Element i

Immunodiagnostic Analyzer

USER

MANUAL

HESKA

Introduction

Thank you for purchasing the Element i® Immunodiagnostic Analyzer.

The Element i® Analyzer is a diagnostic medical device for veterinary hospital use to perform immunological analyses using the proprietary reagent cartridges based on the rate method with laser beam. This analyzer provides you with the required results quickly and easily.

Before using this equipment, please read this manual carefully and follow the precautions for correct operation.

Keep the manual near the Element i® Analyzer, for reference whenever necessary.

CAUTIONS:

1. No part or all of this manual may be reproduced in any form without prior permission.
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 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 environment 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 resulting from natural disasters such as fires, earthquakes, floods, lightning, *etc.*

Table of Contents

This section contains safety precautions which must be followed for the safe operation of the Element i® Immunodiagnostic Analyzer (Henceforth, shortened into "Element i Analyzer" or "Equipment" in this manual.)

Before using this equipment, please read this chapter carefully and follow the precautions given, to ensure correct operation.

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 the transmission of infectious agents, if the precaution 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 if the precaution is not followed.

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 to ensure correct operation of the equipment.

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

⚠ CAUTION
This equipment is an in vitro diagnostic medical device for veterinary hospital use. Intended use of this equipment is to quantitate the immunological reactivity in blood by using the specified reagent cartridge of in vitro diagnostic medical device. Do not use the equipment for other purposes. Please read the *Instructions for Use* included with the reagent cartridge carefully to follow the instructions.

⚠ CAUTION
This equipment is only to be operated by personnel appropriately trained for its intended use and correct operation. Patients should never be allowed to come into direct contact with the equipment.

⚠ CAUTION
In the mode functions described in Section 6, there are 2 kinds of modes: one is the administrator mode, which can only be operated by administrators; another is the normal mode, which can be operated by normal operators. The important modes, which affect test results such as Mode 36 (correlation coefficients settings), can only be operated in the administrator mode. The administrator modes must be operated only by the administrators who have the responsibility for the use of the analyzer. Inputting a password in Mode 0 allows the administrators to operate the administrator modes.

⚠ CAUTION
Do not remodel the equipment. Otherwise, the safety will not be guaranteed.

1.3 Biohazards and Discarding

⚠ WARNING
As used (contaminated) consumables (*e.g.*, Reagent Cartridges, DRI-CHEM AUTO TIPS and sample tubes) and contaminated swabs or cloths used for cleaning the equipment are infectious waste, process the waste correctly in compliance with any applicable local, state or federal regulations.

⚠ WARNING
When discarding the equipment that may be contaminated with samples (serum), be sure to process it correctly in compliance with any applicable regulations.

⚠ WARNING
When handling samples (serum) and performing maintenance (cleaning the analyzer), always follow biohazard procedures (*e.g.*, wearing gloves, lab coat, and safety goggles), referring to the sample handling rules of your facility. If any part of the body comes in contact with samples, immediately rinse the contaminated body part thoroughly under running water and then use a disinfectant. Seek medical assistance if necessary.

⚠ WARNING
Do not touch used reagent cartridges, tips and sample tubes with bare hands as this may cause contamination. If any part of the body comes in contact with contaminated consumables, immediately rinse the contaminated body part thoroughly under running water and then use a disinfectant. Seek medical assistance if necessary.

⚠ WARNING
When samples (serum) come in contact with the analyzer components, immediately clean and disinfect the components.

1.4 Cleaning Solutions

⚠ CAUTION
Do not use cleaning solutions or solvents except for water or specified in the Instruction manual and the Service manual.

⚠ CAUTION
Do not use alcohol for cleaning the cover of the sample set part (translucence), otherwise the surface will be damaged.

1.5 Explosive Hazards

⚠ WARNING
Do not use flammable and explosive gas around the equipment.

1.6 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, *etc*., may splash on the equipment.
- Make sure that the equipment is properly grounded to a protective earth lead for indoor wiring.
- Make sure that all cables have been properly connected.

WARNING

Plug the power cable of the equipment into an outlet with a grounding receptacle. If the equipment is not grounded to a protective earth, this may cause electrical shock.

WARNING

When plugging the power cable in or removing it from an outlet, be sure to hold onto the plug body, not just the cable, to prevent damage to the cable.

WARNING

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

1.7 Electromagnetic Compatibility (EMC)

This equipment conforms to the following EMC requirements:

- EN61326–1:2006 (Class A)
- EN61326–2–6 (Class A)
- FCC Part 15 Subpart B: 2006, Class A
- ICES–003 Issue No. 4, Class A

This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area may cause harmful interference in which case the user will be required to correct the interference at his own expense.

This Class A digital apparatus complies with Canadian ICES–003.

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.

CAUTION

Do not use other devices (such as mobile phone) which generate and can radiate radio frequency energy near the equipment. Otherwise, physical damage or malfunction on the equipment may occur.

Statements for EN61326–2–6

NOTE: It is the manufacturer's responsibility to provide equipment electromagnetic compatibility information to the customer or user. On the other hand, it is the user's responsibility to ensure that a compatible electromagnetic environment for the equipment can be maintained in order that the device will perform as intended.

This equipment complies with the emission and immunity requirements described in EN61326–2–6.

This equipment has been designed and tested to CISPR 11 Class A. In a domestic environment it may cause radio interference, in which case measures may need to be taken to mitigate the interference.

The electromagnetic environment should be evaluated prior to operation of the device.

Do not use this device in close proximity to sources of strong electromagnetic radiation (*e.g.*, unshielded intentional RF sources, mobile phone), as these may interfere with the proper operation.

1.8 Moving Parts

⚠ WARNING

To avoid danger, be sure to shut off the power before inspection and adjustment.

⚠ CAUTION

Do not place hands near moving parts (sampler, reagent cartridge transfer) whenever operating the equipment including maintenance. Also use care not to get hands, hair, clothing, or accessories caught in moving parts.
Do not wear a necktie, necklace, or other accessories that may get caught in moving parts.

1.9 Installation Site Requirements

⚠ CAUTION

Plug the power cable of the equipment into an outlet with a grounding receptacle. If the equipment is not grounded to a protective earth, this may cause electrical shock.

⚠ CAUTION

Avoid the following installation sites:

- **Places where the equipment is directly exposed to artificial air such as air conditioning or air from an electrical fan.**
- **Places where the equipment is directly exposed to exhausts.**
- **Places where spills or water leakage may occur.**
- **Places where the equipment is exposed to direct sunlight.**
- **Places near sources of heat such as heaters.**
- **Places where the temperature may drastically change.**
- **Places where the equipment is subject to vibration or its support table is unstable.**

Install the equipment in the following environmental conditions:

Location:	Indoor use (avoid direct sunlight.)
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 overvoltage category:	II
Pollution degree:	2

	Operation	Transit or Storage	Remarks
Temperature	+15 to +30°C (59 to 86°F)	-10 to +50°C (14 to 122°F)	
Relative humidity	30–80% RH	10–90% RH	No condensation during operation and transportation/storage

NOTE: Temperature change during measurement must be within 2°C.

Use the equipment under the following electrical requirements:

Voltage limit:	100–240 V~
Supply voltage fluctuations:	±10%
Frequency:	50–60 Hz
Phase:	Single
Rated current:	2.0–0.9 A
Type of protection against electrical shock:	CLASS 1 EQUIPMENT

- » Plug the equipment into an independent AC outlet separate from other devices.
- » Empty space is necessary at least 4 inches (10 cm) on the back and the both sides of the equipment. (Empty space on the back is necessary to unplug the power cable connector from the appliance inlet of the equipment.)
- » Unplug the equipment from the AC outlet if it will not be used for an extended period of time.

1.9.1 Attaching a Fan Cover (supplied)

Attach a fan cover (supplied) on the air vent of the right side of the equipment.

Hold the fan cover with the opening section faces forward at the right side of the equipment, and adjust the projection to fit in the channel of the equipment's cover.

1.10 Test Results for Diagnosis

IMPORTANT

Make a diagnosis in a comprehensive manner, considering other relative test results or clinical situation.

WARNING

In case that an analyzer malfunction error(s) is(are) displayed before/during test processing, or warning indications are printed out along with test results, the test results may NOT be accurate. Refer to *Section 5 :Troubleshooting* and rerun the tests.

1.11 Reagent Cartridges

WARNING

Do not touch used reagent cartridges with bare hands as this may cause contamination. If any part of the body comes in contact with used reagent cartridges, immediately rinse the contaminated body part thoroughly under running water and then use a disinfectant. Seek medical assistance if necessary.

WARNING

As used reagent cartridges are infectious waste, process the waste correctly in compliance with any applicable regulations.

CAUTION

The reagent cartridges are classified as in vitro diagnostic medical devices under DIRECTIVE 2006/42/EC. Please read the *Instructions for Use* of the reagent cartridges carefully and follow the instructions.

WARNING

The reagent cartridges should be stored in a refrigerator [35.6–46.4°F (2–8°C)] not unwrapping for light shielding.

- Only the required number of reagent cartridges should be taken out of the refrigerator and warmed up to room temperature before unwrapping the individual packages.
- Do not use expired reagent cartridges.
- Use immediately after unwrapping the individual package.
- Do not break the aluminum seal on the reagent cartridges.
- Do not break the reagent cartridges apart.
- A new reagent cartridge must be used for each measurement. Do not reuse.

NOTE: Types of reagent cartridge and containers are subject to change without notice.

1.12 Handling Samples

WARNING

When handling samples (serum), always follow biohazard procedures (*e.g.*, wearing gloves, lab coat, and safety goggles), referring to the sample handling rules of your facility. If any part of the body comes in contact with samples, immediately rinse the contaminated body part thoroughly under running water and then use a disinfectant. Seek medical assistance if necessary.

IMPORTANT

When using serum, check that the samples have not undergone hemolysis, and that they do not contain any fibrin deposits.

1.13 DRI-CHEM AUTO TIPS and Sample Tubes

(Henceforth, DRI-CHEM AUTO TIPS is shortened into "tips" and Sample Tubes into "tubes" in this manual.)

The Element i Analyzer uses the samplers to inject samples (serum) into the reagent cartridges automatically. This operation requires the tips and tubes.

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 and tubes for each sample. Do not reuse old ones.

IMPORTANT

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

IMPORTANT

Use correct spacers on the sample table for each different sample tube (0.5 mL/1.5 mL).

1.14 Laser Warning

1.14.1 Safety Standard

This equipment complies with FDA performance standards for laser products except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

This equipment is a Class 1 laser product (designed according to IEC60825–1:2007/EN60825–1:2007).

1.14.2 Embedded Laser

The equipment has an embedded laser product [Class 3R, 658 nm, < 5 mW (CW)*].

* Class 3R AEL on condition 2 (φ=7 mm aperture, 70 mm apart from beam waist).

⚠ WARNING

The protective housing of the equipment is secured with screws. Unscrewing and removal of the protective housing would allow access to laser light.

Do not loosen a screw and do not remove the protective housing excluding a service engineer.

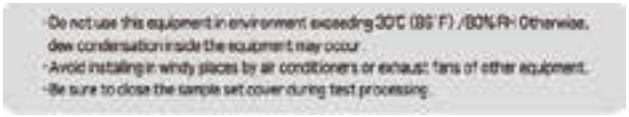
⚠ CAUTION

Use of controls or adjustments or performance of procedures other than those specified in this manual may result in hazardous laser light exposure.

1.15 Warning Labels

Warning labels and safety labels on the analyzer:

- Operation caution label
- Laser caution label
- Moving parts caution label
- Biohazard label
- Rating label
- Identification label
- Communication connector label



Operation caution label

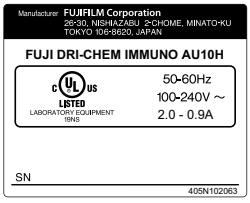
Biohazard Label

The label means biohazard (infections) warning.
Be sure to follow biohazard procedures (e,g., wearing gloves, lab coat, and safety goggles).
When discarding infectious waste, be sure to process it correctly in compliance with any applicable regulations in your country.

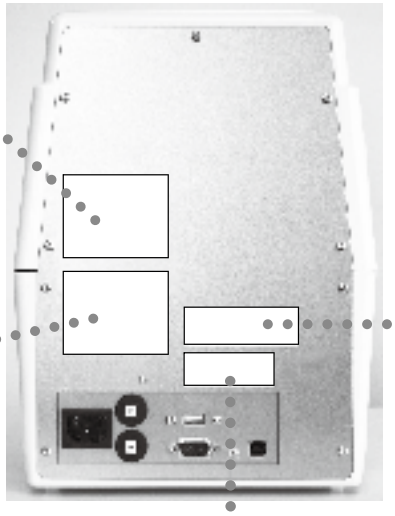
Moving Parts Caution Label

Be careful when the sample set moves.

Identification Label



Rating Label



Laser Caution Label

Communication Connector Label

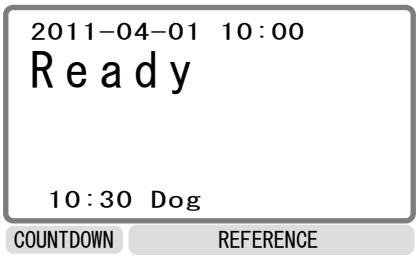
For detailed information on the connector, see P6-34.

⚠ CAUTION

Do not connect the equipment to a host computer or PC which has not been approved by IEC/UL60950–1.

2.1 Component Names

2.2 Names and Functions of Keyboard Controls



DISPLAY

Displays the status of the equipment and the operating procedures.

COUNTDOWN

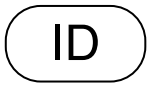
Displays estimated time (min. : sec.) to complete current measurements on the analyzer.

REFERENCE

Displays a selected reference interval name (*e.g.*, dog).

MODE KEY

The **MODE** key is used for starting Mode functions.



ID KEY

The **ID** key is used for inputting sample numbers or sample IDs.

RERUN KEY

The **RERUN** key is used to rerun tests.

The most recent sample number and sample ID are used for the measurements.

WORK LIST KEY

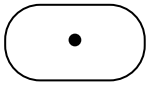
The **WORK LIST** key is provided for requesting patient IDs and the test request information (work list) from an external PC.

REF. KEY

The **REF.** key is used for selecting a species reference interval.

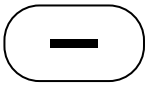
NUMERIC KEYS

The numeric keys are used for inputting alphanumeric characters during sample No./ID input or mode operations.



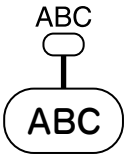
PERIOD KEY

The **.** (Period) key is used for inputting a decimal point.



- (MINUS) KEY

The **–** (Minus) key is used for inputting the minus (-) sign.



ABC INDICATOR LIGHT

When the alphabetical character input mode has been selected, the ABC indicator light will turn on. Turning off the indicator shows the numerical input mode.

ABC KEY

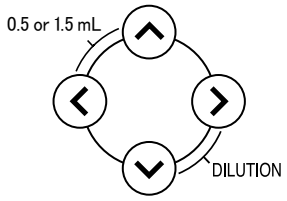
The **ABC** key is used for selecting either alphabetical or numerical character input mode.

C (CLEAR) KEY

The **C** key is used for deleting incorrect input data.

ENTER KEY

The **ENTER** key is used for completing a data input.



SCROLL KEYS

The scroll keys are used for moving a cursor during key input or selecting a menu.

Dilution test can be carried out with the ▶ and ▼ keys pressed at the same time.

Tube size can be changed by pressing ◀ and ▲ at the same time.

STOP KEY

The **STOP** key is used for stopping a sampling process. When the status **[Starting]** is displayed the sampling process can be stopped. To restart, enter the settings (sample ID, and/or dilution factor, *etc.*) and the consumables (tip and/or reagent cartridge, *etc.*) and press **START**.

This key is also used for stopping alarms and terminating a mode process.

START KEY

The **START** key is used for starting testing.

3.1 Preparations

3.1.1 Sample Tube Settings

The sample tubes that the equipment uses need to be set up.

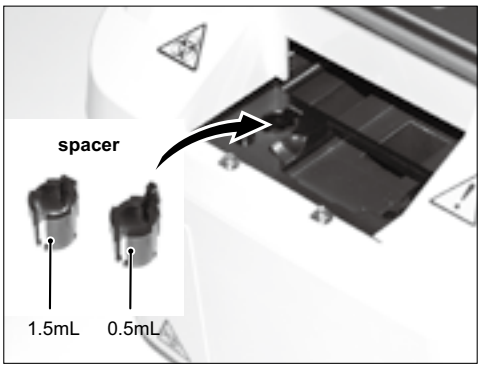
For sample tubes that can be used with the equipment (Refer to *Sample Tubes for the Equipment, Section 3.1.7)*.

IMPORTANT

Select the correct tube size and use the spacer for the selected sample. Incorrect setting may cause insufficient sample volume or inaccurate test result.

To select tube size:

1. Press ◀ and ▲ at the same time.
2. Press arrow to select preferred tube size (0.5 mL or 1.5 mL).
3. Press **ENTER**.
4. Selected tube size will be displayed on the screen.
5. For the selected sample tube, put the spacer into the tube set hole on the sample table. Make sure the spacer is firmly fixed.



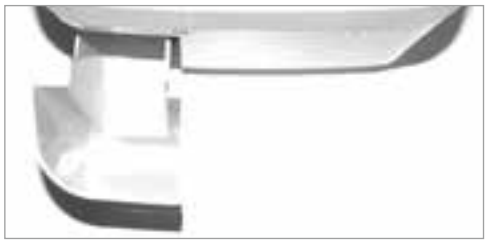
3.1.2 List for Daily Maintenance Before Use

According to *Section 3.1.3* and *Section 3.1.4*, please perform the daily maintenance before use.

Item	Contents	Reference Section
Cleaning disposal box	Discard used tips to empty the disposal box.	3.1.3 (1)
Removing used consumables	Discard used reagent cartridges, and remove remaining sample.	3.1.3 (2)
Checking date and time	If either the date or time is incorrect, adjust it using Mode 20.	3.1.4 (3)

3.1.3 Preparations Before Turning the Power On (Daily Maintenance Before Use #1)

1. Remove the disposal box and discard the tips.



IMPORTANT

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

2. Discard used reagent cartridges and remove samples.

3.1.4 Turning the Power On (Daily Maintenance Before Use #2)

1. Close the sample set cover.

NOTE: Be sure to close the sample set cover before starting measurement process. Failure to observe this precaution could cause fingers to get caught in the sample table.

2. Turn the power switch on.

   (Depress the [I] side of the power switch.) 

NOTE: Turning the power on for the first time or leaving the power continuously off for a long time may cause the date error (error code: W0508) prompting the resetting of the date. In this case, set the date and the time using Mode 20. (Refer to *Section 6.2.3*)

NOTE: When turning the power on, the message at right will appear on the display. Empty disposal box if used tips have not been discarded.

3. Check displayed date and time.

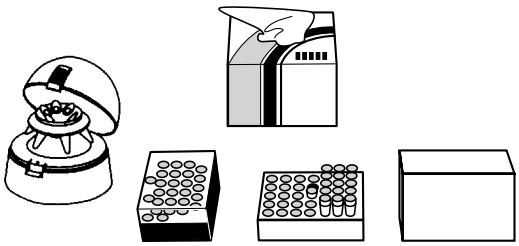
   If either the date or time is incorrect, adjust it using Mode 20 (Refer to *Section 6.2.3*).

IMPORTANT

In case that the date and time are not adjusted correctly, the analyzer may fail to determine the expirations of the reagent cartridges, so that the test results may NOT be accurate.

4. Prepare the necessary peripheral accessories.

   Prepare the reagent cartridges. For further details, refer to the *Reagent Cartridges, Section 1.11*).



3.1.5 List for Daily Maintenance After Use

According to *Section 3.1.6*, please perform the daily maintenance after use.

Item	Contents	Reference Section
Cleaning disposal box	Discard used tips to empty the disposal box.	3.1.6 (4)
Removing used consumables	Discard used reagent cartridges, and remove remaining sample.	3.1.6 (5)
Cleaning sample table	Clean around the sample table.	3.1.6 (6)

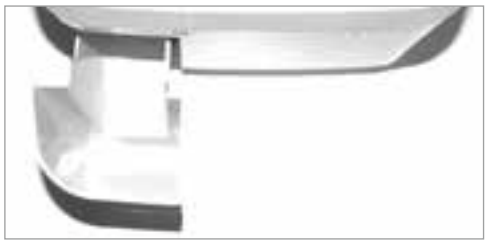
3.1.6 Turning the Power Off (Daily Maintenance After Use)

1. Before turning the power off:

   Make sure that measurements and mode operations are not in progress.

⚠ CAUTION

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

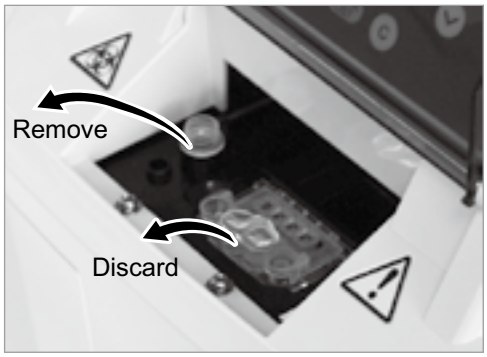


2. Turn the power switch off.

   (Depress the [O] side of the power switch.) 

3. Disconnect the AC power cable.

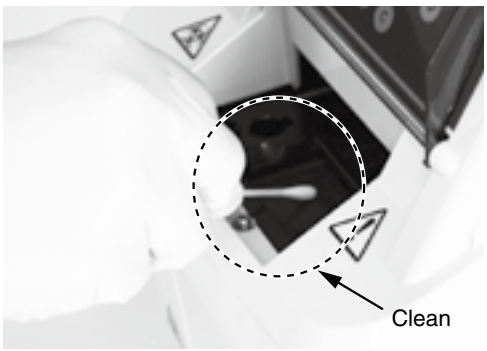
4. Remove the disposal box and discard the tips.



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

5. Discard used reagent cartridges, and remove remaining sample.
6. Clean around the sample table.

   Clean the sample set and cartridge transfer using a swab moistened with ethyl or isopropyl alcohol for disinfection or water.



7. Close the sample set cover.

3.1.7 Sample Tubes for the Equipment

1. The following are the sample tubes that can be used with the equipment.
   a. To use plasma
      - » 1.5 mL Heparin tube (green cap)
      - » 0.5 mL Heparin tube (green cap)

NOTE: When measuring cortisol in plasma, Dilute Mode must always be used. See *Section 3.4* for instruction on performing dilution.

   b. To use serum
      - » 1.5 mL Non-Heparinized tube (red cap)
      - » 0.5 mL Non-Heparinized tube (red cap)

2. Sample amounts.

   The suction limit and upper limit of sample is illustrated at right.

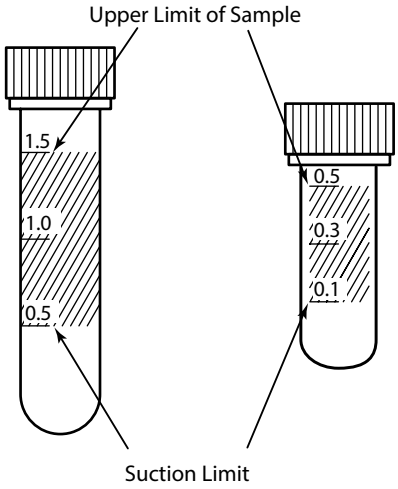
NOTE: If the blood, serum or plasma in the tube is below the suction limit mark, the analyzer will indicate an insufficient sample volume error.

   a. The sample amount required per test is 0.1 mL of plasma or serum.

   b. When whole blood is put into a 1.5 mL green top tube, if the tube is filled to the 1.5 mL mark and then centrifuged, two tests can be performed.

   c. When whole blood is put into a 0.5 mL green top tube, if the tube is filled to the 0.5 mL mark and then centrifuged, one test can be performed.

   d. When using serum in a 1.5 mL or a 0.5 mL red top tube, there must be more than 0.1 mL of serum for each test plus the dead volume/suction limit.



Sample Tube 1.5 mL Sample Tube 0.5 mL

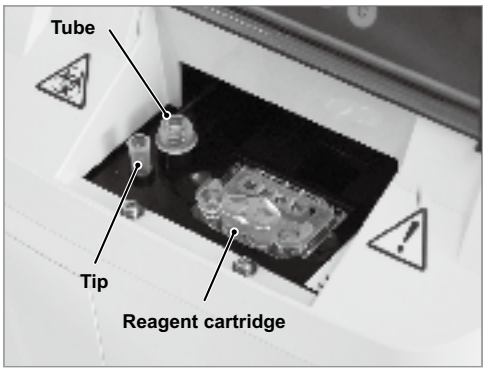
3.2 Measurements

3.2.1 Basic Measurements

CAUTION

- **Do not use this equipment in an environment exceeding 30°C (86°F)/ 80% RH. Otherwise, condensation inside the equipment may occur.**
- **Avoid installing in windy places by air conditioners or exhaust fans of other equipment.**
- **Be sure to close the sample set cover during test processing.**

1. Make sure **[Ready]** is displayed.
2. Open the sample set cover.
3. Set the reagent cartridge in place.



NOTE: Be sure to set the reagent cartridge firmly in place so that it is not lifted.

4. Set a tip into the tip set hole on the sample table.
5. Ensure the correct size tube spacer has been placed in the tube set hole.
6. Remove the cap from the tube which contains the sample and put it into the tube spacer.

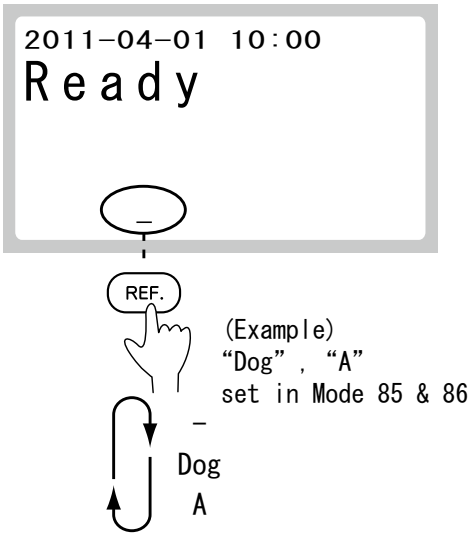
NOTE: Be sure to set the tube firmly in place so that it is not lifted.

NOTE: To change the tube size, replace the spacer on the tube set hole. Set the type of tube by pressing ◀ and ▲ at the same time. (Refer to *Section 6.2.23*).

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

7. Select a reference interval using **REF.**

   Each time **REF.** is pressed, the reference interval changes.

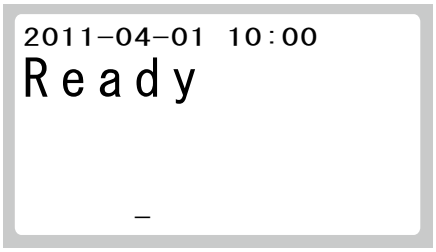


IMPORTANT

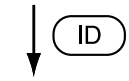
Make sure that the reference interval selection is correct.

NOTE: For further information of the reference interval settings, refer to Mode 39, Mode 85, and Mode 86.

8. Input a sample No. and a sample ID as follows, if required.



(Example) Sample No.=123

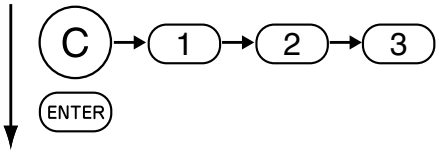


a. Input a sample No.

Sample No. input

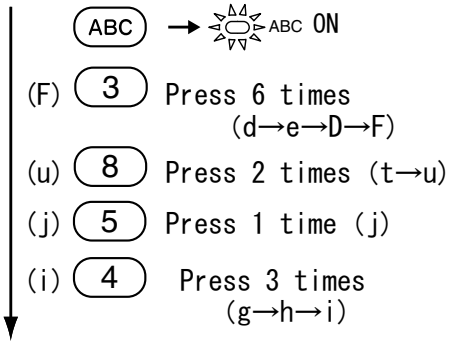
b. Input a sample ID.

After the inputs are completed, the display will return to the previous dialog.



Sample ID input

(Example) Sample ID = Fuji



IMPORTANT

Be careful not to input wrong No. or ID.

NOTE: A maximum of 9 numeric characters can be input for a sample No.

NOTE: A maximum of 13 alphanumeric characters can be input for a sample ID (Refer to *Section 3.3*).

NOTE: If no sample ID is input, the sample No. will be printed out along with the test results. Refer to Mode 27 (Refer to *Section 6.2.7*).

9. Close the sample set cover.

NOTE: Be sure to close the sample set cover before starting measurement process. Failure to observe this precaution could cause fingers to get caught in the sample table.

10. Press **START**.

IMPORTANT

The disposal box must remain closed during testing. Otherwise, the test results may suffer adverse effects.

The **COUNTDOWN** indication (time to test end) is an estimate. When the tests start, the longest time to test end is displayed. The remaining time may be significantly less depending on ambient temperature conditions.

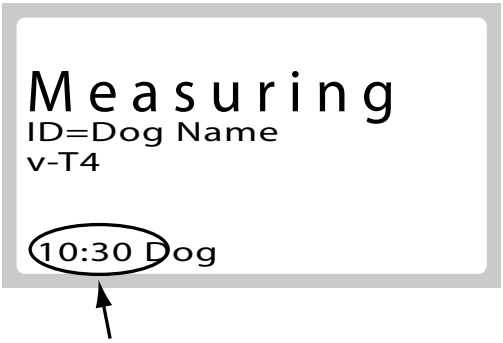
11. The test results will be displayed.

    When the tests are completed, a beep will sound.

12. After the tests are completed, remove the reagent cartridge and remaining sample (tube).

IMPORTANT

The capacity of the disposal box is 20 tips. If the number of used tips per day exceeds 20, empty the disposal box.



Estimated time (min.: sec.) for test completed

3.2.2 Usage of the WORK LIST Key

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

NOTE: To use the function of **WORK LIST** it is necessary to prepare a PC's software for the communication. Please consult your technical support for assistance.

1. Press **WORK LIST**.

   The equipment receives a work list (patient list whose samples are requested to be tested) from PC.

NOTE: Select **[To LIS-YES, Type1]** in the Mode 46. Only this setting can activate **WORK LIST**.

NOTE: If the PC is not connected, communication errors may occur. The message will be displayed or a beep will sound.

2. Select a patient name.

   To select a patient name whose sample is going to be tested, press ◀ or ▶ to scroll.

NOTE: The first line on the display is selectable by Mode 30 (Sample I/Patient ID).

NOTE: To cancel receiving the **WORK LIST**, press **STOP**.

NOTE: Pressing ◀ jumps to the top of the list in the **WORK LIST** with **[◀◀]**

3. Confirm the patient name.

   Display the patient name and press **ENTER**. Measurement items of the patient's sample will be loaded.

