

SENTRY

SENTRY OPTRONICS CORP.

CHROMA METER

Instruction Manual

ST520/522



RoHS
COMPLIANT



REACH
(SVHC)

520/ 522

Chroma Meter

Instruction Manual

使用說明書



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1. Product Introduction

Thank you for purchasing the Chroma Meter. Read through this instruction manual before operating the meter. Please also store and retain this instruction manual for future reference.

1-1 Features

- Precision instrument for light illuminance and color coordinate.
- Meet CIE (International Commission on Illumination) photopic spectral response.
- Illuminance measurement.
- Color temperature and Correlated color temperature measurement.
- Color coordinate measurement.
- Custom reference value of color difference mode.
- Measuring light source selection.(522)
- Low battery indicator.
- Auto power off saves battery life.
- Automatic backlight LCD and triple reading display.
- Data Hold function.
- Lux or foot-candle unit selection.
- Magnetic mount.
- Tripod socket.

1-2 Applications

- Color LED Lighting.
- Interior room lighting.
- Street lighting.
- Greenhouse lighting.
- Commercial displays.

- Film and television.
- Projection halls.
- Art galleries.
- Warehouses.
- Museums.
- Stadiums.
- Arenas.

2. Safety Information

Read the following safety information carefully before attempting to operate or service the meter. Only qualified personnel should perform repairs.

2-1 Safety Symbols

 CE Certification.

This instrument conforms to the following standards:

EN61326: Electrical equipment for measurement, control and laboratory use.

IEC61000-4-2: Electrostatic discharge immunity test.

IEC61000-4-3: Radiated, radio-frequency, electromagnetic field immunity test.

IEC61000-4-8: Power frequency magnetic field immunity test.

Tests were conducted using a frequency range of 80-1000MHz with the instrument in three orientations. The average error for the three orientations is $\pm 3\%$ at 3V/m throughout the spectrum. However, between 180-500MHz at 3V/m, the instrument permissive loss of performance is specified by the specifications.

RoHS Restrict to use of six substances within electrical and electronic equipment (EEE), thereby contributing to the protection of human health and the environment.

REACH (SVHC) The device of used materials content no following substances that list of proposed REACH substances of very high concern.



The device may not be disposed of with the trash. It promotes the re-use recycling and other forms of recovery of used materials and components, and to improve the environmental performance of all operators (manufacturers, traders and treatment facilities) involved in the life cycle of products. Dispose of the product appropriately in accordance with the regulations in force in your country.

2-2 Warning

Be sure to adhere to the following points to avoid injury.

- Please read the manual carefully to ensure safe and correct use of this meter before using. Please reread if necessary.
- Do not immerse the meter in water.
- Do not disassemble or modify the meter.
- Do not attempt to repair it yourself if the meter is malfunction. Only qualified personnel may do it.
- Do not press, push or strike the LCD and receptor head.
- Do not use the meter in places where flammable or nearby the fire.
- Do not use this meter in environments outside this range : 32°F (0°C) to 122°F (50°C) at Relative Humidity no higher than 80%.

- When using is complete, close the receptor cover.
- Be aware the accumulation of irradiations would cause the sensor continue to age. Please keep away the light source and cover with the cap when the unit is not in use.
- If the meter will not be used for a long time, remove the battery and close the receptor cover.
- Never use organic solvents to clean the meter. (such as thinner, benzene, etc.)

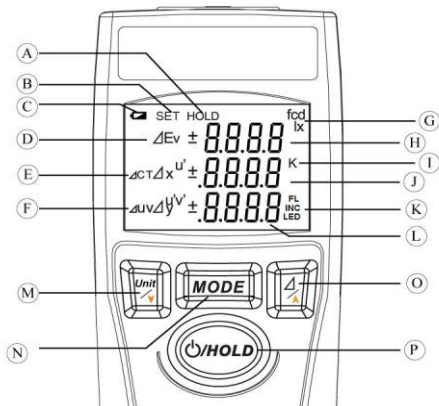
3. Specifications

Model	520	522
Sensor Element	SPC (Silicon Photocell)	
Measuring Light Sources Selection	General Light Source	FL (Fluorescent light source) INC (Incandescent light source) LED (LED light source)
Measuring Function	Illuminance : Ev (lx or fcd) Color Coordinate : (x, y) , (u', v') (CIE 1960) Correlated Color Temperature : CT, Δ uv Color Difference : (Δ Ev, Δ x, Δ y) , (Δ Ev, Δ u', Δ v') , (Δ Ev, Δ u'v') (One set of reference color)	
Correlated Color Temperature Difference Measurement (Δ CT)	NO	YES
Measuring Range	Ev : 0~80000 lx (0~7432 fcd) CT : 99990 K Max.	
Accuracy(at 25°C, 60% RH)	Ev : \pm (3%+2 Digital) (3000 lx, standard illuminant A measured) x, y : \pm 0.02 (100 lx, RGB LED Light)	
Resolution	Ev : 1 (0~9999) \cdot 10 (Over 10000) , lx ; 0.1 (0.0~999.9) \cdot 1 (Over 1000) , fcd ; CT : 1 (0~9999) \cdot 10 (Over 10000) , K ; x, y : 0.001 ; u', v' : 0.001	
Response Time	Approx. 1 sec.	
Repeatability	x, y : \pm 0.003 (100 lx, RGB LED Light)	
Temperature Drift	Ev : \pm (5%+2 Digital) (3000 lx, standard illuminant A measured) x, y : \pm 0.008 (100 lx, RGB LED Light)	
Humidity Drift	Ev : \pm (3%+2 Digital) (3000 lx, standard illuminant A measured) x, y : \pm 0.005 (100 lx, RGB LED Light)	
Operation Temperature	32°F to 122°F (0°C to 50°C) \cdot Less than 80% RH	
Store Temperature	14°F to 140°F (-10°C to 60°C) \cdot Less than 85% RH	
Battery life	70 hours or longer continuous use	
Multi-Display	Triple readings	
Over range indication	Yes (" - H I - ")	
Data Hold	Yes	
Low battery indication	Yes	
Auto Power Off	30 Minutes of idle	
Weight	6.3 oz. (179g) without battery	
Dimensions	Main Instrument : 5.5 x 1.9 x 1.1 inch (140 x 49 x 29 mm) Sensor Probe : 6.5 x 2.0 x 1.4 inch (165 x 50 x 36 mm)	
Accessories	9V Battery x1 , Instruction manual x1 , Carrying case x1	

※ The addition function for 522 is denoted as (522) in the following paragraph.

