



## TECHNICAL MANUAL

Digital voltmeters

VD-723, VD-963

## 1 DESCRIPTION

Digital voltmeters VD-723, VD-963 are designed for measuring voltage in AC electrical circuits.

The devices comply with the requirements of GB/T13850-1998, IEC61010-1, IEC61000-2-11, IEC60068-2-30.

The devices are intended to be used indoors, in electrical enclosures and electrical installations of industrial, residential, public buildings and structures.

A defining feature of these series is high accuracy and reliability, noise immunity, long-term operation without calibration, easy installation, and the ability to adjust to any current transformer.

The ammeter are installed into the front panel of the enclosure (into a square cutout).

## 2 TECHNICAL DATA

Type code

**XX - XXX**

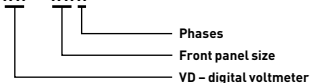


Table 1 - Device models

vd-723	Digital voltmeter VD-723 panel mount (72x72) 3-phase EKF
vd-963	Digital voltmeter VD-963 panel mount (96x96) 3-phase EKF

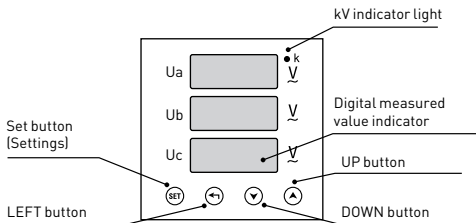
Table 2 - Main technical data

Characteristics	Value
Front panel size, mm	72x72, 96x96
Rated operating voltage, V	500
Accuracy class	0,5
Current type	AC
Rated frequency, Hz	45 - 65
Measured voltage, direct connection, V	0,05 - 500

Table 1 continued

Characteristics		Value
Rated secondary voltage, transformer connection, V		100
Measurement error		$\pm 0.5\% \pm 1$ digit
Supply voltage, V/Hz		$230 \pm 10\% / 50$
Sampling frequency		3 times/s
Programmable transformation ratio values		1,0 - 3200,0
Max. power consumption, VA		8
Operating temperature, °C		-10 to +50
Degree of protection	terminal side	IP20
	front panel side	IP52
Mean time before failure, hours		110 000
Average service life, years		10
Verification interval, years		6

Voltmeters can withstand 1, 2 times input voltage overload for 1 minute.



“k” indicator - lights up when the voltage is displayed in kilovolts.

To enter the settings menu, press and hold the Set button for 2 seconds (in measurement mode). Use the Down, Up, Left button to enter your password (default is 0).

In the settings mode, pressing the SET button switches the menu items. Pressing and holding the SET button for 2 seconds turns off the menu mode.

Use the Down, Up, Left buttons to change values.

If the voltmeter is connected using four conductors (nEt=n 3.4), pressing the Down key will display the phase-to-phase voltage. Pressing the down button again or waiting for 10 seconds will return the device to the phase voltage display mode.

To confirm the selected value, press the SET button.

If no values are entered within 120 seconds, the instrument will return to measurement mode.

You can set the following values in the menu (Table 3).

Table 3 - Configuration menu settings

No.	Menu item	Characteristics	Input range	Description
1	Pt	Voltage transformer rating	1,0 - 3200,0	Sets the transformation ratio (TR) for the voltage transformer in use: $TR = U1n(\text{primary winding}) / U2n(\text{secondary winding})$ . In case of direct connection, set Pt to 1. For example, for a 6kV/100V voltage transformer $TR = 6000 / 100 = 60$
2	nEt	Circuit connection	n 3.3 n 3.4	n 3.3 Three-wire connection n 3.4 Four-wire connection
3	codE	Password	0-9999	Password setting, default factory setting = 0

### 3 INSTALLATION AND OVERALL DIMENSIONS

The overall dimensions of the devices are shown in Figure 1.

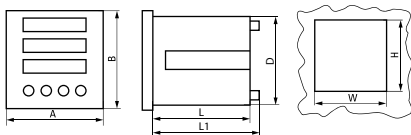


Fig. 1

Table 4 - Dimensions

Device model	Front panel		Panel cutout		Housing dimensions		
	A, mm	B, mm	W, mm	H, mm	L, mm	D, mm	L1, mm
VD-723	72	72	68	68	76	67	81
VD-963	96	96	92	92	76	91	81

Installation, wiring and set-up may only be carried out by qualified electrical personnel.

Voltmeters are connected to the circuit in parallel (Figures 2 - 5).

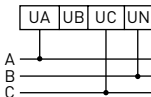


Fig. 2 - Direct voltmeter connection for  $U \leq 500V$  (three conductors,  $nEt=n.3.3$ )

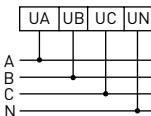


Fig. 3 - Direct voltmeter connection for  $U \leq 500V$  (four conductors,  $nEt=n.3.4$ )

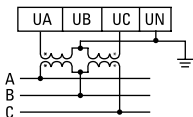


Рис. 4 - Voltmeter connection through a voltage transformer (three conductors,  $nEt=n 3.3$ )

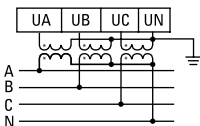


Рис. 5 - Voltmeter connection through a voltage transformer (four conductors,  $nEt=n 3.4$ )

Before installation, make a necessary cutout in the front panel of the enclosure.

