Fully Automated Urine Analyzer

AUTION MAX™

AX-4030 | Operating Manual

arkray,inc.

Premise

This operating manual contains important information on the functions of the AUTION MAX™ AX-4030.

This operating manual is issued by ARKRAY, Inc.
Read carefully prior to starting up the unit.

This instrument is IVD medical device.

This product conforms to European Directive 98/79/EC.

Introduction

Read this operating manual thoroughly before using the instrument. This operating manual gives an outline of the instrument and the proper procedures for operation and maintenance. Follow the instructions in this operating manual in order not to impair the protection by the instrument. Also, keep this operating manual in an easily accessible place near the instrument.

- **TAKE THE UTMOST CARE WHEN HANDLING URINE. This instrument uses urine as sample and an ingredient of control solutions. Urine may be contaminated by pathogenic microbes that can cause infectious diseases. Improper handling of urine may cause infection to the user or other individuals by pathogenic microbes.**
- **This instrument is to be operated by qualified persons only. A qualified person is one having adequate knowledge of clinical testing and the disposal of infectious waste. Thoroughly read this operating manual before use.**
- **Never touch the aspirating nozzle, waste box, waste box tray, trap bottle, drain bottle, drain tubes, transport tray, introduction tray, or other parts where the sample may adhere with unprotected hands. During cleaning or maintenance of these parts, wear protective gloves to prevent exposure to pathogenic microbes.**
- **Discard used samples, test strips, liquid waste, parts, and instrument in accordance with local regulations for biohazardous waste.**

Symbols

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

For Your Safety

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

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

For Optimal Performance

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

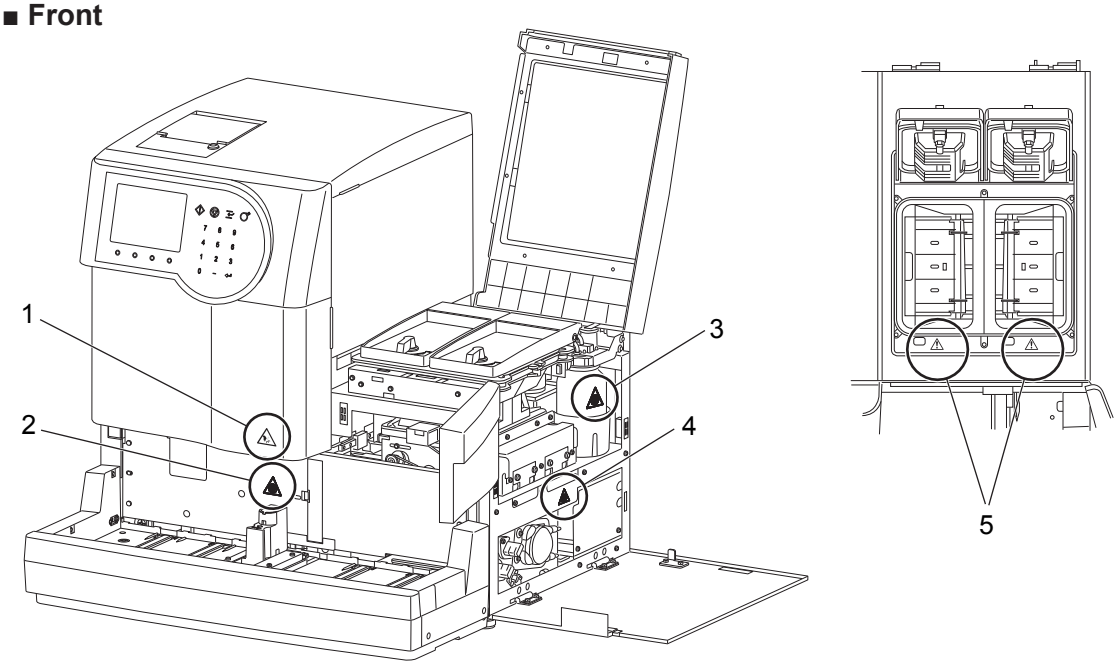
NOTE: Information useful for preventing damage to the instrument or parts, and other important information you should keep in mind.

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

Caution Labels

This instrument has several caution labels on the areas that have potential dangers. Please learn potential dangers warned by each label and observe the precautions described below.

■ **Front**



1. Sample aspirating section

The tip of the nozzle descends from here to aspirate samples. To avoid injury, keep your hands away from here while the power is on. Also, avoid touching the sample racks in the sampler while measurement is in progress. Contact with moving sample racks may result in injury.

2. Front panel

The nozzle, washing bath, and other components inside this instrument can be contaminated by urine samples. Do not touch these parts with unprotected hands. Wear protective gloves to prevent exposure to pathogenic microbes while cleaning these parts.

3. Trap bottle and tube

Do not touch liquid waste with unprotected hands to prevent exposure to pathogenic microbes.

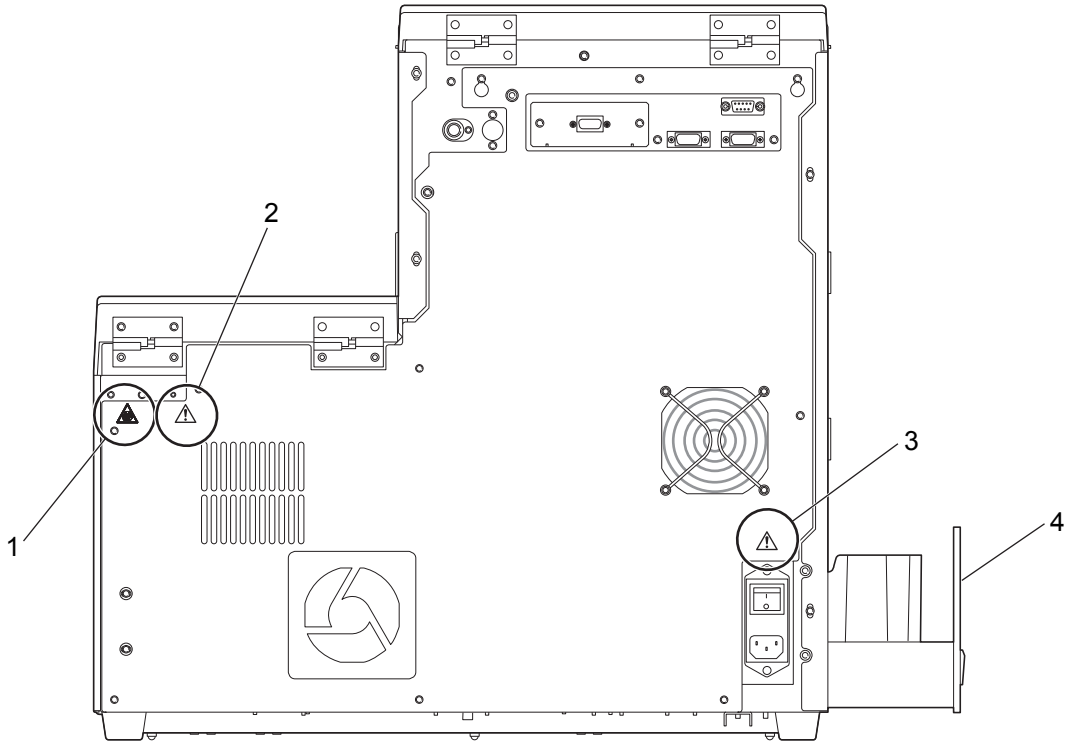
4. Maintenance section

The introduction tray, tubes and other components inside this section can be contaminated by urine samples. Do not touch these parts with unprotected hands. Wear protective gloves to prevent exposure to pathogenic microbes while cleaning these parts.

