BSN 8X53-A1604

SEIKO

ASTRON

GPS SOLAR

8X53
HANDY MANUAL

SEIKO WATCH CORPORATION

＜English＞

Printed in Japan

Please carefully read the instructions in this Complete User Guide before using the watch.

For details, please read the
"8X53 (GPS Solar) Complete User Guide"
(http://www.seikowatches.com/support/ib/index.html).

* Length adjustment service for metallic bands is available at the retailer from whom the watch was purchased. If you cannot have your watch repaired by the retailer from whom the watch was purchased because you received the watch as a gift, or you moved to a distant place, please contact SEIKO WORLDWIDE SERVICE NETWORK. The service may also be available on a chargeable basis at other retailers, however, some retailers may not perform the service.

* If your watch has a protective film for preventing scratches, make sure to peel it off before using the watch. If the watch is used with the film on it, dirt, sweat, dust, or moisture may be attached under the film and may cause corrosion.

CONTENTS

1 Features

This is a GPS solar watch.

GPS signal reception

This watch can be set to the precise local time by just one button operation* anywhere in the world.

∗ DST (Daylight Saving Time) can be set manually.

This watch quickly adjusts the time by receiving GPS signals from GPS satellites. This watch responds to a total of 40 time zones around the world. When the region or time zone where the watch is used is changed, please carry out operation of "time zone adjustment."

Solar charging Function

This watch operates by solar charging.

Expose the dial to light to charge the watch. Once fully charged, the watch runs for approximately 6 months.

When the energy stored in the watch runs out completely, it takes time to fully charge the watch, so please keep in mind to charge the watch regularly.

Automatic time adjustment function

This watch automatically adjusts the time in accordance with action patterns during use.

When the watch has sensed sufficient brightness under an open sky, it automatically receives GPS signals from GPS satellites. This function enables the watch to automatically adjust the time precisely even while you are using the watch.

∗ This watch is unable to receive GPS signals when the energy stored in the watch is low.

Standard Charging Time

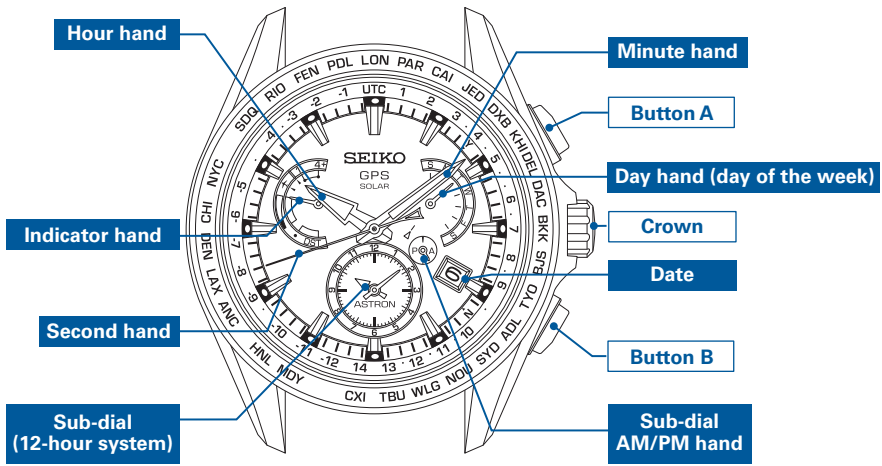
GPS signal reception consumes a lot of energy. It is necessary to charge the watch by exposing it to light so that the indicator hand points to the "middle" or "full" position. (If the charging status is displayed as "low," the reception will not start even with manual GPS signal reception.)

