



Digital Multimeter

**Model: 72-2605, 72-2610
72-10405 and 72-10410 and 72-10415**










IMPORTANT SAFETY INFORMATION

Please read these instructions carefully before use and retain for future reference.

This instrument is designed and manufactured in compliance with: G84793, IEC61010-1, IEC61010-2-030 CAT III 1000V & CAT IV 600V, Pollution Degree 2 and Double Insulation standards.

- Check the test leads, probes and case insulation before using. If you find any breakage or abnormality, or you consider the device is broken, stop using the device immediately.
- When using the test probes, keep your fingers behind the finger protection ring.
- Do not use the meter with the back cover open.
- Select appropriate test range for measurements.
- Ensure all inputs are less than the range selected otherwise it may cause electrical shock or meter damage.
- Do not change the range selector position during voltage or current measurements.
- Do not apply a voltage over 1000V between COM terminal and ground.
- Take caution when working voltages are above 60V DC or 30V AC rms.
- Do not connect the meter to voltage signals when the range selector is on current, resistance, diode or continuity range.
- When measuring current, each single measurement should be shorter than 10 seconds. For current values over 5A, the wait period between each measurement must be longer than 15 minutes.
- When a measurement has been completed, disconnect the testing probes from the circuit under test.
- Replace the batteries as soon as the low battery indicator appears on the display.
- Remove dead batteries from the meter or if it is not going to be used for a long time.
- Never mix old and new batteries together, or different types of batteries.
- Never dispose of batteries in a fire, or attempt to recharge ordinary batteries.
- Before replacing the battery, turn off the meter and disconnect all the test probes.
- To prolong battery life turn off the meter after use.
- CAT III: Measurement category III is for measurements performed in the building installation. Examples are measurements on distribution boards, circuit-breakers, and wiring, such as cables, bus-bars, junction boxes, switches and socket-outlets in the fixed installation, and equipment for industrial application and some other equipment such as stationary motors with permanent connection to the fixed installation.
- Only use test leads and probes that are in compliance with IEC 61010-031, and rated CAT III 1000V.

SYMBOL GUIDE

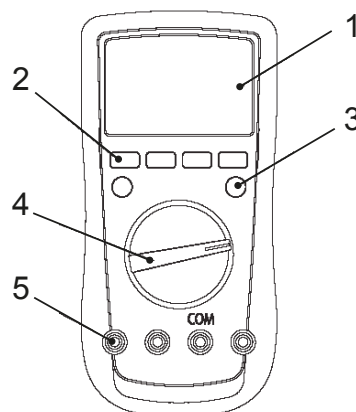
| | | | | | |
|---|-------------------|---|------------------|---|---------|
|  | Low battery |  | Grounding |  | Warning |
|  | Continuity Buzzer |  | AC |  | DC |
|  | Fuse |  | Double insulated |  | Diode |

WHAT'S INCLUDED

- Digital multimeter
- User manual
- Set of test leads
- K-type temperature probe (72-10405 & 72-2610 only)
- 9V battery (installed)
- RS232 PC interface cable

FUNCTIONS

1. LCD Display
2. FUNCTION buttons
3. BLUE button
4. Range selector
5. Input terminals



DC VOLTAGE

72-2605 AND 72-10405

| Range | Resolution | 72-2605 Accuracy 72-10405 | | Input Impedance | Fixed value input |
|-------|------------|---------------------------|-----------|-------------------|---------------------|
| 40mV | 0.01mV | | ±(0.8%+3) | Around >3000MΩ | 1000V DC 750V AC |
| 400mV | 0.1mV | ±(0.8%+3) | | | |
| 4V | 0.001V | ±(0.5%+1) | | Around 10MΩ | |
| 40V | 0.01V | | | | |
| 400V | 0.1V | | | | |
| 1000V | 1V | ±(1.0%+3) | | | |

72-2610 AND 72-10410

| Range | Resolution | 72-2610 Accuracy 72-10410 | Input Impedance | Fixed value input |
|-------|------------|---------------------------|---------------------------|---------------------|
| 60mV | 0.01mV | $\pm(0.8\%+3)$ | Around >3000M Ω | 1000V DC 750V AC |
| 600mV | 0.1mV | $\pm(0.8\%+3)$ | | |
| 6V | 0.001V | $\pm(0.5\%+1)$ | Around 10M Ω | |
| 60V | 0.01V | | | |
| 600V | 0.1V | | | |
| 1000V | 1V | $\pm(1.0\%+3)$ | | |

72-10415

| Range | Resolution | 72-2610 Accuracy | Input Impedance | Fixed value input |
|-------|------------|------------------|---------------------------|---------------------|
| 220mV | 0.01mV | $\pm(0.1\%+5)$ | Around >3000M Ω | 1000V DC 750V AC |
| 2.2V | 0.0001V | $\pm(0.1\%+2)$ | Around 10M Ω | |
| 22V | 0.001V | | | |
| 220V | 0.01V | | | |
| 1000V | 0.1V | $\pm(0.1\%+5)$ | | |

