TECHNICAL INFORMATION

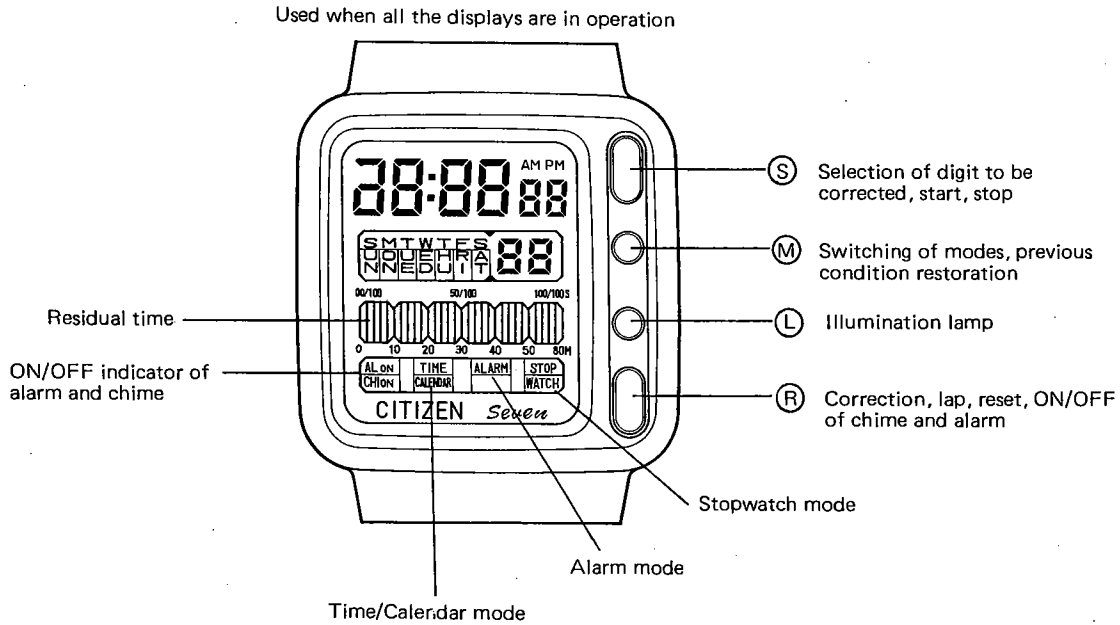CITIZEN QUARTZ

Cal. No. D020

● CITIZEN

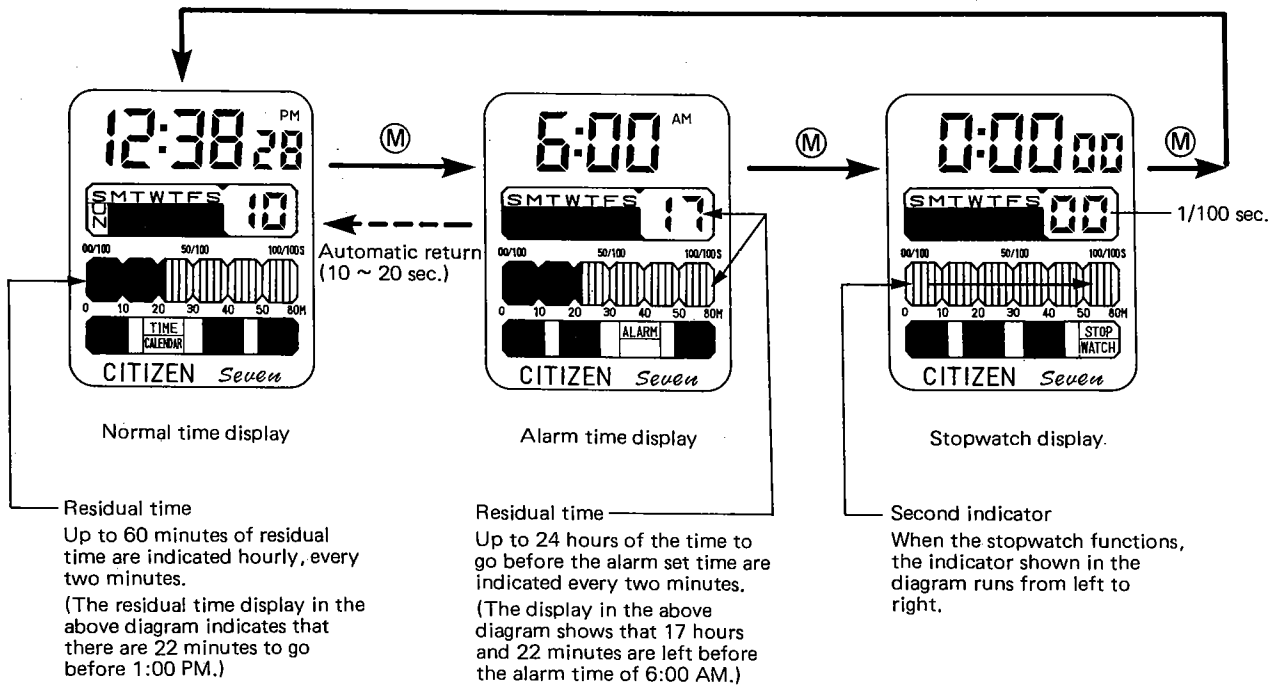## CONTENTS

■3. HANDLING INSTRUCTIONS

(1) Nomenclature

Used when all the displays are in operation

S — Selection of digit to be corrected, start, stop

M — Switching of modes, previous condition restoration

L — Illumination lamp

R — Correction, lap, reset, ON/OFF of chime and alarm

Residual time

ON/OFF indicator of alarm and chime

Stopwatch mode

Alarm mode

Time/Calendar mode

(2) Switching of Display

Normal time display

Alarm time display

Stopwatch display.

1/100 sec.

Automatic return (10 ~ 20 sec.)

— Residual time
Up to 60 minutes of residual time are indicated hourly, every two minutes.
(The residual time display in the above diagram indicates that there are 22 minutes to go before 1:00 PM.)

Residual time —
Up to 24 hours of the time to go before the alarm set time are indicated every two minutes.