Illumination lx (LUX)	Light source	Condition (Example)	From the state where the watch is stopped (not charged)		In the state where the hand moves (the watch is charged)
			To fully charged	To one-second interval movement is secured	To move for one day
700	Fluorescent light	General offices	—	—	3.5 hours
3,000	Fluorescent light	30W 20cm	420 hours	12 hours	1 hours
10,000	Fluorescent light Sunlight	Cloudy day 30W 5cm	115 hours	4 hours	15 minutes
100,000	Sunlight	Sunny day (Under the direct sunlight on a summer day)	50 hours	1.5 hours	10 minutes

The figures of "Time required for charging the watch to start moving at one- second intervals" are estimations of time required to charge the stopped watch by exposing it to light until it moves at steady one-second intervals. Even if the watch is partially charged for a shorter period, the watch will resume one-second- interval movement. However, it may shortly return to two-second-interval movement. Use the charging time in this column as a rough guide for sufficient charging time.

∗The required charging time slightly varies depending on the design and the dial color of the watch.

2 Names of the parts



*Position of each display may differ depending on the model (design).

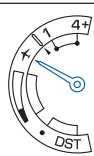
3 Check the charging status

The indicator hand position shows whether this watch is able or unable to receive GPS signals.
In addition, for the low charging state, the movement of the second hand shows the energy depletion state in further detail.

Reception is allowed

Indicator display	Charging status	Solution
	full	Reception is allowed.
	middle	Reception is allowed.

Reception is not allowed

Indicator display	Movement of second hand	Charging status		Solution
	1-second interval movement 	low	The watch is unable to receive GPS signals, but has energy to operate.	Charge the watch at least until the indicator hand points to "middle" so that the watch is able to receive GPS signals.
	2-second interval movement 		The watch is unable to receive GPS signals, and does not have energy to operate. (The energy depletion forewarning function is activated.)	Continue to charge the watch at least until the indicator hand points to "middle" so that the watch is able to continuously operate and receive GPS signals.
	5-second interval movement 			
	—	The charging status is not displayed for the in-flight mode (✈).		Reset the in-flight mode (✈) as long as possible. When the indicator hand points to "low," charge the watch.

* GPS signal reception requires a lot of energy. It is necessary to regularly charge the watch by exposing it to light.

4 Time zone

Time zone

Based on Coordinated Universal Time (UTC), the standard time commonly used is adopted by countries and regions around the world. The standard time is determined by each country or region, and the region where the same standard time is adopted is referred to as the time zone, and presently, the time zone is divided into 40 zones as of March 2015.
Further, DST (Daylight Saving Time) is individually adopted in countries and regions.

DST (Daylight Saving Time)

Depending on the area, DST (Daylight Saving Time) is individually set.
Daylight Saving Time, or summer time, is a system to lengthen daylight time by advancing 1 hour when daylight time is longer during summer. Daylight saving time has been adopted in about 80 countries, mainly in Europe and North America. The adoption and duration of daylight saving time varies depending on the country.

* Daylight Saving Time is subject to change due to circumstances of the country or region.

Coordinated Universal Time (UTC)

UTC is the universal standard time coordinated through an international agreement. UTC is the primary time standard for recording time around the world. The time obtained by adding a leap second to the "International Atomic Time (TAI)" is determined based on the atomic clock around the world. It is coordinated in order to compensate for deviations from universal time (UT) which is astronomically determined by the UTC.

5 Time zone display and list of time zones around the world

The following list shows the relationship between displays of the bezel and dial ring and time difference from the UTC.
Please refer to the second hand positions below to set the time zone or to check the time zone setting.

DST (Daylight Saving Time) is used in time zones with a ★ mark.
In the Lord Howe Island time zone in Australia with a ☆ mark, the time is advanced by 30 minutes while Daylight Saving Time (Summer Time) is in effect. This watch corresponds to DST in the Lord Howe Island time zone.

∗ The time zone of each region and DST (Daylight Saving Time) are as of March 2015.

∗ The displays of city code and the time difference from UTC are Subject to change depending on model.
∗ "-" between figures of the display of time difference shows that there is a time zone in that place.

