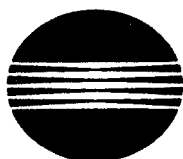


COLOR READER

CECF-9

OPERATION MANUAL



KONICA MINOLTA

Color Reader CECF-9 is an extremely compact, extremely easy-to-use tristimulus colorimeter. After switching on the Color Reader and performing white calibration by placing the tip of the Color Reader against the included white cap and pressing the measuring button, measurements can be taken by simply positioning the Color Reader on the specimen and pressing the measuring button. The Color Reader can be easily operated with one hand and is battery powered for complete portability. Memory is provided for up to 10 measurements.

Please read and study this manual before using the Color Reader for the first time and keep this manual handy for future reference.

SAFETY PRECAUTIONS

- To ensure correct use of this instrument, read the following points carefully and adhere to them. After you have read this manual, keep it in a safe place where it can be referred to anytime a question arises.

WARNING

FAILURE TO ADHERE TO THE FOLLOWING POINTS MAY RESULT IN DEATH OR SERIOUS INJURY.

- Do not use this instrument in places where flammable or combustible gases (gasoline etc.) are present. Doing so may cause a fire.
- Use only optional AC Adapter AC-A12 to supply power to the Color Reader from an AC outlet. Use the AC Adapter AC-A12 only with the rated power source. Damage to the AC adapter may cause a fire or electric shock.
- If this instrument will not be used for a long time, disconnect the AC adapter from the AC outlet. Accumulated dirt or water on the prongs of the adapter may cause a fire and should be removed.
- Do not insert or disconnect the AC adapter with wet hands. Doing so may cause a electric shock.
- Do not disassemble or modify the AC adapter. Doing so may cause a fire or electric shock.
- This instrument should not be operated if it is damaged, or smoke or odd smells occur. Doing so may result in a fire. In such situations, turn the power OFF immediately, disconnect the AC adapter, and contact the nearest authorized service facility.
- Do not disassemble or modify this instrument. Doing so may cause a fire or electric shock.
- Take special care not to allow liquid or metal objects to enter this instrument. Doing so may cause a fire or electric shock. Should liquid or metal objects enter, turn the power OFF immediately, disconnect the AC adapter, and contact the nearest authorized service facility.
- Do not dispose of batteries in fire, short their terminals, apply heat to them, or disassemble them. Also, do not recharge disposable batteries, such as alkaline batteries. Doing so may result in heating or explosion of the battery, fire, or injury.

CAUTION

FAILING TO ADHERE TO THE FOLLOWING POINTS MAY RESULT IN INJURY OR DAMAGE TO THIS INSTRUMENT OR OTHER PROPERTY.

- Do not perform measurement with the measurement aperture directed towards your face. Doing so may cause damage to your eyes.
- Do not use batteries other than those specified. Also, be sure to install the battery with the battery terminals positioned as shown inside the battery chamber. Use of other batteries or incorrect installation may result in battery explosion or leakage, fire, or injury.

NOTES ON USE

- The Color Reader should be used at temperatures between 0 and 40°C (32 and 104°F). Do not use the Color Reader at temperatures outside this range. Also, do not subject the Color Reader to sudden changes in temperature.
- Do not leave the Color Reader in direct sunlight or near sources of heat, such as stoves, etc. The internal temperature of the Color Reader may become much higher than the ambient temperature in such cases.
- Do not use the Color Reader in extremely dusty areas or in areas filled with smoke or chemical fumes.
- Do not use the Color Reader near equipment which produces a strong magnetic field (such as speakers, large motors, etc.)
- When the Color Reader is not in use, be sure to set the POWER switch to O (off) and cover the measurement aperture with the protective cap.
- Do not subject the Color Reader to strong impact or vibration.
- If the instrument malfunctions, do not disassemble the instrument or attempt to repair it yourself. Any necessary repairs should be performed only by a authorized service facility.

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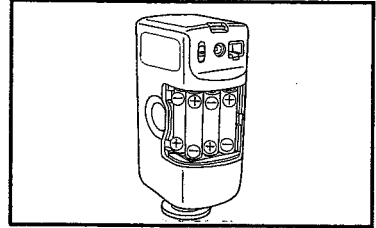
TAKING MEASUREMENTS IMMEDIATELY

To measure the color of a specimen, follow the steps below.

