



Blood Ammonia Meter

PocketChem™ BA

PA-4140 | Operating Manual

This manual contains important information on the functions of the PocketChem™ BA PA-4140.

This manual is issued by ARKRAY, Inc.

Read carefully prior to starting up the unit.

It is recommended to retain this manual for future use.

This product conforms to the EMC Standard EN61326-2-6: 2006.

Class of emission: CISPR 11 Class A

This instrument is IVD medical instrument.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

The electromagnetic environment should be evaluated prior to operation of the device. Do not use this device in close proximity to sources of strong electromagnetic radiation, as these may interfere with the proper operation.

Thank you for purchasing ARKRAY's blood ammonia meter PocketChem BA PA-4140.

Read this operating manual thoroughly before using the instrument. This operating manual gives an overview of the instrument and the proper procedures for operation and maintenance. Follow the instructions in this operating manual in order not to defeat the purpose of protective features of the instrument.

Also, keep this manual in an easily accessible place near the instrument.



- **BE CAREFUL WHEN HANDLING BLOOD.** This instrument uses blood as sample. Blood may be contaminated by pathogenic microbes that can cause infectious diseases. Improper handling of blood may cause infection to the user or other individuals by pathogenic microbes.
- **This instrument is to be operated by qualified persons only.** A qualified person is one having adequate knowledge of clinical testing and the disposal of infectious waste. Thoroughly read this operating manual before use. Anyone who operates the instrument for the first time must be assisted by a trained person.
- **Never touch the parts where sample may adhere with unprotected hands.** During cleaning or maintenance of these parts, wear protective gloves to prevent exposure to pathogenic microbes.
- **Discard used samples, test strips and the instrument in accordance with local regulations for biohazardous waste.**
- **This instrument may become infectious in the course of use.** Discard the instrument in accordance with local regulations for biohazardous waste.

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- It is strictly prohibited to copy any part of this manual without the expressed consent of ARKRAY, Inc.
- The information in this manual is subject to change without notice.
- ARKRAY, Inc. has made every effort to prepare this manual as best possible. Should you discover anything strange, incorrect or missing, contact your distributor.

The following symbols are used in this operating manual and the label on this instrument to call your attention to specific items.

■ For Your Safety



Follow the instructions given here to prevent exposure to pathogenic microbes.



Follow the instructions given here to prevent injury and property damage.

■ For Optimal Performance

IMPORTANT: Follow the instructions given here to obtain accurate measurement results.

NOTE: Information useful for preventing damage to the instrument or parts and other important information you should keep in mind.

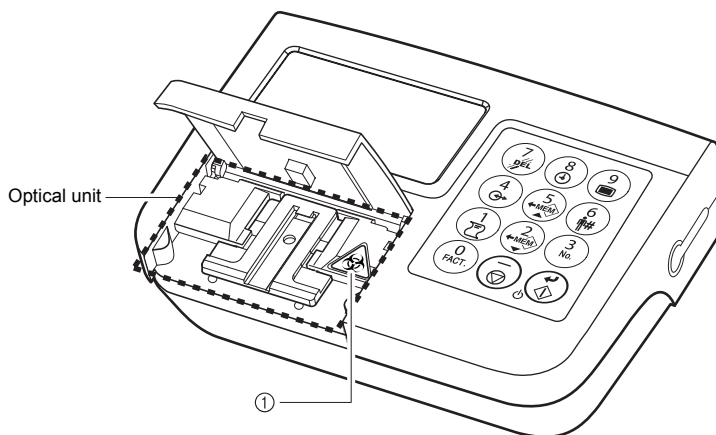
REFERENCE: Additional explanations that help you make the best use of the instrument and information on related functions.

4

Caution Label

This instrument has a caution label on the area that has potential danger. Please learn potential danger warned by this label and observe the precaution described below.

■ Front



① Optical unit

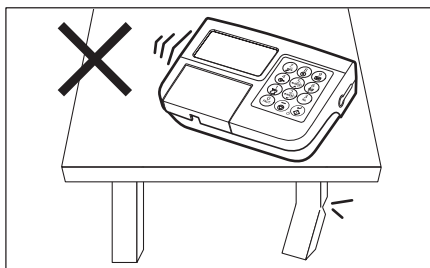


Do NOT touch the optical unit with unprotected hands. Always wear protective gloves when inserting samples or performing maintenance to prevent exposure to pathogenic microbes.

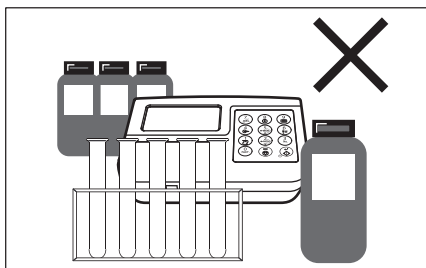
5

Installation Precautions

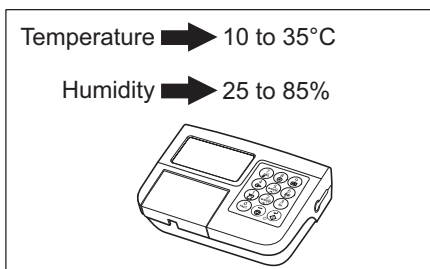
Before installing the instrument, read the following items and always take proper safety precautions.



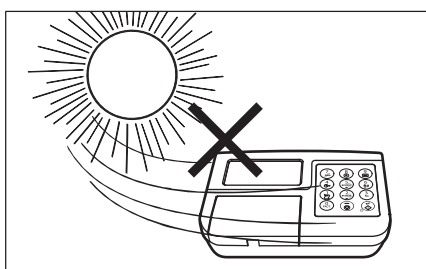
- Install the instrument on a level, vibration-free sturdy platform.



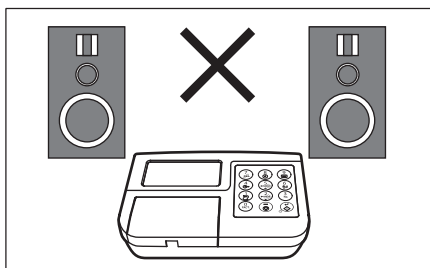
- **Do not** install the instrument near places that store chemicals or near equipment that generates corrosive gas or electrical noise.



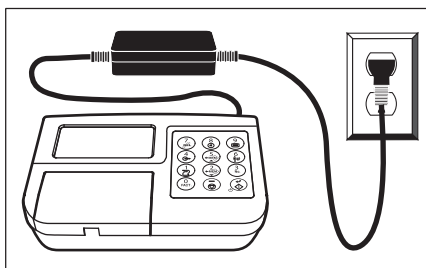
- Install the instrument where temperature and humidity are maintained in the following ranges.
Temperature: 10°C – 35°C
Humidity: 25% – 85%



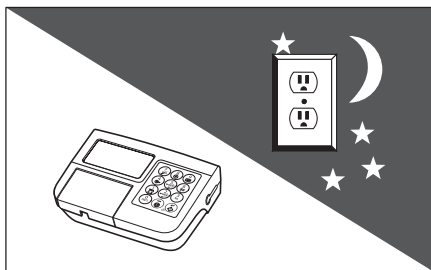
- Install the instrument in a place not exposed to direct sunlight or wind.



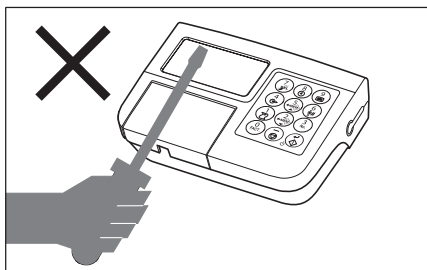
- Keep the instrument away from magnetic sources such as magnets and speakers.



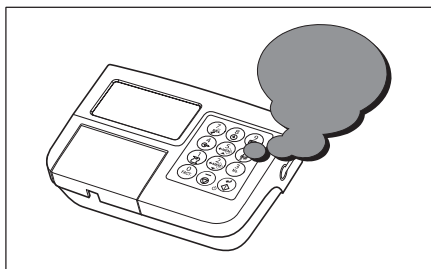
- To run the instrument on AC power, connect the instrument to an AC socket using the AC adapter that came with the instrument.



