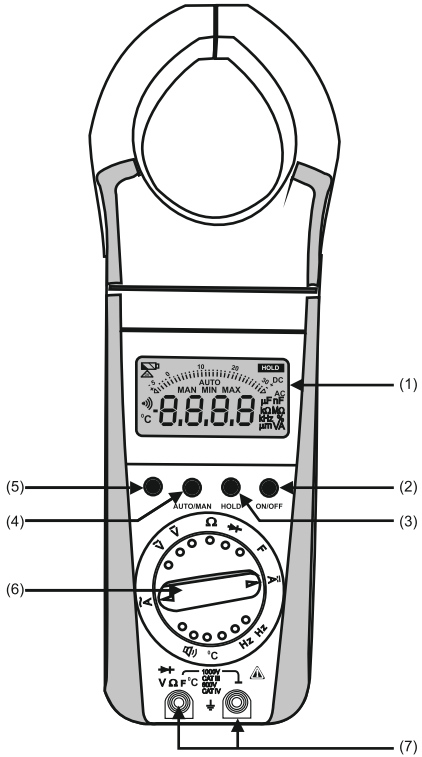
LUMEL
EVERYTHING COUNTS

AC/DC CLAMP-ON METER
1000 A/ 300 A

NC12

USER'S MANUAL

CE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AUTO/MAN
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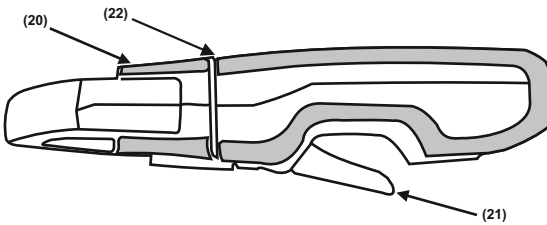
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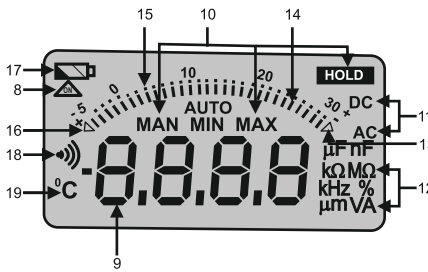
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HOLD
AUTO
MAN MIN MAX
DC
AC
µF nF
kΩ MΩ
kHz %
µm VA

(1) Liquidcrystaldisplay
(2) ON/OFF push button
(3) Push button for data hold And MIN/MAX storagefunctions
(4) Push button for manual range selection
(5) Multifunctionpushbutton
(6) Function selectors witch.
(7) Terminalsockets
(8) Symbolfor "CONTINUOUSLY ON"
(9) Display for digits,decimalpointand polarity.
(10) Display for manual range selection, Data HOLD And MIN/MAX storage.
(11) Display for the selected function
(12) Display for the unitof measuredquantity.
(13) Over range indication for positiveanalogrange.
(14) Pointerforanalogindication.
(15) Scalefor analogindication
(16) Over range indication for negativeanalogrange.
(17) Lowbatteryindication.
(18) Buzzerindication
(19) Display ^{0}C for temperature Measurement range.
(20) Rotarymechanism for clamp jaws.
(21) Safe trigger mechanism.
(22) Limit of safe access for hand held.

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1. Introduction:

Thankyouvery much forselecting ClampMeter.
Weare leadingmanufacturer of Electrical and Electronicsstate-of-art measuring instruments.
These clamp meters are Manufactured as per IS.13875 And DIN43751.

2. Safety features and safety precautions

You have chosen a Clamp meter which provides you a very high degree of safety. The digital clamp meter NC12 *300A/1000A* tested in compliance with the safety standard IEC 61010-1:2010.
In case of incorrect use or careless handing, the safety of both user and clamp meter is not assured.

For proper use and safe handling,it is absolutely necessary to read and understand the operating instructions before using the clamp meter.

Please note the following safety precautions:

- Operators must use individual protective equipment if hazardous live parts of installation could be accessible.
- Keep hands/fingers behind the edge that separates rotating jaws with hand held part(22). This is the limits of the hand held part during measurement.
- The Clamp meter must be operated only By persons Who understand The danger Of shock hazards and are aware of the necessary safety Precautions. Shock hazards exist wherever voltages of more than 30V(TRMS)are present.
- Do not work Alone in shock hazardous Environment while carrying out measurement.
- The maximum permissible voltage between any of the terminal sockets (7) and ground is 1000V.
- T akeinto account that unexpected voltages can occur on device under test(e.g.defective instrument).Forexample,capac itors may be chargedto adangerouslyhigh voltage.
- Verify that the test leads are in good condition, e.g.no cracked Insulation,no open circuits in the leads or connectors.
- This clamp meter must not be used for measurementsoncircuits With corona discharge (highvoltage).
- Be particularly careful when measuring on HF Circuits.Dangerous composite voltagesmayexistthere.
- Measurements under moist environmental conditions are not permitted.
- Do not overload the measuring ranges beyond their allowable capacities. Limit values are given in specifications. Ref. Chapter 16.
- For safe voltage measurements in power systems upto1000V, we Recommend the KS30 measuring adapter, Which is availableas an Accessory. Its internal resistance limits the measuring Current in the case of overvoltage, in correct operation and safely suppresses sparking from spark gap.Also refer to Section "8.1 Voltage measurement on electrical systems up to 1000V with KS30 measuring adapter ".
- Please verify the performance of clamp meter after repairing of the meter, before using it for actual measurement.
- Do not use the clamp meter if obvious wear in jaw opening is visible.
- Protection provided by the digital clamp meter may be impaired if the clamp meter is not used in a manner specified in this user manual.

