

# element **DC5X**

Veterinary Chemistry Analyzer Product Manual

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Thank you for purchasing the Element DC5X® Veterinary Chemistry Analyzer.

The Element DC5X Veterinary Chemistry Analyzer (henceforth, the Element DC5X Analyzer) is an in vitro diagnostic medical device for veterinary hospital use, to analyze blood by colorimetric end-point, rate and ISE tests, using the DRI-CHEM SLIDES.

Before using this instrument, please read this manual carefully to follow the precautions so that you can operate it correctly.

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## 1.1 Cautions and Warnings Used in this Manual

This section contains the safety precautions that must be followed for safe operation of the Element DC5X Analyzer. Before using this analyzer, please read this section carefully and follow the precautions given so that it may be operated correctly.

The following section lists the meaning of precautions (marks) used in this manual.

 **WARNING** indicates hazardous situations that may lead to serious injury, death, or the transmission of infectious agents if the precaution is not followed.

 **CAUTION** indicates hazardous situations that may lead to minor injury, moderate injury, or physical damage if the precaution 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 Operating Cautions

 **CAUTION**

Before using this instrument, please read this *Product Manual* carefully so that you can operate the analyzer correctly.

 **CAUTION**

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

 **CAUTION**

This analyzer is an *in vitro* diagnostic medical device for veterinary hospital use.

Intended use of this equipment is to quantitate the concentration or the activity of the components in blood by using the DRI-CHEM SLIDES. Do not use the equipment for other purposes.

 **CAUTION**

This analyzer is to be operated only by personnel appropriately trained for its intended use and correct operation.

 **IMPORTANT**

Use consumables on or before their listed expiration date.

## 1.3 Biohazards and Disposal

 **WARNING**

Used consumables such as measured slides, tips, mixing cups, sample tubes and cotton swabs and cloths used to clean the equipment are infectious waste. Process this waste in compliance with any applicable local, state or federal regulations.

 WARNING

When discarding the main unit that may be contaminated with blood samples, follow applicable regulations in your country and dispose of it appropriately.

 WARNING

When handling samples (blood) and performing maintenance (cleaning the analyzer), always follow biohazard procedures (wear gloves, a lab coat, and safety goggles) in accordance with the sample handling rules of your facility. If the sample is accidentally touched, immediately rinse the contaminated area thoroughly under running water and disinfect.

## 1.4 Warnings Regarding Explosives

 WARNING

Do not use flammable and explosive gas around the equipment.

## 1.5 Warnings Regarding Electric Shock

 WARNING

The voltage supplied to the equipment is AC 100–240 V. To avoid electrical shock, observe the following precautions.

- Avoid installation locations in which water may splash on the equipment.
- Plug the power cable into an outlet with a grounding receptacle. Electrical shock may occur if the equipment is not grounded to a protective earth.
- Make sure that all cables have been properly connected.

 WARNING

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

## 1.6 Electromagnetic Compatibility (EMC)

**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 so the device will perform as intended.

This equipment conforms to the following emission and immunity requirements:

- IEC 61326–2–6:2012 (Class B)
- EN 61326–2–6:2013 (Class B)
- IEC 61326–2–6:2005 (Class B)
- EN 61326–2–6:2006 (Class B)

This analyzer has been designed and tested to CISPR 11 Class B. In a domestic environment it may cause radio interference, in which case, you may need to take measures 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), as these may interfere with the proper operation.

If this equipment does cause harmful interference to other devices, which can be determined by tuning 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 which generate and can radiate radio frequency energy near the Element DC5X Analyzer. Otherwise, physical damage or malfunction on the Element DC5X Analyzer may occur.

## 1.7 Caution Regarding Moving Parts

 WARNING

Do not place your fingers near moving parts (sampler and sample disk) when operating the equipment, including during maintenance.

Also use care and do not get your fingers, hair, clothing, or accessories caught in moving parts.

 WARNING

During sample processing, ensure the sampler cover is closed to prevent injuries and biohazards. If your finger touches a tip that has sample inside, the sample may spill out from the tip. When the display reads [Ready to test], the sampler cover can be opened.

## 1.8 Installation Locations

 WARNING

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

 CAUTION

Avoid the following installation sites.

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

1. Install the equipment in the following environmental conditions.

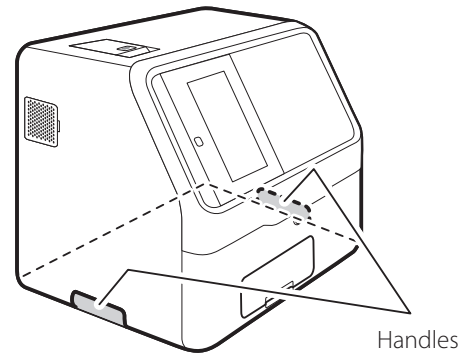
Installation environment:	Indoor use (do not expose to direct sunlight)
Illumination:	6,000 cd/m <sup>2</sup> (lux) or less (3,000 cd/m <sup>2</sup> (lux) or less when using the sample barcode reader)
Atmospheric pressure:	810 hPa or more, equivalent altitude 6,562 ft (2,000 m)
Transient overvoltage category:	II
Pollution degree:	2
Operating temperature:	59°F–89°F (15°C–32°C)
Operating humidity:	30% RH–80% RH (no vapor condensation)

2. Use the equipment under the following electrical specifications.
 

Power supply voltage:	Single phase AC 100–240 V $\pm$ 10%
Frequency:	50 to 60 Hz
Consumption current:	3–1.3 A
Type of protection against electrical shock:	CLASS 1 EQUIPMENT
3. Use an independent outlet separate from other equipment.
4. At least 4 inches (10 cm) of clearance is required on all sides of the analyzer.
5. Unplug the equipment from the AC outlet if it will not be used for an extended period of time.

**⚠ CAUTION**

Hold the handle of the device when lifting or moving it.



**⚠ CAUTION**

- When moving the device to another installation location, remove all slides, samples, diluent, reference fluid, mixing cups, tips, and other consumables beforehand.
- Do not set the device on its side or upside down while moving it.
- Place the device on a flat and stable stand.
- When the device is subject to vibrations, such as when being moved by vehicle, it is necessary to secure the moving parts within the device. Contact Heska Technical Support Services.

Failure to observe these precautions may result in unexpected errors or equipment malfunctions.

## 1.9 Measurement Results

**i IMPORTANT**

Make a diagnosis in a comprehensive manner, considering other relevant test results or clinical symptoms.

**i IMPORTANT**

When an equipment problem (error) appears before or during measurement, or a warning appears in the measurement results, the measurement results may not be accurate. Refer to *Section 7: Troubleshooting*, and then rerun the measurement.

## 1.10 DRI-CHEM Slides

**NOTE:** For the remainder of the manual, DRI-CHEM Slide is shortened to “slide”.

**i IMPORTANT**

- The slides should be stored in a refrigerator still wrapped to avoid humidity, light, and heat.
- Remove the required number of slides from the refrigerator, and allow them to reach room temperature before unwrapping and using them.
- Complete the measurement within 30 minutes after unwrapping the individual package.

- Do not touch either the center part of the surface or back of a colorimetric test slide.
- Do not touch the thread bridge part of an electrolyte slide.
- Do not scratch the identification information on the back of a slide.
- Do not reuse a slide.

**NOTE:** Slide packages and containers for liquids such as reference fluid may change without notice.

## 1.11 QC Card System

1. A QC card is packed together with CM (Colorimetric) slides in the same box. Before using a new lot of CM slides, read the QC card using the card reader.

The analyzer can record up to 5 lots per test, so you can mix and use slides of different lots. Store the read QC card in the box it came in until the accompanying lot of slides has been used up.

**NOTE:** When QC information exceeds 5 lots, the oldest QC information is deleted. Slides without QC information cannot be measured.

2. A QC card contains the slide test name and the correction coefficient corresponding to the manufacturing number (lot). Always use slides from the same box.

## 1.12 Sampler Cover

### WARNING

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

## 1.13 DRI-CHEM AUTO TIPS, Sample Tubes and DRI-CHEM MIXING CUPS

**NOTE:** In this manual, DRI-CHEM Auto Tips may be shortened to “tip”, Sample Tube to “tube”, and DRI-CHEM Mixing Cups to “mixing cup”.

The Element DC5X Analyzer performs sample application automatically. However, it is necessary to load the tips, samples, tubes and mixing cups designed for use with the Element DC5X Analyzer. The sample tubes include the following types:

- HEPARIN TUBE 1.5 mL (green cap)
- HEPARIN TUBE 0.5 mL (green cap)
- PLAIN TUBE 1.5 mL (red cap)
- PLAIN TUBE 0.5 mL (red cap)

### IMPORTANT

Always use new tips, sample tubes and mixing cups for each sample. Do not reuse old ones.

### IMPORTANT:

When the power is shut off during test processing, such as by a power outage, replenish tips and replace mixing cups. The analyzer may lose the information of the usage positions of the consumables and use used mixing cups.

## 1.14 Light Source Lamp

 CAUTION:

The light source lamp gets very hot. Before replacing the lamp, turn the power off, wait at least 5 minutes, and then check that the lamp has cooled.

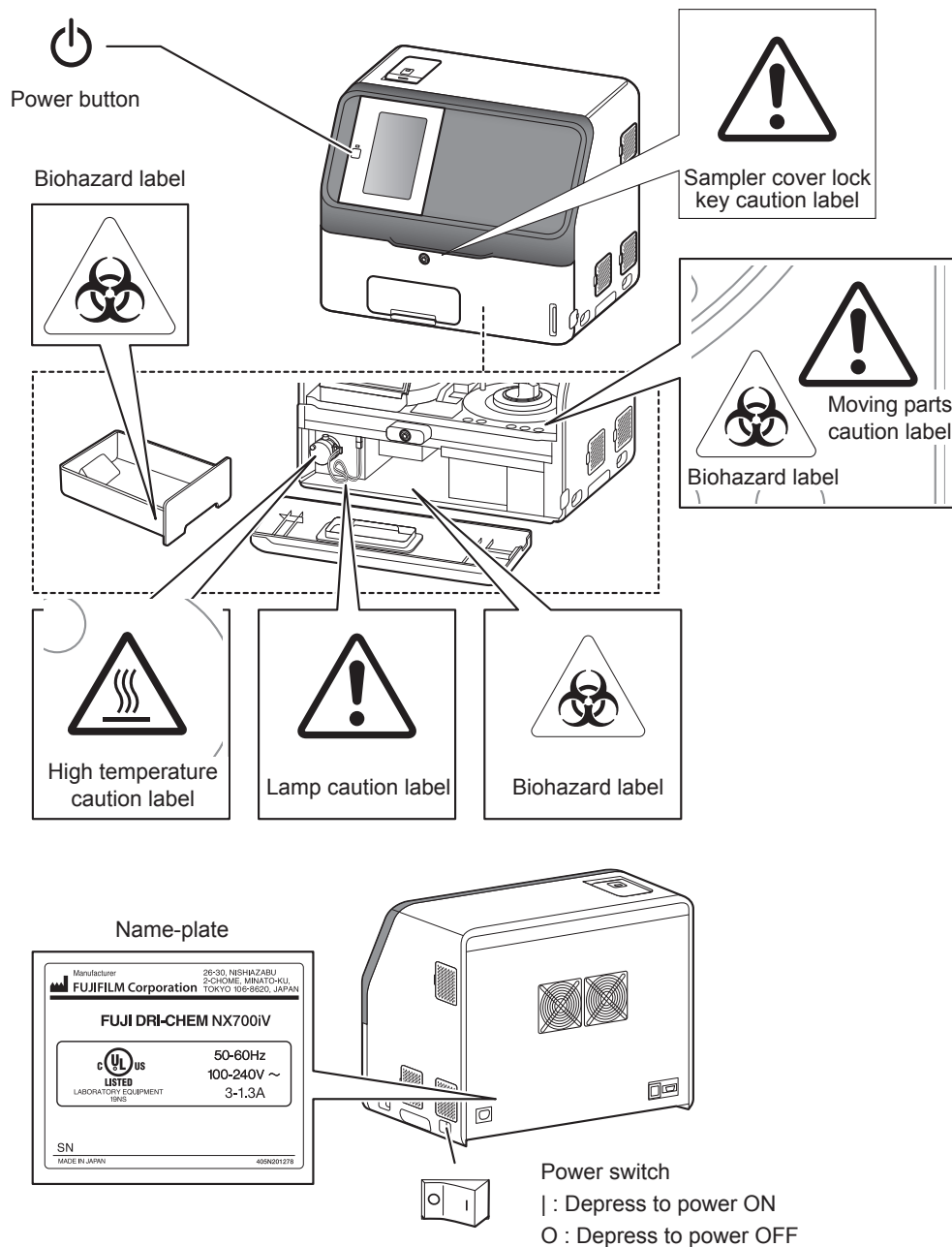
1. The light source lamp is a precision halogen lamp. Do not touch the glass surface of the lamp with your bare hands.
2. The lamp is a consumable with a lifetime. Always keep a spare lamp on hand in case the lamp burns out.

## 1.15 Recording Paper

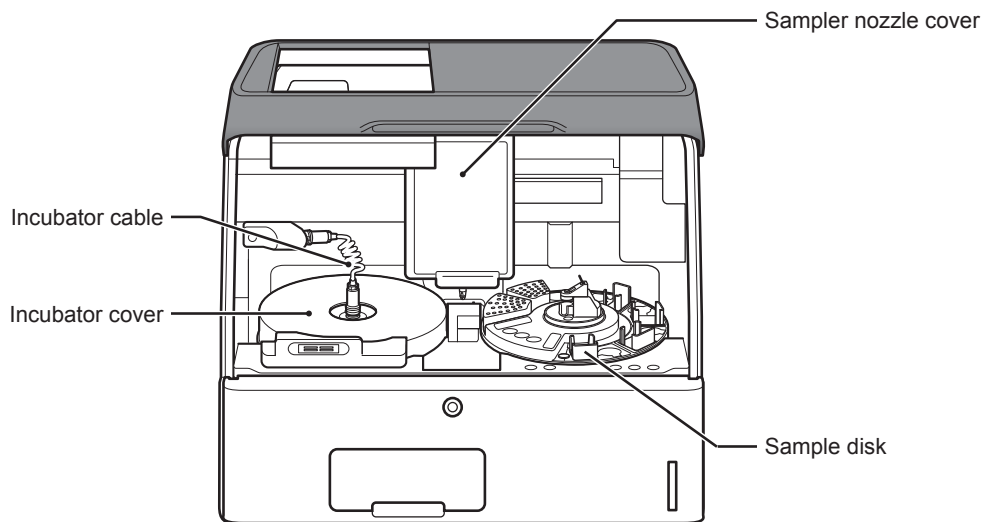
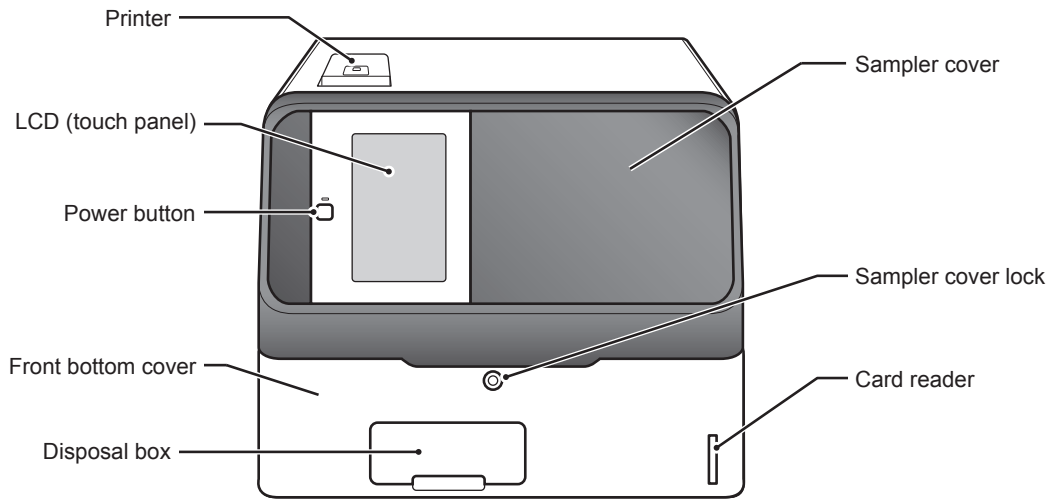
1. Use specified recording paper for the Element DC5X Analyzer.
2. If other recording paper is used, the printer head section may be damaged.

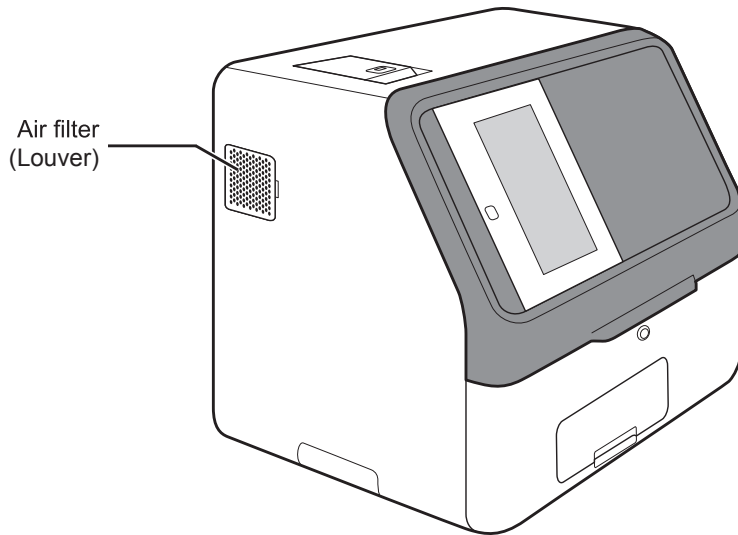
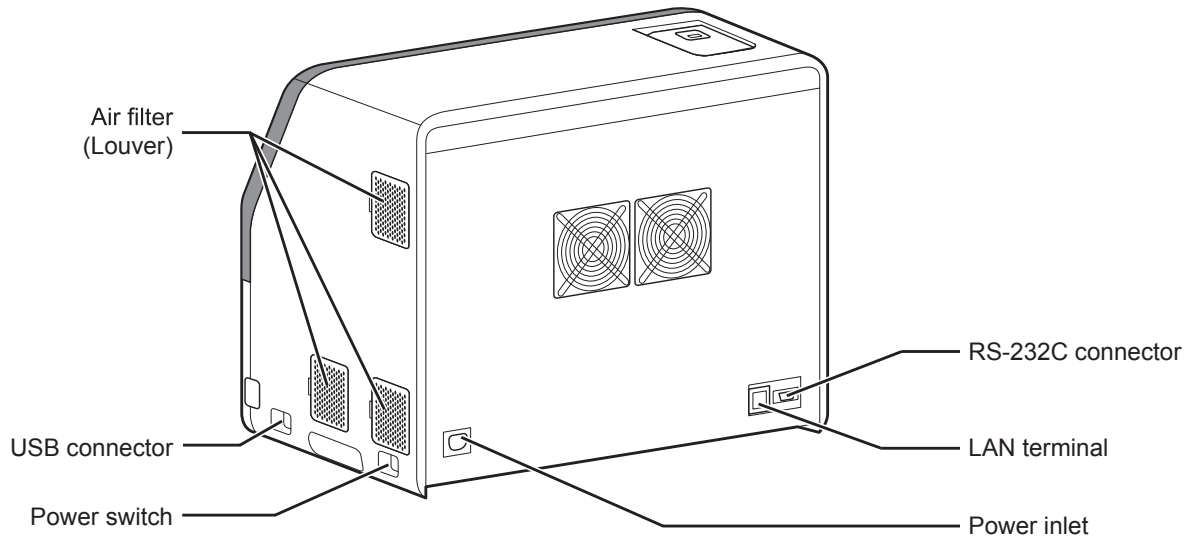
## 1.16 Labels

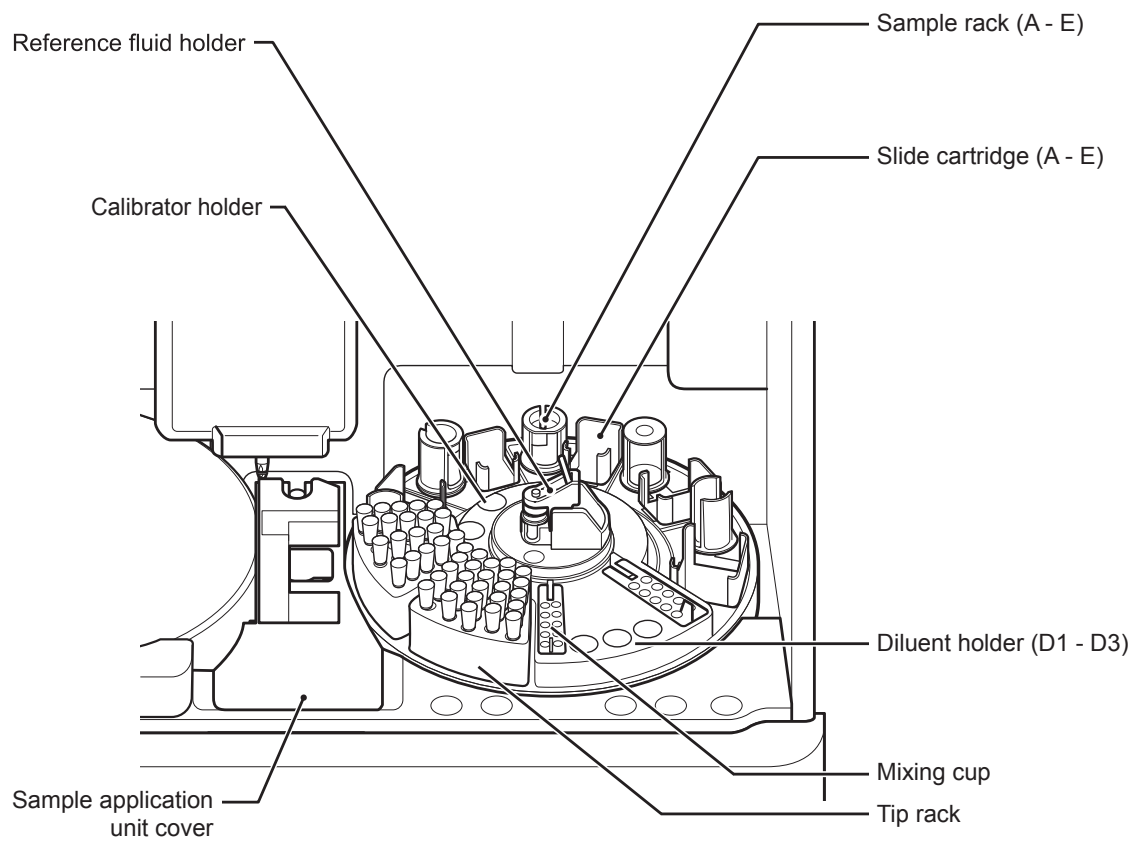
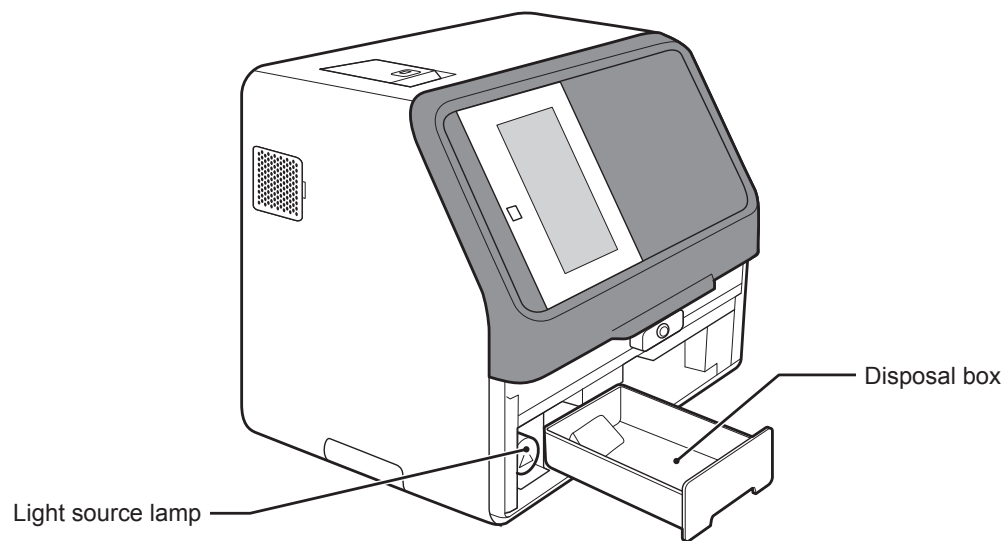
The following safety labels are affixed to the Element DC5X Analyzer.



2.1 Part Names

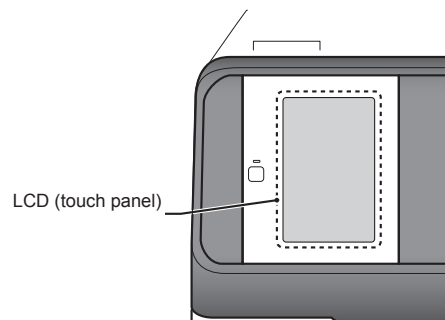






## 2.2 Touch Panel Screen Names and Functions

On the Element DC5X, the touch panel is used to perform configurations, run measurements, confirm measurement results and messages, and perform other operations. Because a pressure-sensitive touch panel was employed, the screen can be operated while wearing gloves.

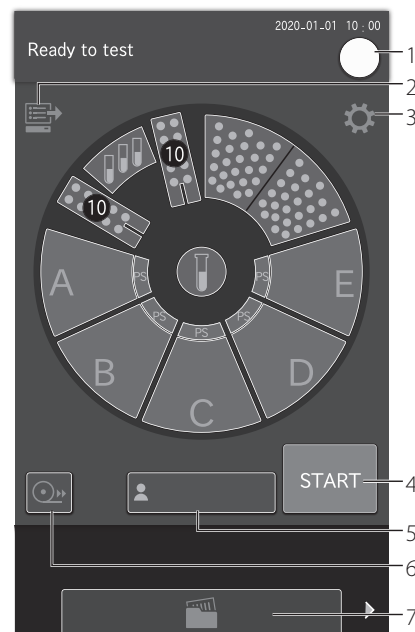


### 2.2.1 Measurement preparation screen

If the power is switched on, the Measurement preparation screen appears after startup.

#### Buttons

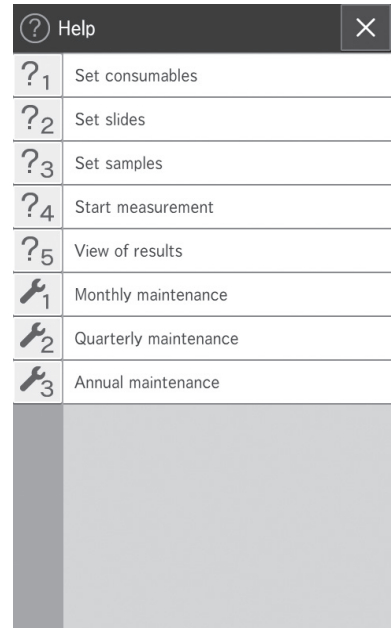
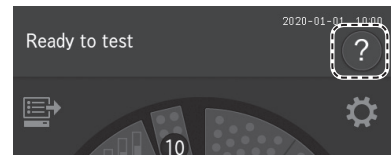
1. HELP button  
Display the help screen. *Section 2.2.2*
2. WORK LIST button  
Obtain order information from the host PC. *Section 4.4.*
3. Function menu button  
Display the function menu screen. *Section 8*
4. START button  
Start a measurement.
5. OPERATOR ID button (displayed according to settings)  
If touched, you can enter the operator ID. *Section 8.4.16*
6. PRINT button  
Print all measurement results of the displayed sample.
7. PAUSE button (displayed during sample application operation)  
If the PAUSE button is touched during sample application, tips are discarded, operation stops, and the equipment enters a paused state. If PAUSE is touched again, the subsequent sample applications are terminated.
8. MEASUREMENT RESULTS button  
Display the measurement results. *Section 3.4*
9. Mixing cups  
Displays the number of remaining mixing cups. Touch to load mixing cup. *Section 5.3*
10. Diluent  
Touch to load diluent. *Section 5.4*
11. Reference fluid display  
Touch to load reference fluid. *Section 5.5*
12. Tips  
Touch to load tips. *Section 5.2*
13. Sample racks (A–E)  
Touch sample rack and the sample information registration screen of that rack is displayed. *Section 3.3*





## 2.2.2 HELP screen

During measurement, maintenance, consumable exchange, and other actions on the Element DC5X Analyzer, the **?** may be touched on the Measurement preparation screen to check the procedures.

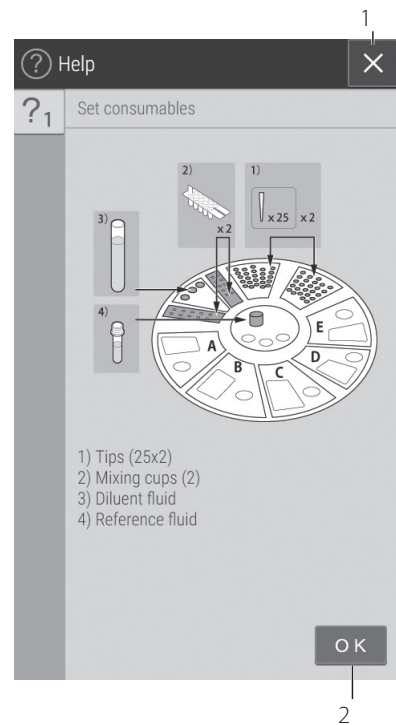


### 1. X button

Touch and the Measurement preparation screen appears.

### 2. OK button

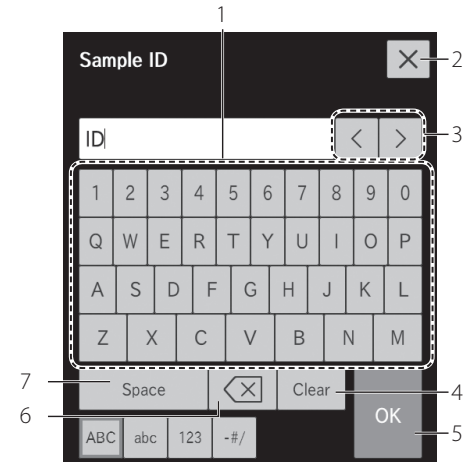
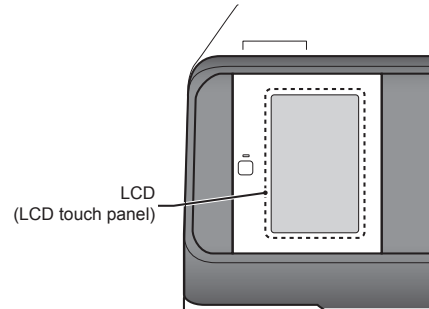
Touch to return to the previous screen.



## 2.3 Names and Functions of Software Keyboard Screens

When data entry for operations and configurations is necessary, the software keyboard appears on the LCD automatically. Enter alphanumeric characters and symbols.

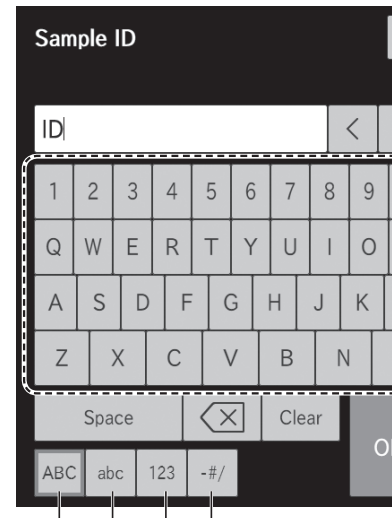
1. Alphabetical characters, numbers and symbols.  
Enter alphabetical characters, numbers and symbols.
2. X button  
Delete all entered characters, and then quit keyboard entry.
3. MOVE CURSOR buttons  
Move the position of the cursor left or right by one character.
4. CLEAR button  
Delete all entered characters.
5. OK button  
Confirm the entered characters.
6. BACKSPACE button  
Delete the character to the left of the cursor.
7. SPACE button  
Enter a space of one single character width.