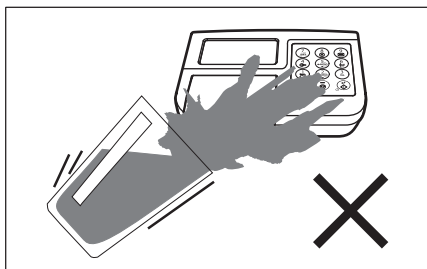
- Remove the AC adapter when not in use.



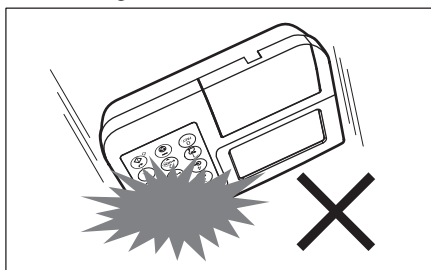
- Do not disassemble or modify the instrument.



- If you detect abnormal noise, odors or smoke, immediately turn off the power and contact your distributor after making sure that the abnormal situation is not continuing.



- Keep liquids away from the instrument.



- Do not expose the instrument to physical shocks or impact.

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Chapter 1 Before Use

This chapter describes information you should know before using the instrument.

1-1 Overview

1-1-1 Features

- **Modular design**
The PA-4140 features a modular design with separate analyzer and printer components for improved portability.
- **Minimal maintenance**
The only maintenance required is to clean the optical unit.
- **Long-life light source**
Use of LED and short-time lighting enables a longer light source life.
- **Thermal compensation**
Automatic thermal compensation using a built-in temperature sensor reduces errors caused by variations in the environment temperature.
- **Power supply**
The analyzer can use either dry-cell batteries or a special AC adapter (optional).
Use the special AC adapter when operating the analyzer in combination with the printer (optional).
- **Memory for up to 50 samples**
Measurement results for up to 50 samples can be stored in memory.
- **External output**
Serial communication (RS-232C) is included.

1-1-2 Specifications

■ General Specifications

Item	Specifications
Product	Blood Ammonia Meter PocketChem BA PA-4140
Configuration	Instrument, accessories, printer (optional)
Sample	Whole blood
Test strip	AMMONIA TEST KIT II

For the purchase of reagents, consumables or other optional items, contact your distributor.

■ Instrument

Item	Specifications
Measurement item	Blood ammonia concentration
Measurement range	10 to 400 N-μg/dL
Measurement principle	Test strip, Single wavelength reflectance method
Measurement wavelength	Single wavelength LED (635 nm)
Sample supply method	Dropping with pipette
Reaction time	Approx. 3 minutes and 20 seconds per test
Warm-up time	Max. 10 seconds
Measurement types	Normal measurement, continuous measurement and check measurement
Display	LCD
Operator panel	12-button panel with numeric and function buttons
Memory capacity	Test results for 50 samples
External output	RS-232C compliant
Thermal compensation	Automatic compensation using a built-in temperature sensor
Operating environment	Temperature: 10-35°C; Humidity: 25-85% RH
Measurement environment	Temperature: 10-35°C; Humidity: 25-85% RH
Storage environment	Temperature: 1-35°C; Humidity: 20-85% RH (Non-condensing)
Environment during transport	Temperature: -10-60°C; Humidity: 20-85% RH (Non-condensing)
Dimensions	Instrument: 124 (W) × 85 (D) × 38 (H) mm
Weight	Approx. 150 g (not including batteries)
Power supply	Instrument: Two AA batteries or AC adapter 7.5 VDC 3A
Power consumption	Battery power: 0.15 W (AC power: 4 W)
Noise level	Less than 85 dB
Location of use	Indoor use only
Altitude	2000 m
Pollution level	2
Overvoltage category	II
Expected life	5 years from first use (installation) of instrument (according to company data)

■ Printer (optional)

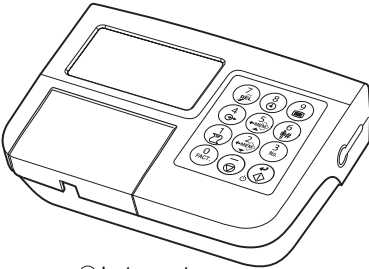
Item	Specifications
Printer	Thermal line printer
Printer paper	High color development thermal paper (W58 mm × ϕ 26 mm)
Dimensions	125 (W) × 133 (D) × 36 (H) mm
Weight	180 g (not including printer paper)
Power supply	AC adapter 7.5 VDC 3A
Power consumption	20 W
Attachment	One-touch attachment
Connection	Contact
Expected life	5 years from first use (installation) of instrument (according to company data)

1-2

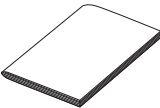
Unpacking

Check to see that the PocketChem BA PA-4140 package contains the items listed below. Contact your distributor if any items are missing or damaged.

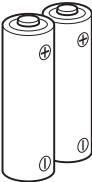
1-2-1 Instrument



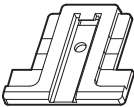
① Instrument



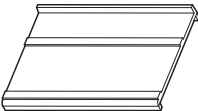
② Operating manual
(this manual)



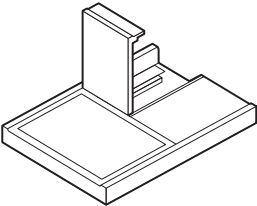
③ AA batteries



④ Strip holder



⑤ Tray



⑥ Check strip set

No.	Item	Description	Quantity
①	Instrument	PocketChem BA PA-4140	1
②	Operating manual		1
③	AA battery		2
④	Strip holder		1
⑤	Tray		1
⑥	Check strip set		1

1-2-2 After-sales Parts



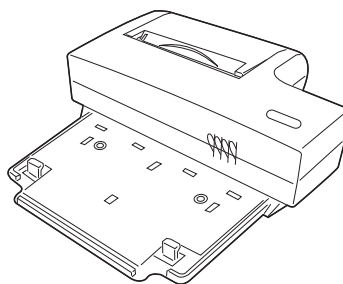
① Power cord



③ Communication cable



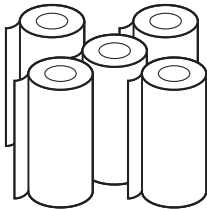
② AC adapter



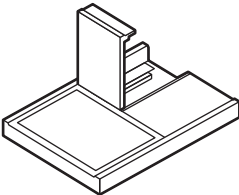
④ PocketChem printer

No.	Item	Description
①	Power cord	
②	AC adapter	
③	Communication cable	RS-232C cable
④	PocketChem printer	

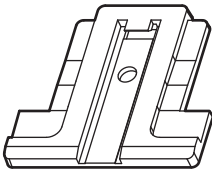
1-2-3 Consumables



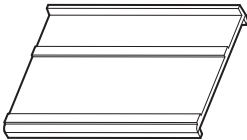
① Printer paper



② Check strip set



③ Strip holder



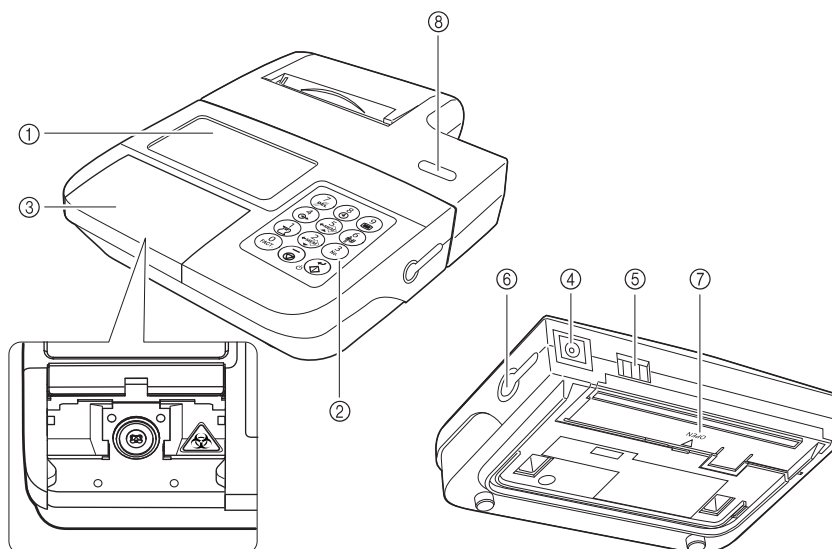
④ Tray



⑤ Stylus pen

No.	Item	Description
①	Printer paper	
②	Check strip set	
③	Strip holder	
④	Tray	
⑤	Stylus pen	

