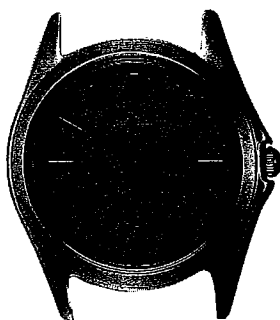


***TECHNICAL INFORMATION***  
***INFORMACION TECNICA***

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**CITIZEN QUARTZ**  
**Cal. No. 5080**



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## §1. OUTLINE

This watch is a ladie's solar power watch which has a solar cell on its dial that converts the light energy into electrical energy to drive its mechanism.

## §2. SPECIFICATIONS

<b>Caliber NO.</b>		<b>5080A</b>
Type		Analog solar power watch (Three hands)
Movement size (mm)		ø30.8 x 26.0 x 5.0t
Accuracy (At normal temperature)		±30 sec/month (5°C~35°C/41°F~95°F)
IC		1 unit of C/MOS-LSI
Operating temperature		-10°C~+60°C (14°F~140°F)
Converter		Bipolar step motor
Time adjustment		No adjustment terminal for use in market
Measurement gate		10 sec.
Additional functions		Quick start
		Insufficient charge warning
		Time setting warning
		Over-charging prevention
Continuous operating time	From full recharge to stop	Approx. 5 month
	From two second interval movement to stop	Approx. 3 days
Secondary battery block	Part NO.	295-37
	Remarks	Plate supporter, secondary battery connector spring, secondary battery, and secondary battery strap are made in one unit. (Since these four parts are secured by caulking, they cannot be disassembled.)

### §3. HANDLING OF WATCH

#### A. Solar Power Watch

This watch is powered not by an ordinary battery, but by converting light energy into electrical energy.

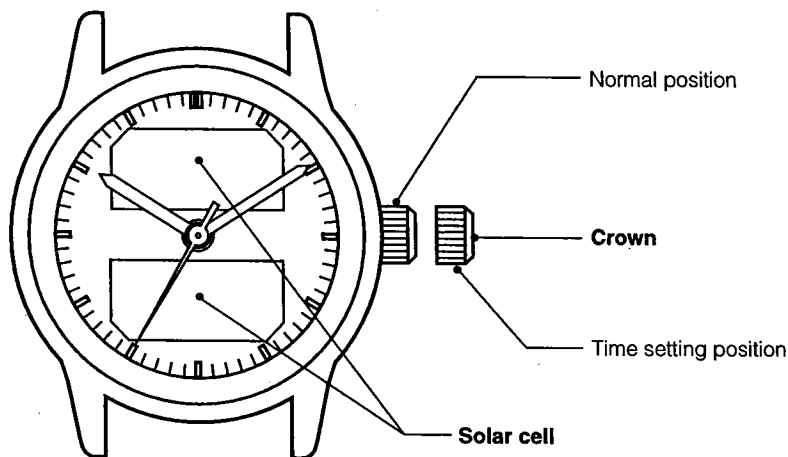
A secondary battery is used in this watch to store electrical energy. **This secondary battery is a clean energy battery which doesn't use any toxic substances such as mercury. Once fully charged, the watch will continue to run for about 1.5 months without further charging.**

To use this watch comfortably, **make sure that the watch is always recharged before it finally stops.**

There is no concern for over-charging this watch. (Over-Charging Prevention Function is included)

