UNI-T®

UT61B+ UT61D+ UT61E+

1000V 真有效值数字万用表使用说明书

1000V True RMS Digital Multimeter User Manual

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1000V True RMS Digital Multimeter
User Manual

序 言

尊敬的用户：

您好！感谢您选购全新的优利德仪表，为了正确使用本仪表，请您在使用之前仔细阅读说明书全文，特别有关“安全注意事项”的部分。

如果您已经阅读完本说明书全文，建议您将此说明书进行妥善的保管，与仪器一同放置或者放在您随时可以查阅的地方，以便在将来的使用过程中进行查阅。

目　录

一、概述

UT61B+/UT61D+/UT61E+(真有效值)是一系列具备高可靠性、高安全性自动6000计数(UT61B+/UT61D+),22000计数 (UT61E+)，手持式万用表。具有超大屏幕数字显示和高解析度的模拟指针显示，全量程过载保护和独特的外观设计，使之成为性能更为新一代的实用电工测量仪表。本仪表系列可用于测量：交直流电压和电流、电阻、二极管、三极管hFE (UT61E+)、电路通断、电容、频率、占空比、温度(UT61D+)、NCV交流电场感应探测等参数。并具备数据传输功能,免装驱动USB标准接口、数据保持、相对测量、峰值测量(UT61D+/UT61E+)、机内大电流温度报警、欠压提示、背光和自动关机功能。

可用于各类大专院校、冶炼、通讯、制造、石油、国防、电力、电工、暖通(UT61D+)、电路电力设备的检测、维护和维修的专用测量工具，更多地解决马达驱动、工厂自动化、配电和机电等高电压设备测量的要求。

二、开箱检查

本使用说明书包括有关的安全信息和警告提示等，请仔细阅读有关内容并严格遵守所有的警告和注意事项。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，请即与你的供应商联系。

使用说明书 ---------- 一本
表笔 ---------- 一副
转接插头座 ---------- 一个（UT61E+）
K型热电偶 ---------- 一个（UT61D+）
保修证 ---------- 一张
通用下载指南 ---------- 一张
USB标准接口线 ---------- 一条
AAA 1.5V电池 ---------- 四节

三、安全工作准则

本仪表严格遵循GB4793电子测量仪器安全要求以及IEC61010-1安全标准进行设计和生产。符合双重绝缘过电压标准CAT Ⅲ1000V 、CAT Ⅳ 600V和污染等级Ⅱ的安全标准。如果未能按照有关的操作说明使用仪表，则可能会削弱或失去仪表为你提供的保护。

1. 使用前要检查仪表和表笔，谨防任何损坏或不正常的现象，如果发现任何异常情况：表笔裸露、机壳损坏、液晶显示器无显示或乱显等等，请勿使用。
2. 严禁使用没有盖好盖的仪表，否则有电击危险。
3. 表笔破损必须更换，并须换上同样型号或相同电气规格的表笔。
4. 当仪表正在测量时，不要接触裸露的电线、连接器、没有使用的输入端或正在测量的电路。
5. 测量高于直流60V或交流30V以上的电压时，务必小心谨慎，切记手指不要超过表笔护指位，以防触电。
6. 在不能确定被测量值的范围时，须将仪表工作于最大量程位置。
7. 切勿在端子和端子之间，或任何端子和接地之间施加超过仪表上所标注的额定电压或电流。
8. 测量时功能开关必须置于正确的位置。在功能开关转换之前，必须断开表笔与被测电路的连接，严禁在测量进行中转换档位，以防损坏仪表。
9. 进行在线电阻、二极管或电路通断测量之前，必须先将被测器件所在电路中所有的电源切断，并将所有的电容器放尽残余电荷。
10. 测量电流以前，应先检查仪表的保险丝是否完好，并先将被测电流关闭,等仪表可靠连接到电路上之后，再开通被测电流,以免打火花的危险。
11. 不要在高温、高湿、易燃、易爆和强电磁场环境中存放或使用仪表。
12. 请勿随意改变仪表内部接线，以免损坏仪表和危及安全。
13. 当LCD显示器显示“ ”标志时,应及时更换电池，以确保测量精度。
14. 测量完毕应及时关断电源。长时间不用时，应取出电池。

四、电气符号

	电池电量不足
	AC(交流)/DC(直流)
	警告提示
	双重绝缘
	高压警示
	接地
	保险丝
CAT III	IEC过电压三类标准:三类标准(CATIII)设备用于保护固定设备装置中的设备,如配电盘,馈线和短分支电路及大型建筑中的防雷设施免受瞬态电压的损害.
CAT IV	IEC过电压四类标准:四类标准(CATIV)设备用于保护设备免受一级电源等级,如电表或高空线路或电下线路设施产生的瞬态电压的损害.

五、外形结构图

1. NCV感应位置
2. 指标灯
3. LCD显示屏
4. 功能按钮
5. 功能选择开关
6. 测量输入端口
7. USB(蓝牙)通信外接输入口
8. 多功能表笔定位架
9. 外接支架螺母
10. 电池仓固定螺丝
11. 支架

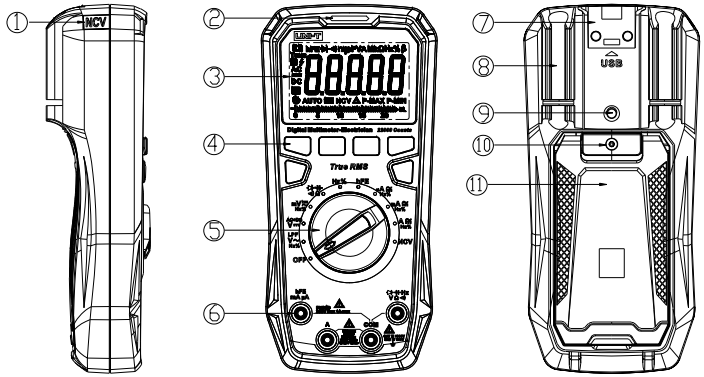

图 1

六、LCD显示

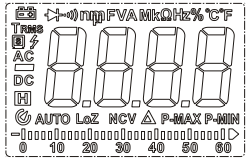

图2（UT61B+/UT61D+全显图）

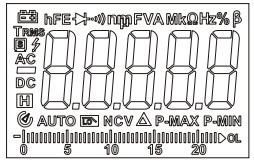

图3（UT61E+全显图）

符号	说明
⚡	交直流电压高于30V警示符
H	数据保持提示符
−	负的读数
AC/DC	交/直流测量提示符
🔋	电池电量不足提示符
AUTO	自动量程提示符
▶|	二极管测量提示符
·ıı))	电路通断测量提示符
Δ	相对值测量提示符
Ω, kΩ, MΩ	电阻单位：欧姆、千欧姆、兆欧姆
mV, V	电压单位：毫伏、伏
μA, mA, A	电流单位:微安、毫安、安培
nF, μF, mF	电容单位：纳法、微法、毫法
Hz, %	频率单位：赫兹、占空比
S	数据传输提示符
β	三极管放大倍数(UT61E+)
NCV	非接触电压测量
P-MAX/P-MIN	峰值最大最小值测量(UT61D+/UT61E+)
MAX/MIN	最大最小值测量
°C/°F	摄氏/华氏温度单位(UT61D+)
LoZ	交流低阻抗提示符(UT61D+)
hFE	三极管测试(UT61E+)
	自动关机提示符
TRMS	真有效值符

七、 旋钮开关及按键功能

功能位置	说明
OFF	关机
LPF V~ Hz%	交流电压测量/低通滤波测量/频率占空比测量(UT61E+)
AC+DC V⎓	直流电压测量/AC+DC测量(UT61E+)
V~ Hz%	交流电压测量/频率占空比测量(UT61B+)
V⎓≂ Hz%	交直流电压测量/频率占空比测量(UT61D+)
mV⎓≂ Hz%	交直流毫伏电压测量/频率占空比测量
•)) Ω ⊣▶⊢	二极管PN结电压测量/电路通断测量/电阻测量/电容测量(UT61D+/UT61E+)
•)) Ω	电路通断测量/电阻测量(UT61B+)
⊣▶⊢	二极管PN结电压测量/电容测量(UT61B+)
hFE	三极管放大测量(UT61E+)
Hz%	频率占空比测量
μA⎓≂ Hz%	交直流微安电流测量/频率占空比测量
mA⎓≂ Hz%	交直流毫安电流测量/频率占空比测量
A⎓≂ Hz%	交直流A电流测量/频率占空比测量
NCV	非接触电压测量

按键说明：

短按：按下按键，保持时长＜2s
长按：按下按键，保持时长＞2s

1. SELECT 按键：

1) 电阻/通断/二极管/电容档：短按循环选择电阻->通断->二极管->电容(UT61D+/UT61E+)。
2) 电阻/通断档:短按循环选择 电阻->通断 (UT61B+)。
3) mV档:短按循环选择 交流mV->直流mV。
4) ACV档:短按循环选择 交流电压->低通滤波交流电压(UT61E+)。
5) DCV档:短按循环选择 直流电压->AC+DC电压(UT61E+)。
6) ACV/DCV档:短按循环选择 交流电压->直流电压(UT61D+)。
7) °C/°F档:短按循环选择 摄氏->华氏温度单位(UT61D+)。
8) uA/mA/A档:短按循环选择 直流电流->交流电流。
9) 关机状态按住 SELECT，产品进入不可休眠模式，每间隔15分钟蜂鸣器提示5声，提醒使用者未关机。

2. RANGE 按键：

短按进入手动量程切换，长按退出手动进入自动量程切换。

3. Hz% USB 按键：

短按切换测量频率和占空比，长按则开启/关闭数据通信功能(注:只有在USB通信模组插入时才起作用)。

4. REL 按键：

相对测量按键。

5. PEAK MAX MIN 按键：

短按切换最大或最小值选择按键,长按切换峰值最大或最小值选择按键(UT61D+/UT61E+)。

6. MAX MIN 按键：

短按切换最大或最小值选择按键 (UT61B+)。

7. HOLD 按键：

短按显示值被锁定保持，LCD显示“H”提示符，再短按一次,锁定被解除，长按则开启/关闭背光功能。

八、测量操作说明

首先请注意检查内置1.5Vx4节电池，仪表开机如果电池不足，显示屏上会出现“ ”符号，则须及时更换电池后再能使用。还要注意测试表笔插口之旁符号“ ”，这是警告你要留意被测试电压或电流不要超出指示的数字，以确保测量安全！

1. 交流电压测量

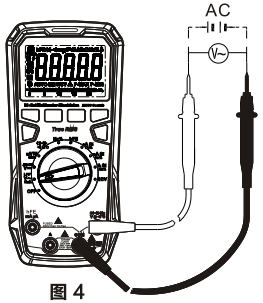

图 4

测量交流电电压的步骤如下：

1) 将红表笔插入 (UT61B+/UT61E+) 或 (UT61D+) 插孔，黑表笔插入"**COM**”插孔。
2) 将旋钮转至 (UT61B+) 或 (UT61D+) 或 (UT61E+) 档。
3) 短按 **SELECT** 键选择所需测量的交流或LPF交流电电压 (UT61E+)。在进入LPF交流电电压测量功能时默认手动最大量程 (UT61E+)。
4) 将表笔并联到待测电源或负载上，测量电压。
5) 从显示器上直接读取被测电压值。如果电压大于1000V，此时红色指示灯点亮，蜂鸣器发声报警。如此时需要读取在线频率值或占空比时，短按 **Hz%** **USB** 键即可切换，方便读取。但读取在线频率值或占空比对输入幅度是有要求的，详见技术指标。

⚠ 注意：

- 不要输入高于1000V的电压。测量更高的电压是有可能的，但有损坏仪表的危险！
- 在测量高电压时，要特别注意避免触电危险！
- 在完成所有的测量操作后，要断开表笔与被测电路的连接。
- 在使用前测试已知电压，以确认产品功能是否正确。
- 仪表输入阻抗约为10MΩ时，这种负载在高阻抗的电路中会引起测量上的误差。大部分情况下，如果电路阻抗在10kΩ以下，误差可以忽略 (0.1%或更低)。

