Operation Manual

Insight Lite

FETAL MONITOR Ver 1.0

medicalECONET

■ Im Erlengrund 20, 46149 Oberhausen, Germany
Tel : +49 208 377 890 00
Fax : +49 208 377 890 55
www.medical-econet.com

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Insight Lite

FETAL MONITOR Ver 1.0

Table of Contents

INTRODUCTION GENERAL

Thank you for buying Insight Lite (Fetal Monitor). For safe use, stable performance and follow-up management, please read this manual before using the device.
Before using the device, please read this manual to perfectly understand the basic function, using method and maintenance method of the device, so that you can assure the safe use and long-term stable performance of the device.

We, MEDICAL ECONET, provide you with reliable products only.

- The device shall be assembled/extended/amended/repaired by us or the person certified by us.
- The device shall be installed meeting relevant regulations including electrical installation and etc.
- The device shall be used in accordance with the User's Manual.

The device shall be used under the direction of the person who is medically certified.

This device is used to monitor the fetus's status.

For the patient's safety, use only the parts and accessories recommended by us.

If you connect the device with any part or accessory not specified in the User's Manual, you shall notify it to us or any distributor who has the right to sell this product.

WARRANTY PERIOD

- This product is made through strict quality management and test process. This product can be repaired, replaced or refunded in accordance with “Consumer’s Damage Compensation Regulation” noticed by Economic Planning Board.
- This product is warranted for 1 year.
- If broken while being used normally, this product will be freely repaired by our service center for such warranty period.
- If you find any problem on the device, please let us know the model name, device number, purchasing date and breakage content.

SERVICE REQUEST

The service for Medical Econet can be carried out by only Medical Econet Customer Service Dept or the person certified of such service by Medical Econet. If the device is repaired or tried to be repaired by any person other than such certified person for the warranty period, the warranty period shall be void.

Medical Econet Customer Service Dept or any distributor certified of Medical Econet Product Service is obligated to carry out any service requested by the user.

If you find any problem on the device or any risk on the human body in any hospital and place where the device is used, the maintenance/repair work shall be promptly and fully taken.

If you find any problem on the device, take the actions as follow:

- Please immediately contact our Customer Service Dept or any distributor representing us for our service. Check the model name, product number, purchasing date, problem or question to ask before contacting us.
- Our Customer Service Dept will check and solve the problem online first. If difficult to solve the problem online, it will visit you to solve the problem immediately.

HOW TO CONTACT US

Customer Center

■ MEDICAL ECONET
Im Erlengrund 20, 46149 Oberhausen, Germany
Tel : + 49 208 377 890 00
Fax : + 49 208 377 890 55

* Before making reservation on troubleshooting, please check the model name, serial number, purchasing date and abnormality of the damaged product.

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CHAPTER 1 How to use the User's Manual

1.1 General

- This device provides you with the exact and stable values (fetus's heart rate, patient's uterus shrinking level and etc) measured on the patient and fetus and correct information of the fetus's status.
- This manual covers Insight Lite, a Fetal Monitor manufactured by Medical Econet, which is designed for maximal user's convenience. This manual consists of independent chapters. Some information is specified several times here in this manual.
- This manual is a guidebook for efficient use of Insight Lite. For clinical and pathological information about the device, please refer to basic relevant medical books. Then, you will use the function of the device better. If you refer to clinical books together with this manual, you will expect more effects from using the device.
- If you find any Problem while using, please contact us or our A/S Reservation Office.

1.2 Contents

- The user must read the User's Manual before using the device.
- This manual consists of the chapters as follow:

1.3 Meaning of Symbols in the User' s Manual

- We have marked on the user manual to emphasize the following agreements. The user must follow all warnings and remarks.
- In case of improper use or poor maintenance on the equipment resulting in product defect, neither the manufacturer nor the distributor will be responsible for any damages.

WARNING!

"WARNING" is used to notify the possibility of critical injury, death, and physical and financial damage in case the warning is ignored

CAUTION!

"PRECAUTION" is used to notify the possibility of non-critical injury in case the notice is ignored

NOTE

"Note" is used to notify users of not dangerous but very important information regarding equipment installation, usage, and maintenance

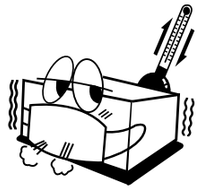
CHAPTER 2 Precautions for Use

2.1 Precautions of Using-Environment

- Avoid using or storing the device under the environments as follow:

Keep it away from wet place or do not use it by wet hands.

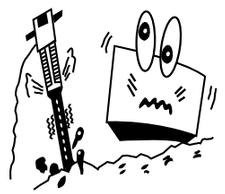
Keep it away from direct sunlight.



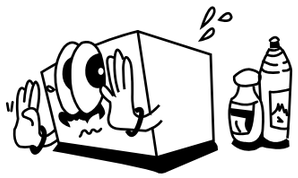
Avoid areas that have high fluctuations in temperature. (Temperature Range for Use: 10℃~45℃, Humidity: 30% ~ 85%)

Keep it away from any electric heater.

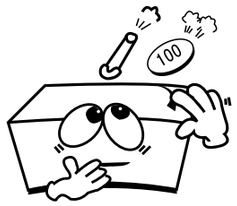
Avoid areas of high humidity or ventilation problems



Avoid areas susceptible to large shock or vibration



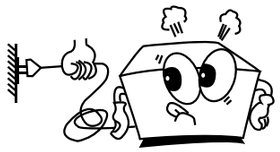
Avoid areas near
chemicals or explosive gas



Make sure to not let any dirt or especially metallic objects from going inside the equipment

Do not disassemble it.
We WILL NOT be responsible under any circumstances in this case.

Do not power it on before completely installed.
Otherwise, it may be damaged.



Hold the plug to withdraw the power cord.

IPX7
(DOP, UC Probes)

Do not submerge the probe for 5 hours or longer.

Basic environments for use are as follow:

- Temp : 10℃ ~ 45℃
- Pressure : 70 ~ 106 KPa
- Humidity : 30% ~ 85%

Basic environments for storage are as follow:

- Temp : -10℃ ~ 50℃
- Pressure : 70 ~ 106KPa
- Humidity : 20% ~ 95%

2.2 Precautions for Electric Safety

Before using the device, please check the items as follow:

- Is the power supply line of the device proper? (100 - 240VAc).
- Is every connection part (power line or any optional device) connected to the device properly? For correct connection method, see the Chapter 4.
- Is the device completely grounded? (Otherwise, noise may be made.)

NOTE

To avoid electrical noise or disturbance, install the device away from generators, X-ray devices, broadcasting devices, and idle wires. Inaccurate reading may show in case above mentioned devices are nearby. The Insight Lite requires a separate power source and stable connection. Inaccurate reading may show in case these devices are sharing the same power line.

NOTE

Insight Lite is classified as follows:
- This device is I type-BF grade device in terms of electric shock.
- It is improper to use this device nearby inflammable anesthetic and solvent.
- IEC/EN 60601-1 (Safety of Electric Medical Equipment) based noise making is A class. IEC/EN 60601-1-2 (Electromagnetic Compatibility Requirements) based noise proof is B level.

WARNING!

If you connect other devices to use RS-232C port, you should use the devices which are satisfied with standard EN60601-1.

2.3 Maintenance and Cleanness

You can maintain cleanliness on Insight Lite and its accessories (including the probe) in various ways. Use the method provided below to avoid damage or contamination on the equipment.

If you use materials that can damage the product, (non-approved cleaning material) the warranty will be voided.

PRECAUTION!

After cleaning the device, check the main body and the sensors very carefully.
If the device is overused and damaged, do not use it.

Using warm water, clean the main body with alcohol on a soft cloth at least once a month, and do not use lacquer, thinner, ethylene, and acidic cleansers. These materials can damage the device.

The cable and accessories must be maintained to avoid contact with dirt and wiped down with warm water (approximately 104˚F) on a cloth pad, and use alcohol to clean it once a week.

Do not dowse the connection parts of the accessories in liquid or detergent. Also, no liquid must go in the connection part of the device or the accessories.

CHAPTER 3 Overview of Insight Lite

3.1 Principle and Features of Insight Lite

Insight Lite is a Fetal Monitor, which basically measures the fetus's heart rate and the patient's uterus shrinkage. Insight Lite sends supersonic signal to the patient's abdomen and then measures the signal returned from the fetus's heart. It then sorts out the Doppler frequency from the returned signal and converts it into the heart beat of the fetus. The signal is then analyzed and displayed as the fetus's heartbeat and printed out on a printer. The patient's contraction level of uterus can be measured with pressure sensors, as well as printing out the data to inform the level of her labor pain and frequency. Insight Lite is that the adjustments and values of the signals can easily be controlled with simple key controls. Insight Lite is capable of measuring twin fetus, and supports an optional central monitoring system on serial communication. It is also available AST(optional) function.

