PARTS CATALOGUE / TECHNICAL GUIDE

Cal. S820A

[SPECIFICATIONS]

Item \ Cal. No.		S820A
Module		(x 1.0)
Module size	Outside diameter	34.3 mm between 6 o'clock and 12 o'clock sides 31.6 mm between 3 o'clock and 9 o'clock sides
	Casing diameter	–
	Height	7.3 mm
Display medium		Nematic Liquid Crystal, FEM (Field Effect Mode)
Liquid crystal driving system		Multiplex driving system

Display system		• Time/calendar display
		 • Automatic calendar (from 1993 to 2042 including February 29 of leap years)
		 • Temperature graph
		• Thermometer display
		 • Automatic and manual temperature measurements
		 • Measurable range : From -20° C to +50° C (From -4° F to +122°F)
		 • Automatic measurement : Up to 30 sets of measurement data can be stored in memory.
		 • Manual measurement : Up to 10 sets of measurement data can be stored in memory.
		• Thermometer recall display
		 • Memory recall of automatic measurement:
		  The newest, highest and lowest temperatures in memory and temperature graph
		 • Memory recall of manual measurement:
		  Temperature and month, date and time when the measurement was made are recalled.
		  The data is recalled successively from the newest to the oldest.
		• Stroke display
		 • The watch can be set to beep at a rate between 20 and 240 strokes per minute.
		• Chronograph/tachymeter display
		 • Up to 10 hours in 1/1000 second increments
		 • Auto start function : The chronograph/tachymeter can be set to start automatically after 10 seconds.
		  The watch beeps to signal the remaining time and the start of measurement.
		• Chronograph recall display
		 • Up to 10 sets of chronograph measurement data (total time and average speed per hour) are recalled.
		• Time difference display
		 • Chronograph measurement data (total time, and difference between the fastest total time and another) are displayed in order from the fastest to the slowest.
		• Alarm display
		 • One daily alarm and two single-time alarms

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Cal. No. Item	S820A
Additional mechanism	• Sound on/off : Sound for button operation confirmation can be switched on and off as required. • Battery life indicator • Illuminating light (electroluminescent panel)
Loss/gain	Monthly rate at normal temperature range: less than 20 seconds
Regulation system	Nil
Measuring gate by quartz tester	Any gate can be used.
Battery	Matsushita CR2025 Battery life is approximately 2 years. Voltage: 3.0V
Temperature measurement accuracy	±2° C within a temperature range of -20° C and +50° C (when the watch is off the wrist)