AC VOLTAGE**72-2605 and 72-10405**

| Range | Resolution | 72-2605 Accuracy 72-10405 | | Input Impedance | Fixed value input |
|-------|------------|---------------------------|-----------|-----------------|---------------------|
| 40mV | 0.01mV | | ±(1.2%+5) | Around >3000MΩ | 1000V DC 750V AC |
| 400mV | 0.1mV | ±(1.2%+5) | | | |
| 4V | 0.001V | ±(1.0%+3) | | Around 10MΩ | |
| 40V | 0.01V | | | | |
| 400V | 0.1V | | | | |
| 750V | 1V | ±(1.2%+5) | | | |

- Displays effective value of sine wave. mV range is applicable from 5% of range to 100% of range.

72-2610 and 72-10410

| Range | Resolution | 72-2610 Accuracy 45~1kHz | Input Impedance | Fixed value input |
|-------|------------|--------------------------|-----------------|---------------------|
| 60mV | 0.01mV | ±(1.2%+5) | Around >3000MΩ | 1000V DC 750V AC |
| 600mV | 0.1mV | | | |
| 6V | 0.001V | ±(1.0%+3) | Around 10MΩ | |
| 60V | 0.01V | | | |
| 600V | 0.1V | | | |
| 750V | 1V | ±(1.2%+5) | | |

- Displays effective value of sine wave. mV range is applicable from 5% of range to 100% of range.

72-10415

| Range | Resolution | Accuracy | | Input Impedance | Fixed value input |
|-------|------------|------------|-------------|-------------------|---------------------|
| | | 45~1kHz | >1kHz~10kHz | | |
| 220mV | 0.01mV | ±(1.0%+10) | ±(1.5%+50) | Around >3000MΩ | 1000V DC 750V AC |
| 2.2V | 0.0001V | ±(0.8%+10) | ±(1.2%+50) | Around 10MΩ | |
| 22V | 0.001V | | ±(2.0%+50) | | |
| 220V | 0.01V | | | | |
| 750V | 0.1V | ±(1.2%+10) | ±(3.0%+10) | | |

- True RMS is applicable from 10% of range to 100% of range.
- AC crest factor can be up to 3.0 except 1000V when it is 1.5.
- A residual reading of 10 digits with test leads shorted will not affect stated.

DC CURRENT

72-2605 and 72-10405

| Range | Resolution | Accuracy | Overload Protection |
|--------|------------|-----------|--|
| 400μA | 0.1μA | ±(1.0%+2) | Fuse 1 F600mA H 1000V 6.35 dia x 31.8mm |
| 4000μA | 1μA | | |
| 40mA | 0.01mA | ±(1.2%+3) | |
| 400mA | 0.1mA | | |
| 4A | 0.001A | ±(1.5%+3) | Fuse 2 F10A H 1000V 10.3 dia x 38.1mm |
| 10A | 0.01A | | |

- When <5A continuous measurement is allowed/
- When >5A use 10 seconds measurement at an interval of more than 15 minutes.

72-2610 and 72-10410

| Range | Resolution | Accuracy | Overload Protection |
|--------|------------|-----------|--|
| 600μA | 0.1μA | ±(1.0%+3) | Fuse 1 F600mA H 1000V 6.35 dia x 31.8mm |
| 6000μA | 1μA | | |
| 60mA | 0.01mA | | |
| 600mA | 0.1mA | | |
| 6A | 0.001A | ±(1.2%+5) | Fuse 2 F10A H 1000V 10.3 dia x 38.1mm |
| 10A | 0.01A | | |

- When <5A continuous measurement is allowed/
- When >5A use 10 seconds measurement at an interval of more than 15 minutes.

72-10415

| Range | Resolution | Accuracy | Overload Protection |
|--------|------------|------------|--|
| 220μA | 0.01μA | ±(0.5%+10) | Fuse 1 F600mA H 1000V 6.35 dia x 31.8mm |
| 2200μA | 0.1μA | | |
| 22mA | 0.001mA | | |
| 220mA | 0.01mA | | |
| 10A | 0.001A | ±(1.2%+50) | Fuse 2 F10A H 1000V 10.3 dia x 38.1mm |

- When <5A continuous measurement is allowed/
- When >5A use 10 seconds measurement at an interval of more than 15 minutes.

AC CURRENT

72-2605 and 72-10405

| Range | Resolution | Accuracy | Overload Protection |
|--------|------------|-----------|--|
| 400μA | 0.1μA | ±(1.2%+5) | Fuse 1 F600mA H 1000V 6.35 dia x 31.8mm |
| 4000μA | 1μA | | |
| 40mA | 0.01mA | ±(1.5%+5) | |
| 400mA | 0.1mA | | |
| 4A | 0.001A | ±(2.0%+5) | Fuse 2 F10A H 1000V 10.3 dia x 38.1mm |
| 10A | 0.01A | | |

- When <5A continuous measurement is allowed.
- When >5A use 10 seconds measurement at an interval of more than 15 minutes.
- Displays effective value of sine wave.