4. Set the reagent cartridges, tips and tubes.

5. Perform the measurements.

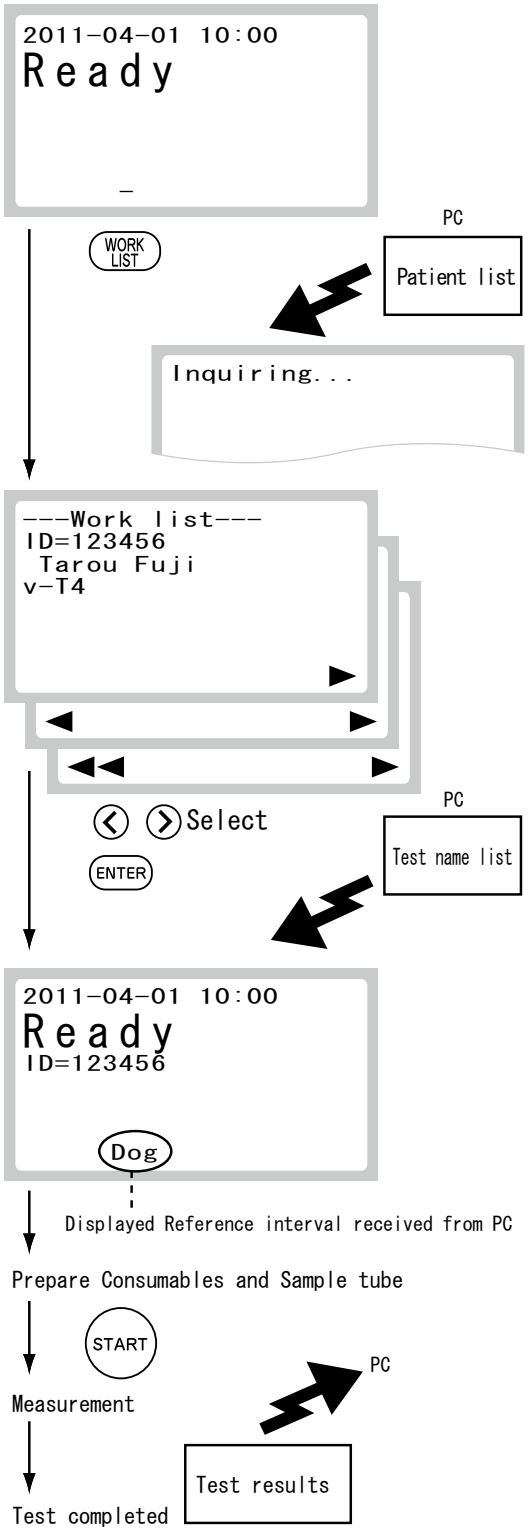
   For the testing procedures (Refer to *Section 3.2.1, Basic Measurements)*.

   If measuring a different test item on the same sample, press **RERUN**.

NOTE: To cancel the test for the patient, press **STOP**.

6. After the tests are completed, the test results will be automatically transmitted.

   If more than two test items on the same sample need to be tested, repeat the operation procedures from the step (1) for the rest of the test items.



3.3 Inputting Sample ID

3.3.1 Usable Letters for Sample IDs

The following numbers and letters can be used for inputting IDs.

A maximum of 13 alphanumeric characters can be input for a sample ID.

Operational 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
0	0	- # / ? ! . , : ; ( )
.	.	.
-	-	

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

NOTE: Special characters (Ä, ü, ê, *etc.*) cannot be input.

3.3.2 Input Procedures

Press **ID** to enter the sample No. input mode. Next, press **ENTER** to enter the sample ID input mode.

Input a sample ID as follows:

IMPORTANT

Be careful not to input wrong No. or ID. Otherwise, wrong test results will be reported to doctors.

NOTE: Using Mode 27 setting, the sample No. input dialog can be skipped (Refer to *Section 6.2.7)*.

1. Inputting numbers.

   (Example) Inputting "1, 2, 3".

   a. Make sure the ABC indicator light is not lit. If it is, press **ABC** to turn off the ABC indicator light.

   b. Press the numeric keys (**1, 2, 3**).

   c. Press **ENTER** to terminate the input dialog.

2. Inputting alphabetical characters.

   (Example) Inputting an "F"**.**

   a. Press **ABC** to light the ABC indicator light.

   b. Press **3** (a key for D, E, and F). **d** appears first.

   c. Press **3** again until "F" appears:
   (d ▶ e ▶ f ▶ D ▶ E ▶ F).

   d. Press ▶ to move the cursor to the next position.
   Input the next letter.

NOTE: In case that the next letter to be input is on another key, another letter will appear on the display when another key is pressed without pressing ▶.

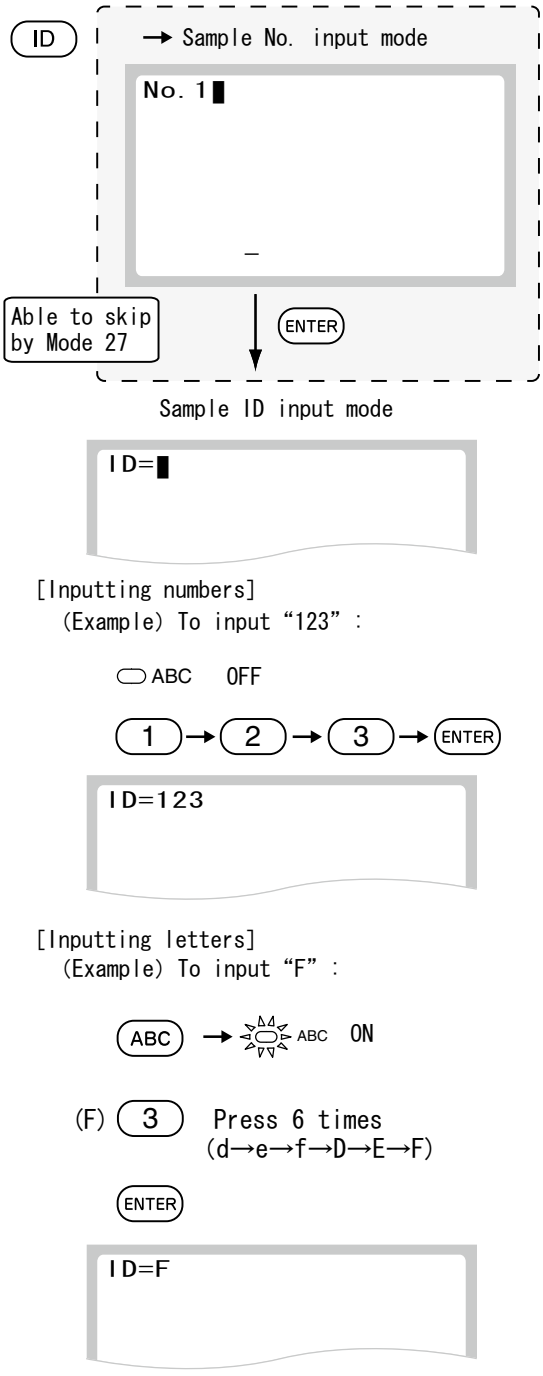
   e. After the sample ID input is completed, press **ENTER**.

3. Correcting numbers or letters.

   The cursor moves from side to side each time ◀ or ▶ are pressed.

   Select a number or a letter to be corrected using the ◀ or ▶ and then press the **C** (clear) to erase.

4. In the input dialog, pressing **C** erases the input characters to return **[ID=]**.



3.4 Dilution Tests

For dilution in approved tests perform the measurements as follows:

IMPORTANT

Always use Normal Saline as the diluent for dilution tests.

IMPORTANT

If a sample that was diluted outside of the analyzer is measured, an incorrect test result will be obtained. Always follow the procedure of this section to perform dilution tests.

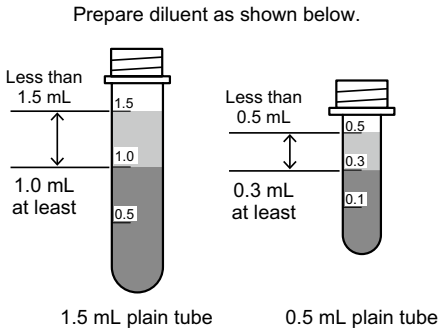
NOTE: Dilution is only validated for the cortisol cartridge. If measuring cortisol in plasma, Dilution Mode must always be used.

1. Make sure **[Ready]** is displayed.

NOTE: Perform the settings of the reference interval, the sample No. and the sample ID as needed in the same manner of the basic measurement.

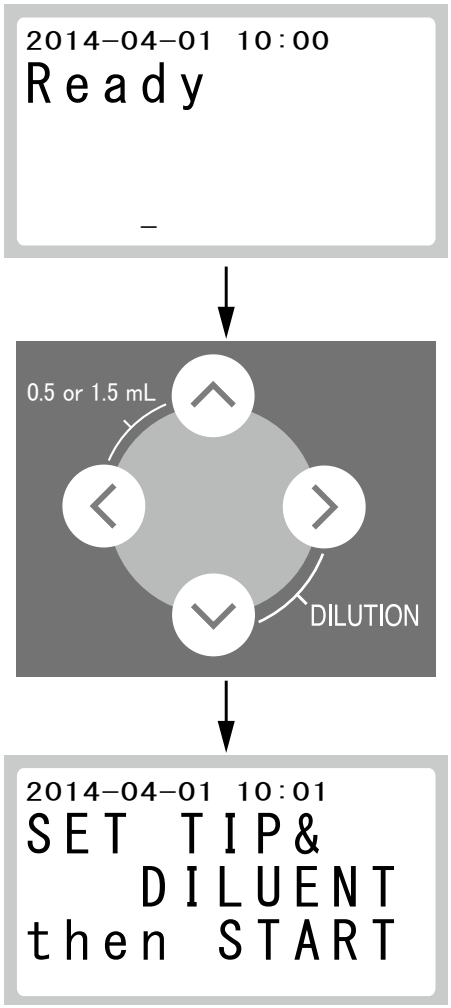
2. Prepare diluent as the following:

NOTE: Use the same size of tube as the tube used for sample.



NOTE: To change the tube size, replace the spacer on the tube set hole. Set the type of tube by pressing ◀ and ▲ at the same time. (*Refer to Section 6.2.23*).

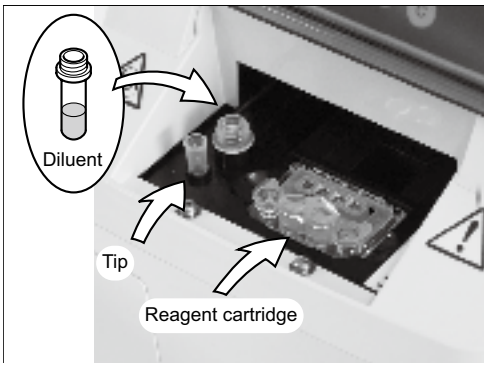
3. Press ▶ and ▼at the same time.
4. Make sure **[SET TIP&DILUENT then START]** is displayed.
5. Open the sample set cover.



6. Set the reagent cartridge in place.

NOTE: Be sure to set the reagent cartridge firmly in place so that it is not lifted.

7. Set a tip into the tip set hole on the sample table.
8. Set a tube containing diluent in the tube spacer with the cap removed.



IMPORTANT

Be sure to load the diluent first. If a sample is loaded by mistake, a wrong test result will be obtained.

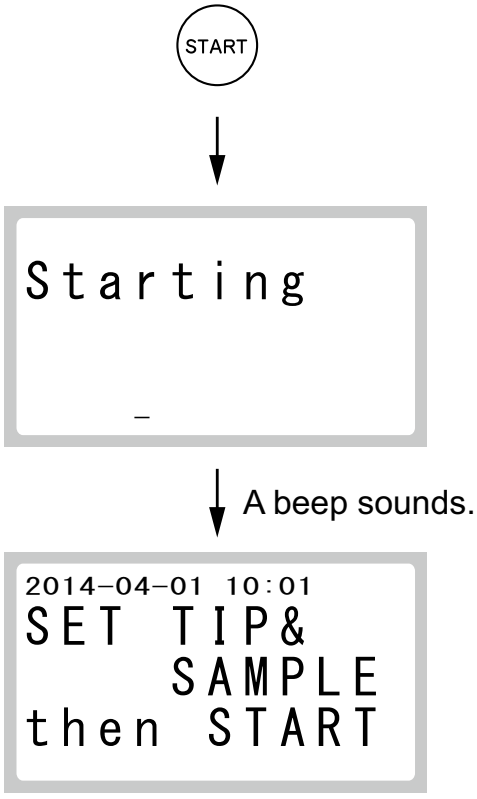
NOTE: Be sure to set the tube firmly in place so that it is not lifted.

NOTE: Make sure that there are no bubbles in the diluent.

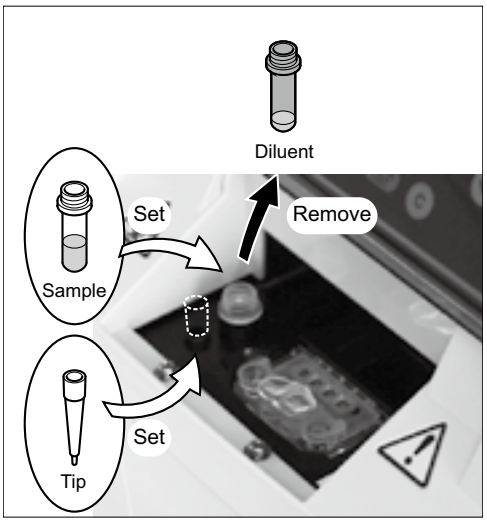
9. Close the sample set cover.

NOTE: Be sure to close the sample set cover before starting the measurement process. Failure to observe this precaution could cause fingers to get caught in the sample table.

10. Press **START** to start the aspiration of the diluent.
11. Make sure **[SET TIP&SAMPLE then START]** is displayed. Then, open the sample set cover.



12. Remove the remaining diluent (tube).



IMPORTANT

Promptly set a sample to start the measurement. If left standing for a certain period of time, the test result may be effected.

13. Set a tube containing SAMPLE in the tube spacer with cap removed.

IMPORTANT

Be sure to load the SAMPLE here. If diluent is loaded by mistake, a wrong test result will be obtained.

NOTE: Be sure to set the tube firmly in place so that it is not lifted.

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

14. Set a tip into the tip set hole on the sample table.

15. Close the sample set cover.

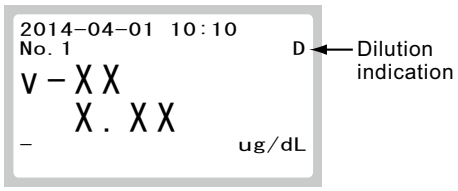
NOTE: Be sure to close the sample set cover before starting the measurement process. Failure to observe this precaution could cause fingers to get caught in the sample table.

16. Press **START** to start the measurement.

IMPORTANT

The disposal box must remain closed during testing. Otherwise, the test results may suffer adverse effects.

17. The test result will be displayed. When the tests are completed, a beep will sound.



18. After the test is completed, remove the reagent cartridge and remaining sample (tube).

IMPORTANT

The capacity of the disposal box is 20 tips. If the number of used tips per day exceeds 20, empty the disposal box.

NOTE: When carrying out the dilution test continuously, perform the procedures beginning from step (1) for the second test or later. When using the **RERUN** function, press **RERUN** at first and then perform the procedures beginning from step (1).

4.1 Periodic Maintenance

In order to keep the best performance by this equipment; perform the periodic maintenance by users and the specific maintenance by Heska Technical Support Services at 800.464.3752, option 5.

IMPORTANT
If the periodic maintenance described is not performed, the analyzer's performance and specifications will not be maintained, and adverse effects on test results may occur.

IMPORTANT
Be sure to reassemble the parts removed for maintenance and tighten thumbscrews securely. Otherwise, adverse effects on test results may occur.

CAUTION
Refer to each section for information about usable solvents for cleaning. For further information, please contact Heska Technical Support Services.

CAUTION
Do not use alcohol for cleaning the sample set cover (translucent), otherwise the surface will be damaged.

NOTE: When cleaning the outer covers of the equipment, wipe those using soft cloth moistened with water or ethyl alcohol for disinfection (excluding the sample set cover).

4.1.1 User Periodic Maintenance

According to the following table, please perform periodic maintenance according to the following table.

Part	Cleaning	Inspection	Replacement	Reference Section
SPF detector	When errors frequently occur	-	-	4.2
Sampler O-ring	-	Once a month	Once a year	4.3
Air filter	Once a month	-	-	4.4
Sample set	When contaminated with samples (serum), or when errors frequently occur.	-	-	4.5

4.2 SPF Detector Lens Cleaning

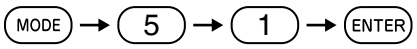
Clean the SPF detector lens when inaccurate test results or reading errors frequently occur. Stains on the lens may cause these errors. Canned air is required.

WARNING
Do not remove the covers secured by screws. The equipment has a built-in laser source. Exposure could harm eyes.

4.2.1 Cleaning Procedures

1. With maintenance cover closed, enter into Mode 51.

   Refer to Mode 51 (*Section 6.2.16*).



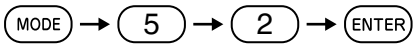
2. Open the maintenance cover, and insert the canned air straw through the cover channel into the hole at side panel. Insert straw 2.4 inches.

3. Blow air for a few seconds.

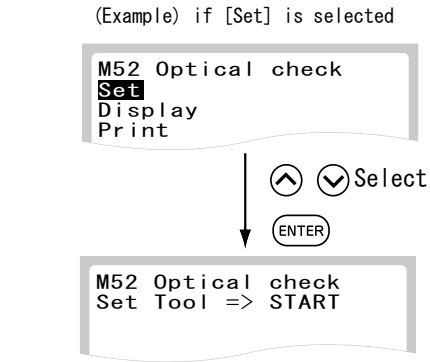
NOTE: Do not turn the air-duster upside down; liquid may be blown out.

4. After cleaning the lens, close the maintenance cover. Press **STOP** to quit maintenance (Mode 51).
5. Perform the optical check (Mode 52).

6. Enter into Mode 52.



7. Select **[Set]** using ▲or ▼ and then press **ENTER**.

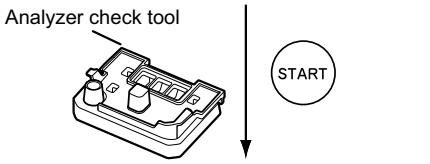


8. Set the analyzer check tool on the sample table, close the sample set cover, and enter **START**.

NOTE: Use the analyzer check tool supplied with the equipment. Notice that last 5 digits of serial number on the equipment are also labeled on the analyzer.

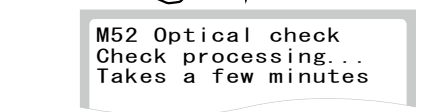
SN ××× (○○○○○)

The error E5204 will occur if any other check tool is used and the optical check will not start.



9. Start the optical check.

   The optical check takes about 3 minutes.

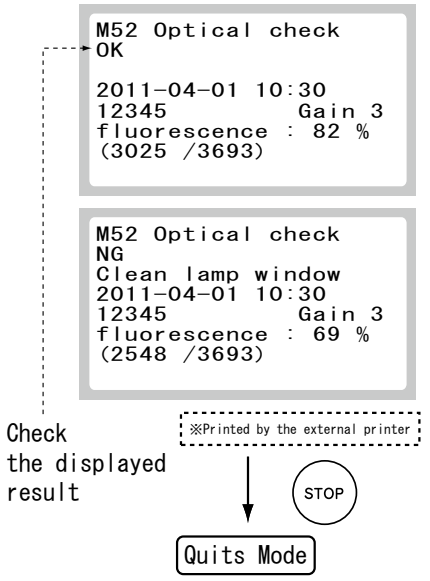


A beep sounds when check process is complete.

10. Display the result.

    After the check is complete, the analyzer displays the result and quits the mode operation.

NOTE: The percentage value may change by temperature in the equipment and can be used if **[OK]** is displayed. If the result is **[NG]**, the message "Clean lamp window" will be displayed. Clean the SPF detector lens again (Refer to *Section 4.2.1*).



4.3 Inspecting and Replacing the Sampler O-ring

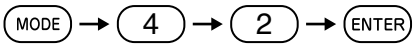
The sampler nozzle O-ring wears with use. Periodic inspection (once a month) and replacement (once a year) are necessary.

IMPORTANT

If the analyzer is used without inspecting and replacing the sampler O-ring, spotting volume may be inaccurate to cause adverse effects on test results.

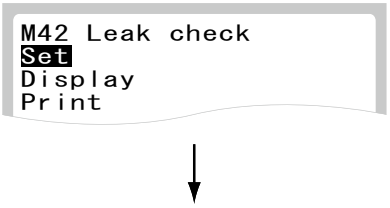
4.3.1 Inspecting the Sampler O-ring

1. Select Mode 42 for leak checks.

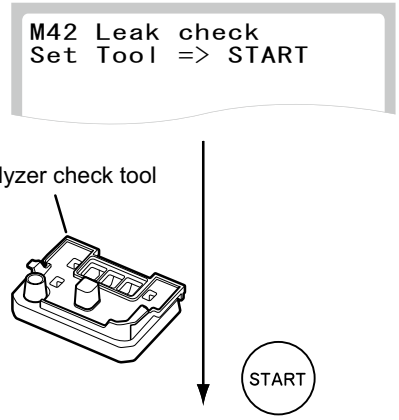


NOTE: Mode 42 is an administrator mode. Inputting a password in Mode 0 allows administrators to operate Mode 42. Refer to Mode 42 (*Section 6.2.13*).

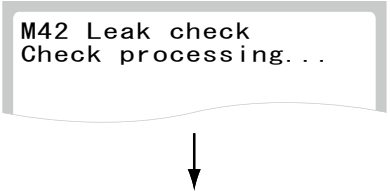
2. Select **[Set]** using ▲or ▼ and press **ENTER**.

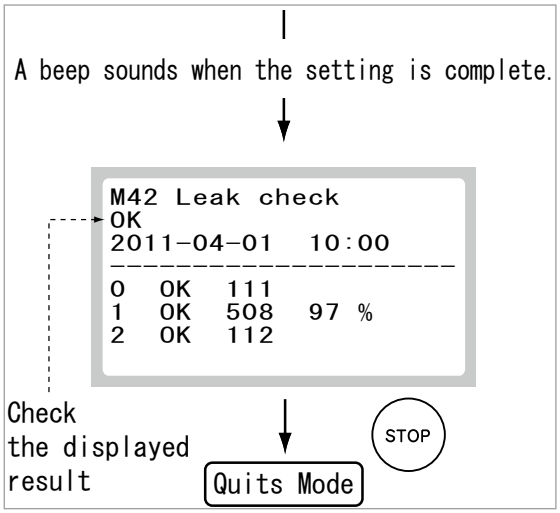


3. Leak check for the sampler.
   a. Set the analyzer check tool on the sample table.



   b. Close the sample set cover and press **START**. The leak check starts, and the result will be displayed.
   c. Press **STOP** to quit Mode.
   d. Remove the analyzer check tool.





4.3.2 Replacing the Sampler O-ring

Replace the sampler O-ring once a year.

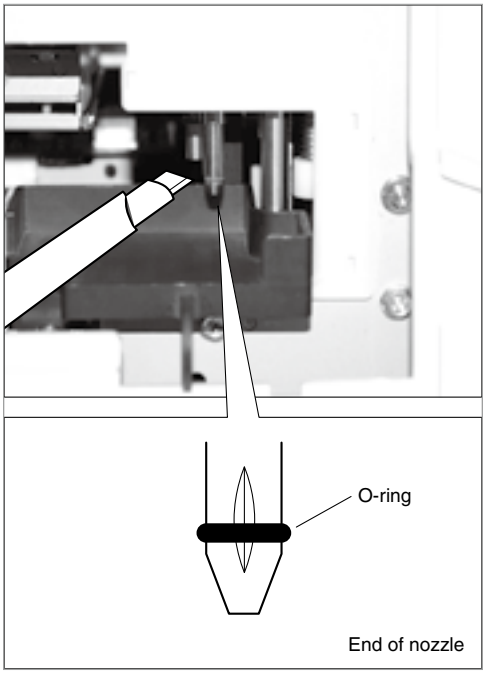
IMPORTANT

If the analyzer is used without inspecting and replacing the sampler O-ring, spotting volume may be inaccurate to cause adverse effects on test results.

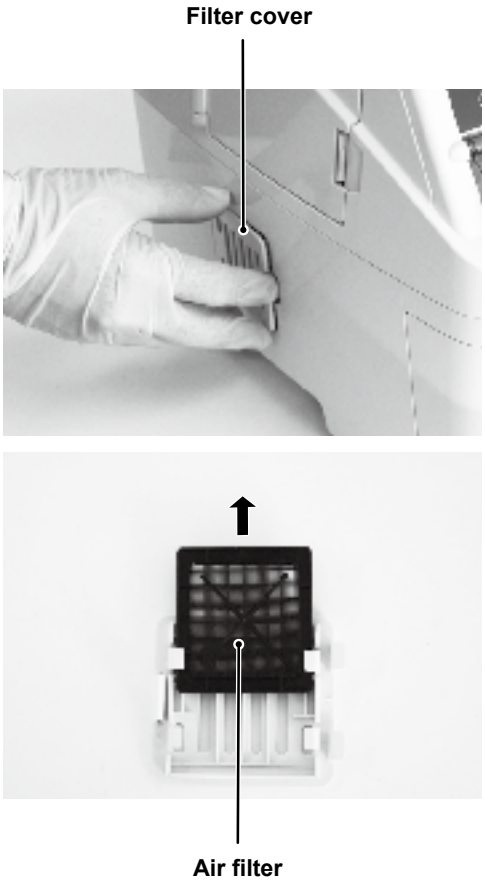
1. Turn the power off.
2. Open the maintenance cover.
3. Set the supplied tray to catch the O-ring when cut off.
4. Cut off the used O-ring by bringing the razor blade knife into contact with the vertical notch on the end of the nozzle.
5. Mount a new O-ring in the groove around the nozzle by sliding it from the end of the nozzle.

NOTE: Use the specified O-ring designed for this purpose.

6. Close the maintenance cover.
7. Perform leak check for O-ring after completing the replacement (Refer to *Section 4.3.1)*.



4.4 Cleaning the Air Filter



The air filter becomes dirty quickly in some environmental conditions, so it should be checked and cleaned at least once a month.

IMPORTANT

If the air filter is not cleaned, the temperature of the analyzer inside will increase, so that adverse effects on test results may occur.

1. Turn the power off.
2. Open the filter cover.
3. Clean the air filter.

   Pull out the air filter as shown at right. Remove dust adhering to the filter with a vacuum cleaner or running water.
4. Put the filter back.

   If washing the filter with running water, make sure it is dried well before putting it back.

   The filter can be placed into the filter cover without distinction of the front/back or the top/bottom of the filter.
5. Close the filter cover after putting the filter back.

IMPORTANT

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

4.5 Cleaning the Sample Set

Clean the sample set and cartridge transfer when QR information reading errors or cartridge transfer errors frequently occur. Dust or debris on the sample set and cartridge transfer may cause these errors.

CAUTION

Be sure to turn the power off when cleaning the sample set and cartridge transfer.

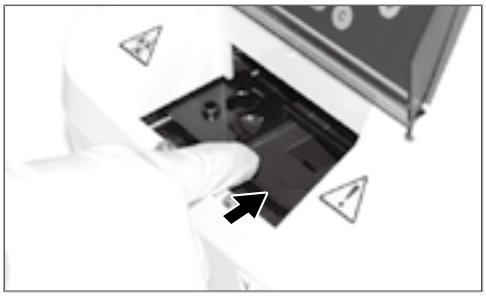
IMPORTANT

Be sure to clean the sample set and cartridge transfer as described. Failure to observe this precaution could cause adverse effects on the test results.

1. Open the sample set cover.
2. Clean the sample set and cartridge transfer with a cotton swab moistened with water or ethyl or isopropyl alcohol for disinfection.

NOTE: If the cartridge transfer is very dirty, slide the sample set forward and clean the cartridge transfer completely. After cleaning, turn the power on, and then the sample set will return to the original position.

3. Close the sample set cover.



5.1 Error Indications

IMPORTANT

In case that analyzer malfunction (errors) is 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.

5.1.1 Error Code Table

Error Code	Error Description	Reference Section
E0001	Temperature sensor error.	5.2.15
E0002	Humidity sensor error.	5.2.15
E0003	The maintenance cover has opened during test processing.	5.2.15
E0004	A pressure sensor output error has occurred (vertical).	5.2.15
E0010 – E0012	Control board malfunction.	5.2.15
E0013 – E0024	Temperature control sensor or fan error.	5.2.15
E0101	Clogging detected.	5.2.7
E0102 – E0111	Clogging detected during sampling.	5.2.7
E0112	The sample cannot be aspirated.	5.2.7
E0113	The pipe clogs since the nozzle aspirates the sample.	5.2.7
E0120 – E0122	Sample sending errors.	5.2.7
E0123, E0124	O-ring errors.	5.2.7
E0125	Insufficient volume of sample.	5.2.7
E0126, E0127	Pressure is not released (Solenoid error).	5.2.7
E0201 – E0207	Sample table sensor errors.	5.2.8
E0208, E0209	No tip or sample has been set.	5.2.8
E0501 – E0507	LD, LED, or circuit board errors.	5.2.10
E0601 – E0605	Optical unit operation errors.	5.2.11
E1001 – E1012	Sampler vertical operation errors.	5.2.4
E1013	Surface of the sample is exceeded the upper limit.	5.2.4
E1014	No sample surface found.	5.2.4
E1101, E1102	Motor operation errors.	5.2.5
E1103	Tips are not disposed.	5.2.5
E1104	Tips are not detected.	5.2.5
E1105 – E1107	Motor operation errors.	5.2.5
E1108, E1109	Detection sensor errors.	5.2.5
E1201 – E1208	Motor operation errors.	5.2.6

Error Code	Error Description	Reference Section
E1503	Temperature control malfunction after turning the power on.	5.2.9
E3001 – E3006	Memory errors.	5.2.13
E3021 – E3026	Saving data errors.	5.2.13
E5201 – E5204	QR code errors.	5.2.3
E6001 – E6004	The test data of time course are spread.	5.2.14
E6005 – E6009	Reaction error.	5.2.14
W0007	The maintenance cover is opened.	5.2.15
W0008	The disposal box is not set at the beginning of measurement process.	5.2.15
W0009	The disposal box is open during testing.	5.2.15
W0016	Peltier cooling fan error.	5.2.15
W0505	Laser deterioration error.	5.2.10
W0508	The built-in clock error.	5.2.10
W1501, W1502, W1510	Environmental temperature and humidity are out of predetermined range.	5.2.12
W1504 – W1509	The temperature control has not been stabilized.	5.2.9
W3011 – W3014	Memory errors.	5.2.13
W3031, W3032	USB memory error.	5.2.13
W5205	Unit (B) has not been set up.	5.2.17
W7001 – W7004	Errors related to data communication.	5.2.16

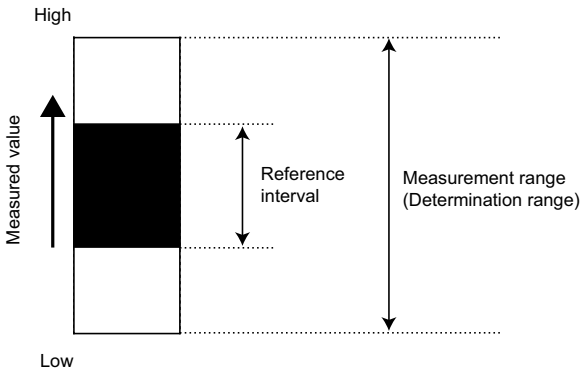
5.1.2 Display Indication Table

Printout Message	Description	Reference Section
H	Testing value exceeds the upper limit of the preset reference interval.	5.2.17
L	Testing value falls below the lower limit of the preset reference interval.	5.2.17
>	Testing value exceeds the upper limit of the measurement range.	5.2.17
<	Testing value falls below the lower limit of the measurement range.	5.2.17
@	Testing value is out of the measurement range. Or, during dilution test, the loading interval between diluent and sample exceeds a certain period of time. IMPORTANT **The testing value may NOT be accurate. Rerun the tests again.**	5.2.17
#	The valid term of the reagent cartridge has expired. IMPORTANT **The testing value may NOT be accurate. Refer to the related troubleshooting pages and rerun the test.**	5.2.17
C	Testing value is a result in control mode. The control mode can be canceled by using Mode 19.	5.2.17
*	The disposal box was open when the measurements are in progress.	5.2.17
+	The temperature standard for the reagent cartridge exceeded the upper limit.	5.2.17
-	The temperature standard for the reagent cartridge was below the lower limit.	5.2.17
D	Testing value is a result obtained by dilution test.	3.4

5.1.3 (Supplement) About Measurement Range

The relation between measurement range (determination range) and reference interval is as shown below. Each value depends on each test name.