5. Feeders

The test strip storage section of the feeder may move during measurement. To avoid injury, do not touch inside the storage section when adding new test strips to the feeder. Press the standby switch to turn off the power before cleaning the test strip storage section.

■ **Rear**



1. Drain joint

Liquid waste is discharged from this joint to the drain bottle. Do not touch liquid waste with unprotected hands because the drainage contains urine samples. When cleaning the drain joint, tube and bottle, wear protective gloves to prevent exposure to pathogenic microbes.

2. Washing solution joint

The washing solution in the washing solution bottle goes through this joint. Use the specified washing solution.

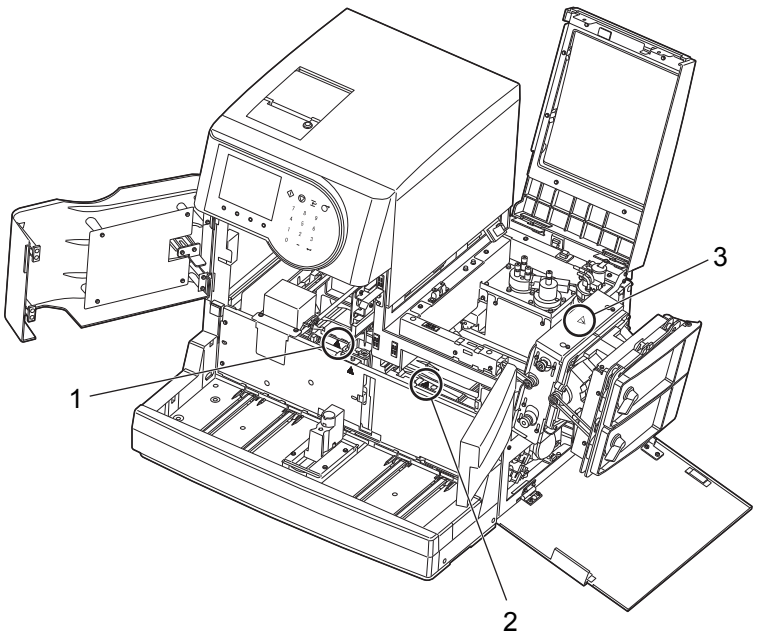
3. Power input terminal

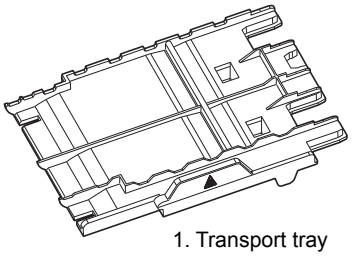
The supplied power cord is plugged in here. Use of other cords may cause electric shock or fire. The fuse holders are also located here. Prepare fuses of the specified capacity for replacement.

4. Waste box and waste box tray

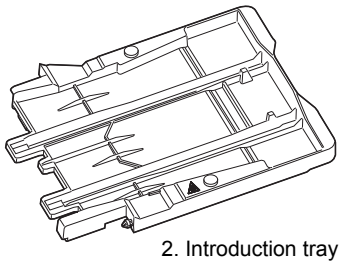
Used test strips are collected in this box. When discarding the test strips, wear protective gloves to prevent exposure to pathogenic microbes.

■ Inside





1. Transport tray



2. Introduction tray

1. Transport tray

The transport tray can be contaminated by urine samples. Do not touch this tray with unprotected hands. Wear protective gloves to prevent exposure to pathogenic microbes while cleaning these parts.

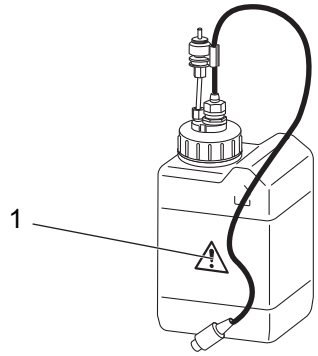
2. Introduction tray

The introduction tray can be contaminated by urine samples. Do not touch this tray with unprotected hands. Wear protective gloves to prevent exposure to pathogenic microbes while cleaning these parts.

3. Test strip storage section

Contact with the electrical circuits can damage the instrument. Do not touch the electrical circuits.

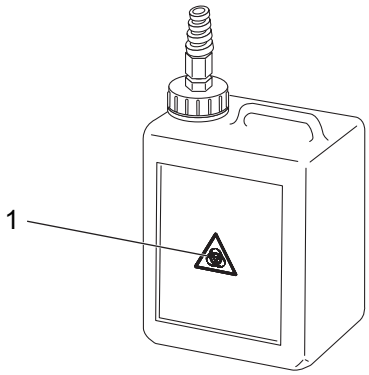
■ Washing solution bottle



1. Washing solution bottle

Fill this bottle with the washing solution prepared as specified.

■ Drain Bottle



1. Drain Bottle

Liquid waste is collected in this bottle. When discarding liquid waste, wear protective gloves to prevent exposure to pathogenic microbes.

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Chapter 4 Maintenance

Chapter 5 Troubleshooting

Chapter 1 Before Use

1.1 Outline of the AX-4030

1.1.1 What You Can Do with the AX-4030

Measurement Items

The AX-4030 uses test strips to analyze urine samples fully automatically. Comprehensive assessments can be made based on color-tone and turbidity measurements, abnormal coloration detection, S.G. (specific gravity) measurement, as well as ten qualitative analyses of GLU (glucose), PRO (protein), BIL (bilirubin), PH (pH), BLD (blood), URO (urobilinogen), KET (ketones), NIT (nitrite) and LEU (leukocytes).

Measurement Method

AX-4030 performs the following measurements.

■ Normal measurement

Normal measurement continuously measures a number of samples loaded in the sample racks. A sample rack can contain up to 10 samples. Place the sample racks with samples in the sampler and press the start key. The instrument then automatically transports the sample racks, aspirates the samples in order, and obtains the results. Up to 5 sample racks (50 samples) can be loaded into the sampler for *one-way* transportation, and up to 10 sample racks (100 samples) for *loop* transportation.

* The instrument is factory-set to the one-way transportation mode. If you prefer loop transportation to measure more samples at a time, contact your distributor.

■ STAT measurement

STAT measurement is used to interrupt ongoing normal measurements and measure one or more urgent samples. There are two types of STAT measurements:

Port STAT measurement: Measures a single sample loaded into the STAT port. If you have a sample to test urgently, you can load the sample into the STAT port to interrupt normal measurements in progress.

Rack STAT measurement: Interrupts normal measurements in progress to measure up to 7 samples loaded into the STAT and control rack.

