CHN Spec

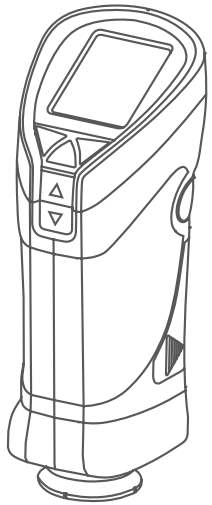
领先的中国色彩与光泽分析专家
China's leading expert of color and gloss analysis

CHN Spec

精密色差仪

产品使用说明

CS-10
CS-200/210/220/260



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CATALOGUE
目录

精密色差仪使用须知

1、本说明书所述“ 色差仪 ”指的是精密色差仪。
2、本说明书所述“ 标准黑腔 ”、“ 标准白板 ”指与色差仪配套，用于仪器校准的工作标准器件。
3、本仪器使用应避开强电磁干扰。
4、本说明书中提及的L、A、B、C、H指GB/T 7921-2008中规定的CIELAB色空间中的L*,a*，b*， C*，h。

注意事项

1、本机属精密仪器，不能承受因跌落而导致的碰撞，使用时请放置于相对平整的地方。
2、本机不能防潮或抗潮，受潮或液体溅入易损坏本机。
3、本机的屏幕是由玻璃制成，受到异常外力或锐器的作用易损坏。
4、本公司建议使用原配电源适配器。
5、为保障本机正常工作，请不要在过冷或过热的地方存贮和使用，也勿将本机放置在潮湿或阳光长期直射的地方，更不要在强震等恶劣的环境中使用本机，以免发生意外。
6、为了保证测试的准确性，请在测试之前仔细检查干电池。
7、色差仪是精密仪器，使用时请避开强电磁干扰。
8、为保证测量准确，请不要用本机测量不平整的表面。
9、为保证测量准确，测试时请保持仪器平稳，不要摇晃。
10、测试时请将仪器的测试口紧贴测试物体表面，但不要用力按压。
11、本机属精密仪器，使用完毕请将仪器装入软包内保管。
12、请将仪器存放在干燥的地方，如果长时间不使用仪器，请将干电池取出。
13、本机及说明书如有进一步改进或补充，恕不另行通知。如有疑问，敬请垂询本公司。

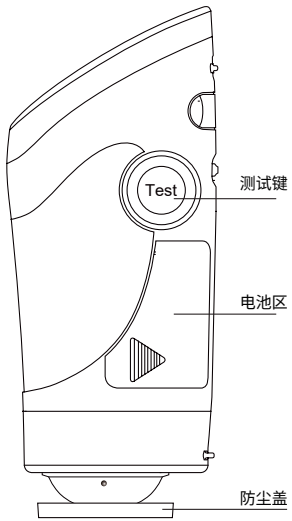
色差仪功能描述

1、比较样板与被检测品之间的颜色差异，输出样板和被检测品的颜色差异，可以测量XYZ,RGB,ΔL*a*b,ΔL*C*h数据,查看Yxy色空间图和比较后的ΔE*ab,ΔL*,Δa*,Δb*,ΔC*,Δh色差数据，可以进行白度，黄度测试（除CS-10外均可进行白度，黄度测试）。
2、人性化设计、良好的人机交互界面。
3、USB通信功能，可连接电脑，实现电脑端数据分析管理，可打印测试报告。
4、具备数据浏览功能，测试时数据可手动保存或自动保存。
5、具有低电能提示功能，存储数据空间满提示功能。
6、可连接微型打印机。
7、特定型号具备摄像头取景、粉末胶体测量、潘通色卡查找功能。

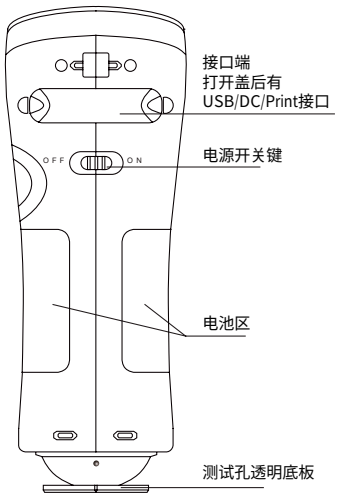
技术参数

	CS-10	CS-200	CS-210	CS-220	CS-260
照明受光系统	8/d（8°照明/漫射受光），含镜面反射光（SCI）			8/d（8°照明/漫射受光），不含镜面反射光（SCE）	8/d（8°照明/漫射受光），含镜面反射光（SCI）
显示模式	色度值：L*a*b*，L*C*h，ΔE*ab，Yxy，相对RGB值；色差值：Δ（L*a*b），Δ（L*C*h）；沾色牢度；变色牢度				
		白度值：亨特白度，甘茨白度;黄度值：YI			
测量直径	Φ8mm（可定制Φ4mm）				
测量条件	CIE 10° 标准观察者，CIE D65光源				
测量范围	L*：1-100				
重复性	标准偏差△E*ab*，0.1以内（测量白色校正板30次求平均值）	标准偏差△E*ab*，0.08以内（测量白色校正板30次求平均值）			
存储	标准样10组，每组标准样下测试组100组	标准样100组，每组标准样下测试组100组			
测量时间	约0.5秒				
测量光源	LED光源				
界面语言选择	中文/英文				
电源	4节AA1.5V碱性电池或镍氢电池、专用适配器DC5V				
接口	USB2.0,打印机				
重量	550g				
尺寸	77*86*210mm				
其他功能			摄像头取景功能	粉末胶体测量功能	潘通色卡查找功能