NOTE: Reference intervals can be input by using Mode 39 (Refer to *Section 6.2.12*).



5.2 Troubleshooting

NOTE: To stop beeping when an error occur, press **STOP**.

NOTE: When an error occurs, the analyzer will terminate the measurements. When rerunning the sample, enter the sample No., sample ID, reference interval and load reagent cartridges, tips and tubes and then restart.

5.2.1 Startup Errors

When the analyzer does not start after the power switch is depressed to the [I] 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 still does not start up, please contact Heska Technical Support Services for assistance.

5.2.2 Display Trouble

1. When the display is too light or dark:

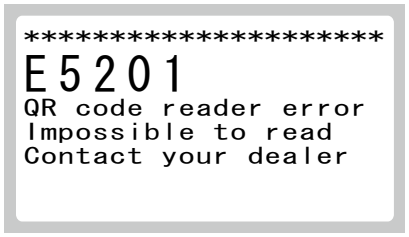
   ☞ Adjust the display brightness using Mode 82 (Refer to *Section 6.2.21*).

5.2.3 QR Code Errors

1. E5201

   A QR code reader error has occurred.

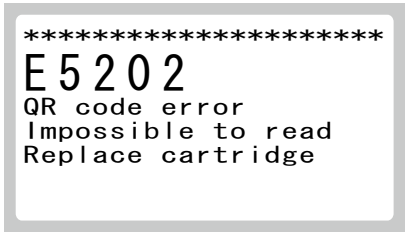
   ☞ Please contact Heska Technical Support Services for assistance.



2. E5202

   The QR code cannot be read.

   ☞ Replace the reagent cartridges.



3. E5203

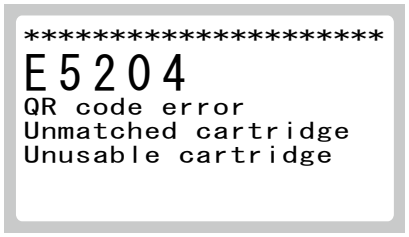
   The received QR code information is incorrect.

   ☞ Please contact Heska Technical Support Services for assistance.

4. E5204

   This reagent cartridge cannot be used.

   ☞ Replace the reagent cartridges.

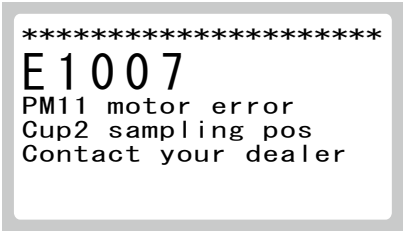


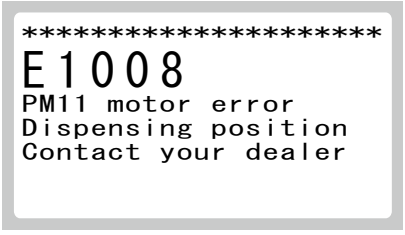
5.2.4 Sampler Behavior Errors (vertical)

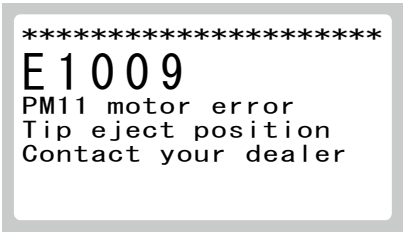
1. E1001 – E1012

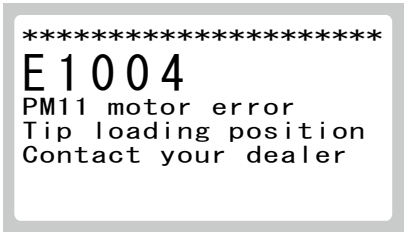
   A motor error of vertical operation has occurred.

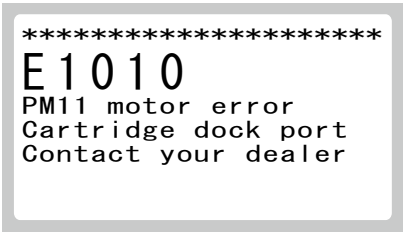
   ☞ Cancel measurement process. Turn the power off and on again. If the error still occurs, please contact Heska Technical Support Services for assistance.

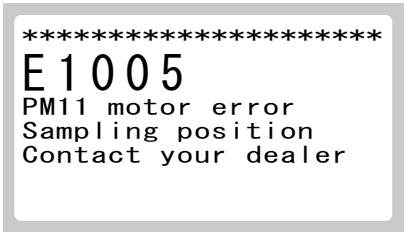


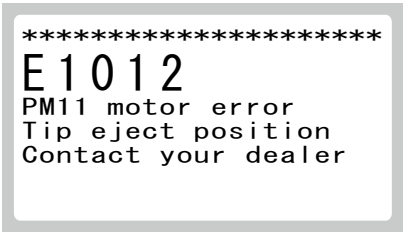








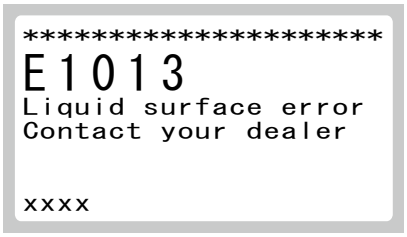




2. E1013

   Surface of the sample exceeds the upper limit.

   ☞ Please contact Heska Technical Support Services for assistance.



3. E1014

   No sample surface found:

   ☞ Perform the following troubleshooting.

   Press **STOP** to stop the beep.

   Check that DRI-CHEM AUTO TIPS are used.

   Make sure that the sample volume is above the aspiration limit. Add the sample if it is not sufficient.

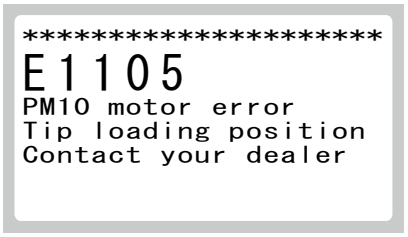
   Put a new DRI-CHEM AUTO TIP on the sample table to rerun the tests from the beginning.

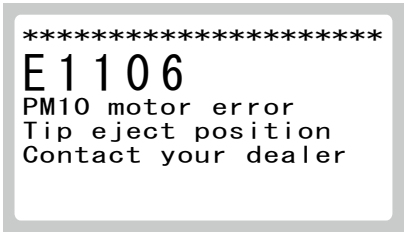
5.2.5 Sampler Behavior Errors (horizontal)

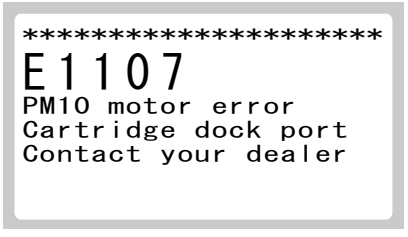
1. E1101, E1102, E1105 – E1107

   Motor drive error has occurred.

   ☞ Cancel measurement process. Turn the power off and on again. If the error still occurs, please contact Heska Technical Support Services for assistance.



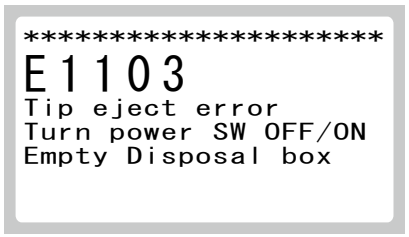




2. E1103

   During the tip disposal process, tips could not be disposed.

   ☞ Cancel measurement process and turn the power off. Discard the tips in the disposal box. If the error still occurs even after turning the power on again, please contact Heska Technical Support Services for assistance.



3. E1104

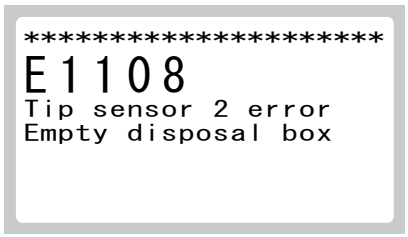
   During the tip detection process, the analyzer could not detect the tip.

   ☞ Put a tip on the setting position and rerun the tests from the beginning.

4. E1108

   The tip sensor 2 error has occurred.

   ☞ Cancel measurement process and turn the power off. Discard the tips in the disposal box. If the error still occurs even after turning the power on again, please contact Heska Technical Support Services for assistance.



5. E1109

   A tip sensor error has occurred.

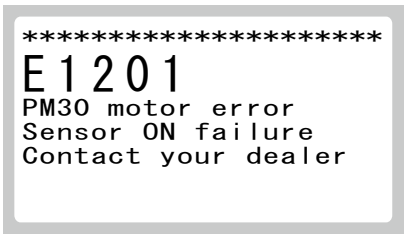
   ☞ Cancel measurement process, and contact Heska Technical Support Services for assistance.

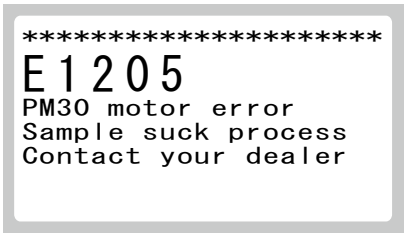
5.2.6 Syringe Errors

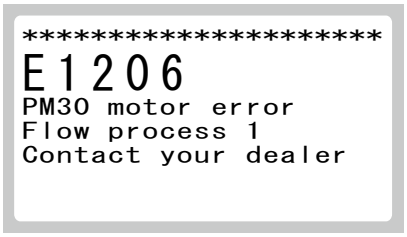
1. E1201 – E1208

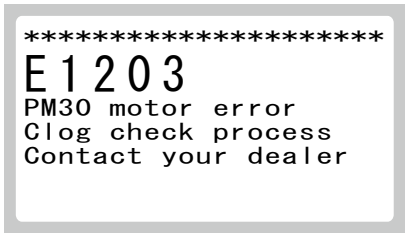
   Motor drive error has occurred.

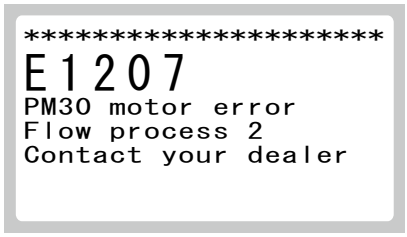
   ☞ Cancel measurement process. Turn the power off and on again. If the error still occurs, please contact Heska Technical Support Services for assistance.

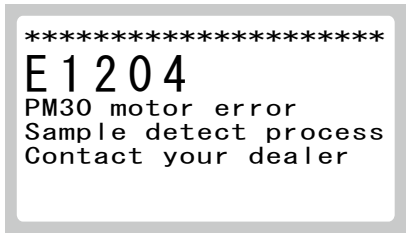


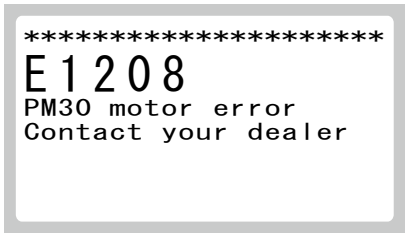












5.2.7 Aspiration System Errors

1. E0101

   The aspiration system got clogged.

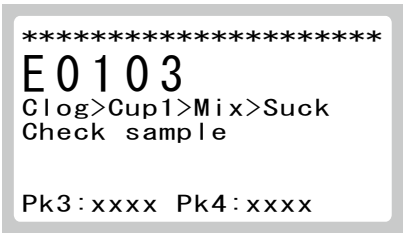
   ☞ Please contact Heska Technical Support Services for assistance.

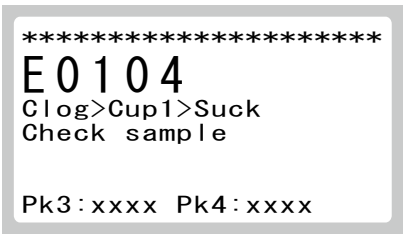
2. E0102 – E0111

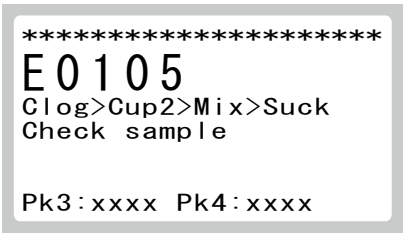
   Clogging error has been detected during sampling. Fibrin deposition in the sample may occur.

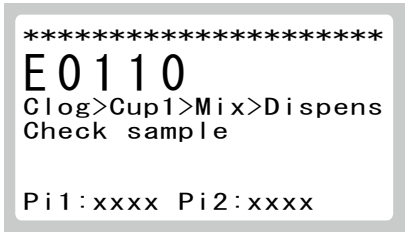
   ☞ Remove fibrin from the sample, and set consumables (reagent cartridges and/or tips, *etc.*) and rerun the tests from the beginning.

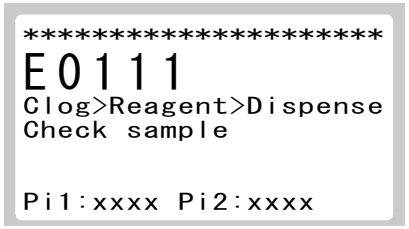
NOTE: If the error still occurs, the piping system may be clogged. Please contact Heska Technical Support Services for assistance.











3. E0112

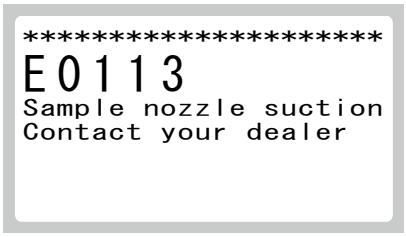
   The sample cannot be aspirated.

   ☞ Check the sample.

4. E0113

   The pipe got clogged since the nozzle aspirated the sample.

   ☞ Cancel measurement process, and contact Heska Technical Support Services for assistance.



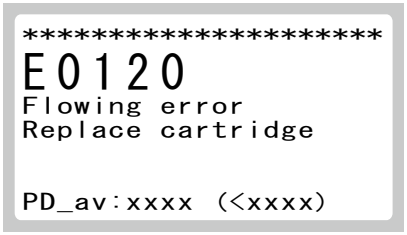
5. E0120 – E0122

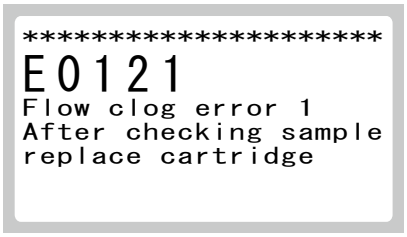
   A sending sample error has occurred.

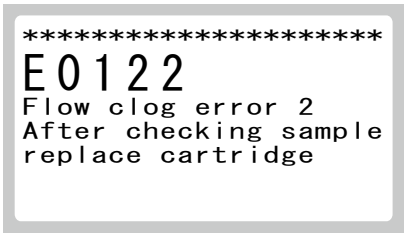
   ☞ Perform the following troubleshooting.

   Remove fibrin from the sample, and set consumables (reagent cartridges and/or tips, *etc.*) and rerun the tests from the beginning.

NOTE: If the error still occurs, the piping system may be clogged. Please contact Heska Technical Support Services for assistance.



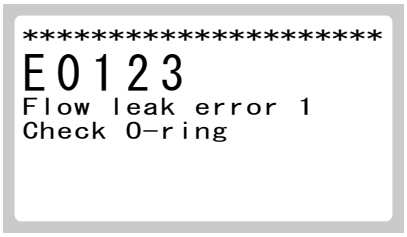


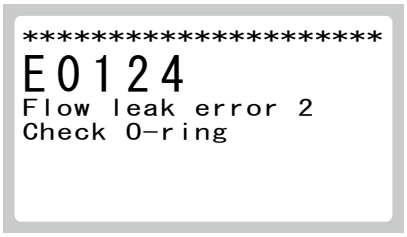


6. E0123, E0124

   A sampler O-ring error has occurred.

   ☞ Check the sampler O-ring.

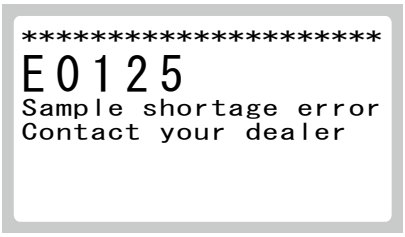




7. E0125

   A volume of the sample is not sufficient.

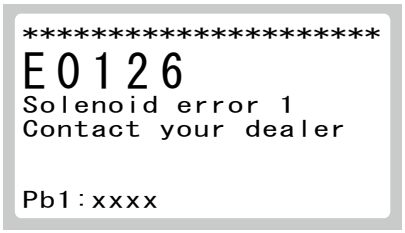
   ☞ Check the sample.

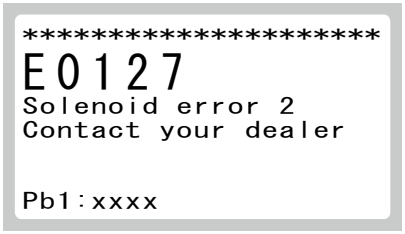


8. E0126, E0127

   Pressure is not released (Solenoid error).

   ☞ Cancel measurement process and contact Heska Technical Support Services for assistance.



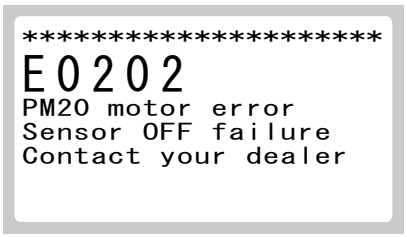


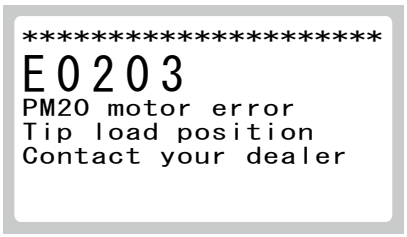
5.2.8 Sample Table Errors

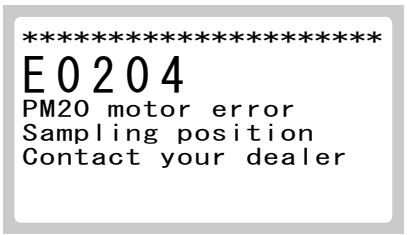
1. E0201 – E0207

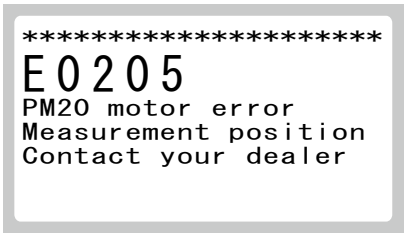
   The sensor has detected an error.

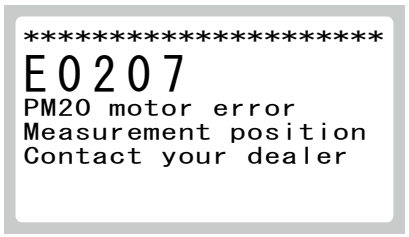
   ☞ Cancel measurement process. Turn the power off and on again. If the error still occurs, please contact Heska Technical Support Services for assistance.







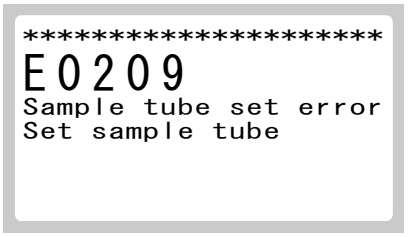




2. E0208, E0209

   The tip or sample tube has not been set.

   ☞ Set the tip or sample tube.



5.2.9 Temperature Control Errors

1. E1503

   An error has occurred when starting up the temperature control.

   ☞ Cancel measurement process, and contact Heska Technical Support Services for assistance.

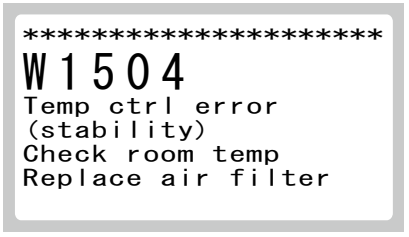
2. W1504, W1505

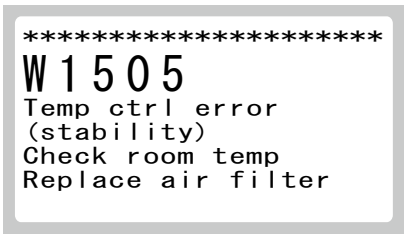
   The temperature control has not been stabilized.

   ☞ Make sure that environmental temperature is within the predetermined range.

   Clean the air filter.

   If the error still occurs, please contact Heska Technical Support Services for assistance.

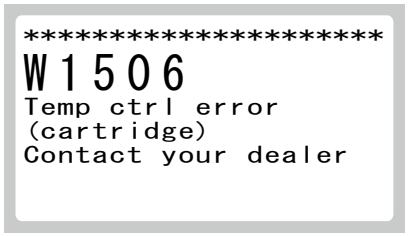


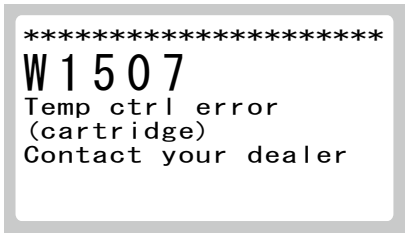


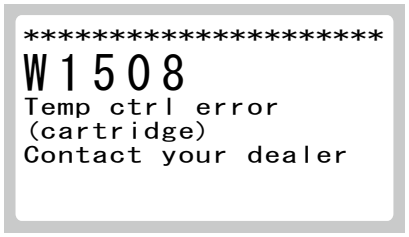
3. W1506 – W1509

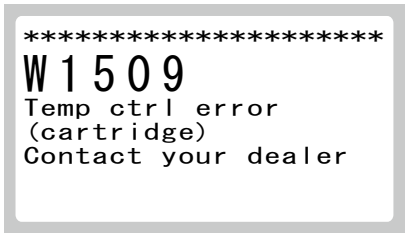
   The temperature control error for the reagent cartridge has occurred.

   ☞ Cancel measurement process, and contact Heska Technical Support Services for assistance.







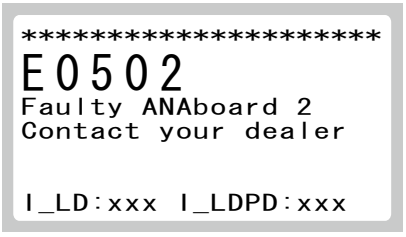


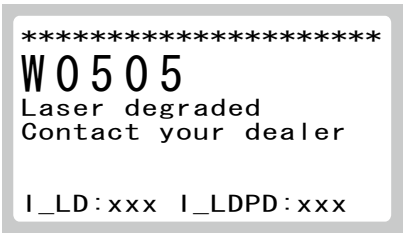
5.2.10 Analog Unit Errors

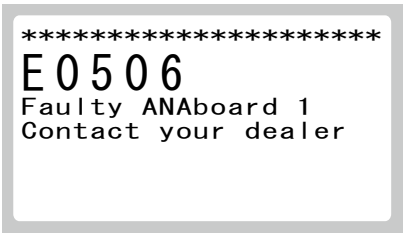
1. E0501 – E0507, W0505

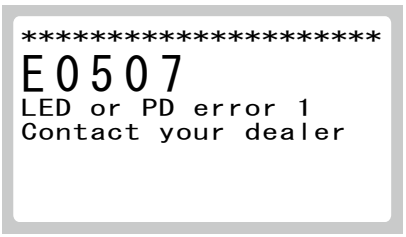
   An LD, LED, or circuit board error has occurred.

   ☞ Cancel measurement process, and contact Heska Technical Support Services for assistance.





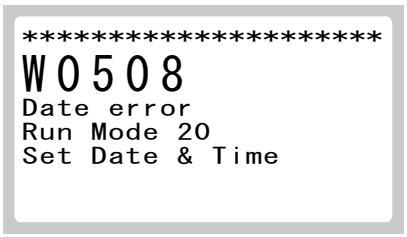




2. W0508

   The built-in clock has been reset.

   ☞ Set the date and time using Mode 20. If the error still occurs, please contact Heska Technical Support Services for assistance.



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

IMPORTANT

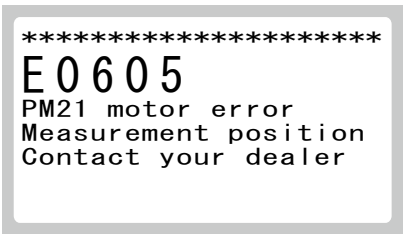
In case that the date and time are not adjusted correctly, the analyzer may fail to determine the expirations of the reagent cartridges, so that the test results may NOT be accurate.

5.2.11 Optical Unit Errors

1. E0601 – E0605

   An optical unit behavior error has occurred.

   ☞ Cancel measurement process. Turn the power off and on again. If the error still occurs, please contact Heska Technical Support Services for assistance.



5.2.12 Installation Environment Errors

1. W1501, W1502, W1510

   Environmental temperature is out of predetermined range.

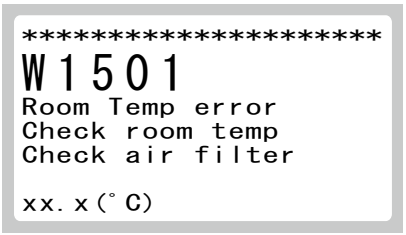
   ☞ Perform the following troubleshooting.

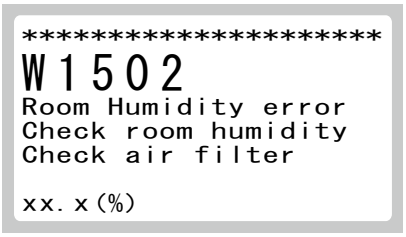
   a. Check that the room temperature is between 59–86°F (15–30°C) and the humidity is between 30–80%.

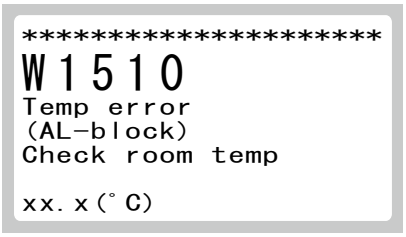
   b. Turn the power switch off.

   c. Clean the air filter.
   Refer to *Section 4.4*.

   d. Cool down the analyzer by leaving it off for 10 minutes and turn back on. If the error still occurs, please contact Heska Technical Support Services for assistance.





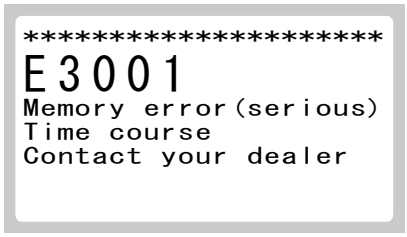


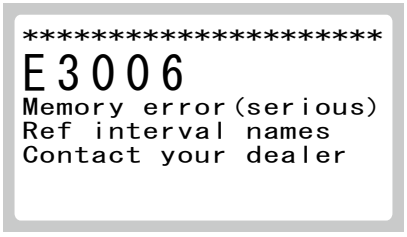
5.2.13 Memory Errors

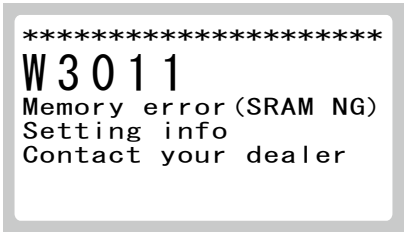
1. E3001 – E3006, W3011 – W3014

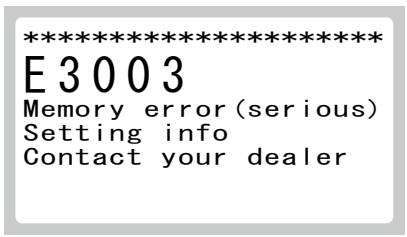
   An internal memory error has occurred.

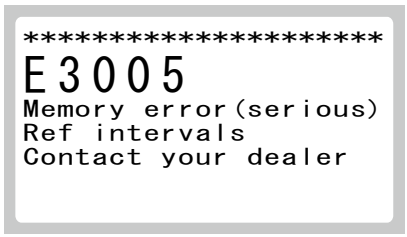
   ☞ Cancel measurement process, and contact Heska Technical Support Services for assistance.







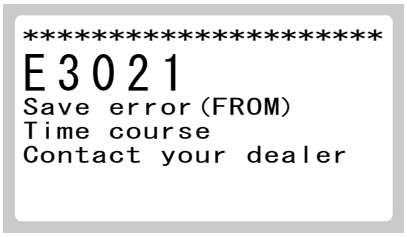


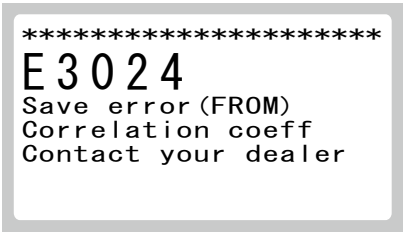


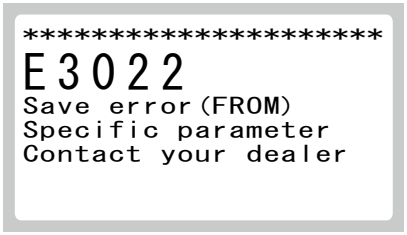
2. E3021 – E3026

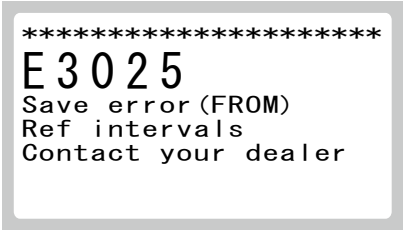
An error has occurred when saving data.

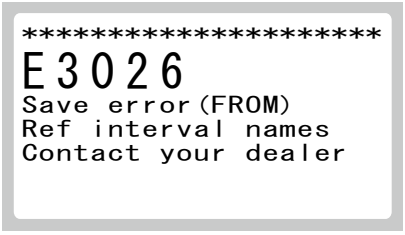
☞ Cancel measurement process, and contact Heska Technical Support Services for assistance.







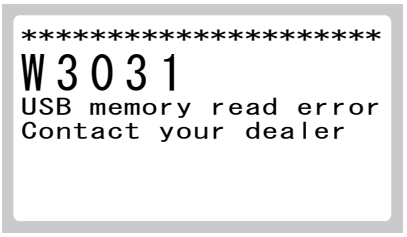


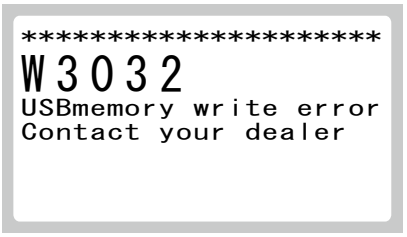


3. W3031, W3032

A USB memory error has occurred.

☞ Please contact Heska Technical Support Services for assistance.



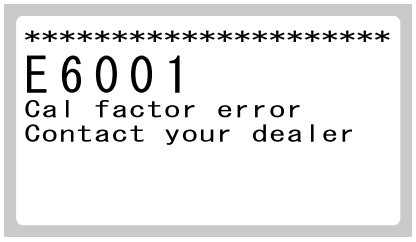


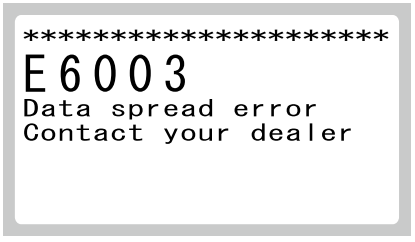
5.2.14 Calculation (Including Reaction System) Errors

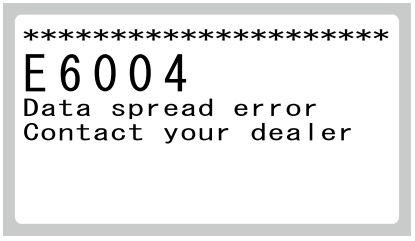
1. E6001 – E6004

   A Cal factor or data spread error has occurred.

   ☞ Please contact Heska Technical Support Services for assistance.