**Explain the user to expose the dial (solar cell) of this watch to light as long as possible.**

#### B. Setting the Time

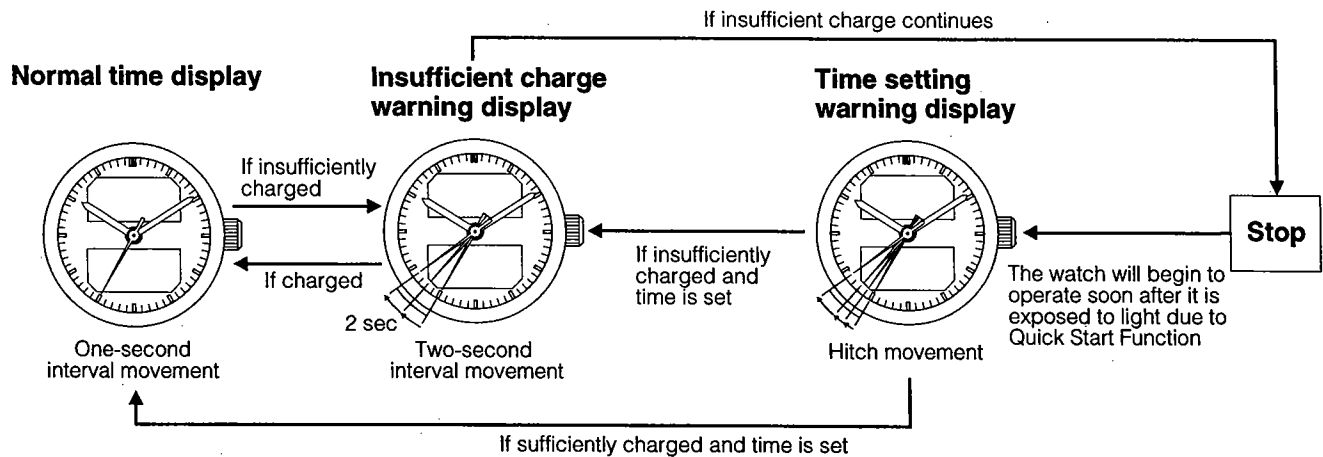


#### ■ Setting the time

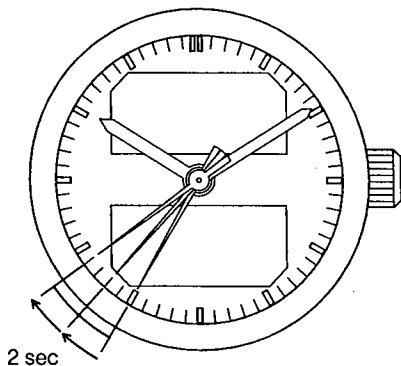
1. Stop the second hand at the 0 second position by pulling out the crown.
2. Turn the crown to set the time.
3. After setting the time, firmly push the crown back in to its normal position.

## C. Functions of the Solar Power Watch

If the charge becomes insufficient, a warning function will operate and the display changes, as below.



### ■ Insufficient Charge Warning Function



**Two-second interval movement**

**The second hand changes to two-second interval movement to indicate insufficient recharging.**

Even in such a case, the watch keeps correct time, but about 3 days after two-second interval movement begins, the watch will stop.

After exposing the watch to light, recharging takes place and the watch returns to one-second interval movement.

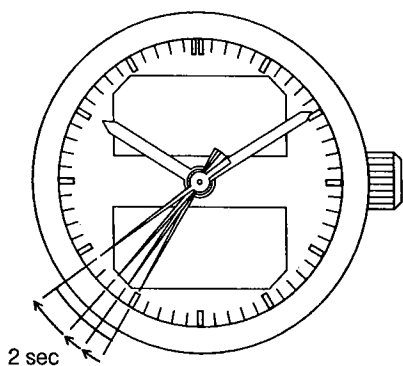
### ■ Quick Start Function

The watch will stop if it is completely discharged.

**It will begin to operate soon after (within 10 second) it is exposed to light.**

(However, the time to start may vary according to the brightness of the light.)

## ■ Time Setting Warning Function



Hitch movement

If the watch stops, subsequent exposure to light allows the 'quick start' function to start again, and **the second hand moves with a hitch to indicate that the time incorrect.**

In this case, quickly recharge the watch and reset the time.

Even if the secondary battery is fully recharged, the hitch movement will continue, unless the time is reset and the crown is returned to the normal position.