2. 直流电压测量

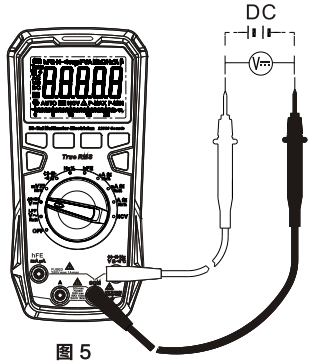

图 5

a.测量直流电电压的步骤如下：

1) 将红表笔插入 (UT61B+/UT61E+) 或 (UT61D+) 插孔，黑表笔插入“**COM**”插孔。
2) 将旋钮转至 (UT61B+) 或 (UT61D+) 或 (UT61E+) 档。
3) 短按**SELECT** 键，选择直流电电压档位。
4) 将表笔并联到待测电源或负载上，测量电压。
5) 读取显示屏上测出的电压。如果电压大于1000V，此时红色指示灯点亮，蜂鸣器发声报警。

b.测量脉动直流AC+DC电压的步骤如下 (UT61E+)：

1) 将红表笔插入 插孔，黑表笔插入“**COM**”插孔。
2) 将旋钮转至 。
3) 短按**SELECT** 键切换为AC+DC测量功能。
4) 将表笔并联到待测电源或负载上，测量电压。
5) 读取显示屏上测出的电压，AC和DC电压大约每间隔1秒交替显示。

3. 交直流mV电压测量

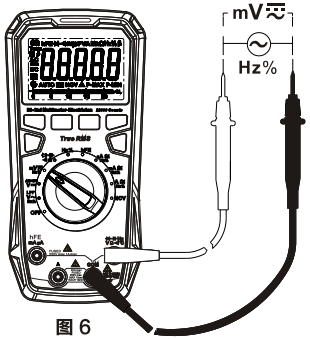

图 6

测量交直流mV电压的步骤如下：

1) 将红表笔插入 $\frac{\text{Hz}}{\text{V}\Omega\cdot\text{))}}$ (UT61B+/UT61E+) 或 $\frac{\text{Hz}}{\text{V}\Omega\cdot\text{))}\,^{\circ}\text{C}}$ (UT61D+) 插孔，黑表笔插入“COM”插孔。
2) 将旋钮转至 $\frac{\text{mV}}{\text{Hz\%}}$ 档。
3) 短按 **SELECT** 键，选择需要测量的档位(mV~、mV−)。
4) 将表笔并联到待测电源或负载上，测量电压。
5) 从显示器上直接读取被测电压值。如此时需要读取在线频率值或占空比时，短按 $\frac{\text{Hz\%}}{\text{USB}}$ 键即可切换，方便读取。但读取在线频率值或占空比对输入幅度是有要求的，详见技术指标。

⚠ 注意：

- 不要输入高于1000的电压。测量更高的电压是有可能的，但有损坏仪表的危险！
- 在测量高电压时，要特别注意避免触电危险！
- 在完成所有的测量操作后，要断开表笔与被测电路的连接。
- 在使用前测试已知电压，以确认产品功能是否正确。
- 仪表交流电压mV档输入阻抗约为10MΩ，这种负载在高阻抗的电路中会引起测量上的误差。大部分情况下，如果电路阻抗在10kΩ以下，误差可以忽略（0.1%或更低）。
- 直流电压mV档输入阻抗为无穷大（约1GΩ），测量微弱信号不衰减，因此测量精度高。但在表笔开路的情况下显示会有一些数字，这些数字出现是正常的，不影响测量读数。
- 60mV交流电压档在线频率测量仅供参考(UT61B+/UT61D+)。

4. LoZ（低阻抗）ACV测量(UT61D+)

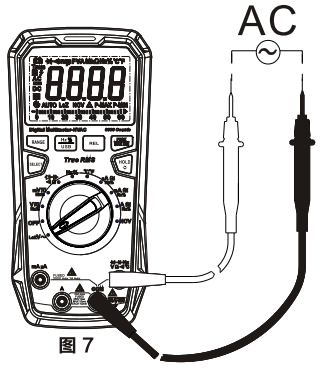

图 7

测量低阻抗交流电压步骤如下：

1) 将红表笔插入 $\frac{\text{Hz}}{\text{V}\Omega\cdot\text{))}\,^{\circ}\text{C}}$ 插孔，黑表笔插入“COM”插孔。
2) 将旋钮转至 **LozV～** 档。
3) 将表笔并联到待测电源或负载上，测量电压。
4) 读取显示屏上测出的电压。如此时需要读取在线频率值或占空比时，短按 $\frac{\text{Hz\%}}{\text{USB}}$ 键即可切换，方便读取。但读取在线频率值或占空比对输入幅度是有要求的，详见技术指标。

⚠ 注意：

- 不要输入高于1000V的电压。测量更高的电压是有可能的，但有损坏仪表的危险！
- 在测量高电压时，要特别注意避免触电危险！
- 在完成所有的测量操作后，要断开表笔与被测电路的连接。
- 在使用前测试已知电压，以确认产品功能是否正确。
- 请在使用LoZ（低阻抗）功能档后，让仪表等待3分钟后再启用。
- LoZ（低阻抗）电压测量，为了消除杂散虚假的电压，仪表的 LoZ功能在整个导线电路上提供一个低阻抗，以便获得更为准确的测量值。

5. 电阻测量

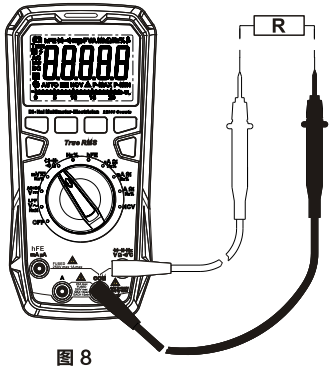

图 8

测量电阻的操作步骤如下：

1) 将红表笔插入 (UT61B+/UT61E+) 或 (UT61D+) 插孔，黑表笔插入“**COM**”插孔。
2) 将旋钮转至 Ω (UT61B+) 或 (UT61D+/UT61E+) 档，确保已切断待测电路的电源。
3) 将笔针接触想要的电路测试点，测量电阻。
4) 在显示屏上读取电阻测试值。

注意：

- 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！
- 如果被测电阻开路或阻值超过仪表最大量程时，显示屏将显示“OL”。
- 当测量在线电阻时，在测量前必须先将被测电路内所有电源关断，并将所有电容器放尽残余电荷。才能保证测量正确。
- 在低阻测量时，表笔会带来约0.1Ω～0.3Ω电阻的测量误差。为获得精确读数，应首先将表笔短路，采用REL相对值测量模式，才能确保测量精度。
- 如果表笔短路时的电阻值不小于0.5Ω时，应检查表笔是否有松脱现象或其它原因。
- 测量20MΩ以上高阻量程时，可能需要数秒时间后读数才会稳定。这对于高阻的测量属正常。

6. 电路通断

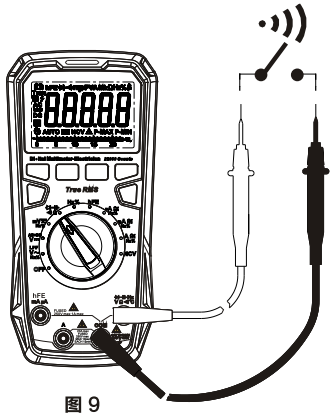

图 9

通断测量的操作步骤如下：

1) 将红表笔插入 (UT61B+/UT61E+) 或 (UT61D+) 插孔，黑表笔插入“**COM**”插孔。
2) 将旋钮转至 Ω (UT61B+) 或 (UT61D+/UT61E+) 档，确保已切断待测电路的电源。
3) 短按**SELECT**键，选择通断测量功能。
4) 将笔针接触想要的电路测试点。
5) 若测两端之间电阻<50Ω，则认为电路良好导通，蜂鸣器连续声响，此时绿色指示灯点亮。

注意：

- 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！
- 当测试在线电路通断，在测量前必须先将被测电路内所有电源关断，并将所有电容器放尽残余电荷。

7. 二极管测量

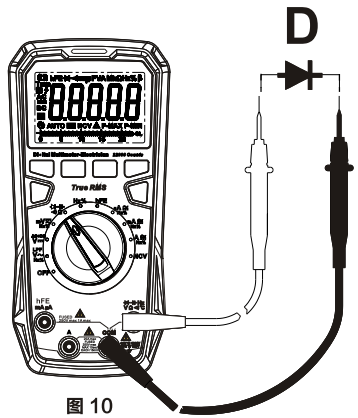

图 10

二极管测量的操作步骤如下：

1) 将红表笔插入 (UT61B+/UT61E+) 或 (UT61D+) 插孔，黑表笔插入“**COM**”插孔。
2) 将旋钮转至 (UT61B+) 或 (UT61D+/UT61E+)。
3) 短按**SELECT** 按键，选择二极管测试功能。
4) 将红色表笔笔针接到待测二极管的阳极，黑色表笔笔针接到阴极。
5) 在显示屏上读取正向偏压值。
6) 当读取值<0.12V时红色指示灯点亮表示二极管可能击穿损坏，当读取值在0.12V-2V时绿色指示灯点亮表示二极管正常(供参考)。
7) 如果被测二极管开路或极性反接时，将会显示"OL"。对硅PN结而言，一般约为500～800mV确认为正常值。

⚠ 注意：

- 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！
- 当测量在线二极管时，在测量前必须首先将被测电路内所有电源关断，并将所有电容器放尽残余电荷。
- 二极管测试电压范围约为3V。

8. 电容测量

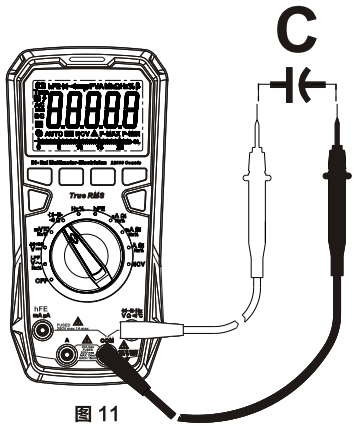

图 11

电容测量的步骤如下：

1) 将红表笔插入 (UT61B+/UT61E+) 或 (UT61D+) 插孔，黑表笔插入“**COM**”插孔。
2) 将旋钮转至 (UT61B+) 或 (UT61D+/UT61E+)档。
3) 短按**SELECT** 按键，选择电容测试功能
4) 将表笔笔针接触电容器引脚。
5) 当测量数值比较大的电容器时，测量时间约30S，待读数稳定。
6) 在显示屏上读取电容值。

⚠ 注意：

- 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！
- 测试前必须将电容全部放尽残余电荷后再进行测量，对带有高压的电容尤为重要，避免损坏仪表和伤害人身安全。
- 如果被测电容短路或容值超过仪表的最大量程，显示屏将显示“OL”。
- 对于大容量电容的测量，会需要数秒的测量时间，均属正常。
- 在无输入时仪表会显示一个固定读数，此数为仪表内部固有的电容值。对于小量程档电容的测量，被测量值一定要减去此值，才能确保测量精度。为此可以利用仪表相对测量REL功能自动减去，方便测量读数。

9. 三极管测量 (UT61E+)

三极管测量的操作步骤如下：

1) 将旋钮转至**hFE**档，确保表笔没有接任何电路。
2) 将转接座插入表笔座孔内。
3) 将被测三极管的三个引脚插入到转接插座对应的极性孔内。
4) 读取显示屏数据为测量三极管的放大倍数。