Meaning of categories and their signifi canceper IEC61010-1

CAT I: Measurements in electrical circuits which are not directly connected to the mains: for example electrical systems in motor vehicles and aircraft, batteries etc.
circuits
CAT II: Measurements in electrical which are electrically connected to the low-voltage mains:with plugs, e.g. at home, in the office or laboratory etc.
CAT III: Measurements in building installations, stationary power consumers, distributor terminals, devices connected permanently to the distributor
CAT IV: Measurements at power sources for low-voltage installations, meters, mains terminals, primary over voltage protection devices.

Meaning of th esymbols on the device

Warning of adangerpoint (Attention, refer to the user manual)

Earth (ground)terminal.

Doubleorreinforced insulation

CAT III/IV

Instrument for overvoltage category III OR IV

Meaning of the acoustic signals

1) Intermittent acoustic signal: Voltage limit exceeded; for Voltage>1000 V
2) Intermittent acoustic signal: Current limit exceeded; for Current>1100A

Repair,replacement of parts:
When opening the meter, live parts may be exposed.Therefore , the Meter must be disconnected from the measuring circuit prior to opening Its case for repair or replacement of parts. If repair cannot Beavoided Unless the meteris opened and live, this work must only be performed by A qualified person who understands the danger in volved.

Faults and abnormalstress:
When it is realised that the safe operation is no longer possible, take the Meter out of service and secureit against accidental use.
Safe operation May not be possible:

- When the meter shows obvioussigns of damage,
- When the meter no longer functions correctly,
- After prolonged storage und eradver seconditions,
- Due to Severestress during transportation.

3. Switching the Clampmeter “ON"

Battery
We have already fitted your meter with a 9V flat cell battery according to IEC6F22 or IEC6LR61. It is ready for operation. *Before you use the Meter for the first time or after storage, refer to Section"18.1Maintenance-Battery".*

Switching the meter “ON"

- Press the"ON/OFF"push button (2).
  Switch - “ON"is Acknowledged by a sound Signal. As long as you Keep the push button pressed, all segments of the LCD will appear.The LCD is shown behind over page
  After the push button is released, the meter is ready for operation.

Note:

Electric discharges and high-frequency Influence may cause incorrect Information to be displayed and block the measuring process .Reset the Meter by switching it OFF and ON again otherwise,check the battery connections.

Disconnect the clamp meter from the measuring circuit before You open it, and See section "18.Maintenance".

Automatic TURN-OFF

The meter turns off automatically, when the measuredvalue remains constant (variations of the measured value ≤ ± 2 digits) for about 10 Minutes and when neither a push button no the function select Or switch is operated during that time.

How to prevent automatic TURN-OFF

In order to prevent automatic "TURN OFF" select "CONTINUOUS L Y ON" Mode. For This, press yellow multi-function Push button(5) and the "ON/OFF" Pushbutton(2)together. Thefunction"CONTINUOUSLY ON" Is shown on the LCD(1) by the symbol ON (8).

Turning the multimeter OFF

Press the "ON/OFF"push button (2).

4. Function and range selection

4.1 Autoranging

The multimeters feature autoranging for All measuring ranges with the Exception of the 30mV ⎓, 300mV ⎓ Ranges. Autorangingis Automatically Selected after switching the Multimeter ON. According To the measured quantity Applied, the Multimeter automatically selects The measuring range which gives the best resolution. When swItching to Frequency measurement and ratiomeasurement the previously Selected Voltage measuring range is maintained.

The meters witches automatically to:

The next higher range	at ± (3099 digits+1digit)
The next lower range	at ±(240/280digits-1digit)

4.2 Manual rangesection

You can switch OFF autoranging and select the ranges manuall y According to the table on the following page.
Manual modeiss witched OFF when push button AUTO/MAN is pressed (4) for approximately 1s, when the function selector switch (6) is operated, Or when the meteris turned OFF and ON again.
When switching back to autoranging from 30mV ⎓ Or 300mV⎓ ranges, 3 V⎓ Rangeis automatically selected.

↓ AUTO/ MAN (4)	Function	Acknowledgement	
		Display	Sound Signal
Short	Manual mode on : Used range is fixed	MAN (10)	1 x
Short	Switching sequence at: V ⎓ : 3V → 30V → 300V → 1000V → 30 mV→ 300 mV → 3 V → ... V~ : 3V→ 30 V → 300 V → 1000 V → 3V→ ... Ω : 30MΩ → 30Ω → 300Ω → 3 kΩ →30 kΩ → 300kΩ → 3 MΩ → 30MΩ ... F : 30 nF→300 nF → 3 µF →30 µF→ 30 nF... Hz : 300 Hz →3 KHz→30 KHz→100 KHz→300 Hz...	MAN (10)	1 x
	NC12Clamp *1000A* A~, A⎓ : 300A →1000A →300A...		
	NC12Clamp *300A* A~, A⎓ : 30A →300A →30A...		
Long	Return to autoranging	–	2 x

5. Liquid crystal display

5.1 Digital display

The digital display(9)shows the measured value with correc TIocation of decimal Point and sign.The selected measuring Unit(12) and the func tion(11) are simultaneously Displayed. When measuring DC quantities, Aminussign appears in front of the digits, when the positive pole of the measured quantityisappliedtothe" ⊥ "Inputterminal. When upperrange limit 3099 (ontherange →|←:1999),is exceeded then "OL" is displayed.
With V and Ω measurements, the digital display is updated two times Per second.