4. General Descriptions

4-1 LCD and Control Panel



A. Data Hold Symbol

B. SET Function Symbol

C. Low Battery Symbol

D. Measuring Symbols of Primary Reading

E. Measuring Symbols of Secondary Reading

F. Measuring Symbols of Tertiary Reading

M. Unit / Down Button

N. Mode Button

G. Illuminance Unit (lx or fcd) Symbol

H. Primary Reading

I. Color Temperature Unit (K) Symbol

J. Secondary Reading

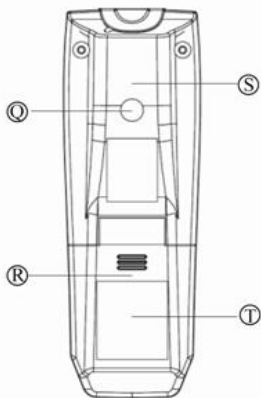
K. Light Source Symbol (FL, INC or LED) (522)

L. Tertiary Reading

O. Δ (Color Difference) / Up Button

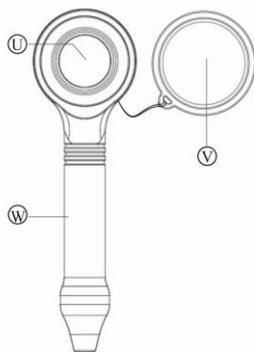
P. Power and Hold Button

4-2 Rear




- Q. Tripod Socket
- R. Battery Cover
- S. Magnet Position
- T. Anti-slippery Pad

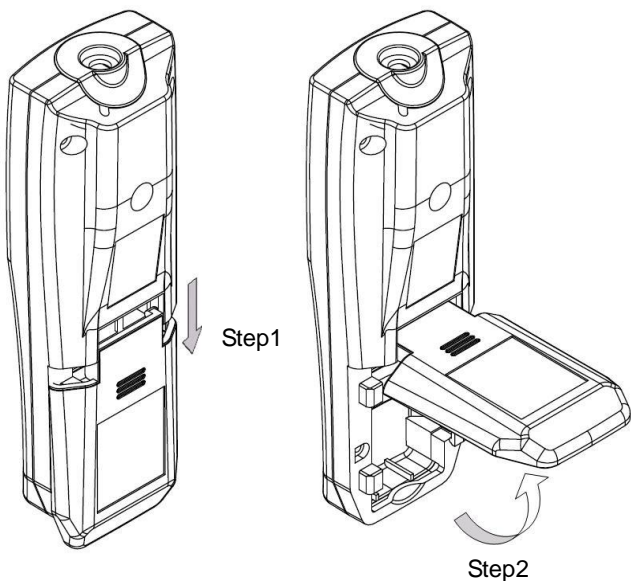
4-3 Probe



- U. Receptor Head
- V. Receptor Cover
- W. Grip

4-4 Battery Change

The meter is powered by a 9V battery. When the  symbol appears, the battery voltage drops below the level for reliable operation, the user has to replace a new battery. Turn the meter off first, open the battery cover on the back and replace the battery in the battery compartment.



5. Operation Instruction

5-1 Main Function

Power ON/OFF

Press and hold the Power button for 2 seconds to turn the meter on. Then all of symbols will appear for 2 seconds on the LCD. After power-on, the meter will measure and show the readings on the LCD continuously. Repeat to press and hold the Power button for 2 seconds again to turn the meter off.

Measuring Units

Press the **Unit**/ ∇ button to select the illuminance (Ev) unit : Lux (lx) or foot-candle (fcd)

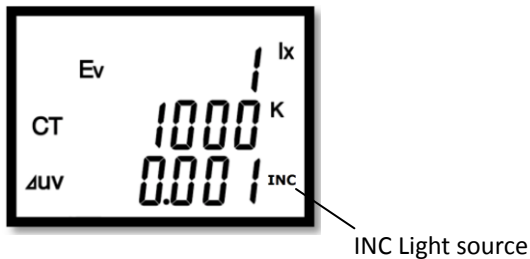
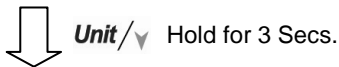
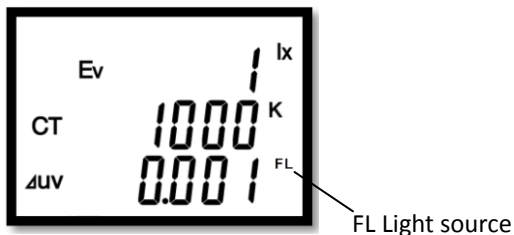
Measuring light source selection(522)

After power-on, user is suggested to select the type of light sources to be measured.

In the CT or \triangle CT display mode, press **Unit**/ ∇ button for 3 seconds to select different light source for measuring. There are three different light sources can be selected : FL(Fluorescent), INC(Incandescent) and LED.

The CT value will be more accurate when the selected light source is correspondent with the light source is being measured. If the CT value displays "----", it represents the measured CT value exceeds the light source's defined value, please select different light source for measuring.

Example: Switch FL light source to INC light source.



Data Hold

During measuring, press the HOLD button once to hold the measured values and the HOLD symbol will appear on the LCD. Press HOLD button again to return to measure.

Measuring Modes

Color measurement and color difference are switchable by pressing MODE and Δ/\wedge button.

Both of them also have 3 modes to select :

• Color Measurement :

1. E_v, x, y (Illuminance, Color coordinate)
2. E_v, u', v' (Illuminance, Color coordinate, CIE1960)
3. $E_v, CT, \Delta uv$ (Illuminance, Color temperature)

Press the MODE button to toggle in the color measurement.

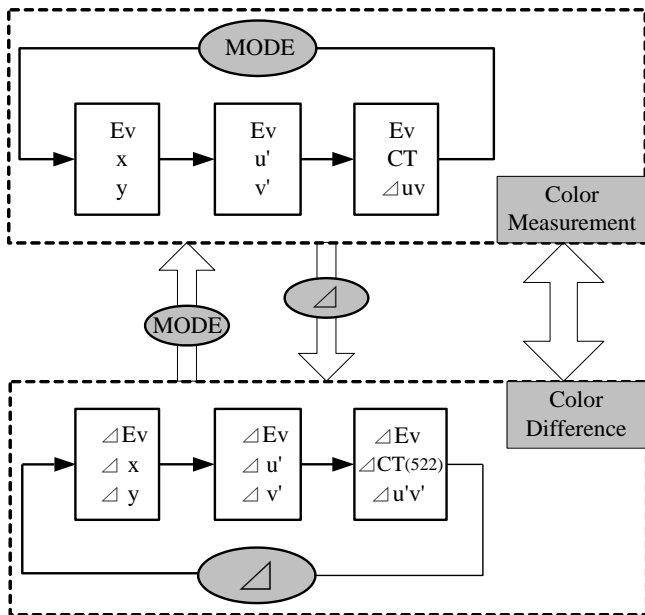
• Color Difference :

1. $\Delta E_v, \Delta x, \Delta y$ (Color difference of Illuminance and Color coordinate)
2. $\Delta E_v, \Delta u', \Delta v'$ (Color difference of Illuminance and Color coordinate, CIE1960)
3. $\Delta E_v, \Delta CT(522), \Delta u'v'$ (Color difference of Illuminance and Color temperature)

This function provides the users to measure or check the difference of illuminance, color coordinate color and color temperature between two or more than two light sources.