72-2610 and 72-10410

| Range | Resolution | Accuracy | Overload Protection |
|--------|------------|-----------|--|
| 600μA | 0.1μA | ±(1.2%+5) | Fuse 1 F600mA H 1000V 6.35 dia x 31.8mm |
| 6000μA | 1μA | | |
| 60mA | 0.01mA | ±(1.5%+5) | |
| 600mA | 0.1mA | | |
| 6A | 0.001A | ±(2.0%+5) | Fuse 2 F10A H 1000V 10.3 dia x 38.1mm |
| 10A | 0.01A | | |

- When <5A continuous measurement is allowed.
- When >5A use 10 seconds measurement at an interval of more than 15 minutes.
- Displays effective value of sine wave.

72-10415

| Range | Resolution | Accuracy | | Overload Protection |
|--------|------------|------------|-------------|--|
| | | 45~1kHz | >1kHz~10kHz | |
| 220μA | 0.01μA | ±(0.8%+10) | ±(1.2%+50) | Fuse 1 F600mA H 1000V 6.35 dia x 31.8mm |
| 2200μA | 0.1μA | | ±(1.5%+50) | |
| 22mA | 0.001mA | ±(1.2%+10) | ±(1.5%+50) | |
| 220mA | 0.01mA | | ±(1.5%+50) | |
| 10A | 0.001A | ±(1.5%+10) | >1kHz~5kHz | Fuse 2 F10A H 1000V 10.3 dia x 38.1mm |
| | | | (2.0%+50) | |

- When <5A continuous measurement is allowed.
- When >5A use 10 seconds measurement at an interval of more than 15 minutes.
- True RMS is applicable from 10% of range to 100% of range.
- AC crest factor can be up to 3.0 except 1000V where it is 1.5.
- A residual reading of 10 digits with test leads shorted will not effect stated.

RESISTANCE

72-2605 and 72-10405

| Range | Resolution | Accuracy | Overload Protection |
|-------|------------|-----------|---------------------|
| 400Ω | 0.1Ω | ±(1.2%+2) | 1000V DC 750V AC |
| 4kΩ | 0.001kΩ | ±(1.0%+2) | |
| 40kΩ | 0.01kΩ | | |
| 400kΩ | 0.1kΩ | | |
| 4MΩ | 0.001MΩ | ±(1.2%+2) | |
| 40MΩ | 0.01MΩ | ±(1.5%+2) | |

Note: When measuring below 2kΩ, apply REL ▲ to ensure measurement accuracy.

72-2610 and 72-10410

| Range | Resolution | Accuracy | Overload Protection |
|-------|------------|-----------|---------------------|
| 600Ω | 0.1Ω | ±(1.2%+2) | 1000V DC 750V AC |
| 6kΩ | 0.001kΩ | ±(1.0%+2) | |
| 60kΩ | 0.01kΩ | | |
| 600kΩ | 0.1kΩ | | |
| 6MΩ | 0.001MΩ | ±(1.2%+2) | |
| 60MΩ | 0.01MΩ | ±(1.5%+2) | |

Note: When measuring below 2kΩ, apply REL ▲ to ensure measurement accuracy.

72-10415

| Range | Resolution | Accuracy | Overload Protection |
|-------|------------|------------|---------------------|
| 220Ω | 0.01Ω | ±(0.5%+10) | 1000V DC 750V AC |
| 2.2KΩ | 0.0001kΩ | | |
| 22KΩ | 0.001kΩ | | |
| 220KΩ | 0.01kΩ | | |
| 2.2MΩ | 0.001MΩ | ±(1.5%+10) | |
| 22MΩ | 0.001MΩ | ±(1.5%+10) | |
| 220MΩ | 0.01MΩ | ±(3.0%+50) | |

Note: When measuring below 2kΩ, apply REL ▲ to ensure measurement accuracy.

CAPACITANCE

72-2605 and 72-10405

| Range | Resolution | Accuracy | Overload Protection |
|--------|------------|-------------|---------------------|
| 40nF | 0.01nF | ±(3.0%+5) | 1000V DC 750V AC |
| 400nF | 0.1nF | | |
| 4μF | 0.001μF | | |
| 40μF | 0.01μF | | |
| 400μF | 0.1μF | ±(4.0%+5) | |
| 4000μF | 1μF | Unspecified | |

Note: There is around 10nF residual reading when the circuit is open.

72-2610 and 72-10410

| Range | Resolution | Accuracy | Overload Protection |
|--------------|---------------|----------------|---------------------|
| 40nF | 0.01nF | $\pm(3.0\%+5)$ | 1000V DC 750V AC |
| 400nF | 0.1nF | | |
| 4 μ F | 0.001 μ F | | |
| 40 μ F | 0.01 μ F | | |
| 400 μ F | 0.1 μ F | $\pm(4.0\%+5)$ | |
| 4000 μ F | 1 μ F | Unspecified | |

Note: There is around 10nF residual reading when the circuit is open.

