



SEIN ELECTRONICS CO., LTD.

English



## SE-311

Full Auto Wrist Blood  
Pressure Monitor

U.S.A Patent : 5,662,092

CE 0123

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### INSTRUCTION MANUAL

#### Full Auto Wrist Blood Pressure Monitor

#### Model SE-311

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Before Operating this unit please read these instructions completely

## 1. Caution

- 1) This device is designed to make automatically rapid exhaust if cuff pressure reach at 320 mmHg or more. If the cuff doesn't make automatically rapid exhaust when cuff pressure reach at 320 mmHg or more, please detach the cuff from the wrist.

## 2. Introduction

Thank you for purchasing the SE-311 Full Auto Wrist Blood Pressure Monitor. The SE-311 is a compact, and light device which is easy to use due to an oscillometric method of measurement, in addition to a small, pre-formed wrist cuff of the unit, which is easy to apply and is able to store 180 memories - 45 memories each for 4 user. With the touch of a button the Compact Wrist unit measures your blood pressure and pulse and displays the reading on a clear digital panel. Perfect for quick, easy readings at home, at work, almost anywhere!

The Compact Wrist unit uses the oscillometric method of blood pressure measurement. This means the unit detects your blood movement through the artery in your wrist and converts the movements into a digital reading. An oscillometric unit does not need a stethoscope so that the unit is simple to use and easy to measure.

Clinical research has proven a direct relationship between blood pressure in the wrist and blood pressure in the arm. Changes in Wrist blood pressure reflect changes in arm blood pressure because the arteries in the wrist and the arm are connected.

Frequent wrist blood pressure measurement will provide you and your doctor with an accurate indication of changes in your true blood pressure.

"Blood pressure measurement determined with this device are equivalent to those obtained by a trained observer using the cuff/stethoscope auscultation method, within the limits prescribed by the American National Standard for Electronic or Automated sphygmomanometers(ANSI/AAMI SP10-1992)".

The fifth korotkoff sound was used to determine diastolic blood pressure.

## 3. Important Information Before Blood Pressure Measurement

1. Perform measurement in a quiet place and in a relaxed posture.
2. Stress will raise blood pressure, therefore, avoid measurement during stressful situations.
3. Although such cases are rare, for subjects having an extremely weak pulse or irregular pulse, error may result which prevent proper measurement.
4. Apply the cuff so that unit is on the inside of your left wrist with the digital display in easy view.
5. Blood pressure naturally varies throughout the day and is also affected by many different factors such as smoking, alcohol consumption, medication and physical activity.
6. Any blood pressure recording can be affected by the position of the subject, his or her physiologic condition and other factors.

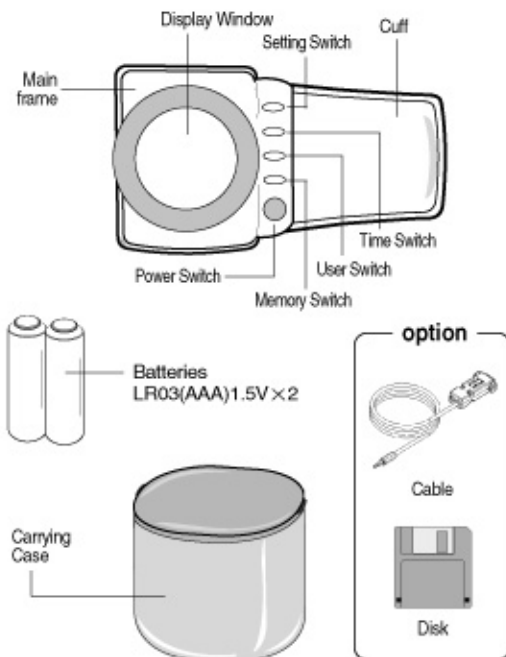
7. Remain still and do not talk during measurement to avoid inaccurate readings.
8. In case of re-measurement, allow 5 minute interval before re-taking your blood pressure thus allowing blood to circulate. You may require more or less rest time between readings depending upon your individual physiological characteristics.
9. Blood pressure measurements should be interpreted by a physician or a trained health professional who is familiar with your medical history. By using the device regularly, and recording the results for your physician to interpret, you keep your physician informed of the continuing trends in your blood pressure.
10. Try to take your readings at the same time each day for consistency because blood pressure can vary considerably.
11. The SE-311 Full Auto Wrist Digital Family Blood Pressure Monitor is indicated for use by adults at home for the serial measurement of Systolic and diastolic blood pressure and pulse rate. The device employs a wrist cuff and the oscillometric method of measurement.
12. Any contraindication is not known.
13. This device complies with Class B for Noise-emission, Level A for Noise-immunity according to a standard of IEC 60601-1-2. But please use this device away from intense electromagnetic fields such as TV, Radio, etc.
14. It is recommended that this device should be checked every 2 years in accordance with EN 1060-1:1995 and EN 1060-3:1997 to ensure exact measurement. Carry out the test in pressure steps of 50mmHg between 0mmHg and the maximum pressure of the scale range.
15. Please feel free to contact SEIN should you want any further information such as circuit diagrams, part lists, descriptions, calibration instructions, etc.