■ Control measurement

The specified controls should be measured at regular intervals for the quality control of the instrument. Use the STAT and control rack to load the controls. Up to 3 types (or 3 concentrations) of controls can be used at a time.

■ Check measurement

If obtained measurement results seem inaccurate, perform a check measurement using the supplied check strips to check if the instrument is working correctly.

1.1.2 Features

■ Easy to operate

Daily measurements are done in three easy steps: 1) load the test strips, 2) load the samples, and 3) press the start key. After pressing the start key, the instrument automatically performs the entire series of operations to effectuate measurement: test strip picking, sample transport, sample aspiration, test strip staining, measurement, and test strip disposal.

■ Test strip staining

After aspirating sample with a nozzle, the instrument stains each reagent pad on the test strip with a small quantity of sample. Measurements can be performed as long as there is at least 2 mL of sample in the sample tube.

■ Dual test strip feeders for multiple test strips

The instrument has two feeders, therefore two types of test strips can be loaded in the instrument at all times. When using the supplied item racks, test strips can be automatically picked from the feeder assigned to the item racks so as to expedite measurement. This reduces the hassles of changing test strips in/out and makes measurement work more efficient.

■ Large color LCD

A large color LCD makes measurement conditions and menu settings easy to read and identify, which facilitates operation. If a warning occurs such as test strips or solution running out, remedial action is displayed in English so that the situation can be quickly corrected.

■ Thermal compensation function

The best temperature range for measurements is 20 - 25°C, but some measurement items may not yield correct results if visually evaluated outside of this range. The thermal compensation feature of this instrument has an advantage over human visual evaluation in that it minimizes errors caused by temperature changes within a 10 - 30°C range to deliver correct measurement results.

■ General diagnostics support

Samples are measured according to color, turbidity and abnormal coloration detection. These capabilities eliminate the need for visual evaluation and provide useful information for basing evaluations on printed results.

Color-tone measurement

The instrument examines the color of the sample by measuring contrast and hue. It evaluates samples against 23 colors (see page 1-9).

Turbidity measurement

The instrument measures turbidity and evaluates samples as “clear”, “turbid” or “dense turbid”.

Abnormal coloration detection

The instrument automatically detects false positive reactions of reagent pads caused by drug-administered urine and notifies you by adding a "!" to printed measurement results.

■ Memory capacity for measurement results of 2,500 samples

Measurement results for a total of 2,500 samples, between normal measurements and STAT measurements, can be stored in memory. These results can be displayed, printed and sent to an external device as necessary. As new data is recorded above 2,500 samples, the old data is sequentially deleted. Up to 200 control measurements, 50 check measurements and 100 troubles can be logged.

■ Management by barcode

Measurement results can be managed by ID using a barcode reader. If a barcode label is affixed to the sample tube, the barcode is read during measurement and assigned to the measurement results as an ID. A built-in barcode reader is included with the instrument as part of the standard equipment, while a hand-held barcode reader is optionally available.

■ Two-way/one-way online communications

The instrument can be connected to an external device for two-way or one-way communications. It can operate as a component in an online network configuration.

1.1.3 Specifications

Specifications

Product	AUTION MAX AX-4030
Configuration	Instrument, sampler, and accessories
Sample	Urine
Reagent	AUTION Sticks 9EB

Instrument specifications

Measurement items	GLU (Glucose), PRO (Protein), BIL (Bilirubin), URO (Urobilinogen), PH (pH), BLD (Blood), KET (Ketones), NIT (Nitrite), LEU (Leukocytes), S.G. (Specific gravity), turbidity, and color tone
Measurement range	Test strip: For rank table, see page 1-11. S.G.: 1.000 to 1.050 (Resolution: 0.001) Color tone: For color classification diagram, see page 1-9. Turbidity: Three levels including “clear”, “turbid”, and “excessively turbid”
Measurement method	Test strip: Dual-wavelength reflectance measurement (Single wavelength for BLD) S.G.: Reflection refractometry Color tone: Light-transmission measurement Turbidity: Light-scattering measurement
Measurement wavelength	5 LED wavelengths (430, 500, 565, 635, 760 nm)
Sample supply	Sampler
Test strip reaction	About 60 seconds
Test strip storage	Two test strip storage compartments, each of which can contain different test strips
Test strip storage capacity	Max. 200 test strips × two storage compartments
Processing speed	225 samples/hour
Sample consumption	0.90 mL
Required sample volume	Min. 2.0 mL
Sample container	Use the sample tubes that comply with the standards illustrated in “Sample Containers” in *“2.1.4 Sample Containers and Sample Racks”* on page 2-7.
Applicable racks	ARKRAY racks
Sample loading capacity	One-way transportation (default): Max. 50 samples, Loop transportation: Max. 100 samples
Warm-up time	Max. 2 minutes
Display	Large color liquid crystal display (320 × 240 dots)
Built-in printer	58-mm width thermal printer paper (24 digits)
Memory capacity	Normal and STAT measurement: 2500 tests Control measurement: 200 tests Check measurement: 50 tests Trouble list: 100 tests
External output	2 ports (One of these ports can be optionally used as an Ethernet port.)
Communication system	RS-232C compliant (Switchable between one-way and two-way)
Transmission speed	RS-232C: Selectable from 300, 600, 1200, 2400, 4800, 9600, and 19200 bps Ethernet: 10BASE-T
Thermal compensation	Supported
Operating environment	Temperature: 10 - 30°C; Humidity: 20 - 80% RH (Non-condensing)
Measurement environment	Temperature: 10 - 30°C; Humidity: 30 - 60% RH (Non-condensing)
Storage environment	Temperature: 1 - 30°C; Humidity: 20 - 80% RH (Non-condensing)
Environment during transport	Temperature: -13 - 43°C; Humidity: 20 - 80% RH (Non-condensing)
Dimensions	530 (W) × 530 (D) × 530 (H) mm
Weight	Instrument: approx. 37 kg; Sampler: approx. 4 kg
Supply voltage (Instrument)	100 - 240 V AC (Max. power line fluctuation of ±10%), 50/60 Hz
Power input	Max. 150 VA
Sound pressure level	Less than 85 dB
Site location	For indoor use only
Altitude	2000 m
Pollution degree	2
Over voltage category	II
Expected life	5 years (According to company data)

1.1.4 Measurement Principle

This instrument measures purpose-specific test strips by dual-wavelength reflectance measurement (single wavelength for BLD) and urine specific gravity (S.G.) by reflection refractometry.
This section explains the principles for measuring “test strips”, “specific gravity”, “color”, and “turbidity”.

Test Strip Measurement

Test strips loaded in the feeder are sent one at a time to the tray inside the instrument and carried to the sample staining position by the introduction arm. At the sample staining position, the nozzle that aspirated the sample from the sample tube in the sampler stains each reagent pad (each measurement item) of the test strip. Once stained, the test strip is transported to the optical block. Within about 60 sec of staining, the test strip reacts and changes color, therefore its reflectivity is measured in that moment. When measurement has been completed, the test strip is discarded in the waste box.