Change the entry screen by using the ABC, abc, 123, or -#/ button.

When the ABC button is selected

8. ABC button  
Display the entry screen for uppercase alphabetical characters and numbers.



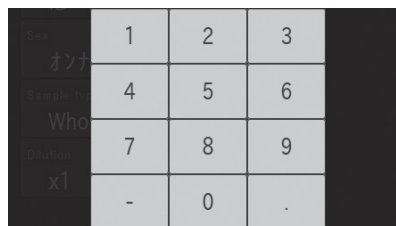
9. abc button

Display the entry screen for lowercase alphabetical characters and numbers.



10. 123 button

Display the entry screen for numbers, decimal (.) and minus symbol (-).



11. - # / button

Display the entry screen for symbols and numbers.



## 2.4 Accessories

AC power cable	1
Recording paper	2
Slide cartridge	5
Slide weight	5
Light source lamp	1
O-ring	4
Tip rack	2
Sample rack (TUBE 1.5 mL type)	5
Sample rack (TUBE 0.5 mL type)	5
Sampler leak check tool	2
DRI-CHEM Auto Tips	1 case
PLAIN TUBE 1.5 (1.5 mL type)	1 pk
PLAIN TUBE 0.5 (0.5 mL type)	1 pk
DRI-CHEM Mixing Cups	1 pk
Key (for sampler cover)	2
Installation method	1

The requirements of the cable specifications for the Element DC5X Analyzer.

Power voltage:	100 V–120 V
Requirements for the plug/connector:	AC 125 V, 10 A
Requirements for the cable:	SVT 3/18 AWG 140°F (60°C)
Power voltage:	200 V–240 V
Requirements for the plug/connector:	AC 250 V, 10 A
Requirements for the cable:	GTCE–3 1.0 mm <sup>2</sup> 158°F (70°C)

**NOTE:** The AC power cable is required to be in compliance with any applicable regulations in your country.

**NOTE:** Do not change AC power cable to in appropriate one.

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

## 2.5 Consumables and Optional Accessories

To purchase the consumables or optional accessories listed below, please contact your dealer.

### 2.5.1 Consumables

Accessories	Package/unit
* DRI-CHEM Auto Tips	96 tips/box
Sample Tubes:	
HEPARIN TUBE (1.5 mL)	500 × 1 box
HEPARIN TUBE (0.5 mL)	500 × 1 box
PLAIN TUBE (1.5 mL)	500 × 1 box
PLAIN TUBE (0.5 mL)	500 × 1 box
*Recording paper	3 rolls × 1 pkg
*Light source lamp	1
*O-ring	4
*DRI-CHEM Mixing Cups	50 × 1 box

**NOTE:** Parts names marked with "\*" are the same parts packed with the Element DC5X Analyzer.

### Chemicals

DRI-CHEM CONTROL QN

DRI-CHEM REFERENCE FLUID RE

**NOTE:** Types of packages or containers for consumables are subject to change without notice.

## 2.5.2 Optional accessories

Name	Package/unit
*Slide cartridge	1
*Slide weight	1
Sample barcode reader	1
*Sample rack kit	1



### CAUTION

The sample barcode reader specified for the Element DC5X Analyzer can be used.

Do not connect a barcode reader other than specified for this analyzer. Otherwise, physical damage or danger of fire may result.

**NOTE:** Parts names marked with "\*" are the same parts packed with the Element DC5X Analyzer.

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

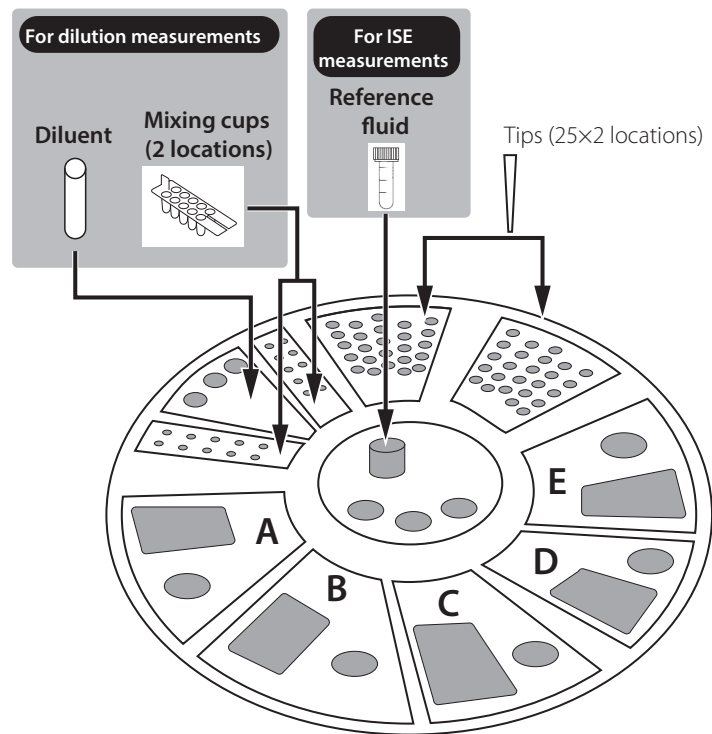
### 3.1 Operation Overview

On the Element DC5X Analyzer, first load the consumables and other items to prepare for measurement (Step 1), and then perform the actual measurement (Step 2).

#### Step 1 – Measurement preparation

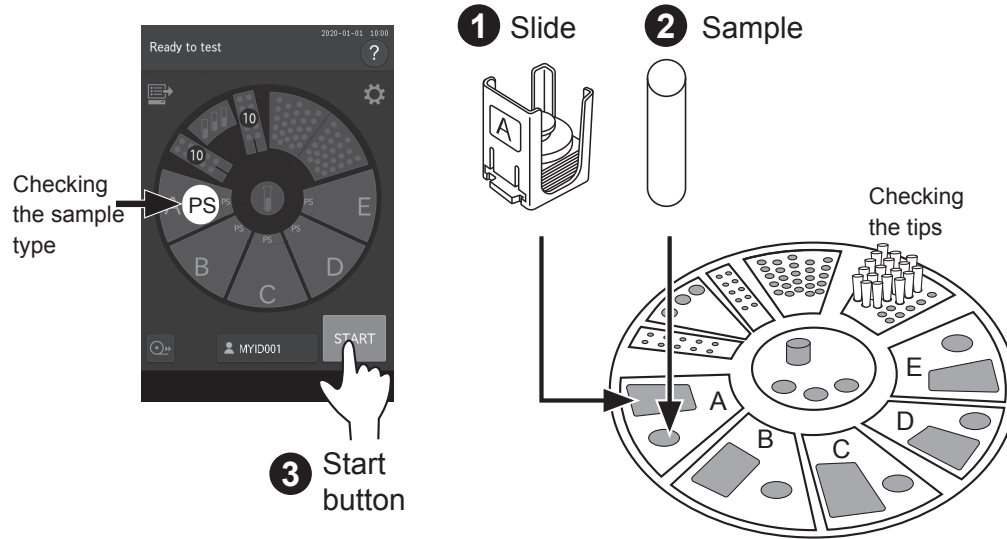
- Cleaning the disposal box
- Checking the recording paper
- Starting the Element DC5X
- Checking the date and time

#### Loading consumables



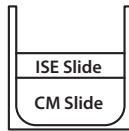
## Step 2 – Measurement

### Basic measurements



Slide set order

•To test CM and ISE slide



Checking the measurement results.



Ending measurement.

## 3.2 Measurement Preparation

### Cleaning the disposal box

1. Remove the disposal box and dispose of the tips and slides.
2. Use isopropyl alcohol to disinfect the waste drawer.

#### IMPORTANT

If the disposal box is full, a slide transfer error or tip disposal error may occur, which may negatively affect the measurement values.

#### IMPORTANT

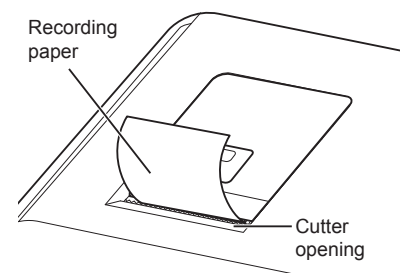
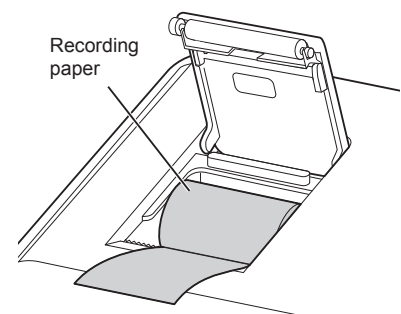
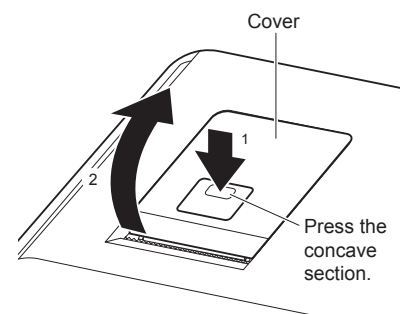
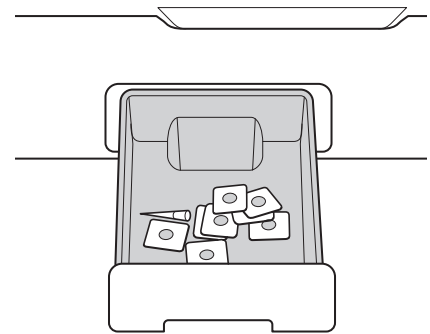
After emptying the disposal box, be sure to load the disposal box. If the analyzer is used without the box, the measurement results may be negatively affected.

### Checking the recording paper

1. Press the area shown in the illustration to release the lock (1), and then lift up the cover (2).

2. Check the remaining recording paper (FUJI thermal paper). If the recording paper is short for the measurement, replace the old roll with a new one.

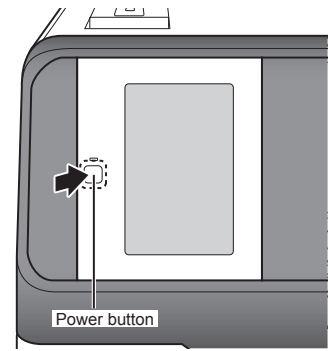
**NOTE:** Before closing the cover, pull out the edge of the recording paper.



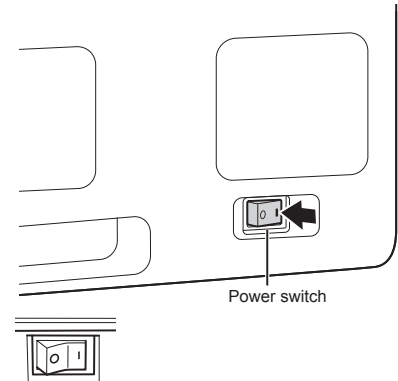


## Starting the Element DC5X

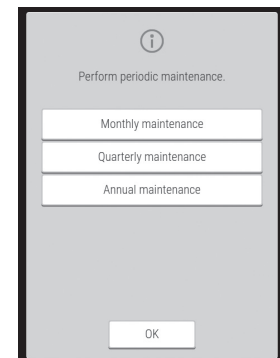
1. Press power button.



**NOTE:** If the power switch is not in the ON position, press the switch to the "I" side.



**NOTE:** The listing to the right is displayed during start-up once a month. Perform the periodic maintenance listed in *Section 6*.



## 2. Checking the date and time

Check that the date and time displayed on the LCD are correct.

If they are incorrect, set the date and time using [Date & Time settings] in Normal mode. *Section 8.3.1*

### IMPORTANT

If the date and time are not adjusted correctly, the analyzer may fail to determine the expiration of the slides and calibration, and measurement results might be incorrect.

## 3. Loading consumables

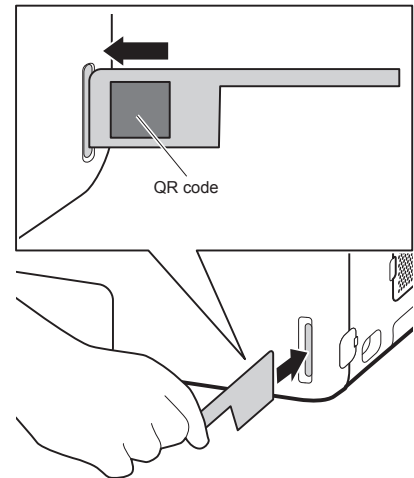
Load the consumables (tips, mixing cups, diluent, and reference fluid) in accordance with the type of measurement. *Section 5.*

## 4. Reading a QC card

The Element DC5X Analyzer can compensate for the differences of the slide production lots by reading the QC card in the box of slides.

When [Warming up] or [Ready to test] appears on the LCD, set the QR code on the left side, and then insert the QC card into the reader fully. *Section 3.9*

**NOTE:** If the QC card is dirty or folded, the read error may occur.

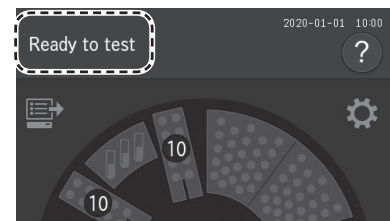


## 3.3 Basic Measurements

**NOTE:** By default, this analyzer switches off the light source lamp to save lamp life when the analyzer has not been used for the time configured under [Lamp management] in Normal mode. When the lamp is off, the screen is dark. Touch the LCD to warm the lamp.

### 1. Checking the LCD

Make sure [Ready to test] appears on the LCD.



## 2. Setting tips

Open the sampler cover, and then check the tip racks have been loaded with tips. When there are not enough tips, touch the tip display on the LCD to display the replacement screen, and then load the tips.

For details of the loading method, refer to *Section 5.2*.

## 3. Loading samples and slides

### WARNING

When handling samples (blood), always follow biohazard procedures (wear gloves, a lab coat, and safety goggles) in accordance with the sample handling rules of your facility. If you accidentally touch a sample, immediately rinse the contaminated area thoroughly under running water and disinfect.

- a.. Open the packaging of the slides to be used.

### IMPORTANT

After the package has been unwrapped, finish measurement within 30 minutes.

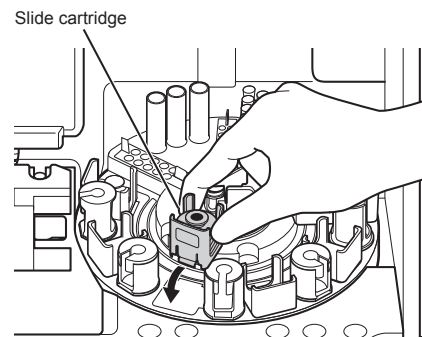
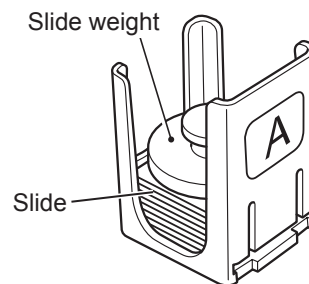
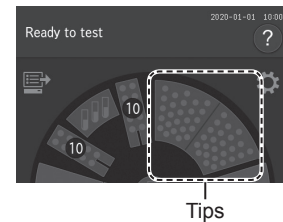
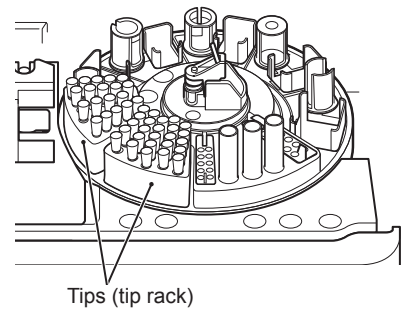
- b. Remove the slide cartridge of the sample position to be measured from the sample disk.
- c. Place slides to be measured in the slide cartridge with the test name facing up. Be sure to put the slide weight on top of the stacked slides.

**NOTE:** ISE slides must be loaded with arrows up and pointing towards the center of the carousel.

**NOTE:** Take out the necessary number of slides from the refrigerator, allow them to reach room temperature, and then open each package.

**NOTE:** ISE slides should be loaded first in the slide cartridge. Including ISE slides, a maximum of 20 slides can be loaded.

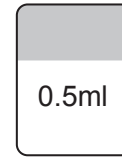
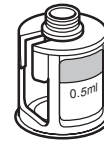
- d. Place the slide cartridge back into its designated position.



e. Make sure the sample rack and sample tube size match.

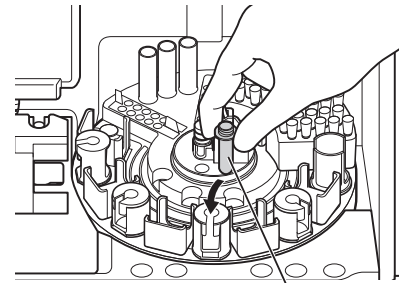
**NOTE:** To avoid a suction error or malfunction, use a sample tube that matches the label on the sample rack.

**NOTE:** Refer to *Section 3.8* for sample tubes that can be used.



f. Remove the cap of the sample tube that contains sample and then place it into the specific sample rack.

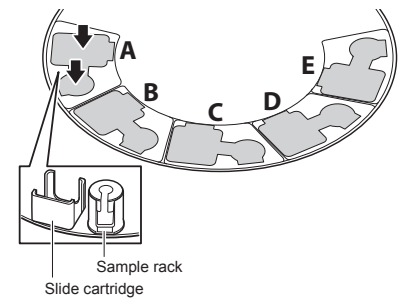
**NOTE:** Make sure there are no bubbles in the sample in the sample tube. Use a centrifuge to remove bubbles.



Blood collecting tube  
or FUJI Sample Tube

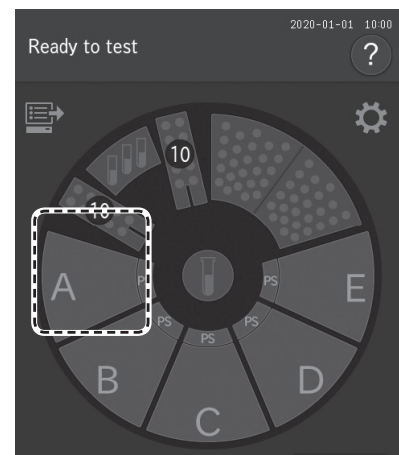
**i** IMPORTANT

Be sure the sample and its measurement slides are in the correct positions.



4. Registering sample information.

Touch a sample rack position to display the sample information registration screen.



Enter or select the sample information (sample number, sample ID, reference standard, and sample type), and then touch **OK** (button 7).

1. If desired, enter the sample number using the software keyboard.
2. Obtain order information from the host PC if using work lists. *Section 4.4*
3. Enter the sample ID using the software keyboard. *Section 2.3*
4. Select a species (animal) from the list.
5. Sample type should always be plasma/serum.
6. Select a dilution factor from the list, if desired. *Section 3.6 & 8.4.12*
7. Touch **OK**.
8. Cancel entry of the registration information, and then return to the Measurement preparation screen.



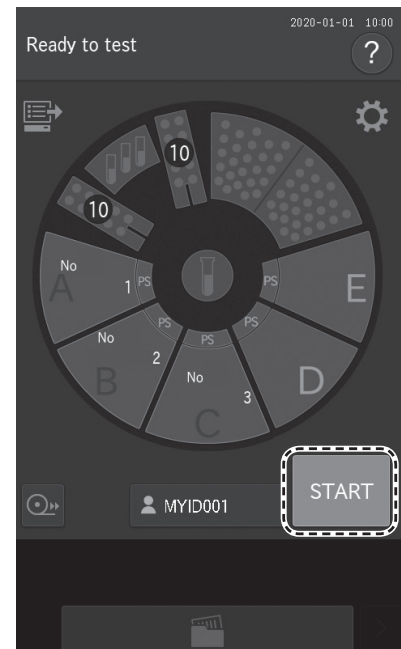
**NOTE:** When the analyzer is connected to a PC, sample information can be acquired automatically from the work list. *Section 4.4.*

5. Starting measurement.
  - Close the sampler cover.
  - Touch **START** to begin measurement.

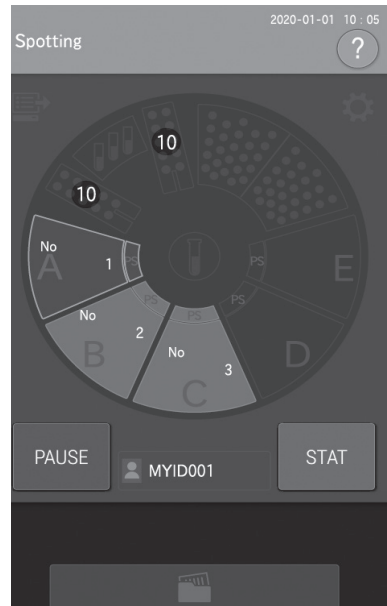
**i** **IMPORTANT**

Close the disposal box. If it is open, the measurement results will be affected.

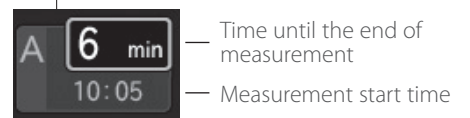
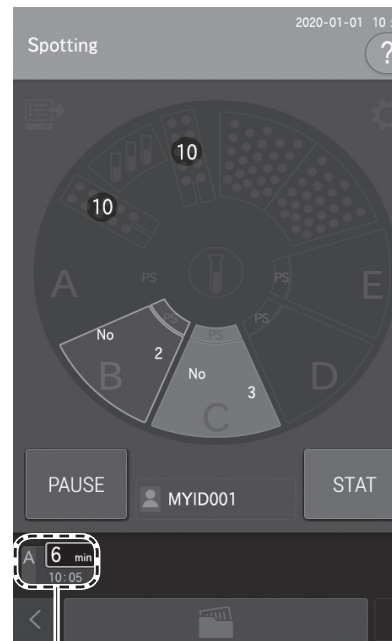
**NOTE:** When starting measurements, the analyzer recognizes the presence of sample racks and slides, and then measures properly loaded samples.




If sample application is started, the sample rack display blinks during sample application.



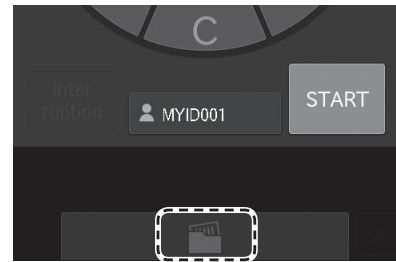
If sample application ends, the sample rack display switches off. When slides and samples have been loaded in multiple sample racks, the next sample rack display blinks orange, and then sample application is started.



6. Checking the measurement results.

After measurement of all samples has ended, touch  and then check the measurement results.

The measurement results are printed in the order that the slides were loaded in the cartridge, if using the internal thermal printer.



To retest (Section 4.3), touch **RERUN**.

**NOTE:** For the details of the measurement result screen. Section 3.4.

7. Ending measurement.

To complete the measurement, open the sampler cover and remove the measured samples.

**NOTE:** When a measurement is not being performed, empty the disposal box as appropriate. The disposal box can hold 150 slides and 75 Auto Tips. Always empty the disposal box before these numbers are exceeded.

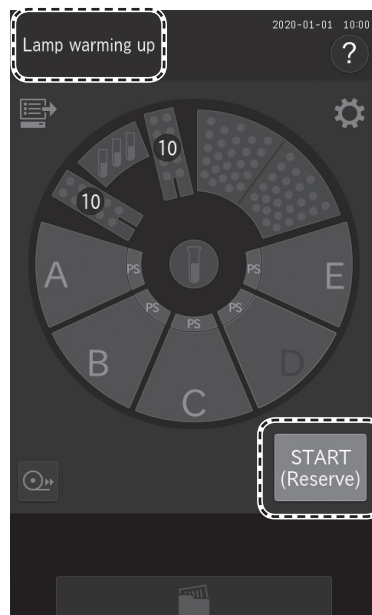


3.3.1 Lamp off and measurement start scheduling

By default, when this analyzer has not been used for 20 minutes while [Ready to test] is displayed on the LCD, it switches off the light source lamp to save lamp life. After the lamp is switched on again, the start of measurement can be scheduled even when [Lamp warming up] is displayed on the LCD.

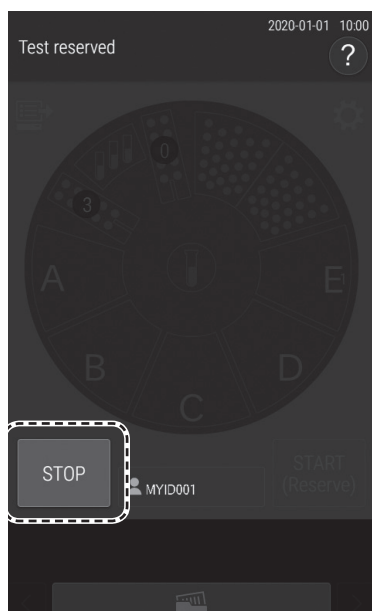
**NOTE:** With dilution measurements (Section 3.6), you can schedule the start of measurement as follows: touch sample rack display to display the sample information registration screen. After configuring the dilution factor in the [Dilution] field, touch **START** [Reserve] on the Measurement-preparation screen.

The touch panel screen becomes darker when the lamp is off. If the screen is touched, the lamp switches on, and [Lamp warming up] is displayed on the LCD.



If measurement is possible, it starts automatically.

**NOTE:** To cancel a scheduled measurement-start, touch **STOP**.

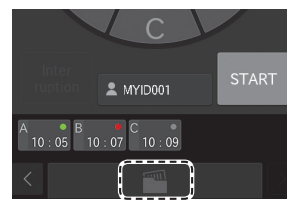
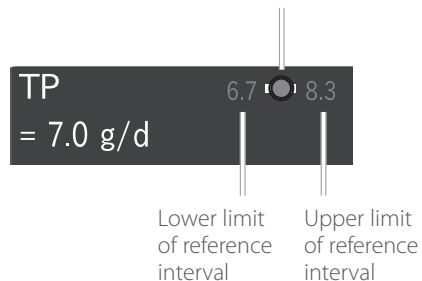


### 3.4 Measurement Results Screen


After measurement has ended, touch , then check results.


#### 3.4.1 Measurement Results display:

- Green: Within reference interval  
Red: Outside reference interval






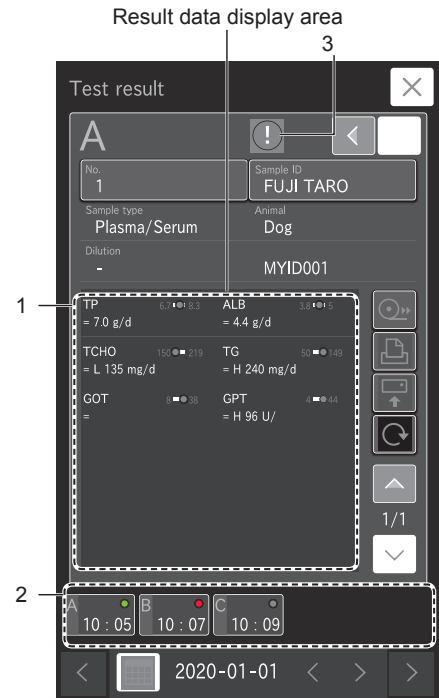
- 

Green: All measurement results are within reference interval
- 

Red: There is a result outside the reference interval

- Measurement results that include a value outside the reference interval are indicated by , and the corresponding test name and value become red. If touched, the details screen appears.

**NOTE:** If measurement items that display H, L, #, or other characters are touched, the details screen appears.



### 3.4.2 Measurement Results screen buttons

1.  button

Close the Measurement results screen, and then return to the Measurement preparation screen.

2. CHANGE SAMPLE NO. button

Change the sample number for which measurement results are to be displayed.

3. FEED button

Feed the recording paper with a fixed amount.

4. PRINT button

Print all measurement results of the displayed sample.

5. SEND button

Send the measurement results of the displayed sample to a PC.

6. RERUN button

Perform the measurement again under the same conditions for sample number, sample ID, reference standard, and sample type. Only the dilution factor can be changed.

*Section 4.2*

7. RESULT DATA scroll button

Change the display of the measurement result data of the slide.

8. Sample No. tab

Touch to display the measurement results of the selected sample number.

9. Sample No. tab scroll button

Change the display of the Sample No. tab. This button is available when five or more samples have been measured.

10. Date scroll button

Change the measurement date.

11. Display calendar button

Display the calendar. If a date within the calendar is touched, the measurement results of that day are displayed.



### 3.4.3 Calendar display

#### 1. Measurement month scroll buttons

Change the display of the calendar month.

#### 2. Date buttons

Display the measurement results screen of a date. The currently displayed date is displayed in blue.

**NOTE:** Dates with no measurements are displayed in gray and cannot be selected.



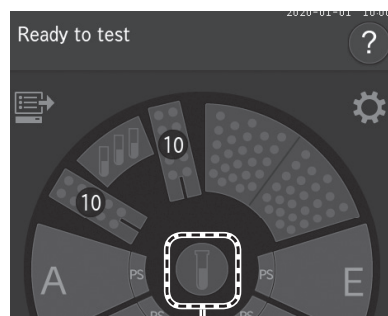
### 3.5 ISE Test Measurements

#### **i** IMPORTANT

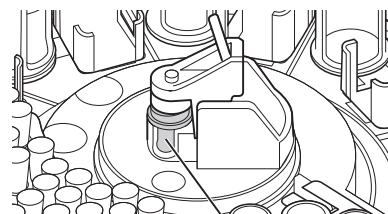
The analyzer cannot detect the expiration of ISE slides automatically. Check that slides are still valid.

**NOTE:** Two tips are necessary for each slide, one for sample, the other for reference fluid.

1. Touch the **REFERENCE FLUID DISPLAY** on the LCD to display the Replacement screen, and then load the reference fluid. When the loading is complete, touch **FINISH** to close the Replacement screen. For the reference fluid tube (Plain tube 0.5 mL or 1.5 mL.), use the tube configured for [Tube setting for diluent & reference fluid] in Mode function for administrator, *Section 8.4.12*. For details of the loading method see *Section 5.5*.
2. Check the sample type setting.  
Make sure sample type is set to Plasma/Serum. *Section 3.3*



**Reference fluid display**



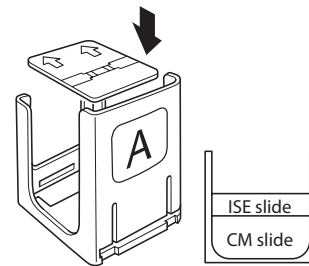
Reference fluid

3. Load samples and slides.

For details of the sample and slide loading method. *Section 3.3.*

**NOTE:** Place an ISE slide with the arrows facing up and pointing opposite the sample label of the cartridge (in this case, "A") as shown in the illustration.

**NOTE:** When you measure an ISE slide and CM slide at the same time, we recommend loading the ISE slide first in the cartridge. *Section 4.4*



4. Close the sampler cover.
5. At the Measurement-preparation screen, touch **START** to begin measurement.

### 3.6 Dilution Tests

There are 2 types of dilution measurement.

- Dilute and measure automatically by using [Dilution setting] in Mode function for administrator to preset dilution factors for each test and sample type. This is not commonly used in veterinary clinics. *Section 8.4.11*
- Dilute and measure all items to be measured by setting a dilution factor for each sample at the sample information registration screen.

The second method at the sample information registration screen is explained in this section.

#### **IMPORTANT**

**If bubbles appear in the tip when diluting a plasma/serum sample, perform the measurement again from the beginning.**

**NOTE:** The results of measurements that included dilution are calculated automatically, so the results can be reported without adjustment.

**NOTE:** The maximum number of dilution measurements from one mixing cup well (hole) is three. When the diluted sample in the well is insufficient, the analyzer automatically dilutes using the next well.

(Example) When diluting Sample A 2x

1. Check the remaining volume of the consumables (tips, mixing cups, and diluent).

If consumables are insufficient, supplement or replace them.

- Loading tips. *Section 5.2*
- Loading mixing cups. *Section 5.3*
- Loading diluent. *Section 5.4*

2. Load samples and slides.  
For details of the sample and slide loading method. *Section 3*
3. Touch **SAMPLE RACK DISPLAY A**. In the Sample information registration screen, touch **DILUTION**.