3.2 Composition

Basic Accessories

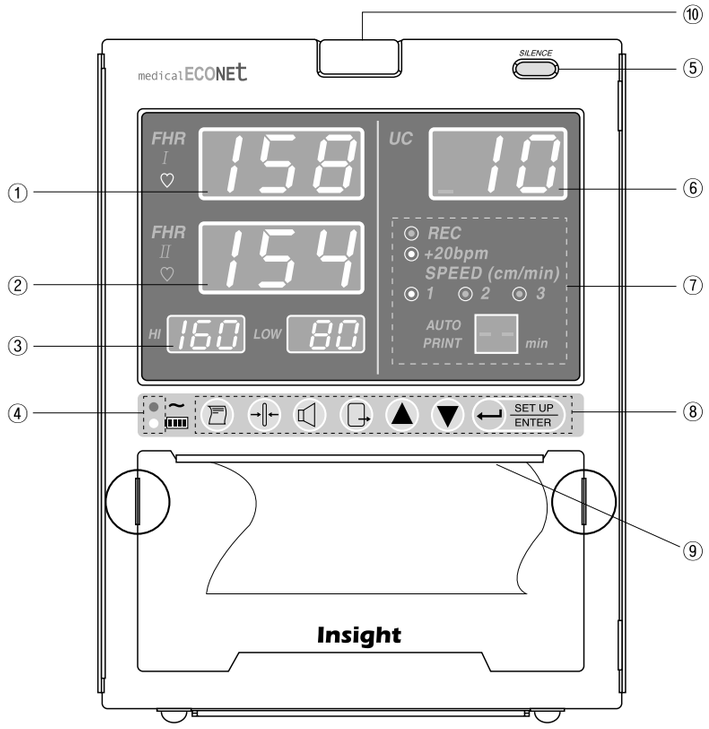
- Supersonic Probe (DOP) (1EA)
- UC Probe (1EA)
- Event Mark Jack(1EA)
- Printer Paper (1EA)
- Power Cord (1EA)
- 110V AC Conversion Jack (1EA)
- User's Manual (1 Volume)
- Supersonic Gel(1EA)
- Belt for Probe Fixation (3EA)

Options

- Central Monitoring Device Cable/Communication Program
- Cart
- AST Probe
- Internal Battery

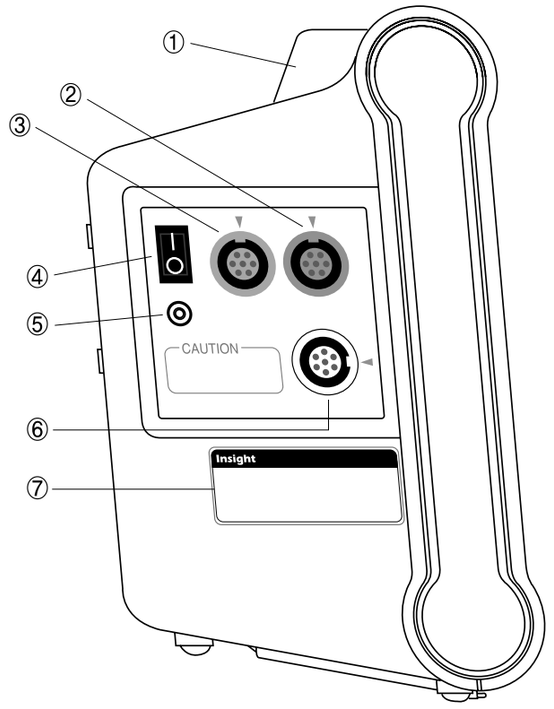
3.3 Parts

■ Front Face & Control Panel



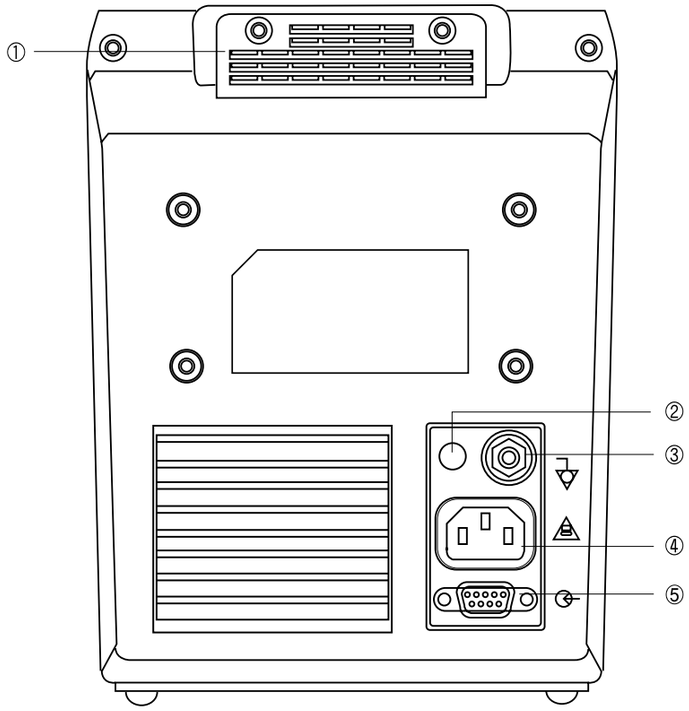
(1) Display for FHR 1 Value
(2) Display for FHR 2 Value
(3) Display for Alarm setting
(4) A/C & Battery Power LED
(5) Warning On/Off Key
(6) Display for UC Value
(7) Display for Printer setting
(8) Key Control Panel
(9) 4″ Printer
(10) Alarm LED Lamp

■ Left Face



(1) Handle for Carriage
(2) DOP1 Probe Connection Part
(3) DOP2/AST Probe Connection Part
(4) AC Power Switch
(5) Mark Jack Connection Part
(6) UC Probe Connection Part
(7) ID Label

■ Rear Face



(1) Handle for Carriage
(2) Adapter Power Connection Part
(3) Ground Terminal
(4) AC Power Connection Part
(5) RS-232C Cable Connection Part

WARNING!

Do not disassemble the device. Otherwise, you may be electrically shocked. The device shall not be disassembled by other than the person qualified for our product service.

3.4 Symbols

Symbol	Description	Symbol	Description
DC 15V 3A	15V-3A DC Power Input		Print Start/End
	Type BF Device, Electric Shock Device Protection		UC Reference Setting Display
	Warning or Precaution (See the User s Manual.)		Volume Control
I / O	AC Main Power On/Off		Back to Default Screen (Exit)
DOP1	DOP1 Probe Connection Part		Setting Change
DOP2	DOP2 Probe Connection Part		Setting Change
UC	UC Probe Connection Part	SET UP ENTER	Save the Setting Back to Menu mode
MARK	Mark Jack Connection Part		DC Communication Port
SILENCE	Ethernet Connection Terminal	2x T1 AL250V	AC Power Input Part
~	Working by AC Input		Terminal for Equipotent by Connection of Each Part of Device/System without Necessity of Ground Potential
	Working by Battery		

CHAPTER 4 How to install Insight Lite

4.1 Precautions for Installation

Precautions for Installation of Insight Lite:

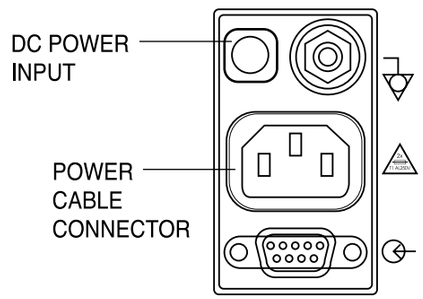
- Insight Lite shall be used at the ambient temperature of 10°~45° and humidity of 30% ~ 85%.
- Check the connection status of Power Cord.
- Do not plug various cords into an electric consent.
- Place the main body on flat place.
- Ground it. (Otherwise, noise may be made).
- Do not use an electric cord that may generate noise.
- Probe may be damaged by impact. Do not get the Probe externally impacted nor submerge it in water or oil
- If Supersonic Probe used, it must be used with Supersonic Gel. After use, wash it clearly and store it.
- Install it considering the ambient temperature and humidity. Keep it away from dusty or inflammable substances.
- All configuration settings are stored without demonstration setting in the internal memory even after the device is powered off and then turned back on. However, if the device has not been used for over ten years or an external shock is applied to it, the stored data may be altered, and you must reconfigure the information.

