



# **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

<u>-</u> +	Low battery	÷	Grounding	$\wedge$	Warning
•1))	Continuity Buzzer	~	AC		DC
4	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	
400mV	0.1mV	±(0.8%+3)		>3000MΩ	
4V	0.001V				1000V DC
40V	0.01V	±(0.5%+1)			750V AC
400V	0.1V			Around 10MΩ	
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	±(0.8%+3)	Around	
600mV	0.1mV	±(0.8%+3)	>3000MΩ	
6V	0.001V			1000V DC
60V	0.01V	±(0.5%+1)		750V AC
600V	0.1V			
1000V	1V	±(1.0%+3)		

# 72-10415

Range	Resolution	72-2610 Accuracy	Input Impedance	Fixed value input
220mV	0.01mV	±(0.1%+5)	Around >3000MΩ	
2.2V	0.0001V			
22V	0.001V	±(0.1%+2)		750V AC
220V	0.01V			
1000V	0.1V	±(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	
400mV	0.1mV	±(1.2%+5)		>3000MΩ	
4V	0.001V				1000V DC
40V	0.01V	±(1.0%+3)			750V AC
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	
600mV	0.1mV	I (1.2 %+3)	>3000MΩ	
6V	0.001V			1000V DC
60V	0.01V	±(1.0%+3)		750V AC
600V	0.1V		Around TUNIO	
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	Acc 45~1kHz	uracy >1kHz~10kHz	Input Impedance	Fixed value input
220mV	0.01mV	±(1.0%+10)	±(1.5%+50)	Around >3000MO	• • • •
2.2V	0.0001V		1/1 20/ 150)		
22V	0.001V	±(0.8%+10)	±(1.2%+50)		750V AC
220V	0.01V		±(2.0%+50)		
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 (1.00(+2)	
4000µA	1μΑ	±(1.0%+2)	Fuse 1 F600mA H 1000V
40mA	0.01mA	(1.20(	6.35 dia x 31.8mm
400mA	0.1mA	±(1.2%+3)	
4A	0.001A		Fuse 2 F10A H 1000V
10A	0.01A	±(1.5%+3)	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.

## 72-2610 and 72-10410

Range	Resolution	Accuracy	<b>Overload Protection</b>
600µA	0.1µA		
6000µA	1μΑ	. (1.00(	Fuse 1 F600mA H 1000V
60mA	0.01mA	±(1.0%+3)	6.35 dia x 31.8mm
600mA	0.1mA		
6A	0.001A	L (1 20/ LF)	Fuse 2 F10A H 1000V
10A	0.01A	±(1.2%+5)	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.

#### 72-10415

Range	Resolution	Accuracy	Overload Protection
220µA	0.01µA		
2200µA	0.1µA		Fuse 1 F600mA H 1000V
22mA	0.001mA	±(0.5%+10)	6.35 dia x 31.8mm
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	L (1 20( · F)	
4000µA	1μΑ	±(1.2%+5)	Fuse 1 F600mA H 1000V
40mA	0.01mA		6.35 dia x 31.8mm
400mA	0.1mA	±(1.5%+5)	
4A	0.001A	L (2,00( · F)	Fuse 2 F10A H 1000V
10A	0.01A	±(2.0%+5)	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.
- Displays effective value of sine wave.

# 72-2610 and 72-10410

Range	Resolution	Accuracy	Overload Protection
600µA	0.1µA	1 (1 D0( · F)	
6000µA	1μΑ	±(1.2%+5)	Fuse 1 F600mA H 1000V
60mA	0.01mA		6.35 dia x 31.8mm
600mA	0.1mA	±(1.5%+5)	
6A	0.001A	1/2 0% ( 5)	Fuse 2 F10A H 1000V
10A	0.01A	±(2.0%+5)	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.
- Displays effective value of sine wave.

## 72-10415

Dense Deselution		Accuracy		Overlaged Dretestion
капде	Resolution	45~1kHz	>1kHz~10kHz	Overload Protection
220µA	0.01µA	1(0.89/+10)		
2200µA	0.1µA	$\pm(0.8\%+10)$	±(1.2%+50)	Fuse 1 F600mA H 1000V
22mA	0.001mA	1 (1 20( . 10)		6.35 dia x 31.8mm
220mA	0.01mA	±(1.2%+10)	±(1.5%+50)	
104	0.001.0	+(1 E9/ 10)	>1kHz~5kHz	Fuse 2 F10A H 1000V
IUA	0.001A	±(1.5%+10)	(2.0%+50)	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.
- 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)	
4kΩ	0.001kΩ		
40kΩ	0.01kΩ	±(1.0%+2)	1000V DC
400kΩ	0.1kΩ		750V AC
4MΩ	0.001ΜΩ	±(1.2%+2)	
40ΜΩ	0.01ΜΩ	±(1.5%+2)	

Note: When measuring below  $2k\Omega,$  apply REL  $\blacktriangle$  to ensure measurement accuracy.

