KUSAM-MECO®

An ISO 9001:2008 Company

1000A DC/AC DIGITAL CLAMP METER

Model 2781 / 2781-T(True RMS)

9 FUNCTIONS 32 RANGES

FEATURES :

- Overload protection on all ranges.
- Maximum Voltage between any terminal and earth ground 600V rms
- Dual slope integration
- Data-hold facility
- DCA zero button for accurate reading
- Low battery indication
- Auto power off

GENERAL SPECIFICATIONS :

- **Sensing :** Average sensing **(Model 2781)** True RMS sensing **(Model 2781-T)**
- **Jaw opening size :** cables 40mm
- **Display :** 3 ¾ digit 3999 counts liquid crystal LCD display.
- **Over range indication :** Display of "OL" on LCD at the highest position means range selection too low for the input. (Except for ranges of 1000A AC, & 600V AC / DC)
- **Polarity :** Symbol "-" automatic displayed for negative input.
- **Sampling rate :** 3 times per second (Digital display)
- **Auto power off :** The meter is automatically powered off after idling for 15 minutes. To awake the meter, turn the rotary function switch or push any button.
- **Operating Temperature & Humidity :** 0°C to 40°C; < 80% R.H. Non-condensing
- **Low battery :** The symbol "⊟" is displayed when the batteries are weak and below the operating Voltage. Replace batteries immidiately.
- **Battery life :** Approx. 60 hrs continuously use with alkaline batteries.
- **Power supply :** 1.5V AAA x 2
- **Dimension :** 228(L) x 76(W) x 39(H) mm
- **Weight :** approx. 465gms. (Including batteries)

ACCESSORIES :

Test leads (pair), Battery installed, User's manual, K-Type Thermocouople(model 2781-T) & Carrying case.

ELECTRICAL SPECIFICATIONS : 2781 / 2781-T

Accuracy are : ±(% of reading + number of digits) at 18°C to 28°C with relative humidity below 80%R.H.

CAPACITANCE

Range	Resolution	Accuracy
40 nF	0.01nF	±(2.5%rdg+10dgts)
400 nF	0.1 nF	±(2.0%rdg+4dgts)
4 F	1 nF	
40 F	10 nF	
100 F	10 nF	Unspecified

Overload Protection : 250V rms

FREQUENCY

Range	Resolution	Accuracy
10Hz (2781only)	0.001Hz	Unspecified
100Hz	0.01 Hz	±(0.5%rdg+3dgts)
1KHz	0.1 Hz	
10KHz	1 Hz	
100KHz	10 Hz	
1MHz	100 Hz	
10MHz	1 KHz	Unspecified

Over load protection : 250Vrms
Sensitivity : 1V

DIODE & CONTINUITY TEST

Range	Description
⊣◁	Display read approx. Forward voltage of diode. Accuracy ± (3.0%rdg+3)
•))	If the resistance is less than 50 , the beeper sounds continuously

Overload Protection : 250V RMS

DC CURRENT

Range	Resolution	Accuracy
40 A (2781-T)	10 mA	± (2%rdg + 5dgts)
400 A	0.1 A	
1000 A	1 A	

Overload Protection : 1200A

DC VOLTAGE

Range	Resolution	Accuracy
400 mV (2781-T)	0.1 mV	±(1.0%rdg+5dgts)
4 V	0.001 V	±(0.8%rdg+2dgts)
40 V	0.01 V	
400 V	0.1 V	
1000 V	1 V	±(1.0%rdg+2dgts)

Overload protection : 1200Vrms
Input Impedance : 10M

RESISTANCE

Range	Resolution	Accuracy
400	0.1	±(1.2%rdg+8dgts)
4 K	1	±(1.0%rdg+2dgts)
40 K	10	
400 K	100	
4 M	1 K	
40 M	10 K	± (2%rdg+5dgts)

Overload Protection : 250V rms

AC CURRENT

Range	Resolution	Accuracy
40 A (2781-T)	10 mA	± (2%rdg + 5dgts)
400 A	0.1 A	
1000 A	1 A	