City code	Display of time difference	City name	UTC ± hours
LON	UTC	★London	0
PAR	1	★Paris/★Berlin	+1
CAI	2	★Cairo	+2
JED	3	Jeddah	+3
—	•	★Tehran	+3.5
DXB	4	Dubai	+4
—	•	Kabul	+4.5
KHI	5	Karachi	+5
DEL	•	Delhi	+5.5
—	•	Kathmandu	+5.75
DAC	6	Dhaka	+6
—	•	Yangon	+6.5
BKK	7	Bangkok	+7

City code	Display of time difference	City name	UTC ± hours
BJS	8	Beijing	+8
—	•	Eucla	+8.75
TYO	9	Tokyo	+9
ADL	•	★Adelaide	+9.5
SYD	10	★Sydney	+10
—	•	☆Lord Howe Island	+10.5
NOU	11	Nouméa	+11
—	•	Norfolk Island	+11.5
WLG	12	★Wellington	+12
—	•	★Chatham Islands	+12.75
TBU	13	Nuku'alofa	+13
CXI	14	Kiritimati	+14
—	–12	Baker Island	–12
MDY	–11	Midway islands	–11

City code	Display of time difference	City name	UTC ± hours
HNL	–10	Honolulu	–10
—	•	Marquesas Islands	–9.5
ANC	–9	★Anchorage	–9
LAX	–8	★Los Angeles	–8
DEN	–7	★Denver	–7
CHI	–6	★Chicago	–6
NYC	–5	★New York	–5
—	•	Caracas	–4.5
SDQ	–4	Santo Domingo	–4
—	•	★St. John's	–3.5
RIO	–3	★Rio de Janeiro	–3
FEN	–2	Fernando de Noronha	–2
PDL	–1	★Azores	–1

6 Time Zone Adjustment

Time zone adjustment

The time zone where you are is localized to adjust the watch to the precise current time by just one button operation* anywhere in the world.

*DST (Daylight Saving Time) can be set manually.

How to adjust the time zone

1 Go to a place where GPS signals can be easily received

Move to the outdoors under an open sky with good visibility.

2 Continue to press Button A (6 seconds), and then release it when the second hand moves to the 30-second position.

* Although the second hand moves to the 0-second position 3 seconds after pressing Button A, continue to press it.

When the second hand has reached the 30-second position, reception is started.
The indicator hand points to "4+."

* While the indicator hand points to "low" or ✈, reception is not started even with operation for reception.

When the hand points to "low," charge the watch by exposing it to light.

Check whether the watch is able/unable to receive GPS signals

When the hand points to ✈, reset the in-flight mode (✈).

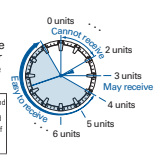
3 Direct the watch face upward and wait

* Please note that it may be difficult to receive GPS signals while you are in motion.

It takes a maximum of 2 minutes to complete reception.
* It depends on the receiving conditions.

〈 Display during reception (= satellites acquisition status) 〉
The second hand indicates ease of receiving (= number of GPS satellites from which GPS signals are received).

* The larger the number of acquired satellites there are, the easier it is to receive GPS signals.



* Even when the hand points to 4 units or more, reception may not be allowed.
* To cancel the reception, press Button B.

4 When the second hand points to "Y" or "N," reception is completed.

The reception result is displayed for 5 seconds.

Then, the hour and minute hands move, and the time and date are adjusted. (The time zone is also adjusted to the local time zone.)

Reception result display	Y: Successful	N: Failed
Display		

Check that the reception is successful after the watch returns to the time display mode.

* During movement of the date, the buttons cannot be operated.
* Manually set Daylight Saving Time (DST).

Precautions on time zone adjustment

If the time zone is adjusted near a time zone boundary, the time of the adjacent time zone may be displayed.
In some areas the boundaries observed by the watch may not exactly correlate to the actual time zone markers on the land. This does not indicate a malfunction. In this case, set the time zone in the manual time zone setting mode.

