pm
product manual

DRI-CHEM 7000

Veterinary Chemistry Analyzer

HESKA

Thank you for purchasing the DRI-CHEM® 7000 Veterinary Chemistry Analyzer.

The DRI-CHEM 7000 Analyzer is an in vitro diagnostic medical device to analyze blood by colorimetric end-point, rate and ISE tests, using the DRI-CHEM Analyzer Slides. Before using this equipment, please read this manual carefully to follow the precautions so that you can operate it correctly. Keep the manual near the DRI-CHEM 7000 Analyzer, so that you can refer to it whenever necessary.

CAUTIONS:

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2. The information contained in this manual may be subject to change without prior notice.
3. FUJIFILM shall not be liable for malfunctions and damage resulting from installation, relocation, remodeling, maintenance, and repair done by anyone other than dealers specified by FUJIFILM.
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6. FUJIFILM shall not be liable for malfunctions and damage resulting from negligence of precautions and operating methods contained in this manual.
7. FUJIFILM shall not be liable for malfunctions and damage resulting from use under environmental conditions outside the range of conditions required for proper use of this product, such as power supply, installation environment, *etc.* contained in this manual.
8. FUJIFILM shall not be liable for malfunctions and damage.

Table of Contents

Analyzer Description

The DRI-CHEM® 7000 Veterinary Chemistry Analyzer is a multi-parameter in-hospital chemistry analyzer produced for multi-species veterinary applications.

Serial Number

The serial number is located on the rear of the analyzer.

Additional Documentation

Additional documentation available from Heska Corporation includes:

- Quick Steps Guide
- Installation Guide Product Bulletin
- Reference Ranges Chart
- Interfering Substances Product Bulletin
- Performance Summary Booklet
- System Performance Data
- Maintenance and Control Log

Operator Requirements

The following operator requirements must be fulfilled before operating the DRI-CHEM 7000 Analyzer.

- Basic skills in a laboratory environment.
- Basic skills in diagnostic chemistry.
- It is highly recommended that the operator read and understand this manual.

Optional Accessories and Consumables

Accessories and consumable lists are available from Heska Corporation. Please call 800.464.3752, option 1.

This section contains safety precautions which must be followed for the safe operation of the DRI-CHEM 7000 Analyzer. Before using this equipment, please read this chapter carefully and follow the precautions given, so that you can operate it correctly.

1.1 Definition of Specific Safety Precautions

Specific safety precautions are noted by the terms **WARNING, CAUTION, IMPORTANT**, and additional information by **NOTE**. The respective meanings are as follows:

⚠ WARNING

Indicates hazardous situations that may lead to serious injury, even death or transmission of infectious agents, if the warning is not followed.

⚠ CAUTION

Indicates hazardous situations that may lead to minor or moderate injury or physical damage, if the caution is not followed.

IMPORTANT

Indicates improper handling that could have an adverse effect on the accuracy of the measurement values.

NOTE: Indicates procedures requiring special attention, instructions that must be followed, supplementary explanations, *etc.*

1.2 Precautions Before Operating This Equipment

⚠ CAUTION

Before using this equipment, please read this Instruction Manual carefully so you can operate it correctly.

⚠ CAUTION

When operating this equipment, be sure to observe the precautions described in this manual. Failure to do so may result in injuries, property damage, or incorrect test results.

⚠ CAUTION

Intended use of this equipment is to quantitate the concentration or the activity of the components in blood by using the DRI-CHEM Analyzer slides. Do not use the equipment for other purposes. Please read the *Instructions for Use* for the slides. This equipment is only to be operated by personnel appropriately trained for the intended use and operation.

⚠ CAUTION

The operators must be appropriately trained for the usage of the key (sampler cover lock) to follow the usage and its cautionary statements. (Refer to *Section 1.11, Sampler Cover*.)

⚠ CAUTION

Do not remodel the DRI-CHEM 7000 Analyzer. Otherwise, the safety will not be guaranteed.

1.3 Biohazards and Disposal

⚠ WARNING

Used (contaminated) consumables (*e.g.*, DRI-CHEM Analyzer slides, DRI-CHEM Analyzer auto tips, DRI-CHEM Analyzer mixing cups and sample tubes) and contaminated swabs or cloths used for cleaning the equipment are infectious waste and should be processed in compliance with any applicable local, state or federal regulations.

⚠ WARNING

When discarding the DRI-CHEM 7000 Analyzer body that may be contaminated with blood samples, be sure to process it correctly in compliance with any applicable regulations.

⚠ WARNING

When handling samples (blood or urine), slides, tips and when cleaning the analyzer or performing maintenance, always follow biohazard procedures (*e.g.*, wearing gloves, lab coat, and safety goggles). If any part of the body comes in contact with samples, or contaminated supplies or equipment, immediately rinse the contaminated body part thoroughly under running water and disinfect.

1.4 Explosive Hazards

⚠ WARNING

Do not to use flammable and explosive gas around the equipment.

1.5 Electrical Hazards

⚠ WARNING

The power supply voltage applied to the equipment is AC100–240V.

To avoid electrical shock, observe the following precautions:
• Avoid installation sites where water may splash on the equipment.
• Plug the power cable of the equipment into an outlet with a grounding receptacle. Electrical shock may occur if the equipment is not grounded to a protective earth.
• Make sure that all cables have been properly connected.

⚠ WARNING

Do not remove covers or other parts that are secured with screws to avoid electrical shock that may result from exposure to hazardous voltage, or injury from moving parts.

1.6 Electromagnetic Compatibility (EMC)

This equipment has been tested and found to comply with EN61326–1:2006, "Electrical equipment for measurement, control and laboratory use—EMC requirements".

This limit is designed to provide reasonable protection against harmful interference in a typical installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to other devices in the vicinity.

NOTE: This equipment has been tested to comply with the limit of class A for electromagnetic emission (Does not comply with the limit of class B).

If this equipment does cause harmful interference to other devices, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
• Reorient or relocate the receiving device.
• Increase the separation between the equipment.
• Connect the equipment into an outlet on a circuit different from that to which the other device(s) are connected.
Consult the manufacturer or field service technician for help.

⚠ CAUTION

Do not use other devices which generate and can radiate radio frequency energy near the DRI-CHEM 7000 Analyzer. Otherwise, physical damage or malfunction may occur.

1.7 Moving Parts

⚠ WARNING

Do not place your hands near the moving part (sampler, sample disk) whenever operating the equipment including maintenance. Also use care not to get your hands, hair, clothing, or accessories caught in moving parts.WARNING

During sample processing, ensure the sampler cover is closed and locked to prevent injuries and biohazard. If fingers touch the tip which has sample inside, the sample will spill out from the tip to cause biohazard. When the display reads "Ready", the sampler cover can be opened.

1.8 Installation Site Requirements

⚠ WARNING

Plug the power cable of the equipment into an outlet with a grounding receptacle. Electrical shock may occur if the equipment is not grounded to a protective earth.

⚠ CAUTION

Avoid the following installation sites:

- Places where spills or water leakage may occur.
- Places where the equipment is exposed to direct sunlight.
- Places near hot sources such as heaters.
- Places where temperature drastically changes.
- Places where the equipment is subject to vibration or is unstable.

1. Install the equipment in the following environmental conditions:

Location	Indoor Use
Illumination	Below 6,000 cd/m2 (lux) Below 3,000 cd/m2 (lux), when using the sample barcode reader.
Altitude	Up to 6,500 ft. (2,000 m)
Transient over-voltage category	II
Pollution degree	2
Operating temperature	59 to 89°F (15°C to 32°C)
Operating humidity	30% to 80% RH (no dew condensation)

2. Use the equipment under the following electrical requirements:

Voltage limit	100–240 V
Frequency	50–60 Hz
Supply voltage fluctuations	±10%
Rated wattage	300 VA
Phase	Single
Type of protection against electrical shock	CLASS 1 EQUIPMENT

3. Plug the DRI-CHEM 7000 Analyzer into an independent AC outlet separate from other devices.
4. At least 4 in. (10 cm) of clearance is required on all sides.
5. Unplug the equipment from the AC outlet if it will not be used for an extended period of time.

1.9 DRI-CHEM Analyzer Slides (SD)

(Henceforth, DRI-CHEM Analyzer Slides (SD) is shortened to "slide" in this manual.)

IMPORTANT

The slides should be stored in a refrigerator 36–46°F (2–8°C) without opening the individual packages to avoid humidity, light, and heat.

- **Only the required number of slides should be taken out of the refrigerator and warmed up to room temperature before opening the individual packages.**
- **Use within 30 minutes after opening the individual package.**
- **Do not touch either the center part of the surface or the back of the colorimetric test slides.**
- **Do not touch the thread bridge part of the electrolyte slide.**
- **A new slide must be used for each measurement. Do not reuse.**

NOTE: If slides have not been used and are still in their wrappers, they may be placed back in a refrigerator as long as they are the first slides to be used the next day.

NOTE: Types of slide packages and containers for liquids (*e.g.*, diluent, reference fluid) are subject to change without notice.

List of Slides for the DRI-CHEM 7000 Analyzer

Classification		Test Name	
Biochemical Tests	Enzymes	ALP	Alkaline Phosphatase
		AMYL	Amylase
		CPK	Creatine Phosphokinase
		GGT	Gamma Glutamyltransferase
		GOT/AST	Aspartate Aminotransferase
		GPT/ALT	Alanine Aminotransferase
		LDH	Lactate Dehydrogenase
		LIP	Lipase
	General Chemistry	ALB	Albumin
		BUN	Blood Urea Nitrogen
		Ca	Calcium
		CRE	Creatinine
		GLU	Glucose
		IP	Inorganic Phosphorus
		Mg	Magnesium
		NH_3	Ammonia
		TBIL	Total Bilirubin
		TCHO	Total Cholesterol
		$TC0_2$	Total Carbon Dioxide
		TG	Triglyceride
		TP	Total Protein
		UA	Uric Acid
	Electrolytes	Na+	Sodium
		K+	Potassium
		Cl−	Chloride

NOTE: Specifications and capabilities are subject to change without notice. Consult *Instructions for Use* for slide.

1.10 Calibration Card System

1. Calibration cards are packed together with slides in the same box. Before you start using a new lot of slides, read the Calibration card using the Calibration card reader. It is advisable to store the Calibration card in the box it came in until the accompanying lot of slides has been used.
2. Read the Calibration card when the display shows READY, WARMING UP, or LAMP OFF.

1.11 Sampler Cover

⚠ WARNING

During sample processing, ensure sampler cover is closed and locked to prevent injuries and biohazard. When the display reads "Ready", the sampler cover can be opened.

The sampler of the DRI-CHEM 7000 Analyzer performs pipetting automatically. However, it is necessary to load the auto tips, sample tubes (heparin or non-heparinized tube), and mixing cups designed for use with the DRI-CHEM 7000 Analyzer.

The sample tubes include the following:

- HEPARIN TUBE 1.5 ml (green cap)
- HEPARIN TUBE 0.5 ml (green cap)
- NON-HEPARINIZED TUBE 1.5 ml (red cap)
- NON-HEPARINIZED TUBE 0.5 ml (red cap)

IMPORTANT

Use new tips, sample tubes, and cups for each sample. Do not reuse old ones.

IMPORTANT

Do not use products other than specified products designed for the DRI-CHEM 7000 Analyzer, as using non-specified products could cause inaccurate test results and damage the analyzer.

1.12 Light Source Lamp

⚠ CAUTION

The light source lamp gets very hot. Before replacing the lamp, turn the power off and wait at least five minutes.

1. The light source lamp is a halogen lamp. Do not touch the glass surface of the lamp with bare hands.
2. The lamp is expendable. A spare lamp should be readily available in case the lamp burns out.

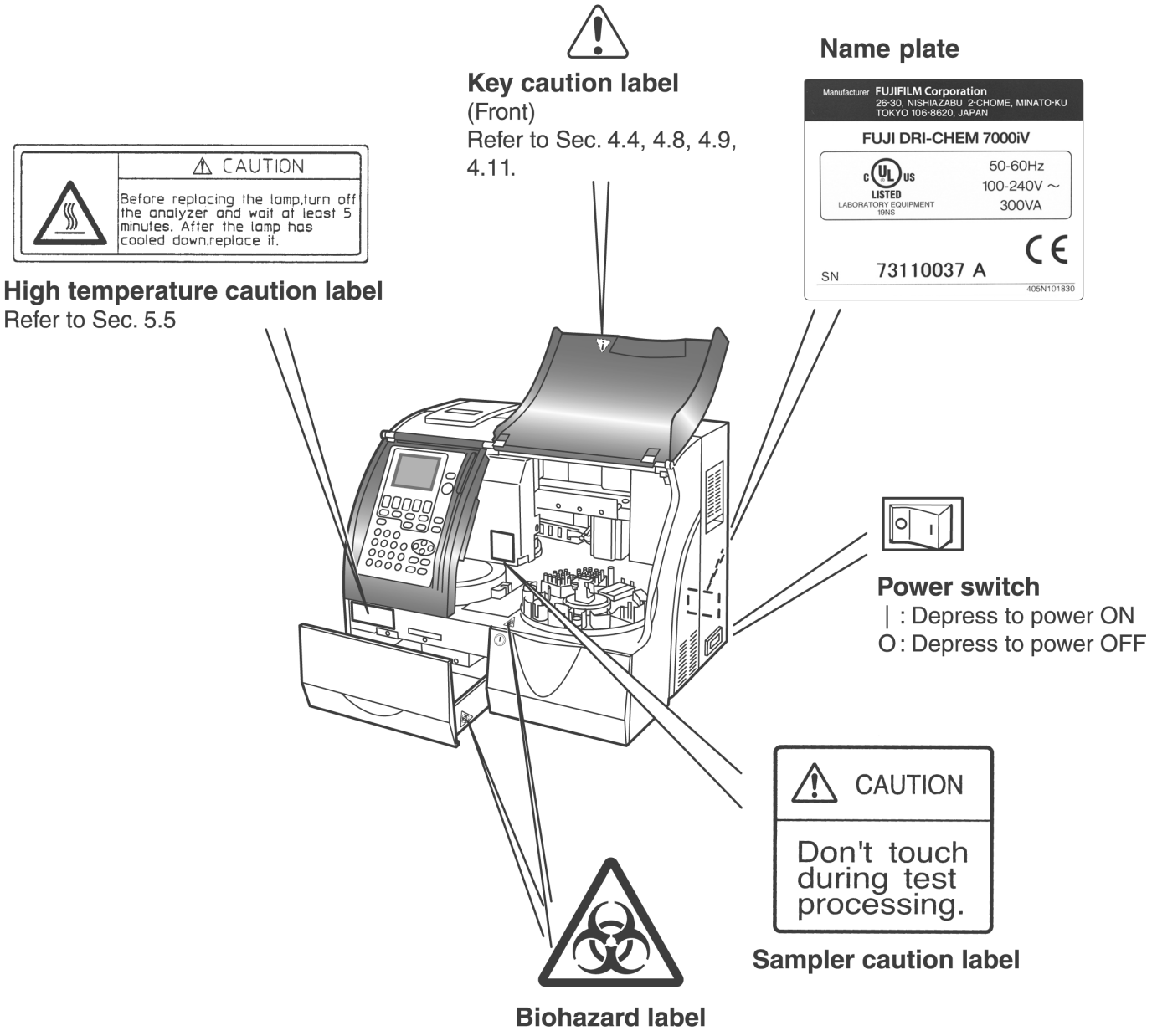
1.13 Recording Paper

1. Use specified recording paper for the DRI-CHEM 7000 Analyzer.
2. Do not use paper other than the type specified, as this could damage the printer head.

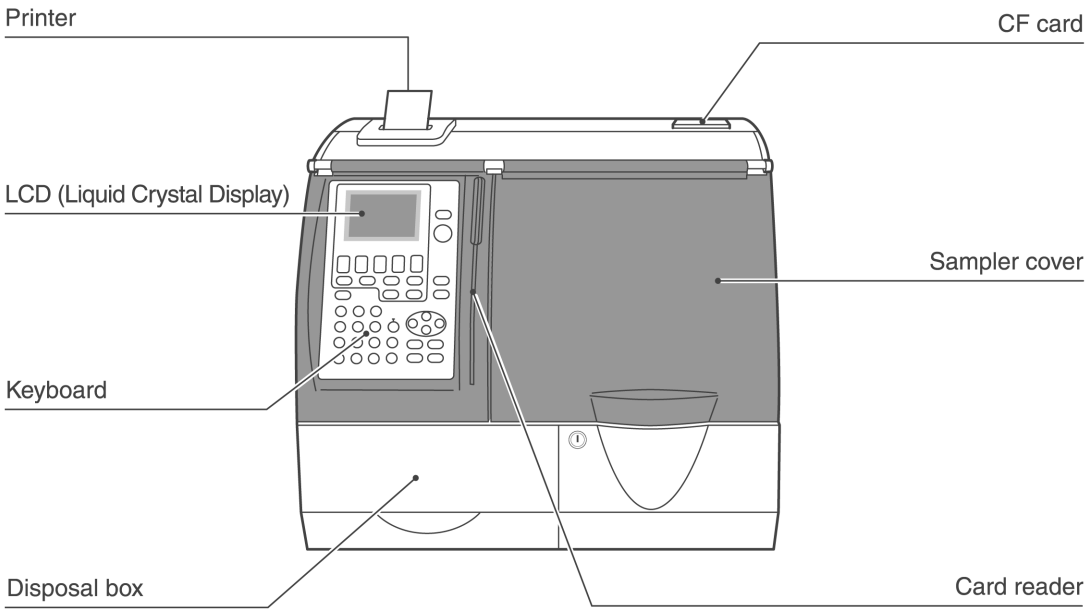
1.14 Warning Labels

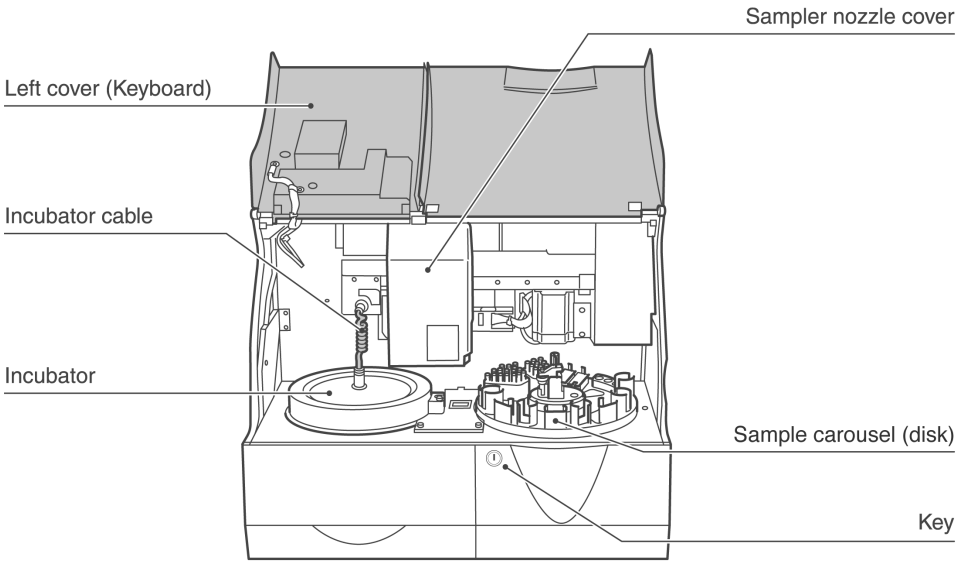
Warning labels and safety labels on the DRI-CHEM 7000 Analyzer are:

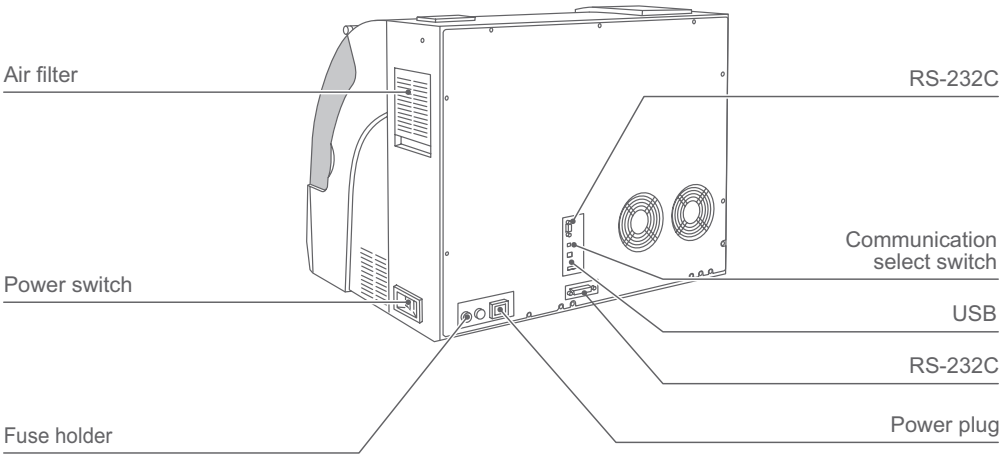
- High temperature caution label
- Biohazard label
- Key caution label
- Sampler caution label
- Power switch
- Name plate



2.1 Component Names





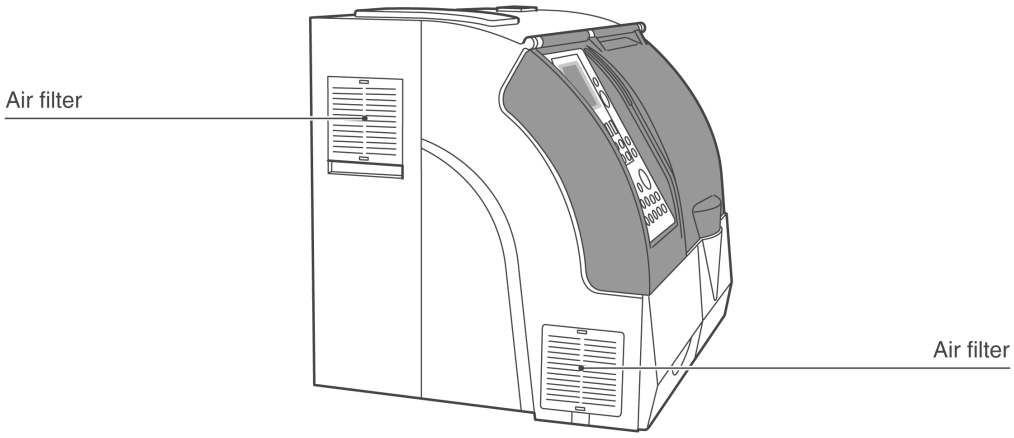


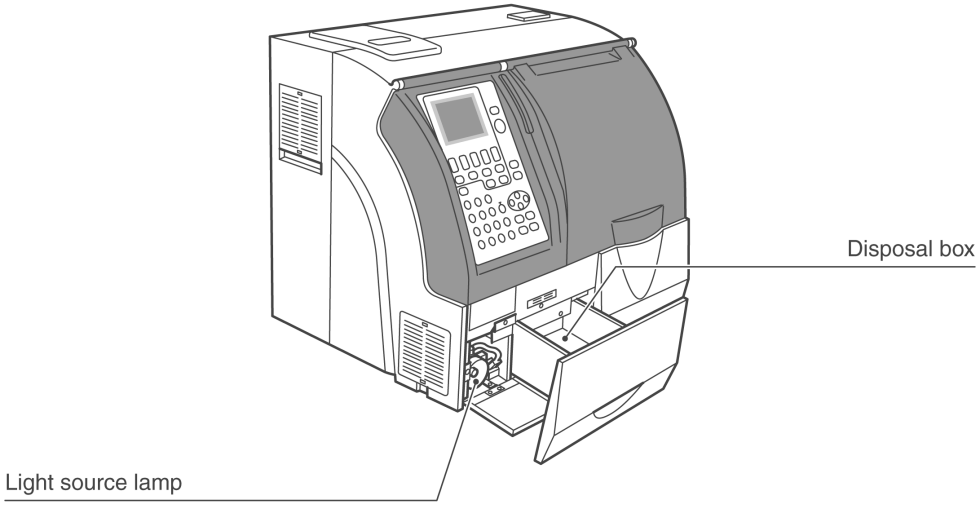
⚠ CAUTION

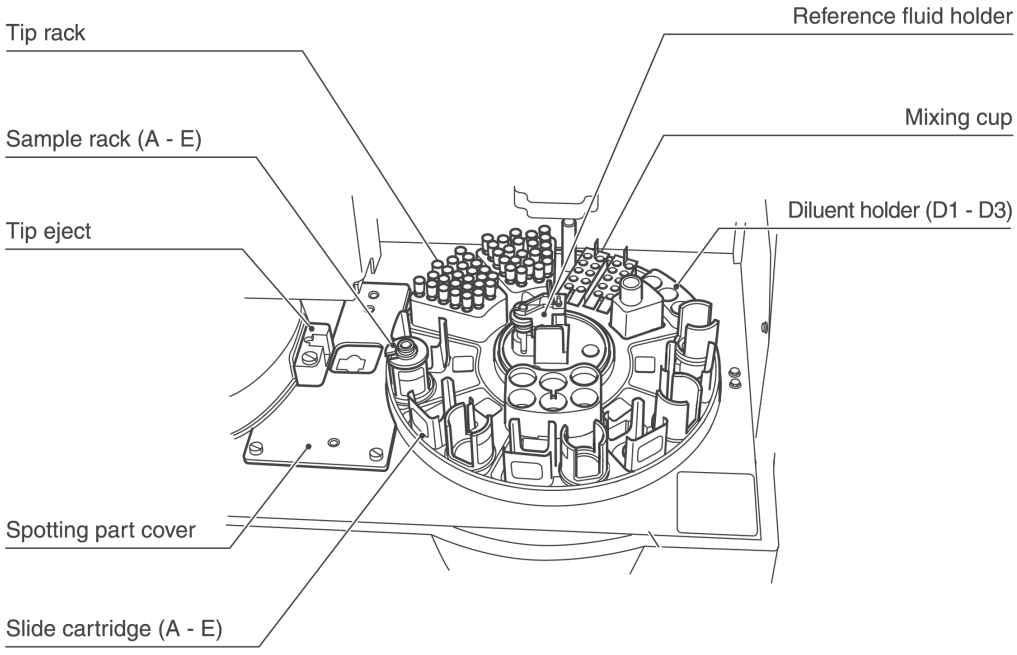
Do not connect the RS–232C connector to a sample barcode reader other than specified for the DRI-CHEM 7000 Analyzer.

Do not connect the RS–232C or USB connector to a computer or PC which has not been approved by IEC/UL60950–1 (Refer to *Section 8.2.19*).

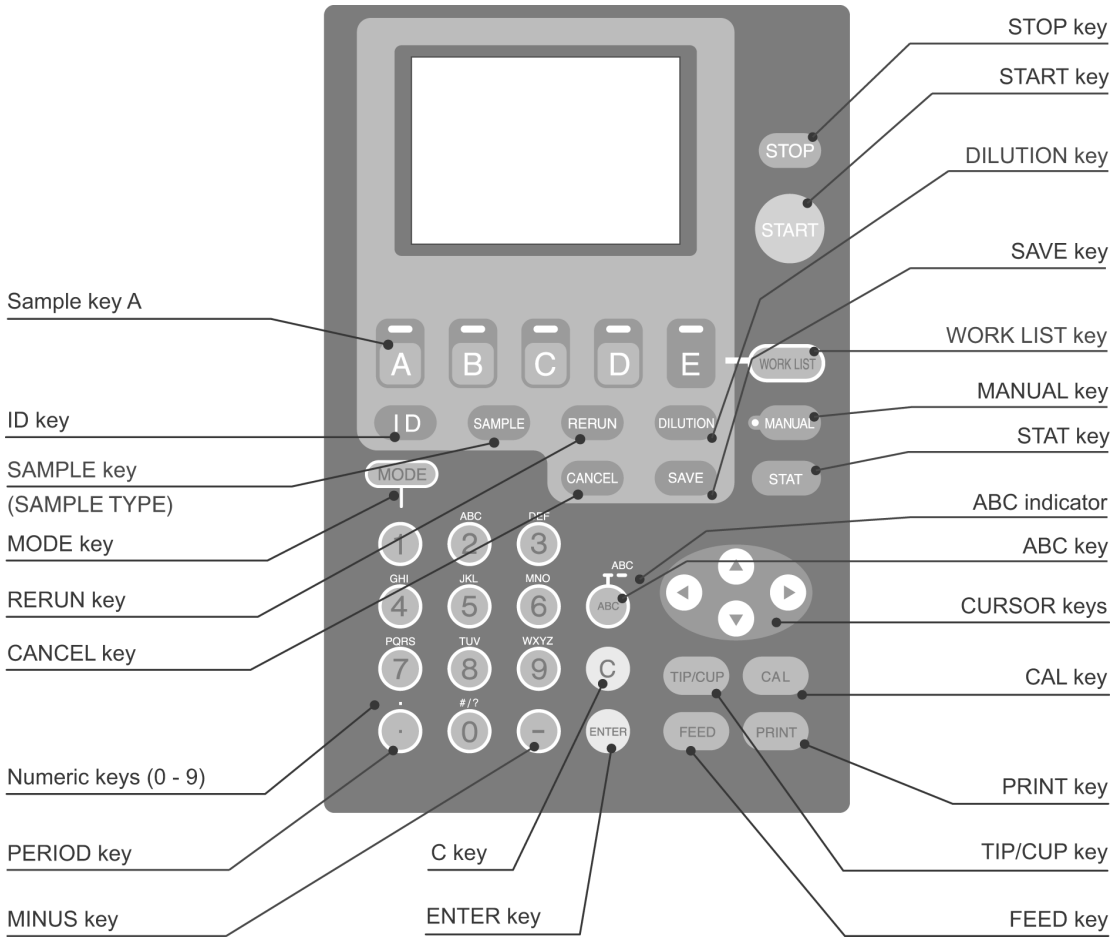
Do not connect an external printer to the RS–232C.

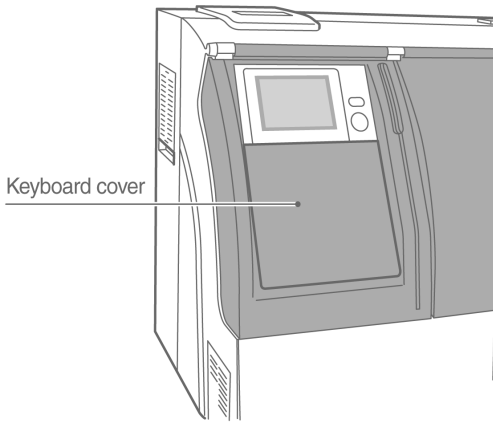



Disposal box
Light source lamp


Tip rack
Reference fluid holder
Sample rack (A - E)
Mixing cup
Tip eject
Diluent holder (D1 - D3)
Spotting part cover
Slide cartridge (A - E)

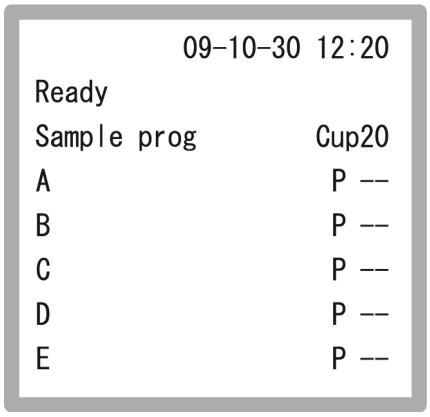
2.2 Names and Functions of Keyboard



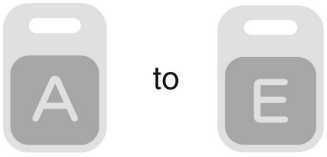


KEYBOARD COVER

This cover is used for simple test operations. The cover allows START/STOP key use only.



LCD (Liquid Crystal Display)
Operating procedures and the status of the DRI-CHEM 7000 Analyzer are displayed on the LCD.



SAMPLE KEYS (A–E)
The Sample keys (A–E) are used for programming test orders. They also indicate the status of the testing process.

Green light is on: Test information for the sample has been programmed.

Green light is blinking: In a programming mode for the sample

Orange light is on: Test information for the sample has been programmed (during sampling process).

Orange light is blinking: Sampling for the sample

Red light is on: A STAT test for the sample has been programmed.

ABC KEY
When the alphabetical character input mode has been selected, the ABC indicator light will be on.

MANUAL KEY
When the MANUAL key is pressed and the light is on, slides are transferred in a manual pipetting mode.

STOP KEY
The STOP key is used to interrupt or stop sampling. When the STOP key is pressed during a sampling process, the analyzer stops and enters into the interrupted stage after ejecting tips. By pressing STOP during the interrupted stage, remaining test programming can be canceled. This key is also used to stop beeping and to terminate a mode process.

START KEY
The START key is used to start testing. If tests have not been run for the given time in Mode 44, the light source lamp turns off. When the START key is pressed, the light will turn on and warming up will be displayed.

WORK LIST KEY
The WORK LIST key is provided for requesting external PC for patient IDs and the test request information (work list).

STAT KEY
The STAT key is used for programming a STAT test.

ID KEY
The ID key is used for inputting a patient ID for the sample.

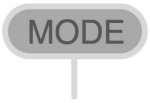
SAMPLE KEY
The SAMPLE key is used for selecting a sample type for the sample. The sample type changes to P (plasma/serum) => U (urine) => E (blank) => W (whole blood) each time the SAMPLE key is pressed. Urine, blank and whole blood are not selections that can be used with Heska's current slide offering. After a Sample key (A–E) is pressed, pressing SAMPLE can select a sample type for the sample whose light is on.

RERUN KEY
The RERUN key is used for rerunning tests with the previous sample. The test will be performed using the previous sample No., sample ID and reference interval.

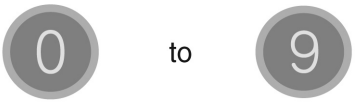
DILUTION KEY
The DILUTION key is used for setting dilution factors.

SAVE KEY
The SAVE key is used for saving programmed test information for each sample.

CANCEL KEY
The CANCEL key is used for canceling the programmed test which has been programmed using the SAVE key and also used for canceling automatic test start. After pressing a Sample key which you want to cancel, press the CANCEL key.



MODE KEY
The MODE key is used to enter Mode functions.



NUMERIC KEYS
The numeric keys are used for inputting IDs and numbers (*e.g.*, in mode operations).

PERIOD KEY
The . (PERIOD) key is used for inputting a decimal point.

C (Clear) KEY
The clear key is used for deleting data input incorrectly.

MINUS KEY
The – (MINUS) key is used for adding the minus (-) sign when inputting numbers.

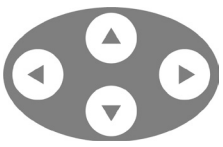
ENTER KEY
The ENTER key is used for completing data input.

TIP/CUP KEY
The TIP/CUP key is used for replacing consumables.

CAL KEY
The CAL key is used for performing the calibration for immuno-chemical tests. This function is not used with Heska's current slide offering.

FEED KEY
The FEED key is used for advancing recording paper in the printer.

PRINT KEY
The PRINT key is used to reprint test results or to transfer data to the ticket printer. Also, the PRINT key is used to print out data during mode operations.



CURSOR KEY
The CURSOR key is used to move the cursor position when inputting data.

Section Overview

Following is an overview of the operations and process used to obtain test results. Detailed operation procedures begin with *Section 4.1*.

3.1 Principles of Operation

Slide loading

The analyzer can compensate for the differences between the slide production lots by reading the Calibration card included with each box of slides, except electrolytes.

The slides are unwrapped and loaded in the slide cartridge after they reach room temperature. An electrolyte (ISE) slide can be loaded in the cartridge along with colorimetric (CM) slides.

The cartridge can contain a maximum of 20 slides at one time. The analyzer identifies the test name and slide lot by scanning the printed information on the back side.

Sample loading

Specific sample tubes (0.5 ml and 1.5 ml) are used. These tubes are for single use only. When running electrolyte tests, the reference fluid must also be loaded. When diluting the sample automatically, a mixing cup and diluent must be loaded.

Sampling and spotting

The sampler detects the surface of the sample, aspirates the required volume of sample, and spots it on the slide. In dilution mode, the sampler dilutes the sample with diluent, and spots it on the slides.

Incubation

The incubator can hold a maximum of 13 colorimetric slides and one electrolyte slide. Colorimetric slides are incubated for up to 6 minutes (varies by test) at 37˚C and an electrolyte slide for 1 minute at 30˚C. If slides remain in the slide cartridge, they will be transferred one by one into the incubator until the cartridge is empty.

Photometer and potentiometer readout

The photometer head below the incubator reads the reflectance of the colorimetric slides as well as the white reference plate and the black reference plate. The analyzer uses the reflectance readings, together with the reference readings, the standard curves, and the calibration information to determine the concentrations of the samples. The potentiometer head below the ISE incubator reads the electrical potential of the electrolyte slide. The analyzer determines the concentrations of the electrolyte in the sample using the electrical potential readings, together with the standard curves. The test results are printed out and can be transmitted to an external computer if desired.

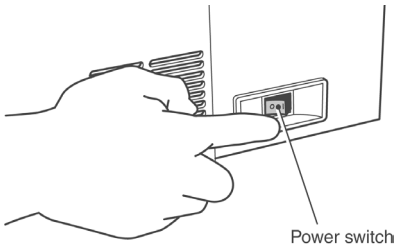
Consumable disposal

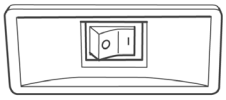
Used slides and tips are discarded into a disposal box. The used sample tubes, diluent, reference fluid, and mixing cups must be removed by hand.

4.1 Procedure for Turning the Analyzer On and Off

4.1.1 Turning On the DRI-CHEM 7000 Analyzer

1. Turn on the power switch. (Depress the [I] side of the POWER switch.) When power is turned on, the printer of the DRI-CHEM 7000 Analyzer prints out the indication "DC 7000", the software version number, the current date, and time.





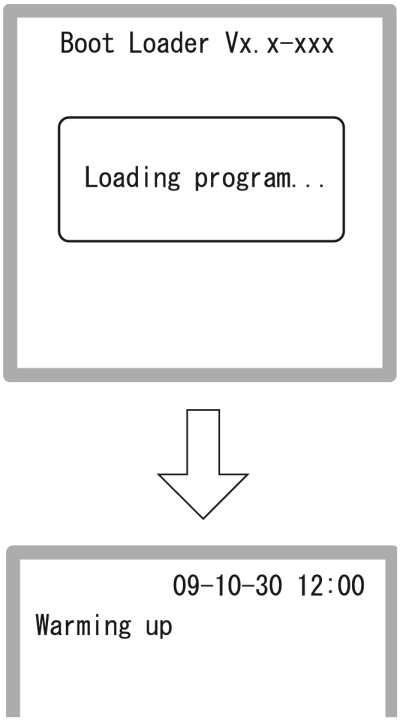
NOTE: Turning the power on the first time or if the power has been off for a long time may cause a date error (Error code: E0500). If this occurs, set the date and the time using Mode 20. (Refer to *Section 7.2.3*.)

IMPORTANT

If the power is shut off by a power outage, load tips and replace the mixing cups. (Refer to *Section 4.3*.) If this occurs, the position information of the tip and the mixing cups may be lost and reset. At the next test, the analyzer may use a used mixing cup, and erroneous test results will be obtained.

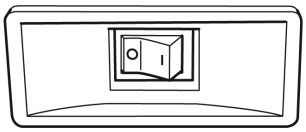
Printout example

```
************************
*     FUJI DRI-CHEM    *
*    FDC7000V V1.0-P01 *
*  Machine:73110001    *
*  Date:09-10-30 12:00 *
************************
```



4.1.2 Turning Off the DRI-CHEM 7000 Analyzer

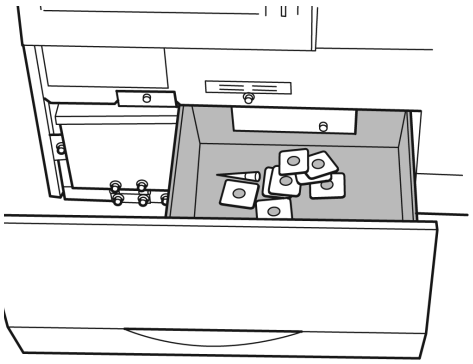
1. Make sure that measurements and mode operations are not in progress. Depress the [o] side of the POWER switch.



⚠ CAUTION

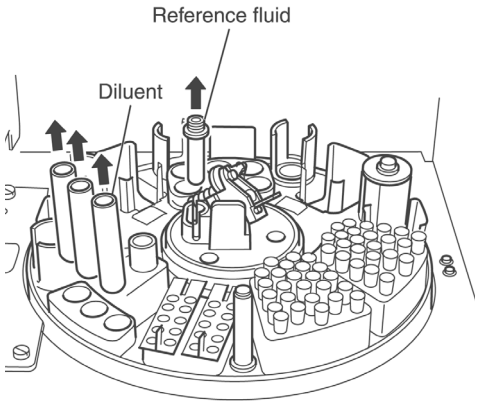
Do not turn off the power during measurement process and mode operations. Otherwise, physical damage may occur.

2. Remove the disposal box and dispose of the tips and slides.

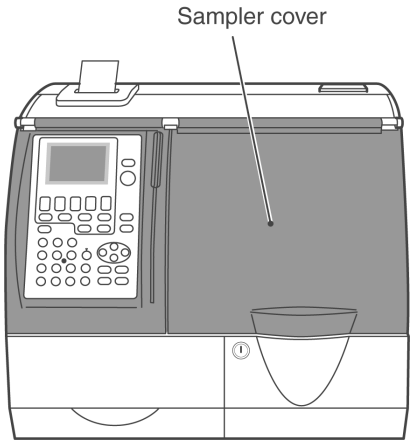


NOTE: When disinfecting the disposal box, use ethyl or isopropyl alcohol for disinfection or 0.5% sodium hypochlorite solution. When using sodium hypochlorite, wash the disposal box well and dry it before use.

3. Remove sample, diluent, and reference fluid tubes from the analyzer.



4. Close the sampler cover. The sample cover should always be closed except when loading and unloading slides.



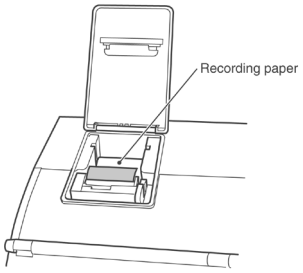
4.2 Preparations

4.2.1 Performing Daily Maintenance Before Use

NOTE: When replacing mixing cups, always use the TIP/CUP key. This is necessary to reset the starting position of the mixing cups.

Check Points	Checking and Operation Details	Procedure
Discarding used consumables	Take the disposal box out and dispose of the tips and slides.	Refer to the next page
Replacing recording paper	Replace the recording paper roll with a new one when the red lines appear.	Refer to *Section 5.4*
Setting tips	Check whether there are enough tips in the tip rack. If not, set additional tips.	Refer to *Section 4.3.1*
Replacing mixing cups	Check the remaining mixing cup wells by the LCD indication. Replace them with new ones when needed.	Refer to *Section 4.3.2*
Replacing diluent	Replace the diluent when required.	Refer to *Section 4.3.3*
Replacing reference fluid	Replace the reference fluid with a new 1.5 ml tube and clean the cap of the reference fluid tube every 12 hours. **NOTE**: If using a 0.5 ml tube, discard the tube with the reference fluid each time the measurement is performed, and prepare a new tube with new reference fluid. Do not add reference fluid to the old tube.	Refer to *Section 4.3.4*
Checking date & time	If either the date or time is incorrect, adjust using Mode 20. IMPORTANT **In case that the date and time are not adjusted correctly, the analyzer may fail to determine the expiration date of the slides resulting in the possibility of inaccurate test results.**	Refer to *Section 7.2.3*

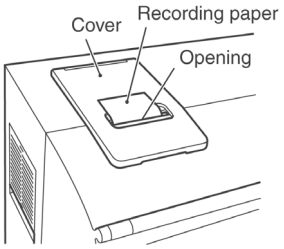
1. Check the remaining recording paper (thermal paper). If the recording paper is short for the measurement, replace the old roll with a new one. (Refer to *Section 5.4*.)



NOTE: Pass the paper through the opening of the printer cover and close the cover.

CAUTION

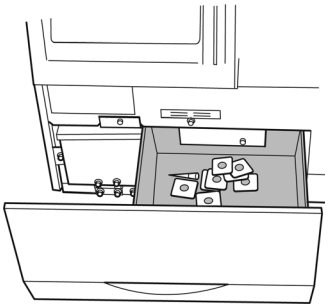
Do not touch the edge of the paper cutter with bare hands.



2. Remove the disposal box and dispose of the tips and slides.

IMPORTANT

If the disposal box is completely full, slide transfer error or tip eject error may occur causing adverse effects on the test results.



IMPORTANT

After emptying the disposal box, be sure to replace the disposal box. If the analyzer is used without the box, adverse effects on test results will occur.