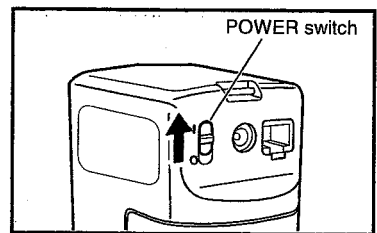
- For more information, refer to the corresponding section of this manual.

1 Install four AA-size batteries.

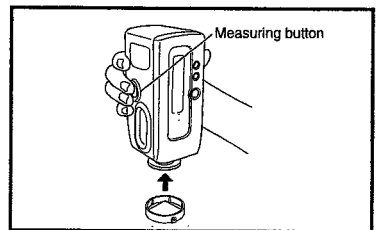
- Check that the polarities are as shown in the battery chamber.



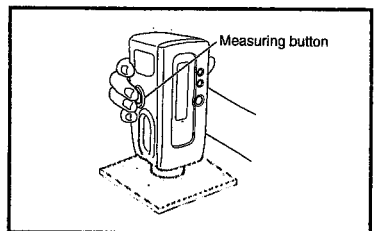
2 Switch on the instrument. The display will automatically change to the calibration display.



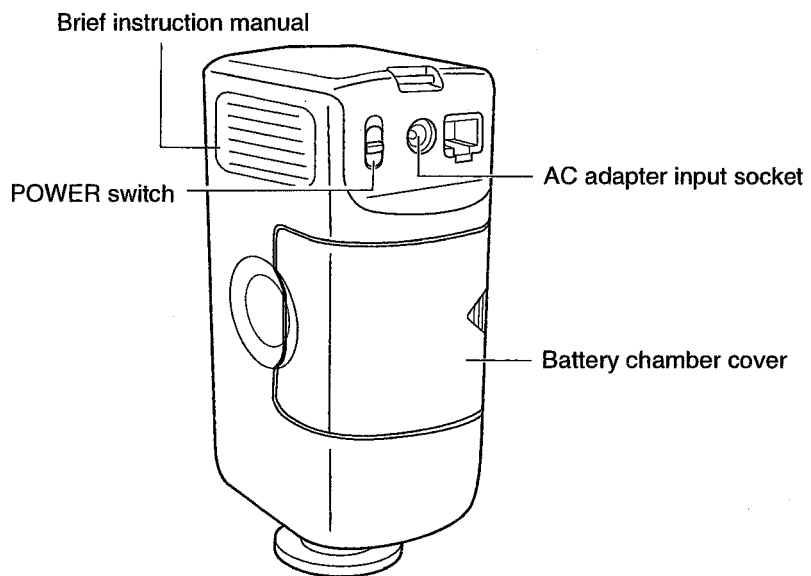
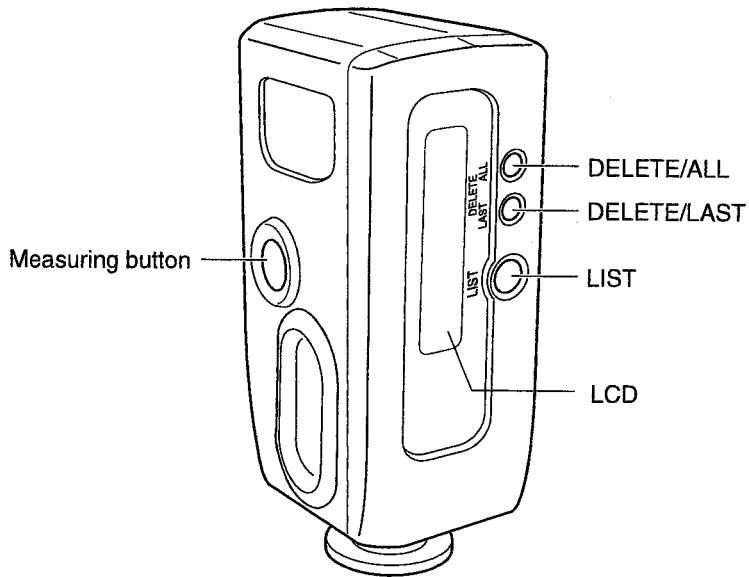
3 Attach the white calibration cap and press the measuring button to perform white calibration.



4 Place the tip of the Color Reader flat against the specimen to be measured and press the measuring button. The specimen will be measured and the measurement results will be shown in the display.



