



## OPERATION MANUAL

### BILIRUBIN METER

*BR – 5000N*



#### **IMPORTANT!**

##### **READ THIS OPERATION MANUAL!**

\*Prior to operation, please read this manual carefully and retain it for future reference. Failure to read, understand and follow the instructions in this manual may result in damage to the unit, injury to operating personnel and/or poor equipment performance.

# TABLE OF CONTENTS

<b>Section 1 - Introduction</b>	
1.1 Introduction -----	2
1.2 Features -----	2
1.3 Important Safety Instruction -----	4
<b>Section 2 – Contents of the unit</b>	
2.1 Description of the unit -----	6
2.2 Control panel Keys, Display and Indicator -----	7
<b>Section 3 – Operation procedure</b>	
3.1 Preparation -----	8
3.2 Taking blood sample -----	8
3.3 Measurement of the specimen -----	10
3.4 Setting the name or ID number of the test -----	12
3.5 Other functions -----	12
3.6 How to use Serum gauge -----	15
<b>Section 4 – Maintenance and inspection</b>	
4.1 Adjustment with standard solution -----	16
4.2 Indication of alarms -----	17
4.3 Inspection abnormalities -----	17
4.4 Light bulb replacement -----	18
<b>Section 5 – Specifications</b>	
5.1 Specifications -----	19

## Section 1 - Introduction

### 1.1 Introduction

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Congratulations on purchasing an **APEL** product. It's an important and very smart decision that's sure to reward you for many years to come. To ensure that you take full advantage of our Bilirubin meter, **BR-5000N**'s offered features and warranty benefits, be sure to carefully read and fully comprehend this Operation Manual. It is designed to acquaint you with the features and help you effectively operate the new instrument in safety. We sincerely hope you will enjoy many benefits of being associated with our product which represents both quality and customer satisfaction. We are proud of the advanced engineering and quality construction of each instrument we build. If you have any questions, please contact your supplier and refer to the model number and **seven-digit serial number** located at the back of your unit, when inquiring.

The BR-5000N Bilirubin meter is a digital, direct reading measuring equipment developed with the purpose of enabling the measurement of total bilirubin in serum of neonate while compensating for hemolysis, turbidity, and other components of obstruction. With the BR-5000N, an alarm is displayed automatically whenever there is a high-density specimen or a high level of obstruction that falls outside the tolerance.

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### 1.2 Features

1. Handles hemolysis and turbidity easily  
Careful selection of the dual wavelength color filters and the combination of electronic technology minimize the interference of hemolysis and turbidity.
2. Easy operation  
Microprocessor enables the Auto Calibration and easy operation. And after the equipment is calibrated with a standard solution, you can measure specimen without using the standard solution after that.
3. Easy set of the sample tube  
A serum gauge is provided on the surface of BR-5000N, which indicates the proper sample volume to be inspected. Only simple action is required to set the capillary tube into the holder.
4. Alarm lamp informs user of abnormalities  
Alarm lamp signals either abnormal value or situations such as burned out of the bulb, bilirubin concentration of 30mg/ dℓ or more, or high hemolysis of 250mg/dℓ or more.

5. The print out by the printer  
The measurement data can be printed out by the option printer.  
(The measurement data are memorized up to 100 samples in maximum while the power switch in being turned on.)  
The printer connector is based on Centronics standard.
6. The equipment can be connected to computer by serial interface.  
The measurement data can be sent to computer through RS-232C interface.
7. mg/dℓ- and  $\mu$  mol/ℓ -indication  
One of mg/dℓ- and  $\mu$  mol/ℓ -indication can be selected by the control panel.
8. Easy to operate by on touch key.  
Normal measurement can be performed by touching start button after inserting the capillary tube to the capillary tube holder.
9. Compact design  
BR-5000N has a compact design that does not occupy much space.
10. Flexible power source  
Power requirement is flexible, from 100 to 240VAC.

### 1.3 Important Safety Instruction

When utilizing your **BR-5000N**, always take basic safety precautions and warnings, in order to avoid damage to your unit, property and/or personal injury, which may result from misuse, exposure to fire or electric shock. Important warnings and safety precautions are as follows:

1. To ensure accuracy of the measurement, always warm-up the instrument for at least 15 minutes, prior to operation.
2. Never cover the unit when it is turned-on. Doing so will prevent the electrical components from being cooled properly and cause damage.
3. Unplug the **BR-5000N** from the wall outlet prior to cleaning. Do not use organic liquid solutions such as alcohol or aerosol cleaners. Use a soft dry cloth for cleaning.
4. Do not directly expose your unit to water or liquid. Avoid spills, which could damage electronic components.
5. Always use appropriate capillary tube in specification, when obtaining bilirubin's data or using standard solution.
6. Place this product on stable cart, stand, or table.
7. If stored in non-room temperature setting, allow the unit to reach room temperature before turning on. Do not place this instrument in an environment where there is severe temperature variation.
8. Place the unit away from dust, excessive moisture, or corrosive chemicals. Cover the instrument when not in use to protect electrical components from dust.
9. Do not dismantle or modify the instrument. Damage or performance problems resulting from disassembly or alteration of the unit, will not be covered under the warranty. Contact your supplier when maintenance, service or repair work are required.
10. When instrument is not in use, make sure the power switch has been turned-off and unplug the power cord from the electrical outlet. Do not pull the cord, but hold the receptacle of the plug and pull it.
11. Only use light bulb, capillary tubes and power cord that come with this instrument. Such replacement parts are available through your supplier.
12. Do not overload wall outlets with extension cords as this can result in the risk of fire or electric shock. Attaching multiple loads to the same wall outlet is dangerous and may cause improper operation of BR-5000N.

13. Do not allow anything to rest on the power cord. Do not locate this product where the power cord may trip any person or object.
14. To keep the accuracy of this instrument, calibration should be done periodically and after a period of long storage prior to operation.
15. Make sure that the GND code is grounded properly.
16. Unplug this product from the outlet and refer to your supplier under the following conditions:
  - \* When the power cord or plug is damaged and/or frayed.
  - \* If the unit has been directly exposed to water or liquid.
  - \* If the instrument displays unusual change in performance.
  - \* If the instrument has been abused or dropped.
  - \* If the unit does not function normally by following the operating instructions. (Adjust only those controls that are presented and mentioned in the instruction.)

**\*IT IS OWNER'S RESPONSIBILITY TO MAKE SURE THAT THE SPECIFIED SAFETY AND OPERATING INSTRUCTIONS ARE FOLLOWED.**

**SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE.**

## Section 2 - Contents of the unit

### 2.1 Description of the unit

#### **Unpacking BR-5000N:**

Open the carton from the top and carefully unpack the **BR-5000N**. Do not discard the packing materials. Save all the packing material in the carton, in case the unit may need to be repacked and returned to your supplier for maintenance, repair, or service work. In the event of missing parts, defects, damages or other problems, immediately contact your supplier. Make sure that your carton contains the following items:

<u>Main Unit</u>	Quantity
BR-5000N -----	1
<u>Standard Accessories</u>	
AC power cord -----	1
Capillary tube (heparinized, red line) -----	1 (pk of 100)
Capillary tube (plain, blue line) -----	1 (pk of 100)
Putty (tube sealant) -----	1
Bilirubin standard -----	1
Fuse (1A) -----	2
Vinyl dust cover -----	1
Operation Manual -----	1

\*Note: All standard accessories are replaceable through your supplier at an additional cost.