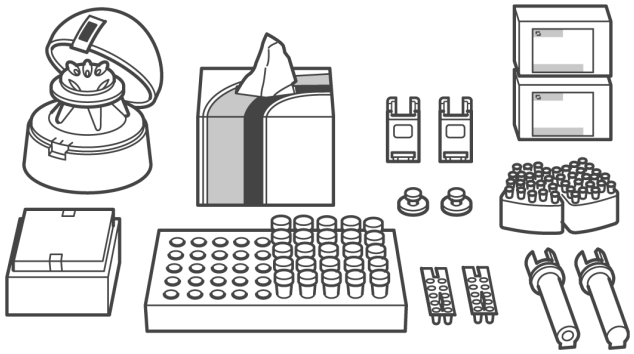
4.2.2 Preparation of the Peripheral Accessories

Prepare the necessary peripheral accessories. Take out the slides from the refrigerator and allow them to stand for at least five minutes so they can reach room temperature. Then unwrap slides.

IMPORTANT

After the individual package has been unwrapped, the slide should be used within 30 minutes.

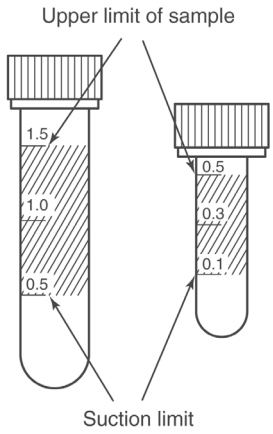
4.2.3 Types of Sample Tubes for the DRI-CHEM 7000 Analyzer



Sample tubes in the following list are available for the DRI-CHEM 7000 Analyzer. Place each sample tube into the sample rack specified for each sample tube. Confirm the following information about dimensions and tube contents of a blood collection tube.

1. 0.5 ml Heparin Tubes (green cap)
2. 1.5 ml Heparin Tubes (green cap)
3. 0.5 ml Non-Heparin Tubes (red cap)
4. 1.5 ml Non-Heparin Tubes (red cap)

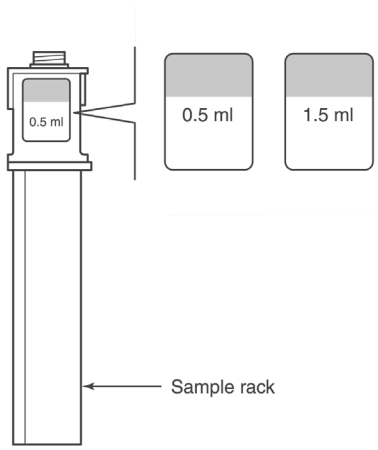
Measurable range for sample tube



Sample Tube

Sample rack

The sample rack is specified for each sample tube size. Place each sample tube into the specified sample rack.



Tube contents and applicable tests

The tube contents of a blood collection tube determine which slide is applicable.

The following is general information about tube contents and the applicable tests.

- Heparin
  Applicable to all tests (For GLU and NH3, measure the samples as soon as possible after blood collection.)
- Plain (no additives, available coagulant contained)
  Applicable to other than GLU and NH3
- NaF
  Applicable only to GLU
- EDTA
  Applicable only to NH3
  (After blood collection, keep samples in ice and measure the samples as soon as possible.)

4.2.4 Processing Samples Using Sample Tubes

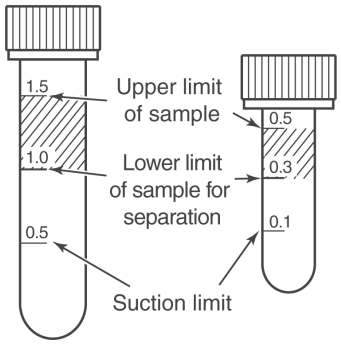
Obtaining plasma samples

Untreated whole blood can be collected and placed directly into heparin tubes (green cap).

Whole blood samples already containing lithium heparin from another collection tube can be transferred into non-heparinized tubes (red cap).

Put caps on the tubes and mix the contents by gently inverting them five or six times.

Centrifuge the samples for at least 2 minutes using the supplied centrifuge or another suitable centrifuge.



NOTE: The top surface of the sample fluid must be within the shaded section of the tubes as shown below. If the blood in the tube is below the suction limit mark, the analyzer will display an insufficient sample volume error.

NOTE: For aspirating only the plasma (of the centrifuged sample) and to avoid aspiration of red blood cells, at least 1.0 ml (for 1.5 ml tube) or 0.3 ml (for 0.5 ml tube) of the whole blood sample should be put in each tube.

NOTE: The maximum number of tests that can be performed using a 0.3 ml whole blood sample in a 0.5 ml sample tube is five.

Obtaining serum samples

Collect whole blood samples not processed with anticoagulant into standard glass clinical plain tubes. Allow sample to clot at room temperature for at least 20 minutes (40 minutes for horses). Centrifuge the sample using a standard clinical centrifuge according to standard practices.

Transfer the separated serum into a 0.5 ml red cap non-heparinized tube and place in the instrument for analysis.

NOTE: Using the centrifuged non-heparinized tube directly in the instrument may cause plugging of the sample tip by fibrin.

NOTE: The top surface of the sample fluid must be within the shaded section of the tube as shown. If the sample is below the section limit mark, the analyzer will display an insufficient sample volume error.

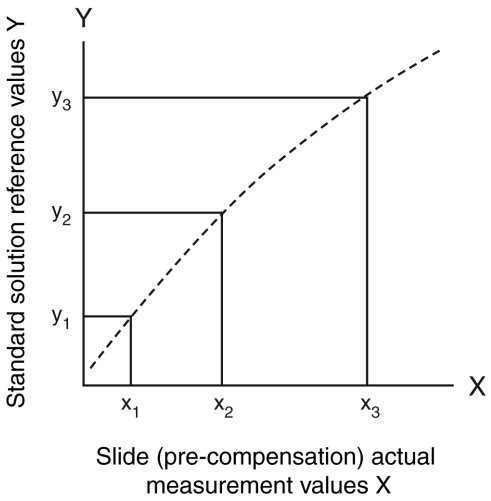
NOTE: To avoid an error, make sure there are no bubbles in the sample. Use a centrifuge to remove bubbles, if necessary.

4.2.5 Calibration Card System

1. The calibration card system compensates for variations between lots of slides and ensures uniform performance.

Calculation method

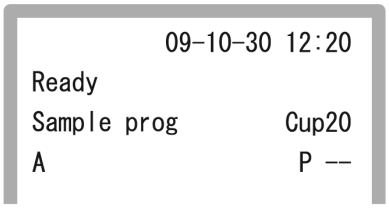
Measurements of a variety of the standard solutions developed especially for slides are performed on each lot of slides. The relationship between the actual measurement values X (x1, x2, x3) and the standard solution reference values Y (y1, y2, y3) is expressed by the formula $Y=c+dX+eX^2$. The lot compensation coefficients (c, d, e) derived thereby are used to compensate for variations in each lot.



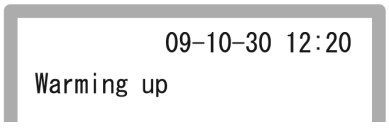
2. Inputting Lot Compensation Coefficients Using the QC Card. The lot compensation coefficients are magnetically recorded on QC cards, and one QC card is packed with each box of slides, except electrolytes. When data is input from a new card, the previously stored lot compensation coefficients are updated. In addition to the lot compensation coefficients, each QC card also has slide data essential for performing measurements recorded on it. Therefore, scan in the new QC card when you switch to a new box of slides.

NOTE: The "e" values recorded on the QC cards represent e x 10^3.

NOTE: The analyzer records the QC card information of 6 lots for each analyte. Reading QC cards for more than 6 lots of an analyte will delete the older QC information in order.



Or

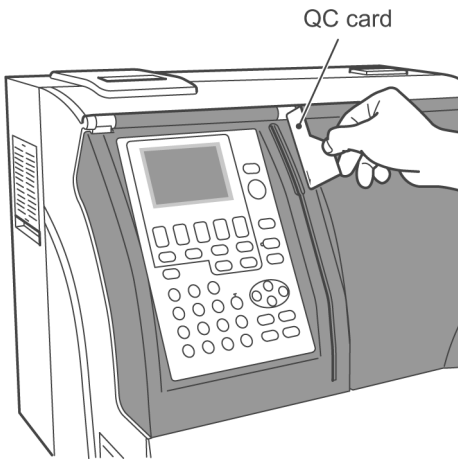


3. Using QC cards.

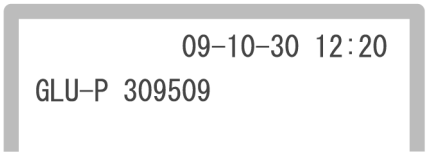
The QC card is needed when a new test slide type will be used or when changing to a new lot of slides. You can input data using a QC card while [Ready] or [Warming up] is indicated on the LCD and the analyzer is not testing.

NOTE: The QC card cannot be read when the analyzer is programmed to start testing (the sample key is blinking green).

a. Insert the QC card into the card reader, located near the key board part of the analyzer, and pull it down.



b. The test name and lot number are indicated on the LCD.



NOTE: While the test name and lot number are indicated, do not insert another QC card.

NOTE: When the test name and lot number are not indicated on the LCD and the analyzer beeps, insert the QC card into the card reader again.

4. Using DI cards.

When you receive DI cards from the manufacturer due to the change of the slide's manufacturing process, read the DI cards according to the instruction. Reading method is the same as QC card.

4.3 Replacing Consumables

Check the consumables and add or replace them as required.

NOTE: If no consumables (tips, mixing cups, diluent, reference fluid) remain, sampling process may be interrupted.

NOTE: Replace the consumables by pressing **TIP/CUP** while a sampling process is not in progress.

NOTE: Pressing **TIP/CUP** is not required to replace the reference fluid. Replace the reference fluid while the sampling process is not in progress.

Replacement Procedures

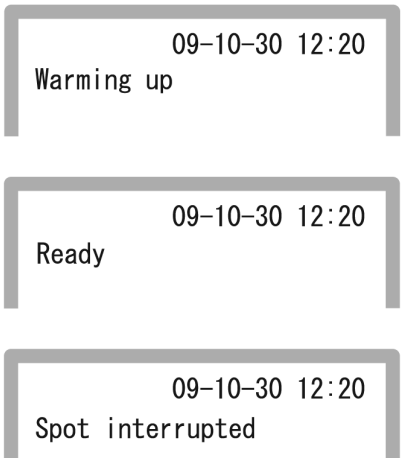
Consumables	1. To Start	2. Replacement	3. To Complete	Reference Section
Tips	TIP/CUP key	Take the tip rack from the sample carousel and set tips in the empty holes. Set the tip rack back on the sample carousel.	To start testing, press **START**. Press C to reset tip location memory to the first position of tip rack. To complete the replacement, press **TIP/CUP**.	4.3.1
Mixing cups	Press **TIP/CUP**, followed by **ENTER**	Replace with new mixing cups. Press ENTER to reset the number of wells.	Press **STOP** to complete the replacement of mixing cups. To start testing, press **START**. To complete the replacement, press **TIP/CUP**.	4.3.2
Diluent	TIP/CUP key	Replace with new diluent.	To start testing, press **START**. To complete the replacement, press **TIP/CUP**.	4.3.3
Reference fluid	No operations	Replace with new reference fluid.	No operations	4.3.4

4.3.1 Setting Tips

WARNING

When the analyzer is in process of sampling, press STOP to interrupt sampling. (Refer to *Section 4.12.*) In the interrupted condition, set the tips. It is unsafe to set tips during sampling process due to moving parts. Check the number of remaining consumables.

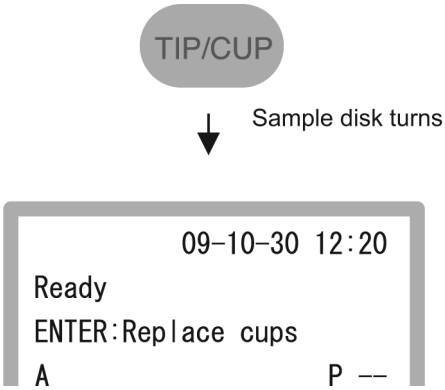
1. Make sure that [Warming up], [Ready] or [Spot interrupted] is displayed on the LCD (the analyzer is not in the process of sampling).



2. Press **TIP/CUP** The sample carousel turns the consumables facing to the operator side.

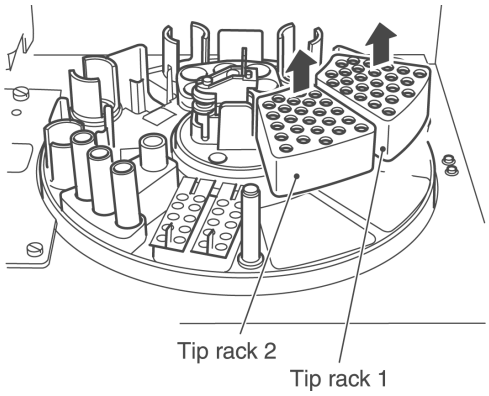
WARNING

Do not touch the sample carousel before it completely stops.

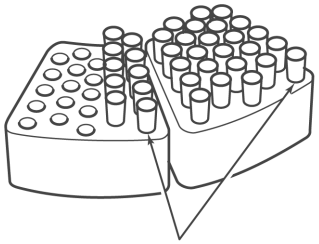


3. After the sample carousel stops, remove the tip racks from the sample carousel.

NOTE: Do not set tips in the tip rack on the sample carousel.

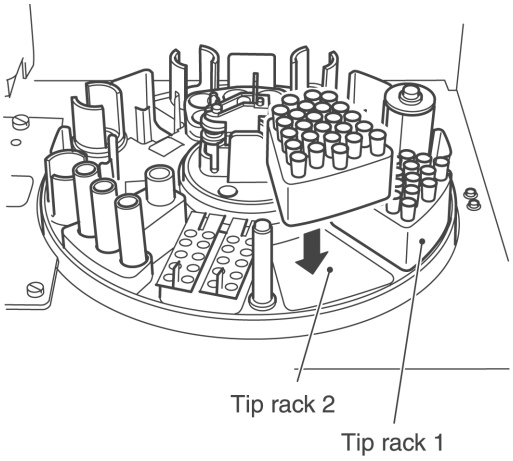


4. Set tips into all holes of the tip rack.



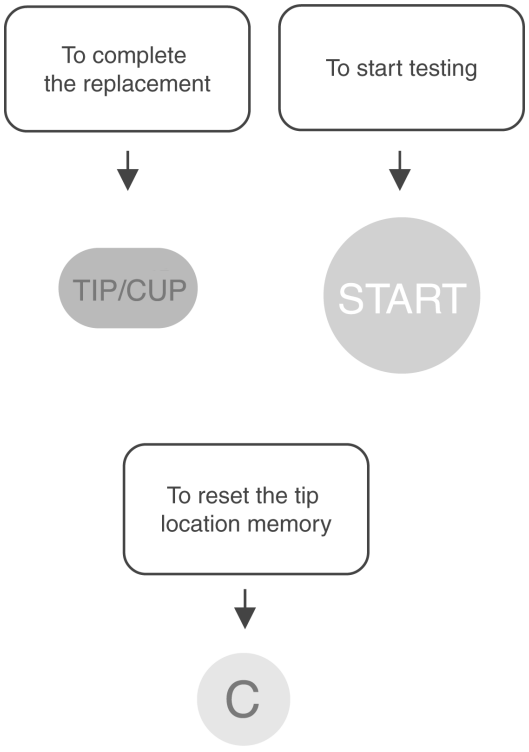
Set tips from the far right line.

5. Set the tip racks back on the sample carousel.
6. Press **C** to reset tip position. This allows the analyzer to use tips from the first position of the tip rack. (The tip location memory is reset to the first position.) The analyzer prints out "Tip pick Position reset" after resetting the tip pick up position.



7. Press **TIP/CUP** to complete the replacement mode. The sample carousel turns the sample racks.

NOTE: Instead of completing the replacement by using TIP/CUP, pressing **START** can start testing.



4.3.2 Replacing Mixing Cups

Mixing cups are used for tests that require dilution. Check the number of remaining mixing cups displayed on the LCD before performing tests that require dilution. If necessary, replace with new mixing cups. Each dilution uses one mixing cup. If no mixing cups remain, tests that require dilution cannot be run.

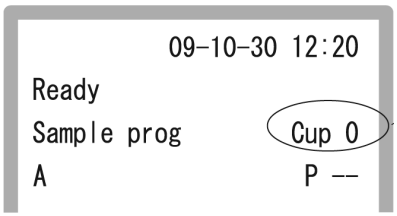
⚠ WARNING

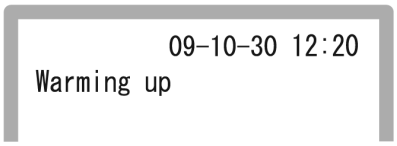
When the analyzer is in process of sampling, press STOP to interrupt sampling. (Refer to *Section 4.12*.) In the interrupted condition, replace the mixing cups. It is unsafe to replace cups during the sampling process due to moving parts.

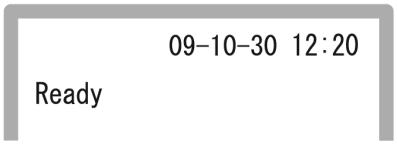
NOTE: The number of remaining mixing cups is displayed on the LCD.

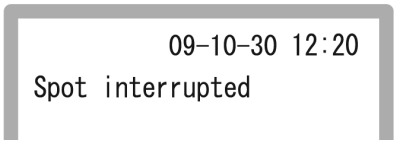
For the example shown at left, no dilution test can be started because the remaining number is 0.

1. Make sure that [Warming up], [Ready] or [Spot interrupted] is displayed on the LCD (the analyzer is not in the process of sampling).





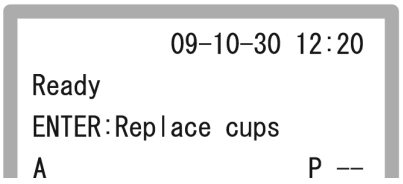




2. Press **TIP/CUP**. The sample carousel turns the consumables facing to the operator side.

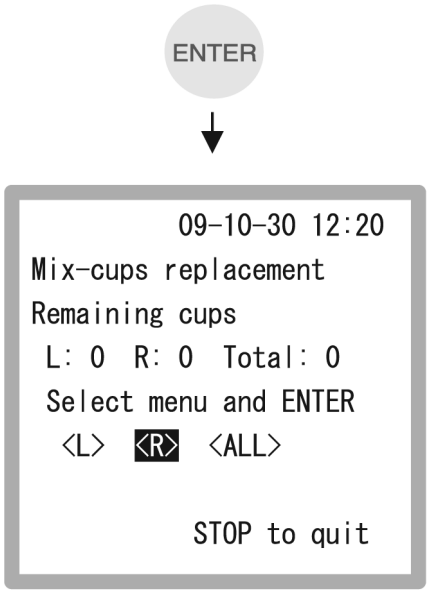
⚠ CAUTION

Do not touch the sample carousel before it completely stops.



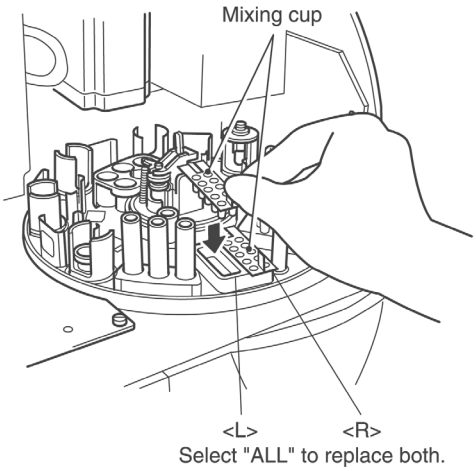
3. Press **ENTER** to enter the replacement mode of mixing cups.

NOTE: Both mixing cups can be replaced at the same time (selecting [ALL]), or replaced independently (selecting [L] or [R]).

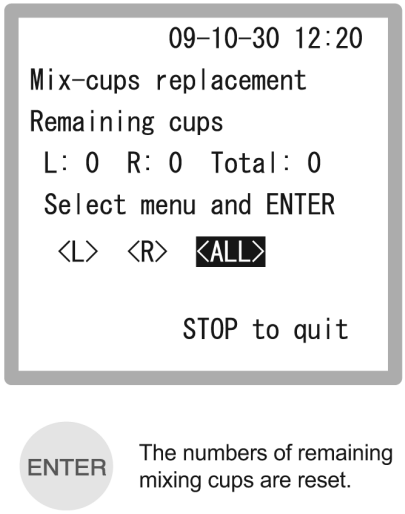


Example: To replace both (L, R) mixing cups:

4. Remove the mixing cups from the sample carousel. Set two new mixing cups.

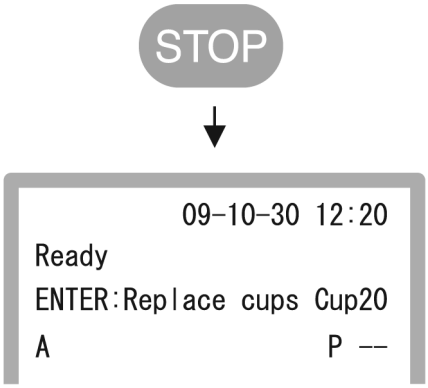


5. Select [ALL] by using the scroll (◄ ►) key and press **ENTER**.



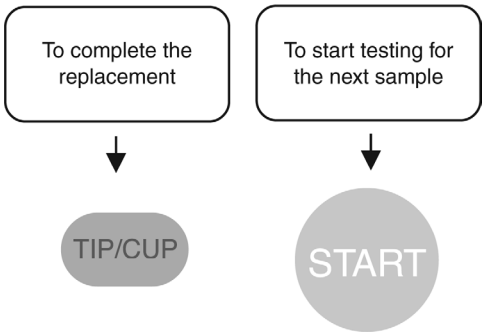
NOTE: The number of remaining mixing cups is reset.

6. Press **STOP** to complete the replacement of the mixing cups.



7. Press **TIP/CUP** to complete the replacement mode. The sample carousel turns the sample racks.

NOTE: Instead of completing the replacement by using TIP/CUP, pressing **START** can start testing.



4.3.3 Replacing Diluent

To replace diluent, press **TIP/CUP**.

WARNING

If the analyzer is in process of sampling, press STOP to interrupt sampling. (Refer to *Section 4.12.*) In the interrupted condition, replace diluent. It is unsafe to replace diluent during sampling process due to moving parts.

IMPORTANT

Use specified tube for the diluent. The specified tube programmed for diluent is the 1.5 ml PLAIN TUBE.

NOTE: Mode 84 can be used to designate kinds of diluent tubes to be used. (Refer to *Section 7.2.27.*) Mode 45 can be used to designate diluent positions for each test name. (Refer to *Section 7.2.18.*)

1. Prepare diluent.

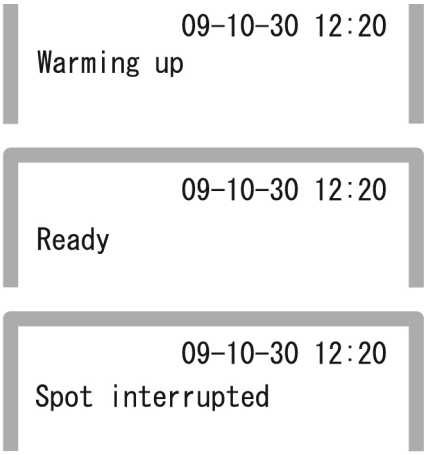
   Pour required amount of diluent into the specified tube.

NOTE: Pour diluent at least 0.5 ml into 1.5 ml PLAIN TUBE.

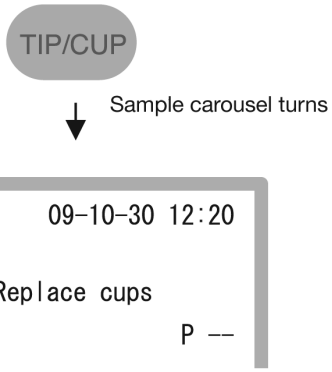
NOTE:

- DL: DRI-CHEM DILUENT DL (CRP): Not used on Heska analyzers.
- Water: Distilled water—used for all Heska slides.
- NSS: Normal Saline Solution

2. Make sure that [Warming up], [Ready] or [Spot interrupted] is displayed on the LCD (the analyzer is not in the process of sampling).



3. Press **TIP/CUP**. The sample carousel turns the consumables facing to the operator side.



CAUTION

Do not touch the sample carousel before it completely stops.

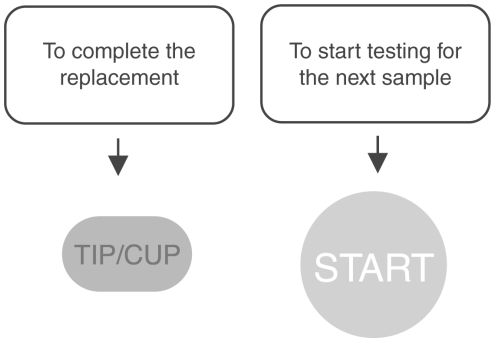
4. Place the tube containing diluent in the sample carousel in accordance with the instruction of the diluent name label.

IMPORTANT

Be sure to set diluent into the correct position in accordance with the diluent name label.

5. Press **TIP/CUP** to complete the replacement mode. The sample carousel turns.

NOTE: Instead of completing the replacement by using the **TIP/CUP** key, pressing **START** can start testing.



4.3.4 Replacing Reference Fluid

WARNING

Do not replace the reference fluid during sample processing. It is unsafe to do so during the sampling process due to moving parts. Make sure that [Warming up], [Ready] or [Spot interrupted] is displayed on the LCD (the analyzer is not in process of sampling). Press STOP to stop sampling if necessary. (Refer to *Section 4.12*.)

IMPORTANT

Use PLAIN TUBE (0.5 ml or 1.5 ml) for the reference fluid. Do not use non-specified tubes to avoid measurement errors and analyzer damage. To designate tubes to be used, perform Mode 84 setting. (Refer to *Section 7.2.27*.) (Mode 84). The analyzer is programmed at the factory to use 1.5 ml tubes.

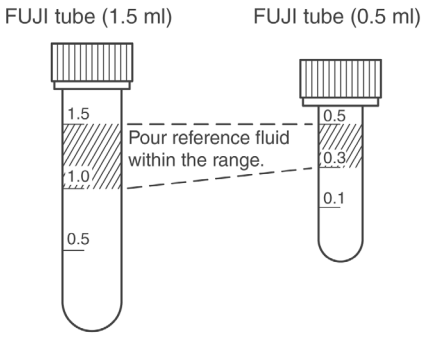
IMPORTANT

When using PLAIN TUBE (1.5 ml), replace reference fluid together with the tube within 12 hours. When using PLAIN TUBE (0.5 ml), replace reference fluid together with the tube for each test.

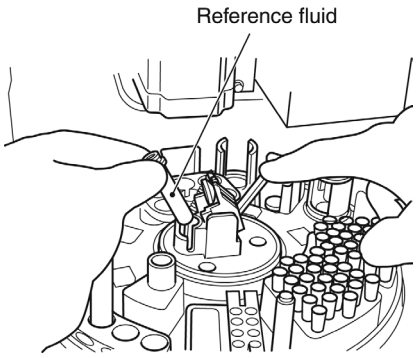
1. Prepare reference fluid.

   Pour the designated amount of reference fluid into each tube as follows:
   - For 1.5 ml tube: At least 1.0 ml.
   - For 0.5 ml tube: At least 0.3 ml.

NOTE: Use reference fluid after it reaches room temperature.



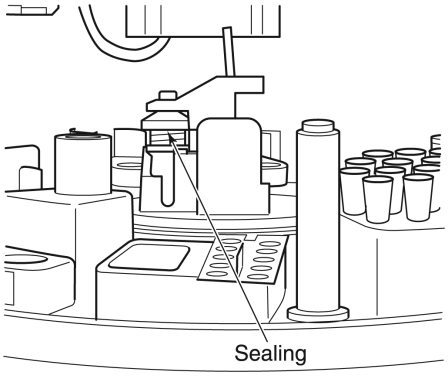
2. Replace reference fluid with a new tube containing new reference fluid.



IMPORTANT

Clean the cap of the reference fluid with distilled water every time when replacing reference fluid. (Refer to *Section 5.8.*)

NOTE: Make sure to get the lid on the tube of reference fluid securely.



4.4 Operations

4.4.1 Operations Flow

Following are the basic operations. For details, refer to each section.

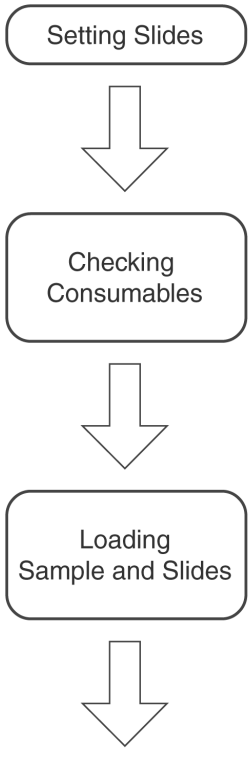
NOTE: If the analyzer has not been used for 20 minutes, the light source lamp is turned off according to the default setting. (Refer to *Section 4.4.5.*)

Slide preparations

Remove the slides from the refrigerator and allow them to stand for at least five minutes so that they can reach room temperature. Then unwrap slide packages.

Tip Setting..... *Section 4.3.1*
Mixing Cup Setting..... *Section 4.3.2*
Diluent Setting..... *Section 4.3.3*
Reference fluid Setting..... *Section 4.3.4*

Slide Setting..... *Section 4.5*
Sample Setting..... *Section 4.6*



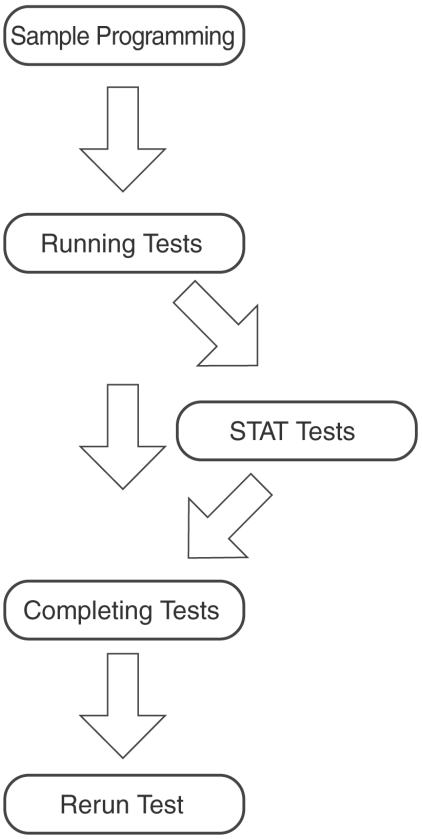
Sample Type Selection.....*Section 4.4.4*
Sequence No. Input.....*Section 4.4.4, 4.7.2*
Sample ID Input.....*Section 4.4.4, 4.7.2*
Dilution Factor Setting .....*Section 4.8*

*Using the WORK LIST key.....*Section 4.4.3*
LCD Indication during Testing .....*Section 4.13*
S

TAT Tests .....*Section 4.12.1*

Test Results (Printer/LCD).....*Section 4.13, 4.14*

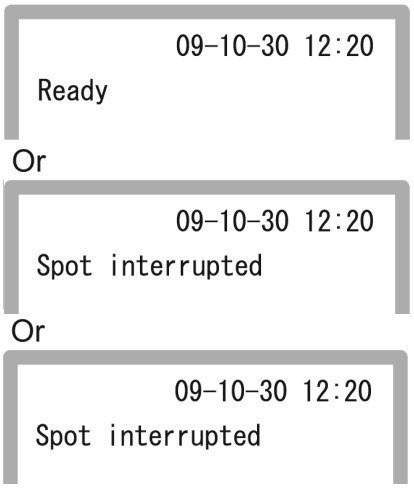
Rerun Tests .....*Section 4.10*



4.4.2 Basic Operations

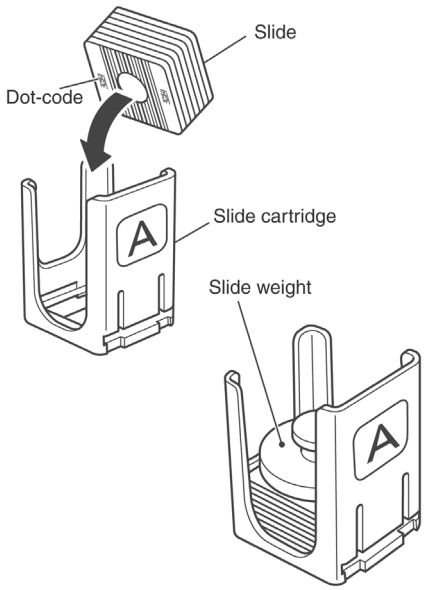
1. Make sure that [Ready] or [Spot interrupted] is displayed on the LCD (the analyzer is not in the process of sampling). To stop sampling, press **STOP**. (Refer to *Section 4.11*.)

NOTE: During sampling, a new sample cannot be set in the analyzer.

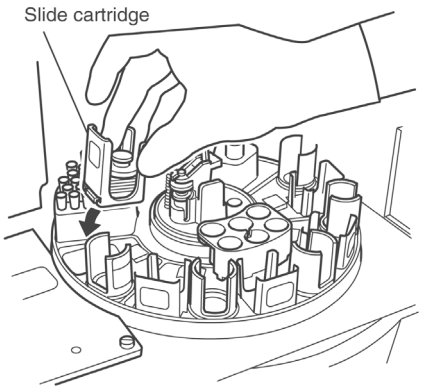


2. Open the sampler cover.
3. Place slides to be tested, dot-code surface down, in the slide cartridge. Be sure to put the slide weight on top of the stacked slides.

NOTE: There is a setting direction rule to set ISE slides. (Refer to *Section 4.5*.)

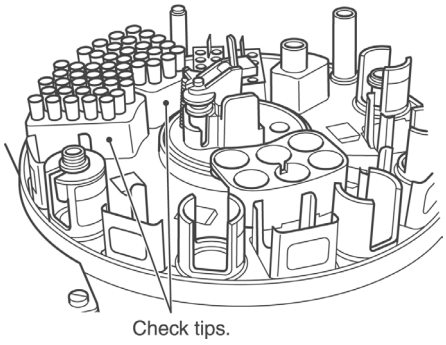


4. Put the slide cartridge properly on the slide set position.



5. Check the tip rack has enough tips.

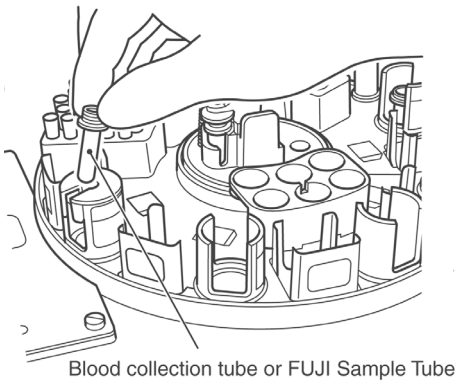
NOTE: Set enough tips for test samples. (Refer to *Section 4.3.1* for tip setting.)



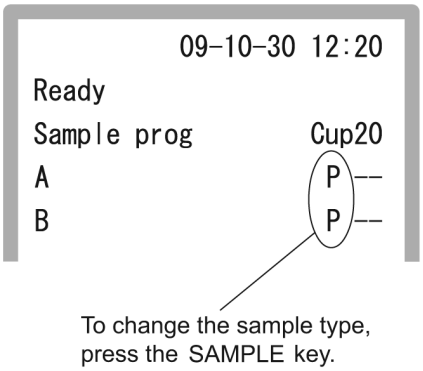
6. Remove the cap from the blood collection tube or sample tube which contains sample. Put the tube into the specified sample rack.

NOTE: To avoid an error, make sure there are no bubbles in the sample. Use a centrifuge to remove bubbles.

NOTE: To avoid a suction error and analyzer damage, use sample tubes that match the name label placed on the sample rack.



7. Check the sample type. Use SAMPLE to select P. The U, E and W indicators are not usable with Heska's current slide selection.



IMPORTANT

The sample type, the slide's sample type and the sample type setting of the DRI-CHEM 7000 Analyzer must be same. Otherwise, the wrong test result will be obtained.

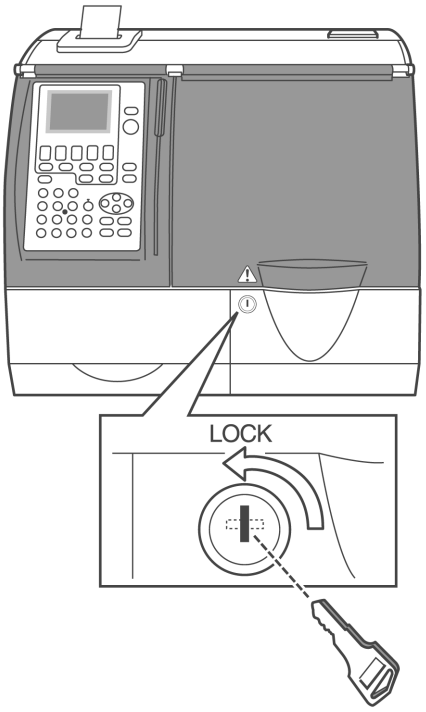
8. Close the sampler cover.

(SAMPLE TYPE)

9. Lock the sampler cover.

WARNING

During sample processing, ensure the sampler cover is closed to prevent injuries and biohazard. When the display reads [Ready], the sampler cover can be opened.



10. Press **START** to start testing. The color of the Sample keys changes to orange and blinks during sampling process.

Press the START key to start testing.

IMPORTANT

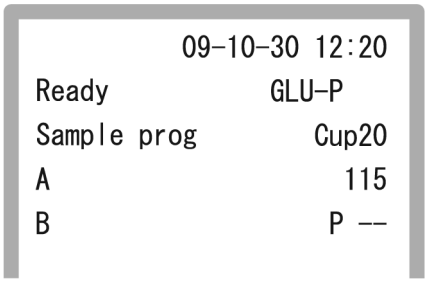
The keyboard and disposal box must remain closed during testing. Otherwise, the results may be affected by opening them.

NOTE: When starting tests, the analyzer automatically checks for sample racks and slides.

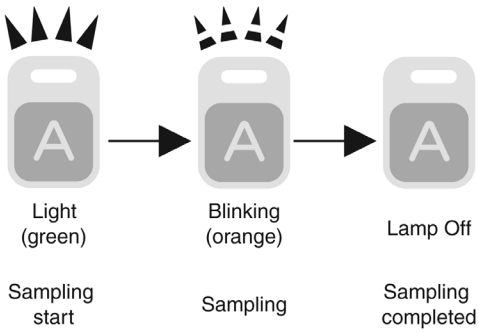
NOTE: The analyzer performs testing for all samples, as long as the analyzer properly detects sample racks and slides in pairs, even if there has been no sample ID programming.

11. When all the Sample key lights are turned off, the analyzer is ready to test new samples.

NOTE: On the LCD message of [READY (*)], (*) in the parentheses indicates the number of empty incubator cells. After the tests are completed, the results are printed out in the order that the slides were stacked in the cartridge.



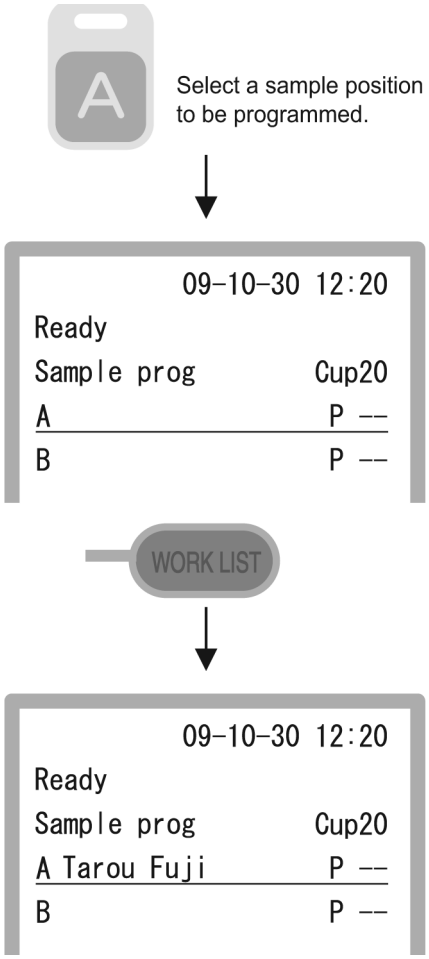
12. After the tests are completed, unlock the sampler cover to open.
13. Remove the remaining samples.



4.4.3 Using the WORK LIST key

If the device is connected to PIMS, you can obtain patient IDs and test requests by pressing **WORK LIST** before performing tests.

1. Press **DISK POSITION** for the sample you intend to test.



2. Press **WORK LIST**. The device will receive a work list (a list of patients and the samples to be tested) for the next ten samples from PIMS and display the first record.

NOTE: If there are no test requests, a buzzer will sound and a message will be displayed.

NOTE: Use the cursor keys (▲▼) to display other work lists.

NOTE: Pressing cursor keys (▼) when the last record is shown displays the record for the next sample number.

NOTE: To reacquire all records, press cursor keys (▲) when the first record is displayed.

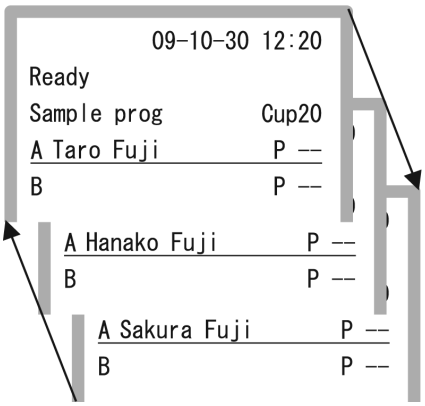
NOTE: If there are no test requests, a buzzer will sound and a message will be displayed.

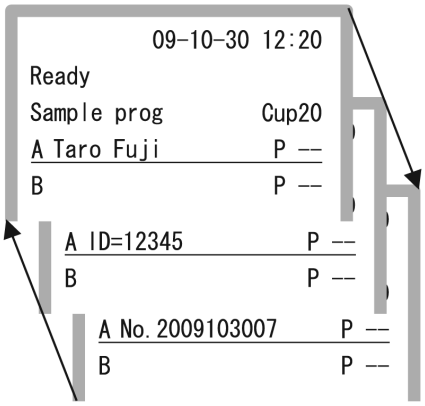
NOTE: Use the cursor keys (▲▼) to display other work lists.

NOTE: Pressing cursor keys (▼) when the last record is shown displays the record for the next sample number.

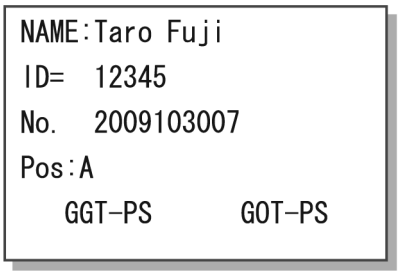
NOTE: To reacquire all records, press cursor keys (▲) when the first record is displayed.

NOTE: Each record contains the patient name, patient ID, and sample ID. Use the cursor keys (◄ ►) to choose the information displayed. Fields that have been left blank will not be displayed.

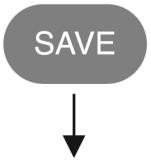




3. Press **PRINT**. The device will request detailed data on the current sample from PIMS and print the names of the requested tests.



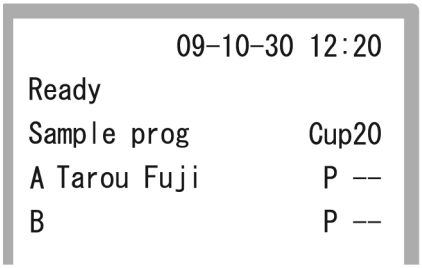
4. Press **SAVE**. To save the test requests. The device will receive a work list (a list of patients and the samples to be tested) for the next ten samples from PIMS and display the first record.



NOTE: The DILUTION, SAMPLE, and RERUN keys are enabled until SAVE is pressed.

NOTE: If you press RERUN before pressing SAVE, the disk position (A–E) will be highlighted. Do not assign sample IDs or sequence numbers that have already been used.

5. Start the test. (Refer to *Section 4.4.2*.)



4.4.4 Programming Test Factors

The following test factors can be programmed:

Programming sequence No. and sample ID for each sample	Refer to number 1. of this section and *Section 4.7, Inputting Sample ID*
Programming dilution factors for each sample	Refer to *Section 4.8, Dilution Tests*
Programming dilution factors for each test	Refer to Section 4.8, *Dilution Tests*
Rerun tests	Refer to *Section 4.10, Rerun Test*
Inputting reference intervals for each test	Refer to *Section 7.2.15, Mode 39*
Inputting correlation coefficients for each test	Refer to *Section 7.2.12, Mode 36*

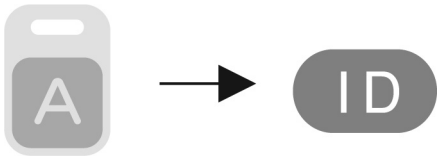
This section explains 2 basic examples as follows:

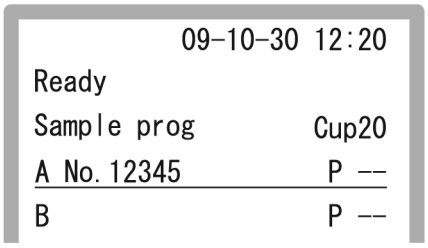
1. Programming sequence No., sample ID and reference intervals.
2. Programming rerun tests that require dilution.

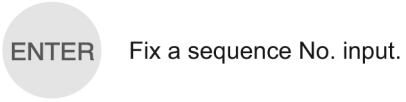
1. Programming sequence No., sample ID and reference intervals.

