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UT210E PRO
迷你数字钳形表
使用说明书

一、基本概述

UT210E PRO迷你数字钳形表具备高可靠性、高安全性、高精度、小型化的特点。分辨率达1mA，最大量程到100A AC\DC；特有VFC启动模式，进入该模式后可准确测量具有VFC变频的电压、电流。电压或电流真有效值响应。全量程过载保护、可靠的测量精度和独特的外观设计，使之成为性能更为卓越的新一代实用电工/电力测量仪表。

二、开箱检查

打开包装盒取出仪表，请仔细检查下列附件是否缺少或损坏，如发现有任何一项缺少或损坏，请立即与你的供应商联系。

1.使用说明书----------一本
2.AAA电池1.5V----------两节
3.合格证----------一张
4.表笔---------- 一付

三、安全须知

本产品设计符合CE认证,符合欧盟IEC 61010－1,61010-2-032,61010-2-033,污染程度2、过电压类别:CATII 600V, CAT III 300V和双重绝缘的安全标准。使用之前先阅读操作说明并遵守所有安全指示：

1.依照操作说明的指示使用钳表，否则电流钳表的安全功能可能无法向你提供保护。
2.遵守国家安全法规,在危险带电导线外露的环境中,必须使用个人保护设备来防止触电、电弧放电等的伤害。
3.请勿越过电流钳表保护档板以外的任何位置。
4.每次使用前,先检查电流钳表外壳或输出电缆绝缘是否有开裂或缺损,并且检查是否存在连接不牢的部件,特别注意夹口周围的绝缘层。
5.在取下电池盖之前,请务必将钳表从所有带电电路上取下,并断开引线的连接。
6.切勿在电压高于600V（CATII600V）或频率高于400Hz的电路上使用本钳表。
7.过压类别等级CATII 600V/CATIII300V,污染等级2,不得超范围使用。
8.在有裸露导线的环境下工作应极其谨慎,与导线接触可能导致触电。
9.对于60V DC(直流),30V AC(交流有效值)或42V AC(峰值)以上电压,应格外小心,该类电压有触电危险。
10.如果要更换表笔时则需用同样等级CATII600V / CATIII300V或更高等级的表笔替代。
11.测量前功能选择旋钮必须置于正确位置,严禁在测量进行中转换档位，以防损坏仪表。

四、电气符号

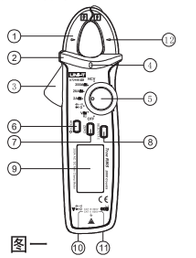
	机内电池电量不足	⚠	警告提示
V⎓	ACV/DCV	⧈	双重绝缘
A⎓	ACA/DCA	▶|	二极管
•))	蜂鸣通断	⏚	接地
⚡	高压危险		
CE	符合欧洲工会(European Union)指令		

五、综合规范

1.⚠输入端子和接地之间的误操作保护电压最高为600V。
2.⚠钳头端子最大过载保护:100A。
3.最大显示:2000Counts,每秒更新2～3次。过量程显示“OL”。
二极管:约3.2V
量程:自动（除电流档）
极性:自动
工作温度:0℃～40℃
相对湿度:0℃～30℃:≤75%, 30℃～40℃:≤50%
储存温度: -10℃～50℃
4.电磁兼容性:
在1V/m的射频场下:总精度=指定精度+5%,
超过1V/m以上的射频场下没有指定指标。
5.工作海拔高度:0～2000m
6.机内电池: AAA 1.5V×2节
7.电池不足:LCD显示“ ”符号
8.外形尺寸:约(175×60×33.5)mm、钳头开口最大尺寸17mm.
9.重量:约170g(包括电池)