PARTS CATALOGUE

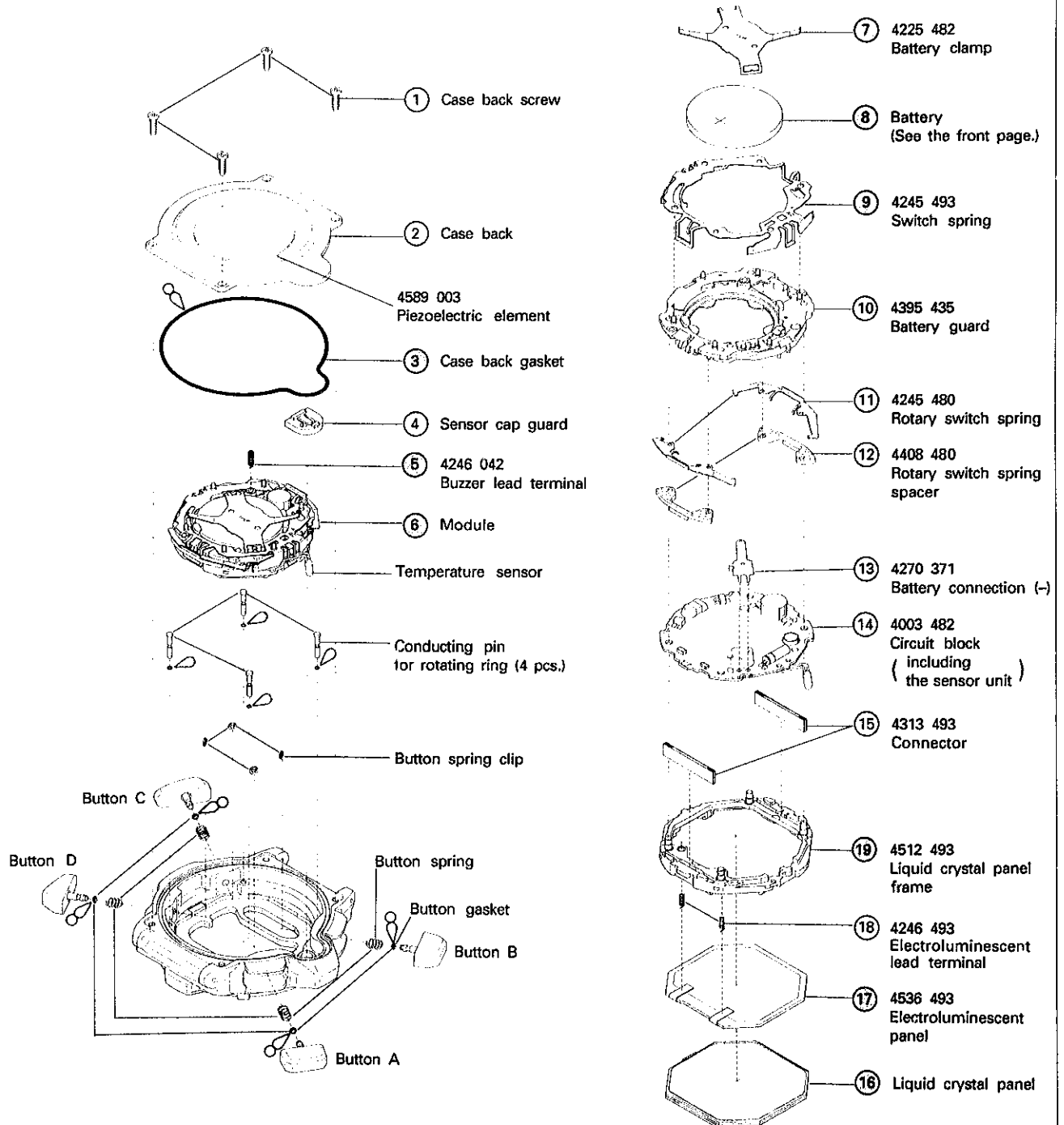|				
Disassembling procedures Figs.:	①	→	⑲	
Reassembling procedures Figs.:	⑲	→	①	

Lubrication: Types of oil   **Oil quantity**

     ∞▷ Silicone oil 500,000 c.s.   ∞▷ Normal quantity

                                          ▷ Extremely small

① Case back screw

② Case back

4589 003
Piezoelectric element

③ Case back gasket

④ Sensor cap guard

⑤ 4246 042
Buzzer lead terminal

⑥ Module

Temperature sensor

Conducting pin
for rotating ring (4 pcs.)

Button spring clip

Button C

Button D

Button spring

Button gasket

Button B

Button A

⑦ 4225 482
Battery clamp

⑧ Battery
(See the front page.)

⑨ 4245 493
Switch spring

⑩ 4395 435
Battery guard

⑪ 4245 480
Rotary switch spring

⑫ 4408 480
Rotary switch spring spacer

⑬ 4270 371
Battery connection (−)

⑭ 4003 482
Circuit block
(including the sensor unit)