Overload Protection : 1200A

AC VOLTAGE

Range	Resolution	Accuracy
400 mV (2781-T)	0.1 mV	±(1.8%rdg+5dgts)
4 V	0.001 V	±(1.0%rdg+5dgts)
40 V	0.01 V	
400 V	0.1 V	
750 V	1 V	±(1.5%rdg+5dgts)

Overload protection : 660Vrms
Input Impedance : 10M
Frequency Response : 40Hz ~ 450Hz for 400V & below, 40Hz ~ 100Hz for 750V

TEMPERATURE (2781-T)

Range	Resolution	Accuracy
-40°C~1000°C	1°C	±(2.5%+3°C)
-40°F~1820°F	1°F	±(2.5%+5°F)

Type-K thermocouple range & accuracy not specified
Supplied K-type thermocouple suitable for 250°C.

DUTY CYCLE

Range	Resolution	Accuracy
0.1% ~ 99.9%		

All Specifications are subject to change without prior notice

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USE TRUE RMS WHEN MEASURING AC WAVEFORMS

The waveforms on today's AC power lines are anything but clean. Electronic equipment such as office computers, with their switching power supplies, produce harmonics that distort power-line waveforms. These distortions make measuring AC voltage inaccurate when you use an averaging DMM.

Average voltage measurements work fine when the signal you're measuring is a pure sine wave, but errors mount as the waveform distorts. By using true RMS measurements, however, you can measure the equivalent heating effect that a voltage produces, including the heating effects of harmonics. Table 1 shows the difference between measurements taken on averaging DMMs & those taken on true RMS DMMs. In each case, the measured signal's peak-to-peak value is 2V. Therefore, the peak value is 1V.

For a 1-V peak sine wave, the average & RMS values are both 0.707V. But when the input signal is no longer a sine wave, differences between the RMS values & the average readig values occur. Those errors are most prominent when you are measuring square waves & pulse waveforms, which are rich in harmonics.

Table 1. Average versus true RMS comparison of typical waveforms.

Waveform	Actual Pk-Pk	True RMS Reading	Average Reading	Reading Error
Sine Wave	2.000	0.707	0.707	0%
Triangle Wave	2.000	0.577	0.555	-3.8%
Square Wave	2.000	1.000	1.111	+11.1%
Pulse (25% duty Cycle)	2.000	0.433	0.416	-3.8%
Pulse (12.5% duty Cycle)	2.000	0.331	0.243	-26.5%
Pulse (6.25% duty Cycle)	2.000	0.242	0.130	-46.2%

One limitation to making true RMS measurements is crest factor, and you should consider crest factor when making AC measurements. Crest factor is the ratio of a waveform's peak ("crest") voltage to its RMS voltage. Table 2 shows the crest factors for ideal waveforms.

Table 2. Crest factors of typical waveforms.

Waveform	Crest Factor
DC	1.000
Square Wave	1.000
Sine Wave	1.414
Triangle Wave	1.732
Pulse (25% duty Cycle)	1.732
Pulse (12.5% duty Cycle)	2.646
Pulse (6.25% duty Cycle)	3.873

A DMM's specifications should tell you the maximum crest factor that the meter can handle while maintaining its measurement accuracy. True RMS meters can handle higher crest factors when a waveform's RMS voltage is in the middle of the meter's range setting. Typically, a DMM may tolerate a crest factor of 3 near the top of its scale but it might handle a crest factor of 5 that's in the middle of the range. Therefore, if you're measuring waveforms with high crest factors (greater than 3), you should adjust the DMM so the measured voltage is closest to the center of the measurement range.

Another limitation of true RMS is speed. If you're measuring relatively clean sine waves, then you can save time & money by using as averaging DMM. True RMS meters cost more than averaging meters and can take longer to produce measurements, especially when measuring millivolt-level AC signals. At those low levels, true RMS meters can take several seconds to stabilize a reading. Averaging meters won't leave you waiting.

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CLAMPMETER 2781

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TAKE MEASUREMENT CAREFULLY AND YOU'LL SPARE YOUR METER AND YOURSELF, SOME PAIN

Nearly every electrical engineer has a hand held digital clamp meter (Tongtester). We sometimes take them for granted, until we damage them or "burn them out". If you incorrectly connect your clamp meter to a circuit, or if you have the clamp meter or wrong setting, you damage the meter and possibly hurt yourself. You can also get into trouble if you try to measure the voltage across a changed capacitor.