A screenshot of a sample information registration screen. At the top is a large letter 'A'. Below it are several input fields: 'No.' with the value '1', 'Sample ID' with 'FUJI TARO', 'Animal' with 'Dog', 'Sample type' with 'Plasma/Serum', and 'Dilution' with a hyphen '-'. The 'Dilution' field is enclosed in a dashed white border. At the bottom of the screen are two buttons: 'Delete' and 'OK'.

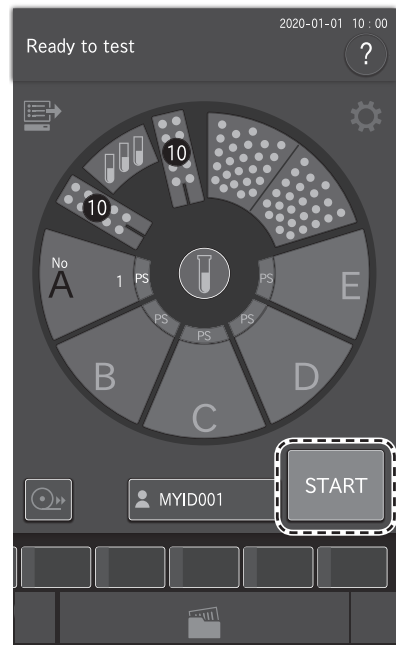
4. In the list, touch x2.
- Dilution is performed according to [Dilution setting] in Mode function for administrator.  
None : No dilution
- NOTE:** If necessary, enter or choose other sample information.



5. Touch **OK** to finish Sample A configuration.
6. Close the sample cover.



- At the Measurement-preparation screen, touch **START** to begin measurement.  
Dilution is performed at the dilution factor specified for each sample.



### 3.7 Powering off the Element DC5X Analyzer

- Make sure that measurement and mode operation are not in progress.

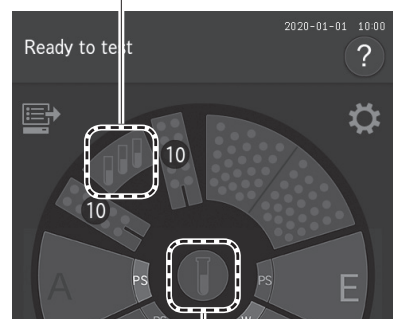
#### CAUTION

Do not switch off the power during measurement or mode operation. Otherwise, the analyzer may malfunction. If the power was shut off during measurement, load tips and other consumables, and then run the measurement again from the start. Always replace mixing cups for dilution measurements.

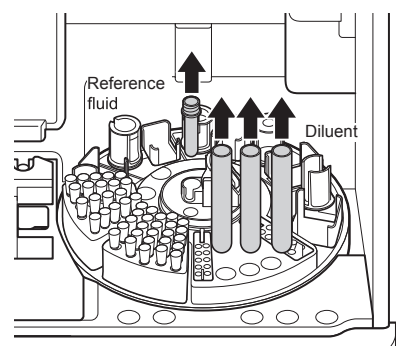
- Remove the samples.
- Touch diluent display or reference fluid display on the LCD to rotate the sample disk, and then remove the diluent and reference fluid from the analyzer.

After removing the items, touch **FINISH** to rotate the sample disk again.

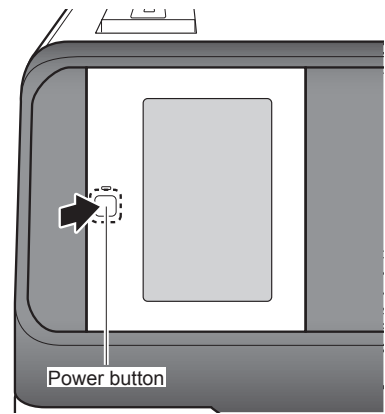
#### Diluent display



#### Reference fluid display

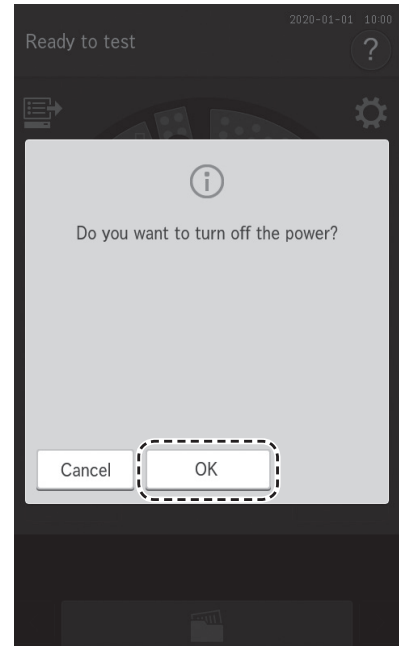


4. Press the power button.



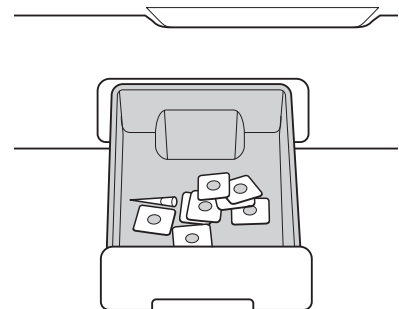
5. Touch OK.

**NOTE:** When the analyzer will not be used for a long time, set the power switch to the [O] side.

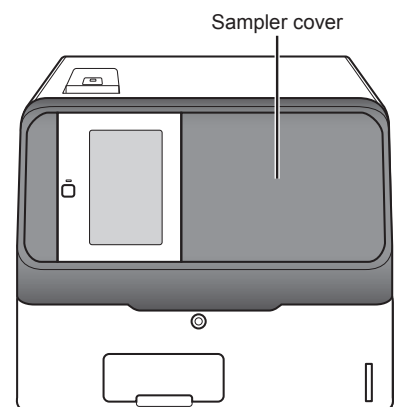


6. Empty the disposal box.

**NOTE:** When disinfecting the disposal box, use alcohol for disinfection.



7. Close the sampler cover.



## 3.8 Sample Tubes for the Element DC5X Analyzer

The following sample tubes can be used on the Element DC5X Analyzer.

- DRI-CHEM Sample Tube; 1.5 mL
- DRI-CHEM Sample Tube; 0.5 mL

### 3.8.1 Blood collection tubes

#### 1. Tube contents and inspection items that can be measured.

The tube contents within a blood collection tube determine which slides are applicable. The following is general information about tube contents and the applicable tests.

Heparin blood collection tubes

- Applicable to all tests. For GLU and  $\text{NH}_3$ , measure the samples as soon as possible after blood collection.
- General color of cap: Green

Plain (no additives or coagulant)

- Applicable to all tests other than  $\text{NH}_3$
- For plasma or serum samples only.
- General color of cap: Red

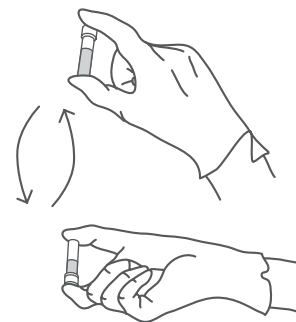
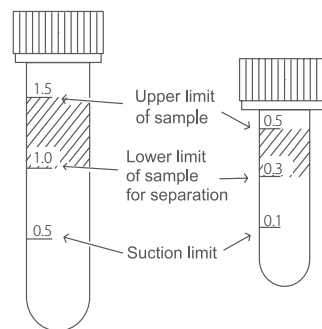
### 3.8.2 Producing samples using sample tubes

#### 1. Obtaining plasma samples.

- Untreated whole blood can be collected and placed directly into heparin tubes (green cap). Whole blood samples already containing lithium heparin from another collection tube can be transferred into non-heparinized tubes (red cap).

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

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

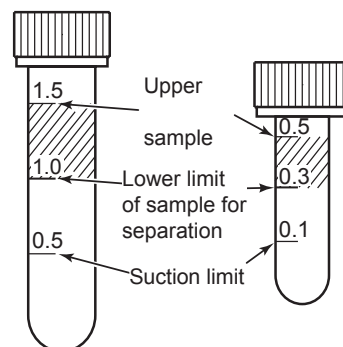


- Put caps on the tubes and mix the contents by rotating them five or six times.
- Centrifuge the samples using a commercially available centrifuge.

#### 2. Obtaining serum samples.

- Collect whole blood samples not processed with anticoagulant into standard glass clinical plain tubes. Allow sample to clot at room temperature for at least 20 minutes (40 minutes for horses).
- Centrifuge the sample using a commercially available centrifuge.
- Transfer the separated serum into a 0.5 ml non-heparinized tube (red cap) and place in the instrument for analysis.

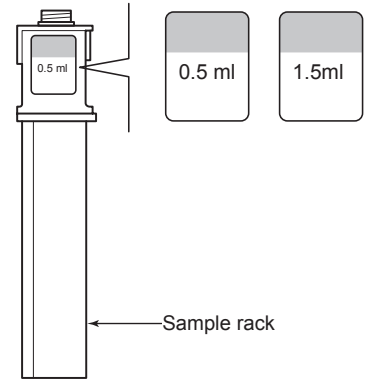
**NOTE:** The top surface of the sample fluid must be within the shaded section of the tubes as shown in the top-right figure. If the serum in the tube is below the suction limit mark, the analyzer will indicate an insufficient sample volume error.





### 3.8.3 Sample racks

A sample rack is specified for each sample tube. Place each sample tube into the specified sample rack.



## 3.9 QC Card System

### Overview

The QC card system compensates for variations between lots of DRI-CHEM slides and ensures uniform performance.

### 3.9.1 Calculation method

A variety of the reference fluids developed for DRI-CHEM slides are measured on each lot of slides.

1. The relationship between the actual measurement values  $X$  ( $x_1, x_2, x_3$ ) and the standard values  $Y$  ( $y_1, y_2, y_3$ ) is expressed by the formula  $Y=c+dX+eX^2$ . The lot compensation coefficients ( $c$ ,  $d$ , and  $e$ ) derived from the formula are used to compensate for variations in  $X$  of each lot.

2. Inputting lot compensation coefficients using a QC card

The lot compensation coefficients are recorded on QC cards, and one QC card is packed with each box of slides. When data is input from a new card, the previously stored lot compensation coefficients are updated. Always read the new QC card when you switch to a new box of slides, because each QC card also contains slide data essential for measurement, in addition to the lot compensation coefficients.

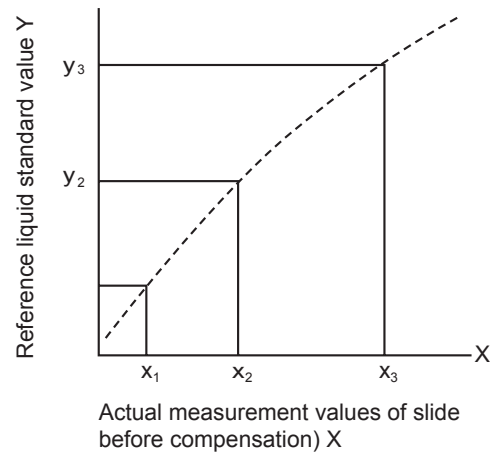
**NOTE:** The "e" values recorded on the QC cards are expressed as  $e \times 10^3$ .

**NOTE:** The analyzer records the QC card information of up to 5 lots for each test. Reading QC cards of more than 5 lots results in deletion of QC information starting from the oldest.

3. Using QC cards.

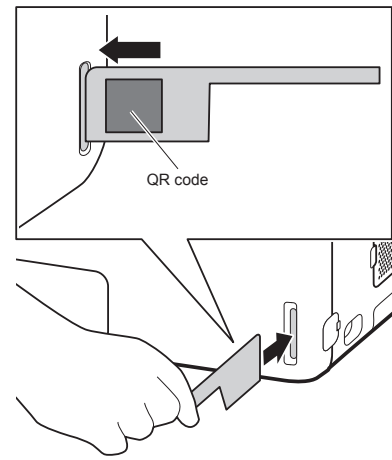
A QC card must be read when a new test slide will be used or when changing to a new lot of slides.

Read the QC card while [Ready to test] or [Warming up] is displayed on the LCD.



Set the QR code on the left side, and then insert the QC card into the card reader fully.

**NOTE:** If the QC card is dirty or folded, the read error may occur.

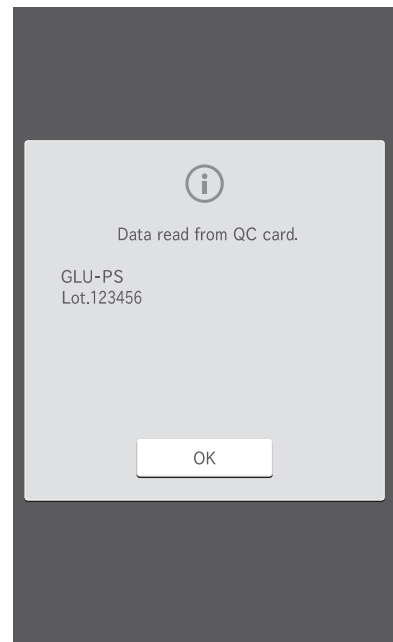


The slide test and production number (lot) are displayed on the LCD and output to the printer as well.

**NOTE:** Do not insert another QC card while the slide test and lot number are displayed.

**NOTE:** When the analyzer beeps and the test is not displayed, insert the QC card into the card reader again.

**NOTE:** A QC card cannot be read when the analyzer is in a measurement request state, and the sample rack display is blinking in green.



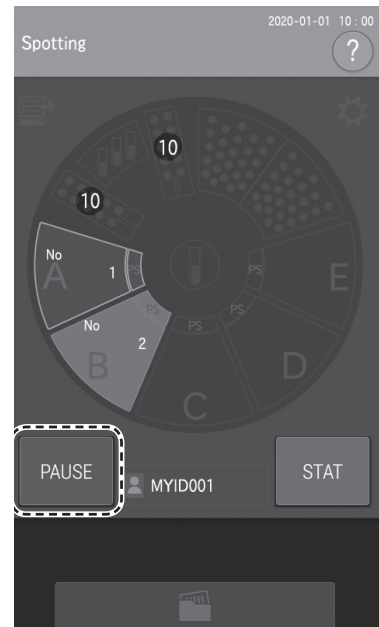
## 4.1 Interrupting Sample Application and STAT Tests

Before adding consumables during sample application, touch PAUSE to interrupt sample application. When the analyzer has run out of tips during sample application, the analyzer stops (as when PAUSE was touched). In this paused state, you can display the loading screen by touching the display of each consumable. You can cancel the remaining sample application by touching PAUSE in this paused state. (The measurement of slides with sample applied continues.)

### 4.1.1 Interrupting and canceling sample application

1. Interrupting sample application.

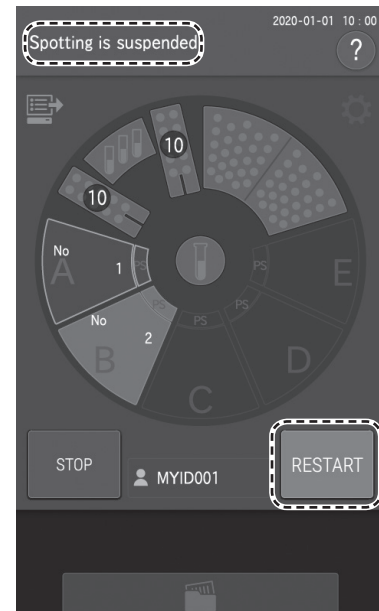
Touch **PAUSE**.



The LCD changes to [Spotting is suspended]. The sample rack display interrupted during sampling continues to flash.

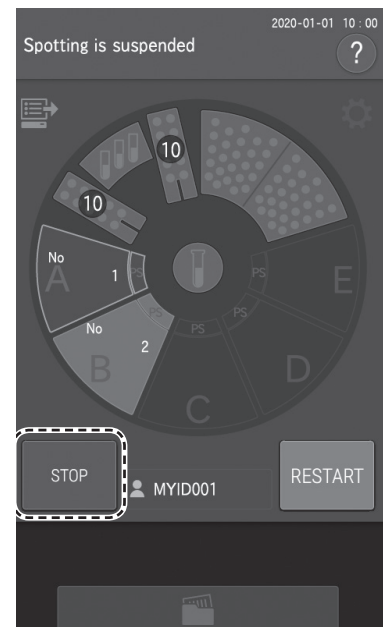
**NOTE:** When sample application is interrupted, the tip in use is discarded.

**NOTE:** To restart after pausing, touch **RESTART**.



2. Canceling the remaining sample application after interrupting sample application.

If STOP is touched while the analyzer is interrupted, the remaining sample application is canceled. If the cancel operation is completed, the LCD changes to [Ready to test]. All sample rack displays get switched off.



#### 4.1.2 Requesting a STAT test

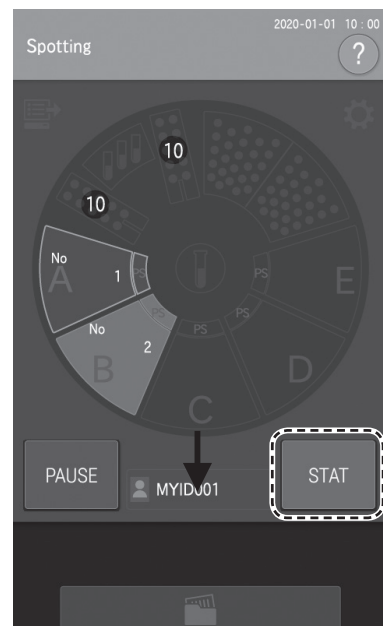
You can request a STAT test by touching STAT.

**NOTE:** The STAT sample is measured after the sample that was currently running has finished.

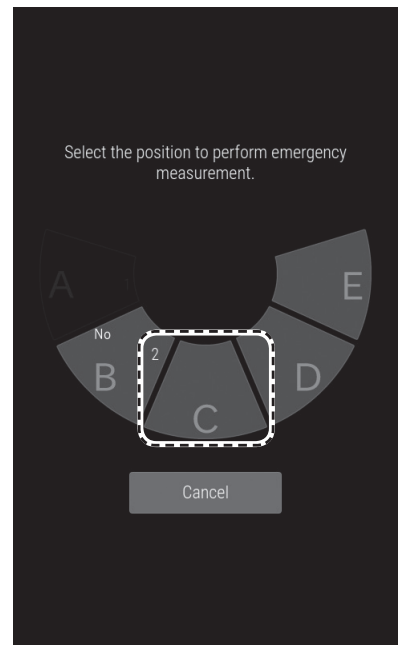
**NOTE:** A STAT test can be requested for 1 sample only.

(Example) Requesting a STAT test for Sample C after Sample A and B were loaded, and Sample A is being applied.

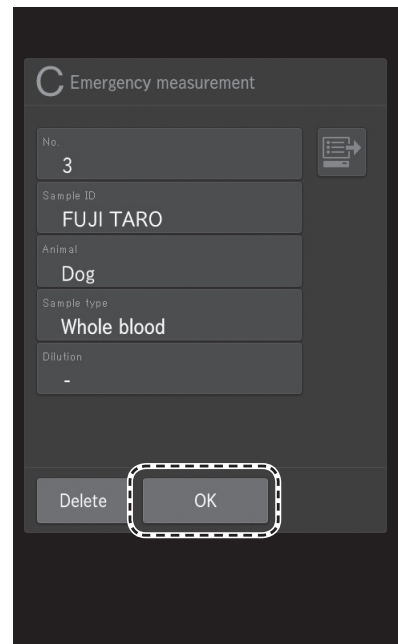
1. Touch **STAT**.



2. Touch sample rack display C.

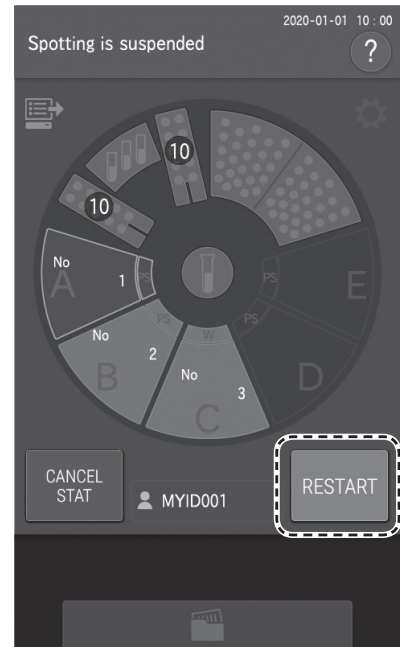


3. Register the measurement information, and then touch OK.





4. Touch **RESTART** to (re)start measurement.


**NOTE:** In this example, the analyzer finishes the remaining application of Sample A, and then measures Sample C.  
Measurement order: A → C → B




## 4.2 Rerunning Tests

You can test again using the previous sample number, sample ID, sample type setting, and reference interval setting by touching  at the Measurement results screen. Furthermore, when a measurement cannot be performed due to an error, you can skip the reentry and re-configuration of the setting information by touching .

### IMPORTANT

The  (Rerun) button is designed only to automatically enter the sample number and sample ID of the previous sample position. Do not use this button to retest samples from before the previous sample.

(Example) Re-running sample A

1. When [Ready to test] appears on the LCD, make sure that the analyzer is not applying samples, and then load the consumables and sample. *Section 3.3*
2. Touch  on the Measurement results screen.

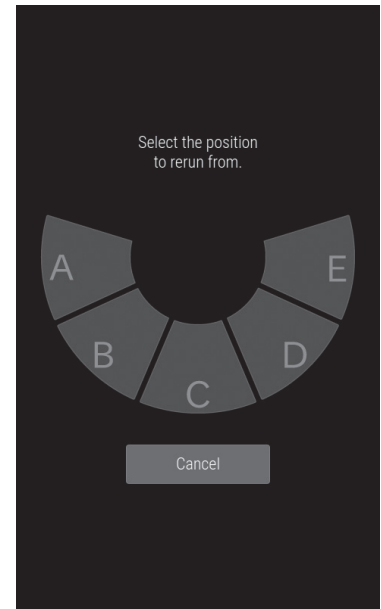



3. Touch the sample rack display of the sample position to be retested.

**NOTE:** The sample information registration screen displays the previous sample number or sample ID that was measured at the Sample A position.

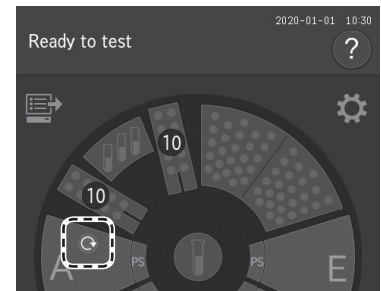
**NOTE:** Touch DILUTION to set the dilution factor, if needed.

4. Touch OK.

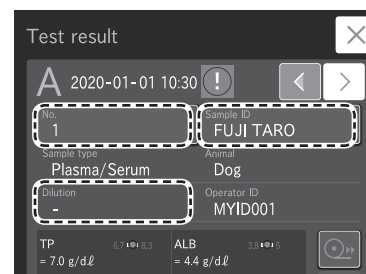
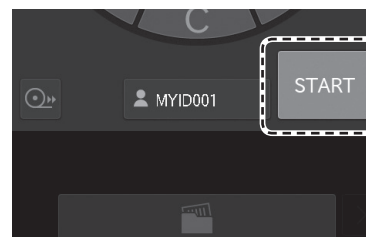


**NOTE:** In case of a sample scheduled for retesting,  appears on the sample rack display.

5. Close the sampler cover.



6. Touch **START** to begin retesting.





### 4.3 Slide Loading Order When Measuring Different Items Simultaneously

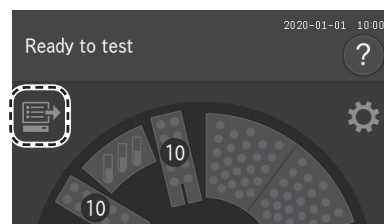
**NOTE:** Any order of slide stacking can be measured. However, please follow the recommended slide stacking rules below. Otherwise, the analyzer may consume excessive amounts of disposal tips and cups.

1. It is recommended to load an ISE slide first.  
If a CM slide is loaded after an ISE slide, an extra tip will be used.

### 4.4 Automatic Acquisition of Sample Information (Work Lists)

If the device is connected to a PC using a validated software program, you can receive patient IDs and their sample information by touching  at the Measurement preparation screen before measurement.

1. Touch  The analyzer receives a work list (a list of patients and the samples to be measured) from the PC.









The Work List index screen appears.

**NOTE:** If there are no measurement requests, the buzzer sounds, and the message [There is no request information] is displayed.

**NOTE:** The display of the list is configured by [Work list selection setting] in Mode function for administrator. *Section 8.4.8*

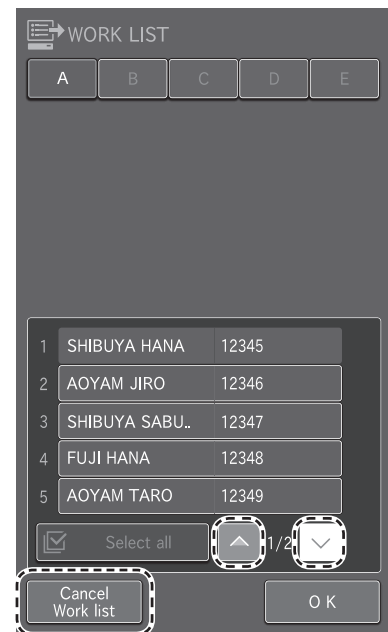
**NOTE:** When there are multiple pages in a list, you can scroll the pages using  .

**NOTE:** If  is touched while the last sample information record is displayed, the sample information of the next sample number is received.

**NOTE:** If  is touched when the first sample information record is displayed, all sample information is received.

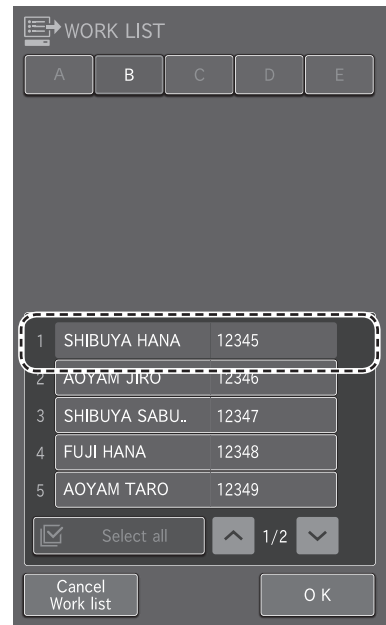
**NOTE:** If **CANCEL WORK LIST** is touched, the analyzer returns to the Measurement preparation screen.

2. Touch the sample rack for which you want to register sample information.




3. Touch the desired patient from the list.

**NOTE:** If **SELECT ALL** is touched, information is registered in order from the first sample information.

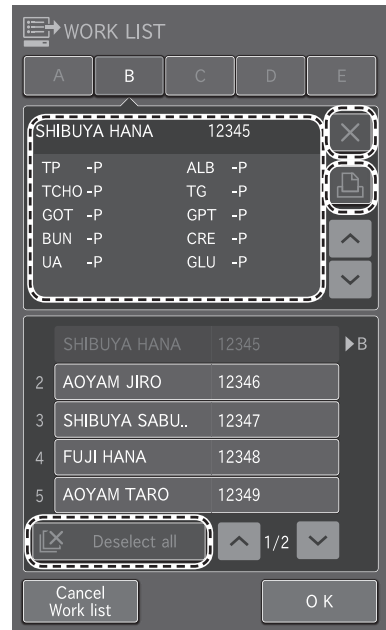


The work list measurement items of the registered sample information are displayed.

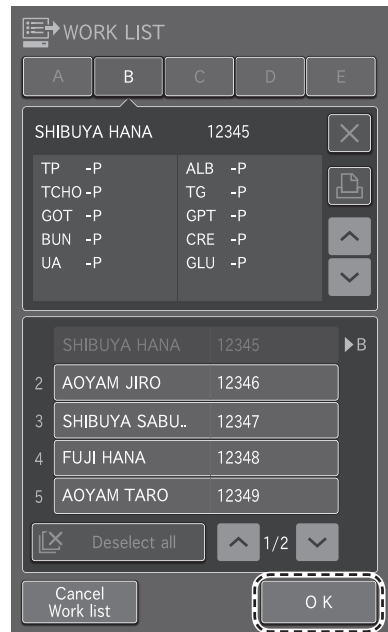
**NOTE:** If  is touched, registration is cleared.

**NOTE:** The work list measurement items can be printed by touching .

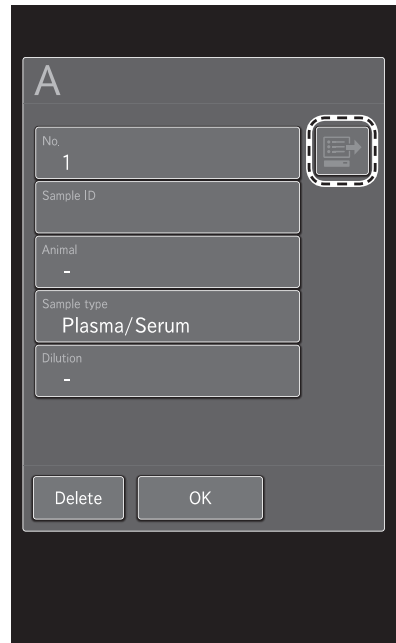
**NOTE:** If **DESELECT ALL** is touched, registrations for all racks are cleared.



4. Touch **OK** to finish registration.  
The Measurement-preparation screen appears.



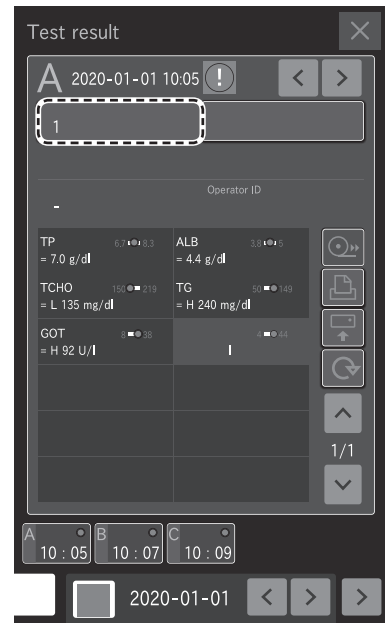
**NOTE:** Work lists can also be obtained from the sample information registration screen.



## 4.5 Editing Sample Numbers and Sample IDs

You can edit the sample number and sample ID of measurement results. You can also send edited data to a host computer.

1. To edit the sample number, touch [No.] at the Measurement results screen. *Section 3.4*

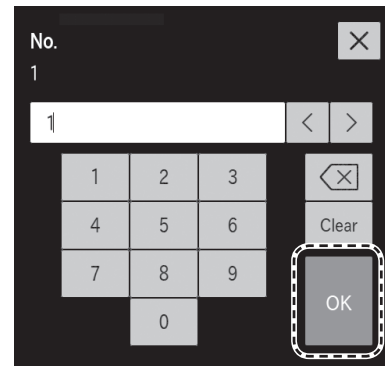


2. Enter the administrator password, then touch **OK**.  
The Sample number entry screen appears.
3. Edit the sample number, then touch **OK**.  
The analyzer returns to the Measurement results screen.

**NOTE:** You can also edit the sample ID using the same procedure.

### **IMPORTANT**

Be sure not to make any entry errors.



## 4.6 Using the Sample Barcode Reader (sold separately)

You can easily enter the sample ID and operator ID by using the optional sample barcode reader.

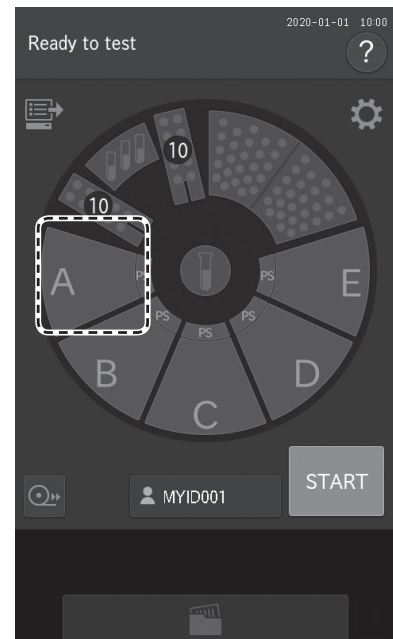
### IMPORTANT

If the sample barcode reader malfunctions or the print quality of the barcode label is poor, incorrect barcode data may be read. Make sure that the barcode data (sample ID) printed in the measurement results are correct.