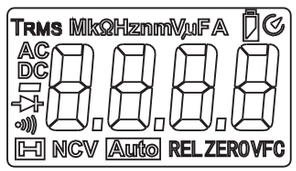
六、产品面板图

1.钳头。
2.保护档板。
3.钳头扳机:按下扳机，可打开钳头。
4.NCV指标灯:被感应的交流电场强度及感应距离满足指定值时会发出警示声和闪光指示。
5.功能选择旋钮:旋转此旋钮,可切到换面板上指示的相应功能。
6.HOLD/ 背光键:用于测量读数锁定/长按约2秒启动或关闭背光。
7.ZERO 键:用于DCA归零、电容/电压测量相对值。
8.SELECT键:选择功能模式,如ACV/HZ/DCV、电阻/通断/二极管/电容、ACA/DCA等,在电流档时长按此键≥2秒则进入或退出VFC功能。在交/直流电压/频率档下长按SELECT,即可进去VFC界面，进行变频电压和频率测量，再长按SELECT,退出VFC测量。
9.LCD显示屏:测量功能、符号、数值等显示界面。
10.正端输入插孔:测试电压、电阻/通断/电容/二极管时，红色表笔插入此孔。
11.COM端输入插孔:测试电压、电阻/通断/电容/二极管时，黑色表笔插入此孔。
12.钳头几何中心指示标记。



图一

七、LCD全显图(图二)



图二

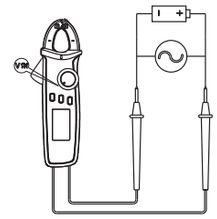
序号	符号	说明
1	TRMS	真有效值测量状态提示符
2	AC/DC	交/直流电压测量提示符
3	−	负的读数
4	▶|	二极管测量提示符
5	•))	电路通断测量提示符
6	H	数据保持提示符
7	Ω kΩ MΩ	电阻单位: 欧姆、千欧姆、兆欧姆
8	Hz kHz MHz	频率单位: 赫兹 、千赫兹 、兆赫兹
9	mV、V	电压单位: 毫伏、伏
10	mA、A	电流单位:毫安、安培
11	nF μF mF	电容单位: 纳法、微法、毫法
12	(EF)NCV	非接触交流电压感测提示符
13	Auto	自动量程提示符
14	ZERO/REL	底数归零/相对测量提示符
15	VFC	变频电压/电流测量提示符
16		机内电池欠压提示符
17		自动关机提示符

八、操作说明

1.交/直流电压/频率测量

- 选择交流电压或直流电压档或频率档。
- 将红色表笔插入红色孔(正端),黑色表笔插入黑色孔(COM端).
- 将红黑表笔触及被测部件,例如电源插座等(图三)。
- 从LCD画面读取测量值

⚠测量电压时,最大输入电压值最高为600V(交流/直流),切勿超过此限值,若超过电压限值则易发生电击的危险，也可能损害仪表。

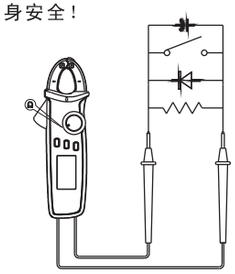

图三

2.电阻/电路通断/二极管/电容

测量将红色表笔插入红色孔(正端),黑色表笔插入黑色孔(COM端)

- 表笔并联到被测部件上进行测量（图四）
- 从LCD画面读取测量值

⚠测量电阻/通断/电容/二极管量程时,不要输入高于直流60V或交流30V以上的电压,避免伤害人身安全！


图四

3.交/直流电流测量(图五、图六)

1）交流电流

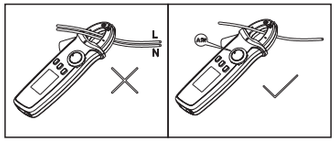
- 选定交流电流量程(2A～、20A～、100A～)
- 打开钳头,钩上电线(单线),使电线置于钳头上指示的几何中心位置,注意应确保左右钳头应完全闭合，左右钳头之间不可有间隙。
- 从LCD上读取测量数据。

2)直流电流

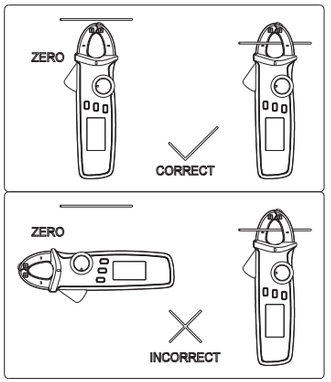
- 按SELECT键进入直流电流量程(2A、20A、100A）测量前需按下归零ZERO键,使读数为零值,若按一次读数仍不为零,可多按几次,使读数为零。注：因产品灵敏度较高,为了确保测量读数准确,仪表测量时的方向需与归零时的方向尽可能一致。
- 打开钳头,钩上电线(单线),使电线置于钳头上指示的几何中心位置,注意应确保左右钳头完全闭合,左右钳头之间不可有间隙。
- 从LCD上读取测量数据。读数为正时,表示电流是从钳头标示的正端流向负端,为负则相反。