72-10415

| Range | Resolution | Accuracy | Overload Protection |
|-------|------------|-------------|---------------------|
| 22nF | 0.001nF | ±(3.0%+5) | 1000V DC 750V AC |
| 220nF | 0.01nF | | |
| 2.2μF | 0.0001μF | | |
| 22μF | 0.001μF | | |
| 220μF | 0.01μF | ±(4.0%+5) | |
| 2.2mF | 0.0001mF | | |
| 22mF | 0.001mF | Unspecified | |
| 220mF | 0.01mF | | |

Note: There is around 1nF residual reading when the circuit is open.

To measure a small value of capacitance, use RE to ensure accuracy.

FREQUENCY

| Model | Range | Accuracy | Max Resolution |
|---------------------------------------|-------------|-----------|----------------|
| 72-2605/72-10405/ 72-2610/72-10410 | 10Hz~10MHz | (0.1%+4) | 0.01Hz |
| 72-10415 | 10Hz~220MHz | (0.01%+5) | 0.001Hz |

- Overload protection 100V DC / 750V AC.
- Input amplitude: DC electric level is zero.
72-2605, 72-10405, 72-2610, 72-10410:
When 10Hz~10MHz: $200\text{mV} \leq a \leq 30\text{Vrms}$.
72-10415:
When 10Hz~10MHz: $300\text{mV} \leq a \leq 30\text{Vrms}$.
When >10Hz~40MHz: $1\text{V} \leq a \leq 30\text{Vrms}$.
When >40MHz: unspecified.
- When measuring on line frequency or duty cycle under AC voltage and current measurement mode, the input amplitude and frequency response must satisfy the following requirement:
- Input amplitude $\geq \text{range} \times 30\%$.
- Frequency response: 72-2605 and 72-10405 $\leq 400\text{Hz}$.
72-2610, 72-10410 and 72-10415 $\leq 1\text{kHz}$.

DIODE TEST

| Model | Resolution | Notes | Overload Protection |
|---------------------------------------|------------|-------------------------------------|---------------------|
| 72-2605/72-10405/ 72-2610/72-10410 | 0.001V | Open circuit voltage around 2.8V | 1000V DC 750V AC |
| 72-10415 | 0.0001V | | |

CONTINUITY TEST

| Model | Resolution | Overload Protection |
|---------------------------------------|------------|---------------------|
| 72-2605/72-10405/ 72-2610/72-10410 | 0.1Ω | 1000V DC 750V AC |
| 72-10415 | 0.01Ω | |

- 72-2605, 72-10405, 72-2610, 72-10410:
Open circuit voltage is around 0.45V.
Broken circuit resistance value is around $>35\Omega$ the buzzer does not sound.
Good circuit resistance value is $\leq 10\Omega$ the buzzer sounds continuously.
- 72-10415:
Open circuit voltage is around -3V.
Broken circuit resistance value is around $>30\Omega$ the buzzer does not sound.
Good circuit resistance value is $\leq 10\Omega$ the buzzer sounds continuously.

TEMPERATURE MEASUREMENT

72-10405 AND 72-2610 ONLY

| Range | Resolution | Accuracy | Overload Protection |
|-------|------------|---------------------------------|---------------------|
| °C | 1°C | (-40°C~20°C):-(8%+5) | 1000V DC 750V AC |
| | | (>-20°C~0°C): $\pm(1.2\%+4)$ | |
| | | (>0°C~100°C): $\pm(1.2\%+3)$ | |
| | | (>100°C~1000°C): $\pm(2.5\%+2)$ | |
| °F | 1°F | (-40°F~4°F):-(8%+6) | |
| | | (>4°F~32°F): $\pm(1.2\%+5)$ | |
| | | (>32°F~212°F): $\pm(1.2\%+4)$ | |
| | | (>212°F~1832°F): $\pm(2.5\%+3)$ | |

Thermocouple

Use K type thermocouple. The included point type contact K type thermocouple can only be used on less than 230°C temperature measurements.