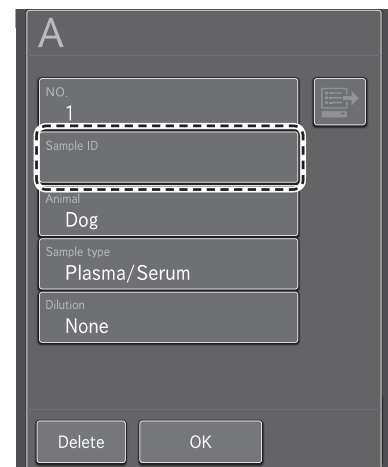
**NOTE:** Carefully read the instructions included with the sample barcode reader before using it. A maximum of 13 alphanumeric characters can be input for a sample ID. Always use the sample barcode reader under lighting at 3,000 lux or lower and avoid direct sunlight.

When inputting the sample ID

1. Touch desired sample rack position to display the sample information registration screen.

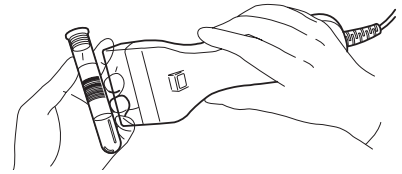


2. Touch **SAMPLE ID** field. The software keyboard appears.

A screenshot of the sample information registration screen for position A. The screen has a dark background. At the top left is the letter "A". Below it are several input fields: "NO." with the value "1", "Sample ID" (highlighted with a dashed white box), "Animal" with the value "Dog", "Sample type" with the value "Plasma/Serum", and "Dilution" with the value "None". At the bottom, there are two buttons: "Delete" and "OK". A barcode icon is visible in the top right corner of the form area.

3. Read the barcode of the sample using the barcode reader.

After reading is complete, the analyzer makes a beep sound. The Sample ID is displayed on the LCD for the selected sample, and the request information is registered.



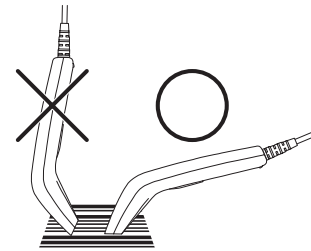
**NOTE:** Position the sample barcode reader properly facing the barcode label. Otherwise, an incorrect reading may occur.

**NOTE:** Make sure the displayed ID is correct.

**NOTE:** When reading a barcode again, touch the sample rack display to be changed first.

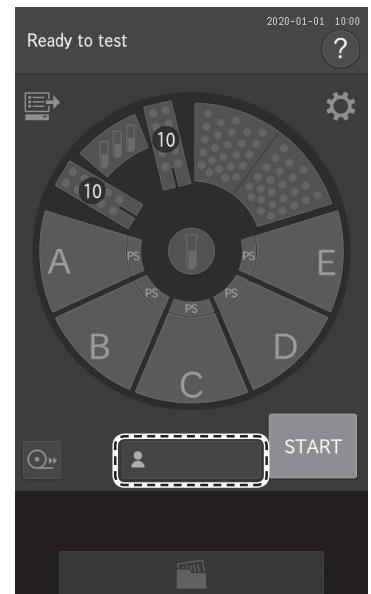
4. Touch **OK** to enter the sample ID.

The Measurement Preparation screen appears.



#### 4.6.1 When inputting the operator ID

1. Touch **OPERATOR ID**. The software keyboard appears.



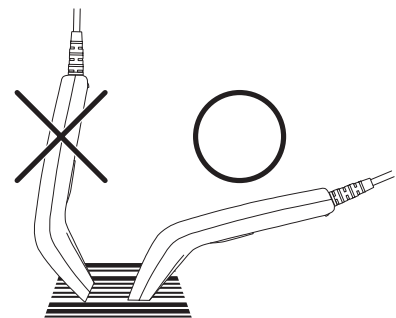
2. Read the operator ID using the sample barcode reader.

After reading is complete, the analyzer makes a beep sound. The operator ID is displayed on the LCD and registered.

**NOTE:** Position the sample barcode reader properly facing the barcode label. Otherwise, an incorrect reading may occur.

**NOTE:** Make sure the displayed ID is correct.

**NOTE:** To re-input a barcode, touch **OPERATOR ID**, and then re-read the barcode.



## 5.1 Loading Consumables

To load consumables, touch the display of each consumable to display the loading screen. When the consumable loading is complete, touch FINISH to exit.

**NOTE:** If there are not enough consumables (tips, mixing cups, diluent, reference fluid, etc.), sample application may be interrupted or canceled.

**NOTE:** Load consumables while the analyzer is not applying samples.

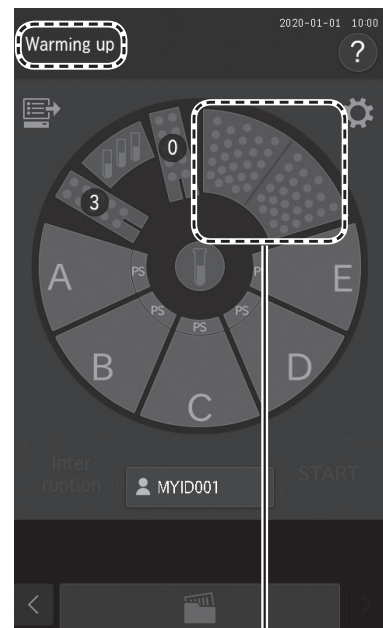
## 5.2 Setting Tips

Tips are required for all measurements. Check the number of remaining tips on the LCD before performing measurements. If necessary, add new tips.

 **WARNING**

If the analyzer is applying samples, touch PAUSE to interrupt application (*Section 4.1*), and then load the tips. It is unsafe to set tips during sample application due to the moving parts of the sampler unit and the sample disk.

1. Make sure [Warming up], [Lamp warming up] or [Ready to test] displayed on the LCD. Make sure that the analyzer is not applying samples.
2. Touch the tip display on the LCD.

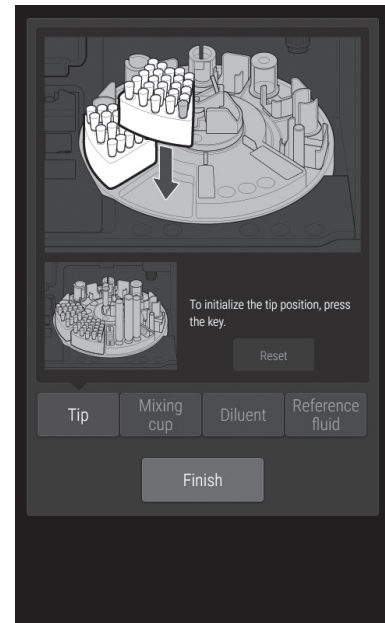


**Tips**

- The Tip loading screen appears. The sample disk turns, and the consumables are moved to the front.

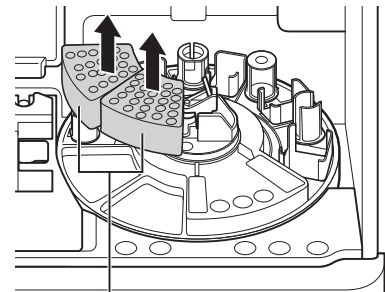
 **CAUTION**

Do not touch the sample disk until it stops.



- After the sample disk stops, remove the tip racks from the sample disk.

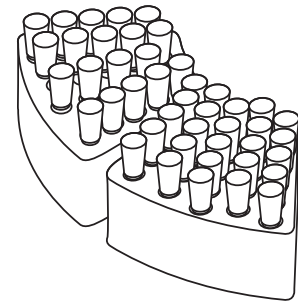
**NOTE:** Always remove the tip racks from the sample disk before loading tips.



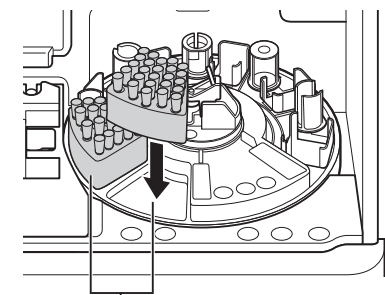
Tip rack

- Load tips in all holes of the tip racks.

**NOTE:** Always set tips in all holes of the tip racks.



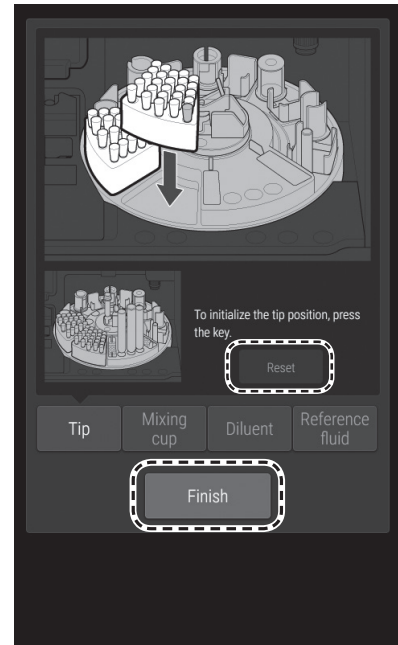
- Load the tip racks on the sample disk.



Tip rack loading positions



7. To initialize the tip usage position, touch **RESET**.
8. Touch **FINISH** to exit.  
The sample disk turns, and the sample rack is moved to the front.



### 5.3 Loading Mixing Cups

Mixing cups are necessary for measurements requiring dilution (*Section 3.6*). Check the quantity of mixing cups on the LCD before measurement. If necessary, load new mixing cups. Each measurement uses one mixing cup. If no mixing cups remain, a dilution cannot be run.

 **WARNING**

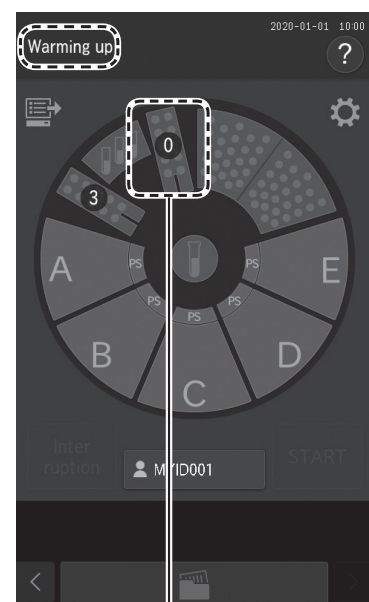
When the analyzer is applying samples, touch **PAUSE** to interrupt sample application (*Section 4.1*), and then load the mixing cups. It is unsafe to set mixing cups during sample application due to the moving parts of the sampler unit and the sample disk.

 **WARNING**

Always wear gloves when handling used mixing cups to avoid biohazards.

**NOTE:** The quantity of mixing cups that can be used is displayed on the LCD. When the amount remaining is insufficient, a dilution measurement cannot be performed.

1. Make sure [Warming up] or [Ready to test] displayed on the LCD. Make sure that the analyzer is not applying samples.
2. Touch mixing cup display on the LCD.



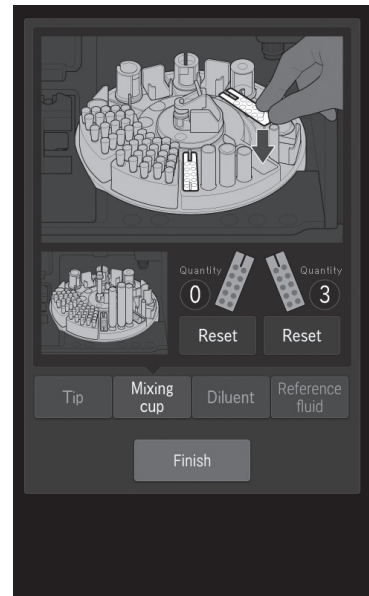
**Mixing cup display**

3. The Mixing cup loading screen appears.

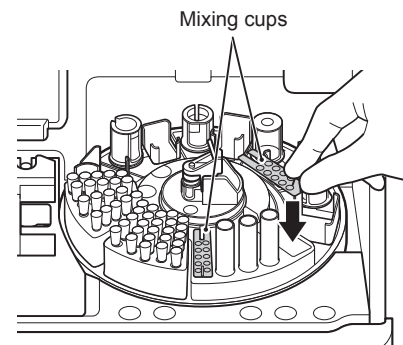
The sample disk turns, and the consumables are moved to the front.

 **CAUTION**

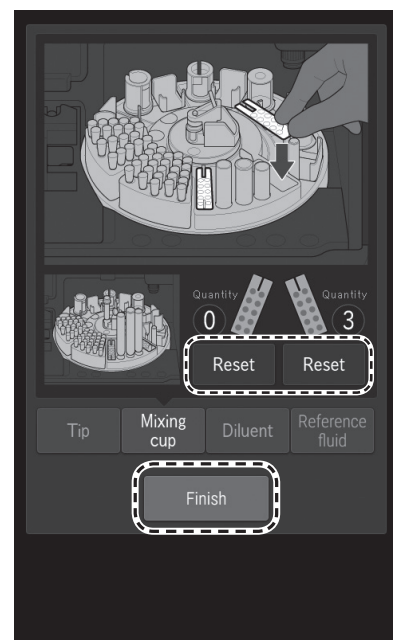
Do not touch the sample disk until it stops.



4. Remove the used mixing cups from the sample disk.  
Set one or two new mixing cups.



5. For the mixing cups that were replaced, touch **RESET** to reset the quantity, and then touch **FINISH** to exit.  
The sample disk turns, and the sample rack moves to the front.



## 5.4 Loading Diluent

Diluent is necessary for dilution measurements. Refer to *Section 3.6*. Dilution measurement requires a specified diluent.

### WARNING

When the analyzer is applying samples, touch **PAUSE** to interrupt sample application and then load the diluent. It is unsafe to set tips during sample application due to the moving parts of the sampler unit and the sample disk. *Section 4.1*

### IMPORTANT

Use specified tube for the diluent. Otherwise, measurement errors or malfunctions may occur. The specified tubes for diluent are the DRI-CHEM PLAIN TUBE (1.5 mL).

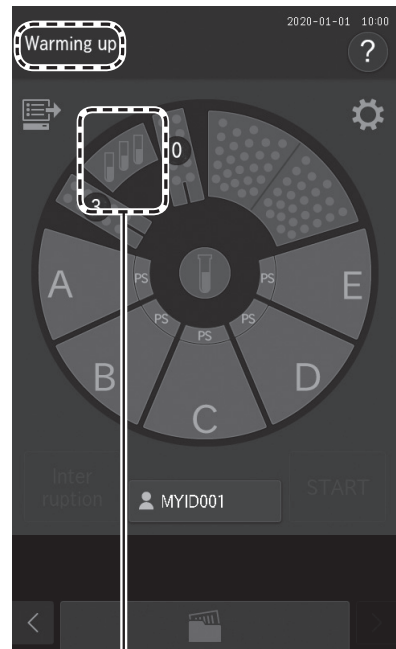
**NOTE:** If necessary, configure the type of diluent container to be used via [Tube setting for diluent & reference fluid] in Mode function for administrator. *Section 8.4.12*

1. Prepare the diluent.

Pour the required amount of diluent into the specified tube. Diluent should be distilled or sterile water.

**NOTE:** For a DRI-CHEM PLAIN TUBE (1.5 mL), pour in at least 0.5 mL of diluent.

2. Make sure [Warming up] or [Ready to test] displayed on the LCD, make sure that the analyzer is not applying samples.
3. Touch **DILUENT DISPLAY** on the LCD.



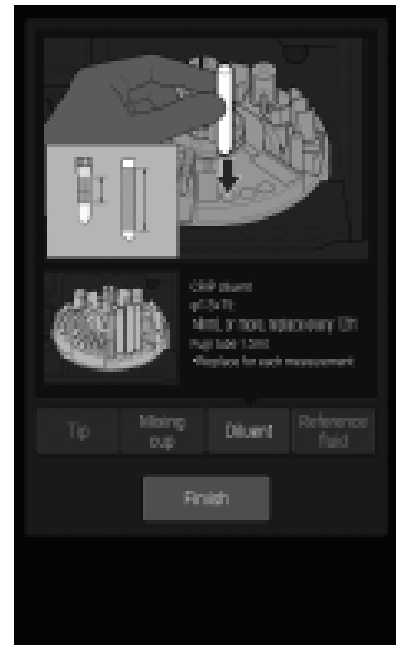
**Diluent display**

4. The Diluent loading screen appears.

The sample disk turns, and the consumables are moved to the front.

 **CAUTION**

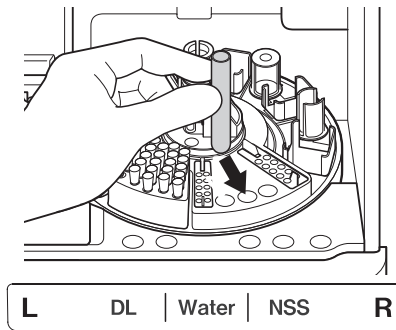
Do not touch the sample disk until it stops.



5. Load the tube containing diluent in the "water" position.

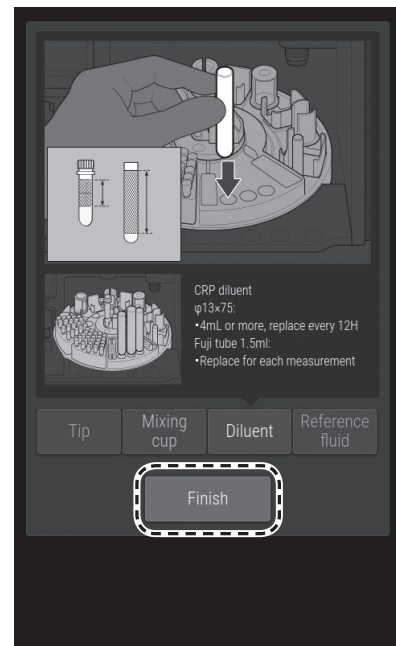
**NOTE:**

- DL: Not used on Heska analyzers.
- Water: Distilled water-use for all Heska slides.
- NSS: Not used on Heska analyzers.



6. Touch **FINISH** to exit.

The sample disk turns, and the sample rack is moved to the front.



## 5.5 Loading Reference Fluid

Reference fluid is necessary for ISE measurements. *Section 3.5*

### WARNING

When the analyzer is applying samples, touch **PAUSE** to interrupt sample application (*Section 4.1*), and then load the reference fluid. It is unsafe to set tips during sample application due to the moving parts of the sampler and the sample disk.

### IMPORTANT

Use a DRI-CHEM PLAIN TUBE (0.5 or 1.5 mL) for reference fluid. Otherwise, measurement errors or malfunctions may occur.

Configure the size of tube to be used via [Tube setting for diluent and reference fluid] in Mode function for administrator. *Section 8.4.12*

### IMPORTANT

Replace DRI-CHEM PLAIN TUBES (0.5 mL and 1.5 mL) every 12 hours.

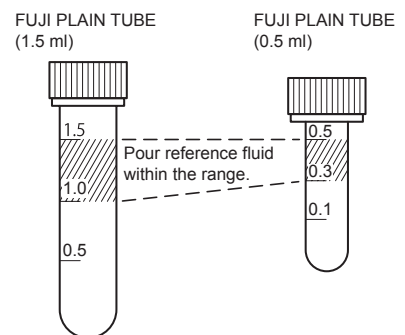
1. Prepare reference fluid.

Pour the following amounts into each type of FUJI PLAIN TUBE.

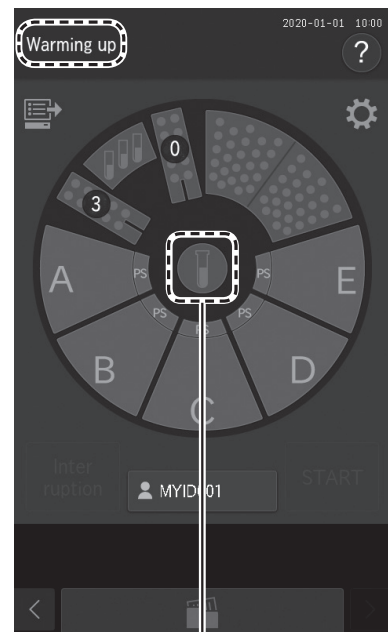
For 1.5 mL tube: 1.0-1.5 mL

For 0.5 mL tube: 0.3-0.5 mL

**NOTE:** Use reference fluid after it reaches room temperature.



2. Make sure [Warming up] or [Ready to test] displayed on the LCD. Make sure the analyzer is not applying samples.
3. Touch reference fluid display on the LCD.



**Reference fluid display**

4. The Reference fluid loading screen appears.

The sample disk turns, and the consumables are moved to the front.

 **CAUTION**

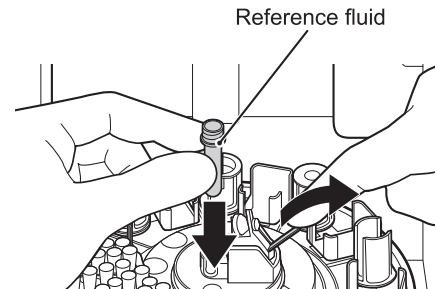
Do not touch the sample disk until it stops.



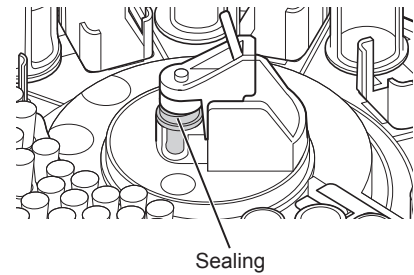
5. Load the tube containing the reference fluid.

 **IMPORTANT**

Clean the cap of the reference fluid every time you load the reference fluid. *Section 6.8*

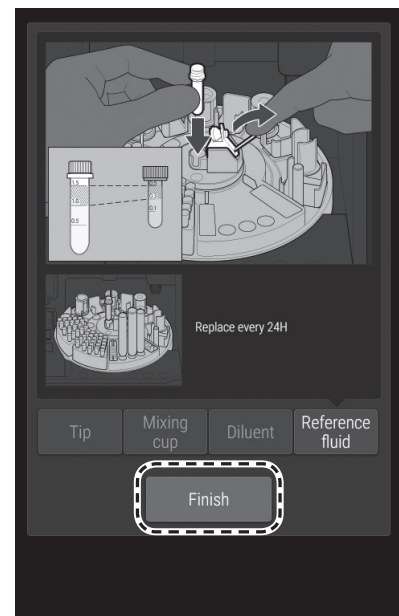


**NOTE:** Make sure the reference fluid cap is closed properly.



6. Touch **FINISH** to exit.

The sample disk turns, and the sample rack is moved to the front.



To keep the performance of the Element DC5X at its best, users must perform daily and periodic maintenance, and designated repair personnel must perform maintenance. When repairs are necessary, contact Heska Technical Support Services.

 **WARNING**

When you clean the analyzer, always wear gloves, a lab coat, and safety goggles.

If you accidentally touch a contaminant, immediately rinse the contaminated area thoroughly under running water.

 **CAUTION**

Refer to each section for information about usable solvents for cleaning and decontamination.

 **CAUTION**

Do not use alcohol to clean the sampler cover (translucent). Otherwise, the surface will be damaged.

 **IMPORTANT**

If you do not perform the periodic maintenance in the manual, the analyzer's performance and specifications will not be maintained, which may negatively affect the measurement values.

 **IMPORTANT**

Be sure to reassemble the parts removed for maintenance and tighten thumbscrews securely. Otherwise, measurement values may be negatively affected.

**NOTE:** If the LCD (touch panel section) becomes soiled, use a soft cloth or a cloth soaked in a small amount of isopropyl alcohol to lightly wipe it.

**NOTE:** When cleaning the outer covers of the equipment, wipe using a soft cloth moistened with water or isopropyl alcohol for disinfection (excluding the sampler cover).

## 6.1 Periodic Maintenance Items

### 6.1.1 Items for daily and periodic inspection by the user

Users must perform the daily and periodic maintenance and replacement of parts in the following table.

Location	Cleaning Interval	Inspection Interval	Replacement Interval	Procedure
Air filter	Once a month.	-	-	Refer to <i>Section 6.2</i>
Transfer bar	Once every 3 months if inaccurate test results occur, or if slide transfer error.	-	-	Refer to <i>Section 6.3</i>
Incubator	Once every 3 months or if inaccurate test results occur.	-	-	Refer to <i>Section 6.3</i>
Spotting part	Once every 3 months along with the incubator and ISE unit or if slide transfer error or contamination with sample occurs.	-	-	Refer to <i>Section 6.3</i>
ISE unit	Once every 3 months if inaccurate test results occur.	-	-	Refer to <i>Section 6.3</i>
Slide reading section	Once every 3 months or if frequent reading errors occur.	-	-	Refer to <i>Section 6.7</i>
Sampler O-ring	-	Perform leak check procedure every 3 months.	-	Refer to <i>Section 6.6</i>
Recording paper	-	-	Appearance of red lines on both sides of paper.	Refer to <i>Section 6.4</i>
Light source lamp	-	-	When a photometer gain setting error occurs or the lamp's cumulative illumination time exceeds 1,000 hours.	Refer to <i>Section 6.5</i>
Reference fluid cap packing	When replacing reference fluid.	-	If it becomes cracked.	Refer to <i>Section 6.8</i>

## 6.2 Cleaning the Air Filters

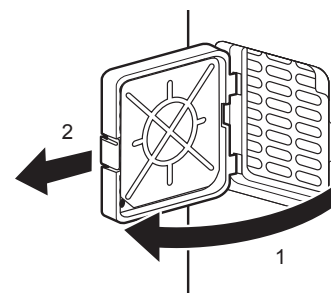
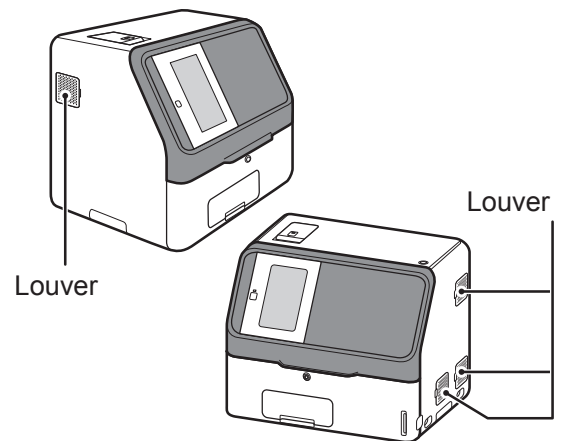
The air filters should be checked and cleaned once a month.

### **i** IMPORTANT

If the air filters are not cleaned, an increase in the temperature inside the analyzer may negatively affect the measurement values.

**NOTE:** Clean all 4 filters.

1. Switch off the analyzer power.
2. Remove the four louvers and pull out the air filters located inside of the louvers. Lift the louver upward #1, then pull forward #2 to remove.





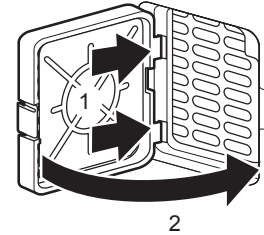
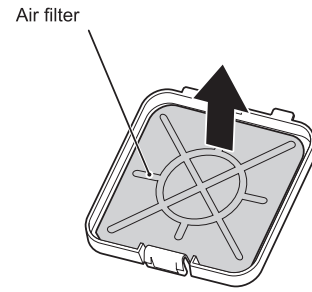
- Remove dust adhering to the filter with a vacuum cleaner or running water.

**NOTE:** If you wash the filter with running water, make sure it is dried well before setting in the analyzer.

- Insert the filter into the louver and put the louver back in the analyzer. Insert the back side of the louver first, then snap the front side in place.

**i** IMPORTANT

If the analyzer is used without setting the filters, measurement values may be negatively affected.



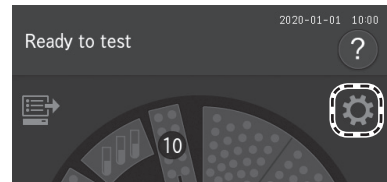
### 6.3 Inspecting and Cleaning the Transfer Bar, Incubator, Spotting Part and ISE Unit

Measuring results are affected by stains (from blood samples, etc.) inside of the incubator and ISE unit. These parts should be checked and cleaned at least once every three months. When a slide transfer error or a tip ejecting error occurs, clean the spotting part.

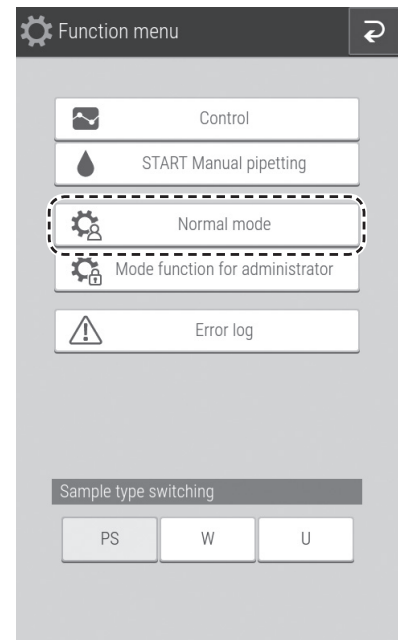
#### 6.3.1 Reference plate level check

Perform [Reference plate level check] before cleaning.

- Touch .



- Touch **NORMAL MODE**.

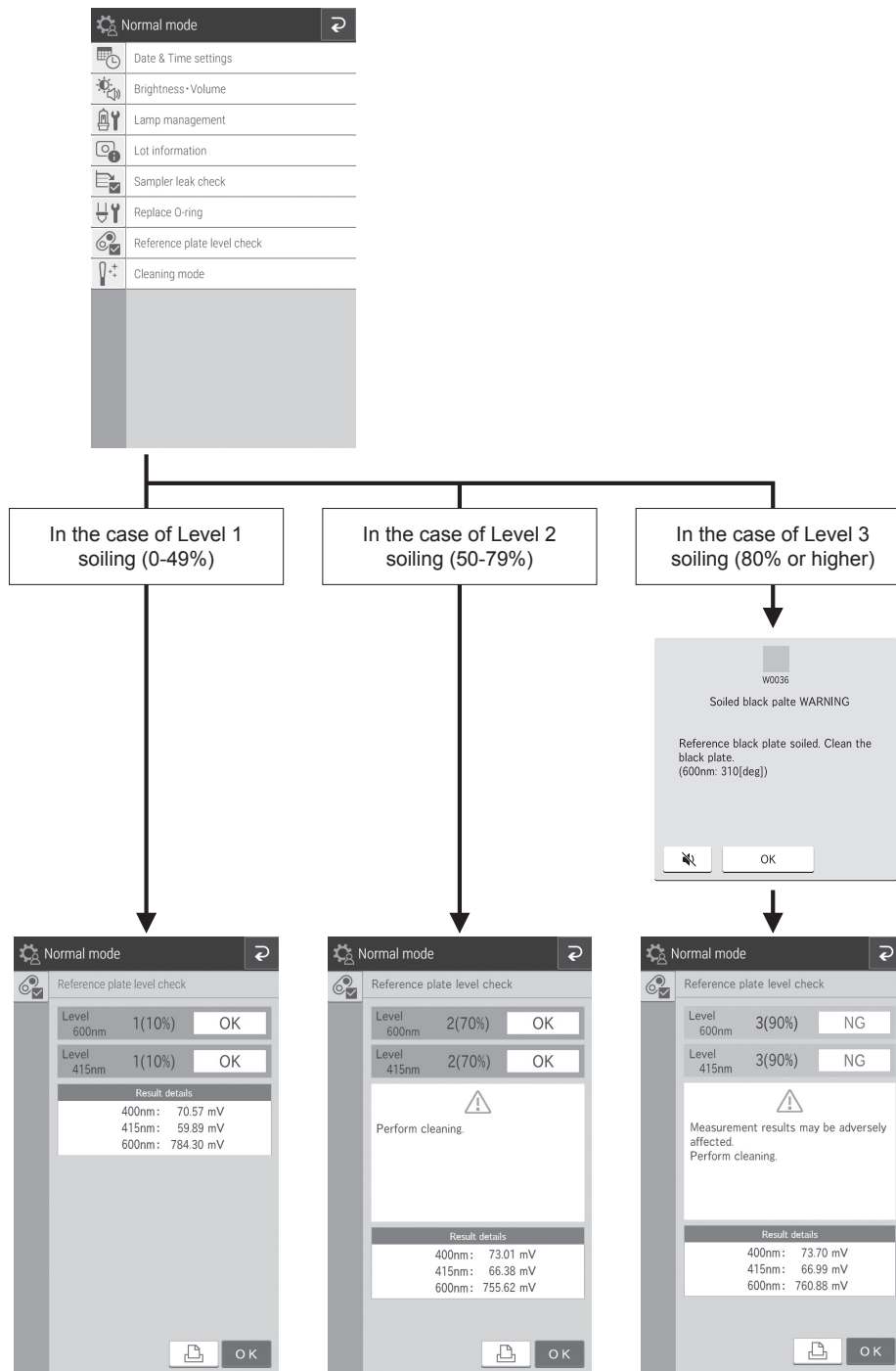


3. Touch **REFERENCE PLATE LEVEL CHECK** to run a check.

If check ends, the Check results screen appears.