⚠测量电流时,请将测试表笔拨掉,避免触电。

图五



图六

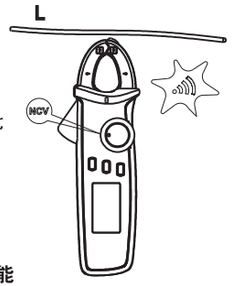


4.NCV非接触电场测量（图七）

如要感测空间是否存在交流电压或电磁场，可将仪表的钳头前端靠近被测物体约8～15mm进行感应探测，感应交流电压的模拟量约：≤临界电压100V显“EF”，＞临界电压100V,显“-”横段，按电压大小共设“----”四段，并按段数伴有不同节奏的蜂鸣声响，同时伴有NCV灯闪烁，以区分感测电场的强度。

⚠量程切换NCV测量时，请将测试表笔拨掉，避免触电。

图七



5.其它功能

- 长按HOLD键约2秒后，可启动或关闭LCD背光功能.
- 自动关机：在测量过程中旋钮开关约在15分钟内无拔动时，仪表会"自动关机"以节能。在自动关机状态下将旋钮开关旋至OFF后重新开机，或点击任一按键可唤醒仪表。
- 关闭自动关机：

  按住SELECT键，然后再上电开机，蜂鸣连续发出5 声提示自动关机功能被取消。关机后重开则回复自动关机功能。

产品在自动关机前约1分钟蜂鸣器会连续发出5声警示，关机前蜂鸣器会发1长声警示。当自动关机功能取消时，每15分钟会连续发出5声警示。

- 蜂鸣器：按任何按键或转动功能开关时，如果该功能按键有效，蜂鸣器会发“Beep”一声（约0.25秒）。 在•))档位时，被测电路良好导通时（≤10Ω）蜂鸣器连续发声。在测量电压或电流超量程时，蜂鸣器也会发出“Beep”持续的间歇声，以示超量程警示，功能状态如下：

a）交、直流电压＞600V 时响蜂鸣警示。

b）100A交、直流档：电流＞所在最大量程时响蜂鸣警示。

- 低电压检测：当电池电压低于2.5V时，显示“▭”电池欠压符号，出现电池欠压符号后测量精确度可能会降低，需及时更换电池；若低于 2.2V，则开机全显后只显示电池欠压符号，不能工作。
- 当电池供电电压降低至2.6V时，LCD背光会处于微弱或不能启动状态；但测量功能仍可正常使用。

九、技术指标

准确度：±（a%读数+b字数），保证期为1年
环境温度：23℃ ±5℃（73.4℉ ±9℉）
相对温度：≤75%

1.直流电压测量

量程	分辨力	准确度
200.0mV	0.1mV	±（0.7%+5）
2.000V	1mV	±(0.7%+3)
20.00V	10mV	
200.0V	100mV	
600V	1V	

⚠输入阻抗：约10MΩ。（由于输入阻抗较高，200mV量程开路时可能会有不稳定数字显示，但接上内阻不大于10MΩ的被测源后即可稳定测量，但需要考虑被测源内阻对测量读数的影响。）

⚠最大输入电压：±600V

2.交流电压测量

量程	分辨力	准确度
2.000V	1mV	±(1.0%+3)
20.00V	10mV	
200.0V	100mV	±(1.0%+3) V.F.C模式:±(4.0%+3)
600V	1V	±(1.2%+3) V.F.C模式:±(4.0%+3)

⚠输入阻抗：输入阻抗均约10MΩ。
⚠最大输入电压：600Vrms
●显示真有效值。频率响应：45～400Hz
●准确度保证范围：5～100%量程，短路允许有<10个字剩余读数。
●非正弦波根据波峰因素按如下计算增加误差：
a）在波峰因素为1～2时：Add 3% 。
b）在波峰因素为2～2.5时：Add 5% 。
c）在波峰因素为2.5～3时：Add 7% 。

3.电阻测量

量程	分辨力	准确度
200.0Ω*	0.1Ω	±(1.0%+2)
2.000kΩ	1Ω	
20.00kΩ	10Ω	
200.0kΩ	100Ω	
2.000MΩ	1kΩ	±(1.2%+3)
20.00MΩ	10kΩ	

