

## TK15H 电流型电池容量显示表 库仑计

# 用户手册

V3.5

### 产品示意图



### 应用范围

本产品为高精度电流采集型电池电量计(也称库仑计)。能准确检测电池组的实时电压、电流、功率、真实容量、剩余使用时间等参数,随时了解电池的工作状态。可用于使用电池设备的电动车、房车、应急电源、储能电源、测量设备、医疗设备、各种仪器仪表等产品。

### 适用电池规格

均可使用工作电压在8V~120V的锂电池、磷酸铁锂、铅酸、镍氢等各种电池组,注意本产品必须配合采样器。

### 首次使用方法

1.接线并检查电流:  
按照[接线方法]图示连接后通电,屏幕应能显示。若无显示应断电检查连接是否正确,再对电池进行放电或充电并检查显示电流值或功率值和实际值是否一致,若误差较大请检查接线是否正确。(确保流过电池的所有电流都经过采样器!)

2.电池实际有效容量的检测和设置:  
首次使用或若是更换电池后需要正确设置电池的实际有效容量值(CAP值),见[使用设置]。  
如电池的有效容量值已知,根据[使用设置]完成有效容量值设置,充满电满,见[容量归位]。

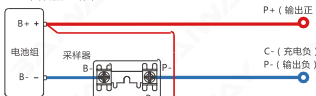
如电池的有效容量未知,需按以下步骤检测:  
A. 进入容量设置界面,将容量值尽量设大(例如预设20Ah的设成30Ah);  
B. 将电池组放空时把表容量置零,再对电池组进行充电;  
C. 充满后将显示的容量值设置为电量表的CAP有效容量值。

3.容量归位(电池容量清零或满容量设置):  
A.将电池放空(空)电后长按▽键,置零容量0%;  
B.或将电池充满电后长按△键,置满容量100%。

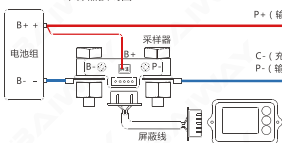
### 接线方法

1. 配套采样器必须串联到电池组的负极回路中。采样器上B-端连接电池组负极B-,P-端连接放电的负极P-/C-。
2. 取一根0.3-0.5mm<sup>2</sup>红色导线将电池正极和采样器B+连接,用于屏幕供电。
3. 用屏蔽线将采样器和电量表相连,确认无误后,通电即可。
4. 接线原则:确保流过电池的所有电流都经过采样器!

50A采样器接线图



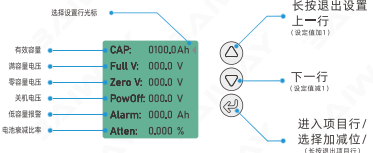
100A/350A采样器接线图



注意:请严格按照接线图接线,采样器必须串联在电池的负极回路中,严禁连接到正极回路!屏蔽线不能自行延长。

### 使用设置

1. 长按<键>2秒进入设置界面



2. 有效容量、电压和报警设置:

### CAP

### FULL V

### ZERO V

### PowerOff

### Alarm

### Atten

有效容量:出厂时为初始容量,请根据电池组实际真实有效容量设置,否则容量百分比显示会不正确;  
满容量电压:高于此电压时容量自动置为100%(置满);  
零容量电压:低于此电压时容量自动置为0%(清零);  
关机电压:低于此电压时背光与液晶均关闭,无显示;  
低容量报警:低于此容量时容量数值闪烁;  
电池衰减比率:电池累计每循环一次CAP容量后,按照此比率对CAP值进行自动变更。