4.2 Installation of Main Body

Insight Lite is designed to be easily used on a normal table, cart, or any other appliances commonly found in a hospital environment. Normally, you can use the handle in the back of the device and place it on a flat surface. Since the center of gravity of the device is low, key manipulation on the device will not topple it over. It also does not slip.

4.3 Cable Connection

1) Power Connection



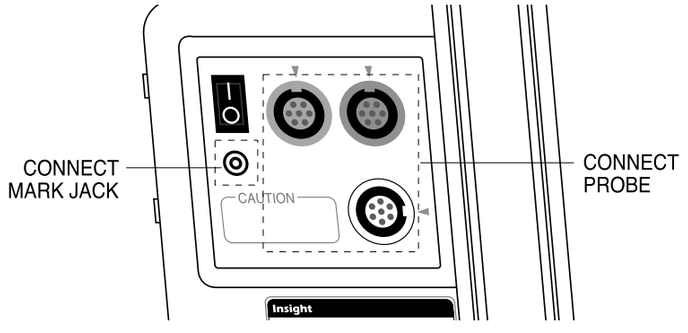
Stick the Power Cable into Insight Lite Power Connection Terminal and change the Power Switch of the left face into “O” status. Then, the device is powered on. If you cannot use the power cable, you can use DC adaptor which suggest DC15V and 3Amp.

NOTE

We recommend the power cable than the adaptor. The adaptor which is DC 15V and 3Amp is optional accessory.

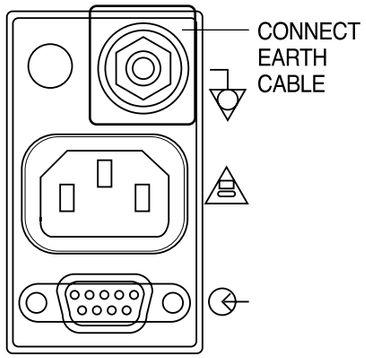
2) Connection of Main Body with Probe

- Connect the probe desired to be measured to the connection terminal part on the left face of the main body.
- If not properly connected, problem may occur.



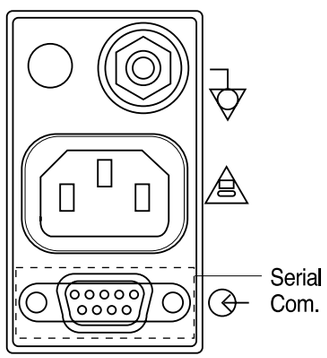
3) Ground Cable Connection

Connect the Ground Terminal of the main body with the Ground Terminal of the installation place.



4) Serial Cable Connection

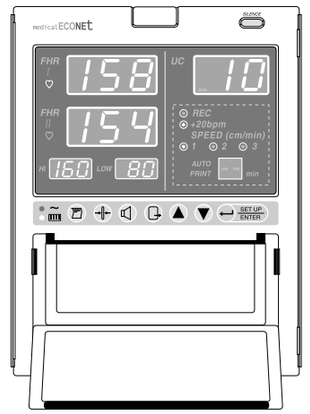
Connect the Serial Connection Part of the main body with the Serial Terminal of the installation place.



4.4 Printer Paper Loading

- In order to put the printing paper in the tray, push the buttons on the side of the front panel of the printer door and pull forward.

- When you pull the door forward the door will open and you will see the area where you can place the roll of printing paper, as well as the printer machine, and black roller on the inside of the door.



- Make sure the paper's printing side is facing up and then close the printer door.

NOTE

Printer paper should be printed side upward. If not, it will not be printed on the paper.

CHAPTER 5 How to use Insight Lite

5.1 Before using Insight Lite

Check for following items before measuring the condition of the fetus.

- Possibilities of any mechanical danger
- Power plug and cable, and accessories
- All items and equipment necessary to measure and inspect the condition of the fetus

5.2 Using Insight Lite

Connect the probe you want to use on the main body. Normal procedure is as follows.

- Pre-labor diagnosis for non-twin fetus : DOP I Probe, UC Probe, Mark Jack
- Pre-labor diagnosis for twin fetus : DOP I Probe, DOP II Probe, UC Probe, Mark Jack
- Wake up the baby : AST probe(optional)

Step 1) Turn on the Power Switch.

Step 2) Attach the probe to the patient. (Refer to 5.5, 5.6, and 5.7)

Step 3) Sound signal is heard.

Step 4) Measured signal is displayed on the FND as numbers.

Step 5) Record the measured readings with the print function.

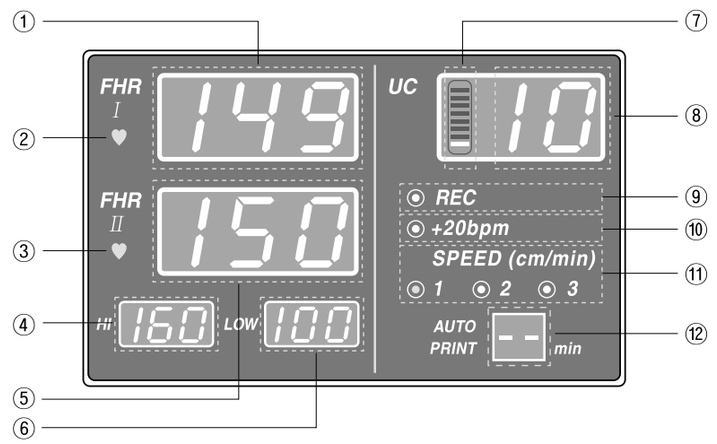
Step 6) SETUP Key is used to modify the configuration. (Refer to 6)

Step 7) If you want to wake up the baby during measuring, please remove the Doppler from DOP2 and connect AST probe(optional). Then press the button on the AST probe on the patient's abdomen. It makes sound for waking up the baby. Please do not close this device to the ear. It makes you harmful.

WARNING!

" DO NOT CLOSE THE DEVICE TO THE EAR!"

5.3 Basic Screen



(1) Displays Value of FHR 1

(2) Displays Heart Rate Rhythm of FHR 1

(3) Displays Heart Rate Rhythm of FHR 2

(4) Displays maximum limit of Alarm Level

(5) Displays Value of FHR 2 or Connecting Status of AST probe

(6) Displays minimum limit of Alarm Level

(7) Indicates bar graph of measured UC value

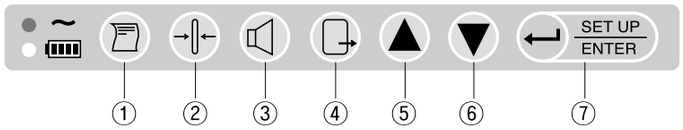
(8) Displays measured UC value

(9) Printer Status

(10) Offset Setting Status

(11) Printing Cycle for Printer Auto-Printing. Indicate remain print time during printing

5.4 Function of Keys



■ Keys on Front Face

(1) (Print): Used as Print On/Off Key

(2) (Reference): used to set UC value as the standard value (10)

(3) (Volume): switch to the volume level

(4) (Exit): Back to the previous default screen from the menu status

(5) (Up): Change to the mode or value in the menu mode

(6) (Down): Change to the mode or value in the menu mode

(7) SET UP ENTER (Setup/Enter): Enter the menu mode or save the setting

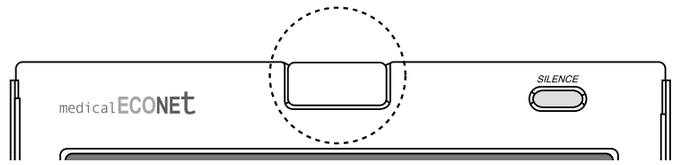
■ Lamp

The LED located on the key area of the front face Panel displays the status of the used Power.

(1) AC Power: LED lights up while AC Power being used

(2) Battery(Optional): LED lights up while Battery Power being used

■ Alarm Lamp



The LED located on the top of the front face Panel displays Alarm and Heart Rate Rhythm.

5.5 Measurement of FHR and UC

Apply ample amount of Supersonic Gel on the surface of the Probe.

The DOP and UC Probe used in Insight Lite previous models are designed to be used under water.

NOTE

Doppler and UC probes are applied by IPX7 so they can be used for the underwater delivery in the water.

■ Probe Connection

Connect DOP1, DOP2, and UC probes at the left side of the device. There are 2 Doppler probes and you may connect them to any one of the DOP1, DOP2 and UC Terminals. When diagnosing twin fetus, connect both terminals.

■ Basic Screen by Probe Connection

If the DOP Probe is not attached, nothing shows on the screen where the heart rate is displayed, and no sound or heart symbol signal shows.

If the DOP Probe is attached but not used, the status is Stand-By, and heartbeat area shows "---" until the diagnosis starts. When the diagnosis starts, the calculated heartbeat shows on the screen. If heartbeat is under 50 or heartbeat sound cannot be measured, heartbeat area shows "---".