图 12

10. 频率/占空比测量

频率/占空比测量的操作步骤如下：

1) 将红表笔插入 (UT61B+/UT61E+) 或 (UT61D+) 插孔，黑表笔插入“**COM**”插孔。
2) 将旋钮转至**Hz%** 档。
3) 在显示屏上读取频率。
4) 如要进行占空比测量，则短按 键。
5) 读取显示屏上显示的占空比百分数。

注意：

- 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！

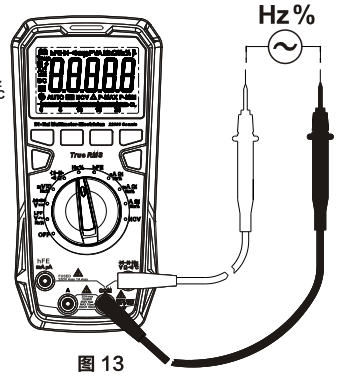

图 13

11. 温度测量(UT61D+)

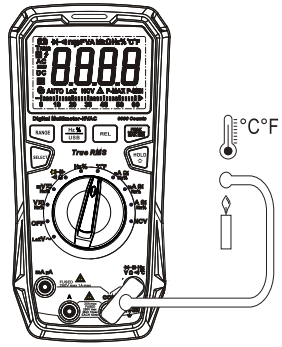

图 14

温度测量的操作步骤如下：

1) 将旋钮转至°**C**°**F**档。
2) 将K型热电偶红色端插入 插孔，黑色端插入“**COM**”插孔。
3) 将热电偶感温端贴近待测温度体的表面。
4) 待显示屏读数稳定后，读取显示屏上的摄氏度温度值。
5) 短按**SELECT** 键可以在℃与℉之间切换。

注意：

- 温度传感器：仅适用于K型(镍铬～镍硅)热电偶。
- 开机显示”0L”。
- ℉=1.8x℃+32。
- 附件配置的点式K型(镍铬～镍硅)热电偶，仅适用于230℃/446℉以下温度测量。

12. 交直流电流测量

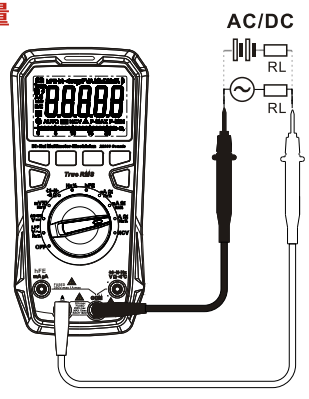

图 15

交直流电流测量操作步骤如下：

1) 根据要测量的电流将红色表笔测试线连接至“**mAμA**”或“**A**”端口，并将黑色表笔接线至“**COM**”端口。
2) 将旋钮转至 $\overset{\mu A}{\underset{Hz\%}{\cong}}$，$\overset{mA}{\underset{Hz\%}{\cong}}$，$\overset{A}{\underset{Hz\%}{\cong}}$ 三个档任意一个档位。
3) 短按**SELECT** 键，可选择交流或直流电流测量模式。
4) 断开待测的电路。然后将测试导线衔接断口并施用电源。
5) 读取显示屏上的测出电流。（在A档位测量时，电流值大>10A的电流时红色指示灯点亮）
6) 交流电流测量频率占空比，通过短按 $\overset{Hz\%}{USB}$ 键进入频率测量模式。

注意：

- 为了防止可能发生的电击，火灾或人身伤害，测量电流时，先断开电路电源，然后再将电表连接至电路中。将产品与电路串联连接。
- 在仪表串联到待测回路之前，应先将回路中的电源关闭。
- 测量时应使用正确的输入端口和功能档位，如不能估计电流的大小，应从高档量程开始测量。
- 10A、mA/μA输入插孔内部均设置有保险丝。切勿把表笔测试针并联到任何电路上，避免供电端子会损坏仪表和危及人身安全！
- A档位输入电流在輸入≤5A时允许连续测量； >5A时允许连续测量时间 ≤10秒，间隔时间：≥15分钟。当测量大电流后机内温度≥75°C时，黄灯点亮蜂鸣器同时发出"嘀－嘀"声，LCD显示“CUT”，当机内温度从≥75°C降低到<40°C时黄灯熄灭，方可测试。

13. NCV非接触电压感应测量

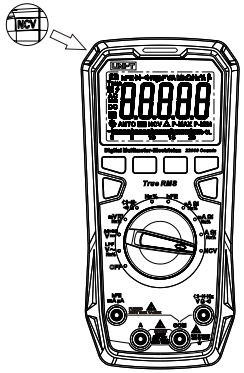

图 16

NCV非接触电压感应测量的操作步骤如下：

1) 将旋钮转至NCV档。
2) 将万用表的左上角**NCV**位置紧靠被测导线。如果被测电源线电压≥50V（频率50Hz/60Hz）红灯亮/Buzzer发音。
3) 当没有检测到电压时，LCD显示“EF”。根据检测电压的强弱，LCD显示"－"，"－ －"，"－ － －"，"－ － － －"，"－ － － － －"，红灯同时闪烁由慢变快，蜂鸣器发声由慢变快来表示不同电压极别。

注意：

- 本产品的感应位置与被测AC电源线的距离不同，感应的级别大小也会发生变化。
- 感应等级电压只供参考，不作具体测量值。感应电压的频率适用50Hz/60Hz。
- NCV功能测量时需要手握万用表壳体。

14. USB数据传输操作

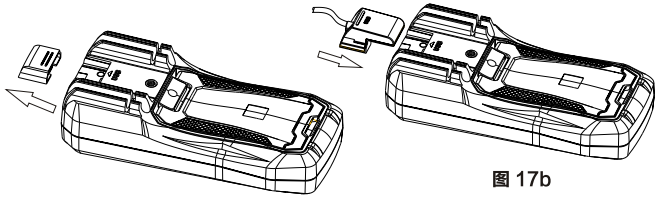

图 17a

图 17b

1) 拔出机身后前端的USB封口盖(如图17a)。
2) 将USB通信模块插入机身USB通信端口，此时LCD屏数据传输提示符会显示(如图17b)。
3) 在测量过程中如果不需要进行USB数据传输功能，可通过长按 Hz% USB 键来关闭数据通信功能，或将USB模块拔出 。此时LCD屏数据传输提示符会消失，如通过长按 Hz% USB 键关闭数据通信功能，再次打开数据通信功能可长按 Hz% USB 键或者将USB模块拔出再插入。
4) USB通信软件可在Uni-Trend官方网站进行下载（www.uni-trend.com.cn)。

15. 其它功能

1) 在测量过程中，约15分钟内无任何操作时，仪表进入“自动关机”状态以节省电能；在自动关机前蜂鸣器会连续发出5声警示，然后发1长声警示，即进入睡眠状态。在睡眠状态下点击**SELECT** 按键，仪表将会“自动唤醒”开机，并伴随蜂鸣器蜂鸣一次。如需取消自动关机功能，关机状态同时按住**SELECT** 键开机即取消自动关机功能，LCD字符 消失并伴随3声蜂鸣警示。重新开机即可恢复Auto-off自动关机功能。
2) 在测量过程提示蜂鸣警示声：
a) 当输入电压量程>1000V有报警声显示高压符，报警时同时亮红亮，警示量程处于极限。
b) 电流量程>10A有报警，报警时同时亮红亮，警示测量电流比较大注意测量时间。
3) 低电压检测：当电池低于≤4.6V±0.2V时，显示“ ”电池欠压符号。

九、综合指标

1. 信号输入端和COM端之间最大电压：详见各量程输入保护电压说明。
2. μA mA输入端子设有保险丝：1A 240V 快熔式保险丝Φ6*25mm。
3. A输入端子设有保险丝：10A 240V快熔式保险丝Φ6*25mm。
4. 显示:最大读数为:6000(UT61B+/UT61D+)、22000(UT61E+)，模拟条：31段(UT61B+/UT61D+)、44段(UT61E+)（转换速率30次/秒)。
5. 显示更新约每秒2～3次。
6. 量程：自动或手动。
7. 极性显示：自动。
8. 过量程提示：显示OL。
9. 电池欠压提示:(≤4.6V +/-0.2V)。
10. 工作温度：0℃～40℃(32℉～104℉)。
11. 存储温度：-10℃～50℃(14℉～122℉)。
12. 相对湿度：0℃～ 30℃以下≤75%，30℃～40℃≤50%。
13. 海拔高度：不超过2000m。
14. 电磁兼容性：按EN61326-1:2006;EN61326-2-2:2006标准。
15. 供电电池：AAA 1.5Vx4。
16. 外形尺寸：186x89x49(mm)。
17. 重量：400g。
18. 安全标准：IEC 61010-1：CAT III 1000V / CAT IV 600V。
19. 污染等级：2。
20. 使用信息：室内/室外使用。

十、技术指标

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

⚠ 注意：
准确度温度条件18℃至28℃，环境温度波动范围稳定在±1℃内。当温度＜18℃或＞28℃时，附加温度系数误差0.1x(指定准确度)/℃。

1.直流电压测量

UT61E+		
量程	分辨力	准确度
220.00mV	0.01mV	± (0.1%+5)
2.2000V	0.1mV	± (0.05%+5)
22.000V	1mV	
220.00V	10mV	
1000.0V	0.1V	± (0.1%+5)

UT61B+/UT61D+		
量程	分辨力	准确度
60.00mV	0.01mV	± (0.8%+5)
600.0mV	0.1mV	± (0.8%+3)
6.000V	0.001V	± (0.5%+3)
60.00V	0.01V	± (0.5%+3)
600.0V	0.1V	
1000V	1V	± (1.0%+3)

- 输入阻抗：mV量程约1GΩ，其它量程输入阻抗均约10MΩ。
- 精度范围：1%~100%，电压量程短路允许有≤5个字剩余读数。（mV量程开路会有不稳定数字显示，属正常现象）
- 最大输入电压：1000V，＞1000V有声光报警。输入＞1010V　LCD显示"OL"。
- 过载保护：1000V。

2. 交流电压测量

UT61E+			
量程	分辨力	频响	准确度
220.00mV	0.01mV	40Hz~1kHz	± (1.0%+10)
		1kHz~10kHz	± (1.5%+30)
2.2000V	0.1mV	40Hz~1kHz	± (0.8%+10)
		1kHz~10kHz	± (1.2%+50)
		40Hz~100Hz (LPF)	± (1.2%+50)
22.000V	1mV	40Hz~1kHz	± (0.8%+10)
		1kHz~10kHz	± (1.2%+50)
		40Hz~100Hz (LPF)	± (1.8%+50)
220.00V	10mV	40Hz~1kHz	± (0.8%+10)
		1kHz~10kHz	± (2.0%+50)
		40Hz~100Hz (LPF)	± (2.0%+50)
1000.0V	0.1V	40Hz~1kHz	± (1.2%+10)
		1kHz~10kHz	± (3.0%+50)
		40Hz~100Hz (LPF)	

UT61B+/UT61D+		
量程	分辨力	准确度
60.00mV	0.01mV	± (1.2%+5)
600.0mV	0.1mV	± (1.2%+5)
6.000V	0.001V	± (1.0%+3)
60.00V	0.01V	± (1.0%+3)
600.0V	0.1V	± (1.0%+3)
1000V	1V	± (1.2%+5)
LoZ ACV 600.0V (UT61D+)	0.1V	± (2.0%+5)
LoZ ACV 1000V (UT61D+)	1V	± (2.0%+5)