5.2 Analog indication

The analog indication with pointer presentation gives the dynamic Response of a moving-coil movement and is updated 20 times per second. When measuring V and W. Analog indicationis of particular advantage when observing variations of measured values and for calibr ation procedures.
Theanalogindicator has itsownpolarityindication.When measuring DC quantities, The analog scale(15) Has a negative Range of 4 scale Divisions so that variations of the measured value saround "Zero"can be observed Exactly. When the measured value exceeds the range of Indication, the left triangle(16)is shown before the polarity of the analog Indicators witches over after approximately 0.7s.The overrangeindication On the measuring range(>3099digits, on the range →|← >1999)is shown By the right triangle(13).

5.3. Backlit (Optional)

The instrument is provided with user selectable Back-litf or taking Measurements in poorlighting conditions/darkareas.

Switching the Backlit ON
By pressing"AUTO/MAN"and"HOLD"keys simultaneously
The Backlit can be switched ON.

Switching the Backlit OFF
By pressing"AUTO/MAN" and "HOLD"Keys simultaneously
The Backlit can be switched OFF.

6. Data “HOLD” facility

The HOLD function allows To automatically hold the measured values. The meter holds The measured value On the Digital display with a sound Signal and displays “ HOLD ” on LCD display (10). The probes or clamp Can now be removed from the Measuring point And the measured value On the digital display (9)can be read.The analog indication Is not influe-Nced by the data HOLD.

The Actual measured value can Still be Noted /Read. Note that with a held digital display, the location of thedecimal point is also held. With autoranging selected, the measuring range of the analog indicator isno longer known.

Note: Hold functionis not available in functions ⊣◀⊢ , ^{0}C And 30mV and 300 mV Ranges in function $V\overline{\cdots}$.

To activate “HOLD” function momentarily, press The HOLD key.

As long as the dataHOLD Functionis active, manualrange selection Is not possible.The dataHOLD function Is switched OFF,when:

- **The “HOLD” pushbutton(3)** is pressed for approx.1s.This is Acknowledged by 2 sound signals.
- The function select or switch (6) is operated or
- The multimeteris turned OFF and ON again.

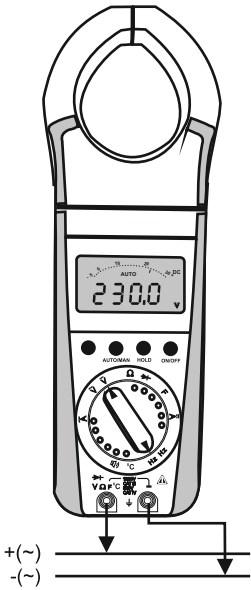
7. Minimum value and Maximum value “MIN / MAX" Storage facility.

With the MIN/MAX function, you can hold the minimum and the maximum Measuredvalue which was applied to the input of The multimeter After activating MIN/MAX function.The most important Application is the determination of the minimum and the maximum value for Long-term monitoring of measured Quantities. MIN/MAX does Not influe Nce the analogindication The Actual measured value can still Be noted/read. Apply the measured quantity to the meter and select the measuring Range priortoactivating the MIN/MAX function.
With The function activated, you can select the measuring ranges only Manually, if you switch to a nother range,the stored MIN/MAX Values are cleared.

Function MIN/MAX	↓ DATA MIN/MAX (3)	Meas-uring ranges	Measured Values MINandMAX	Meter acknowledgement Display		
				Meas. Value digital	MIN MAX	Sound Signal
1. Activateand Store	2xShort, 30mV/ 300mV and ^{0}C 1xshort	V ⎓ A ∼ Ω , F,% ^{0}C ,Hz	Stored	actual meas-ured value	MIN and MAX flash	1 x
2. Storeand display	↓ short	V ⎓ A ∼ Ω , F,% ^{0}C ,Hz	StorageContinued inthebackground, newMIN/MAX. valuesaredisplayed	stored MIN value	MIN	1 x
	↓ short			stored MAX value	MAX	1 x
3. Returnto1.	↓ Short ↓	Same as1.	Sameas1., Stored Values are notcleared	same as1.	same as1.	1 x
Reset	Long		Cleared	Cleared	Cleared	2 x

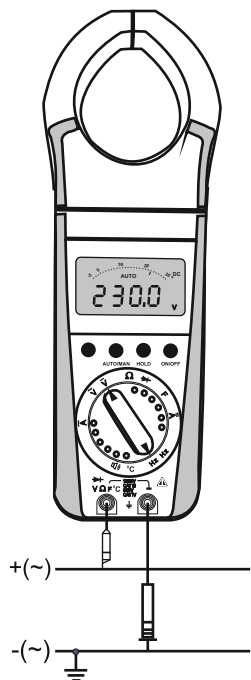
The MIN/MAX Function is switched OFF when the MIN/MAX pushbUtton (3)is pressed for approximately 1s, or when the function selectors witch (6)is operated,or when the meteris turned OFF and ON again.

Voltagemeasurement



Voltage measurement on electrical systems up to 1000V

With the KS30 measuring adapter



8. Voltage measurement

- ☛ According to the voltage to be measured, set The function selector Switch(6) to V ~, V⎓
- ☛ Connect the test leads as Shown. The " ⊥ " socket should be connected to the lowest potential ground available.

Notes:

The 30 mV ⎓ And 300 mV ⎓ measuring ranges can only be selected manuallywiththe "AUTO/MAN" push button(4).

On the1000V range,an intermittent sound signal warns you, when the measured value exceeds the Upper range limit.

Zero adjustment On the 30mV ⎓ Measuring range

- ☛ Connect the test leads to the meter and join the freeends.

After having selected the measuring range,briefly press the yellow multi-Function push button(5).

The meter acknowledges zero setting by a sound signal, the LC D shows "00.00"(+1digit)and the decimal pointflashes.The displayed voltage at the instant the pushbutton is pressed, is used as reference value (max ±200digits)it is automatically deducted from the values measured the reafter.