⚠*量程：被测值=测量显示值-表笔短路值
开路电压约：约1V
过载保护：600V-PTC

4.•))电路通断、▶|二极管测量

量程	分辨力	备注
•))	0.1Ω	电路断开电阻值设定为：≥150Ω，蜂鸣器不发声；电路良好导通阻值设定为：≤10Ω，蜂鸣器连续发声。
▶|	1mV	开路电压约3.2V;硅PN结正常电压值约为0.5～0.8V。

⚠过载保护：600V-PTC

5.电容测量

量程	分辨力	准确度
2nF	1pF	±（4%+10）
20.00nF～200.0μF	10pF～100nF	±(4%+5)
2.000mF～60.00mF	1μF～10μF	±10%

⚠过载保护：600V-PTC
●≤1μF被测电容建议采用ZERO测量模式以确保测量准确度

6.直流电流测量

量程	分辨力	准确度
2.000A	1mA	±(2%+8)
20.00A	10mA	±(2%+3)
100.0A	100mA	±(2%+3)

⚠过载保护100A
●由于地球等外界电磁场的存在，为了确保测量读数的精确性，测量前需按下归零键（ZERO），使读数为零值，若按一次读数仍不为零，可多按几次，直至读数为零。并且使仪表测量时的方向与归零时的方向尽可能一致。

7.交流电流测量

量程	分辨力	准确度
2.000A	1mA	±(3%+10) V.F.C模式：±(4.0%+10)
20.00A	10mA	±(2.5%+8) V.F.C模式：±(4.0%+10)
100.0A	100mA	±(2.5%+5) V.F.C模式：±(4.0%+10)

⚠过载保护：100A
●准确度保证范围：5～100%量程，2A开路允许有<20字剩余读数。
●显示为真有效值。频率响应：50～60Hz
●非正弦波根据波峰因素按如下计算增加误差：
a）在波峰因素为1～2时：Add 3% 。
b）在波峰因素为2～2.5时：Add 5% 。
c）在波峰因素为2.5～3时：Add 7% 。

8.频率测量

量程	分辨力	准确度
10Hz~60kHz	0.01Hz~0.01kHz	±(0.1%+4)

测量灵敏度:5Vrms≤输入幅度≤600Vrms

十、保养和维修

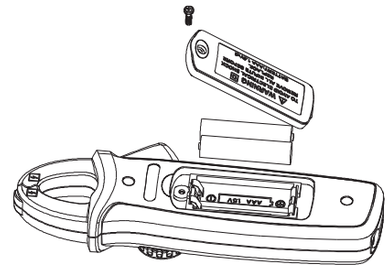
⚠警告：在打开仪表后盖之前，应确定电源已关闭；表笔已离开输入端口和被测电路。

1.一般的保养和维修

* 维护保养请使用湿布和温和的清洁济清洁仪表外壳，不要使用研磨剂或溶剂。
* 如发现仪表有任何异常，应立即停止使用并送维修。
* 在有需要对仪表进行校验或维修时，请由有资格的专业维修人员或指定的维修部门维修。

2.更换电池（见图8）

* 当LCD显示欠压“▭”提示符时，应当立即更换内置电池，否则会影响测量精度。
* 电池规格：AAA 1.5Vx2节



图八

操作步骤：

1. 把电源开关置于“关”位置，并从输入插孔中移走表笔。
2. 用螺丝刀拧下电池后盖固定的一颗螺丝，卸下电池后盖，按图示取出旧电池
3. 更换2PCS新电池（规格AAA1.5V）

执行标准:GB-T 13978-2008

说明书内容如有变更，恕不另行通知。

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UT210E PRO
Mini Clamp Meters
Operation Manual

I.Overview

UT210E PRO mini digital clamp meter features high reliability, safety, precision and compact design. Its resolution ratio is 1mA. Maximum range has maximum range of 100A AC/DC; particular VFC start mode. Entering this mode can accurately measure voltage and current which has VFC frequency conversion. Voltage or current response display is true valid value. Whole range overload protection, reliable measurement accuracy and unique appearance design makes it an outstanding new generation functional electrician/electric power measurement instrument.

II.Open case inspection

Open the package and take out the instrument. Please check whether the following accessories are missing or damaged. If any item is missing or damaged, please contact your supplier immediately.

1. Instruction manual----------1 copy
2. 1.5V AAA battery ----------2 pieces
3. Probe assemblies----------1 pair

III.Safety precautions

This Meter complies with EN 61010-1,61010-2-032,61010-2-033, Pollution Degree 2, measurement category: (CAT II 600V, CAT III 300V) and Double Insulation standards.