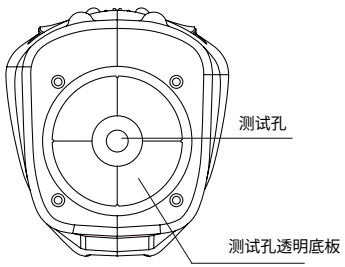
仪器外观结构介绍



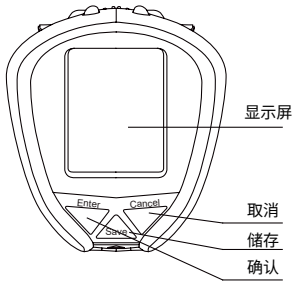
右视图



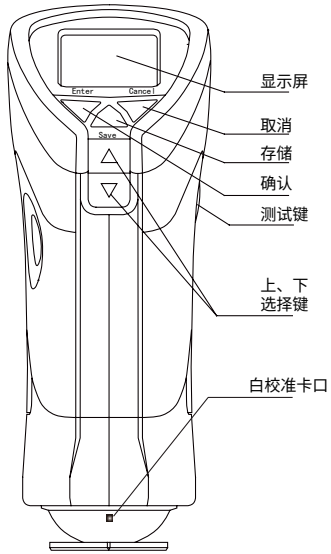
背视图



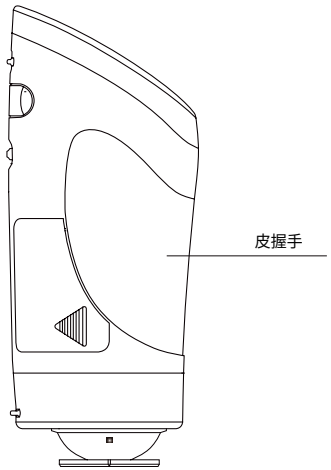
底视图



顶视图

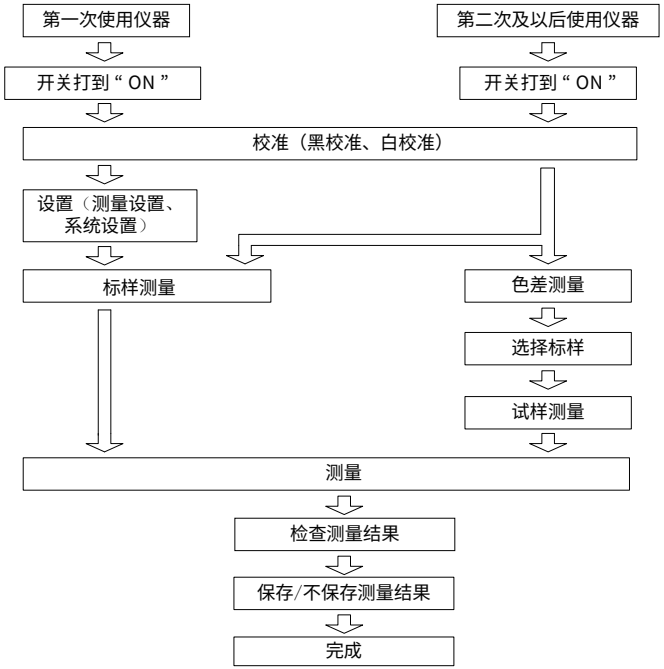


正视图



左视图

测量流程图



校准页面

A 开关打到“ ON ”后，仪器自动进入校准页面。在该页面下，需先对仪器进行黑白校准。

将仪器底部的防尘盖摘下，将黑腔上面的盖子旋转开，把仪器底部放入黑腔扣紧。通过“ Up ”、“ Down ”选择“ 黑校准 ”，按“ Enter ”键，短鸣“ 滴 ”声后完成黑校准。白板旋转与仪器扣紧，通过“ Up ”、“ Down ”选择“ 白校准 ”，按“ Enter ”键，短鸣“ 滴 ”声后完成白校准。校准完成后，按“ Cancel ”键退出校准页面，进入程序主页面。

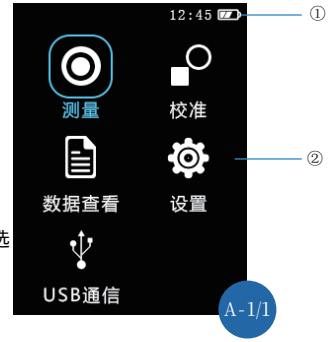
注：为了保证仪器稳定性，建议每次开机都进行黑白校准。

主页面

A-1/1 主页面：

①标题栏：显示当前页面的主要功能信息。

②工作区：显示页面下属子菜单的主要功能或是测试时的数值。



程序基本操作方法：

通过“ Up ”、“ Down ”上下选择键，选择相应的功能按钮，按“ Enter ”键进入选择的功能界面进行相应操作，按“ Cancel ”键返回上一步骤，按“ Save ”键对测试结果或状态设置进行保存。

测量：用户可以测量样品的各项颜色参数，完成样品与标样之间的颜色差异测试，以及查看所保存的测试记录等。

校准：用户可在使用仪器前先对仪器进行黑、白校准。

数据查看：在该页面中用户可以查看已保存的标样下的各项参数。并可对选择的样品进行删除、编辑名称等操作。

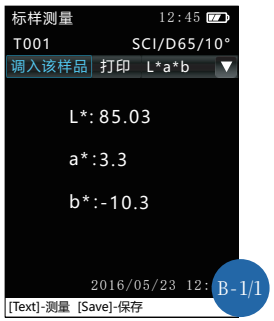
设置：用户可以对仪器测量条件的各项参数进行选择和设置。

USB通信：用户可以通过USB接口与PC机连接进行数据传输，以及进行上位机操作。

测量

B 在主页面，通过Up、Down选择键,选择“ 测量 ”图标，按“ Enter ”键进入“ 标样测量 ”页面。在该页面下，用户可以测量标样的色空间、色度指标参数，查看标样的白度、黄度等信息。还可以测量标样与试样之间的色差，以及查看对试样合格与否的判断。（图B-2为CS-260主页面）

标样测量



B-1/1 将仪器测试口紧压待测样品表面，按“ Test ”键，“ 嘀 ”声后完成测量，查看测量结果。

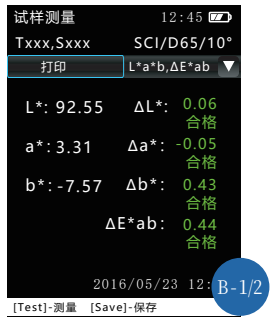
测试结果的标题栏中，分别显示了标样名称和测试结果的测试条件。标样未保存时，标样名称一律显示为“ Txxx ”，当按“ Save ”键保存标样后，名称显示为保存之后的标样名。测试条件格式：SCI为测量条件/D65为光源/10 ° 为观察者。通过Up、Down选择键，还可对测试结果进行“ 调入该标样 ”、“ 打印 ”，选择显示内容（包括“ L*a*b* ”、“ L*C*h ”、“ X,Y,Z ”、“ Y,x,y ”、“ R,G,B ”、“ WHITENESS ”、“ YELLOW ”）等操作。