The measurement unit irradiates the reagent pad with light of 2 wavelengths from a 5-wavelength LED, the reflected light of which is picked up by a single detector.* Moreover, by measuring the reflectivity of the color correction pad of the test strip, destabilizing factors such as the amount of reflected light and colored samples are corrected.

* The irradiated wavelength combinations differ according to measurement item.

Wavelengths by measurement item

Measurement item	GLU	PRO	BIL	URO	PH	BLD	KET	NIT	LEU
Measurement wavelength (nm)	635	635	565	565	635	635	565	565	565
Reference wavelength (nm)	760	760	760	760	760	–	760	760	760

Reflectivity is measured with the formula below.

$$R = (Tm \cdot Cs) / (Ts \cdot Cm)$$

- ***R:*** Reflectivity
- ***Tm:*** Amount of reflected light coming from reagent pad at measurement wavelength
- ***Ts:*** Amount of reflected light coming from reagent pad at reference wavelength
- ***Cm:*** Amount of reflected light coming from color correction pad at measurement wavelength
- ***Cs:*** Amount of reflected light coming from color correction pad at reference wavelength

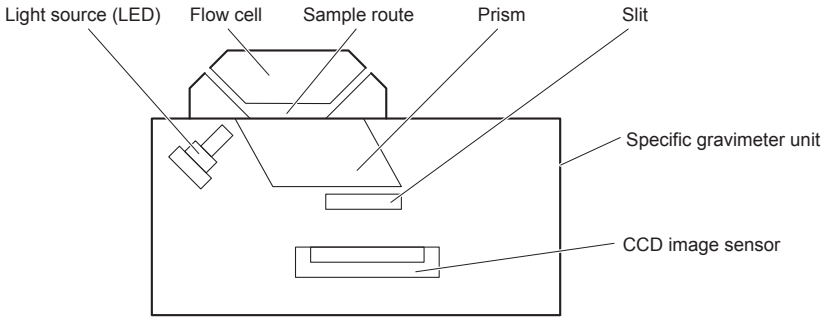
However, BLD is measured with only one wavelength and calculated with the formula below.

$$R = Tm / Cm$$

These reflectivities “R” are compared against calibration curves stored in the instrument and output as measurement results. Also, temperature is corrected to eliminate changes caused by environmental temperature.

Specific Gravity (S.G.) Measurement

Specific gravity of a urine sample is obtained by measuring the refraction of the sample using a prism and subjecting results to a calculation formula (reflection refractometry). The light from an LED passes through the prism and is reflected on the prism face contacting the sample. The light reflected off the prism is collimated into a thin beam by passing through a slit and directed to a detector (CCD image sensor). At this point, the refractive index at the interface between the prism face and sample will change according to the specific gravity, therefore the position of the incident light from the slit will change. The refractive index is obtained by detecting the position of the incident light and, after correcting it for temperature effects, it is converted into a Brix value. The specific gravity of the sample is then obtained using this Brix value and a conversion formula.



The Brix value is the sugar content of an aqueous solution measured at 20°C and represents the strength of the solution as percentage by weight.
For example, the Brix value is 30% for a 30% sucrose solution (30 g of sucrose sugar and 70 g of water in a 100 g solution).

Specific gravity is calculated as follows:

1. The specific gravity of the sample is calculated.

   $$SGx' = 1 + (4/900) \times Brix\ value$$
   (However, specific gravity is equal to 1,000 if the Brix value is below 0.)

2. Correction coefficients *a* and *b* are calculated from the low and high specific gravity values obtained from S.G. calibration.

   $$a = \frac{SG_L - SG_H}{K_L - K_H}$$

   $$b = SG_L - (a \times K_L)$$

3. The obtained specific gravity value of the sample is corrected using correction coefficients *a* and *b*.

$$SGx = a \times SGx' + b$$

SGx: Sample's specific gravity after calibration correction
SGx′: Sample's specific gravity before calibration correction
SG_H: Specific gravity reference of standard solution (high)
SG_L: Specific gravity reference of standard solution (low)
K_H: Specific gravity of standard solution (high)
K_L: Specific gravity of standard solution (low)

Furthermore, high concentrations of glucose (GLU) and protein (PRO) will affect specific gravity. Therefore, specific gravity is corrected using the concentrations of glucose and protein obtained from test strip measurement.

$$SG = SGx - C_{GLU} - C_{PRO}$$

SG: Specific gravity after GLU and PRO correction
SGx: Specific gravity obtained from formula 3.
C_{GLU}: Corrected GLU value
C_{PRO}: Corrected PRO value

Correction values (Unit of concentration: mg/dL)

GLU concentration	0	10	30	50	70	100
Correction value	0.0000	0.0000	0.0001	0.0002	0.0003	0.0004

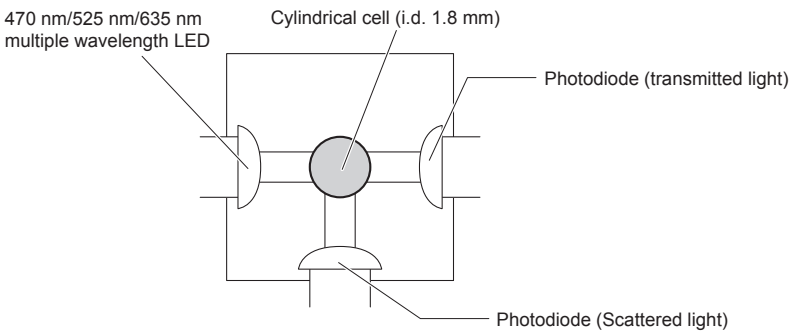
150	200	300	500	1000	OVER
0.0006	0.0008	0.0012	0.0020	0.0040	0.0040

PRO concentration	0	5	10	20	30	50	70
Correction value	0.0000	0.0000	0.0000	0.0001	0.0001	0.0002	0.0002

100	150	200	250	300	600	OVER
0.0003	0.0005	0.0006	0.0008	0.0009	0.0018	0.0018

Color-Tone Measurement

An internal turbidity/color measurement unit measures sample color using transmitted light.



In color-tone measurement, red (635 nm), green (525 nm) and blue (470 nm) lights are irradiated on the sample in the cylindrical tube and the hue and contrast of the sample are obtained from the amount of transmitted light.

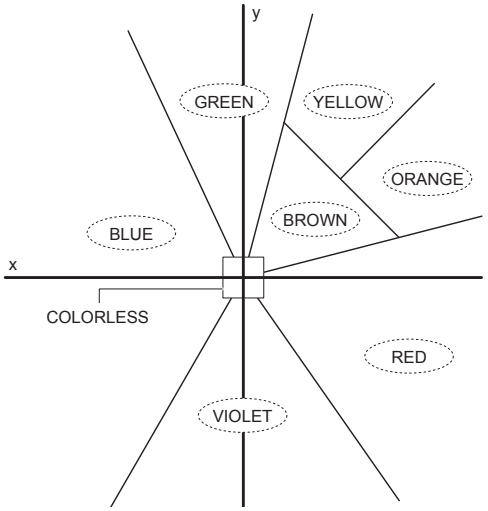
The color is evaluated against 23 standard colors consisting of light, normal and dark shades of yellow, orange, brown, red, violet, blue and green (21 total), plus colorless and other.