## ■ Over-charging Prevention Function

Once the secondary battery is fully recharged, the overcharging prevention feature comes into operation and prevents over-recharging.

## D. Time Required for Recharge

Time required for recharge may vary according to the design (color of the dial, etc.) and operating environment. The following table will serve you as rough reference.

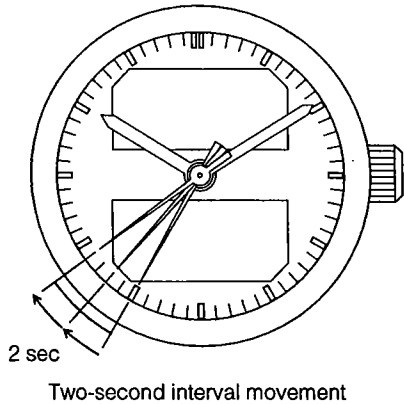
"The recharging time is the time when the watch is continuously exposed to radiation."

Illuminance (lux)	Environment	Time required		
		From the stop state to the one second movement	One day usage	Empty to full
500	Inside an ordinary office	40 hours	2 hours	345 hours
1000	60-70cm (24-28in.) under a fluorescent light (30W)	19 hours	1 hour	166 hours
3000	20cm (8in.) under a fluorescent light (30W)	7 hours	23 minutes	62 hours
10000	Exterior, cloudy	2 hours 30 minutes	8 minutes	23 hours
100000	Exterior, summer, sunny	1 hour 30 minutes	5 minutes	12 hours

Full recharging time .....The time for fully recharge from stopped.  
(Empty to full)

One day usage .....The time required for the watch to run for one day with one second interval movement.

## E. In These Cases

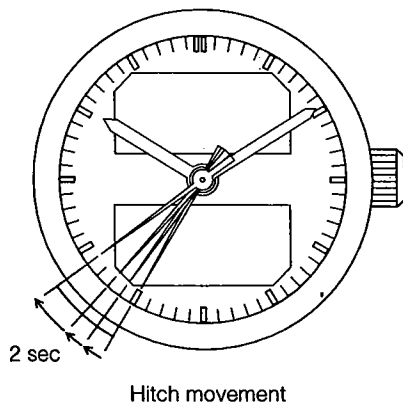


### [If the watch warns that the energy is running short]

The second hand starts moving at two-second increments in order to warn that the watch will stop functioning approximately after 3 days. **(Insufficient charge warning function)**

In such a case, expose the watch to light for a while to cancel the warning. (The second hand returns to the movement at one-second increments when the energy is recharged.)

If the watch is left short of energy, it will stop functioning after 3 days or so.



### [If the watch warns to set the time.]

When the watch that has stopped is exposed to light, the second hand starts hitch movement. **(Quick start function)**

The time elapsed before the second hand restarts moving depends on the illuminance of the light.

After this also, the second hand keeps hitch movement to show that the watch indicates an incorrect time because it once stopped. **(Time setting warning function)**

**In such a case, set the hands to the correct time.**

\* If the watch is insufficiently exposed to light, the second hand will soon switch to the movement at two-second increments in order to warn that the energy is running short.

## F. Care for Handling of Charge

### ■ Notes on Use <Give the following precaution and explanation to the user.>

#### Take care to charge during use.

Please note that if the user wears long sleeves, the watch can easily become insufficiently charged because it is hidden and not exposed to light.

- When the user takes off the watch, it should be placed in as bright a place as possible, and it will always continue to run properly.

#### ■ Notes on Recharge

- Avoid recharging at high temperatures (over about 60°C/140°F), otherwise the watch will be damaged during recharging.

(eg) Charging the watch near a light source that easily becomes hot, such as an incandescent lamp or a halogen lamp.

Charging in a place that easily becomes hot, such as a dashboard.

When you charge the watch by an incandescent lamp, take a distance about 50cm (20in.) from the light source to prevent extremely high temperature.