“ 调入该标样 ”：进入“ 试样测量 ”页面，以当前测试数据为标样，与试样测试结果对比测量色差。

“ 打印 ”：对测试结果的数据进行打印。

选择显示的内容，可通过“ Enter ”键进入选择菜单，通过Up、Down键选择查看测量样品的色空间参数、色度指标参数等信息，具体包括“ L*a*b* ”、“ L*C*h ”、“ X,Y,Z ”、“ Y,x,y ”、“ R,G,B ”、“ WHITENESS ”、“ YELLOW ”。

试样测量



B-1/2 在上面的标样测量完成并保存后，选择“ 调入该标样 ”，按“ Enter ”键进入“ 试样测量 ”页面。该界面下以当前测试数据为标样，仪器测试口贴紧试样，再按“ Test ”键测试，新测量的样品为试样，“ 嘀 ”声后完成色差测量，显示色差结果。再次按下“ Test ”键可进行新的色差测量。与标样测量相同，试样测量在未保存时，在测试结果的标题栏中，试样名称显示为“ Sxxx ”，保存后则显示为保存后的名称。

在“ 数据查看 ”界面下，同样也可以进行色差测量。通过Up、Down键选择已有的标样，按“ Enter ”键进入选择菜单，选择“ 查看详细 ”，查看所选的标样数据。然后在“ 查看标样 ”页面下，按“ 调入该标样 ”，进入该标样下的“ 试样测量 ”页面，按“ Test ”键进行测量，“ 嘀 ”声后完成色差测量，查看测量结果。再次按下“ Test ”键进行新的色差测量。

注：色差测量前请先设置容差。（参看 设置→测量设置→容差设置）
(CS-220可进行SCE测试)

在“ 试样测量 ”页面中，通过Up、Down选择键，还可对色差测试结果进行“ 打印 ”，选择显示内容（包括“ L*a*b*，ΔE*ab ”、“ L*C*h，ΔEch ”、“ X,Y,Z ”、“ Y,x,y ”、“ R,G,B ”、“ WHITENESS ”、“ YELLOW ”）等操作。通过Up、Down选择键选择要查看的内容，包括测量样品与标样之间的色空间参数、色度指标参数，以及合格/不合格判断、偏色详情评价。

校准

C 在主页面，通过Up、Down选择键,选择“ 校准 ”图标，按“ Enter ”键进入“ 校准 ”页面。在该页面下，用户可以进行黑校准、白校准。

黑校准：仪器底部上防尘盖摘下，将黑腔上面的盖子旋转开，把仪器底部放入黑腔平放。通过“ Up ”、“ Down ”选择“ 黑校准 ”，按“ Enter ”键，短鸣“ 滴 ”声后完成黑校准。校准成功后，提示“ 黑校准成功！ ”。

C/1 白校准：白板旋转与仪器扣紧，把仪器放平稳，通过“ Up ”、“ Down ”选择“ 白校准 ”，按“ Enter ”键，短鸣“ 滴 ”声后完成白校准。校准成功后，提示“ 白校准成功！ ”。

数据查看

D 在主页面，通过Up、Down选择键,选择“ 数据查看 ”图标，按“ Enter ”键进入“ 数据查看 ”页面。在该页面下，用户可以查看已保存标样信息、试样信息以及色彩仿真等。

通过Up、Down选择键，选择所需查看的标样，按“ Enter ”键弹出菜单窗，通过Up、Down选择键，进行查看详细、查看试样、删除、编辑名称等操作。

查看详细：查看所选标样的详细数据所有色差测试记录。可在该页面下按“ 调入该标样 ”进入该标样下的试样测量，进行新的色差测试。

查看试样：查看所选标样下的所有试样测试记录。按“ Enter ”键即可在弹出如图所示的菜单窗，对所选测试记录进行查看详细、删除、删除所有、编辑名称等操作。

删除：将删除该标样及标样下的所有色差测试记录。

编辑名称：编辑更改所选样品的名称。

设置

在主页面下，通过Up、Down选择键，选择“ 设置 ”图标，按“ Enter ”键进入“ 设置 ”页面，有测量设置、时间设置、电源管理、恢复出厂、语言选择和版本六个内容。

测量设置

E 通过Up、Down选择键，选择“ 测量设置 ”图标，按“ Enter ”键进入“ 测量设置 ”页。

容差设置：通过该项用户可以设置测试时的最大允许容差。Up、Down选择键选择“ 容差设置 ”，按“ Enter ”键进入容差设置状态，Up、Down键修改数值，按“ Enter ”键确认。

平均设置：通过该项用户可以设置测试时的平均测试次数。Up、Down选择键选择“ 平均设置 ”，按“ Enter ”键进入平均设置状态，Up、Down键修改平均测试次数，按“ Enter ”键确认。

时间设置

E/1 通过Up、Down选择键选择“ 时间设置 ”，按“ Enter ”键进入时间设置页面。设置修改本仪器的测量显示时间，可对年、月、日、时、分进行设置，Up、Down键选择修改项，“ Enter ”键确认，再按Up、Down键修改数值，完成后按“ Cancel ”键退出。

电源管理

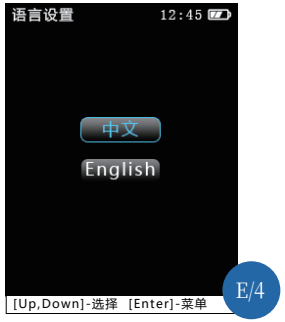
E/2 通过Up、Down选择键选择“ 电源管理 ”，按“ Enter ”键进入电源管理页面。可对仪器的背光时间、关机时间进行修改设置。Up、Down 键选择修改项，“ Enter ”键确认，再按Up、Down键修改数值， 完成后按“ Cancel ”键退出。

(注：背光时间设置为0时代表不关背光；关机时间设置为0时代表不自动关机)

恢复出厂

E/3 通过Up、Down选择键选择“ 恢复出厂 ”，按“ Enter ”键进入恢复出厂页面。
恢复出厂后，所有的数据将会被删除，并且设置系统将会恢复到默认设置。

语言选择



E/4 通过Up、Down选择键选择“ 语言选择 ”，按“ Enter ”键进入语言选择页面。
本仪器提供英文、中文两种界面语言，通过Up、Down键选择。

版本

E/5 通过Up、Down选择键选择“ 版本 ”，按“ Enter ”键进入版本查看页面。显示本仪器的版本号信息，包括仪器型号、软件版本号、公司名称、以及公司网址。