1-3 Components



No.	Component	Description
①	Display	Displays measurement results and error codes. (See “1-5 Basic Operations” on page 1-12.)
②	Operator panel	Used to start measurement and enter numerical values. (See “1-5 Basic Operations” on page 1-12.)
③	Optical unit	Performs measurements.
④	Power input terminal	Connects to the special AC adapter.
⑤	Printer terminal	Connects to the printer.
⑥	DATA output terminal	Used to connect to an external device. Remove the rubber cap and connect the communication cable.
⑦	Battery compartment	Holds batteries.
⑧	FEED button	Feeds printer paper.

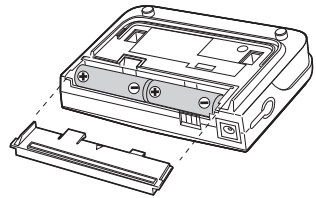
1-4 Instrument Setup

1 Loading batteries or connecting the AC adapter

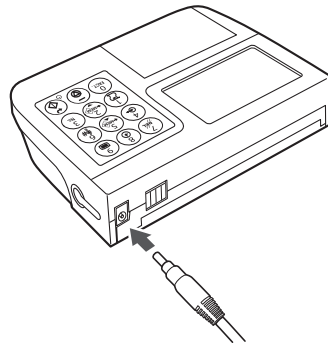
- ① Place batteries in the battery compartment on the bottom of the instrument, making sure to align them properly.

NOTE:

- Remove the old batteries before placing new ones.
- Dispose of old batteries according to your local environmental regulations.

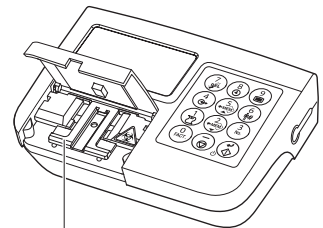


For use with the AC adapter, connect it to the power input terminal on the rear of the instrument and plug the cord into an outlet.



- ② Make sure that the strip holder has been correctly inserted into the instrument.

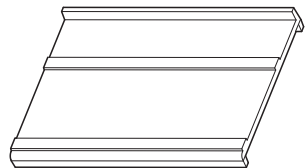
IMPORTANT: Make sure that the strip holder has been correctly inserted all the way into the instrument so that there is no gap. Starting measurement with the strip holder incorrectly inserted may produce incorrect measurement results.



Strip holder

2 Preparing for measurement

Place the instrument and the special tray on a stable, level platform and allow them to adjust to room temperature.



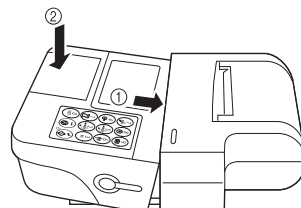
3 Attaching and detaching the printer

To use with the printer (sold separately), attach it to the instrument according to the following procedure.

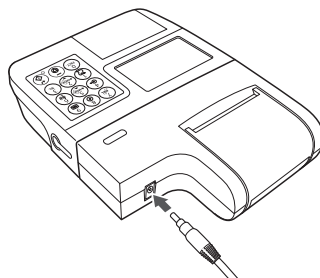
■ Attaching the printer

Align the instrument with the printer ① and press downward ② until the instrument clicks into place.

Make sure that the top of the instrument and printer are horizontally level with one another and both units are firmly locked to each other.

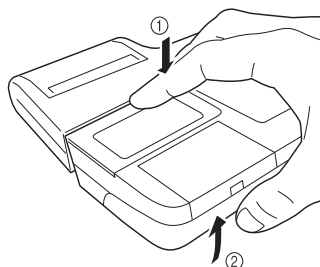


Connect the AC adapter to the power input terminal on the rear of the printer and plug into an outlet.



■ Detaching the printer

Place the instrument on a flat surface such as a desk. Press down on the top center of the display ① and lift up ② to detach the instrument from the printer.

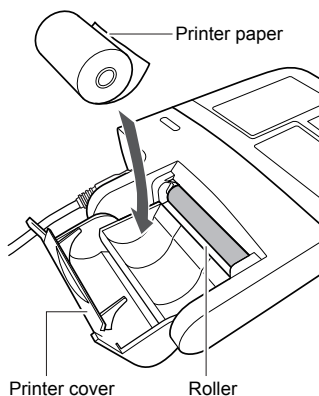


NOTE: Be sure to turn off the instrument and disconnect the AC adapter from the printer before attaching or detaching the printer.

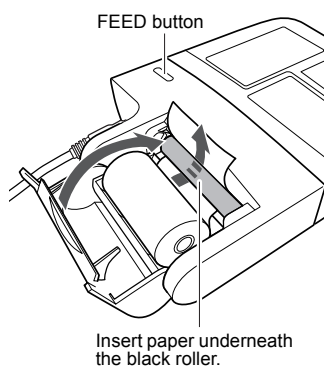
4 Loading printer paper

NOTE: Cut the end of new printer paper to a straight edge using scissors before loading.

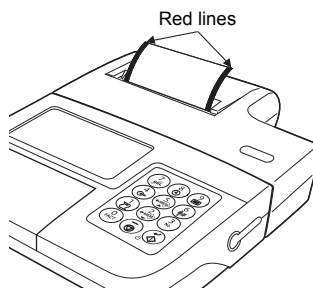
- ① Open the printer cover.
- ② Insert the end of the paper underneath the roller, making sure that the direction of the paper roll is correct.
The printer will feed the paper automatically.



- ③ Press the FEED button to feed the paper through the printer.
- ④ Close the printer cover.

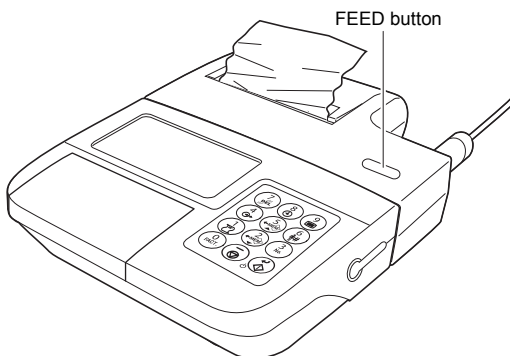


Red lines along both edges of the paper indicate that the paper is about to run out. Follow the above procedure to load a new roll of printer paper.



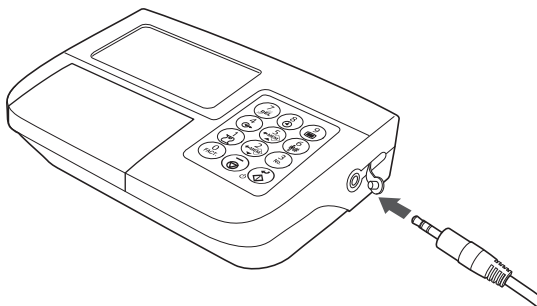
■ Dealing with a paper jam

If a paper jam occurs, press the FEED button while straightening out the jammed paper to remove it.