(The display in the above diagram shows that 17 hours and 22 minutes are left before the alarm time of 6:00 AM.)

— Second indicator
When the stopwatch functions, the indicator shown in the diagram runs from left to right.

(3) Correction of Normal Time

Normal time display More than 2 seconds Correction stage
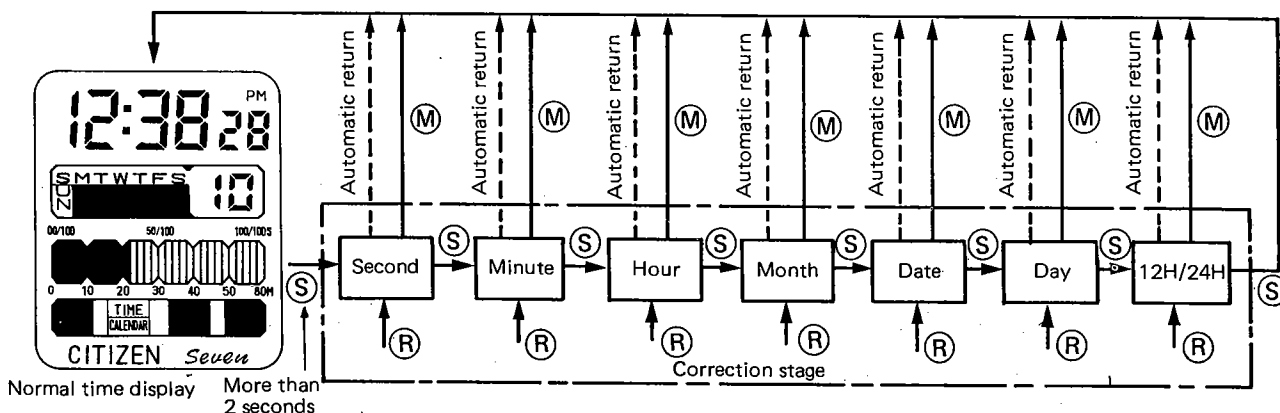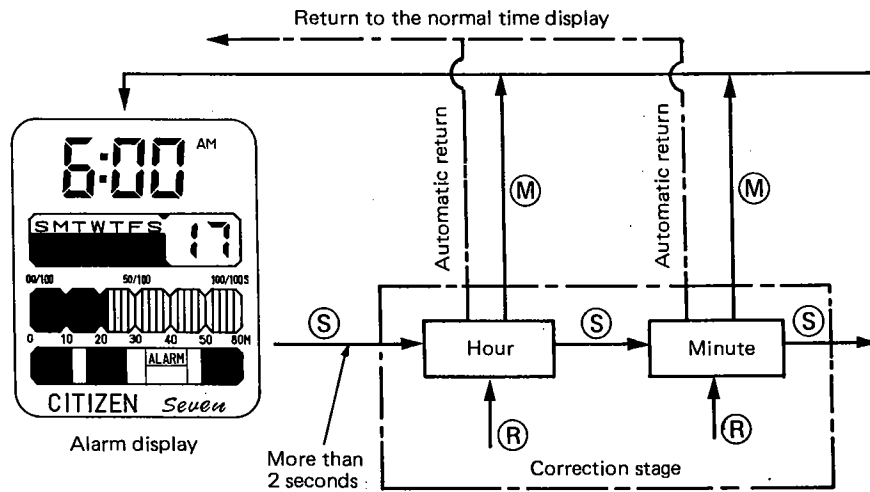
1. **Correction of seconds**
   If you push the Ⓢ button down for more than 2 seconds when the normal time is displayed, the second display shifts to the correction stage, which is identified by the flashing of the second display. Then, push the Ⓡ button, and the second display will indicate "00". (If the Ⓡ button is pushed when the second display indicates figures between 30 and 59, one more minute will be added to the minute display.) The same thing can be said with each of the following corrections.