   Example: Sample A will be assigned a sequence No. of 12345, a sample ID of 100, and a reference interval of "Dog"

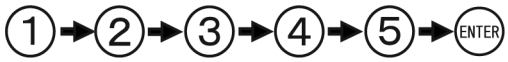
   a. Press Sample key **A**.
   An underline appears for Sample A on the LCD.
   b. Press **ID**.



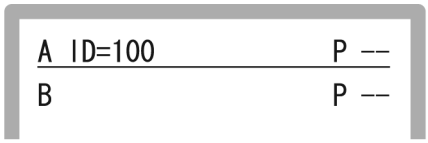


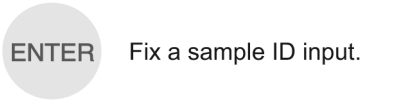


   c. Input a sequence number. Press **ENTER.**

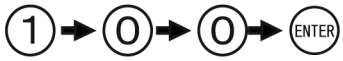


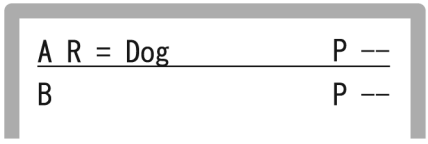
NOTE: The factory default setting does not show sequence number. To turn on use Mode 27.



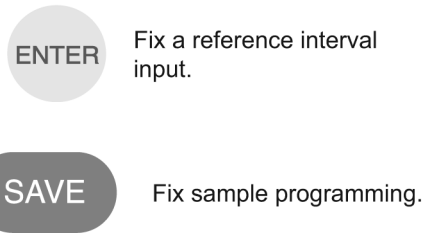


   d. Input a sample ID. Press **ENTER**.





e. Select a reference interval. Use the cursor keys (▲▼) to highlight Dog and press **ENTER.**



NOTE: The reference intervals are named using Mode 86.

f. Check the input information. Press **SAVE** to accept. Sample indicator A turns on green.

NOTE: To confirm the reference intervals, press cursor (◄ ►).

NOTE: A maximum of 13 characters can be input for a sample ID. (Refer to *Section 4.7.*)

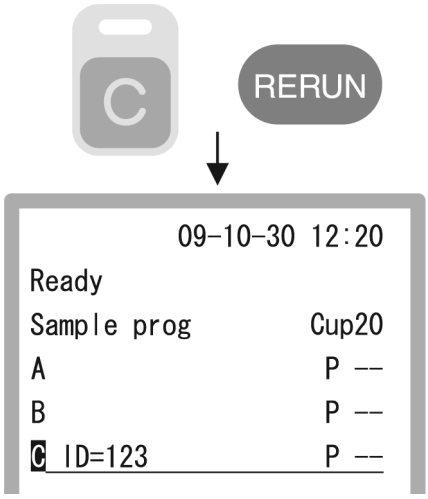
NOTE: In case of no sample ID input, sequence numbers and reference intervals will be printed along with test results.

g. Press **START** to start testing in the same way as the basic operations. (Refer to *Section 4.4.2.*)

2. Programming rerun tests that require dilution.

Example: To rerun Sample C with 5 times dilution:

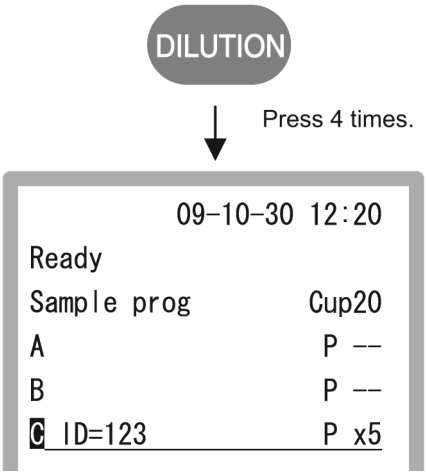
a. Press Sample key **C**, followed by **RERUN**.



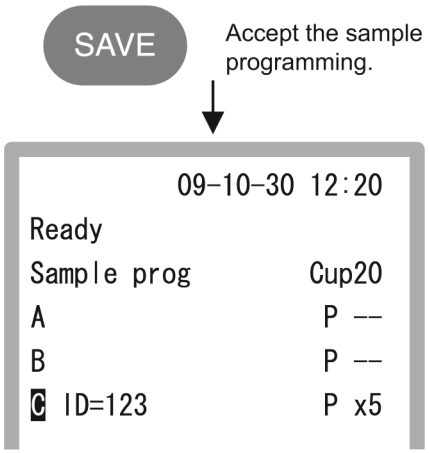
NOTE: The LCD indicates the latest sample's sequence number or sample ID which was measured at Sample C position. Press ID to edit the information if necessary.

NOTE: The sample position on the LCD changes to the reversed character for the sample that is programmed to rerun.

b. Press **DILUTION** to set a dilution factor. Each time DILUTION is pressed, the dilution factor changes in the following order.
[2] => [3] => [4] => [5] => [10] => [1] => [DS] =>[--]



c. Press **SAVE** to accept the sample programming for Sample C.



d. Press **START** to start testing in the same way as the basic operations. (Refer to *Section 4.4.2*.)

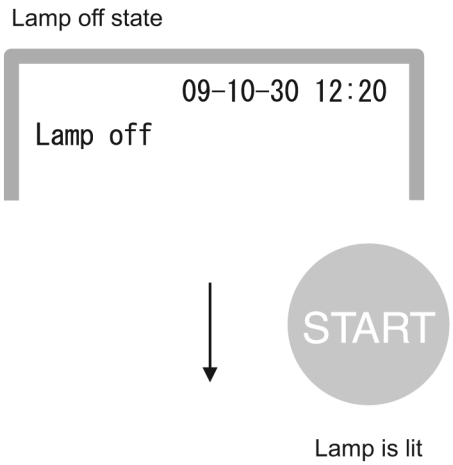
4.4.5 Lamp Off and Automatic Test Start

If the analyzer is not used for 20 minutes (programmed time using Mode 44) while [Ready] is indicated on the LCD, the light source lamp is turned off to save lamp life. At this stage, the message indicates [Lamp off]. Automatic test start can be reserved after the lamp turns back on.

How to cancel "lamp off"

Press **START**.

The analyzer indicates [Warming up] on the LCD and indicates [Ready] when the analyzer is ready. By pressing the Sample keys, the lamp can be turned on.

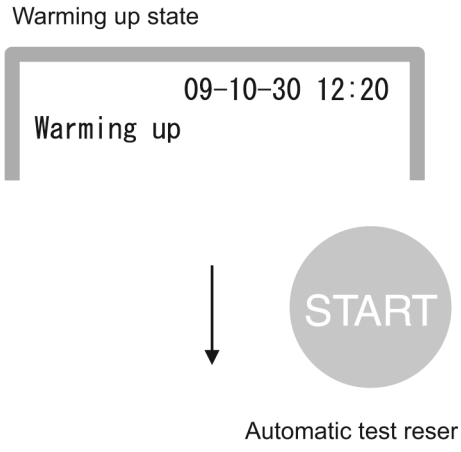


How to reserve "automatic test start"

1. Programming test factors for each sample.

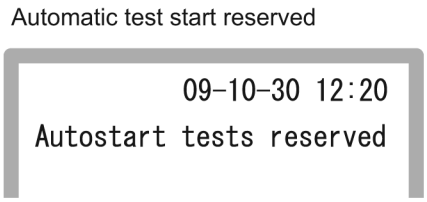
   Press **SAMPLE** first. Input sample types, dilution factors, and sample IDs. Press **SAVE**. Skip this step if not necessary.

Press **START.**



The LCD indicates [Tests reserved], and the analyzer is set to start automatically when the analyzer is ready.

NOTE: To cancel the automatic test start, press **STOP**.



4.5 Setting Slides

IMPORTANT

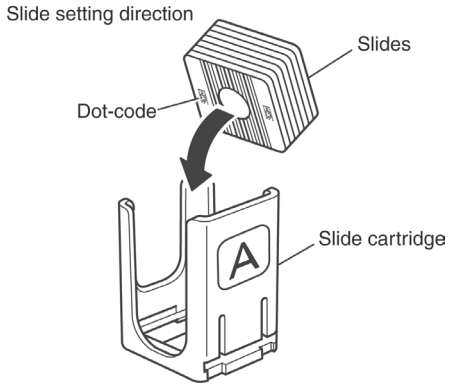
After the individual package has been unwrapped, the slide should be used within 30 minutes.

CAUTION

Do not set slides while the Sample indicators are blinking orange (sampling in progress).

4.5.1 Slide Direction

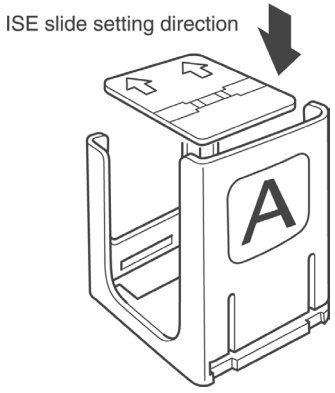
1. Make sure [Warming up], [Ready] or [Spot interrupted] is displayed on the LCD (the analyzer is not in process of sampling). Press STOP to stop sampling if necessary. (Refer to *Section 4.12.*)



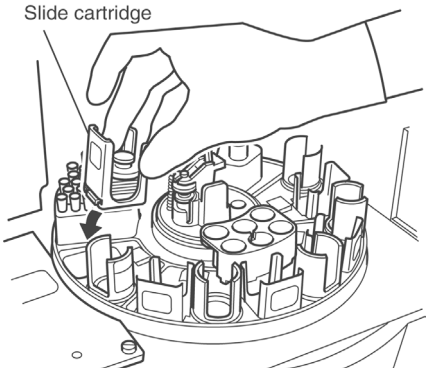
2. Remove a slide cartridge from the sample carousel.

3. Place slides to be tested, dot-code surface down, in the slide cartridge. Be sure to put the slide weight on top of the stacked slides.

NOTE: To place an ISE slide, the arrows must face up and point away from the label of the cartridge *(e.g.*, "A") as shown in the figure.



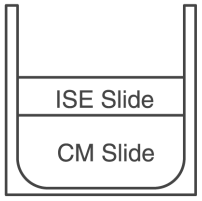
4. Set the slide cartridge with the label facing the outside of the sample carousel.



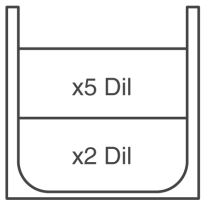
4.5.2 Slide Stacking Rules

NOTE: Any slide stacking order can be measured. However, the following recommended slide stacking rules will minimize tip and mixing cup use.

1. To test CM and ISE slide: Always put an ISE slide last. If an ISE slide is measured first, it will take longer for testing. If an ISE slide is measured between CM slides, an extra tip will be used.



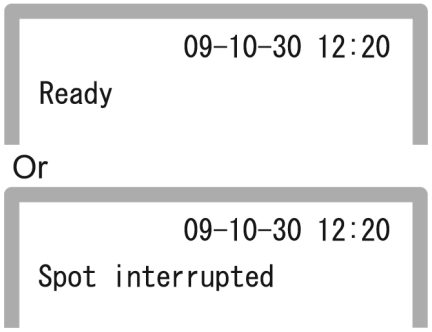
2. To test CM slides that require dilution: If each slide is programmed at different dilution rates, continuously stack slides which are programmed with the same dilution factor. Otherwise, extra tips and mixing cups will be used.



NOTE: If all stacked CM slides are programmed with the same dilution factor, no stacking rules are required.

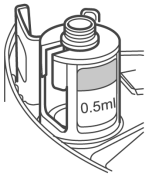
4.6 Setting Samples

1. Make sure [Ready] or [Spot interrupted] is displayed on the LCD (the analyzer is not in the process of sampling). Press **STOP** to stop sampling if necessary. (Refer to *Section 4.12*.)
2. Place the required amount of sample in the test tube (within the measurable range).



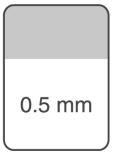
NOTE: To avoid an error, make sure there are no bubbles in the sample. Use a centrifuge to remove bubbles.

3. Make sure the sample rack type matches the sample tube.



NOTE: Using a sample tube different from the tube designated on the sample rack label can cause a suction error or analyzer damage. Refer to *Section 4.2.3* for sample rack types.

4. Remove the cap from the sample tube. Put the tube into the specified sample rack.



IMPORTANT

Make sure that the sample loading position is correct, referring to the sample ID or the sequence No. displayed on the LCD.

4.7 Inputting Sample ID

4.7.1 Usable Letters for Sample ID

Numbers and letters can be used for inputting ID. A maximum of 13 characters can be input for a sample ID.

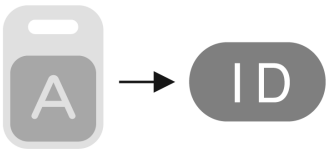
Operation Key	Numerical Input	Alphabetical Input
1	1	
2	2	ABC abc
3	3	DEF def
4	4	GHI ghi
5	5	JKL jkl
6	6	MNO mno
7	7	PQRS pqrs
8	8	TUV tuv
9	9	WXYZ wxyz
10	10	#?
.	.	.

NOTE: A blank space can be input using the ▶ key.

4.7.2 Input Procedures

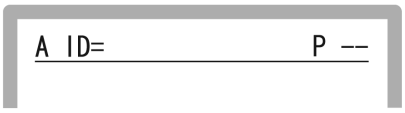
Press a Sample key **A–E** to select a sample position for programming. Press ID to enter the sample ID input mode ([ID=] on the LCD). Input a sample ID as follows.

NOTE: If inputting sequence number ID is necessary, the input dialog can be changed by using Mode 27. (Refer to *Section 7.2.8.*)

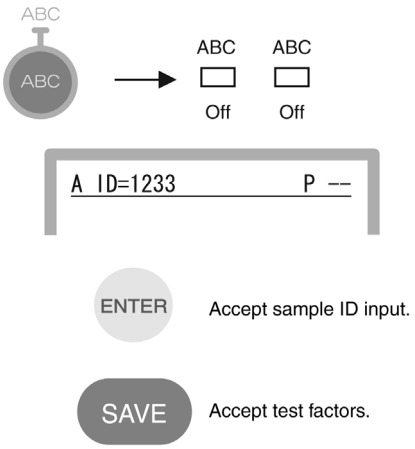


Skip the sequence No. input mode.

Sample ID input mode



NOTE: The cursor moves from side to side each time the ◄ or ► key is pressed.



1. Inputting numbers.

   Example: Inputting "1233"

   a. Press **ABC** to turn off the ABC indicator.
   b. Press numeric keys as follows.

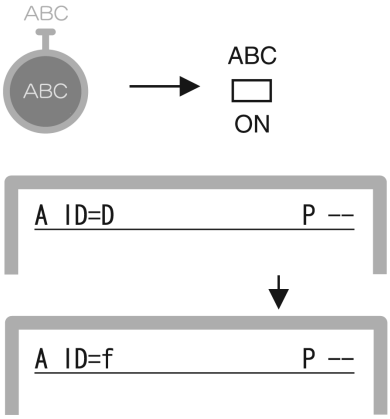
      ①→②→③→③

   c. Press **ENTER** to terminate the input dialog.
   d. Press **SAVE** after checking the ID. The Sample indicator turns green.

2. Inputting letters.

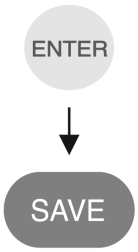
   Example: Inputting an "f"

   a. Press **ABC** to light the ABC indicator.
   b. Press the Numeric **3** (DEF) key. "D" appears first.
   c. Press the **3** (DEF) key again until "f" appears.
      (D => E => F => d => e => f).
   d. Press ► to move the cursor to the next position.



NOTE: In the case that the next letter to be input is on another key, another letter will appear on the LCD without pressing ►.

   e. After the sample ID input is completed, press **ENTER**.
   f. Press **SAVE** after checking data entry. The Sample indicator turns to green.



4.8 Dilution Tests

There are 2 ways to perform dilution tests as follows:

1. One is using Mode 45 to preset dilution factors for each slide code and each sample type. The analyzer automatically starts tests that require dilution according to Mode 45 settings. (Refer to *Section 7.2.18, Mode 45*.)
2. Another is using DILUTION to set a dilution factor for each sample. The analyzer performs tests that require dilution for all stacked slide in the cartridge. Using DILUTION is explained in this section.

IMPORTANT

If diluting a plasma or serum sample more than 10 fold, bubbles may appear in the sample in the tip. In this case, press STOP to terminate the tests and perform the tests that require dilution from the beginning.

NOTE: The test results are multiplied by the dilution factor before printing; no recalculation will be necessary.

NOTE: The maximum number of dilution tests for one mixing cup is 3. If there is not enough diluted sample in the well for the test, the analyzer automatically dilutes using another well.

NOTE: Do not dilute whole blood samples.

NOTE: If "Pr" is selected by using DILUTION dilution factors (factors by Mode 45 and default factors by the manufacturer) will be ignored and tested without dilution. (Pr: Diluted Sample)

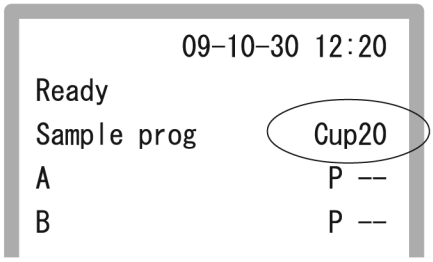
NOTE: Setting positions of diluent are preset in Mode 45.

Example of dilution tests

To dilute Sample A 2 times, Sample B 3 times, Sample C 5 times:

1. Prepare the samples and consumables. Check remaining tips and diluent volume. Place slides to be tested.

   Check the number of remaining wells of mixing cups. If necessary, press **TIP/CUP** to replace. (Refer to *Section 4.3*.)



2. To set diluent factor for Sample A to 2:
   a. Press Sample **A**.
   b. Press **DILUTION** once. (1 => 2)

NOTE: Each time DILUTION is pressed, the dilution factor changes in the following order:

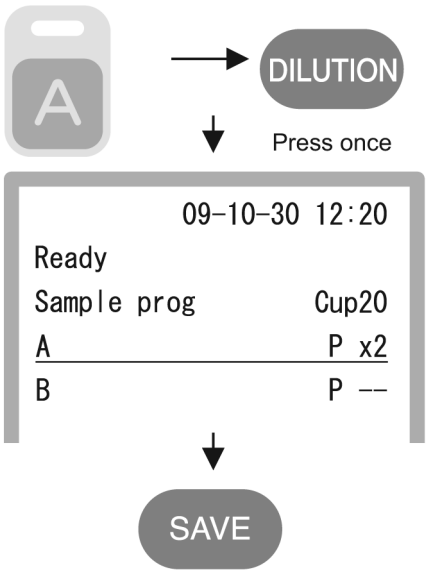
[2] => [3] => [4] => [5] => [10] => [1] => [Pr] => [--]

(Pr: Diluted Sample)

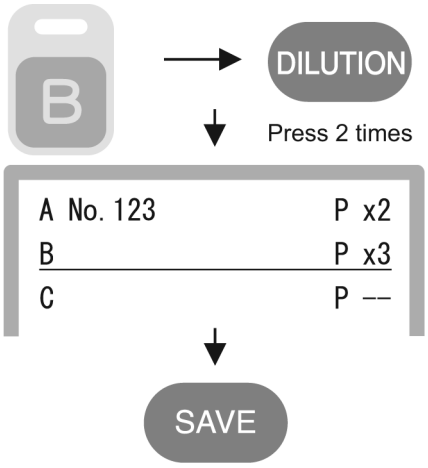
NOTE: When selecting [--], dilution factors set by the DILUTION key are ignored, and preset dilution factors by Mode 45 will be adopted.

NOTE: When selecting [Pr], preset dilution factors by Mode 45 and default factors by the manufacturer will be ignored and measured without dilution.

   c. Press **SAVE**.

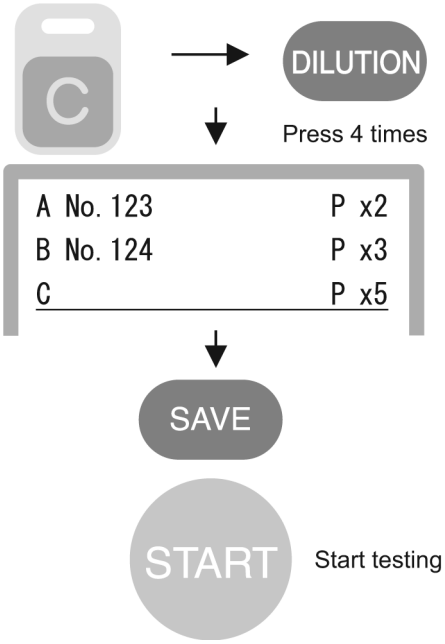


3. To set diluent factor for Sample B to 3:
   a. Press Sample **B**.
   b. Press **DILUTION** 2 times.
      (2 => 3)



   c. Press **SAVE**.

4. To set diluent factor for Sample C to 5:
   a. Press Sample **C**.
   b. Press **DILUTION** 4 times.
      (2 => 3 => 4 => 5)

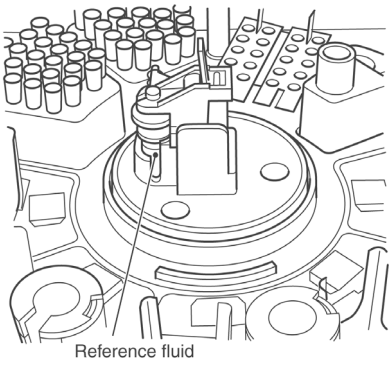


   c. Press S**AVE**.
5. Close the sampler cover.
6. Lock the sampler cover with the key.
7. Press **START** to start tests that require dilution.

4.9 ISE Tests

1. Preparing reference fluid.
   (Refer to *Section 4.3.4* for replacing reference fluid.)
2. Checking consumables.
   a. Check the remaining tips.

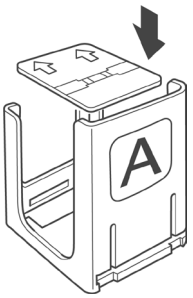
NOTE: Two tips per slide (one is for sample; another is for reference fluid) are necessary.

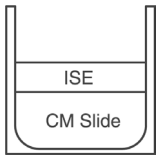


3. Setting samples and slides.

NOTE: Place an ISE slide, the arrow indications facing up and pointing opposite the sample label of the cartridge (*e.g.*, A) as shown in the figure.

NOTE: When performing ISE test and CM test at the same time, always stack ISE slide last in the cartridge.





4. Starting tests.

   Start ISE tests in the same way as the basic operations. (Refer to *Section 4.4.2.*)

4.10 Rerun Tests

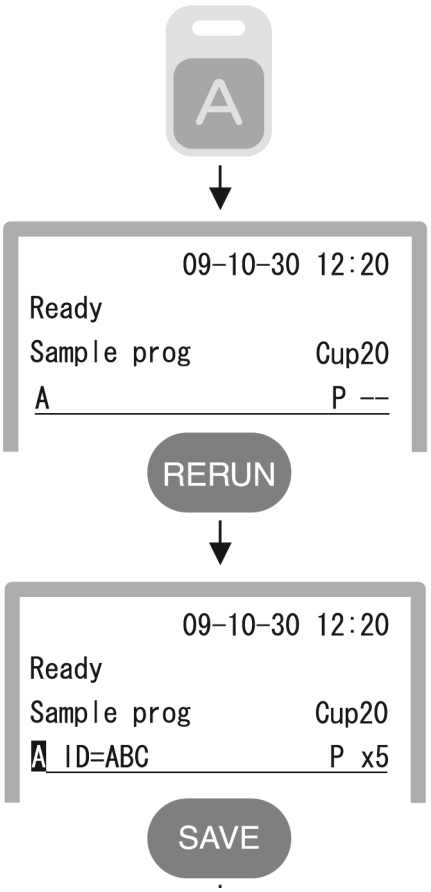
When rerunning tests on the previous sample, pressing RERUN will automatically enter the previous sample number, sample ID and reference interval. This feature is used if there were test errors on the previous run, if additional tests are desired for the same sample, or if dilution of the sample is needed to obtain results of tests that were out of range.

IMPORTANT

The function of RERUN is inputting the previous sequence No., sample ID and reference interval as the next test.

To rerun Sample A

1. Press Sample key **A** to rerun.



2. Press **RERUN**.

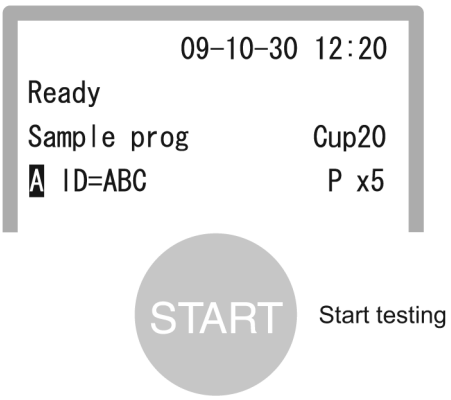
NOTE: For the sample which is programmed to rerun, the LCD indicates the sample position in reversed character.

NOTE: The LCD indicates the previous sequence number or sample ID that is tested for Sample A. Press **ID** to edit the information if necessary.

NOTE: When performing tests that require dilution, press **DIL** before pressing **SAVE** to program a dilution factor.

3. Press **SAVE** to accept test factors for Sample A.

4. Close the sampler cover.
5. Lock the sampler cover.
6. Press **START** to start rerun tests.



4.11 Interrupting Sampling and STAT Tests

To set consumables during sampling, press STOP to interrupt sampling. When the analyzer runs out of consumables during sampling, the analyzer automatically stops. At spot interrupted, TIP/CUP is active. By pressing STOP during the interrupted stage, the remaining test programming will be canceled. (The already spotted slides are finished and results reported.)

4.12 Interrupting Sampling and Canceling Programming

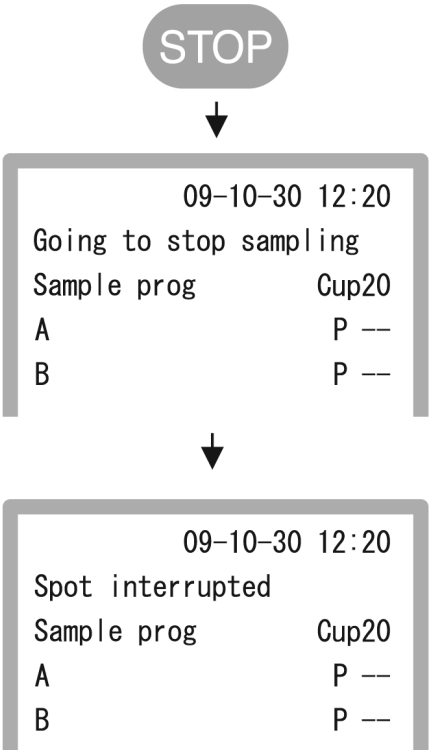
Example: How to interrupt sampling

1. Press **STOP**.

   The LCD indicates [Going to stop sampling]. After completing interruption, the LCD turns to [Spot interrupted]. The Sample indicator (A–E) for the interrupted sample will blink.

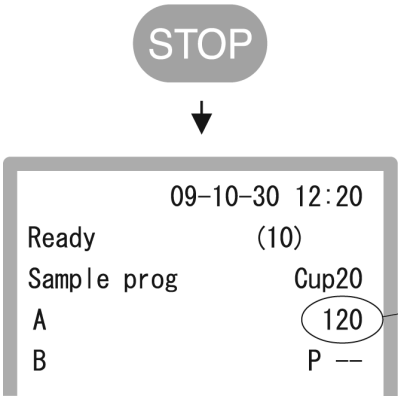
NOTE: When sampling is interrupted, the tip in use will be discarded.

NOTE: After interrupting, press **START** to restart.



2. By pressing **STOP** during interrupted stage, all remaining test programming will be canceled. The LCD turns to [Ready]. All the Sample indicators are turned off.

   Estimated time (sec.) to complete testing is indicated.



4.12.1 STAT Test Programming

The analyzer can be interrupted for STAT tests by pressing STAT. The STAT sample will be measured after the interrupted sample is spotted. STAT test programming can be ordered for only 1 sample.

Example: How to program STAT tests

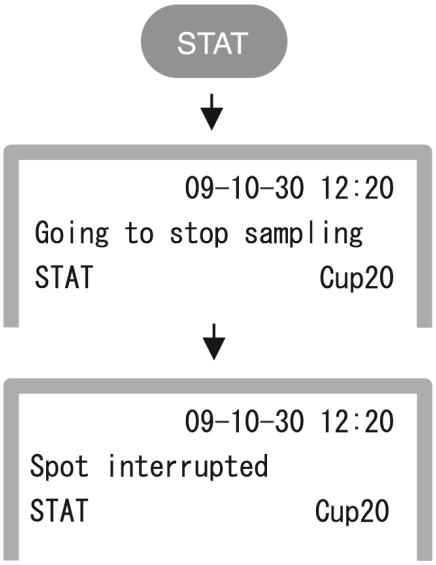
After setting samples for Sample A and Sample B and the analyzer is sampling Sample A; Sample C is programmed as a STAT test.

1. Press **STAT**.

   The LCD indicator changes to [Going to stop sampling].

   After completing interruption, the LCD turns to [Spot interrupted]. The Sample key (A–E) for the interrupted sample blinks.

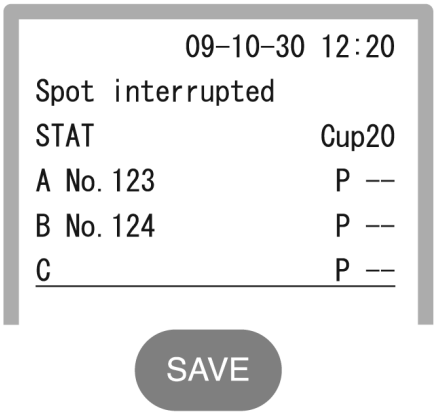
NOTE: In this case, Sample indicator A is blinking and Sample indicator B remains on.



2. Press Sample **C** to program the STAT sample.

3. Press **SAVE** to accept the programming for Sample C.

NOTE: The Sample indicator programmed as the STAT sample turns red.



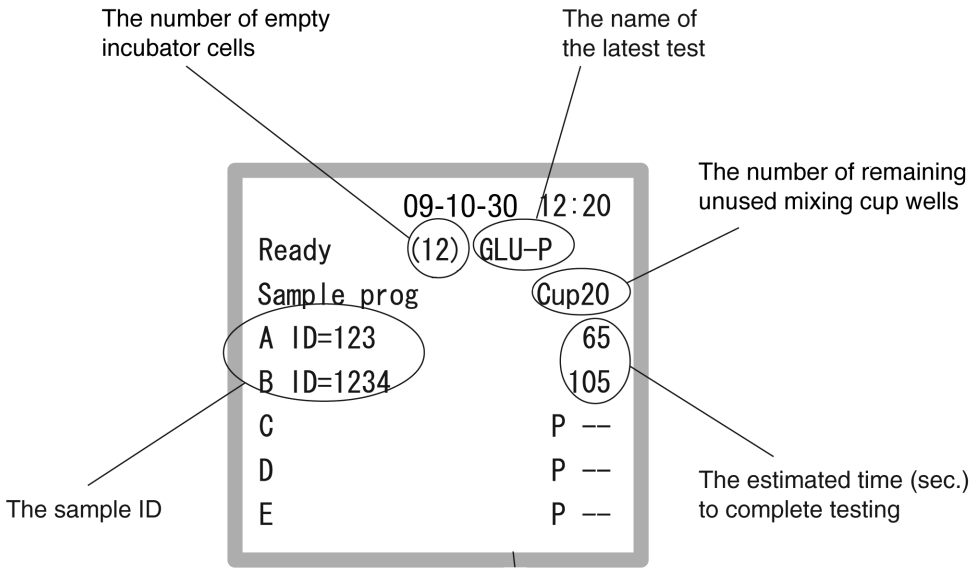
4. Press **START** to restart the tests in the same way as the basic operations. (Refer to *Section 4.4.2.*)

NOTE: In this case, the analyzer finishes Sample A first, then runs Sample C (the STAT sample). Testing order: A => C => B

4.13 Indications on the LCD During Tests

The LCD indicates operating conditions of the DRI-CHEM 7000 Analyzer and the sample information.

1. Examples of LCD indications during testing.

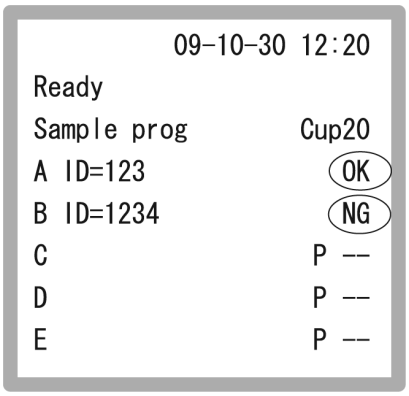


2. Examples of result indications after completing testing.

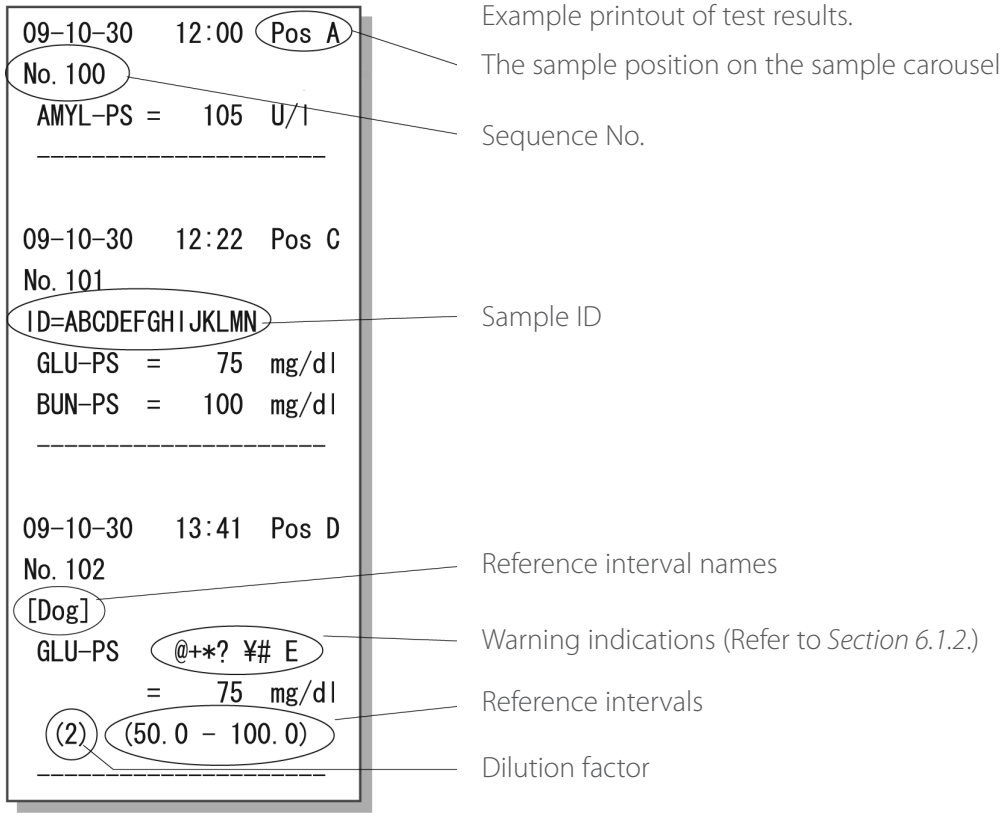
   This shows the tests for Sample A and Sample B are completed, but there were some problems for Sample B.

   OK: No error occurred

   NG: There were problems with the sample run: lack of consumables; sample shortage; analyzer errors; unspotted slides.



4.14 Result Printout Examples and Reprinting Procedures



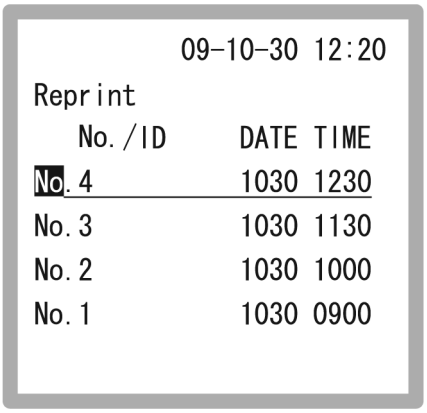
2. Reprinting procedures.

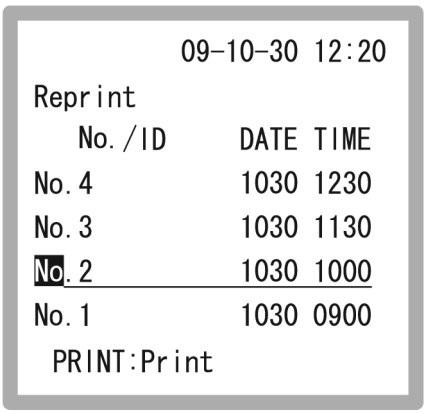
   Results for the last 50 samples measured without turning the analyzer off can be printed out as follows:

   a. Press **PRINT** after completing tests. The LCD indicates results which are able to be reprinted.

NOTE: Results older than the latest 50 samples or samples run before cycling power can be reprinted by using Mode 25.

   b. Select the data to be printed by using scroll keys (▲▼), then press **ENTER**.

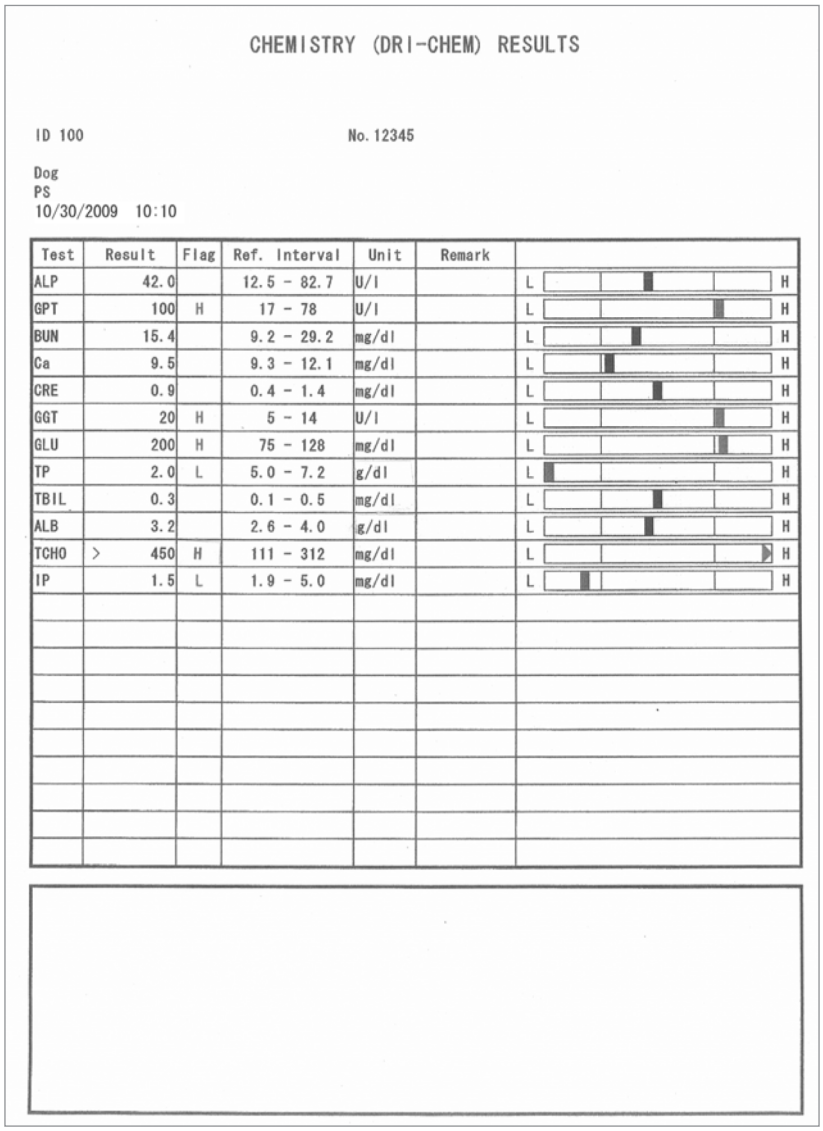




   c. Press **PRINT** to reprint.
   d. To stop printing, press **STOP**.

3. Print examples of test results.

   The test results can be printed when connected to the external printer. For questions or further information, please contact Heska's Technical Support Services for assistance.



CHEMISTRY (DRI-CHEM) RESULTS

ID 100 No. 12345

Dog
PS
10/30/2009 10:10

Test	Result	Flag	Ref. Interval	Unit	Remark	
ALP	42.0		12.5 - 82.7	U/l		L H
GPT	100	H	17 - 78	U/l		L H
BUN	15.4		9.2 - 29.2	mg/dl		L H
Ca	9.5		9.3 - 12.1	mg/dl		L H
CRE	0.9		0.4 - 1.4	mg/dl		L H
GGT	20	H	5 - 14	U/l		L H
GLU	200	H	75 - 128	mg/dl		L H
TP	2.0	L	5.0 - 7.2	g/dl		L H
TBIL	0.3		0.1 - 0.5	mg/dl		L H
ALB	3.2		2.6 - 4.0	g/dl		L H
TCHO	> 450	H	111 - 312	mg/dl		L H
IP	1.5	L	1.9 - 5.0	mg/dl		L H

4.15 Sample Barcode Reader

By using the sample barcode reader, the sample ID can be easily input. Prior to using the sample barcode reader, it is necessary to set the communicating configuration by using Mode 46. (Refer to *Section 7.2.19.*)

⚠ CAUTION

Only the sample barcode reader specified for the DRI-CHEM 7000 Analyzer can be used. Do not connect a barcode reader other than that specified for the DRI-CHEM 7000 Analyzer, or physical damage or fire may result.

IMPORTANT

Depending on the printing quality of barcode labels or malfunction of the sample barcode reader, wrong barcode data may be read. Make sure that the barcode data (sample ID) printed on the test results are correct.

NOTE: Please carefully read the instructions included with the sample barcode reader before using it. A maximum of 13 alphanumerical characters can be input for a sample ID. Always use the sample barcode reader below 3,000 cd/m^2 (lux), avoiding direct sunlight.

NOTE: Turn on the analyzer after connecting the sample barcode reader to the analyzer.

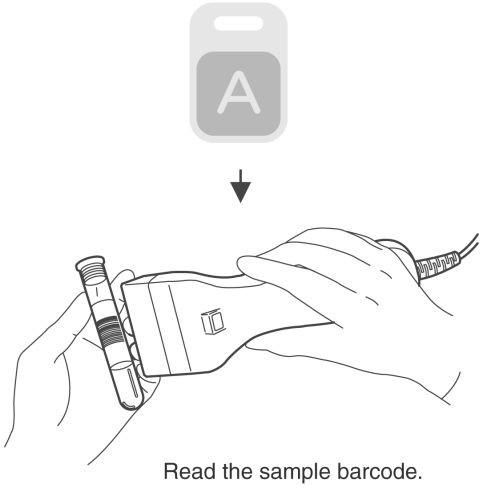
NOTE: The sample barcode reader is an optional accessory.

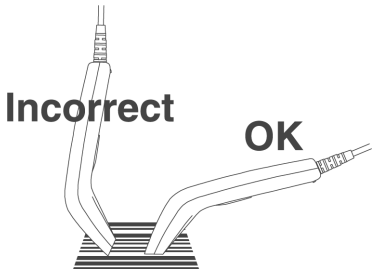
Operating procedures

(Automatic Mode)

1. First, press **SAMPLE POSITION** of the sample to be read.

   Second, read the barcode on the sample tube by using the sample barcode reader.





NOTE: Position the sample barcode reader properly facing the barcode label. Otherwise, a wrong reading may occur.

2. After completing the reading, a beep will be heard and the sample ID will be displayed on the LCD for the selected sample position (ID input completed).

NOTE: When re-inputting barcode by the barcode reader, press **SAMPLE POSITION** to be re-input first and re-read the barcode.

5.1 Periodic Maintenance

In order to keep the DRI-CHEM 7000 Analyzer performance at its best, periodic user maintenance and specific Heska service maintenance must be followed.

IMPORTANT

If the periodic maintenance in this manual is not followed, the analyzer's performance and specifications may degrade, and adverse effects on test results may occur.

IMPORTANT

Be sure to reassemble the parts removed for maintenance and tighten thumbscrews securely.

CAUTION

Refer to each section for information about usable solvents for cleaning. For questions or further information, please contact Heska's Technical Support Services for assistance, 800.464.3752, option 3.

CAUTION

Do not use alcohol for cleaning the sampler cover (translucent), or surface damage may occur.

NOTE: When cleaning the outer covers of the equipment, wipe with a soft cloth moistened with water.

User daily/periodic maintenance

The following table lists the periodic user maintenance.