## 2.2 Control panel Keys, Display and Indicator

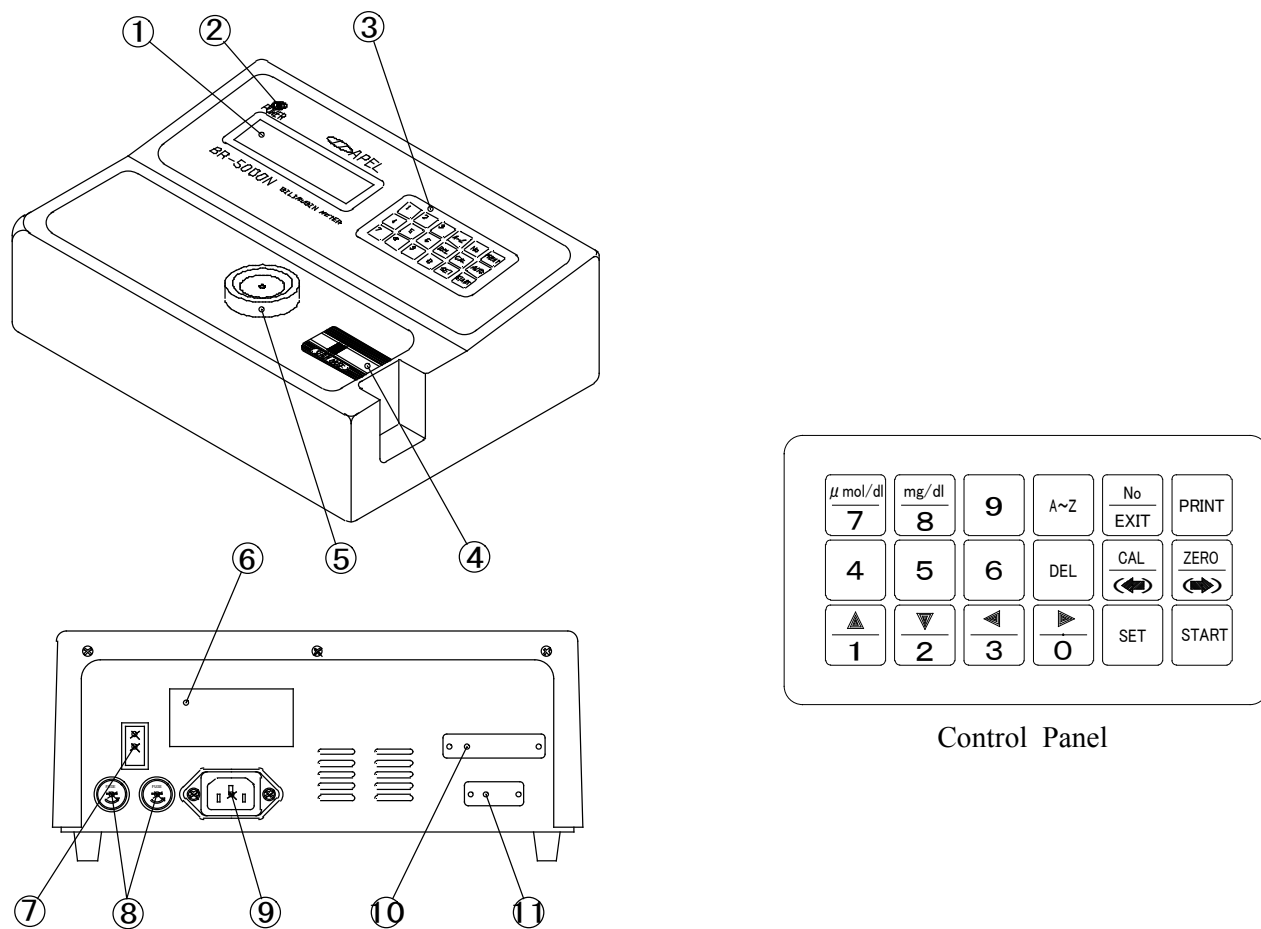


Fig. 1

- |                          |  |
|--------------------------|--|
| 1. LCD Display           | 7. Power switch                                  |
| 2. Pilot lamp            | 8. Fuse holder                                   |
| 3. Control panel         | 9. AC Power socket                               |
| 4. Serum gauge           | 10. Printer Interface Connector(D-sub25p,female) |
| 5. Capillary tube holder | 11. RS-232C Interface Connector(D-sub9p,male)    |
| 6. Serial number label   |  |



## Section 3 – Operation Procedure

### 3.1 Preparation

1. Make sure that the power cord is plugged to the electric wall outlet and turn on the Power switch. Then, you can see the pilot lamp is lit and the number of seconds are counted down on the LCD display.

Warming Up 900

2. LCD Display will show “Ready” as the right figure 15 minutes later, and Control panel can be used.

TEST Ready

\* Press “Start” key, if you want to quit the count down.

3. Measurement of BLANK liquid

- (1) Fill distilled water into a capillary tube (blue line) and seal one end with putty and get rid of the bubbles.

- (2) After wiping off the outside of the tube well, set it in the capillary tube holder. ( Fig. 1 - ⑤)

- (3) Press the “ZERO” key (for more than 2 seconds) and confirm that the display reads **00.0**.

[Auto ZERO]  
Measure Start

- (4) ”Measure End” shows the end of the procedure. If the LCD shows “Measure Error”. Press “ZERO” again after getting rid of the bubbles and/or stains of the capillary tubes.

[Auto ZERO]  
Measure End

4. When the printer is used, confirm the printer cable is connected properly and turn on the switch of the printer. And turn on the “Printer Use” of “SET-4”.(Refer to the section 3.5.2)

### 3.2 Taking blood sample

1. When taking blood sample from neonates, warm the tip of the big toe, the heel of the foot, or wherever blood is to be drawn to get the blood flowing well.  
\*Taking the blood sample within 2 hours after suckling or taking meal may result high turbidity.
2. Disinfect the area that has been rubbed or warmed with alcohol then puncture using a blood-taking needle. (Fig. 2-1)
3. After puncturing, wipe away the first drop of blood, then take the following droplets into a capillary tube (red line) that is provided with the BR-5000N. (Fig. 2-2)
4. Seal one end of the capillary tube with putty when half or more of the capillary tube has been filled with blood. (Fig. 2-3)
5. Put the capillary tube that has been prepared using steps 1 - 4 above, into a high-speed hematocrit centrifuge, facing the end of the capillary tube that is not sealed with putty toward the center of the centrifuge, as shown in Figure 3.
6. After the capillary tube is set in the manner described above, rotate 12,000 rpm over 3 minutes.
7. After the treatment is concluded, the blood in the capillary tube has been

centrifugally separated into serum and blood cells, as shown in Figure 4. (Make sure that there is at least 15mm of serum part. A serum gauge is provided on the surface of BR-5000N)