4. Check the results of [Reference plate level check].

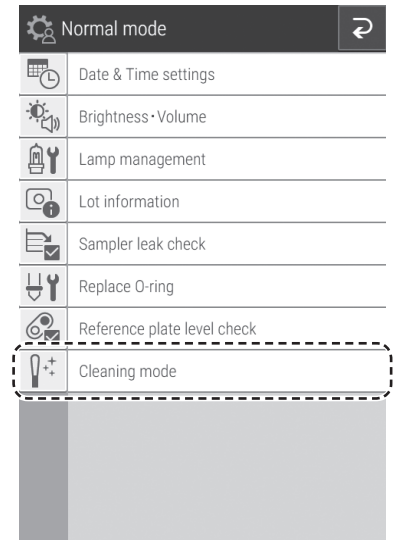
If the result is level 2 or level 3, cleaning is necessary. Touch **OK**. Using the procedure on the following pages, clean the transfer bar, incubator, spotting part, and ISE unit.



## 6.3.2 Cleaning the transfer bar, incubator, spotting part and ISE unit

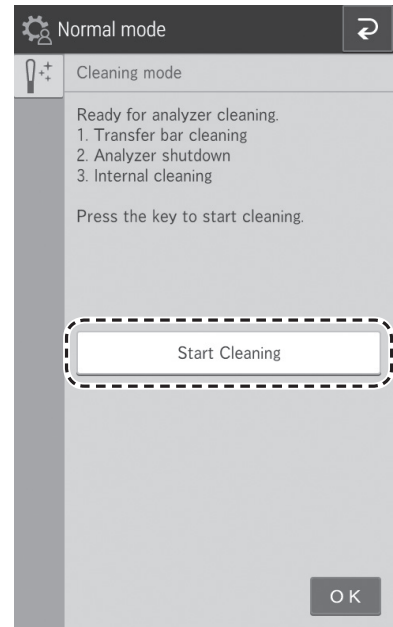
### Cleaning the transfer bar and ISE unit

1. Touch **CLEANING MODE** in Normal mode.



2. Touch **START CLEANING**.

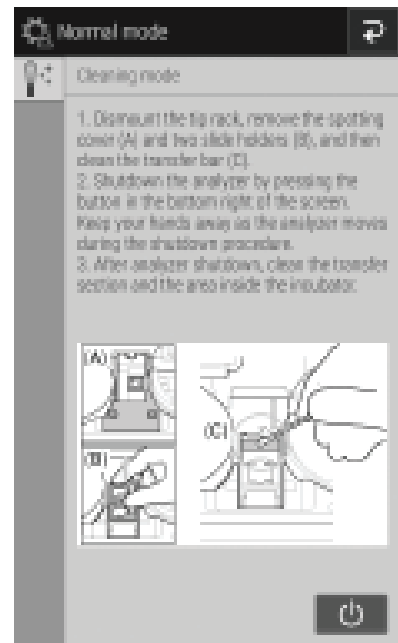
**NOTE:** Keep your fingers clear as the sample disk moves.



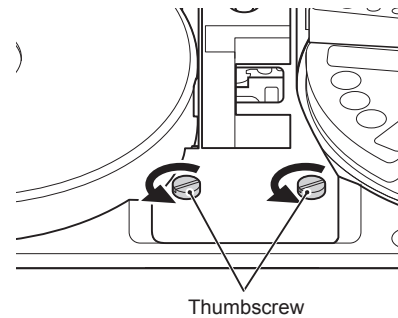
3. The screen to the right appears.

**NOTE:** Although step 2 on the screen prompts to power off the analyzer, do not power off until step 10.

4. Remove the tip rack from the analyzer.

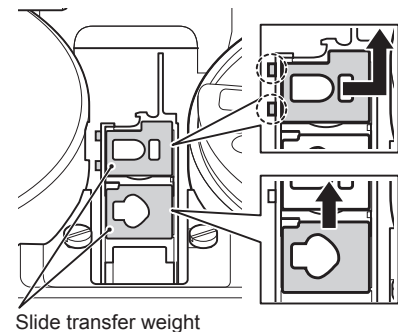


5. Loosen the 2 thumbscrews and pull the sample application unit cover frontward to remove it.

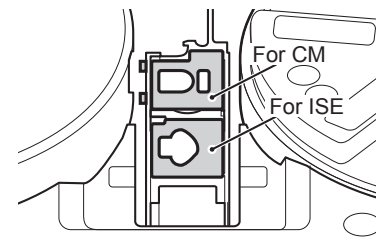


6. Remove the two slide transfer weights.

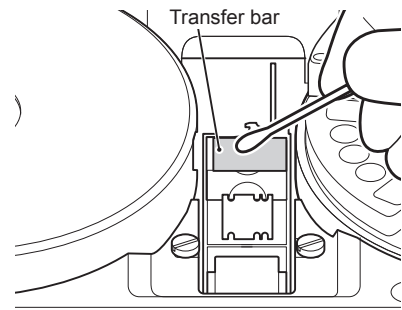
**NOTE:** There are 2 types of slide transfer weight, one each for CM tests and ISE tests.



The slide transfer weight for CM tests has hooks on the left, so lift up from the right before removing it. When installing it, insert the hooks before loading it.



7. Use gauze or a cotton swab moistened with water or isopropyl alcohol to wipe the upper surface of the transfer bar visible in the spotting part.
8. Next, clean the incubator, spotting part and ISE test unit.



9. ISE unit probes

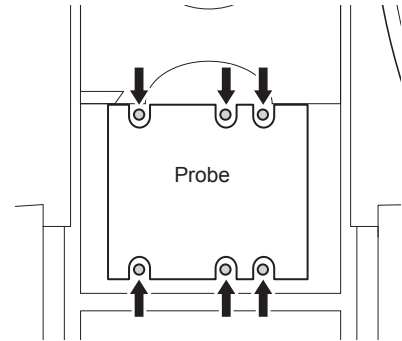
Press down on the black plastic piece to make probes accessible.

Make sure there is no dust on the six ISE probes. When you clean the ISE probes, wipe off the dust using a dry cotton swab.

**CAUTION**

ISE probes are needle-shaped parts. Do not touch them directly by hand. Be careful not to bend the probes.

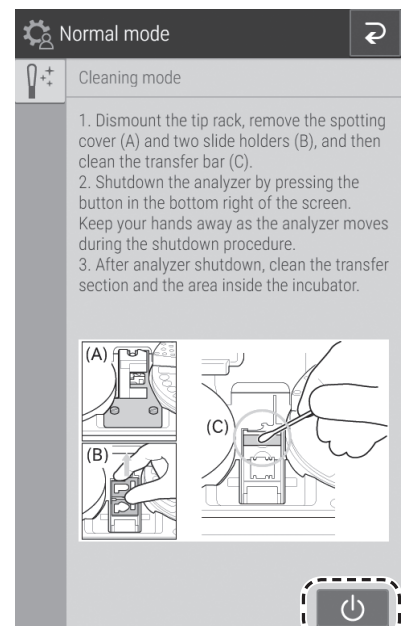
**NOTE:** Do not use solvents, such as methyl or isopropyl alcohol.



10. Power off the analyzer by touching the icon displayed in the bottom right of the screen.

**CAUTION**

Keep your finger clear as the sample disk moves.



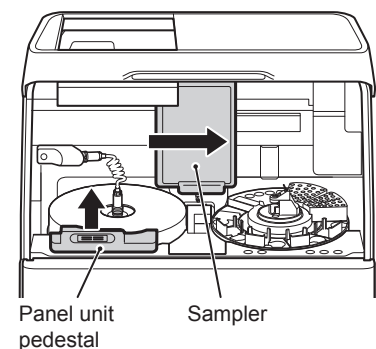
**WARNING**

Always unplug the power cord before the following procedure.

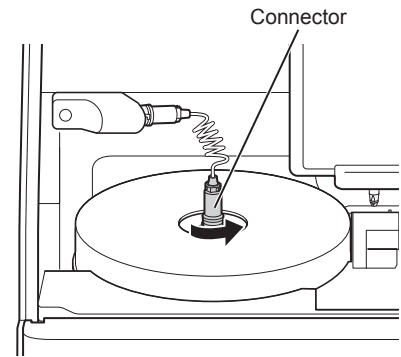
Incubator

1. Lift the panel unit. Move the sampler unit to the right, and then remove the panel unit pedestal by pulling it towards you.

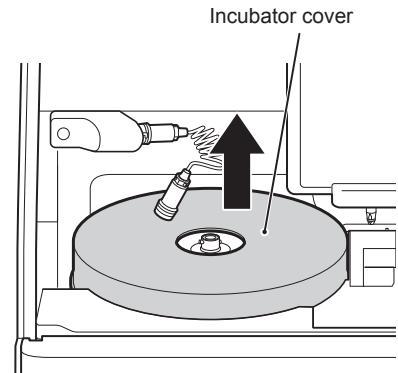
**NOTE:** Be careful not to open the reference fluid cap.



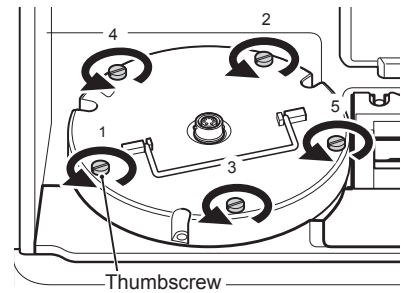
2. Unplug the connector cable from the incubator by turning it to the left.



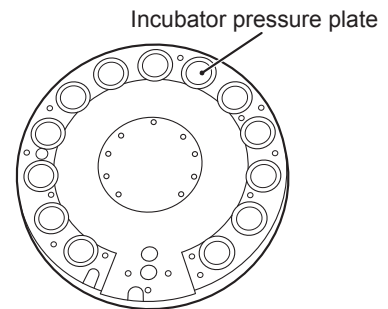
3. Remove the incubator cover.



4. Loosen the 5 screws on the upper surface of the incubator, and then remove the incubator.



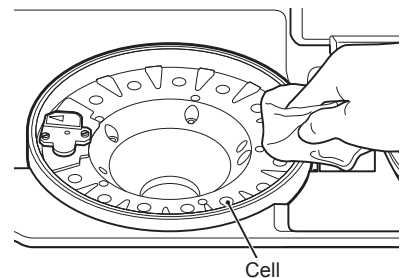
5. Wipe off the 13 pressure plates on the backside of the incubator with a soft cloth or cotton swab moistened with isopropyl alcohol. Dry the pressure plates while the incubator backside (pressure plate surface) is facing up.



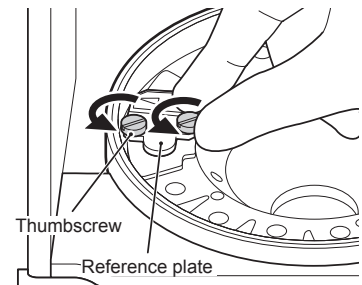
6. Wipe the incubator cells in the same way.

**i** IMPORTANT

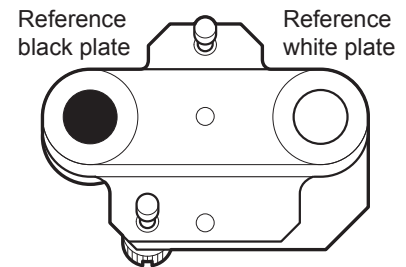
Do not touch the surface of the pressure plates with your bare hands. Otherwise, measurement values may be negatively affected.



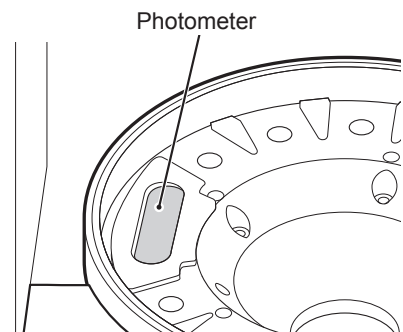
- Loosen the 2 screws on the reference plate and remove the plate from the analyzer.



- Turn over the reference plate and clean the white plate and black plate with a dry cotton swab or using a swab moistened with isopropyl alcohol. Dry with a new cotton swab.



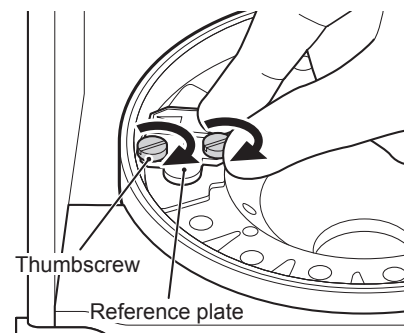
- Clean the photometer head with a dry cotton swab or using a swab moistened with isopropyl alcohol. Dry with a new cotton swab.



- Replace the reference plate.  
Tighten the 2 thumbscrews evenly.

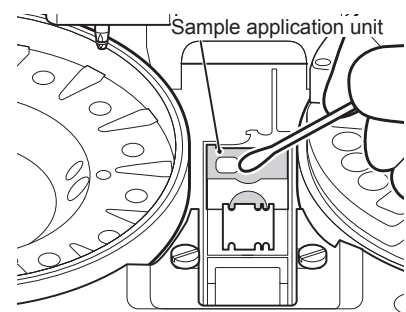
**i** IMPORTANT

Tighten the two thumbscrews securely. Otherwise, the measurement results may be negatively affected.



Spotting part

- Make sure the Spotting part cover and two slide transfer weights were removed for cleaning of the transfer bar.
- Wipe the Spotting part with a soft cloth or a cotton swab moistened with water or isopropyl alcohol. Dry with a new cotton swab.



### 6.3.3 Reassembling parts and ending cleaning

#### 1. Reassemble the incubator.

Align the arrow marks on the incubator and the reference plate, and then tighten the 5 thumbscrews evenly by tightening opposing thumbscrews in numerical order (1 to 5).

#### **i** IMPORTANT

Tighten the five thumbscrews securely. Otherwise, the measurement results may be negatively affected.

#### 2. Reassemble each part as shown in the illustration on the left.

- ① Set the slide transfer weights.
- ② Set the spotting part cover and tighten the thumbscrews.
- ③ Set the incubator cover.
- ④ While aligned with the groove, plug the connector of the incubator cable into the incubator and then lock it by turning it to the right.
- ⑤ Set the panel unit pedestal.

#### **i** IMPORTANT

Tighten the thumbscrews securely. Otherwise, the measurement results may be negatively affected.

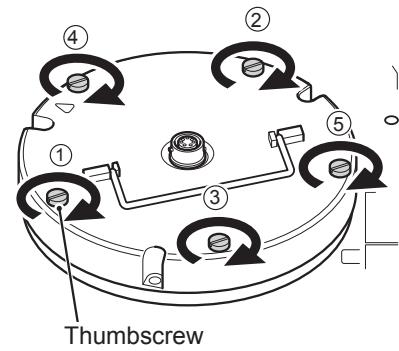
#### **i** IMPORTANT

Be sure to set the incubator cover. Otherwise, the measurement results may be negatively affected.

**NOTE:** When you insert the connector, make sure not to twist or apply too much pressure to the cable. If the cable is twisted more than once, it may break.

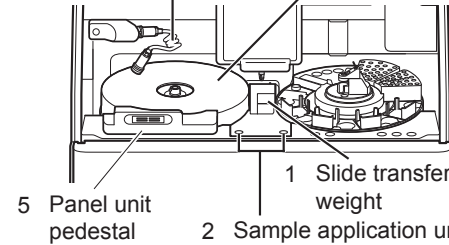
#### 3. Close the panel section to end cleaning. Power analyzer on. Run [Reference plate level check] again, and then check the results. *Section 6.3.1*

**NOTE:** Wait until the temperature of the incubator is steady.



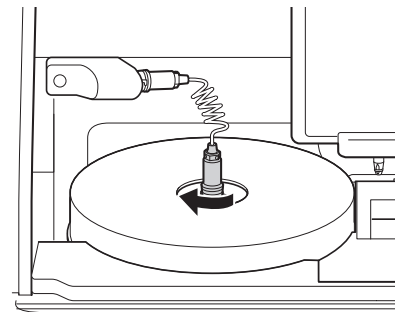
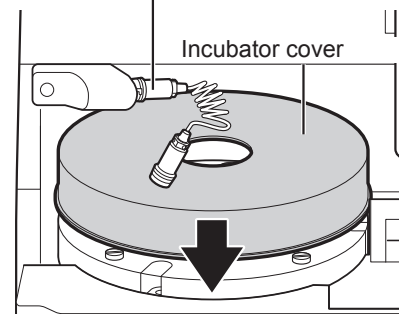
#### 4 Incubator cable

#### 3 Incubator cover



#### Incubator cable

#### Incubator cover



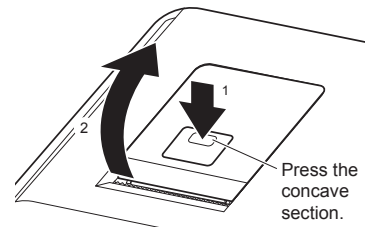


## 6.4 Replacing Recording Paper

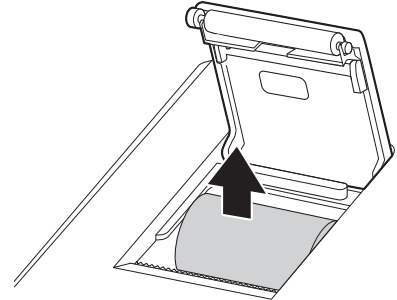
When red lines appear along the sides of the recording paper, the printer is nearly out of paper, so replace the recording paper roll with a new one.

**NOTE:** Use the recording paper specified for the Element DC5X Analyzer.

1. Press the section indicated in the illustration (1) to release the lock, and then open the cover (2).



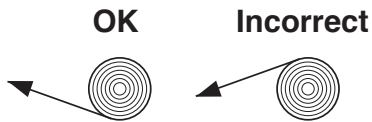
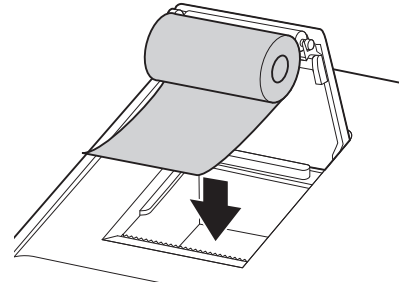
2. Remove the remaining recording paper.



3. Load the new recording paper.

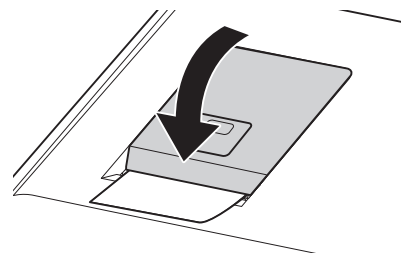
**NOTE:** If the paper replacement was performed during a measurement, the measurement results might be printed out.

**NOTE:** Set the paper roll so the paper is pulled from under the paper roll as shown below.



**NOTE:** If the paper is loaded in reverse, no text is printed on the thermal paper.

4. Pull the top end of the recording paper out slightly and then close the cover.



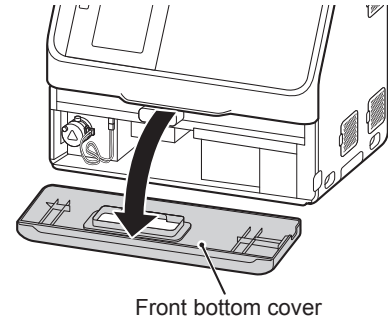
## 6.5 Replacing and Cleaning the Light Source Lamp

The average life of the lamp is about 1,000 hours. Replace the light source lamp if a photometer gain error has occurred or the lamp's cumulative illumination time is near 1,000 hours.

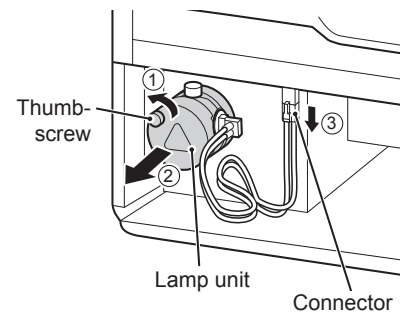
### CAUTION

The light source lamp gets very hot. Before cleaning the light source unit or replacing the light source lamp, turn off the power, wait at least 5 minutes, and then check the lamp has cooled.

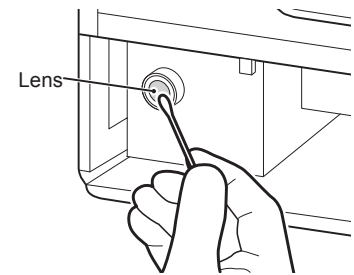
1. Pull out the disposal box, and then remove the front bottom cover.



2. Loosen the thumbscrew as shown in the figure to the right and remove the lamp unit.
3. Unplug the connector of the light source lamp and remove the lamp unit.



4. Wipe the light source unit lens using a dry cotton swab.  
**NOTE:** If you clean with alcohol, always wipe the lens using a dry cotton swab to dry it well.

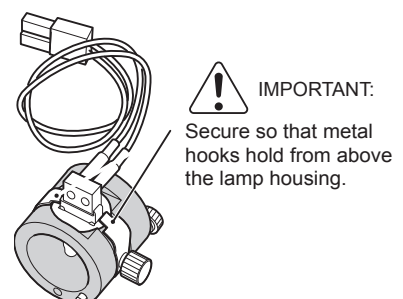
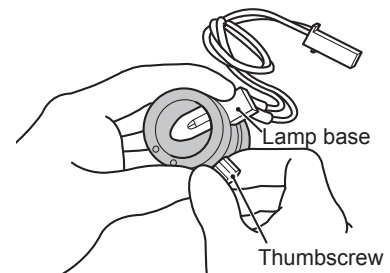


5. Turn the thumbscrew of the lamp unit to the left, remove the lamp, and then replace it with a new one.

### IMPORTANT

Tighten the thumbscrews securely. Otherwise, the measurement results may be negatively affected.

**NOTE:** When you replace the lamp, hold it by its base. Do not touch the glass surface with bare hands.



6. Insert the lamp unit into the analyzer with thumbscrew B facing up. Tighten thumbscrew A securely.

**i** IMPORTANT

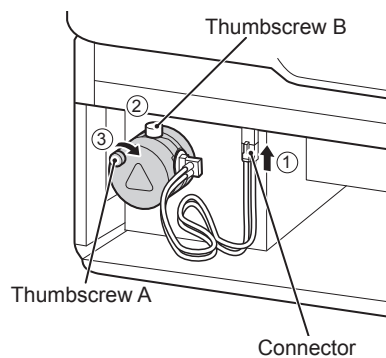
Tighten the thumbscrew securely. Otherwise, the measurement results may be negatively affected.

7. Insert the connector of the light source lamp.
8. Attach the front bottom cover, load the disposal box, and then switch on the power of the Element DC5X Analyzer.

**i** IMPORTANT

Be sure to load the disposal box. If the analyzer is used without the box, the measurement results may be negatively affected.

9. After starting the analyzer, go to [Lamp management] in Normal mode, and then reset [Lamp ON time]. *Section 8.3.3*



## 6.6 Inspecting and Replacing the Sampler O-ring

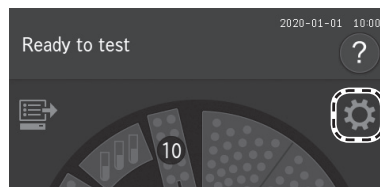
The sampler nozzle O-ring wears over time. Perform a sampler leak check every 3 months.

**i** IMPORTANT

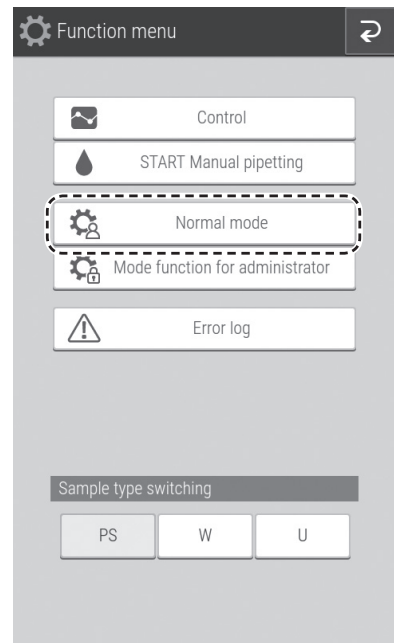
If you do not inspect and replace the sampler O-ring if indicated, the sample application volume will be inaccurate, which may negatively affect the measurement values. The specific leak check tool must be used.

### 6.6.1 Performing the sampler leak check

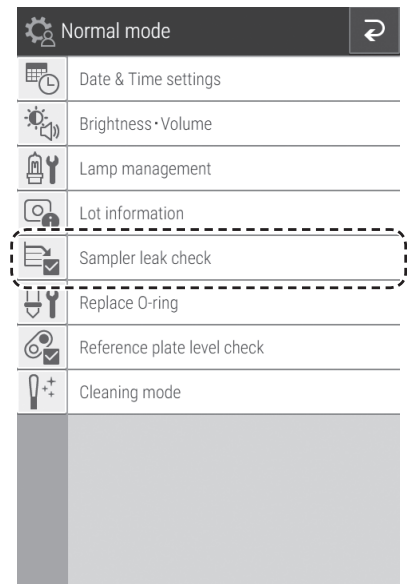
1. Touch .



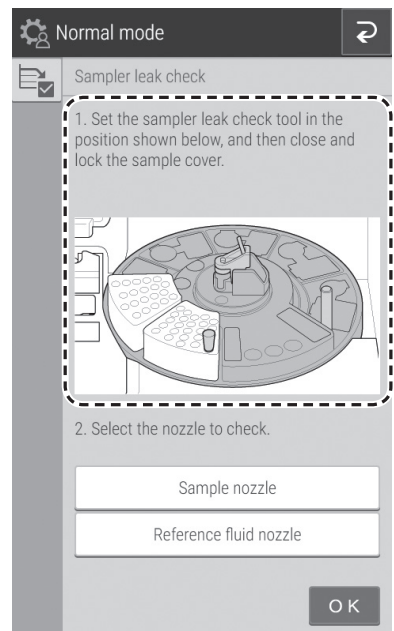
2. Touch NORMAL MODE.



3. Touch SAMPLER LEAK CHECK.



4. Follow the on-screen instructions to prepare for the leak check.

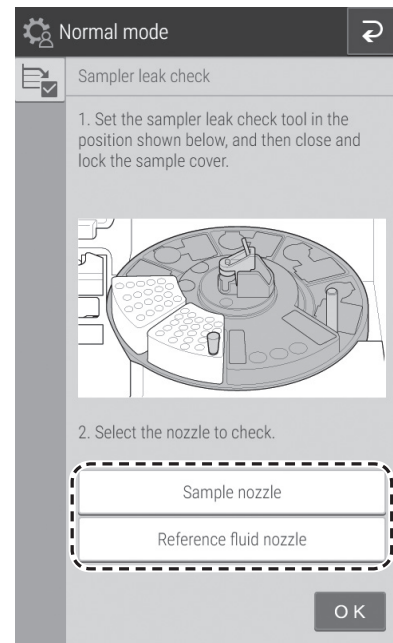


5. Touch the nozzle to be checked to select it, and then run the leak check.

Once check ends, the Check results screen appears.

 **CAUTION**

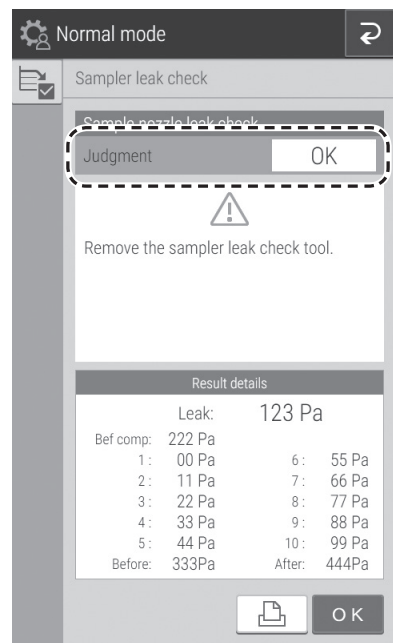
Keep your fingers away as the sampler unit and sample disk move.




6. Check the results of the [Sampler leak check].

If the check results are [OK], it is not necessary to replace the O-ring.

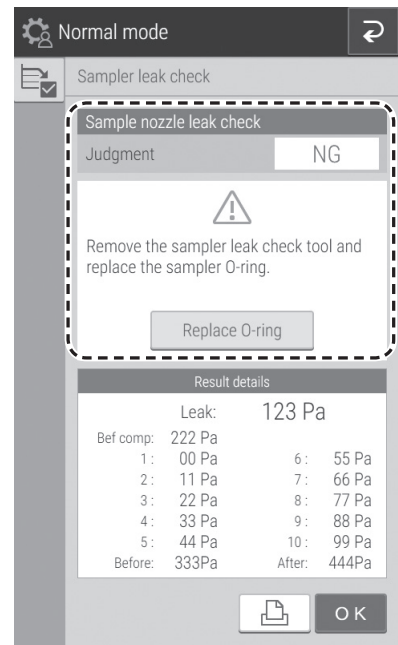
**NOTE:** The check results can be printed by touching .



If the check results are [NG], touch **REPLACE O-RING**, then replace the O-ring according to the following procedure.

**NOTE:** The check results can be printed by touching .

7. Once the check ends, open the sampler cover, and then remove the sampler leak check tool mounted on the sampler nozzle by hand.



### 6.6.2 Replacing the sampler O-ring


The sampler nozzle O-ring wears over time. Replace it if indicated.

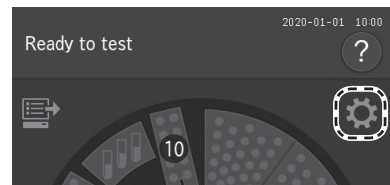
 **IMPORTANT**

If you do not replace the O-ring when indicated, the sample application volume will be inaccurate, which may negatively affect the measurement values.

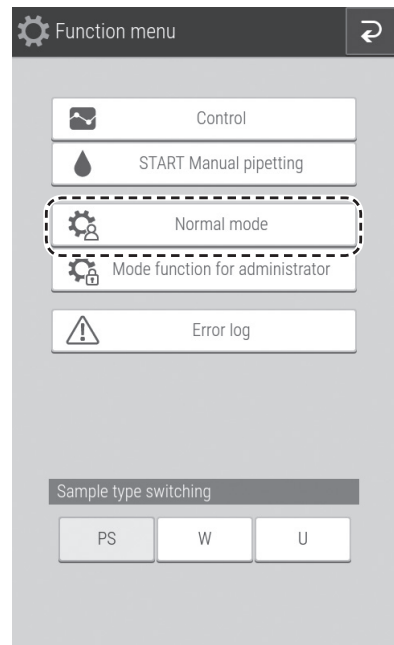
 **IMPORTANT**

Be sure to use the O-ring designed for the Element DC5X Analyzer. Otherwise, the sample application volume will be inaccurate, and the measurement results may be negatively affected.