If the heartbeat displayed on screen goes over or under the alarm level limit, an alarm will sound and alarm lamp will change green to red and FHR value will be twinkled.

Also, if the probe line is cut or the probe has been pulled off from the machine, and if it is disabled during usage, each of the FHR on the FND will show "---". "PRO OFF" and "d-1", "d-2", "UC" will displays by turns in the maximum/minimum alarm level FND. The error code will also displays in the Auto Print FND. And information sound(ding dong ding dong) will be heard.

NOTE

Error Codes

-E1 : Paper Out during printing

-E2 : DOP1 Probe is disconnected during using

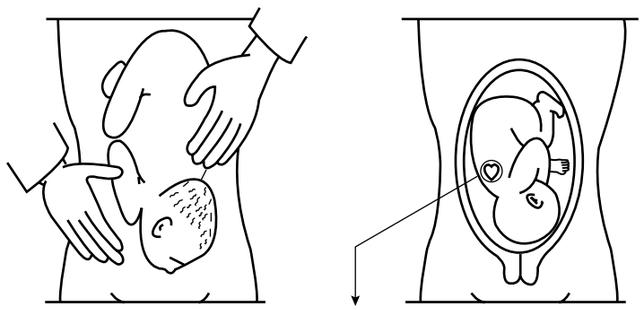
-E3 : DOP2 Probe is disconnected during using (If "E2" error occurs, it will not be displayed)

-E4 : UC Probe is disconnected during using (If "E2" or "E3" errors occur, it will not be displayed)

-E5 : Low Battery (If "E2", "E3" or "E4" errors occur, it will not be displayed)

■ FHR Measurement

(1) Touch the patient's belly and search for the fetus°Øs back and place the DOP Probe. If the fetus is positioned facing left or right, place the probe as shown on the picture.



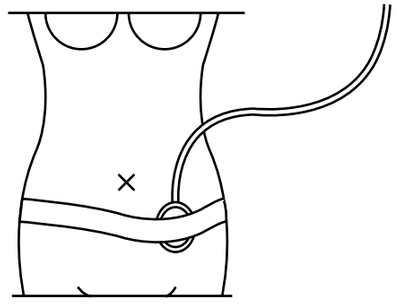
• If the probe is placed on the front of the fetus instead of the back, the focus tends to often disrupt, and you may not get an accurate reading.

• If the fetus is facing up or down, take extra caution to place the probe. Place the probe around the patient's navel.

(2) Move the probe slightly around and locate the area where the fetus's heartbeat sounds the loudest, and then use the belt to fasten the probe.

• Do not adjust the volume until you have located an exact position with the probe.

• Place the probe at the exact location, that is, an area where the heartbeat is heard loud and strong, and the FHR heartbeat rhythm symbol blinks in sync with the fetus's heartbeat, and then adjust the volume.



(3) When using the belt to fasten the probe, make sure it does not slip.

• As shown above, the probe cable going up in the direction of the patient's head can prevent damage to the cable and the probe does not move as much.

(4) It is important to apply ample amount of Supersonic gel on the probe surface to get rid of air bubbles in between the abdomen and the probe.

(5) Insight Lite uses a Button-Top styled DOP Probe. Insert the protruding buttons on the opposite side of the DOP Probe surface to the Button-Hole on the belt under the patient.

(6) It takes 4 to 5 seconds for the heartbeat to show. Once a stable heartbeat is displayed the printing begins.

■ UC Measurement

UC measurement uses an external attachable pressure sensor. Once the UC Probe is placed on the patient's abdomen, the pressure fluctuation of the patient°Øs uterus enables the contraction level.

(1) Place the belt underneath the back of the patient.

(2) Place the UC Probe on the highest point of the patient's belly (Fundus: Usually about 10 cm above the navel) or, the point on the patient's belly where it has become the first place to harden up.

(3) Insert the protruding buttons on the opposite side of the UC Probe surface to the Button-Holes on the belt under the patient. The recommended tightness on the fastening of the belt is from 20 to 90.

(4) If the UC Probe is attached but not in use, a meaningless number displays on the screen. When using the UC Probe, press the "Reference" key to reset the default value of 10 on the front panel before use. Insight Lite shows the LED bar of uterine contraction level.

(5) Once a stable UC value is found, the printing begins.

5.6 How to use Event Mark

The purpose of the marking is to record the moment when the patient senses the start of the fetal movement. When you press the Mark switch during printing an arrow shows on the printing paper. Mark Jack is connected to the left connection terminal of the device.

5.7 How to use Printer

The printer used in Insight Lite is a 4 inch Porti-M400V, made by Wooshim System. It uses 9V Power and the width of the printing paper is 112mm.

■ Printer Operation

(1) "REC" indicator will turns on as red color after pressing the "Print"(or "Record") key once. And the FHR1, FHR2, UC, and the Fetal Movement (FM 1, FM 2) are recorded. FM will not be recorded by the user's menu setting.
(2) If you press the "Print" key once again the red colored LED will disappears and the recording stops. The Printer scrolls out 1~2cm of extra sheet after the recording has stopped.
(3) The FHR 2 graph can be printed +20bpm more than the FHR 1 area. If you turn on the offset, "Offset" indicator will turns on as green color

■ Auto Operation

(1) Control the print time. Print time is set by 10min, 20min, 30min, 40min, 50min, 60min and off. If you use "OFF", it will stop printing by press the "Print" button or out of paper.
(2) After finishing the setting by users, it will apply to the initial printing. This setting applies to the "AUTO PRINT" area. This setting value is displayed the remained operation time.

■ FHR 2 Offset Operation

(1) Using 2 Probes simultaneously to measure FHR 1, 2, and the value comes out similar is when it's most effective. The Offset draws a graph by increasing +20bpm from the FHR 2 value.
(2) Before using the printer, use the "Up/Down/Enter" key to turn the Offset On.
(3) Once the "Offset : On" status is confirmed, another 20 is added to the FHR 2 value. After finishing the setting by users, it will apply to the initial printing.

■ ZOOM Operation

(1) Use this function when you want to see the changes in the FHR more closely.
(2) When you select "On" in the "Zoom" category in the Print Setup, the FHR area is expanded about 105 ~ 200 BPM than the normal range. After finishing the setting by users, it will apply to the initial printing.

■ SPEED Operation

(1) Control the print speed.(1cm/min, 2cm/min and 3cm/min)
(2) After finishing the setting by users, it will apply to the initial printing

■ CONTRAST Operation

(1) Control the contrast of print by 3-step. High number is thicker to print.
(2) After finishing the setting by users, it will apply to the initial printing. This setting does not apply during the printing. This setting also applies to the graph area.

■ FM Operation

(1) FM record on the paper is decided by setting.
(2) After finishing the setting by users, it will apply to the initial printing. This setting does not apply during the printing. This setting also applies to the graph area.

NOTE

During printing, you cannot change the printer setting. If you want to change the setting, you should stop to print.

Changed setting value without ZOOM is not changed even though you turn off the system. Zoom is initialized after turning off.

■ Reading the Recorded Sheet

Press the "Print" key once to begin recording and the sheet ejects as described below.

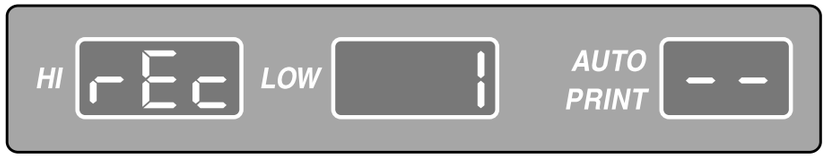
The recording areas are divided into two main categories - the text area and the graph area. The text and graph show as soon as the printing begins. The text is repeated at paper top area on 10 minute and is included the setup value of print-(1) Date (2) Time (3) Status of DOP 1, DOP 2 Probe and UC Probe (4) Status of FM (5) Print Speed (6) Status of Offsset and (7) Status of ZOOM.

5.8 Volume Control

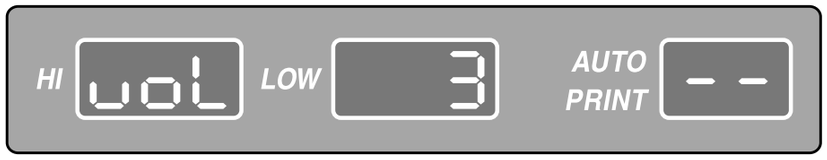
The volume can be adjusted in 8 levels and there are two ways to control it. One is to use the SETUP key(SET UP ENTER) and control it from the menu, and the other is to use the volume key( ). The volume of Doppler I and II can be adjusted.