- 输入阻抗：输入阻抗约10MΩ。
- 显示真有效值，频率响应：40Hz～500Hz（UT61B+）、40Hz～1KHz（UT61D+）、40～10KHz（UT61E+）。
- 交流波峰因素在3000 counts测量时允许波峰因素≤3.0，满量程6000 counts交流波峰因素只能在≤1.5，非正弦波根据波峰因素按如下计算增加误差（UT61B+/UT61D+）：
  a）Add 4%在波峰因素为1～2
  b）Add 5%在波峰因素为2～2.5
  c）Add 7%在波峰因素为2.5～3
- 交流波峰因素在10000 counts测量时允许波峰因素≤2.0，满量程22000 counts交流波峰因素只能在≤1，非正弦波根据波峰因素按如下计算增加误差（UT61E+）：
  a）Add 4%在波峰因素为1～2
  b）Add 5%在波峰因素为2～2.5
  c）Add 7%在波峰因素为2.5～3
- 交流电压在线频率测量范围为：40Hz～500Hz（UT61B+）、40Hz～1KHz（UT61D+）、40Hz～10kHz（UT61E+），最小测量幅度：输入幅度≥该档最小量程×10%。占空比测量仅供参考。
- 准确度保证范围（UT61B+/UT61D+）：ACV 60mV 2%~100%，ACV其余1～100% 量程，短路允许有≤3个字剩余读数。
- 准确度保证范围（UT61E+）：1～100% 量程（40～1k Hz）（分辨力：0.1HZ），10～100% 量程（1k Hz～10kHz），短路允许有有≤10个字的剩余读数。
- 最大输入电压：1000V ，＞1000V有声光报警。输入＞1010V LCD显示"OL"。
- 过载保护：1000V。

3. AC+DC电压测量(UT61E+)

UT61E+			
量程	分辨力	频响	准确度
2.2000V	0.1mV	40Hz~500Hz	± (1.8%+70)
22.000V	1mV	40Hz~500Hz	± (1.8%+70)
220.00V	10mV	40Hz~500Hz	± (1.8%+70)
1000.0V	0.1V	40Hz~500Hz	± (4.0%+70)

- 显示正弦波真有效值。
- 输入阻抗约10MΩ。
- 保证精度要求输入信号为当前量程的10%-100%。
- ACV短路允许小于200个字。
- 过载保护：1000V。

UT61+系列使用说明书 UNI-T

4.电阻测量

UT61E+		
量程	分辨力	准确度
220.00Ω	0.01Ω	± (0.5+10)
2.2000kΩ	0.1Ω	
22.000kΩ	1Ω	
220.00kΩ	10Ω	
2.2000MΩ	100Ω	± (0.8+10)
22.000MΩ	1kΩ	± (1.5%+10)
220.00MΩ	10kΩ	± (3.0%+50)

UT61B+/UT61D+		
量程	分辨力	准确度
600.0Ω	0.1Ω	± (1.2%+2)
6.000kΩ	1Ω	± (1.0%+2)
60.00kΩ	10Ω	
600.0kΩ	100Ω	
6.000MΩ	1kΩ	± (1.2%+2)
60.00MΩ	10kΩ	± (2.0%+5)

- 600.0Ω（UT61B+/UT61D+） 220Ω（UT61E+）量程：被测值 = 测量显示值 - 表笔短路值。
- 开路电压约：1V。
- 精度范围：1%～100%。
- 过载保护：1000V。

5. 电路通断、 二极管测量

UT61B+/UT61D+/UT61E+		
量程	分辨力	备注
•))	0.1Ω	电路断开电阻值设定为：≥70Ω, 蜂鸣器不发声； 电路良好导通阻值设定为：<50Ω, 有声光报警.
▶|	0.001V	开路电压约3V, 测试正常时, 蜂鸣器会哔的一声。 短路, 蜂鸣器会长响

- 过载保护：1000V。
- 当被测二极管导通压降在0.12V～2.0V时，蜂鸣器会响”嘀”的一声，当被测二极管导通压降＜0.12V时，蜂鸣器会长鸣。

6. 三极管测量(UT61E+)

UT61E+		
量程	分辨力	备注
1000β	1β	Ib0: 约 1.8μA; Vce: 约 2.5V

- 三极管放大倍数显示数值仅供参考。

7. 电容测量

UT61E+		
量程	分辨力	准确度
22.000nF	1pF	± (3.0%+5)
220.00nF	10pF	
2.2000μF	100pF	
22.000μF	1nF	
220.00μF	10nF	± (4.0%+5)
2.2000mF	100nF	
22.000mF	1μF	± (10%+5)
220.00mF	10μF	± (20%+5)

UT61B+/D+		
量程	分辨力	准确度
60.00nF	10pF	± (3%+5)
600.0nF	100pF	
6.000μF	1nF	
60.00μF	10nF	
600.0μF	100nF	
6.000mF	1μF	± (10%+5)
60.00mF	10μF	

- 过载保护：1000V。
- 被测值=测量显示值-表笔开路值，≤1μf(UT61B+/UT61D+)、≤22nF (UT61E+)建议采用REL模式测量 扣除开路读数。
- 精度范围：1%∽100%。
- 2.2uF及以下量程精度在≤3%范围时需加10个字(UT61E+)。
- 60mF(UT61B+/UT61D+) 220mF(UT61E+) 档测量时间约20S。

8.温度测量(UT61D+)

量程		分辨力	准确度
-40~1000°C	-40~0°C	0.1°C~1°C	± (1.0%+3°C)
	0~300°C		± (1.0%+2°C)
	300~1000°C		± (1.0%+3°C)
-40~1832°F	-40~32°F	0.2°F~2°F	± (1.0%+6°F)
	32~572°F		± (1.0%+4°F)
	572~1832°F		± (1.0%+6°F)

- 过载保护：1000V

备注：附件配置的点式K型(镍铬～镍硅)热电偶，仅适用于230℃/446℉以下温度的测量。

9. 直流电流测量

UT61E+		
量程	分辨力	准确度
220.00μA	0.01μA	± (0.5%+10)
2200.0μA	0.1μA	
22.000mA	1μA	
220.00mA	10μA	
20.000A	1mA	± (1.2%+50)

UT61B+/UT61D+		
量程	分辨力	准确度
600.0μA	0.1μA	± (1.0%+2)
6000μA	1μA	
60.00mA	10μA	± (1.0%+3)
600.0mA	0.1mA	
6.000A	1mA	± (1.2%+5)
10.00A (UT61B+)	10mA	
20.00A (UT61D+)	10mA	

- 过载保护:
  μA mA量程：F1保险丝1A 240V 6*25mm
  A量程：F2保险丝10A 240V 6*25mm
- 电流量程开路允许有≦5个字（UT61B+/UT61D+）、≦10（UT61E+）个字剩余读数。
- 20A量程：输入≤5A时允许连续测量；＞5A时允许连续测量时间≤10秒，间隔时间：≥15分钟。
- 精度范围：1%～100%。

10. 交流电流测量

UT61E+			
量程	分辨力	频响	准确度
220μA	0.01μA	40Hz~1kHz	± (0.8%+10)
		1kHz~10kHz	± (3%+50)
2200μA	0.1μA	40Hz~1kHz	± (0.8%+10)
		1kHz~10kHz	± (3%+50)
22mA	1μA	40Hz~1kHz	± (1.2%+10)
		1kHz~10kHz	± (3%+50)
220mA	10μA	40Hz~1kHz	± (1.2%+10)
		1kHz~10kHz	± (3%+50)
20A	1mA	40Hz~1kHz	± (1.2%+10)
		1kHz~10kHz	± (3%+50)

UT61B+/UT61D+		
量程	分辨力	准确度
600.0μA	0.1μA	± (1.2%+5)
6000μA	1μA	
60.00mA	10μA	± (1.5%+5)
600.0mA	0.1mA	
6.000A	1mA	± (2.0%+5)
10.00A (UT61B+)	10mA	
20.00A (UT61D+)	10mA	

- ACA 频率响应：40Hz～500Hz(UT61B+)、40Hz～1KHz(UT61D+),40～10kHz(UT61E+).
- 显示正弦波真有效值。
- ACA 量程准确度保证范围(UT61B+/UT61D+)：ACA 600.0uA量程：5%～100%，其余ACA 1～100% 量程。
- ACA 量程准确度保证范围(UT61E+)：uA档最小测量电流为30uA,其余档位：1～100%量程(40～1k Hz)，10～100% 量程(1k Hz～10kHz)。
- 电流量程开路允许有≦5个字（UT61B+/UT61D+）、≦10（UT61E+）个字剩余读数。
- 交流波峰因素在3000 counts测量时允许波峰因素≤3.0,满量程6000 counts交流波峰因素只能在≤1.5,非正弦波根据波峰因素按如下计算增加误差(UT61B+/UT61D+)：

a) Add 4%在波峰因素为1～2
b) Add 5%在波峰因素为2～2.5
c) Add 7%在波峰因素为2.5～3

- 交流波峰因素在10000 counts测量时允许波峰因素≤2.0，满量程22000 counts交流波峰因素只能在≤1，非正弦波根据波峰因素按如下计算增加误差(UT61E+)：
  a) Add 4%在波峰因素为1～2
  b) Add 5%在波峰因素为2～2.5
  c) Add 7%在波峰因素为2.5～3
- 在交流电流档监测在线频率时必须满足如下要求： 频率测量：40Hz～500Hz(UT61B+)、40Hz～1KHz(UT61D+)、40Hz～10kHz(UT61E+)，最小测量幅度：输入幅度≥该档最小量程×50%。
- 交流电流档的占空比测量仅供参考
- 在交流电流档监测在线频率时精度为±(0.1%+4)，分辨率0.1HZ(UT61B+/UT61D+)。
- 20A量程：输入≤5A时允许连续测量；＞5A时允许连续测量时间≤10秒，间隔时间：≥15分钟。
- 过载保护：(同直流电流测量过载保护)

11. 频率/占空比测量

UT61E+		
量程	分辨力	准确度
10Hz~220MHZ	0.01Hz~0.01MHz	± (0.01%+5)
0.1%~99.9%	0.1%	± (2%+5)

UT61B+/UT61D+		
量程	分辨力	准确度
10.00Hz~10.00MHZ	0.01Hz~0.01MHz	± (0.1%+4)
0.1%~99.9%	0.1%	± (2.0%+5)

- 频率测量范围：10Hz～10MHz (UT61B+/UT61D+)、10Hz～220MHz(UT61E+)，
  ≤100kHz：200mVrms≤输入幅度≤20Vrms
  ＞100kHz～1MHz：600mVrms≤输入幅度≤20Vrms；
  ＞1MHz (UT61B+/UT61D+)：1Vrms≤输入幅度≤20Vrms
  ＞1MHz～40MHz(UT61E+)：1Vrms≤输入幅度≤20Vrms
  ＞40MHz 时(UT61E+)：未指定
- 占空比仅适用于方形波测量
  1Vpp≤输入幅度≤20Vpp
  频率≤10kHz 占空比10.0%-90.0%
- 过载保护：1000V。

12.LED三色功能指示表

功能	LED指示颜色	描述
NCV	灯不亮	<36V
	亮红灯	50V-1000V时红色灯闪烁由慢变快，蜂鸣器发声由慢变快。
通断	灯不亮	OL
	亮红灯	不导通（≥70Ω）
	亮绿灯	导通（<50Ω）
二极管	亮绿灯	导通（ 0.12V-2V）
	亮红灯	击穿（ <0.12V）
	灯不亮	>2V
电压	灯不亮	DCV ≤1000V, ACV ≤1000V
	亮红灯	DCV >1000V, ACV > 1000V
电流	灯不亮	≤10A
	亮红灯	>10A
大电流测量时机内温度	灯不亮	当测完大电流后机内温度从≥75℃降低到<40℃时
	亮黄灯	当测量大电流后机内温度≥75℃时，蜂鸣器同时发出"嘀一嘀"声，LCD显示 "CUT"

十一、保养和维修

⚠ **警告：在打开仪表后盖或电池盖之前，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剂清洁仪表外壳，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。
- 利用电阻测量功能档可自检内置1A和10A保险丝。具体操作见(图18a)，将红色表笔插入 (UT61B+/UT61E+)或 (UT61D+)输入端口，表笔尖插入 "mA uA" 输入端口测量阻值，若显示屏显示 "OL"，则1A保险丝熔断。将红色表笔尖插入 "A" 输入端口测量阻值，若显示屏显示 "OL"，则10A保险丝熔断。

2. 电池或保险丝管的安装或更换(图 18b)

本产品内置电池规格为：1.5Vx4 AAA电池

保险丝规格：mA输入端保险管"F1" 1A 240V 6*25mm

A输入端保险管"F2" 10A 240V 6*25mm

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。

更换电池或保险丝：

a)把电源开关置于"OFF"位置,并取出表笔测试线。

b)将本产品面板朝下，并旋开电池盒上的一颗螺丝，卸下电池盖即可更换电池和保险丝。

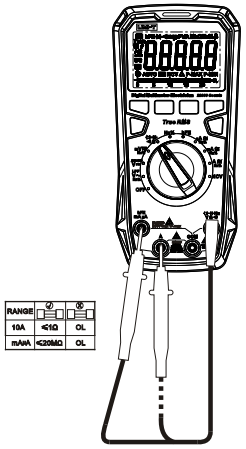

图 18a

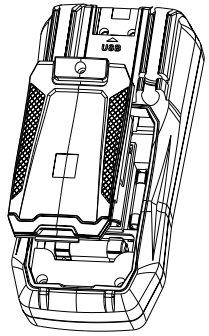

图 18b

优利德
优利德科技(中国)股份有限公司
地址:中国广东省东莞松山湖高新技术产业
开发区工业北一路6号
电话:(86-769)8572 3888
邮编: 523 808
http://www.uni-trend.com.cn
执行标准：GB-T 13978-2008

Preface

Thank you for purchasing this brand new product. In order to use this product safely and correctly, please read this manual thoroughly, especially the safety notes.