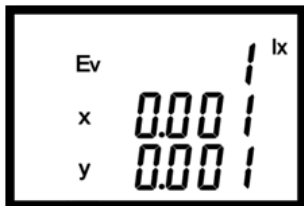
Press the Δ/\wedge button to toggle the color difference mode.

Measuring Modes Diagram

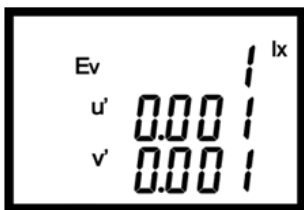


• **LCD Display in the Color Measurement :**

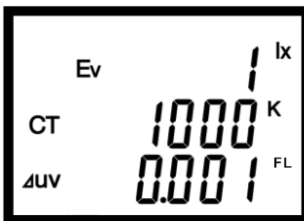
1. Ev, x, y (Illuminance, Color coordinate)



2. Ev, u', v' (Illuminance, Color coordinate, CIE1960)

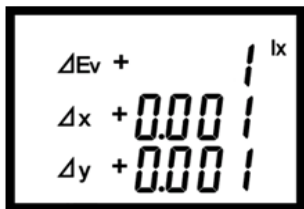


3. Ev, CT, Δuv (Illuminance, Color temperature)

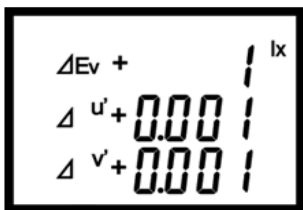


• **LCD Display in the Color Difference :**

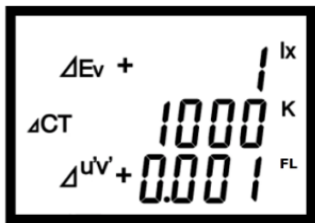
1. ΔE_v , Δx , Δy (Color difference of Illuminance and Color coordinate)



2. ΔE_v , $\Delta u'$, $\Delta v'$ (Color difference of Illuminance and Color coordinate, CIE1960)



3. ΔE_v , $\Delta CT(522)$, $\Delta u'v'$ (Color difference of Illuminance and Color temperature)



5-2 SET Function

Color Difference : This function allows user to set certain reference values ($E_{v_{ref}}$, x_{ref} , y_{ref} , u'_{ref} , v'_{ref} , $CT_{ref}(522)$) to compare with the target color.

Set the Reference Value

You can select one of these color difference modes to set :

1. ΔE_v , Δx , Δy
2. ΔE_v , $\Delta u'$, $\Delta v'$
3. ΔE_v , $\Delta CT(522)$, $\Delta u'v'$

In the Color Difference mode, press the Δ/\wedge button and hold for 3 seconds into set mode. (See diagram 5-2a)

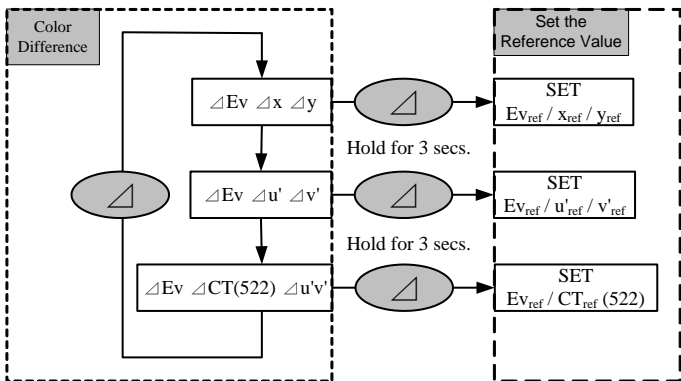


Diagram 5-2a set reference values

Set the reference values in either of two methods :

5-2-1. Using the measured values and adjust it manually as the reference values.

5-2-2. Using the previous values stored in memory and adjusts it manually as the reference values.

The difference between method 5-2-1 and 5-2-2 is whether the Data Hold was enabled before entering the set mode. (See diagram 5-2b)

Note :

Color difference = (Measured value) – (Reference value)

Example:

$$\Delta Ev = Ev_{\text{meas}} - Ev_{\text{ref}}$$

$$\Delta X = X_{\text{meas}} - X_{\text{ref}}$$

$$\Delta y = y_{\text{meas}} - y_{\text{ref}}$$

$$\Delta u' = u'_{\text{meas}} - u'_{\text{ref}}$$

$$\Delta v' = v'_{\text{meas}} - v'_{\text{ref}}$$

$$\Delta CT = CT_{\text{meas}} - CT_{\text{ref}} (522)$$

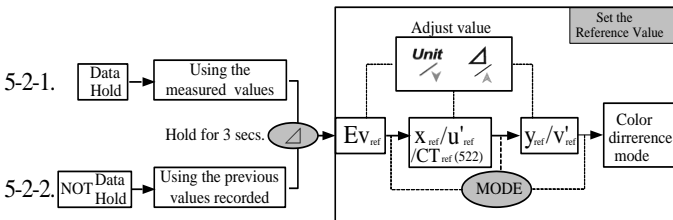


Diagram 5-2b

5-2-1 Using the Measured Values

a. Select the (Ev, x, y) mode first and measure a light source.

1. Press the HOLD button to hold these values that you want to use as your reference values.
2. Press the Δ/\wedge button once to toggle the color difference mode.
3. Press the Δ/\wedge button again and hold for 3 seconds to toggle the set reference values mode. The SET symbol will appear and the Ev symbol will flash on the LCD. In the set mode, the default of Ev reference will show the measured value that you held previously.
4. Press the **Unit**/ \vee or Δ/\wedge button to adjust the Ev reference value (Ev_{ref}) if necessary.
5. Press the MODE button to toggle next reference value (x_{ref}).
6. Repeat the step 4 and step 5 to adjust the rest reference values (x_{ref} and y_{ref}).
7. Press the MODE button again to back to color difference mode.

$Ev_{ref} \rightarrow$ **MODE** $\rightarrow x_{ref} \rightarrow$ **MODE** $\rightarrow y_{ref} \rightarrow$ **MODE** \rightarrow Color difference mode

b. Select the (Ev, u', v') mode and repeat step 1 ~ 7 to set the u' and v' reference values.