Contrast and hue indications (23 colors)

COLORLESS	
YELLOW	LIGHT, normal and DARK are indicated for each color. Example: LIGHT YELLOW, YELLOW, and DARK YELLOW
ORANGE	
BROWN	
RED	
VIOLET	
BLUE	
GREEN	
OTHER	

Hue is obtained from the areas in the coordinate system at right. Coordinates are calculated as follows:

Color classification



1. XYZ stimulus is obtained.

$$X = ((a \times R) + (b \times G) + (c \times B)) \div 1000$$
$$Y = ((d \times R) + (e \times G) + (f \times B)) \div 1000$$
$$Z = ((g \times G) + (h \times B)) \div 1000$$

R: Transmission intensity of 635 nm light
G: Transmission intensity of 525 nm light
B: Transmission intensity of 470 nm light
a *to* ***h:*** Correction coefficients

2. The x and y color coordinates are obtained from formula 1.

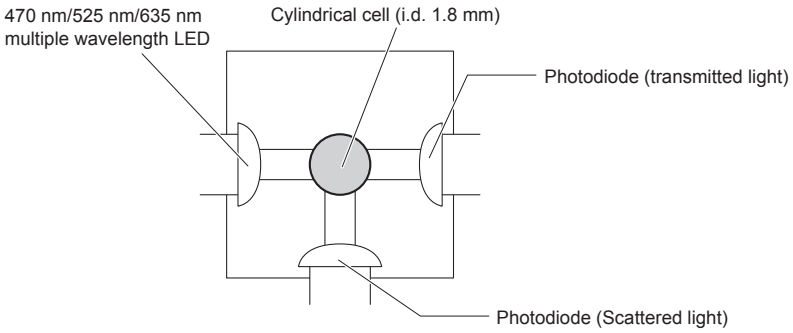
$$x = X \div (X + Y + Z)$$
$$y = Y \div (X + Y + Z)$$

3. The density is obtained from formula 2.

$$\sqrt{(x^2 + y^2)}$$

Turbidity Measurement

An internal turbidity/color measurement unit measures sample turbidity using transmitted and scattered lights.



Light of 635 nm is irradiated on the sample in the cylindrical cell and turbidity is calculated using the formula below.

$$T = \left(\frac{Ss}{Ts} - \frac{Sw}{Tw} \right) \Big/ K$$

T: Turbidity
Ss: Scattered light of sample
Ts: Transmitted light of sample
Sw: Scattered light of washing solution
Tw: Transmitted light of washing solution
K: Factory-set instrument coefficient

Turbidity is determined by the obtained T value.

T range	Turbidity	Output
T < (Level 1)	Clear	–
(Level 1) ≤ T < (Level 2)	Turbid	1+
(Level 2) ≤ T	Densely turbid	2+

* (Level 1) and (Level 2) are constants.

1.1.5 Rank Table

Measurement results are represented as qualitative and/or semi-quantitative values as listed below. The shaded areas ▭ contain abnormal values, which are preceded by an abnormal mark (*) on the displayed and printed reports.

GLU (glucose)

Rank	1	2	3	4	5	6	7	8	9	10	11
Qualitative	–	±		1+		2+		3+		4+	
Semiquantitative (mg/dL)		30	50	70	100	150	200	300	500	1000	OVER

PRO (protein)

Rank	1	2	3	4	5	6	7	8	9	10	11
Qualitative	–	±		1+			2+		3+		4+
Semiquantitative (mg/dL)		10	20	30	50	70	100	200	300	600	OVER

BIL (bilirubin)

Rank	1	2	3	4	5	6	7	8	9	10
Qualitative	–	1+		2+			3+			4+
Semiquantitative (mg/dL)		0.5	1.0	2.0	3.0	4.0	6.0	8.0	10.0	OVER

URO (urobilinogen)

Rank	1	2	3	4	5	6	7	8
Qualitative	NORMAL	1+		2+		3+		4+
Semiquantitative (mg/dL)		2	3	4	6	8	12	OVER

PH (pH)

Rank	1	2	3	4	5	6	7	8	9
Value	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0

BLD (blood)

Rank	1	2	3	4	5	6	7	8
Qualitative	–	±	1+		2+		3+	
Semiquantitative (mg/dL)		0.03	0.06	0.1	0.2	0.5	1.0	OVER

KET (ketones)

Rank	1	2	3	4	5	6	7	8	9	10
Qualitative	–	±	1+		2+		3+		4+	
Semiquantitative (mg/dL)			10	20	40	60	80	100	150	OVER

NIT (nitrite)

Rank	1	2	3
Qualitative	–	1+	2+

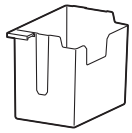
LEU (leukocytes)

Rank	1	2	3	4	5
Qualitative	–				
Semiquantitative (Leu/µL)		25	75	250	500

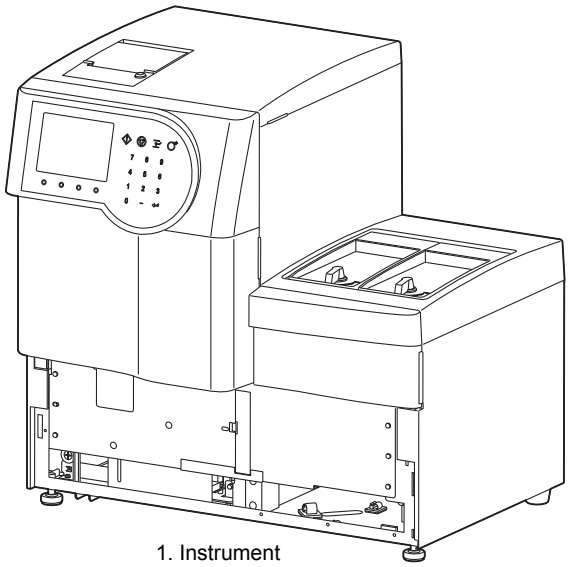
1.2 Unpacking

The instrument boxes in three cartons. Unpack the boxes and make sure you have all items listed in this section. If anything is missing or damaged, contact your distributor.