■ Volume Change in the Menu

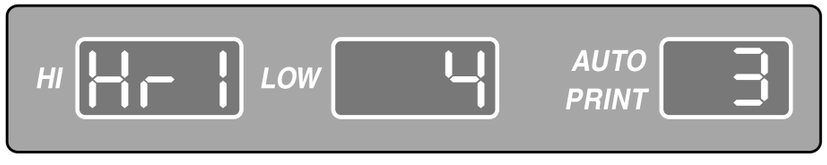
(1) Press the SETUP key(SET UP ENTER) to move the menu setting mode.



(2) Press the Up/Down key(▲ / ▼) to move the volume menu.



(3) Press the Enter key(SET UP ENTER) to enter the volume control area.



(4) Press the Up/Down key(▲ / ▼) for changing the volume HR1 or HR2 and then press the Enter key(SET UP ENTER). The volume level will be twinkled in the “LOW” area.

(5) Press the Up/Down key(▲ / ▼) to control the volume during twinkling.

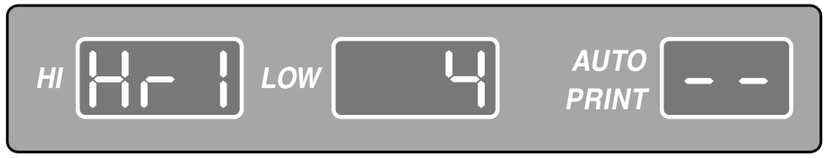
(6) Press the Enter key(SET UP ENTER) or Exit key( ) at the desired level and the volume control operation is complete. If you press the Enter key, the desired level will be saved and move to menu (3). If you press the Exit key, the volume level will be returned to previous level and move to menu (2).

(7) You can change the volume level of DOP1 and DOP2 with process (2) ~ (6).

(8) Press the Exit key( ) and move to the basic screen after all setting.

■ Using the Volume Key

(1) Press the Volume key( ) to move to menu setting mode. The initial setting is to control DOP 1. If you press the Volume key once more, DOP 2 will be controlled. DOP 1 and DOP 2 are will be changed by the Volume key.



(2) Adjust the volume to use Up/Down key(▲ / ▼) after choosing DOP 1 or DOP 2. DOP 1 or DOP 2 can be adjusted to repeat process (1) and (2).

(3) Press the Enter key(SET UP ENTER) or Exit key( ) at the desired level and the volume control operation is complete. If you press the Enter key, the desired level will be saved. If you press the Exit key, the volume level will be returned to previous level.

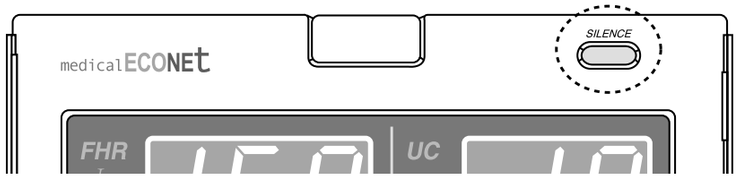
NOTE

The Volume of Key Sound, Alarm Sound and Information Sound cannot be adjusted. If the alarm sound happens, you can turn off the sound to use SILENCE key. If the information sound happens, you can turn off the sound to use Exit key.

5.9 Alarm On/Off

1) By default the Alarm function is On when you turn the Power on.

2) When the values go over or below the Alarm range the beep will sound. The user can stop the alarm. Press the “SILENCE” on the front of the device and the beep does not sound for 3 minutes. If you press the “SILENCE” two times, the beep does not sound until press the “SILENCE”. “AL OFF” will be displayed during the silence situation.



- Display during the silence for 3 minutes(Below screen will be displayed in rotation)

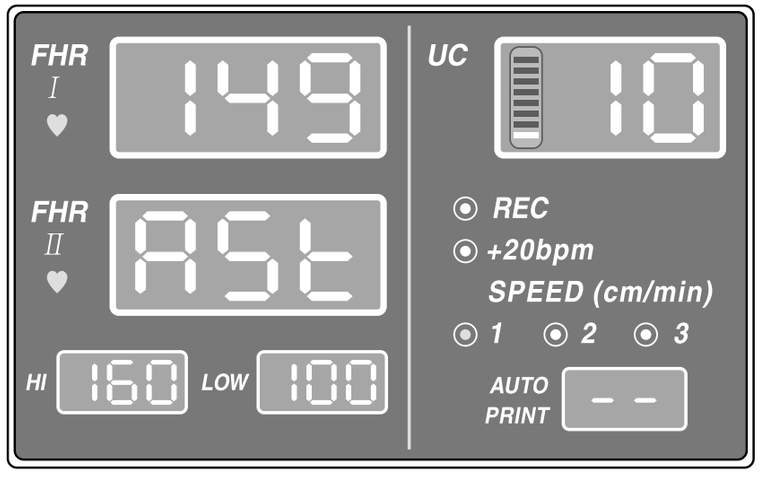
- Display during the silence

5.10 Sound

(1) Doppler Sound : This is the Doppler sound of the fetus’s heartbeat. The volume of this sound can also be adjusted using the Volume Key.
(2) Alarm Sound : When a measured HR value exceeds the set range the beep will sound repeatedly.
(3) INFORMATION : When a probe is disconnected or the battery is low, or the printer door is ajar, and when the printing paper is missing, a “ding dong” sound will repeat.
(4) The alarm sound and information sound cannot be adjusted.

5.11 AST(Optional)

This function is for waking up the baby. Insight Lite is designed to use AST to connect DOP 2 Probe connector. Insight Lite shows “AST” on the FHR2 area.



Press the button on the AST probe on the patient°Øs abdomen. It makes sound for waking up the baby. Please do not close this device to the ear. It makes you harmful.

WARNING!

“DO NOT CLOSE THE DEVICE TO THE EAR!”

CHAPTER 6 Setting by Menu Function

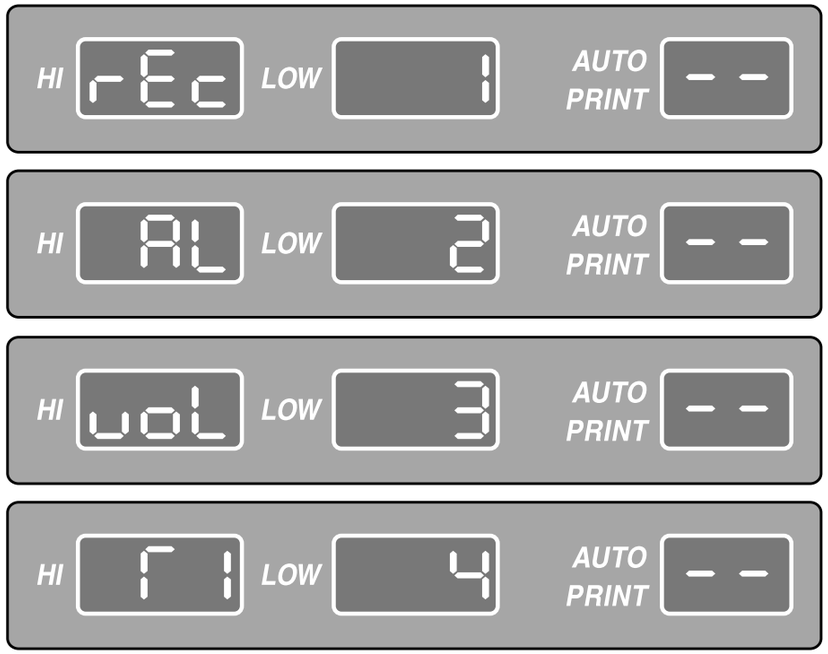
Menu cannot be set on the volume control mode.

Setup Key(SET UP ENTER) changes various setting values as follow:

- Record : Sets the printer status: Printer Relevant Setting Value
- Alarm : Alarm Sound Making Range
- Volume : Sets the volume level of FHR1 and FHR2
- Time : Sets time(Year, Month, Day, Hour, Minute)

Step 1) Press the Setup key(SET UP ENTER) on the basic screen. If you press the Exit key( ), the present screen will returns to the basic screen.

Step 2) Press the Up/Down key(▲ / ▼) to move to the menu in the menu setting mode.
Move to the Record, Alarm, Volume and Time.



Step 3) Press the Enter key(SET UP ENTER) on the item desired to be set. Then, each relevant setting screen will be displayed.
The setting screen will be described in more detailed later.

<Screen for "Auto Print" of Record Setting>

Step 4) Press the Up/Down key(▲ / ▼) to move to the detailed setting mode. If you press the Exit key( ), the menu will move to previous mode(Step 2).
If you press the Enter key(SET UP ENTER) , the menu will move to detailed setting mode.

