



# TECHNICAL MANUAL

Digital multimeter






MS8232 EKF EXPERT

## SAFETY INFORMATION


The digital multimeter MS8232 EKF EXPERT complies with IEC 61010-1:2001 in terms of safety requirements, and IEC 61326-2-1:2005 and IEC 61326-2-2:2005 in terms of electromagnetic compatibility. To ensure safe operation of the device, follow the instructions herein.

The safety symbols used herein are listed in Table 1.

Table 1

	Important safety information
	High voltage may be present
	Grounding
	Double insulation
	The fuse can be replaced with a similar one with the parameters specified in the operation manual

## SAFETY INSTRUCTIONS

- Use sockets, functions and measuring ranges as described herein.
- Do not use the multimeter if its housing is damaged. Pay particular attention to the connection sockets.
- Use original probes from this model of multimeter. Do not use defective probes. Check the insulation of the probes on the regular basis. When measuring, keep your fingers behind the barrier edge of the probes.
- Do not use the multimeter with the back lid open or the housing loosely closed.
- Never exceed the overload capacity value specified for each measuring range.
- Do not touch any unused sockets when the device is connected to the measured circuit.
- If you do not know the measured value order before measuring, set the range switch to the maximum value.
- Before changing the position of the range switch, disconnect the probe from the circuit to be measured.
- When measuring in TV sets and static power supplies, be aware that high voltage pulses may be present at the measured points, which can damage the device.
- Disconnect power and discharge high voltage capacitors when measuring electrical resistance, testing circuit continuity and diodes.
- Never measure resistance in a closed circuit.
- Do not use the product in explosive or high-humid environment.
- Replace the battery as soon as the symbol  appears.
- Be careful whenever dealing with voltage over 60V DC or 30V AC.



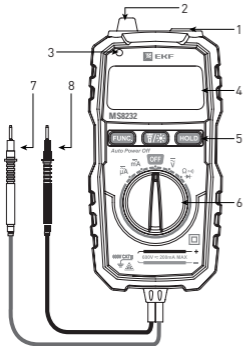
If you fail to observe the manufacturer's operating instructions, the protection of the device may be degraded. Stop using the device immediately if any malfunctions or faults occur. The device shall be serviced and repaired only by authorized service companies. For cleaning of the product, use a soft cloth; do not use abrasives or solvents.

## 1 DESCRIPTION

The digital multimeter MS8232 EKF EXPERT is a high-quality measuring instrument with a wide range of functions for everyday use:

- DC / AC voltage measurement DCV / ACV ( $\bar{V}$ )
- Direct current / alternating current measurement DCA / ACA ( $\bar{\mu A}$ ,  $\bar{mA}$ )
- electrical resistance measurement ( $\bar{\Omega}$ )
- diode test ( $\rightarrow|$ )
- data hold (HOLD)
- display backlight ( $\star$ )
- automatic range selection AUTO
- automatic power off (Apo). If you do not operate the multimeter for more than 15 minutes, the display will switch off, and the device will turn to the standby mode. To deactivate this function, press and hold the «**HOLD**» button.
- circuit continuity test ( $\bullet\bullet$ )
- non-contact voltage detection NCV
- workspace backlight ( $\square$ )

## 2 FRONT PANEL ELEMENTS




1. Flashlight
2. Non-contact voltage (NCV) tester
3. NCV LED
4. LCD-display 3 1/2 digits
5. Control buttons:  
«**FUNC.**» - Selection of measurement types;  
« $\star$ » - Workspace backlight / display backlight;  
«**HOLD**» - current value hold («**HOLD**» will be displayed). Press the button again to reset and return to the regular measuring mode.
6. Range switch: for selecting the functions and measurement range, and switching on/off the device (OFF)
7. Probe: red - positive (+) polarity
8. Probe: black - negative (-) polarity

Fig. 1 Front panel elements

### 3 TECHNICAL DATA

Table 2

Parameter	Value
Maximum display value	2000
Measurement method	Double-integrated ADC
Measuring rate	3 measurements per second
Overload indicator	«OL» on the LCD display
Fuse	250 mA/250 V
Low battery indicator	symbol  on the LCD display
Polarity indicator	symbol « - » for negative polarity
Safety category	600V CATIII
Housing insulation	double, class II
Degree of protection by IEC 60529	IP20
Operating temperature, °C	from 0 to +40 at relative humidity of max. 80%
Altitude above sea level, m	max. 2000
Power supply	2x1.5 V batteries AAA
Dimensions, mm	61x128x25
Weight, g	150 (with battery)
Service life, years	10

#### DC VOLTAGE

Range	Resolution	Accuracy
200 mV	0,1 mV	± 0,5% ± 3D
2 V	0,001 V	
20 V	0,01 V	
200 V	0,1 V	
600 V	1 V	± 0,8% ± 5D

\*D - least significant digit value  
 Maximum input voltage:  
 600 V DC or AC (RMS)

#### AC VOLTAGE

Range	Resolution	Accuracy
2 V	0,001 V	± 0,8% ± 3D
20 V	0,01 V	
200 V	0,1 V	
600 V	1 V	± 1,0% ± 5D

Maximum input voltage: 600 V DC or  
 AC root-mean-square value (RMS).  
 Frequency: 40 Hz to 400 Hz.