NAMES OF PARTS



FUNCTIONS OF CONTROLS

Measuring button	Takes measurement.
DELETE/ALL	Deletes all measured data from memory.
DELETE/LAST	Deletes latest measured data from memory.
LIST	Scrolls up (toward higher specimen numbers) through stored measurement data.
LCD	Displays measurement results, etc.
POWER switch	Switches power on (I) and off (O).
Battery chamber cover	Covers battery chamber which holds four AA-size batteries.
AC adapter input socket	Used for connecting AC adapter to supply power from an AC socket. Use only AC Adapter AC-A12.

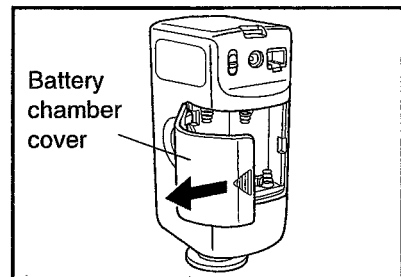
POWER

The Color Reader can be powered by either four AA-size batteries or optional AC Adapter AC-A12.

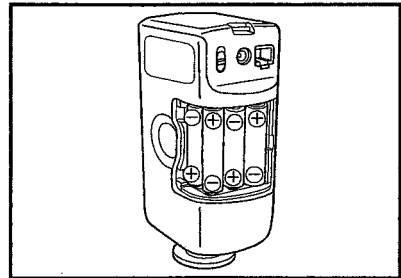
Installing Batteries

- Do not use batteries other than those specified. Also, be sure to install the battery with the battery terminals positioned as shown inside the battery chamber. Use of other batteries or incorrect installation may result in battery explosion or leakage, fire, or injury.
- Do not dispose of batteries in fire, short their terminals, apply heat to them, or disassemble them. Also, do not recharge disposable batteries, such as alkaline batteries. Doing so may result in heating or explosion of the battery, fire, or injury.
- When installing or removing batteries, be sure the POWER switch of Color Reader is set to O (off).
- Do not mix battery types or ages. Mixing battery types or ages could result in battery leakage, reduced battery life, or damage to the Color Reader.
- Do not touch or short the battery terminals inside the battery chamber. Doing so may damage the Color Reader.
- Use alkaline-manganese or Ni-Cd batteries.

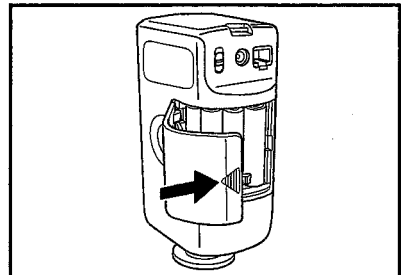
- 1 Check that the POWER switch is set to O (off) and slide the battery chamber cover in the direction of the arrow while gently pressing it in.



- 2 Install four AA-size batteries in the battery chamber with the polarities as shown inside the chamber.



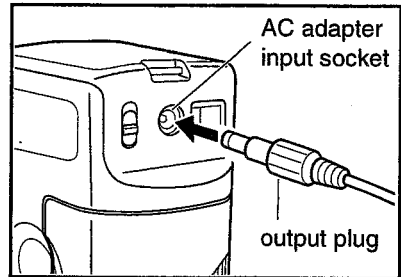
- 3 Close the battery chamber cover.
 - Be sure that both tabs on the battery chamber cover catch.



Using AC Adapter

- Use only optional AC Adapter AC-A12 to supply power to the Color Reader from an AC outlet. Use the AC Adapter AC-A12 only with the rated power source. Damage to the AC adapter may cause a fire or electric shock.
- If this instrument will not be used for a long time, disconnect the AC adapter from the AC outlet. Accumulated dirt or water on the prongs of the adapter may cause a fire and should be removed.
- Do not insert or disconnect the AC adapter with wet hands. Doing so may cause a electric shock.
- Do not disassemble or modify the AC adapter. Doing so may cause a fire or electric shock.
- This instrument should not be operated if it is damaged, or smoke or odd smells occur. Doing so may result in a fire. In such situations, turn the power OFF immediately, disconnect the AC adapter, and contact the nearest authorized service facility.
- Do not disassemble or modify this instrument. Doing so may cause a fire or electric shock.
- Take special care not to allow liquid or metal objects to enter this instrument. Doing so may cause a fire or electric shock. Should liquid or metal objects enter, turn the power OFF immediately, disconnect the AC adapter, and contact the nearest authorized service facility.

- 1 Check that the POWER switch of the Color Reader is set to O (off) and insert the output plug of the AC adapter into the AC adapter input socket of the Color Reader.



- 2 Insert the input plug of the AC adapter into an AC wall outlet.