After reading this manual, it is recommended to keep the manual at an easily accessible place, preferably close to the device, for future reference.

Limited Warranty and Liability

Uni-Trend guarantees that the product is free from any defect in material and workmanship within one year from the purchase date. This warranty does not apply to damage caused by accident, negligence, misuse, modification, contamination or mishandling. The dealer shall not be entitled to give any other warranty on behalf of Uni-Trend. If you need warranty service within the warranty period, please contact your seller directly.

Uni-Trend will not be responsible for any special, indirect, incidental or subsequent damage or loss caused by using this device.

Table of Contents

I. Overview

The UT61B+/UT61D+/UT61E+ is a handheld true RMS digital multimeter with high reliability and security (UT61B+/UT61D+: 6000 counts; UT61E+: 22000 counts). With large screen, high resolution analog pointer display, full scale overload protection, and unique appearance design, it becomes a new practical electrical measuring meter. The meter can measure AC/DC voltage/current, resistance, diode, transistor hFE (UT61E+), continuity, capacitance, frequency, duty ratio, temperature (UT61D+), etc. Featuring data transmission, data hold, relative value measurement, peak measurement (UT61D+/UT61E+), internal temperature alarm, low battery indication, backlight, auto power off, and NCV functions, the meter is an ideal measuring tool for many application fields.

II. Accessories

Open the package box and take out the meter. Please double check whether the following items are missing or damaged.

1. User manual ---------- 1 pc
2. Test leads ---------- 1 pair
3. Adapter socket (UT61E+) ---------- 1 pc
4. K-type thermocouple (UT61D+) ---------- 1 pc
5. USB cable ---------- 1 pc
6. Download operation guide ---------- 1 pc
7. Warranty card ---------- 1 pc
8. 1.5V AAA batteries ---------- 4 pcs

If any of the above is missing or damaged, please contact your supplier immediately.

III. Safety Instructions

The meter is designed and manufactured according to IEC61010-1 safety standard, and conforms to CAT III 1000V, CAT IV 600V, and pollution degree 2. If the meter is used in a manner not specified by the manufacturer, the protection provided by the meter may be impaired.

1. Before use, please check if there is any item which is damaged or behaving abnormally. If any abnormal item (such as bare test lead, damaged meter casing, broken LCD, etc.) is found, please do not use the meter.
2. Do not use the meter if the rear cover or the battery cover is not completely covered up, or it may pose a shock hazard!
3. Damaged test leads must be replaced with ones of the same model or same electrical specifications.
4. During measurement, do not touch any exposed wires, connectors, unused inputs or circuits being measured.
5. Use caution when working with voltages above AC 30Vrms, 42Vpeak or DC 60V. Keep fingers behind the finger guards of the test leads to prevent electric shock.
6. If the range of the measured value cannot be determined, the meter must be operated at the maximum range.
7. Do not apply more than the rated voltage or current marked on the meter between the terminals or between any terminal and earth ground.
8. Place the function dial in the correct position before measurement.
9. Before measuring resistance, diode, continuity, or capacitance, switch off the power supply of the circuit, and fully discharge all capacitors.
10. Before measuring current, make sure the fuses are intact.
11. Do not use or store the meter in high temperature, high humidity, flammable, explosive, or strong magnetic field environments.
12. Do not change the internal circuit of the meter to avoid damage to the meter or user!
13. When " " is displayed, please replace the batteries in time to ensure measurement accuracy.
14. Turn off the meter in time after measurement. If the meter is not in use for a long time, please remove the batteries.

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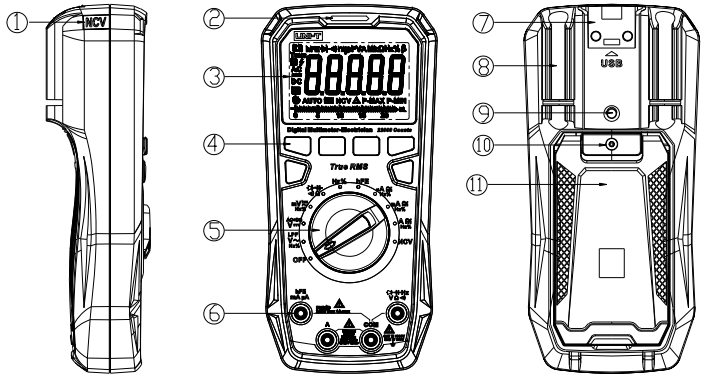
IV. Electrical Symbols

Symbol	Description
	Warning or Caution
	Caution, possibility of electric shock
	Both direct and alternating current
	Equipment protected throughout by DOUBLE INSULATION or REINFORCED INSULATION
	Earth (ground) Terminal
CAT III	It is applicable to testing and measuring circuits connected to the distribution part of the building's low-voltage MAINS installation.
CAT IV	It is applicable to testing and measuring circuits connected at the source of the building's low-voltage MAINS installation.

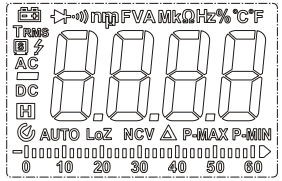
V. External Structure (Picture 1)

1. NCV detector
2. Indicator light
3. LCD display
4. Function buttons
5. Function dial
6. Input terminals
7. USB (Bluetooth) access port
8. Test lead slots
9. Nut for external holder
10. Battery compartment fixing screw
11. Tilt stand

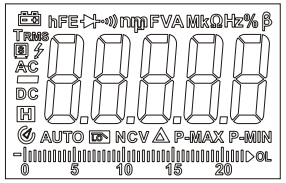


Picture 1

VI. LCD Display (Picture 2, Picture 3)



Picture 2 UT61B+/UT61D+



Picture 3 UT61E+

Symbol	Description
⚡	Measured voltage is >30V (AC or DC)
H	Data hold
−	Negative reading
AC/DC	AC/DC measurement
	Low battery indication
AUTO	Auto range
	Diode test
	Continuity test
Δ	Relative value measurement
Ω, kΩ, MΩ	Resistance units: ohm, kilohm, megaohm
mV, V	Voltage units: millivolt, volt
μA, mA, A	Current units: microampere, milliampere, ampere
nF, μF, mF	Capacitance units: nanofarad, microfarad, millifarad
Hz, %	Frequency, duty ratio
S	Data transmission
β	Transistor magnification (UT61E+)
NCV	Non-contact voltage detection
P-MAX/P-MIN	Peak measurement (UT61D+/UT61E+)
MAX/MIN	Maximum/Minimum measurement
°C/°F	Celsius/Fahrenheit (UT61D+)
LoZ	Low impedance measurement (UT61D+)
hFE	Transistor magnification measurement (UT61E+)
	Auto power off
TRMS	True RMS

VII. Function Dial and Function Buttons

1. Function Dial

Dial Position	Description
OFF	Power off
LPF V~ Hz%	AC voltage measurement/Low pass filter measurement/ Frequency and duty ratio measurement (UT61E+)
AC+DC V⎓	DC voltage measurement/AC+DC measurement (UT61E+)
V~ Hz%	AC voltage measurement/Frequency and duty ratio measurement (UT61B+)
V≂ Hz%	AC/DC voltage measurement/Frequency and duty ratio measurement (UT61D+)
mV≂ Hz%	AC/DC millivolt voltage measurement/Frequency and duty ratio measurement
•)) Ω ⊣◁⊢	Diode test/Continuity test/Resistance measurement/ Capacitance measurement (UT61D+/UT61E+)
•)) Ω	Continuity test/Resistance measurement (UT61B+)
⊣◁⊢	Diode test/Capacitance measurement (UT61B+)
hFE	Transistor magnification measurement (UT61E+)
Hz%	Frequency and duty ratio measurement
μA≂ Hz%	AC/DC microampere current measurement/ Frequency and duty ratio measurement
mA≂ Hz%	AC/DC milliampere current measurement/ Frequency and duty ratio measurement
A≂ Hz%	AC/DC ampere current measurement/Frequency and duty ratio measurement
NCV	Non-contact voltage detection

2. Function Buttons

Short press: Press a button for less than 2s.
Long press: Press a button for more than 2s.

1) 

Button
Short press to switch between functions in each compound function position.

2) 

Button
Short press to enter the manual range mode and change the range.
Long press to exit the manual range mode.

3) 

Button
Short press to switch between frequency and duty ratio measurement.
Long press to turn on/off data communication (note: only available when USB communication module is inserted into the casing).

4) 

Button
Short press to enter/exit the relative value measurement mode.

5) 

Button
Short press to cycle through the measured maximum and minimum.
Long press to cycle through the peak maximum and peak minimum (UT61D+/UT61E+).

6) 

Button
Short press to cycle through the measured maximum and minimum (UT61B+).

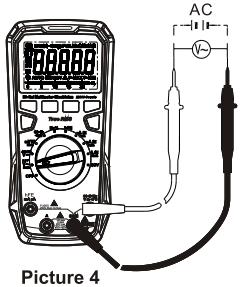
7) 

Button
Short press to hold the measurement on the display and " H " will be displayed.
Short press again to cancel data hold.
Long press to turn on/off the backlight.

VIII. Operating Instructions

Please check the internal batteries first. If " " is displayed, replace the batteries in time. Please also pay attention to the warning sign " " beside the input terminals, which indicates that the measured voltage or current must not exceed the values marked on the meter.

1. AC Voltage Measurement (Picture 4)



Picture 4

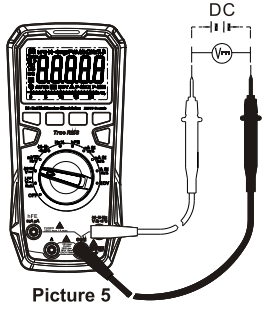
1) Insert the red test lead into the or terminal, and black test lead into the **COM** terminal.
2) Turn the function dial to the , , or position.
3) Short press the **SELECT** button to switch to AC voltage measurement or LPF ACV measurement (UT61E+, manual maximum range by default) if required.
4) Connect the test leads with the measured load or power supply in parallel.
5) Read the voltage value on the display (if the voltage is >1000V, the red indicator light will be on and the buzzer will sound an alarm).
6) Short press the Hz% / USB button to display the frequency/duty ratio of the measured voltage.