2. **Correction of minutes**
   Correction of minutes is possible with a push of the Ⓡ button in the minute correction stage.

3. **Correction of hours**
   Correction of hours is possible with a push of the Ⓡ button in the hour correction stage.

4. **Correction of months**
   Correction of months is achieved with a push of the Ⓡ button in the month correction stage. (Months are indicated on the digits of hours of the normal time display.)

5. **Correction of dates**
   Correction of dates is achieved with a push of the Ⓡ button in the date correction stage. A non-existing date, if set, is automatically corrected and changed to the first day of the following month when the normal time display is restored.

6. **Correction of days of the week**
   Correction of days is achieved with a push of the Ⓡ button in the day correction stage.

7. **12H/24H switching**
   Selection between the 12H and 24H displays is possible when pushing the Ⓡ button in the 12H/24H display selection stage. (The 12H and 24H displays are indicated on the digits of hours and minutes at the normal time display, respectively).

(Note)
● When correcting minutes, hours, months, dates and days, quick correction is possible with a push of the Ⓡ button for more than 2 seconds.
● In any correction stages, pushing the Ⓜ button will immediately restore the condition before the Ⓡ button was pushed.
● When any correction stages are left unchanged for 1 − 2 minutes, the display will automatically return to the normal time.
● All the displays will be reset with a simultaneous push of the Ⓢ, Ⓜ, Ⓛ and Ⓡ buttons, and they will begin flashing. If resetting is canceled, the displays will be as follows. In this case, setting again from the beginning is necessary.

Time	:	13 h. 00 min. 00 sec.
Calendar	:	January 1st, Sunday
Alarm	:	13 h. 00 min., Alarm OFF, Chime OFF
Stopwatch	:	0 h. 00 min. 00 sec. 00

● In case something goes wrong with the displays when replacing the power cell or receiving strong shocks, the displays must all be reset as mentioned above.
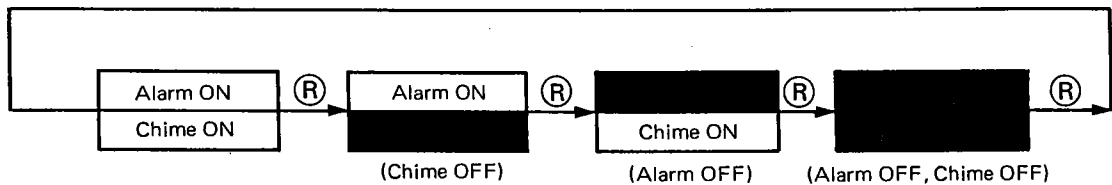
(4) Correction of Alarm Time

Return to the normal time display

Alarm display

More than 2 seconds

Correction stage

1. Correction of hours
   If you push the Ⓢ button down for more than 2 seconds when the alarm time is displayed, the hour display shifts to the correction stage, which is identified by the flashing of the hour display. Then, push the Ⓡ button, and correction of hours is achieved. When correcting hours, pay attention to AM/PM.

2. Correction of minutes
   Correction of minutes is possible with a push of the Ⓡ button in the minute correction stage.

(Note) ● When correcting hours and minutes, quick correction is possible with a push of the Ⓡ button for more than 2 seconds.
   ● In any correction stages, pushing the Ⓜ button will immediately restore the alarm time display.
   ● When any correction stages are left unchanged for 10 — 20 seconds, the normal time will automatically return to the display.
   ● Selection between ON and OFF of "alarm" and "chime" is possible by operating the Ⓡ button when the alarm time is displayed. At this moment, a confirmation sound is heard with every push of the button.

| Alarm ON | Ⓡ | Alarm ON | Ⓡ | | Ⓡ | | Ⓡ |
| Chime ON | | (Chime OFF) | | Chime ON | | | |
| | | | | (Alarm OFF) | | (Alarm OFF, Chime OFF) | |

   ● If you push the Ⓡ button when the alarm time is displayed, the alarm monitor starts operating.

(5) Operation of Stopwatch

Stopwatch display   [Running]   [Lap running]

[Reset]