DISPLAYS

Calibration Display

```
Set Cal. Plate  
--> Measure
```

Calibration can be performed in this display. This display automatically appears when the Color Reader is first switched on.

Measurement Display

```
1
```

```
5 *****  
#####++
```

When this display is shown, the Color Reader is ready to take a measurement. If there are measurement data in memory, the results for the previous measurement are shown in the display; if there are no measurement data in memory, only the specimen number "1" will be shown.

- "*****" displays the name of the nearest color stored in the Color Reader's memory.
- "#####" displays the name of the second nearest color stored in the Color Reader's memory.
- "+" or "++" mark is added to the measured data. These signs show the degree of difference between measured data and memorized color data.

No Sign : Almost the same

"+" : Fairly close

"++" : Somewhat close

Display with "Memory Full" Message

```
Memory Full
```

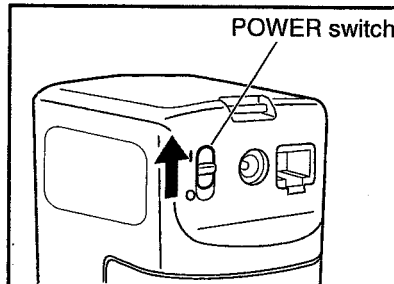
This display appears when additional measurements are taken after the number of measurements stored in memory has reached 10. When this display is shown, it is necessary to delete a latest or all measured data in memory for storing new data. See page 15 for other error messages.

WHITE CALIBRATION

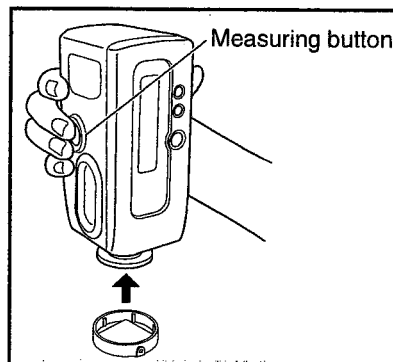
After the POWER switch is set to | (on), white calibration must be performed before measurements can be taken. White calibration can be performed only when the calibration display is shown; this display appears automatically after the POWER switch is set to | (on).

- 1 Set POWER switch to | (on). The calibration display will appear.

Set Cal. Plate
--> Measure



- 2 Place the tip of the Color Reader flat against the white calibration cap.
 - Use only the white calibration cap having the same serial number as the Color Reader. Use of a different white calibration cap will result in inaccurate measurements and may also result in error messages.



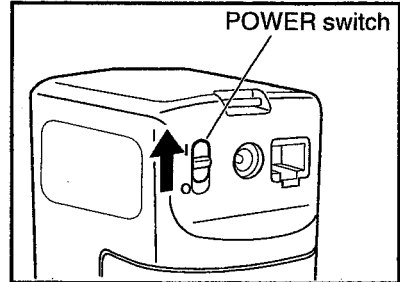
- 3 Press the measuring button. White calibration will be performed and the display will change to the measurement display (showing data if data are stored in memory).

1

TAKING MEASUREMENTS

- Do not perform measurement with the measurement aperture directed towards your face. Doing so may cause damage to your eyes.

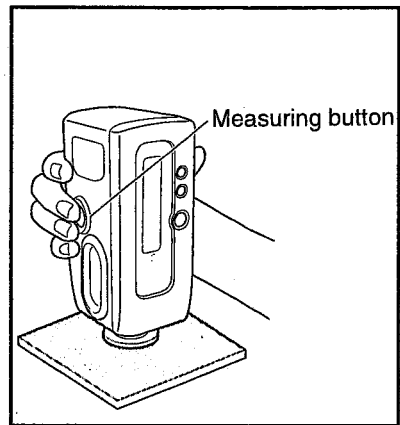
- 1 Set the POWER switch of the Color Reader to | (on) and perform white calibration (see previous page).



- 2 Place the tip of the Color Reader flat against the color to be measured and press the measuring button. When measurement has been completed, a beep will sound and the measurement results will appear in the display.



- If a measurement is taken when the number of measurements stored in memory has already reached 10, "Memory Full" will appear in the display.



RECALLING DATA IN MEMORY

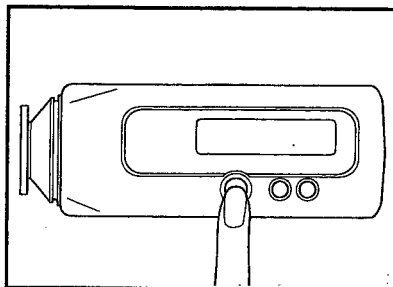
Measured data stored in memory can be recalled to the display by using LIST.