Check Points	Once A Month	Replacement Interval	Procedure
Air filter	Once a month	-	Refer to *Section 5.2*
Incubator	Once every 3 months or when inaccurate test results occur	-	Refer to *Section 5.3*
Spotting part	When slide transfer error or tip ejection error, *etc.* occurs	-	Refer to *Section 5.3*
Recording paper	-	Appearance of red lines (both sides of paper)	Refer to *Section 5.4*
Light source lamp	-	When a photometer gain setting error occurs, or the lamp's cumulative illumination time exceeds 1000 hours.	Refer to *Section 5.5*
Sampler O-ring		Once a year	Refer to *Section 5.6*
Slide detecting part	When slide detecting errors occur frequently.	-	Refer to *Section 5.7*
ISE unit	Once every 3 months	-	Refer to *Section 5.3*
Reference fluid cap	When replacing reference fluid	Once every 3 months	Refer to *Section 5.8*

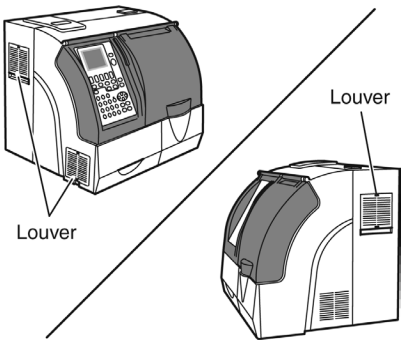
5.2 Cleaning the Air Filters

The air filters should be checked and cleaned once a month.

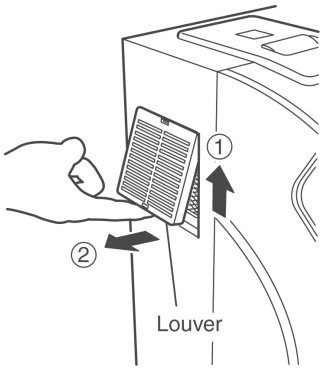
NOTE: Perform cleaning for all (3) filters.

Cleaning procedures

1. Turn off the analyzer power switch.

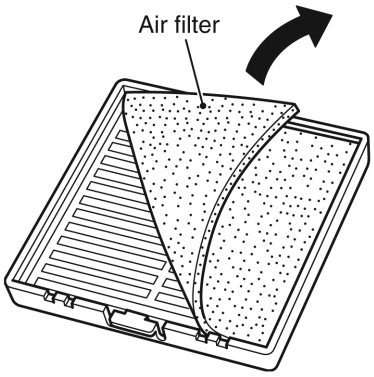


2. Remove all three louvers and pull out the air filter located inside of the louver. Lift the louver upward ▲ and then pull frontward ▼ to remove.



3. Remove dust adhering to the filter with a vacuum cleaner or running water.

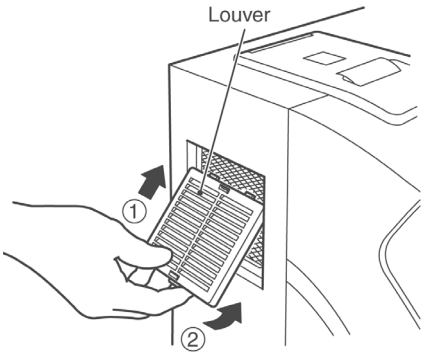
NOTE: If washing the filter with running water, make sure the filter is dried well before placing back into the analyzer.



4. Insert the filter into the louver and put the louver back on the analyzer. Lift up the louver ▲ and then push it toward the analyzer ▼.

IMPORTANT

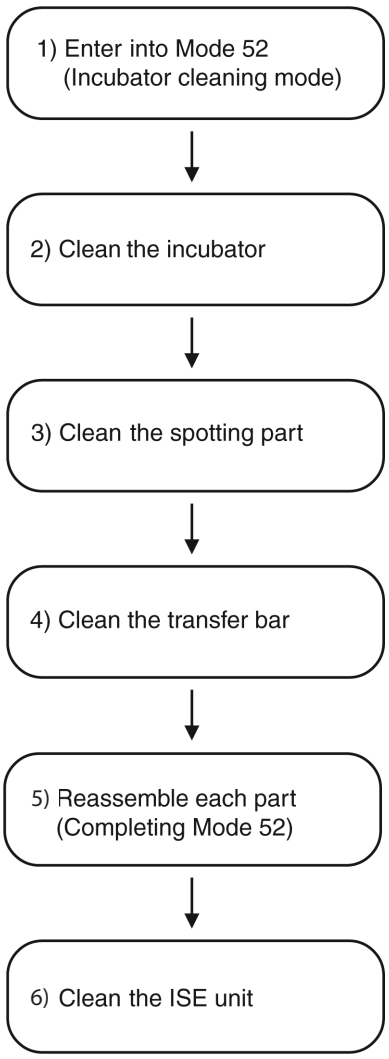
If the analyzer is used without the filter, adverse effects on test results may occur.



5.3 Cleaning the Incubator, Spotting Part, and ISE Unit

Test results are affected by dust or sample spills inside of the incubator and ISE unit. These parts should be checked and cleaned at least once every three months. When a slide transfer error or a tip ejecting error occurs, clean the spotting part.

Cleaning Procedures Flow



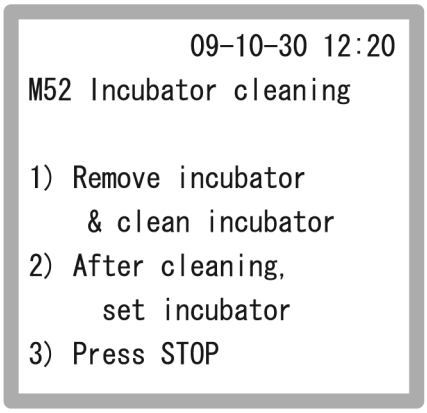
1. Entering the cleaning mode.
   a. Enter Mode 52.

NOTE: Refer to *Section 7.2.21, Mode 52*.

⚠ CAUTION

Make sure that the messages shown at left appear on the LCD before starting cleaning.

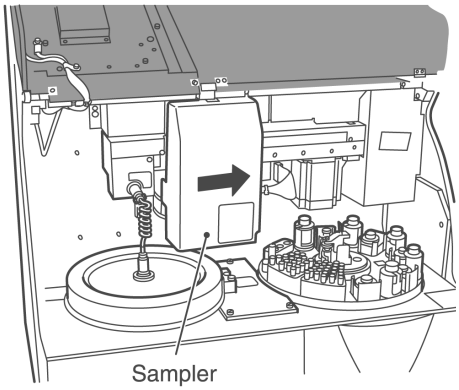
NOTE: Prior to pressing **STOP**, complete Steps 1–4 in this section.



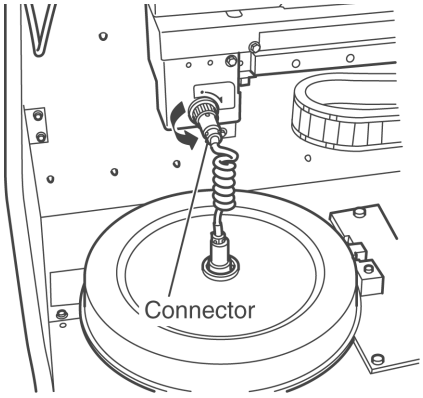
2. Cleaning the Incubator.

a. Open the sampler cover and the keypad. Move the sampler unit to the right.

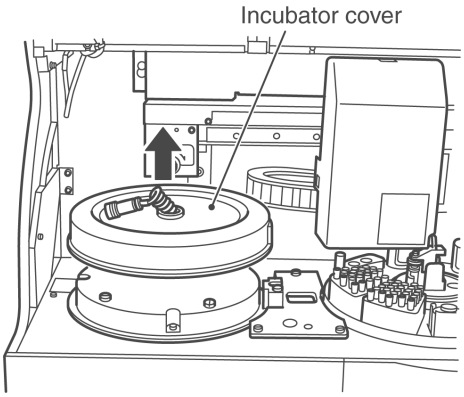
NOTE: Be careful not to open the reference fluid cap.



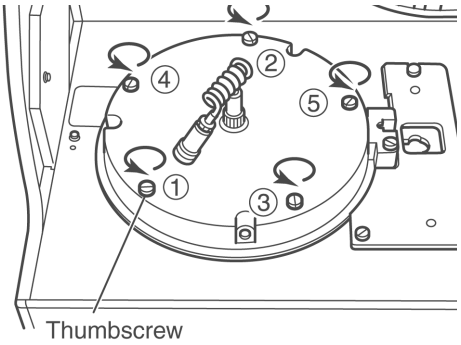
b. Unplug the connector of the incubator cable by turning it counterclockwise.



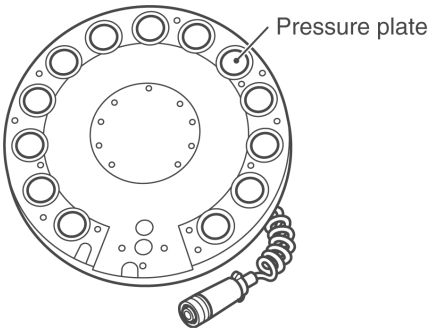
c. Lift the incubator cover to remove.



d. Unscrew the 5 screws on the upper incubator and remove the incubator.



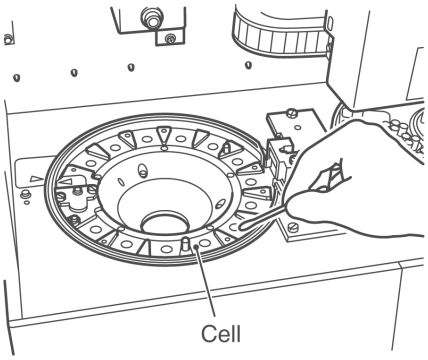
e. Wipe off the 13 pressure plates on the backside of the incubator with a soft gauze-like cloth or cotton swab moistened and tightly wrung out with sterilizing ethyl or isopropyl alcohol. Dry the pressure plates by facing the incubator backside (pressure plate surface) up.



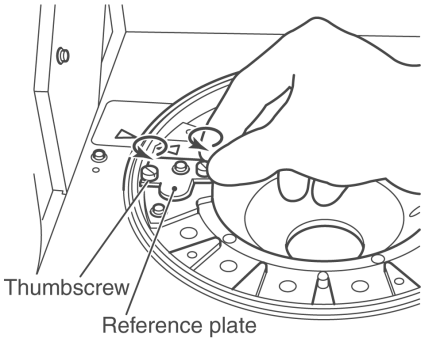
IMPORTANT

Do not touch the surface of the pressure plates with bare fingers. Otherwise, adverse effects on test results may occur.

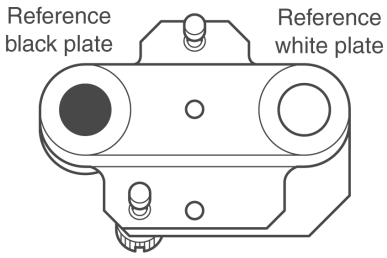
f. Clean the incubator cells in the same way.



g. Unscrew the 2 screws fastening the reference plate and remove the plate from the body.



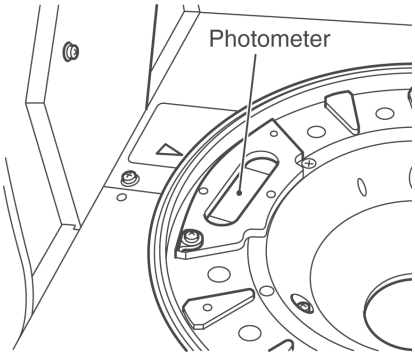
h. Turn over the reference plate and clean the white plate and the black plate with a dry cotton swab.



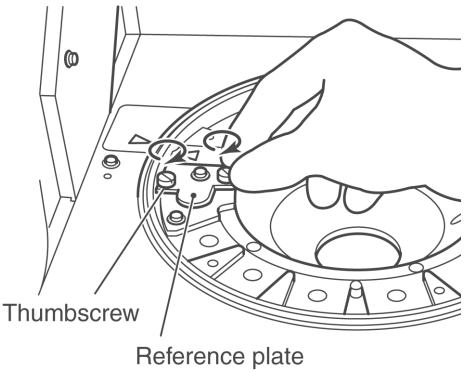
MPORTANT

Do not touch the surface of the black and white plates with bare fingers. Otherwise, adverse effects on test results may occur.

i. Clean the photometer head with a dry cotton swab.



j. Remount the reference plate. Align the arrow mark on the reference plate with the arrow mark on the analyzer. Screw the 2 thumbscrews evenly.

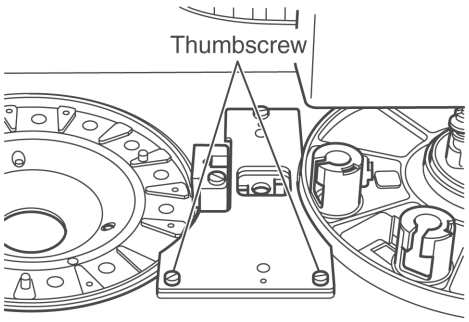


IMPORTANT

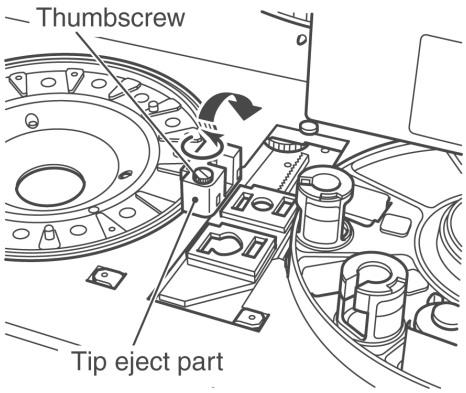
Tighten the two thumbscrews securely. Otherwise, adverse effects on test results may occur.

3. Cleaning the spotting part.

a. Unscrew the 2 thumbscrews and pull the spotting part cover frontward to remove.

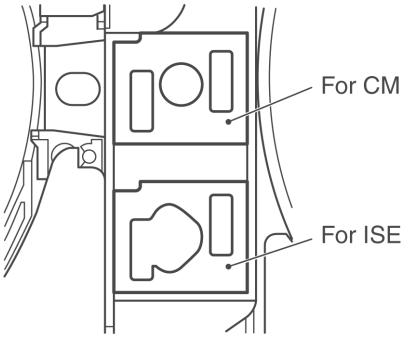


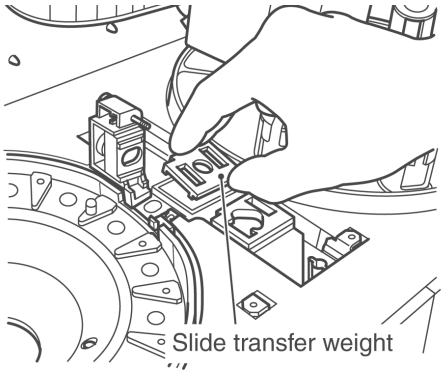
b. Unscrew the thumbscrew on the tip eject part and turn the tip eject part backward.



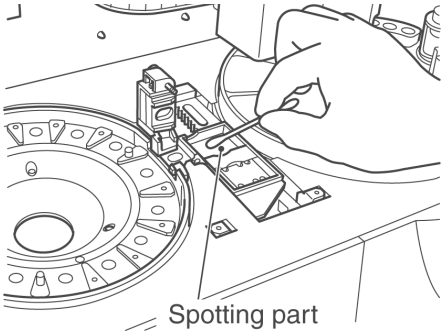
c. Remove the 2 slide transfer weights of the spotting part.

NOTE: There are 2 types of the slide transfer weight (for CM/ISE). Make sure to set properly when reassembling.





d. Wipe off the spotting part with soft gauze-like cloth or cotton swab moistened with water.

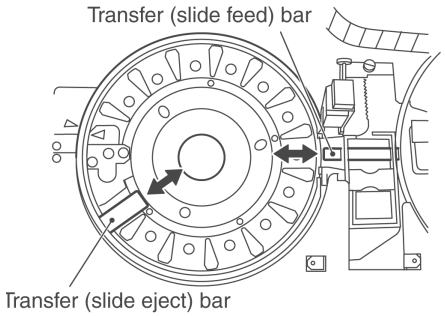


4. Cleaning the slide transfer bar (feed, eject).
   a. Press Sample **A**.

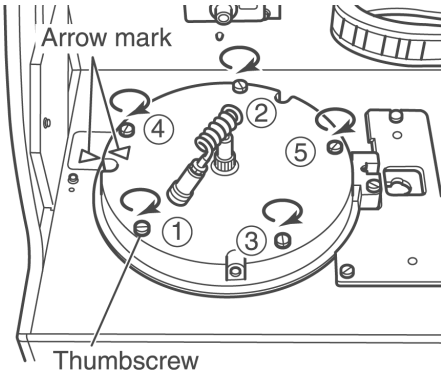
NOTE: By pressing Sample **A**, the incubator and the slide transfer bar moves.

   b. Wipe off the transfer bar with a soft gauze-like cloth or cotton swab moistened with water.
   c. After cleaning, press Sample **B**.

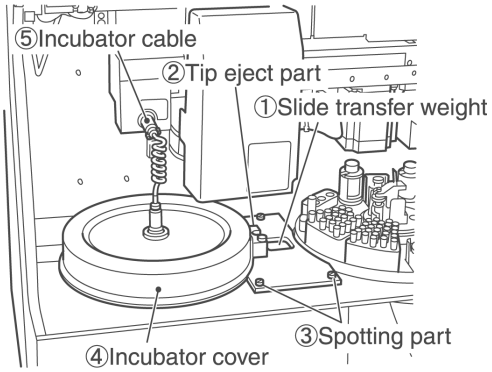
NOTE: By pressing Sample B, the incubator and the slide transfer bar moves to the home position.



5. Reassembling and completing cleaning mode.
   a. Reassemble the upper incubator.
   Align the arrow mark on the upper incubator with the arrow mark on the analyzer. Screw the 5 thumbscrews in the order (1 to 5) evenly.



   b. Close the tip eject part and screw the thumbscrew.
   c. Set the incubator cover.
   d. Plug the connector of the incubator cable to the analyzer and lock it by turning it clockwise.
   (Insert the connector to the socket by aligning the guide keys.)
   e. Close the left cover (keyboard).



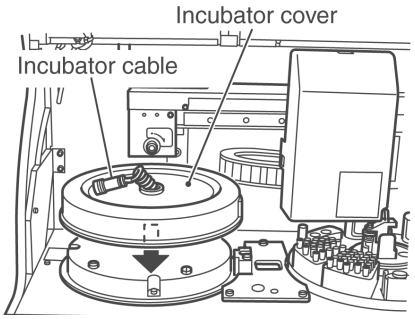
IMPORTANT

Tighten the five thumbscrews securely. Otherwise, adverse effects on test results may occur.

IMPORTANT

Be sure to set incubator cover. If the analyzer is used without setting the cover, adverse effects on test results may occur.

NOTE: To avoid stressing the cable, ensure that the incubator cable is not twisted. Otherwise, the cable will be damaged in a short time.



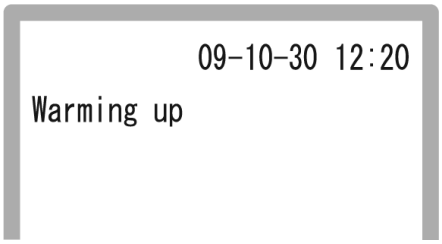
6. Press **STOP** as indicated on LCD screen.

NOTE: The sample carousel moves and the analyzer performs initial settings. After completing the cleaning mode, the analyzer performs reference plate quality check automatically and prints out the result.

NOTE: If the quality level exceeds level 2, perform mode 52 again and clean the reference plate.

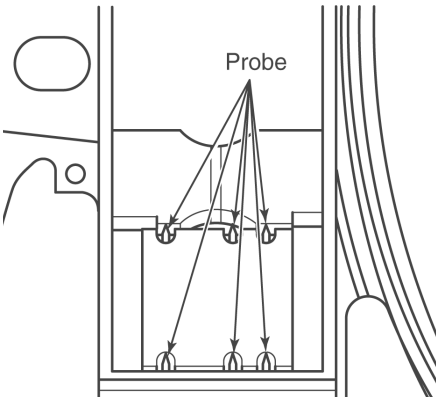
NOTE: Refer to the *Section 7.2.21, Mode 52* for further information on the printout message.

NOTE: Wait until the temperature of the incubator becomes ready.



7. Cleaning the ISE probe unit.
   a. Press on the black plastic piece to make probes accessible.
   b. Gently wipe the tips of the 6 ISE probes with a dry cotton swab.

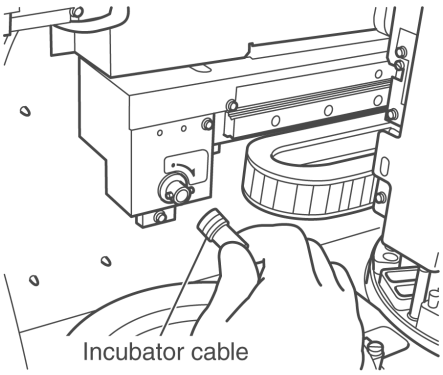
NOTE: Do not use solvents, such as methyl alcohol or isopropyl alcohol.



⚠ CAUTION

ISE probes are needle-shaped parts. Do not directly touch with hands. Be careful not to bend the probes.

   c. Set the slide transfer weights.
   d. Set the spotting part cover and screw the thumbscrews.



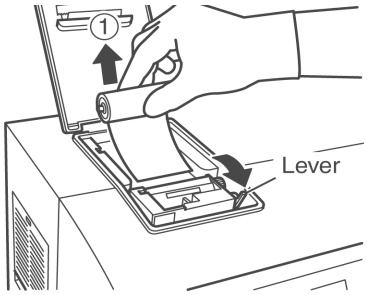
5.4 Replacing the Recording Paper

A red line appearing along the sides of the recording paper means that the printer is nearly out of paper. Replace the recording paper with a new one.

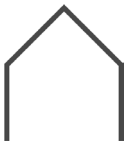
NOTE: Use thermal paper (TSPS–50SS–FBR, 58.25 m) for the DRI-CHEM 7000 Analyzer.

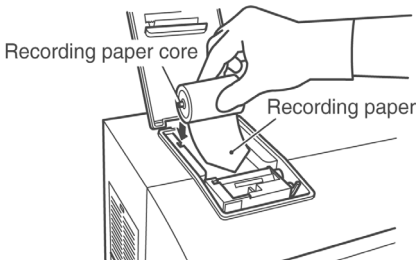
Replacement procedure

1. Open the printer cover.
2. Raise the lever to release the recording paper from the printer.
3. Pick up the remaining paper roll and pull it out in the direction of ▲ as shown the left.

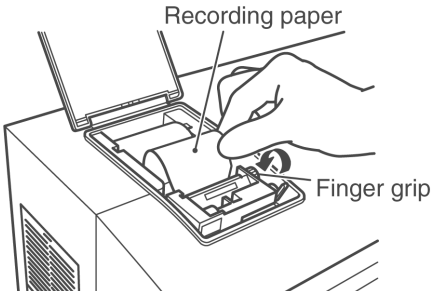


4. Cut off the left and right corners of the end of the new paper. Insert the core into the paper roll and put the paper roll into its loading space.

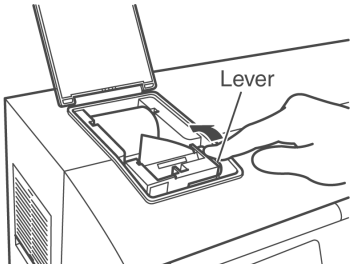


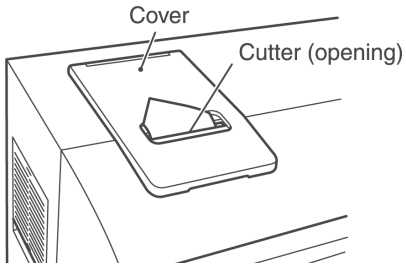


5. Insert the paper under the rubber roller. Turn the finger grip and feed the paper to remove any slack. Make sure that the recording paper is set properly and lower the lever.



6. Pass the paper through the opening of the printer cover and close the cover.





5.5 Replacing and Cleaning the Light Source Lamp

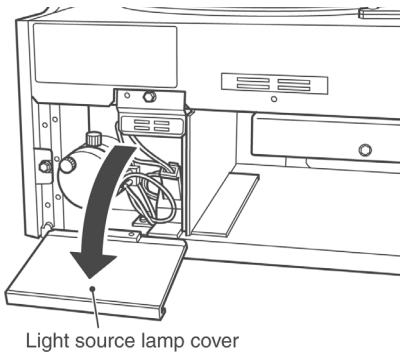
The average life of the lamp is about 1000 hours. It is necessary to replace the light source lamp if a Photometer Gain error occurs or if the lamp's cumulative illumination time has exceeded 1,000 hours.

⚠ CAUTION

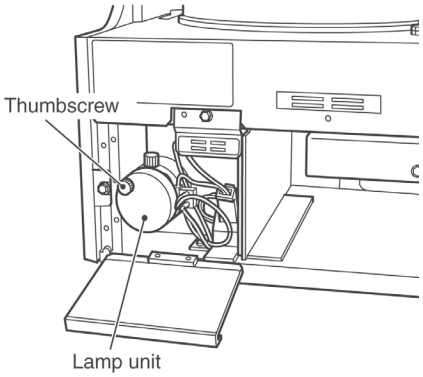
The light source lamp gets very hot. Before replacing the lamp, turn off the power and wait at least five minutes. The lamp can be safely replaced once it has cooled down.

Replacement and cleaning procedures

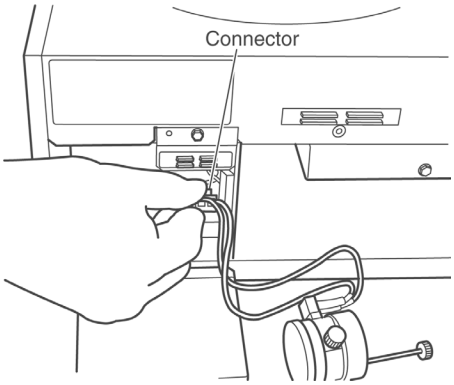
1. Take the disposal box out. Then, open the cover of the light source lamp located on the left side of the analyzer.



2. Unscrew the thumbscrew as shown in the left figure and remove the lamp unit.

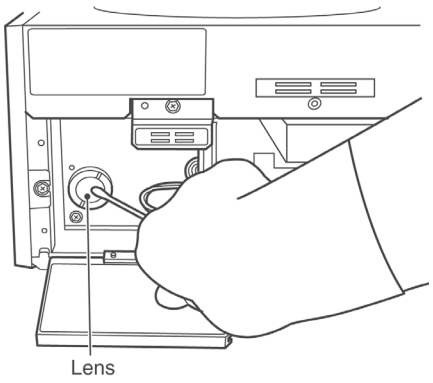


3. Unplug the connector of the light source lamp and remove the lamp unit.



4. Wipe off the light source unit lens in the analyzer using a dry cotton swab.

NOTE: If cleaning with alcohol, always wipe off the lens using a dry cotton swab to dry it well.

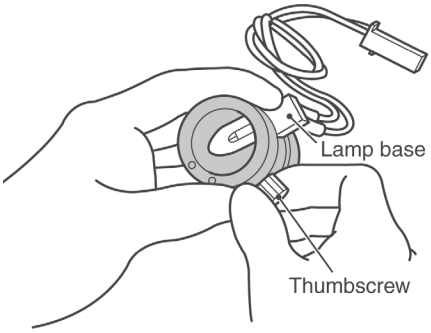


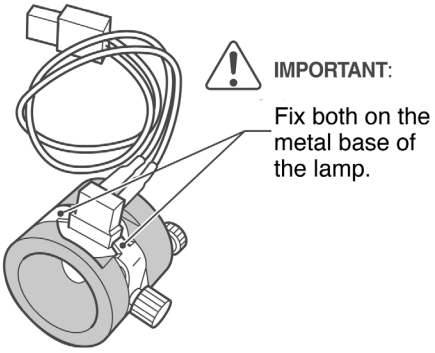
5. Unscrew the thumbscrew of the lamp unit and replace the lamp with a new one.

IMPORTANT

Tighten the thumbscrew securely. Otherwise, adverse effects on test results may occur.

NOTE: When replacing the lamp, hold it by its base. Do not touch the glass surface with bare fingers.





6. Remount the lamp connector and insert the lamp unit into the analyzer with thumbscrew B facing up. Screw in thumbscrew A securely.

IMPORTANT

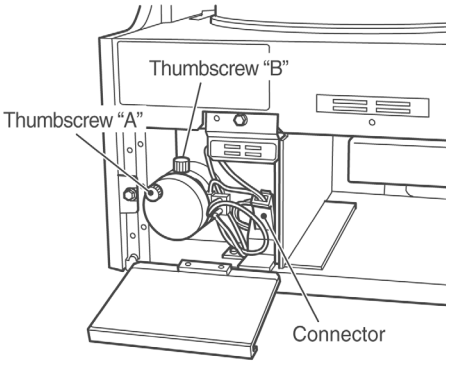
Tighten the thumbscrew securely. Otherwise, adverse effects on test results may occur.

7. Close the lamp source unit cover and the disposal box. Then turn on the analyzer.

IMPORTANT

Be sure to set the disposal box. Otherwise, adverse effects on test results will occur.

8. After the analyzer has started up, reset the lamp's cumulative illumination time to "0" using Mode 23. (Refer to *Section 7.2.4.*)



5.6 Replacing the Sampler O-ring

The sampler nozzle O-ring wears with use. Periodic replacement (once a year) is necessary. Refer to *Section 7.2.16, Mode 42* for O-ring's inspection (leak check).

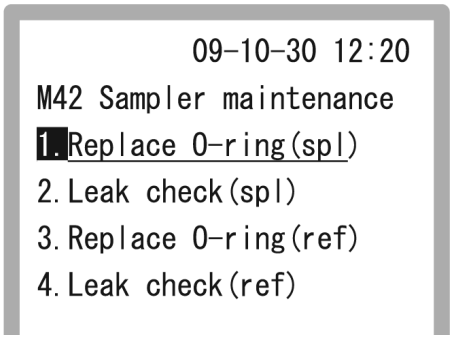
IMPORTANT

If you do not perform the O-ring's replacement periodically, the spotting volume will be inaccurate, and test results may be adversely affected.

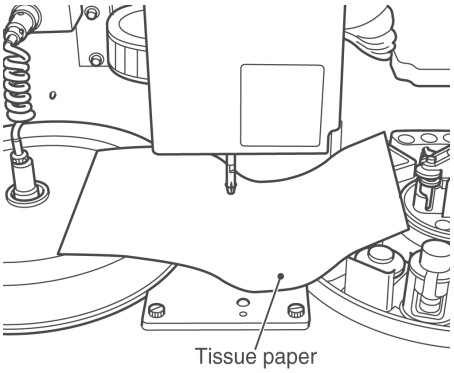
Replacement procedure

1. Remove the slide cartridge and the sample rack.
2. Select Mode 42 for the replacement of O-ring.
   MODE → 4 → 2 → ENTER
3. Select [1. Replace O-ring (spl)] on the LCD.
   1 → ENTER

NOTE: The sampler unit moves and the sampler nozzle comes down.



4. Place a piece of tissue paper on the spotting part to prevent the O-rings from falling into the analyzer.

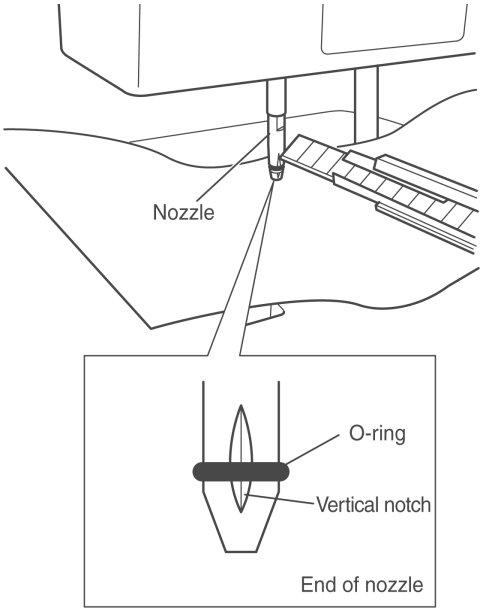


5. Cut off the used O-ring (bring a razor blade into contact with the vertical notch on the end of the nozzle).
6. Mount a new O-ring in the groove around the nozzle by sliding it from the end of the nozzle.
7. Press **STOP**.
8. For the ISE unit, select [3. Replace O-ring (ref)] on the LCD.
   3 → ENTER

NOTE: The sampler unit moves and the sampler nozzle comes down.

9. Perform procedures 4. to 6. to replace the O-ring.
10. Press **STOP** twice to complete the replacement of the O-rings.

NOTE: The sampler unit moves and the analyzer performs initial settings.

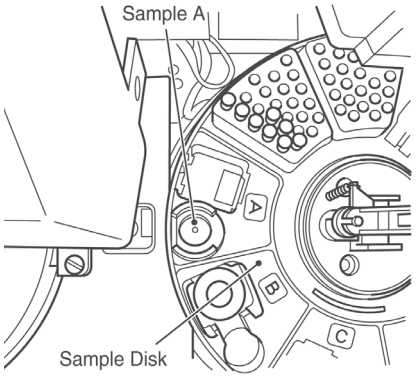


5.7 Cleaning the Slide Detecting Part

When the slide detecting part becomes dirty, slide-detecting errors may occur.

Cleaning procedures

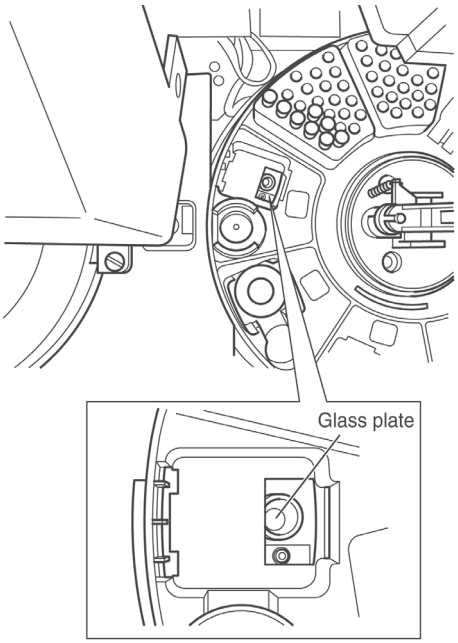
1. Turn off the analyzer power switch.
2. Remove the slide cartridge of Sample A.
3. Turn the sample carousel by hand, to position Sample A at the aspiration position. This is at the 10 o'clock position.



4. A light source should be used to visualize this plate.

   Wipe off the glass plate of the slide detecting part with a cotton swab moistened with isopropyl alcohol through the opening of the slide cartridge setting position of Sample A. Immediately dry the lens with a dry cotton swab until no streaks are present.

   If slide reading errors continue, refer to the *Slide Optics Cleaning Instructions* product bulletin for further instructions.



5.8 Cleaning and Replacing the Reference Fluid Cap

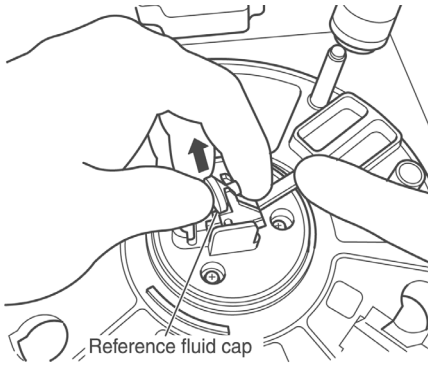
Clean the reference fluid cap each time reference fluid is replaced by wiping with distilled water. Replace the reference fluid cap, if it becomes cracked or discolored.

IMPORTANT

If you do not perform the reference fluid cap maintenance (cleaning and replacement), the reference fluid may concentrate with adverse effects on test results.

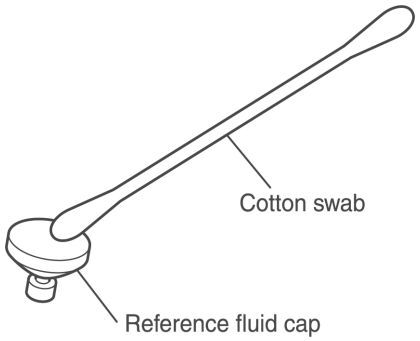
Cleaning and replacement procedure

1. Before cleaning, remove a reference fluid tube from the holder and discard it.
2. Remove the reference fluid cap as shown in the left figure.



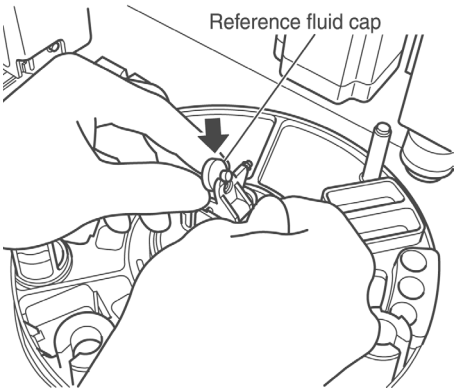
3. Wipe off the reference fluid cap using a cotton swab or soft gauze-like cloth moistened with distilled water. Dry it after cleaning.

NOTE: Replace it with a new cap if stain can not be wiped off.



4. Set the reference fluid cap properly.

NOTE: Do not touch the surface of the reference fluid cap (reference fluid side).



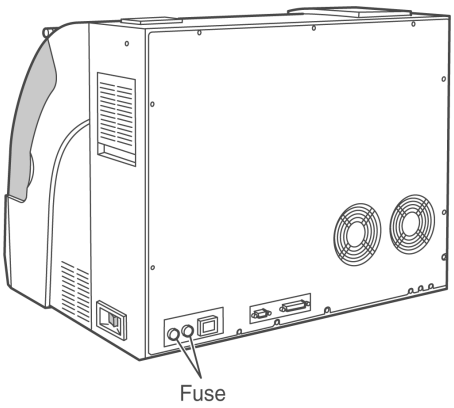
5.9 Replacing the Fuse

⚠ CAUTION

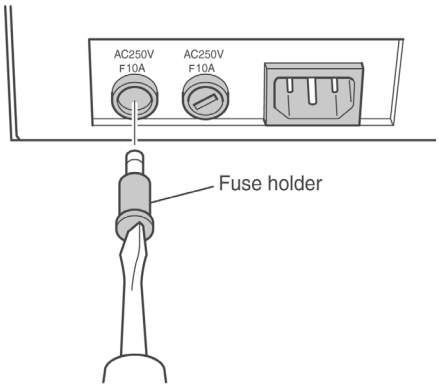
Before replacing the fuse, always unplug the power cable from the analyzer.

Replacement procedure

1. Turn off the power switch and unplug the power cable from the analyzer.



2. Pull out the fuse holder by turning it 1/4 turn counterclockwise using a screw driver. If the fuse has burned out, replace it with a new one. Insert the fuse holder and lock it by turning it 1/4 turn clockwise.



⚠ CAUTION

Double Pole/Neutral Fusing
Fuse rating: 250V F 10A
Fuse maker: Little Fuse
Model No.: 314010

⚠ CAUTION

Be sure to use the above model of fuse (packed as an accessory). Otherwise, safety cannot be guaranteed.

WARNING

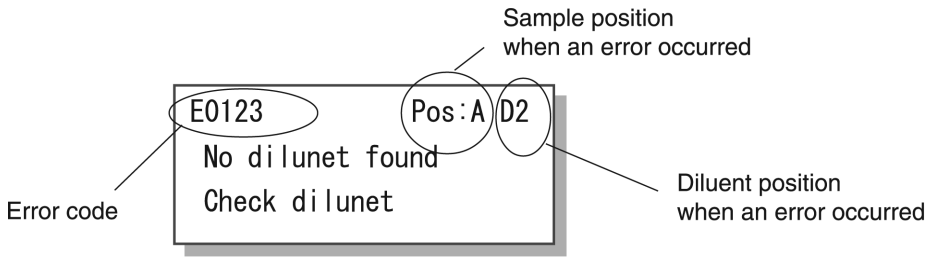
When performing troubleshooting, always follow biohazard procedures (e.g., wearing gloves, lab coat, and safety goggles). If any part of the body comes in contact with contaminated parts, immediately rinse the contaminated body part thoroughly under running water and then use ethyl alcohol as a disinfectant. Seek medical assistance, if necessary.

6.1 Error Indications

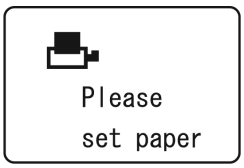
IMPORTANT

In the case that analyzer malfunctions (error) are displayed (printed) before/during test processing, or warning indications are printed out along with test results, the test results may NOT be accurate. Refer to the related troubleshooting pages and rerun the test.

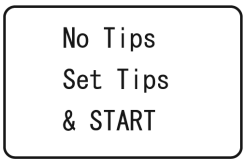
Printout example



Example of LCD indication
No recording paper or incorrect setting.
Check the recording paper. (Refer to *Section 5.4.*)



No tips
Press TIP/CUP and set tips on tip rack 1 and 2.
(Refer to *Section 4.3.1.*)



6.1.1 Error Codes Table

Error Code	Error Description	Reference Page
W030	Light intensity error	96
W040	Sample type setting error	105
W060	Insufficient sample volume during sampling	91
W070	Interference filter malfunction	96
W09x	Data communication error	107
W110–W111	Error related to tip picking up	90
W115–W116	Error related to tip ejection	90
W120	Error related to tip ejection	90
W140	ISE slide loading error	105
W141	Error related to ISE tests	107
W142	Insufficient reference fluid volume	93
W151–W153	Error related to mixing cups	91
W161	Insufficient diluent volume	93
W170	Error related to QC card	104
W173	Error related to slide information reading	89
W20x	Error related to sample barcode reader	107
W100	Error related to communication cable connection	107
W1520–W1521	Error related to room temperature	100
W5000	Printer error (No paper)	89
W9400–W95xx	Circuit board signal errors	102
W97xx	Data communication error with the host computer	107
W98xx	Error related to the USB external printer	108
E035	Errors related to photometer	102
E036	Errors related to the reference black plate	96
E050	Light source lamp error	97
E011x	Sample aspiration or spotting error	92
E0120	Sample volume error	91
E0121–E0122	Diluent aspiration or spotting error	94
E0123	Diluent volume error	93
E0124–E0125	Diluent aspiration or spotting error	92
E0127–E0128	Reference fluid aspiration or spotting error	94
E0129	Reference fluid volume error	93
E0140–E0146	Sample or fluid volume error	91, 93
E0200–E0202	Slide transfer error	98
E0205–E0207	Slide eject error	98
E0300–E0302	Gain errors	102
E0400–E0402	Slide transfer error	98
E0500–E0501	Date and time reset error	101

Error Code	Error Description	Reference Page
E0510	Circuit board photometric error	102
E0511–E0512	Error related to light intensity	97
E0530–E0531	Error related to ISE self-test	105
E0532	Circuit board malfunction	102
E0540	Errors related to slide detecting	102
E0600–E0602	Incubator motor error	98
E0700–E0702	ISE probe motor error	98
E0900–E0902	Interference filter motor error	97
E1000–E1012	Sampler vertical motor error	95
E1100–E1102	Sampler horizontal motor error	95
E1200–E1202	Syringe motor error	95
E1400–E1402	ISE slide feed motor error	98
E1500–E15xx	Temperature control error	100, 101
E1600–E1603	Sample disk motor error	98
E3015	Circuit board signal error	102
E4010	Error related to QC information for the panel slide	104
E4012	Error related to DI card	104
E50xx	Circuit board signal error	103
E5100	Printer error	89
E520x	Circuit board signal error	103
EFFxx	Circuit board signal error	102

NOTE: "x" means given value.

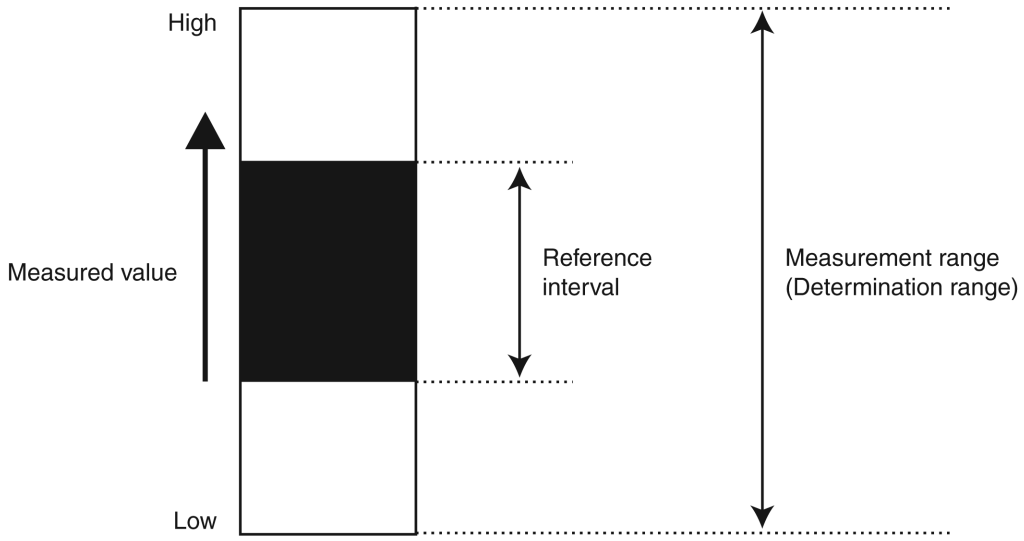
6.1.2 Printout Indications Table

Printout Message	Description	Reference Page
H	Testing value exceeds the upper limit of the preset reference interval.	-
L	Testing value falls below the lower limit of the preset reference interval.	-
>	Testing value exceeds the upper limit of the measurement range.	-
<	Testing value falls below the lower limit of the measurement range.	-
@	Testing value is outside of the measurement range. Testing value may not be accurate.	-
+OR	Testing value of the ISE test exceeds the upper limit of the measurement range.	107
-OR	Testing value of the ISE test falls below the lower limit of the measurement range.	107
+, -, $	Temperature control error. Testing value may not be accurate. Refer to the related troubleshooting pages and rerun the test.	100, 101
* , ?	Fluctuation of light source intensity. Testing value may not be accurate. Refer to the related troubleshooting pages and rerun the test.	96
E	Unable to calculate the test result due to the transfer error or abnormal readout of the photometer.	110
&	Abnormal high testing value. If Ca, slide not spotted.	109
#	The valid term of the slide has expired. Testing value may not be accurate. Refer to the related troubleshooting pages and rerun the test.	109
¥	Unspotted slide.	109
Ctrl	The test is performed in the control mode. The control mode can be canceled by using Mode 19. Control mode is not used with Heska Chemistry Control.	109
ERR=xxx	Errors related to electrolyte test results. ("x" indicates the numeric number from 0 to 8.) Testing value may not be accurate. Refer to the related troubleshooting pages and rerun the test.	105

About measurement range

The measurement range (determination range) and the reference interval differ in value for each test. The relation between the measurement range and the reference interval is as shown below. For details, refer to the *Istructions for Use* of the slides.