When the time zone is adjusted while traveling on land, avoid time zone boundaries to carry out time zone adjustment in the representative cities in the time zone whenever possible. In addition, when the watch is used near time zone boundaries, make sure to check the time zone setting, and manually set the time zone as necessary.

7 Manual time zone selection of the main-dial

Manual time zone selection

In places where the time zone cannot be adjusted, the time zone can be set manually.

How to manually set the time zone

1 Pull out the crown to the first click

The second hand moves to display the currently set time zone.

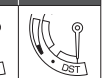
2 Turn the crown and set the second hand to the time zone of the destination

When the crown is turned, the second hand moves to the next zone.

Turn the crown clockwise to advance 1 time zone.

Turn the crown counter clockwise to set back 1 time zone.

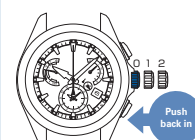
< Display of the indicator hand >
Displays ON/OFF setting of DST (Daylight Saving Time).

DST	OFF	ON
Display		
Hand position	•	DST

3 Push the crown back in

The second hand returns to the time display mode. The indicator hand returns to the display of charging status.

∗ During movement of the date, the buttons and crown cannot be operated.



8 Manual time zone selection of the sub-dial

Manual time zone selection of the sub-dial

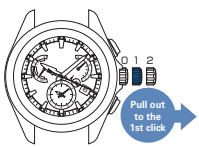
Adjust the sub-dial by selecting the time of the time zone.

∗ The sub-dial cannot be adjusted to a time outside the time zone.

How to select the manual time zone of the sub-dial

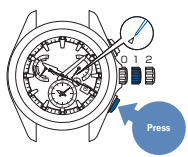
1 Pull out the crown to the first click

The second hand moves to display the currently set time zone.



2 Press Button B

The second hand moves to display the currently set time zone of the sub-dial. The day hand points to Δ.



3 Turn the crown and set the second hand to the time zone of the destination

When the crown is turned, the second hand moves to the next zone.

Turn the crown clockwise to advance 1 time zone.

Turn the crown counter clockwise to set back 1 time zone.

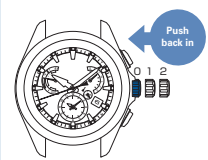
< Display of the indicator hand >
Displays ON/OFF setting of DST (Daylight Saving Time).

DST	OFF	ON
Display		
Hand position	•	DST

4 Push the crown back in

The second hand returns to the time display mode. The indicator hand returns to the display of charging status.

∗ During movement of the date, the buttons and crown cannot be operated.



9 DST setting of the main-dial

Turn ON DST (Daylight Saving Time)

DST (Daylight Saving Time) can be manually set.

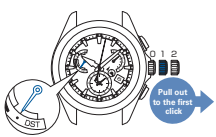
∗ DST (Daylight Saving Time) is not automatically changed.

∗ ON/OFF of the DST (Daylight Saving Time) is not automatically changed with operation of time zone adjustment/manual time zone selection. When traveling to a region where DST (Daylight Saving Time) is not adopted from a region where it is adopted, turn off the DST (Daylight Saving Time) setting.

1 Pull out the crown to the first click

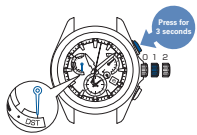
The indicator hand moves to indicate the current DST (Daylight Saving Time) setting.
The second hand moves to indicate the current time zone.

< When DST (Daylight Saving Time) setting is OFF >



2 Continue to press Button A (3 seconds) within 5 seconds after operation of ①

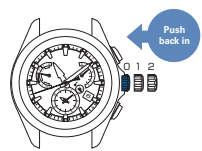
The indicator hand moves to point to "DST (ON)," and the hour and minute hands advance by one hour.



∗ In the Lord Howe Island time zone in Australia, the time is advanced by 30 minutes while DST (Daylight Saving Time) is in effect.

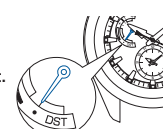
3 Push the crown back in

The second hand returns to the time display mode.
The indicator hand returns to the display of charging status.