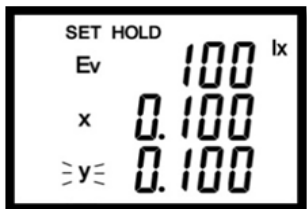
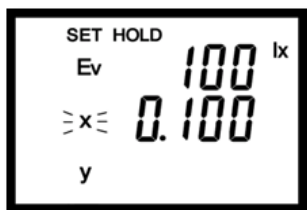
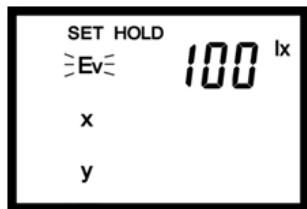
$Ev_{ref} \rightarrow$ **MODE** $\rightarrow u'_{ref} \rightarrow$ **MODE** $\rightarrow v'_{ref} \rightarrow$ **MODE** \rightarrow Color difference mode

c. Select the (Ev, CT, Δuv) mode and repeat step 1 ~ 7 to set the CT reference values. (522)

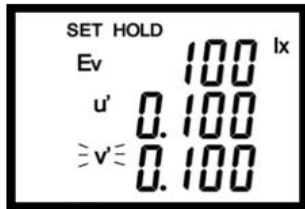
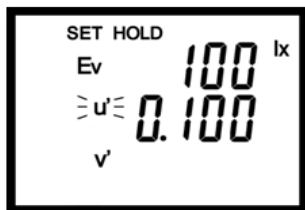
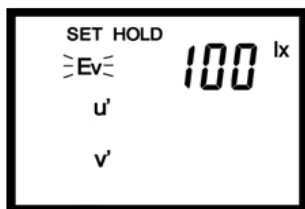
$Ev_{ref} \rightarrow$ **MODE** $\rightarrow CT_{ref} \rightarrow$ **MODE** \rightarrow Color difference mode

Please note that the Ev reference value in the three modes (Ev, x, y, Ev, u', v' and Ev, CT, Δuv) is the same.

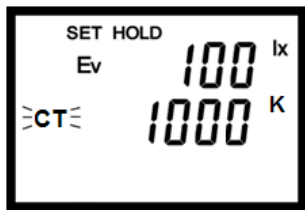
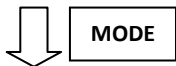
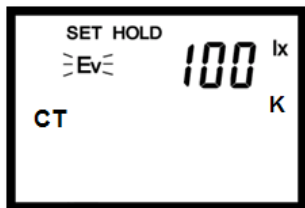
a. Using the measured values to set the reference values of (ΔE_v , Δx , Δy) mode.



b. Using the measured values to set the reference values of (ΔE_v , $\Delta u'$, $\Delta v'$) mode.



c. Using the measured values to set the reference values of (ΔE_v , ΔCT , $\Delta u'v'$) mode.(522)



5-2-2 Using the previous values stored in memory

a. Select the color difference (ΔE_v , Δx , Δy) mode directly.

1. Press the Δ/\wedge button and hold for 3 seconds to toggle set reference values mode without Data Hold.
2. The SET symbol will appear and the E_v symbol will flash on the LCD. In the set mode, the default of E_v reference will show the previous value stored in memory.
3. Press the **Unit**/ ∇ or Δ/\wedge button to adjust the E_v reference value ($E_{v_{ref}}$).
4. Press the MODE button to toggle next reference value (x_{ref}).
5. Repeat the step 3 and step 4 to adjust reference value (x_{ref} and y_{ref}).
6. Press the mode button again to back to color difference mode.

$E_{v_{ref}} \rightarrow$ **MODE** \rightarrow $x_{ref} \rightarrow$ **MODE** \rightarrow $y_{ref} \rightarrow$ **MODE** \rightarrow Color difference mode

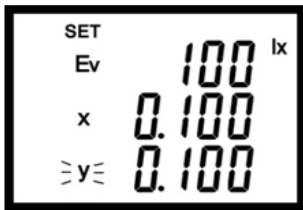
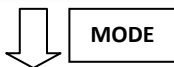
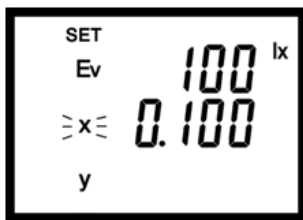
b. Select the (ΔE_v , $\Delta u'$, $\Delta v'$) mode and repeat step 1~6 to set the u' and v' reference values.

$E_{v_{ref}} \rightarrow$ **MODE** \rightarrow $u'_{ref} \rightarrow$ **MODE** \rightarrow $v'_{ref} \rightarrow$ **MODE** \rightarrow Color difference mode

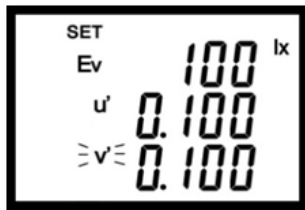
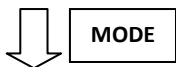
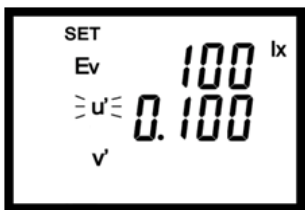
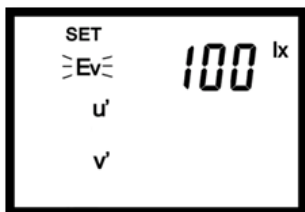
c. Select the (ΔE_v , ΔCT , $\Delta u'v'$) mode and repeat step 1~6 to set the CT reference values. (522)

$E_{v_{ref}} \rightarrow$ **MODE** \rightarrow $CT_{ref} \rightarrow$ **MODE** \rightarrow Color difference mode

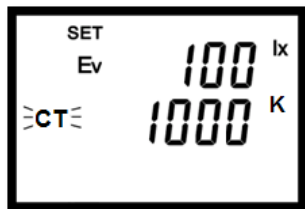
a. Using the previous values to set the reference values of (ΔEv , Δx , Δy) mode.



b. Using the previous values to set the reference values of (ΔE_v , $\Delta u'$, $\Delta v'$) mode.



c. Using the previous values to set the reference values of (ΔE_v , ΔCT , $\Delta u'v'$) mode.(522)



Zero the Reference Values of Color Difference

Close the receptor cover and the (E_v , x , y , E_v , u' , v' or EV , CT) measured values will show zero. Then repeat the section 5-2-1 that using the measured values to zero the reference value.

6. Maintenance

Clean the Receptor Head :

Blow off loose particles using clean compressed air. Gently brush remaining debris away with a camel's hair brush. Carefully wipe the surface with a cotton swab. The swab may be moistened with some water.

Clean the Housing :

When you clean the meter, wipe it with soap and water on a damp sponge or soft cloth.

NOTE :

Never use organic solvents to clean the meter or receptor head. (such as thinner, benzene, etc.) If the meter will not be used for a long time, remove the battery and close the receptor cover.