- Pressing LIST scrolls through the data in memory toward higher specimen numbers.

```
1  * * * * * * * *  
   # # # # # # # # +
```



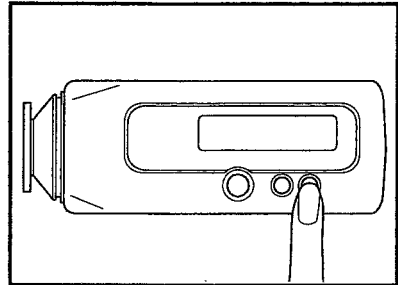
```
2  * * * * * * * * +  
   # # # # # # # # + +
```



DELETING ALL DATA FROM MEMORY

All data stored in the Color Reader's memory can be deleted by following the procedure below.

- 1 Press DELETE/ALL. "All Data Delete" will appear in the display.



- 2 Continue holding DELETE/ALL pressed until "All Data Deleted" appears in the display. Deletion of all data previously stored in the Color Reader's memory has been completed. It takes approx. 3 seconds.

All Data Delete



All Data
Deleted



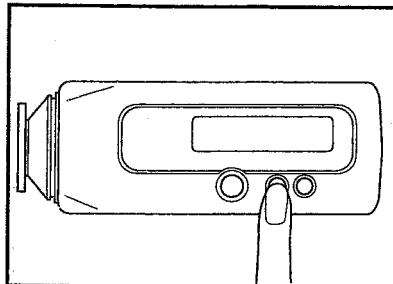
1

- The display will change to the measurement display, showing only the specimen number "1".
- To interrupt deletion of all data in memory, release DELETE/ALL before "All Data Deleted" appears in the display.

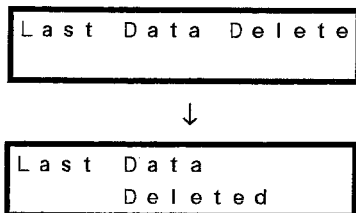
DELETING A LATEST MEASURED DATA FROM MEMORY

Latest measured data stored in the Color Reader's memory can be deleted by following the procedure below.

- 1 Press DELETE/LAST. "LAST Data Delete" will appear in the display.



- 2 Continue holding DELETE/LAST pressed until "Last Data Deleted" appears in the display. Deletion of a latest measured data previously stored in the Color Reader's memory has been completed. It takes approx. 1.5 seconds.



- The display will change to the measurement display.
- To interrupt deletion of a latest measured data in memory, release DELETE/LAST before "Last Data Deleted" appears in the display.
- To delete next latest data in memory, perform above procedure again.

ERROR MESSAGES

- If any of the following messages continue to be displayed after the suggested corrective action has been taken, contact the nearest authorized service facility.

Error message	Cause	Corrective action
Measure Again	Measurement was not taken correctly (Color Reader was moved during measurement, ambient light entered measurement aperture, etc.)	Take measurement again, being sure tip of Color Reader is flat against the specimen and that the Color Reader is not moved until the beep indicating completion of measurement has sounded.
Sample Too Dark	Reflectance of specimen is low.	Specimens with low reflectance cannot be measured.
!!	Battery power is almost exhausted.	Replace batteries or use optional AC adapter.
Change Battery		
Illumination Error	Lamp filament is broken or measurement circuit is malfunctioning.	Contact the nearest Minolta authorized service facility.
Cal. Again	White calibration was performed using something other than the white calibration cap.	Use only the white calibration cap included with the Color Reader.
Memory full	Color Reader's measured data memory is full.	Delete all or a latest measured data in memory.
No Calibration	White calibration was not performed after POWER switch was set to (on).	Set power switch to O (off), then set it back to (on) to perform white calibration.