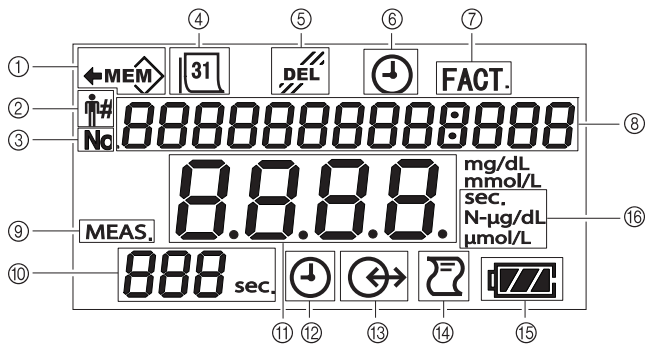
■ Connecting an external device

Use the communication cable (RS-232C; sold separately) to connect an external device to the DATA output terminal on the side of the instrument.



1-5 Basic Operations

1-5-1 Display and Icons



No.	Symbol and name		Description
①		Memory	Appears when a measurement result is reviewed.
②		Patient ID	Continuous light: Indicates that the patient ID is displayed. Flashing: Indicates that the patient ID is being set.
③	No.	No.	Continuous light: Indicates that the measurement number is displayed. Flashing: Indicates that the measurement number is being set.
④		Date	Continuous light: Indicates that the date is displayed. Flashing: Indicates that the date is being set.
⑤		Delete	Flashes when deleting measurement result(s).
⑥		Time	Continuous light: Indicates that the time is displayed. Flashing: Indicates that the time is being set.
⑦	FACT.	Calibration curve	Continuous light: Indicates that the calibration curve type is displayed. Flashing: Indicates that the calibration curve type is being set.
⑧		Numerical value (13 digits)	Displays information such as measurement number, patient ID, date and time.
⑨	MEAS.	MEAS	Indicates that the sample is being measured.
⑩	888 sec.	Counter	Displays the countdown timer.
⑪		Measurement data	Displays measurement results.

No.	Symbol and name		Description
⑫		Waiting	Is lit from start to end of measurement count.
⑬		Transferring	Is lit while measurement results are being transferred to an external device.
⑭		Printing	Is lit while measurement results are being printed.
⑮		Battery	Displays the battery level.
⑯	sec. N-μg/dL μmol/L	Unit	Displays the unit for the measurement result.

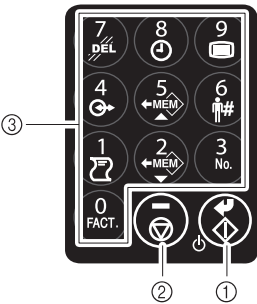
1-5-2 Battery Icon

The battery icon at the lower right of the instrument’s LCD indicates the timing of battery exchange. Approximately 1,000 consecutive measurements can be performed by using a new set of alkaline batteries.

Check the battery level and replace the batteries as needed.

	Battery is full.
	The battery level has lowered, but measurement is still possible.
	<u>Immediately replace the batteries with new ones.</u> Measurement may stop in progress because of insufficient battery power.
 (Flashing)	Measurement is impossible because of insufficient battery power. Replace the batteries immediately.

1-5-3 Operator Panel



No.	Symbol	Description
①		Starts measurement. Confirms the entry. Turns on the power./Turns off the power.
②		Stops measurement. Enters a hyphen (-).
③		Selects a function. Enters numerical values.

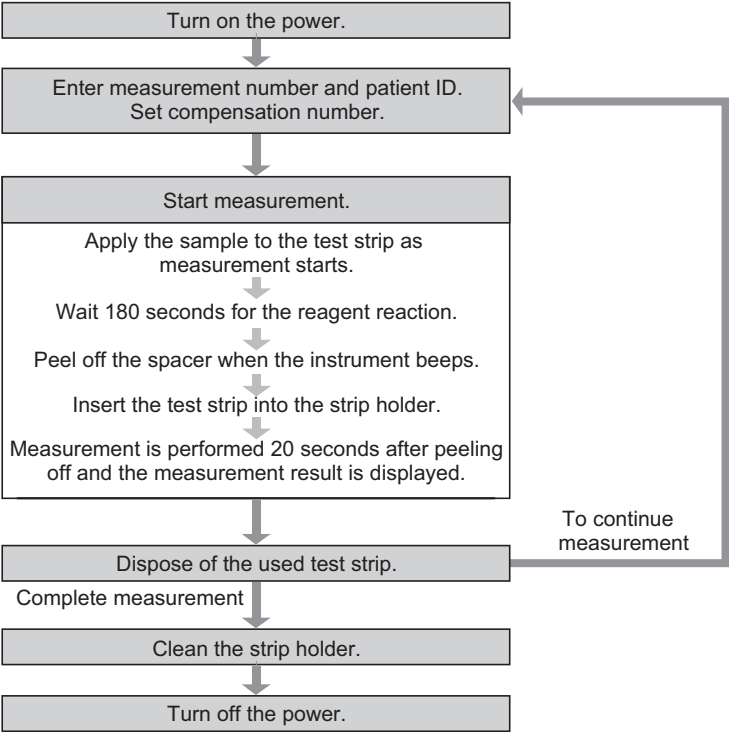
Chapter 2 Measurement

This chapter describes instructions on how to measure samples and check the status of the instrument (check measurement). Measurement precautions and an example of measurement result printout are also included.

2-1 Operation Flow Chart

2-1-1 Normal Measurement

The following flowchart describes the measurement procedure. Refer to the flowchart to perform measurement at the right time.



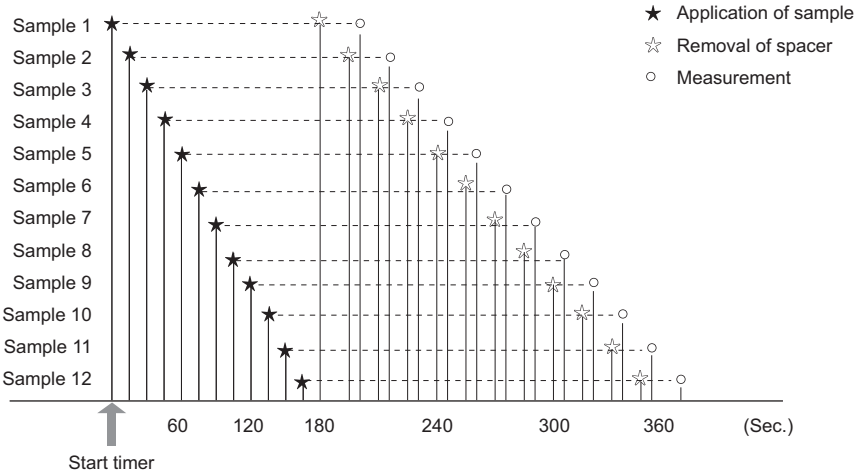
2-1-2 Continuous Measurement

There are two ways to perform continuous measurement: measurement with a stopwatch and measurement at regular intervals (15 or 30 seconds) using the instrument's countdown timer.

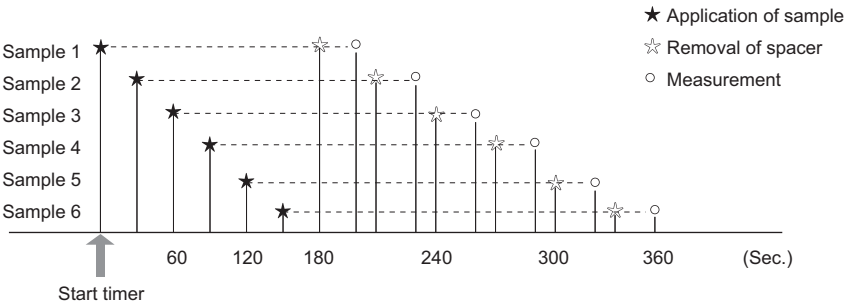
REFERENCE:

- Up to 12 samples can be measured using continuous measurement at 15-second intervals.
- Up to 6 samples can be measured using continuous measurement at 30-second intervals.