USB通信

E/6 在主页面，通过Up、Down选择键，选择“ USB通信 ”图标，按“ Enter ”键，进入“ USB通信 ”页面。
使用本仪器标配的USB数据线将仪器与PC机相连，根据提示安装驱动。（驱动程序在本仪器提供的光盘内,具体软件的使用请参考软件的帮助文档）
正确安装后即可在PC机上进行上位机操作。

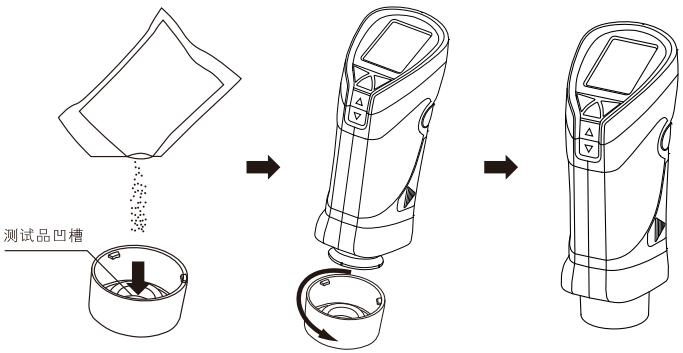
当USB线未插入USB接口或USB线与USB接口接触不良时，将如图显示。
插入USB接口或重新插入即可正常连接，进行上位机操作。

CS-210摄像头取景

F CS-210可以使用摄像头取景。在“ 测量 ”页面下，长按“ Enter ”键即可调出摄像头取景功能。通过观察摄像头取景框，移动仪器到所需测量的地方，即可以进行后续的测量功能。

F/1 例如在标样测试下，长按“ Enter ”键查看测试位置并调出摄像头取景框。按“ Cancel ”键取消。

CS-220糊状物、粉末测试



把测试样品放入测试附件的凹槽内，所需要放置测试样的份量要稍微超过测试品凹槽的高度。将仪器的透明底板放入已装好测试样的测试附件，使透明底板与测试品凹槽紧密贴合，然后把仪器放平，就可以对测试品进行测试。

测试完一定要对测试附件和透镜底板进行清理，避免对下次测量产生干扰，导致测试结果不准确。

CS-260色卡查找

G 在主页面下，通过Up、Down选择键，选择“ 色卡查找 ”图标，按“ Enter ”键进入“ 色卡查找 ”页面。

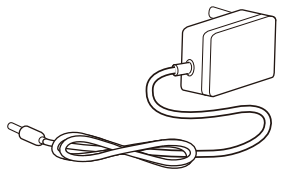
在色卡选项下拉框中选择已经建好的色卡库，将仪器测量口对准被测品，按下仪器上的“ Test ”键进行测量，“ 滴 ”声后，会得到测量的L*，a*，b*的结果，以及在选择的色卡库中与其颜色接近的色卡号名称和这块色卡所在的页数等信息。

产品配件介绍

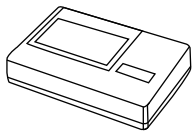
配件组成:	
白板	用于设备校准。
黑腔	用于设备校准。
外部供电电源	交流电源适配器的额定电流2A，正常工作电压5V。
光盘	光盘里的软件，为本仪器配套的上位机软件。
USB数据线	用于设备和PC机的通信。
测试附件	具有用于测试粉末和糊状物样品的测试附件(特定型号标配)
微型打印机	为可选配件，用于打印测量数据。

配件图示：

上位机光盘

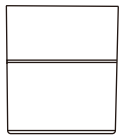


电源适配器



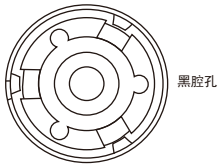
微型打印机（可选附件）

USB数据线

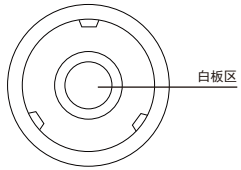


黑腔校准盒

测试附件（CS-220附带）



开盖后黑腔校准盒
顶视图



开盖后白板测试盒
顶视图

异常处理

异常情况	分析	处理方法
仪器无法开机	1、检查仪器是否连接到外部交流电源适配器或是否装了干电池 2、检查电池电量是否充足	安装或更换干电池，或连接电源适配器
开机后不能进入主程序	1、检查是否进行过黑、白校准 2、检查黑、白校准是否有误	重新进行黑白校准并再次进入
测量结果报错	检查容差设置是否合理	重新调整容差设置
测试数值异常	1、检查测量时仪器及测试品是否平稳，测量口与测量面接触是否紧密良好 2、检查测量物体是否太薄漏光 3、检查测量部位是否是混色	1、保持仪器及测试品平稳 2、在测试品底部放置一个厚的塑料垫或一张白纸 3、请测量单一颜色部分，不要测量混色部位
两次测量结果相差较大	检查电池电量是否过低	更换新的干电池

测量结果分析

▼ΔE总色差的大小 $\Delta E^*ab=\sqrt{(\Delta L^*)^2+(\Delta a^*)^2+(\Delta b^*)^2}$

ΔL+值表示偏白，ΔL-值表示偏黑；Δa+值表示偏红，Δa-值表示偏绿；Δb+表示偏黄，Δb-值表示偏蓝。当一种颜色用CIE*a*b*表示时，L*表示明度值；a*表示红/绿值及b*表示黄/蓝值。

▼CIE LAB

CIE LAB色空间是基于一种颜色不能同时既是绿又是红、也不能同时既是蓝又是黄这个理论而建立。所以，单一数值可用于描述红/绿色及黄/蓝色特征。当一种颜色用CIEL*a*b*表示时，L*表示明度值；a*表示红/绿值及b*表示黄/蓝值。

▼CIE LCH

CIE LCH颜色模型采用了同L*a*b*一样的颜色空间，但它采用L*表示明度值；C*表示饱和度值及h表示色调角度值的柱形坐标。

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CHN Spec

China's leading expert of color and gloss analysis

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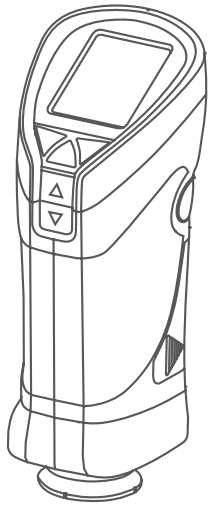
PRECISE COLOR READER OPERATION MANUAL

CS-10
CS-200/210/220/260



Service hotline:+86 571 85888707

Address:No.166,Wenyuan North Road,Jianggan District,Hangzhou City,China

WARNING

Please do not disassemble the product without the assistance of customer support center, If you have any questions, please contact the local agency.

www.chnspec.com

V. 2022.1

CATALOGUE

Please read this manual seriously before using

1. The subject instrument of this manual is referred to as “the color reader”in this manual.
2. This “black cavity” and “white board” mentioned in this manual is macthing with instrument, used for calibration.
3. Keep away from the electromagnetic radiation when the instrument is working.
4. The L、A、B、C、H mentioned in this manual is L*, a*, b*, C*, h.