520/522

色彩照度計

Instruction Manual

使用說明書



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1. 產品簡介

感謝您購買本公司色彩照度計。請詳閱此手冊，再依照手冊操作儀器。並請保有手冊，以做為未來操作時的依據。

1-1 特色

- 光照度與色座標量測的精密儀器。
- 符合國際照明委員會(CIE)的明視覺光譜響應。
- 照度量測。
- 色溫及相對色溫量測。
- 色座標量測。
- 使用者可自定義色差模式的參考值。
- 可選擇量測的光源種類。(522)
- 低電量指示。
- 自動關機。
- 自動背光 LCD 與三排顯示。
- 資料鎖定功能。
- 照度(Lux)或燭光(foot-candle)單位選擇。
- 磁鐵固定。
- 三腳架固定孔。

1-2 適用範圍

- 彩色LED照明。
- 室內裝潢照明。
- 街道照明。
- 溫室照明。
- 商業廣告。

- 電影與電視。
- 投影廳。
- 藝術畫廊。
- 倉庫。
- 博物館。
- 圖書館。
- 體育場。
- 戲院。
- 學校。
- 活動場所。
- 辦公室。

2. 安全須知

欲使用或保養本儀器前，請仔細閱讀以下安全須知。並且只有合格認證的工程師才可對本產品進行維修。

2-1 安全標章



本儀器符合下列標準：

EN61326：實驗室量測或控制設備電磁相容檢測。

IEC61000-4-2：靜電放電耐受檢測。

IEC61000-4-3：輻射耐受檢測。

IEC61000-4-8：電源頻率磁場耐受檢測。

當外來電磁波頻率在180~500MHz附近且強度達到3V/m時，儀器可能無法達到產品所要求的規格。

RoHS 規範電器電子儀器(EEE)產品所禁用的6種物質，以確保人體健康及環境安全。

REACH (SVHC)

謹遵守REACH管理規範，本儀器不含高度關切物質(SVHC)。



本產品不能當作一般垃圾處理。提倡回收可重複利用的材料元件，並改善企業環境績效，請按照所在國家的法規妥善處理廢棄產品。

2-2 注意要項

確實遵守下列要點以避免損害：

- 使用儀器前請先仔細閱讀使用手冊以確保安全，並正確地使用。如有需要請反覆閱讀。
- 請勿將儀器浸泡在水裡。
- 請勿拆解或修改儀器。
- 假使儀器故障，請勿自行嘗試修復，只有合格認證的工程師才能進行維修。
- 請勿按壓或敲擊LCD與接收探頭。
- 請勿在易燃或鄰近火源的地方使用儀器。
- 請勿在超出此溫濕度範圍的環境使用儀器：0°C~50°C，小於80% RH。
- 使用完畢請闔上接收探頭蓋子。
- 請了解在長時間照射下感測器會逐漸老化。
- 假使儀器長時間未使用請移除電池並闔上接收探頭蓋子。
- 請勿使用有機溶劑清潔儀器（如稀釋劑、苯等）。

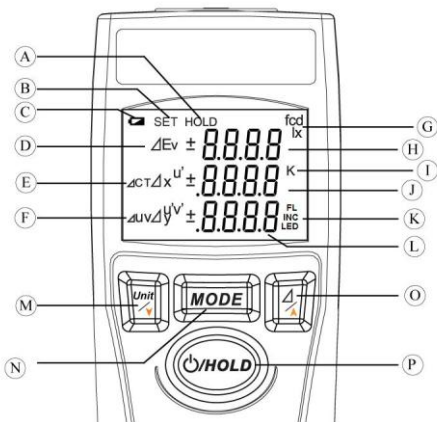
3. 規格

型號	520	522
感測元件	矽光二極體	
量測光源種類	通用型光源	FL(螢光光源) INC(白熾光源) LED(LED 光源)
量測功能	照度： E_v (lx 或 fcd) 色座標： (x, y) , (u', v') (CIE 1960) 相對色溫：CT, Δuv 色差： $(\Delta E_v, \Delta x, \Delta y)$, $(\Delta E_v, \Delta u', \Delta v')$ $(\Delta E_v, \Delta u' v')$, (可設一組參考值)	
相對色溫差值量測(ΔCT)	無	有
量測範圍	E_v : 0-80000 lx (0-7432 fcd) CT: 99990 K 最大	
精準度 (在 25°C, 60%)	E_v : $\pm (3\%+2)$ (3000 lx, 標準 A 光源) x, y : ± 0.02 (100 lx, RGB LED 光源)	
解析度	E_v : 1 (0-9999) · 10 (超過 10000), lx ; 0.1 (0.0-999.9) · 1 (超過 1000), fcd ; CT: 1 (0-9999) · 10 (超過 10000), K ; x, y : 0.001 ; u', v' : 0.001	
反應時間	大約 1 秒	
重複性	x, y : ± 0.003 (100 lx, RGB LED 光源)	
溫度飄移	E_v : $\pm (5\%+2)$ (3000 lx, 標準 A 光源) x, y : ± 0.008 (100 lx, RGB LED 光源)	
濕度飄移	E_v : $\pm (3\%+2)$ (3000 lx, 標準 A 光源) x, y : ± 0.005 (100 lx, RGB LED 光源)	
操作溫度	32°F ~122°F (0°C 到 50°C), 小於 80%相對濕度	
保存溫度	14°F ~140°F (-10°C 到 60°C), 小於 85%相對濕度	
電池壽命	連續使用超過 70 小時	
多顯示	三排讀值	
超出規格顯示	有 ("—H I—")	
資料鎖定	有	
低電量指示	有	
自動關機	閒置 30 分後	
重量	未含電池 179 克 (6.3 盎司)	
主機尺寸	主機: 140 x 49 x 29 公厘 (5.5 x 1.9 x 1.1 英吋) 探測棒: 165 x 50 x 36 公厘 (6.5 x 2.0 x 1.4 英吋)	
配件	9V 電池, 操作手冊, 手提箱	

※ 在以下的說明中，以(522) 註記代表 522 專屬之功能。

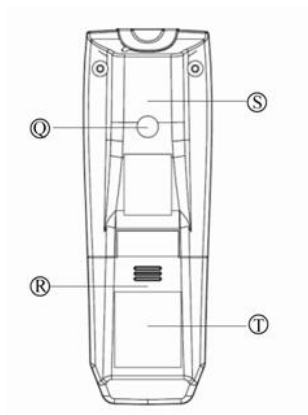
4. 一般說明

4-1 LCD 與控制面板



- A. 資料鎖定符號
- B. 設定功能符號
- C. 低電量指示符號
- D. 第一排讀值的量測符號
- E. 第二排讀值的量測符號
- F. 第三排讀值的量測符號
- G. 照度單位流明(lx)或燭光(fcd)符號
- H. 第一排量測讀值
- I. 色溫單位(K)符號
- J. 第二排量測讀值
- K. 量測光源種類(FL, INC 或 LED)(522)符號
- L. 第三排量測讀值
- M. 單位切換/向下鍵
- N. 模式切換鍵
- O. Δ(色差)/向上鍵
- P. 電源與資料鎖定鍵