1.2.1 Instrument



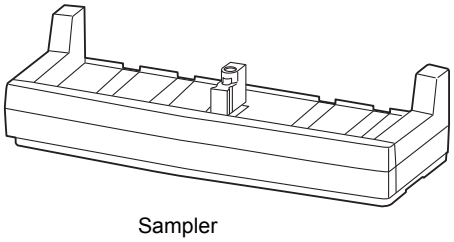
2. Waste box



1. Instrument

No.	Item	Description	Qty.
1	Instrument	AUTION MAX AX-4030	1
2	Waste box		1

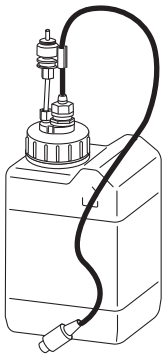
1.2.2 Sampler



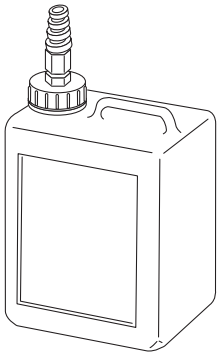
Sampler

No.	Item	Description	Qty.
1	Sampler	Rack type	1

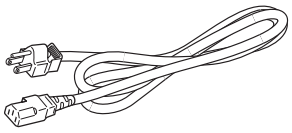
1.2.3 Accessories



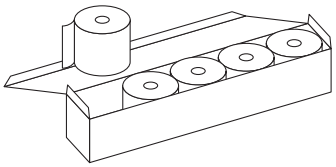
1. Washing solution bottle



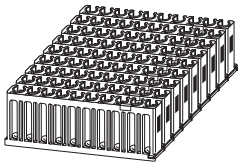
2. Drain bottle



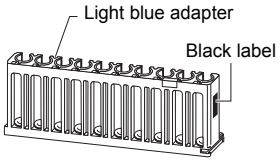
3. Power cord



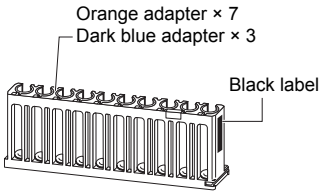
4. Thermal printer paper



5. Rack set

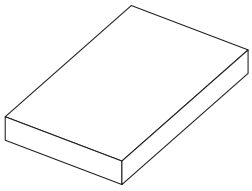


6. Start rack

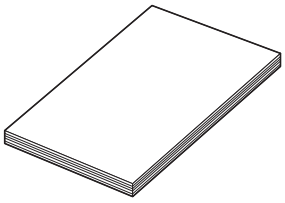


7. STAT and control rack

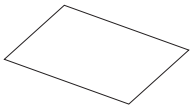
8. Adapter (gray)



9. Accessory case



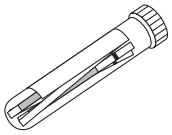
10. Operating manual



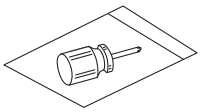
11. Error and trouble list

No.	Items	Descriptions	Qty.
1	Washing solution bottle	With a liquid sensor cord, 2 L	1
2	Drain bottle	3 L	1
3	Power cord	The type of power cord supplied varies depending on the country.	1
4	Thermal printer paper	58-mm width, 5 rolls	1
5	Rack set	10 item racks with rubber cushions	1
6	Start rack	With rubber cushions and light blue adapters	1
7	STAT and control rack	With rubber cushions, and orange and blue adapters	1
8	Adapters	Gray colored	100
9	Accessory case	See page 1-15.	1
10	Operating manual	This manual	1
11	Error and trouble list		1

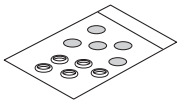
1.2.4 Accessory Case



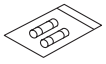
1. Check strip set



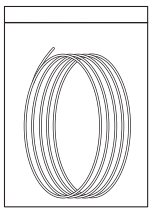
2. Phillips screwdriver



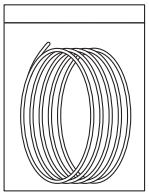
3. Filter set



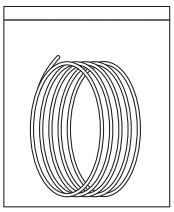
4. Fuses



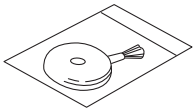
5. Tygon tube



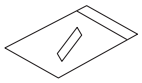
6. Silicon tube



7. Silicon tubes



8. Blower brush



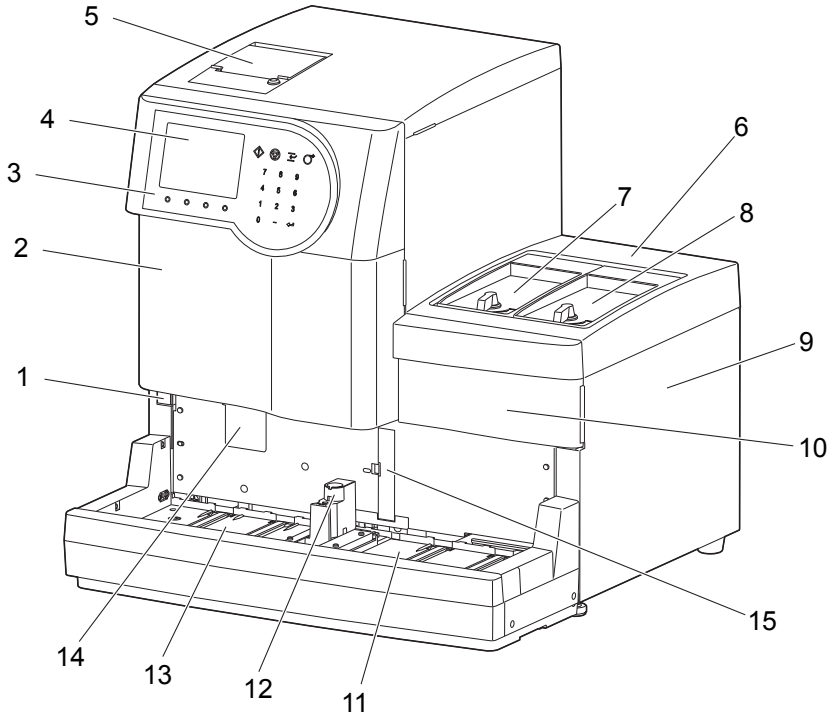
9. White plate

10. Tweezers

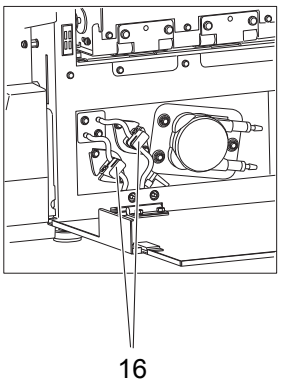
No.	Items	Descriptions	Qty.
1	Check strip set	White check strips × 2, Gray check strips × 2	1
2	Phillips screwdriver	No.2, plastic insulated	1
3	Filter set	Mesh filter, O-ring (5 pieces for each)	1
4	Fuses	T5AE250V~ × 2	1
5	Tygon tube	For washing solution bottle 1/16” (i.d.) × 3/16” (o.d.), 2 m × 1	1
6	Silicon tube	For drain bottle 3 mm (i.d.) × 6 mm (o.d.), 4 m × 1	1
7	Silicon tubes	For drain pinch valves 2 mm (i.d.) × 4 mm (o.d.), 100 mm × 2	1
8	Blower brush		1
9	White plate		1
10	Tweezers	L125	1