Step 5) Press the Enter key(SET UP ENTER) in Step 4 and desired the level will be twinkled.
Then press the Up/Down key(▲ / ▼) for changing the level.

Step 6) After setting is completed, if press the Exit key( ), menu will move to previous mode (Step 2) without saving. If press the Enter key(SET UP ENTER), menu will move to previous mode(Step 4) with saving.

Step 7) After all setting is completed, press the Exit key( ) to move to the basic screen.

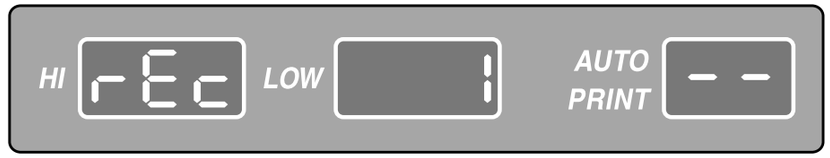
6.1 Record Setting

Possible to set the printer relevant works

Symbol	Description	Setting Range
Auto Print 	Automatically records during the set time while printing	10, 20, 30, 40, 50, 60, OFF min Initial setting : OFF
Offset 	If this function is selected, HR value of HR II will be recorded adding 20bpm.	ON, OFF Initial setting : OFF
Zoom 	Extends FHR recording area of PRINT record paper. If this function is selected, FHR area of the record paper will change from the range of 50 ~240bpm to the range of 105~200bpm.	ON, OFF Initial setting : OFF
Speed 	PRINT Speed	1, 2, 3 cm/min Initial setting : 3cm/min
CONTRAST 	PRINT CONTRAST	1, 2, 3 steps Initial setting : 2
Fetal Movement 	Print Fetal Movement	ON ,OFF Initial setting : ON

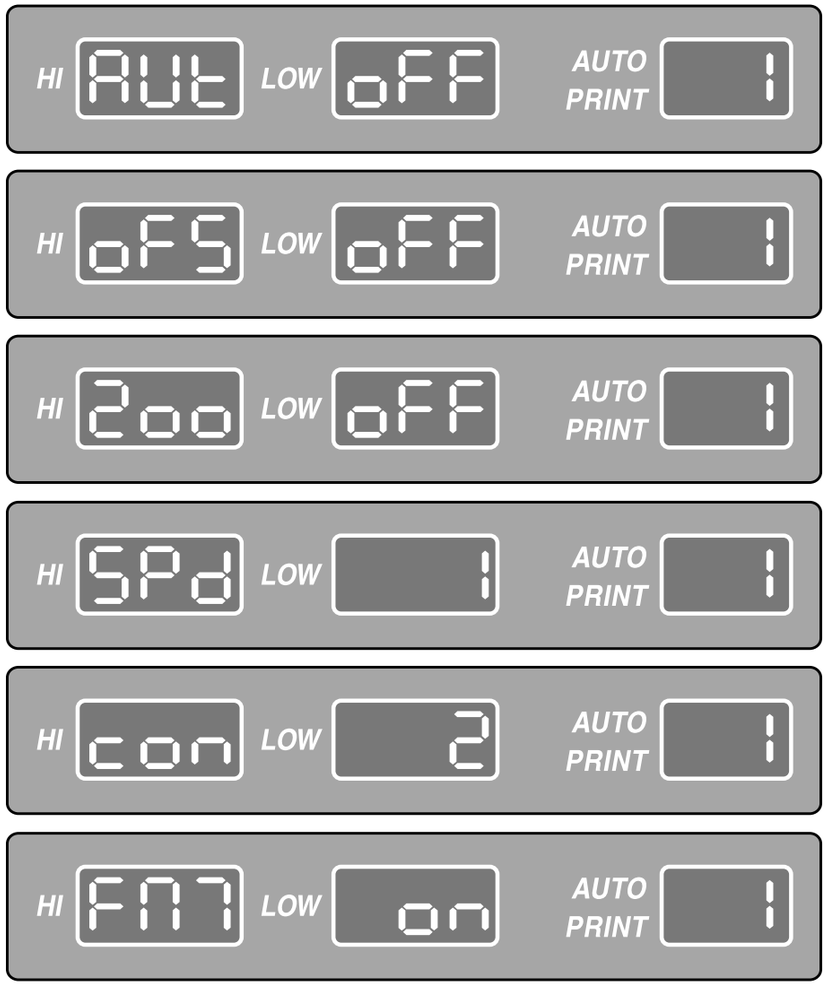
Step 1) Press the Setup key(SET UP ENTER) to move to menu setting mode in the basic screen.
If you press the Exit key( ) , menu will return to the basic screen.

Step 2) Press the Up/Down key(▲ / ▼) to move to the Record menu in the menu setting mode.



Step 3) Press the Enter key(SET UP ENTER) to move to the detailed setting mode.

Step 4) Press the Up/Down key(▲ / ▼) to move to desired setting mode among Auto Print, Offset, Zoom, Speed, Contrast and Fetal Movement. If press the Exit key( ), menu will move to the previous mode(Step 2). If press the Enter key( ), menu will move to the detailed setting mode of each mode.



Step 5) Press the Enter key( ) in Step 4 and desired the level will be twinkled. Then press the Up/Down key(▲ / ▼) for changing the level. Refer to the above setting range in the table.

NOTE

This system is not changed during printing.

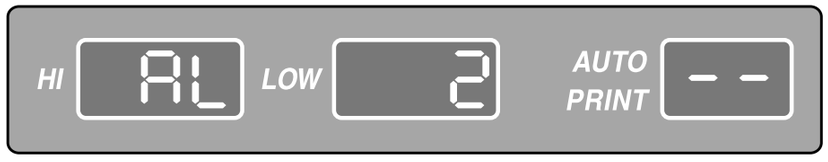
6.2 Alarm Setting

Possible to set the Alarm Sounding Area

Symbol	Description	Setting Range
High 	If HR value is measured not smaller than the top limit, ALARM will be made.	50 ~ 240 bpm Initial setting : 160 bpm
Low 	If HR value is measured not bigger than the bottom limit, ALARM will be made.	50 ~ 240 bpm Initial setting : 80 bpm

Step 1) Press the Setup key(SET UP ENTER) to move to menu setting mode in the basic screen.
If you press the Exit key( ) , menu will return to the basic screen.

Step 2) Press the Up/Down key(▲ / ▼) to move to the Alarm menu in the menu setting mode.



Step 3) Press the Enter key(SET UP ENTER) to move to the detailed setting mode.

Step 4) Press the Up/Down key(▲ / ▼) to move to desired setting mode among Auto Print, Offset, Zoom, Speed, Contrast and Fetal Movement. If press the Exit key( ), menu will move to the previous mode(Step 2). If press the Enter key(SET UP ENTER), menu will move to the detailed setting mode of each mode.

Step 5) Press the Enter key(SET UP ENTER) in Step 4 and desired the level will be twinkled.
Then press the Up/Down key(▲ / ▼) for changing the level.

Step 6) After setting is completed, if press the Exit key( ), menu will move to previous mode (Step 2) without saving. If press the Enter key(SET UP ENTER), menu will move to previous mode(Step 4) with saving.

Step 7) After all setting is completed, press the Exit key( ) to move to the basic screen.

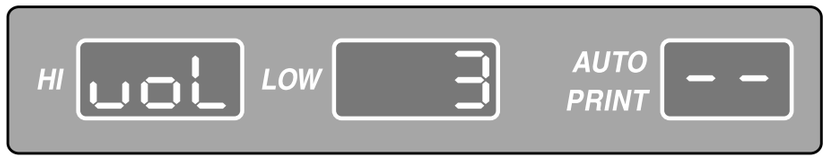
6.3 Volume Setting

Possible to set the volume level for DOP1 and DOP2 respectively

Symbol	Description	Setting Range
DOP1 	Sets DOP1 volume	0 ~7 Step Initial setting : 4
DOP2 	Sets DOP2 volume	0 ~7 Step Initial setting : 4

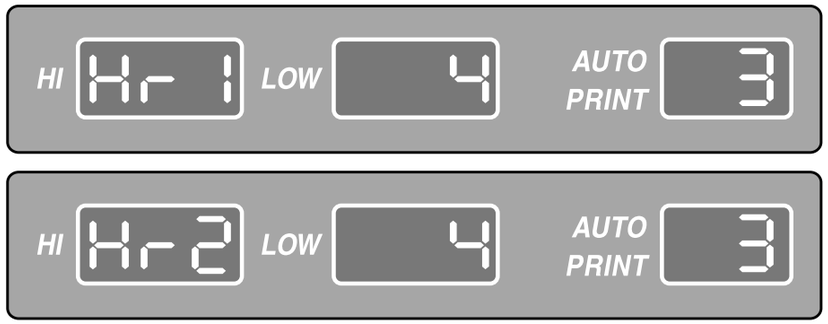
Step 1) Press the Setup key(SET UP ENTER) to move to menu setting mode in the basic screen.
If you press the Exit key( ) , menu will return to the basic screen.