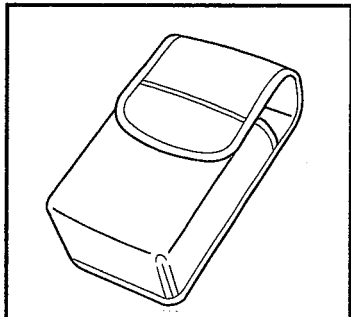
CARE AND STORAGE

- To protect the white surface of the white calibration cap from changing color due to exposure to ambient light, and also to protect it from being scratched or stained, be sure to close the cover of the white calibration cap after use.
- If the Color Reader becomes dirty, it can be cleaned by wiping with a soft, dry cloth. Do not use benzene, paint thinner, or other chemicals to clean the Color Reader.
- If the white calibration cap becomes dirty, it can be wiped with a clean, dry cloth. If the stain is difficult to remove, a soft cloth moistened with lens-cleaning fluid may be used. After cleaning the surface with lens-cleaning fluid, wipe the surface with a cloth moistened with water and then let the surface dry before use. If the white calibration cap is scratched or has a stain which cannot be removed, it should be replaced. Contact the nearest Konica Minolta Sensing authorized service facility to purchase a replacement. In this case new white calibration data should be restored in the Color Reader's memory.
- The Color Reader should be stored at temperatures between -20 and 40°C (-4 and 104°F). Do not store the Color Reader in areas subject to high temperatures, high humidity, or where condensation may occur.
- Do not leave or store the Color Reader in direct sunlight, inside a closed motor vehicle, in the trunk of a motor vehicle, or in any other area subject to extremely high temperatures.
- Do not store the Color Reader in extremely dusty areas or in areas filled with smoke or chemical fumes.
- If the Color Reader will not be used for more than two weeks, remove the batteries to avoid the possibility of damage due to battery leakage or corrosion.

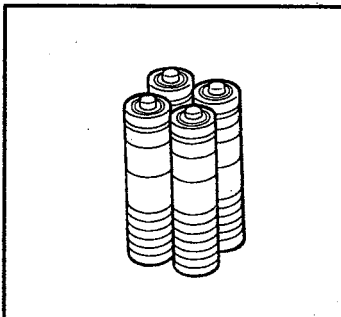
ACCESSORIES

Standard Accessories

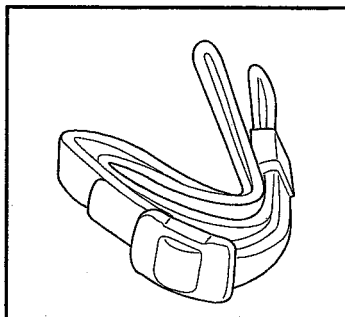
Soft Case CR-A68



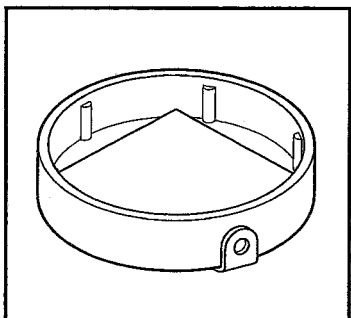
AA-size batteries (4)



Wrist Strap CR-A73

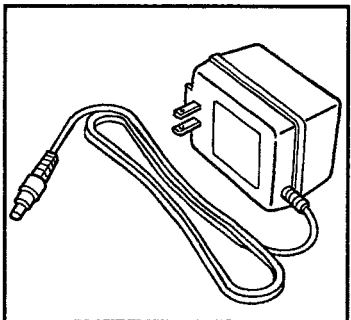


White Calibration Cap CR-A82



Optional Accessories

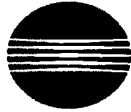
AC Adapter AC-A12



SPECIFICATIONS

Model	CECF-9
Illuminating/viewing geometry	8/d (8° illumination angle/diffuse viewing; specular component included)
Measuring area	Approximately Ø8mm
Light source	Gas-filled tungsten lamp
Detector	6 silicon photocells
Memory	Maximum of 10 measurements
Minimum interval between measurements	Approx. 1.5 sec.
Power source	Four AA-size batteries or optional AC Adapter AC-A12
Battery life	Alkaline-manganese: Approx. 2000 measurements at 10-sec. intervals
Display	16-character × 2-row dot-matrix LCD
Operating environment conditions	Temperature range: 0 to 40°C (32 to 104°F; less than 85% relative humidity, no condensation), Maximum altitude: 2000m, Installation category: I, Pollution degree: 1
Storage temperature range	-20 to 40°C (-4 to 104°F)
Dimensions (W × H × D)	59 × 158 × 85mm (2-5/16 × 6-1/4 × 3-3/8 in.)
Weight	360g (12.7 oz.) not including batteries
Standard accessories	White Calibration Cap CR-A82; Soft Case CR-A68; Wrist Strap CR-A73; AA-size batteries (4)
Optional accessories	AC Adapter AC-A12

- Specifications are subject to change without notice.



KONICA MINOLTA