Clamp meter users frequently burn their meters by trying to measure current the same way as they measure voltage. Remember, you measure voltage across a circuit, and current through a circuit. When you use the current input, your clamp meter becomes a low impedance circuit element.

Even if you correctly insert your clamp meter in to the circuit, you can still damage you meter. Don't try to measure current in excess of your meter's capacity. Check the current capacity of the Clamp meter.

If you are measuring current in industrial environment. *you can easily exceed those ratings. The best way to avoid damage is to use a clampmeter with high current measuring capacity. To prevent excess current from flowing through your meter, set your meter to the correct function, say current, and its highest range for the setting. If the reading is small, change the range to the next lower range till the reading can be read with the best possible accuracy. When measuring voltage, connect the test leads before your apply power to your circuit. To be safe, start by setting your meter to its highest range first.

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Overview

⚠ Warning

To avoid electric shock or personal injury, read the "Safety Information" and "Rules for Safe Operation"carefully before using the Meter.

Digital Clampmeter Model - 2781 (hereafter referred to as "the Meter") is a 3¾ digits Clampmeter with steady operations, and highly reliable hand-held measuring instrument having different measurement positions. The Clampmeter not only can measure AC/DC Voltage, AC/DC Current, Resistance, Capacitance, but also has Diode Test, Frequency & duty cycle measurement & full icon Display.

Terms in this manual

⚠ Warning : identifies conditions and actions that could result in serious injury or even death to the user.

⚠ Caution : identifies conditions and actions that could cause damage or malfunction in the instrument.

KUSAM-MECO

Unpacking Inspection

Open the package case and take out the Clamp Meter from the carrying case. Check the following items carefully to see any missing or damaged part :

Item	Description	Qty.
1	English Operating Manual	1 piece
2	Test Lead	1 pair

In the event you find any Part missing or damaged, please contact your dealer immediately.

SPECIFICATIONS

GENERAL SPECIFICATIONS :

- Maximum voltage including transient overvoltage between any terminals and grounding : 750Vrms.
- Display : 3¾ digits (3999 Counts) LCD for Accurate Reading.
- Auto Polarity Display
- Overloading : Display **OL** or **-OL**
- Battery Deficiency : Display "⊟"
- Measurement Speed : Update 2.5 times/second.
- Measurement Deviation : When the conductor being measured is not placed in a correct position during AC current measurement. It will cause ±1% reading deviation
- Max. Jaw Size : 40 mm diameter.
- Power : 2pcs of 1.5V battery (AAA)
- Auto Power Off : 15 minutes after the last operation was made. To turn ON the display, turn the rotary switch to any position or push any button.
- Temperature and humidity : Operating 0°C`40°C (<80% R.H.) Storage:- 0°C~60°C (<80% R.H.)
- Dimensions (LxWxH) : 228mm X 76mm X 39mm
- Weight : Approximate 465g (battery Included)
- Accessories : Test Leads, Carrying Case, Manual, Battery installed.

Electrical Specifications

Accuracy : ±(% reading + digits)
Operating temperature : 23°C±5°C
Relative humidity : < 75% R.H.

AC Current

Range	Resolution	Accuracy
400 A	0.1 A	± (2%+5)
1000 A	1 A	

- Frequency Response : 40~ 5Hz
- Overload Protection : 1100A

DC Current

Range	Resolution	Accuracy
400 A	0.1 A	± (2%+5)
1000 A	1 A	

Overload Protection : 1100A

AC Voltage (Auto ranging)

Range	Resolution	Accuracy
4 V	0.001 V	± (1.0%+5)
40 V	0.01 V	
400 V	0.1 V	
750 V	1 V	± (1.5%+5)

Overload protection: 820V rms
Input impedance : 10M
Frequency response : 40Hz~450Hz for 400V and below.
40Hz~100Hz for 750V

DC Voltage (Auto ranging)

Range	Resolution	Accuracy
4 V	0.001 V	±(0.8%+2)
40 V	0.01 V	
400 V	0.1 V	
1000 V	1 V	±(1.0%+2)

Overload Protection : 1100V rms
Input impedance : 10M .