# 72-2610 and 72-10410

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

Note: When measuring below  $2k\Omega,$  apply REL  $\blacktriangle$  to ensure measurement accuracy.

### 72-10415

Range	Resolution	Accuracy	Overload Protection
220Ω	0.01Ω		
2.2ΚΩ	0.0001kΩ	±(0.5%+10)	
22ΚΩ	0.001kΩ		10001/ DC
220ΚΩ	0.01kΩ		1000V DC
2.2ΜΩ	0.001ΜΩ	±(1.5%+10)	7507 AC
22ΜΩ	0.001ΜΩ	±(1.5%+10)	
220ΜΩ	0.01ΜΩ	±(3.0%+50)	

**Note:** When measuring below  $2k\Omega$ , apply REL  $\blacktriangle$  to ensure measurement accuracy.

# CAPACITANCE

# 72-2605 and 72-10405

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

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

## 72-10415

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

**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:

72-10415:When  $10Hz \sim 10MHz$ :  $200mV \le a \le 30Vrms$ .72-10415:When  $10Hz \sim 10MHz$ :  $300mV \le a \le 30Vrms$ .<br/>When  $>10Hz \sim 40MHz$ :  $1V \le a \le 30Vrms$ .<br/>When >40MHz: unspecified.

- When measuring on line frequency or duty cycle under AC voltage and current measurement mote, the input amplitude and frequency response must satisfy the following requirement:
- Input amplitude ≥range x 30%.
- Frequency response: 72-2605 and 72-10405 ≤400Hz. 72-2610, 72-10410 and 72-10415 ≤1kHz.

# **DIODE TEST**

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

#### **CONTINUITY TEST**

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

• 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 ≤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 ≤10 $\Omega$  the buzzer sounds continuously.

# TEMPERATURE MEASUREMENT

# 72-10405 AND 72-2610 ONLY

Range	Resolution	Accuracy	<b>Overload Protection</b>
		(-40°C~-20°C):-(8%+5)	
°c	1°C	(>-20°C~0°C): ±(1.2%+4)	
Ľ		(>0°C~100°C): ±(1.2%+3)	
		(>100°C~1000°C): ±(2.5%+2)	1000V DC
		(-40°F~4°F):-(8%+6)	750V AC
°F	105	(>4°F~32°F): ±(1.2%+5)	
	1.6	(>32°F~212°F): ±(1.2%+4)	
		(>212°F~1832°F): ±(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	1ß	lbo = 10µA 1000ß Max

# OPERATION

# **Rotary Switch**

Below table indicates the rotary selector switch position functions.

v~ m <b>v</b>	AC and DC Voltage measurement
Ω	Resistance measurement
→+	Diode test
•1))	Continuity test (sounder)
-IF	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	Н	Data hold is active.		
2	ى ک	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	•1))	Continuity buzzer on		
12	MAX/MIN	Maximum and Minimum reading.		
13	S	Data output is in progress		
14	Ēŧ	The battery is low.		
15	<u>_</u> EF	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 1x10³ or 1,000ohms Megaohm 1x10 <sup>6</sup> or 1,000,000ohms		
	V, mV	Volts unit of voltage Millivolt 1x10 <sup>-3</sup> or 0.001volts		
	μΑ, mΑ, Α	Amperes unit of current Milliamp 1x10 <sup>-3</sup> or 0.001amperes Microamp 1x10 <sup>-6</sup> or 0.000001amperes		
	nF, μF, mF	Farad unit of capacitance Microfarad 1x10 <sup>-6</sup> or 0.000001farads Nanofarad 1x10 <sup>-9</sup> or 0.000000001farads		
	°C, °F	Centigrade or Fahrenheit unit of temperature		
	Hz, kHz, MHz	Hertz unit of frequency in cycles per second Kilohertz 1x10 <sup>3</sup> or 1,000Hertz Megahertz 1x10 <sup>6</sup> or 1,000,000Herts		
	ß	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, **H** 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 C 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 10MΩ except mV range which input impedance is 3000MΩ. This loading effect can cause measurement errors in high impedance circuits. If the circuit



- impedance is less than or equal to  $10k\Omega$ , 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  $\mu A$ , 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 >5A 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  $\Omega$  resistance measurement ( $\Omega$ ) is default or press BLUE button to select  $\Omega$  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 multipurpose socket to carry out testing. The measured value shows on the display.

# Select

#### 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  $0.2\Omega$  to  $0.5\Omega$  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 >1M $\Omega$ , 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 •1) 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 → terminal and press BLUE button to select → 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 H 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 multipurpose 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  $\stackrel{\frown}{\swarrow}$  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 i			rval ≥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	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 response 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.