The zero adjustment is cleared when;

- ☛ By pressing the yellow Multifunction pushbutton(5) for along time Clearance is acknowledged by the two Sound signal.
- ☛ By switching The instrument OFF.

8.1 Voltage measurement on electrical systems up to 1000V with theKS30 measuring adapter.

On low-Voltage systems, Transient overvoltages of several Kilovolts can occur due to switching functions or lightning discharges. Direct connection of your multimeter to such systems for voltage measurement can be dangerous.

For voltage measurements in power systems with nominal voltAges up to 1000V use the KS.30 measuring adapter. It is an adapter for multimeter Which eliminates dangers caused by overvoltages and incorrect operation Of the multimeter. It provides the following protective funCtions.

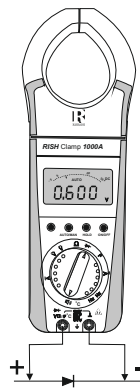
- ☛ Protection of the input circuit of voltage measuring range of Multimeters.The internal resistance of the KS30 limits the current in the case of overvoltage.
- ☛ Overloadcapacity: Continuously 1200 Vrms
  Transient (rise 10 Ms/fall 1000 ms) 6kVmax.
- ☛ Safe suppression of sparking from sparkplug after overvoltage.

Voltages above 1000V can be measured with a high-voltage probe, Provided the necessary safety precautions are taken!

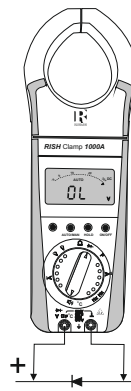
Resistance measurement

Diode Test

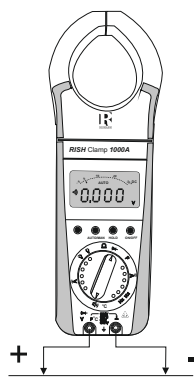
Forwarddirection

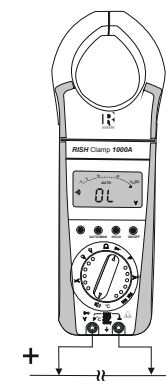


Reversedirection



Continuity Test





9. Resistance measurement

- ☛ Verify that the device under test is electrically dead. External voltages Would falsify the measured result!
- ☛ Set the function selector switch(6) to "Ω".
- ☛ Connect the device under test as shown.

Zero adjustment on the 30 Ω measuring range

When measuring small resistance Values on the 30Ω range, you can eliminate the Resistance of the leads and contact resistance by zero adjustment.

- Connect the test leads to the multimeter and join the free ends.
- Briefly press the yellow multi-function push button (5). The meter acknowledges zero adjustment by a sound signal, the LCD shows "00.00"(+1digit)and the decimalpointflashes.The resistance Measured at the instant the Pushbutton is pressed is used as reference value (Max.200 digits). It is automatically deducted from the values Measured there after. Zero Adjustmentcan be cleared.
- By pressing the yellow multifunction pushbutton (5) for along time and is acknowledges by two sound signals.
- By switching the multimeter OFF.

10.Diode test and continuity test

- Verifyth at the device under test is electrically dead. External Voltages Would falsify the Measured results!
- Set the function selector switch(6) to" →|– "
- Connect the device under test as shown.

Forward Direction and/or short circuit:

The multimeter displays the forward voltage inVolts. As long As the voltage Drop does not exceed the maximum display Value of 1.999V, you can also rest several series-connected elements or reference diodes with small Reference voltage.

Reverse direction or Open circuit:

The multimeter Indicates overrange"OL"

Note:

Resistors and Semiconductor function in parallel with the dIode falsify the measured results!

Diodetestandcontinuitytestwithbuzzer

With The"buzzer" function Selected, the meter emitsa contiNuous sound Signal on The range 0...approx.0.2V.

To switch the buzzer ON:

- Briefly press the Yellow multi-function Push button(5).
- The multimeter acknowledges turn-ON with a sound signal. At the same time, the symbol ·))) (18) appears on the LCD.

To switch the buzzer OFF

- Briefly press the yellow Multi-function push button (5) again .
- The multimeter acknowledges turn-OFF with a sound Signal. The symbol ·))) (18) disappears from the LCD.

When selecting the function "Diode test and Continuty test" With the function Selector switch (6), the buzzer is always switched OFF. Repeated brief Pressing of the multifunction push button (5) alternatelys Witches the buzzer On and off. When pressing the push button For a long time, The buzzer is always switched OFF, this is acknowledged by the buzzer sounding twice.

11. Temperature measurement

The *NC12 Clamp 300A/ 1000A AC-DC* Allows you to measure Temperature with Pt100 and Pt1000 temperature sensors in the range from- 200(-100) ^{0}C...+850^{0}C.

- ☛ Set the function selector switch(6) to"Ω "
- ☛ Connect the sensor to the two terminals.
- ☛ Briefly press the yellow Multifunction push button(5).
  The multimeter switches to temperature measurement, it automatically detects thec onnected sensor(Pt100 to Pt1000) and shows the measured temperature in ^{0}C on the digital display.

Notes:

This measurement automatically considers the lead Resistance of Temperature Sensors which are available as accessory.
It is not possible to switch over to temperature measurement when the 30Ω resistance range is selected.

Sensorlead resistance up to 50Ω

Leadresistance of sensors having a value differing from that of company Sensors can be considered up to a value of 50 Ω As follows:

- ☛ Briefly press the yellow Multi-function pushbutton (5) again.
  The LCD now Displays the Resistance value which The multimeter Automatically considers after selecting The temperature measuring Range. We can recognise that this is the resistance correction Value on the temperature measuring Range. The " ^{0}C " character is simultaneously shown on the display.
- ☛ Y ou can set the leadresistance correction valueas follows:
  Press the HOLD push button(3)to increment the value, or the AUTO/MAN push button(4) to Decrement the Value. Each time the pushbutton is briefly pressed,the value changes by one digit.
- ☛ Briefly Press the yellow Multifunction push button(5)again.in.
  The LCD displays the measured Temperature.The flashing decimal Point shows you that we have entered a correction value for the lead Resistance.The correction value is retained as long as multimeteris switched on.