Resistance (Auto Ranging)

Range	Resolution	Accuracy
400	0.1	±(1.2%+5)
4K		±(1.0%+2)
		±(2%+5)

Overload Protection : 250V rms.

Capacitance (Auto Ranging)

Range	Resolution	Accuracy (50Hz 60Hz)
40nF	0.01 nF	±(2.5%+10)
400nF	0.1 nF	
4 F	1 nF	±(2.0%+4)
40 F	10 nF	
100 f	100 nF	Unspecified

Overload protection : 250Vrms

Frequency & Duty Cycle (Auto Ranging)

Range	Resolution	Accuracy	Sensitivity	Overload protection
10Hz	0.001Hz	Unspecified	1V	250Vrms
100Hz	0.01Hz	±(0.5%+3)		
1KHz	0.1Hz			
10KHz	1Hz			
100KHz	10Hz			
1MHz	100Hz			
10MHz	1KHz	Unspecified		
DUTY Range : 0.1% to99.9%				

Diode/Audible continuity

Range	Description
→|←	Display read approx. Forward voltage of diode. Accuracy : ±(3.0%rdg+3)
•ı))	If the resistance is less than 50 , the beeper sounds continuously

Overload protection : 250 Vrms

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RULES FOR SAFE OPERATION

△Warning

To avoid possible electric shock or personal injury, and to avoid possible damage to the Meter or to the equipment under test, adhere to the following rules :

- Before using the Meter inspect the case. Do not use the Meter if it is damaged or the case (or part of the case) is removed. Look for cracks or missing plastic. Pay attention to the insulation around the connectors and Clamps.
- Inspect the test leads for damaged insulation or exposed metal. Check the test leads for Continuity. Replace damaged test leads with identical electrical Specifications before using the Meter.
- Do not apply more than the rated voltage, as marked on the Meter, between the terminals or between any terminal and grounding.
- The rotary switch should be placed in the right position and no any changeover of range shall be made while measurement is conducted to prevent damage of the Meter.
- When measurement is taken at an effective voltage over 60V in DC or 30V rms in AC, special care should be taken for there is danger of electric shock.
- Use the proper terminals, function, and range for your measurements.
- Do not use or store the Meter in an environment of high temperature, humidity, explosive, inflammable and strong magnetic field. The performance of the Meter may deteriorate after the meter gets dampened.
- When using the test leads, keep your fingers behind the finger guards.

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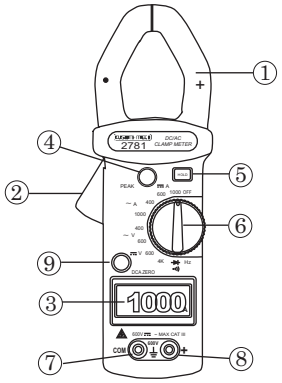
RULES FOR SAFE OPERATION (2)

- Disconnect circuit power and discharge all high-voltage capacitors before testing resistance, continuity, diodes, or current.
- Replace the battery as soon as the low battery indicator appears. With a low battery, the Meter might produce false readings that can lead to electric shock and personal injury.
- Turn the Meter power off when it is not in use and take out the battery when not using for a long time.
- Constantly check the battery as it may leak when it has not been used for some time, replace the battery as soon as leaking appears. A leaking battery will damage the Meter.

International Electrical Symbols

	AC (Alternating Current).
⎓	DC (Direct Current).
⎓	Both DC & AC.
⏚	Grounding.
▣	Double Insulated.
- +	Deficiency of Built-In Battery.
•)))	Continuity Test.
→|	Diode.
▭	Fuse.
△	Warning ! Refer to the Operating Manual.
⚠	Caution ! Risk of Electric Shock.

THE CLAMP METER STRUCTURE



1) SENSOR JAWS :
Pick up the current flowing through the conductor.

2) Jaw Opening TheTrigger :
Press the trigger to open the jaw.

3) LCD display :
3 3/4 digital LCD with indications for measurement values, unit symbol, decimal point, polarity and low battery etc.