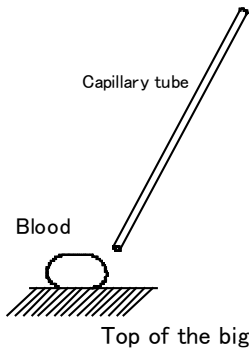


Fig. 2-1

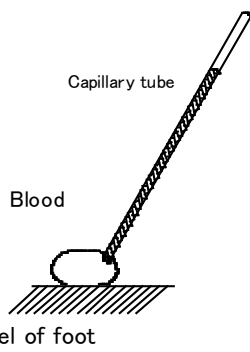


Fig. 2-2

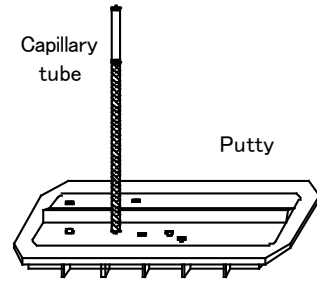


Fig. 2-3

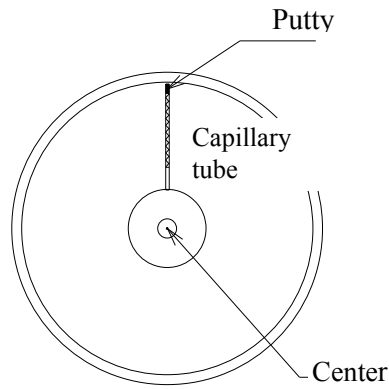


Fig. 3

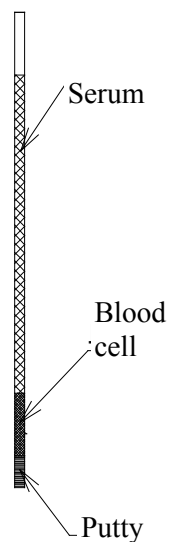
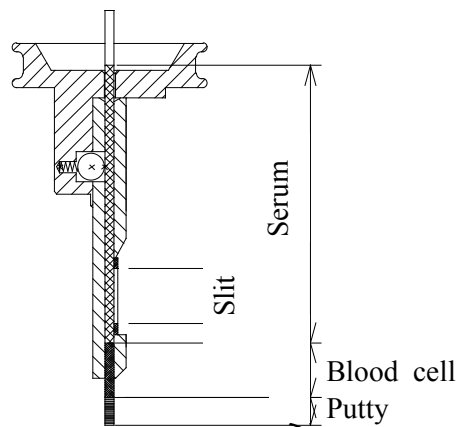


Fig. 4-1



Cross section of Capillary tube and the holder

Fig. 4-2

### 3.3 Measurement of the specimen

#### 3.3.1 Normal measurement [ No. 0 ]

Normal measurement is used only for temporary measurement. The data is not stored.

1. Take the capillary tube containing distilled water out of the capillary tube holder, insert the specimen tube that has been through centrifugal treatment. The serum part must fall within the same height as the part of the slit of cell holder. (Fig.4-2)

\*Make use of the serum gauge on the surface of the instrument to inset the capillary tube correctly. Refer to section 3.6.)

2. Make sure the cell holder is inserted completely to the equipment.

No. 0	TEST
	Ready

3. Select No. 0 and press "START" key.

4. The end of the measurement.

\* When any errors occur, the buzzer sounds 3 times and the display value is turned on and off.

TEST	16.5mg/dl
	End

(1) Abnormality of the concentration of Bilirubin: [ \*BIL. high ]

(2) Abnormality of the concentration of Hemoglobin and/or turbidity: [ \*Hem. high ]

5. Display Unit - mg/dℓ or μ mol/ℓ can be changed by the keys "mg/dℓ" or "μ mol/ℓ" respectively.

#### 3.3.2 Measurement with ID\_No. [ No. 1 ~ 25 ]

In this measurement, ID\_No. or name of individual babys can be stored and can be controled with them. Measured data are stored up to 100 until the power switch is turned off.

For example, if the samples of 10 babys are measured, 10 data per baby can be stored. Or, 5 data per baby for 5babys and 15 data per baby for 5 babys can be stored.

\* Once the power switch is turned off, whole data are cleared.