NOTE: Reference intervals can be input by using Mode 39. (Refer to *Section 7.2.15*.)



6.2 Troubleshooting

6.2.1 Startup Errors

1. When the analyzer does not start after the power switch is depressed to the [|] side: Check that the power cable is properly connected and the fuse is not burned out. Then try turning on the analyzer again. If the analyzer does not start, please contact Heska's Technical Support Services for assistance.

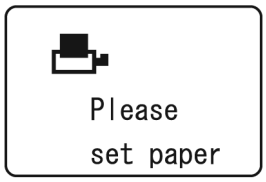
NOTE: Refer to *Section 5.9* for fuse replacement.

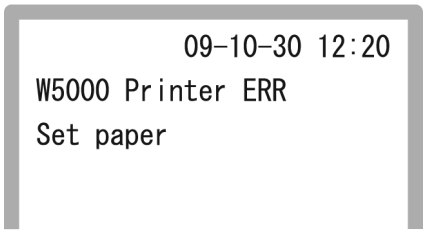
6.2.2 Printer Errors

1. Too light or too dark printouts. Refer to *Section 7.2.25, Mode 82* to adjust the density of the printouts.
2. White lines appear or certain parts of characters are not printed. The printer head has malfunctioned. Please contact Heska's Technical Support Services for assistance.

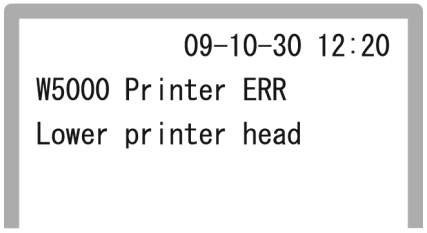
3. Printer errors.

   a. W5000
   No recording paper. Set the recording paper for the printer. (Refer to *Section 5.4.*)

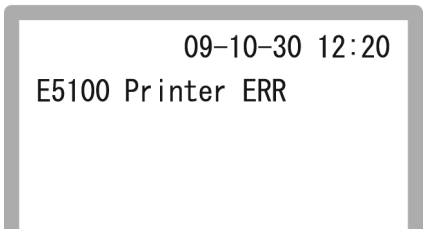




   b. W5000
   Incorrect recording paper settings. Check that the recording paper and the printer lever (printer head) are set properly. (Refer to *Section 5.4.*)



   c. E5100
   Paper jamming. Remove the jammed recording paper by following the steps for replacing paper. (Refer to *Section 5.4.*)



6.2.3 Slide Information Reading Error

1. Slide information reading error.

   The analyzer failed to read the slide information printed on backside of the slide. Clean the slide information reader (Refer to *Section 5.7*). Rerun the test. If errors still occur, please contact Heska's Technical Support Services for assistance.

NOTE: When this error occurs, the slide is discarded and sampling for the next slide will start.

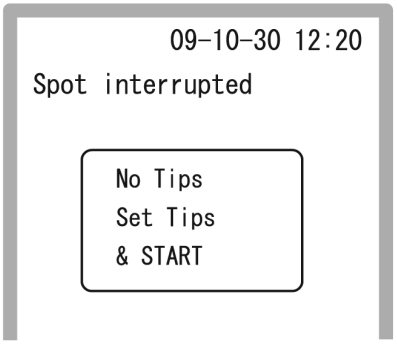
6.2.4 Sampler Errors

1. Tip pick up error.

   No tips loaded in the tip racks.

   Set tips correctly (Refer to *Section 4.3.1.*) and press **START** to start testing. To stop the test, press **STOP.**

   a. W110
   No tip has been detected on the sample nozzle after tip pick up.



b. W111
No tip has been detected on the reference fluid nozzle after pick up.

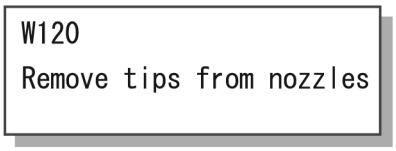
NOTE: Set tips into all holes of the tip racks after this error. (Refer to *Section 4.3.1*.)

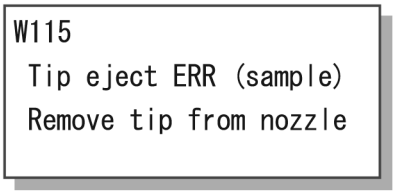
2. Tip ejecting error.

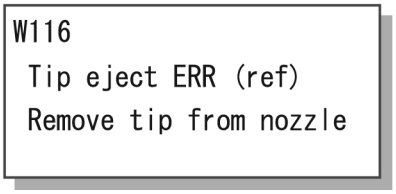
   The analyzer has failed to eject a tip. Remove the tip from the sampler nozzle by hand. After removing the tip, press **STOP**.

NOTE: Rerun the tests from the beginning (sample programming).

a. W120, W115, W116
Failed to eject a tip.



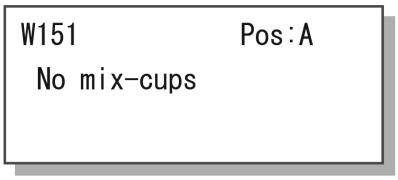


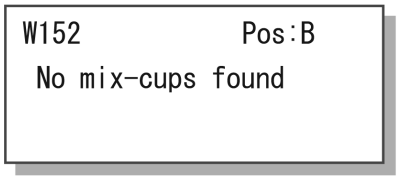


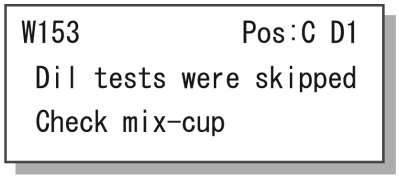
3. Insufficient or no mixing cups.

   Replace mixing cups by referring to *Section 4.3.2*. After the replacement, rerun the tests from the beginning (sample programming).

a. W151
No remaining wells of mixing cups.
b. W152
No mixing cups found.
c. W153
The analyzer stopped the tests that require dilution due to the shortage of remaining mixing cup wells.







4. Sample volume error.

   Make sure that the sample volume in the tube is within the measurable range, and an appropriate tube is used in the sample rack. Rerun the tests from the beginning (sample programming).

NOTE: If the amount of sample is insufficient, add the sample to the tube.

   a. E0120
      No sample found (no sample tube or insufficient sample volume).
   b. W060
      Insufficient sample volume during sampling.
   c. E0140
      Excess sample volume (beyond the upper limit).

NOTE: Refer to *Section 4.2.3* for the measurable range.

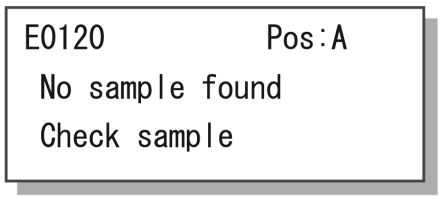
5. Sample aspiration or spotting error.

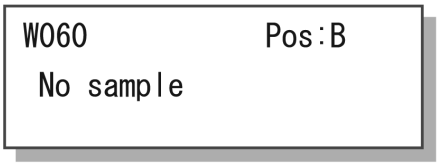
   The sample may contain fibrin deposits. Check and remove the fibrin from the sample, then rerun the tests from the beginning (sample programming).

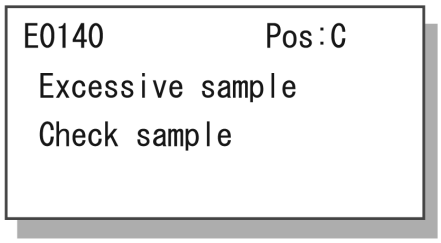
   a. E0110, E0111, E0124
      Nozzle clogging during sample aspiration

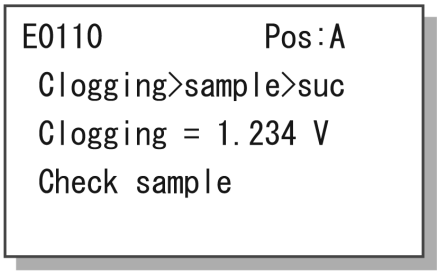
   b. E0112, E0113, E0125
      Nozzle clogging during sample spotting

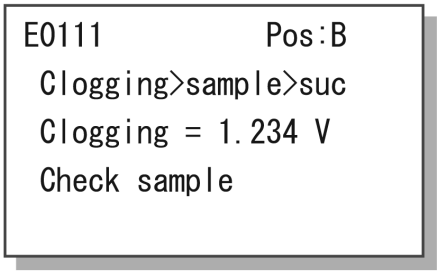
NOTE: If the errors continue, a malfunction might have occurred in the piping system. Please contact Heska's Technical Support Services for assistance.

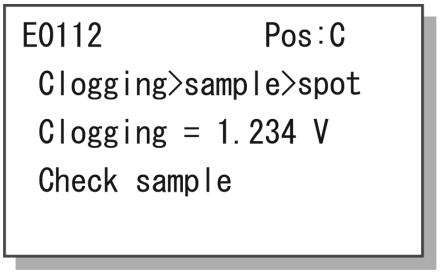


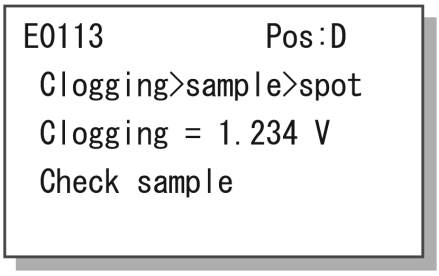












6. Insufficient sample spotting volume.

   The error marks "<" or "@" appear continuously due to sample spotting failure. Check each point below and rerun the tests from the beginning (sample programming).

IMPORTANT

- DRI-CHEM Analyzer AUTO TIPS are used.
- Tips are not reused.
- No bubbles on the sample surface of the tube.
- The sample tube is set on a specific sample rack.
- Replacement of the sampler O-ring is performed periodically (once a year).

NOTE: Do not reuse DRI-CHEM Analyzer AUTO TIPS. If the errors still occur, please contact Heska's Technical Support Services for assistance.

7. Diluent/reference fluid volume error.

   Replace diluent or reference fluid in accordance with the error code. After replacing, rerun the tests from the beginning (sample programming).

NOTE: Replace the diluent/reference fluid tube with a new one. Do not add diluent/reference fluid to the current tube. Refer to each section listed below for replacement and aspiration ranges.

- Diluent: *Section 4.3.3*
- Reference fluid: *Section 4.3.4*

a. E0141
   Excess diluent volume (beyond the upper limit)

b. E0142
   Excess reference fluid volume (beyond the upper limit)

c. E0123, E0143
   Insufficient diluent

```
09-10-30   12:00  Pos A
No.100
 BUN-PS  <   5.0  mg/dl
 TBIL-PS <   0.2  mg/dl
 Ca-PS   <   1.0  mg/dl
 ---------------------

09-10-30   12:22  Pos C
No.101
 BUN-PS     @
         =   0.1  mg/dl
 TBIL-PS    @
         =   0.1  mg/dl
 Ca-PS      @
         =   0.1  mg/dl
 ---------------------
```

```
E0141          Pos:A D1
 Excessive diluent
 Check diluent/tip
```

```
E0142          Pos:A
 Excessive ref fluid
 Check reference fluid
```

```
E0123          Pos:A D2
 No diluent found
 Check diluent
```

```
E0143          Pos:A D1
 No diluent
 Check diluent
```

d. E0129, E0144
Insufficient reference fluid

```
E0129          Pos:A
 No ref fluid found
```

```
E0144          Pos:A
 No reference fluid
 Check reference fluid
```

e. W142
Due to out of range reference fluid volume, the analyzer has skipped the ISE tests for this sample.

```
W142           Pos:A
 PM tests were skipped
 Check reference fluid
```

f. W161
Due to out of range diluent volume, the analyzer has skipped the tests that require dilution for this sample.

```
W161           Pos:A D1
 Dil tests were skipped
 Check diluent
```

8. Diluent/reference fluid aspiration or spotting error.

Check whether the diluent/reference fluid are filled and in the proper tube. If problems are found, replace diluent/reference fluid with new one. After replacement, rerun the tests from the beginning (sample programming).

a. E0121
Nozzle clogging during diluent aspiration.

```
E0121          Pos:C D1
 Clogging>dil>suc
 Clogging = 2.345  V
 Check diluent
```

b. E0122
Nozzle clogging during diluent dispensing.

```
E0122          Pos:C D1
 Clogging>dil>spot
 Clogging = 2.345  V
 Check diluent
```

c. E0127
Nozzle clogging during reference fluid aspiration.

```
E0127          Pos:A
 Clogging>ref>suc
 Clogging = 2.345  V
 Check reference fluid
```

d. E0128
Nozzle clogging during reference fluid dispensing.

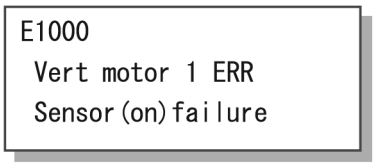
```
E0128          Pos:B
 Clogging>ref>spot
 Clogging = 2.345  V
 Check reference fluid
```

NOTE: If the errors continue, a malfunction might have occurred in the piping system. Please contact Heska's Technical Support Services for assistance.

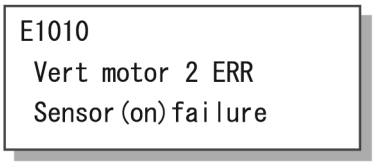
9. Sampler movement error.

   Turn off the analyzer when tests are completed. Check for foreign objects (ex. tip or slide) around the sampler unit. If the errors continue after turning off and on, please contact Heska's Technical Support Services for assistance.

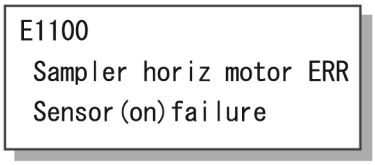
   a. E1000–E1002
      Vertical movement motor 1 (sample/diluent) error



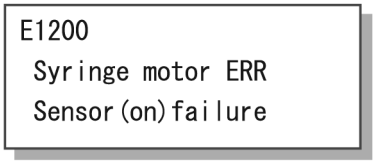
   b. E1010–E1012
      Vertical movement motor 2 (reference fluid) error

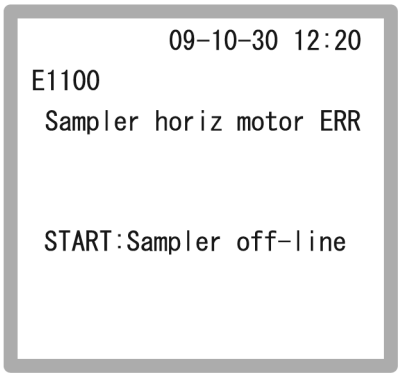


   c. E1100–E1102
      Sampler horizontal motor error



   d. E1200–E1202
      Syringe motor error





6.2.5 Photometric System Errors

IMPORTANT

If photometric system errors occur, perform each operation listed below and rerun the test.

1. Fluctuation of light source intensity.

   The light source lamp or the photometer might be dirty. The light source lamp or interference filter might have degraded.

   Turn the analyzer off and clean each part listed below.
   - Clean the light source lamp. (Refer to *Section 5.5*.)
   - Clean the reference plate. (Refer to *Section 5.3*.)
   - Clean the photometer head. (Refer to *Section 5.3*.)

   After cleaning, turn the power switch on.

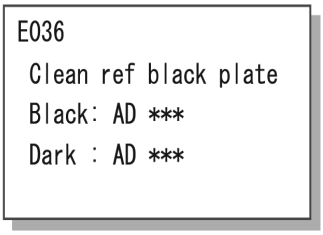
If the errors still occur after cleaning, replace the light source lamp with a new one. (Refer to *Section 5.5*.)

CAUTION

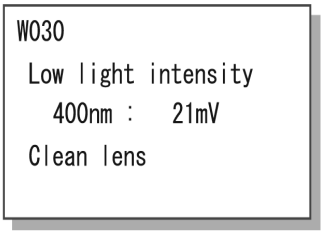
The light source lamp gets very hot. Before replacing the lamp, turn off the power and wait for at least five minutes.

The lamp can be safely replaced once it has cooled down.

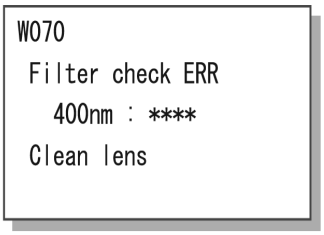
a. E036
   The reference black plate is dirty.



b. W030
   Low light intensity.



c. W070
   The interference filter is dirty or has degraded.



d. [* , ?]
The light intensity changed during the test.

Error marks " * " or " ? " are printed on the results

```
09-10-30   12:50  Pos B
No.102
 BUN-PS      *
         =  ****  mg/dl
 TP-PS       *
         =  ****  g/dl
 ---------------------

09-10-30   12:50  Pos C
No.103
 BUN-PS      ?
         =  ****  mg/dl
 TP-PS       ?
         =  ****  g/dl
 ---------------------
```

e. E0511–E0512
The light intensity changed during the test.

2. Light source lamp error.

   Turn off the power and replace the light source lamp. Turn on the analyzer after replacement. (Refer to *Section 5.5.*)

   a. E050
   The light source lamp is burned out.

```
E050
 Replace lamp
```

⚠ CAUTION

The light source lamp gets very hot. Before replacing the lamp, turn off the power and wait for at least five minutes. The lamp can be safely replaced once it has cooled down.

3. Interference filter motor error.

   Turn the analyzer off and on. If the same error continues, please contact Heska's Technical Support Services for assistance.

   a. E0900–E0902
   The rotation of interference filter motor is abnormal.

```
E0900
 Filter motor ERR
 Sensor(on)failure
```

6.2.6 Transfer Errors

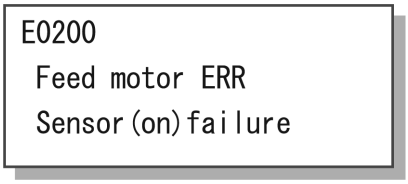
The spotting part or the incubator may be dirty or the disposal box may be full of slides and tips.

Turn the analyzer off, and perform the following:

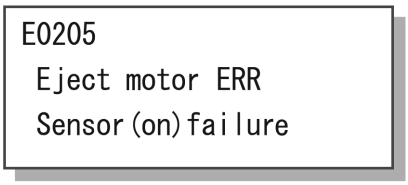
- Empty and clean the disposal box.
- Clean the incubator. (Refer to *Section 5.3*.)
- Clean the spotting part. (Refer to *Section 5.3*.)

NOTE: If a slide is stuck at the spotting part or the ISE unit, perform "Emergency cleaning mode" described in this section. If the errors continue, please contact technical support for assistance.

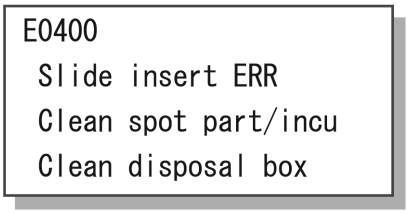
a. E0200–E0202
Slide feed motor error.



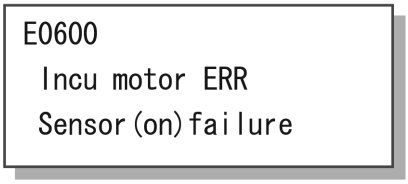
b. E0205–E0207
Slide eject motor (incubator unit) error.



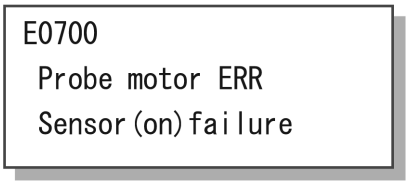
c. E0400–E0402
Slide insert motor error during the slide transfer.



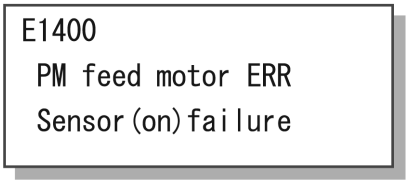
d. E0600–E0602
Incubator motor error.



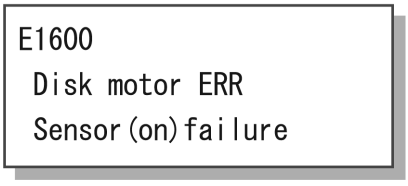
e. E0700–E0702
Probe motor (ISE unit) error.



f. E1400–E1402
ISE slide feed motor (ISE unit) error.



g. E1600–E1603
Sample disk motor error.



Emergency cleaning mode

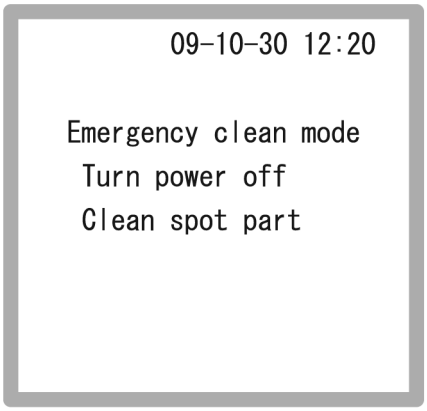
This mode is used to recover from errors due to foreign matter (*i.e.*, slides) stuck (jammed) at the spotting part.

1. Turn off the power switch.
2. Turn on the power switch with STAT continuously pressed on. Press **STAT** continuously until the LCD indicates "Loading program…".

Turn on the power switch while pressing the STAT key.

3. Make sure that the LCD indicates "Emergency clean mode". Then turn off the power switch.
4. By following the procedure of *Section 5.3: Cleaning the Incubator, Spotting Part, and ISE Unit*, remove the foreign matter from the analyzer. After cleaning, turn on the power switch.

NOTE: When performing *Emergency cleaning mode*, operating Mode 52 is not necessary.



Turn off the power switch and clean each part.

6.2.7 Temperature Controller Errors

IMPORTANT

Testing value with "+" or " -" mark may NOT be accurate. Perform the following operations and rerun the test.

1. When "+" or "-" marks appear on the test results the temperature controller is abnormal. Incubator temperature is not within the controlled range. Turn off the analyzer. Check and clean each part listed below. If the errors continue, please contact technical support for assistance.
   - Check that the room temperature is within 59°F to 89.6°F (15°C to 32°C). If the temperature is out of range, control the room temperature.
   - Clean the air filters. (Refer to *Section 5.2*.)
   - Check the incubator installation. Make sure that thumbscrews of the incubator unit are screwed properly and the incubator cable is connected to the connector properly. (Refer to *Section 5.3*.)
   - Check the spotting part installation. Make sure that the spotting part cover is assembled properly. Screw the thumbscrews securely.

```
09-10-30   12:50  Pos B
No.102
 BUN-PS      +
          =   15.0 mg/dl
 TP-PS       +
          =   3.7  g/dl
 ---------------------

09-10-30   12:50  Pos C
No.103
 BUN-PS      -
          =   15.0 mg/dl
 TP-PS       -
          =   3.7  g/dl
 ---------------------
```

   a. E1500, E1501
      Temperature control errors for CM incubator.

```
E1500
 CM temp not ready
 Check room temp
 Clean air filter
 Room temp = 25.2
```

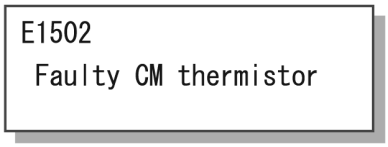
   b. E1510, E1520
      Temperature control errors for ISE incubator.
   c. W1520, W1521
      Room temperature is out of range.

```
W1520
 Room temp too low
 Check room temp
 Clean air filter
 Room temp = 44.2
```

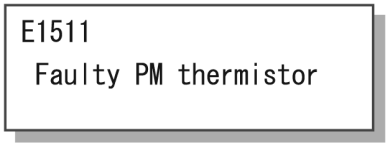
2. When "$" mark appears on the test results, the incubator cable is disconnected. Turn off the power switch and connect the incubator cable again (Refer to *Section 5.3*). If the errors continue, please contact Heska's Technical Support Services for assistance.

```
09-10-30   13:10  Pos A
No.103
 BUN-PS      $
          =  ****  mg/dl
 TP-PS       $
          =  ****  g/dl
 ---------------------
```

a. E1502, E1503
CM incubator unit disconnection error.



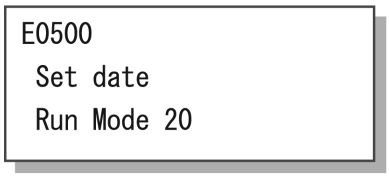
b. E1511, E1512
ISE incubator unit disconnection error.



6.2.8 Circuit Board Signal Errors

1. E0500

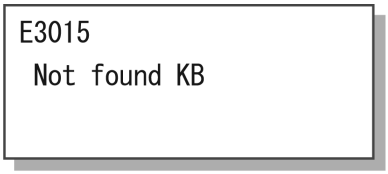
   The date and the time have been reset. Run Mode 20 to set the date and the time. (Refer to *Section 7.2.3*.) If the error continues after turning the analyzer off and on, please contact Heska's Technical Support Services for assistance.



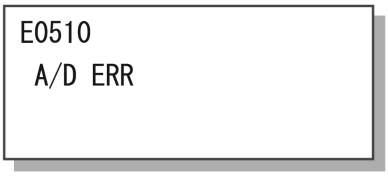
NOTE: Turning the power on the first time or turning the power off for a long time may cause the date error.

2. E3015, E0510, E0532, EFF0x, E0540, E030x, E035

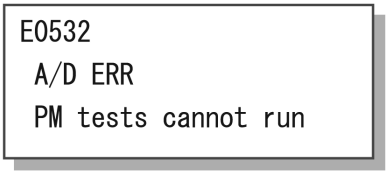
   Circuit board signal errors. If the errors continue after turning the analyzer off and on, please contact Heska's Technical Support Services for assistance.



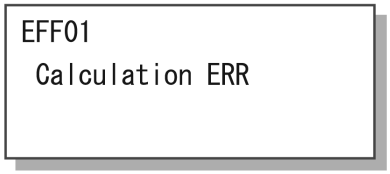
   a. E3015, W9400–W95xx
   Circuit board signal error.



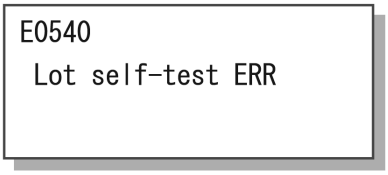
   b. E0510, E0532
   Circuit board photometric error.



   c. EFF01–EFF0D
   Calculation error occurred when calculating the analyte concentration.



   d. E0540
   Error occurred at the slide detecting part.



e. E0300–E0302, E035
Failed to gain the light intensity.

E3015
Not found KB

3. E50xx

Circuit board signal errors.

If the errors continue after turning the analyzer off and on, please contact Heska's Technical Support Services for assistance.

E5000
CF card ERR

IMPORTANT

If these errors occur, test values may be incorrect. Check each point listed below and rerun the test.

NOTE: If the E5024 and E5034 error occur, set tips and replace mixing cups. The settings listed below may have reset to the initial settings. Check that the mode settings listed below are correct:

- Mode 24: Unit conversion (Unit (A)/Unit (B) switch)
- Mode 27: Sequence number and ID settings
- Mode 28: Switches display method for values outside of the determination range
- Mode 39: Reference interval settings and printout
- Mode 44: Lamp off selection
- Mode 46: Selects communication destinations
- Mode 81: Beep sound configurations
- Mode 82: Density adjustments (LCD/printer)
- Mode 83: Sets print sheets of test results

E5024
Read ERR [INI info]
Set tips
Replace mix-cup

E5034
Read ERR [INI info]
Set tips
Replace mix-cup

NOTE: If the E5026 error occurs, run Mode 84 to confirm diluent and reference fluid settings.

E5026
Read ERR [ENV info]
Contact your dealer

NOTE: If the E5002 error occurs, read all the QC cards again.

E5002
Read ERR [QC info]
Contact your dealer

4. E5200

Errors occurred and the power should be turned off. The errors by cause of other than [E5200] are indicated or printed. After checking the errors and solving the problem, turn the analyzer off and on.

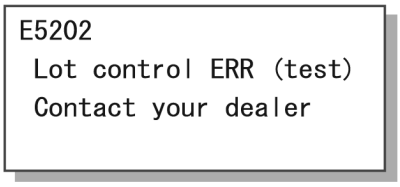
E5200
Turn power SW off/on
to restart

E5201
Lot com setup ERR
Turn power SW off/on
to restart

E520x

Circuit board signal errors.

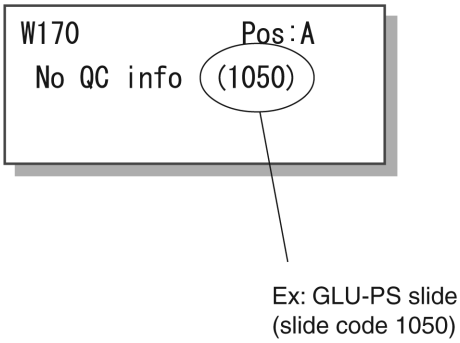
If the errors continue after turning the analyzer off and on, please contact Heska's Technical Support Services for assistance.



6.2.9 Errors Related to QC/DI Card

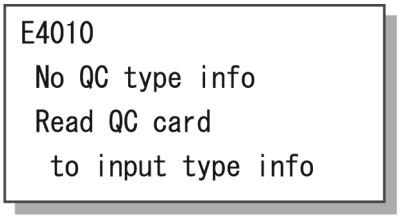
1. When the QC information does not appear after QC card reading, the analyzer has failed to read the QC card. Slide the QC card again.
2. W170

   QC information has not been read. No QC information is stored in the analyzer for the slide set on the slide cartridge. Check the printed slide code, and then read the QC card of that slide and rerun the test.



3. E4010

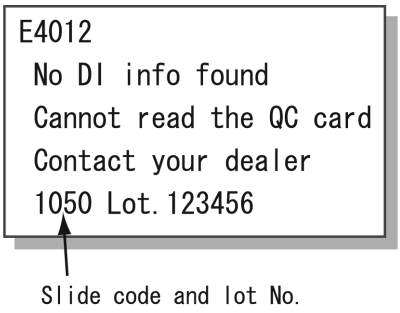
   No QC information is stored in the analyzer for the panel slide. Re-read the QC card to the analyzer.



4. E4012

   No DI card information for the slide.

   Contact Heska's Technical Support Services for assistance.



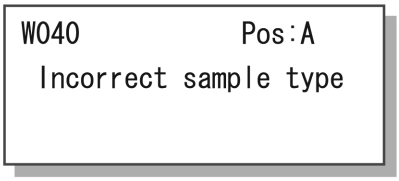
6.2.10 Slide Loading Errors

1. Sample type setting error.

   The sample type setting of the analyzer and the slide do not match.

- When a W slide (for whole blood) and a P slide (for serum, plasma) are set together in the same slide cartridge.
- When P slides are set on the slide cartridge, and the specimen type W is selected in the sample programing. The sample type (set by the SAMPLE key) and the slide's sample type must match.

  Rerun the tests from the beginning.



2. Incorrect loading direction of electrolyte slide.

   An electrolyte slide is loaded incorrectly in the slide cartridge. Load the electrolyte slide in correct direction in the slide cartridge and rerun the test. (Refer to *Section 4.5.*)

```
W140              Pos:A
 PM slide direction ERR
```

6.2.11 ISE Test Related Errors

IMPORTANT

Measured value with an error code [ERR=*] may NOT be accurate. Perform the following troubleshooting and rerun the tests.**

1. Self-test error.

   A self-test error has been detected before starting ISE tests. Turn the power switch off and on and rerun the tests.

   If the errors still occur, please contact Heska's Technical Support Services for assistance.

```
E0530
 Self test gain ERR
 PM tests cannot run
```

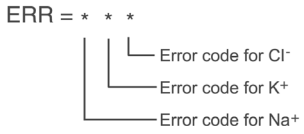
```
E0531
 Self-test offset ERR
 PM tests cannot run
```

2. Error code printed on the result.

   While performing an ISE test, several checks listed in the left table will be performed automatically. If any errors are detected, [E=***] will be printed along with the test result. The 3-digit figures are error codes of Na+ (sodium), K+ (potassium), and Cl– (chloride).

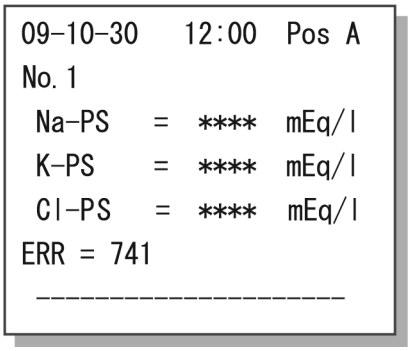
NOTE: Error codes (*) will be displayed with numbers from 0 to 8.

Check menu	Description
Drift check	Checking abnormal time course (voltage) during testing
Impedance check	Checking the slide impedance after completing a test
Over range check	Checking test result is within the measurement range



Code	Description
0	No problem
1	Drift error
2	Impedance error
3	Outside of the measurement range (This is not an analyzer malfunction.)
4	Drift error and impedance error
5	Impedance error and outside of the measurement range
6	Drift error and outside of the measurement range
7	Drift error, impedance error, and outside of the measurement range
8	Impossible measurement

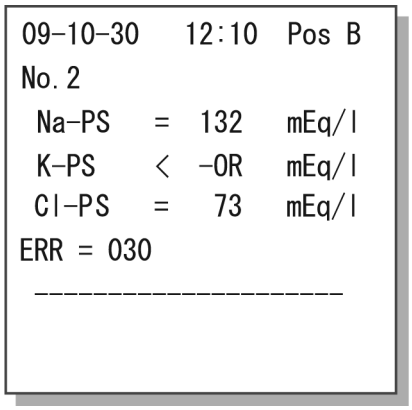
a. When the error codes are displayed with numbers other than 0 or 3, sample or reference fluid may not have been sufficiently absorbed into the slide.
   - Ensure proper handling of reference fluid.
   - Perform the test once again and check the following:
   - Aspirated fluids (sample and reference fluid) in the tips are almost equal in volume. If the aspirated volume is not normal, perform inspection or replacement of sampler O-ring. (Refer to *Section 5.6*.)
   - Spotted fluids in the spotting holes on the slide are almost equal in volume. If the fluids are not spotted into the spotting holes normally, contact technical support for assistance.
   - Clean the spotting part and ISE probe unit. (Refer to *Section 5.3*.)
   - Check the analyzer's performance with control.



NOTE: If the errors still occur, please contact Heska's Technical Support Services for assistance.

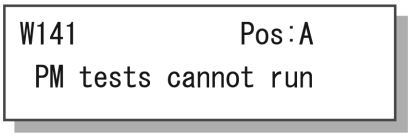
b. An error code displayed with number "3" is not an analyzer malfunction. The concentration of the sample is outside of the measurement range.

NOTE: Refer to the *Instructions for Use* of the slide for the measurement range.



3. W141

   The ISE tests cannot start due to errors. Check the other errors related to ISE tests that occurred before the (W141) occurred. Perform the troubleshooting for the other errors. After troubleshooting, turn the power switch off and on, and rerun the tests from the beginning.

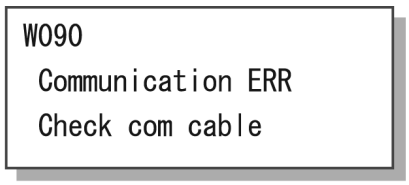


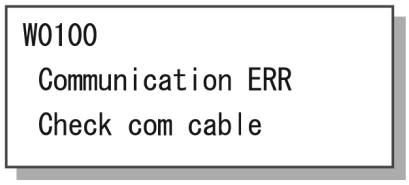
6.2.12 Errors Related to Data Communication and Sample Barcode Reader

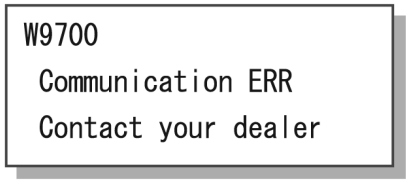
1. W090–W098, W0100, W97xx

   Data communication error. When data communication errors occur, make sure that the communication cable has been connected properly and check the status of the host computer. Check the communication parameter settings. (Mode 46)

   If the errors still occur, please contact Heska's Technical Support Services for assistance.

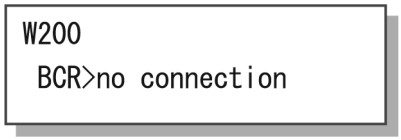




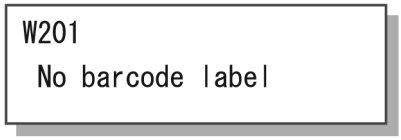


2. Sample barcode reader error.

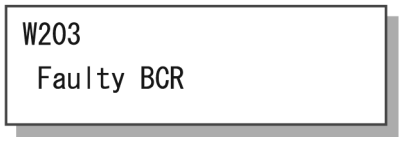
   a. W200
      The sample barcode reader is not connected to the analyzer. Turn on the analyzer after connecting the sample barcode reader to COM2 of the analyzer.



   b. W201, W202
      Barcode label is unusual. Check the barcode label and re-read the label.



   c. W203
      The sample barcode reader is not ready to read. Turn the analyzer off and on. If the error continues, please contact Heska's Technical Support Services for assistance.



6.2.13 LCD Contrast/Printout Density

1. Too weak/strong LCD contrast.

   Adjust the LCD contrast using Mode 82. (Refer to *Section 7.2.25*.)

2. Too light/dark printout density.

   Adjust the print density using Mode 82. (Refer to *Section 7.2.25*.)

6.2.14 Errors Related to the USB External Printer

Check the status of the external printer, and try to print again. If the errors still occur after turning the analyzer off and on, please contact your Heska's Technical Support Services for assistance.

```
W9802
 USB printer busy
 Check printer
```

```
W9803
 USB printer cancel
 Check printer
```

```
W9805
 USB printer cover open
 Check printer
```

```
W9806
 USB printer paper jam
 Check printer
```

```
W9807
 USB printer no ink
 Check printer
```

6.2.15 Other Errors

IMPORTANT

Measured data with the "#" or "&" mark may NOT be accurate. Perform the following troubleshooting and rerun the tests.

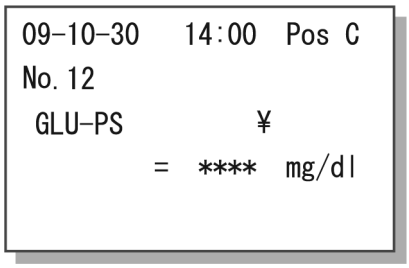
1. When "&" marks appear on test results:
   a. If this mark is printed on Ca-P test result, the sample has not been spotted. Rerun the test.
   b. For other tests, the test results are abnormally high. Perform the dilution test by following the *Instructions for Use* of the slides.
   c. If this mark is printed on v-LIP test result, the sample may have glycerol interference, or the test result is abnormally high. Perform the dilution test by following the *Instructions for Use* of the slides.

```
09-10-30   12:00  Pos A
No.10
 Ca-PS          &
        >    16  mg/dl
 ---------------------
```

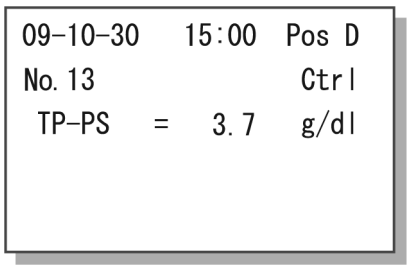
2. When "#" marks appear on test results:
   a. The Valid term of the slide has expired.

```
09-10-30   13:00  Pos B
No.11
 GLU-PS         #
        =   104  mg/dl
 ---------------------
```

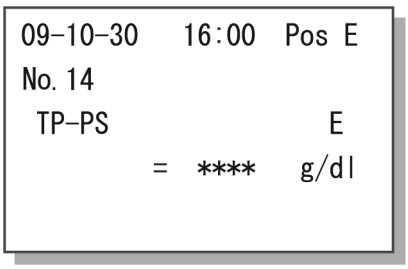
3. When "¥" marks appear on test results:
   The sample may not be spotted. Rerun the test.



4. When "Ctrl" marks appear on test results:
   This is not an error mark. The test was performed in control mode. Cancel by using Mode 19. Refer to *Section* 7.2.2. *Mode 19* is not used with HESKA Chemistry Control.



5. When "E" marks appear on test results: The analyzer could not calculate the test result due to some interruption of testing (*e.g.*, slide jam). Check previous errors, and perform the necessary troubleshooting.



6.3 Slide Code Table

Test	Slide Code Test Code	Sample Code	Test	Test Code	Sample Code
GLU-P	10	50	GGT-P	30	50
BUN-P	11	50	GOT/AST-P	31	50
UA-P	13	50	GPT/ALT-P	32	50
TCHO-P	14	50	CPK-P	33	50
NH3-P	15	50	LDH	34	50
TG-P	16	50	ALP-P	35	50
CRE-P	17	50	vAMY-P	43	50
TP-P	18	50	vLIP-P	44	50
ALB-P	20	50	TCO_2	45	50
TBIL-P	21	50	Na	91	00
Ca-P	23	50	K	92	00
IP-P	24	50	Cl	93	00
Mg-P	28	50			

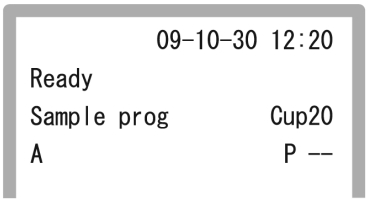
7.1 Mode Setting Procedure and Description

7.1.1 Mode Setting Procedure

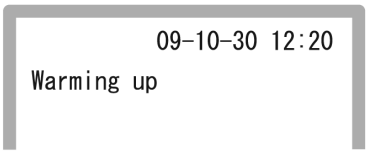
With the analyzer in Ready or Warming up, and with all lamps of the Sample keys off, press keys in the following sequence to perform mode settings.

MODE → Numeric keys → ENTER

The circle symbol indicates a key, and an arrow (↘) indicates the inputting sequence. To quit a mode operation, press **STOP**.



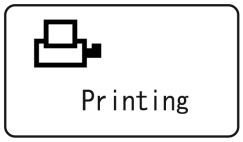
Or



7.1.2 Description of the LCD Indication During Mode Settings

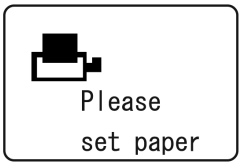
NOTE: This figure indicates printing. To stop printing in mid-course, press STOP.

[Printing]



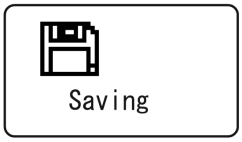
NOTE: This figure indicates lack of or incorrect setting of the recording paper. Set the recording paper properly.

[No recording paper]



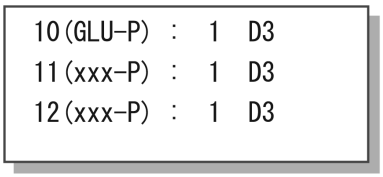
NOTE: This figure indicates saving the data to the built-in memory. Do not turn off the power when this indication appears on the LCD, otherwise, analyzer malfunction may result.

[Recording Data]



NOTE: For test names with no QC information, "xxx" will appear as a test name as shown at the left figure.