### 注意事项:

在未了解电池组电压特性(充满电压和放空电压)情况下,请勿设置FULL V 和 ZERO V。FULL V和ZERO V出厂默认为0V,即无效。

### 使用说明

1. 进行充电和放电时库仑计必须处于工作状态,否则不能准确计算电池容量。本产品为低功耗设计,背光不亮(待机)时功耗很低,供电B+尽量不接在电源开关后,即始终保持通电状态。
2. 连接负载,当放电电流>背光开启电流时,背光开启(若背光闪烁,说明采样器的B-和P-接反),指示电池在放电,并显示放电电流和剩余放电时间。若负载电流波动较大,时间也会波动,属正常现象。
3. 断开负载,连接充电器,当充电电流>背光开启电流时,背光闪烁(若背光常亮,说明采样器的B-和P-接反),指示电池在充电,并显示充电电流和剩余充电时间。
4. 充电或放电电流值<背光关闭电流时,将进入低功耗状态,背光关闭。
5. 如使用一段时间后百分比和容量值出现偏差,可进行归位(见[首次使用方法]→[容量归位])。如果仍出现偏差,电池容量可能衰减,需要重新进行电池容量校正(见[首次使用方法]→[电池有效容量的检测和设置])。
6. 本产品具有断电容量记忆功能。
7. 在电流变化剧烈的场合可能产生一定的误差,影响容量值。

### 低功耗 休眠/关机

当电池电流<开启电流,电量表将进入低功耗休眠状态,背光关闭,电量表不工作(不采集容量),但仍显示电池参数,如设置了关机电压,且电池电压<关机电压,则进入关机状态。

以下状态可以唤醒休眠或退出关机:

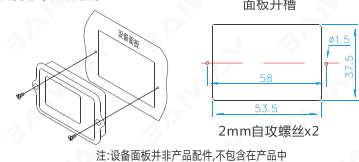
1. 当电池电流>开启电流或按下任意键,电量表自动唤醒工作且背光亮起;
2. 当电池电压>关机电压或按下任意键,或者电池电流>开启电流都将退出关机状态;

### 调整背光亮度

点按▽或△键降低或增加背光亮度。

### 安装方式

在要安装的设备面板上开一个矩形孔和两个螺丝孔,将显示器置于要安装的设备面板正面,从设备面板的正面嵌入式安装,再从正面用自攻螺丝将TK15与设备面板固定。如下图所示:



### 技术参数

参数	最小值	常规值	最大值	单位
工作电压	8.0	50.0	120.0	V
工作功耗		6.0	8.0	mA
静态功耗		0.5	0.8	mA
关机功耗		50		μA
电压采集精度		±1.0		%
电流采集精度		±1.0		%
容量采集精度		±1.0		%
背光开启电流(50A规格)		50		mA
背光开启电流(>50A规格)		100		mA
容量检测范围	0.1	100	9999.0	Ah
50A采样器电流	0	50.0	75.0	A
100A采样器电流	0	100.0	150.0	A
350A采样器电流	0	350.0	500.0	A
使用环境温度范围	-10	20	60	°C
重量(50A/100A/350A)		150/220/360		g
屏幕尺寸		66*40*14		mm

注意:本产品需配合采样器使用,不同规格采样器与电量表禁止混用。采样器为发热部件,尽量安装在空气流通处,严禁包裹盖!

按照最大电流长期使用,务必保持通风和散热。

### 注意事项及质保

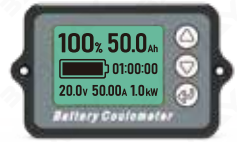
本产品不能在阳光下长期暴晒,不能长时间暴露在低于-10°C和高于50°C的极端条件下,否则将缩短显示器液晶屏的使用寿命。

本产品自原始购买之日起享有1年保修期,保修期内出现非人为质量问题,均可免费维修。

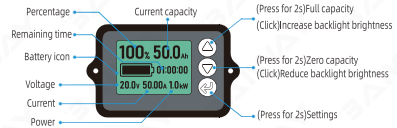
本产品可能会技术改进或更新,如果您购买的产品与本手册中描述的产品外观、技术参数有出入,请以实物或网站介绍为准。

# TK15H current battery capacity indicator Coulometer

## USER MANUAL



### Product indication



### Application range

This product is a battery fuel gauge with high precision current acquisition (also known as coulomb meter). It can accurately detect the voltage, current, power, real capacity and remaining usage time of the battery pack in real time etc. You can always know the working status of the battery at any time. It is suitable for electric vehicles, emergency power supplies, energy storage power supplies, measuring equipment, medical equipment, various instruments and other products that use battery.