⑮ 4313 493
Connector

⑲ 4512 493
Liquid crystal panel frame

⑱ 4246 493
Electroluminescent lead terminal
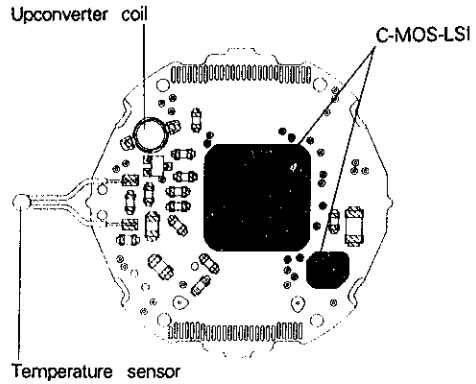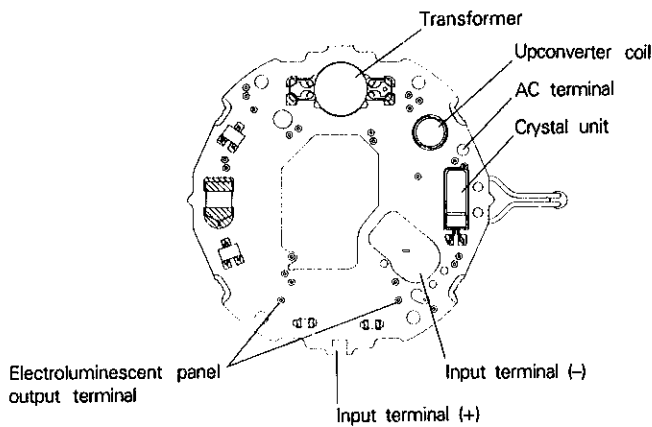
⑰ 4536 493
Electroluminescent panel

⑯ Liquid crystal panel

* Do not disassemble buttons A, B, C and D except when they need to be replaced.

◎ ⇨ Please see the remarks on the following pages.

TECHNICAL GUIDE

- The explanation here is only for the points partir ' .. ..al. S820A.
- For the repairing, checking and measuring procedures, refer to the "TECHNICAL GUIDE, GENERAL INSTRUCTIONS".

I. STRUCTURE OF THE CIRCUIT BLOCK

Transformer
Upconverter coil
AC terminal
Crystal unit

Electroluminescent panel output terminal

Input terminal (–)

Input terminal (+)

Upconverter coil
C-MOS-LSI

Temperature sensor

II. REMARKS ON INSTALLING THE BATTERY

- After the battery is replaced with a new one, or after the battery is re-installed following repairing procedures, be sure to short-circuit   the AC terminal of the circuit block and the switch spring with conductive tweezers to reset the circuit as illustrated at right.

AC terminal

Tweezers

SEIKO
S820A JAPAN
(–)UP
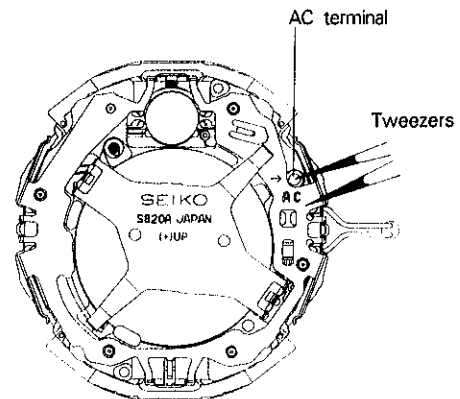
- To reset the circuit of the complete watch, press and hold buttons "A", "B", "C" and "D" at the same time for 2 to 3 seconds. The display will become blank, and "12:00'00" AM, Friday, January 1st, 1993" will be shown as the buttons are released, indicating that the resetting of the circuit has been completed.

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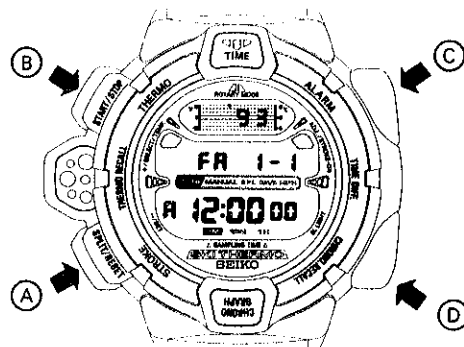
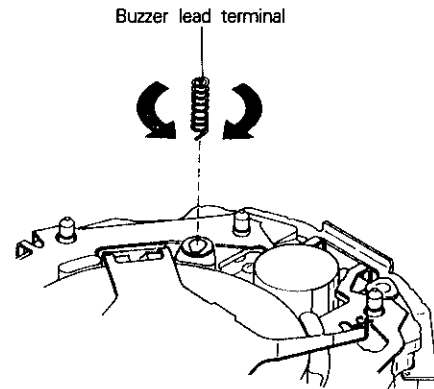## III. REMARKS ON DISASSEMBLING AND REASSEMBLING

⑤ Buzzer lead terminal

Buzzer lead terminal

• How to remove
Turn the buzzer lead terminal to release its end portion from the groove of the battery guard, and then remove it.