4) SELECT or Hz/DUTY button :
When switch at →|•))) test position, press this button to select or →| or •))) mode. When switch at DCV, ACV test position, press this button to select V or Hz or DUTY mode. When switch at Hz test position, press this button to select Hz or DUTY mode.

5) Data Hold button :

Press it once to hold the measured value and store the value in memory. Press again to release the hold fuction.

6) Rotary switch :

For selecting of desired range, and exiting from auto-power off mode.

7) COM socket :

Connet to negative lead (black test lead) for voltage, frequency, resistance, Capacitance, diode testing.

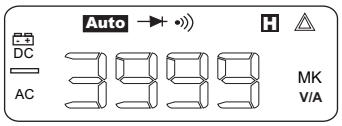
8) "V Hz" socket :

Connect to positive lead (red test lead) for voltage, frequency, resistance, Capacitance, continuity, and diode measurement.

9) RANGE or REL button :

When switch at DCV, ACV or position, press this button to enter the manual range mode. Keep this button for more than 2 seconds, return to auto-range state. When switch at DCA position, push this button to set the LCD reading to zero before measuring DCA current.

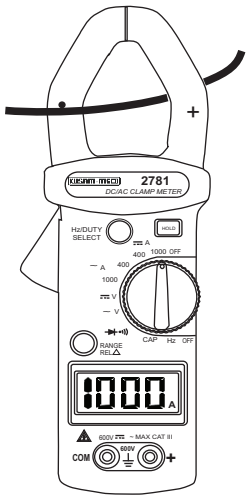
DISPLAY SYMBOLS



No.	Symbol	Meaning
1	AC	Indicator for AC Voltage or Current.
2	DC	Indicator for DC Voltage or Current
3	- +	The battery is low. Warning : To avoid false readings, which could lead to possible electric shock or personal injury, replace the battery as soon as the battery indicator appears.
4	Auto	The Meter is in auto range mode in which the Meter automatically selects the range with the best resolution.
5	→|	Test of diode.
6	H	Data hold is active.
7	•))	The continuity buzzer is on.
8	nf, F	The unit of Capacitance
9	, K , M	: Ohm. The unit of resistance. K : kilo-ohm. 1 x 10^3 or 1000 ohms. M : Megaohm. 1 x 10^6 or 1,00,000 ohms.
11	A	A : Amperes (amps). The unit of current.
12	V	V : Volts. The unit of voltage.
13	—	Indicates negative reading.
14	OL	The input value is too large for the selected range.

MEASUREMENT OPERATION

A) AC Current Measurement



⚠ Warning

To avoid electric shock, never measure current while the test leads are inserted into the input terminals and disconnect test leads and tested circuit connection.

Never attempt an in-circuit current measure- ment where the open-circuit voltage between the circuit and the ground is greater than 60V

Use proper function and range for the measurement.

The measurement range of current are :

400A / 1000A

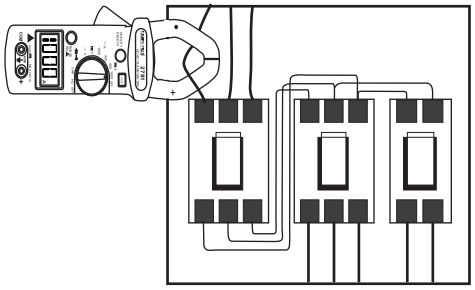
To measure current, connect the meter as follows :

1. Set the function / range switch to the A range.(400A or 1000A)
2. Clamp the sensor jaw around one of the conductors under test. Make sure that the clamp jaw is perfectly closed.
3. Read the displayed value.
   The measured value is shown on the display, it is an effective value of sine wave (mean value response).

⚠ Caution

- To obtain accurate reading, measure only one conductor at each time.
- When current measurement has been completed, disconnect the connection between the conductor under test and the jaw, and remove the conductor away from the transformer jaw of the Meter.
- Place the switch in 1000A range if the measured current is unknown.