Turn OFF DST (Daylight Saving Time)

Carry out steps ① to ③ in the state where DST (Daylight Saving Time) setting is ON.
In step ② , adjust the indicator hand to the "OFF" position as shown in the figure at the right.
The hour and minute hands return by one hour.



10 DST setting of the sub-dial

Set the DST of the sub-dial.

DST (Daylight Saving Time) can be manually set.

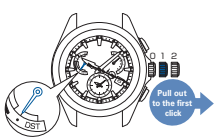
∗ The setting of the DST (Daylight Saving Time) of the sub-dial does not change automatically.

∗ ON/OFF of the DST (Daylight Saving Time) is not automatically changed with operation of manual time zone selection. When DST (Daylight Saving Time) ends in the time zone set in the sub-dial, reset the DST (Daylight Saving Time).

1 Pull out the crown to the first click

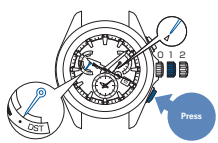
The indicator hand moves to indicate the current DST (Daylight Saving Time) setting.
The second hand moves to indicate the current time zone.

< When DST (Daylight Saving Time) setting is OFF >



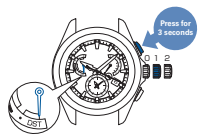
2 Press Button B

The second hand moves to display the currently set time zone of the sub-dial. The day hand points to Δ.



3 Continue to press Button A (3 seconds) within 5 seconds after operation of ①

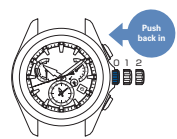
The indicator hand moves to point to “DST (ON),” and the hour and minute hands advance by one hour.



∗ In the Lord Howe Island time zone in Australia, the time is advanced by 30 minutes while DST (Daylight Saving Time) is in effect.

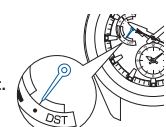
4 Push the crown back in

The second hand returns to the time display mode.
The indicator hand returns to the display of charging status.



Turn OFF DST (Daylight Saving Time)

Carry out steps ① to ④ in the state where DST (Daylight Saving Time) setting is ON.
In step ③ , adjust the indicator hand to the “OFF” position as shown in the figure at the right.
The hour and minute hands return by one hour.



11 How to manually adjust the time

Manual time adjustment

The watch can be set to the precise current time of the currently set time zone. (The time zone is not changed.)

How to manually adjust the time

1 Go to a place where GPS signals can be easily received

Move to the outdoors under an open sky with good visibility.

2 Continue to press Button A (3 seconds), and then release it when the second hand moves to the 0-second position.

When the second hand has reached the 0-second position, reception is started. The indicator hand points to "1."

∗ While the indicator hand points to "low" or ✈, reception is not started even with operation for reception.

When the hand points to "low," charge the watch by exposing it to light.

When the hand points to ✈, reset the in-flight mode (✈).

3 Direct the watch face upward and wait

It takes up to one minute to complete reception.

∗ The reception time depends on the reception conditions.

〈 Display during reception (= satellites acquisition status) 〉

The second hand indicates ease of receiving (= number of GPS satellites from which GPS signals are received).

∗ To acquire only time information, the number of satellites necessary for reception is one.

Number of acquired satellites	1	0
Display		
State	Easy to receive	Cannot receive

∗ To cancel the reception, press Button B.

4 When the second hand points to "Y" or "N," reception is completed.

The reception result is displayed for 5 seconds. Then, the hour and minute hands move, and the time and date are adjusted.

Reception result display	Y: Successful	N: Failed
Display		

Check that the reception is successful after the watch returns to the time display mode.

When the time is not correct even if "Y" is displayed, the time zone may not correspond to the region where you are. Check the time zone or DST (Daylight Saving Time) selection.

∗ During movement of the date, the buttons cannot be operated.

∗ Manually set DST (Daylight Saving Time).