4-2 背面外觀



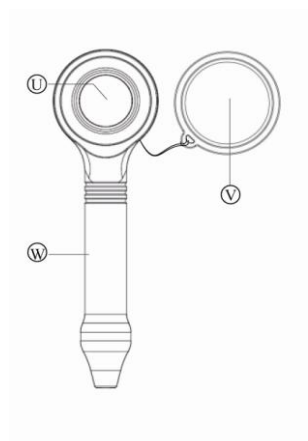
Q. 三腳架固定孔

R. 電池蓋

S. 磁鐵固定位置

T. 止滑墊

4-3 探測棒外觀




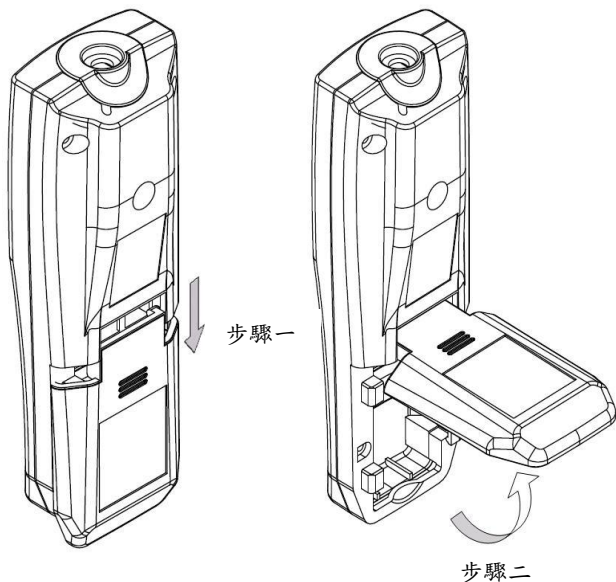
U. 接收探頭

V. 接收探頭蓋

W. 握把

4-4 電池替換

本儀表使用9V電池供電。當低電量  符號亮起，表示電池低於正常操作電壓，使用者必須更換新電池。先打開後面的電池蓋，然後更換電池槽內的電池，完成後確實蓋好電池蓋。



5. 操作說明

5-1 主功能

電源開關與量測

按壓住電源鍵2秒開啟電源，LCD上所有符號會顯示2秒，之後儀表將連續讀取待測光源之量測值並且顯示在LCD上。當使用者要關閉儀表時，請重覆按壓住電源鍵2秒關機。

量測單位

按下 **Unit**/√ 鍵可切換照度(Ev)單位：流明 (lx) 或燭光 (fcd)。

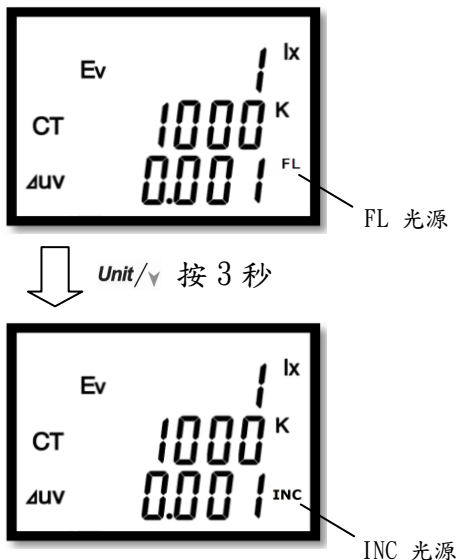
量測光源種類選擇(522)

在量測前，使用者宜先選擇待測光源之類別，提升色彩及照度之量測值之精確性。選擇光源之操作步驟如下：

在 CT 及 Δ CT 畫面顯示時，按壓住 **Unit**/√ 鍵 3 秒可依序切換量測的光源種類，共有三種光源可以選擇，分別為：FL(螢光光源)、INC(白熾光源)、LED(LED 光源)。量測時選擇正確對應的光源種類，可得到較精確 CT(色溫)數值。

注意：若在量測時，CT 數值顯示為” --- ”，代表此待測物的 CT 數值超出該光源種類的設定範圍，請切換不同光源種類進行量測。

如下圖所示:由 FL 光源切換到 INC 光源。



資料鎖定

量測期間，按下HOLD鍵可鎖定量測值，且HOLD符號會顯示在LCD上，再按下HOLD鍵則返回連續量測。

量測模式

本儀表提供兩種量測：色彩與色差量測。

色彩與色差量測可透過 MODE 鍵和 Δ/\wedge (色差) 鍵互相切換。
兩種量測也都有 3 種模式可選擇：

• 色彩量測：

1. E_v, x, y (照度, 色座標)
2. E_v, u', v' (照度, 色座標, CIE1960)
3. $E_v, CT, \angle uv$ (照度, 色溫)

色彩量測請按下 MODE 鍵切換。

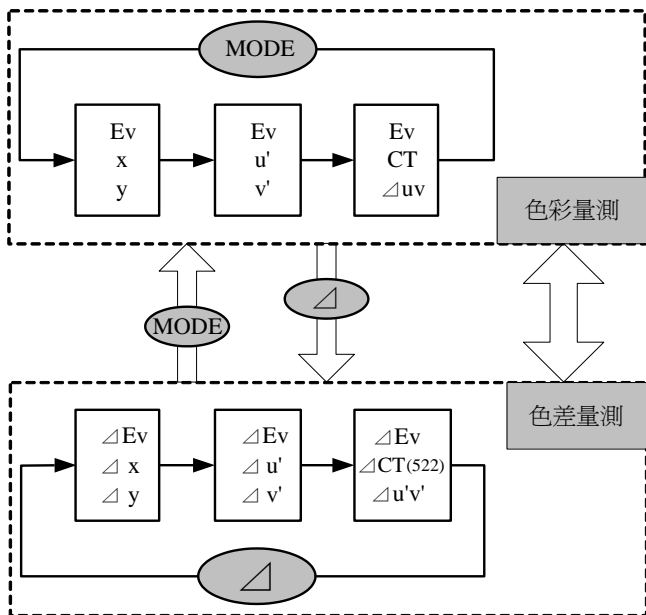
• 色差量測：

1. $\Delta E_v, \Delta x, \Delta y$ (照度差值, 色座標差值)
2. $\Delta E_v, \Delta u', \Delta v'$ (照度差值, 色座標差值, CIE1960)
3. $\Delta E_v, \Delta CT(522), \Delta u' v'$ (照度差值, 色溫差值)