- ☛ Each time the Yellow multifunction Push button(5) is briefly Pressed, The display changes between measured temperature and correction Value of the lead resistance.

We can exit the temperature Measurement function

- By pressing the yellow multi-function switch(5) longer, this is confirmed by the two sound signals.
- By changing the function selector switch.

Note:

For the lead resistance,the actual value measured on the clamp meter should be taken as correction value and not any specified value.

12.Capacitance measurement

- Verify that the device under testis electrically dead. External Voltages would falsify the measured results.
- Set the function selector switch (6) to 'F'
- Connect the (discharged!) device under test to the"⊥"and "F" socket via test lead.

Notes:

Connect polarized capacitors with the"_"pole to the"⊥"socket
Resistors and semiconductor junction in parallel with the capacitor falsify the measured results!

Zero adjustment on the 30 nF measuring range

When measuring small capacitrance values on the 30 nF range, the internal resistance of the multimeter and the capacitrance of the leads can be eliminated by zero adjustement.

- Connect the test leads to the meter without device under test.
- Briefly press the yellow multi-function pushbutton (5) diplaying"00.00"(+1 digit) on the LCD and by a flashing decimal point.The capacitance measured at the instant the pushbutton is pressed is used as reference value (max.200 digits). It is automatically deduced from the values measured thereafter.

Zero adjustment can be cleared

- By pressing the yellow multi-function pushbutton (5) for a long time clearance is acknowledged by the two sound signal.
- By switching the multimeter off.

13.Frequency measurement

Frequency measurement is possible on all voltage measuring ranges in AC and DC modes.

- Set the function selector switch (6) to v~,v-
- Connections are made the same way as for voltage measurement.
- Briefly press the yellow multi-function pushbutton (5)
  The multi meter switches to frequency measurement.The frequency is displayed on the LCD.

See section!16. Specifications"for the lowest measurable frequencies and the maximum permissible voltages.

Changing over between voltage,frequency and duty cycle measurement.

Repeated brief pressing of the yellow multi-function switch (5) changes the measuring function in the following order:

Voltage⇨Frequency⇨duty cycle⇨Voltage

From frequency or duty cycle measurement,directly switching back to voltage measurement is possible.

- By pressing the yellow multi-function pushbutton (5) for a long time.The meter acknowledges this by two sound signals.The voltage measuring range last selected is maintained.
- By operating the function selector switch(6).

14.Duty Cycle measurement

With duty cycle measurement, we can determine the ratio of pulse duration to cycle time of recurring square-wave signals.

- Set the function selector switch (6) to V~ or V-
- Connections are made in the same way as for voltage measurement
  Briefly press the yellow multifunction pushbutton (5) twice.The meter switches to duty-cycle measurement.The duty cycle that is the percentage pulse duration of a signal is displayed on the LCD in %
- That is:

$$\text{Duty cycle (\%)} = \frac{\text{Pulse duration}}{\text{Cycle duration}} \times 100$$

Notes : Input applied frequency must remain constant during the duty cycle measurement. Change-over between voltages,frequency and duty cycle factor measurement is done as described in the preceding section.

15. Currentmeasurement

NC12 *1000A* can measure Current Up to 1000A,in two ranges I.e. 300.0A and 1000A. Where as *Clamp NC12 300A* can measure current up to 300A in Two ranges i.e.30.00 A and 300.0 A. One of the two range scan be selected manually with AUTO/MAN Key. To measure the current through a cable, push the trigger (21) to open the jaws and clamp the jaws around the cable as shown in Figure a and figure b.

15.1 DC Current measurement

☛ Set thefunctionselector switch(6) to A ⎓.

Zero adjustment on A ⎓ functionality

☛ Zero adjustment is possible with lower range (30.00A range for Clamp NC12 *300A* and 300.0A range for Clamp NC12 *1000A*).

☛ Press yellow multifunction key shortly either in AUTO mode or lower range in Manual mode.

☛ For higher range (300.0A range for NC12 *300A* and 1000A range for NC12 *1000A*) same reference which is available for lower range is used.

The meter acknowledges zero setting by a sound signal, the LCD shows "00.00 / 000.0"(+1digit). The displayed current at the instant the pushbutton is pressed, is used as reference value. It is automatically deduced from v a l u e measured thereafter. Maximum number of digits that can be nullified are 100 .

The zero adjustment is cleared when;

☛ By pressing the yellow multifunction push button(5)for along time two times.

☛ By switching the instrument OFF.

15.2 AC Current measurement

☛ Set The function selector switch(6) to A ⎓ and briefly press multifunction key(5).

Chnge over between A⎓ and A~

Repeated brief pressing of the yellow multi-function switch (5) changes the measuring function in the following order:

A ⎓ ⇨ A ~ ⇨ A ⎓

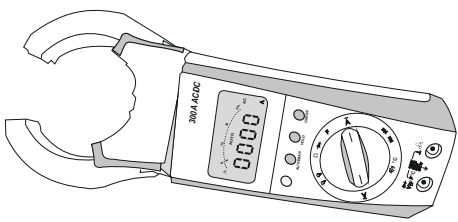


Figure a

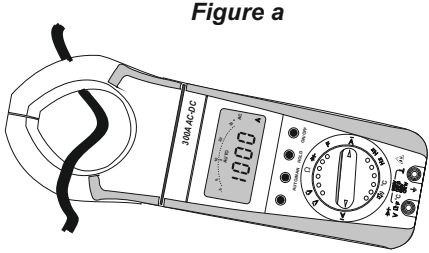


Figure b

Unique design for safety and comfort

Rotary mechanism for clamp jaws:
In conventional clamp meters display, keys and clamp jaws are in the same plane. When current measurement is to be done on vertical bus bars, over head cables, cables in congested places user connect the clamp meter but the keys and display may not be visible, hence not able to take the readings or operate the keys.