Ⓢ   Ⓡ

Ⓡ

Ⓢ   Ⓢ   Ⓢ   Ⓢ

Ⓡ   Ⓡ

[Stop]   [Lap stop]
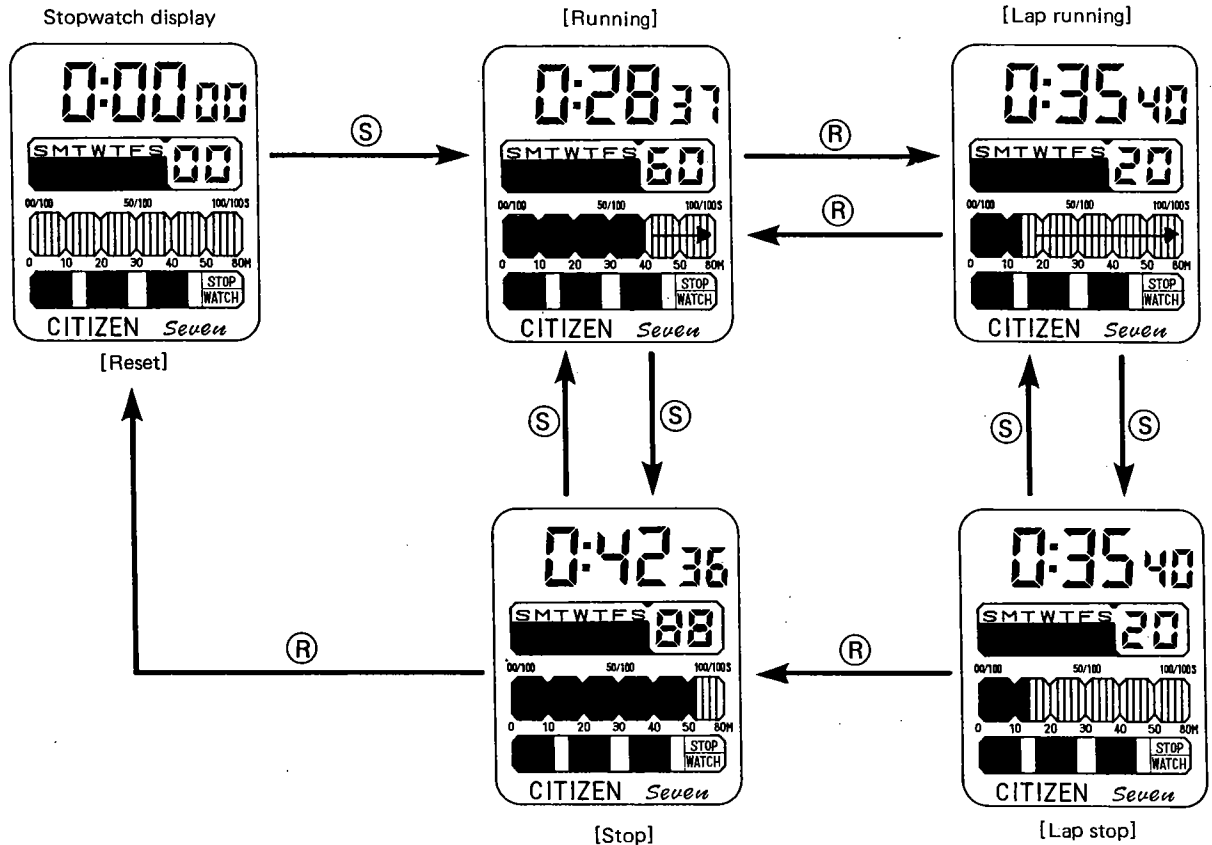
(Note)
- While the stopwatch is functioning, the second indicator keeps running.
- If the stopwatch mode is changed to other display modes while the lap running continues, the lap running will be released. (Normal running will resume.)
- A confirmation sound is heard with every push of the start or stop button.
- The 1/100 sec. display is possible in two ways. One is the digital display and the other is the second indicator, as illustrated below, by which not exact but fairly precise time can be read.