• How to install
Set the end portion of the buzzer lead terminal into the groove of the battery guard, then turn it to fix it in place.
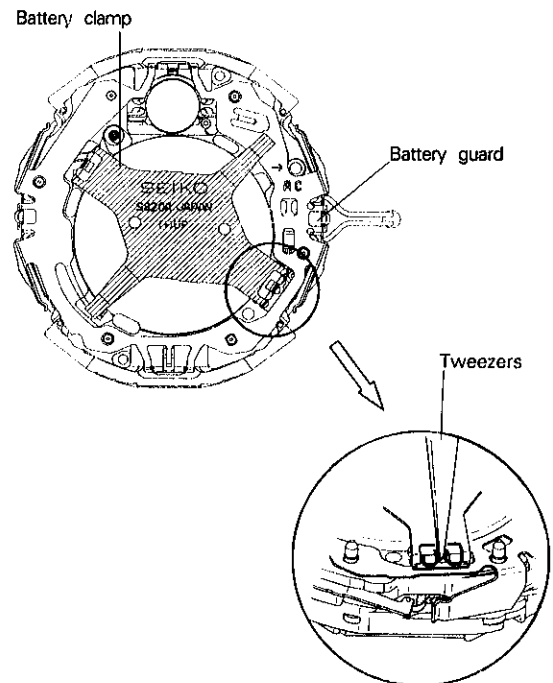
⑦ Battery clamp

Battery clamp

• How to remove
Using tweezer tips or a screwdriver, pry up the two protrusions of the battery clamp hooked to the notches of the battery guard.

Battery guard

• Checking after installation
After installing the battery clamp, check that the battery guard is securely held by the two protrusions of the battery clamp.

Tweezers

⑧ Battery

• How to install
Install the battery slantwise as shown in the illustration lest it should distort the battery contact portion of the battery guard.

Set the battery slantwise.

Switch spring

Battery contact portion
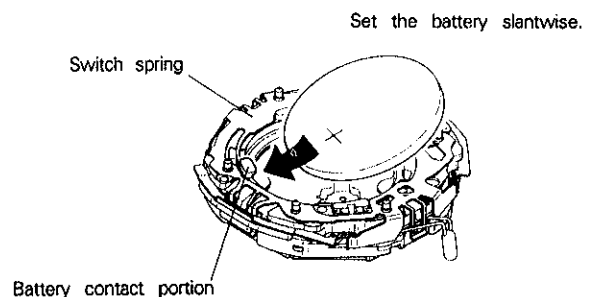
⑨ Switch spring

• How to remove

Pry up the four hooking portions of the switch spring with the tip of a screwdriver to remove it.