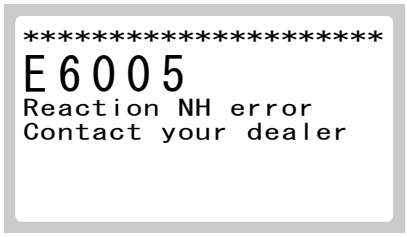


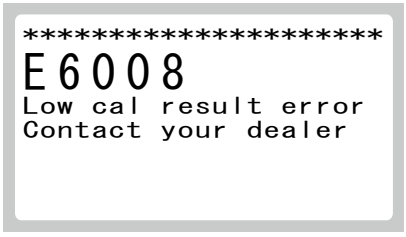


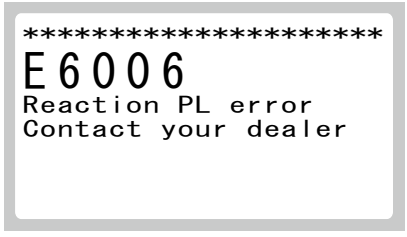
2. E6005 – E6009

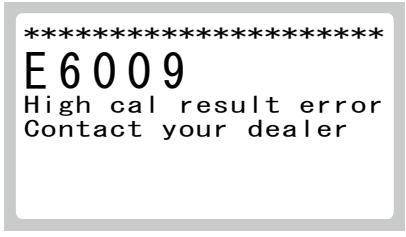
   A reaction error has occurred.

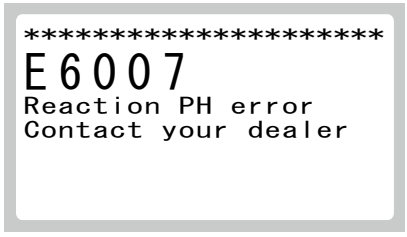
   ☞ Please contact Heska Technical Support Services for assistance.









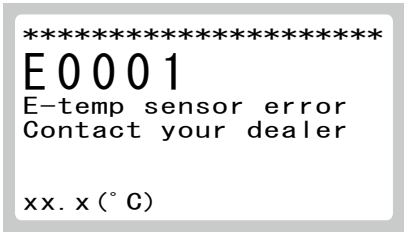


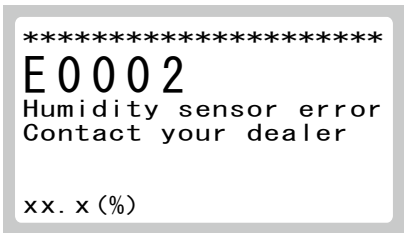
5.2.15 Body and Components Errors

1. E0001, E0002

   A temperature or humidity sensor error has occurred.

   ☞ Cancel measurement process, and contact Heska Technical Support Services for assistance.

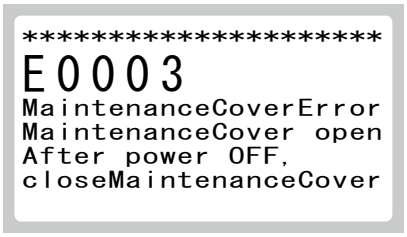




2. E0003

   The maintenance cover has opened during measurement process.

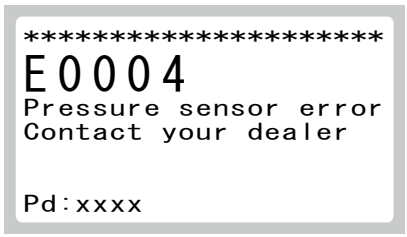
   ☞ Close the maintenance cover and start measuring again from the beginning.



3. E0004

   A pressure sensor output error has occurred.

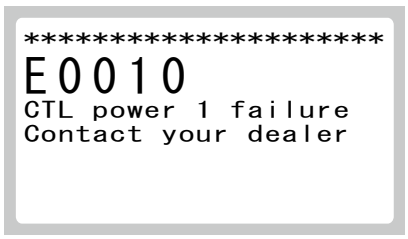
   ☞ Cancel measurement process, and contact Heska Technical Support Services for assistance.

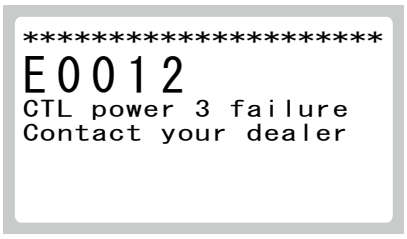


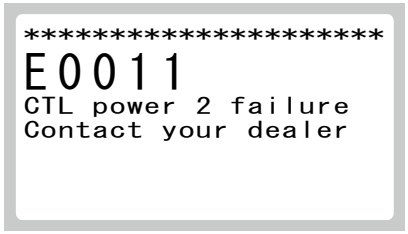
4. E0010 – E0012

   A control board error has occurred.

   ☞ Please contact Heska Technical Support Services for assistance.



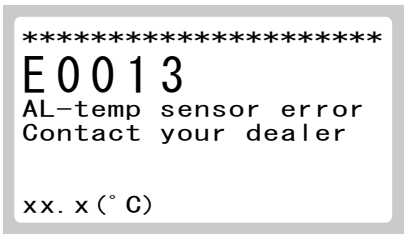


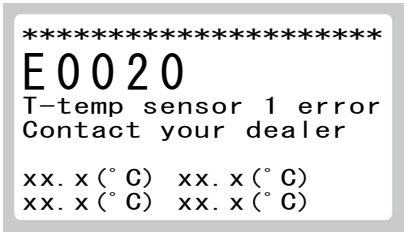


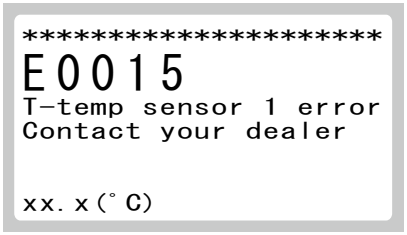
5. E0013 – E0024

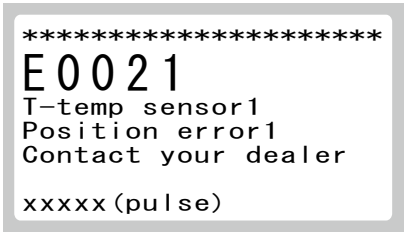
A temperature control sensor error has occurred.

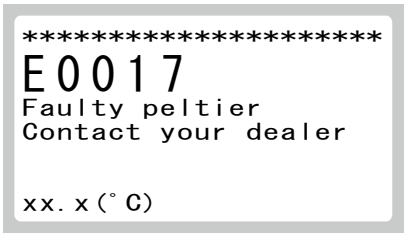
☞ Please contact Heska Technical Support Services for assistance.

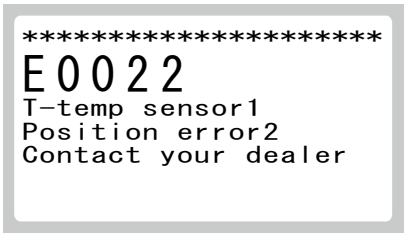








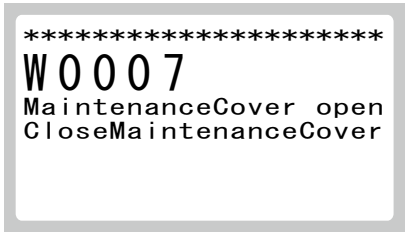




6. W0007

   The maintenance cover is open.

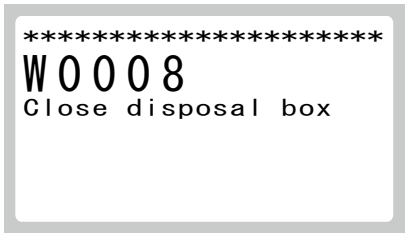
   ☞ Close the maintenance cover and start measuring again from the beginning.



7. W0008

   The disposal box is not set at the beginning of measurement process.

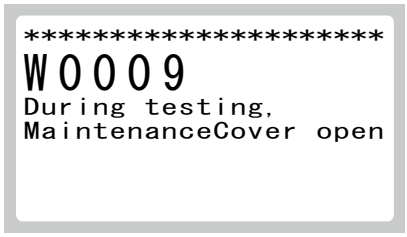
   ☞ Set the disposal box.



8. W0009

   The disposal box is open during testing.

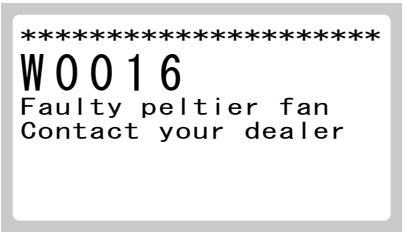
   ☞ Close the disposal box, and rerun the tests from the beginning.



9. W0016

   Wheeling malfunction for Peltier cooling fan is detected.

   ☞ Please contact Heska Technical Support Services for assistance.

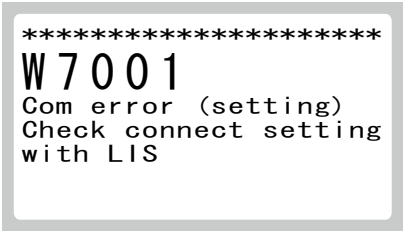


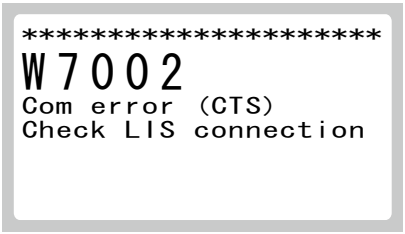
5.2.16 Errors Related to Data Communication

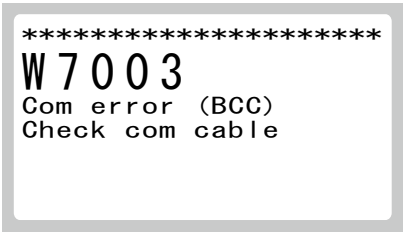
1. W7001 – W7004

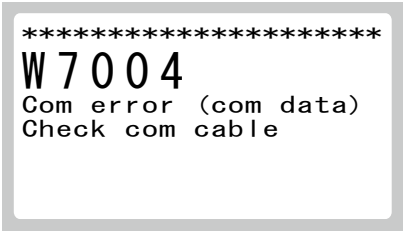
   When data communication errors occur, perform the following:

   » Make sure that the communication cable has been connected properly.
   » Make sure that the status of the host computer is ready to communicate.
   » Make sure that the communication settings (Mode 46, Refer to *Section 6.2.14*) have been set correctly.









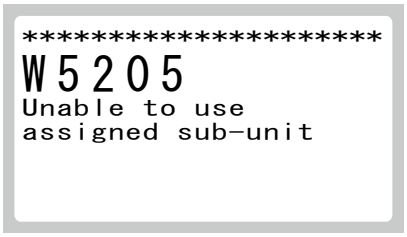
5.2.17 Other Errors

1. W5205

   The disagreement for use of unit (B) occurred.

   Unit (B) is selected in Mode 24, but unit (B) is invalid for the QR code on reagent cartridges.

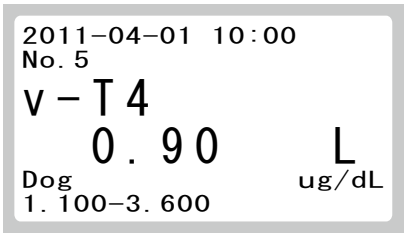
   Read the Instructions included with the reagent cartridge carefully, and switch the unit in Mode 24.

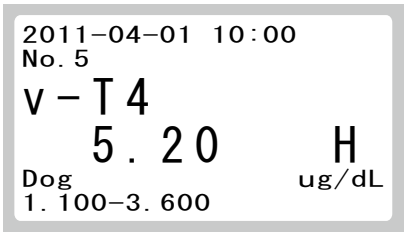


2. When **L** or **H** marks appear on test results:

   » **L** will be displayed if the result is less than the lower end of the reference range.

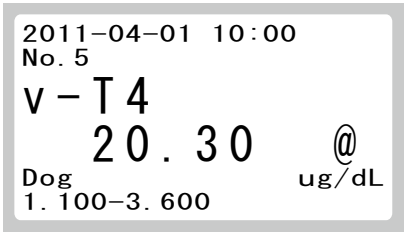
   » **H** will be displayed if the result is greater than or equal to the upper end of the reference range.





3. When @ appears on test results:

   Test value is outside of the measuring range.



IMPORTANT

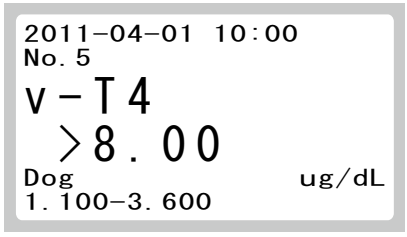
Measured values with "@" marks may NOT be accurate. Rerun the tests again.

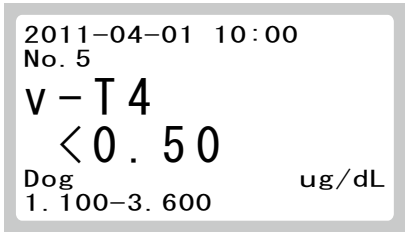
4. When > or < appears on test results:

   Test value is outside of the measuring range.

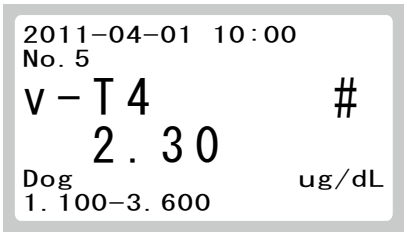
   » > will be displayed if the result is greater than or equal to the upper limit.

   » < will be displayed if the result is less than the lower limit.





5. When # appears on test results:



IMPORTANT

Measured values with a "#" mark may NOT be accurate.

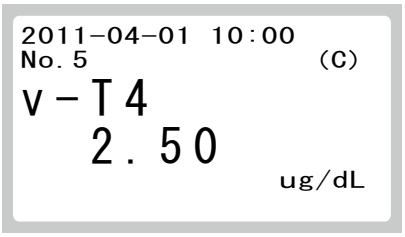
IMPORTANT

Expired reagent cartridges cannot be used. Use valid reagent cartridges for expiration date.

The valid term of the reagent cartridges are expired.

☞ Use a valid reagent cartridges and start measuring again from the beginning.

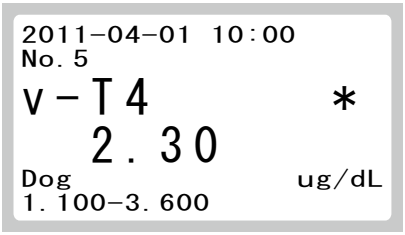
6. When **C** appears on test results:



The test results are obtained during the control mode.

☞ The control mode can be canceled by using Mode 19. Refer to *Section 6.2.2*.

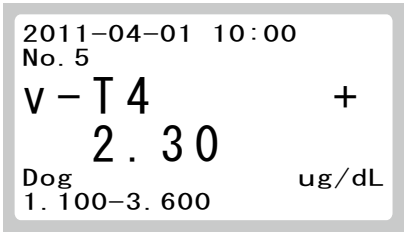
7. When * appears on test results:

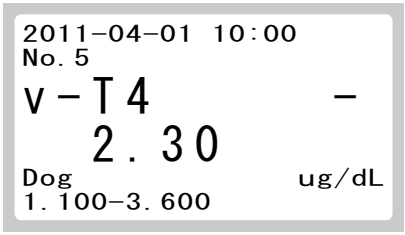


The disposal box was open during testing.

☞ Close the disposal box and rerun the tests from the beginning.

8. When + or – appear on test results:





IMPORTANT

Measured values with "+" or "–" marks may NOT be accurate. Perform the following troubleshooting and rerun the tests.

Temperature for the reagent cartridge is not within the controlled range.

☞ Perform the following troubleshooting.

a. Make sure the room temperature is between 59–86°F (15–30°C). If it is out of the range, air-condition the room.

b. Turn the power switch off.

c. Clean the air filter. Refer to *Section 4.4*.

d. After the interior of equipment has cooled down (about 10 minutes), turn the power switch on. If the error still occurs, please contact Heska Technical Support Services for assistance.

6.1 Mode Function List and Mode Selection

Mode functions are used for changing functions, inputting or printing parameters, or cleaning the analyzer, *etc.*

6.1.1 Mode List

There are 2 kinds of modes: one is the administrator mode, which can only be operated by administrators; another is the normal mode, which can be operated by normal operators.

The important modes, which affect test results such as Mode 36 (correlation coefficients settings), can only be operated in the administrator mode. The administrator modes must be operated only by the administrators who have the responsibility for the use of the analyzer. Inputting a password in Mode 0 allows the administrators to operate the administrator modes.

Mode Number	Mode Description	Reference Section	Operator
0	Changes mode type.	6.2.1	Normal
19	Turns on the control mode (a, b canceled).	6.2.2	Normal
20	Sets date and time.	6.2.3	Normal
24	Unit conversion [Unit (A) / Unit (B) switch].	6.2.4	Admini.
25	Data retransmission to host computer.	6.2.5	Normal
26	Review/reprint test results.	6.2.6	Normal
27	Sample No. and sample ID settings.	6.2.7	Admini.
28	Switches display method for values outside of the determination range.	6.2.8	Admini.
30	Work list display item setting.	6.2.9	Admini.
35	Edits sample No. and sample ID.	6.2.10	Admini.
36	Correlation coefficients (a, b) settings and printout.	6.2.11	Admini.
39	Reference interval settings and printout.	6.2.12	Admini.
42	Leak check.	6.2.13	Admini.
46	Selects communication destinations.	6.2.14	Admini.
49	Prints out error logs.	6.2.15	Normal
51	Maintenance.	6.2.16	Normal
52	Optical check.	6.2.17	Normal
53	Saving fluorescence values for the optical check.	6.2.18	Admini.
55	Selects language.	6.2.19	Admini.
81	Beep sound settings.	6.2.20	Admini.
82	Display brightness and print density.	6.2.21	Admini.
83	Test result print sheets setting.	6.2.2)	Admini.
84	Settings the sample tubes.	6.2.23	Admini.
85	Display order of reference interval name.	6.2.24	Admini.
86	Edits and inputs reference interval names.	6.2.25	Admini.
91	Reading the QR code information.	6.2.26	Admini.
92	Version information.	6.2.27	Normal
103	Displays temperature and humidity.	6.2.28	Normal

6.1.2 How to Select Each Mode

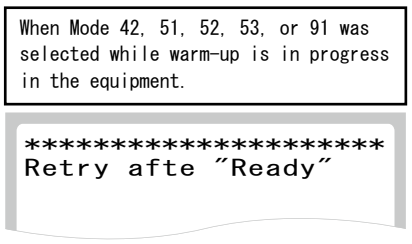
1. To enter a mode operation:

   There are 2 ways to select a mode:

   » Selects a Mode by scroll. ▶ (a)

   » ◀ or ▶ Inputs a Mode No. directly. ▶ (b)

NOTE: After a beep sounds and the message is displayed about two seconds, the analyzer quits the mode operation:



a. Selecting a Mode by scroll.

   At the right display conditions, press MODE to display the mode number input dialog.

NOTE: ◯ or ▭ indicates a key and → indicates order of steps.

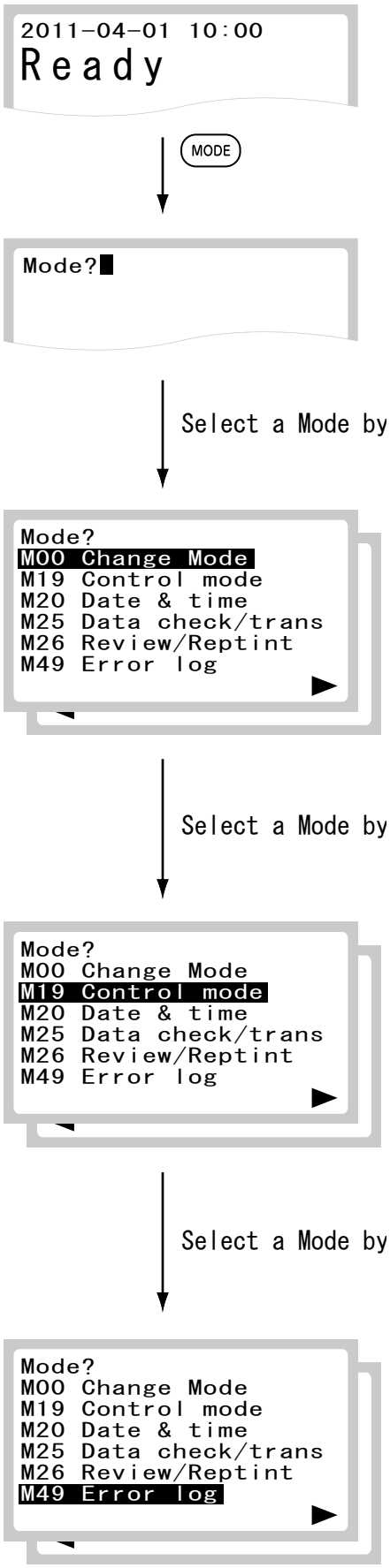
b. Next, press ▼ to display a mode menu.

   By pressing ▼ the menu will scroll.

NOTE: By pressing ▼, the menu will scroll back.

NOTE: Switch the page using ◀ or ▶.

When the menu is displayed, press **ENTER** to display the first dialog of the mode.

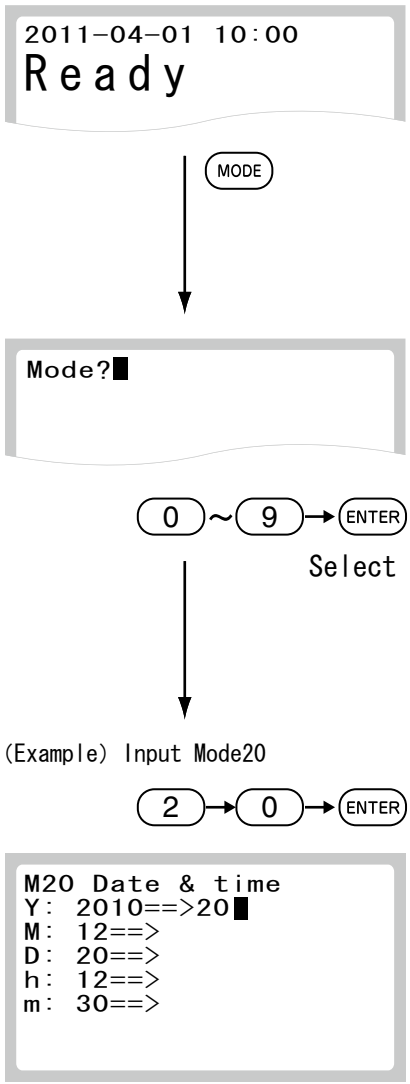


b. Inputting a Mode No. directly.

In the display conditions shown at the right, press **MODE** to display the mode number input dialog.

Input a Mode No. from the keyboard and press **ENTER** to display the first dialog of the mode.

NOTE: ◯ or ▭ indicates a key and → indicates order of input steps.



2. To quit a mode operation, press **STOP**.

⚠ CAUTION

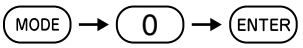
Do not turn off the power during mode operations. Otherwise, physical damage may occur.

6.2 Mode Functions

6.2.1 Mode 0 – Changing Mode Type <Normal>

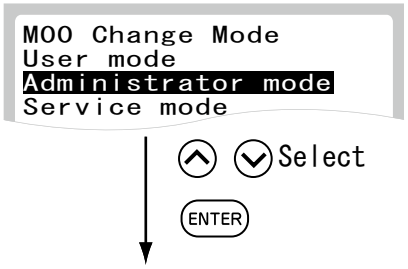
The important modes, which affect test results such as Mode 36 (correlation coefficients settings), can only be operated in the administrator mode.

1. Enter into Mode 0.



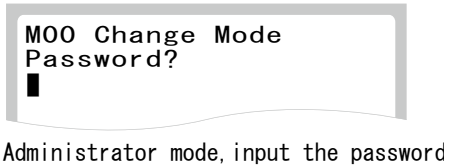
2. Select the administrator mode using ▲ or ▼, then press **ENTER**.

NOTE: Although the service mode will be displayed on the menu, the mode is not available.



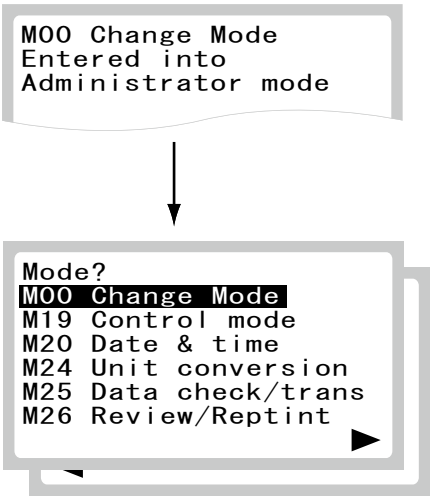
3. Input the password and press **ENTER**. The password is **10**.

NOTE: If the entered password is not correct, a beep sounds and the password entry screen will be displayed again.



4. The analyzer has entered into the administrator mode and informs it on the display.

NOTE: When turning the power off, the administrator mode will be canceled.



6.2.2 Mode 19 – Turning on the Control Mode (a, b canceled) <Normal>

This mode is used for daily measurements of control fluids and for performing control surveys.

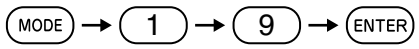
When the control mode is selected, the analyzer calculates the concentration with the correlation coefficients for all tests reset to a=1 and b=0.

» Correlation coefficients for all test names (Mode 36 settings) ▶ Resets to (a=1, b=0)
» Units (Mode 24 settings) ▶ Resets to Unit (A)

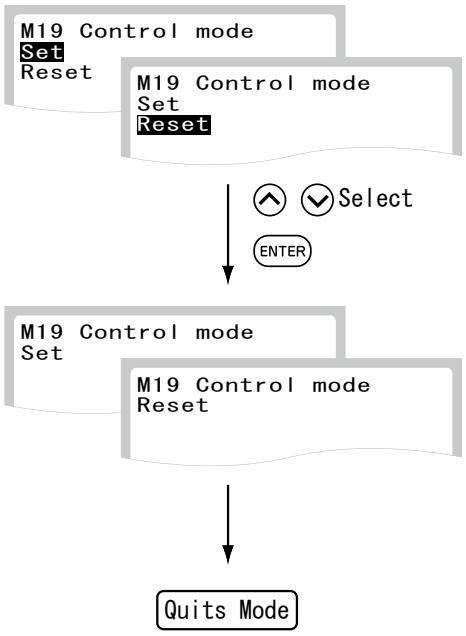
On the printout for each measurement, the indication " C " appears after the Sample No.

NOTE: Turning off the power cancels this mode.

1. Enter into Mode 19.



2. Select **[Set]** or **[Reset]**.



Select a menu using ▲ or ▼ whether to set or reset the control mode and press **ENTER.**

NOTE: The shaded part is a selected menu.

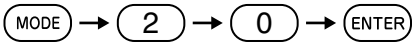
The analyzer displays the selection (**[Set]** or **[Reset]**) and quits the mode operation.

3. When the control mode is selected, **[Control]** will be displayed at the bottom.

6.2.3 Mode 20 – Setting Data and Time <Normal>

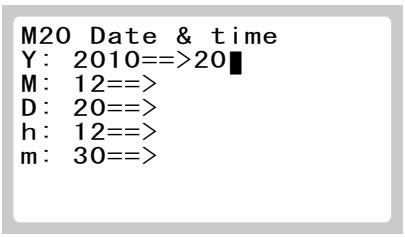
This mode is used to set the date and time.

1. Enter into Mode 20.



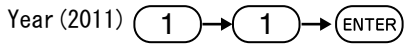
2. Input date.

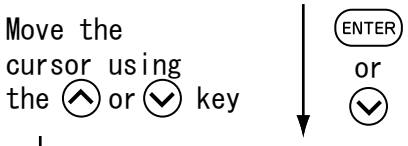
[To set date]
(Example) Apr. 01 2011

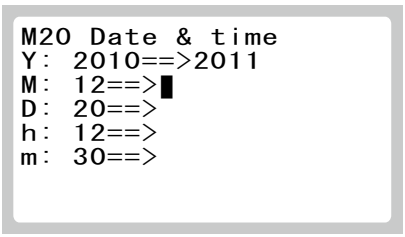


a. Input year from the keyboard and press **ENTER**.

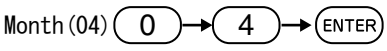
NOTE: Input the last 2 digits for inputting year.

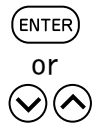


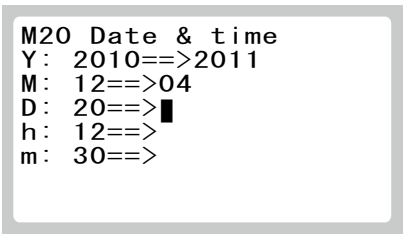




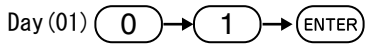
b. Input month from the keyboard and press **ENTER**.

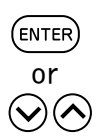






c. Input day from the keyboard and press **ENTER**.



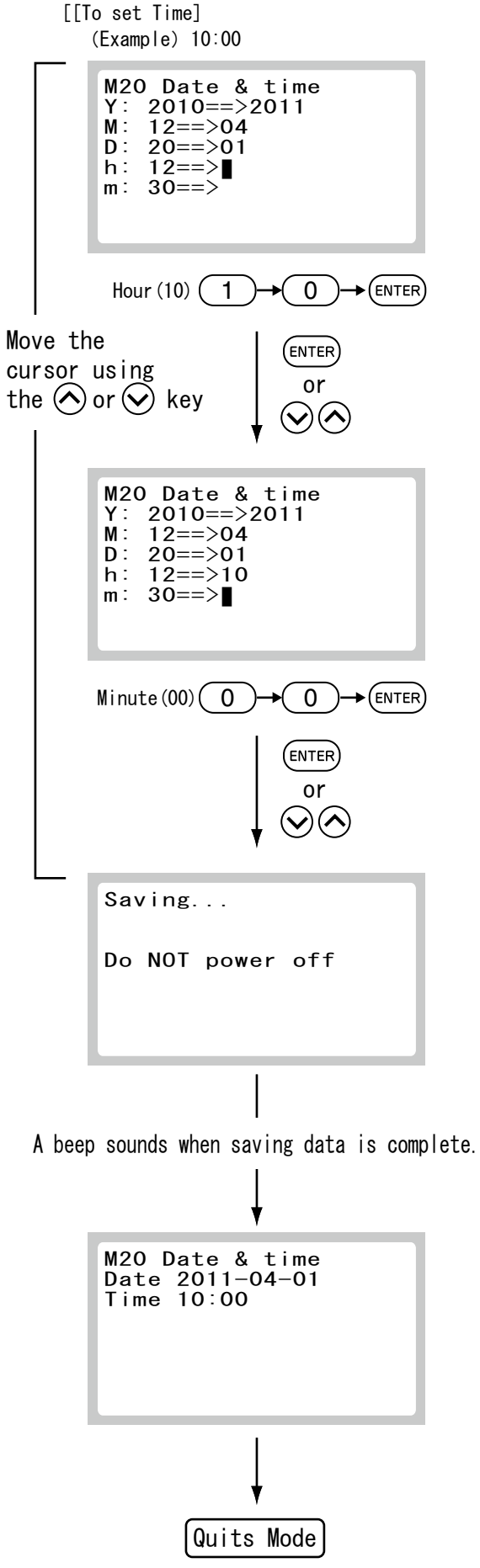


3. Input time.

a. Input hour from the keyboard and press **ENTER**.

b. Input minute from the keyboard and press **ENTER**.

The analyzer displays the new date and time, and quits the mode operation.



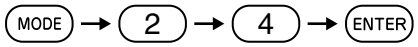
6.2.4 Mode 24 – Unit Conversion [Unit (A) / Unit (B) Switch] <Admini.>

This mode is used to switch the results unit between Unit (A) and Unit (B) for each test code.

IMPORTANT

Values of correlation coefficients are not affected by unit switching in Mode 24 – Unit Conversion. Make sure that values (a, b) are correct.

