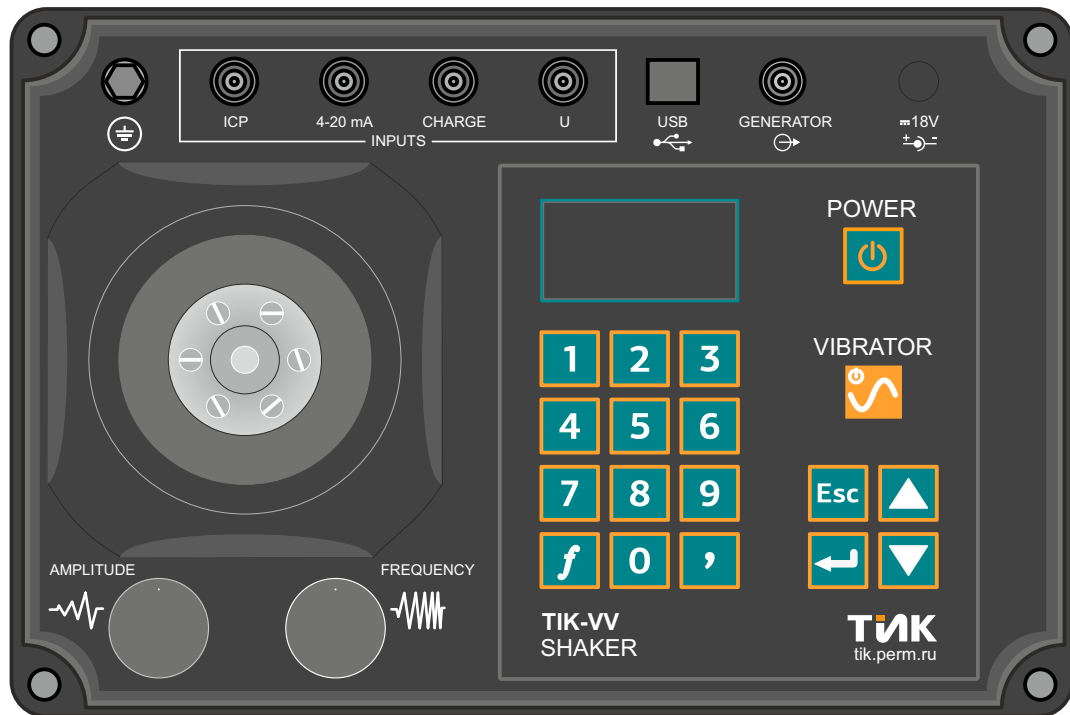
По результатам проведенной поверки вибропреобразователь **DVA141** зав. № **8964** соответствует требованиям технических условий и признан **годным** к эксплуатации.

Поверитель: \_\_\_\_\_ / \_\_\_\_\_  
(подпись) (расшифровка)

**TIK** Национальный приборостроительный завод  
Пермь, (342) 213-55-01, <http://tik.perm.ru>

Calibration certificate (example)

## User board



## Package contents



TIK-VV shaker assembly in a compact rugged case



Handy carrying backpack



Laptop with pre-installed Shaker WKS Software

\*It is supplied optionally, by special order



Kits of studs\*, mounting pads, connecting cables; retainer and vibration-absorbing rubber mat

\*Three additional customized adapter-studs free of charge



Device to check charge measuring channel



Power supply



## Accessories



Adjusting device (with 40X metal disk)

\* Any other metall disk on request



Laser printer



Different indicating gauges for adjusting device



Mounting fixture for TIK-UDS eddy-current transducers (with 40X metal disk)



Screwdriver with bits set



Transport box



Frame for TIK-VV fixed installation



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