Switch spring
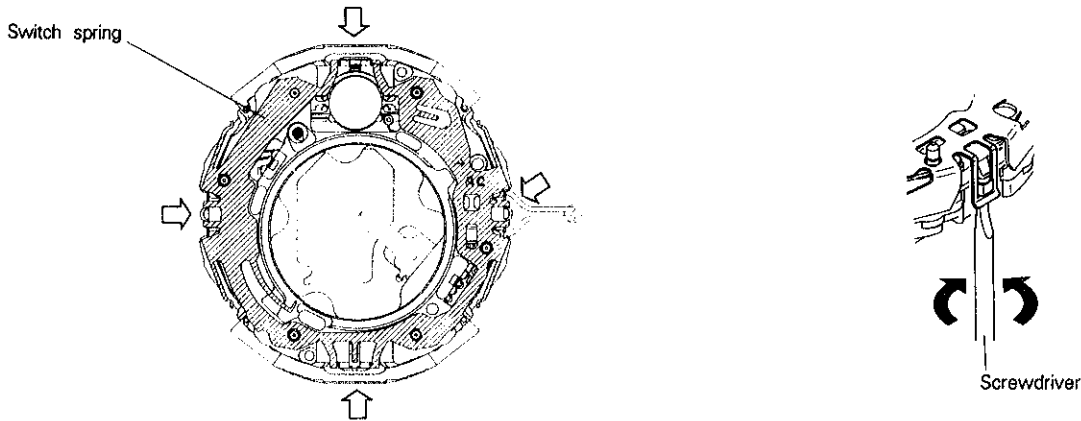
Screwdriver

⑯ Liquid crystal panel

⑲ Liquid crystal panel frame

• How to remove

Insert the tip of a screwdriver into the hooking portion of the liquid crystal panel frame at the 6 o'clock position, and pry it up in the direction of the arrow as shown in the illustration to remove the liquid crystal panel.

Screwdriver   Liquid crystal panel frame

(6 o'clock side)   (12 o'clock side)

Liquid crystal panel
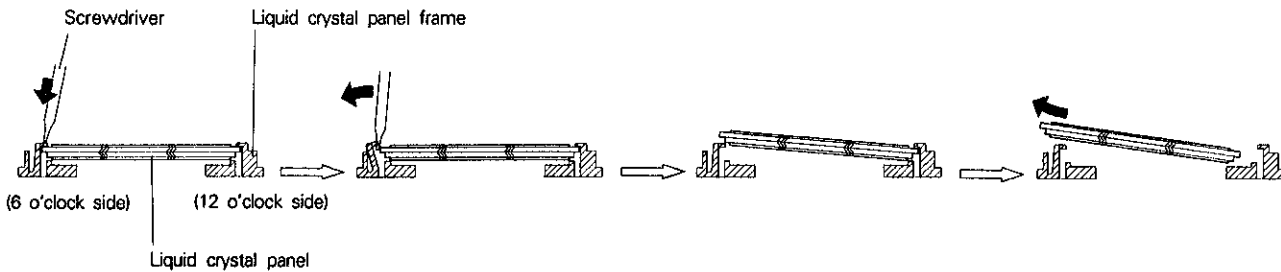
⑰ Electroluminescent panel

When replacing the electroluminescent panel, bend the two lead portions of the new electroluminescent panel at the joint as shown in the illustration before reassembling it.

Non-luminous surface (black)

Luminous surface (light green)

Lead portion
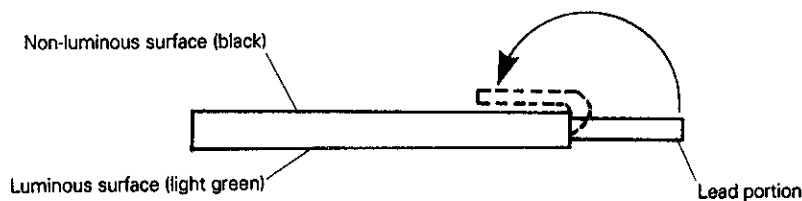
* The electroluminescent panel is highly susceptible to humidity. Therefore, a new electroluminescent panel should be put in a sealed moistureproof bag and kept in a cool, dark place if it is not used right away.

③ Case back gasket

⑥ Module

- **Remarks on installing the module and case back gasket in the case**

    - The case back gasket is shaped for exclusive use with Cal. S820A. When installing the case back gasket in the case, set the protruding portion of the gasket securely in the groove of the case's sensor portion.