TRANSISTOR TESTING

72-2605 ONLY

| Range | Resolution | Notes |
|-------|------------|----------------------------------|
| hFE | 1β | I _{bo} = 10μA 1000β Max |

OPERATION

Rotary Switch

Below table indicates the rotary selector switch position functions.









| | |
|-------------|-------------------------------|
| | AC and DC Voltage measurement |
| | Resistance measurement |
| | Diode test |
| | Continuity test (sounder) |
| | Capacitance test |
| Hz % | Frequency and duty cycle test |
| °C | Temperature in Celsius |
| °F | Temperature in Fahrenheit |
| hFE | Transistor test |
| μA≈ | DCA and ACA measurement |
| mA≈ | DCmA and ACmA measurement |
| 10A≈ | 10A DC and AC measurement |
| EF | Sensor test (72-2605 only) |
| OFF | Power off |

Function Buttons


Below table indicates the operation of the function buttons.

| Button | Operation |
|---|--|
| Light (72-2605, 72-10405, 72-2610 & 72-10410) | Press and hold for 2 sec to turn backlight on or off |
| Hold | Press to enter or exit data hold mode |
| BLUE button | Press to select the alternate feature |
| RANGE | Press RANGE to enter the manual ranging mode Press RANGE to step through the ranges available Press and hold RANGE for 2 secs to return to autoranging |
| MAX/MIN (72-2605, 72-10405, 72-2610 & 72-10410) | Press to select maximum and minimum value. |
| REL ▲ | Press to enter REL mode and again to exit REL mode For Model 72-10405, 72-2610 Press and hold for over 2 seconds to enter or exit RS232C or USB mode. |
| PEAK (72-10415 only) | Press to step through Pmax and Pmin readings Press and hold for 2 secs to exit peak mode CAL enters the self calibration mode |

Display symbols

| No | Symbol | Meaning |
|----|---|--|
| 1 |  | Data hold is active. |
| 2 |  | Sleep Mode indicator |
| 3 |  | Indicates negative reading. |
| 4 | AC | Indicator for AC measurement |
| 5 | DC | Indicator for DC measurement |
| 6 | AUTO | The Meter is in the auto range mode in which the Meter automatically selects the range with the best resolution. |
| 7 | MANU | Indicator for manual ranging mode. |
| 8 | OL | The input value is too large for the selected range. |
| 9 | hFE | Transistor testing indicator |
| 10 |  | Diode test |
| 11 |  | Continuity buzzer on |
| 12 | MAX/MIN | Maximum and Minimum reading. |
| 13 | S | Data output is in progress |
| 14 |  | The battery is low. |
| 15 |  | Sensor test is in progress |
| 16 |  | REL is on to display stored value minus present value |
| 17 | Ω, kΩ, MΩ | Ohm unit of resistance Kilohm 1×10^3 or 1,000ohms Megaohm 1×10^6 or 1,000,000ohms |
| | V, mV | Volts unit of voltage Millivolt 1×10^{-3} or 0.001volts |
| | μA, mA, A | Amperes unit of current Milliamp 1×10^{-3} or 0.001amperes Microamp 1×10^{-6} or 0.000001amperes |
| | nF, μF, mF | Farad unit of capacitance Microfarad 1×10^{-6} or 0.000001farads Nanofarad 1×10^{-9} or 0.000000001farads |
| | °C, °F | Centigrade or Fahrenheit unit of temperature |
| | Hz, kHz, MHz | Hertz unit of frequency in cycles per second Kilohertz 1×10^3 or 1,000Hertz Megahertz 1×10^6 or 1,000,000Herts |
| | β | Unit of transistor |

Hold Mode

- The Hold mode is applicable to all measurement functions.
- Press HOLD to enter Hold mode; the meter buzzer sounds.
- Press HOLD again to exit Hold mode; the meter buzzer sounds.
- In Hold mode,  is displayed.

Note: To avoid possibility of electric shock, do not use Hold mode to determine if circuits are without power. The Hold mode will not capture unstable or noisy readings.

Range button

- Press RANGE to enter the manual ranging mode; the Meter buzzer will sound.
- Press RANGE to step through the ranges available for the selected function; the Meter buzzer will sound.
- Press and hold RANGE for over 2 seconds to return to autoranging; the Meter buzzer will sound.


MAX MIN button 72-2605,72-10405 and 72-2610, 72-10410 only

- Press MAX MIN to start recording of maximum and minimum values. Steps the display through high (MAX) and low (MIN) readings. The Meter enters manual ranging mode after pressing MAX MIN button.
- Press and hold MAX MIN for over 2 seconds to exit MAX MIN mode and return to the active measurement range.


Peak Hold 72-10415 only

- Under voltage and current measurement mode, press the PEAK button to enter manual ranging mode and start recording of Pmax and Pmin values. The LCD displays MANU/Pmax.
- Press PEAK again to display MANU/Pmin.
- Press PEAK to step the display through Peak Max and Peak Min readings.
- Press and hold PEAK for over 2 seconds to exit Peak mode, the LCD displays the present measurement values.
- Don't press the "PEAK" Key. If the meter has entered "CAL" mode.

Data Output all except 72-10405, 72-10415 and 72-2610, 72-10410 only

- Press and hold REL button for over 2 seconds to enter or exit RS232C or USB mode.
- The sleep mode feature will be disabled after entering RS232C or USB modes, the  on the LCD will disappear (72-10405,72-10410 and 72-2610 only).
- If the meter is performing HOLD, MAX MIN or REL measurement, the LCD will display the corresponding readings but the interface output will still be the random value of the present input terminal measurement.