Notice

1. The color reader is a precise instrument, cannot afford to collisions in drop. Please place it at a smooth plane.
2. This instrument is not moisture proof or water resistance, it may be damaged if liquid splashed into it.
3.The screen of this instrument is made of glass; it is easily damaged by outside force.
4.Use the original power adapter.
5. Please do not place or use this instrument in a cold or hot environment, do not place this instrument in a humid or direct sun light environment, do not use this instrument in strong vibration or other harsh environment.
6. In order to ensure the accuracy of test, please check batteries carefully first.
7. Avoid testing on uneven surfaces.
8. Keep the instrument balance when working.
9. The instrument should be put closely on the sample surface.
10. Please put the instrument into the soft bag after using.
11. Please keep this instrument dry, and take out the batteries for long time unused.
12. The information contained in this document is subject to change without notice.

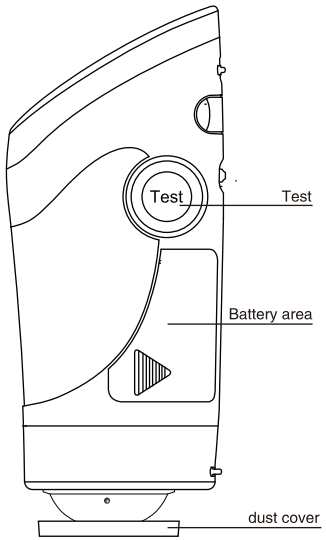
The color reader has the flowing main function

1. Display color values by Lab, XYZ, RGB, ΔL*a*b、ΔL*C*h, display the difference values of sample and tested item by ΔE*ab、ΔL*、Δa*、Δb*、ΔC*、Δh,besides Yxy, Yellowness index and Whiteness index,Specific model can measure Whiteness and Yellowness index.
2. Use humanized design, friendly graphical user interface.
3. Data browse.
4. Reminder for low battery and full memory.
5. USB communication.USB to connect with PC to analysis test result, generate and print test report.
6.Instrument can work with micro printer.
7.Specific model is with camera, holder for powder and pasty material and build-in pantone color swatches.

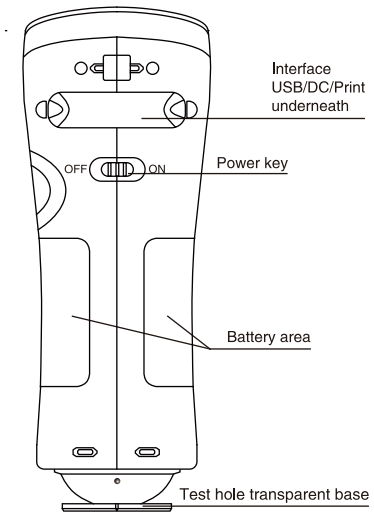
Design criterion

	CS-10	CS-200	CS-210	CS-220	CS-260
Optial System	8/d (8°illumination angle/diffuse viewing) specular component included			8/d (8°illumination angle/ diffuse viewing) specular component excluded	8/d (8°illumination angle/ diffuse viewing) specular component included
Dispaly Mode	Colority Value:L*a*b,L*C*h,ΔE*ab,XYZ,Yxy,relative RGB; Color Difference:ΔE*ab,ΔE*Ch;Staining fastness;Color fastness				
		Whiteness:Hunter Whiteness,Ganz Whiteness; Yellowness Index:YI			
Measuring Aperture	Φ8mm				
Measuring Condition	CIE 10°standard observer/CIE D65 light source				
Measuring Angle	L*：1~100				
Repeatability	Standard deviation within ΔE*ab＜0.1（measuring condition:measuring white tile 30 times）	Standard deviation within ΔE*ab＜0.08（measuring condition:measuring white tile 80 times）			
Storage Capacity	10 targets and 100 samples for each target	100 targets and 100 samples for each target			
Measurement Time	0.5 second				
Light Source	LED				
Interface Language	Chinese and English				
Power Supply	Four 1.5V AA-sized alkaline battery or nickel metal hydride batteries/DC5V				
Interface	USB2.0,Printer				
Weight	550g				
Volume	77*86*210mm				
Other Functions			Camera	Pasty Material Measurement	Color Number Matching

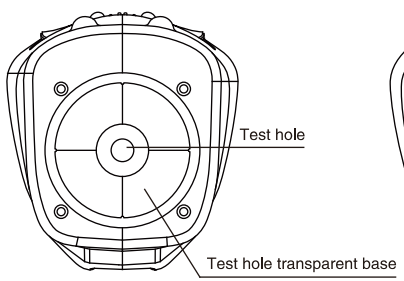
Instrument appearance and structure introduce