## 4. Operation Guide

See the steps below for your convenience.

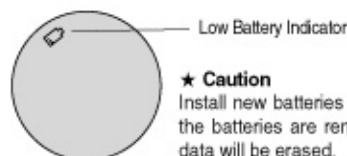
Battery Installation	See page 6
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Attaching pressure cuff	See page 7
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Press the power switch	See page 10
▼	
How to measure	See page 9
▼	
Displaying measurements	See page 10
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▼	
Description of display symbols	See page 12

## 5. Parts Identification



## 6. Battery Installation / Replacement

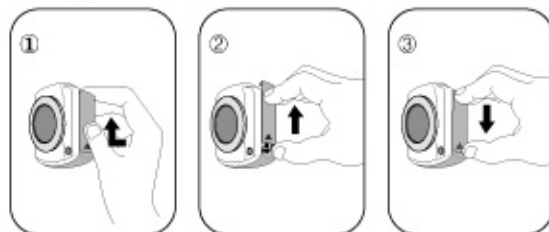
1. If nothing display or the Low Battery Indicator appears on the display when power on, replace both batteries.



### ★ Caution

Install new batteries within 30 seconds after the batteries are removed. If not, all stored data will be erased.

2. To do so, remove the cover from the battery compartment and insert the batteries as shown. Be sure to pay attention to the polarity of the batteries.



### ★ IMPORTANT

In order to ensure that the device functions properly, the cover of the battery compartment must fit tightly.

Take the battery out of the main unit when this device will not be used for a long time. If the batteries are not used any more, please dispose of them in accordance with National Regulation.

## 7. Attaching Pressure Cuff

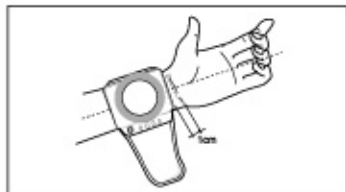
### Wrap the pressure cuff around the left wrist.

- The display should be placed on the palm side of the wrist.
- The wrist should be bare skin.



### Fasten the pressure cuff snugly .

- Do not pull the pressure cuff.
- Do not tighten the pressure cuff too much.
- The cuff edge should be approximately 1cm above from your palm.



### ★ NOTE

- Please apply the pressure cuff on you left wrist to get an accurate reading.

- Please use only a cuff supplied by SEIN ELECTRONICS CO.,LTD. using other cuffs may impede measurement. To avoid cuff constriction of the wrist due to a defect in the machine, the user must ture the power off. They must remove the cuff from the wrist and remove from main unit immediately.

## 8. Correct Measurement Position

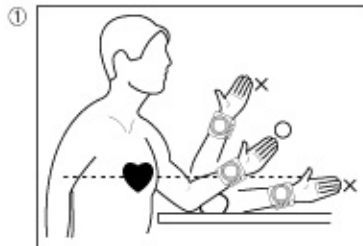
### Measurement values vary according to your posture.