B) DC Current Measurement



Warning

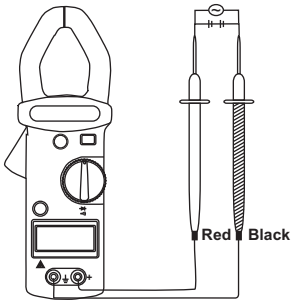
Make certain that all test leads are disconnected from the meter terminals.

1. Set the function / range switch to the A range. (400A or 1000A)
2. Check that the display reads 00.01. If not, then press the DCA Zero button to bring the display reading to zero.
3. Clamp the sensor jaw around one of the conductors under test. Make sure that the clamp jaw is perfectly closed
4. Read the displayed value.

Caution

- To obtain accurate reading, measure only one conductor at each time.
- When current measurement has been completed, disconnect the connection between the conductor under test and the jaw, and remove the conductor away from the transformer jaw of the Meter.
- Place the switch in 1000A range if the measured current is unknown.

C) AC Voltage Measurement



Warning

To avoid harms to you or damages to the Meter from electric shock, do not attempt to measure voltage higher than 1000V DC & 750V AC although readings may be obtained

To measure AC Voltage range are :

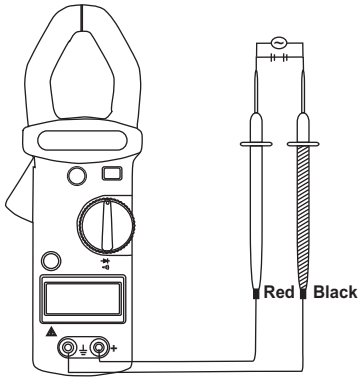
4V, 40V, 400V, 750V.

1. Set the function/range switch to the V range.
2. Connect the black and red test leads to the COM and + terminals respectively.
3. Connect the test leads to the circuit being measured and read the displayed value.

Caution

- In each range, the Meter has an input impedance of 10 M . This loading effect can cause measurement errors in high impedance circuits. If the circuit impedance is less than or equal to 10k , the error is negligible (0.1 or less).
- When AC voltage measurement has been completed, disconnect the connection between the testing leads and the circuit under test and remove testing leads from the input terminal.
- If the display indicates " I " it is required to remove the test leads from the circuit under test as the selected range is overloaded.

D) DC Voltage Measurement



⚠ WARNING

To avoid harms to you or damages to the Meter from electric shock, do not attempt to measure voltage higher than 1000V AC& 750V DC, although reading may be obtained.

The DC Voltage ranges is : 4V, 40V, 400V, 1000V
To measure DC Voltage, connect the Meter as follows :

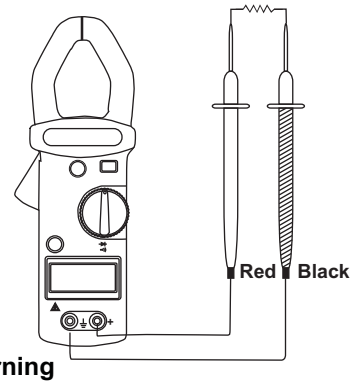
1. Set the function switch to the ⎓V range.
2. Connect the black and red test leads to the COM and + terminals respectively.
3. Connect the test leads across with the object being measured

The measured value is shown on the display.

⚠ Caution

- In each range, the Meter has an input impedance of 10M This loading effect can cause the measurement errors in high impedance circuits. If the circuit impedance is less than or equal to 10k , the error is negligible (0.1 or less).
- When DC voltage measurement has been completed, disconnect the connection between the testing leads and the circuit under test and remove testing leads from the input terminals.
- If the display indicates " I ", it is required to remove the leads from the circuit under test as the selected range is overloaded.

E. Measuring Resistance



⚠ 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.

The resistance ranges are :
400.0 , 4.000k , 40.00k , 400k , 4.000M and 40.00M

To measure resistance, connect the Meter as follows :

1. Insert the red test lead into the **V** terminal and the black test lead into the **COM** terminal.
2. Set the rotary switch to ; resistance measurement ( ) is default or press SELECT button to select resistance measurement mode.
3. Connect the test leads across with the resistance being measured.
   The measured value is shown on the display.

Note :
The test leads can add 0.1 to 0.3 of error to resistance measurement.