Step 2) Press the Up/Down key(▲ / ▼) to move to the Volume menu in the menu setting mode.



Step 3) Press the Enter key(SET UP ENTER) to move to the detailed setting mode.

Step 4) Press the Up/Down key(▲ / ▼) to move to desired setting mode among Auto Print, Offset, Zoom, Speed, Contrast and Fetal Movement. If press the Exit key( ), menu will move to the previous mode(Step 2). If press the Enter key(SET UP ENTER), menu will move to the detailed setting mode of each mode.



Step 5) Press the Enter key(SET UP ENTER) in Step 4 and desired the level will be twinkled. Then press the Up/Down key(▲ / ▼) for changing the level.

Step 6) After setting is completed, if press the Exit key( ), menu will move to previous mode(Step 2) without saving. If press the Enter key(SET UP ENTER), menu will move to previous mode(Step 4) with saving.

Step 7) After all setting is completed, press the Exit key( ) to move to the basic screen.

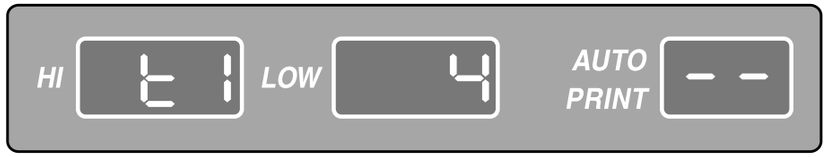
6.4 Time Setting(Date and Time)

Possible to set the time

Symbol	Description	Setting Range
YEAR 	Sets year	2000 ~2099 year (Display last 3 digits)
MONTH 	Sets month	1 ~12 month DAY
DAY 	Sets day	1 ~31day HOUR
HOUR 	Sets hour	0 ~23 hour MINUTE
MINUTE 	Sets minute	0 ~59 minute

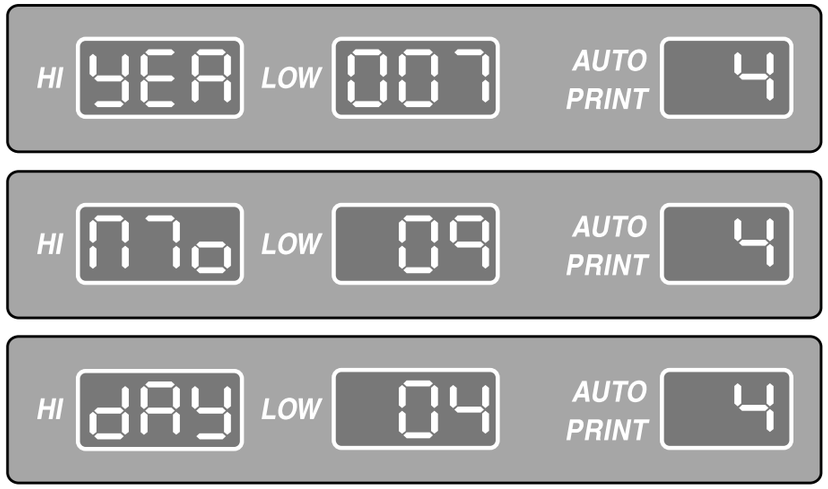
Step 1) Press the Setup key(SET UP ENTER) to move to menu setting mode in the basic screen.
If you press the Exit key( ) , menu will return to the basic screen.

Step 2) Press the Up/Down key(▲ / ▼) to move to the Time menu in the menu setting mode.



Step 3) Press the Enter key(SET UP ENTER) to move to the detailed setting mode.

Step 4) Press the Up/Down key(▲ / ▼) to move to desired setting mode among Auto Print, Offset, Zoom, Speed, Contrast and Fetal Movement. If press the Exit key( ), menu will move to the previous mode(Step 2). If press the Enter key(SET UP ENTER), menu will move to the detailed setting mode of each mode.



Step 5) Press the Enter key(SET UP ENTER) in Step 4 and desired the level will be twinkled.
Then press the Up/Down key(▲ / ▼) for changing the level.

Step 6) After setting is completed, if press the Exit key( ), menu will move to previous mode (Step 2) without saving. If press the Enter key(SET UP ENTER), menu will move to previous mode(Step 4) with saving.

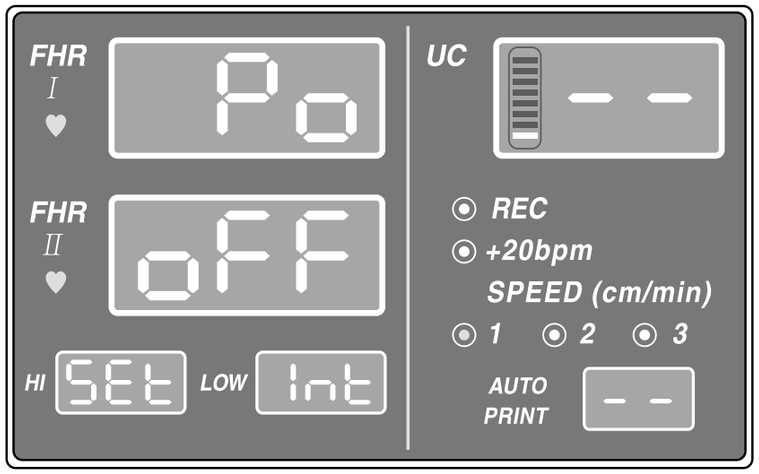
Step 7) After all setting is completed, press the Exit key( ) to move to the basic screen.

6.5 Default Setting

Every basic parameter except for time on the device is initialized.

Step 1) Press the Print key( ) + UC REF key( ) at once in the turning the device off condition.

Step 2) Turn on the device with pressing the above keys. All basic parameter except for time is initialized. If initialized, the screen will be like below.



Step 3) Then turn on the device without pressing the keys. All parameter is initialized.

CHAPTER 7 Solution for precaution and warning

Error Code	
Code	Description
E1	No paper or paper out during printing
E2	Disconnected DOP1 from DOP1 connection part during using
E3	Disconnected DOP2 from DOP2 connection part during using If “E2” error occurs, it will not be displayed
E4	Disconnected UC from UC connection part during using If “E2” and “E3” error occurs, it will not be displayed
E5	Low Battery Low If “E2” ~ “E4” error occurs, it will not be displayed.

7.1 Solution for Alarm sound and Message

When the values go over or below the Alarm range over 10 seconds, the beep will sound. The color of alarm LED lamp will be changed green to red. The FHR will be also twinkled.

NOTE

If you want to turn off the alarm, press the SILENCE key.

7.2 Solution for Information sound and Message

① The beep sounds once like “ding dong” as information sound when turn on the device.

② The beep sounds “ding dong” every 5 minutes when no paper until error is released or press the Exit key. Error message will be displayed in Hi/Low and Auto Print FND until error is released.

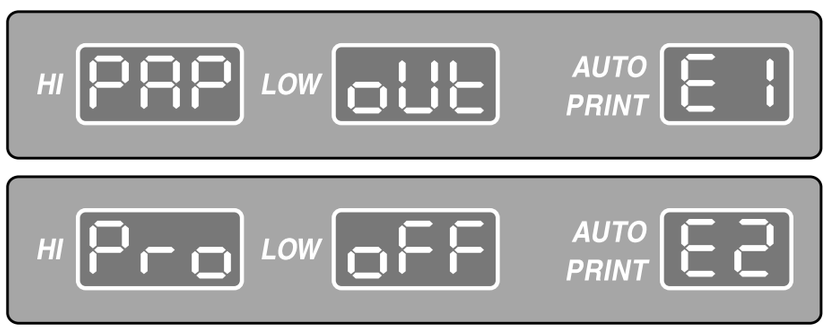
③ The beep sounds “ding dong” every 5 minutes when probe is disconnected during using until error is released or press the Exit key. Error message will be displayed in Hi/Low and Auto Print FND until error is released.

④ The beep sounds “ding dong” every 5 minutes when the battery is low until error is released or press the Exit key. Error message will be displayed in Hi/Low and Auto Print FND until error is released.

⑤ Display for each error

- Probe is disconnected during using : Display “Pro oFF” and “d-1”, “d-2”, “Uc” with error code by turns in each disconnected probe.