#### Measure your blood pressure in the sitting position

- Place your elbow on a table or other object.
- Use the storage case to position the arm, so that the pressure cuff can be at the same height as the heart.
- Open your hand and fingers slightly, and relax.
- Blood pressure will vary in relation to the level of the cuff from the heart.
- Relax your hand with the palm facing up snugly.

### ★ NOTE

Your heart is located slightly below your armpit.



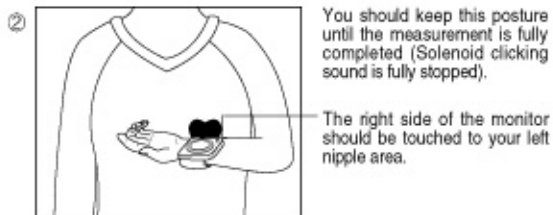


Figure : Proper posture during measurement

**This is very important for you to get a correct reading all the time.**

- Always make sure you are sitting comfortably and relaxed.
- Push the power button of the monitor and position your wrist with the monitor across the chest as shown in the figure : "proper posture during measurement"
- you can hear the motor pumping sounds, After full inflation you will hear the solenoid clicking sound (if the cuff reinflates, do not worry, as this can be normal for some people).

#### ★ NOTE

While the monitor is operating,

- Do not move or put any pressure on your left wrist and left hand.
- Do not talk, sneeze or cough.
- Do not take a measurement standing up.

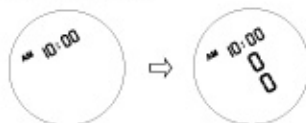
If you miss any of above instruction, you will not get an accurate reading.

For successive readings, wait about 5 minutes between measurements.

- Waiting allows the engorged blood vessels to return to normal before each new measurement is taken.

## 9. How to set the number of users

- ① Press and hold the power button in time mode, and the display will be indicated as follows:



- ② Then press the User Button , and the display will be indicated as follows:



This indicates that the unit will store 45 memory each for 4 persons.

- ③ To advance to 1 user, press the setting button while the above is on the display. The display will go to :



This indicates that the unit will store 180 memory for 1 person.

- ④ To advance to two user, press the setting button while the above is on the display. The display will go to :



This indicates that the unit will store 90 memory each for 2 persons.

- ⑤ If the setting button is pressed while the above is on the display, the display will go to ② again. If power button is pressed when the figure of ②(③ or ④) is displayed, the display will be changed to time mode and the number of users will be set as 4 persons(1 person or 2 persons).

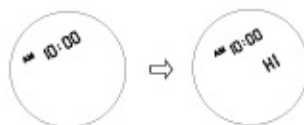
#### ★ Caution

Be careful that all stored data are erased if the setting button is pressed to change the number of user.

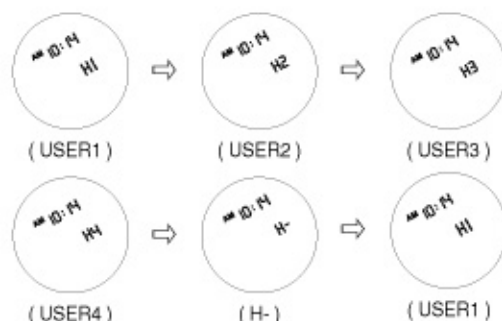
## 10. How to determine user's turn

We assume that the number of users is set as 4 persons.

- ① Press the user button in the time mode, and the display will be indicated as follows :



- ② According as the setting button is pressed, the display will be changed as follows :



- ③ Select your turn and press the user button. The display will return to time mode. It is that you are ready to measure blood pressure.

#### ★ Caution

When H- is selected, no measurements will be stored.

## 11. How to Measure

**Please read completely 3. Important Information Before Blood Pressure Measurement, 6. Attaching Pressure Cuff and 7. Correct Measurement Position before measuring.**

- Please select of user value of H4, H1 or H2 where you want to memorize the reading.