1. Enter into Mode 24.



Test Type	Test code	Unit (A)	Unit (B)	Conversion Coefficient
v-T4	211	ug/dL	nmol/L	12.87

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

2. Input a test code.

   Input a triple-digit code and press **ENTER**.

   Test code is labeled on an outer case for each reagent cartridge.

NOTE: After a beep sounds and the message is displayed about two seconds, the analyzer quits the mode operation:

If the QR code information for the entered item code does not exist.

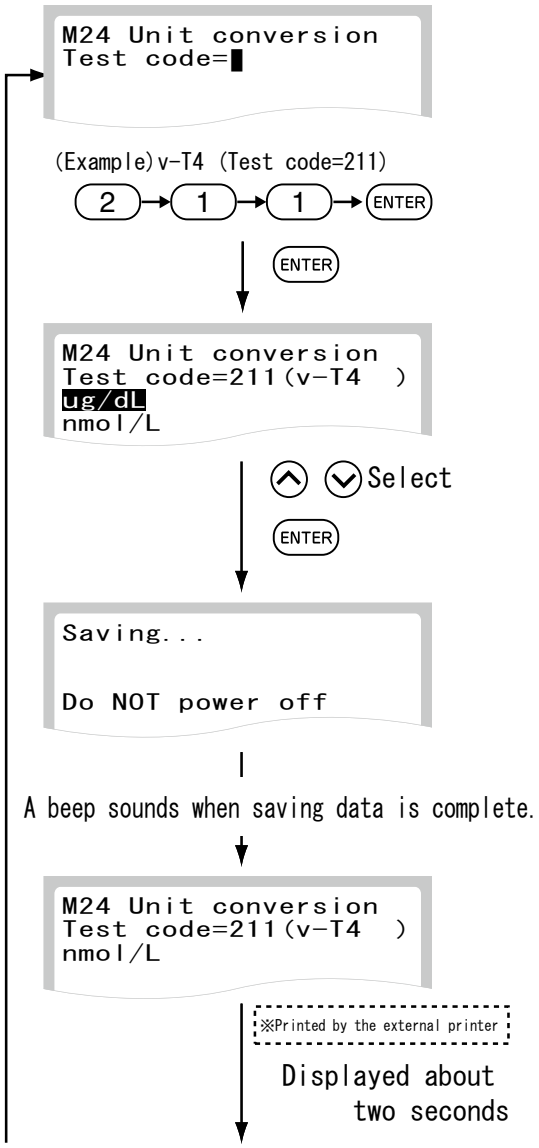
```
**********
No QR code info
for assigned test
```

If the item code is out of the range.

```
**********
Undefined test code
```

If the unit (B) of the item code is invalid.

```
**********
Impossible to use
Assigned Sub-unit
```



3. Select a unit.

   Select a unit using ◀ or ▶ and press **ENTER**.

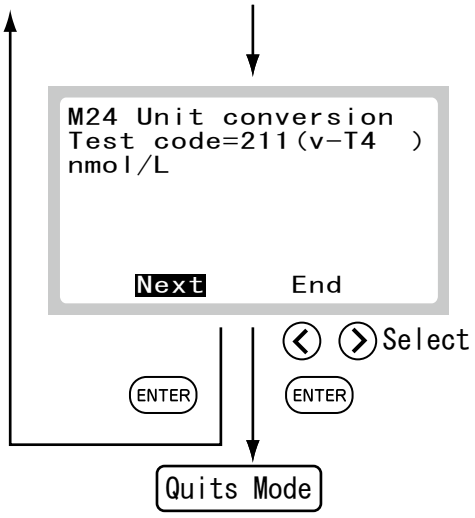
   NOTE: The shaded part is a selected menu.

   The new selection will be displayed.

4. To quit the mode:

   Select **[End]** and press **ENTER** to quit the mode.

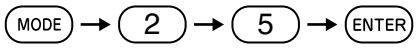
NOTE: To switch a unit for other test codes, select **[Next]** followed by **ENTER**.



6.2.5 Mode 25 – Data Retransmission to Host Computer <Normal>

This mode is used to retransmit test results to host computer via the COM1A or COM1B connector. Prior to using this mode, it is necessary to set the communication destination and the protocol using Mode 46.

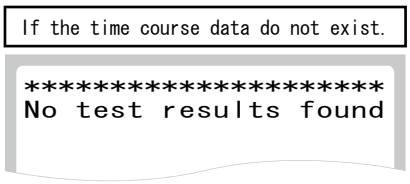
1. Enter into Mode 25.



2. Select data to be sent.

   Press ▼ to display a data selection dialog which shows a sample No. (or a sample ID) and its test date and time.

NOTE: After a beep sounds and the message is displayed about two seconds, the analyzer quits the mode operation:



NOTE: The display format depends on Mode 27 setting as follows:

Mode 27 Setting	Display on Mode 25
No. /ID	Sample ID (*1)
ID	Sample ID (*1)
No.	Sample No.

   Select data to be sent using ◀ or ▶.

NOTE: (*1) If no ID input, the sample No. will be displayed.

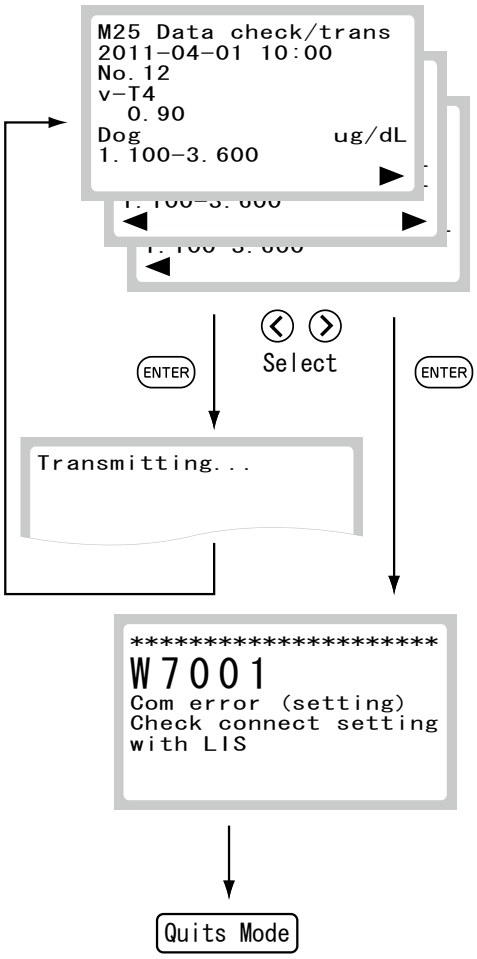
NOTE: The data will be displayed in order from the latest (maximum 100 samples).

NOTE: If only ◀ is displayed, it means the last (oldest) item in the memory.

NOTE: When the "LIS com setting" is set to **[No]** in Mode 46, data transmission will not be performed.

3. Send the data.

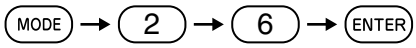
   Press **ENTER** to transmit the data which currently displayed.



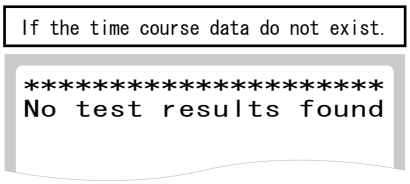
6.2.6 Mode 26 – Review/Reprint Test Results <Normal>

This mode is used to review/reprint test results separately or output test results stored in the analyzer memory to the printer in sequence beginning with newest data. A maximum of latest data for 100 samples can be reviewed or reprinted.

1. Enter into Mode 26.
   - » Review/reprint separately. ▶ (2).
   - » Print all. ▶ (3).



NOTE: After a beep sounds and the message is displayed about two seconds, the analyzer quits the mode operation:



2. To review/reprint separately.

   a. Select a review/reprint option.

   Select **[Display each/Print]** using ▲ or ▼ and press **ENTER**.

   NOTE: Highlight indicates a selected option.

   b. Select the test result.

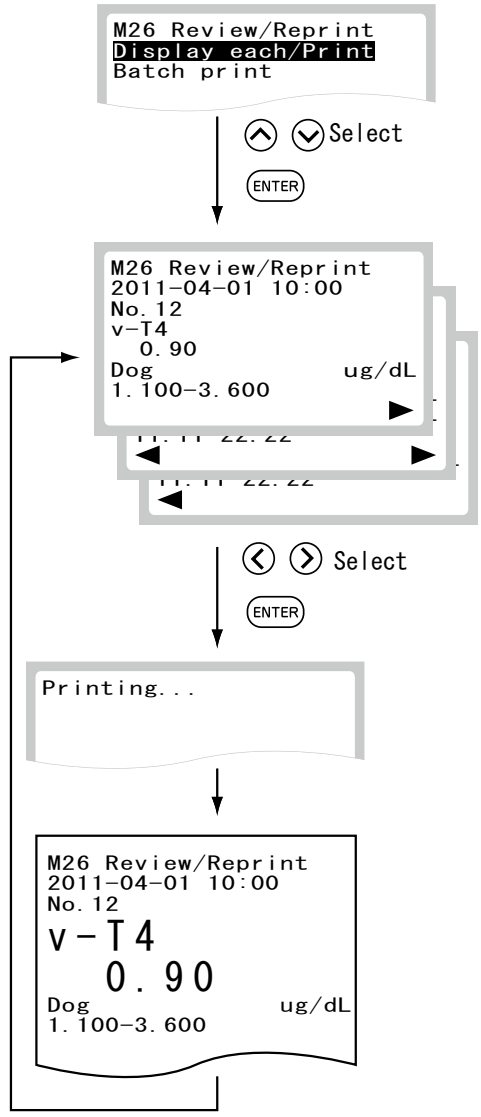
   Data selection screen shows the sample No. or ID, and the date and time of the measurement.

   Select the test result to be printed using ◀ or ▶ and press **ENTER**.

   NOTE: If only ◀ is displayed, it means the last (oldest) item in the memory.

   NOTE: If **[No]** is selected for the external printer setting in Mode 46, the data cannot be sent.

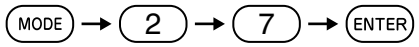
(Example) if [Display each/Print] is selected



6.2.7 Mode 27– Sample No. and Sample ID Settings <Admini.>

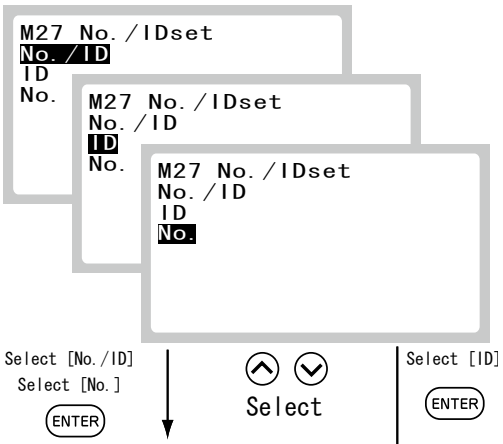
This mode is used to change the settings for sample No. and sample ID on test results.

1. Enter into Mode 27.



2. Select sample No. and/or sample ID printed along with test results.

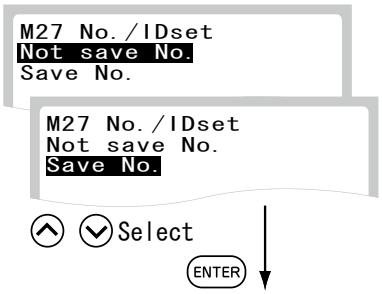
   When printing both a sample No. and a sample ID along with the test result, select **[No./ID]**; only a sample ID, select **[ID]**; only a sample No., select **[No.]**.
   - » To print out both a sample No. and a sample ID: ▶ **[No./ ID]**
   - » To print out only a sample ID: ▶ **[ID]**
   - » To print out only a sample No.: ▶ **[No.]**



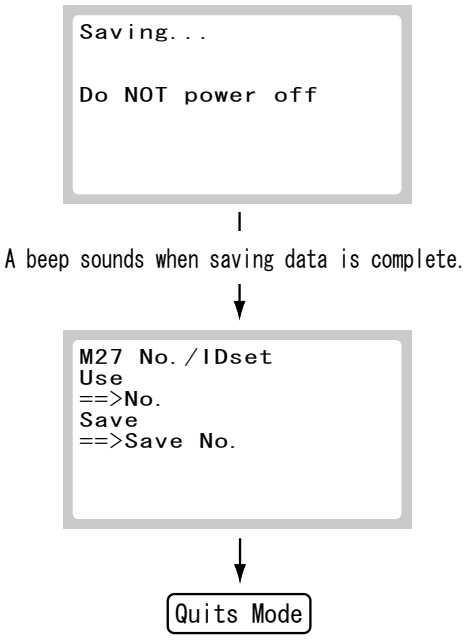
3. Select whether the sample No. is saved **[Save]** or not **[No]**.

   When selecting **[Save No.]**, the sample No. is incremented (the latest No. + 1) even if the power is turned off and on.

   When selecting **[Not save No.]**, the sample No. is reset to **[No.=1]** after turning off and on.



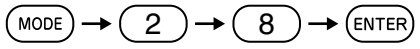
4. The analyzer displays the new settings and quits the mode operation.



6.2.8 Mode 28 – Switching Display Method for Values Outside of the Determination Range <Admini.>

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

1. Enter into Mode 28.



2. Select a display format.

   a. To print out a numeric value with "@" mark for the value outside of the determination range:

      Select "@" using ▲ or ▼ and press **ENTER**.

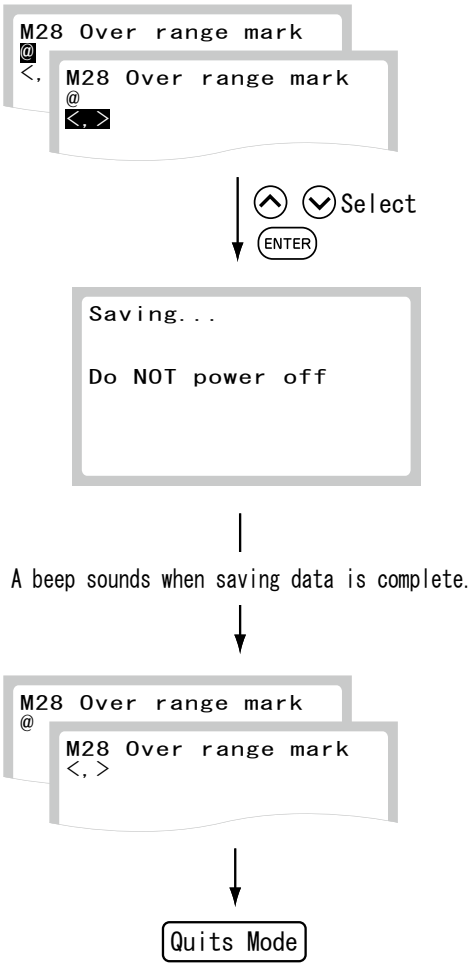
IMPORTANT

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

   b. To print out the value outside of the determination range using a "<" or ">" mark:

      Select "<" or ">" using ▲ or ▼ and press **ENTER**.

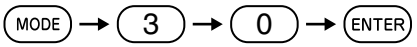
3. The analyzer displays the new settings and quits the mode operation.



6.2.9 Mode 30 – Work List Display Item Setting <Admini.>

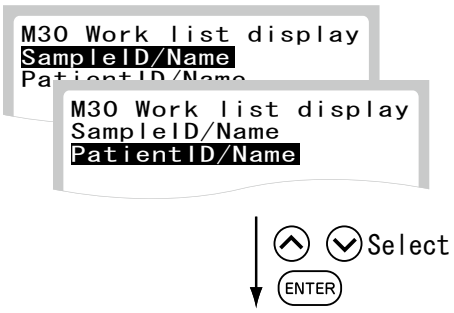
This mode is used to select items displayed on the work sheet dialog.

1. Enter into Mode 30.

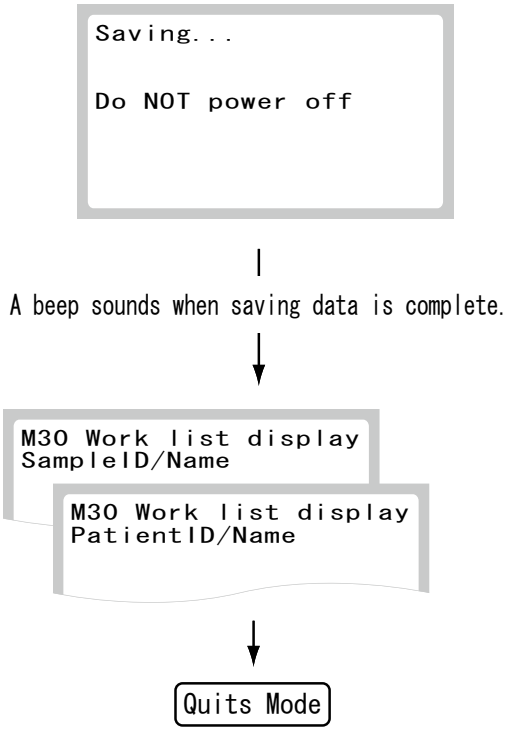


2. Select a display format.

   Select **[Sample ID/NAME]** or **[Patient ID/NAME]** using ▲ or ▼ and press **ENTER**.



3. The analyzer displays the new settings and quits the mode operation.



6.2.10 Mode 35 – Editing Sample No. and Sample ID <Admini.>

This mode is used to edit sample No. and sample IDs memorized in the analyzer memory. The edited data can be sent to host computer.

1. Enter into Mode 35.

MODE → 3 → 5 → ENTER

NOTE: After a beep sounds and the message is displayed about two seconds, the analyzer quits the mode operation:

```
Time course data do not exist.
**********
No test results found
```

2. Select data to be edited.

   Select data to be edited using ▲ or ▼.

   And, press **ENTER** to display the edit dialog.

NOTE: The display format depends on Mode 27 setting as follows:

Mode 27 Setting	Display on Mode 35
No. /ID	Sample No. /ID (*1)
ID	Sample ID (*1)
No.	Sample No.

NOTE: Switch the page using ▲ or ▼.

NOTE: (*1) If no ID input, the sample No. will be displayed.

NOTE: The data will be displayed in order from the latest (maximum 100 samples).

3. Input a new numbers for the sample No.

   Input a new sample No. and press **ENTER**.

4. The edited result (the new sample No.) will be displayed.

   Make sure that the edited result (before editing **[OLD=xxxx]** and after editing **[NEW=xxxx]**) is correct.

(Example) No. displayed

```
M35 Edit No./ID
No.12
  2011-04-01 11:30
No.11
  2011-04-01 10:30
No.10
  2011-04-01 10:00
                   ►
```

(Example) Id. displayed

```
M35 Edit No./ID
ID=Fuji
  2011-04-01 11:30
ID=suzuki
  2011-04-01 10:30
ID=ABC
  2011-04-01 10:00
                   ►
```

Select

Switch the page using the ⟨ or ⟩ key.

ENTER

(Example) If [No./ID] is selected

(Example) Sample No. = 12 → 13

```
M35 Edit No./ID
No.  OLD=12
No.  NEW=
```

1 → 3 → ENTER

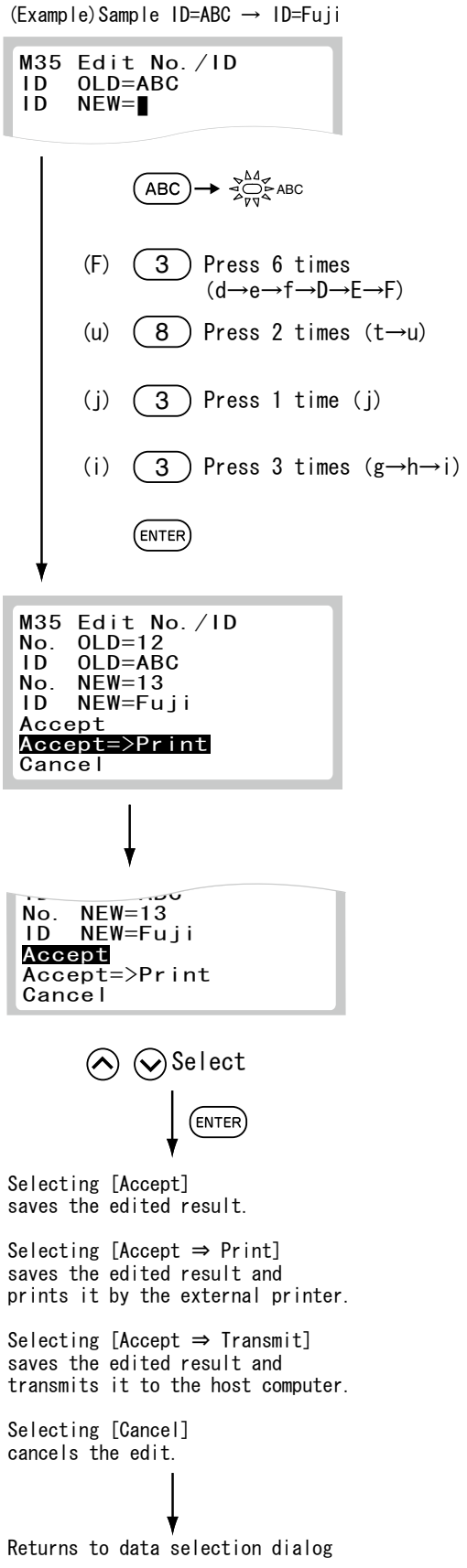
5. Input new alphanumeric characters for the sample ID.

   Select a sample ID to be edited.

   Input a new sample ID from the keyboard and press **ENTER**.

6. The edited result (the new sample ID) will be displayed.

   Make sure that the edited result (before editing **[OLD=xxxx]** and after editing **[NEW=xxxx]**) is correct.



7. Accept the edited result.

   After confirming the edited result, select any of the following options using ▲ or ▼ and press **ENTER**.

   - » To accept: **[Accept]**
   - » To accept and print: ▶ **[Accept ▶ Print]**
   - » To accept and transmit: ▶ **[Accept ▶ Transmit]**
   - » To cancel: ▶ **[Cancel]**

NOTE: If **[No]** is selected for the external printer setting in Mode 46, **[Accept ▶ Print]** is not displayed.

NOTE: If **[No]** is selected for the host connection setting in Mode 46, **[Accept ▶ Transmit]** is not displayed.

NOTE: Edited results will be saved as the latest results but will not overwrite original results. Results can be confirmed in Mode 26 – Review/Reprint Test Results (Refer to *Section 7.2.6*).

8. The display returns to the data selection dialog.

   Press **STOP** to quit the mode.

6.2.11 Mode 36 – Correlation Coefficients (a, b) Settings and Printout <Admini.>

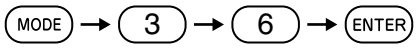
This mode is used to input, reset or print out correlation coefficients.

For further details, refer to the "Description of the Correlation Function" at the end of this section.

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

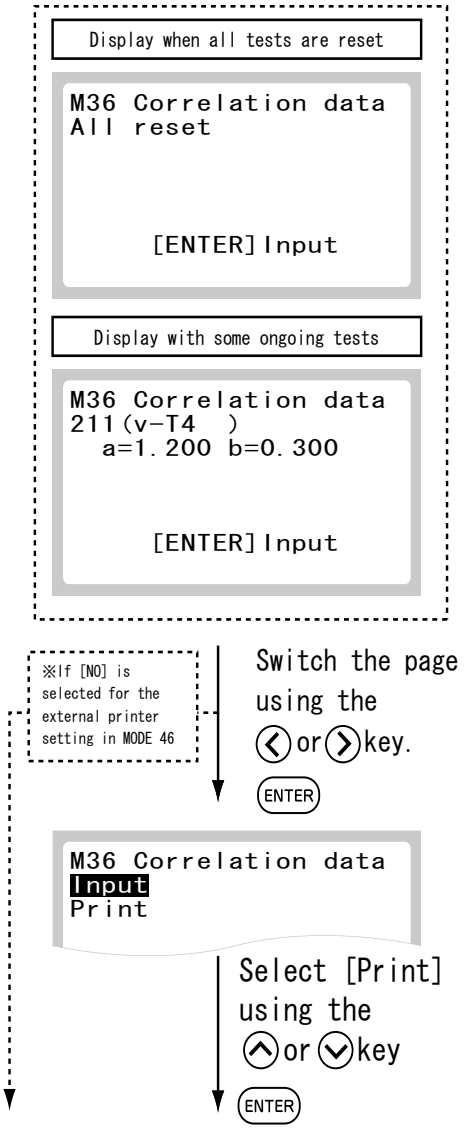
IMPORTANT
Values of correlation coefficients are not affected by unit switching in Mode 24 – Unit Conversion. Make sure that values (a, b) are correct.

1. Enter into Mode 36.



2. To print out the currently input data.

NOTE: If **[Yes]** is selected for the external printer setting in Mode 46, the data can be printed.



a. Select **[Print]** and press **ENTER**.

NOTE: The coefficients other than (a=1, b=0) are printed out.

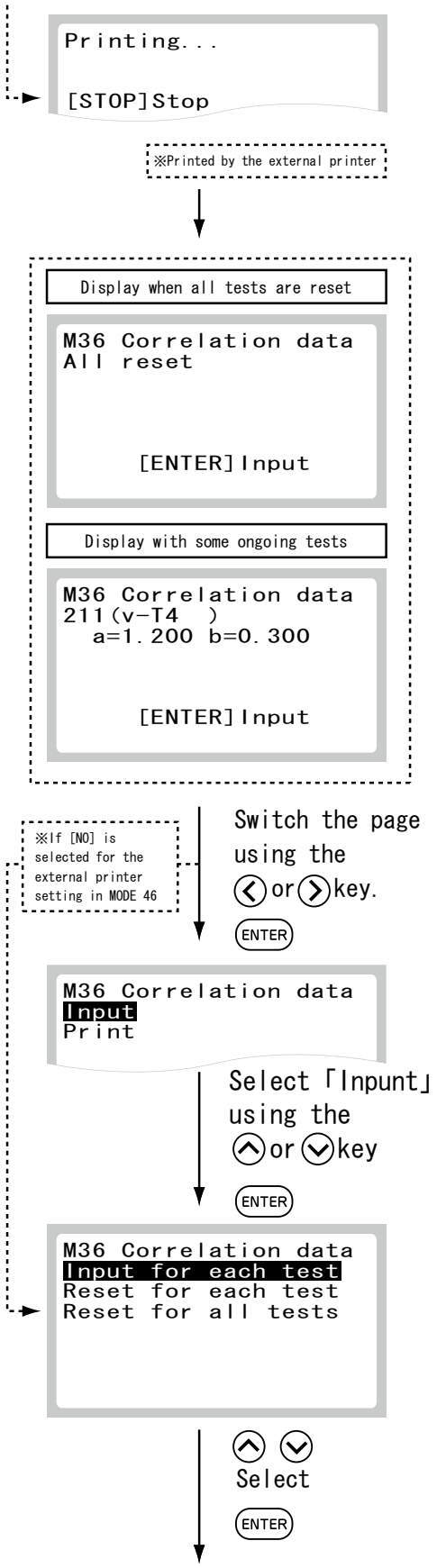
NOTE: To cancel printing press **STOP**.

3. To select correlation data.

   a. Press **ENTER**.

   b. Select **[Input]** and press **ENTER**.

   c. Select **[Input for each test]** and press **ENTER**.



d. Input test code:

Test code is labeled on an outer case for each reagent cartridge.

Select **[INPUT for Each Test]** from the menu and press **ENTER**.

NOTE: After a beep sounds and the message is displayed about two seconds, the analyzer quits the mode operation:

If the QR code information for the entered item code does not exist.

```
**********************
No QR code info
for assigned test
```

If the item code is out of the range.

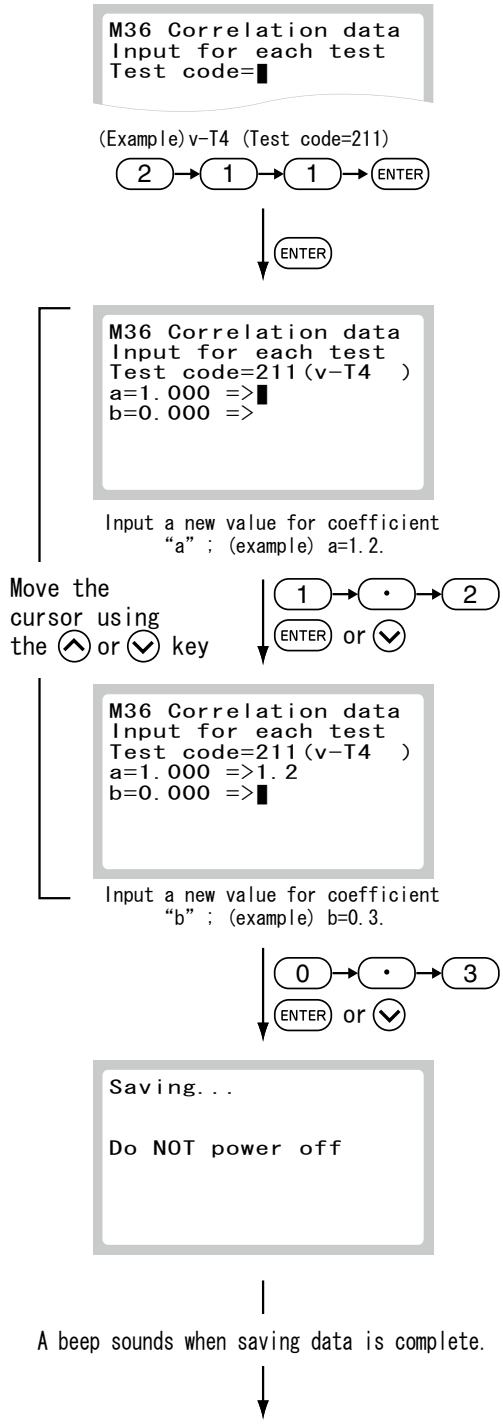
```
**********************
Undefined test code
```

e. Input a new value for coefficient "**a**".

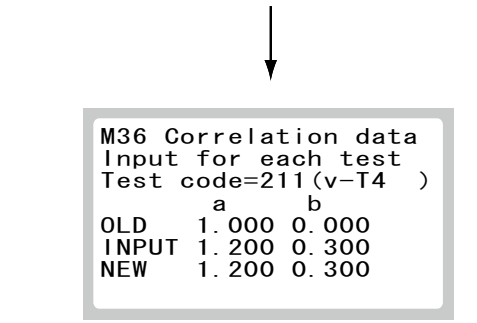
The current value is displayed.

Input a new value for "a" and press **ENTER**.

f. Input a new value for coefficient **"b"** in the same manner.



g. After completing the inputs of (a, b), the old values, the input values, and the new values are displayed.



IMPORTANT

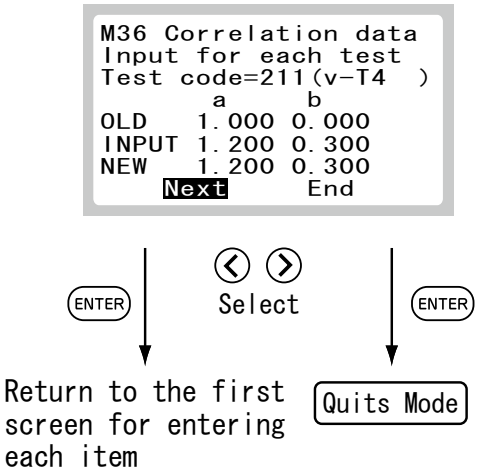
Incorrect inputs for (a, b) will cause incorrect test results.
Make sure that the printed or displayed new values for (a, b) are correct.

NOTE: If values for (a, b) have already been input, old values will not be canceled as follows.

For further details, refer to the "Description of the Correlation Function" at the end of this section.

h. Select **[End]** to terminate the mode.