1.3 Components

1.3.1 Front View

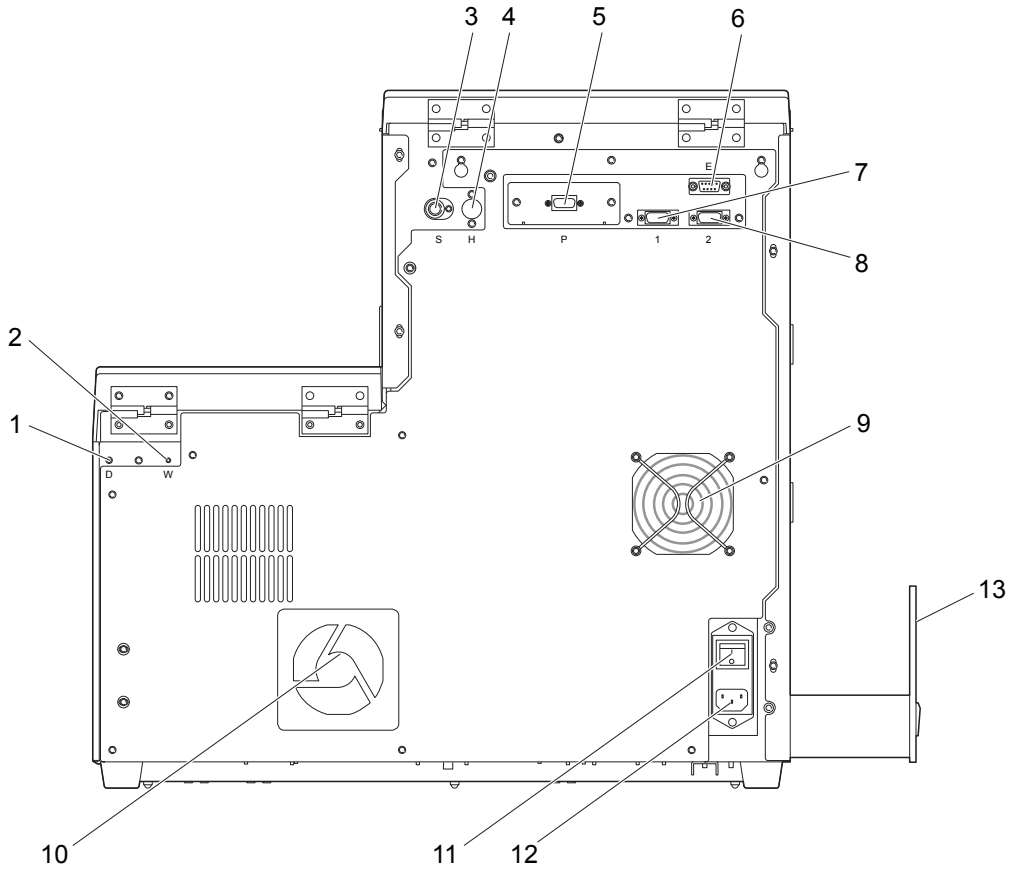


With the side cover open



No.	Components	Descriptions
1	Standby switch	Use this switch to turn on and off the instrument for daily use. The switch lamp illuminates green while the power is on.
2	Front cover	This protects the nozzle drive unit and prevents users from accidentally touching the nozzle.
3	Operator panel	There are operation keys for starting measurement and entering numeric values. See *"1.7 Basic Operations"* on page 1-40.
4	Display	You can view results and check status information here.
5	Built-in printer	This thermal printer prints results and parameter settings.
6	Feeder protective cover	This cover protects two feeders.
7	Feeder cover 1	This cover has a locking lever to open and close feeder 1.
8	Feeder cover 2	This cover has a locking lever to open and close feeder 2.
9	Side cover	The pumps for aspirating samples, for staining samples on test strips, and for flushing the washing solution are located inside. The trap bottle is also attached here.
10	Maintenance cover	Open this cover to clean inside the instrument.
11	Loading side	Place sample racks with samples loaded here.
12	STAT port	Load a sample for port STAT measurement here.
13	Unloading side	The sample racks are discharged here after sample aspiration. If the instrument has been set for loop transportation, you can load 5 more sample racks to be measured here.
14	White plate cover	Open this cover to replace the white plate.
15	Built-in barcode reader	The barcode reader reads barcodes labeled on sample tubes.
16	Drain pinch valves	These valves control drainage flow.

1.3.2 Rear View



No.	Components	Descriptions
1	Drain joint (D)	Connect the tube from the drain bottle here.
2	Washing solution joint (W)	Connect the tube from the washing solution bottle here.
3	Washing solution sensor terminal (S)	Connect the liquid sensor cord of the washing solution bottle here.
4	Hand-held barcode reader terminal (H)	Connect the optional hand-held barcode reader here.
5	Data output terminal (P)*	Connect the communication cable from an RS-232C port of an external device here.
6	Data output terminal (E)	Connect the communication cable from an RS-232C port of the AX-4030-exclusive device here.
7	START terminal (1)	Use these terminals to attach the extended sampler or joining unit A.
8	STOCK terminal (2)	
9	Cooling fan	The fan exhausts heated air to keep the inside of the instrument cool.
10	Cooling fan	The fan draws in air from outside to cool the inside of the instrument.
11	Main power switch	Press this switch to turn on or off the main power supply. Keep this switch on for daily use, and turn it off when cleaning specific components or during long-term disuse.
12	Power input terminal	Connect the power cord which came with the instrument here.
13	Waste box tray	Attach the waste box here to collect used test strips.

* This terminal can be replaced with the Ethernet terminal (optional Ethernet board) to connect the instrument to a LAN. For more information, contact your distributor.

1.4 Installation

1.4.1 Precautions in Instrument Installation

Before installation of the instrument, read the following notes and always take proper safety precautions.

> ⚠ **Install the instrument under the supervision of a serviceperson. It is dangerous to handle the instrument with the covers open. High voltage parts are located inside. Contact could be dangerous.**

- **The instrument weighs about 37 kg and the sampler about 4 kg. Determine a location for the instrument and assemble it in that location. Do NOT carry the instrument with the sampler attached. Separate the two units before moving. For safety reasons, always transport and assemble the instrument with the help of at least one other person. Hold the bottom of the instrument with both hands when carrying it.**

- **During installation, be careful not to pinch your hands under the instrument.**

- **Install the instrument at least 20 cm away from walls. Inadequate clearance between the instrument and walls may cause overheating of the instrument or undesirable load on cable connections, thus resulting in fire or incorrect measurement results.**

- **Ensure at least 10 cm clearance between walls and the left panel (viewed from the front) for users to be able to draw the waste box and dispose of the used test strips. Insufficient distances may block the waste box. Also, users will have trouble trying to turn off the main power switch and disconnect connectors in the event of errors or trouble.**

- **Install the instrument where temperature and humidity can be maintained in the following ranges:**
  Temperature: 10°C - 30°C
  Humidity: 20% - 80%
  Installation in the measurement environment outside these ranges may result in incorrect measurement results.