Conforms to UL STD. 61010-1, 61010-2-032, 61010-2-033 Certified to CSA STD. C22.2 NO. 61010-1,IEC STD 61010-2-032, 61010-2-033

CAT II: Applicable to test and measuring circuits connected directly to utilization points (socket outlets and similar points) of the low-voltage MAINS installation.

CAT III: Applicable to test and measuring circuits connected to the distribution part of the building's low-voltage MAINS installation, before use and follow all safety instructions.

1. Use the clamp meter by following operation instructions, otherwise safety functions of the current clamp meter may fail to protect you.
2. Abide by national safety laws and regulations. When operate in dangerous and live wire exposed environment, use personal protection equipment to prevent accidents such as electric shock and arc discharge.
3. Do not cross any position other than protective barrier of current clamp meter.
4. Before each use, check whether current clamp meter housing or output cable insulation cracks or damaged first, also check for poor connected parts. Especially pay attention to insulating layer around the clamping mouth.
5. Before removing the battery cover, please remove clamp meter from all energized circuit and disconnect lead wire.
6. Do not use clamp meter in circuit with voltage higher than 600V this or frequency higher than 400Hz.
7. Measurement category class is CAT II 600V/CAT III 300V, pollution degree is 2. Do not use it out of scope.
8. Be cautious when work in environment with exposed wire. Contact with wire may result in electric shock.
9. For voltage above 60V DC (direct current), 30V AC (AC effective value) or 42V AC (peak value), such voltage may cause electric shock.
10. Probe assemblies used for MAINS measurements CAT II 600V /CAT III 300V according to IEC 61010-031, If you want to replace the probe assemblies and they need the same level CAT II 600V /CAT III 300V or better level. Protection impairment if used in a manner not specified by the manufacturer.
11. Function switches shall be set at the correct position prior to measurement. It is forbidden to perform gear conversion in measurement to guard against damage to the meter.

IV.Electrical symbol

	Low battery		Warning		Buzzing on-off
V⎓	ACV/DCV		Diode	⏚	Earthing
A⎓	ACA/DCA		Double insulation		
	Danger! High voltage				

CE	Comply with European Union directives
	Application around and removal from UNINSULATED HAZARDOUS LIVE conductors is permitted
	This symbol signify the product comply with both USA and Canada requirement

V.General standard

1. Maximum faulty operation protection voltage between input terminal and earthing is 600V.
2. Maximum overload protection for clamp head terminal:100A.
3. Maximum display: 2000Counts, update 2~3 times per second.
   Over range displays "OL".
   Diode: approx. 3.2V
   Range: automatic (exclusive of electricity gear)
   Polarity: automatic
   Work temperature: 0℃～40℃
   Relative humidity: 0℃～30℃:75%,30℃～40℃:50%
   Storage temperature: -10℃～50℃
4. Electromagnetic compatibility:
   In 1V/m radio frequency field: overall frequency=designated precision+5% , radio frequency field above 1V/m has no designated index.
5. Work altitude: 0～2000m
6. Built-in battery: AAA 1.5V×2 pieces
7. Low battery: LCD displays "".
8. Dimensions: approx. approx. (175×60×33.5)mm , maximum clamp head size is 17mm.
9. Weight: approx. 170g (including battery)

VI. Product panel figure

1. Clamp head.
2. protective barrier.
3. Clamp head trigger: pull the trigger to open clamp head.
4. NCV indicator: when the induced AC electric field intensity and induction distance satisfy designated value, it will send out warning sound and flashes.
5. Function selection button: rotate this button to switch to corresponding functions indicated on the panel.
6. HOLD/backlight key: for measuring readings/long press 2s to turn on or turn off backlight.
7. ZERO key: used for DCA zero, capacitance/voltage measurement relative value.
8. SELECT key: select function mode, such as ACV/HZ/DCV,resistance/on-off/diode/capacitance, ACA/DCA, etc, in current gear, long press this key for more than 2s to enter or exit VFC function.At DCV/ACV/Frequency post, long press "SELECT" to switch to VFC function for variable frequency/Frequency measurement, then long press"SELECT" to quit VFC function.
9. LCD display screen: measurement function, symbol and numerical value.
10. Positive terminal input jack: when measure voltage, resistance/on-off/capacitance/diode, red meter pen inserts into this jack.
11. Input jack at COM terminal: when measure voltage, resistance/on-off/capacitance/diode, black meter pen inserts into this jack.
12. Indication mark for geometric center of the clamp head.