10	20	30	40	50	60	70	80	90
≀	≀	≀	≀	≀	≀	≀	≀	≀
19	29	39	49	59	69	79	89	99

Second
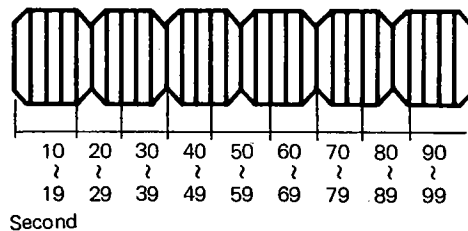
* Display cannot be obtained between 0 and 9 sec.
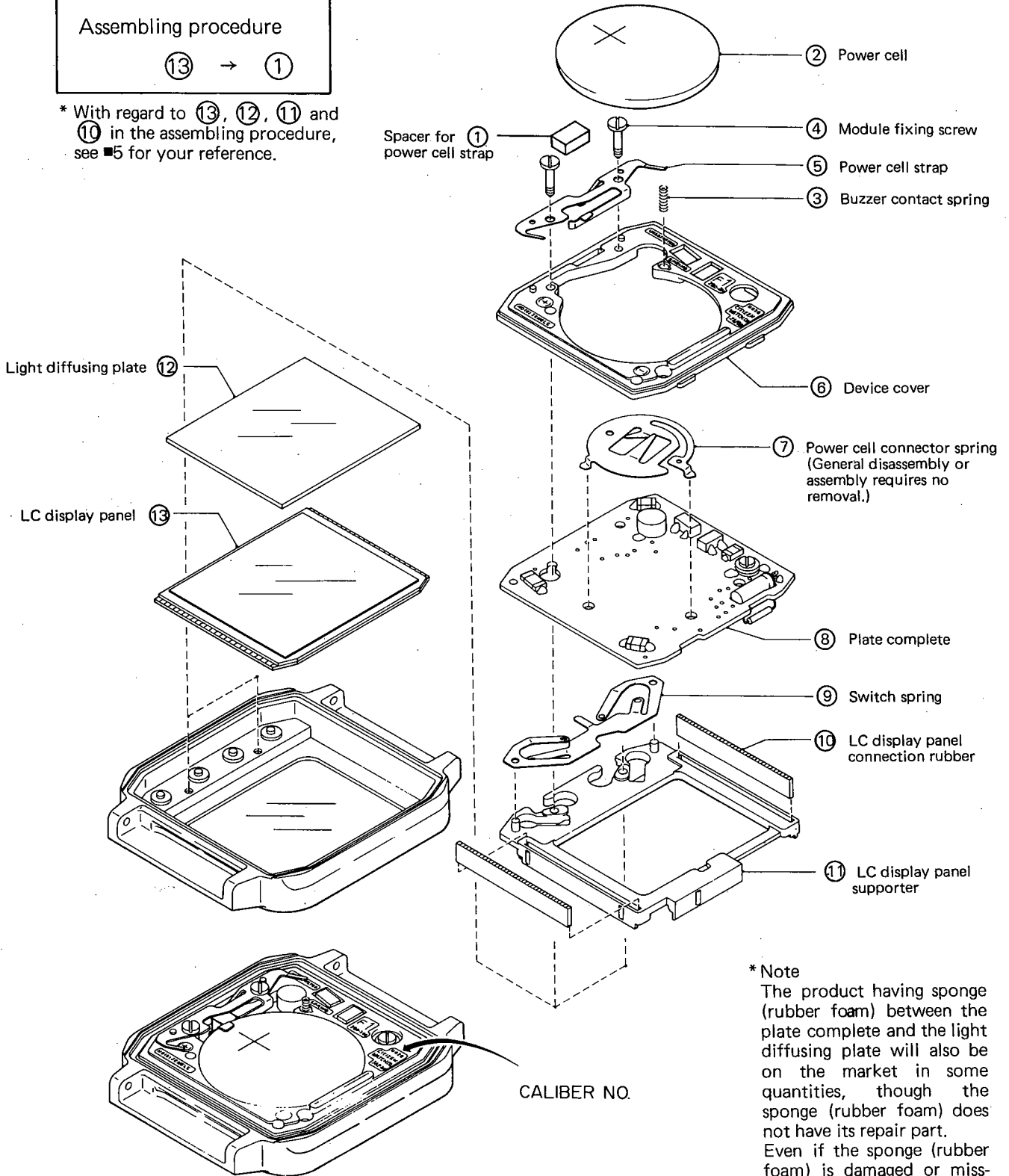
■4. DISASSEMBLY & ASSEMBLY

```
Disassembling procedure

    ①  →  ⑬

Assembling procedure

    ⑬  →  ①
```
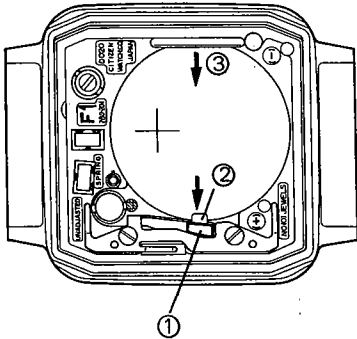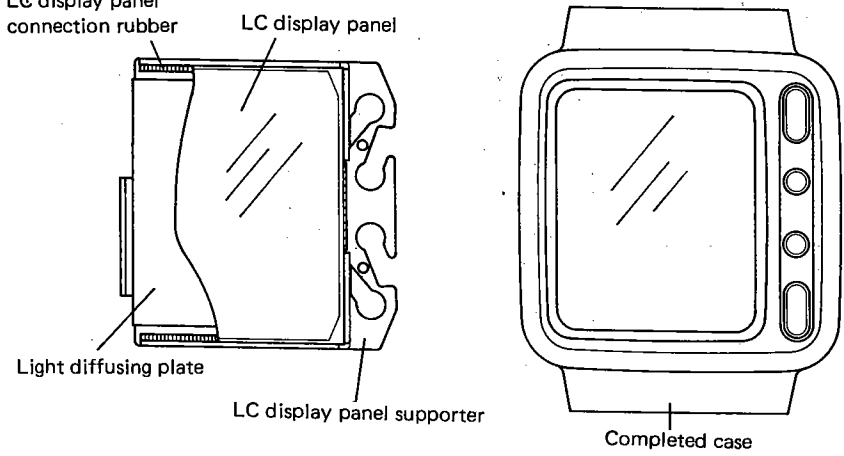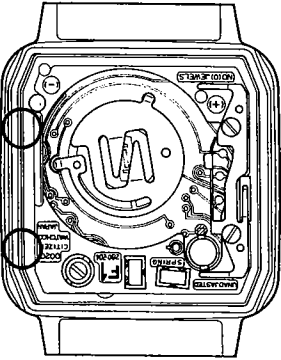
* With regard to ⑬, ⑫, ⑪ and
  ⑩ in the assembling procedure,
  see ■5 for your reference.