此功能提供用戶對於多個光源測量或檢查照度, 顏色坐標顏色和色溫之間的偏差值。

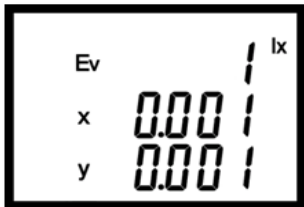
色差量測請按下 Δ/\wedge (色差) 鍵切換。

量測模式圖

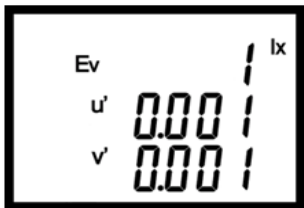


• 色彩量測下，LCD 顯示畫面：

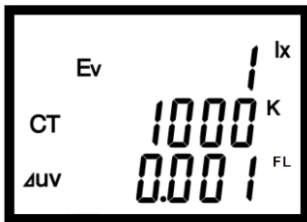
1. Ev, x, y (照度，色座標)



2. Ev, u', v' (照度，色座標 CIE1960)

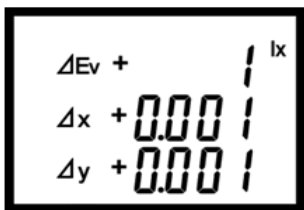


3. Ev, CT, Δuv (照度，色溫)

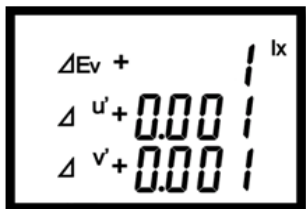


• 色差量測下，LCD 顯示畫面：

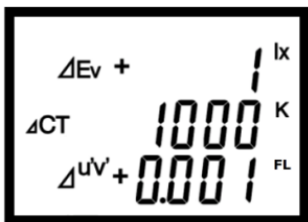
1. ΔE_v , Δx , Δy (照度差值，色座標差值)



2. ΔE_v , $\Delta u'$, $\Delta v'$ (照度差值，色座標差值 CIE1960)



3. ΔE_v , $\Delta CT(522)$, $\Delta u'v'$ (照度差值，色溫差值)



5-2 設定功能

色差量測：本儀表提供色彩的比對功能，使用者可以設定一組特定的色彩參考值（ E_v 參考值， X 參考值， y 參考值， u' 參考值， v' 參考值， CT 參考值(522)），來比較與待量測光源之色彩的差異。

設定參考值

可選用其中的一種色差模式進去做設定：

1. ΔE_v ， Δx ， Δy
2. ΔE_v ， $\Delta u'$ ， $\Delta v'$
3. ΔE_v ， $\Delta CT(522)$ ， $\Delta u' v'$

在色差模式下，按壓住 Δ/\wedge （色差）鍵 3 秒可進入設定。
（參照圖 5-2a）

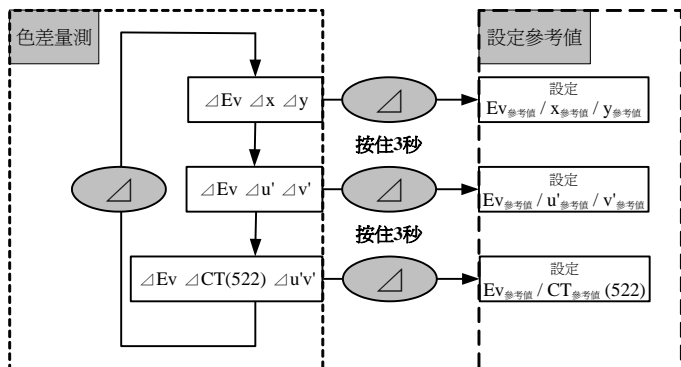


圖 5-2a 設定參考值方式

使用下列兩種方式中任一來設定參考值：

5-2-1. 使用量測值，然後再手動調整該值當參考值。

5-2-2. 使用原先儲存值，然後再手動調整該值當參考值。

上述兩種方式的差異在，進入設定模式前，資料鎖定 HOLD 是否有開啟。（參照圖 5-2b）

備註：（色差 = 量測值 - 參考值）

範例：

$$\Delta Ev = Ev_{\text{量測值}} - Ev_{\text{參考值}}$$

$$\Delta X = X_{\text{量測值}} - X_{\text{參考值}}$$

$$\Delta y = y_{\text{量測值}} - y_{\text{參考值}}$$

$$\Delta u' = u'_{\text{量測值}} - u'_{\text{參考值}}$$

$$\Delta v' = v'_{\text{量測值}} - v'_{\text{參考值}}$$

$$\Delta CT = CT_{\text{量測值}} - CT_{\text{參考值}} \quad (522)$$

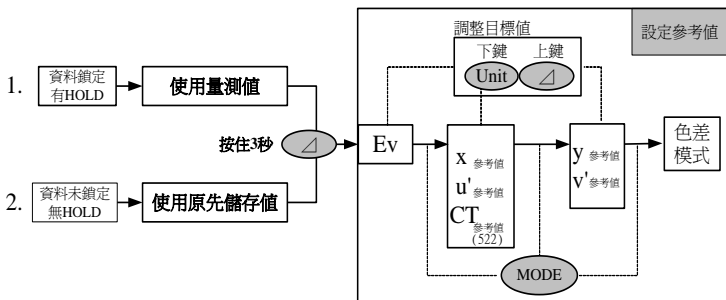


圖 5-2b

5-2-1 使用量測值設定參考值

a. 先選擇 (Ev, x, y) 模式並量測一個光源。

1. 按下HOLD鍵鎖定您認為穩定的量測值當參考值使用。
2. 按下 Δ/\wedge (色差) 鍵一下切換到色差量測。
3. 再按壓住 Δ/\wedge (色差) 鍵3秒進入設定參考值模式。LCD上SET符號會顯現，Ev符號會閃爍。設定模式下，Ev參考值預設值會顯示先前鎖定的量測值。
4. 按下 **Unit**/ ∇ 鍵或 Δ/\wedge 鍵可調整Ev參考值。
5. 按下MODE鍵確定，至下個參考值 (X參考值)。
6. 重複步驟4，再去調整參考值X參考值和Y參考值。
7. 再次按下MODE鍵可返回色差量測。