■ Example of continuous measurement at 15-second intervals (up to 12 samples)



■ Example of continuous measurement at 30-second intervals (up to 6 samples)



2-2

Measurement Precautions

2-2-1 Operational Precautions



- This instrument is to be operated by qualified persons only. A qualified person is one having adequate knowledge of clinical testing and the disposal of infectious waste. Thoroughly read this operating manual before use. Anyone who operates the instrument for the first time must be assisted by a trained person.
- Never touch the parts where sample may adhere with unprotected hands. During cleaning or maintenance of these parts, wear protective gloves to prevent exposure to pathogenic microbes.
- Discard used samples, test strips and the instrument in accordance with local regulations for biohazardous waste.



- Read "Installation Precautions" and ensure the instrument is installed in a proper environment before turning on the power.
- Do NOT place a collection cup or any other vessel containing sample or other liquid on the unit. Sample or other liquid that gets inside the instrument may cause trouble.
- In the ambient temperature range of 10 to 35°C, the temperature correction function operates to give the most accurate measurement results possible. However, for more precise results, we recommend that you perform measurement using the optimum operating environmental conditions, an ambient temperature of 25°C.
- Built-in temperature sensor compensates for the effect of temperature variations on measurement results. If the instrument is subjected to temperature changes of 10°C or more, allow the instrument to adjust to room temperature for 20 minutes or more before performing measurement.
- If you feel that the system is operating abnormally, or detect abnormal odors or smoke, immediately turn OFF the power and unplug the power cord (if using the AC adapter). Continuing operation in such conditions may result in fire or damage to the instrument and consequently lead to personal injury.
- In case of instrument trouble, contact your local distributor for repairs. Unauthorized servicing or modification can damage the instrument and consequently lead to personal injury.
- Any vibration during measurement may cause a malfunction and prevent accurate measurement.
- Peel the spacer off from the test strip when the beep sounds. If the reaction time is too short, color will not change sufficiently. If the reaction time is too long, the reaction on the test strip will continue and incorrect measurement results may be obtained.

REFERENCE: New results beyond the 50th overwrite previously stored results in the order of the oldest first.

2-2-2 Handling Samples



- **BE CAREFUL WHEN HANDLING WHOLE BLOOD.** This system uses whole blood as sample. Whole blood may be contaminated by pathogenic microbes that can cause infectious diseases. Improper handling of whole blood may cause infection to the user or other individuals by pathogenic microbes.
- Discard used samples and test strips in accordance with local regulations for biohazardous waste.

IMPORTANT:

- Prepare fresh blood samples. Measured values increase gradually with time after sample collection. If measurement cannot be performed immediately after sample collection, seal the sample after adding an anticoagulant (heparin or EDTA) and keep refrigerated.
- Take blood samples with a capillary tube and pipette included with reagent.
- Use venous blood samples for measurement. Earlobe blood can be used, but higher measurement results may occur. If sweat or tissue fluid is mixed with sample, higher measurement results may occur. Do not use fingertip blood.
- Do NOT use samples in which oxalic acid as an anticoagulant or a glycolytic inhibitor has been added. Use of those additives may cause a rapid increase in ammonia concentrations.
- Do NOT expose samples to direct sunlight. Doing so may degrade the sample, leading to incorrect measurement results.

2-2-3 Handling Test Strips

IMPORTANT:

- Use only AMMONIA TEST KIT II test strips for measurement. Carefully read the test strip package insert before use.
- Do NOT use test strips once their expiration date has passed. Incorrect measurement results may be obtained.
- To avoid contamination with ammonia in the air, remove only the required number of test strips from the aluminum foil package immediately before performing measurement.
- Do NOT touch the sample-receiving layer or indicator layer. Doing so with unprotected hands may produce incorrect measurement results.
- Set the compensation number printed on the aluminum foil package. Using a compensation number other than the one printed will produce incorrect measurement results. For more information about how to set the compensation number, see “2-4 Measurement Conditions Setup” on page 2-6.

2-3

Start Up

1 Turning on the power

Press and hold the  button on the operator panel for 3 seconds to turn on the power.

The standby screen will appear after all icons/indicators, the current date/time and then the version are shown.

IMPORTANT:

- **Do NOT turn on the power with a test strip in the strip holder. Doing so prevents the instrument from checking the light intensity using the white plate on the back of the cover, leading to incorrect measurement results.**
- **Be sure to close the optical unit cover before turning on the power. Turning on the power with the cover open will result in an error.**

The instrument provides two types of standby screen.

Measurement can be started by pressing the  button from either screen.

- Standby screen 1

Displays the most recent measurement result.



- Standby screen 2

Displays conditions for the measurement to be performed (measurement number or patient ID, and compensation number).

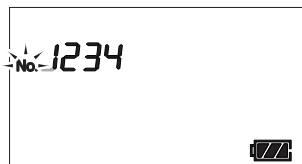


2-4

Measurement Conditions Setup

1 Setting measurement number

- ① Press the  button on the standby screen to switch to the measurement number setting mode. The **No.** icon and cursor will flash.
- ② Enter the desired number using the numeric buttons (up to 4 digits).
- ③ To change the number you have entered, press the  button and enter a new number. Press the  button to confirm your entry and return to the standby screen.



REFERENCE: The measurement number can be set as desired. Once a number has been set, it is incremented by 1 each time a measurement is performed.

2 Setting patient ID

- ① Press the  button on the standby screen to switch to the patient ID setting mode. The  icon and cursor will flash.
- ② Enter the desired number using the numeric buttons (up to 13 digits, including hyphens).
- ③ Press the  button to confirm your entry and return to the standby screen.

**REFERENCE:**

- The  button also functions as the hyphen button. If you wish to cancel the entered patient ID, confirm your entry first and then reenter a new number. (Press and hold the  button for about 1 second to cancel your entry and return to the standby screen.)
- Once a patient ID has been set, the measurement number and patient ID will alternately appear on the standby screen or during measurement. During continuous measurement, only the measurement number is shown.
- The patient ID is included in both printed results and serial output to external devices. When no patient ID has been set, "— — —" is used.

3 Setting compensation number

- ① Press the  button on the standby screen to switch to the compensation number selection mode. The display will flash “**FACT.**” and show the compensation number.



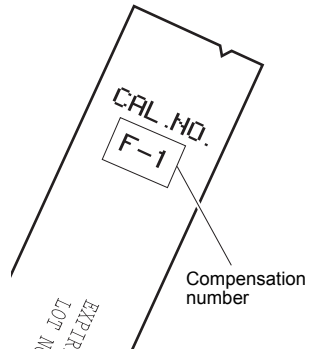
- ② Press the  or  button to change the compensation number. Select the compensation number that is printed on the test strip aluminum foil package.

F-1 → F-2 → → F-10 → CHE

↑

- ③ Press the  button to confirm your entry or the  button to cancel your entry and return to the standby screen.

IMPORTANT: Be sure to select the compensation number that is printed on the aluminum foil package. Setting a compensation number other than the one printed will produce incorrect measurement results.



2-5

Normal Measurement

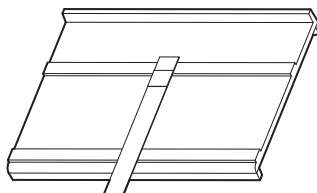


- Wear protective gloves to prevent exposure to pathogenic microbes.
- Discard used samples and test strips in accordance with local regulations for biohazardous waste.

1 Preparing test strips

Remove a test strip from the aluminum foil package and place it on the special tray.

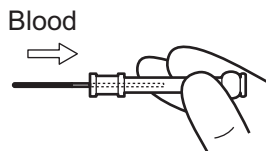
REFERENCE: Use of the special tray reduces the effect of temperature transmitted from the desk while keeping the desk free of blood.

**2** Preparing samples

- ① Insert a capillary tube into the pipette (push-out tube).
- ② Touch the tip of the capillary tube to the blood drop and hold the tube at a horizontal angle.
- ③ Blood will be drawn into the tube naturally through capillary action. Remove the capillary tube from the blood, after making sure that the tube is filled with blood to the top.