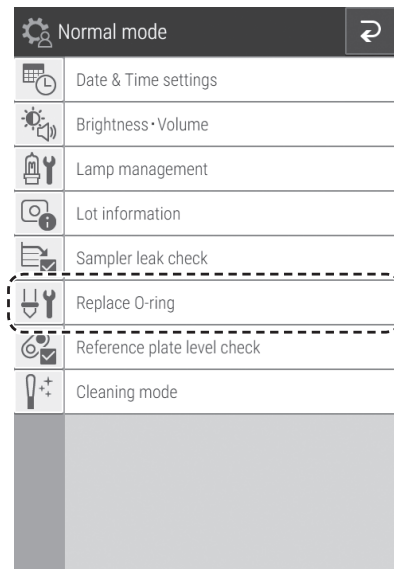
1. Remove the sample rack and slide cartridge.
2. Touch .



3. Touch **NORMAL MODE**.



4. Touch **REPLACE O-RING**.



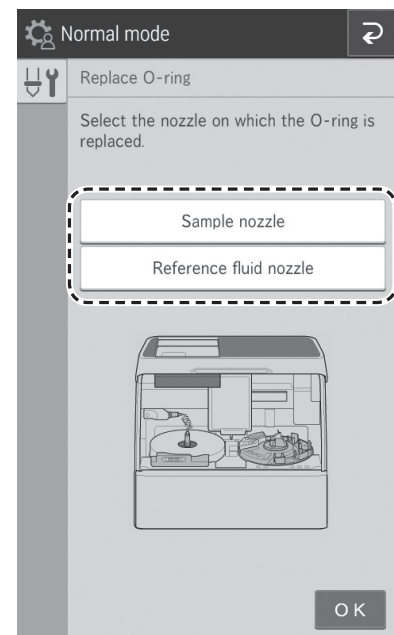
5. Touch the nozzle on which you want to replace the O-ring to select it.

The sampler unit moves, and the sampler nozzle comes down.

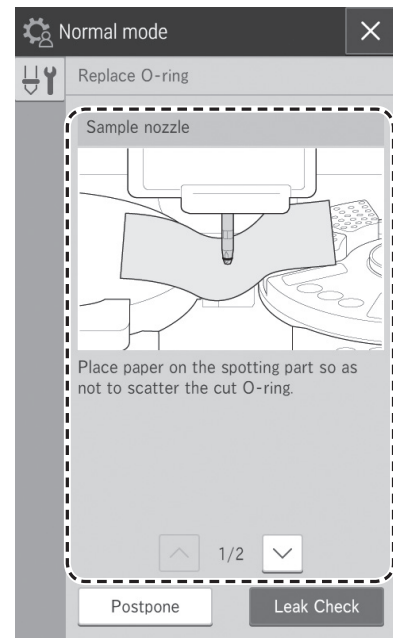


**CAUTION**

Keep your fingers away as the sampler unit moves.



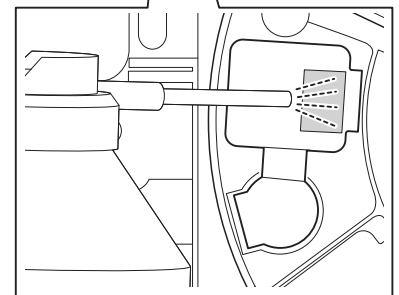
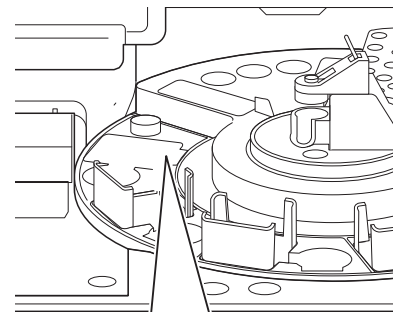
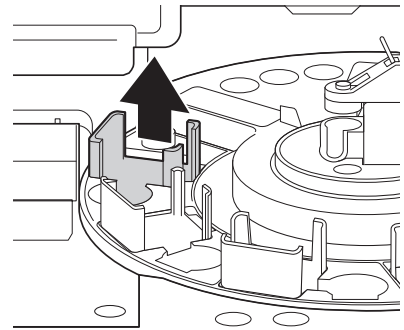
6. Follow the on-screen instructions to replace the O-ring.
7. Touch **LEAK CHECK** to check for leaks. *Section 6.6.1*



## 6.7 Cleaning the Slide Reading Section

When a slide-detection error has occurred, dust and other soiling may be the cause. Clean the slide reading section to avoid these errors.

1. Switch off the analyzer power.
2. Open the sampler cover and panel unit.
3. Slide the sampler unit all the way to the left.
4. Remove the slide cartridge of sample A and the sample rack in position A..
5. Turn the sample disk by hand so sample A is in the aspiration position. (between 9 o'clock and 10 o'clock).
6. A light source should be used to locate the slide reader lens.
7. Through the opening of the slide cartridge area of sample A, use canned air to blow away any dust on the glass plate of the reading section.





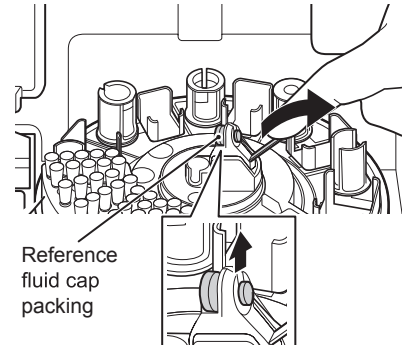
## 6.8 Cleaning and Replacing the Reference Fluid Cap

Clean the reference fluid cap each time the reference fluid is replaced. Replace the reference fluid cap if it becomes cracked.

### IMPORTANT

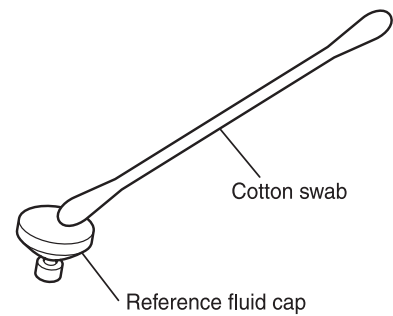
If you do not clean the reference fluid cap, the reference fluid will be concentrated, which may negatively affect the measurement values.

1. If reference fluid is loaded, remove the reference fluid tube and discard it.
2. Remove the reference fluid cap as shown in the illustration to the right.



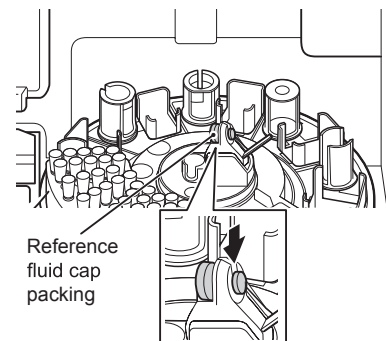
3. Wipe off the reference fluid cap using a cotton swab or soft cloth moistened with distilled water and then allow it to dry.

**NOTE:** Replace it with a new cap if stains cannot be wiped off, or if cap is cracked.



4. Replace the reference fluid cap properly.

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



 WARNING

When you troubleshoot, always wear gloves, a lab coat, and safety goggles.

If you accidentally touch a contaminant, immediately rinse the contaminated area thoroughly under running water and disinfect.

 IMPORTANT

If an analyzer malfunction (error) appears before or during measurement or warnings appear in the measurement results, the measurement results may be inaccurate. Refer to the related troubleshooting pages and rerun the measurement.

## 7.1 Error Display

If an error occurs, an error message appears on the LCD.

**NOTE:** Some error codes may show additional information.

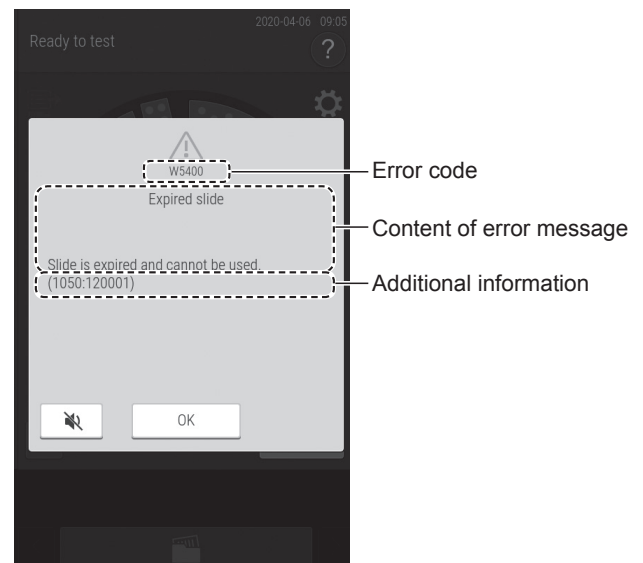
Example

1050 (GLU-P slide code)

120001 (Lot number)

\*Refer to *Section 7.3* for slide codes.

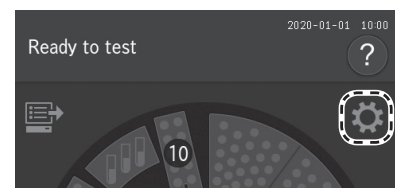
**NOTE:** The error messages listed in this document and the descriptions displayed on the LCD may differ.



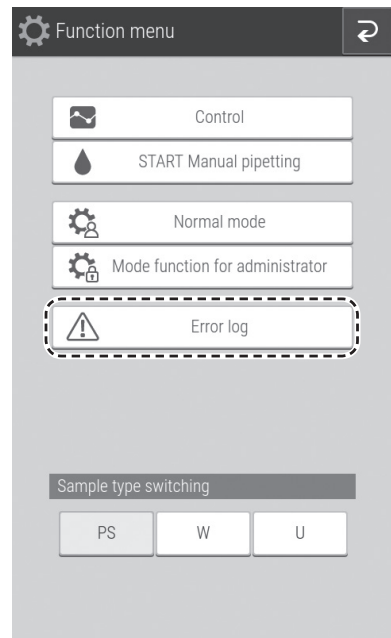
### 7.1.1 Error log

You can view the history of errors that occurred by using [Error log] in the function menu.

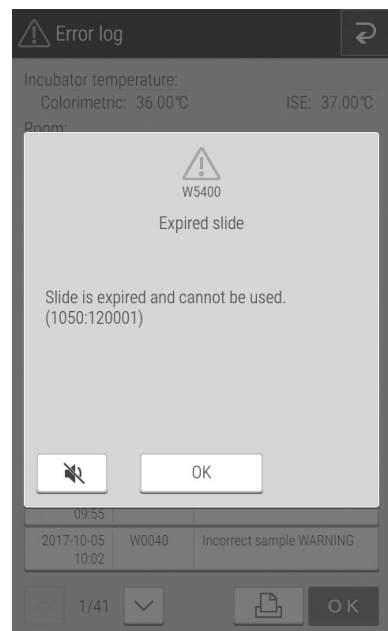
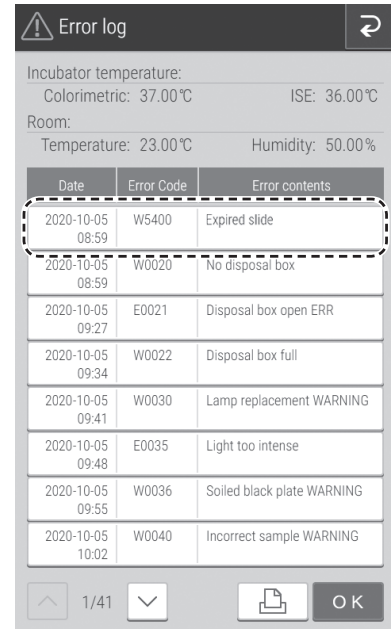
1. Touch .



2. Touch **ERROR LOG**.  
An error log list is displayed.



3. Touch an error.  
The error details are displayed.



## 7.1.2 Error code and reference section table




Error code	Error Description	Reference Section
E0021	The disposal box was open during measurement.	7.2.13
E0035	Photometric control system error.	7.2.8
E0050	Light source lamp is burned out.	7.2.5
E0080, E0081	Tip detection sensor error.	7.2.13
E0082–E0085	Tip mounting error.	7.2.4
E0086, E0087	Tip disposal error.	7.2.4
E0111, E0112	Clogging error during sampling of sample.	7.2.4
E0121, E0122	Clogging error during sampling of diluent.	7.2.4
E0124	Clogging error during sampling of diluted sample.	7.2.4
E0125	Clogging error during sampling of diluted sample.	7.2.4
E0127, E0128	Clogging error during sampling of reference fluid.	7.2.4
E0154	Mixing cup error.	7.2.4
E0200–E0204 E0210–E0213 E0220–E0227	Slide transfer error.	7.2.6
E0300, E0301, E0302	Reference white plate measurement error during initial operation.	7.2.8
E0509, E0510	Signal system error inside circuit board.	7.2.8
E0511	Light intensity error.	7.2.5
E0515, E0516, E0517	Signal system error inside circuit board.	7.2.8
E0530, E0531	ISE measurement unit (self-test) error.	7.2.11
E0532, E0533, E0537, E0538	Signal system error inside circuit board.	7.2.8
E0534, E0535, E0536, E0539, E0540	Signal system error inside circuit board.	7.2.8
E0565	ISE temperature control error.	7.2.7
E0600–E0604	Incubator motor error.	7.2.6
E0700–E0703	ISE measurement unit motor error.	7.2.6
E0900–E0903	Interference filter motor error.	7.2.5
E1000–E1003, E1010–E1013	Sampler vertical operation error.	7.2.4
E1100–E1103	Sampler horizontal operation error.	7.2.4
E1200–E1203	Syringe operation error.	7.2.4
E1400–E1403	Sample application unit feed error.	7.2.6
E1500, E1501, E1505	Temperature control error.	7.2.7
E1502, E1503, E1504	Temperature control error.	7.2.7
E1510, E1511, E1512, E1514, E1515	ISE temperature control error.	7.2.7
E1520, E1521	Installation environment temperature error.	7.2.7
E1530, E1531, E1532	Signal system error inside circuit board.	7.2.8
E1600–E1603	Sample disk operation error.	7.2.6
E1750–E1755	Slide reading control system error.	7.2.8
E3900	Signal system error inside circuit board.	7.2.8
E4401, E4403	Signal system error inside circuit board.	7.2.8
E4410	Measurement result reference error.	7.2.8
E4411	Control chart reference error.	7.2.8
E4454, E4490, E4600–E4613	Signal system error inside circuit board.	7.2.8
E4730, E4732	Signal system error inside circuit board.	7.2.8
E5101, E5102, E5103	Printer error.	7.2.2

Error code	Error Description	Reference Section
E5500	Signal system error inside circuit board.	7.2.8
E5510	Slide position offset during measurement.	7.2.5
E5901	Signal system error inside circuit board.	7.2.8
E6200, E6201, E6210	Communication error.	7.2.12

Error code	Error Description	Reference Section
W0020	The disposal box is open.	7.2.13
W0022	The disposal box is full.	7.2.13
W0030	Insufficient light intensity.	7.2.5
W0036	Reference black plate soiling.	7.2.5
W0040	The sample type configuration and sample type of the slide do not match.	7.2.10
W0042	Sample rack configuration error.	7.2.10
W0060	Insufficient sample.	7.2.4
W0090	The ISE slide is loaded in reverse.	7.2.10
W0091, W0092	ISE measurement error.	7.2.11
W0120	Sample surface cannot be detected.	7.2.4
W0123, W0129	Liquid volume error.	7.2.4
W0140	Liquid volume error.	7.2.4
W0141–W0144	Liquid volume error.	7.2.4
W0151, W0152	Mixing cup error.	7.2.4
W0170	QC card has not been read.	7.2.9
W0173	The slide information has not been read.	7.2.3
W0214	Slide transfer error.	7.2.6
W0500–W0503	Malfunction of the internal fan.	7.2.13
W0704	ISE measurement unit motor error.	7.2.6
W0904	Interference filter motor error.	7.2.5
W1004, W1014	Sampler vertical operation error.	7.2.4
W1104	Sampler horizontal operation error.	7.2.4
W1204	Syringe operation error.	7.2.4
W1404	Sample application unit feed error.	7.2.6
W1604	Sample disk motor error.	7.2.6
W1650	A sample rack has not been loaded.	7.2.13
W1652	Slide transfer error.	7.2.6
W1654	Sample rack configuration error.	7.2.10
W1700–W1702, W1704–W1706	Malfunction of the QC card reader.	7.2.9
W1703	QC card read ERR.	7.2.9
W4010	QC type has not been read.	7.2.9
W4011	Panel card error.	7.2.9
W4012	DI card error.	7.2.9
W4013, W4014	QC card error.	7.2.9
W4460–W4475	Signal system error inside circuit board.	7.2.8
W4500, W4501, W4502	Serial communication error.	7.2.12
W4510	LAN communication error.	7.2.12
W4520	Error related to work list.	7.2.12

Error code	Error Description	Reference Section
W4720	Clock time error.	7.2.8
W4721, W4731, W4733, W4735, W4736	Signal system error inside circuit board.	7.2.8
W5000, W5020	Signal system error inside circuit board.	7.2.8
W5050	USB memory has not been inserted.	7.2.8
W5100	Printer error.	7.2.2
W5110	No recording paper.	7.2.2
W5330, W5331	Sample barcode reader error.	7.2.12
W5400	Expired slide.	7.2.10
W5401, W5402	Tip discarding error.	7.2.4
W66xx	Input value warning.	7.2.13
I5920	Reboot warning.	7.2.13

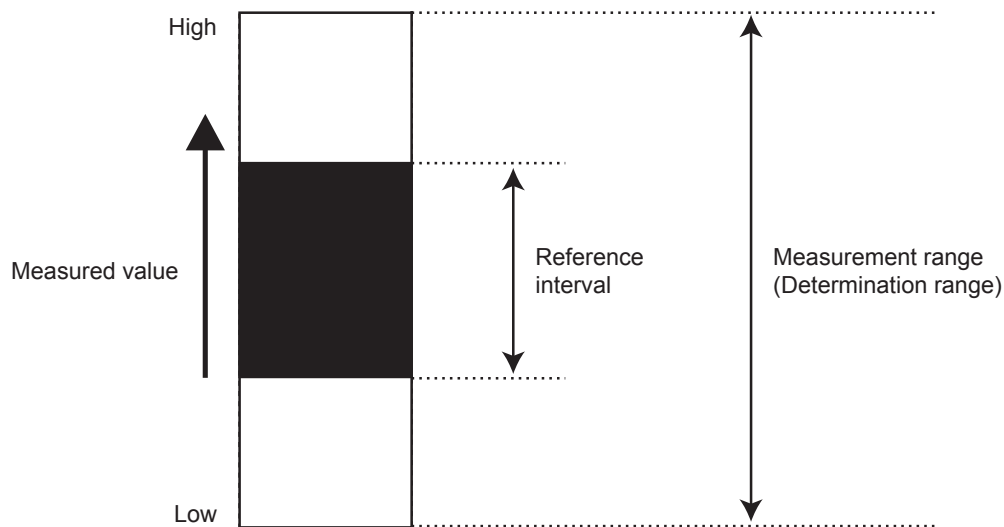
### 7.1.3 Printout reference table

Printout	Meaning and Conditions	Troubleshooting
H	Measurement value is higher than the upper limit of the preset reference interval.	–
L	Measurement value is lower than the lower limit of the preset reference interval.	–
>	Measurement value is higher the upper limit of the measurement range.	–
<	Measurement value is lower than the lower limit of the measurement range.	–
@	The measurement values are reference values outside the measurement range.  <b>IMPORTANT</b> <b>Measurement values might be incorrect.</b>	–
+ OR	Measurement value of the ISE test is higher than the upper limit of the measurement range.	Refer to <i>Section 7.2.11</i>
– OR	Measurement value of the ISE test is lower than the lower limit of the measurement range.	Refer to <i>Section 7.2.11</i>
+, -, \$	 <b>IMPORTANT</b> <b>Measurement values might be incorrect. Refer to the related troubleshooting pages and rerun the measurement.</b>	Refer to <i>Section 7.2.7</i>
*, ?	Light intensity is fluctuating during measurement.	Refer to <i>Section 7.2.5</i>
E	Unable to calculate the measurement result because measurement was interrupted due to a transfer problem or other error. The measurement results are printed as [****].	Check whether other errors have occurred, and then perform the necessary troubleshooting.
&	Abnormally high measurement value. In the case of a Ca-P slide, the sample has not been spotted.	Perform a dilution.
#	The valid term of the slide has expired. Measurement value may not be accurate.  <b>IMPORTANT</b> <b>The # for expired slides is not shown on ISE tests.</b>	Use slides within their validity terms.
¥	Problem with sample application on slide (not applied).	Rerun the measurement.

## (Supplement) Measurement range

The measurement range (determination range) and the reference interval differ by measurement item. Their relation is shown below.

**NOTE:** Set the values of the reference interval by using [Reference interval range setting] in Mode function for administrator.  
Section 8.4.6



## 7.2 Troubleshooting

### 7.2.1 Startup errors

1. The analyzer does not start after the power button is pressed.

Check that the power cable is properly connected. Turn the power switch OFF and ON again, and press the power button.

If the analyzer still does not start, please contact Heska Technical Support Services for assistance.

### 7.2.2 Printer or LCD trouble

1. Printed characters are too faint or dark.

Please contact your dealer for assistance.

2. White lines appear on printed characters or certain parts of characters are missing.

The printer head has malfunctioned. Please contact Heska Technical Support Services for assistance.

3. Printer errors

Error Code	Error Message	Error Condition	Troubleshooting
W5110	Printer error (Arm open) No paper. Set paper.	No recording paper.	Load recording paper onto the printer. <i>Section 6.4</i>
W5100, E5101, E5102, E5103	Printer errors.	The printer is malfunctioning.	Please contact Heska Technical Support Services.

4. LCD is too faint or dark.

Adjust the brightness using [Brightness and Volume] in Normal mode. *Section 8.3.2*

### 7.2.3 Slide reading errors

Error Code	Error Message	Error Condition	Troubleshooting
W0173	Slide identification ERR No slide information. Check the slide.	The slide information on backside of the slide could not be read correctly.	Clean the slide reader, and then rerun the measurement. <i>Section 6.7</i> <b>NOTE:</b> If the error occurs again, please contact Heska Technical Support Services.

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

### 7.2.4 Sampler errors

1. When tip cannot be mounted.

Error Code	Error Message	Error Condition	Troubleshooting
E0082	Sample tip detection ERR No tip detected. Set tips and rerun the tests from the beginning.	No tip can be detected on the sample nozzle after mounting.	The tip is not loaded correctly. Load a tip correctly, and then rerun the test from the beginning. <i>Section 5.2</i> <b>NOTE:</b> Set tips into all holes of the tip racks after this error has occurred.
E0083	Reference fluid tip detection ERR No tip detected.	No tip has been detected on the reference fluid nozzle after mounting.	Set tips and rerun the tests from the beginning.
E0084	Sample tip clogging ERR Rerun the tests from the beginning.	A clog was detected during mounting of the sample nozzle tip.	If the error occurs again, please contact Heska Technical Support Services.
E0085	Reference fluid tip clogging ERR Rerun the tests from the beginning.	A clog was detected during mounting of the reference fluid nozzle tip.	If the error occurs again, please contact Heska Technical Support Services.

2. When tip cannot be ejected.

Error Code	Error Message	Error Condition	Troubleshooting
E0086	Sample tip eject ERR After analyzer shut-down, empty disposal box, and then turn the power ON.	Tips cannot be discarded.	After analyzer shutdown, empty disposal box, and then turn the power ON.
E0087	Reference fluid tip eject ERR After analyzer shutdown, empty disposal box and then turn the power ON.	Tips cannot be discarded.	After analyzer shutdown, empty disposal box, and then turn the power ON.
W401	Reconfirmation An error occurred while discarding the tip at the last startup. Please check the disposal box. If the disposal box is not empty, please shut down, empty the disposal box, and restart.	Tips cannot be discarded.	Please check the disposal box. If the disposal box is not empty, please shut down, empty the disposal box, and restart.
W402	Reconfirmation An error occurred while discarding the tip at the last startup. Please check that the sample application unit cover is set. If the sample application unit cover is not set, please shut down, assemble the sample application unit cover, and restart.	Tips cannot be discarded.	Please check that the sample application unit cover is set. If the sample application unit cover is not set, please shut down, assemble the sample application unit cover, and restart.



3. When there are insufficient number of or no mixing cups.

Error Code	Error Message	Error Condition	Troubleshooting
W0151	Lack of mixing cup. Set mixing cup and re-run the tests from the beginning.	There are not enough mixing cups.	After you replace the mixing cups, re-run from the measurement request. <i>Section 5.3</i>
W0152	No mixing cup is detected. Set mixing cup and re-run the tests from the beginning.	No mixing cups can be detected.	After you replace the mixing cups, re-run from the measurement request. <i>Section 5.3</i>
W0154	Mixing cup detection sensor ERR	Error of the mixing cup detection sensor.	If the error still occurs after switching the analyzer off and on, please contact Heska Technical Support Services.

4. During a sample volume error.

Error Code	Error Message	Error Condition	Troubleshooting
W0120	Sample shortage Sample is insufficient. Check the sample.	Either the sample is not loaded or the sample volume is insufficient.	Make sure that the sample volume in the tube is within the measurable range and an appropriate sample tube is used in the sample rack, and then rerun from the measurement request. <b>NOTE:</b> If the sample volume is low, add sample to the tube or perform manual sample application.
W0060	Sample shortage Check the sample volume. Confirm that a sample rack matching the sample tube size is used.	There is not enough sample volume.	
W0140	Surface detection ERR (sample) Sample volume is too much. Check the sample volume.	There is too much sample volume.	

5. During a sample aspiration or application error.

Error Code	Error Message	Error Condition	Troubleshooting
E0111	Aspiration clogging ERR (sample) Clogging was detected during sampling. Check the sample.	Clogging was detected during sample aspiration.	The sample may contain fibrin deposits. After checking the sample, rerun from the measurement request.
E0124	Aspiration clogging ERR (diluted sample) Clogging was detected during sampling. Check the sample and diluent.	Clogging was detected during sample aspiration.	
E0112	Spotting clogging ERR (sample) Clogging was detected during sampling. Check the sample.	A clog was detected during sample application (ejection).	
E0125	Spotting clogging ERR (diluted sample) Clogging was detected during sampling. Check the sample and diluent.	A clog was detected during sample application (ejection).	The sample may contain fibrin deposits. After checking the sample, rerun from the measurement request. <b>NOTE:</b> If the error occurs again, there might be a piping system problem. Please contact Heska Technical Support Services.

6. When sample is not spotted onto slides.

Error Code	Error Message	Error Condition	Troubleshooting
	Sample application problem <, @ or ¥ .	Because the sample is not applied to the slide, the error mark <, @ or ¥ appears continuously. <b>i</b> <b>IMPORTANT</b> Measurement values with an [ @ ] mark might be incorrect. Run the measurement again.	Check the following: a. Make sure that DRI-CHEM Auto Tips are being used. b. Make sure that tips are not being reused. c. Make sure that there are no bubbles on the sample surface in the sample tube. d. Check the sample for fibrin. e. Make sure that a sample rack that matches the sample tube size is being used. f. Inspect the sampler O-ring. <i>Section 6.6.1</i>

7. During a diluent/reference fluid volume error.

Error Code	Error Message	Error Condition	Troubleshooting
W0141	Surface detection ERR (diluent) Diluent volume is too much. Check the diluent volume.	There is too much diluent volume.	<p>Follow the instructions of the error code to replace the diluent or reference fluid, and then rerun from measurement request.</p> <ul style="list-style-type: none"> <li>• Diluent → <i>Section 5.4</i></li> <li>• Reference fluid → <i>Section 5.5</i> <b>NOTE:</b> Replace the diluent/reference fluid container with a new one. Do not add diluent or reference fluid to the existing tube.</li> </ul>
W0142	Surface detection ERR (reference fluid) Reference fluid volume is too much. Check the reference fluid volume.	There is too much reference fluid volume.	
W0123	Diluent is insufficient Check the diluent.	There is not enough diluent.	
W0143	Diluent is insufficient Check the diluent volume.	There is not enough diluent.	
W0129	Reference fluid shortage Reference fluid is insufficient. Check the reference fluid.	There is not enough reference fluid.	
W0144	Insufficient reference fluid Reference fluid is insufficient. Check the reference fluid volume.	There is not enough reference fluid.	

8. During a diluent / reference fluid error.

Error Code	Error Message	Error Condition	Troubleshooting
E0121	Aspiration clogging ERR (diluent) Clogging was detected during sampling. Check the diluent.	Clogging was detected during diluent application.	<p>Check whether the diluent/reference fluid are loaded in a proper tube. If there was a loading problem, replace the diluent and reference fluid, and then rerun from the measurement request.</p> <p><b>NOTE:</b> If the error occurs again, there might be a piping system problem. Please contact Heska Technical Support Services.</p>
E0122	Spotting clogging ERR (diluent) Clogging was detected during sampling. Check the diluent.	Clogging was detected during diluent application.	
E0127	Aspiration clogging ERR (diluent) Clogging was detected during sampling. Check the sample and diluent.	Clogging was detected during reference fluid application.	
E0128	Spotting clogging ERR (diluent) Clogging was detected during sampling. Check the sample and diluent.	Clogging was detected during reference fluid application.	

9. During a sampler drive system error.


Error Code	Error Message	Error Condition	Troubleshooting
E1000, E1001, E1003, E1004	Sampler up/down motor ERR Problem on the sample nozzle side. Perform inspection. Contact Heska Technical Support Services.	Movement error of sample/dilution nozzle.	Switch off the analyzer when the measurement is completed. Make sure there are no foreign objects (such as a tip or slide) stuck in the sampler unit.  <b>NOTE:</b> If the error still occurs after switching the analyzer off and on, please contact Heska Technical Support Services.
E1002	Sampler up/down motor operation ERR Problem on the sample nozzle side. Perform inspection. Contact Heska Technical Support Services.	Movement error of sample/dilution nozzle.	
E1010, E1011, E1013, E1014	Sampler up/down motor ERR Problem on the reference fluid nozzle side. Perform inspection. Contact Heska Technical Support Services.	Movement error of reference fluid nozzle.	
E1012	Sampler up/down motor operation ERR Problem on the reference fluid nozzle side. Perform inspection. Contact Heska Technical Support Services.	Movement error of reference fluid nozzle.	
E1100–E1103 W1104	Sampler movement motor ERR Problem with sampler movement. Perform inspection. Contact Heska Technical Support Services.	Movement error during horizontal transfer of the sampler unit.	
E1200, E1201, E1203, W1204	Syringe motor ERR Problem with the syringe. Contact Heska Technical Support Services.	Movement error of the syringe motor.	
E1202	Syringe motor operation ERR Problem with the syringe. Contact Heska Technical Support Services.	Movement error of the syringe motor.	

7.2.5 Photometric system errors

 **IMPORTANT**

If a photometric system error has occurred, perform each troubleshooting step listed below and rerun the measurement.

1. During a fluctuation of light source intensity.

Error Code	Error Message	Error Condition	Troubleshooting
W0036	Soiled black plate WARNING Reference black plate soiled. Clean the black plate.	The reference plate is dirty.	Switch off the analyzer and clean each part listed below. <ul style="list-style-type: none"> <li>Clean the light source unit lens → <i>Section 6.5</i></li> <li>Clean the reference plate → <i>Section 6.3</i></li> <li>Clean the photometer → <i>Section 6.3</i></li> </ul> After cleaning, switch on the power. If the errors still occur after cleaning, replace the light source lamp. <i>Section 6.5</i> <b>NOTE:</b> If the error occurs again, please contact Heska Technical Support Services.
W0030	Lamp replacement WARNING Low light intensity. Clean photometer.	The light intensity of the light source lamp is insufficient.	
E0511	Faulty A/D controller	The light intensity is changing during measurement.	 <b>CAUTION</b> The light source lamp gets very hot. Before cleaning the light source unit or replacing the light source lamp, turn off the power, wait at least 5 minutes, and then check the lamp has cooled.
Error marks * or ?	Error marks * or ? are printed on the results	The light intensity is changing during measurement.	

2. When lamp is burned out.

Error Code	Error Message	Error Condition	Troubleshooting
E0050	Lamp replacement Low light intensity. Replace the lamp.	The light source lamp is burned out.	Switch off the power and replace the light source lamp. Switch the analyzer on again after replacement. <i>Section 6.5</i> <b>⚠ CAUTION</b> The light source lamp gets very hot. Before cleaning the light source unit or replacing the light source lamp, turn off the power, wait at least 5 minutes, and then check the lamp has cooled.