1. Press "No." key, and set the ID Number. (1 ~ 25)

No. 12	ID-K012
SN. 001	Ready

2. Take the capillary tube containing distilled water out of the capillary tube holder, insert the specimen tube that has been through centrifugal treatment. (Fig. 4-2)

3. Press "START" key

No. 12	
SN. 001	Start

4. The end of the measurement.

When any errors occur, the buzzer sounds 3 times and the display value is turned on and off.

No. 12	13.5mg/dlS
N. 001	End

(3) Abnormality of the concentration of Bilirubin: [ \*BIL. high ]

(4) Abnormality of the concentration of Hemoglobin and/or turbidity: [ \*Hem. high ]

- The sample No.( SN. XXX) shown on the LCD display is automatically incremented(+1) for the next measurement.
- When the total measurement numbers reach 100, and one more measurement is tried to be executed, the alarm buzzer sounds and the LCD display shows “\* Memory Full \*” as shown right figure.

\* Memory Full \*  
Print all data ?

Press “SET” or “PRINT” to print out the whole data stored in the instrument.

If you want to skip the print, Press “EXIT”.

After the print or when the EXIT is pressed, LCD display shows “Clear all data?” Press “SET” for clearing all data, or press “EXIT” to skip the procedure.

\* Memory Full \*  
Clear all data ?

\* Any measurement can not be done unless stored data are not cleared, when \*Memory Full\* is shown.

### 3.3.3 Print-out of measured data

The printer can be connected to BR-5000N and the measured data can be printed out.

Connect the instrument and the printer with the printer cable, and turn on the switch of the printer.

Turn on “PRINTER USE” of “SET 4” which is described in the section 3.5.2 “The setting of the printer”.

- Auto print at each measurement.  
Turn on the “Auto printer (SET 5)”. (Refer to 3.5.3)
- Manual operation of printing right after the measurement.  
Press “PRINT” after a data is measured.
- Printing of whole data with designated ID\_No.  
Set the ID\_No. and Press “EXIT” key then press “PRINT” key.
- Printing of the whole data.  
When the memory area is fully stored, the whole stored data are printed.  
Refer to 3.3.2 “Memory Full”

No. 12     [Ready]

[Print]    No. 12

### 3.3.4 Data communication function

Display and collection of data on the Computer can be done through the RS-232C cable from the instrument.

Turn on “COMM(RS-232C), SET 6” as described in the section 3.5.4, if the communication is used.

Adjust the baud rate and the protocol to the computer.

Data format for output.

2 1	S A M P - 0 0 5	0 0 1	2 1 . 3	OD 0A
ID_No.	ID_Code, Name	Sample No.	Data	CR LF

### 3.4 Setting the ID number

1. Press “No” key, and set the ID number (1 ~ 25)

No. 5	ID-E005
SN. 001	Ready

2. Press “SET” key.  
Then, ID No. can be set.

No. 5	[A-Z]
	_ID-E005

3. Set ID Number with the following keys.

- [A-Z] : Alphabet/Numeral Change key  
(The display shows “NUM” or “ALP” according to the condition.)
- [▲], [▼] : Select key for alphabets and numerals.
- [◀], [▶] : Move cursor at inputting alphabets and numerals.
- [0] ~ [9] : Inputting numerals.
- [←], [→] : Move cursor.
- [DEL] : Delete the letter on the cursor
- [SET] : Fix and memorize the characters shown on the LCD display.
- [EXIT] : Quit the storage and end the procedure.

No. 5	[A-Z]
	3F-12-N5

Up to 8 letters can be used for the ID numbers.

The basic parameters are memorized even after the power switch is turned off.

### 3.5 Other functions

Following parameters can be set for BR-5000N.

Confirm the present state of parameter before measurement.

SET 0 :	Standard CONC	10.0 ~ 30.0 mg/dℓ
SET 4 :	Printer Use	1:on, 2:off
SET 5 :	Auto-Print	1:on, 2:off
SET 6 :	Comm(RS-232C)	1:on, 2:off
SET 7 :	Baud rate	1:9600, 2:19200, 3:34800 bps
SET 8 :	RS-232C mode	d:Data bit 7/8, s:Stop bit 1/2 p:Parity bit odd/even/none

#### 3.5.1 The setting of standard solution

1. Press “SET”, and then “0” key.  
The standard concentration value at present can be seen.

Set-0
-------

2. Set CONC value with the following keys.  
『0』 ~ 『9』 : Input numerals.  
Decimal point is fixed, and the effective range is from 9.0 to 30.0.

STD-CONC	20.0
	19.8

[DEL] key clears the displayed numbers to “0.0”.

3. Press “SET” key.  
The datum is fixed and memorized.  
Display comes back to “Ready” without memorizing the data when “EXIT” key is pressed.

### 3.5.2 The setting of Printer

Choose whether Printer Interface is active or not.