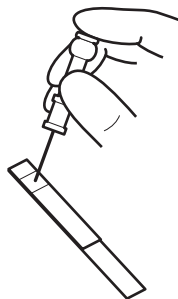
The capillary tube holds 20 μL of blood.

NOTE: When drawing blood, first wipe away sweat and dirt from the blood sampling site.



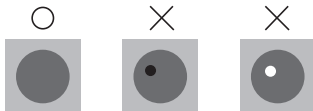
3 Starting normal measurement

- ① Cover the top (open) end of the pipette with your index finger and push slowly to form a drop of blood at the tip of the capillary tube. Apply the drop of blood to the center of the filter paper on the test strip and immediately press the  button.
Blood drop will spread out over the entire paper through absorption.



NOTE:

- Make sure not to press the tip of the capillary tube onto the filter paper on the test strip when applying blood drop.
- Pressing the tip of the capillary tube against the filter paper may prevent the blood from spreading evenly, resulting in abnormally high or low values.



- ② 180-second timer will start countdown.
To cancel measurement, press and hold the  button for 1 second.

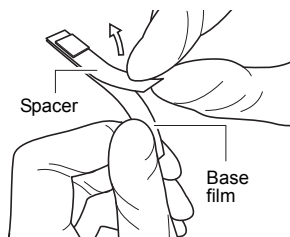


IMPORTANT:

- **Do NOT** insert the test strip into the strip holder before pressing the  button. Doing so prevents the instrument from checking the light intensity using the white plate on the back of the cover, leading to incorrect measurement results.
- Make sure that the optical unit cover is closed when the  button is pressed. Pressing the button with the cover open will result in an error.

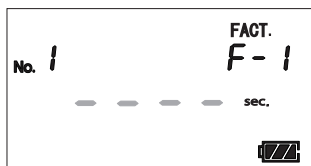
4 Peeling off spacer

180 seconds after sample application, a beep will sound for 2 seconds. Hold the base film and spacer with both hands and quickly peel off the spacer.

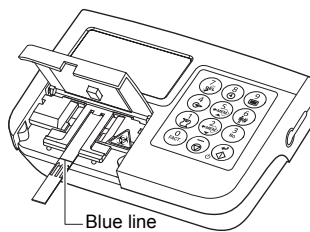


5 Inserting the test strip into the strip holder

The display will flash “----” every 2 seconds for 20 seconds after the removal of spacer. During these 20 seconds, open the optical unit cover, insert the test strip all the way into the strip holder with the application side down, and close the cover.



IMPORTANT: Failure to insert the test strip correctly into the strip holder may produce incorrect measurement results. Make sure that the test strip has been inserted far enough so that the blue line printed on the strip is not visible when the cover is closed.



6 Displaying measurement results

The measurement result will be displayed after 20 seconds.

The measurement result will be printed when the printer is attached.

The measurement result will be transferred to an external device when connected.



IMPORTANT: If you insert the test strip incorrectly (or fail to insert it), repeat measurement according to the following procedure:

- ① Insert the test strip correctly into the strip holder.
- ② Close the cover and press the  button. “F” will appear.
- ③ Press the  button.
- ④ The measurement result will be displayed immediately.

7 Completing measurement

Dispose of the used test strip.

If all measurements have been completed, remove the strip holder from the instrument and wash.

8 Turning off the power

Press and hold the  button for 3 seconds to turn off the power.

* Remove batteries or disconnect the AC adapter from the outlet before long periods of non-use.

REFERENCE: The instrument turns off automatically if no buttons are pressed for 10 minutes.

2-6 Continuous Measurement



- **Wear protective gloves to prevent exposure to pathogenic microbes.**
- **Discard used samples and test strips in accordance with local regulations for biohazardous waste.**

The following three methods can be used to perform continuous measurement:

- Measuring with a stopwatch (“F”).
- Measuring at 15-second intervals (“15sec”).
Up to 12 samples can be measured consecutively.
- Measuring at 30-second intervals (“30sec”).
Up to 6 samples can be measured consecutively.

2-6-1 Measuring with Stopwatch (“F”)

Measurements are performed consecutively, timed with a stopwatch.

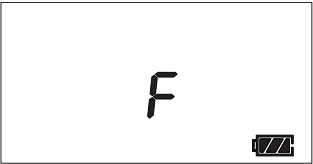
1 Preparing test strips and samples

Preparation procedure is the same as that for normal measurement.

Prepare necessary samples.

2 Selecting continuous measurement method

- ① Press the  button.
“F” will appear.



3 Starting measurement

Apply a drop of blood to the test strip and check the time using the stopwatch.

IMPORTANT: Be sure to use **AMMONIA TEST KIT II** with the same compensation number for continuous measurement.

REFERENCE: After 30 seconds, apply a drop of blood from the next sample to a test strip and proceed to Step .

4 Peeling off spacer

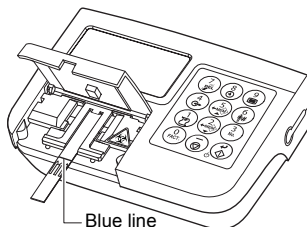
Peel off the spacer 180 seconds after sample application.

5 Inserting the test strip into the strip holder

Open the optical unit cover and insert the test strip into the strip holder with the application side down.

Insert the test strip all the way into the strip holder. Make sure that the test strip has been inserted far enough so that the blue line printed on the strip is not visible when the cover is closed.

IMPORTANT: Failure to insert the test strip correctly into the strip holder may produce incorrect measurement results.

**6 Measuring sample**

Press the  button 20 seconds after the removal of spacer. The measurement result will be displayed immediately.

The measurement result will be printed when the printer is attached.

To continue measurement, press the  button and return to the display showing "F".

NOTE: If you fail to insert a test strip, repeat measurement.

**7 Completing measurement**

Dispose of the used test strips. If all measurements have been completed, remove the strip holder from the instrument and wash.

8 Turning off the power

Press and hold the  button for 3 seconds to turn off the power.

* Remove batteries or disconnect the AC adapter from the outlet before long periods of non-use.

REFERENCE: The instrument turns off automatically if no buttons are pressed for 10 minutes.

IMPORTANT: When performing continuous measurement, you can set a patient ID for the first sample only.

2-6-2 Measuring at 15-/30-second Intervals ("15sec", "30sec")

Measurements are performed consecutively by applying samples according to the displayed countdown. Up to 12 samples can be measured at 15-second intervals, and up to 6 samples can be measured at 30-second intervals.

1 Preparing test strips and samples

Preparation procedure is the same as that for normal measurement.

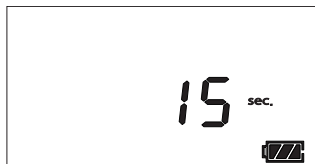
Prepare necessary samples.

2 Selecting continuous measurement method

- ① Press the  button.

"F" will appear.

- ② Press the  or  button to select between "15sec" and "30sec".



3 Starting measurement

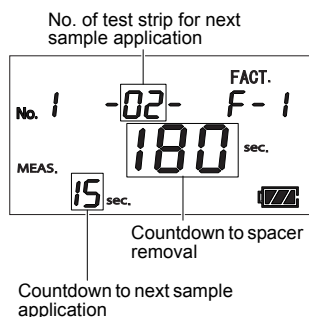
Apply the first sample to a test strip and press the  button.

The number of test strip for the next sample application will appear and countdown will begin at the lower left of the display indicating the timing of the next sample application.

IMPORTANT:

- Be sure to use **AMMONIA TEST KIT II** with the same compensation number for continuous measurement.
- Do NOT insert the test strip into the strip holder before pressing the  button. Doing so prevents the instrument from checking the light intensity using the white plate on the back of the cover, leading to incorrect measurement results.
- Make sure that the optical unit cover is closed when the  button is pressed. Pressing the button with the cover open will result in an error.

REFERENCE: When the countdown at the lower left of the display reaches 0, apply the next sample to a test strip.