### Turn Power On

- When Power is turned on, all display symbols appear for approximately 1 second.
- The display symbols disappear and the deflation Indicating symbol(↓) starts to flash and release air in the wrist cuff.
- When the "0" is displayed, the unit is ready for measurement. When the "↓" symbol appears, the air in the cuff is released automatically



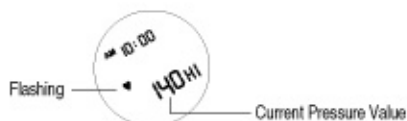
### Automatic Inflation

- In 1 second, the pressure cuff inflates after the "0" is displayed on the window.
- When the power switch is subsequently pressed during pressurization, the unit is turned off and the cuff deflates.
- When inflation is completed, the "♥" symbol will appear indicating that measurement is in progress.
- Constant-speed deflation  
The pressure reducing function starts by opening the solenoid valve for a short time. After the pressure reduced and pulse is detected, pressure reduction is synchronized with patient's pulse cycle and deflation is carried out.

- The pressure value appears on the upper part, and exhaust speed on the lower part of the display.



- When a pulse is detected, the pressure value moves to the lower part of the display. At this time the "♥" symbol flashes at the same rate as pulse rate.



- The buzzer sounds when the measurement is completed (beeps), Systolic pressure is displayed on the upper part and Diastolic pressure on the middle, and Pulse on the lower part of the display.



### Turn Power OFF

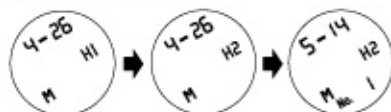
- Press the Power switch to turn Power off.

### Automatic Power OFF Function

- If the unit is left on after measurement an automatic POWER off function turns the power off after approximately 1 minute.

## Memory Recall Function

- ① To confirm previous measurement value, press Memory switch while current measurement value or time is displayed. To select which you want to recall memories, press user button and then choose the User(H1, H2, H3 or H4) by Setting button down. And touch memory button again.



- ② After M. no.1 and date of the measurement are displayed for 1 second, the measurement value in Memory No.1 is displayed for 5 seconds, and the display automatically returns to the previous.



- ③ Memory NO. is Setting by 1 once Memory switch is pressed while memory No. or measurement value is displayed. 1 second after Memory No. is displayed, stored value in the memory No. is displayed.
- ④ When new measurements is performed, the new measurement value is stored in Memory No.1 and the measurement value which was stored in Memory No. 1 moves to Memory No. 2. automatically.

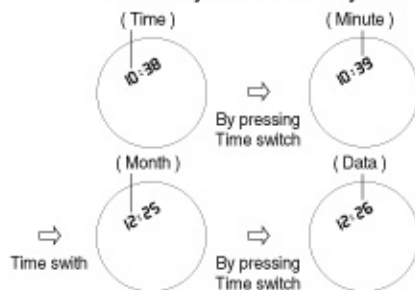
Measurement value stored in last memory address disappears.

## Change of Time and Date

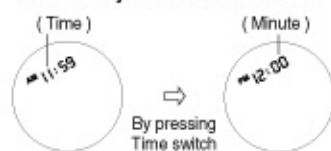
(Press TIME S/W and change with Setting S/W)

- ① To change time and date, press TIME switch while time or measurement value is displayed.
- ② Flashing refers to the changeable.
- ③ Flashing value Setting by 1 once Setting switch is pressed.
- ④ Flashing moves to Time, Minute, Month and Date in turn by pressing TIME switch.
- ⑤ The change is completed by pressing TIME switch once more after Date change.
- ⑥ To stop change, leave the unit without pressing any switch, 10 seconds later the display returns to the previous and current time is displayed.