[Data indication for the test without QC information]



7.1.3 Mode Description

Mode Number	Description	Reference Page
15	Prints out specific parameter values	102
19	Turns on the control mode (a, b canceled)	102
20	Sets date and time	104
23	Displays and resets the lamp's cumulative illumination time	104
24	Unit conversion [Unit (A)/Unit (B) switch]	105
25	Result search	108
26	Reprints test results	109
27	Sequence number and sample ID settings	110
28	Switches display method for values outside of the determination range	111
29	Displays and prints out slide lot numbers	112
35	Edits sequence No. and sample ID	114
36	Inputs and resets correlation coefficients (a, b)	115
37	Inputs and resets lot compensation coefficients (c, d, e)	122
39	Reference interval settings and printout	127
42	Sampler maintenance	130
44	Lamp off selection	133
45	Dilution factor settings	134
46	Selects communication destinations	137
49	Prints out error logs	140
52	Incubator cleaning	141
76	Prints out DI card information	142
80	Mode function list	143
81	Beep sound configurations	144
82	Density adjustments (LCD/printer)	149
83	Sets print sheets of test results	151
84	Test tube settings for diluent and reference fluid	152
85	Display order of reference interval names	153
86	Editing and inputting reference interval names	155
90	Change manufacturer dilution factors	157

7.2 Mode Functions

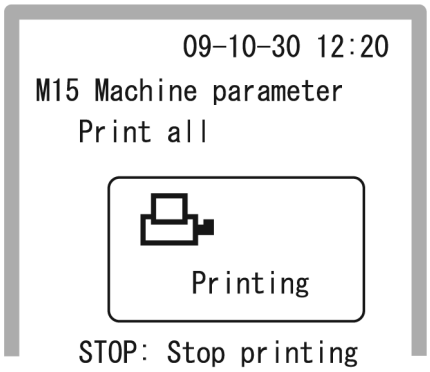
7.2.1 Mode 15: Prints Out Specific Parameter Values

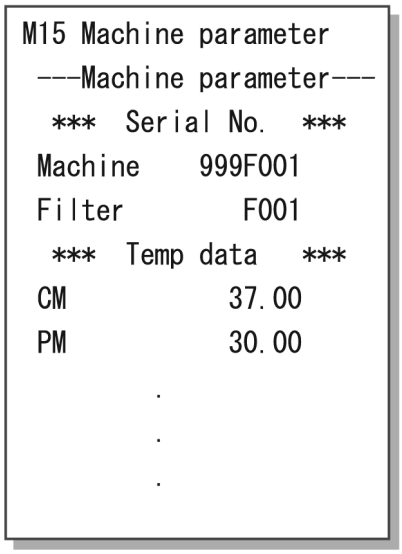
This mode is used to print out the parameter values stored in the memory of the DRI-CHEM 7000 Analyzer.

Keyboard input

MODE → 1 → 5 → ENTER

To stop printing mid-course, press **STOP**.





7.2.2 Mode 19: Turns On the Control Mode (a, b Cancelled)

This mode is used for measurement of DRI-CHEM 7000 CONTROL QP-L, QP-H. This mode is not used when using HESKA Chemistry Control. When the control mode is set, the measurements will be performed in the condition listed below.

1. Correlation coefficients (Mode 36) reset to a=1, b=0.
2. Unit conversion (Mode 24) resets to Unit a..
3. Dilution factor (Mode 45) resets to no dilution.

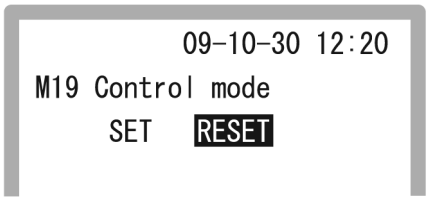
On the printout for each measurement, "Ctrl" mark appears after the sample number.

NOTE: After turning the analyzer off and on, the control mode is canceled.

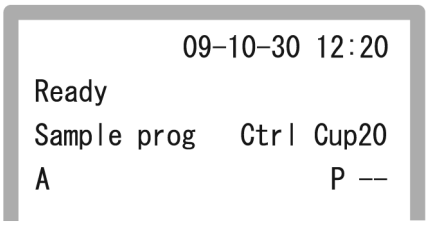
Keyboard input

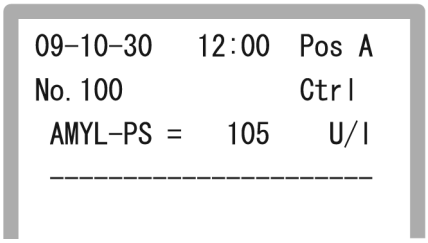
MODE → 1 → 9 → ENTER

Select [Set] (on) or [Reset] (off) for the control mode using the cursor keys (◄ ►).

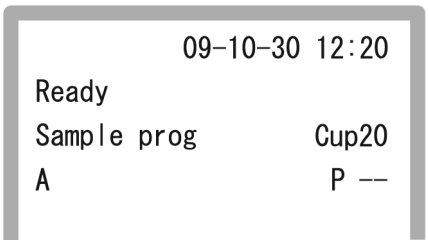


[LCD indications and printouts when this mode is set]





[LCD indication when this mode is reset]



7.2.3 Mode 20: Sets Date and Time

This mode is used to set the date and time.

Keyboard input

MODE → 2 → 0 → ENTER

Example: To set Dec. 24, 2009 17:40:

NOTE: Input last 2 digit for year.

1. First, press numeric keys corresponding to the year, month, and day.

   [year] 0 → 9 →

   [month] 1 → 2 →

   [day] 2 → 4 → ENTER

2. Next, press numeric keys corresponding to the hour, and minute (two digits for each).

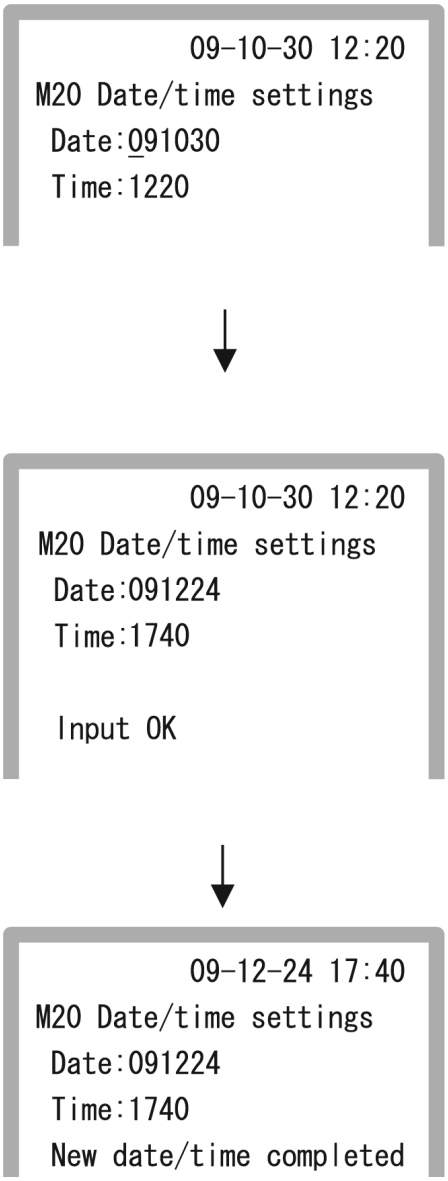
   [hour] 1 → 7 →

   [minute] 4 → 0 → ENTER

The analyzer quits the mode automatically if there are no inputting errors.

NOTE: If there is a mistake, re-input from the beginning.

NOTE: To quit the mode in mid course, press **STOP**.



7.2.4 Mode 23: Displays and Resets the Lamp's Cumulative Illumination Time

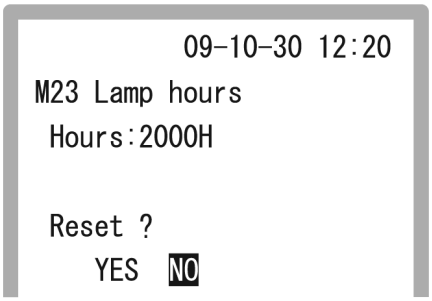
This mode is used to display and reset the cumulative illumination time of the lamp currently installed in the analyzer. Reset the cumulative illumination time of the lamp after replacing the lamp.

Keyboard input

MODE → 2 → 3 → ENTER

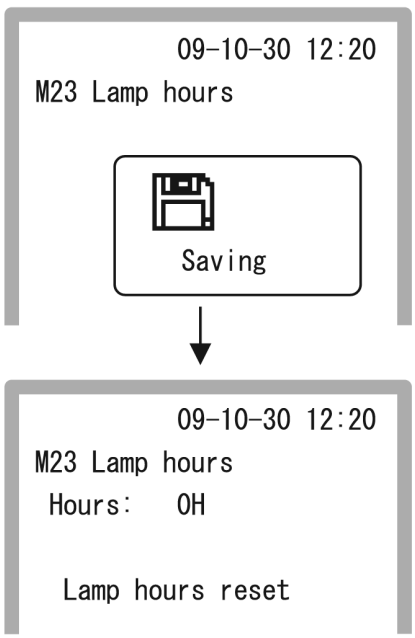
The cumulative illumination time appears on the LCD. The cumulative illumination time should be reset when the lamp is replaced.

NOTE: The average life of the lamp is 1000 hours.



To reset the cumulative illumination time, select [Yes] by using the cursor keys (◄ ►) and press **ENTER**.

ication when time is reset]



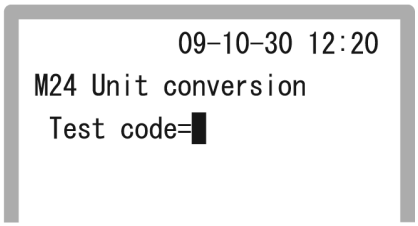
7.2.5 Mode 24: Unit Conversion (Unit (A)/Unit (B) Switch)

This mode is used to switch the results printing unit between Unit (A) and Unit (B) for each test code. The test code and units are listed on the table on the following page.

Keyboard input

MODE → 2 → 4 → ENTER

Input a test code and press **ENTER**.



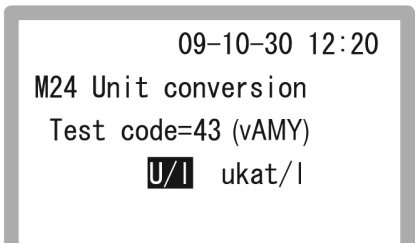
Example: Input 43 for vAMY (Test code for vAMY = 43)

4 → 3 → ENTER

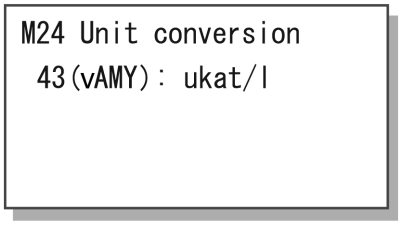
NOTE: Unit (A) and Unit (B) for this test are displayed.

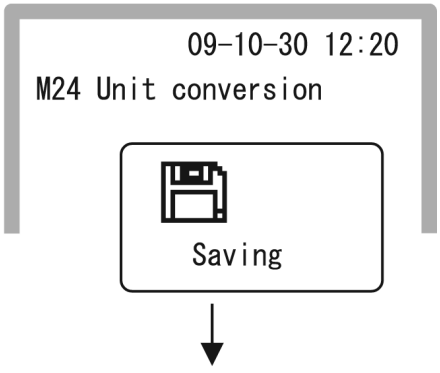
The shaded part is the currently used (selected) unit.

NOTE: The left-hand side of Unit on the LCD is Unit A.



To switch the unit, select another unit by using the cursor keys (◄ ►) and press **ENTER**.





After saving the setting, the LCD returns to the initial selection dialog. To quit the mode, press **STOP**.

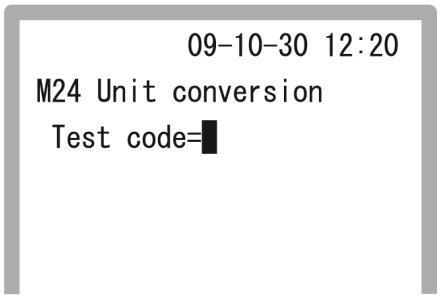


Table of Unit (A), Unit (B), and Conversion Coefficients

Classification		Test Name	Test Code	Unit (A)	Unit (B)	Conversion Coefficient
Biochemical Tests	Enzymes	ALP	35	U/L	µkat/L	0.0167
		vAMY	43	U/L	µkat/L	0.0167
		CPK	33	U/L	µkat/L	0.0167
		GGT	30	U/L	µkat/L	0.0167
		AST/GOT	31	U/L	µkat/L	0.0167
		ALT/GPT	32	U/L	µkat/L	0.0167
		LDH	34	U/L	µkat/L	0.0167
		vLIP	44	U/L	µkat/L	0.0167
	General Chemistry	ALB	20	g/dL	g/L	10
		BUN	11	mg/dL	mmol/L	0.357
		Ca	23	mg/dL	mmol/L	0.25
		CRE	17	mg/dL	µmol/L	88.4
		GLU	10	mg/dL	mmol/L	0.05551
		IP	24	mg/dL	mmol/L	0.3228
		Mg	28	mg/dL	mmol/L	0.4114
		NH_3	15	µg/dL	µmol/L	0.7139
		TBIL	21	mg/dL	µmol/L	17.1
		TCHO	14	mg/dL	mmol/L	0.02586
		$TC0_2$	45	mmol/L	–	–
		TG	16	mg/dL	mmol/L	0.01129
		TP	18	g/dL	g/L	10
		UA	13	mg/dL	µmol/L	59.48
	Electrolytes	Na	91	mEq/L	mmol/L	1
		K	92	mEq/L	mmol/L	1
		Cl	93	mEq/L	mmol/L	1

NOTE: Unit (B) = Unit (A) x Conversion coefficient

NOTE: Slide codes are subject to change without notice. Slide codes are printed out on the slide's outer package.

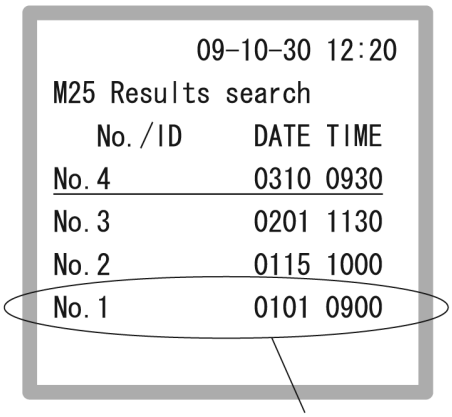
7.2.6 Mode 25: Result Search

This mode is used to retransmit the test results to the printer or to the host computer. Prior to using this mode, it is necessary to perform Mode 46 (Selects communication destinations) settings.

Keyboard input

MODE → 2 → 5 → ENTER

NOTE: The recorded data is indicated in order from the latest. (Maximum 300 samples). The sequence No., ID, the test date, and the time are indicated on the LCD.

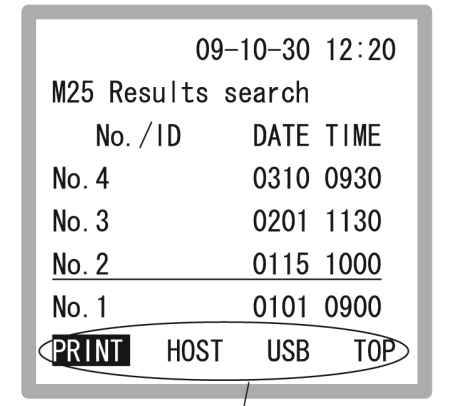


This indication corresponds to the data tested on 9:00a.m., Jan. 1.

1. Select the data to be searched by using the scroll keys (▲▼), and then press ENTER.
2. Highlight a destination using the cursor keys (◄►) and press ENTER.

NOTE: For the example in the left figure, the host computer has already been selected by using Mode 46.

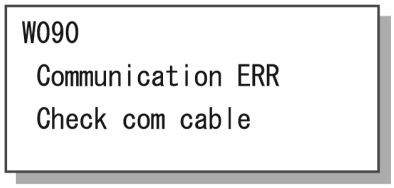
NOTE: If the error message shown at left is printed, make sure that the computer is ready and the cables are connected properly.



Destination is selected by Mode 46 as indicated here.

3. To quit, press STOP.

[Data transmission error]

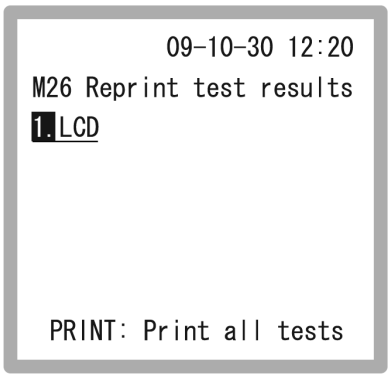


7.2.7 Mode 26: Reprints Test Results

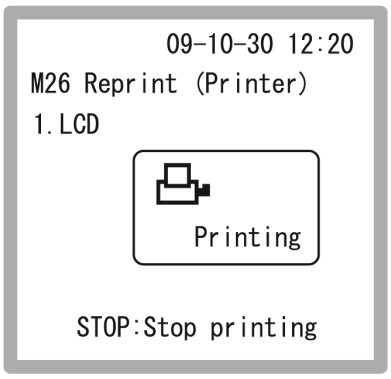
This mode is used to output test results stored in memory to the printer or the LCD, beginning with the latest data (maximum 300 samples).

Keyboard input

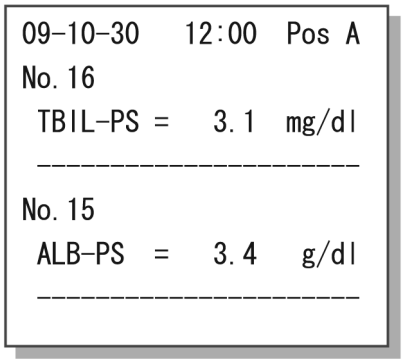
MODE → 2 → 6 → ENTER



1. To print out test results:
   a. Press **PRINT**.



Printout example:

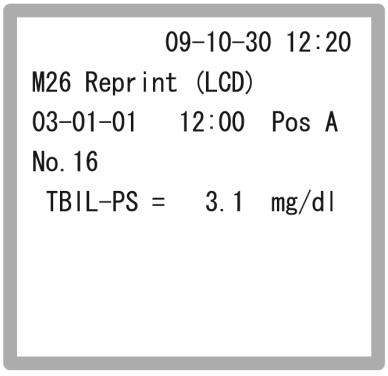


2. To display test results on the LCD:
   a. Press **ENTER**.

NOTE: Each time **ENTER** is pressed, the next test result will be displayed.

   b. To quit, press **STOP**.

[LCD example]



ENTER Press the **ENTER** key to display the next test result.

7.2.8 Mode 27: Sequence Number, Sample ID and Reference Interval Settings

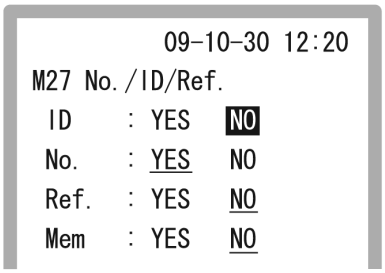
This mode is used to change the current setting of test sequence No. and sample ID displayed with test results.

Keyboard input

MODE → 2 → 7 → ENTER

NOTE: The current settings are indicated with an underline and a shaded part on the LCD.

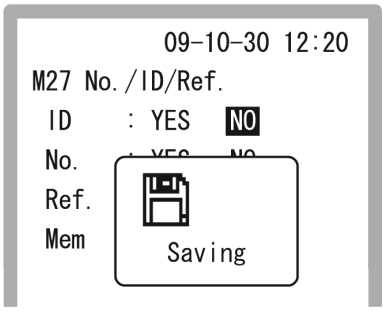
[Example of the LCD indication of the current settings]



To switch each setting, select them by using the cursor keys (◄ ►) and press **ENTER**.

NOTE: Do not turn off the power while the analyzer is saving the new settings.

[LCD indication and printout example when the settings are switched]



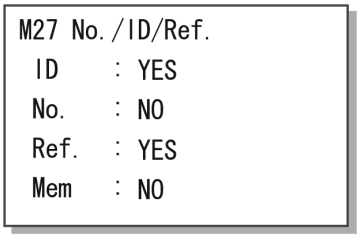
LCD display descriptions:

ID: Select [Yes] to include the sample ID when entering sample data. Note that the sequence number will not be included in the printed test results when [Yes] is selected.

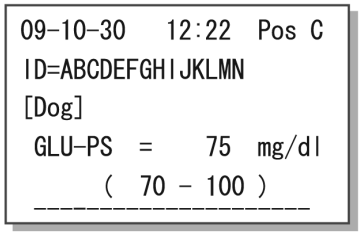
No.: Select [Yes] to include the sequence number when entering sample data.

Ref: Select [Yes] to use reference intervals. Reference intervals are set by selecting Modes 86, 85, and 39 in turn.

Mem: Select [Yes] if the sequence number (No.) of the latest test will be continued for the next test when turning on the analyzer. If [No]. is selected, the sequence number starts from [No.=].



[Printout example when “ID” is selected]



7.2.9 Mode 28: Switches Display Method for Values Outside of the Determination Range

This mode is used to switch the display method for test results outside of the determination range for all tests.

Keyboard input

MODE → 2 → 8 → ENTER

NOTE:: The current settings are indicated with an underline and a shaded part on the LCD.

Select the over range mark by using the cursor keys (◄ ►) and press **ENTER**.

1. [@, >]

   To print the numeric value with an "@" mark when the test results are below the determination range.

IMPORTANT

Indicated value with an "@" mark may NOT be accurate. Rerun the test.

Printout examples of test results:

```
09-10-30   12:00  Pos A
No.16
 GLU-PS  >  600   mg/dl
 GOT-PS     @
        =    1     U/l
  ---------------------
```

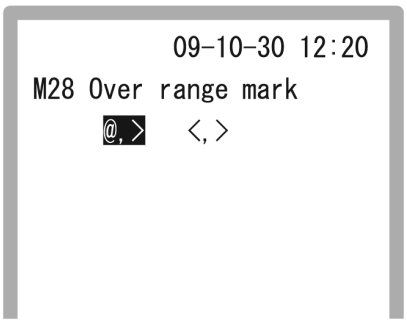
2. [◄ ►]

   To print out test results outside of the determination range with a ◄ or ► mark.

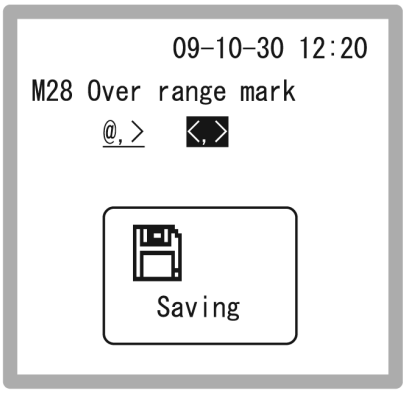
Printout examples of test results:

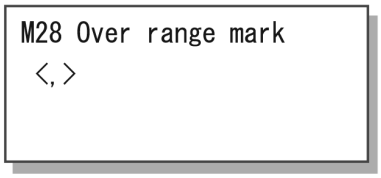
```
09-10-30   12:00  Pos A
No.16
 GLU-PS  >  600   mg/dl
 GOT-PS  <   10    U/l
  ---------------------
```

[Example of the LCD indication of the current settings]



[LCD indication when the settings are switched]





7.2.10 Mode 29: Displays and Prints Out Slide Lot Numbers

This mode is used to display or print out the slide lot numbers recorded in the analyzer memory.

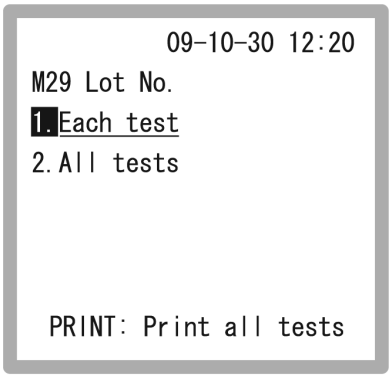
Keyboard input

MODE → 2 → 9 → ENTER

Select [1. Each test] or [2. All tests] by using the scroll keys (▲▼) or press a numeric key 1 or 2, and press **ENTER**.

1. To display data for each test name:
   a. Select [1. Each test].

      1 → ENTER

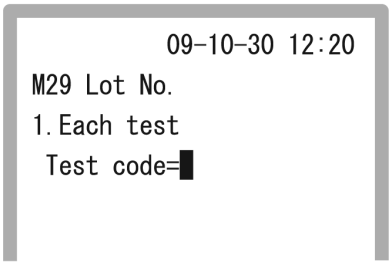


Example: To display lot numbers for Glucose

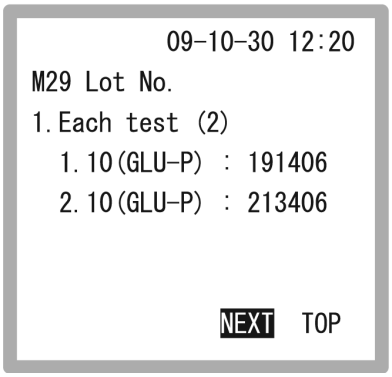
(GLU test code=10)

   b. Input the test code.

      1 → 0 → ENTER



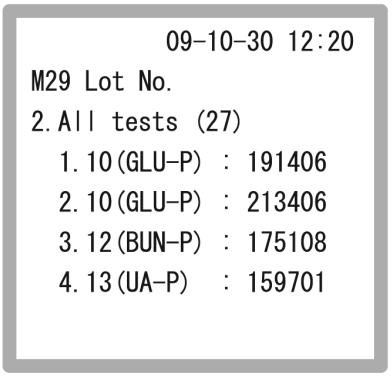
   c. To display other tests, select **NEXT** by using the cursor keys (◄►) and press **ENTER**. To return to the top menu, select [Top] and then press **ENTER**.



2. To display all recorded data:
   a. Select [2. All tests] and press **ENTER**.

      2 → ENTER

[LCD indication example of the recorded data]



NOTE: If all data cannot be displayed at once, use the scroll keys (▲▼).

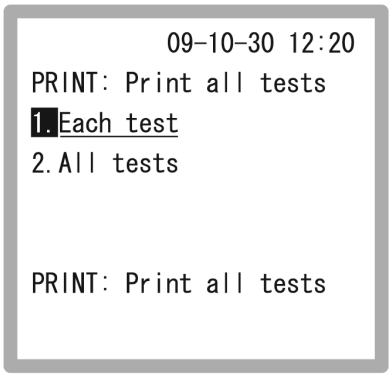
3. To print out all recorded data:

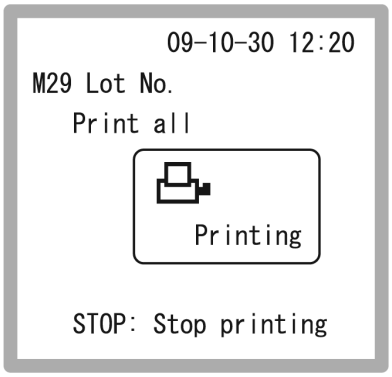
   a. Press **PRINT** when the LCD displays the Mode 29 menu.

NOTE: To stop the printing, press **STOP**.

Printout example of the recorded data:

```
------- Lot No. -------
 1.10(GLU-P)  : 191406
 2.10(GLU-P)  : 213406
 3.12(BUN-P)  : 175108
 4.13(UA-P)   : 159701
          .
          .
          .
25.91(Na)     : 100000
26.92(K)      : 100000
27.93(Cl)     : 100000
```





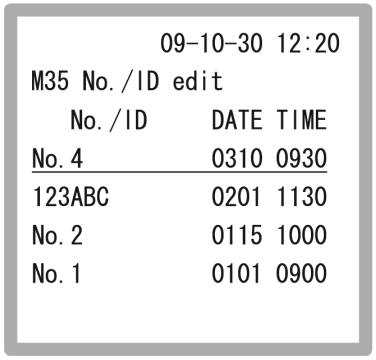
7.2.11 Mode 35: Edits Sequence Number and Sample ID

This mode is used to edit sequence numbers and sample IDs of test results in analyzer memory.

Keyboard input

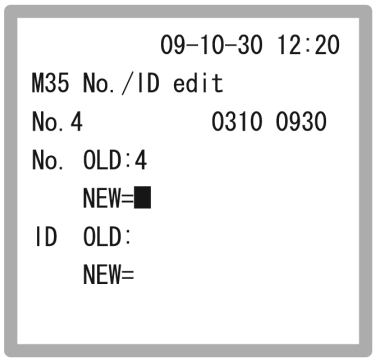
NOTE: The recorded data is listed in order from the newest to the oldest. The sequence No., ID, test date, and time are indicated on the LCD (maximum 300 samples).

1. Select the data to be edited by using scroll keys (▲▼), and then press **ENTER**.



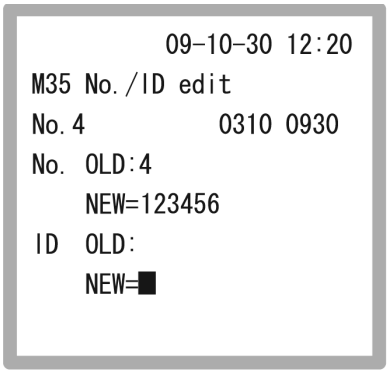
2. Input a new sequence number. Press **ENTER**.

NOTE: If there is no need to change, just press **ENTER**.



3. Input a new sample ID. Press **ENTER**.

NOTE: Refer to *Section 4.7* for input procedures.

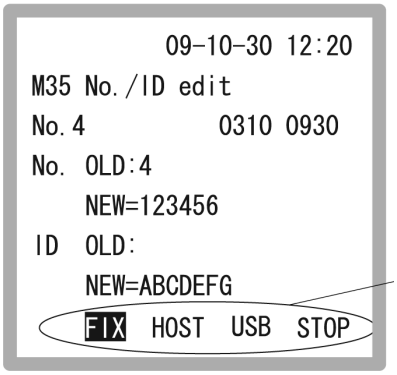


4. After confirming the input data, select [Fix] and press **ENTER**.

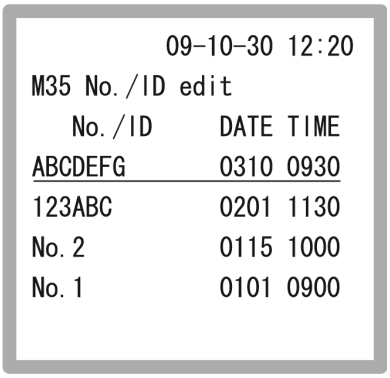
NOTE: To re-input the information, select [Stop] and press **ENTER**. The LCD display returns to step a..

NOTE: The test result can be sent to either host computer (HOST), or the external printer (USB). The destination is selected using Mode 46.

NOTE: To use the analyzer printer, press **PRINT** on the keyboard.



b. The LCD returns to the M35 menu.
To quit, press **STOP**.



7.2.12 Mode 36: Inputs and Resets Correlation Coefficients (a, b)

This mode is used to input, reset or print out the correlation coefficients (a, b) for each test and for each sample type (W, P, U, E).

IMPORTANT

Incorrect inputs for (a, b) will cause incorrect test results. Make sure that the inputs (a, b) are correct using this mode.

Keyboard input

MODE → 3 → 6 → ENTER

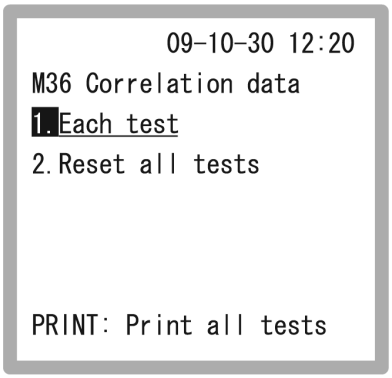
Select [1. Each test] or [2. Reset all tests] by using the scroll keys (▲▼) or press a numeric key 1 or 2 and press **ENTER**.

To print out the current data: .....See 1

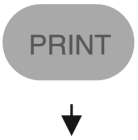
To input coefficients for each test name: .....See 2

To reset coefficients for each test name: .....See 3

To reset all data: .....See 4

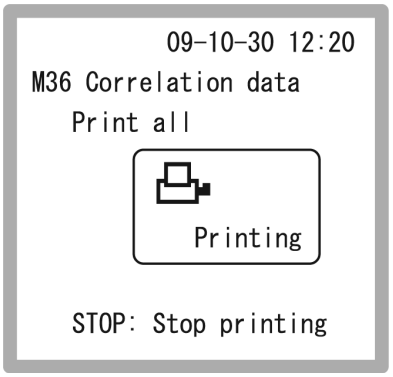


1. To print out all current correlation data:
   a. Press **PRINT**.



Printout example

```
M36 Correlation data
 -- Correlation data --
 10(GLU)     a       b
  P        1.2     0.3
 13(UA)      a       b
  P        0.97    0.01
  U        0.98    0.02
  E        0.99    0.03
 ---------------------
```

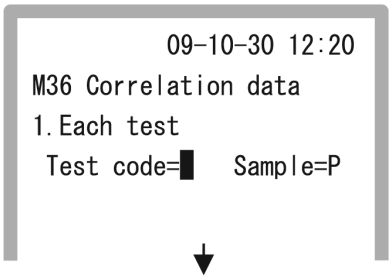


NOTE: Only correlation coefficients other than default values (a=1, b=0) are printed.

2. To input coefficients for each test name:
   a. Select [1. Each test] and press **ENTER**.

   ① → ENTER

   b. Select a sample type.
   Check [Sample=] on the LCD and select a sample type by pressing **SAMPLE**.



Example: To input GLU-PS (a=1.2, b=0.3)

(GLU test code=10)

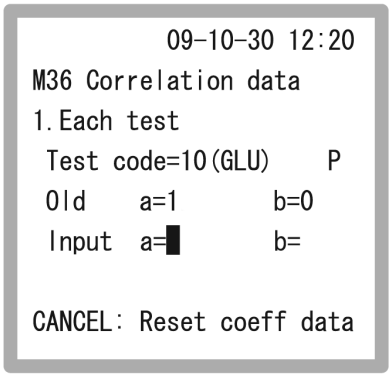
① → 0 → ENTER

(a=1.2)

① → · → 2 → ENTER

(b=0.3)

0 → · → 3 → ENTER



Printout example of the settings:

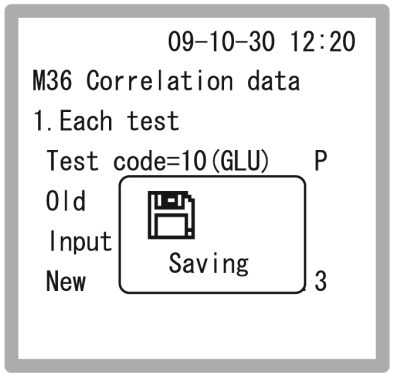
```
M36 Correlation data
 10(GLU-P)
 Old    a=1      b=0
 New    a=1.2    b=0.3
```

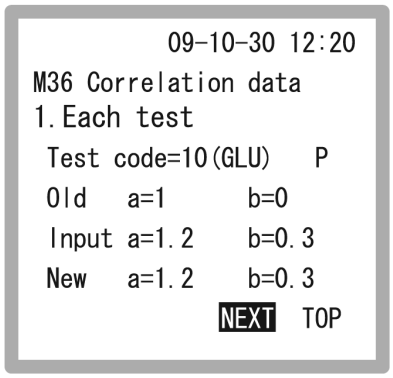
IMPORTANT

Make sure that the printed new values for (a, b) are correct. Incorrect inputs for (a, b) will cause incorrect test results.

NOTE: If values for a and b have already been input (a≠1, b≠0), the new coefficients will be calculated automatically according to the formulas. (Refer to *Section 7.2.13*, Description of the Correlation Function, for further information.)

c. To input for other tests, select **NEXT** by using the cursor keys (◄ ►) and press **ENTER**. To return to the top menu, select [Top] and then press **ENTER**. To quit, press **STOP**.

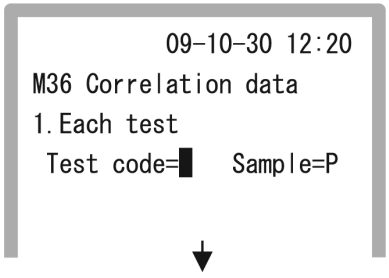




3. To reset coefficients for each test name:

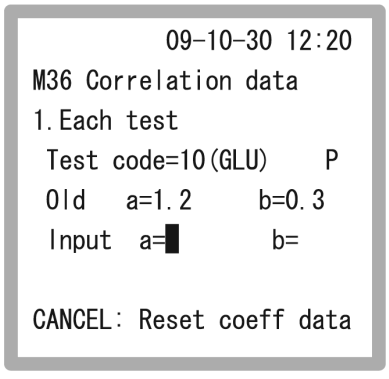
a. Select [1. Each test] and press **ENTER**.

b. Select a sample type.
Check [Sample=] on the LCD and select a sample type by pressing **SAMPLE**.



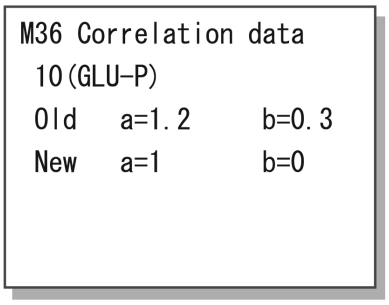
Example: To reset coefficients for GLU-PS

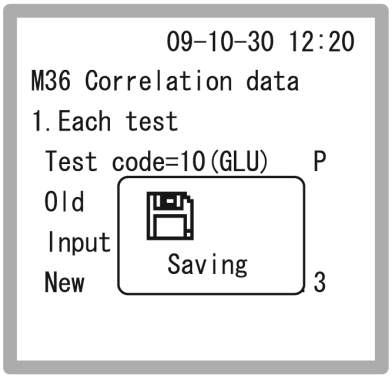
(GLU test code=10)



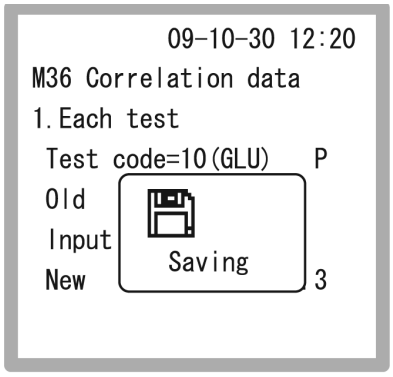
c. Press **CANCEL** to reset the data.

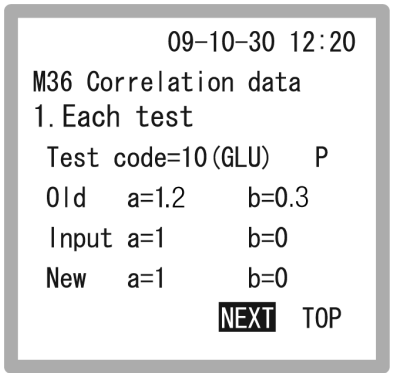
Reset data printout example:





d. To reset for other tests, select **NEXT** by using cursor keys (◄ ►) and press **ENTER**. To return to the top menu, select [Top] and then press **ENTER**. To quit, press **STOP**.

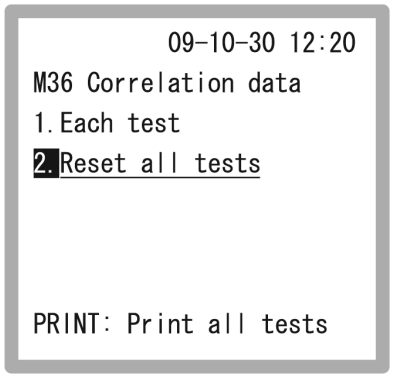




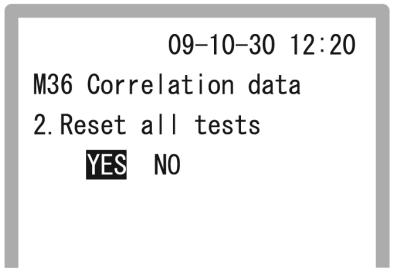
4. To reset all data:

NOTE: This menu resets data for all tests at once (a=1, b=0).

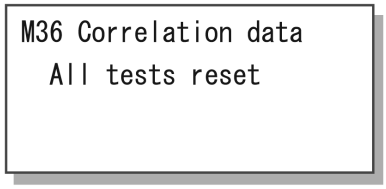
a. Select [2. Reset all tests] and press **ENTER**.

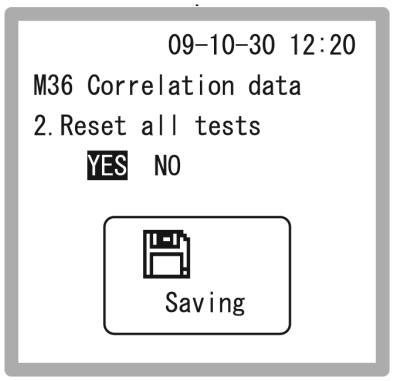


b. Select [Yes] by using the cursor key and press **ENTER**.



Printout example:





c. The LCD returns to the M36 menu. To quit the mode, press **STOP**.

7.2.13 Description of the Correlation Function

This function is designed to determine the correlation between the measured data obtained using the DRI-CHEM 7000 Analyzer and the data obtained using the conventional measuring method with your own instruments.

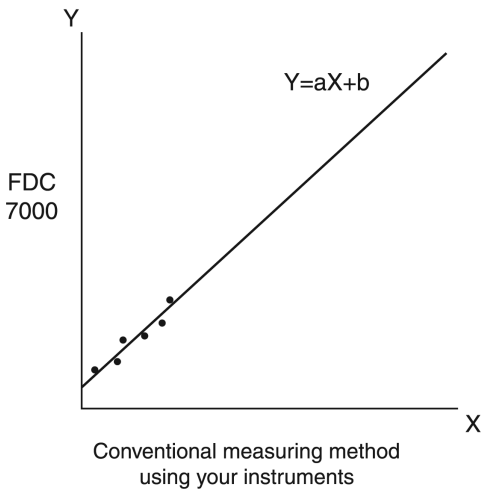
On the X-axis, the measured data obtained using your instruments are plotted, and on the Y-axis, the measured data obtained using the DRI-CHEM 7000 Analyzer. The correlation regression equation in this case is:

$Y = aX + b$

Once values for the two coefficients (a, b) are recorded in the analyzer memory, the DRI-CHEM 7000 Analyzer performs compensation calculations internally using the formula:

$X = (Y-b)/a.$

In this way, the DRI-CHEM 7000's measured data (Y) are adjusted to match those that would be obtained using your instruments with the conventional method.



NOTE: In order to obtain a better correlation, it is essential to exercise caution regarding the number of data points and the sample type.

1. It is possible to set separate a and b values for each sample type.
2. The correlation function is independent of other compensation functions.
3. If values for (a, b) have already been input, old values will not be canceled as follows. If the old values are represented as (a1, b1), and the new values as (a2, b2), the resulting values for (a, b) will be determined according to the following formulas:

$a = a1 \times a2$

$b = a1 \times b2 + b1$

4. Depending on the values input for (a, b), the apparent limits of the measurement range will shift as follows.

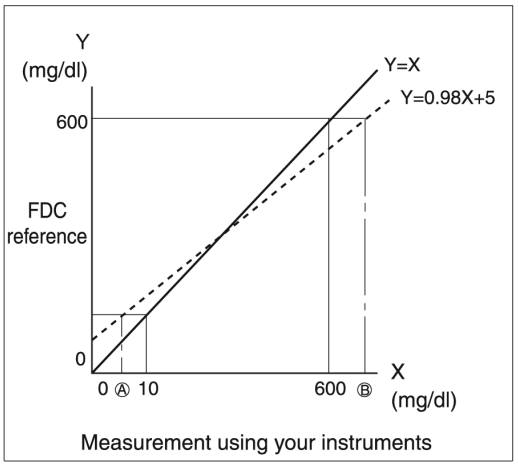
Example GLU measurements

If a=1 and b=0 (Y=X), the measurement range is 10-600 mg/dl. But by inputting regression coefficients as shown, the lower limit changes to A and the upper limit to B.

If the regression formula is Y = 0.98× + 5:

A = 5 mg/dl

B = 607 mg/dl



Measurement using your instrumentsPrintout example)

```
09-10-30    12:00   Pos A
No. 16
 GLU-PS       @
          =     5   mg/dl
 GLU-PS   >   607   mg/dl
 ----------------------
```

Value under the measurement range

Value above the measurement range

If the regression formula is Y = 1.1× – 5:

A = 14 mg/dl

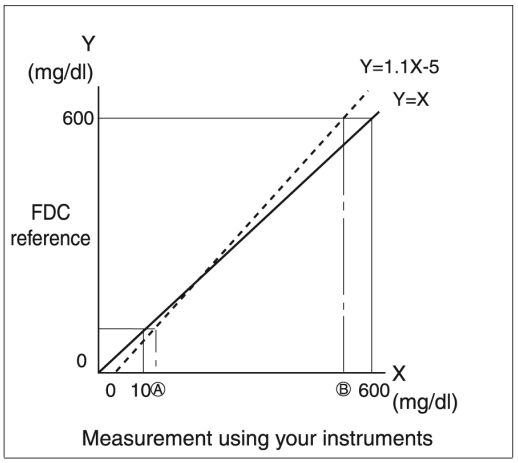
B = 550 mg/dl

If the measured data is below the measurement range, an "@" indication is printed out, as shown at the example printout.

If the measured data is above the measurement range, a greater-than indication "▶" is printed out, as shown at the example printout.

IMPORTANT

Measured values with an "@" mark may NOT be accurate. Rerun the tests.



Measurement using your instrumentsPrintout example)

```
09-10-30    12:10   Pos B
No. 17
 GLU-PS       @
          =    10   mg/dl
 GLU-PS   >   550   mg/dl
 ----------------------
```

Value under the measurement range

Value above the measurement range

7.2.14 Mode 37: Lot Compensation Coefficients (c, d, e) Settings

This mode is used to input, reset or print out the values (c, d, e) printed on the calibration cards. Settings included with slides. This mode is needed if it is not possible to read the data directly from the calibration card due to loss.

IMPORTANT

Incorrect inputs for (c, d, e) will cause incorrect test results. Make sure that the inputs for (c, d, e) are correct using this mode.

IMPORTANT

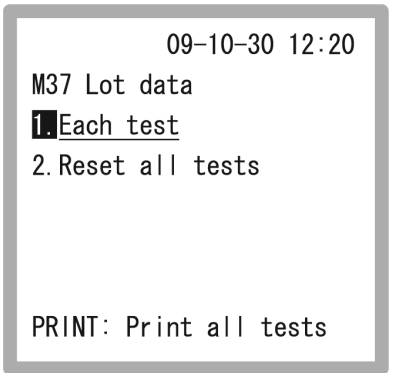
In Mode 37, it is possible to input values for (c, d, e) only for the slide lots which the Slide Type Number's standard curve information has already been input into the analyzer. It is necessary to read in the calibration card for the slide lots which have a new Slide Type Number.