Caution:

- Do not input a voltage over 1000V or it may damage the meter.
- Be cautious to avoid electric shock when measuring high voltages.
- After completing the measurement, disconnect the test leads from the circuit under test.

- Before each use, verify meter operation by measuring a known voltage.
- The input impedance of the meter is about 10MΩ. This load effect may cause measurement errors in high-impedance circuits. In most cases, if the impedance of the circuit is below 10kΩ, the error can be ignored (≤0.1%).

2. DC Voltage Measurement (Picture 5)



Picture 5

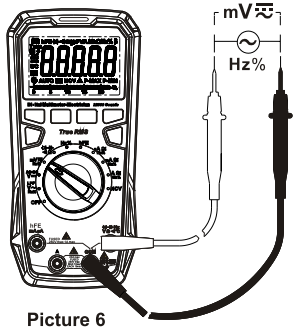
DC Voltage Measurement

1) Insert the red test lead into the or terminal, and black test lead into the **COM** terminal.
2) Turn the function dial to the **V⎓**, , or position.
3) Short press the **SELECT** button to switch to DC voltage measurement if required.
4) Connect the test leads with the measured load or power supply in parallel.
5) Read the voltage value on the display (if the voltage is >1000V, the red indicator light will be on and the buzzer will sound an alarm).

AC+DC Voltage Measurement (UT61E+)

1) Insert the red test lead into the terminal, and black test lead into the **COM** terminal.
2) Turn the function dial to the position.
3) Short press the **SELECT** button to switch to AC+DC voltage measurement.
4) Connect the test leads with the measured load or power supply in parallel.
5) Read the voltage values on the display. The AC and DC voltages are displayed alternately.

3. AC/DC Millivolt Voltage Measurement (Picture 6)



Picture 6

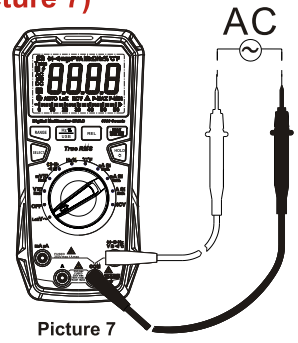
1) Insert the red test lead into the $\frac{}{V\,\Omega\,\cdot))}$ or $\frac{}{V\,\Omega\,\cdot))\,°C}$ terminal, and black test lead into the **COM** terminal.
2) Turn the function dial to the $\frac{mV}{Hz\%}$ position.
3) Short press the **SELECT** button to switch to AC/DC millivolt voltage measurement if required.
4) Connect the test leads with the measured load or power supply in parallel.
5) Read the voltage value on the display.
6) When measuring AC millivolt voltage, short press the $\frac{Hz\%}{USB}$ button to display the frequency/duty ratio of the measured voltage.

⚠ Caution:

- Do not input a voltage over 1000V or it may damage the meter.
- Be cautious to avoid electric shock when measuring high voltages.
- After completing the measurement, disconnect the test leads from the circuit under test.
- Before each use, verify meter operation by measuring a known voltage.
- The input impedance of the AC mV range is about 10MΩ. This load effect may cause measurement errors in high-impedance circuits. In most cases, if the impedance of the circuit is below 10kΩ, the error can be ignored (≤0.1%).

- The input impedance of the DC mV range is infinite (about 1GΩ), and it does not attenuate when measuring weak signals, so the measurement accuracy is high. When the test leads are open, there may be a value on the screen, but this is normal and will not affect the measuring result.
- Frequency measurement at 60mV range (AC voltage) is for reference only (UT61B+/UT61D+).

4. LoZ (low impedance) ACV Measurement (UT61D+, Picture 7)



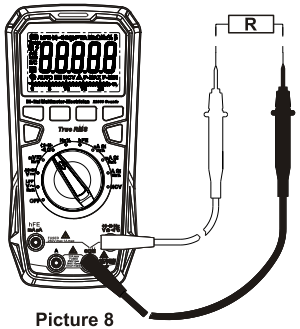
Picture 7

1) Insert the red test lead into the $\frac{}{V\,\Omega\,\cdot))\,°C}$ terminal, and black test lead into the **COM** terminal.
2) Turn the function dial to the **LozV～**position.
3) Connect the test leads with the measured load or power supply in parallel.
4) Read the voltage value on the display.
5) Short press the $\frac{Hz\%}{USB}$ button to display the frequency/duty ratio of the measured voltage.

⚠ Caution:

- Do not input a voltage over 1000V or it may damage the meter.
- Be cautious to avoid electric shock when measuring high voltages.
- After completing the measurement, disconnect the test leads from the circuit under test.
- Before each use, verify meter operation by measuring a known voltage.
- After using the LoZ function, wait 3 minutes before next operation.
- LoZ ACV measurement eliminates ghost voltage for more accurate measurement.

5. Resistance Measurement (Picture 8)



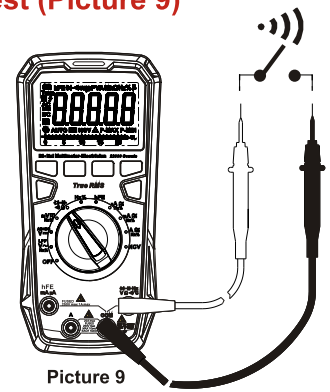
Picture 8

1) Insert the red test lead into the V Ω ·ıı)) Hz or V Ω ·ıı)) °C Hz terminal, and black test lead into the **COM** terminal.
2) Turn the function dial to the ·ıı)) Ω or ·ıı)) Ω position.
3) Touch the probes to the test points in the circuit.
4) Read the resistance value on the display.

⚠ Caution:

- Use caution when working with voltages above AC 30Vrms, 42Vpeak or DC 60V. Such voltages pose a shock hazard.
- If the measured resistor is open or the resistance exceeds the maximum range, the LCD will display “OL”.
- Before measuring resistance, switch off the power supply of the circuit, and fully discharge all capacitors.
- When measuring low resistance, the test leads will produce 0.1Ω~0.3Ω measurement error. To obtain accurate measurement, short-circuit the test leads and use the relative value measurement (REL) mode.
- If the resistance is not less than 0.5Ω when the test leads are short-circuited, please check if the test leads are loose or abnormal.
- When measuring high resistance, it is normal to take a few seconds to stabilize the reading.

6. Continuity Test (Picture 9)



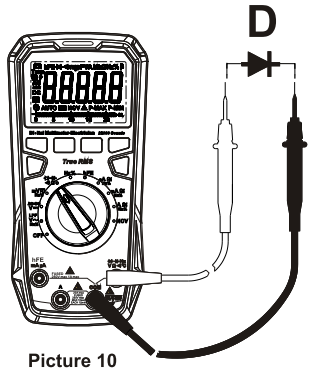
Picture 9

1) Insert the red test lead into the V Ω ·ıı)) Hz or V Ω ·ıı)) °C Hz terminal, and black test lead into the **COM** terminal.
2) Turn the function dial to the ·ıı)) Ω or ·ıı)) Ω position.
3) Short press the **SELECT** button to switch to continuity test.
4) Touch the probes to the test points in the circuit.
5) Measured resistance <50Ω: The circuit is in good conduction status; the buzzer beeps continuously and the green indicator light is on.

⚠ Caution:

- Use caution when working with voltages above AC 30Vrms, 42Vpeak or DC 60V. Such voltages pose a shock hazard.
- Before testing continuity, switch off the power supply of the circuit, and fully discharge all capacitors.

7. Diode Test (Picture 10)



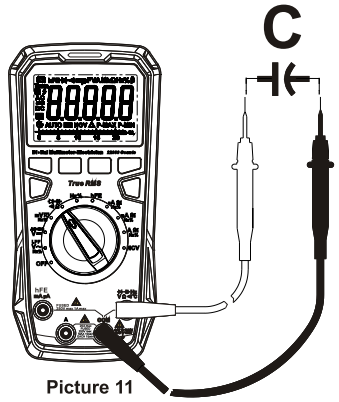
Picture 10

1) Insert the red test lead into the V Ω ·)) Hz or V Ω ·)) °C Hz terminal, and black test lead into the **COM** terminal.
2) Turn the function dial to the ⊣◀ or ·)) Ω ⊣ position.
3) Short press the **SELECT** button to switch to diode test if required.
4) Connect the red probe with the diode anode, and black probe with the diode cathode.
5) Read the forward bias value on the display.
6) Measured value <0.12V: The diode may be damaged; the red indicator light is on.
   Measured value within 0.12V~2V: The diode is normal; the green indicator light is on (for reference only).
7) If the diode is open or its polarity is reversed, the LCD will display “OL”. For silicon PN junction, the normal value is generally about 500~800 mV.

⚠ Caution:

- Use caution when working with voltages above AC 30Vrms, 42Vpeak or DC 60V. Such voltages pose a shock hazard.
- Before testing the diode, switch off the power supply of the circuit, and fully discharge all capacitors.

8. Capacitance Measurement (Picture 11)



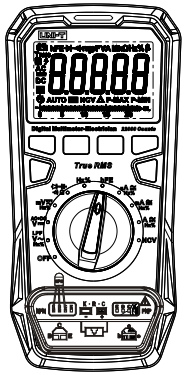
Picture 11

1) Insert the red test lead into the V Ω ·)) Hz or V Ω ·)) °C Hz terminal, and black test lead into the **COM** terminal.
2) Turn the function dial to the ⊣◀ or ·)) Ω ⊣ position.
3) Short press the **SELECT** button to switch to capacitance measurement.
4) Touch the probes to the capacitor pins.
5) Read the capacitance value on the display after it gets steady.

⚠ Caution:

- Use caution when working with voltages above AC 30Vrms, 42Vpeak or DC 60V. Such voltages pose a shock hazard.
- Before measuring, fully discharge all capacitors (especially high-voltage capacitors) to avoid damage to the meter and user.
- If the measured capacitor is short-circuited or the capacitance exceeds the maximum range, the LCD will display “OL”.
- When measuring high capacitance, it is normal to take a few seconds to stabilize the reading.
- For small capacitance measurement, the REL mode should be used to avoid the influence coming from distributed capacitance so as to obtain the correct reading.

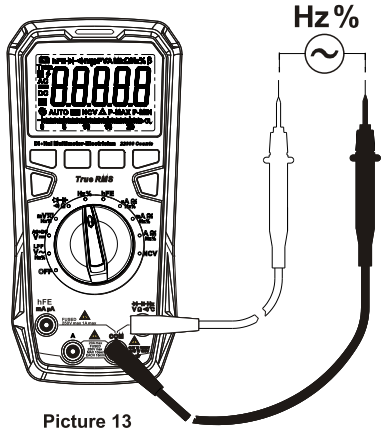
9. Transistor Magnification (hFE) Measu rement (UT61E+, Picture 12)



Picture 12

1) Turn the function dial to the **hFE** position.
2) Insert the adapter socket into the input terminals.
3) Insert the three pins of the transistor under test into the corresponding holes of the adapter socket.
4) Read the magnification of the measured transistor.

10. Frequency/Duty Ratio Measurement (Picture 13)



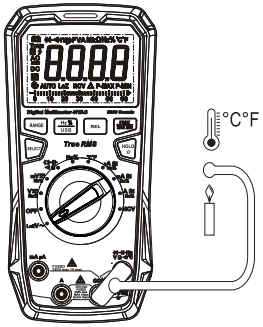
Picture 13

1) Insert the red test lead into the $\frac{\text{Hz}}{\text{V}\,\Omega\,\cdot))}$ or $\frac{\text{Hz}}{\text{V}\,\Omega\,\cdot))\,°\text{C}}$ terminal, and black test lead into the **COM** terminal.
2) Turn the function dial to the **Hz%** position.
3) Short press the $\frac{\text{Hz}\%}{\text{USB}}$ button to switch to frequency/duty ratio measurement if required.
4) Read the frequency/duty ratio value on the display.