To over come the above mentioned problem NC12Clamp meter*300A/1000A* Has a unique feature called "Rotary mechanism for clamp jaws". In this, the clamp jaws are rotating. Hence it is possible to align the clamp jaws as the orientation of bus bar/conductor while keeping Display and keys facing the user, so that user can take the readings and operate the keys.

Rotary clamp jaws can be rotated at different angles with the step of 30**º,** maximum up to 90**º** in both clock-wise as well as anti-clock wise direction as shown in **figure c**.

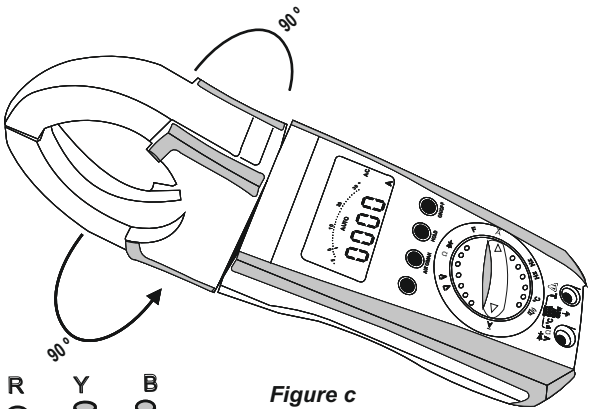


Figure c

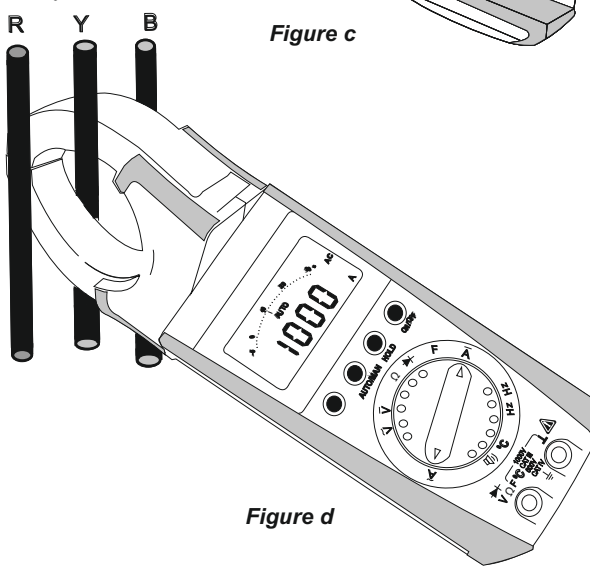


Figure d

Normally, it is difficult to access the middle busbar for current measurement. With "Rotary mechanism for clamp jaws" it is easy to access middle bus bar, while keeping display and keys facing towards the user as shown in **figure d** on previous page.

Safe trigger mechanism

The conventional clamp meters have trigger mechanism either near to left jaw or right jaw. While taking measurements on bare bus bar or bare conductor the user!s hand comes very close to bare bus bar/conductor, which increases the risk of electric shocks to the user.

Also in conventional clamp meters trigger is operated with single finger, usually a thumb which causes fatigue to the user while opening or closing the clamp jaws.

To over come the above mentioned problems, *NC12*Clamp *300A/1000A* Has a unique feature called "Safe trigger mechanism" in which trigger is located at bottom side of the clamp meter and far away from the jaws and hence the bus bar.

So user's hand is at safer distance from bare conductors, hence minimizes the risk of electric shock to the user.This is shown in **figure e.**

Also trigger can be comfortably operated with more than one finger which eliminates fatigue to the user.

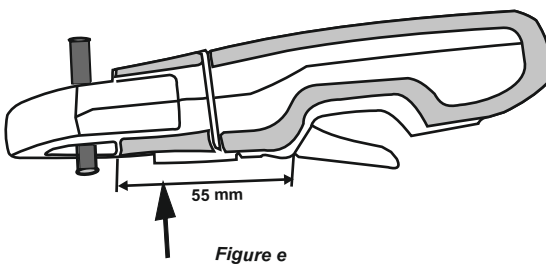
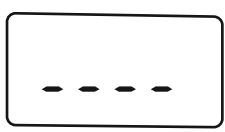


Figure e

User's hand is at safer distance from bare bus bar/conductor.

16. Empty Positions

Empty positions on dial indicates no function is available on these positions.The digital display will look like as in figure below.There are three empty positions present on the dial.