1. Press “SET”, and then “4” key.

Set-4

2. Choose the condition with [1]/[2] keys.

On : Printer effective

Off : Printer ineffective

Printer Use  
1:on 2:off

3. Press “SET” key.

The condition is fixed and memorized.

Display comes back to “Ready” without memorizing the data.  
when “EXIT” key is pressed.

### 3.5.3 The setting of Auto-Print

When “Auto-Print is ON, the measured data are printed automatically on the printer after each measurement. When it is OFF, data can be printed with the “PRINT” key.

1. Press “SET”, and then “5” key.

Set-5

2. Choose the condition with [1]/[2] keys.

On : serial output effective

Off: serial output ineffective

Auto Print  
1:on 2:off

3. Press “SET” key.

The condition is fixed and memorized.

Display comes back to “Ready” without memorizing the data  
when “EXIT” key is pressed.

\* Even when the “Auto print” is off, the measured data can be printed out after the measurement with [PRINT] key.

### 3.5.4 The setting of RS-232C output

Choose whether RS-232C Interface is active or not.

1. Press “SET”, and then “6” key.

Set-6

2. Choose the condition with [1]/[2] keys.

on : Serial output effective

off : Serial output ineffective

Comm (RS-232C)  
1:on 2:off

3. Press “SET” key.

The condition is fixed and memorized.

Display comes back to “Ready” without memorizing the data  
when “EXIT” key is pressed.

### 3.5.5 The setting of the Baud rate for the RS-232C

Baud rate of RS-232C output can be set.

1. Press “SET”. and then “7” key.

Set-7

2. Choose the condition with [1]/[2]/[3] keys.

1:9600bps 2:19200bps 3:38400bps

Baud rate  
1:9600bps

3. Press “SET key.

The condition is fixed and memorized.

Display comes back to “Ready” without memorizing the data when “EXIT” key is pressed.

### 3.5.6 The setting of the other RS-232C protocols

Protocols for RS-232C output can be set.

1. Press “SET”, and then “8” key.

Set-8

2. Choose the condition with [◀],[▶] keys.

d :Data\_bit s :Stop\_bit p :Parity

RS-232C mode  
d:8 s:1 p:none

3. Press “SET”, and then “8” key.

Data bit : [7]( 7 bit) / [8]( 8 bit)

Stop bit : [1]( 1 bit) / [2]( 2 bit)

Parity : [1](ODD) / [2](EVEN) / [4](NONE)

4. Press “SET key.

The condition is fixed and memorized.

Display comes back to “Ready” without memorizing the data when “EXIT” key is pressed.

### 3.5.7 Deletion of data

You can delete the stored data for the designated ID\_No..

And “SN\_” comes back to “1”.

1. Press “No.” key.

e.g. in case of ID\_No. 5, press [NO] then, [5].

No. 5 ID-A105  
SN. 20 Ready

2. Press “DEL” key.

No. 5 ID-A105  
Delete data ?

3. Press “SET key.

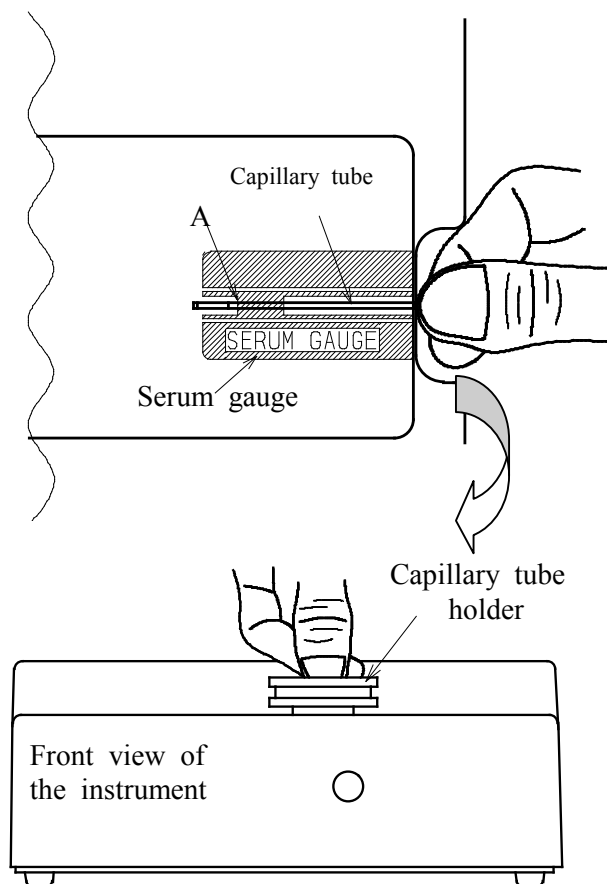
The condition is fixed and memorized.