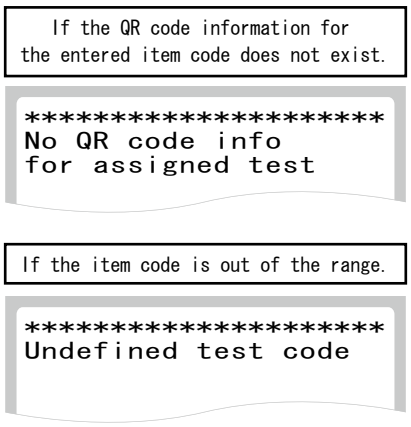
To input coefficients for other tests, select **[Next]** ▶ **ENTER**.



4. To reset coefficients for each test:

   Select [**Reset for each test**] from the menu and press **ENTER**.

   NOTE: After a beep sounds and the message is displayed about two seconds, the analyzer quits the mode operation:

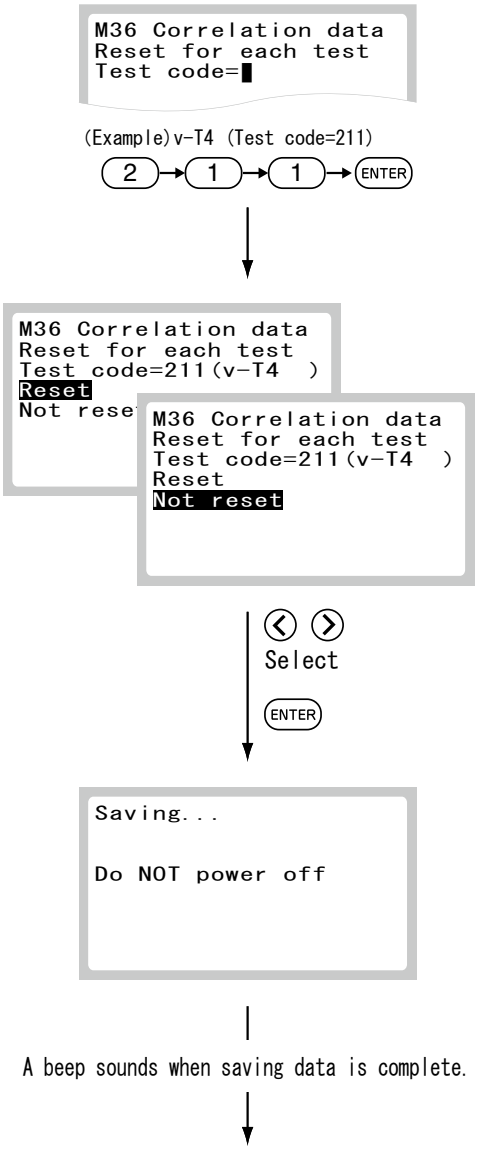


   a. Select a sample type and input a test code.

      Input a triple-digit code and press **ENTER**.

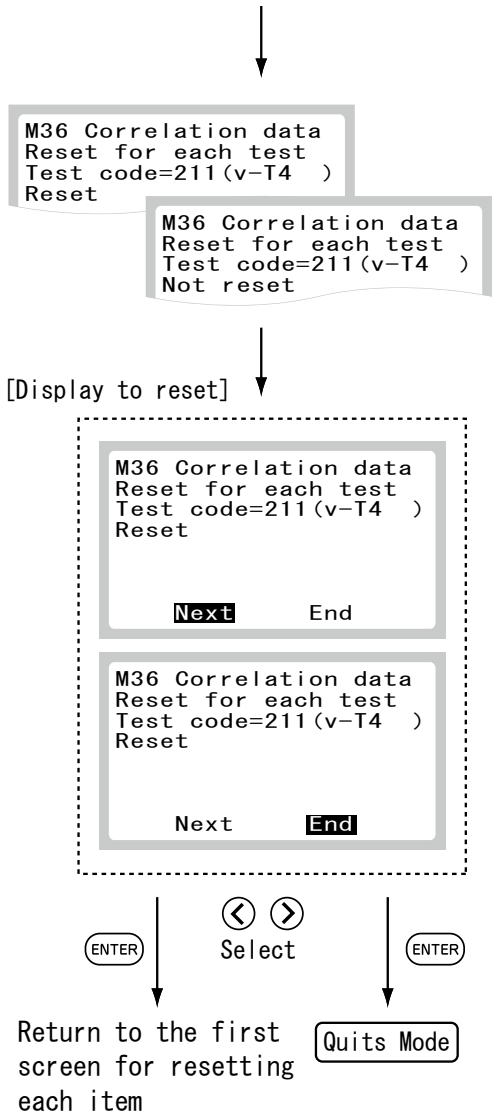
   b. Select whether to reset the coefficients or not.

      Select a menu using ▲ or ▼ whether to reset the coefficients or not and press **ENTER**.



c. Select **[End]** to terminate the mode.

To reset coefficients for other tests, select **[Next]** followed by **ENTER**.



5. To reset coefficients for all tests:

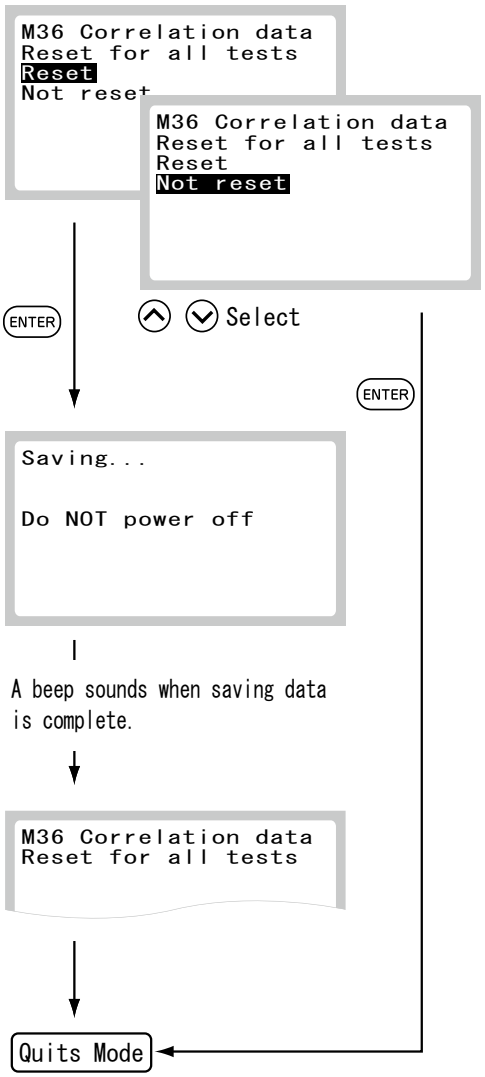
   Select a menu using ▲ or ▼ whether to reset coefficients for all tests or not and press **ENTER**.

   a. When selecting **[Reset]** (reset):

      The analyzer displays on the screen that all coefficients have been reset, and quits the mode operation.

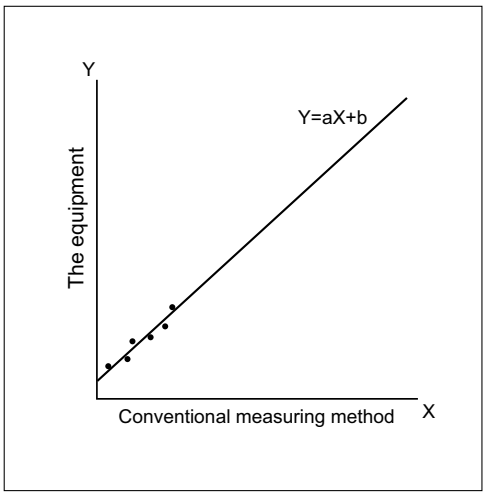
   b. When selecting **[Not reset]** (not to reset):

      The analyzer quits the mode.



Description of the Correlation Function

This function is designed to determine the correlation between the measured data obtained using the equipment and the data obtained using the conventional measuring method.



On the X-axis, the measured data obtained are plotted and on the Y-axis, the measured data obtained using the equipment.

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 equipment performs compensation calculations internally using the formula:
X = (Y-b)/a

In this way, the equipment measured data (Y) are adjusted to match those that would be obtained with the conventional method.

Note: In order to obtain a better correlation, it is essential to exercise caution regarding the amount of data and the sample.

1. It is able to set separate a and b values for each different 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 x a2
   b = a1 x b2 + b1
4. Measurement range after inputting coefficients (a, b.)

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

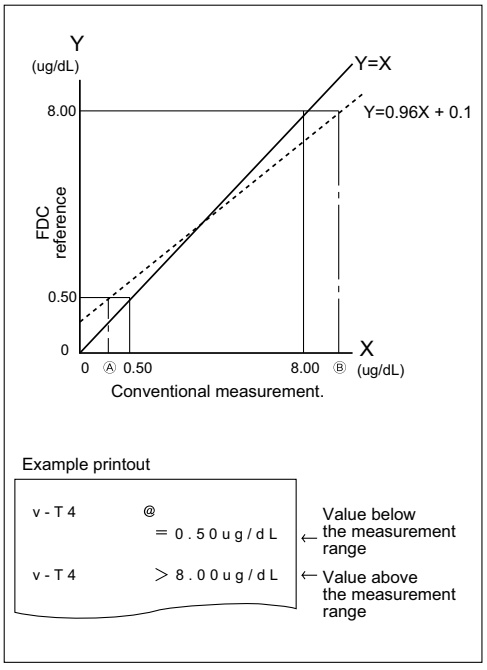
   (Example) v–T4 measurements

   If a = 1 and b = 0 (Y = X), the measurement range is 0.50–8.00 ug/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 = 0.96X + 0.1:
   A = 0.42 ug/dL
   B = 8.23 ug/dL

   If the regression formula is Y = 1.1X -0.1:
   A = 0.56 ug/dL
   B = 7.36 ug/dL

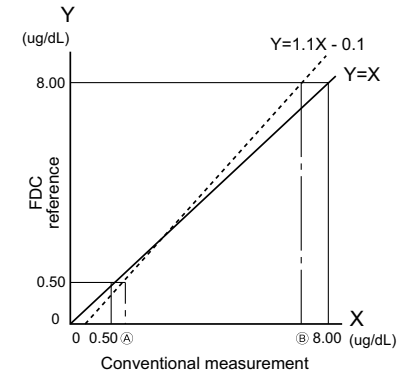


If the measured data is below the measurement range, a **"@"** indication is printed out, as shown at the top of the example printout.

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

IMPORTANT

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



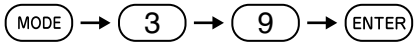
Example printout

```
                @
v - T 4         = 0 . 5 0 u g / d L   ← Value below the measurement range
v - T 4         > 8 . 0 0 u g / d L   ← Value above the measurement range
```

6.2.12 Mode 39 – Reference Interval Settings and Printout <Admini.>

This mode is used to input reference intervals for each test and species.

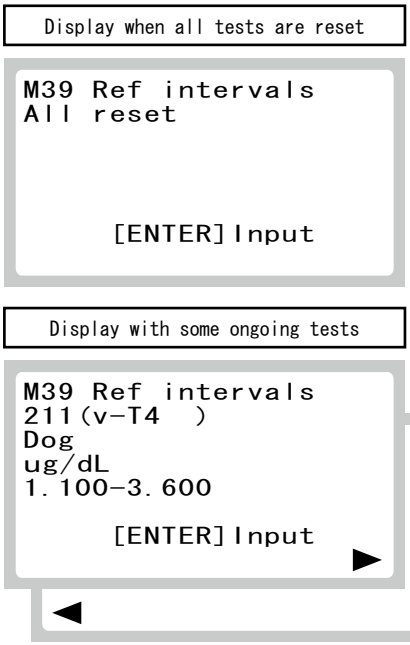
1. Enter into Mode 39.
   - » Printing out the presently input data. ▶ (2).
   - » Inputting the reference intervals. ▶ (3).
   - » Adding the reference intervals to the test results ▶ (4).



2. To print out the presently input data:

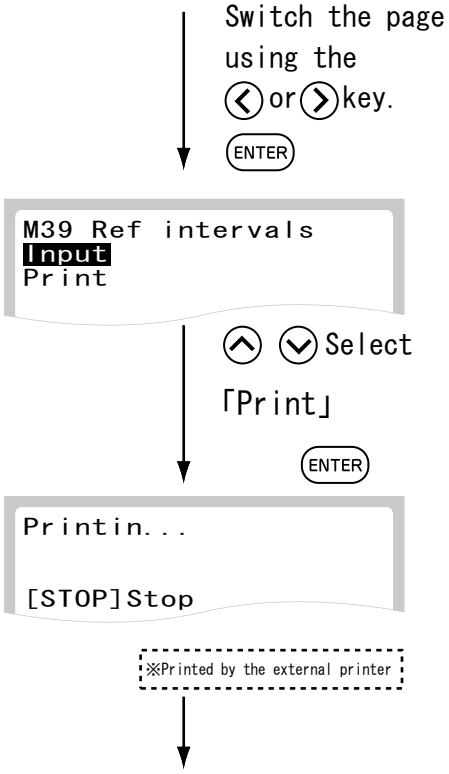
   Press **PRINT** at the first menu dialog.

   NOTE: If **[Yes]** is selected for the external printer setting in Mode 46, the data can be printed.



   a. Select **[Print]** using ▲ or ▼ and press **ENTER**.

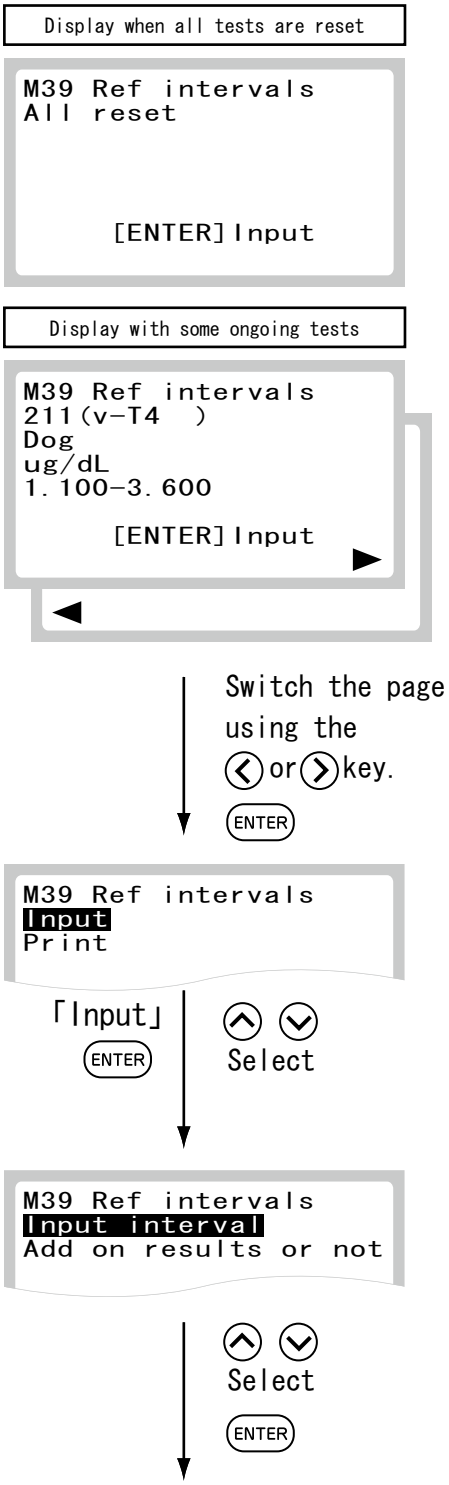
   NOTE: To stop the printing in mid-course, press **STOP**.



3. To input reference interval.

   a. Press **ENTER**.

   b. Select **[Input]** and press **ENTER**.



c. Select **[Input interval]** from the menu and press **ENTER**.

NOTE: After a beep sounds and the message is displayed about two seconds, the analyzer quits the mode operation.

If the QR code information for the entered item code does not exist.

```
**********************
No QR code info
for assigned test
```

If the item code is out of the range.

```
**********************
Undefined test code
```

```
M39 Ref intervals
Input interval
Test code=
```

(Example) v-T4 (Test code=211)

2 → 1 → 1 → ENTER

ENTER

```
M39 Ref intervals
Input interval
Test code=211(v-T4  )
                  ug/dL
Reference interval?

      Dog
```

REF. Using the REF key, select a reference interval name

ENTER

d. Input a test code.

Input a triple-digit code and press **ENTER**.

(The figure at left shows the example of the code=211.)

Test code is labeled on an outer case for each reagent cartridge.

```
M39 Ref intervals
Input interval
Test code=211(v-T4  )
Dog               ug/dL
Lower    =
Upper    =
```

e. Select a reference interval name.

Using **REF.** selects reference interval name.

After the selection, press **ENTER**.

Input a lower limit value

f. Input a lower limit value.

After the input, press **ENTER**.

Move the cursor using the ⌃ or ⌄ key

ENTER or ⌄

```
M39 Ref intervals
Input interval
Test code=211(v-T4  )
Dog               ug/dL
Lower    =1.5
Upper    =
```

Input a upper limit value

g. Input an upper limit value.

After the input, press **ENTER**.

ENTER or ⌄ ⌃

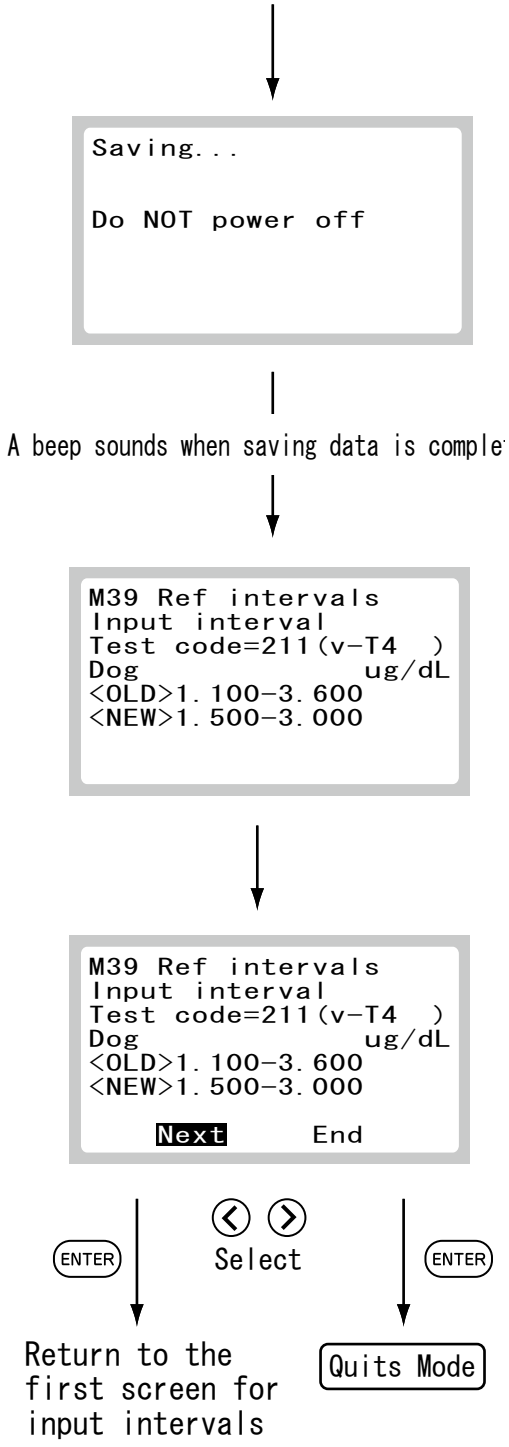
h. The new data will be displayed.

IMPORTANT

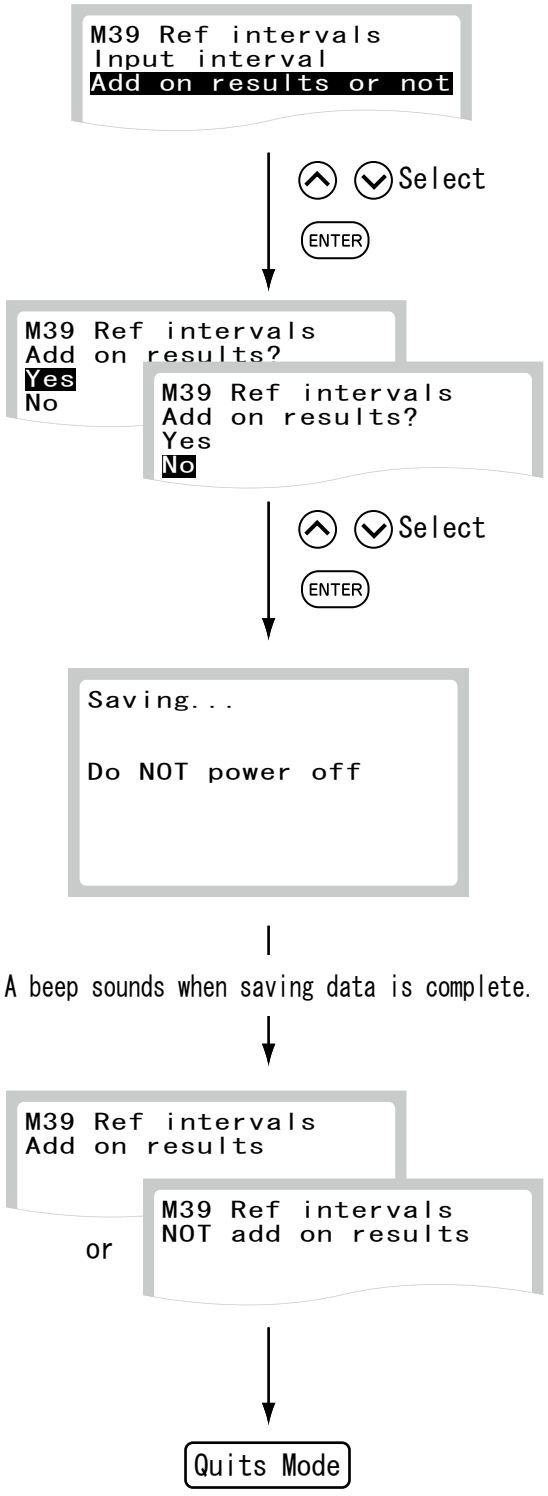
Make sure that the displayed new values are correct. If they are incorrect, wrong marking "L" or "H" on test results may affect the diagnosis.

i. Select **[End]** to terminate the mode.

To input reference intervals for other tests, select **[Next]** ▶ ENTER.



4. Select **[Add on results or not]** from the menu and press **ENTER**.



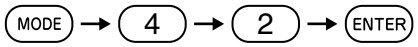
a. Select whether to add the reference interval on the results using ▲ or ▼ and press **ENTER**.

After saving the edited data, the analyzer quits the mode operation.

6.2.13 Mode 42 – Leak Check <Admini.>

This mode is used to test sampler leakage. Prior to using the mode, prepare the analyzer check tool (packed as an accessory).

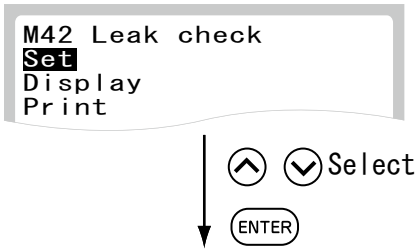
1. Enter into Mode 42.
   - » Running the leak check. ▶ (2).
   - » Displaying the leak check result. ▶ (3).
   - » Printing the leak check result. ▶ (4).



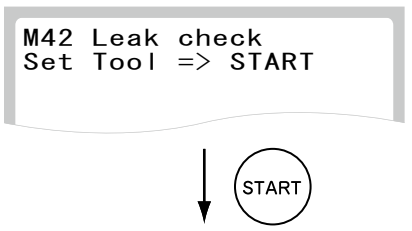
2. To run the leak check:

   a. Select **[Set]** using ▲ or ▼ and press **ENTER**.

(Example) if [Set] is selected



   b. Set the analyzer check tool to the reagent cartridge set on the sample table, close the sample set cover, and press **START**.



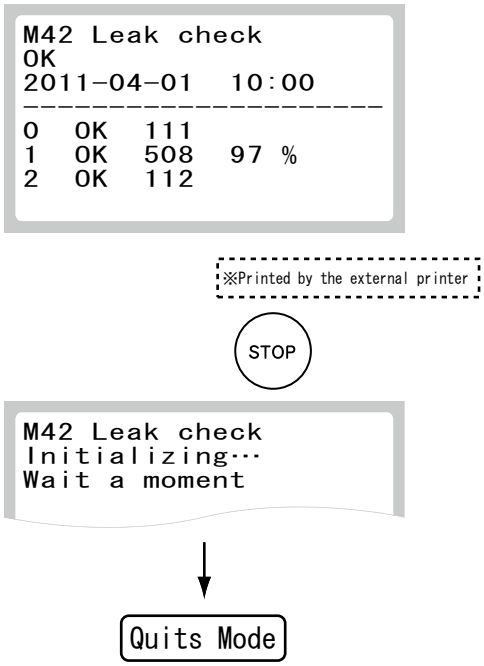
   Leak check processing will be displayed.

   After the leak check is complete, the result will be displayed.

   When an error occurs, replace the sampler O-ring (Refer to *Section 4.3.2*).

   Press **STOP** to quit.

A beep sounds when check process is complete.



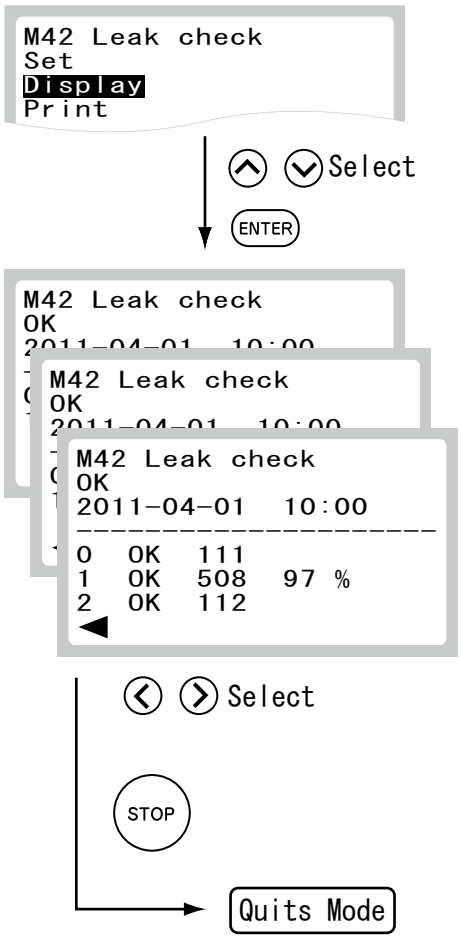
3. To display the leak check result:

   a. Select **[Display]** using ▲ or ▼ and press **ENTER**.

   b. Switch the page using the ◀ or ▶.
      Last 10 leak check results will be displayed.

   c. Press **STOP** to quit.

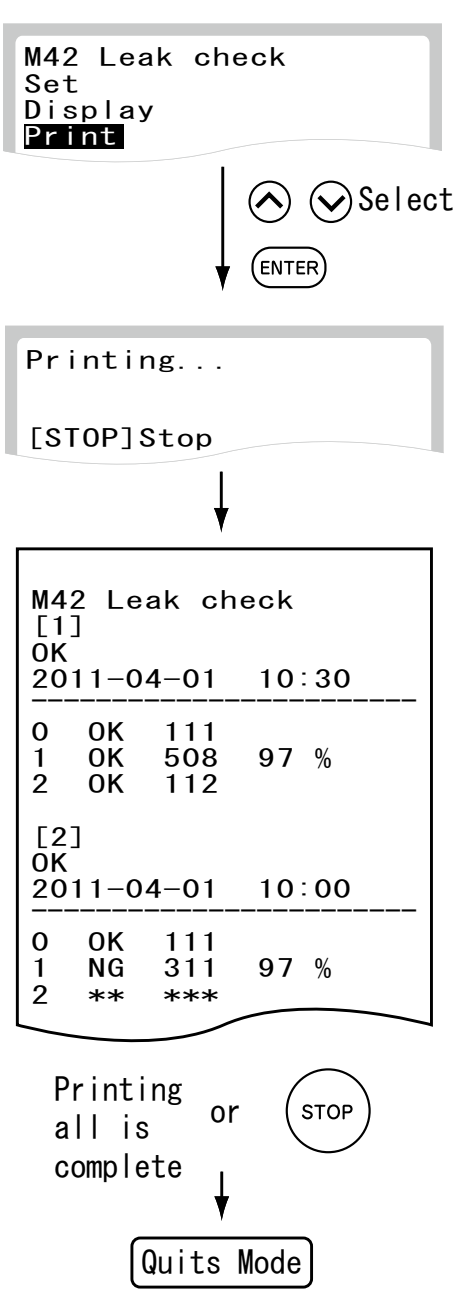
(Example) if [Display] is selected



4. To print the leak check result:
   a. Select **[Print]** using ▲ or ▼ and press **ENTER**.
      NOTE: To cancel printing, press **STOP**.

After printing the leak check result, the analyzer quits the mode operation.

(Example) if [Print] is selected



6.2.14 Mode 46 – Selecting Communication Destinations <Admini.>

The equipment is able to communicate with the host computer/PC, the sample barcode reader, and/or the external printer via serial interface connector (COM1A) and the USB connectors (USB, COM1B).

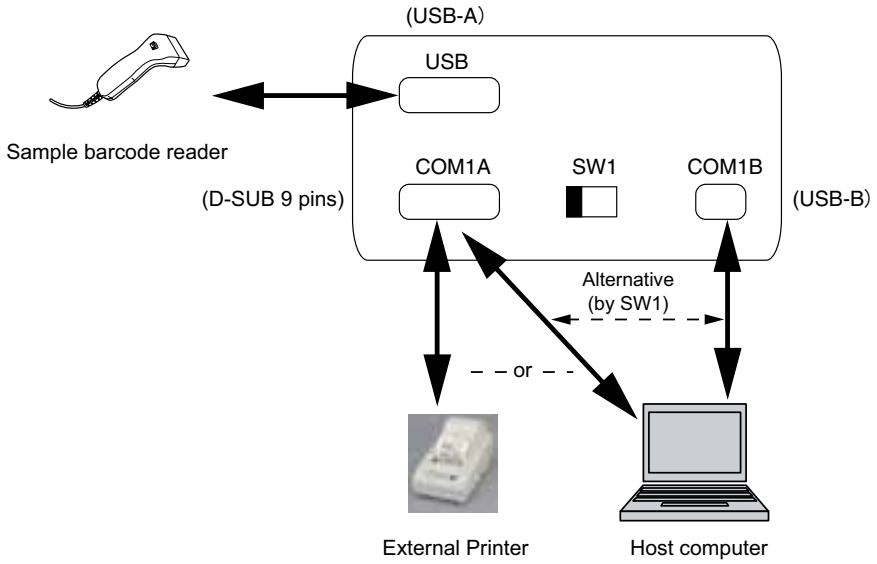
This mode is used to select communication destinations and to set communication parameters.

NOTE: Be sure to connect the sample barcode reader to the USB–A connector.

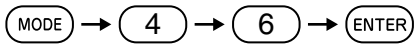
NOTE: When connecting to the host computer, select either COM1A or COM1B by the SW1 on the rear panel. It is impossible to communicate through both connections at the same time.

NOTE: The host computer and the external printer cannot be connected to the equipment at the same time.

NOTE: Perform this mode operation after connecting the communication cables to COM1A, COM1B or the USB connector.



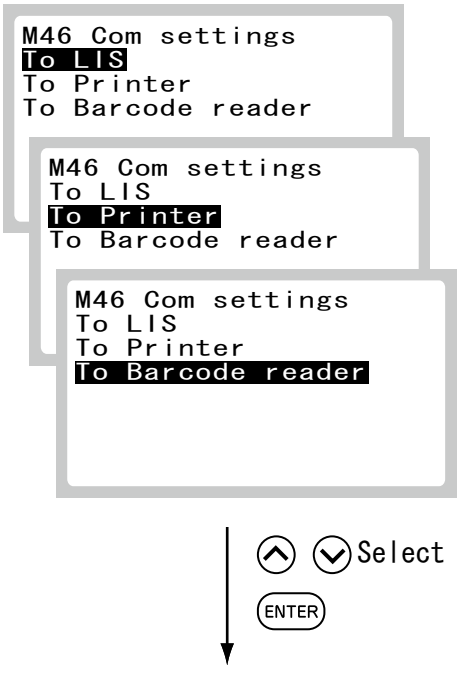
1. Enter into Mode 46.