3. During an interference filter motor error.

Error Code	Error Message	Error Condition	Troubleshooting
E0900, E0901, E09003, W0904	Filter motor ERR Problem with the interference filter.	Movement error of the filter motor.	Switch the analyzer off and on. <b>NOTE:</b> If the errors still occur after switching off and on the analyzer, please contact Heska Technical Support Services for assistance.
E0902	Filter motor operation ERR Problem with the interference filter.		

4. Other errors.

Error Code	Error Message	Error Condition	Troubleshooting
E5510	Slide slip ERR	The slide stop position shifted during measurement.	Tighten 5 thumbscrews on the top incubator piece..

7.2.6 Transfer errors

Error Code	Error Message	Error Condition	Troubleshooting
E0200–E0204, E0220–E0227	Feed motor ERR Problem with the slide transfer system. Perform inspection.	Movement error of the slide supply motor.	The spotting part or the incubator may be dirty or the disposal box may be full of slides and tips. Switch off the analyzer, and perform the following. <ul style="list-style-type: none"> <li>• Cleaning the disposal box → <i>Section 6.3</i></li> <li>• Cleaning the incubator → <i>Section 6.3</i></li> <li>• Cleaning the spotting part → <i>Section 6.3</i></li> </ul> <b>NOTE:</b> If the error occurs again, please contact Heska Technical Support Services for assistance.
E0210–E0213, W0214	Eject motor ERR Problem with the slide transfer system. Perform inspection.		
W1652	Initialization ERR Problem with the slide transfer system. Perform inspection.		
E0600–E0604	Incubator motor ERR Problem with the incubator. Perform inspection.	Movement error of the incubator motor of the incubator.	
E0700, E0701, E0703, E0704	Probe motor ERR Problem with ISE. Perform inspection.	Movement error of the probe motor of the ISE unit.	
E0702	Probe motor operation ERR Problem with ISE. Perform inspection. Contact Heska Technical Support Services.		
E1400–E1403, W1404	Transfer change motor ERR Problem with the slide transfer system.	Movement error of the ISE transfer motor of the sample application unit.	
E1600–E1603, W1604	Sample disc motor ERR Problem with the sample disk.	Movement error of the disk motor of the sample disk section.	

**!** IMPORTANT

A measurement value with a “+” or “-” mark may not be accurate. Perform the following operation and rerun the measurement.

Error Code	Error Message	Error Condition	Troubleshooting
E0565	ISE temperature control ERR Problem with ISE.	When the measurement results are appended with a “+” or “-” mark or an error listed to the left occurs, the temperature inside the incubator is outside the specified range.	Please contact Heska Technical Support Services for assistance.
E1500	Temperature control ERR Check the ambient temperature. Clean the air filter. Reboot the analyzer.		Perform the following troubleshooting. a. Check the room temperature is within 59°F to 89.6°F [15°C to 32°C]. If the temperature is out of the range, control the room temperature. b. Switch off the power. c. Clean the air filters. <i>Section 6.2</i> d. Make sure that thumbscrews of the incubator are tightened properly and the incubator cable is connected to the connector properly. <i>Section 6.3.3</i> e. Make sure that the sample application unit cover is attached to the analyzer properly. Tighten the thumbscrews securely. f. Leave the analyzer off for about 10 min. to allow the interior to cool, and then switch on power. <b>NOTE:</b> If the error occurs again, please contact Heska Technical Support Services.
E1501, E1505	Temperature control ERR Check the ambient temperature. Reboot the analyzer.		
E1510	ISE temperature control ERR Check the ambient temperature. Clean the air filter. Reboot the analyzer.		
E1511, E1515	Temperature control ERR Check the ambient temperature. Reboot the analyzer.		
E1520, E1521	Room temperature WARNING Check the ambient temperature. Reboot the analyzer.		
E1502	Temperature control ERR Incubator temperature sensor disconnected. Check the incubator cable.	When the measurement results are appended with a “\$” mark or an error listed to the left occurs, the incubator cable is not connected.	Switch off the power and connect the incubator cable again. <b>NOTE:</b> After inserting the connector of the incubator cable, you must turn it to the right to lock it. <i>Section 6.3.3</i> <b>NOTE:</b> If the error occurs again, please contact Heska Technical Support Services for assistance.
E1503	Temperature control ERR Incubator temperature sensor damaged.		
E1504	Temperature control ERR Incubator heater disconnected. Check the incubator cable.		
E1512	ISE temperature control ERR ISE temperature control element damaged.	Disconnection error of the ISE incubator.	Please contact Heska Technical Support Services for assistance.
E1514	ISE temperature control ERR ISE heater disconnected.		

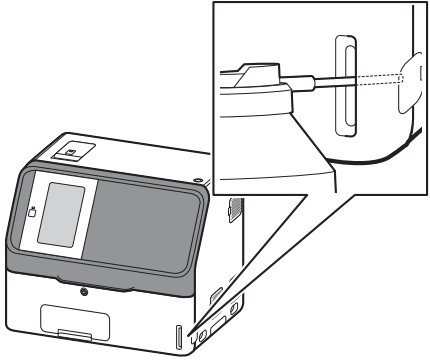
## 7.2.8 Circuit board signal errors

Error Code	Error Message	Error Condition	Troubleshooting	
E0035	Light too intense Light too intense.	A circuit board signal error has occurred.	If the error still occurs after switching the analyzer off and on, please contact Heska Technical Support Services for assistance.	
E0300, E0301, E0302	Gain setting ERR			
E0509	AD conversion calibration ERR		Please contact Heska Technical Support Services for assistance.	
E0510	Faulty A/D controller			
E0515	DA conversion initialization ERR			
E0516	AD conversion reset ERR			
E0517	AD conversion initialization ERR			
E0532, E0533, E0537, E0538	ISE self-test AD conversion ERR For ISE measurement, turn the power SW OFF and ON. Other parameters besides ISE can be measured.			When an error occurs after turning the power on and off, please contact Heska Technical Support Services for assistance. Tests other than ISE do not require a restart.
E0534, E0535, E0536, E0539	ISE AD conversion ERR For ISE measurement, turn the power SW OFF and ON. Other parameters besides ISE can be measured.			
E0540	ISE AD conversion initialization ERR For ISE measurement, turn the power SW OFF and ON. Other parameters besides ISE can be measured.			
E1530, E1531, E1532	Temperature AD conversion ERR		Please contact Heska Technical Support Services for assistance.	
E1750–E1755	Slide reading unit failure.		If the error still occurs after switching the analyzer off and on, please contact Heska Technical Support Services for assistance.	
E3900	Internal communication ERR			
E4401, E4403	Save ERR		This measurement result cannot be referred.	
E4410	Measurement result reference error The number of measurement results, with the new result, currently exceeds capacity. The selected measurement result was deleted.			
E4411	Control chart reference error The selected chart is not up-to-date with the new measurement. Please go back to the parameter selection screen and display the chart again.			
E4454	Memory loading ERR		Please contact Heska Technical Support Services for assistance.	
W4460, W4461, W4464, W4469, W4470, W4473, W4474	Memory recovery WARNING (setting info.) Recovery performed from backup memory.		Check whether the setting for reference intervals is correct.	
W4462, W4463	Memory recovery WARNING Recovery performed from backup memory. Check whether the setting for reference intervals is correct.			

Error Code	Error Message	Error Condition	Troubleshooting		
W4465–W4468	Memory recovery WARNING Recovery performed from backup memory. Check whether the QC card is read by confirming the lot number. If not, re-read the QC card.	A circuit board signal error has occurred.	Check the lot information whether the QC card has been read. If the card has not been read, read the QC card again. Please contact Heska Technical Support Services for assistance.		
W4471, W4472	Memory recovery WARNING Recovery performed from backup memory. Check the setting for control fluid range.		Check the setting for control fluids.		
W4475	Memory initial-value recovery WARNING Recovery performed from backup memory.		Please contact Heska Technical Support Services for assistance.		
E4490	File deletion ERR				
E4600–E4613	Calculation ERR				
W4720	Clock setting WARNING Set date & time. If the error still occurs, contact Heska Technical Support Services.	The date and time have been reset.	Set the date and time using [Date & Time settings] in Normal mode. <i>Section 8.3.1</i> <b>i IMPORTANT</b> <b>If the date and time are not adjusted correctly, the analyzer may fail to determine the expiration of the slides and the calibration, and the measurement results may not be accurate.</b>		
W4721	Clock control failure WARNING Set date & time. If the error still occurs, contact Heska Technical Support Services.	A circuit board signal error has occurred.	Set the date and time using [Date & Time settings] in Normal mode. <i>Section 8.3.1</i>		
E4730	Hardware initialization ERR		Please contact Heska Technical Support Services for assistance.		
W4731, E4732	Power control ERR				
W4733	Power switch control WARNING				
W4735	LCD backlight control WARNING				
W4736	LCD brightness setting WARNING				
W5000	USB memory read ERR				
W5020	USB memory write ERR				
W5050	No USB memory USB memory can not be recognized.			The USB memory is not inserted.	Insert USB memory. If the error occurs again, please contact Heska Technical Support Services for assistance.
E5500	Abnormal sample spreading on slide			Signal system error inside circuit board.	When an error occurs after turning the power on and off, please contact Heska Technical Support Services for assistance.
E5901	Software logic ERR	A software error has occurred.	Please contact Heska Technical Support Services for assistance.		

## 7.2.9 QC card, and DI card errors

- When data is not displayed after a QC card is read.

Error Code	Error Message	Error Condition	Troubleshooting
-	-	Problem reading QC card information	<p>Read the QC card again.</p>  <p>Spray card reader with canned air by pushing in the end of the nozzle about 50 mm.</p>

- When QC information has not been read.

Error Code	Error Message	Error Condition	Troubleshooting
W0170	No QC card info No QC information. Read QC card.	The QC card of the slides loaded in the slide cartridge has not been read.	Read the QC card of the printed slide code.
W4010	No QC type info No type information corresponding to the slide. Read QC card corresponding to the slide.	There is no type information for the corresponding item.	Read the corresponding QC card.

- When a DI card has not been read.

Error Code	Error Message	Error Condition	Troubleshooting
W4012	No DI info. No DI info found. Cannot read this card.	There is no DI card information.	Please contact Heska Technical Support Services for assistance.

- Other precautions.

Error Code	Error Message	Error Condition	Troubleshooting
W1700–W1702, W1704–W1706	QC card reader failure QC card reader damaged. Measurement is still possible.	The card reader has malfunctioned.	Please contact Heska Technical Support Services for assistance.
W1703	QC card read ERR Check the QC card direction and reread it. (Insert the QR code so that it faces the far left side.) If the error occurs repeatedly, contact Heska Technical Support Services.	QC card read error.	Make sure the card is inserted at correct orientation.
W4011	QC card ERR Cannot save data.	Panel card read error.	Please contact Heska Technical Support Services for assistance.
W4013	QC card ERR Check whether this is the correct QC card.	A QC card data error has occurred.	Check whether the QR code of the QC card is dirty. When the error is not resolved, please contact Heska Technical Support Services.
W4014	QC card ERR Cannot read QC card for “Mode Function Underway” or “Spotting Underway”. Read again after mode function ends, or after spotting ends.	The QC card cannot be read at this time.	After mode function or sample application ends, read the card again.



## 7.2.10 Slide loading errors.

Error Code	Error Message	Error Condition	Troubleshooting
W0040	Incorrect sample WARNING The sample type set in analyzer does not correspond to the read sample type. Set the sample type by SAMPLE key and the slide's sample type corresponding to the sample. Rerun the tests from the beginning.	The sample type selected by the [Sample type] button and the sample type of the slide do not match.(Example) • Plasma/serum (P) slides were loaded when [W] had been selected by the [Sample type] button. .	Match the configuration by the [Sample type] button and the sample type to measure the slide to be used, and then rerun the measurement from the beginning
W0042	Incorrect sample rack WARNING Correct sample rack not set in place. Check the sample rack.	A re-inspection was attempted for a measurement that uses the PF, but a rack other than a PF sample rack was loaded. A PF sample rack has been loaded for a control measurement.	Load a PF sample rack in which a sample extracted by PF has been loaded.  Load a sample rack other than a PF sample rack.
W0090	ISE slide direction ERR Incorrect loading direction of ISE slide. Check the ISE slide.	The ISE slide is loaded in reverse.	Load the ISE slide in the slide cartridge in the proper direction, and then measure again.
W1654	Check sample rack Unusable sample rack was set in place. Check the sample.	A sample rack that cannot be used is loaded.	Use a sample rack intended for this equipment. If the error occurs again, please contact Heska Technical Support Services for assistance.
W5400	Expired slide Slide is expired and cannot be used.	The validity term of the slide has expired.	Always use valid slides. <b>i IMPORTANT</b> <b>Slide validity is not detected in ISE tests.</b> <b>NOTE:</b> Depending on the device settings, this warning may not be generated.

## 7.2.11 ISE measurement errors



### IMPORTANT

ISE measurement values to which error codes have been appended (E1–E8) may not be correct. Perform the following troubleshooting and rerun the measurement.

1. When a self-test error occurred.

Error Code	Error Message	Error Condition	Troubleshooting
E0530	ISE self-test gain ERR For ISE measurement, turn the power SW OFF and ON. Other parameters besides ISE can be measured.	An error was detected during a self-test performed before the start of an ISE measurement.	The analyzer must be restarted for an ISE measurement. If the error occurs again, please contact Heska Technical Support Services for assistance. Tests other than ISE do not require a restart.
E0531	ISE selftest offset ERR For ISE measurement, turn the power SW OFF and ON. Other parameters besides ISE can be measured.		

- Errors are appended to measurement results.

During an ISE measurement, the checks listed in the table below are performed.

If there is a problem with a measurement value, an error code from E1 through E8 is appended to the measurement result.

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

Code	Description
E1	Drift error
E2	Impedance error
E3	Outside of the measurement range (This is not an analyzer malfunction.)
E4	Drift error and impedance error
E5	Impedance error and outside of the measurement range
E6	Drift error and outside of the measurement range
E7	Drift error, impedance error, and outside of the measurement range
E8	Impossible measurement

When the error code is **not** E3.

The sample or reference fluid may have not been sufficiently absorbed into the slide. Perform the following troubleshooting steps.

- Insure proper handling of reference fluid.
- Inspect the sampler O-ring. *Section 6.6.1*
- Clean the spotting part and ISE probe unit. *Section 6.3.2*
- Make sure that the analyzer can measure correctly by running a quality control on an electrolyte slide.

**NOTE:** If the error occurs again, please contact Heska Technical Support Services for assistance.

When the error code is E3.

There is no problem with the analyzer. The concentration of the sample is outside of the measurement range.

- Other errors.

Error Code	Error Message	Error Condition	Troubleshooting
W0091	Unacceptable ISE test ISE tests cannot run. Turn the power SW OFF and ON. Rerun the tests from the beginning.	An ISE measurement error has occurred, and ISE measurement cannot be started.	Check ISE measurement errors that occurred before this error, and then carry out the corresponding troubleshooting. After troubleshooting, turn the power of the device on and off, and then start measurement again from the beginning.
W0092	Unacceptable manual ISE spotting test ISE test cannot be done in this test mode. Set a measurable slide and redo the test from the beginning.	There was an attempt to measure an ISE slide using manual sample application measurement.	Measure an ISE slide using automatic sample application.

## 7.2.12 Errors related to data communication and sample barcode reader

### 1. When a communication error occurs.

Error Code	Error Message	Error Condition	Troubleshooting
W4500, W4501, W4502	Serial communication ERR Check the specifications and connection of the communication cable.	Serial communication error.	Check the following: communication cable, host computer, and communication destination settings. <b>NOTE:</b> If the error occurs again, please contact Heska Technical Support Services for assistance.
W4510	LAN communication ERR Check the specification and the connection of the communication cable.	LAN communication error.	
W4520	Incorrect work list information Check whether work list information for the host computer is correct.	The received work list information does not match specifications.	Check the work list information. <b>NOTE:</b> If the error occurs again, please contact Heska Technical Support Services for assistance.
E6200, E6201, E6210	Communication ERR	A communication error has occurred.	Please contact Heska Technical Support Services for assistance.

### 2. Sample barcode reader error.

Error Code	Error Message	Error Condition	Troubleshooting
W5330	Barcode reader not connected Check the barcode reader connection.	The sample barcode reader is not connected.	Connect the sample barcode reader to the USB connector, and then switch the analyzer off and on.
W5331	Exceeded number of characters from barcode reader The number of input characters from the barcode reader exceeded the capacity.	Barcode label error.	Check the barcode label.

## 7.2.13 Other errors.

Error Code	Error Message	Error Condition	Troubleshooting
W0020	No disposal box Insert disposal box then press START key.	Measurement was started with the disposal box pulled out.	Insert the disposal box completely, and then start measurement.
E0021	Disposal box open ERR Disposal box opened during measurement. Close Disposal box and run the tests from the beginning.	The disposal box was open during measurement.	Close the disposal box, and then start measurement again from the beginning.
W0022	Disposal box full Disposal box became full of slides and tips. Discard slides and tips to empty the box when measurement is not in progress.	The disposal box is full of slides and tips.	While a measurement is not being performed, dispose of slides and tips in the disposal box. <b>NOTE:</b> When there are 150 slides or 75 tips in the disposal box, this error occurs. If the disposal box is pulled out, it is determined that the slides and tips were discarded, and the disposal count is reset. Always empty the disposal box after pulling it out.
E0080	Sample tip sensor ERR Please contact Heska Technical Support Services for assistance..	Malfunction of the sample tip sensor.	Please contact Heska Technical Support Services for assistance.
E0081	Reference fluid tip sensor ERR.	Malfunction of the reference fluid tip sensor.	
W0500	Rear fan 1 stop	A fan error has occurred.	
W0501	Rear fan 2 stop		
W0502	Intake fan stop		
W0503	Exhaust fan stop		


Error Code	Error Message	Error Condition	Troubleshooting
W1650	No sample rack Sample rack is not set.	No sample rack has been loaded.	Load a sample rack.
I5920	Turn the power ON 30 days or more have passed from when the analyzer was started. For stable system performance, turn the power ON.	A long time has passed since startup.	Switch the analyzer off and on.
W66xx	Input value ERR Check input value and reenter.	The entered value is incorrect.	Check the entered value and enter it again.

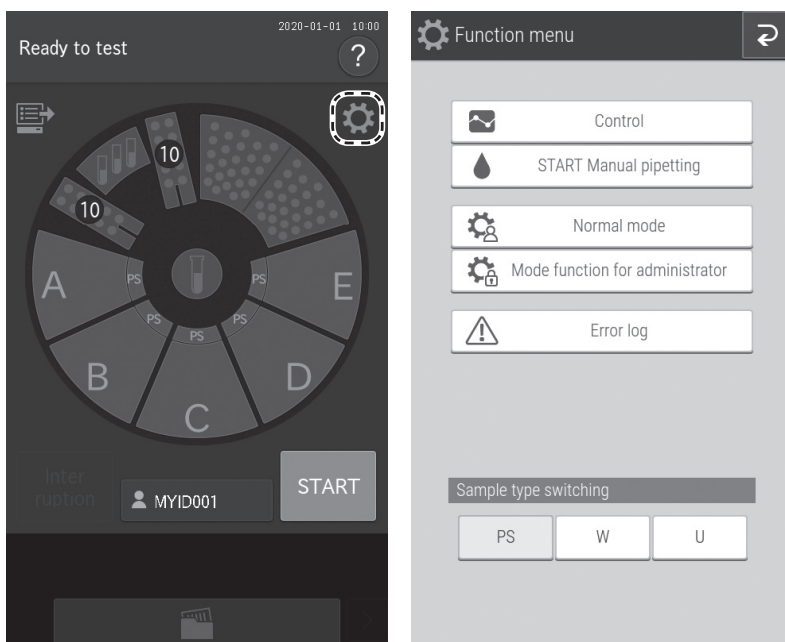
### 7.3 Slide Code Table

Slide Code				Slide Code			
Test	Test Code	Sample Code		Test	Test Code	Sample Code	
GLU	-P	10	50	GGT	-P	30	50
BUN	-P	11	50	GOT/AST	-P	31	50
UA	-P	13	50	GPT/ALT	-P	32	50
TCHO	-P	14	50	CPK	-P	33	50
NH <sub>3</sub>	-P	15	50	LDH	-P	34	50
TG	-P	16	50	ALP	-P	35	50
CRE	-P	17	50	v-AMY	-P	43	50
TP	-P	18	50	v-LIP	-P	44	50
ALB	-P	20	50	TCO <sub>2</sub>	-P	45	50
TBIL	-P	21	50	Na		91	00
Ca	-P	23	50	K		92	00
IP	-P	24	50	Cl		93	00
Mg	-P	28	50				

**NOTE:** Slide codes are subject to change without notice. Check the slide code printed on the slide box.

## 8.1 Function Menu

If the  (Function menu) is touched, the Function menu screen appears.



Function menu list.

Function Menu Items	Settings	Advanced Settings	Reference Section
Control	–	–	8.2
Normal mode	Date & time settings	–	8.3.1
	Brightness • Volume	Display brightness Error sound Other general sound	8.3.2
	Lamp management	Lamp ON time Lamp OFF timer setting	8.3.3
	Lot information	–	8.3.4
	Sampler leak check	Sample nozzle Reference fluid nozzle	6.6.1
	Replace O-ring	Sample nozzle Reference fluid nozzle	6.6.2
	Reference plate level check	–	6.3.1
	Cleaning mode	–	6.3.2

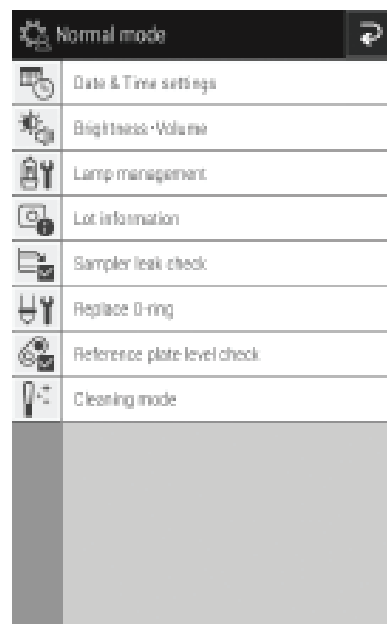
Function Menu Items	Settings	Advanced Settings	Reference Section
Mode function for administrator	Language setting	–	8.4.1
	Host connection setting	None Serial connection LAN connection	8.4.2
	Calculated parameter	–	8.4.3
	Unit conversion	–	8.4.4
	Switch measurement range display	–	8.4.5
	Reference interval range setting	–	8.4.6
	Sample No./IC setting	–	8.4.7
	Work list selection setting	Sample ID/Patient name Patient ID /Patient name	8.4.8
	Correlation coefficients	–	8.4.9
	Lot compensation coefficients	–	8.4.10
	Dilution setting	–	8.4.11
	Tube setting for diluent and reference fluid	Diluent Reference fluid	8.4.12
	Print setting for measured result	Number of printing sheets Print order	8.4.13
	Operator ID setting	–	8.4.14
	Test item name setting	Display and printout Data transmission	8.4.15
Error log	–	–	7.1.1

## 8.2 Control

This mode is not used for Heska Chemistry Control. If Control mode is entered accidentally, cycle power to cancel control mode.



## 8.3 Normal mode

Use this function menu for general, normal operation. For example, set the time and configure the brightness of the LCD.



### 8.3.1 Date and time settings

This mode is used to set the date and time settings stored in the memory.








- Touch  or  to change the date and time values.
- Configure the order of the year, month, and date by using [Date format setting].
- If transmitting results to a PC, the date format setting must be YYYY-MM-DD.

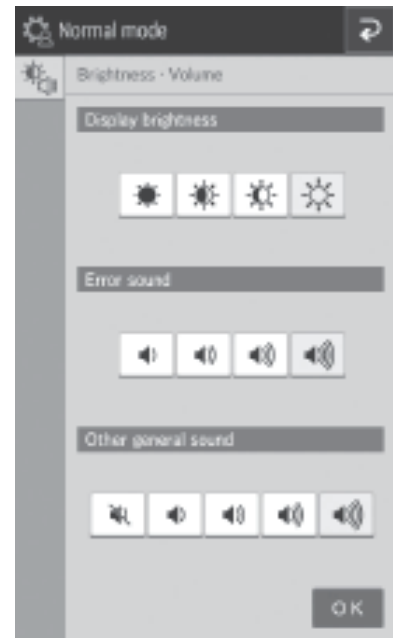
**NOTE:** The analyzer must be restarted to enable a change of [Date format setting].



### 8.3.2 Brightness and volume

You can configure the brightness of the LCD and buzzer sounds (error warning, measurement completed).

- Configure the brightness of the LCD using [Display brightness]. Use  and  to set the minimum and maximum brightness.
- Configure the buzzer sound when an error occurs by using [Error sound]. Use  and  to set the minimum and maximum.
- Configure the buzzer sound when measurement ends by using [Other general sound]. Use  and  to set the minimum and maximum. If  is configured, the buzzer is muted.



### 8.3.3 Lamp management

Display and reset the cumulative illumination time of the lamp currently installed in the analyzer.

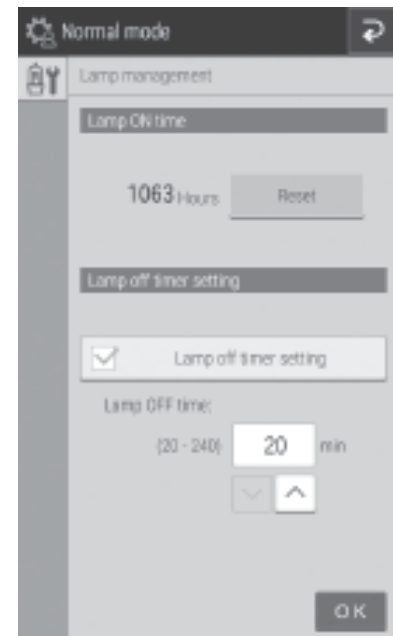
- Check the cumulative illumination time by using [Lamp ON time]. If the **RESET** is touched, the cumulative illumination time is reset.

**NOTE:** Reset the cumulative illumination time of the lamp after replacing the lamp.

- If the [Lamp off timer setting] check box is selected, the lamp is switched off automatically after some time. Configure the time until the lamp is switched off.

**NOTE:** The default setting is 20 minutes.




- The lamp should be replaced every 1,000 hours.



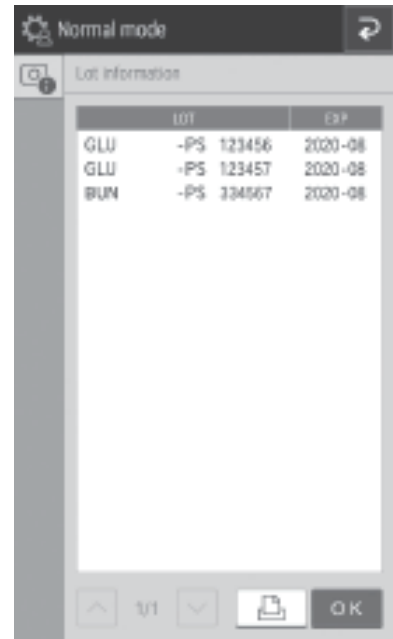


### 8.3.4 Lot information

The screen displays the lot information of currently registered QC cards. You can also print all currently registered lot information.

- When there are two or more pages that can be displayed, touch  and  to scroll pages.
- If  is touched, all currently registered lot information is printed.

**NOTE:** Up to five lots are registered for one test.



## 8.4 Mode Function for Administrator

**NOTE:** To display Mode function for administrator, open the Function menu page, touch MODE FUNCTION FOR ADMINISTRATOR, then enter the password.



#### 8.4.1 Language setting

Configure the language to be used.

1. Touch the language to be configured.

**NOTE:** After configuration, the analyzer shuts down once.  
When the analyzer is started again, the settings are applied.



#### 8.4.2 Host connection setting

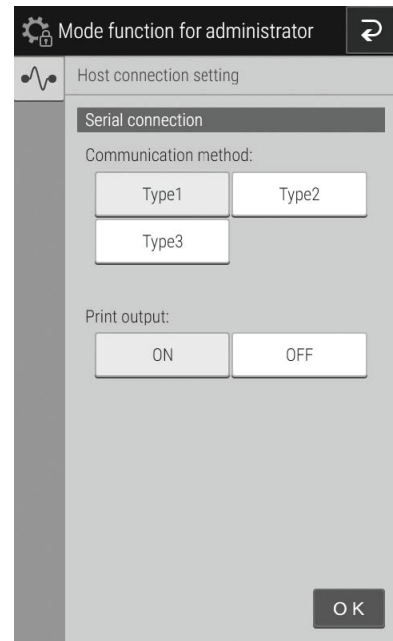
Configure the connection terminal and communication parameters to connect to the host computer (PC). Furthermore, switch the built-in printer on or off.


- When you will not connect to a host computer, set [None].

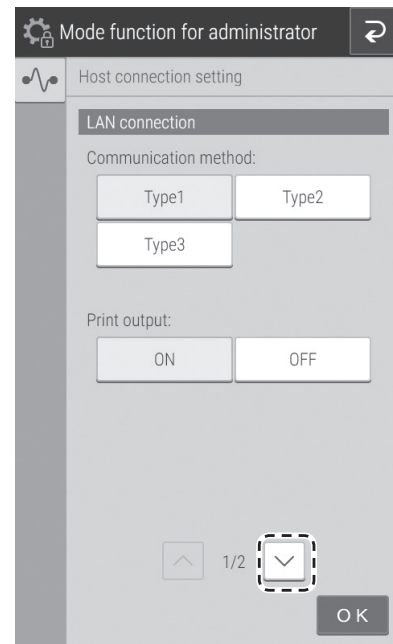


- If [Serial connection] is set, configure the communication type and whether to output from the printer. You can choose from 3 communication types.
  - Type 1: Bidirectional connection
  - Type 2: Unidirectional connection (bidirectional format)
  - Type 3: Unidirectional connection (standard format)

**NOTE:** After configuration, the analyzer shuts down once. When the analyzer is started again, the settings are applied.



- If [LAN connection] is set, configure the communication type and whether to output from the printer. You can choose from 3 communication types.
  - Type 1: Bidirectional connection
  - Type 2: Unidirectional connection (bidirectional format)
  - Type 3: Unidirectional connection (standard format)
- Touch  and the LAN configuration screen appears. If an entry field is touched, the software keyboard appears so the value may be edited.



**NOTE:** The following section shows the default.

LAN settings

FDC settings

IP address:192.168.100.1    Subnet mask:255.255.255.0    Port number:65535

PC settings

IP address:192.168.100.2    Port number:65535

**NOTE:** After configuration, the analyzer shuts down once. When the analyzer is started again, the settings are applied.

### 8.4.3    Calculated parameter

You can configure the settings to calculate the following items from simultaneously measured values and then display the results. Items registered for calculation have their measurement results displayed and printed.

Test Name	Calculation Test Name	Unit	Calculation Formula
Globulin	GLOB	g/dL or g/L	GLOB = TP value - ALB value
Albumin/Globulin ratio	ALB/GLOB	–	ALB/GLOB = ALB value/(TP value - ALB value)
BUN/Creatinine ratio	BUN/CRE	mg/mg or (SI)	
GOT/GPT ratio (AST/ALT ratio)	GOT/GPT (AST/ALT)	–	GOT/GPT = GOT value/GPT value (AST/ALT = AST value/ALT value) <b>NOTE:</b> The calculation test name can be changed by [Test item name setting] in the Mode function for administrator. <i>Section 8.4.17</i>
Sodium/Potassium ratio	Na/K	–	Na/K = Na value/K value
Anion Gap	Anion Gap	mEq/L or mmol/L	Anion Gap = Na value - (Cl value + TCO <sub>2</sub> value)

If using HeskaView Integrated Software® or Heska Data Capture Utility (DCU), desired calculated parameters can be selected within the software program and do not need to be selected in the analyzer.

#### IMPORTANT

Calculation items display a value calculated from simultaneously measured values. Therefore, calculation results are impacted by errors included in measurement values and the effects of interfering materials. Please understand that when you use the results for a diagnosis, you must make an overall determination in combination with the measurement values is used in the calculation.