Display comes back to “Ready” without memorizing the data when “EXIT” key is pressed.

### 3.6 How to use the Serum gauge.

Capillary tube containing the sample can be inserted correctly without pulling out the capillary tube holder, if the serum gauge is used as follows.

1. Put the capillary tube treated centrifugally on the serum gauge. The border line between blood corpuscles and serum must be left of the line "A" as shown in the figure.
2. Hold the capillary tube with the thumb touching the right side of the gauge.
3. Lift up the capillary tube as it is and insert it into the capillary holder until the thumb touches the top of the capillary holder
4. Then the slit of the capillary tube holder must be within the range of the serum part of the capillary tube.
5. The capillary tube can be inserted to the inside of the instrument because the holder has no stopper. In case the capillary tube is broken, the fragment of it can drop inside without remaining inside of the capillary holder.





## Section 4 – Maintenance and inspection

### 4.1 Adjustment with standard solution

The standard value that is set in the equipment will fluctuate corresponding to deterioration of the light bulb, so to keep the accuracy of the instrument, confirm the value every 1 month (assuming 2 hours of usage/day) or after the light bulb is replaced or the instrument is not used for a long interval.

\*Standard solution to be used for the adjustment must be diluted precisely. Otherwise, measured value could have error.

#### 4.1.1 The procedure of adjustment

1. Turn on the power switch and wait until the LCD display shows “Ready”.
2. Adjust “ZERO” according to the procedure of 3.1, 3-6 .
3. Prepare standard solution with "Hi Level Check-BIL", manufactured by International Reagents Corp., Japan or any substitute standard solution.

#### [Prepare original standard solution]

Remove cap and stopper of Hi Level Check-BIL. Reconstitute each vial with 3mℓ distilled or deionized water of low bacterial count. Replace the stopper. Leave it as it is for 5 minutes, then mix well by swirling. A high concentration standard is obtained.

#### [To use with BR-5000N]

Empty the standard solution into a larger container. Add 6mℓ of distilled or deionized water and dissolve the standard solution again. Assay value  $\times 1/3$  concentration standard is obtained. This is the specified value to be used with BR-5000N.

\* The assay value of Hi Level Check-BIL is specified per each production Lot. Confirm the value in note enclosed with Hi Level Check-BIL, e.g. assay value for Lot No. 7324 is 54.0mg/dℓ. Specified value is  $54.0 \times 1/3 = 18.0\text{mg/dℓ}$ .

4. Set the standard value of the standard solution according to the section 3.5.1.
5. Fill standard solution into a capillary tube (blue line) and set it in the capillary holder, then press the “CAL” key not less than 2 second.

[Auto CAL]  
Measure Start

6. The adjustment will end if the display shows “Measure End”.

[Auto CAL]  
Measure End

If “Error BBK = x.xxx” is shown, confirm the standard solution and the procedure of calibration, and calibrate it again.

[Auto CAL] 20.0  
Error BBK=0.000

\* Measure the standard solution as the normal sample, then confirm if the measured value falls within  $\pm 0.5$  of the calibrated value.

## 4.2 Indication of alarms

When an alarm is given as the buzzer sounds 3 times and display value turned on and off, it is because of one or more of following reasons.

1. The high concentration of the specimen.  
(Bilirubin that exceeds a measurement value of 30mg/dℓ.)
2. High concentration of hemolysis or turbidity.  
(Specimen with hemolysis or turbidity exceeding 250mg/dℓ.)

\* With case 1. and 2. above, accurately dilute the specimen with an equal amount of distilled water, then measure. Then, double the measurement value obtained.

3. The outside of the capillary tube being dirty, or bubbles exist inside.
4. The placement of the serum part being incorrect.
5. The light bulb being deteriorated, or light bulb cables being cut.
6. The placement of the light bulb being incorrect.