NOTE: The Slide Type Number is the most significant digit of a lot number. (Example) The Slide Type Number of "Lot No. 123456" is 1.

Keyboard input

MODE → 3 → 7 → ENTER

Select [1. Each test] or [2. Reset all tests] by using the scroll keys (▲▼) or press a numeric key 1 or 2 and press **ENTER**.

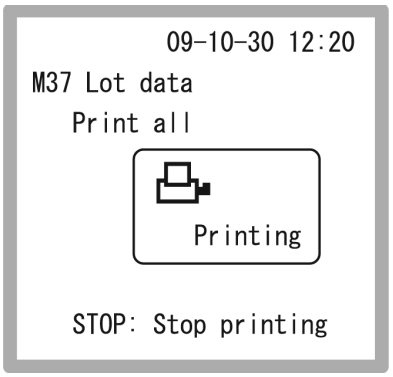


To print out the current data: .....See 1
To input coefficients for each test name: .....See 2
To reset coefficients for each test name: .....See 3
To reset all data: .....See 4

1. To print out the current data:
   a. Press **PRINT**.

Printout example:

```
M37 Lot data
 -----  Lot data  -----
 10(GLU-P)     212345
  c=-0.596
  d=1.051
  e=-0.141
 30(GGT-P)     312345
  c=1.3
  d=1.071
  e=-0.047
 ----------------------
```



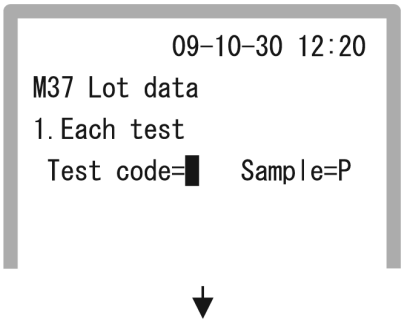
NOTE: Only lot compensation coefficients other than default values (c=0, d=1, e=0) are printed out.

2. To input coefficients for each test name:

   a. Select [1. Each test] and press **ENTER** key.

   ① → ENTER

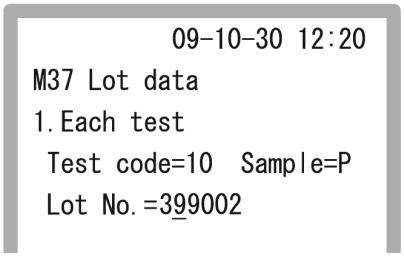
Example: To input data for GLU-PS
Lot number: 399106
c=0.009 d=1.006 e=0.889
Expiration date: Dec. 2009



   b. Select a sample type.
   Check [Sample=] on the LCD and select a sample type by pressing **TYPE**.

   c. Input a test code.
   (GLU test code=10)

   ① → 0 → ENTER



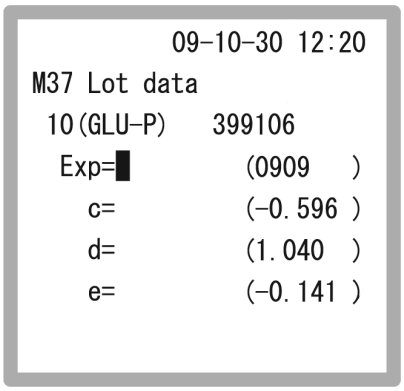
   d. Input the lot number (6 digits).

   3 → 9 → 9 → 1 → 0 → 6 → ENTER

   e. Input the expiration date.
   Input last 2 digits of the year and month.

   Example: Dec. 2003

   0 → 3 → 1 → 2 → ENTER



   f. Input a value for "c".

   0 → · → 0 → 0 → 9 → ENTER

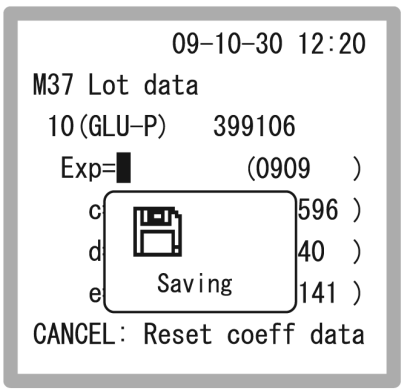
   g. Input a value for "d".

   1 → · → 0 → 0 → 6 → ENTER

   h. Input a value for "e".

   0 → · → 8 → 8 → 9 → ENTER

NOTE: The analyzer saves the input data automatically, if there are no inputting errors.



Printout example of the settings:

```
M37 Lot data
 10(GLU-P)    399106
   Exp=0912     (0909    )
     c=0.009    (-0.596 )
     d=1.006    (1.040   )
     e=0.889    (-0.141 )
```

```
                09-10-30 12:20
M37 Lot data
 10(GLU-P)    399106
   Exp=0912     (0909    )
     c=0.009    (-0.596 )
     d=1.006    (1.040   )
     e=0.889    (-0.141 )
                NEXT  TOP
```

IMPORTANT

Make sure that the printed new values for (c, d, e) are correct. Incorrect inputs for (c, d, e) will cause incorrect test results.

i. To input for other tests, select **NEXT** by using cursor keys (◄ ►) and press **ENTER**. To return to the top menu, select [Top] and then press **ENTER**. To quit, press **STOP**.

3. To reset coefficients for each test name:

   a. Select [1. Each test] and press **ENTER**.

Example: To reset data for GLU-PS

Reset data to (c=0, d=1, e=0) for GLU (lot 399106).

   b. Select a sample type.
   Check [Sample=] on the LCD and select a sample type by pressing **SAMPLE**.

   c. Input a test code.
   (GLU test code=10)

   d. Select the lot number to be changed by using the **CAL** key.
   Input the lot number (last 5 digits)..

NOTE: The left most digit (type No.) cannot be changed.

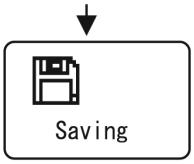
   e. Input the expiration date.
   Input last 2 digits of the year and month.
   Example: Dec. 2009

   f. Press **CANCEL**.
   The analyzer resets the data and saves the default values.

```
                09-10-30 12:20
M37 Lot data
1.Each test
Test code=    Sample=P
```

```
                09-10-30 12:20
M37 Lot data
1.Each test
Test code=0   Sample=P
Lot No.=399002
```

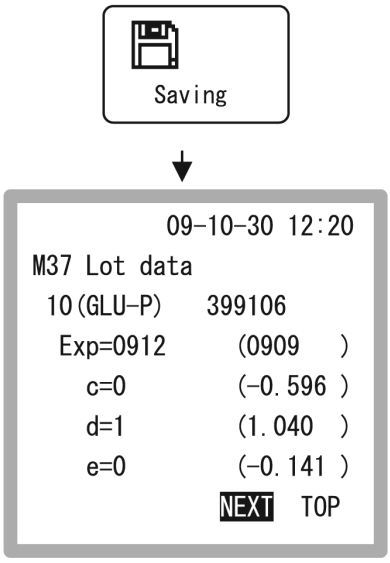
```
                09-10-30 12:20
M37 Lot data
 10(GLU-P)    399106
   Exp=0912     (0909    )
     c=         (-0.596 )
     d=         (1.040   )
     e=         (-0.141 )
CANCEL: Reset coeff data
```



Printout example of the settings:

```
M37 Lot data
 10(GLU-P)    399106
  Exp=0912      (0909    )
    c=0         (-0.596 )
    d=1         (1.040   )
    e=0         (-0.141 )
```

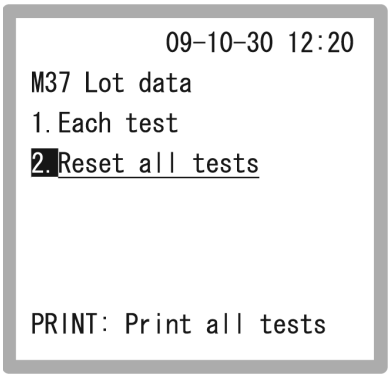
g. To reset for other tests, select **NEXT** by using cursor keys (◄ ►) and press **ENTER**. To return to the top menu, select [Top] and then press **ENTER**. To quit, press **STOP**.



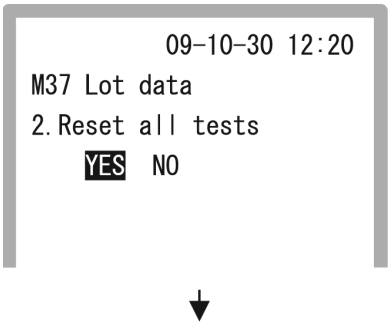
4. To reset all data:

NOTE: This menu resets data for all tests at once to (c=0, d=1, e=0).

a. Select [2. Reset all tests] and press **ENTER**.



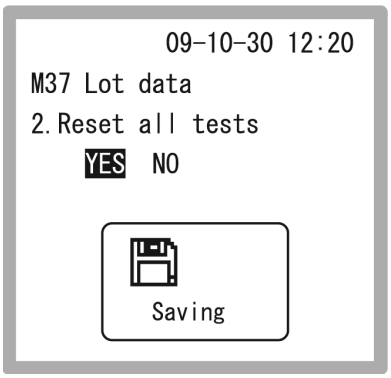
b. To reset all the data, select [Yes] by using the cursor key and press **ENTER**.



Printout example of the settings:

c. The LCD returns to the M37 menu. To quit the mode, press **STOP**.

```
M37 Lot data
  All tests reset
```



7.2.15 Mode 39: Reference Interval Settings and Printout

A reference interval must be set for each reference interval name and sample type. The reference intervals have been set at zero as the default value.

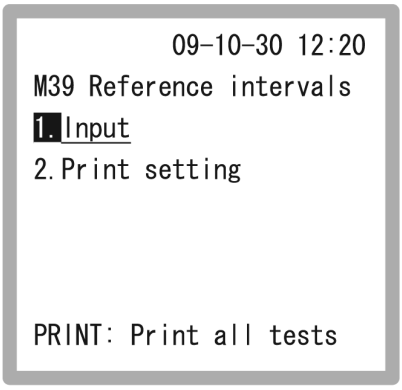
NOTE: Reference intervals are set by selecting Modes 27, 86, 85, and 39 in turn.

Keyboard input

MODE → 3 → 9 → ENTER

Select [1. Input] or [2. Print setting] by using the scroll keys (▲▼) or press a numeric key 1 or 2 and press **ENTER** key.

To print out the current data:..... See 1
To input reference intervals: ..... See 2
To print out reference intervals along with results:..... See 3

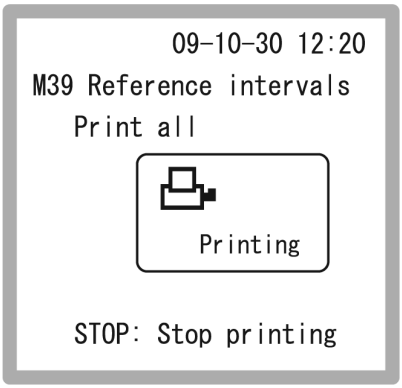


1. To print out the current data:
   a. Press **PRINT**.

Printout example:

```
M39 Reference intervals
  -Reference intervals-
10(GLU- P):Dog
mg/dl      :   60 - 100
15(NH3- P):Dog
ug/dl      :   12 -  66
91(Na  -P):Cat
mEg/dl     :  136 - 149

 Print ref intervals
  --------------------
```



NOTE: The analyzer only prints the reference intervals which have been entered.

2. To input reference intervals:

   a. Select [1. Input] and press **ENTER**.

   ① → ENTER

Example: To input data for GLU-PS

Reference interval=Dog, Lower limit = 70, Upper limit = 110 (mg/dl)

   b. Select a sample type.
   Check [Sample=] on the LCD and select a sample type by pressing **TYPE**.

   c. Input a test code.
   (GLU test code = 10)

   ① → 0 → ENTER

   d. Select a reference interval name. Use the cursor keys (▲▼) to highlight the reference interval name and press **ENTER**.

NOTE: The reference intervals are named using Mode 86.

   e. Input a lower limit value.

   7 → 0 → ENTER

   f. Input an upper limit value..

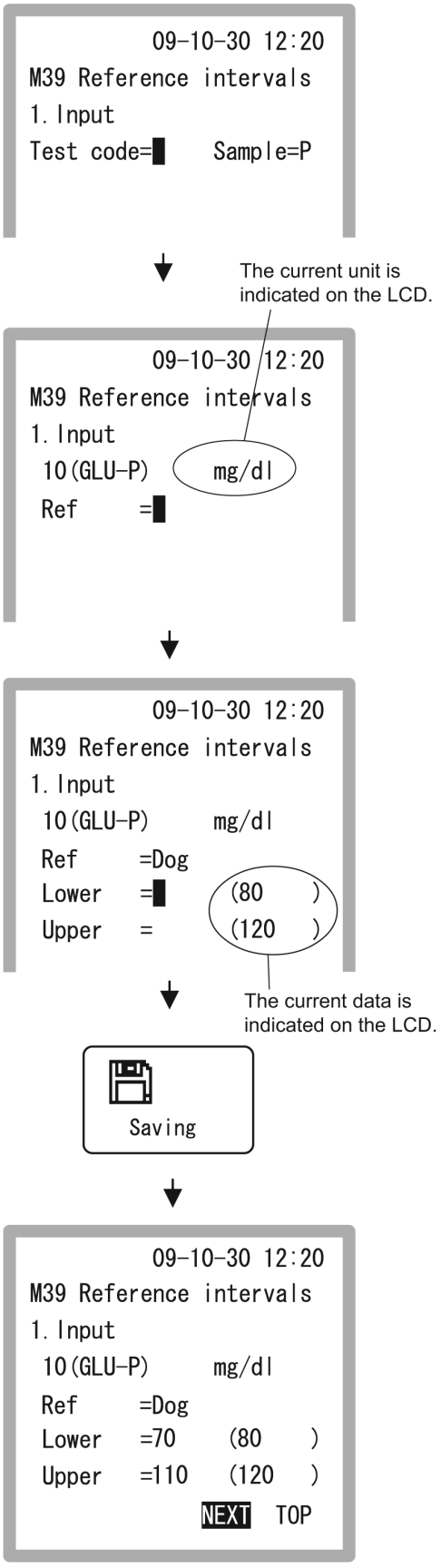
   ① → ① → 0 → ENTER

NOTE: The analyzer saves the input data automatically if there are no inputting errors.

Printout example:

```
M39 Reference intervals
  -Reference intervals-
10(GLU-P) :Dog
mg/dl     :   70 - 110
```

   g. To input for other tests, select **NEXT** by using the cursor keys (◄►) and press **ENTER**. To return to the top menu, select [Top] and then press **ENTER**. To quit, press **STOP**.

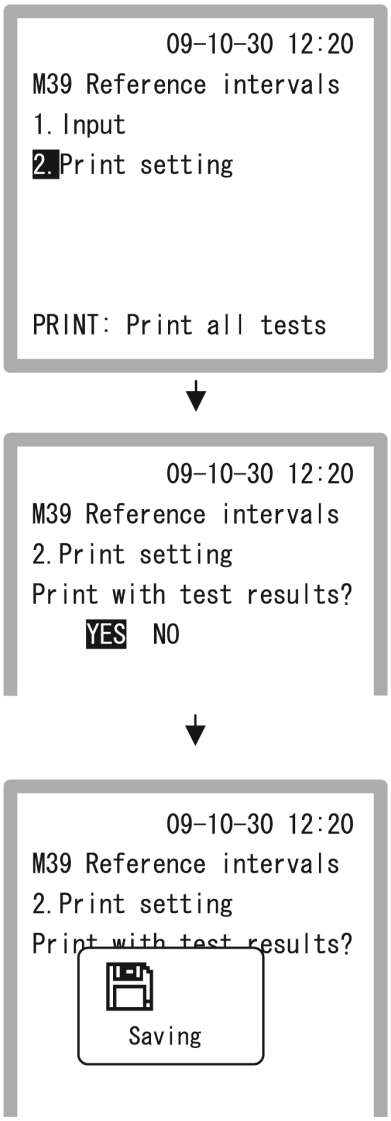


3. To print out reference intervals along with results:

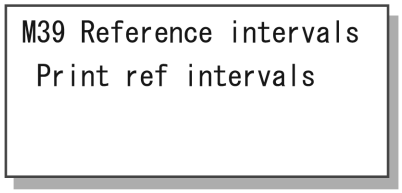
   a. Select [2. Print setting] and press **ENTER**.

   b. To print out reference intervals along with test results, select [Yes] by using the cursor keys (◄ ►) and press **ENTER**.



Printout example



   c. The LCD returns to the M39 menu. To quit the mode, press **STOP**.

7.2.16 Mode 42: Sampler Maintenance

The O-rings of the sampler nozzles wear with use. Replace the O-rings once a year. This mode is used to replace the O-rings and to perform a leak check of the sampler.

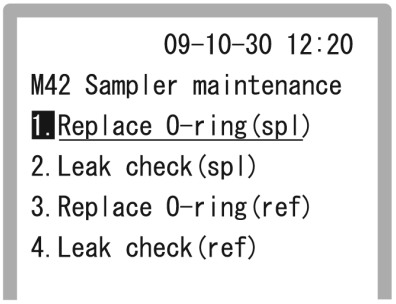
NOTE: Prior to performing the leak check, prepare the sampler leak check tip (packed as an accessory).

Keyboard input

MODE → 4 → 4 → 2

Select a menu by using the scroll keys (▲▼) or press a numeric key and press **ENTER**.

To replace the sampler O-rings: .....See 1
To perform leak check: .....See 2



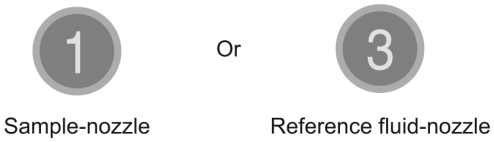
1. Sampler O-ring replacement procedures

   a. Select sampler nozzle to be replaced.
      To replace O-ring of sample-nozzle:

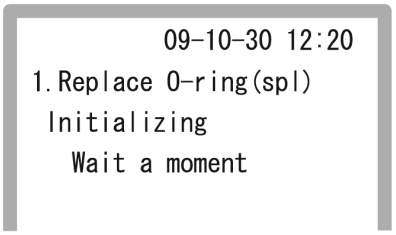
      1 → ENTER

      To replace O-ring of reference fluid-nozzle:

      3 → ENTER

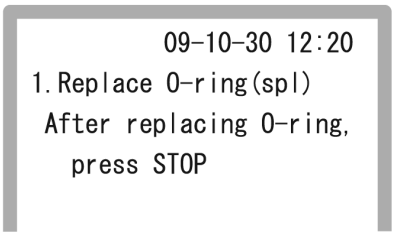


NOTE: The sampler unit moves and the sampler nozzle comes down.



   b. Replace the sampler O-ring.
      Refer to *Section 5.6* for O-ring replacement procedures.
   c. Press **STOP** after replacement.

NOTE: The sampler unit goes back to the normal position.



   d. The LCD returns to the M42 menu.
      To quit, press **STOP**.

NOTE: After this mode has finished, the tip pickup position is reset back to the top of tip rack ▲. Set tips on the tip rack. (Refer to *Section 4.3.1*).

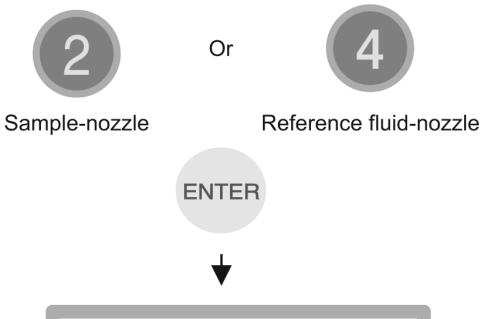
2. Leak check procedure.

   a. Select a sampler nozzle to be checked.
   To check the sample-nozzle:

   ② → ENTER

   To check the reference fluid-nozzle:

   ④ → ENTER



NOTE: The sampler unit moves and the sample disk turns so that the tip racks face to the operator side.

```
                09-10-30 12:20
2.Leak check(spl)
 Initializing
   Wait a moment
```

   b. Place a "Sampler leak check tip" to the position of the tip rack shown in the figure and press **START**.

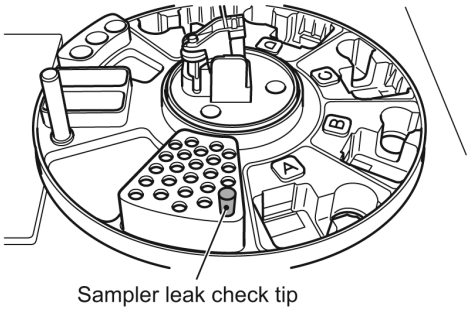
```
                09-10-30 12:20
2.Leak check(spl)
 Place leak check tip
  on tip rack 1
  and press START
```

Printout example:

```
M42 Sampler maintenance

  Leak check>spl nozzle
  0   : 4.790 [V]
  --------------------
  Aft10sec: 4.675[V]
  Leak    : 0.115[V] OK


  Leak check>ref nozzle
  0   : 4.956 [V]
  --------------------
  Aft10sec: 4.946[V]
  Leak    : 0.010[V] OK
```



NOTE: Replace the sampler O-rings (Refer to *Section 5.6.*) when the test results are [NG].

```
                09-10-30 12:20
2.Leak check(spl)

 Leak check processing
   Wait a moment
```

   c. After the leak check is completed, remove the "Sampler leak check tip" from the nozzle by hand and press **STOP**.

NOTE: The sampler unit goes back to the normal position.

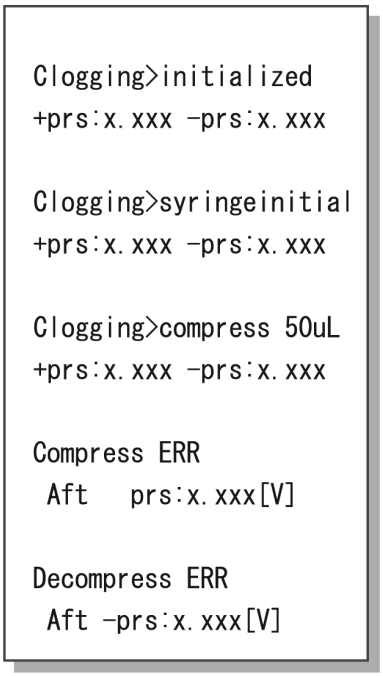
```
                09-10-30 12:20
Leak check>spl nozzle
Remove leak check tip
from nozzle & press STOP
```

d. The LCD returns to the M42 menu.
To quit, press **STOP**.

NOTE: After this mode has finished, the tip pickup position is reset back to the top of tip rack ▲. Set tips on the tip rack (Refer to *Section 4.3.1.*)

When the errors indicated on the left appear, the sampler nozzle may be clogged. Please contact Heska's Technical Support Services for assistance.

NOTE: "x.xxx" means a given value.



7.2.17 Mode 44: Lamp Off Selection

Choose the delay before the light source turns off automatically when no operations are performed. Choose a value between 20 and 240 minutes; the default setting is 20 minutes.

NOTE: The average life of lamp is about 1000 hours if the lamp is continuously lit. If the power is continuously switched on for 24 hours in the "Lamp on" selection, the lamp will be used up in about 40 days.

Keyboard input

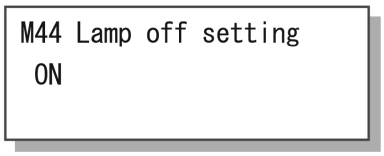
MODE ➔ 4 ➔ 4 ➔ ENTER

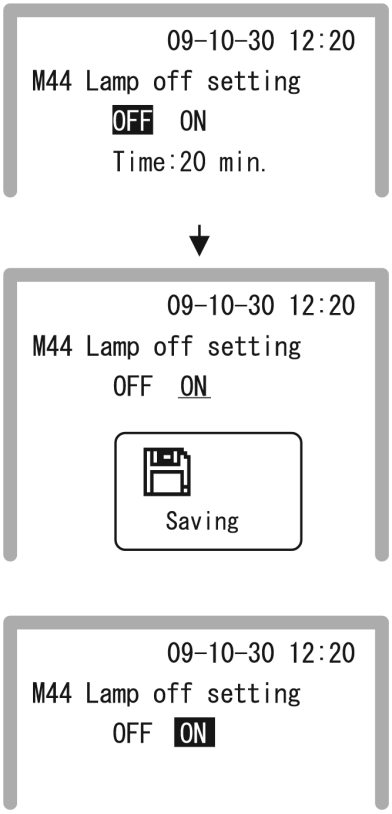
To prevent the light source from turning off automatically.....See 1

To choose an auto lamp-off delay.....See 2

1. To prevent the light source from turning off automatically:
   a. Select [ON] using the cursor keys (◄ ►) and press **ENTER**.

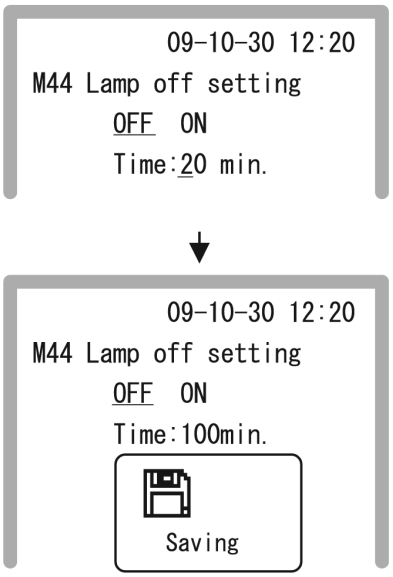
Printout example





2. To choose an auto lamp-off delay:

   a. Select [OFF] using the cursor keys (◄ ►) and press **ENTER**.



   b. Enter the desired auto lamp-off delay and press **ENTER** .

Printout example:

```
M44 Lamp off setting
 OFF
 Time:100min
```

7.2.18 Mode 45: Dilution Factor Settings

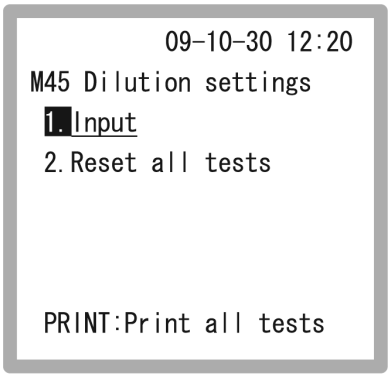
This mode is used to set a dilution factor and a diluent position for each test and each sample type. When performing tests without setting a dilution factor using the DIL key, the analyzer performs tests according to the preset dilution factors in this mode.

Keyboard input

MODE ➔ 4 ➔ 5 ➔ ENTER

Select [1. Input] or [2. Reset all tests] by using the scroll keys (▲▼) or press a numeric key 1 or 2 and press **ENTER**.

To print out the current data: ..... See 1
To set dilution factors: ..... See 2
To reset dilution factors for all tests: ..... See 3

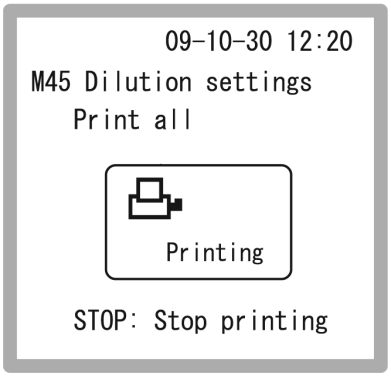


1. To print out the current data:

   a. Press **PRINT**.

Printout example:

```
M45 Dilution settings
   ----- Dil data -----
 10(GLU-P) :  2   D2
 11(BUN-P) :  2   D4
 30(GGT-P) :  3   D2
  --------------------
```



NOTE: Only the dilution settings that have been set will be printed out.

   b. The LCD returns to the M45 menu. To quit the mode, press **STOP**.

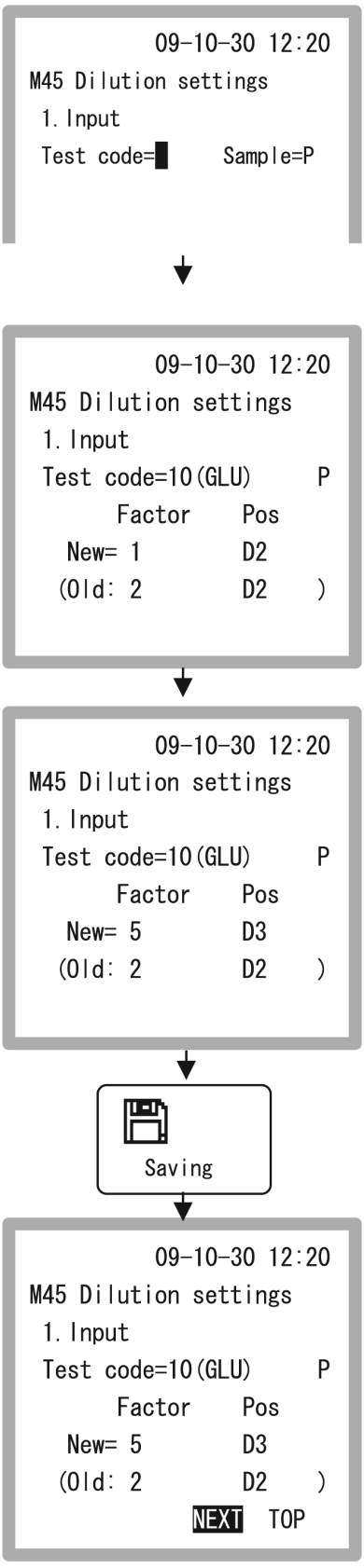
NOTE: Refer to *Section 7.4* for the default diluent position.

2. To set dilution factors:

   a. Select [1. Input] on the LCD.

   ① → ENTER

Example: To set 5 as dilution factor for GLU-PS and use diluent position D3.



   b. Select a sample type. Check [Sample=] on the LCD and select a sample type by pressing **TYPE**.

   c. Input a test code. (GLU test code = 10)

   ① → 0 → ENTER

   d. Press **DIL** 4 times to set the dilution factor as 5.

   DIL Press 4 times.

NOTE: Each time the DIL key is pressed, a dilution factor changes as follows.

1 → 2 → 3 → 4 → 5 → 10

   e. Press scroll (▲▼) once to set the diluent position as D3.

NOTE: Each time the scroll key (▲▼) is pressed, a diluent position changes from D1 to D4.

   f. Press **ENTER** to accept the settings.

Printout example:

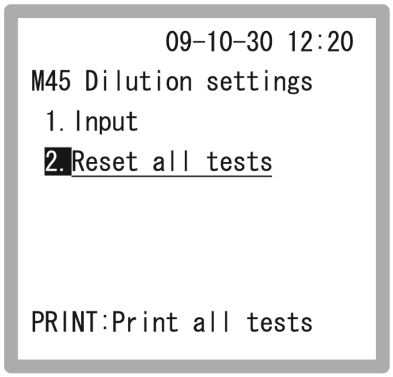
```
M45 Dilution settings
  ----- Dil data -----
10(GLU-P) :  5  D3
```

   g. To set for other tests, select **NEXT** by using cursor keys (◄►) and press **ENTER**. To return to the top menu, select [Top] and then press **ENTER**. To quit, press **STOP**.

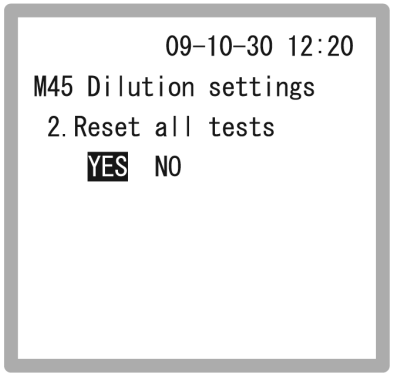
3. To reset dilution factors for all tests:

   a. Select [2. Reset all tests].

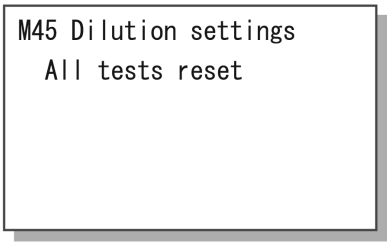
   ② → ENTER



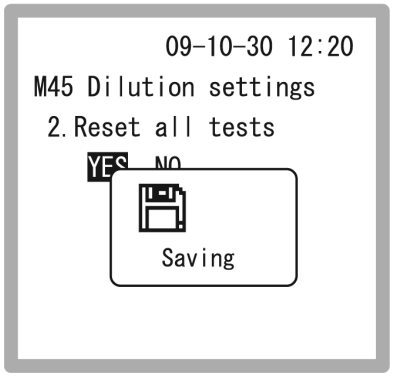
   b. To reset the data, select [Yes] by using the cursor key and press **ENTER**.



Printout example:



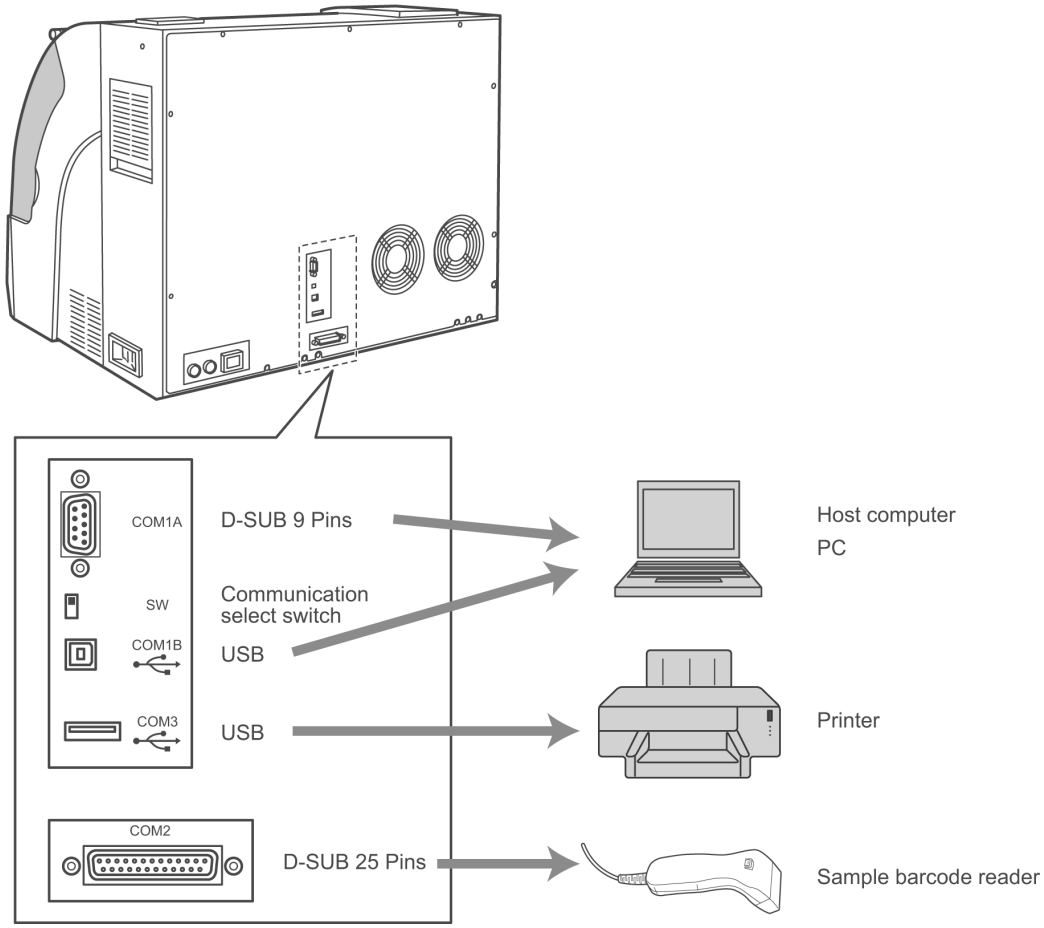
   c. The LCD returns to the M45 menu. To quit the mode, press **STOP**.



7.2.19 Mode 46: Selects Communication Destinations

This mode is used to select the communication destination for COM1, COM2 and COM3 connectors of the DRI-CHEM 7000 Analyzer. The destinations which are able to be connected are shown below.

- COM1A, COM1B: Host computer or PC
- COM2: Sample barcode reader
- COM3: Printer



⚠ CAUTION

Only the sample barcode reader specified for the DRI-CHEM 7000 Analyzer can be used. Do not connect a barcode reader other than one specified for the DRI-CHEM 7000 Analyzer, otherwise, physical damage or fire may result.

NOTE: Do not connect the DRI-CHEM 7000 Analyzer to a host computer, PC or printer, which has not been approved by IEC/UL60950–1.

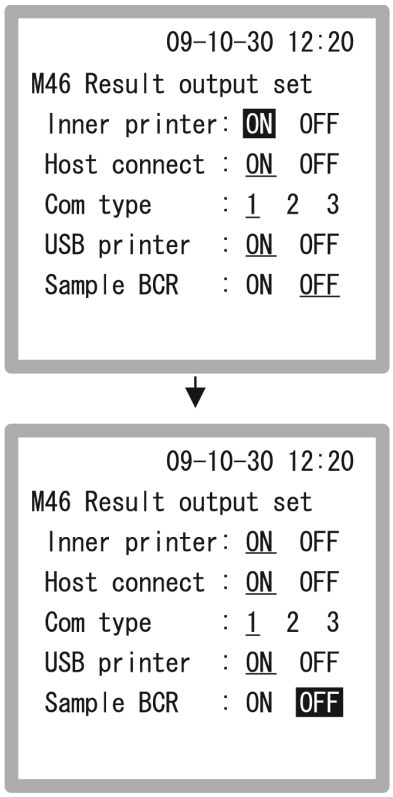
NOTE: Connect the host computer to the COM1 and connect the sample barcode reader to the COM2.

NOTE: Perform this mode operation after connecting the communication cables to the analyzer (COM1/COM2).

Keyboard input

MODE → 4 → 6 → ENTER

a. Choose a host. Select [ON] or [OFF] or 1, 2, or 3 using the cursor keys (◄ ►) and press **ENTER** to select and proceed to the next item.



LCD display items

Inner printer:
Select [ON] to use the Inner printer.

Host connect:
Select [ON] to connect to the host computer.

NOTE: The following are COM1 communication parameters which the host computer is connected to.

BPS: 19200bps, VRC: None, Stop bits: 1bit

BCC setting:
Select Disable for unidirectional connection (standard format).

Select Enable for bidirectional connection.

Com type:
Select 1 for a bidirectional connection, 2 for a unidirectional connection (bidirectional format), or 3 for unidirectional connection (standard format).

USB printer:
Select [ON] to use a printer connected via USB.

Sample BCR:

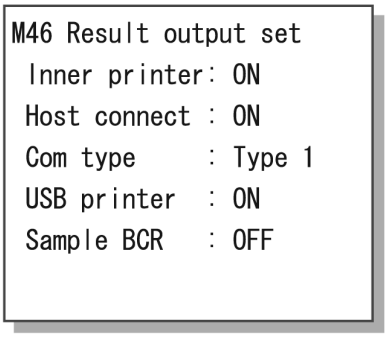
Select [ON] if you intend to connect a sample barcode reader to the device.

NOTE: Com type option is only available when [ON] is selected for Host connect.

b. After choosing a setting for Sample BCR, press **ENTER** to save settings.

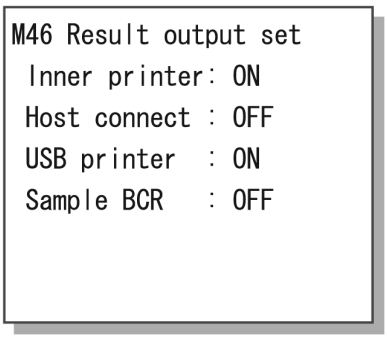
NOTE: If all settings are OFF when settings are saved, Inner printer will automatically be set to ON.

Printout example



c. The LCD returns to the menu. To quit the mode, press **STOP**.

d. Restart the analyzer.



NOTE: The analyzer must be restarted to connect to the selected device.

7.2.20 Mode 49: Prints Out Error Logs

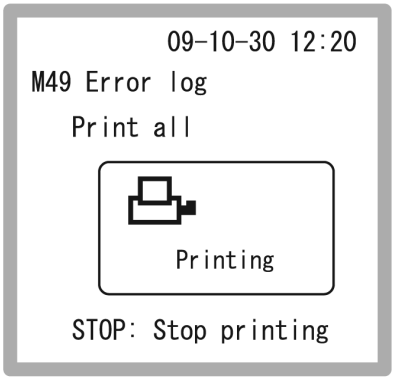
This mode is used to print out error logs memorized in the analyzer.

Keyboard input

MODE → 4 → 9 → ENTER

To stop the printing, press **STOP**.

[LCD/printout example]




```
M49 Error log
[1] 09-10-30 12:00:37
 W040
 Incorrect sample type
[2] 09-10-30 12:30:15
 W110
 No tip
[3] 09-10-30 13:00:29
 W151
 No mix-cups
         .
         .
         .
```

7.2.21 Mode 52: Incubator Cleaning

This mode is used to perform cleaning of the incubator, the ISE test unit, and the spotting part of the analyzer.

Keyboard input

MODE → 5 → 2 → ENTER

1. Cleaning procedures.

   a. Clean the incubator, and the spotting part of the analyzer. Refer to *Section 5.3* for the cleaning procedures.

   b. Press **STOP** after cleaning.

      The analyzer indicates [Warming up] on the LCD and indicates [Ready] when the analyzer is ready. After completing the cleaning mode, the analyzer performs reference plate quality checks automatically and prints the result.

```
                09-10-30 12:20
M52 Incubator cleaning

1) Remove incubator
    & clean incubator
2) After cleaning,
     set incubator
3) Press STOP
```

NOTE: Reference plate quality: The reference plate quality indicates the level of the reference plate contamination. If the quality level is 2 or more, perform the cleaning. "xx" means given value.

```
M52 Incubator cleaning
Ref plate quality check
 600nm
   Quality : 1 (xx%)
   OK
```

   c. Clean the ISE test unit.

Clean ↓ Dirty

Quality	Printout message (Description)
1	Quality : 1 (xx%) OK
2	Quality : 2 (xx%) Clean incubator
3	Quality : 3 (xx%) NG Clean incubator (Adverse effects on test results may occur. Clean the reference plates.)

NOTE: If the error message shown at left is printed after completing this mode, perform Mode 52 again and connect the incubator cable to the analyzer properly.

```
M52 Incubator cleaning

E1502
 Faulty CM thermistor
```

7.2.22 Mode 76: Prints Out DI Card Information

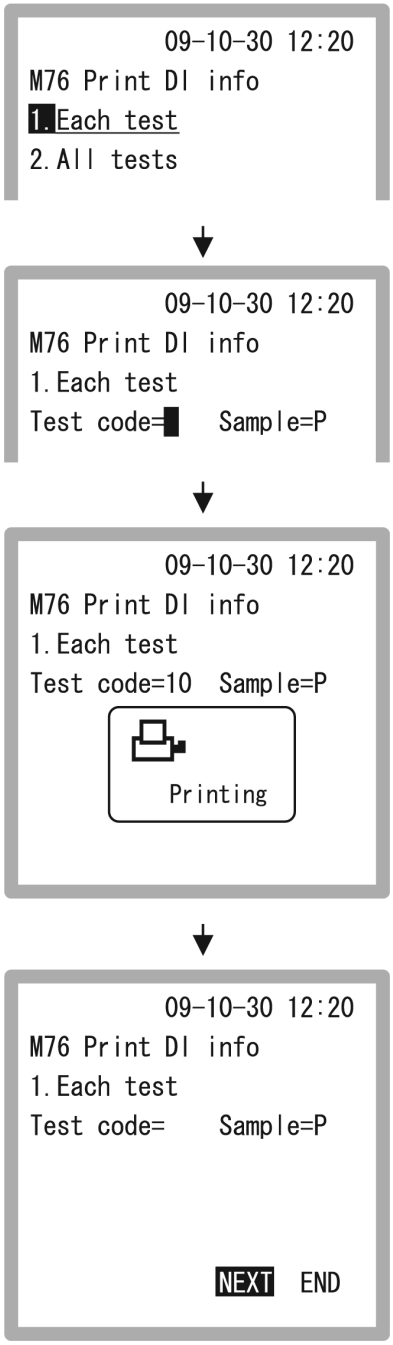
This mode is used to print out DI card information recorded in the analyzer memory.

Keyboard input

MODE → 7 → 6 → ENTER

Select [1. Each test] or [2. All tests] by using the scroll keys (▲▼) or press a numeric key 1 or 2 and press **ENTER**.

To print out data for each test name: .....See 1
To print out all data: .....See 2



1. To print out data for each test name:
   a. Select [1. Each test].
      1 → ENTER
   b. Select a sample type.
      Check [Sample=] on the LCD and select a sample type by pressing **SAMPLE**.
   c. Input a test code.