After that:

- Insert the device into this cutout from the outside of the enclosure.
- Insert the clamps supplied with the device into the side slots of the device.
- Tighten the clamps, pushing them close to the enclosure panel.
- Connect the device according to the diagrams in Figures 2 - 5.
- Make sure that the power supply, input signal and terminals clamps are connected correctly and meet the requirements.
- The device must be allowed to warm up for 15 minutes to ensure measurement accuracy.
- The device is calibrated at the factory and verified prior to sale. If the device does not take measurements correctly and displays incorrect values, check the correct settings of the device (transformer selection, transformer rating). If the device is correctly configured, but does not take correct measurements, contact the supplier for warranty repair or replacement.

The devices have independent AC  $230V \pm 10\%$  power supply, connected via terminals 1 and 2 (Fig. 6, 7).

When the voltmeter is connected to the three-phase network using 4 conductors, then the A, B, C displays show the following voltages:  $U_{ab}$ ,  $U_{bn}$ ,  $U_{cn}$ . When the voltmeter is connected to the three-phase network using 3 conductors, then the A, B, C displays show the following voltages:  $U_{ab}$ ,  $U_{bc}$ ,  $U_{ca}$ .

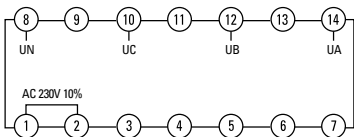


Fig. 6 - Terminal designations for 72x72 devices



Fig. 7 - Terminal designations for 96x96 devices

#### 4 OPERATION CONDITIONS

4.1 Operating temperature: from  $-10$  to  $+50^{\circ}\text{C}$ .

4.2 Position in space: vertical  $\pm 5^{\circ}$ .

4.3 Relative air humidity - up to 85%.

#### 5 DELIVERY SCOPE

Delivery scope:

- Device - 1 pc.;
- Mounting kit - 1 pc.

Documentation is available via the QR-code on the insert or on the inside of the package.

## **6 SAFETY REQUIREMENTS**

6.1 Before putting them into operation, the devices do not require any special preparation, except for an visual inspection to confirm the absence of visible damage to the housing and corrosion or contamination of the terminals, check for clarity and readability of the device's label and the availability of the verification info. Compare the markings of the device with the parameters specified in the technical manual to verify the suitability of the device for your circuit.

6.2 The voltmeters conform to IEC 61140 Class II for protection against electrical shock, installation category II.

6.3 Do not operate the devices with damaged housing or faulty insulation on connected conductors.

6.4 Do not subject the device to impacts, drops and vibrations. Follow device operation and storage instructions contained in the technical manual.

## **7 MAINTENANCE**

7.1 Observe the national safety rules for operation of electrical Installations, as well as the instructions in this manual for maintenance of the devices.

7.2 The devices are not user-repairable do not require any additional maintenance during operation.

7.3 Clean the device housing as frequently as the other equipment inside the electrical enclosure.

## **8 STORAGE AND TRANSPORTATION**

8.1 The devices can be transported in the original manufacturer's packaging by any means of covered transport, which protects them against mechanical damage, dirt, and moisture.

8.2 The devices shall be stored indoors, in their original packaging, at the ambient temperature from  $-40^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$  and relative humidity of max. 85%.

## **9 MANUFACTURER'S WARRANTY**

9.1 The manufacturer guarantees that the device complies with the requirements of regulatory documentation, provided that the consumer follows the operation, transportation and storage conditions and requirements.

9.2 Warranty period: 5 years from the date of sale.

9.3 Shelf life: 5 years from the date of manufacture.

9.4 Service life - 10 years.

**Importer and EKF trademark service representative:** EKF ELECTRICAL SOLUTION – FZCO, Dubai Silicon Oasis, DDP, Building A2, Dubai, United Arab Emirates.

**Made to order and under the control of:** OOO «Electroresheniya», Otradnaya st., 2b bld. 9, 5th floor, 127273, Moscow, Russia.  
Tel.: +7 (495) 788-88-15.

**Importer and EKF trademark service representative on the territory of the Republic of Kazakhstan:** TOO «Energoresheniya Kazakhstan», Kazakhstan, Almaty, Bostandyk district, Turgut Ozal st., 247, apt 4.

## **10 DEFECTS AND COMPLAINTS**

10.1 If the voltmeter malfunctions during the warranty period, please report to: OOO «Electroresheniya», Otradnaya st., 2b bld. 9, 5th floor, 127273, Moscow, Russia. Tel.: +7 (495) 788-88-15  
info@ekf.su, www.ekfgroup.com

- 1) serial number, manufacturing and commissioning dates for the ammeter;
- 2) the nature of the defect;
- 3) contact phone number and address.

## **11 VERIFICATION**

11.1 Initial and periodic verification of voltmeters shall be carried out in accordance with IEC 60364-6:2016 Low voltage electrical installations - Part 6: Verification.

11.2 Voltmeters are subject to periodic verification by operators with an interval of 6 years between verifications.



### **13 NOTE OF SALE**

Date of sale

Seller's signature

Seller's seal

L.S.

v3

ERIL



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# EKF