To obtain precision reading in low-resistance, in 400 range, short-circuit the input terminals before hand and record the reading obtained (call this reading as x). (x) is the additional resistance from the test lead. Then use the equation.

Measured resistance value (y) - (x) = Precision reading of resistance.

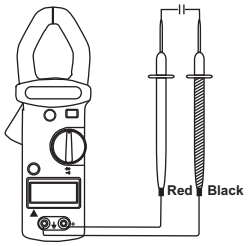
- For high-resistance measurement (>1M), it is normal for the meter to take several seconds to obtain a stable reading.
- The LCD displays OL indicating open-circuit or the tested resistor value is higher than the maximum range of the meter.
- Resistance measurement is default to auto range mode.
- Remove the objects being tested from the circuit when measuring, to obtain more accurate result.

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

Caution

1) Never connect high voltage to the input sockets with the switch in resistance range.
2) Using Resistance measurement function in a live circuit will produce false results and may damage the instrument. In many cases the suspect component must be disconnected from the circuit to obtain an accurate reading.

F. Capacitance measurement :



Warning

To avoid damages to the Meter or to the equipment under test, disconnect circuit power and discharge all high-voltage capacitors before measuring capacitance. Use the DC voltage function to confirm that the capacitor is discharged. Never attempt to input over 60V in DC or 30V rms in AC to avoid personal injury.

The Capacitance function has 6 measurement ranges : 4nF, 40nF, 400nF, 4 F, 40 F F
To measure Capacitance connect the Meter as follows :

Discharge capacitors before trying to measure it.

Set the meter in the capacitance range, using the **FUNCTION** select button.

Insert the red test lead into the **+** terminal and the black test lead into the **COM** terminal.

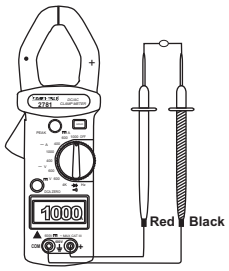
The measured value is displayed on the LCD.

⚠ Caution

Never connect high voltage to the Input sockets with the switch in Capacitance range.

Using Capacitance measurement function in a Live circuit will produce false results and may damage the instrument. In many cases the suspect component must be disconnected from the circuit to obtain an accurate reading.

G) Frequency & Duty Cycle



⚠ Warning :

To avoid harm to you or damages to the Meter, do not attempt to measure voltages higher than 60V in DC or 30V rms in AC although reading may be obtained.

When the frequency signal to be tested is higher than 30 V rms, the Meter cannot guarantee accuracy of the measurement.

The frequency measurement range is upto 10MHz.

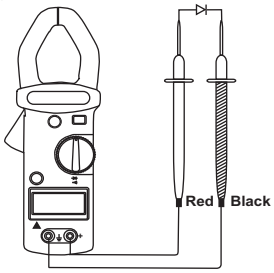
To measure frequency; connect the meter as follows :

1. Insert the red test lead into the V terminal and the black test lead into the COM Terminal.
2. Set the rotary switch in the Hz range.
3. Connect the test leads across with the object being measured.
   The measured value is shown on the display.

⚠ Caution

- When Hz measurement has been completed, disconnect the connection between the testing leads and the circuit under test.

H. Testing Diodes



⚠ Warning

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

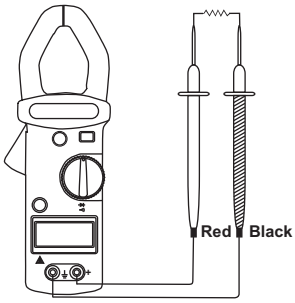
Use the diode test to check diodes, transistors and other semiconductor devices. The diode test sends a current through the semiconductor junction, then measure the voltage drop across the junction. A good silicon junction drops between 0.5V and 0.8V. To test the diode out of a circuit, connect the Meter as follows :

1. Connect red test lead to the "+" terminal and black test lead to the "COM" terminal.
2. Set switch to the diode test position " ".
3. Connect the red test to the anode side and black test lead to the cathode side of the diode being tested.
4. Read forward voltage (V) value on display.