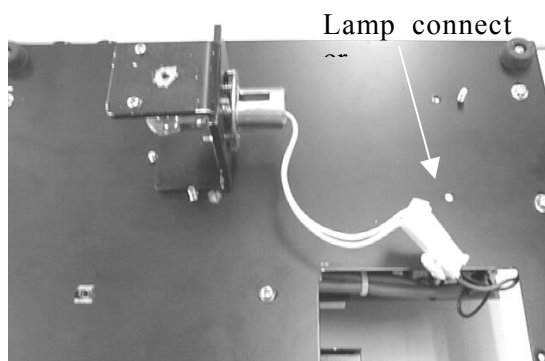
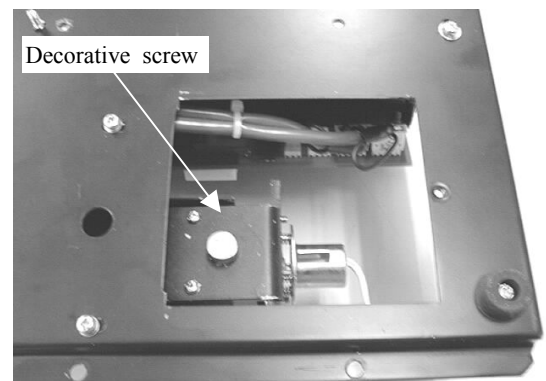
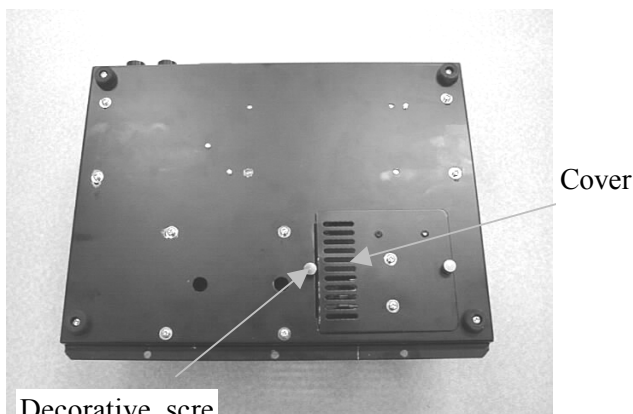
## 4.3 Inspection abnormalities

Symptoms	Possible cause	Corrective action
LCD display and/or LED does not glow when the power switch is turned on.	1)The unit is not plugged in.	Plug in the power cord into electrical wall outlet and the unit securely.
	2)DC power supply has some troubles.	Consult your supplier.
	3)Certain cables inside are not securely connected.	
	4)Main Circuit board, LED and/or LCD have some troubles.	
The keys of the operation panel do not work.	1)Key switch has some troubles. 2)Main Circuit board has some troubles.	Consult your supplier.
LCD display can not be adjusted to "0.0".	1)The stain of the capillary tube.	Replace the capillary tube.
	2)Deterioration of capillary tube or snapping of lamp cable.	Replace the lamp. Confirm the mounting of the lamp.
	3)Lamp is not mounted correctly.	
	4)The circuit board has some troubles.	Consult your supplier.
Measured value is not displayed correctly.	1)The serum portion of the sample is not correctly inserted.	Check it with the serum gauge.
	2)Scars and/or stains on the capillary tube.	Replace the capillary tube.
	3)Incorrect calibration.	Calibrate the instrument with the new standard solution again.
	4)Circuit board has some troubles.	Consult your supplier.

## 4.4 Light bulb replacement

Caution : Prior to replacing the light bulb, be sure to turn off the power switch, unplug the power cord from the wall outlet, and make sure that the bulb is not hot.

- (1) Remove a decorative screw and the cover from the bottom of the main unit. (fig5)
- (2) Remove a decorative screw which fixed the lamp holder.(Fig. 6)
- (3) Disconnect the lamp connector. (fig7)
- (4) Turn the light bulb counterclockwise toward the bulb, and remove it. Do not touch the bulb by your fingers directly, but hold it with a cloth.(fig8)
- (5) Replace the bulb and reverse the procedure.
- (6) Connect the lamp connectors.
- (7) Fix the lamp holder with the decorative screw.
- (8) Put the lamp cover and fix it with the decorative screw.



**Never fail to adjust the instrument with the standard solution.**

(Refer to 4.1 Adjustment with standard solution)

## Section 5 – Specifications

### 5.1 Specifications

Range of Measurement	: 0 ~ 30mg/dℓ (Total bilirubin)
	: 0 ~ 513.09 μmol/ℓ
Measurement accuracy	: ± 5 %
Correcting Hemolysis	: 0 ~ 250mg/dℓ Hbcv
Measuring method	: Dual wavelength differential system (461nm,551nm)
Sample volume	: 50 ~ 60 μℓ
Sample container	: Hematocrit capillary tube (Heparinized)
Light source	: 5V, 0.75A tungsten lamp
Detector	: Silicon photocell
Display	: LCD Display 16 rows × 2 lines
Power requirements	: 100~240V A C 50/60H z, 10VA
Dimensions	: 280mm (W) × 230mm (D) × 115mm (H)
Weight	: Net 3.4kg (Main body)
Operating temperature range	: +10°C ~ +40°C
Storage temperature range	: 0°C ~ +55°C
Humidity	: 30% ~ 75%
	Dew condensation must be avoided.
Pollution Degree	: 2 ( IEC 1010-1, IEC 664 )
Overvoltage Category	: II ( IEC 1010-1, IEC 664 )
Fuse ( In Power Unit )	: T 3.15A (IEC 127)