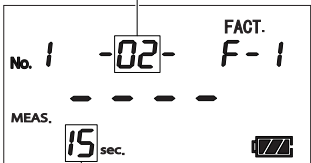


4 Peeling off spacer

After 180 seconds, the countdown in the center of the display reaches 0. Immediately peel off the spacer.

The display will show “— — —”.

No. of test strip for next spacer removal

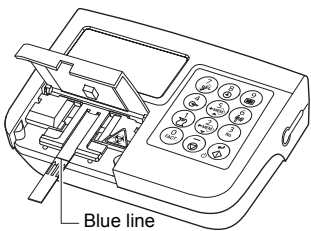


Countdown to next spacer removal

5 Inserting the test strip into the strip holder

When “— — —” flashes on the display, open the optical unit cover and insert the test strip into the strip holder with the application side down.

Insert the test strip all the way into the strip holder. Make sure that the test strip has been inserted far enough so that the blue line printed on the strip is not visible when the cover is closed.



IMPORTANT: Failure to insert the test strip correctly into the strip holder may produce incorrect measurement results.

6 Measuring sample

The measurement result will be displayed 20 seconds after the removal of spacer.

NOTE: If you fail to insert a test strip, repeat measurement.

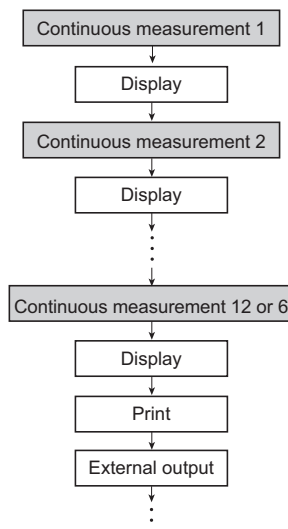


7 Completing measurement

After completion of all measurements, measurement results will be redisplayed in the order the measurements were made. Measurement results will be printed if the printer is attached. Printing and external output are performed at the same time as the measurement results are redisplayed.

Dispose of the used test strips. If all measurements have been completed, remove the strip holder from the instrument and wash.

REFERENCE: Printing and external output are performed in the order the measurements were made.



8 Turning off the power

Press and hold the  button for 3 seconds to turn off the power.

* Remove batteries or disconnect the AC adapter from the outlet before long periods of non-use.

REFERENCE: The instrument turns off automatically if no buttons are pressed for 10 minutes.

IMPORTANT:

- Continuous measurement results are stored after each measurement is performed. Printing and external output are performed after all measurements are complete.
- When performing continuous measurement, you can set a patient ID for the first sample only.

2-7

Check Measurement



Wear protective gloves to prevent exposure to pathogenic microbes.

Use the check strip that came with the instrument to see if the instrument is working properly. It is recommended to check the instrument on a regular basis or when a malfunction is suspected.

1 Washing the strip holder

Referring to “4-1 Maintenance” on page 4-1, wash the strip holder and wipe away water with a soft cloth.

NOTE: If the strip holder is not washed before check measurement, the check strip may become contaminated and lose its effectiveness.

2 Setting the measurement test strip

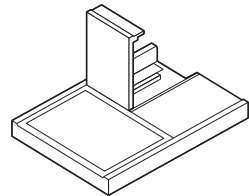
Referring to “2-4 Measurement Conditions Setup” on page 2-6, set the measurement test strip to “CHE”.



3 Preparing the check strip

Insert the check strip (for routine use) into the strip holder with the reflection side down.

IMPORTANT: Be careful not to damage or contaminate the reflection side of the check strip and keep it in its special case.



4 Starting check measurement

Press the  button. The measurement result will be displayed.



5 Checking concentration

The instrument is operating properly if the displayed value falls within the range printed on the special case.

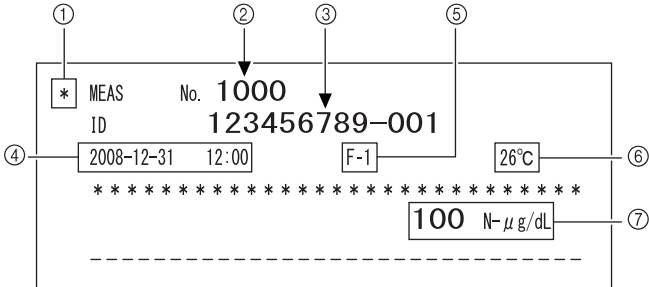
If the value is outside of this range, the optical unit may be contaminated or the check strip may be contaminated or damaged.

Clean the optical unit and repeat measurement with the check strip (for reference).

An abnormal reading for the second measurement indicates that there is a problem with either the instrument or the check strip. Please contact your distributor.

2-8 Printing Measurement Results

When the printer is attached, measurement results are printed after measurement.



No.	Item	Description
①	Abnormal sample mark	Abnormal sample mark “*” is printed when the measurement result is abnormal.
②	Measurement number	4-digit measurement number is printed.
③	Patient ID	Patient ID (entered with numeric buttons) is printed. If no patient ID has been set, (-----) is printed instead.
④	Date and time	The date and time of measurement are printed. The date format is as follows: Example: 2008-07-05 09:53 (year-month-day-time) 07-05-2008 09:53 (month-day-year-time) 05-07-2008 09:53 (day-month-year-time)
⑤	Compensation number	Test strip compensation number is printed. Example: F-1
⑥	Internal instrument temperature	Temperature inside the instrument is printed in Celsius (°C). Example: 29°C
⑦	Measurement result	Concentration value and measurement unit are printed.

Chapter 3 Auxiliary Operations

This chapter describes auxiliary operations including measurement result printing, measurement settings and parameter settings.

3-1 Displaying and Setting the Time

- ① Press the  button on the standby screen. The display will show the current time for 2 to 3 seconds and return to the standby screen.



- ② Press the  button while the time is being displayed to switch to the time setting screen. The  icon and cursor will flash.
- ③ Enter a new time using the numeric buttons.



- ④ Press the  button to confirm your entry. To cancel your entry, press the  button. The display will return to the standby screen after showing the date.



3-2 Displaying and Setting the Date

- ① Press the  button twice on the standby screen. The display will show the current date for 2 to 3 seconds and return to the standby screen.
- ② Press the  button while the date is being displayed to switch to the date setting screen. The  icon and cursor will flash.
- ③ Enter a new date using the numeric buttons.



- ④ Press the  button to confirm your entry.
To cancel your entry, press the  button. The display will return to the standby screen.

3-3 Reviewing Measurement Results

- ① Press the  or  button on the standby screen to review the most recent measurement result.
The  icon will appear at the upper left of the display.



- ② Press the  button while the measurement result is being displayed. The second most recent result will appear.
You can review the previous result by pressing the  button.

Press the  button to display the next result.
Press the  button to return to the standby screen.

REFERENCE:

- You can check measurement information such as patient ID by pressing the following buttons on the result review screen:
 -  button: Measurement number (default setting)
 -  button: Patient ID
 -  button: Time of measurement
 -  button twice: Date of measurement
- These settings will apply to all measurement results until you finish reviewing results.
- If you press the  button while reviewing the oldest measurement result, the most recent measurement result will appear.

3-4 Deleting Measurement Results

3-4-1 Deleting a Specific Result

Single result can be deleted from the memory.

- ① Press the  button while reviewing a measurement result. The  icon will flash and the result is displayed.

- ② Press the  button to delete the measurement result on the display. The next measurement result will appear.

REFERENCE: If you press the  button instead of the  button, the result will not be deleted and the review screen will appear.

3-4-2 Clearing All Results

All stored results can be cleared from the memory.

- ① Press and hold the  button for 1 second while reviewing a measurement result. The  icon will flash and “ALL” will appear.



- ② Press the  button to clear all the measurement results stored in memory.

REFERENCE: If you press the  button instead of the  button, no results will be cleared and the review screen will appear.

3-5

Transferring Measurement Results

3-5-1 Transferring a Specific Result

Single result stored in memory can be transferred.

- ① Press the  button while reviewing a measurement result. The  icon will flash and the result is displayed.



- ② Press the  button to transfer the measurement result on the display.