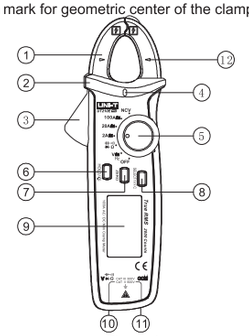

Figure 1

VII. LCD full view figure (Figure 2)

Figure 2

No.	Symbols	Instructions
1	TRMS	True valid value measurement status prompt
2	AC/DC	AC/DC voltage measurement prompt
3	−	Negative reading
4	▶|	Diode measurement prompt
5	·))	Circuit on-off measurement prompt
6	H	Data hold prompt
7	Ω kΩ MΩ	Resistance unit: Ω, kΩ, MΩ
8	Hz kHz MHz	Frequency unit: Hz, kHz, MHz
9	mV、V	Voltage unit: mV, V
10	mA、A	Current unit: mA, A
11	nF μF mF	Capacitance unit: nF, μF, mF
12	(EF)NCV	Noncontact AC voltage induction prompt
13	Auto	Auto range prompt
14	ZERO/REL	Zero/relative measurement prompt
15	VFC	Variable frequency voltage/current measurement prompt
16		Low built-in battery prompt
17		Auto power-off prompt

VIII. Operation instructions

1. ACV/DCV/Frequency measurement

- To select ACV/DCV or Frequency
- Insert red meter pen into red jack (positive terminal), black meter pen into black jack (COM terminal)
- Touch the test piece by red and black meter pen, for example, power socket (Figure 3).
- Read measurement value from LCD screen.

⚠When measure voltage, maximum input voltage is 600V (AC/DC), do not exceed this limitation, otherwise it may cause electric shock or damage to the meter.

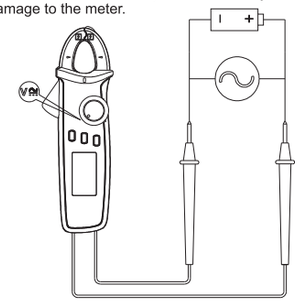

Figure 3

2. Resistance/circuit on-off/diode/capacitance

- Insert red meter pen into red jack (positive terminal), black meter pen into black jack (COM terminal)
- Connect meter pen in parallel to test piece for measurement (Figure 4)
- Read measurement value from LCD screen.

⚠When measure resistance/on-off/capacitance/diode range, do not input voltage over DC 60V or AC 30V to avoid injury to human.

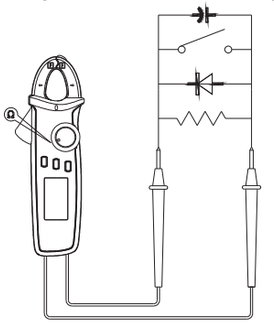

Figure 4

3. AC/DC current measurement (Figure 5, Figure 6)

1)AC

- Select AC range (2A～, 20A～, 100A～)
- Open clamp head, hook electric wire (single wire), place electric wire on geometric center indicated by clamp head, make sure the left and right clamp heads are totally closed. There is no gap between the left and right clamp heads.
- Read measurement data from LCD.

2)DC

- Press SELECT key to enter DC range （2A⎓, 20A⎓, 100A⎓）
- Press ZERO key before measurement to make readings zero. If it does not return to zero after one press, then press it several times until the reading is zero. Note: as the product is highly sensitive, to ensure correct measurement data, direction of meter during measurement should be the same as when it is in zero as much as possible.
- Open clamp head, hook electric wire (single wire), place electric wire on geometric center indicated by clamp head, make sure the left and right clamp heads are totally closed. There is no gap between the left and right clamp heads.
- Read measurement data from LCD. When the reading is positive, it means current flows from positive end indicated by clamp head to the negative end. Negative reading is the opposite.

⚠ When measure current, unplug test pen to avoid electric shock.