Ev 參考值 \rightarrow **MODE** \rightarrow X 參考值 \rightarrow **MODE** \rightarrow Y 參考值 \rightarrow **MODE** \rightarrow 色差模式

b. 選擇 (Ev, u', v') 模式並重覆步驟1~7即可設定u', v' 參考值。

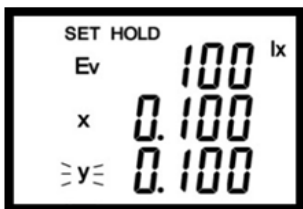
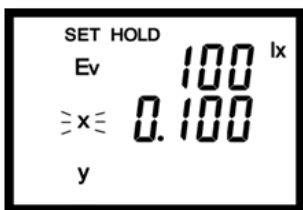
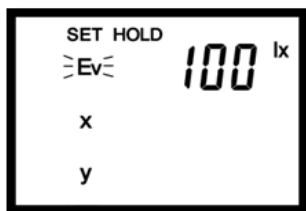
Ev 參考值 \rightarrow **MODE** \rightarrow u' 參考值 \rightarrow **MODE** \rightarrow v' 參考值 \rightarrow **MODE** \rightarrow 色差模式

c. 選擇 (Ev, CT, u'v') 模式並重覆步驟1~7即可設定CT參考值 (522)。

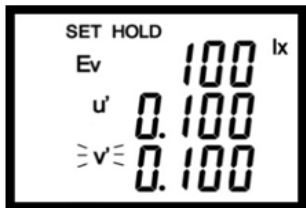
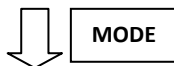
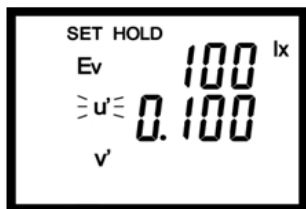
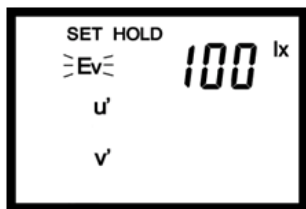
Ev 參考值 \rightarrow **MODE** \rightarrow CT 參考值 \rightarrow **MODE** \rightarrow 色差模式

注意：上述三種模式下 (Ev, x, y)、(Ev, u', v') 與 (Ev, CT, u'v') 的Ev參考值為相同的。

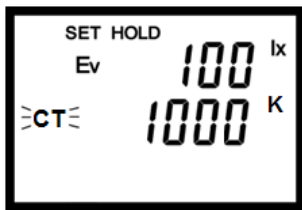
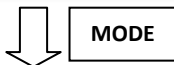
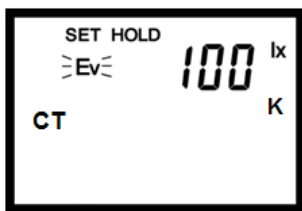
a. 使用量測值去設定 (ΔEv , Δx , Δy) 模式下的參考值



b. 使用量測值去設定 (ΔE_v , $\Delta u'$, $\Delta v'$) 模式下的參考值



c. 使用量測值去設定 (ΔEv , ΔCT , $\Delta u'v'$) 模式下的參考值(522)



5-2-2 使用原先儲存值設定參考值

a. 直接選擇色差量測 (ΔEv , Δx , Δy) 模式。

1. 在無資料鎖定下，按壓住 Δ/\wedge (色差) 鍵 3 秒進入設定模式。
2. 在LCD上SET符號會顯現，Ev符號會閃爍。設定模式下，Ev參考值預設值會顯示原先儲存值。
3. 按下 **Unit**/ \surd 鍵 Δ/\wedge 鍵可調整Ev參考值。
4. 按下MODE鍵至下個參考值 (X參考值)。
5. 重複步驟3，去調整參考值X參考值和y參考值。
6. 再次按下MODE鍵可返回色差量測。

Ev參考值 \rightarrow **MODE** \rightarrow X參考值 \rightarrow **MODE** \rightarrow y參考值 \rightarrow **MODE** \rightarrow 色差模式

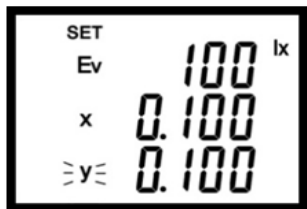
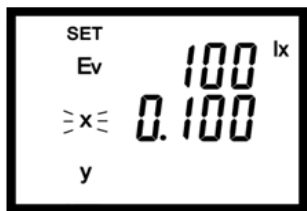
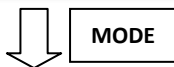
b. 選擇 (ΔEv , $\Delta u'$, $\Delta v'$) 模式並重覆步驟1~6即可設定u', v' 參考值。

Ev參考值 \rightarrow **MODE** \rightarrow u'參考值 \rightarrow **MODE** \rightarrow v'參考值 \rightarrow **MODE** \rightarrow 色差模式

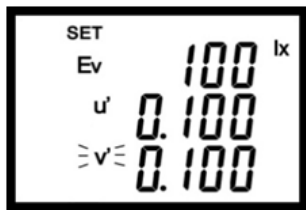
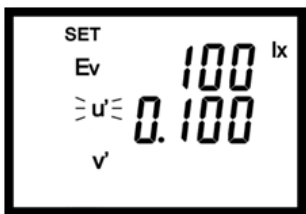
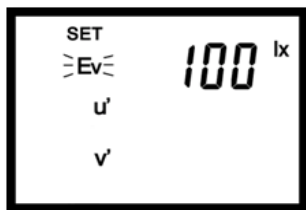
c. 選擇 (ΔEv , ΔCT) 模式並重覆步驟1~6即可設定Ev, CT參考值。
(522)

Ev參考值 \rightarrow **MODE** \rightarrow CT參考值 \rightarrow **MODE** \rightarrow 色差模式

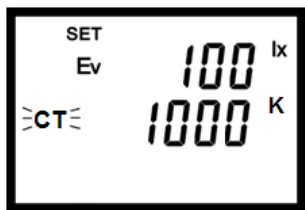
a. 使用原先儲存值去設定 (ΔEv , Δx , Δy) 模式下的參考值



b. 使用原先儲存值去設定 (ΔE_v , $\Delta u'$, $\Delta v'$) 模式下的參考值



c. 使用原先儲存值去設定 (ΔEv , ΔCT , $\Delta u'v'$) 模式下的參考值 (522)



色差參考值的歸零

闔上接收探頭的蓋子，(Ev, x, y、Ev, u', v'、Ev, CT)皆會顯示零，然後重覆 5-2-1 章節，使用量測值設定，就能將參考值歸零。

6. 基本保養

清潔接收探頭：

用乾淨的壓縮空氣吹掉表面塵粒，再用軟刷輕輕的刷去剩餘碎屑，並小心地用棉布擦拭，棉布可沾些水幫助清潔。

清潔外殼：

清潔儀器時，可用沾有肥皂水的海綿或軟布擦拭。

注意：

請勿使用有機溶劑清潔儀表或接收探頭（如稀釋劑、苯等）。假使儀表長時間未使用，請移除電池並蓋好接收探頭蓋子。

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