17.Specifications

Measurement Function	Measuring Range		Resolution	Input impedance		Intrinsic error of digital display ± (...% of rdg. +...digits) at reference conditions	Overload capacity1)	
							Overload Value	Overload duration
V ⎓	30.00 mV		10 mV	>10G Ω// < 40pF		0.5+3 2)	1000V DC AC eff/rms sine wave	Continuously
	300.0 mV		100 mV	>10G Ω// < 40pF		0.5+3		
	3.000 V		1mV	11M Ω// < 40pF		0.25 + 1		
	30.00 V		10mV	10M Ω// < 40pF		0.25 + 1		
	300.0 V		100mV	10M Ω// < 40pF		0.25 + 1		
	1000 V		1V	10M Ω// < 40pF		0.35 + 1		
V~ (TRMS)	3.000 V		1mV	11M Ω// < 40pF		0.75 + 2 (10...300 Digit) 0.75 + 1 (>300 Digit)		
	30.00 V		10mV	10M Ω// < 40pF				
	300.0 V		100mV	10M Ω// < 40pF				
	1000 V		1V	10M Ω// < 40pF				
				Noload voltage				
Ω	30.00 Ω		10m Ω	max. 3.2 V		0.5+3 2)	1000V DC AC eff/rms sine wave	10 min
	300.0 Ω		100m Ω	max. 3.2 V		0.5+3		
	3.000 kΩ		1 Ω	max. 1.25 V		0.4 + 1		
	30.00 kΩ		10 Ω	max. 1.25 V		0.4 + 1		
	300.0 kΩ		100 Ω	max. 1.25 V		0.4 + 1		
	3.000 MΩ		1k Ω	max. 1.25 V		0.6 + 1		
	30.00 MΩ		10k Ω	max. 1.25 V		0.6 + 1		
⏚	2.000 V		1mV	max. 3.2 V		0.25 + 1		
A~ (TRMS)	NC12 Clamp1000A	300.0A	0.1A	------		1.5+5	1100A	Continuously
		1000A	1A	------		1.5+5		
	NC12 Clamp300A	30.00A	0.01A	------		1.5+5	330A	
		300.0A	0.1A	------		1.5+5		
A⎓	NC12 Clamp1000A	300.0A	0.1A	------		1.5+5	1100A	Continuously
		1000A	1A	------		1.5+5		
	NC12 Clamp300A	30.00A	0.01A	------		1.5+5	330A	
		300.0A	0.1A	------		1.5+5		
				Discharge Resistance	U 0 max			
°C	pt 100	-200.0... +200.0 °C	0.1 °C	–	–	2Kelvin+ 5Digit 3)	1000V DC/ AC eff/rms sine	10min
		+200.0... +850.0 °C	0.1 °C	–	–	1.0+5 3)		
	pt 1000	-100.0... +200.0 °C	0.1 °C	–	–	2Kelvin+ 2Digit 3)		
		+200.0... +850.0 °C	0.1 °C	–	–	1.0+2 3)		
F	30.00 nF		10pF	250 kΩ	2.5 V	1.0+3 4)	1000V DC/ AC eff/rms sine	Continuously
	300.0 nF		100pF	250 kΩ	2.5 V	1.0+3		
	3.000 µF		1nF	250 kΩ	2.5 V	1.0+3		
	30.00 µF		10nF	250 kΩ	2.5 V	3.0+3		
Hz	300.0 Hz		0.1 Hz	1 Hz	45 Hz	0.5+1 4)	<=3KHz; 1000V <=30KHz; 300V <=100KHz 30V	Continuously
	3.000 KHz		1 Hz	1 Hz	45 Hz			
	30.00 KHz		10 Hz	**10 Hz**	45 Hz			
	100.0 KHz		100 Hz	100 Hz	100 Hz			
%	2.0....98.0 %		0.1 %	2 Hz	–	2Hz...1KHz ±5digits 5) 1 KHz...10KHz; ±5 Digts/KHz 5)		

1) At0 °...+40 °C

2) With zero adjustment, without zero adjustment +35 digits

3) Without sensor

4) 3VU=1.5V eff/rms... 100V eff/rms
30VU=15V eff/rms...300V eff/rms
300VU=150 V eff/rms...1000V eff/rms

5) On the range 3V ⎓, Square wave signal positive on oneside 5...15V, F=const.,not 163.84Hz or integral multiple

Referenceconditions

Ambient temperature :	+ 23 °C ±2K
Relative humidity:	45% ... 55 % RH
Frequency of measured quantity	45Hz ...65 Hz
Waveform of the measured quantity	sinusoidal
Batteryvoltage	8V ±0.1V

Influence Quantities and Variations

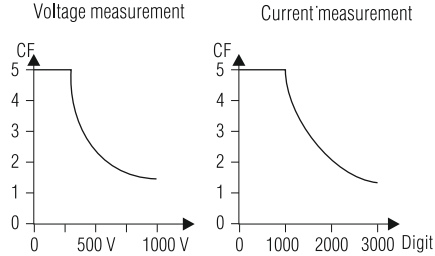
Influence quantity	RangeofInfluence	Measured quantity/ Measuringrange	Variation NC12 Clamp 1000A/300A
Battery voltage	1) ...<7.9V >8.1V...10.0V	V⎓	±2Digit
		V~	±4 Digit
		30Ω/300Ω/ °C	±4Digit
		3kΩ ---30 MΩ	±3Digit
		A ~	±6 Digit
		F,Hz,%	±10 Digit
Relative humidity	75 % 3 days Meteroff	V≃ ,A ~ Ω ,F,Hz,% °C	1 x intrinsic error
HOLD	-		±1Digit
MIN/MAX	-	V≃ ,A~	±2 Digit

1) Afterthe" ▨ "Symbolis displayed.