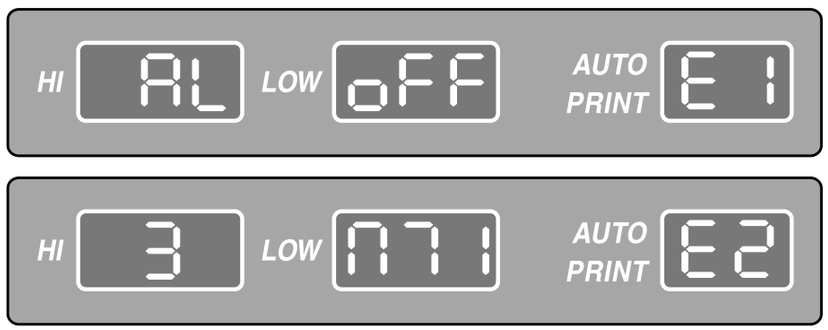
- Probe is disconnected with no paper : Display “ PAP oUt” and “Pro oFF” with error code by turns.



- Probe is disconnected with silence for 3 minutes : Display “AL oFF” and “3 MI” with error code by turns.

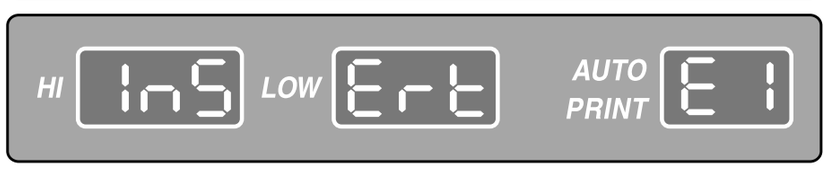
- Probe is disconnected with silence : Display “AL oFF” with error code.

- Probe is disconnected with paper out and silence for 3 minutes : Display “AL oFF” and “3 MI” with error code by turns.

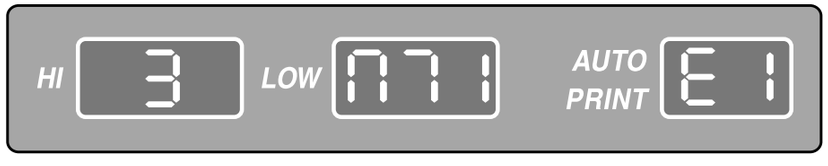


- Probe is disconnected with paper out and silence : Display “AL oFF” with error code by turns.

- Paper out : Display “PAP oUt” and “Ins Ert” with error code by turns.

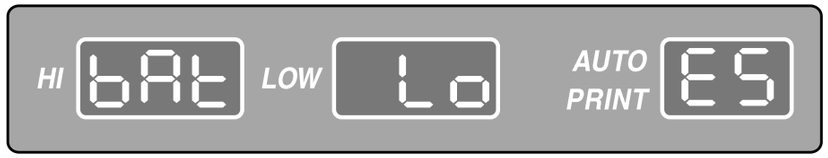


- Paper out with silence for 3 minutes : Display “AL oFF” and “3 MI” with error code by turns.



- Paper out with silence : Display “AL oFF” with error code

- Low Battery : Display “bAt Lo” with error code(if internal batter is instlled : optional)



NOTE

If no management with low battery within 10 minutes, the device will be turned off. Before turning off the device, connect AC power and charge the battery. If the device is turned off with low battery message, the device will not be turned on before connecting the AC power.

CHAPTER 8 Power

BPM-900L is powered on by both AC/DC. It is powered on by AC basically. It is also powered on by DC Battery(Optional) while being carried.

8.1 AC Power

When the AC Power is connected to the device the AC Power LED on the front of the device will show a green light. If the device is not in use, it will revert to auto charge mode.

8.2 BATTERY Power (Optional)

When you turn the power on without the AC Power connected, the device uses the battery to operate. When using the battery, the BATTERY LED will show a green light.

- In case battery power is short:

When the internal charge level of the battery is under 10.0V, an information alarm will sound and “bAt Lo” will display on the “Hi/Low, Auto Print” FND. If no management with low battery within 10 minutes, the device will be turned off. Before turning off the device, connect AC power and charge the battery. If the device is turned off with low battery message, the device will not be turned on before connecting the AC power.

- Charging Time: 12 hours or longer

- Consecutive Using Time: 6 hours(when full charge)

Lithium Battery Used Only

PRECAUTION

If the device is not operating with battery, please do not open the device. It does not replace the battery from the external. Do not dispose the battery in any dangerous place for environmental protection.

NOTE

If the battery is connected by AC power, LED for AC power will be lit and the battery will be charging automatically. When charging is finished, Insight Lite will be finished charging automatically.

CHAPTER 9 Simple Troubleshooting

This chapter covers simple troubleshooting methods. You may sometimes not be able to control the device as you want or may not know what to do with the device while using the device. At this moment, check the followings instead of thinking “It’s broken”

• System Performance

Situation	Checkpoint
It is not powered.	- AC power not plugged in - Bad switch connection
It does not work normally.	- Unstable connection - Badly grounded

• While measuring FHR I, FHR II and UC :

Situation	Checkpoint
On HR measured value display part, nothing is shown.	- Check to see if the connection between the device and the Probe Connection Terminal is normal. - Check to see if the Probe is manufactured and provided from our company. You must use the probe provided by us. - Check to see if the FHR II measurement setting is correctly done.

• While the printer working:

Situation	Checkpoint
“PAPER OUT!”	- Open the print door to make sure the paper is inserted correctly. If there is no paper, please install more printing paper.

For troubleshooting or repair, please contact our Customer Service Dept or A/S Reservation Office.

CHAPTER 10 Specification

• **Mechanical**

Base Unit Size : 180mm(W) x 248 mm(H) x 175 mm(D)
Weight : less than 3.7Kg (with paper)

• **Monitor Environmental Specifications**

Temperature Range
Operating : 10 to 45℃
Storage : -10 to 50℃
Relative Humidity Range
Operating : 30 ~ 85%
Storage : 20 ~ 95%
Atmospheric Pressure Range
Operating : 70 ~ 106kPa
Storage : 70 ~ 106kPa

• **Power Specifications**

Power Requirements : 100 - 240VAC, 50/60Hz, 1.0A
Power Fail Protection
Battery Specifications :,Sealed Rechargeable Battery (11.1V 4.4Ah, Li-ion Battery)
Operation Time : about 6 hours
Charge Time (after connection to AC power) : about 12 hours
Class 1 Equipment

• **Monitor Performance Specifications**

Doppler

Pulsed Doppler
Ultrasound Frequency : 2.0 MHz
Intensity : <10mW/cm2
FHR Range : 50 ~ 240 bpm
FHR Accuracy : ±2% of range
Dual Doppler

Dual Fetal Movement Detection
IPX7

UC
External Type
Frequency Response : DC ~ 0.5 Hz
Reference(Zero) Control
Measurement Range : 0 ~ 99 units
IPX7

Printer
4inch Thermal Array Type
Print Speed : 1,2,3 cm/min
Print Contrast : 1,2,3 steps
Auto Print Period : 10,20,30,40,50,60,off min
FHR Print Area Zoom Function
FHR 2 Offset Function
FM On/Off Function
ROLL Type Paper

Indicators
Battery On (orange LED) - optional
AC Power (green LED)

Display
Printing State
Offset State
Speed State
Auto Print Time
Heart Rhythm
FHR1(DOP1) Value
FHR2(DOP2) Value
UC Value, Bar

Sound
Doppler Sound with Volume Control
Information Sound
Alarms Sound
Key Sound

External Link
RS-232 port

Standard Accessories

- Ultrasound Doppler Probe	2 ea
- UC Probe	1 ea
- Event Marker Jack	1 ea
- Print Paper	1 ea
- Power cord	1 ea
- ADAPTER JACK 220 TO 110	1 ea
- Ultrasound Gel	1 set
- Probe Belt	3 ea
- Operation Manual	1 ea

Optional Accessories
- Cart
- AST Probe
- Li-ion Battery
- Serial Cable

CE 0470

Warranty

Product Name	**Fetal Monitor**
Model Name	**Insight Lite**
Item Certificate No.	
Item Certified Date	
Manufacturing No.	
Warranty Period	**2 years**
Purchasing Date	**DD/MM/YY**
Customer	**Hospital Name:** **Address:** **Name:** **Tel:**
Seller	
Manufacturer	

※ Thank you for buying Insight Lite.

※ **This product is a medical device.**

※ This product is under thorough quality management and complied with strict test.

※ This product can be repaired, replaced or refunded in accordance with "Consumer's Damage Compensation Regulation" noticed by Economic Planning Board.