### Applicable battery specifications

It is suitable for various battery packs such as lithium batteries, Touring car, lithium iron phosphate, lead acid, and nickel hydrogen with a working voltage of 8V to 120V. Note that this product must be used with the sampler.

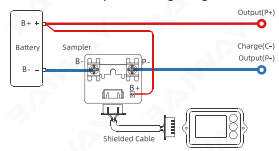
### First use method

- Wiring and checking the current  
Power on after completing the connection as [wiring method] shown. The screen should be able to display. If there is no display, the power should be turned off to check whether the connection is correct or not. Then discharge or charge the battery and check whether the displayed current value or power value is consistent with the actual value. If the error is large, please check if the wiring is correct. **(Make sure that all current flowing through the battery passes through the sampler.)**
- Detection and setting of battery actual effective capacity  
The actual effective capacity (CAP value) of the battery should be set correctly when the battery is used for the first time or replaced, see [Usage Settings].  
If the effective capacity value of the battery is known, complete the effective capacity setting according to the [Use settings], and set it to full when the battery is fully charged, see [Capacity homing].  
If the effective capacity of the battery is unknown, you need to follow the steps below:  
A: Enter the capacity setting interface and set the capacity value as large as possible (For example, it is set to 30Ah if the estimated value is 20Ah.);  
B: Empty the battery pack and at the same time clear the capacity value to 0%, and then charge the battery pack;  
C: After full charge, set the displayed capacity value to the CAP effective capacity value of the electricity meter.
- Capacity Homing (The battery capacity is cleared or full capacity setting):  
A. Press and hold the button  $\nabla$  after the battery is discharged (empty), then the capacity value is cleared to 0%;  
B. Or Press and hold the button  $\Delta$  after the battery is full charged and then the capacity value is set to 100%.

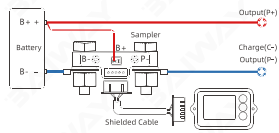
### Wiring method

- The sampler supplied with this product must be connected in series to the negative circuit of the battery pack. The B- of the sampler is connected to the negative B- of the battery pack. The P- of the sampler is connected to the negative P-/C- of the battery pack.
- Take a red wire (20-22AWG) and connect the battery positive to the sampler B+ for screen power supply.
- Use a shielded cable to connect the sampler to the meter. After confirming that it is correct, power on.
- Wiring principle: **Make sure that all current flowing through the battery passes through the sampler.**

#### 50A Sampler wiring diagram



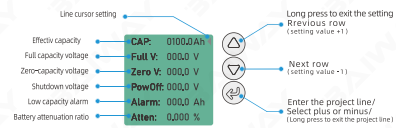
#### 100A/350A Sampler wiring diagram



Note: Please wire strictly as shown. The sampler must be connected in series with the negative circuit of the battery. It is strictly forbidden to connect the positive circuit. Shielded wires cannot be extended by yourselves.

### Use settings

- Press and hold the button  $\nabla$  for 2s to enter the setting interface :



- Effective capacity, voltage and alarm setting

### CAP

Effective capacity: It is the initial capacity at the factory. Please set according to the actual, real and effective capacity of the battery pack, otherwise the display of capacity percentage will be incorrect;

### Full V

Full capacity voltage: It will be automatically set to 100% if above this voltage capacity(Fill up);

### Zero V

Zero-capacity voltage: It will be automatically set to 0% if below this voltage capacity(Zero clearing);

### PowerOff

Shutdown voltage: Backlight and LCD off and no display if below this capacity;

### Alarm

Low capacity alarm: The capacity value will flash if below this capacity;

### Atten

Battery attenuation ratio: After the battery Capacity cumulatively once per cycle, The capacity value is automatically changed according to this ratio.

#### Precautions:

Do not set Full V and Zero V without understanding the voltage characteristics of the battery pack (full voltage and vent voltage). The factory default of Full V and Zero V is 0V, which is invalid.