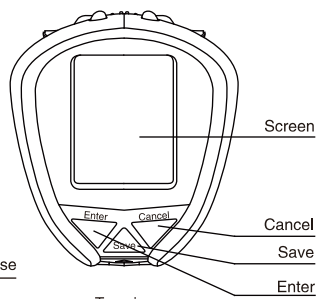
Right view



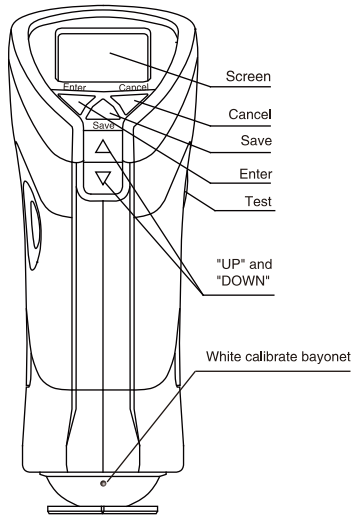
Back view



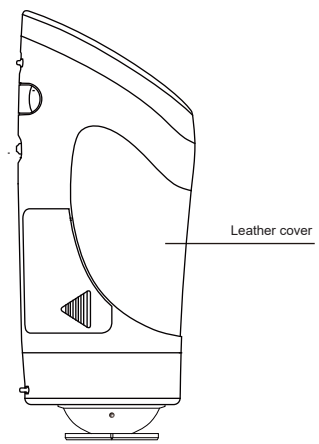
Bottom view



Top view

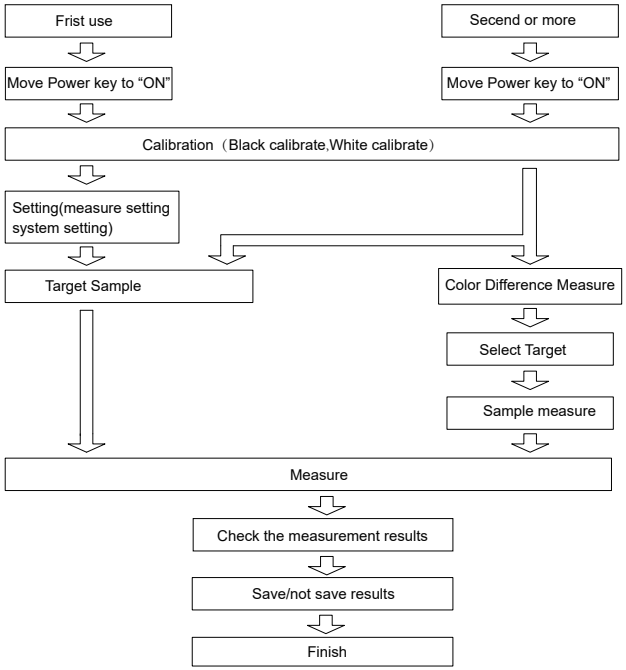


Front view

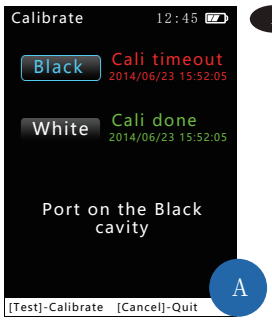


Left view

Measurement flow chart



Calibration page



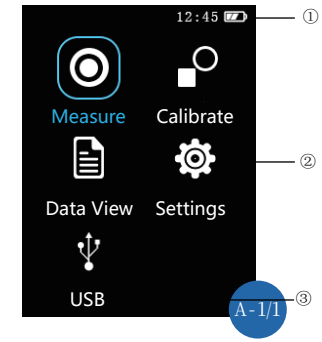
A Make sure the instrument works and move Power key to “ON”.The instrument shows the starting page and transfers to calibrate page， under this page, calibrate the instrument.

off the dust cover and black cavity cover, put the bottom of instrument into black cavity and place evenly， Through the "Up", "Down" to choose "black calibration", press “Enter”, we can do black calibration.

Put the instrument on the white tile. Press the "Up", "Down" to choose " White calibrate ", Press “Enter”to do “White calibrate”。 Press ”Cancel” to exit the calibration page and enter the main page.

Note: In order to guarantee the stability of instrument, it is recommended that the “Black calibrate” and “White calibrate” must be complete every time when switch on the instrument.

Main page



A-1/1 Main page:

①title: display main function information of the current page

②working area: display main functions of the subordinate submenu or the testing data

③status bar: Guide the current operating situation

Basic operation method:

Press the "Up"and "Down" to choose function button, Press "Enter" button to choose function interface to operation . press "Cancel" button to return to the last step, Press "Save" button to Save the result of the test or the state setting.

Measure: Users can measure sample each color parameters, complete samples and color difference between sample tests, and view the saved test records

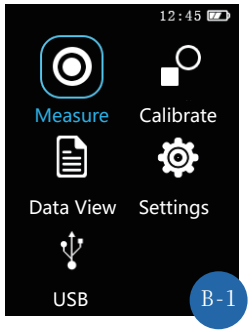
Calibrate: User can do black and white calibration.

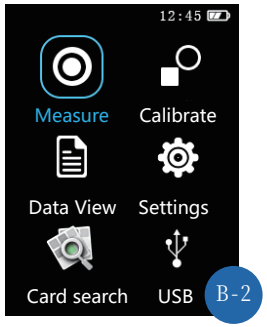
Data view: User can view the saved data. And could save, delete or edit the name of the sample.

Settings: User can select the parameters and other settings.

USB: USB interface is for PC connection of data transfer.

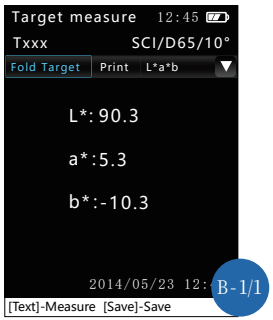
Measure





B The main page , Press the "Up"and "Down" to choose “Measure”,press “Enter” into the “target measure”page. Under the page, User can choose the parameters to measure, measure the target color value, whiteness and yellowness index. The color difference between target and sample can also be measured.(Figure B-2 is the home page of CS-260)

Target measure

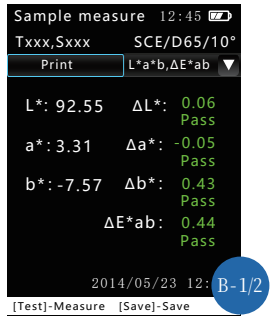


B-1/1 Put the instrument test aperture on sample, press "test", then we can see the test result on screen.it shows the name of the sample and the test conditions in title bar. The target sample not saved, the name of target sample will be displayed as "Txxx".user can press ”save” to rename and save the target sample. Test condition format: measuring condition /light/observer. Press "Up"and "Down" to chosse “Fold target”,“print”and display content(include “L*a*b*”、“L*C*h”、“X,Y,Z”、“Y,x,y”、“R,G,B”、“WHITENESS”、“YELLOW”).Press “Enter" to enter into sample measure page. User can compare the color difference between target and sample.

“print”: print the result of the test data.

Chosse display content: press “enter” into the page , press "Up"and "Down" to chosse show different color parameters, include “L*a*b*”、“L*C*h”、“X,Y,Z”、“Y,x,y”、“R,G,B”、“WHITENESS”、“YELLOW”.