② Power cell

Spacer for ①
power cell strap

④ Module fixing screw

⑤ Power cell strap

③ Buzzer contact spring

⑥ Device cover

⑦ Power cell connector spring
(General disassembly or
assembly requires no
removal.)

Light diffusing plate ⑫

LC display panel ⑬

⑧ Plate complete

⑨ Switch spring

⑩ LC display panel
connection rubber

⑪ LC display panel
supporter

CALIBER NO.

*Note
The product having sponge
(rubber foam) between the
plate complete and the light
diffusing plate will also be
on the market in some
quantities, though the
sponge (rubber foam) does
not have its repair part.
Even if the sponge (rubber
foam) is damaged or miss-
ing, the watch can operate
without it.

■5. NOTES ON ASSEMBLY/DISASSEMBLY

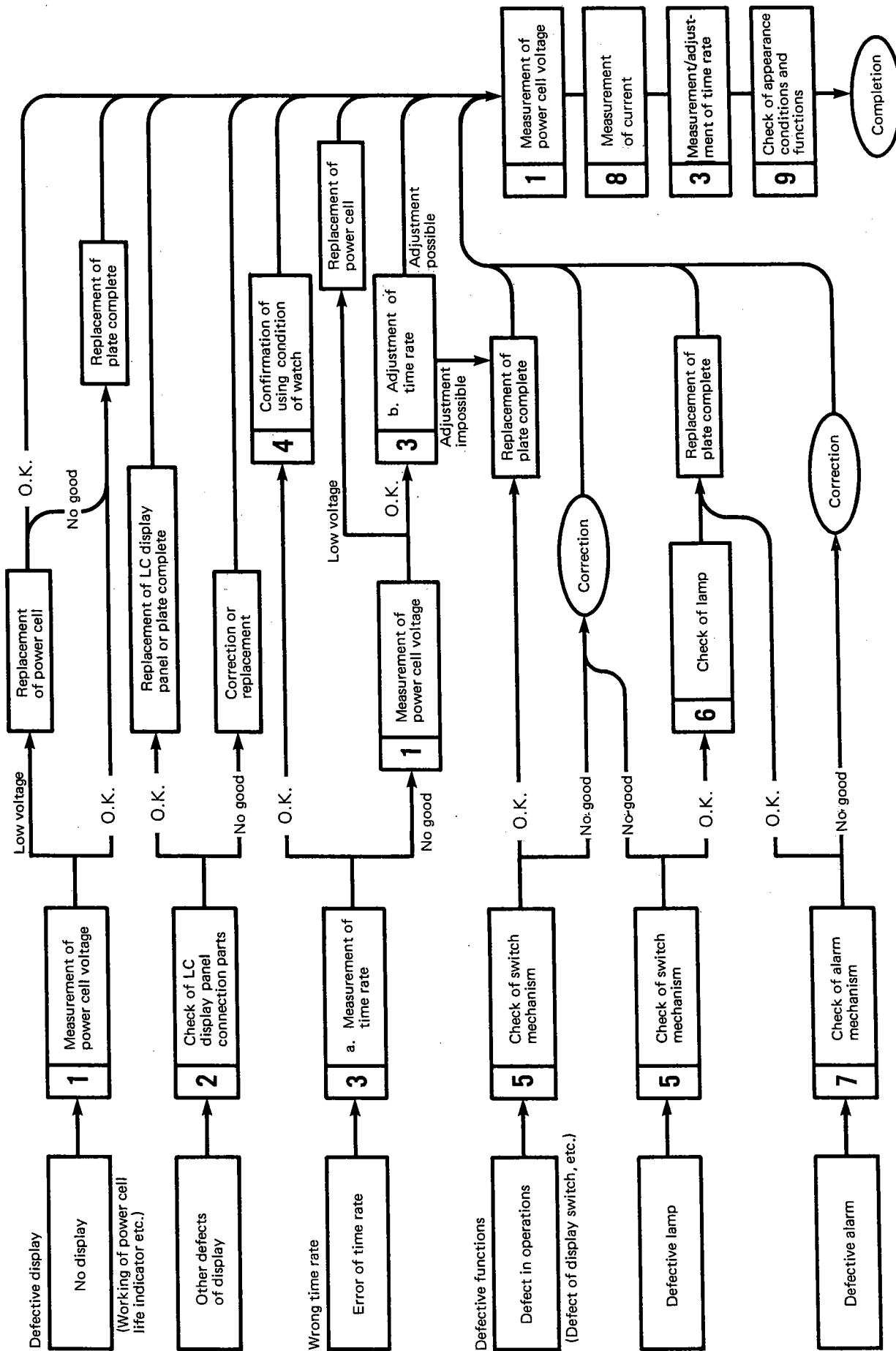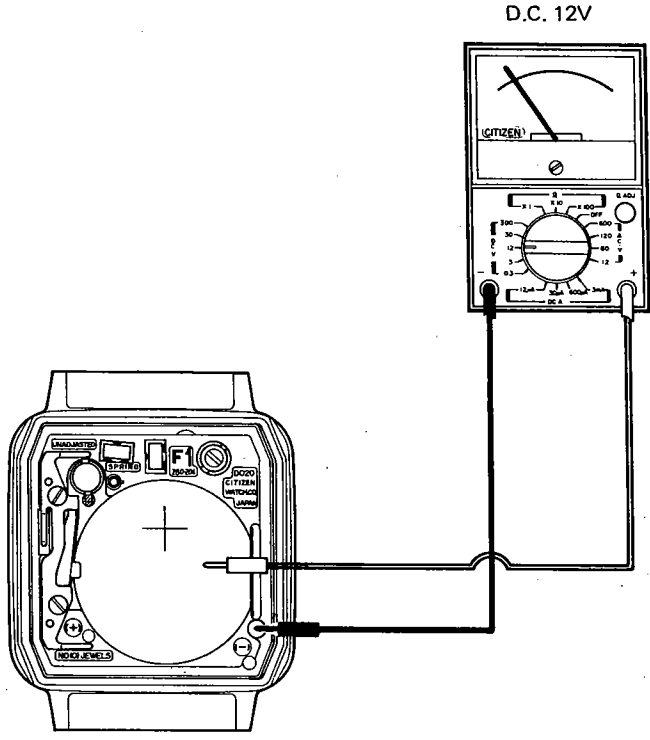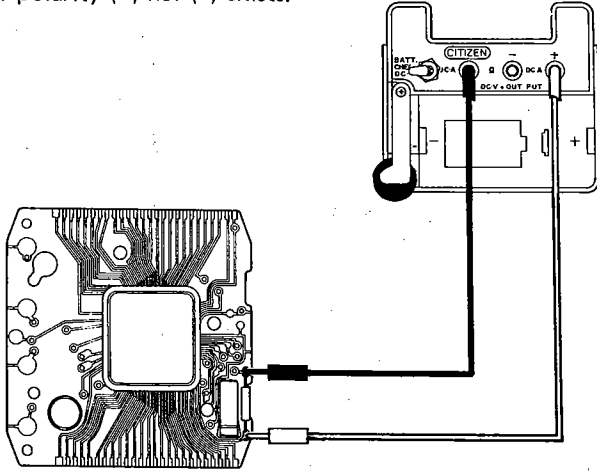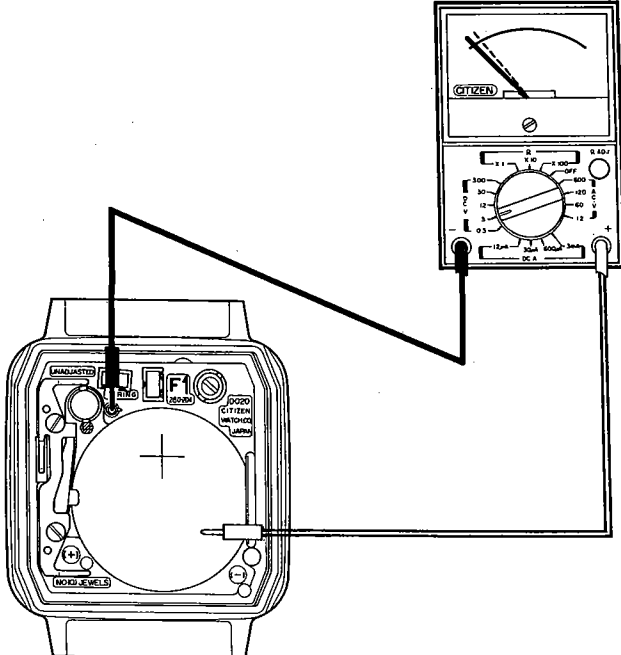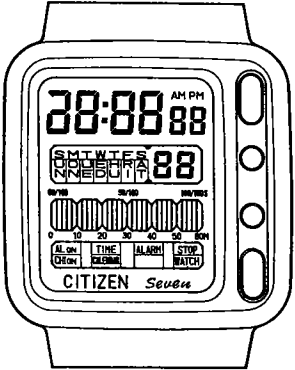| Items	Contents
Mounting/ dismounting of power cell	● Dismounting Remove the spacer for power cell strap ①. Move the power cell strap ② in the direction of the arrow. Take out part No. ③ by pulling in the direction of the arrow. ● Mounting Push part No. ③ into its former position. Push the surface of the power cell gently with your finger while moving the power cell strap ② toward the outside. Mount the spacer for power cell strap ①.
Mounting of LC display panel supporter, LC display panel connection rubber, LC display panel and light diffusing plate	LC display panel connection rubber LC display panel Light diffusing plate LC display panel supporter Completed case (1) Prepare the LC display panel supporter first. (2) Mount the LC display panel connection rubber, the light diffusing plate and the LC display panel inside the LC display panel supporter. (3) Hook the completed case to the mounted LC display panel section. (4) Turn upside down. (5) Proceed to the next stage of the assembly procedure.
Mounting of device cover	When mounting the device cover, insert the two sections marked with a circle under the case first, and then attach the device cover to the case with the screws on the opposite side.