## G. Replacing the Secondary Battery

This watch uses the secondary battery, which does not have to be periodically replaced due to repeated charging and discharging, unlike ordinary batteries.

### Caution

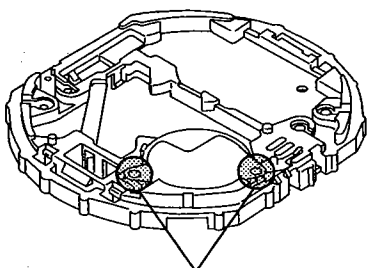
Never use a battery other than the secondary battery used in this watch.

The watch structure is so designed that a different kind of battery other than the specified cannot be used to operate it. In case a different kind of battery—such as a silver battery—is used by some chance, there is a danger that the watch will be overcharged to burst, causing damage to the watch and even to the human body.

## §4. PRECAUTIONS FOR DISASSEMBLY AND ASSEMBLY

### [Secondary battery block]

Secondary battery block



Secured by caulking (Two places)

### **The secondary battery block cannot be disassembled.**

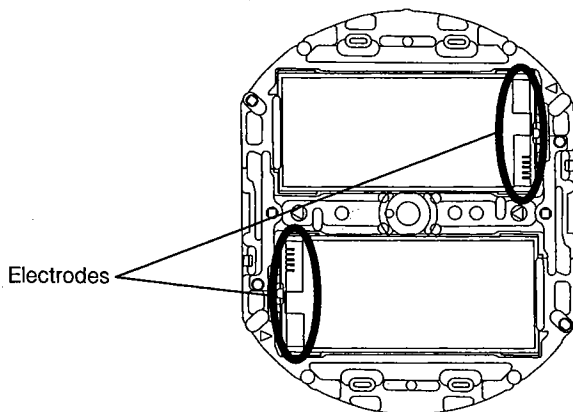
The plate supporter, secondary battery connector spring, secondary battery, and secondary battery strap of this watch are made in one unit by caulking them so that a wrong battery will not be installed.

### [Handling of solar cell]

- When handling the solar cell, take care not to scratch it. If it is partly damaged, its charging capacity and other functions may be lowered. Replace it in this case.
- If the electrodes are stained or peeled off, a continuity trouble occurs. Since the stain on their surface cannot be removed easily, do not touch it with a finger directly.
- The solar cell may be deteriorated with static electricity and moisture. Take care when storing it separately.

### [Setting method of solar cell and solar cell supporter]

Set the solar cell in the solar cell supporter, then set the latter holding the former in the secondary battery block.



- \* Set the solar cell in the solar cell supporter as shown below, seen from the back side.
  - Upper stage: Set the solar cell with the electrode on the right side.
  - Lower stage: Set the solar cell with the electrode on the left side.

(The two solar cells are the same.)



Check Items	How to Check	Results and Treatments
<p>⑩ Measurement of current consumption</p>	<p>* Refer to Technical Manual, Basic Course: II-1-f.</p> <ul style="list-style-type: none"> <li>This watch uses the secondary battery block, instead of an ordinary battery. Accordingly, prepare a silver battery (1.55V) and measure the current consumption according to the following procedure.</li> </ul> <ol style="list-style-type: none"> <li>Remove the circuit unit supporter and unit of electronic circuit.</li> <li>Put an insulating sheet of vinyl, paper, etc. between the secondary battery connector spring of the secondary battery block and the pattern of the electronic circuit unit, and installed the circuit unit supporter and electronic circuit unit (See the figure below).</li> <li>Referring to Technical Manual, Basic Course, set the silver battery (1.55V) to the adapter of the tester correctly.</li> <li>Pull out the crown.</li> <li>Set the tester.</li> </ol> <div data-bbox="597 751 1117 1186" style="text-align: center;"> </div> <p style="text-align: center;">&lt;Tester range: DC 10<math>\mu</math>A&gt;</p> <ol style="list-style-type: none"> <li>Return the crown to the normal position and measure the current consumption of the movement.</li> </ol> <div data-bbox="480 1367 1105 1541" style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>Note:</b> When measuring the current consumption, do not apply any light to the solar cell. If any light is applied, the voltage changes and correct current consumption cannot be measured.</p> </div>	<ul style="list-style-type: none"> <li>Current consumption of the movement  <b>Under 0.9<math>\mu</math>A</b>  → Normal</li> <li><b>Over 0.9<math>\mu</math>A</b>  → Check train wheel and dial-side mechanism.  → Remove dust and dirt.</li> </ul> <p style="text-align: center;">↓</p> <ul style="list-style-type: none"> <li>Current consumption measured again  <b>Over 0.9<math>\mu</math>A</b>  → Replace the unit of electronic circuit.</li> </ul>
<p>⑪ Check of appearance and function</p>	<p>* Refer to Basic Course: II-2-f.</p>	