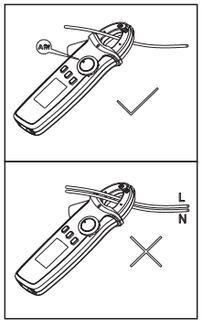

Figure 5

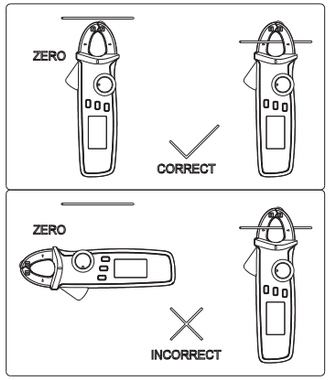

Figure 6

4. NCV noncontact electric field measurement (Figure 7)

If you want to measure whether there is AC voltage or electromagnetic field, place front end of clamp head 8~15mm close to the test piece, analog quantity of inductive AC voltage is about ≤critical voltage 100V, display "EF", > critical voltage 100V, display "-", it has four "----" levels based on voltage size with different buzzing at each level, with NCV light flashing to discriminate electric field intensity.

⚠When ranges switch NCV measurement, please unplug the test pen to avoid electric shock .

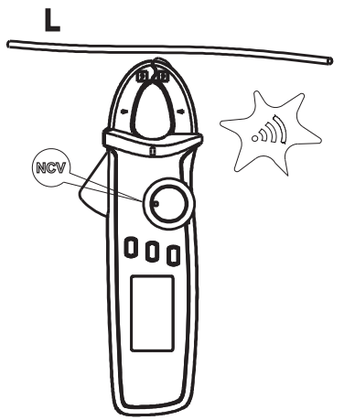

Figure 7

5. Other functions

- Long press HOLD key for 2s to turn on or turn off LCD backlight function.
- Automatic power-off: when measuring, if the rotary button has not pulled out in 15 minutes, the instrument will automatically power off to save energy. In automatic power-off mode, turn rotary button to OFF and restart the machine, or click any key to wake the instrument.
- Turn off automatic power-off function: press and hold SELECT key, then power-on start, you will heard 5 buzzing which means automatic power-off function is cancelled. Turn off and restart the machine, automatic power-off function will be recovered.
- The buzzer will send out 5 warnings 1 minute before automatic power off. A long buzz will be heard before power off. When automatic power -off function is canceled, you will hear 5 continuous warnings in every 15 minutes.
- Buzzer : press any key or rotate function switch,if such function key is valid, buzzer will "beep" once (lasting approx. 0.25s). In gear , when the circuit-under-test is conductive (≤10Ω),buzzer makes sound continuously. When measure voltage or current outrange, buzzer will "Beep" to warn outrange, function status is as below:

a)When AC, DC voltage＞600V, buzzer beeps

b) 100A AC and DC gear: current ＞maximum range, buzzer beeps .

- Low-voltage detect: when battery voltage is lower than 2.5V, battery under-voltage symbol appears, measurement accuracy may be lower once this symbol shows, replace battery timely; if it is lower than 2.2V, only battery under-voltage symbol shows after starting up, it can't work.
- When battery supply voltage lowers to 2.6V, LCD backlight will be in weak or non-start state; but measurement functions still work.

IX. Technical index

Accuracy: ±(a% reading + b word count), warranty period is 1 year.
Environment temperature:23℃±5℃(73.4℉±9℉)relative humidity:≤75%

1.DC voltage measurement

Range	Resolution	Accuracy
200.0mV	0.1mV	±（0.7%+5）
2.000V	1mV	±(0.7%+3)
20.00V	10mV	
200.0V	100mV	
600V	1V	

⚠ Input resistance is about 10MΩ. (as input resistance is high, when 200mV range open circuit, there may be instable digital display, but measurement can be stabilized once the measured source with internal resistance lower than 10MΩ is connected, but the impact of internal resistance of measured source on measurement reading should be considered)

⚠ Maximum input voltage: ±600V

2. AC voltage measurement

Range	Resolution	Accuracy
2.000V	1mV	±(1.0%+3)
20.00V	10mV	
200.0V	100mV	±(1.0%+3) V.F.C. mode: ±（4.0%+3)
600V	1V	±(1.2%+3) V.F.C. mode: ±（4.0%+3)

⚠Input resistance: 10 MΩ in average.

⚠Maximum input voltage: 600Vrms

- Show true virtual value. Frequency response: 45～400Hz
- Accuracy guarantee range: 5~100% range, short circuit allows <10 residue readings.
- Non-sinusoidal wave counts add error by crest factor:
  When crest factor is 1~2: Add 3%.
  When crest factor is 2~2.5: Add 5%.
  When crest factor is 2.5~3: Add 7%.

