



EKF



TECHNICAL MANUAL

Digital clamp meter
266 / 266F EKF MASTER






SAFETY INFORMATION

The digital clamp meter 266 / 266F EKF MASTER 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 by a similar one with the parameters specified herein |

SAFETY INSTRUCTIONS:

- Use sockets, functions and measuring ranges as described herein.
- Do not use the device if its housing is damaged. Pay particular attention to the connection sockets.
- Use only original probes from this device model. Do not use defective probes. Check insulation of the probes regularly. When measuring, keep your fingers behind the barrier edge of the probes.
- Do not operate the device with the back lid open or the housing loosely closed.
- Never exceed overload capacity values of the device specified for each measuring range.
- Do not touch any open 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 turning the range switch, disconnect the probes from the measured circuit.
- 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 place more than one wire into the clamp meter.
- Replace the battery as soon as the battery symbol  appears.
- Be careful whenever dealing with voltage over 60 VDC or 30 VAC.

 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 clamp meter 266 / 266F EKF Master is a small-size device with functions as follows: (for details refer to Table 2):










- Alternating current measurement (no circuit opened) 
- DC voltage (DCV) measurement 
- AC voltage (ACV) measurement 
- Electrical resistance measurement 
- Frequency measurement 
- Diode test 
- Circuit continuity test (buzzer) 
- Insulation test (if the option 500 V insulation tester is connected).

Table 2

| Function | A~ | | V⋮ | | | | V~ | | Ω | | | | | Hz |  |  | Insulation |
|----------|-------|--------|-----|------|-------|--------|-------|-------|---------|--------|---------|----------|--------|-------|---|---|-----------------------|
| Range | 200 A | 1000 A | 2 V | 20 V | 200 V | 1000 V | 200 V | 750 V | 200 Ohm | 2 kOhm | 20 kOhm | 200 kOhm | 2 MOhm | 2 kHz | 1 mA, 2.8 V | < 50 Ohm | 20 MOhm; 2000 MOhm |
| 266F | + | | | | | | | | | | | | | | | | |
| 266 | + | + | | | | + | | + | + | | + | | | | | + | + |

2 FRONT PANEL ELEMENTS

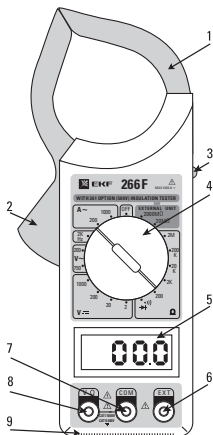



Figure 1. Front panel elements

1. Transformer clamps for AC non-contact measurement in a wire.
2. Clamp opening trigger
3. «**DATA HOLD**» button to save the measured values of AC and voltage, DC voltage and frequency.
4. Rotary switch for selecting functions and measurement range, and switching on/off the device. The device is switched off when the switch is in the «**OFF**» position.
5. LCD-display comprises 3 1/2 digits, character height is 12,7 mm.
6. Input socket «**EXT**» for connecting 500V insulation tester [out of delivery scope].
7. Input socket «**COM**» for connecting the black probe of negative polarity.
8. Input socket «**VΩ**» for connecting the red probe of positive polarity.
9. Battery compartment (rear side).

3 TECHNICAL DATA

Table 3

| Characteristics | Value |
|-----------------------------------|--|
| Maximum display value | 1999 with automatic polarity detection |
| Measurement method | Double-integrated ADC |
| Measurement rate | 2 measurements per second |
| Overload indicator | «1» on LCD display |
| Low battery indicator |  symbol on LCD display |
| Polarity indicator | symbol « - » for negative polarity |
| 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 | 9 V Battery [NEDA 1604, 6F22] |
| Dimensions, mm | 230x68x37 |
| Weight, g | 240 (with battery) |
| Service life, years | 10 |

DC VOLTAGE

| Range | Resolution | Accuracy |
|--------|------------|-------------|
| 2 V | 1 mV | ± 0,8% ± 5D |
| 20 V | 10 mV | |
| 200 V | 0,1 V | |
| 1000 V | 1 V | ± 1,0% ± 5D |

* D - least significant digit value

Overload protection: 220 V root-mean-square value (RMS) for 200 mVAC range and 1000 V DC or 750 V DC/AC for all other ranges.

AC VOLTAGE

| Range | Resolution | Accuracy |
|-------|------------|-------------|
| 200 V | 0,1 V | ± 1,0% ± 5D |
| 750 V | 1 V | ± 1,2% ± 5D |

Overload protection: 1000 V DC or 750 V DC/ AC (RMS).

Frequency: 45 - 450 Hz.

Measurement of the mean value equal to the RMS value for sinusoidal signals.

ALTERNATING CURRENT

| Range | Resolution | Accuracy |
|--------|------------|-------------|
| 200 A | 0,1 A | ±2,5% ± 13D |
| 1000 A | 1 A | ±2,5% ± 8D |

Overvoltage protection: 60 sec., 1200 A.

OTHER FUNCTIONS

| Function | Description |
|----------------------------------|---|
| Circuit continuity test (buzzer) | If the resistance of the tested circuit is less than 30 ± 20 Ohm, the buzzer sounds. Overload protection: 15 s, 220 V DC/ AC (RMS) |
| Diode test | Indicates the direct voltage drop in the diode |

RESISTANCE

| Range | Resolution | Accuracy |
|----------|------------|-------------|
| 200 Ohm | 0,1 Ohm | ±1,0% ± 10D |
| 2 kOhm | 1 Ohm | ±1,0% ± 4D |
| 20 kOhm | 10 Ohm | |
| 200 kOhm | 0,1 kOhm | |
| 2 MOhm | 1 kOhm | |

Maximum open circuit voltage: 3 V.