Check Items	How to Check	Results and Treatments
③ Check of connection parts	<ul style="list-style-type: none"> <li>* Refer to Technical Manual, Basic Course: II-2-a.</li> <li>• Check for looseness of screws, dust, stain, etc.</li> <li>• Check for stain and removal of the solar cell pattern (two places), deformation of connection spring, removal of welded lead plate of the secondary battery, stain of the circuit pattern, bad contact of each part.</li> </ul>	<p>Stain of solar cell pattern and circuit pattern. → Remove stain.</p> <p>Removal of solar cell pattern, removal of circuit pattern, removal of welded lead plate of secondary battery. → Replace parts.</p>
④ Measurement of coil resistance	<ul style="list-style-type: none"> <li>* Refer to Technical Manual, Basic Course: II-1-c.</li> <li>• Remove the unit of electronic circuit and measure the coil resistance</li> </ul> <p style="text-align: center;">&lt;Tester range: R x 10Ω&gt;</p> <p>&lt;The tester lead pins have no polarity&gt;</p>	<ul style="list-style-type: none"> <li>• <b>1.9 kΩ - 2.3 kΩ</b> → Normal</li> <li>• Out of above range → Replace coil unit</li> </ul>
⑤ Check of train wheel	<ul style="list-style-type: none"> <li>* Refer to Basic Course: II-2-b.</li> </ul>	
⑥ Check of dial side mechanism	<ul style="list-style-type: none"> <li>* Refer to Basic Course: II-2-c.</li> </ul>	
⑦ Check of solar cell	<ul style="list-style-type: none"> <li>• Check the solar cell for breakage and stain, and check its electrode for stain and flaking.</li> </ul>	<ul style="list-style-type: none"> <li>• Breakage of solar cell → Replace solar cell.</li> <li>• Stain → Remove stain.</li> <li>• Flaking of electrode → Replace solar cell.</li> </ul>
⑧ Measurement of time rate	<ul style="list-style-type: none"> <li>* Refer to Basic Course: II-2-d.</li> </ul> <p style="text-align: center;">&lt;Measurement gate: Analog 10 sec&gt;</p> <ul style="list-style-type: none"> <li>• The time rate cannot be adjusted.</li> <li>• The time rate may not be measured accurately in the 2-second interval movement or hitch movement. In this case, apply light to the watch until the second hand moves in the 1-second interval movement mode, then measure the time rate.</li> </ul>	<ul style="list-style-type: none"> <li>• The watch loses or gains substantial time → Replace the unit of electronic circuit</li> </ul>
⑨ Confirmation of using condition	<ul style="list-style-type: none"> <li>* Refer to Basic Course: II-2-e.</li> <li>• Since this watch is energized by light, it should receive light as much as possible. If the watch is placed near a light source which generates heat (above 60°C) such as an incandescent lamp, a halogen lamp, etc., its functions and parts may be deteriorated or deformed by the heat. Accordingly, take care when applying light to it.</li> </ul> <p>Example: When the watch is hidden under a long sleeve or the customer works in a dark place, it needs to be exposed to light on purpose.</p>	