### 24-hours system with military hour



### 12-hours system with AM and PM



## 12. Description of Display Symbols

Display symbol	Condition/Cause	Corrective action
 Measurement in progress	Appears in the measurement condition and flashes when pulse is detected.	Measurement in progress-remain quiet.
 Exhaust	flashes when power is applied and there is air remaining in the cuff.	Automatic exhaust is performed.
 Insufficient pressure	Measurement has begun but the pressure was insufficient.	Automatic repressurization is performed.
 Replace batteries	Appears when the battery voltage is excessively low.	Replace both batteries with new ones.
 Measurement error	Appears when the accurate blood pressure could not be obtained.	Wait a further 5 minutes and then remeasure. Loosen cuff to allow circulation of blood in the wrist and hand
 Pulse error	Appears when the accurate pulse rate could not be obtained.	
	In a 12-hours system AM and PM are displayed.	

## 13. More about Blood Pressure Measurements

### What is Blood Pressure ?

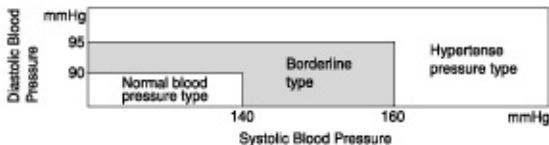
Blood pressure is the force of blood flowing against the walls of the arteries. Arterial blood pressure varies during the course of the cardiac cycle. The highest pressure in the cycle is called the **SYSTOLIC BLOOD PRESSURE** ; the lowest the **DIASTOLIC BLOOD PRESSURE**. Both pressure readings, the **SYSTOLIC** and **DIASTOLIC**, are necessary to enable a physician to evaluate the status of a patient's blood pressure. Many factors such as physical activity, anxiety, or the time of day, can influence your blood pressure. Blood pressure is typically low in the morning and increases from afternoon to evening. It is lower in the summer and higher in the winter.

### Why is it important to measure your Blood Pressure at home?

blood pressure measurement by a doctor in a hospital or a clinic, and group health checks, tends to stimulate nervousness in the subject and may even create higher blood pressure. Also blood pressure varies in accordance with a variety of conditions, and so judgement is not possible on the basis of a single measurement. The blood pressure measured in the morning just after getting up, before taking any food, and with the subject still, is known as the fundamental blood pressure. In practice, it is rather difficult to record the fundamental blood pressure, but to come as near as possible to measuring the blood pressure in the environment that is close to this, is why it is useful to take the measurement at home. It is recommended that this device should be checked every 2 years in accordance with EN1060-1:1995 and EN1060-3:1997 to ensure accurate measurement.

### Who Blood Pressure Classifications

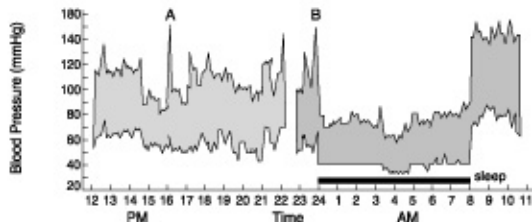
Standards for assessment of high or low blood pressure, without regard to age, have been established by the World Health Organization (WHO), as shown in this chart.



Reference Material : Investigation into Adult Diseases Report by the Ministry of Health and Social Security, 1971.

### Variations in Blood Pressure

Individual blood pressures vary greatly both on a daily and a seasonal basis. These variations are even more pronounced in hypertensive patients. Normally the blood pressure rises while at work and is at its lowest during the sleeping period. The graph below illustrates the variations in blood pressure over a whole day with measurement taken every five minutes.



Shown is data for measurements taken every 5 minutes. The thick line represents sleep. The rise in blood pressure at 4 PM(A in the graph) and 12 PM(B in the graph) correspond to an attack of pain and sexual intercourse. (Beven, Honor & Stott : Clin. Sci. 36 : 329, 1969)

## 14. Care and Maintenance

1. Avoid storing the unit where it will be exposed to direct sunlight, dust or high humidity.
2. Do not Wash the main unit or pressure cuff.
3. Do not disassemble the unit.
4. Do not drop the unit. Protect it from sudden jars or shocks.
5. Do not clean the unit with volatile liquids.