Caution:

- Use caution when working with voltages above AC 30Vrms, 42Vpeak or DC 60V. Such voltages pose a shock hazard.

11. Temperature Measurement (UT61D+, Picture 14)



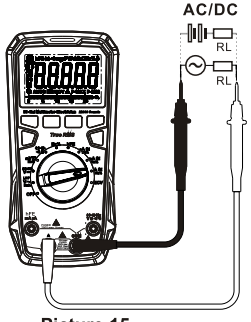
Picture 14

1) Turn the function dial to the **°C°F** position.
2) Insert the K-type thermocouple into the $\frac{+|-|Hz}{V\,\Omega\,\bullet))\,°C}$ and **COM** terminals, observing correct polarity.
3) Bring the temperature sensing end of the thermocouple close to the object surface under test.
4) Read the Celsius temperature value on the display after it gets steady.
5) Short press the **SELECT** button to switch between °C and °F.

⚠ Caution:

- Only K-type thermocouple is applicable.
- The LCD displays “OL” when the meter is turned on.
- The measured temperature should be less than 230°C/446°F (°F = °C × 1.8 + 32)

12. AC/DC Current Measurement (Picture 15)



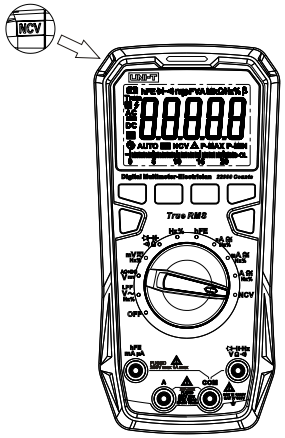
Picture 15

1) Insert the red test lead into the **mA/μA** or **A** terminal, and black test lead into the **COM** terminal.
2) Turn the function dial to the $\frac{\mu A\,\tilde{}}{Hz\%}$, $\frac{mA\,\tilde{}}{Hz\%}$, or $\frac{A\,\tilde{}}{Hz\%}$ position.
3) Short press the **SELECT** button to switch to AC/DC current measurement if required.
4) Connect the test leads with the measured load or power supply in series.
5) Read the current value on the display (if the current is >10A, the red indicator light will be on and the buzzer will sound an alarm).
6) When measuring AC current, short press the $\frac{Hz\%}{USB}$ button to display the frequency/duty ratio of the measured current.

⚠ Caution:

- To prevent possible electric shock, fire, or personal injury, switch off the power supply of the circuit, and then connect the meter with the circuit in series before measuring the current.
- If the range of the measured current is unknown, select the maximum range and then accordingly reduce.
- There are fuses inside **mA/μA** and **A** input terminals. Do not connect the test leads with any circuit in parallel.
- When the measured current is >5A, each measurement time should be ≤10s and the rest interval should be ≥15 minutes.
- When the temperature in the meter is ≥75°C after measurement of large current, the yellow indicator light will be on, the buzzer will beep, and the LCD will display “CUT”. When the temperature drops to <40°C, the yellow indicator light will be off, and the measurement can be made.

13. Non-Contact Voltage (NCV) Detection (Picture 16)



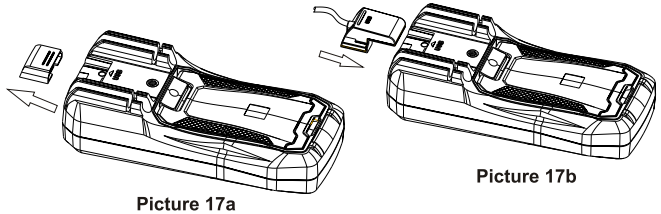
Picture 16

1) Turn the function dial to the **NCV** position.
2) Bring the NCV detector (top left corner of the meter) close to the wire (AC) under test.
3) If the voltage of the wire is ⩾50Vrms (frequency: 50Hz/60Hz), the red indicator light will be on and the buzzer will beep. If no voltage is detected, the LCD will display “EF”. As the intensity of the detected voltage increases, more segments “-” will be displayed, and the frequency for buzzer beeping and red indicator light flashing will be higher.

⚠ Caution:

- The detected voltage level varies with the distance between the NCV detector and the wire under test.
- The detected voltage level is for reference only, not for specific measurement. The frequency of the detected voltage should be 50Hz/60Hz.
- Hold the meter casing for non-contact voltage detection.

14. USB Data Transmission (Picture 17a, Picture 17b)



Picture 17a

Picture 17b

1) Pull out the USB sealing cover at the back of the meter (Picture 17a).
2) Insert the USB communication module into the USB access port of the meter and the LCD will display “S” (Picture 17b).
3) If USB data transmission is not needed during measurement, long press the Hz% / USB button or pull out the USB module to disable data transmission, and “S” will disappear.
4) To recover this function, long press the Hz% / USB button or insert the USB module.
5) The USB communication software can be downloaded from the official website of Uni-Trend (www.uni-trend.com.cn).

15. Others

1) Auto power off: During measurement, if there is no operation for 15 minutes, the meter will automatically shut down to save power; before the automatic shutdown, the buzzer will beep for warning. Users can wake the meter up by pressing the **SELECT** button. To disable the auto-off function, press and hold the **SELECT** button in the off state, and then turn on the meter. To recover the function, restart the meter.
2) Buzzer alarm during measurement: When the input voltage >1000V or current >10A, the buzzer will sound an alarm.
3) Low battery indication: When the battery voltage is ⩽4.6V ±0.2V, “ ” will be displayed.

IX. Specifications

1. General Specifications

1) Max voltage between the input terminal and **COM** terminal: Please refer to the description of input protection voltage for each range.
2) **mA/μA** input terminal protection: 1A 240V fast-acting fuse, Φ6x25mm
3) **A** input terminal protection: 10A 240V fast-acting fuse, Φ6x25mm
4) Max display: 6000 (UT61B+/UT61D+), 22000 (UT61E+)
   Analog bar: 31 segments (UT61B+/UT61D+), 44 segments (UT61E+) (conversion rate: 30 times/s).
5) Refresh rate: 2~3 times/s
6) Range: Auto/Manual
7) Polarity display: Auto
8) Over-range Indication: OL
9) Low battery indication: "🪫" is displayed.
10) Operating temperature: 0°C~40°C (32°F~104°F)
11) Storage temperature: -10°C~50°C (14°F ~122°F)
12) Relative humidity: ≤75% at 0˚C~30˚C; ≤50% at 30˚C~40˚C
13) Operating altitude: ≤2000m
14) Electromagnetic compatibility: Conforms to EN61326-1:2006 and EN61326-2-2:2006 standards
15) Battery: 4×1.5V AAA
16) Dimensions: 186mm×89mm×49mm
17) Weight: 400g
18) Safety standard: IEC 61010-1: CAT III 1000V/CAT IV 600V
19) Pollution degree: 2
20) Information of usage: Indoor and outdoor

2. Electrical Specifications

Accuracy: ± (a% of reading + b digits), 1 year warranty
Ambient temperature: 23°C ± 5°C (73.4°F ± 9°F) Relative humidity: ≤75%

⚠ **Caution:**
To ensure measurement accuracy, the operating temperature should be within 18°C~28°C and the fluctuation range should be within ±1°C. When the temperature is <18°C or >28°C, add temperature coefficient error: 0.1 x (specified accuracy)/ °C.

1) DC Voltage

UT61E+		
Range	Resolution	Accuracy
220.00mV	0.01mV	± (0.1%+5)
2.2000V	0.1mV	± (0.05%+5)
22.000V	1mV	
220.00V	10mV	
1000.0V	0.1V	± (0.1%+5)

UT61B+/UT61D+		
Range	Resolution	Accuracy
60.00mV	0.01mV	± (0.8%+5)
600.0mV	0.1mV	± (0.8%+3)
6.000V	0.001V	± (0.5%+3)
60.00V	0.01V	± (0.5%+3)
600.0V	0.1V	
1000V	1V	± (1.0%+3)

- Input impedance: About 1GΩ for mV range, about 10MΩ for other ranges
- Accuracy guarantee: 1%~100% of range; short circuit allows least significant digit ≤5
- Max input voltage: 1000V (if the voltage is >1000V, the red indicator light will be on and the buzzer will sound an alarm; if the voltage is >1010V, the LCD will display "OL")
- Overload protection: 1000V

2) AC Voltage

UT61E+			
Range	Resolution	Frequency response	Accuracy
220.00mV	0.01mV	40Hz~1kHz	± (1.0%+10)
		1kHz~10kHz	± (1.5%+30)
2.2000V	0.1mV	40Hz~1kHz	± (0.8%+10)
		1kHz~10kHz	± (1.2%+50)
		40Hz~100Hz (LPF)	± (1.2%+50)
22.000V	1mV	40Hz~1kHz	± (0.8%+10)
		1kHz~10kHz	± (1.2%+50)
		40Hz~100Hz (LPF)	± (1.8%+50)
220.00V	10mV	40Hz~1kHz	± (0.8%+10)
		1kHz~10kHz	± (2.0%+50)
		40Hz~100Hz (LPF)	± (2.0%+50)
1000.0V	0.1V	40Hz~1kHz	± (1.2%+10)
		1kHz~10kHz	± (3.0%+50)
		40Hz~100Hz (LPF)	

UT61B+/UT61D+		
Range	Resolution	Accuracy
60.00mV	0.01mV	± (1.2%+5)
600.0mV	0.1mV	± (1.2%+5)
6.000V	0.001V	± (1.0%+3)
60.00V	0.01V	± (1.0%+3)
600.0V	0.1V	± (1.0%+3)
1000V	1V	± (1.2%+5)
LoZ ACV 600.0V (UT61D+)	0.1V	± (2.0%+5)
LoZ ACV 1000V (UT61D+)	1V	± (2.0%+5)

- Input impedance: About 10MΩ
- Display: True RMS
- Frequency response: 40Hz~500Hz (UT61B+), 40Hz~1kHz (UT61D+), 40Hz~10kHz (UT61E+)
- The AC crest factor can be ⩽3.0 at 3000 counts, and can only be ⩽1.5 at 6000 counts. The additional error should be added according to the crest factor of a non-sinusoidal wave as follows (UT61B+/UT61D+):

a) Add 4% when crest factor is 1~2
b) Add 5% when crest factor is 2~2.5
c) Add 7% when crest factor is 2.5~3

- The AC crest factor can be ⩽2.0 at 10000 counts, and can only be ⩽1 at 22000 counts. The additional error should be added according to the crest factor of a non-sinusoidal wave as follows (UT61E+):

a) Add 4% when crest factor is 1~2
b) Add 5% when crest factor is 2~2.5
c) Add 7% when crest factor is 2.5~3

- Frequency measurement range: 40Hz~500Hz (UT61B+), 40Hz~1kHz (UT61D+), 40Hz~10kHz (UT61E+); input amplitude: ⩾10% of voltage range Duty ratio is for reference only.
- Accuracy guarantee (UT61B+/UT61D+): 2%~100% of 60mV range, 1%~100% of other ranges; short circuit allows least significant digit ⩽3
- Accuracy guarantee (UT61E+): 1%~100% of range at 40Hz~1kHz, 10%~100% of range at 1kHz~10kHz; short circuit allows least significant digit ⩽10
- Max input voltage: 1000V (if the voltage is >1000V, the red indicator light will be on and the buzzer will sound an alarm; if the voltage is >1010V, the LCD will display “OL”)
- Overload protection: 1000V

3) AC+DC Voltage (UT61E+)

UT61E+			
Range	Resolution	Frequency response	Accuracy
2.2000V	0.1mV	40Hz~500Hz	± (1.8%+70)
22.000V	1mV	40Hz~500Hz	± (1.8%+70)
220.00V	10mV	40Hz~500Hz	± (1.8%+70)
1000.0V	0.1V	40Hz~500Hz	± (4.0%+70)

- AC voltage display: True RMS
- Input impedance: About 10MΩ
- Accuracy guarantee: 10%~100% of range
- For AC voltage, short circuit allows least significant digit ⩽200
- Overload protection: 1000V

4) Resistance

UT61E+		
Range	Resolution	Accuracy
220.00Ω	0.01Ω	± (0.5+10)
2.2000kΩ	0.1Ω	
22.000kΩ	1Ω	
220.00kΩ	10Ω	
2.2000MΩ	100Ω	± (0.8+10)
22.000MΩ	1kΩ	± (1.5%+10)
220.00MΩ	10kΩ	± (3.0%+50)

UT61B+/UT61D+		
Range	Resolution	Accuracy
600.0Ω	0.1Ω	± (1.2%+2)
6.000kΩ	1Ω	± (1.0%+2)
60.00kΩ	10Ω	
600.0kΩ	100Ω	
6.000MΩ	1kΩ	± (1.2%+2)
60.00MΩ	10kΩ	± (2.0%+5)

- Measurement result = displayed value – resistance of shorted test leads
- Open circuit voltage: About 1V
- Accuracy guarantee: 1%~100% of range
- Overload protection: 1000V

5) Continuity and Diode

UT61B+/UT61D+/UT61E+		
Range	Resolution	Remarks
	0.1Ω	Broken circuit: Resistance ⩾70Ω, no beep Well-connected circuit: Resistance <50Ω, audio/visual alarm
	0.001V	Open circuit voltage: About 3V For normal diodes, the buzzer will beep once. For short circuit, the buzzer will beep for a long time.