Using Relative Value mode

- The REL mode applies to all measurement functions except frequency/duty cycle measurement. It subtracts a stored value from the present measurement value and displays the result.
- Press REL  to enter REL mode and the present measurement range is locked and display shows "0" as the stored value.
- Press REL again to reset the stored value and exit the REL mode.

The BLUE button

- This is used to select the required measurement function when there is more than one function option within one position on the rotary control setting.

Turning on the display backlight 72-2605, 72-10405 and 72-2610 only.

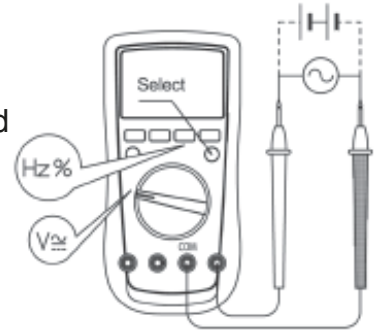
- Use to avoid mistaken readings in insufficient lighting or poor vision applications.
- Press and hold HOLD/LIGHT for over 2 seconds to turn the display backlight on.
- The backlight will automatically switch off after around 10 seconds.

Sleep mode

- To preserve battery life the meter will automatically power off if you do not move the rotary switch or press any button for around 15 minutes.
- The meter re-activates by pressing any button or turning the rotary switch.
- To disable the sleep function press and hold the BLUE button while turning on the meter.

Measuring Voltage

- Insert the red test lead into the V terminal and the black test lead into COM.
- Set the rotary selector to V, DC measurement is default.
- Press the BLUE button to switch between AC and DC modes.
- Connect the test leads across the object to be measured and the value will be displayed.

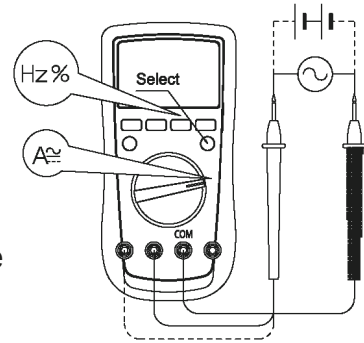


Notes

- In each range, the Meter has an input impedance of 10M Ω except mV range which input impedance is 3000M Ω . This loading effect can cause measurement errors in high impedance circuits. If the circuit impedance is less than or equal to 10k Ω , the error is negligible (0.1% or less).
- For 72-2605 : When measuring mV, you must press RANGE manually to enter mV range.
- When voltage measurement has been completed, disconnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.

Measuring Current

- Insert the red test lead into the mA or A input terminal and the black test lead into the COM terminal.
- Set the rotary switch to μA , mA, or A.
- The Meter defaults to DC current measurement mode. To switch between DC and AC current measurement function, press the BLUE button.
- Connect the test lead in serial to the circuit to be tested. The measured value shows on the display.
- 72-2605, 72-10405 and 72-2610: displays effective value of sine wave (mean value response).
- 72-10415: displays the true rms value.

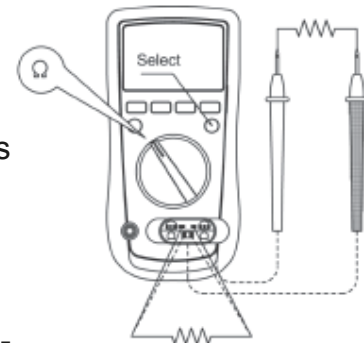


Notes:

- If the current to be measured is unknown, choose the maximum measuring range and reduce it step by step until a satisfactory reading is obtained.
- Disconnect from the circuit under test when changing the range.
- If the display only shows "OL", it indicates the measured current is out of range. In this case, turn the range selector to a higher range.
- For safety, each measurement time for $>5\text{A}$ current should be less than 10 seconds and the interval time between 2 measurements should be greater than 15 minutes.

Measuring Resistance

- Insert the red test lead into the Ω terminal and the black test lead into the COM terminal.
- Set the rotary switch to Ω resistance measurement (Ω) is default or press BLUE button to select Ω measurement mode.
- Connect the test leads across with the object being measured. If there is lead on the resistor or SMT resistor, it is more convenience to use the included multi-purpose socket to carry out testing. The measured value shows on the display.



Warning

To avoid damages to the Meter or to the devices under test, disconnect circuit power and discharge all the high-voltage capacitors before measuring resistance.

To avoid harm to yourself, do not input higher than DC 60V or AC 30V voltages.

Notes

The test leads can add 0.2Ω to 0.5Ω of error so to obtain precision readings, short circuit the terminals and use REL measurement function to automatically subtract the short circuit value from the reading measured.

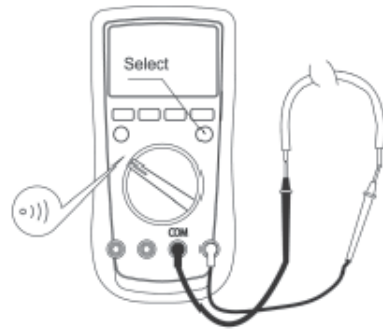
For high resistance measurement $>1\text{M}\Omega$, it is normal for it to take several seconds to obtain a stable reading.