## DIRECT CURRENT

Range	Resolution	Accuracy
200 $\mu$ A	0,1 $\mu$ A	$\pm 1,8\% \pm 5D$
2000 $\mu$ A	1 $\mu$ A	
20 mA	0,01 mA	
200 mA	0,1 mA	

Overload protection: 250 mA/250 V fuse

## ALTERNATING CURRENT

Range	Resolution	Accuracy
200 $\mu$ A	0,1 $\mu$ A	$\pm 2,0\% \pm 5D$
2000 $\mu$ A	1 $\mu$ A	
20 mA	0,01 mA	
200 mA	0,1 mA	


Overload protection: 250 mA/250 V fuse

## RESISTANCE

Range	Resolution	Accuracy
200 Ohm	0,1 Ohm	$\pm 1,0\% \pm 3D$
2 kOhm	0,001 kOhm	
20 kOhm	0,01 kOhm	
200 kOhm	0,1 kOhm	
2 MOhm	0,001 MOhm	$\pm 1,2\% \pm 15D$
20 MOhm	0,01 MOhm	

Maximum input voltage 600 V DC or AC (RMS)

## 4 MEASUREMENTS

 Never exceed the overload capacity value specified for each measuring range.


### DC AND AC VOLTAGE MEASUREMENT ( $\bar{V}$ )


1. Set the rotary switch to ( $\bar{V}$ ) and press the «**FUNC.**» button, select the type of measured voltage: DCV or ACV.
2. Connect the probes to the circuit to be measured.
3. Read the value and polarity of the measured voltage on the display.
4. If the display shows «**OL**», overload has occurred. Set the range switch to a higher value.
5. When the work is completed, put the rotary switch to the «**OFF**» position.

### DIRECT CURRENT AND ALTERNATING CURRENT MEASUREMENT ( $\bar{\mu A}$ , $\bar{mA}$ )

1. Set the rotary switch to the position  $\bar{\mu A}$  or  $\bar{mA}$  and press the «**FUNC.**» button, select the type of current to be measured: DCA or ACA.
2. Open the circuit to be measured and connect the probes of the device in series with the load where the current is measured.
3. Read the current value and polarity on the display.
4. If the display shows «**OL**», overload has occurred.
5. When the work is completed, put the rotary switch to the «**OFF**» position.

### RESISTANCE MEASUREMENT ( $\Omega$ )

1. Set the rotary switch to the position ( $\Omega$ )  $\rightarrow$  , press the «**FUNC.**» button to select the resistance measurement mode.
2. Connect the probes to the resistance to be tested.
3. Read the measurement value on the display.
4. When the work is completed, put the rotary switch to the «**OFF**» position.

 If the resistance to be measured is set in the circuit, switch off the power supply and discharge all capacitances in the circuit before carrying out the measurements.

## DIODE TEST (→|)

1. Set the rotary switch to the position ( $\Omega \cdot \text{V}$ ) →|), press the «**FUNC.**» button to select the diode test mode.
2. Connect the red probe to the anode and the black probe to the cathode of the diode under test. The display will show the approximate voltage drop in the diode when the direct current is flowing through it. When the probes are reverse connected to the diode, the display will show «**OL**».
3. When the work is completed, put the rotary switch to the «**OFF**» position.


## CIRCUIT CONTINUITY TEST / BUZZER (•|))

1. Set the rotary switch to the position ( $\Omega \cdot \text{V}$ ) →|), press the «**FUNC.**» button and select the circuit continuity test mode.
2. Connect the probes to two points of the circuit under test. If there is an electrical contact between the points (less than 50 Ohm resistance), the buzzer will sound.
3. When the work is completed, put the rotary switch to the «**OFF**» position.

## NON-CONTACT VOLTAGE DETECTION (NCV)

1. Set the rotary switch to any position other than «**OFF**».
2. Bring the sensor (at the top of the device) within 5 mm to the tested conductor.
3. The NCV LED will light up if current is flowing through the conductor.
4. When the work is completed, put the rotary switch to the «**OFF**» position.

## BATTERY AND FUSE REPLACEMENT

If the symbol  is displayed, the battery needs to be replaced. The fuse rarely needs to be replaced and frequently blows due to user's error. To replace the battery and fuse (250 mA/250 V), unscrew the screw on the back lid of the device. Remove the failed element and replace it with a new one. Observe polarity of the battery.



Before replacing the battery, make sure that the probes are disconnected from the devices under test and the rotary switch is in the «**OFF**» position».

## 5 DELIVERY SCOPE

1. Multimeter - 1 pc.;
2. Set of probes (red/black) - 1 pc.;
3. Battery 1.5 V - 2 pcs.;
4. Technical and operation manual – 1 pc.

## 6 TRANSPORTATION AND STORAGE

The product shall be transported in compliance with the transportation regulations applicable to each means of transport. The product shall be protected against mechanical impact during storage and transportation. The product shall be stored in heated and ventilated space at the ambient temperature from -25 to +35 °C and relative humidity of max. 70%. Do not expose to direct sunlight and precipitations. Do not store near acid and alkali.

## 7 DISPOSAL



Life-expired and failed products shall be disposed of in compliance with the national and local laws and regulations in force. To dispose of the product, send it to an authorized company for recycling in compliance with the national and local laws and regulations in force.

## 8 MANUFACTURER'S WARRANTY

The manufacturer guarantees the products comply with the declared characteristics, provided that the consumer follows the operation, transportation and storage conditions.

**Service life:** 10 years.

**Shelf life:** 10 years from the date of manufacture.

**Warranty period:** 12 months from the date of sale.

**Manufacturer:** For information, refer to the product package.

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

**Importer and EKF trademark service representative on the territory of the Russian Federation:** 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.



## 9 CERTIFICATE OF ACCEPTANCE

The digital multimeter MS8232 EKF EXPERT has been manufactured in compliance with laws and regulations in force and has been approved for operation.

Quality control stamp

**Date of manufacture:**

For information, refer to the product package.



## 10 NOTE OF SALE

Date of sale \_\_\_\_\_

Seller's signature \_\_\_\_\_

Seller's seal



[www.ekfgroup.com](http://www.ekfgroup.com)