### Instructions for use

- The coulombmeter must be in working condition when charging or discharging, otherwise the battery capacity cannot be accurately calculated. It's designed for low power consumption. When the backlight is not bright (standby), the power consumption is very low. Don't connect the power supply B+ behind the power switch, always keep the power on.
- When connect the load. The backlight turns on (the sampler's B- and P- are reversed if the backlight flashes) indicating that the battery is discharging when the discharge current > the backlight turn-on current. And display the discharge current and the remaining discharge time. If the load current fluctuates greatly, the time will also fluctuate, which is a normal phenomenon.
- Disconnect the load and connect the charger. When the charging current > the backlight turn-on current, the backlight flashes (if the backlight is always on, it means that the B- and P- of the sampler are connected reversely), indicating that the battery is charging. And display the charging current and the remaining charging time.
- It will enter low power consumption and the backlight will be turned off when the charge or discharge current < the backlight turn-off current.
- If the percentage and capacity values deviate after a period of use, it can be reset ( see [first use method] → [capacity reset] ). If the deviation still occurs, the battery capacity may decay, and the battery capacity needs to be corrected again ( see [first use method] → [detection and setting of battery effective capacity] ).
- This product has a power-off capacity memory function.
- A certain error may occur in the case where the current changes drastically, which affects the capacity value.

### Low power dormancy / shutdown

When the battery current < the turn-on current, the battery enters a low power sleep state, the backlight turns off, and the electric meter does not work but the battery parameters are still displayed; If the shutdown voltage is set and the battery voltage < the shutdown voltage, it will enter the shutdown state.

The following states can wake-up or exit shutdown:

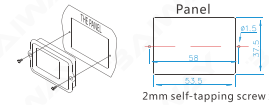
- When the battery current > turn-on current or pressing anykey, the electricity meter will wake up automatically and the backlight will light up
- When battery voltage > shutdown voltage, battery current > turn-on current or pressing anykey, it will exit shutdown status.

### Adjustment of backlight brightness

- Click  $\nabla$  or  $\Delta$  button to increase or reduce backlight brightness.

### Installation method

Open a rectangular hole and two screw holes on the panel of the device which will be installed, and place the monitor on the front side of the device panel. Install the monitor from the front, and secure the TK15 to the device panel from the front side with self-tapping screws. As shown below:



(Note: The panel of the device are not product accessories and not included in the product.)

### Technical parameters

Parameter	Min.	Regular	Max.	Unit
Working voltage	8.0	50.0	120.0	v
Working Consumption		6.0	8.0	mA
Static Consumption		0.5	0.8	mA
Power off Consumption		50		μA
Accuracy of Voltage Collecting		±1.0		%
Accuracy of Current Collecting		±1.0		%
Accuracy of Capacity Collecting		±1.0		%
Backlight on current(>50A specification)		50		mA
Backlight on current(>50A specification)		100		mA
Capacity detection range	0.1	100.0	9999.0	Ah
50A Sampler Current	0	50.0	75.0	A
100A Sampler Current	0	100.0	150.0	A
350A Sampler Current	0	350.0	500.0	A
Temperature Range in Application Environment	-10	20	60	°C
Weight (50A/100A/350A)		150/220/360		g
Appearance size		66*40*14		mm

Note: This product needs to be used with a sampler. Because of the different internal parameters of the meter, samplers of different specifications and meters are not allowed to be mixed. The sampler is a heat-generating component, try to install it in a ventilated place, and it is strictly forbidden to be covered!

When using the maximum current for a long time, be sure to maintain ventilation and heat dissipation

### Precautions and warranty

This product cannot be exposed to sunlight for a long time, and cannot be exposed to extreme conditions below -10 ° C and above 50 ° C for a long time, otherwise it will shorten the life of the LCD screen.

The warranty period of this product is within one year from the date of purchase. It is repaired free of charge when non-human quality problems occur.

This product may be technically improved or updated. If the product you purchased differs from the appearance and technical parameters of the product described in the Product User's Guide, please refer to the actual product or website.