12 When boarding (in-flight mode (✈))

In-flight mode (✈)

Set to the in-flight mode (✈) where the reception may influence operation of other electronics devices in an airplane, etc.
In the in-flight mode (✈), the GPS signal reception (time zone adjustment, manual time adjustment, and automatic time adjustment) does not function.

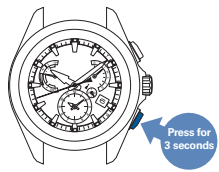
〈In-flight mode (✈)〉
The indicator hand points to ✈.

∗When the in-flight mode (✈) is reset, the indicator hand indicates the charging status.

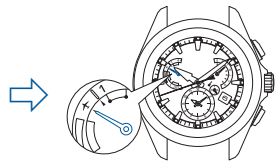
Set to the in-flight mode (✈).

1 Continue to press Button B (3 seconds)

The indicator hand indicates the charging status.



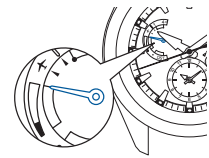
The indicator hand points to ✈.



When the in-flight mode (✈) is set, the indicator hand does not indicate the charging status.

Reset the in-flight mode (✈).

Carry out operation ①.
When the indicator hand points to "the charging status" in the figure at the right, the in-flight mode (✈) can be reset.



∗The display when the charging status is "full"

13 Leap second (Automatic leap second reception function)

Leap second

The leap second is to compensate for deviations from the universal time (UT) which is astronomically determined and the "International Atomic Time (TAI). "1 second" may be added (deleted) once a year or every few years.

Automatic leap second reception function

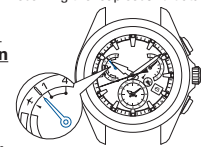
A leap second is automatically added by receiving "leap second data" from GPS signals at the time of leap second addition.

∗ "Leap second data" includes information about future leap second addition and current leap second data.

Receiving Leap Second Data

When the GPS signal reception is performed on or after December 1st and June 1st, the indicator hand displays as shown at the right.

Receiving the leap second data



When the leap second data reception is completed, the indicator hand returns to display the charging status. Use the watch as it is.

∗ The leap second data reception is performed every half a year regardless of leap second addition.

It takes up to 18 minutes to receive the leap second data.

When GPS signals are received under the following conditions, the leap second data reception is also started.

- **GPS signals are received after the system reset**
- **GPS signals have not been received for a long time**
- **Leap second data reception has failed**
  (Leap second data reception is performed again during the next GPS signal reception. It is repeated until the leap second data reception is successful.)

14 Reception result display

Check whether the leap second data reception was successful

The successful / failed reception result of the regular leap second data reception is displayed for 5 seconds.

1 Press Button A and then release it

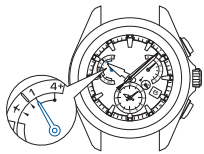
The second hand and indicator hand display the reception result.

∗ When Button A is kept pressed, the watch enters the Manual time adjustment operation.

2 The result of the reception is displayed

The second hand displays the result of the GPS signal reception (time adjustment or time zone adjustment).

The indicator hand points to “1” or “4+” which shows “time adjustment” or “time zone adjustment”.



∗ The indicator hand points to “4+” as a result of time zone adjustment.

Second hand: Reception result (successful / failed)

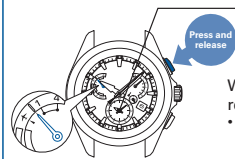
Result	Successful	Failed
Display		
Position	**Y 8-second position**	**N 22-second position**

∗ After 5 seconds have elapsed or when Button B is pressed, the watch returns to the time display mode.

3 Press Button A and then release it while the result of the reception is displayed (for 5 seconds) in step 2

The second hand displays the result of the leap second data reception (successful / failed).

The indicator hand displays “0” of the leap second data reception.



∗ When Button A is kept pressed, the watch enters the Manual time adjustment operation.

∗ After 5 seconds have elapsed, or when Button B is pressed, the watch returns to the time display mode.