Overload protection: 15 s, 220 V DC/ AC (RMS).

FREQUENCY

| Range | Resolution | Accuracy |
|-------|------------|----------|
| 2 kHz | 1 Hz | ±3% ± 5D |

INSULATION RESISTANCE

If the option 500 V insulation tester is connected.

| Range | Resolution | Accuracy |
|-----------|------------|-------------------------|
| 20 MOhm | 10 kOhm | ±2% ± 2D |
| 2000 MOhm | 1 MOhm | ±4% ± 2D up to 500 MOhm |
| | | ±5% ± 2D over 500 MOhm |

4 MEASUREMENTS

DC AND AC VOLTAGE MEASUREMENT (V_{DC} and V_{AC})

1. Connect the red probe to the socket « V_{Ω} », and the black probe to the socket «**COM**». The polarity of the red probe is considered positive.
2. Use the rotary switch to select the desired DCV or ACV measurement range. If you do not know the measured value before measuring, set the range switch to the maximum voltage position and switch to lower values to achieve the required measurement accuracy.
3. Connect the probes to the tested circuit.
4. Read the value and polarity of the tested voltage on the display.
5. If the display shows only «1» in the left digit, overload has occurred. Set the range switch to a higher value.
6. When the work is finished, put the rotary switch to the «**OFF**» position.



When the range switch is set to «**1000 V_{DC}**» or «**750 V_{AC}**», the display will show the «**HV**» sign to warn of high voltage operation. Caution is required.

ALTERNATING CURRENT MEASUREMENT (A_{AC})

1. Make sure the «**DATA HOLD**» button is not pressed.
2. Use the rotary switch to select the desired current range.
3. Release the clamps and place the wire between the clamps.
4. Read the current value on the display.
5. If the display shows only «1» in the left digit, overload has occurred. Set the range switch to a higher value.
6. When the work is finished, put the rotary switch to the «**OFF**» position.



Only one wire can be measured at once.

RESISTANCE MEASUREMENT (Ω)

1. Connect the red probe to the socket «**V Ω** », and the black probe to the socket «**COM**». The polarity of the red probe is considered positive.
2. Use the rotary switch to select the desired resistance (Ω) measurement range.
3. Connect the probes to the measured resistance and read the value on the display.
4. If the value of the measured resistance exceeds the maximum value of the selected measurement range, the display will show «1» in the left digit.
5. When the work is finished, put the rotary switch to the «**OFF**» position.



If the measured resistance is set in the circuit, disconnect the power and discharge all capacitances of the circuit before measuring.

If the measured resistance is 1 MOhm or higher, the clamp meter requires a few seconds to stabilize the voltage. It is normal for high resistance values.

FREQUENCY MEASUREMENT (Hz)

1. Connect the red probe to the socket «**V Ω** », and the black probe to the socket «**COM**». The polarity of the red probe is considered positive.
2. Turn the rotary switch to the «**Hz**» position.
3. Connect the probes to the measured circuit and read the frequency value.
4. When the work is finished, put the rotary switch to the «**OFF**» position.



Do not measure frequency in circuits with voltages over 250 V (RMS).

DIODE TEST ($\rightarrow|$)

1. Connect the red probe to the socket «**V Ω** », and the black probe to the socket «**COM**». The polarity of the red probe is considered positive.
2. Turn the rotary switch to position $\rightarrow|$.
3. Connect the red probe to the anode, and the black probe to the cathode of the tested diode. 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 «1».
4. When the work is finished, put the rotary switch to the «**OFF**» position.

CIRCUIT CONTINUITY TEST ($\bullet|$)

1. Connect the red probe to the socket «**V Ω** », and the black probe to the socket «**COM**».
2. Turn the rotary switch to position $\bullet|$.
3. Connect the probes to two points of the measured circuit. In case of electrical contact between the points (resistance is less than 30 ± 20 Ohm), the buzzer sounds.
4. When the work is finished, put the rotary switch to the «**OFF**» position.

INSULATION TEST


- 1 Connect the tester to the clamp meter via matching sockets.
- 2 Set the rotary switch to insulation test position to the 2000 MΩ limit.
- 3 Connect the probe from the tester to the «L» socket and the clamp to the «E» socket.



The tester shall be powered off.

- 4 Turn the power switch to the «ON» position.
- 5 Press the insulation test button. The red indicator «500V» will light up. The displayed value corresponds to the insulation resistance. If the value is less than 19 MΩ, lower the test limits on both devices to increase accuracy.
- 6 When the work is finished, put the rotary switch to the «OFF» position.

BATTERY REPLACEMENT

If the symbol «» is displayed, the battery needs to be replaced.



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


5 DELIVERY SCOPE

1. Clamp meter - 1 pc.
2. Set of probes (red/black) - 1 pc.
3. Battery 9 V - 1 pc.
4. Bag - 1 pc.
5. 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. The warranty does not cover accessories: probes, battery.

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 clamp meter 266 / 266F EKF MASTER 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



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