Influence quantity	Range of Influence	Measuring ranges	Attenuation
Common mode interference voltage	Noise quantity max.1000V ~	V⎓	> 120 dB
	Noise quantity max.1000V ~ 50Hz,60Hz sinusoidal	3V~ ,30V ~	> 70 dB
		300V ~	> 70 dB
		1000V ~	> 60 dB
Normal mode interference voltage	NoisequantityV ~ Value of the measuring range at a time max.1000V ~ ,50Hz,60Hz. sinusoidal	V⎓	> 50 dB
	Noise quantity max.1000V -	V~	> 110 dB

Influence quantity	RangeofInfluence	Measured quantity/ Measuringrange	Variation [1] ±(...%ofrdg.+...digits)
T emperature	0 °C +21 °C and +25 °C...+40 °C	30/300mV ⎓	1.0+3
		3...300V ⎓	0.15+1
		1000V ⎓	0.2+1
		V ~	0.4+2
		30 Ω [2]	0.15 + 2
		300 Ω	0.25+2
		3K Ω - 3M Ω	0.15+1
		30M Ω	1.0+1
		- 200 ... + 200°C	0.5°C+2
		+200...+850 °C	0.5+2
		A ⎓, A ~	± 0.1 x specified accuracy +10
Frequency ofthe measured quantity	>65Hz...400Hz	3...300V ~	2.0+3
	> 400 Hz... 1 kHz		2.0+3
	>65Hz...1kHz	1000V ~	3.0+3
	15Hz...< 30Hz	A~	± 1 % of range + 1
	30Hz... < 45Hz		
	66 Hz... < 1 kHz		
Waveform ofthe measured quantity [3]	Crest factorCF 1...3 / >3...5	V~ [4], A~ [4]	± 1% of rdg. ± 3% of rdg.

The permissible crest factor CF of the AC quantity to be measured function of the displayed value



1) With Temperature: Error data apply per 10K change in temperature
With Frequency: Error data apply to a display from 300 digits On words

2) With zero adjustment

3) With unknown waveform (crest factor CF > 2), measure With manual range selection

4) With exception of sinusoidal waveform.

Display

Liquid crystal display section (52mmx38mm) with analog indIcation and digital Display and wit hdisplay of the Unit of measured quantity, function and Various special functions.

Analog:

Indication	LCD Scale with pointer
Scale length	55mm
Graduation	∓5...0... ±30 with 29 scale divisionson ⎓, 0...30 with 25 Scale divisions on all other ranges
Polarity indication	With automatic change-over
Overrange Indication by triangle(13)	
Sampling rate	20 Readings/s,on Ω;10 readings/s

Digital:

Display/Heightof	numer.7-segment numerals/12mm
Number Of digits	$3^{3/4}$ digit ≙ 3100 counts
Overrange	"OL"is displayed.
Polarity indication	"-" sign is displayed,when the positive pole is at"⊥"
Sampling rate	2 readings/s,on Ω and ^{0}C;1reading/s

Power supply

Battery	9V Flat cell battery;manganese-dioxidecell according To IEC 6F22, Alkaline-mangane secellaccording to IEC6LR61or suitable NiCd Storage battery.
Lifespan	Without backlit ON,using alkaline-manganese cell: Approx.220 hourson V⎓ approx. 80 hourson V~
Batterytest	Automatically flashesthe "▭" symbol, when the Battery voltage drops below approx.7V.

Electrical Safety:

As per IEC 61010-1 : 2010-06

Protection class	:	II
Measuring Category	:	III IV 1000V 600V
Pollution Degree	:	2
Test Voltage	:	7.4 kV ~ between housing and input 4.26 kV ~ between housing with jaws and input

EMC	Electromagnetic compatibility
Emission	EN61326: 2002 Class B
Immunity	En61326: 2002
	IEC61000-4-2 8 kV atmosphere discharge 4 kV contact discharge
	IEC61000-4-3 3 V/m

Responsetime (aftermanualrangeselection)

Measuredquantity/ measuringrange	Responsetime		Transientresponsefor stepfunctionofthe measuredquantity
	ofanalog indication	ofdigital display	
V⎓, V~ A⎓, A~	0.7s	1.5s	from 0 to 80 % ofupperrangelimit
30Ω...3MΩ	1.5s	2s	from 0 to 50% Of upperrange limit
30MΩ	4s	5s	
→|	0.7s	1.5s	
µF, °C		Max.1...3s	from 0 to50% ofupperrangelimit
300 Hz,3 KHz		Max.2s	
30,100 KHz		Max.0.7s	
% (1Hz)		Max. 9s	
% (>=1Hz)		Max.2.5s	

Ambient conditions

Functional temperature range -10 C...+50 C

Storagetemperature Range -25^0 C...$+70^0$ C without batteries

Altitude Up to2000m

Mechanical configuration

Dimensions 90mm(W)x270mm(L)x70mm(H)

Weight 600g Approx.,including battery

18. Maintenance

Caution

Disconnect the meter from the measuring circuit before you open it to Replace the battery!

18.1. Battery

Prior to initial start-up,or after storage of clamp meter, Verify that the battery Of clamp meter does not leak. Repeat this check-in regular short intervals. If the battery Leaks,completely remove the battery electrdyte carefully With a moist cloth and install a new battery before you operate Clamp Meter NC12 again.

When the symbol" ▭ "(17) flashes on the LCD(1)replace the battery as soon as possible. Measurement can be done, but are duced measuring Accuracy must be taken into account.

The multimeter operates with a 9 V flat cellbattery according To IEC6F 22 or IEC6Lr61 or with a suitable NiCd storagebattery .

Attention!

Disconnect the instrument from the measuring circuit

Before opening battery cover to replace the batteries.

Replacing the battery

- Place the clamp meter on its face. Loosen the screw of battery cover Which is a trearbottom side of meter. Remove battery cover by Sliding it to bottom side.
- Remove the battery from the battery compartment and carefully disconnect Battery connectors.
- Snap the battery connectors To a New 9V battery and insert the Battery into the battery compartment.
- Replace the battery cover by fitting it in to slots on battery compartment
- Tighten the battery cover with the screw.
  Please destroy the batteries in an environment friendly way.

18.2.Periodic Check-up:

The clamp Meter does not require any specific maintenance. The surface Between opening jaws should be cleaned with dry cloth before operating. Avoid use of cleansers, abrasives Or solvents.

19.Servicing

When you need service, refer the cover page for company address.

NOTE

LUMEL
EVERYTHING COUNTS

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NC12-09