Second hand: Reception result (successful / failed)

Result	Successful	Failed
Display		
Position	**Y 8-second position**	**N 22-second position**

When the leap second data reception result is Y (successful)

- The leap second data reception was successful.
  Use the watch as it is.

When the leap second data reception result is N (failed)

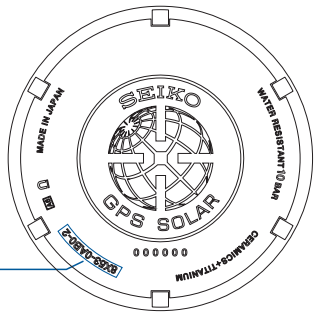
- The leap second data reception, periodically performed, has not been successful.
  It will be performed automatically with the next GPS signal reception (automatic time adjustment/manual time adjustment).
  Use the watch as it is.

∗ The leap second data is received on or after December 1st and June 1st.

∗ Even when the leap second data reception has not been successful, the time is correct until the leap second data is added (deleted).

15 How to check when the time zone information was configured for your watch

The case back shows the caliber-case number of your watch.



Caliber-case number
The number to identify the watch type

∗ Display may vary depending on the model.

By referring to caliber-case number shown on the case back, you will be able to determine when the time zone data was configured.

For more details, refer to the URL below.

http://www.seikowatches.com/gpstimezonedatainfo/

If the official time zone has changed in a region after the watch's time zone data was configured, the correct time will not be displayed even after receiving GPS signals. Please perform the following operations to display the correct time:

< To set the time of this watch in a region where the official time zone has changed >

1. Select the time zone appropriate for the current time in the target region by manual time zone setting.
   → For details, please refer to "7. Manual time zone selection of the main-dial" P. 15

2. Next, adjust the time by manual time adjustment.
   → For details, please refer to "11. How to manually adjust the time" P. 23

3. When using the watch within the same time zone, the correct time will be displayed after automatic (GPS) or manual time adjustments.

4. When moving from a region where the official time zone has changed to a different time zone, then back to the region where the official time zone has changed, carry out the same operations from 1. - 3. as indicated above to display the correct time in the region where the official time zone has changed.

SPECIFICATIONS

SEIKO

1. Basic function ..... Main-dial; three hands (hour/minute/second hands), date, day display, indicator hand, Dual time display function, AM/PM display, world time function (40 Time zones)

2. Frequency of crystal oscillator ... 32,768 Hz (Hz = Hertz ... Cycles per second)

3. Loss/gain (monthly rate) ..... Loss / gain ±15 seconds on a monthly rate (When the watch is used without automatic time setting by receiving GPS signal and when it is worn on the wrist within a normal temperature range between 5°C and 35°C (41°F and 95°F)).

4. Operational temperature range ... Between –10°C and +60°C (14°F and 140°F)

5. Driving system ..... Step motor (hour/minute/second hands of main-dial), day display, date, indicator hand, sub dial (hour, minute).

6. Power source ..... Secondary battery, 1 piece

7. Duration of operation ..... Approximately 6 months (Fully charged, and the Power Save is not activated).
∗ If the Power Save is activated after it is fully charged, the watch continues to run for approximately 2 years at maximum.

8. GPS signal reception function ... Time zone adjustment, manual time adjustment, automatic time adjustment

9. IC (Integrated Circuit)..... Oscillator, frequency divider and driving circuit C-MOS-IC, 4 pieces

∗ The specifications, as noted above, are subject to change without prior notice for product improvement purposes.

Product : GPS solar watch
Model : 8X53

TRA
REGISTRED No: ER34314/14
DEALER No: DA0090709/12

TRC/GPS/2014/6

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CE

This product is in compliance with the essential requirements and other relevant provisions of the R&TTE Directive (1999/5/EC).

http://www.seikowatches.com/support/ib/pdf/SEIKO_8X53.pdf#declaration

SEIKO WATCH CORPORATION

http://www.seikowatches.com/