REFERENCE: If you press the  button instead of the  button, the result will not be transferred and the review screen will appear.

3-5-2 Transferring All Results

All results stored in memory can be transferred.

- ① Press and hold the  button for 1 second while reviewing a measurement result. The  icon will flash and “ALL” will appear.



- ② Press the  button to transfer all the measurement results stored in memory, starting with the most recent.

REFERENCE:

- If you press the  button instead of the  button, no results will be transferred and the review screen will appear.
- You can cancel this operation by pressing the  button while results are being transferred.

3-6

Reprinting Measurement Results (When Connected to Printer)

3-6-1 Reprinting a Specific Result

Single result stored in memory can be printed.

- ① Press the  button while reviewing a measurement result. The  icon will flash and the result is displayed.



- ② Press the  button to print the measurement result on the display.

REFERENCE: If you press the  button instead of the  button, the result will not be printed and the review screen will appear.

3-6-2 Reprinting All Results

All results stored in memory can be printed.

- ① Press and hold the  button for 1 second while reviewing a measurement result. The  icon will flash and "ALL" will appear.



- ② Press the  button to print all the measurement results stored in memory, starting with the most recent.

REFERENCE:

- If you press the  button instead of the  button, no results will be printed and the review screen will appear.
- You can cancel this operation by pressing the  button while results are being printed.

3-7

Setting Special Parameters and Compensation Coefficients

3-7-1 Settings

■ Date format setting

Select the date format from “year-month-day”, “month-day-year” or “day-month-year”.
The setting applies to the LCD display as well as printouts and remains effective even after turning the power off.
The default for the date format for external output is “year-month-day”.

■ Unit setting

Select from “N-μg/dL”, “μmol/L” or “μg/dL”.

■ Compensation coefficients “a” and “b” setting

Measurement results can be compensated by setting desired values for coefficients, “a” and “b”, of the compensation formula ($Y = aX + b$). By default, coefficient “a” is “1.000” and “b” is “0.0”.

3-7-2 Setting Parameters

Parameters are entered as a 2-digit number. The first number sets the date format and the second number sets the unit.

First number		Second number	
Entered value	Setting	Entered value	Setting
1	Year-month-day	1	N-μg/dL
2	Month-day-year	2	μmol/L
3	Day-month-year	3	μg/dL

Examples

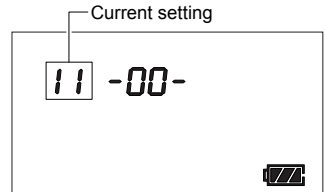
Entering “32” will set the date format to “day-month-year” and the unit to “μmol/L”.
Entering “21” will set the date format to “month-day-year” and the unit to “N-μg/dL”.

- ① Press the  button while holding down the  button to turn on the power. Keep holding down the  button until “-00-” appears on the display.



- ② Enter the password "99" using the numeric buttons and press the  button.

The entry screen for 2-digit number will appear.



- ③ Enter new values using the numeric buttons and press the  button. The new setting will be saved and the standby screen will appear.

REFERENCE:

- Changes to the setting remain effective even after turning the power off and on.
- Entering a value other than "1" to "3" will leave the setting unchanged.

3-7-3 Setting Compensation Coefficients

- ① Press the  button while holding down the  button to turn on the power.

Keep holding down the  button until "-00-" appears on the display.



- ② Enter the password "99" using the numeric buttons and press the  button.

The entry screen for 2-digit number will appear.

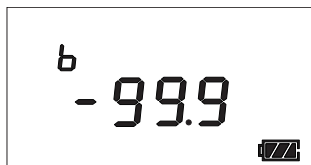


- ③ Press the  button.

- ④ Enter a new value for compensation coefficient "a" (a: 0.000 to 9.999). The entry field will flash.



- ⑤ Press the  button.
- ⑥ Enter a new value for compensation coefficient “b” (b: -99.9 to 99.9). The entry field will flash.



- ⑦ Press the  button to confirm the compensation coefficients.

REFERENCE:

- To cancel the change of compensation coefficients, press and hold the  button until the parameter setting screen appears.
- The setting for compensation coefficients “a” and “b” will be confirmed when you press the  button after setting compensation coefficient “b”.

Chapter 4 Daily Maintenance

This chapter describes how to clean the components of the instrument.

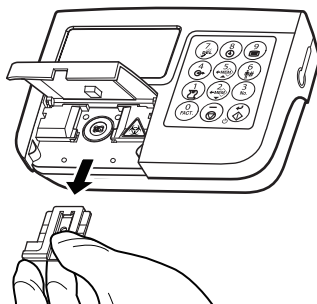
4-1 Maintenance

Sample may adhere to the strip holder and optical unit during measurement and contaminant may build up as more samples are measured. To obtain accurate results, wash and disinfect the strip holder and optical unit after completing all measurements for the day.

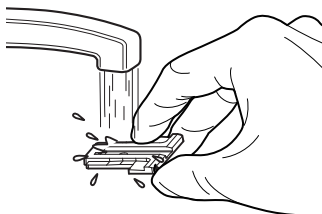


- **Wear protective gloves to prevent exposure to pathogenic microbes.**
- **Discard used cloth, protective gloves and cotton swabs in accordance with local regulations for biohazardous waste.**
- **Alcohol is sometimes needed for instrument maintenance. Alcohol is readily combustible, therefore handle it carefully and keep away from flames, electrical sparks and sources of heat. Also, ventilate the room sufficiently during use.**

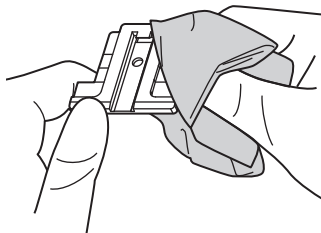
- ① Pull the strip holder straight out.



- ② Wash the strip holder with a mild detergent and rinse thoroughly in tap water. Wash the groove with particular care.

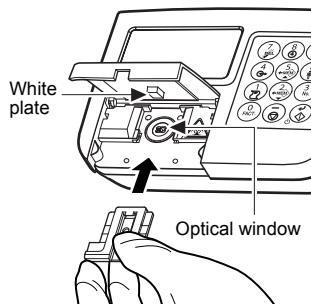


- ③ Wipe away water with a soft cloth.



- ④ Wipe dirt off the white plate with a cotton swab or piece of gauze moistened with water or alcohol.

Wipe dirt off the optical window (glass window) with a dry cotton swab or piece of gauze.



- ⑤ Insert the strip holder all the way into the instrument so that there is no gap.

IMPORTANT: Starting measurement with the strip holder incorrectly inserted may produce incorrect measurement results.

Chapter 5 Troubleshooting

The instrument displays error codes when malfunctions occur during measurement.
This chapter describes these errors and how to recover the instrument from the errors.

5-1 When an Error Occurs

You will see an error code on the display (and also on the printout, if using the printer) when there is a problem with measurement or printing. See the following table to resolve the error. If the error persists, contact your distributor.

Error code chart

Code	Cause	Remedy
E-01	The optical unit cover is open.	Close the optical unit cover.
E-02	The white plate on the back of the cover is dirty, or a test strip has been left on the strip holder.	Remove the test strip from the strip holder and clean the white plate on the back of the cover with a soft cloth moistened with water or alcohol. Turn on the power.
E-03	The optical unit cover is open. The white plate on the back of the cover is dirty.	Close the optical unit cover. Clean the white plate on the back of the cover with a soft cloth moistened with water or alcohol. Turn on the power.
E-04	The printer ran out of printer paper.	Load a new roll of printer paper.
E-05	No printer paper is loaded in the printer. The printer is not operating properly.	Load a roll of printer paper. Press the  button to return to the standby screen and check to see if the printer is correctly attached to the instrument.
E-07	The instrument is malfunctioning.	Contact your distributor.
Flashing “LO” or “HI”	“LO” and “HI” flash to indicate that the result is outside of the measurement range (10 to 400 N-µg/dL).	Repeat measurement.

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