2. Select a menu.

   Menu
   - » Setting for host computer: ▶ (3)
   - » To Printer: ▶ (4)
   - » Setting for barcode reader: ▶ (5)

   NOTE: Pressing ▲ or ▼ can change the menu on the display.



3. Setting for host computer.

   a. Select [Yes] or [No] using ▲ or ▼ and press ENTER.

      [No]
      No communication with host computer.

      [Yes]
      Connected to the host computer.

      NOTE: After a beep sounds and the message is displayed about two seconds, the analyzer quits the mode operation:

```
        If [YES] is selected
when the external printer is connected.

**********************
Impossible to connect
both LIS & Printer
```

   b. Select a protocol ([Type1], [Type2] or [Type3]) to be connected to the host computer using ▲ or ▼and press ENTER.

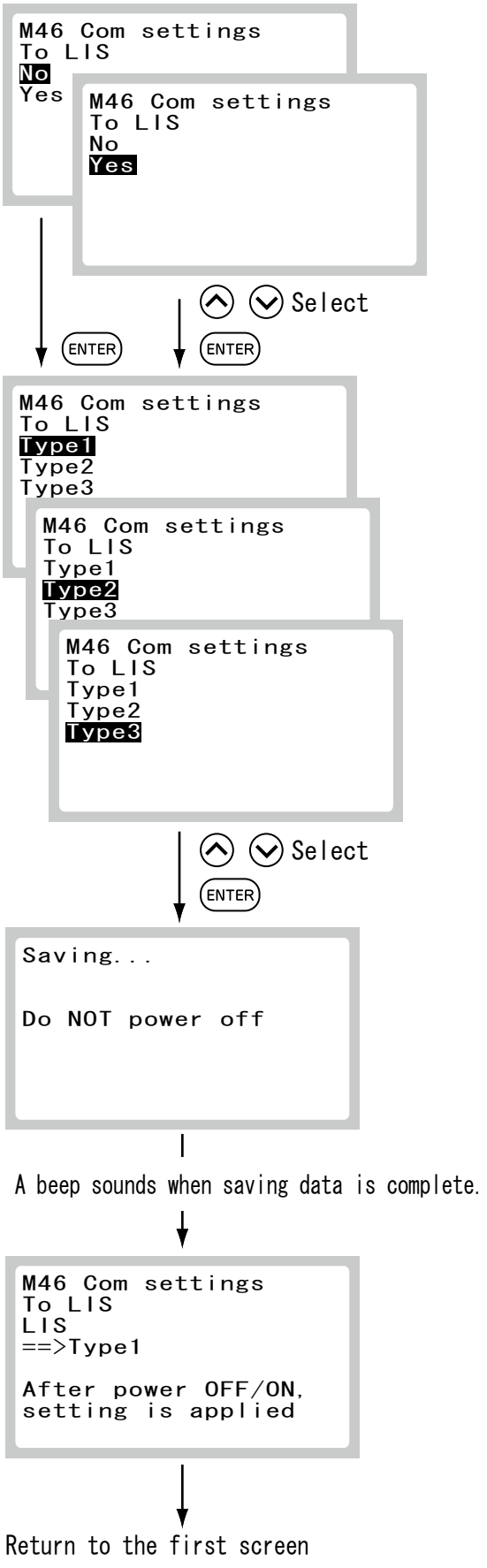
      [Type1]
      Type1 is 2-way communication requesting for work list (patient names, test names, *etc.*)

      [Type2]
      Type2 does not request the work list, but performs one-way transmission of test results (from analyzer to host computer) by using the Type1 protocol.

      [Type3]
      Type3 is one-way transmission of test results by a legacy protocol and is rarely used.

      After the new selection is displayed, the screen returns to the menu dialog (2).

      NOTE: The settings are enabled after turning the power off and on.



4. To Printer.

   a. Select [Yes] or [No] using ▲ or ▼and press ENTER.

      [No]
      The external printer will not be connected.

      [Yes]
      The external printer will be connected.

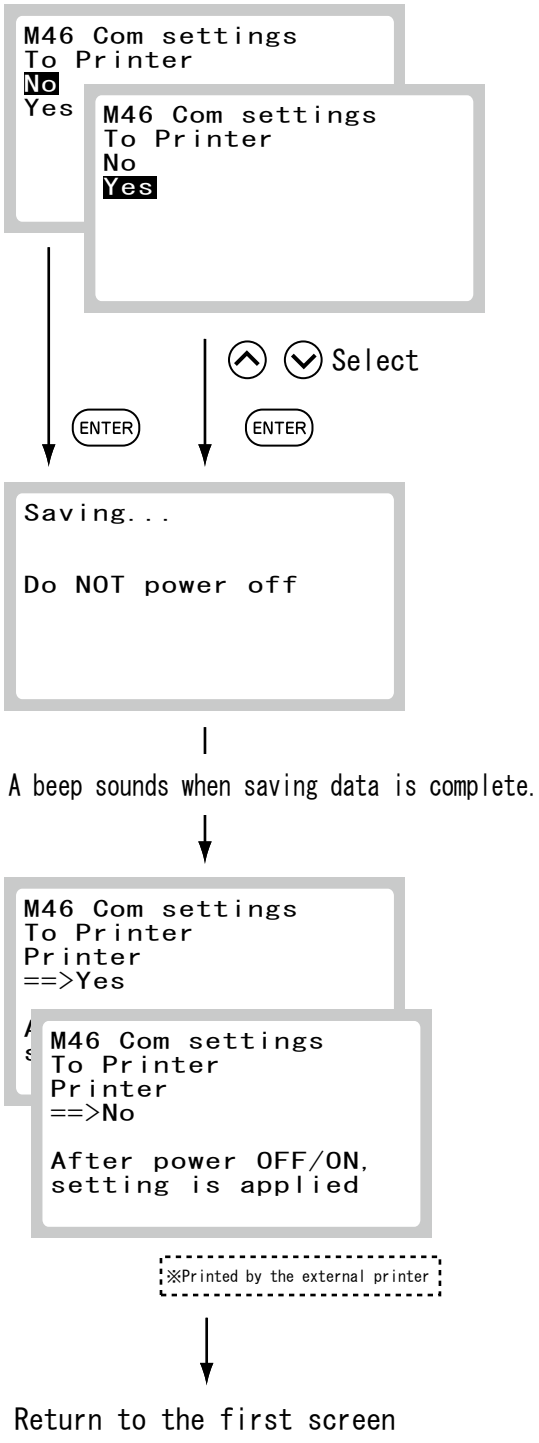
   NOTE: After a beep sounds and the message is displayed about two seconds, the analyzer quits the mode operation:

```
If [YES] is selected
while the host computer is connected.

**********************
Impossible to connect
both LIS & Printer
```

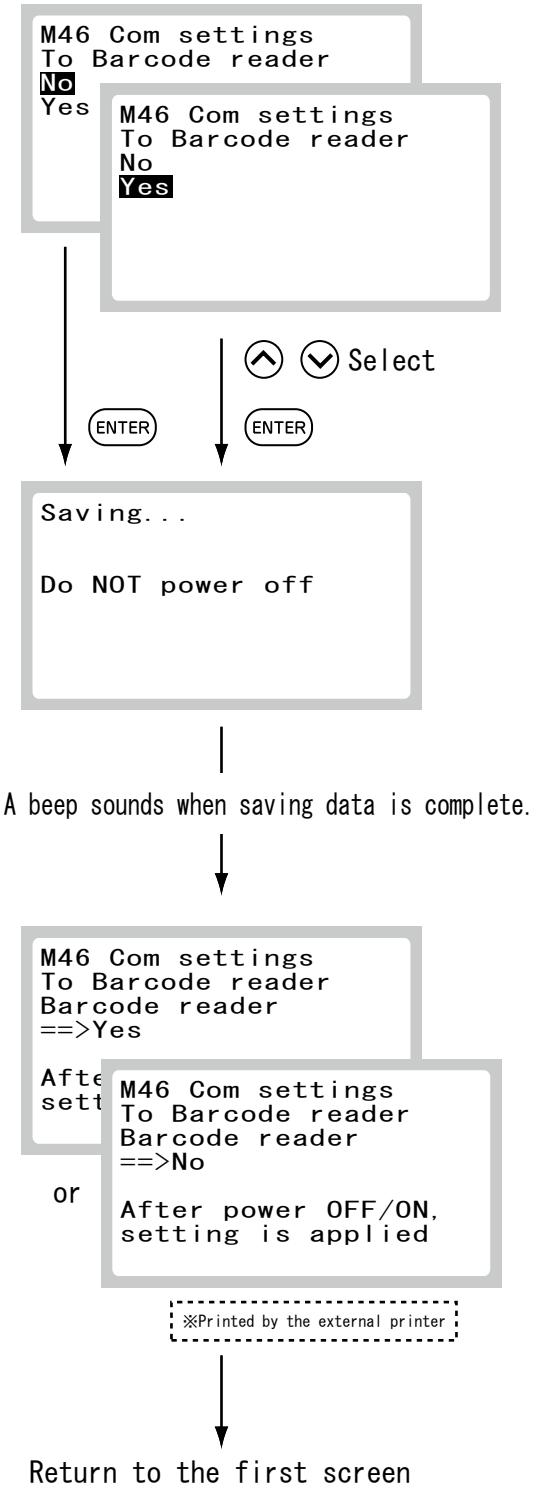
   After the new selection is displayed, the screen returns to the menu dialog (2).

   NOTE: The settings are enabled after turning the power off and on.



5. Setting for barcode reader.

   Select a menu using ▲ or ▼ whether to use a sample barcode reader or not, and press **ENTER**.

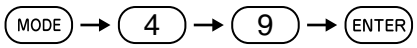


After the new selection is displayed, the screen returns to the menu dialog (2).

NOTE: The settings are enabled after turning the power off and on.

6.2.15 Mode 49 – Displaying/Printing Out Error Logs <Normal>

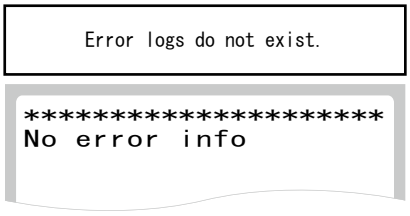
This mode is used to display/print out error logs memorized in the analyzer.



1. Enter into Mode 49.
   - » To display the error logs: ▶ (2).
   - » To print the error logs: ▶ (3).

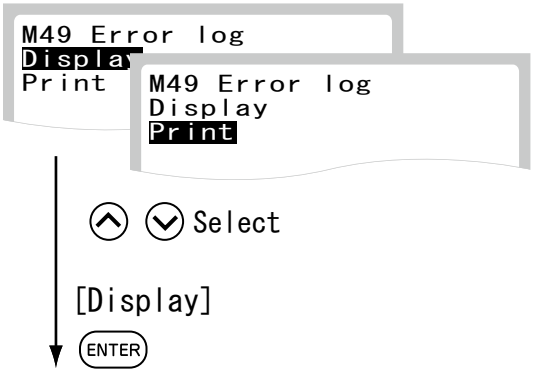
NOTE: If **[No]** is selected for the external printer setting in Mode 46, the error logs cannot be printed.

NOTE: After a beep sounds and the message is displayed about two seconds, the analyzer quits the mode operation:



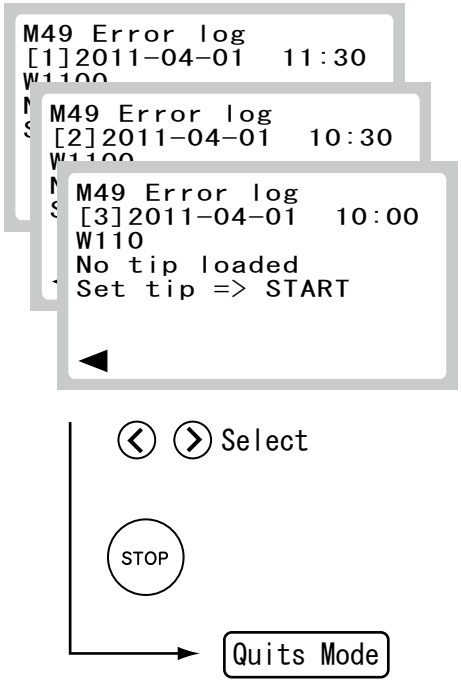
2. To display the error logs:
   a. Input a test code.

      Select **[Display]** using ▲ or ▼and press **ENTER**.



   b. Switch the page using ◀ or ▶.

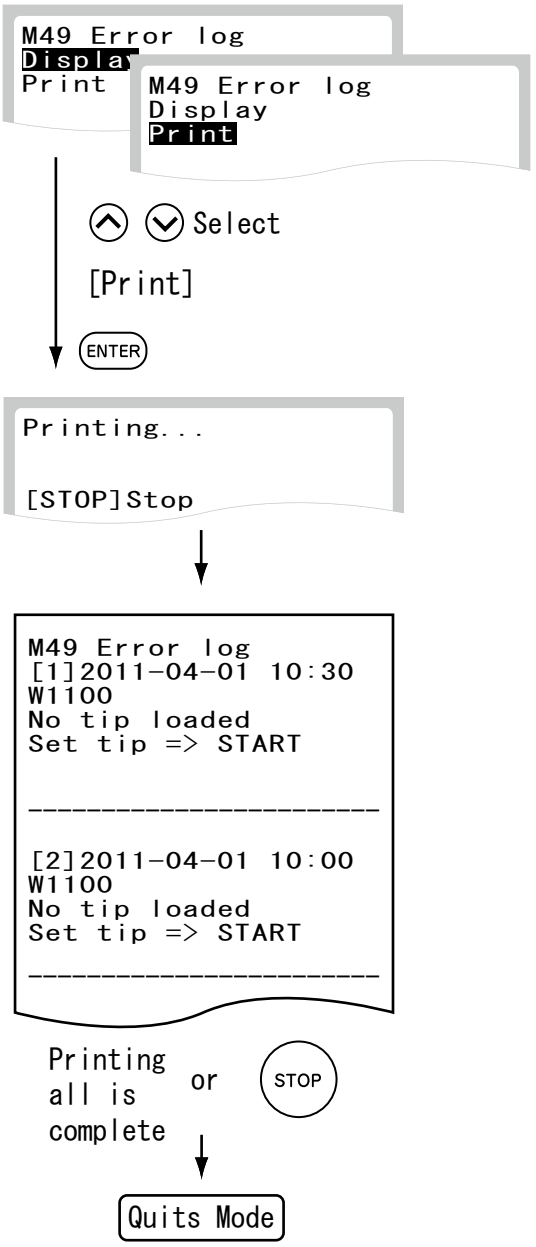
      Maximum 100 error logs will be displayed in order from the latest.



   c. To exit press **STOP**.

3. To print the error logs.

NOTE: To cancel printing press **STOP**.



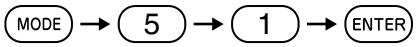
After printing the error logs, the analyzer quits the mode operation.

6.2.16 Mode 51 – Maintenance <Normal>

This mode is used to check the optical unit.

NOTE: In this section, operations on Mode 51 are discussed. See *Section 4.2* for actual cleaning, check, and replacement.

1. Enter into Mode 51.

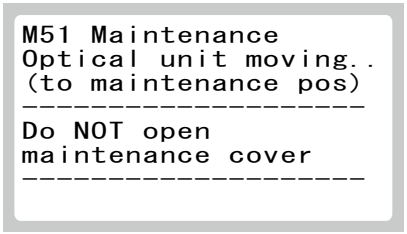


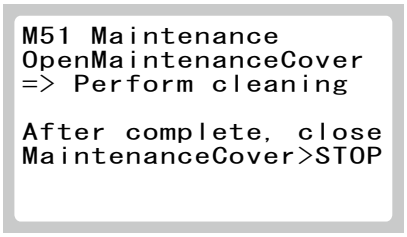
2. For cleaning.

   NOTE: See *Section 4.2* for cleaning method.

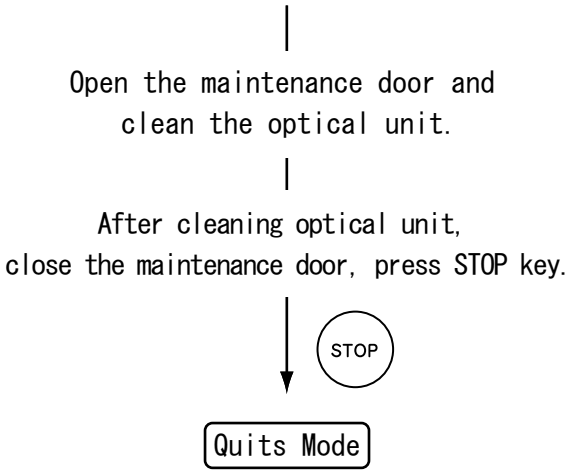
   The optical unit moves to the maintenance position and gets ready for cleaning.

   Clean the optical unit.





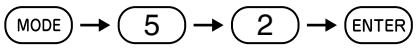
3. After cleaning optical unit, close the maintenance door, press **STOP** and quit the mode operation.



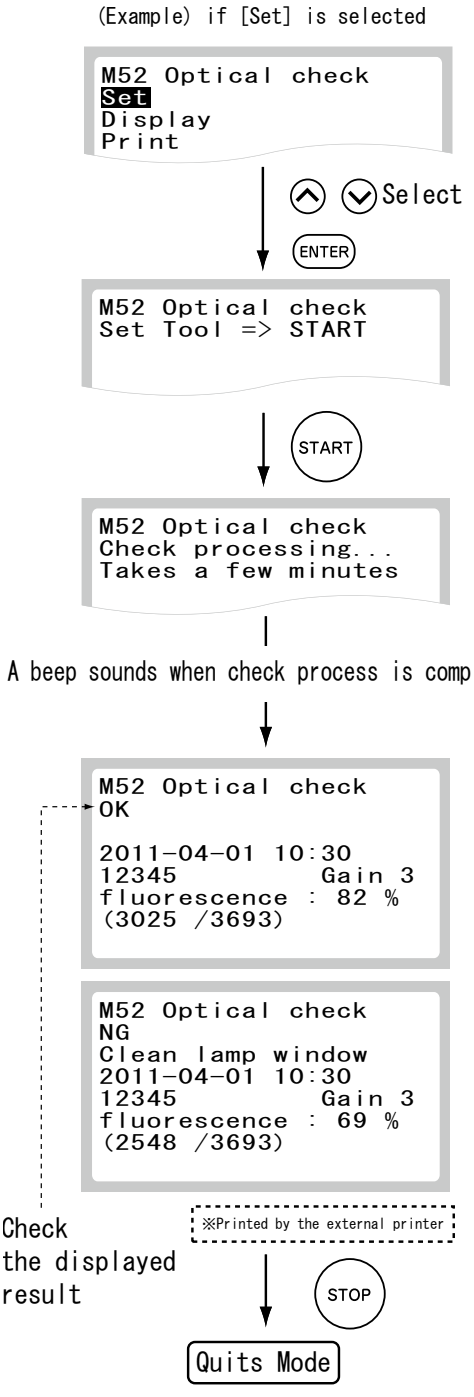
6.2.17 Mode 52 – Optical Check <Normal>

This mode is used to perform the optical check.

1. Enter into Mode 52.
   - » Running the optical check. ▶ (2).
   - » Displaying the optical check result. ▶ (3).
   - » Printing the leak optical result. ▶ (4).



2. To run the optical check:
   a. Select **[Set]** using ▲ or ▼ and press **ENTER.**



   b. Set the analyzer check tool to the reagent cartridge set on the sample table, close the sample set cover and press **START**.

   NOTE: Use the analyzer check tool supplied with the equipment. Notice that last 5 digits of serial number on the equipment are also labeled on the analyzer.

   SN ××× (○○○○○)

   The error E5204 will occur if any analyzer other than supplied is used and the optical check will not start.

   c. Start the optical check.

      The optical check takes about 3 minutes.

   d. Display the result.

      After the check is complete, the analyzer displays the result and quits the mode operation.

   NOTE: The percentage value may change by temperature of the equipment and can be used if **[OK]** is displayed. If the result is **[NG]**, the message "Clean lamp window" will be displayed. Clean the SPF detector lens again (Refer to *Section 4.2.1*).

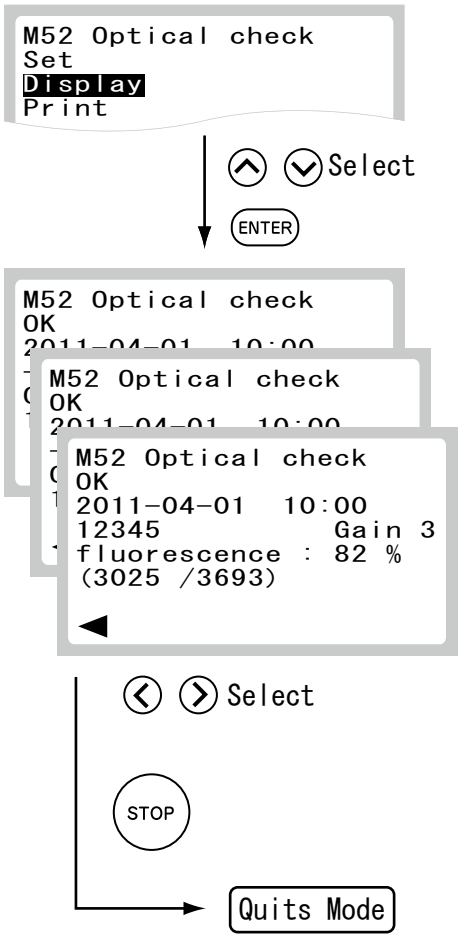
3. To display the optical check result:

   a. Select **[Display]** using ▲ or ▼ and press **ENTER**.

   b. Switch the page using ◀ or ▶.
      Last 10 optical check results will be displayed.

   c. Press **STOP** to quit.

(Example) if [Display] is selected



4. To print the optical check result:

   a. Select **[Print]** using ▲ or ▼ and press **ENTER**.

   NOTE: To cancel printing, press **STOP**.

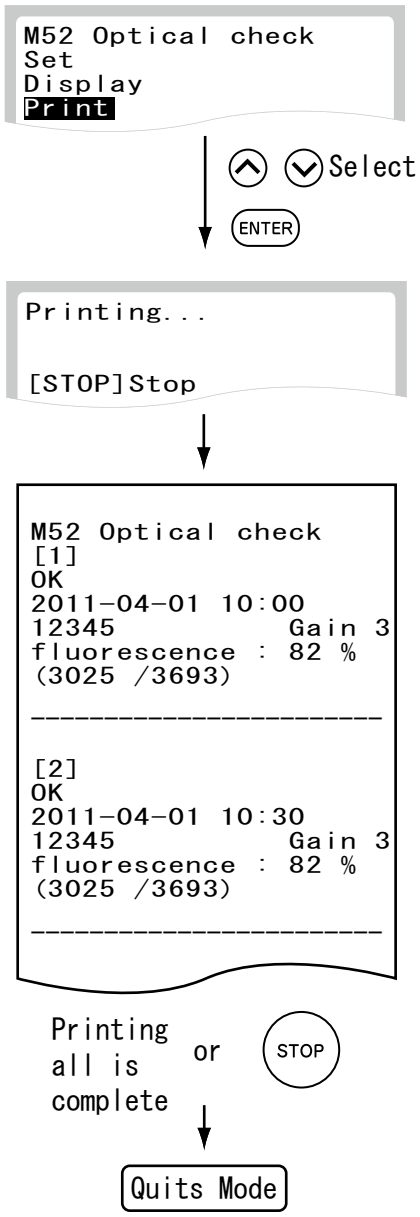
   NOTE: After a beep sounds and the message is displayed for about two seconds, the analyzer quits the mode operation:

```
No check is performed when
[Display] or [Print] is selected.

**********
No check result
```

After printing the optical check result, the analyzer quits the mode operation.

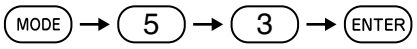
(Example) if [Print] is selected



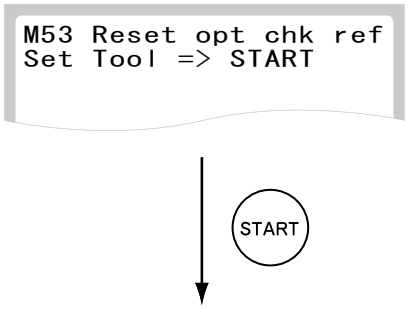
6.2.18 Mode 53 – Saving Fluorescence Values for the Optical Check <Admini.>

This mode is used to reset fluorescence values for the optical check when the analyzer check tool (supplied as an accessory) has been lost or damaged and replaced with the new one.

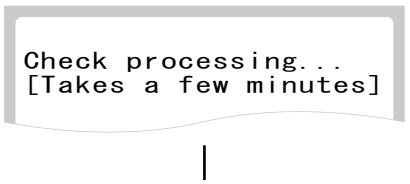
1. Enter into Mode 53.



2. Set the new analyzer check tool to the reagent cartridge set on the sample table, close the sample set cover and press **START**.



3. The operation of reading fluorescence values starts.



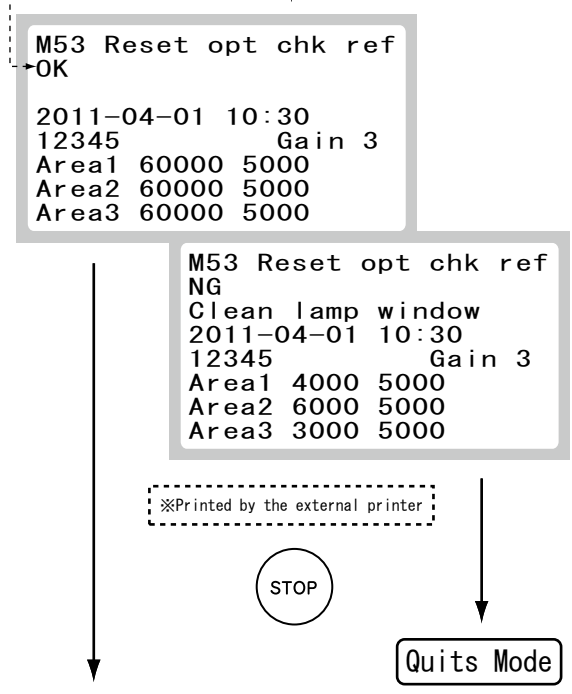
A beep sounds when check process is complete.

4. After the reading is complete, the analyzer displays the result.

NOTE: If the result is **[OK]**, save the read fluorescence values.

NOTE: If the result is **[NG]**, the message "Clean lamp window" will be displayed. Clean the SPF detector lens (Refer to *Section 4.2.1*).

Check the displayed result



5. To save the read fluorescence values:

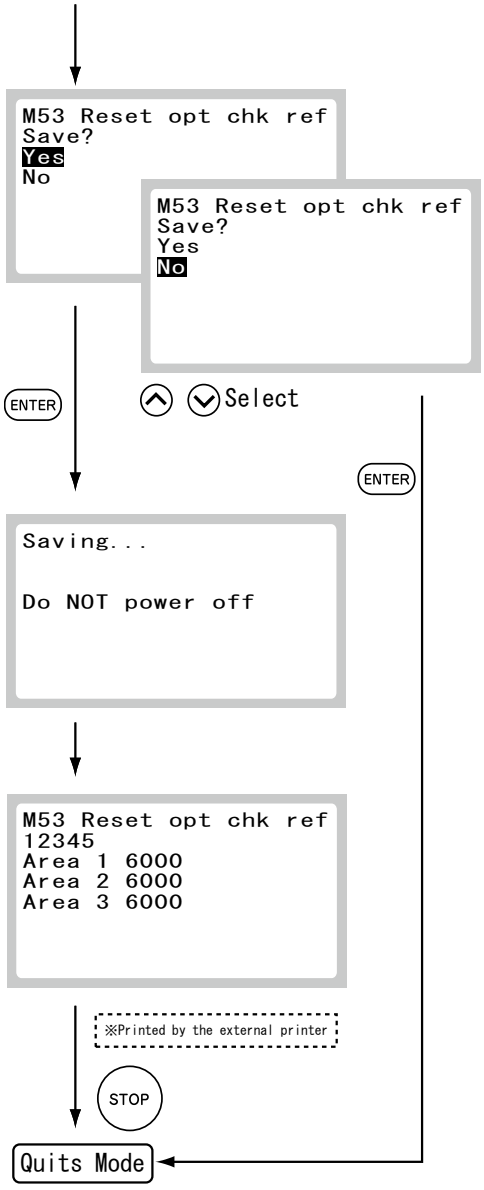
   Select [Yes] or [No] whether to save the read fluorescence values or not using ▲ or ▼, and press ENTER.

   a. When selecting [Yes]:

      The analyzer displays on the screen that the read fluorescence values are saved, and quits the mode operation.

   b. When selecting [No]:

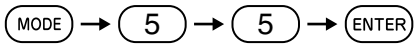
      The analyzer quits the mode operation.



6.2.19 Mode 55 – Selecting Language <Admini.>

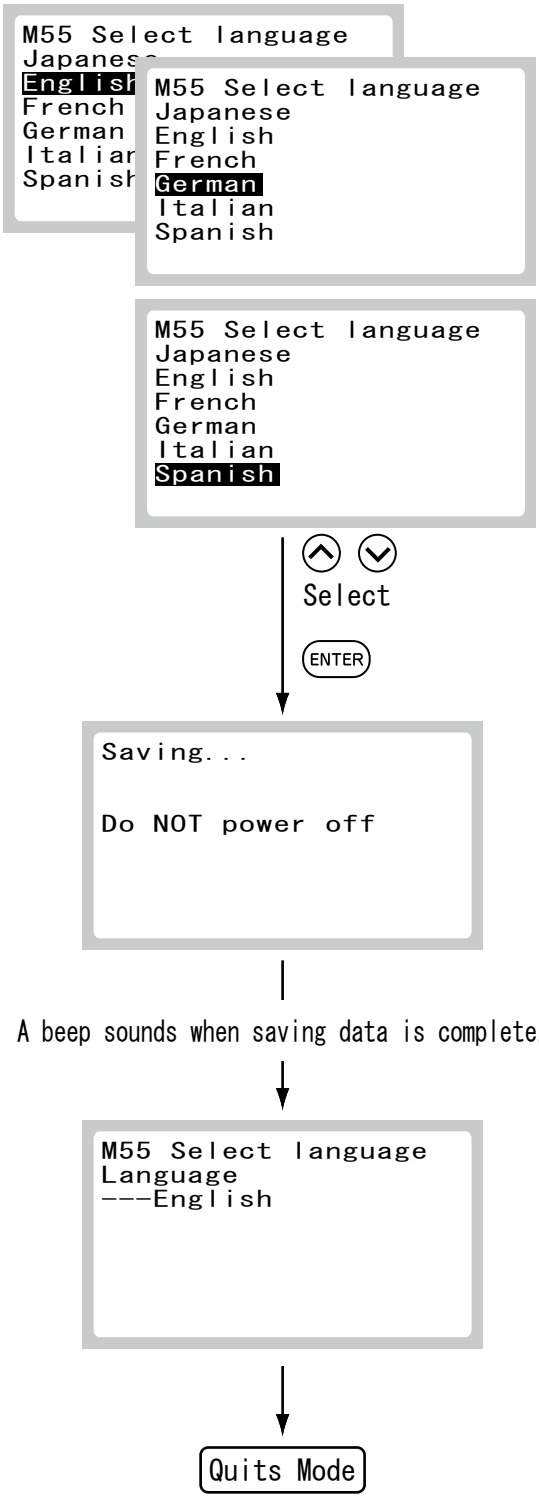
This mode is used to select a language for display and printout.