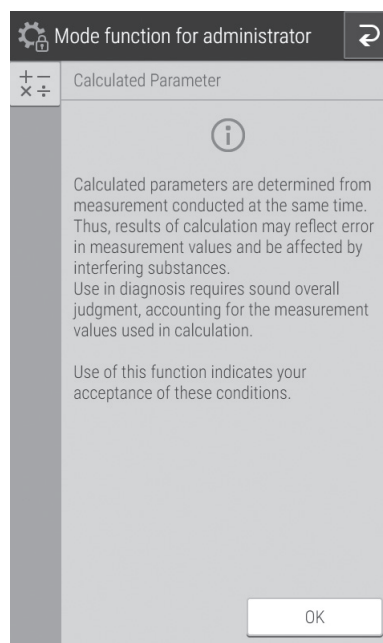
**NOTE:** In the case of additional testing and retesting, items subject to calculation must be measured at the same time.

**NOTE:** When there are two or more slides of the same item subject to calculation in the slides measured at the same time, the initial measurement value is used.

**NOTE:** When the measurement results of items subject to calculation exceed the measurement range (determination range), the calculation results of this calculation item are displayed and printed as "\*\*\*\*\*".

**NOTE:** When an item subject to calculation has expired, an expiration warning symbol (#) is displayed and printed for the measurement results of this item and the calculation results.

If [Calculated Parameter] is touched in Mode function for administrator, precautions for use of calculation items are displayed. To use calculation items after confirming the precautions, touch **OK**.



Configure the calculation items to be used.

**NOTE:** If the QC card of an item to be used for calculation has not been read, the calculation item is not displayed.



## 8.4.4 Unit conversion

Configure the main unit and secondary unit for each measurement item. The following table shows the units that can be used for each configuration item and the conversion coefficient.

Test	Test Code	Unit (A)	UNIT (B)	Conversion Coefficient	Test	Test Code	Unit (A)	UNIT (B)	Conversion Coefficient
GLU	10	mg/dL	mmol/L	0.05551	GGT	30	U/L	μkat/L	0.0167
BUN	11	mg/dL	mmol/L	0.357	GOT/AST	31	U/L	μkat/L	0.0167
UA	13	mg/dL	μmol/L	59.48	GPT/ALT	32	U/L	μkat/L	0.0167
TCHO	14	mg/dL	mmol/L	0.02586	CPK	33	U/L	μkat/L	0.0167
NH <sub>3</sub>	15	μg/dL	μmol/L	0.7139	LDH	34	U/L	μkat/L	0.0167
TG	16	mg/dL	mmol/L	0.01129	ALP	35	U/L	μkat/L	0.0167
CRE	17	mg/dL	μmol/L	88.4	v-AMY	43	U/L	μkat/L	0.0167
TP	18	g/dL	g/L	10	v-LIP	44	U/L	μkat/L	0.0167
ALB	20	g/dL	g/L	10	TCO <sub>2</sub>	45	U/L	mmol/L	0.0167
TBIL	21	mg/dL	μmol/L	17.1	Na	91	mmol/L	mmol/L	0.0167
Ca	23	mg/dL	mmol/L	0.25	K	92	mEq/L	mmol/L	0.0167
IP	24	mg/dL	mmol/L	0.3228	Cl	93	mEq/L	mmol/L	0.0167
Mg	28	mg/dL	mmol/L	0.4114					

**NOTE:** Unit (B) = Unit (A) × Conversion coefficient

**NOTE:** BUN measured value in Unit (B) (mmol/l) is shown as molar concentration of Urea.

- Touch unit of measurement to be used for each test type.



#### 8.4.5 Switch measurement range display

Switch the display method for data outside the measurement range (passing the upper/lower limit of the determination range) for all tests.

- If [ @ ] is configured, an [ @ ] symbol is added to indicate the displayed measurement value is outside the measurement range.

**NOTE:** Measured values with an [ @ ] symbol may not be accurate.

- If [ < / > ] is configured, a value outside the measurement range is displayed by a [ < ] or [ > ] symbol.

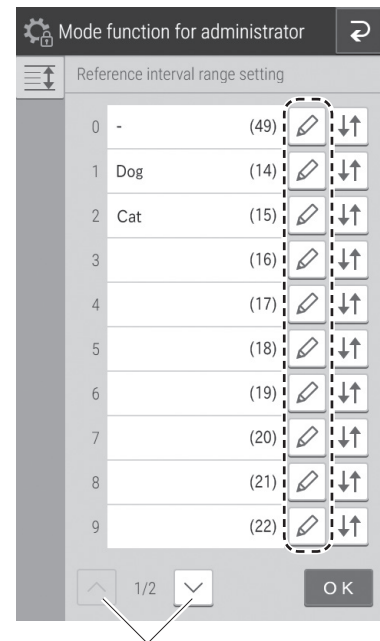


#### 8.4.6 Reference interval range setting

Add, edit, and change the order of the reference interval names to be selected when registering sample information.

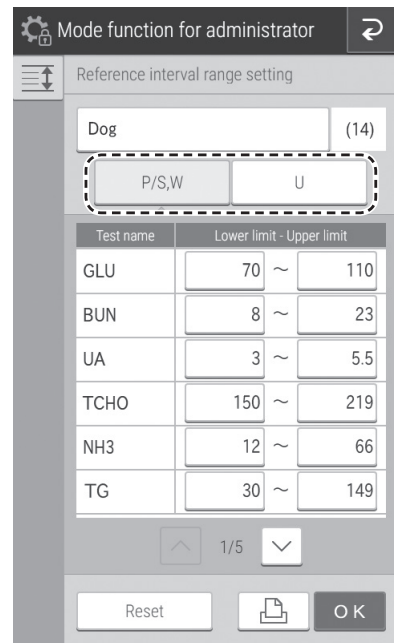
Adding and editing of reference interval names.

Touch  of the item you want to edit or add.



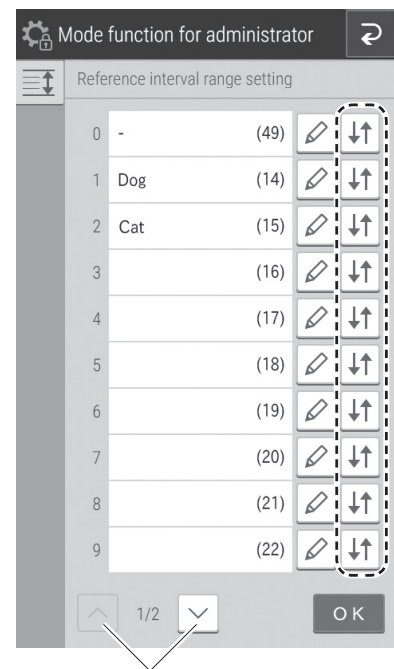
If an entry field is touched, the software keyboard appears in order to edit the test name and other details. *Section 2.3*

Make sure the sample type selected is [P/S, W].



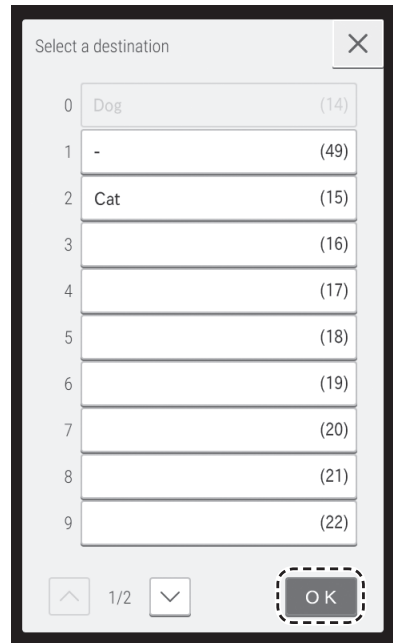
Changing the display order.

Touch  of the test to change the display order.



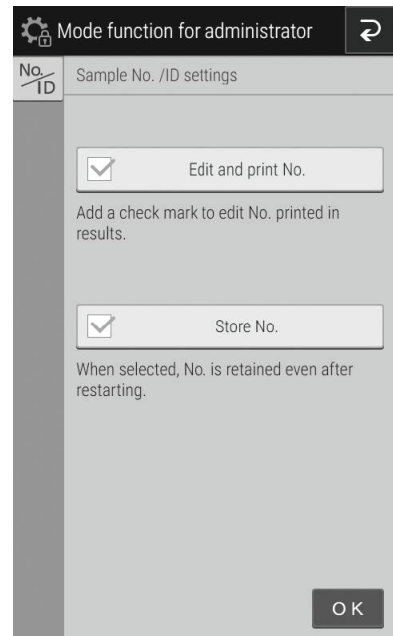


Touch the transfer destination of the test field to be configured and then touch **OK**.



#### 8.4.7 Sample No./ID settings

- Configure whether to display the sample number in the measurement results under [Edit and print No.].
- Configure whether to record the sequence number of the analyzer under [Store No.].



#### 8.4.8 Work list selection setting

Configure whether to display the sample ID or patient ID at the Work list index screen.




#### 8.4.9 Correlation coefficients

Enter, reset, or print the correlation coefficients for each sample type ([P/S,W] or [U]). For details, refer to "Description of the correlation function" on the next page..

#### IMPORTANT

**Incorrect entry of "a" and "b" causes incorrect measurement results. Always make sure that the entries (a, b) are correct.**

Touch **DATA INPUT**.

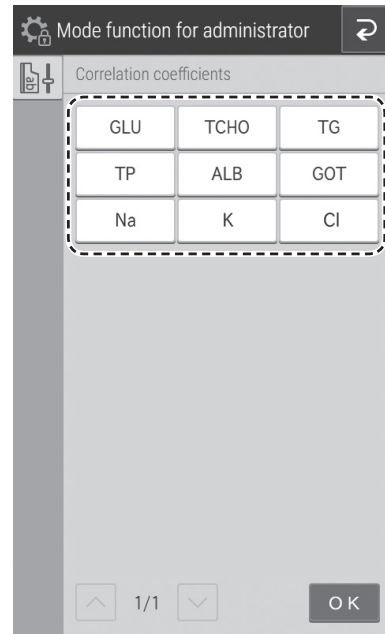
**NOTE:** If  is touched, all correlation coefficient settings are printed.

**NOTE:** If RESET ALL TESTS is touched, a reset confirmation screen appears. To reset the correlation coefficients of all measurement items, touch OK. To cancel the reset, touch CANCEL.



Touch the measurement item you want to edit.

**NOTE:** Only measurement items for which QC cards have been read are displayed.

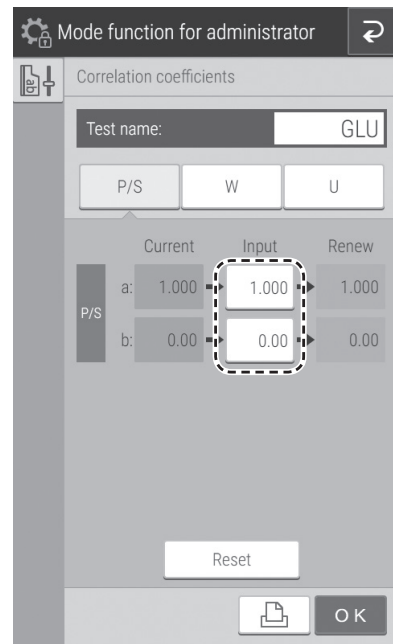


If the [Input] field of an item is touched, the software keyboard appears so you can enter the value. *Section 2.3*

To change the sample type, touch [P/S], [W], or [U].

**NOTE:** If RESET is touched, a reset confirmation screen appears. To reset the selected measurement items and the correlation coefficients of the sample type, touch OK. To cancel the reset, touch CANCEL.

**NOTE:** If values are entered for "a" and "b" when values have already been entered, the current values are not discarded, and corrections are also applied. For details, refer to *Description of the correlation function* below.



**i** IMPORTANT

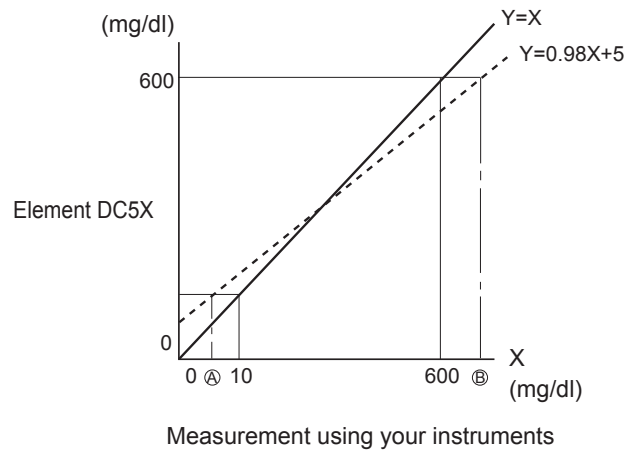
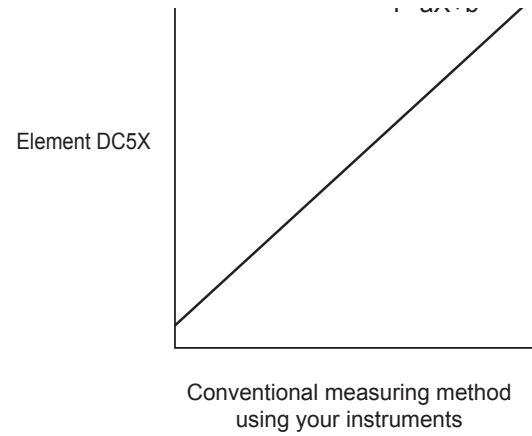
**Description of the correlation function**

This function is designed to determine the correlation between the measured data obtained using the Element DC5X and the data obtained using the conventional measuring method with your own instruments.

The X-axis shows the measured data obtained using your instruments, and the Y- axis shows the measured data obtained using the analyzer. The correlation regression equation in this case is:

$$Y = aX + b$$

After values for the two coefficients (a, b) are registered in the analyzer memory, the analyzer performs compensation calculations internally using the formula:  $X = (Y-b)/a$ . In this way, measured data obtained using the analyzer are adjusted to match measured data that would be obtained using your instruments.



**Method**

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

1. You can configure a and b values by sample type.
2. The correlation function is independent of other compensation functions.
3. If values for (a, b) have already been input, old values will not be canceled as follows. If the old values are represented as (a1, b1), and the new values as (a2, b2), the resulting values for (a, b) will be determined according to the following formulas:  
 $a = a1 \times a2$   
 $b = a1 \times b2 + b1$
4. Depending on the values input for (a, b), the apparent limits of the measurement range will shift as follows.

(Example) GLU measurements

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

Printout example

If the regression formula is  $Y = 0.98X + 5$ :

$$A = 5 \text{ mg/dl}$$

$$B = 607 \text{ mg/dl}$$

2020-10-30 12:00 Pos A	
No. 16	
GLU-PS	@
	= 5 mg/dl
GLU-PS	> 607 mg/dl
-----	

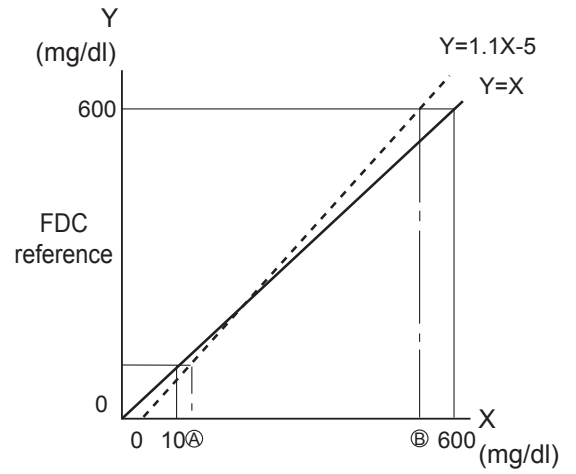
Value under the measurement range. ←

Value above the measurement range. ←

If the regression formula is  $Y = 1.1X - 5$ :

A = 14 mg/dl

B = 550 mg/dl



Measurement using your instruments


If the measured data is below the measurement range, an "@" mark is added as shown in the example printout.

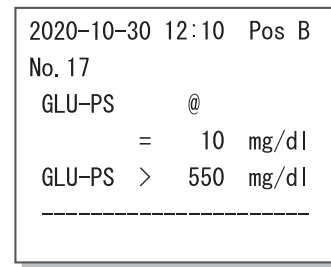
If the measured data is above the measurement range, a ">" sign is printed as shown in the example printout.

**i** IMPORTANT

Reported values with "@" marks may not be accurate. Run the measurement again.

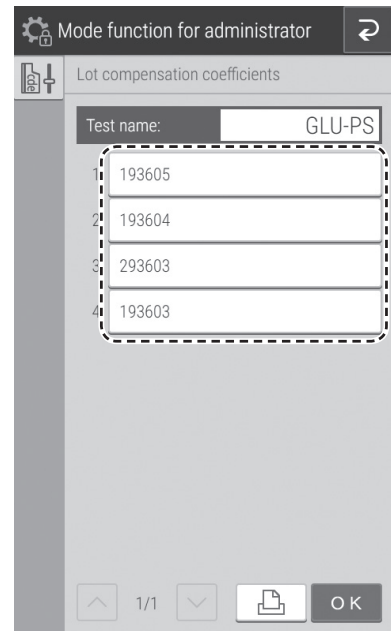
Touch the Lot No. for which you want to enter a lot compensation coefficient.

**NOTE:** If  is touched, all lot compensation coefficient settings are printed.



Value under the measurement range.


Value above the measurement range.



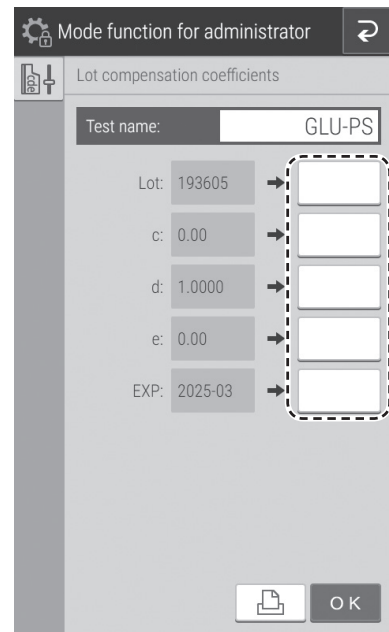
If the [Input] field of an item is touched, the software keyboard appears so you can enter the value. *Section 2.3*

**NOTE:** The most significant digit of a [Lot] number (the type number) is fixed. Enter from the second digit.

**NOTE:** Incorrect entries will cause incorrect measurement results. Always make sure that the displayed values are correct.

**NOTE:** If  is touched, all lot compensation coefficient settings are printed

**NOTE:** For the expiration date for use (EXP), enter xxxx-xx (four digits for the year and two digits for the month). Also enter the hyphen (-).



#### 8.4.10 Lot compensation coefficients

Enter the lot compensation coefficients (c, d, and e) printed on the QC cards of slides. This mode is needed if it is not possible to read the data directly because the QC card was lost or damaged.

It is only possible to enter coefficients for boxes of individual slides. This is not possible on boxes of panels.

#### IMPORTANT

Incorrect inputs for (c, d, and e) will cause incorrect measurement results.

Make sure that the inputs for (c, d, and e) are correct using this mode.

#### IMPORTANT

When the slide type number was changed, even if the new values (c, d, and e) are entered by using this setting, the new standard curve information will not be updated. It is necessary to read the QC card when the slide type number was changed.

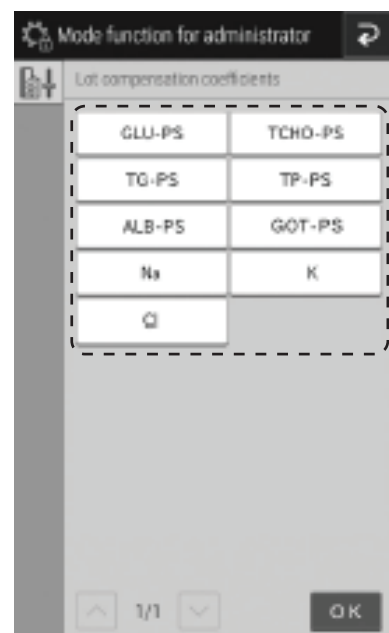
The slide type number is the most significant digit of a lot number.

(Example) The slide type number of "Lot No.123456" is 1.

Touch "Measurement item - sample type" you want to edit.

**NOTE:** Only "Measurement item - sample type" items that have been read from QC cards are displayed as buttons.


**NOTE:** Measurement items are displayed in ascending order of test code.

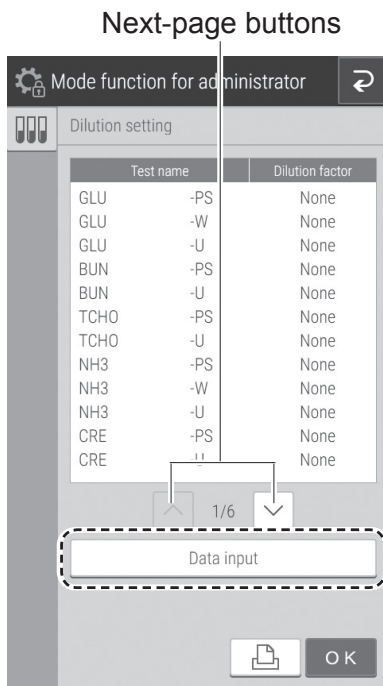


## 8.4.11 Dilution setting

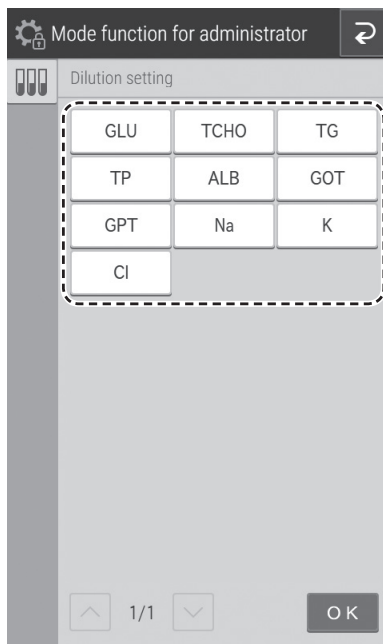
You can configure the dilution factor and position of the diluent to be used for each measurement item. When a dilution factor is not configured for each sample on the sample information registration screen, measurement is performed using the dilution factor configured here.

1. Touch **DATA INPUT**.

**NOTE:** When  is touched, all dilution factor settings will be printed.

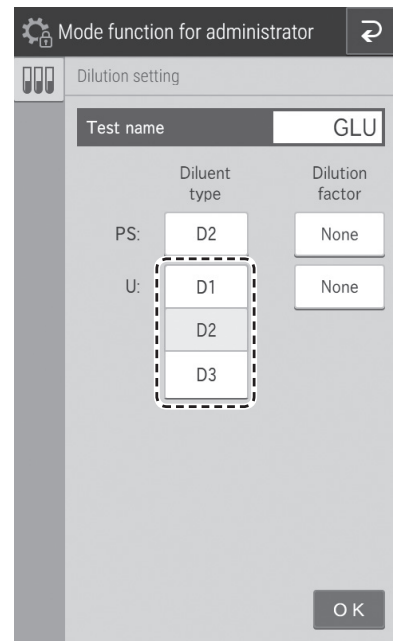


2. Touch the measurement item to be edited.

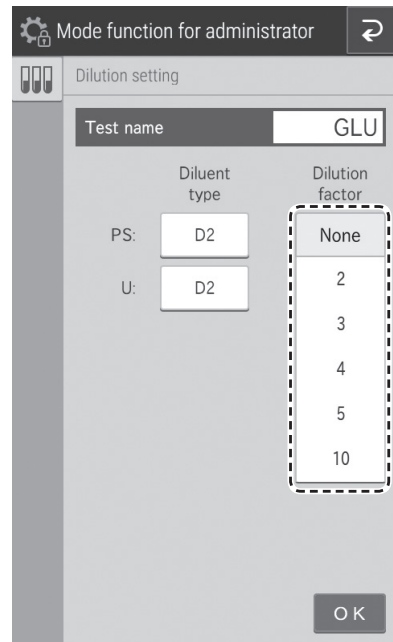


3. For the sample type (liquid type), touch a button, and then select from [D1], [D2], or [D3].

**NOTE:** D2 is the default for PS and should not be changed.



4. For the dilution factor, touch a button, and then select from [None], [2], [3], [4], [5], or [10].





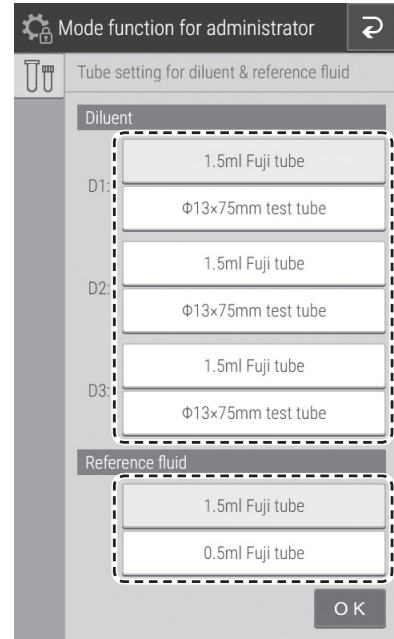
#### 8.4.12 Tube setting for diluent and reference fluid

Configure the test tube type to be used for diluent and reference fluid.

**NOTE:** For the types of containers that can be used for diluent and reference fluid. *Section 5.4 and 5.5*

- Touch the container you want to use.

**NOTE:** [D1] through [D3] under [Diluent] indicate position of the diluent holder. [D2] is the default for veterinary analyzers and should be set to 1.5 ml Fuji tube.



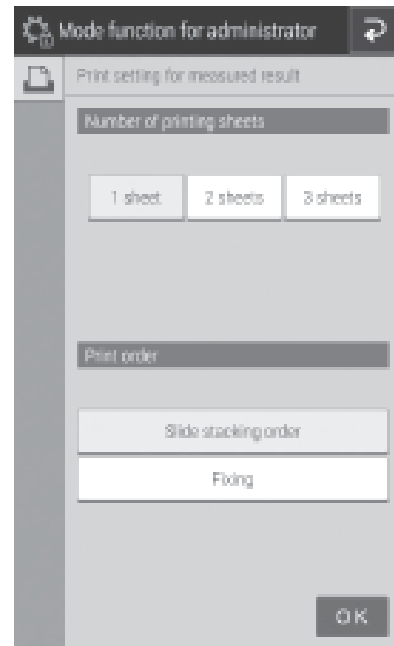
#### 8.4.13 Print setting for measured result

Configure the print quantity (1 to 3 sheets) and print order of measurement results.

- Touch the print quantity you want to configure.
- For [Print order], you can select [Slide stacking order] or [Fixing].

**NOTE:** If [Fixing] is selected, printing occurs in the following order.

TP → ALB → TBIL → GOT/AST → GPT/ALT → ALP → LDH → GGT →  
CPK → v-AMY → TCHO → TG → UA → BUN → CRE → Na-K-Cl →  
Ca → IP → Mg → GLU → NH3 → v-LIP → TCO2



#### 8.4.14 Operator ID setting

Configure whether to display the Operator ID at the Measurement preparation screen and Measurement results screen.

To display the operator ID, touch the check box.

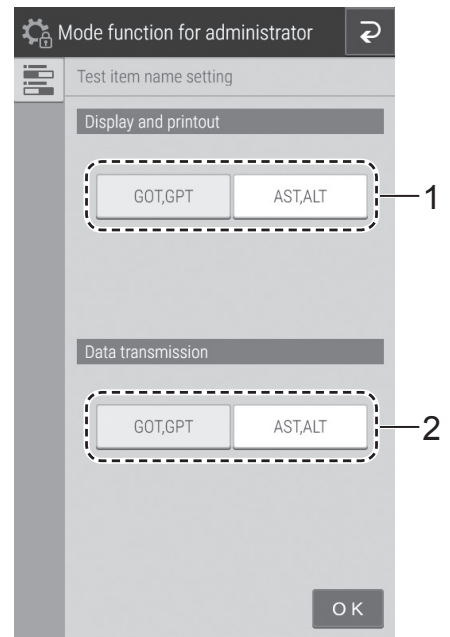
**NOTE:** By default, the check box is cleared (not-enabled).



#### 8.4.17 Test item name setting

Configure the display of item names. The names appear in the screen display and printed paper of measurement results.

1. Choose the item names to be used for display and printing. Touch either **GOT, GPT** or **AST, ALT**.
2. Choose the names to be used for external communication output to the host computer. Touch either **GOT, GPT** or **AST, ALT**.



## 9.1 Data Communication

The analyzer can transmit measurement results to a host computer or PC that has been approved by IEC/UL60950-1.

To communicate, it is necessary to prepare the software and a cable to receive data. Before you use this function for the first time, please contact your dealer for assistance.

**NOTE:** Use a shielded LAN cable. Otherwise, electromagnetic interference may occur.

**NOTE:** When a LAN cable or serial cable is not connected, measurement results are not sent. Make sure a cable is connected.

## 10.1 Specifications

Processing speed	190 tests per hour (simultaneous CM and ISE measurements)
Number of incubator cells	CM: 13; ISE: 1
Incubation temperature	98.6°F [37°C] (CM) 86°F [30°C] (ISE)
Incubation time	1 to 6 minutes
Capacity for simultaneously loaded slides	20
Slide lot information	Each item: maximum 5 lots
Sampler	
1. Number of samples	5 samples (on the sample disk)
2. Sample application fluid volume	50 µl or less (automatic switching)
3. Dilution	Automatic dilution (maximum 21x dilution)
Slide ejection	Automatic ejection (max. 150 slides into the disposal box)
Used tip ejection	Automatic ejection (max. 75 slides into the disposal box)
Measurement wavelengths	400 nm, 415 nm, 505 nm, 540 nm, 577 nm, 600 nm, 625 nm, 650 nm
Light source	Halogen lamp (6 V, 10 W)
Measurement precision	$\sigma \leq 0.0004$ OD/5 minutes
Measurement accuracy	Within $\pm 0.005$ OD (600 nm)
Display	7-inch color touch panel
Backup data of test results	For 270 animal patients
Printer	Thermal type (paper size: 2.28 in x 82 ft [58 mm x 25 m])
Warming up time	Approx. 10 minutes/77°F [25°C], approx. 20 minutes/59°F [15°C]
Environmental conditions	Indoor use (6,000 cd/m <sup>2</sup> (lux) or lower. 3,000 cd/m <sup>2</sup> (lux) or lower when using the sample barcode reader.) Altitude: Up to 2,000m (802 hPa) Transient overvoltage category: II Pollution degree: 2 Operating temperature: 59 to 89.6°F [15 to 32°C] Operating humidity: 30 to 80% RH (no vapor condensation)
Storage and transport conditions	Temperature: 014 to 122°F [-10 to 50°C] Humidity: 10 to 90% RH (no vapor condensation)
Voltage used	Single phase AC; 100–240 V $\pm 10\%$ ; 50 to 60 Hz
Consumption current	3–1.3 A
Type of protection against electrical shock	CLASS 1 EQUIPMENT
Volume level	Within 70 dB (including buzzer sound)
Data transfer	RS–232C (1 port); USB (1 port); LAN (1 port)
External dimensions	W 19.7 x D 14.96 x H 16.14 inches [W 500 x D 380 x H 410 mm]
Weight	72.75 lbs [33 kg]
Effective period of service (service life)	6 years after installation (This period is valid as long as the precautions for use are followed and regular periodic maintenance is performed correctly.)

## 11.1 Glossary

Glossary of the display and printout messages.

**NOTE:** Because the display spaces and printouts are limited, some abbreviations are used.

**NOTE** Periods will not be used after abbreviations on the display and printout messages.

AD	Analog/Digital
ave	Average
bef comp	Before compress
cali/calib	Calibration
charac	Character
comm	Communication
ctrl	Control
DA	Digital/Analog
decomp	Decompress
dil	dlution
ERR	error
exp	expiration
Info	information
NG	No Good
NSS	Normal Saline Solution
OD	Optical Density
pos	Position
prob	Problem
prog	Program
sam	Sample