Sample measure



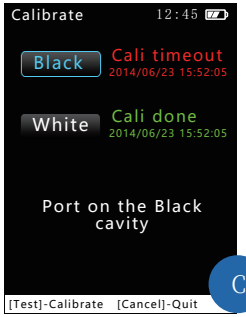
B-1/2 In this page,user can measure the unknown sample to evaluate the color difference between the sample and the target by press button “Test”.The name of the unknown sample displayed on the screen is “Sxxx” before saved. Users can also do the measurement in the page “Data View”. Press the "Up", "Down" to choose the existing target,press“Enter” enter the options menu,choose” view details”, view the selected target data,choose “Fold target”,we will enter into the sample measure page.Press “test”to measure,the color diffrence measurement is finished. Press"Test" again for another sample color measurement.

Attention:Color tolorance should be set before color difference measure-ment.(Please refer to Setting→Meas Setup→tolorance).

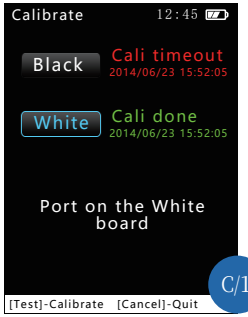
In the page of"sample measure”, press the "Up", "Down",user can print the color diffrence measure results. Choose the display content include “L*a*b*，ΔE*ab”、“L*C*h，ΔEch”、“X,Y,Z”、“Y,x,y”、“R,G,B”、“WHITENESS”、“YELLOW”. Press “Up” and “Down” to select to view the content including color space, chrominance indicators, pass/fail, colour evaluation between the samples with the target sample.

Calibrate

In the main page, press "Up", "Down" to choose the " calibrate ", press "Enter" to enter the page of " calibrate " in this page，user can choose “Black calibrate” and “White calibrate”.



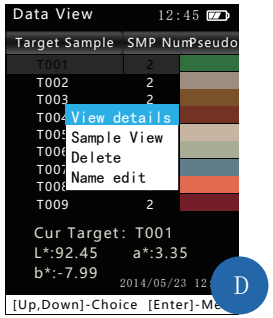
C Take off the dust cover and black cavity cover, put the instrument into black cavity and place evenly， press the "Up", "Down" to choose "black calibration", press “Enter”, we will finish black calibration.



C/1 White calibrate :Put the instrument on white calibration tile. Through the "Up", "Down" to choose " White calibrate ", Press “Enter”to “White calibrate”.

Data View

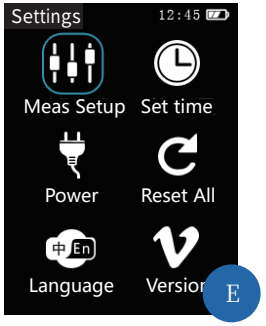
In the main page, press the "Up", "Down" to choose the "Data View", press "Enter" to enter the page of " Data View".In this page， User can view the saved target,sample color simulation and so on.



D Press the "Up", "Down" to choose the “Data View", press "Enter" ,Press“Up” and “Down” to choose view detail, check the sample name, delete, edit, and so on.
View Details: look at all the detailed data for the selected target. Press “enter” ,user can measure the samples under the target sample, a new sample can be tested.
Sample View: view all the sample under the selected target. Press "Enter" to choose view detail, delete,delete, delete all, name edit operation can be done.
Delete: deletes all the color difference test records of the sample and the target sample.
Rename: change the name of the selected samples.

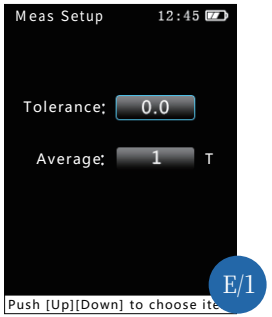
Settings

E On the main page, press the "Up", "Down" to choose "Settings", press "Enter" to enter the settings page,include calibrate, meas setup, set time, power, reset all and language.



Measure Setup

Press the "Up", "Down" to choose the "measuresetup", press "Enter" to Enter "measure Settings" page.



E/1 Tolerance the user can set the maximum allowable tolerance.
Press the "Up", "Down" to choose the "Tolerance", press "Enter" to Enter tolerance settings, Up and Down keys to modify values, press the "Enter " to confirm.

Average settings: the user can set the times of average test.
Press the "Up", "Down" to choose the "average", press "Enter" to enter the average settings, Up, Down key to modify the times of average test, press "Enter" to confirm.

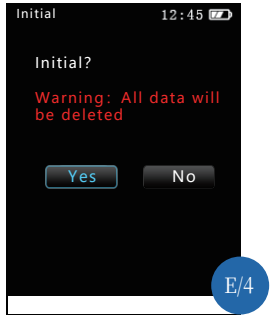
Time settings

E/2 Press "up" or "down" to choose the "set time", press "Enter" to enter the time settings page. modify the display time of this instrument, year, month, day, hour, minute can be set, up or down keys to select Modify items,press "Enter" to confirm, and then press up or down to modify the numerical, press "Cancel" to quit when finished.

Power management

E/3 Press "up" or "down" to choose the "power ", press "Enter" to enter the power page. Backlight time, power off time of instrument can be modified . “Up" or "down"keys to select Modify items,press "Enter" to confirm,
and then press “Up" or "down" to modify the numerical, press "Cancel" to quit when finished.(Note: When backlight time is set to 0, the backlight will be still on. When power off time is set into 0, instrument will not power-off automatically.)

Reset All



E/4 Press the "up","down" to choose initial. Press "Enter" to enter into the initial page. We could see the machine type and software version in this page. If we choose "Yes" all testing data will be removed and the setting system will be back to the default settings.

Language

E/5 Press the "Up", "Down" to choose the "language ", press "Enter" to enter the language selection page. This instrument provides English, Chinese two interface language, through the “Up” and “Down” to choose.

Version

E/6 Press the "Up", "Down" to choose the " version ", press "Enter" to enter the version page. This instrument display version number information, including the instrument model, version number, software product serial number, and the name of the company.