The unit and pressure cuff may be wiped clean with a soft, dry cloth.

## 15. Managing the data

1. With RS-232C and PC, the data measured might be managed.
2. The program of managing data should be supplied additionally through supplier.
3. Our SE-311 may manage the data with your computer with RS-232C and the operating program.
4. May purchase the cable for RS-232 & the operating program disk at store where you bought the unit.
5. Please refer to the "help" icon of the program to manage the data.

## 16. Limited two Year Warranty

Your **SE-311** Full Auto Wrist Blood Pressure Monitor is warranted to be free from manufacturing defects for a period of two years under normal use. This warranty extends only to the original retail purchaser.

Should repair be needed within the warranty period, ship the unit prepaid to **SEIN ELECTRONICS CO., LTD. #133-3, Pyungchondong, Dongan-gu, Anyang-city, Kyungki-do, Korea.**

**ATTN :** Service Dept. Be sure to include the model number of your unit and your phone number on any correspondences. We will either repair or replace (at our option) free of charge any parts necessary to correct defects in the materials or workmanship.

The above Warranty is Complete and exclusive. The warrantor expressly disclaims liability for incidental, special, or consequential damages of any nature some states do not allow the exclusion or limitation of incidental or consequential damages, so the above warranty may not apply to you.

Any implied warranties arising by the operation of law shall be limited in duration to the term of this warranty. (Some states do not allow limitations on how long an implied warranty lasts, So the above limitation may not apply to you)

This warranty gives you specific legal rights and you may have other rights which vary from state to state. As a condition to operation of your warranty, the enclosed registration card must be completed and sent to us within one month from the date of purchase.

**FOR CUSTOMER SERVICE CALL 82-31-421-0389**

## 17. FCC Information

### Warning

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

### Note

Potential For Radio/ Television Interference (for U.S.A. only)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Potential For Radio/Television Interference (for Canada only)

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus", ICES-003 of the Canadian Department of Communications.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe B prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques", NMB-003 édictée par le ministre des communications.

## 18. Specifications

Name and model number	Full Auto Wrist Blood Pressure Monitor SE-311
The degree of protection against electric shock	Type BF equipment 
Display system	Digital display system/LCD 14digits SYS, DIA, PULSE, TIME, DATE, USER
Measuring method	Oscilometric method
Power source	LR03(AAA) 1.5Vx2 batteries, DC 3V
Measuring range	20-300 mmHg (Pressure) 40-199 Pulses/minute (Pulse)
Accuracy	$\pm 3$ mmHg (pressure) $\pm 5\%$ (Pulse)
Initial pressure setting	180mmHg
Pressurization	Automatic pressurization using a micropump.
Rapid air release	Solenoid valve
Deflation	Dual pulse step down air release by solenoid valve
Memory	180 measurement for one user 90 measurements each for two users 45 measurements each for three or four users
Automatic Power OFF	To be automatically cut off after 1 minute of non use to save energy.
Automatic repressurization	To be automatically repressurized when the cuff pressure is insufficient.
Battery life	Approximately 200 times measurements
Operating environment	+10°C ~ +40°C, less than 85% RH
Storage environment	- 10°C ~ +60°C, less than 95% RH
Unit Dimensions	69mm(W) x 70mm(D) x 37mm(H)
Weight	Packaged : Approx. 330g Unpackaged : Approx. 140g(including 2 batteries)
Cuff Dimensions	Approximately 304(L)x 70(W) mm
Wrist Circumference Range	Approximately 130~210mm
Accessories	Carrying Case, Instruction Manual, LR03(AAA) 1.5V x 2 batteries.
Option	Floppy diskette, Interface Cable

These specifications are subject to change without notice for  
purposes of improvement



■ **Manufacturer**

Company:SEIN ELECTRONICS CO.,LTD.

Address:#133-3, Pyungchon-dong, Dongan-gu, Anyang-city, kyungki-do, Korea.

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