3.Resistance measurement

Range	Resolution	Accuracy
200.0Ω*	0.1Ω	±(1.0%+2)
2.000kΩ	1Ω	
20.00kΩ	10Ω	
200.0kΩ	100Ω	
2.000MΩ	1kΩ	±(1.2%+3)
20.00MΩ	10kΩ	

⚠ Range: measured value=measurement display value-meter pen short circuit value
Open-circuit voltage is about 1V
Overload protection: 600V-RMS

4. ·ıı) circuit on-off, ▶| diode measurement

Range	Resolution	Remarks
·ıı)	0.1Ω	Resistance value for circuit disconnect: ≥150Ω, buzzer makes no sound; Resistance value for circuit conduct: ≤10Ω, buzzer beeps continuously.
▶|	1mV	Open circuit voltage is 3.2V: normal voltage for silicon PN junction is 0.5~0.8V.

⚠ Overload protection: 600V-RMS

5. Capacitance measurement

Range	Resolution	Accuracy
2nF	1pF	±（4%+10）
20.00nF～200.0μF	10pF～100nF	±(4%+5)
2.000mF～60.00mF	1μF～10μF	±10%

⚠Overload protection: 600V-RMS
≤1μF measured capacitance, it is suggested to use ZERO measurement mode to ensure accuracy.

6. DCA measurement

Range	Resolution	Accuracy
2.000A	1mA	±(2%+8)
20.00A	10mA	±(2%+3)
100.0A	100mA	±(2%+3)

⚠Overload protection 100A
As external electromagnetic field such as the earth exists, to ensure accuracy of measurement reading, press ZERO key before measurement to make readings be zero. If it is not zero after one press, press it for several times until reading is zero. Direction of meter during measurement should be the same as when it is in zero as much as possible.

7.ACA measurement

Range	Resolution	Accuracy
2.000A	1mA	±(3%+10) V.F.C mode：±（4.0%+10)
20.00A	10mA	±(2.5%+8) V.F.C mode：±（4.0%+10)
100.0A	100mA	±(2.5%+5) V.F.C mode：±（4.0%+10)

⚠Overload protection 100A

- Accuracy warranty coverage: 5~100% range, 2A open circuit allows <20 residue readings.
- Displays are true valid value. Frequency response: 50～60Hz.
- Non-sinusoidal wave counts add error by crest factor:
  a) When crest factor is 1~2: Add 3%.
  b) When crest factor is 2~2.5: Add 5%.
  c) When crest factor is 2.5~3: Add 7%.

8.Frequency measurement

Range	Resolution	Accuracy
10Hz~60kHz	0.01Hz~0.01kHz	±(0.1%+4)

measuring sensitivity：5Vrms≤input value≤600Vrms

X. Maintenance and repair

⚠ Warning: before remove rear cover of the instrument, make sure power supply is off; meter pen leaves input port and circuit-under-test .

1.General maintenance and repair

* For maintenance and repair, use wet cloth and mild cleaner to clean instrument cover, do not use grinding agent or solvent.
* If the instrument is abnormal, stop use it and maintain.
* If it is necessary to verify or maintain the instrument, maintain it by qualified professional serviceman or designated maintenance department.

2.Replace battery (see Figure 8)

* When LCD displays under-voltage prompt, replace built-in battery immediately otherwise it will affect measurement accuracy.
* Battery specification: AAA 1.5V x2cells

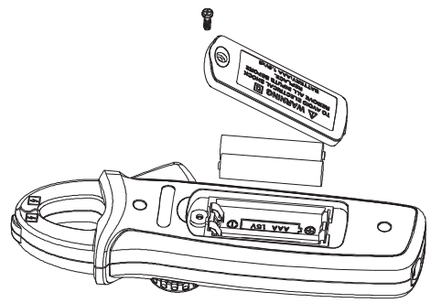

Figure 8

Operation procedure:

1.Place power switch on "off" position and remove meter pen from input jack .
2.Unscrew the screw fixed on the rear cover of battery by screwdriver, remove battery rear cover and take out old battery as shown in the figure.
3.Replace 2 pcs of new batteries (specification AAA1.5V)

This instruction manual is subject to change without further notice.

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