■6. TROUBLESHOOTING AND ADJUSTMENT

Defective display

No display → [1] Measurement of power cell voltage

(Working of power cell life indicator etc.)

Low voltage → Replacement of power cell → O.K. → Replacement of plate complete

No good → O.K.

Other defects of display → [2] Check of LC display panel connection parts → O.K. → Replacement of LC display panel or plate complete

No good → Correction or replacement

Wrong time rate

Error of time rate → [3] a. Measurement of time rate → O.K. → [4] Confirmation of using condition of watch

No good → [1] Measurement of power cell voltage → Low voltage → Replacement of power cell

O.K. → [3] b. Adjustment of time rate

Adjustment possible →

Adjustment impossible → Replacement of plate complete

Defective functions

Defect in operations → [5] Check of switch mechanism → O.K. → Replacement of plate complete

(Defect of display switch, etc.)

No good → Correction

Defective lamp → [5] Check of switch mechanism → No good → Correction

O.K. → [6] Check of lamp → Replacement of plate complete

Defective alarm → [7] Check of alarm mechanism → O.K. → Correction

No good →

[1] Measurement of power cell voltage → [8] Measurement of current → [3] Measurement/adjustment of time rate → [9] Check of appearance conditions and functions → Completion

Checking items	How to check	Result and treatment
1 Measurement of power cell voltage	D.C. 12V	**Over 2.8V** ⟶ Nondefective **Under 2.8V** ⟶ Replacement of the power cell with a new one
2 Check of LC display panel connection parts	●Make sure that the LC display panel connection rubber is set in a correct way. ●Make sure that the LC display panel connection rubber has no damages. ●Make sure that the electrode part is clean with no dust or dirt.	●If something wrong is found, make an adjustment or replace the existing part with a new one.
3 Measurement and adjustment of time rate	a) Measurement of time rate Either CQT-210 or CQT-101 can be used for measurement. b) Adjustment of time rate Make an adjustment by turning the trimmer condenser with a screwdriver. Turning it clockwise makes the watch gain time.	●Avoid direct sunlight or incandescent electric light when measuring time rate. A shift in time rate may cause an incorrect measurement
4 Confirmation of using condition of watch	Confirm that the environment in which the watch is used is appropriate. Accuracy may be affected by the environment. (Be careful about magnetism, an excessive degree of temperature, humidity and damage.)	

Checking items	How to check	Result and treatment
5 Check of switch mechanism	Check the switch spring and its proximity paying attention to the following: ●The state of contact between the switch spring and the push button. ●The state of contact between the switch spring and the plate. ●Damage of the switch spring. ●Damage of the push button and its malfunction due to dust or dirt.	If something wrong is spotted, make an adjustment or replace the existing part with a new one.
6 Check of lamp	●Clamp the lithium power cell with the adapter. ●Neither polarity (+) nor (−) exists. 	Lighting ⟶ Nondefective No lighting ⟶ Replacement of the plate complete with a new one
7 Check of alarm mechanism	Check the alarm mechanism with the alarm monitor in full operation. D.C. 3V 	The tester pointer swings ⟶ Nondefective The tester pointer does not swing ⟶ Replacement of the plate complete with a new one

Checking items	How to check	Result and treatment
8 Measurement of current	●Clamp the lithium power cell with the adapter. D.C. 12μA *This caliber receives a very large supply of current for 4 seconds after the supply is started, due to the characteristic of IC. For this reason, the rotary switch should be set at "3 mA" first, and then reset it to "12μA" after the tester pointer swings back to around 0 V. (If a very large supply of current still flows after 4 seconds, start measurement again from the beginning.) *Do not press the tester lead pin too hard against the surface of the LC display panel because the lamp is located nearby. D.C. 12μA	**Under 2.2μA** →Nondefective **Over 2.2μA** →Measurement of only the plate complete's current **Under 1.2μA** →Nondefective **Over 1.2μA** →Replacement of the plate complete with a new one *Do not measure current in direct sunshine or incandescent electric light. If measured under these circumstances, current value may increase. A fluorescent light has no effect on the current value during measurement.

Checking items	How to check	Result and treatment
9 Check of appearance and functions	Make a check on the finished watch in the following respective points: ●Whether each function operates as smoothly as expected. ●Whether each push button works in a correct way. ● If the alarm functions. ● If the illumination lamp lights. ● If the surface of the LC display panel is cleared of dust or dirt.	If there is something wrong, the appropriate check is necessary.

CITIZEN WATCH CO., LTD.
Tokyo, Japan