    - Four conducting pins for the rotating ring protrude from the case. When attempting to install the module in the case, therefore, the module may not fit correctly into the case.
      Line up notch (A) of the module with protrusion (a) inside the case and close the case back pushing the module down in the case.
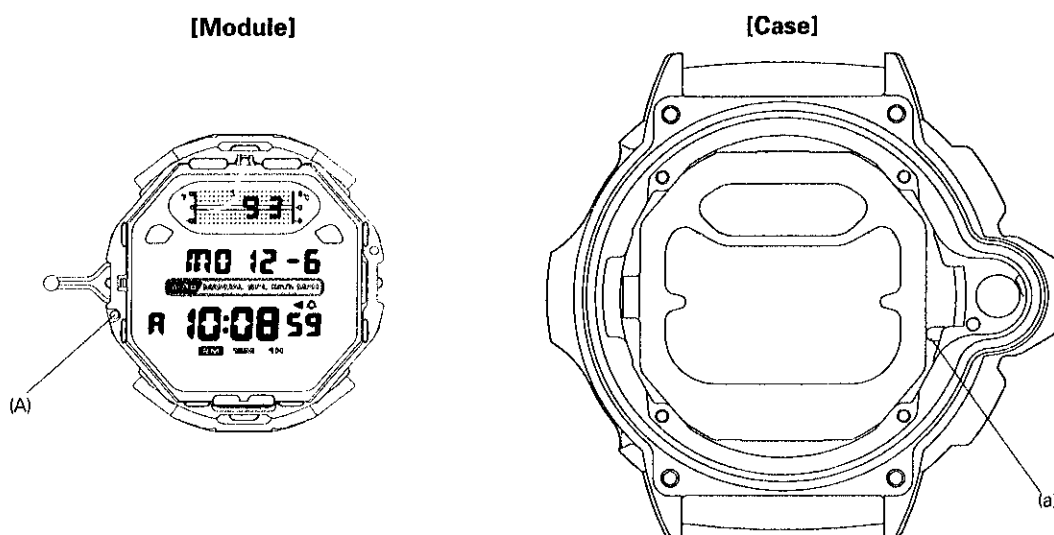
[Module]   **[Case]**

- After installing the module in the case, turn the rotary switch to check that the modes shown on the display correspond to the respective mode marks on the rotary switch.

IV. VALUE CHECKING

- **Time accuracy**

To measure accuracy, light up all the segments of the display. To do so, press buttons "A" and "B" at the same time in the TIME/CALENDAR SETTING display.
After the measurement, press button "A", "B", "C" or "D" to return to the TIME/CALENDAR display.

- **Upconverter coil resistance**

    $125\Omega \sim 175\Omega$

- **Current consumption for the whole of the module**

    - When the electroluminescent panel is not used :   less than $4.6\mu A$
    - When the electroluminescent panel is used   :   less than $17.0mA$

    Note: Before measuring the current consumption, be sure to reset the circuit. Otherwise, the display will become disordered, and the current consumption not be measured properly.

- **Troubleshooting for the electroluminescent panel**

If the electroluminescent panel will not light, check the following points for the cause of failure:

Cause-1:   Battery
            Check the voltage of the battery.

Cause-2:   Insufficient contact of the parts with the battery
            Check if the battery contact portion of the switch spring and the battery
            connection (−) are securely in contact with the battery.

Cause-3:   Insufficient contact of button "D"
            Check if the switch spring and the circuit block are dusty.

Cause-4:   Defective circuit block or electroluminescent panel
            Follow the procedure below.

> Remove the case back of the complete watch, and supply power
> (3V) externally.
> While keeping button "D" pressed, measure the voltage of the
> electroluminescent panel output terminal of the circuit block.

More than AC 35V   Less than AC 35V

> The circuit block is normal.
> Disassemble the watch and check the lead
> portions of the electroluminescent panel and the
> electroluminescent lead terminals for proper
> conductivity. (Also check them for dust)

> Replace the circuit block with a new
> one.

> If there is no conductivity failure, replace the
> electroluminescent panel with a new one.

- **Checking of the temperature sensor**

The following display in the THERMOMETER mode indicates a malfunction in the temperature sensor if
the actual temperature is higher than this.

- 20.L °C   - 4.L °F

(Centigrade display)   (Fahrenheit display)

If this display appears, replace the whole circuit block with a new one.

Remarks: The temperature sensor is bonded to the circuit block and cannot be replaced nor be supplied
                as a separable unit.

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