1. Enter into Mode 55.



2. Select a language using ▲ or ▼ and press **ENTER**.

   Menu
   - » [Japanese]
   - » [English]
   - » [French]
   - » [German]
   - » [Italian]
   - » [Spanish]



After the new selection is displayed, the analyzer quits the mode operation.

6.2.20 Mode 81 – Beep Sound Settings <Admini.>

This mode is used to change the beep sound settings (error warning, end of a test).

1. Enter into Mode 81.

2. Select **[Error sound]** or **[Test end sound]** .

   Select a menu **[Error sound]** or **[Test end sound]** using ▲ or ▼ and press **ENTER**.

   a. To change error sound:

      ☞ Error sound cannot be set on mute.

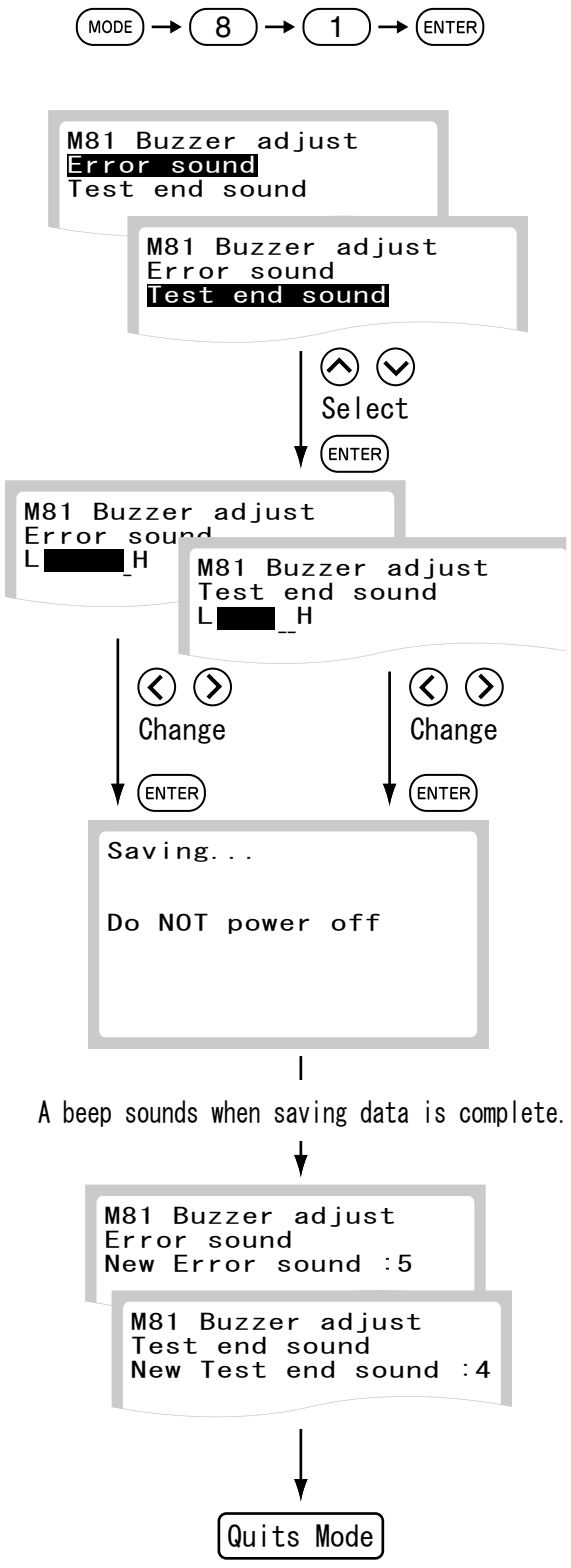
      By moving the shaded part (cursor) using ◀ or ▶ the changed sound is heard. Select desired sound and press **ENTER**. The analyzer will terminate the mode.

   b. To change test end sound:

      ☞ Test end sound can be set on mute. Move the shaded part (cursor) to L direction to mute.

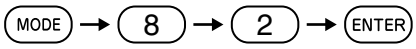
      By moving the shaded part (cursor) using ◀ or ▶ the new sound is heard. Select desired sound and press **ENTER**. The analyzer will terminate the mode.

3. The new selection for an error sound or a test end sound is displayed.



6.2.21 Mode 82 – Display Brightness and Print Density <Admini.>

1. Enter into Mode 82.



   » To adjust the display brightness: ▶ (2).
   » To adjust the print density: ▶ (3).

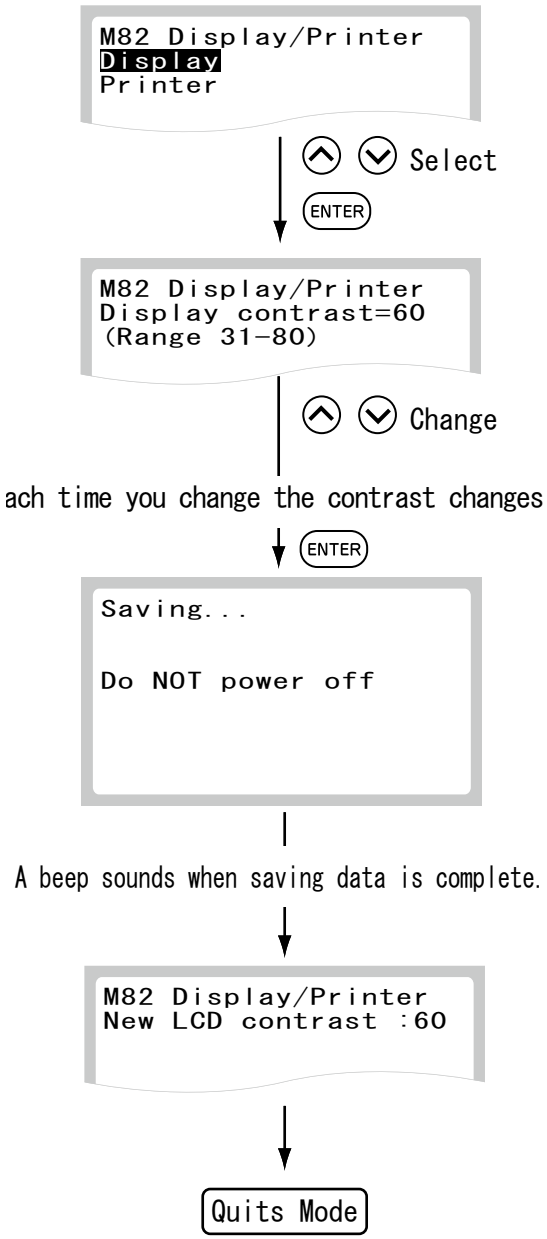
   NOTE: If **[No]** is selected for the external printer setting in Mode 46, **[Printer]** cannot be selected.

2. To adjust the display brightness:

   a. Select **[Display]** using ▲ or ▼and press **ENTER.**

   b. By moving the shaded part (cursor) using ▲ or ▼ the brightness will change. Select desired brightness and press **ENTER**.

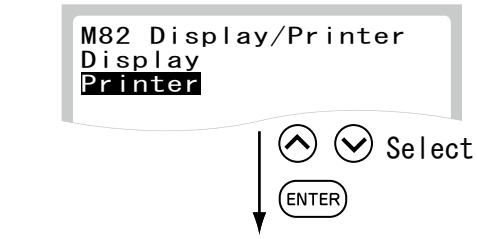
   NOTE: Choose from 50 brightness levels (31–80).

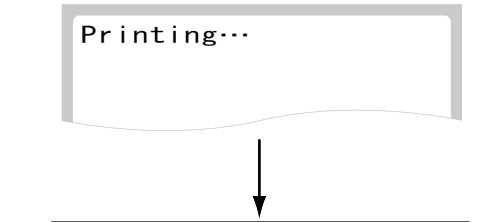


After the new brightness setting is displayed, the analyzer quits the mode operation.

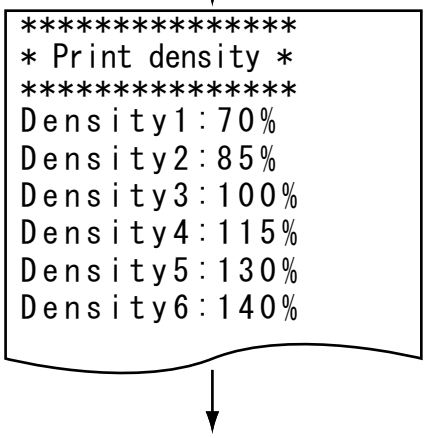
3. To adjust the print density:

   a. Select **[Printer]** using ▲ or ▼ and press **ENTER**.



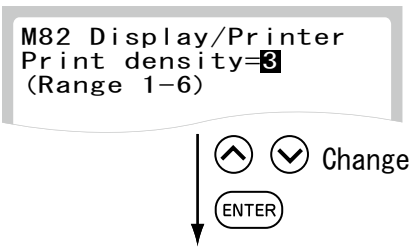


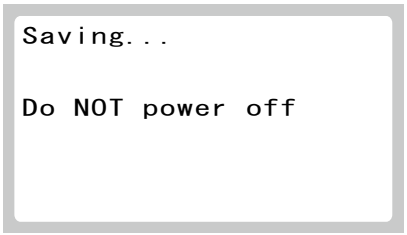
The sample of the density levels is printed out.



   b. Select a density level using ▲ or ▼and press **ENTER**.

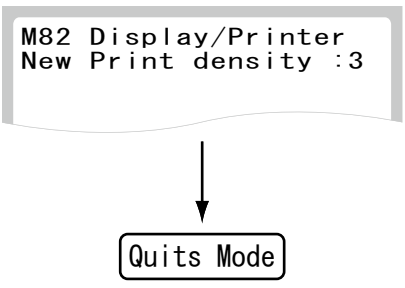
   NOTE: Choose from 6 density levels (1–6).





A beep sounds when saving data is complete.

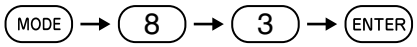
After the new density setting is displayed, the analyzer quits the mode operation.



6.2.22 Mode 83 – Test Result Print Sheets Setting <Admini.>

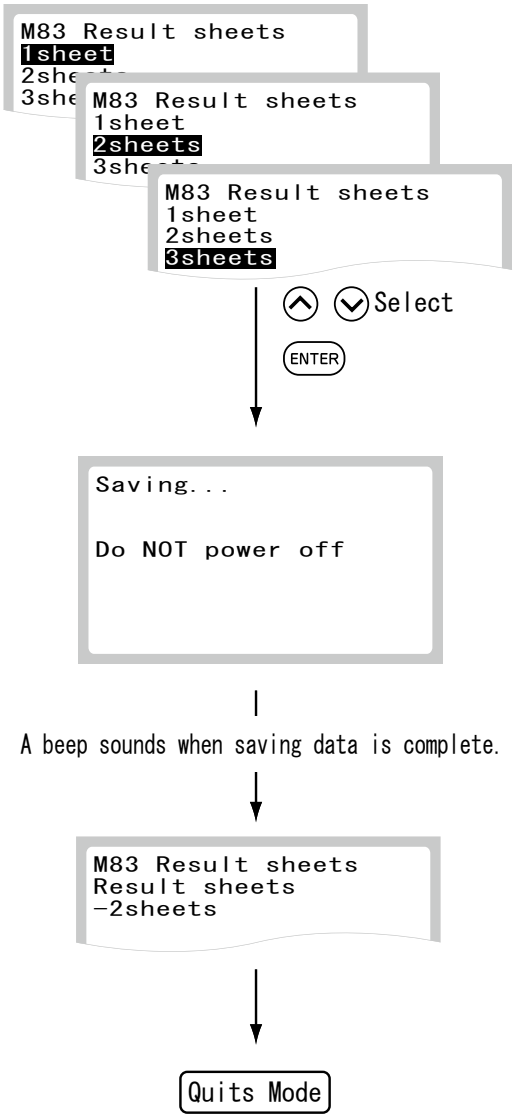
This mode is used to set a number of test result print sheets (selectable 1, 2, or 3).

1. Enter into Mode 83.



2. Select a number of print sheets.

   Select a number of print sheets ([1sheet], [2sheets] or [3sheets]) using ▲ or ▼ and press ENTER.



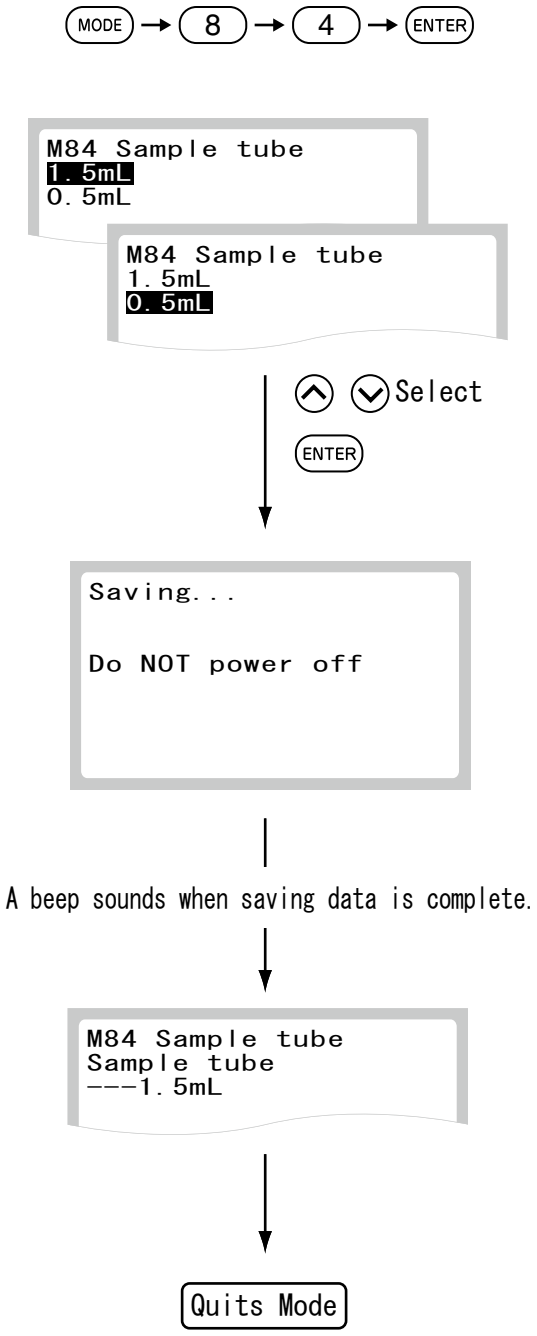
After the new setting for the print sheets is displayed, the analyzer quits the mode operation.

6.2.23 Mode 84 – Settings the sample tubes <Admini.>

This mode is used to select a type of sample tubes. Enter into Mode 84.

The user may enter into mode 84 using a shortcut from the main keypad.

1. Press ◀ and ▲ at the same time.
2. Arrow to the correct sample tube size (1.5 mL or 0.5 mL).
3 Press **ENTER**.
4. The selected sample size will be displayed on the screen of the analyzer.



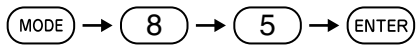
After the new selection is displayed, the analyzer quits the mode operation.

NOTE: Set the sample tube spacer on the sample table according to a type of the sample tube.

6.2.24 Mode 85 – Display Order of Reference Interval Names <Admini.>

This mode is used to change the display order in the selection dialog for a reference interval name.

1. Enter into Mode 85.



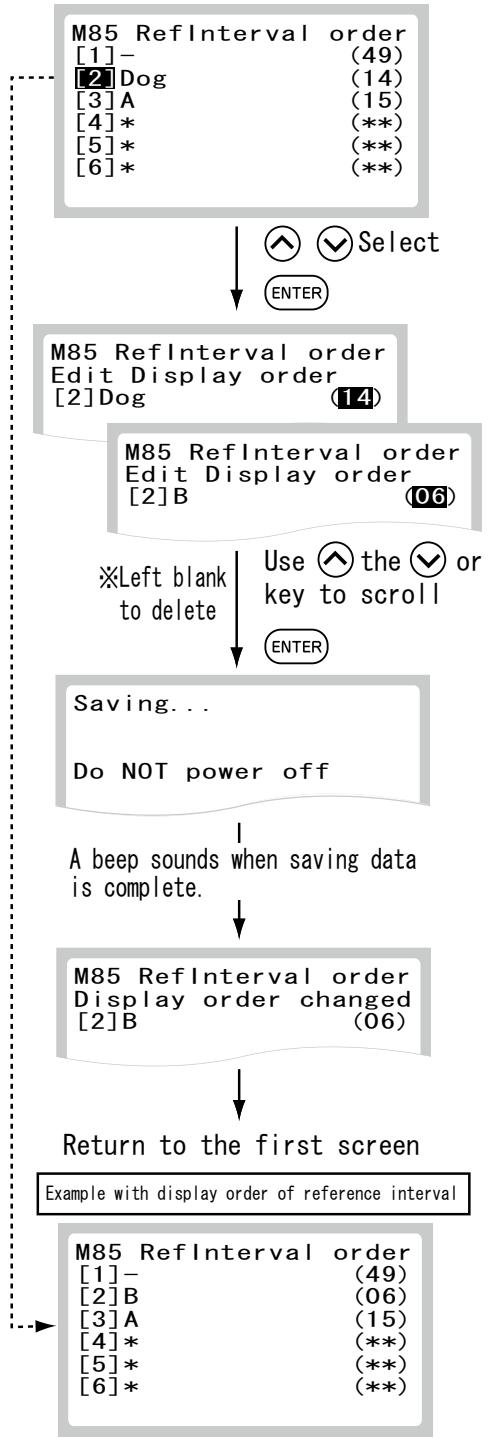
2. Select an order (from [1] to [6]) to be changed.

   Select an order to be changed using ▲ or ▼ and press **ENTER**.

NOTE: When there are plural undefined reference interval names, only one is displayed.

Max. 6 reference intervals can be displayed

(Example) [1] to [3] defined



3. Select a menu by scrolling or directly input the number of the menu.

   By selecting an order to be changed followed by **ENTER** in (2), the edit dialog for the order will appear.

   There are 2 ways to select a reference interval name as follows:
   - » Selects a reference interval name by using ▲ or ▼. ▶ (a)
   - » Inputs a reference interval number directly. ▶ (b)

   a. To select a reference interval name by using ▲ or ▼:

      Select a reference interval name on the display using ▲ or ▼ and press **ENTER**.

   b. To input the number for the menu directly:

      Input the number in 2 digits and press **ENTER**.

   NOTE: The number to be input is defined by Mode 86.

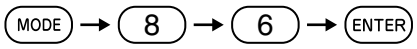
4. After the new selection is displayed, the screen returns to the menu dialog (2).

   Press **STOP** to quit the mode.

6.2.25 Mode 86 – Editing and Inputting Reference Interval Names <Admini.>

This mode is used to edit or input reference interval names.

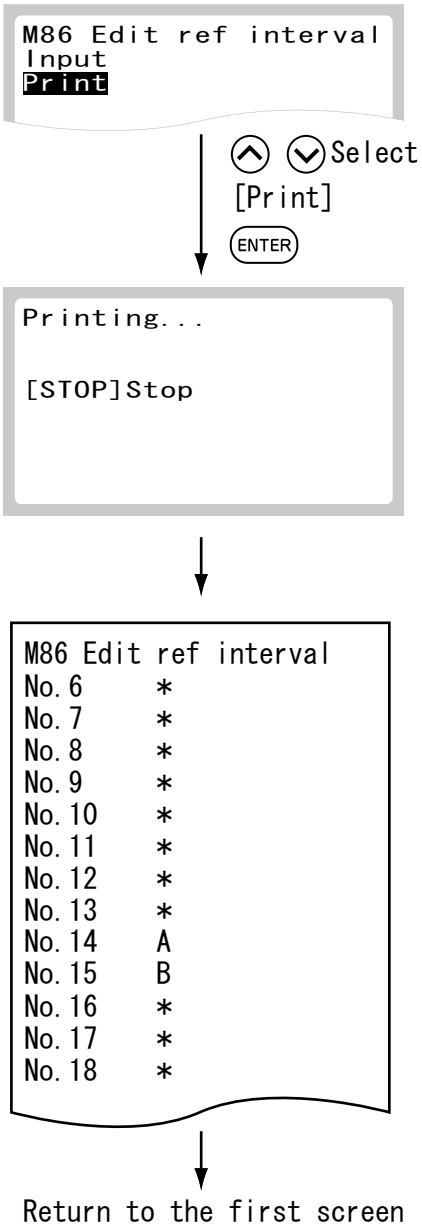
1. Enter into Mode 86.
   - » To print the list: ▶ (2).
   - » To edit the reference interval names: ▶ (3).



NOTE: If **[No]** is selected for the external printer setting in Mode 46, **[Print]** cannot be selected.

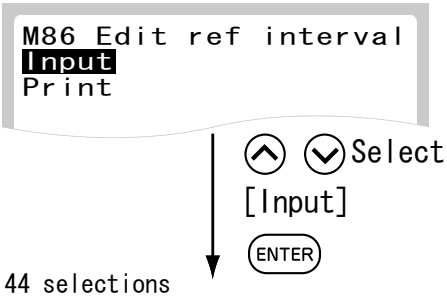
2. To print a list of the reference interval names:
   a. Select **[Print]** using ▲ or ▼ and press **ENTER**.

      The list of the names currently registered will be printed out.



3. To select a reference interval name.

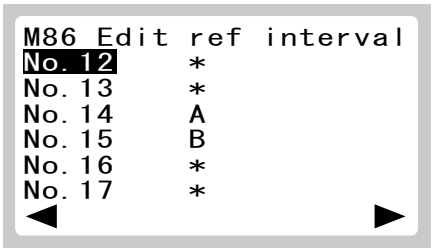
   a. Select **[Input]** using▲ or ▼ and press **ENTER**.



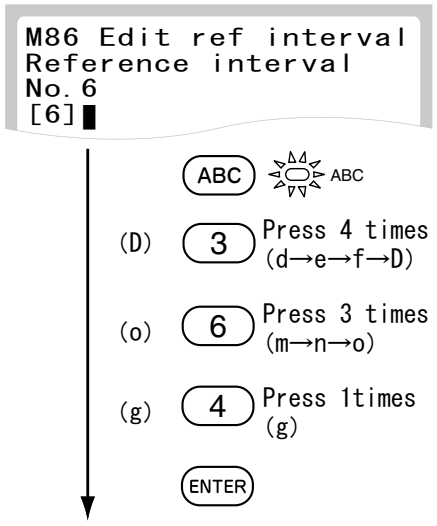
44 selections

   b. Select a number to be edited and press **ENTER**.

   NOTE: Choose between 6 and 48 or 49.



(Example) Input "Dog" into No.6



   c. Type a name for the reference interval.

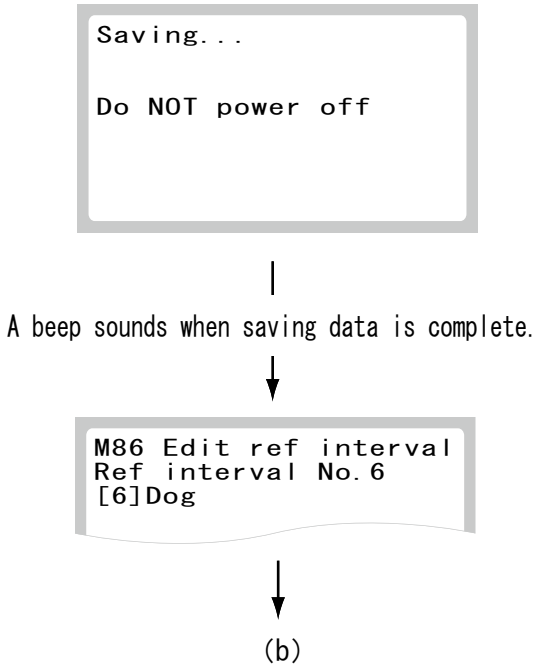
      After the input, press **ENTER**.

      Shown at the left is an example for inputting "Dog" into No. [6].

   NOTE: A maximum of 13 alphanumeric characters can be input.

4 After the result is displayed, the screen returns to the input dialog.

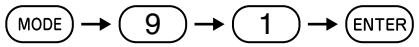
Press **STOP** to quit the mode.



6.2.26 Mode 91 – Reading the QR Code Information <Admini.>

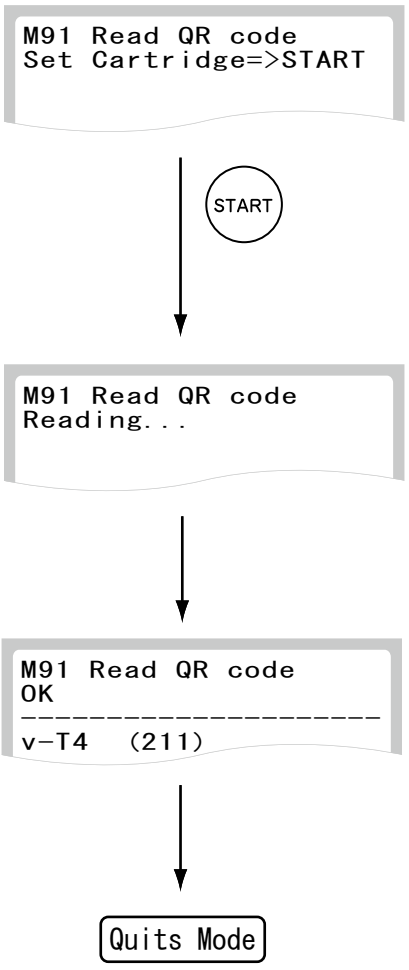
This mode is used to read the QR code information added to the reagent cartridges.

1. Enter into Mode 91.



2. Set the reagent cartridges to the sample table and press **START.**

   To quit the mode operation, press **STOP**.

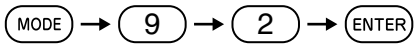


After the recognized information is displayed, the analyzer quits the mode operation.

6.2.27 Mode 92 – Version Information <Normal>

This mode is used to display the version information with last updated time and date.

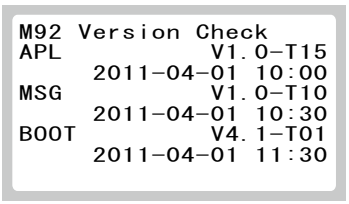
1. Enter into Mode 92.

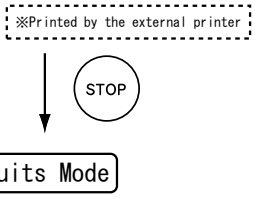


When the process is complete, a beep sounds

2. Display the version information with last updated time and date.
   - » Application ▶ [APL]
   - » Message ▶ [MSG]
   - » BootLLoader ▶ [BOOT]

   NOTE: If the external printer is connected, the data can be printed.



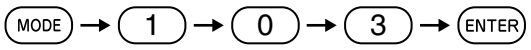


3. Press **STOP** to quit the mode operation.

6.2.28 Mode 103 – Displaying Temperature and Humidity <Normal>

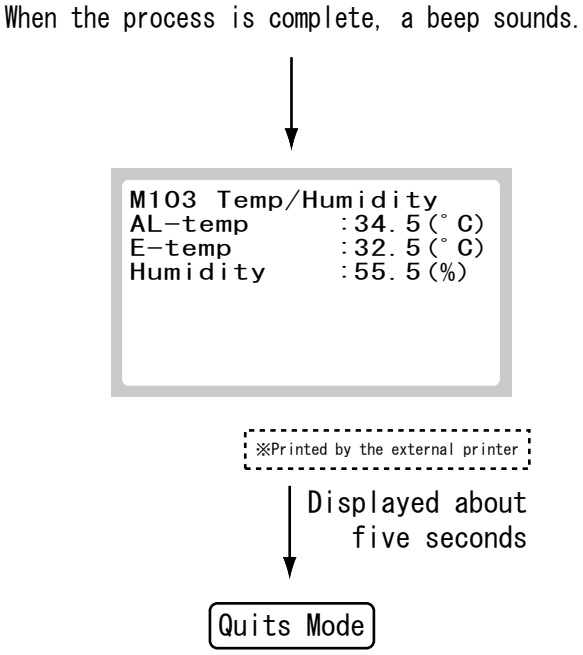
This mode is used to display environmental temperature and humidity (inner body).

1. Enter into Mode 103.



2. After the temperature and humidity are displayed about two seconds, the analyzer quits the mode operation.
   - » AL-temperature ▶ [AL-temp]
   - » Temperature ▶ [E-temp]
   - » Humidity ▶[Humidity]

NOTE: If the external printer is connected, the data can be printed.



7.1 USB Memory

The USB memory is used when the programs of the equipment are upgraded by the technical support (dealer).

NOTE: Do not insert the USB memory into the analyzer.

7.2 Data Communication

The equipment can transmit test results to the host computer or PC which has already been approved by IEC/UL60950–1.

NOTE: Do not connect the equipment 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 a cable to receive data. When using this function for the first time, contact technical support for assistance.

8.1 Specifications and Standard Accessories

8.1.1 Specifications

Detection method:	SPF Excitation 658 nm/fluorescence 690 nm
Light source:	LD 35 mW
Reagent cartridge:	Proprietary reagent cartridge, 1 item/cartridge
Processing capacity:	1 cartridge batch process, 11 minutes/cartridge
Required sample volume:	100 uL (dead volume for sample tubes 0.5 mL: 50 µL)
Recordable data volume:	100 test results
Cartridge information:	Information such as item, expiration date, or coefficients added to a cartridge is read out at every measurement.
Display:	VFD, 21 characters, eight lines
Warming up time:	Approximately 10 minutes after turning the power on.
Environment conditions:	Indoor use, Below 6000 lux, Below 3000 lux when using the sample barcode reader. Operating temperature 59 to 86°F (15 to 30˚C). Temperature change during measurement must be within 5°F (3°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:	Single phase AC100 – 240 V±10%, 50–60 Hz
Consumption current:	2.0–0.9 A
Sound level:	Under 70 dB (includes beep sound)
Data transfer:	RS–232C interface (1 port) or USB interface (2 port)
External dimensions:	9.4" (w) × 12.8"(d) × 12.2" (h) [238 (w) × 326 (d) × 310 (h) mm]
Weight:	15 lbs (7 kg)
Durability period:	6 years (after installation) (This period is valid as long as the precautions for use are followed and regular periodic maintenance is performed correctly.)

8.1.2 Standard Accessories

O-ring:	2
Spacer Kit	1 set
Analyzer Check Tool	1
Tray	1
Fan Cover	1
Power Cable	1
Installation Quick Guide	1
User Manual	1
AUTO TIPS	1 set (96 tips)
PLAIN TUBE 0.5 mL	1 set (50 tubes)
PLAIN TUBE 1.5 mL	1 set (50 tubes)
AC Power Cable	1

8.2. Consumables

For purchasing consumables listed below, please contact Heska at 800.464.3752, option 1.

8.2.1 Consumables

Accessories	Package
*DRI-CHEM AUTO TIPS	96 tips
HEPARIN TUBE 1.5 mL	500 tubes per box
HEPARIN TUBE 0.5 mL	500 tubes per box
*PLAIN 1.5 mL	500 tubes per box
*PLAIN 0.5 mL	500 tubes per box
*O-ring	1

*Parts packed with the equipment.

NOTE: Specifications and capabilities are subject to change without notice.

9.1 Glossary of the Display & 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
avg	average
BCC	Block Check Character
cal	calibration
CM	colorimetric
coeff	coefficient
com	communication
ctrl	control
dil	dilution
dilspl	diluted sample
dir	direction
ERR	error
exp	expiration
incu	incubator
info	information
mt	motor
NG	No Good
OD	Optical Density
pos	position
prs	pressure
ref	reference
rot	rotation
spl	sample
std	standard
temp	temperature
vert	vertical
VRC	Vertical Redundancy Check

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