Example

To print out for GLU-PS:

(GLU test code=10)

1 → 0 → ENTER

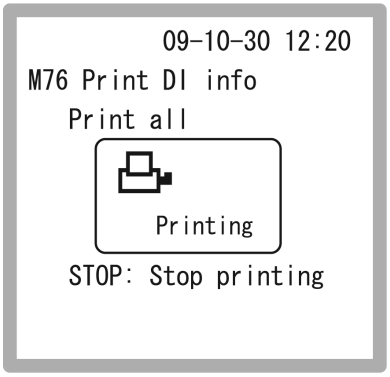
Printout example:

```
--- Print DI info ---
10(GLU -P):DI = 0
          :DI = 1
```

To input for other tests, select **NEXT** by using cursor keys (◄ ►) and press **ENTER**. To quit, select **END** and pres **ENTER**.

2. To print out all data:

   a. Select [2. All tests].



Printout example

```
--- Print DI info ---
10(GLU -P):DI = 0
15(NH3 -P):DI = 0
17(CRE -P):DI = 0
23(Ca  -P):DI = 0
          :DI = 1
30(GGT -P):DI = 0
```

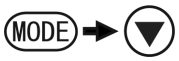
To stop printing in mid-course, press **STOP**

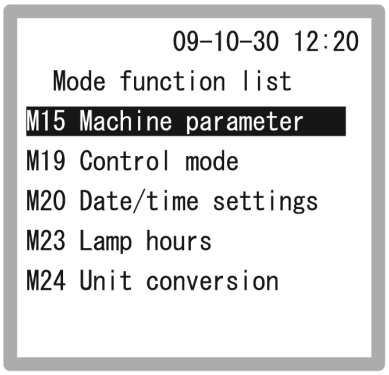
7.2.23 Mode 80: Mode Function List

This mode is used to browse the list of available modes on the LCD and select a mode to enter.

Keyboard input

Or

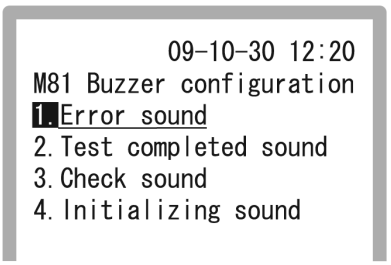




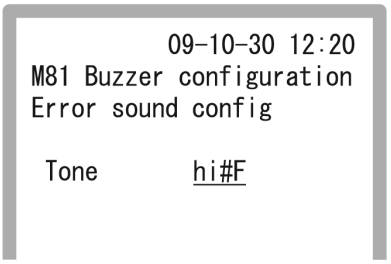
   a. Scroll through the mode menu by using the scroll keys (▲▼).
   b. To enter each mode, select a mode from the menu by using scroll keys (▲▼) (in reversed character). Then, press **ENTER**.
   c. To quit browsing, press **STOP**.

7.2.24 Mode 81: Beep Sound Configurations

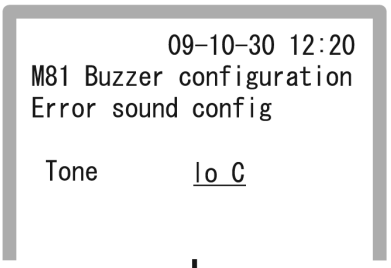
This mode is used to change the beep sound settings (error warning, test completed).



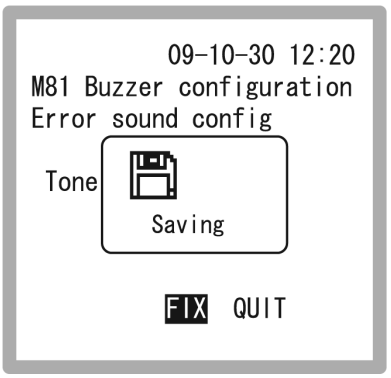
1. To set the error sound: This mode is used to change the tone (pitch) or to turn the error sound off.
   a. Select [1. Error sound]. [1] =>**ENTER**.



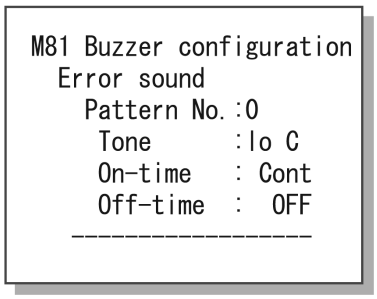
   b. Select a tone (pitch) by using the scroll keys (▲▼). Press **ENTER** to accept the selected data. Each time the (▲) key is pressed, the tone (pitch) goes up. [LoC => Lo#C => LoE....Hi#A => HiB => OFF) By selecting [OFF], the error sound is turned off.



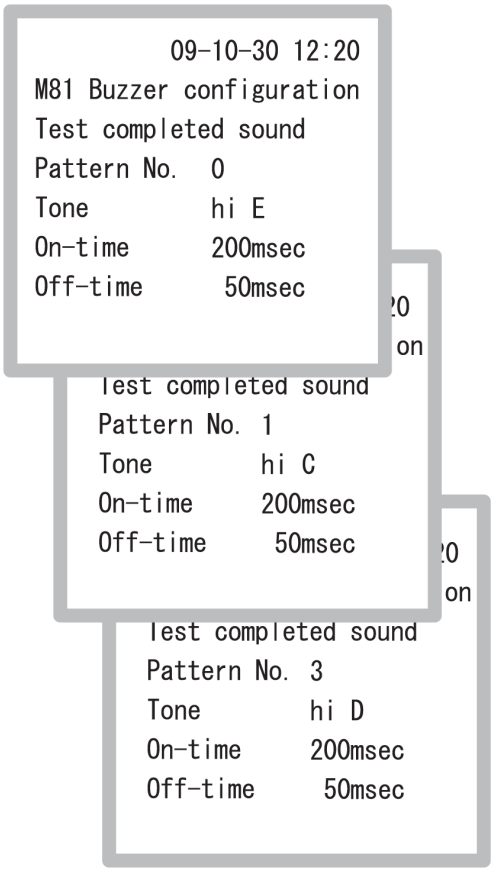
   c. Select [Fix] and then press **ENTER** to save data. To quit, select [Quit] by using the cursor keys (▲▼) and press **ENTER**.



Printout example

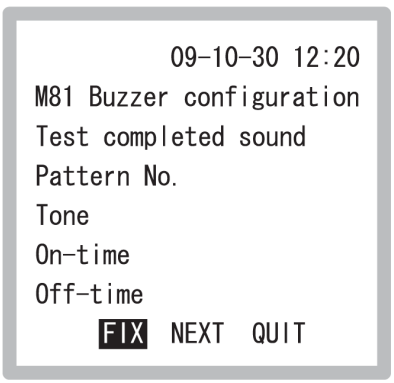


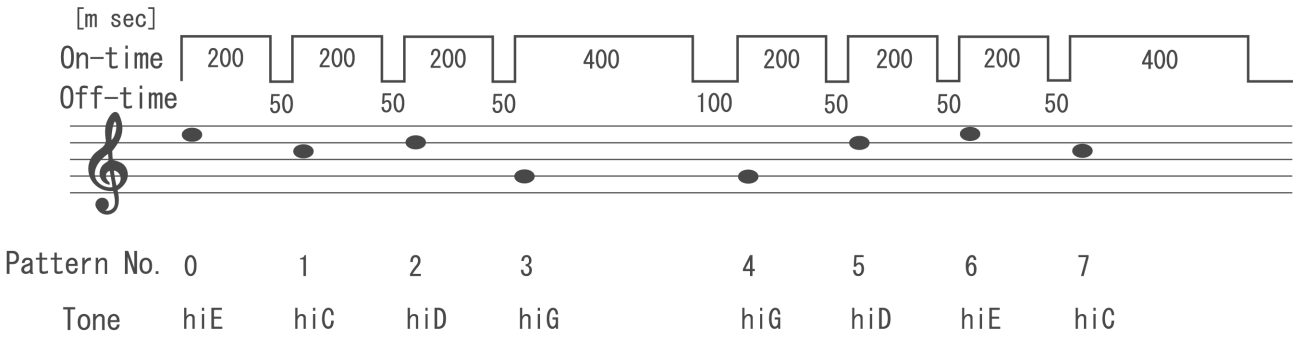
2. To set the test completed sound: This mode is used to set the sound when all tests are complete. The tone (pitch) and turn on/off intervals can be set for each pattern No. By using 8 patterns, a melody can be made.
   a. Select [2. Test completed sound]. [2] => **ENTER.**
   b. Set the tone (pitch) of the test completed sound. Select the tone (pitch) by using the scroll keys (▲▼) and press **ENTER** to accept. Each time the (▲) key is pressed, the tone (pitch) goes up.
      loC => lo#C => loE....hi#A => hiB => OFF.
   c. Set the turn-on time. Select On-time by using the scroll keys (▲▼) and press **ENTER** to accept.
   d. Set the turn-off time. Select Off-time by using the scroll keys (▲▼) and press **ENTER** to accept.



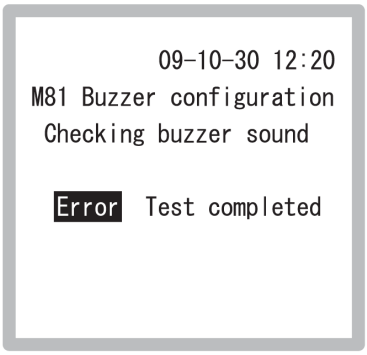
   e. Pattern from 0 to 7 can be set if necessary. To save the sound data, press **ENTER** to accept **FIX**. To set the next [Pattern], select **NEXT** by using the cursor keys (◄ ►) and press **ENTER**. To cancel the new sound data, select **QUIT** by using the cursor keys (◄ ►) and press **ENTER**.

NOTE: For the initial setting data, refer to "4." To reset the sound configurations to the default settings".



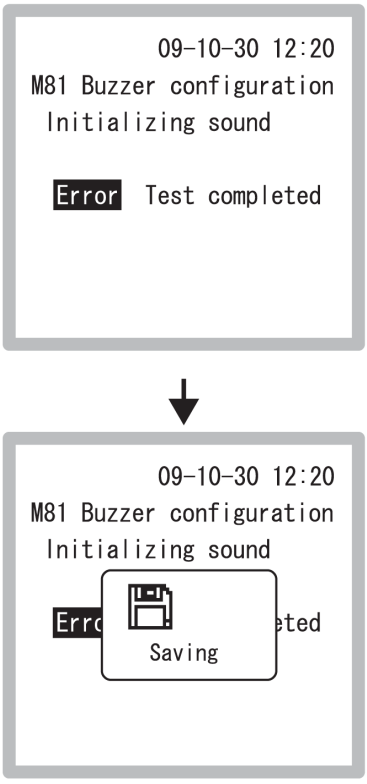


3. To check the current sound:
   a. Select [3. Check sound]. [3] => **ENTER**.
   b. Select [Error] or [Test completed]. To check the error sound, select [Error] using the cursor keys (◄ ►). To check the test completed sound, select [Test completed]. And then, press **ENTER**. To stop playing the error sound, press cursor (◄ ►).



4. To reset the sound configurations to the default settings:
   a. Select [4. Initializing sound]. [4] => **ENTER**.
   b. Select the sound by using the cursor keys (◄ ►), and press **ENTER** to reset the data.

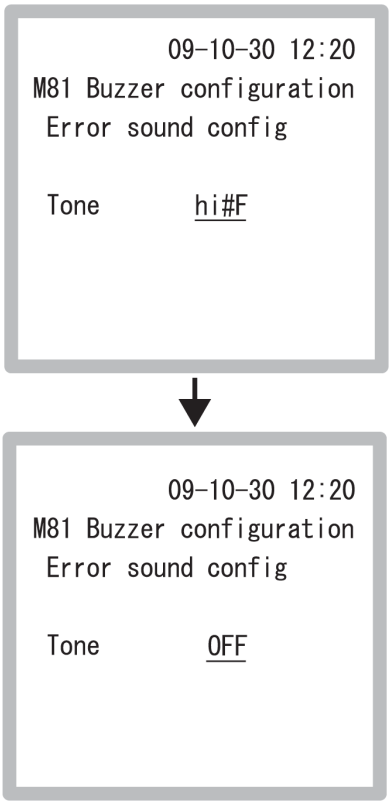
NOTE: For the default setting data, refer to the next page.



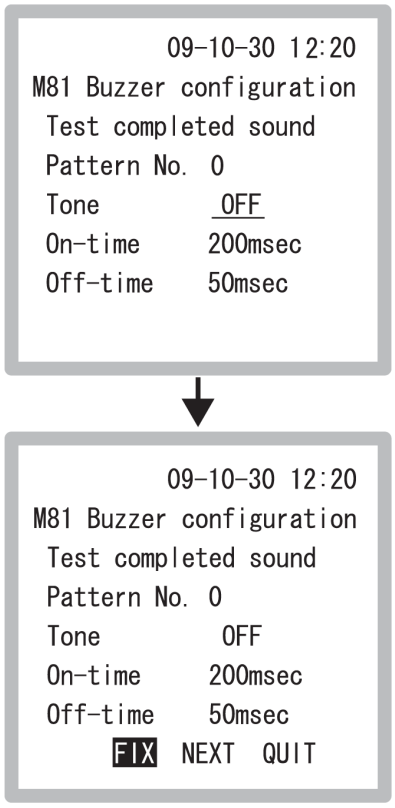
```
M81 Buzzer configuration
Error sound config
Pattern No.    :0
Tone           :hi#F
On-time        : Cont
Off-time       :  OFF
 ----------------------
```

```
M81 Buzzer configuration
Test completed sound
  Pattern No.:0
   Tone       :hi E
   On-time    :200msec
   Off-time   : 50msec
  Pattern No.:1
   Tone       :hi C
   On-time    :200msec
   Off-time   : 50msec
  Pattern No.:2
   Tone       :hi D
   On-time    :200msec
   Off-time   : 50msec
  Pattern No.:3
   Tone       :lo G
   On-time    :400msec
   Off-time   :100msec
  Pattern No.:4
   Tone       :lo G
   On-time    :200msec
   Off-time   : 50msec
  Pattern No.:5
   Tone       :hi D
   On-time    :200msec
   Off-time   : 50msec
  Pattern No.:6
   Tone       :hi E
   On-time    :200msec
   Off-time   : 50msec
  Pattern No.:7
   Tone       :hi C
   On-time    :400msec
   Off-time   :  OFF
--------------------
```

5. To turn the sound off: This mode is used to turn the error warning and tests completed sounds off.
   a. To turn the error sound off:
      ① Select [1. Error sound]. [1] => **ENTER**.
      ② Select a tone (pitch) [Off] by using the scroll keys.
      ③ Press **ENTER** to accept the selected data.
      ④ Press **ENTER** to accept and save the selected data.



   b. To turn the tests completed sound off: By changing Tone of the [Pattern No. 0] to OFF, the tests completed sound can be set to turn-off.
      ① Select [2. Test completed sound]. [2]= > **ENTER**.
      ② Set the Tone of the [Pattern No. 0] to [Off] by using the scroll keys ▲▼.
      ③ Without changing On-time and Off-time, press **ENTER** to accept the data.
      ④ Select [Fix] and then press **ENTER** to save data.

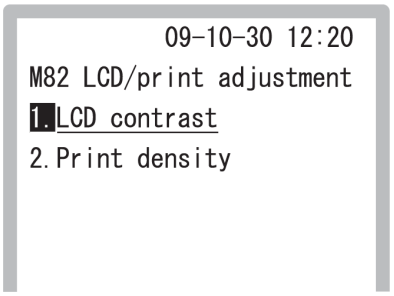


7.2.25 Mode 82: Density Adjustments (LCD/Printer)

Keyboard input

MODE → 8 → 2 → ENTER

Select [1. LCD contrast] or [2. Print density] by using the scroll keys (▲▼) or press a numeric key 1 or 2 and press **ENTER**.



1. To change the LCD contrast:

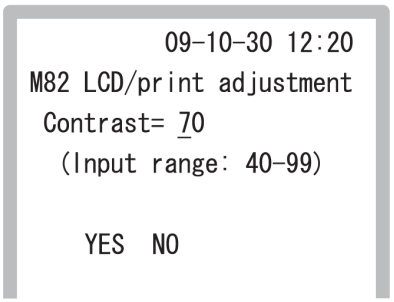
   1 → ENTER

   a. Input a number to change the LCD contrast.

NOTE: As the number increases, the contrast increases.

NOTE: It is recommended to change the number step by step.

NOTE: The input range is from 40 to 99.

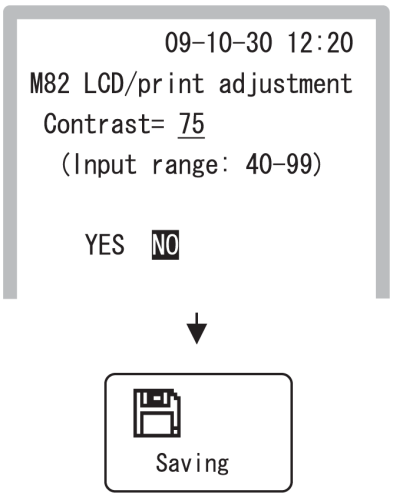


Example: Inputting "75"

7 → 5 → ENTER

   b. Check the LCD contrast. If the new LCD contrast is suitable, select [Yes] by using the cursor keys and press **ENTER**. To change the LCD contrast again, select [No] and press **ENTER**.

   c. To quit the mode, press **STOP**.



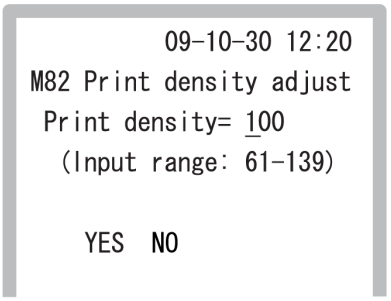
2. To adjust the print density:

   2 → ENTER

   a. Input a number to adjust the print density.

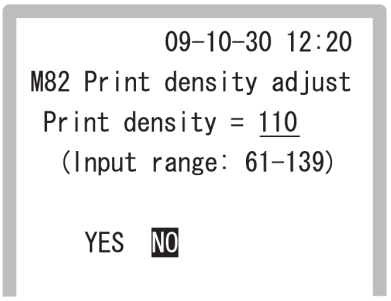
NOTE: As the number increases, the print density appears darker.

NOTE: The input range is from 61 to 139.

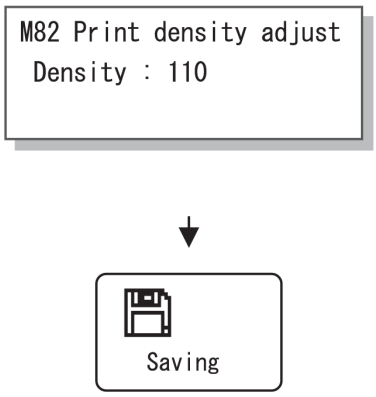


Example: Inputting "110"

① → ① → ⓪ → ENTER



b. Check the print density of the printer. If the new print density is suitable, select [Yes] by using the cursor keys and press **ENTER**. To change the print density again, select [No] and press **ENTER**.
c. To quit the mode, press **STOP**.



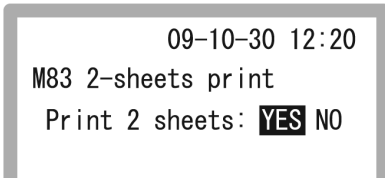
7.2.26 Mode 83: Sets Print Sheets of Test Results

This mode is used to select the number of test result print sheets to 2 sheets or not.

NOTE: By setting [Print 2 sheets] to [Yes] in this mode, the same test result will be printed out twice.

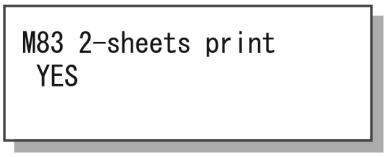
Keyboard input

MODE → ⑧ → ③ → ENTER



1. Select a number of print sheets either 2 sheets [Yes] or 1 sheet [No].
2. Press **ENTER**.

Printout example



7.2.27 Mode 84: Test Tube Settings for Diluent and Reference Fluid

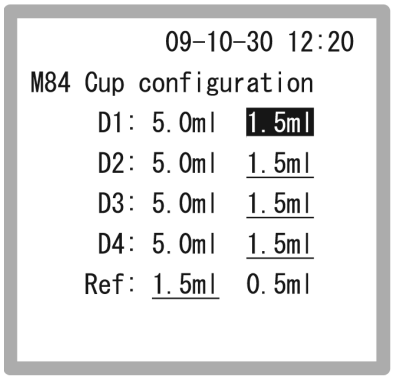
This mode is used to select a tube type for each diluent and the reference fluid.

NOTE: Refer to *Section 4.3.3* for diluent and refer to *Section 4.3.4* for reference fluid.

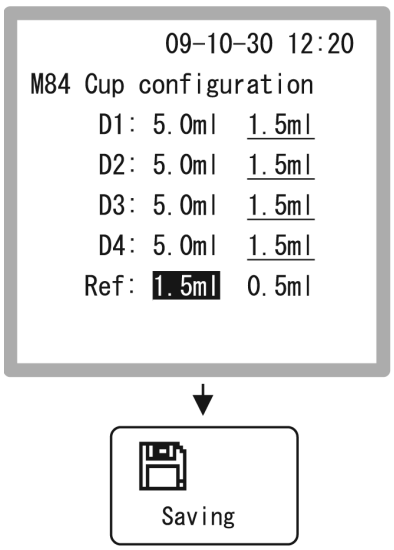
Keyboard input

MODE → 8 → 4 → ENTER

NOTE: LCD display descriptions: D1–D4: Tube type for each diluent holder Ref: Tube type on the reference fluid holder.



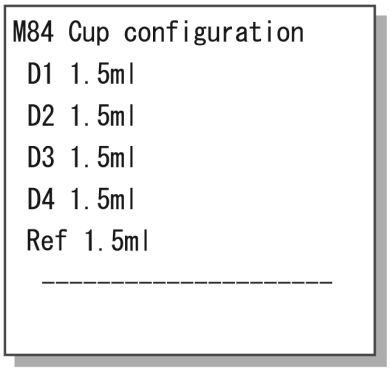
1. Select a tube type for diluent holder [D1] by using cursor keys (◄ ►), and then press **ENTER**.



2. Select each tube type for [D2] to [Ref] and press **ENTER**. After selecting the tube types for all holders, the analyzer saves the data automatically and quits the mode.

NOTE: The tube for D4 is fixed at 1.5 ml.

Printout example



7.2.28 Mode 85 : Display Order of Reference Interval Names

Choose the sort order for the reference interval names included in test results.

NOTE: Reference intervals are set by selecting Modes 27, 86, 85, and 39 in turn.

Keyboard input

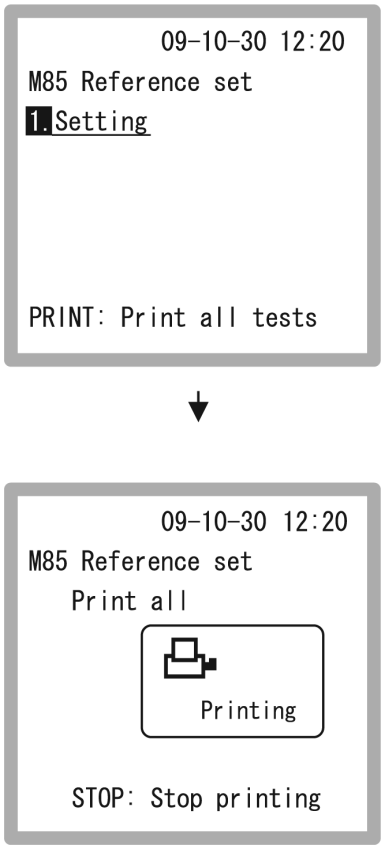
MODE → 8 → 5 → ENTER

To print the current reference intervals: ..... See 1

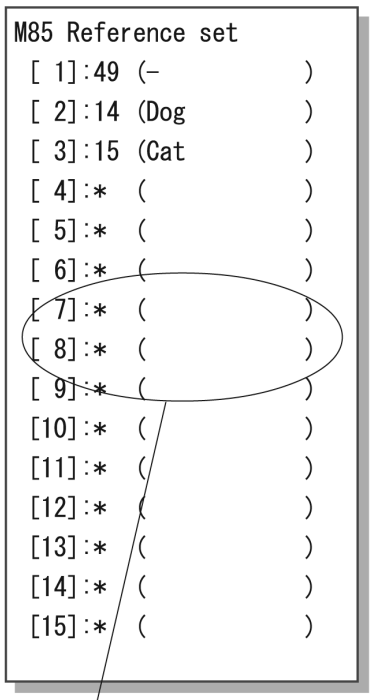
To edit or input reference intervals: ..... See 2

To print the current reference intervals:

a. Press **PRINT**.



Printout example



Reference intervals for which no data exist are indicated by an asterisk; the reference interval name is left blank.

2. To edit or input reference intervals:

   a. Select [1. Setting].

   ① → ENTER

   b. Enter a number indicating the display order. (2 in this example).

   0 → 2 → ENTER

   c. Select a reference interval number either by highlighting the number with the cursor keys (▲▼) and pressing **ENTER** or by typing in a two-digit number and pressing **ENTER**.

NOTE: Enter one of the reference interval numbers specified using Mode 86.

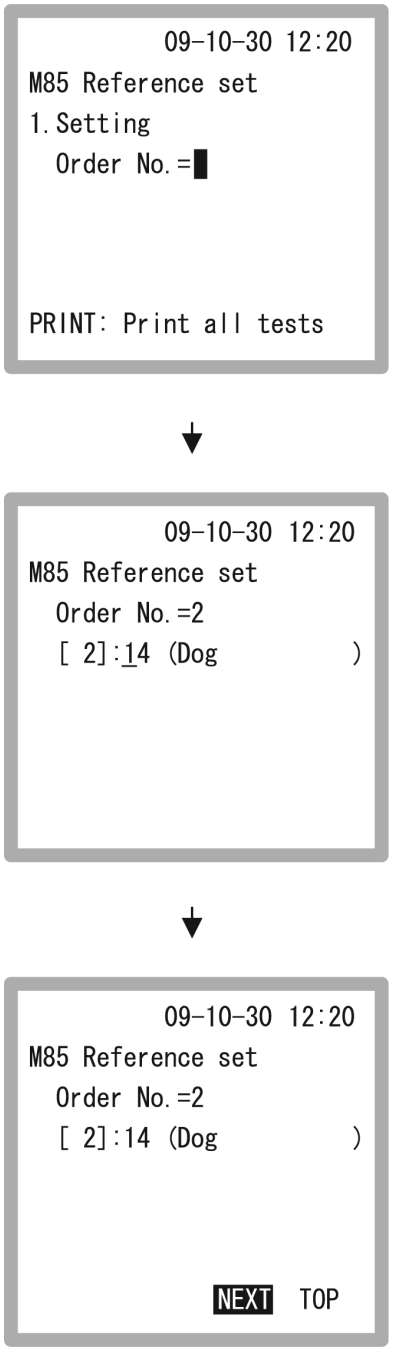
NOTE: To delete a reference interval, press **C**. The remaining reference intervals will be automatically renumbered. The reference interval with display number 1 can not be deleted.

Printout example

```
M85 Reference set
 [ 2]:14 (Dog          )

  ____________________
```

   d. To edit additional items, highlight **NEXT** using the cursor keys (◄ ►) and press **ENTER**, or select [Top] to return to the top menu. To exit, press **STOP**.



7.2.29 Mode 86: Editing and Inputting Reference Interval Names

Input or edit reference interval names.

NOTE: Reference intervals are set by selecting Modes 27, 86, 85, and 39 in turn.

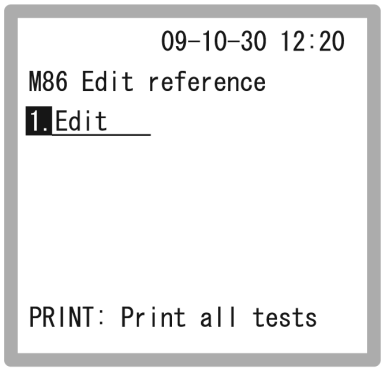
Keyboard input

MODE → 8 → 6 → ENTER

To print the current reference intervals: .....See 1

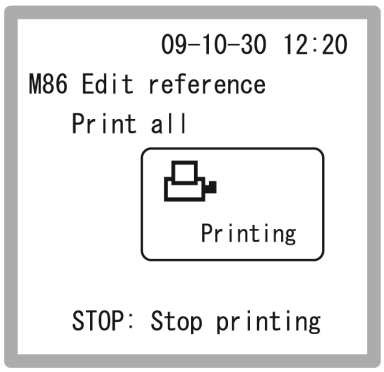
To edit or input reference intervals: .....See 2

1. To print the current reference intervals:
   a. Press **PRINT**.



Printout example

```
M86 Edit reference
--- Reference list ---
No.49 -
No. 0 *
No. 1 *
No. 2 *
   ≀
No.14 Dog
No.15 Cat
```



NOTE: The printout includes reference intervals 0–13 and 49. The analyzer can only use reference intervals 14–48.

2. To edit or input reference interval names:

Example

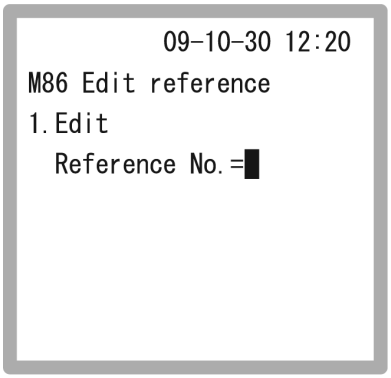
We will enter the reference interval name "Cat" for reference interval number 15.

   a. Select [1. Edit].

      1 → ENTER

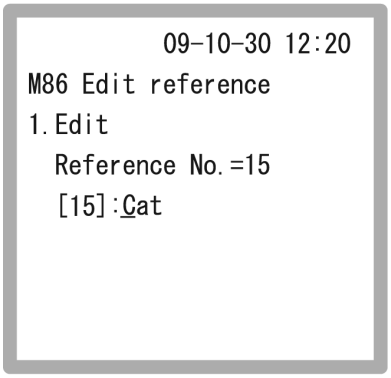
   b. Enter a reference interval number.
      (15 in this example)

      1 → 5 → ENTER



NOTE: Enter a two-digit number between 14 and 48 (letters can not be entered).

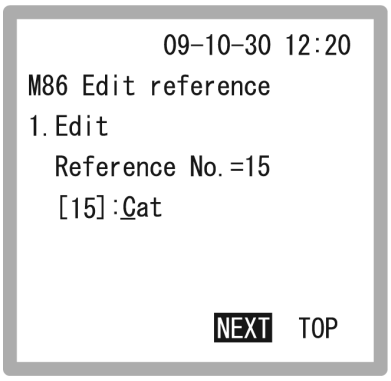
   c. Enter a reference interval name and press **ENTER**.
      (Cat in this example)



NOTE: Reference interval names may be up to 12 characters long and may include both numbers and letters (*Section 4.7.2.*)

NOTE: See *Section 4.7.2.* for information on character input.

NOTE: A buzzer will sound if you attempt to enter more than 12 characters. Input the reference name again.



Printout example

```
M86 Edit reference
--- Reference list ---
No.15 Cat
```

d. To edit additional items, highlight **NEXT** using the cursor keys (◄ ►) and press **ENTER**, or select [Top] to return to the top menu. To exit, press **STOP**.

7.2.30 Mode 90: Changes Manufacturer Dilution Factors

IMPORTANT

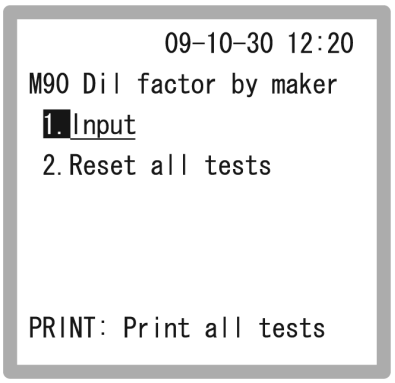
Prior to changing the manufacturer dilution factors, be sure to contact to technical support.

Keyboard input

MODE → 9 → 0 → ENTER

Select [1. Input] or [2. Reset all tests] by using the scroll keys (▲▼) or press a numeric key 1 or 2 and press **ENTER**.

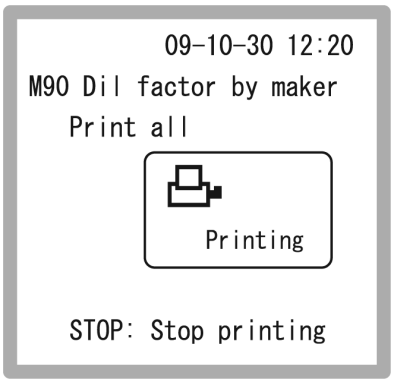
To print out the current data: 1
To input dilution factors: 2
To reset dilution factors for all tests: 3



1. To print out the current data:

   a. Press **PRINT**.

```
M90 Dil factor by maker
  --- Maker dil data ---
91(Na-U) : 1
  --------------------
```



Printout example

NOTE: Only the dilution factors changed from default values are printed out.

2. To input dilution factors:

   a. Select [1. Input] on the LCD.

   ① → ENTER

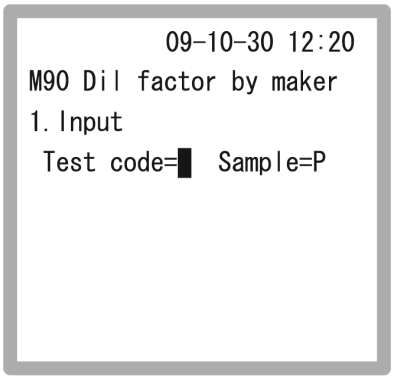
Example: To set the dilution factor to "1" for Na-U (no dilution)

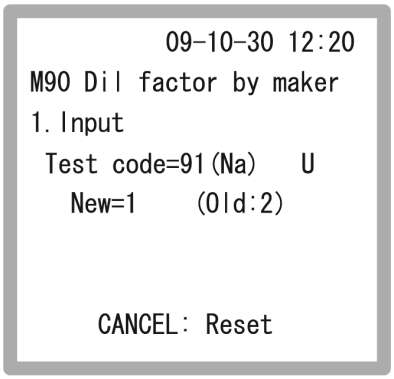
   b. Select a sample type.
   Check [Sample=] on the LCD and select a sample type to be set by pressing **TYPE**.

   c. Input a test code. (Na-U test code = 91)

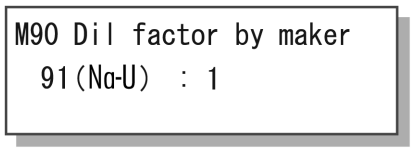
   ⑨ → ① → ENTER

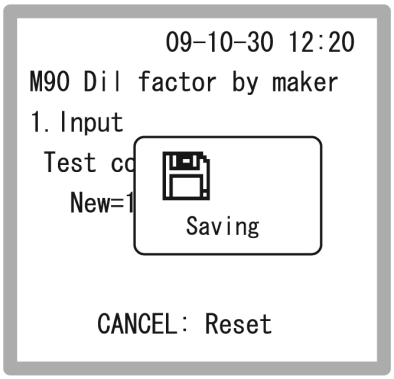
   d. Press DIL to set a dilution factor and press **ENTER**.



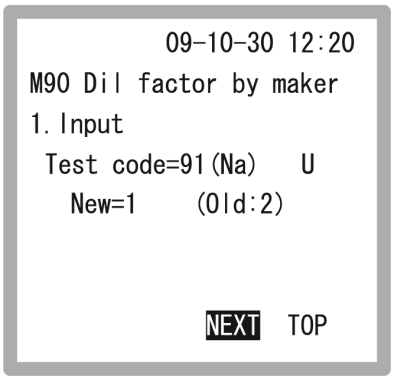


Printout Example

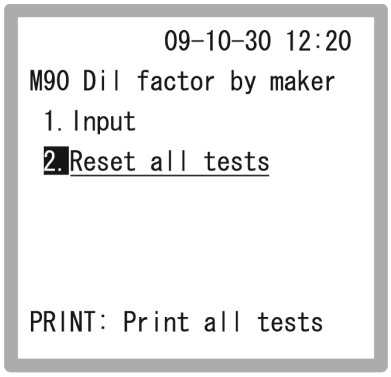




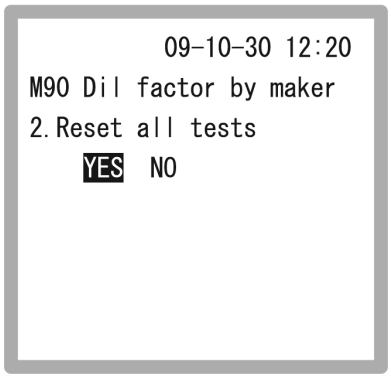
   e. To input for other tests, select **NEXT** by using cursor keys (◄ ►) and press **ENTER**. To return to the top menu, select [Top] and then press **ENTER**. To quit, press **STOP**.



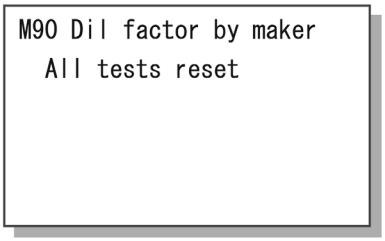
3. To reset dilution factors for all tests:
   a. Select [2. Reset all tests].

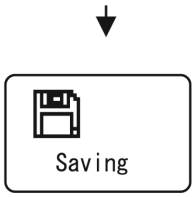


   b. To reset the data, select [Yes] by using the cursor keys. Press **ENTER**.



Printout Example





NOTE: The dilution factors are reset to the manufacturer's default values.

   c. The LCD returns to the M90 menu. To quit the mode, press **STOP**.

7.3 Slide Code Table

Test	Slide Code Test Code	Sample Code	Test	Test Code	Sample Code
GLU-P	10	50	GGT-P	30	50
BUN-P	11	50	GOT/AST-P	31	50
UA-P	13	50	GPT/ALT-P	32	50
TCHO-P	14	50	CPK-P	33	50
NH3-P	15	50	LDH	34	50
TG-P	16	50	ALP-P	35	50
CRE-P	17	50	vAMY-P	43	50
TP-P	18	50	vLIP-P	44	50
ALB-P	20	50	$TC0_2$	45	50
TBIL-P	21	50	Na	91	00
Ca-P	23	50	K	92	00
IP-P	24	50	Cl	93	00
Mg-P	28	50	–	–	–

8.1 Data Communication

The DRI-CHEM 7000 Analyzer can transmit test results to a host computer or PC which has already been approved by IEC/UL60950–1.

NOTE: Do not connect the DRI-CHEM 7000 Analyzer to a host computer or PC which has not been approved by IEC/UL60950–1.

To communicate, it is necessary to prepare the software and cable to receive data. When using this function for the first time, please contact technical support for assistance.

8.2 CF Card

The slot for a CF card on the top of the body is used for upgrading the DRI-CHEM 7000's software.

NOTE: Do not insert a CF card into the slot without instruction by technical support (dealer).

9.1 Specifications and Standard Accessories

9.1.1 Specifications

Throughput:	180 tests per hour (CM), 90 tests per hour (ISE) 190 tests per hour (simultaneous CM and ISE tests)
Number of incubator cells:	CM 13, ISE 1
Incubation temperature:	98.6°F (37°C) (CM), 86°F (30°C) (ISE)
Incubation time:	1 to 6 minutes
Slide loading capacity:	20 slides/cartridge
Sampler	
1. Sample loading:	5 samples (on the sample disk)
2. Pipetting fluid volume:	Below 50 µl (automatic switching)
3. Dilution: CM tests:	x2, x3, x4, x5, x10
ISE tests: Auto x2 for urine sample	
Slide ejection:	Automatic ejection (max. 160 slides into the disposal box)
Used tip ejection:	Automatic ejection (into the disposal box)
Measurement wavelengths:	400 nm, 505 nm, 540 nm, 577 nm, 600 nm, 625 nm, 650 nm
Light source:	Halogen lamp
Measurement precision:	0.0004 OD/5 minutes
Measurement accuracy:	± 0.002 OD (600 nm)
Indications:	Liquid crystal display (24 characters, 8 lines) Indicator light (Sample key A to E, ABC key, MANUAL key)
Printer:	24 characters/line, Thermal type (paper size: 58 mm x 25 m)
Warming up time:	Approx. 10 minutes/77°F (25°C), approx. 20 minutes/59°F (15°C)
Environmental conditions:	Location: Indoor use
Illumination:	Below 6,000 cd/m^2 (lux) (Below 3,000 cd/m^2 (lux) when using the sample barcode reader)
Altitude:	Up to 6,500 ft. (2,000 m)
Transient over voltage category:	II
Pollution degree:	2
Operating temperature:	59 to 89°F (15 to 32°C)
Operating humidity:	30 to 80% RH (no vapor condensation)
Storage and transportation conditions:	
Temperature:	14 to 122°F (-10 to 50°C)
Humidity:	10 to 90% RH (no vapor condensation)
Electrical requirements	
Voltage limit:	100–240 V ~
Frequency:	50–60 Hz
Supply voltage fluctuations:	± 10%
Rated wattage:	300 VA
Phase:	Single
Type of protection against electrical shock:	CLASS 1 EQUIPMENT
Sound level:	Under 60 dB
Data transfer:	RS-232C0 interface, USB interface
External dimensions:	21 (W) x 16.5 (D) x 17.7 (H) in (540 (W) x 420 (D) x 450 (H) mm)
Weight:	88 lb (40 kg)

9.1.2 Standard Accessories

Fuses (10A)	2
AC power cable	1
Recording paper	2 rolls
Paper core	1
Slide cartridges	5
Slide weights	5
Slide cartridge label (A, B, C, D, E)	1 (will be applied)
Light source lamp	1
O-rings	4
Tip racks	2
Diluent label	1 (will be applied)
DRI-CHEM Analyzer AUTO TIPS	1 case
DRI-CHEM Analyzer MIXING CUPS	1 box
MIXING CUP label (L, R)	1 (will be applied)
Keyboard cover	1
Sampler leak check tools	2
PLAIN TUBE 1.5 (1.5 ml type)	1 pack
PLAIN TUBE 0.5 (0.5 ml type)	1 pack
HEPARIN TUBE 1.5 (1.5 ml type)	1 pack
HEPARIN TUBE 0.5 (0.5 ml type)	1 pack
Sample racks (TUBE 1.5ml type)	5
Sample racks (TUBE 0.5ml type)	5
Keys (Sampler cover)	2
Authorized representative label	1
Instruction manual	1
Installation quick guide	1

NOTE: An AC power cable is supplied with units sold in the U.S. Users in these regions should use the supplied power cable. Users in regions in which a power cable is not supplied should prepare an AC power cable that conforms to the following specifications.

The requirements of the cable specifications for the DRI-CHEM 7000 Analyzer

Power voltage: 100 V–120 V
- Requirements for the plug/connector: AC 125 V 10 A
- Requirements for the cable: SVT 3/18 AWG 60°C

Power voltage: 200 V–240 V
- Requirements for the plug/connector: AC 250 V 10 A
- Requirements for the cable: GTCE–3 1.0 mm 270°C

NOTE: The AC power cable is required to be compliance with any applicable regulations in your country.

NOTE: Specifications and capabilities are subject to change without notice.

9.2 Consumables and Optional Accessories

To purchase the consumables or optional accessories listed below, please contact Heska at 800.464.3752, option 1.

9.2.1 Consumables

Accessories	Package
* DRI-CHEM Analyzer AUTO TIPS	6 cases
Sample tubes	
HEPARIN TUBE 1.5 (1.5 ml containing heparin Li)	500 tubes per box
HEPARIN TUBE 0.5 (0.5 ml containing heparin Li)	500 tubes per box
PLAIN TUBE1.5 (1.5 ml plain)	500 tubes per box
PLAIN TUBE 0.5 (0.5 ml plain)	500 tubes per box
* Recording paper	1 box
* Light source lamp	1
* O-rings	4
* DRI-CHEM Analyzer MIXING CUPS	50 per box
Reference fluid cap	5 per pack

NOTE: Types of packages or containers for consumables are subject to change without notice.

9.2.2 Optional Accessories

Name	Package
* Sample barcode reader (Specified for the DRI-CHEM 7000 => See CAUTION)	1
* Sample rack	1
* Slide cartridge	1
* Slide weight	1

⚠ CAUTION

Only the sample barcode reader specified for the DRI-CHEM 7000 Analyzer can be used. Do not connect a sample barcode reader other than one specified for the DRI-CHEM 7000 Analyzer. Otherwise, damage or fire may result.

NOTE: Parts names marked with "*" are the same parts packed with the DRI-CHEM 7000 Analyzer.

NOTE: Specifications and capabilities are subject to change without notice.

Glossary of the display and printout messages.

NOTE: Because the display spaces and printouts are limited, some abbreviations are used.

NOTE: Periods will not be used after abbreviations on the display and printout messages.

Abbreviation	Meaning
A/D	Analog/Digital
aft	after
avg	average
BCC	Block Check Character
BCR	Barcode Reader
BPS	Bits Per Second
cal	calibration
calib	calibration
CM	Colorimetric
coeff	coefficient
com	communication
ctrl	control
dil	dilution
ERR	error
exp	expiration
horiz	horizontal
incu	incu incubator
info	information
KB	keyboard
NG	No Good
NSS	Normal Saline Solution
OD	Optical Density
para	parameter
PM	Potentiometric
pos	position
prog	program
prs	pressure
RBP	Reference Black Plate
ref	reference

Abbreviation	Meaning
RTC	Real Time Clock
RWP	Reference White Plate
seq	sequence
spd	speed
spl	sample
std	standard
suc	suck
temp	temperature
vert	vertical
VRC	Vertical Redundancy Check