The display will show OL if the tested resistance is greater than the maximum range of the meter.

- When resistance measurement has been completed, disconnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.

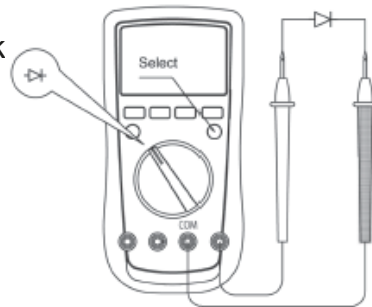
Testing for continuity

- Insert the red test lead into the Ω terminal and the black test lead into the COM terminal.
- Set the rotary switch to $\bullet|||$ terminal.
- The buzzer sounds continuously if the resistor to be tested is $<10\Omega$
- The buzzer does not sound if the resistor to be tested is $>35\Omega$
- When continuity testing has been completed, disconnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.



Testing Diodes

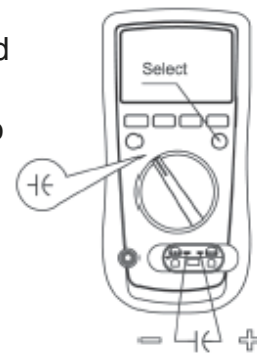
- Insert the red test lead into the Ω terminal and the black test lead into the COM terminal.
- Set the rotary switch to $\rightarrow+$ terminal and press BLUE button to select $\rightarrow+$ measurement.
- For forward voltage drop readings on any semiconductor component place the red test lead on the anode and the black test lead onto the cathode.
- The measured value shows on the display.
- When diode testing has been completed, disconnect the connection between the testing leads and the item under test, and remove the testing leads away from the input terminals of the Meter.



Note: A good diode should produce a forward voltage drop of 0.5V to 0.8V.

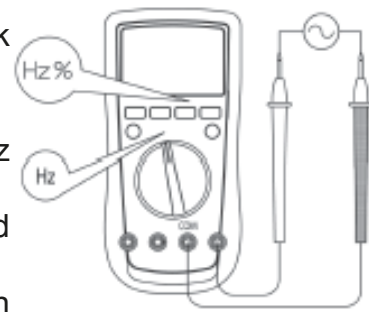
Capacitance measurement

- Insert the red test lead into the Ω terminal and the black test lead into the COM terminal.
- Set the rotary switch to $\text{---}|$ terminal and press BLUE button to select nF measurement.
- The Meter will display a fixed value as below which is the Meters internal fixed distributed capacitance value. To ensure accuracy when measuring a small value of capacitance, use REL to subtract this from the tested value.
- Connect the test leads across the object being measured.
- 72-2605, 72-10405, 72-2610 and 72-10415: is around 10nF
- 72-10415: is around 1nF.
- Alternatively, use the included multi-purpose socket for measuring capacitors with leads or SMT capacitor. Insert the capacitor to be tested into the corresponding "+" and "-" jack of the multi-purpose socket. This method is more stable and suitable for small value of capacitance testing.
- OL is displayed if the tested capacitor is shorted or exceeds the maximum range.
- When capacitance testing has been completed, disconnect the connection between the testing leads and the item under test, and remove the testing leads away from the input terminals of the Meter.



Frequency measurement

- Insert the red test lead into the Hz terminal and the black test lead into the COM terminal.
- Set the rotary switch to Hz% frequency measurement
- Hz is default or press Hz% button to select Hz measurement mode.
- Connect the test leads across the object being measured and the value shows on the display.
- If you need to measure the duty cycle, press Hz% button to select % measurement mode.
- When frequency measurement has been completed, disconnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.

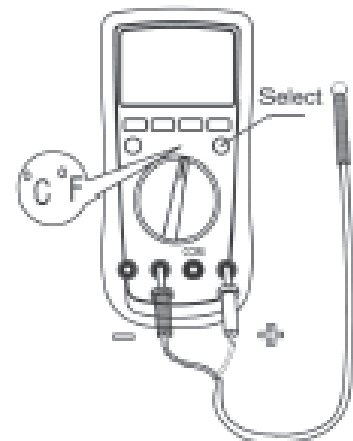


Temperature measurement 72-10405 and 72-2610 only

- Set the rotary switch to C° F°
- Insert the temperature probe into the input terminal as shown:
- Place the temperature probe to the object being measured.
- After few seconds, the measured value shows on the display.
- Press BLUE button to toggle between C° and F° options.

Note To avoid measurement error especially low temperature measurement, the ambient operating temperature must not exceed 18°C~28°C.

- When temperature measurement has been completed, disconnect the temperature probe from the object being measured, and remove the temperature probe from the input terminals of the Meter.