- Overload protection: 1000V
- When the forward voltage drop is within 0.12V~2V, the buzzer will beep once. When the forward voltage drop is <0.12V, the buzzer will beep for a long time.

6) Transistor Magnification (UT61E+)

UT61E+		
Range	Resolution	Remarks
1000β	1β	Ib0: About 1.8μA; Vce: About 2.5V

- The displayed value of the transistor magnification is for reference only.

7) Capacitance

UT61E+		
Range	Resolution	Accuracy
22.000nF	1pF	± (3.0%+5)
220.00nF	10pF	
2.2000μF	100pF	
22.000μF	1nF	
220.00μF	10nF	± (4.0%+5)
2.2000mF	100nF	
22.000mF	1μF	± (10%+5)
220.00mF	10μF	± (20%+5)

UT61B+/UT61D+		
Range	Resolution	Accuracy
60.00nF	10pF	± (3%+5)
600.0nF	100pF	
6.000μF	1nF	
60.00μF	10nF	
600.0μF	100nF	
6.000mF	1μF	± (10%+5)
60.00mF	10μF	

- Overload protection: 1000V
- Measurement result = displayed value – capacitance of open-circuit test leads
- For capacitance ⩽1μF (UT61B+/UT61D+) and ⩽22nF (UT61E+), it is recommended to use the REL mode to deduct the open circuit reading.
- Accuracy guarantee: 1%~100% of range
- For ranges of 2.2μF and below, when the accuracy is ⩽3%, 10 digits should be added (UT61E+).
- For ranges of 60mF (UT61B+/UT61D+) and 220mF (UT61E+), the measurement time is about 20s.

8) Temperature

Range		Resolution	Accuracy
-40~1000°C	-40~0°C	0.1°C~1°C	± (1.0%+3°C)
	0~300°C		± (1.0%+2°C)
	300~1000°C		± (1.0%+3°C)
-40~1832°F	-40~32°F	0.2°F~2°F	± (1.0%+6°F)
	32~572°F		± (1.0%+4°F)
	572~1832°F		± (1.0%+6°F)

- The measured temperature should be less than 230°C/446°F.

9) DC Current

UT61E+		
Range	Resolution	Accuracy
220.00μA	0.01μA	± (0.5%+10)
2200.0μA	0.1μA	
22.000mA	1μA	
220.00mA	10μA	
20.000A	1mA	± (1.2%+50)

UT61B+/UT61D+		
Range	Resolution	Accuracy
600.0μA	0.1μA	± (1.0%+2)
6000μA	1μA	
60.00mA	10μA	± (1.0%+3)
600.0mA	0.1mA	
6.000A	1mA	± (1.2%+5)
10.00A (UT61B+)	10mA	
20.00A (UT61D+)	10mA	

- Overload protection:
  mA/μA range: F1 Fuse 1A 240V Φ6x25mm
  A range: F2 Fuse 10A 240V Φ6x25mm
- Open circuit allows least significant digit ⩽5 (UT61B+/UT61D+) and ⩽10 (UT61E+).
- Accuracy guarantee: 1%~100% of range

10) AC Current

UT61E+			
Range	Resolution	Frequency response	Accuracy
220μA	0.01μA	40Hz~1kHz	± (0.8%+10)
		1kHz~10kHz	± (3%+50)
2200μA	0.1μA	40Hz~1kHz	± (0.8%+10)
		1kHz~10kHz	± (3%+50)
22mA	1μA	40Hz~1kHz	± (1.2%+10)
		1kHz~10kHz	± (3%+50)
220mA	10μA	40Hz~1kHz	± (1.2%+10)
		1kHz~10kHz	± (3%+50)
20A	1mA	40Hz~1kHz	± (1.2%+10)
		1kHz~10kHz	± (3%+50)

UT61B+/UT61D+		
Range	Resolution	Accuracy
600.0μA	0.1μA	± (1.2%+5)
6000μA	1μA	
60.00mA	10μA	± (1.5%+5)
600.0mA	0.1mA	
6.000A	1mA	± (2.0%+5)
10.00A (UT61B+)	10mA	
20.00A (UT61D+)	10mA	

- Display: True RMS
- Frequency response: 40Hz~500Hz (UT61B+), 40Hz~1kHz (UT61D+), 40Hz~10kHz (UT61E+)
- Accuracy guarantee (UT61B+/UT61D+): 5%~100% of 600.0μA range, 1%~100% of other ranges; open circuit allows least significant digit ≤5
  Accuracy guarantee (UT61E+): 1%~100% of range at 40Hz~1kHz, 10%~100% of range at 1kHz~10kHz (the minimum measured current at μA ranges is 30μA); open circuit allows least significant digit ≤10
- The AC crest factor can be ≤3.0 at 3000 counts, and can only be ≤1.5 at 6000 counts. The additional error should be added according to the crest factor of a non-sinusoidal wave as follows (UT61B+/UT61D+):

a) Add 4% when crest factor is 1~2
b) Add 5% when crest factor is 2~2.5
c) Add 7% when crest factor is 2.5~3

- The AC crest factor can be ≤2.0 at 10000 counts, and can only be ≤1 at 22000 counts. The additional error should be added according to the crest factor of a non-sinusoidal wave as follows (UT61E+):

a) Add 4% when crest factor is 1~2
b) Add 5% when crest factor is 2~2.5
c) Add 7% when crest factor is 2.5~3

- Frequency measurement range: 40Hz~500Hz (UT61B+), 40Hz~1kHz (UT61D+), 40Hz~10kHz (UT61E+); input amplitude: ≥50% of current range.
  Duty ratio is for reference only.
- Frequency accuracy: ± (0.1%+4); resolution: 0.1Hz (UT61B+/UT61D+)
- Overload protection: Same as that for DC current

11) Frequency/Duty Ratio

UT61E+		
Range	Resolution	Accuracy
10Hz~220MHZ	0.01Hz~0.01MHz	± (0.01%+5)
0.1%~99.9%	0.1%	± (2%+5)

UT61B+/UT61D+		
Range	Resolution	Accuracy
10.00Hz~10.00MHz	0.01Hz~0.01MHz	± (0.1%+4)
0.1%~99.9%	0.1%	± (2.0%+5)

- Frequency input amplitude:
  ≤100kHz: 200mVrms ≤ input amplitude ≤ 20Vrms
  >100kHz~1MHz: 600mVrms ≤ input amplitude ≤ 20Vrms
  >1MHz (UT61B+/UT61D+): 1Vrms ≤ input amplitude ≤ 20Vrms
  >1MHz~40MHz (UT61E+): 1Vrms ≤ input amplitude ≤ 20Vrms
  >40MHz (UT61E+): Not specified
- Duty ratio measurement is only applicable to square waves.
  1Vpp ≤ input amplitude ≤ 20Vpp
  Frequency ≤10kHz, duty ratio: 10.0% ~ 90.0%
- Overload protection: 1000V

12) Indicator Light

Function	Status	Description
NCV	Off	<36V
	On, red	50V~1000V (the red indicator light flashes from slow to fast)
Continuity	Off	OL
	On, red	No continuity (≥70Ω)
	On, green	Continuity (<50Ω)
Diode	Off	>2V
	On, red	Breakdown (<0.12V)
	On, green	Conduction (0.12V~2V)
AC/DC voltage	Off	≤1000V
	On, red	>1000V
Current	Off	≤10A
	On, red	>10A
Internal temperature during AC/DC current measurement	Off	The temperature in the meter drops to <40°C after measurement of large current.
	On, yellow	The temperature in the meter is ≥75°C after measurement of large current.

X. Maintenance

⚠ **Warning: Before opening the rear cover or battery cover of the meter, switch off the power supply and remove the test leads.**

1. General Maintenance

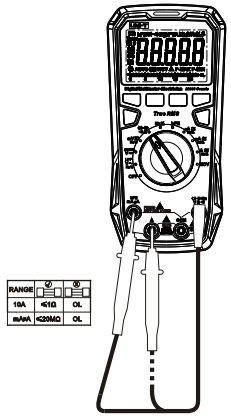
1) Clean the meter casing with a damp cloth and mild detergent. Do not use abrasives or solvents!
2) If there is any malfunction, stop using the meter and send it for maintenance.
3) The maintenance and service must be implemented by qualified professionals or designated departments.

4) Resistance measurement can be used to check the built-in 1A and 10A fuses. Operation (Picture 18a): Insert the red test lead into the terminal or terminal. Insert the red probe into the **mA/μA** input terminal to measure the resistance. If the LCD displays “OL”, the 1A fuse is blown. Insert the red probe into the **A** input terminal to measure the resistance. If the LCD displays “OL”, the 10A fuse is blown.

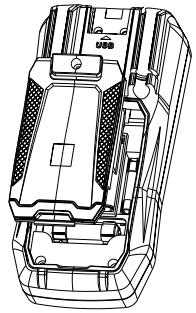
2. Battery/Fuse Replacement (Picture 18b)

Battery: 4×1.5V AAA batteries
Fuse: F1 Fuse 1A 240V Φ6x25mm (mA/μA input terminal)
F2 Fuse 10A 240V Φ6x25mm (A input terminal)
When “” is displayed, please replace the batteries in time to ensure measurement accuracy.

Replacement steps:
1) Turn the function dial to the "OFF" position, and remove the test leads.
2) Unscrew and remove the battery cover to replace the batteries and fuses.



Picture 18a



Picture 18b

The contents of this manual are subject to change without prior notice.

UT61+ Series User Manual

UNI-T
UNI-TREND TECHNOLOGY (CHINA) CO., LTD.
No. 6, Gong Ye Bei 1st Road,
Songshan Lake National High-Tech Industrial
Development Zone, Dongguan City,
Guangdong Province, China
Made in China

彩盒 菲林做货要求

序号	项目	内容	备注
1	尺寸	尺寸:110*150mm	
2	材质	封面128铜板+80g铜板	
3	颜色	四色印刷	
4	外观要求	完整清晰、版面整洁，无斑墨、残损、毛边、刀线错位等缺陷。	
5	装订方式	胶粘（根据需求可自行调整书籍厚度）	
6	表面处理		
7	其它	无	
版本		REV0	
DWH 设 计	宣浩	MODEL 机型: Ut61+中英文	Part NO. 物料编号: 110401109323X
CHK 审核		UNI-T 优利德科技（中国）有限公司 UNI-TREND TECHNOLOGY (CHINA) LIMITED	
APPRO. 批 准			