⚠ Caution

- In a circuit, a good diode should still produce a forward voltage drop reading of 0.5V to 0.8; however, the reverse voltage drop reading can vary depending on the resistance of the pathways between the probe tips.
- Connect the test leads to the proper terminals as said above to avoid error display.
- The LCD will display OL indicating either open circuit or wrong polarity connection.
- The unit of diode is volt (V), displaying the forward voltage drop readings.
- Remove the object being tested from the circuit when measuring, to obtain a more accurate result.
- When diode testing has been completed, disconnect the connection between the testing leads and the circuit under test and remove testing leads from the input terminals.

I) Testing for continuity (see figure 10)



⚠ 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 continuity.

To test for continuity, connect the Meter as follows :

1. Insert the red test lead into the •)) →+ **V** terminal and the black test lead into the **COM** terminal.
2. Set the rotary switch to •)) →+ and press **SELECT** button to select continuity measurement mode.
3. The buzzer sounds if the resistance of a circuit under test is less than 50

Note

- The LCD displays **OL** indicating the circuit being tested is open.
- When continuity testing has been completed, disconnect the connection between the testing leads and the circuit under test and remove testing leads from input terminal.

Sleep Mode

To preserve battery life, the Meter automatically turns off if you do not turn the rotary switch or press any button for around 15 minutes.

The meter can be activated by turning the rotary switch or pressing any button.

MAINTENANCE

This section provides basic maintenance information including battery replacement instruction.

⚠ Warning

Do not attempt to repair or service your Meter unless you are qualified to do so and have the relevent calibration, performance test and service information.

To avoid electrical shock or damage to the Meter, do not get water inside the case.

A. General Service.

- Periodically wipe the case with a damp cloth and mild detergent. Do not use abrasives or solvents.
- To clean the terminals with cotton bar with detergent as dirt or moisture in the terminals can affect readings.
- Turn the Meter power off when it is not in use.
- Take out the battery when it is not using for a long time.
- Do not use or store the Meter in a place of humidity, high temperature, explosive, inflammable and strong magnetic field.

B. Replacing the Battery

⚠ Warning

To avoid false readings, which could lead to possible electric shock or personal injury, replace the battery as soon as the battery indicator " ⊟ " appears.

Make sure the transformer jaw and the test leads are disconnected from the circuit being tested before opening the case bottom.

To replace the battery :

1. Turn the Meter off and remove all the connections from the input terminals.
2. Turn the Meter's case top down.
3. Remove the screw from the bottom case, and separate the bottom case from the front case .
4. Remove the old battery from the battery compartment.
5. Replace the battery with 2pcs of new 1.5V (AAA) battery.
6. Rejoin the case bottom and the front case, and reinstall the screw.

KUSAM-MECO

MUMBAI

TEST CERTIFICATE

DIGITAL CLAMPMETER

This Test Certificate warrantees that the product has been inspected and tested in accordance with the published specifications.

The instrument has been calibrated by using equipment which has already been calibrated to standards traceable to national standards.

MODEL NO. **KM 2781**

SERIAL NO. _____

DATE: _____

ISO 9001
REGISTERED

QC
KUSAM-MECO
PASS

KUSAM-MECO

WARRANTY

Each “KUSAM-MECO” product is warranted to be free from defects in material and workmanship under normal use & service. The warranty period is one year (12 months) and begins from the date of despatch of goods. In case any defect occurs in functioning of the instrument, under proper use, within the warranty period, the same will be rectified by us free of charges, provided the to and fro freight charges are borne by you.

This warranty extends only to the original buyer or end-user customer of a “KUSAM-MECO” authorized dealer.

This warranty does not apply for damaged Ic’s, fuses, burnt PCB's, disposable batteries, carrying case, test leads, or to any product which in “KUSAM-MECO’s” opinion, has been misused, altered, neglected, contaminated or damaged by accident or abnormal conditions of operation or handling.

“KUSAM-MECO” authorized dealer shall extend this warranty on new and unused products to end-user customers only but have no authority to extend a greater or different warranty on behalf of “KUSAM-MECO”.

“KUSAM-MECO’s” warranty obligation is limited, at option, free of charge repair, or replacement of a defective product which is returned to a “KUSAM-MECO” authorized service center within the warranty period.