Transistor hFE Measurement 72-2605 only

- Set the rotary switch to hFE.
- Insert the multi-purpose socket into the input terminal as shown on figure 10.
- Insert the transistor to be tested into the corresponding multi-purpose socket jacks.
- The LCD display hFE nearest value.
- When transistor measurement has been completed, disconnect all the connection between multi-purpose socket, transistor and the Meter.



EF Function 72-2605 only

- Set the rotary switch to EF and remove any test leads from the input terminals.
- Place the housing front part with marking  toward the source of EF.
- There will be three types of displays:
- LCD displays shows the strength of detected signal.
- When the LCD displays OL, the buzzer sounds and the red LED flashes.



SPECIFICATIONS

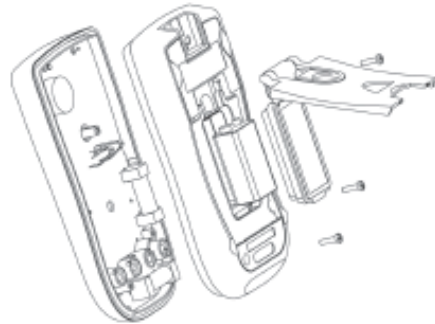
| Function | Range/description | | |
|------------------------|---|---|--|
| Operating Temperature | 0°~40°C (32°F~104°F) | | |
| Storage Temperature | -10°C~50°C (14°F~122°F) | | |
| Relative Humidity | ≤75%@ 0°C~30°C below ≤50%@ 30°C~40°C | | |
| Battery Type | 9V NEDA 1604 or 6F22 or 006P | | |
| Range | Auto or manual | | |
| Polarity | Auto | | |
| Measurement speed | Updates 2-3 times/second | | |
| Analogue bar graph | 72-2605 and 72-10405 | 72-2610 | 72-10415 |
| | 41 segments, max reading 4000 (frequency 9999) | 61 segments, max reading 6000 (frequency 9999) | 46 segments, max reading 22000 (frequency 9999) |
| DC Voltage | 0 to 1000V | | |
| DC Current | 0 to 10A (5~10A for ≤10 seconds, interval ≥15 minutes) | | |
| AC Voltage | 0 to 750V | | |
| AC Current | 0 to 10A (5~10A for ≤10 seconds, interval ≥15 minutes) | | |
| Dimensions (H x W x L) | 180 x 87 x 47mm | | |
| Weight | 370g incl battery | | |

BATTERY REPLACEMENT

Warning: Only replace the battery after the test leads are removed and the power is turned off.

To replace the battery,

- Remove the screw from the tilt stand and the battery cover and separate the battery cover and the tilt stand from the case bottom.
- Remove the battery from the battery compartment.
- Replace the battery with a new 9V battery (NEDA1604, 6F22 or 006P)
- Refit the tilt stand and battery cover to the case bottom, and reinstall the screw.

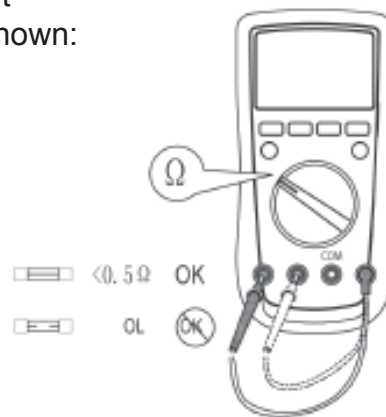


FUSE REPLACEMENT

If the Meter does not respond when measuring current and transistor hFE, test to see if a fuse has blown as shown:

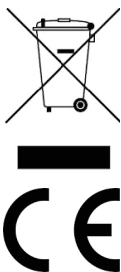
To replace the fuses,

- Turn the Meter power off and remove all the connections from the terminals.
- Remove the screw from the tilt stand and the battery cover and separate the tilt stand from the case bottom half.
- Remove the two screws from the case bottom, and separate the case halves.
- Remove the fuse by gently prying one end loose, then take out the fuse from its holder.
- Install ONLY replacement fuses with the identical type and specification as follows and make sure the fuse is fixed firmly in the holder.
A mA range: F1, 600mA H 1000V, 6.35x31.8mm
10A range: F2, 10A H 1000V, 10.3 x 38.1mm
- Refit the case bottom to the case top, and reinstall the screw.
- Refit the tilt stand, battery compartment and case bottom, and reinstall the screw.



CLEANING

- Clean the meter with a clean, soft cloth.
- Do not use any chemicals, abrasives or solvents that could damage the meter.



INFORMATION ON WASTE DISPOSAL FOR CONSUMERS OF ELECTRICAL & ELECTRONIC EQUIPMENT

These symbols indicate that separate collection of Waste Electrical and Electronic Equipment (WEEE) or waste batteries is required. Do not dispose of these items with general household waste. Separate for the treatment, recovery and recycling of the materials used. Waste batteries can be returned to any waste battery recycling point which are provided by most battery retailers. Contact your local authority for details of the battery and WEEE recycling schemes available in your area.

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