USB

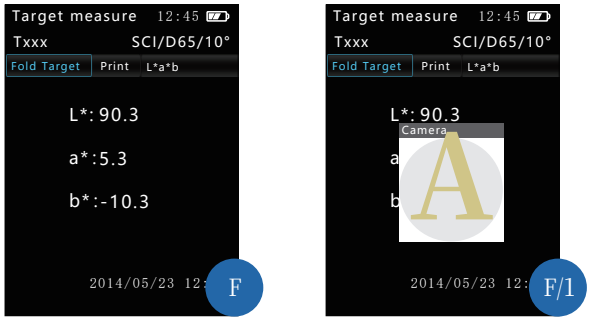
E/7 In the main page, Press the "Up", "Down" to choose the "USB ", press "Enter" to enter the page of "USB".
The USB cable which is a standard accessory can be used to connect instrument with PC. According to the prompts to install the driver. (please refer to the software use specific software drivers provided in this instrument in the CD)

When the USB cable is not inserted into the USB interface or the USB cable or the USB interface is bad,above figure will show.
Re-enter into the USB interface or re-insert the USB cable to PC.

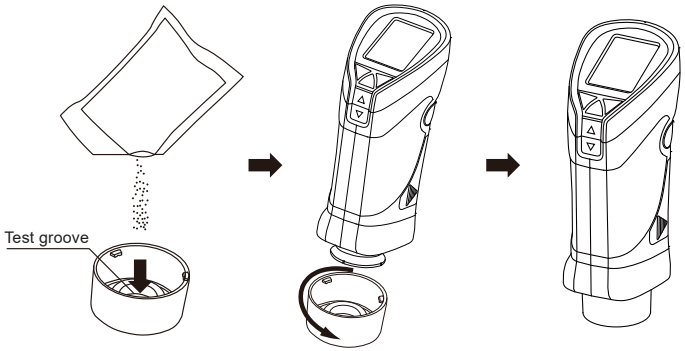
CS-210 Camera

F CS-210 is with camera for viewing the testing area.In the "Measure" page, press "enter" we can view the measurement area with camera.Press "Cancel" to cancel the view function.

F/1 For example in the sample test, long press "Enter" to view the test position.



CS-220 Pasty and powder material measurement



Put test sample into the test accessory the groove,and place enough test sample to make sure it is slight higher than grooves.Force the transparent base to test accessory with samples tightly,place the instrument smooth and then measure samples.
To avoid disturbance to the next measurement,please clean the test accessory and transparent base.

CS-260 Card Search

G In the main page, press the "Up", "Down" to choose the "Card search ", press "Enter" to enter the page of "Card search".

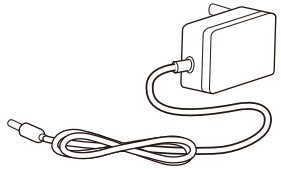
On the dropdown list of color chart, choose the established color library. Put the instrument on the testing sample. Press button “test”. After hearing the sound “beep”, we could get the testing result for L*,a*,b* and instrument will tell the closest color number, page and other information.

Accessory introduce

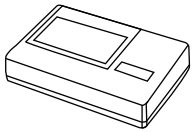
Accessory list	
White board	used for white calibration.
Black cavity	used for black calibration.
Extermal power supply	AC power adapter,with 2A rated current,5V required
CD	It contains the PC software.
USB Cable	communicate with PC
Test accessory	CS-220 is with accessory for testing powder and pasty material.
Micro printer	Optional accessories.Print the test result.

Standard Accessories Pictures:

PC software CD

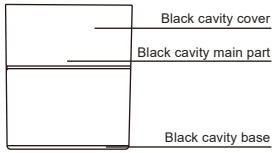


Switching AC/DC Power adapter



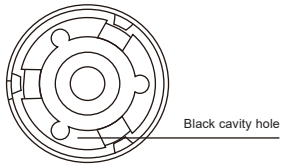
Micro printer(Optional accessories)

USB Cable

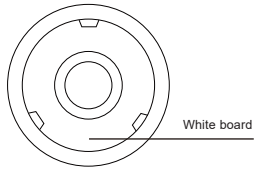


Side view for black cavity

Test accessory （For CS-220）



Top view for black cavity



Top view for white

Trouble Shooting

Touble Shooting	Analysis	Solutions
Unable to start instrument	1. Check instrument connects to power supply or not; 2. Check battery supply is sufficient or not.	Replace batteries.
Unable to enter main program after start	1. Check black and white calibration is done or not; 2. Check black and white calibration is correct or not.	Black calibrate or white calibrate again
Measurement data is wrong	Check tolerance is reasonable or not.	Reset tolerance
Measurement values abnormal	1. Check tested item is balance or not; check testing aperture force to tested surface properly or not; 2. Check tested item leak light or not; 3. Check tested item is multi-color or not.	1. Keep testing item balance; 2. Put a thick plastic sheet or white paper under tested item; 3.Avoid multi-color area and test single color area.
Large difference between two measurement results	Check batteries power consumption below 40% or not.	Replace batteries

Testing Result Analysis

▼ΔE Color Difference Scale $\Delta E^*ab = \sqrt{(\Delta L^*)^2+(\Delta a^*)^2+(\Delta b^*)^2}$

ΔL+ represents white, ΔL- represents black, Δa+ represents red, Δa- represents green, Δb+ represents yellow, Δb- represents blue. When we use CIE*a*b* to show a clolr, L* is balck or whilte. a* is red or green.b* is yellow or green.

▼CIE LAB

CIE LAB is color space based on the fact that a color can't be both red and green, or both blue and yellow, because these colors oppose each other.So a single data could be used to describe red/green and yellow/blue. When we use CIEL*a*b* to describe a color,L* means lightness, a* means red/green and b* means yellow/blue.

▼CIE LCH

CIE LCH adopts same color space as L*a*b*, but its L* represents lightness, c* represents saturation and h* represents hue.

Company's statement

1.The company promises that our colorimeter offers one year of warranty after purchase date. Non-artificial damage under normal use is subjected to free warranty. The company offers repair services for artificial damage, or damage after the warranty time limit; however, the repair services would require fees relative to the damage.

2.The warranty only holds for the person, or company who purchased the instrument. Damage occurring under third party would not be eligible for warranty service.

3.The company is not responsible for data loss because of error, repairing, or power outages. To prevent loss of important data, please save copies of the data on your PC.

4.The copyright ownership of the instrument and its associated software belong to our company and is protected by the Copyright Laws of People ' s Republic of China.

5.Our company sells the instrument does not mean we transfer the copyright, or any intellectual property ' s ownership to the user.

6.The specifications and information in this manual are subjected to further updates without notice.