- **Install the instrument on a level, vibration-free sturdy platform. Operation of the instrument in an unstable place may cause trouble or malfunction of the instrument resulting in personal injury. DO NOT install the instrument where it may fall off or topple over.**

- **Do not install the instrument near places that store chemicals or near equipment that generates corrosive gas or electrical noise. Chemicals, corrosive gases and electrical noise may cause fire or damage to the instrument and consequently lead to personal injury, or may otherwise cause incorrect measurement results.**

- **Install the instrument in a place not exposed to direct sunlight, condensation or wind. These factors may cause incorrect measurement results, as well as deformation of or damage to the instrument.**

- **Apply the correct voltage (100 to 240 V AC) and frequency (50/60 Hz) to the instrument. The wrong voltage and frequency may result in fire or damage to the instrument and consequently lead to personal injury.**

- **Use the power cord that came with the instrument for the electrical connection to avoid electric shock and fire.**

- **Connect the instrument's power cord directly to a single outlet, without using an extension cord or power tap. The maximum power supply for the instrument is 150 VA.**

- **Use the specified RS-232C cross cable to connect an external device to the 9-pin data output terminal of the instrument, to avoid electric shock and fire. For more information, contact your distributor.**

- **Use the specified Ethernet cable to connect an external device to the Ethernet terminal that is provided when the optional Ethernet board is installed in the instrument. Use of other cables may cause electric shock or fire. For more information, contact your distributor.**

- **The START (1) and STOCK (2) terminals are used to connect optional joining unit A or an expansion sampler. Connecting to other devices may cause damage to the instrument. For the installation of these optional parts or precautions on operating them, contact your distributor. Install optional parts under the supervision of a serviceperson. Confirm operating precautions with the serviceperson ahead of use.**

- **DO NOT disassemble the instrument unless required for installation. DO NOT modify the instrument. Disassembly and modification of the instrument may result in exposure to pathogenic microbes or cause fire or damage to the instrument and consequently lead to personal injury.**

- **If you need to disassemble the instrument after use, wear protective gloves to prevent exposure to pathogenic microbes.**

1.4.2 Unlocking the Instrument

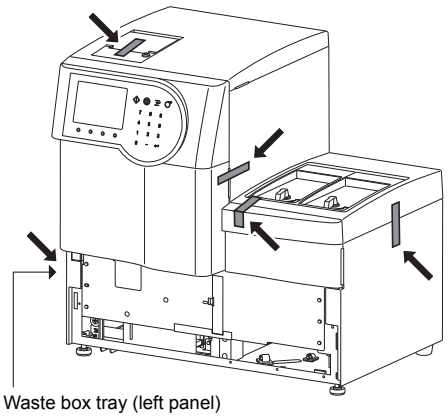
To prevent the instrument from being damaged in transport, various parts are anchored before shipping from the factory. Remove these retainers before installing the instrument. Also, before doing anything, read *"1.4.1 Precautions"* on page 1-18.

Prepare: Phillips screwdriver

REFERENCE: Keep your removed screws in the accessory case. These screws will be needed the next time the instrument is moved.

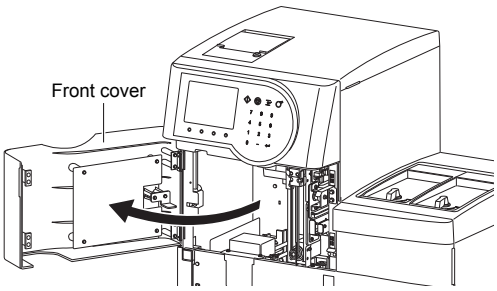
1 Remove the anchoring tape.

❶ Remove the anchoring tape at the locations shown in the right figure.
- Also, remove the tape from the waste box tray on the left panel.



2 Unlock the nozzle drive section.

❶ Open the front cover.

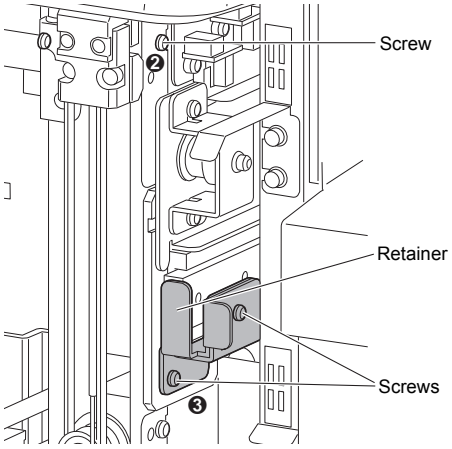


❷ Loosen the screw that locks the nozzle drive using a Phillips screwdriver, and remove it.

❸ Loosen the two screws on the retainer of the nozzle drive with a Phillips screwdriver, and remove the retainer.

NOTE: Take care not to drop the screws inside the instrument.

❹ Close the front cover.



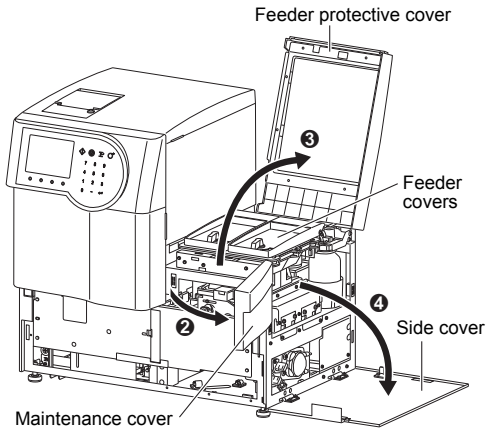
3 Remove the anchoring tape from the identification section.

❶ Make sure both feeder covers are locked.

❷ Open the maintenance cover.

❸ Open the feeder protective cover.
- The cover stops at a 120° angle.
- This cover can be removed from the instrument by unhooking the hinge.

❹ Open the side cover.



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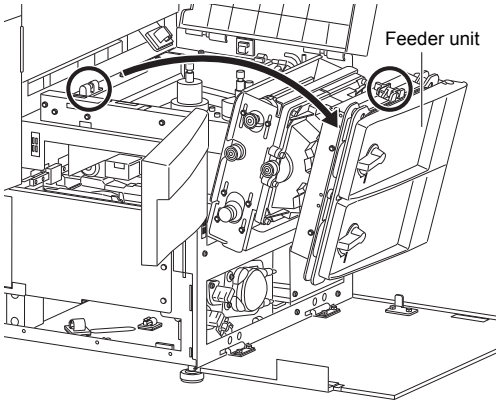
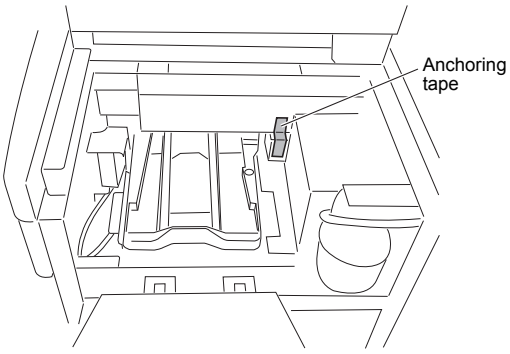
❺ Tilt the feeder unit to the right.
- The feeder unit is locked with the latch shown with the circles in the figure. So, first you need to pull the whole feeder unit to the right with a little force to open the latch.

NOTE: Do not apply excessive pressure to the feeder unit when in the tilted position, as this may cause damage to the instrument.



---

❻ Remove the anchoring tape.



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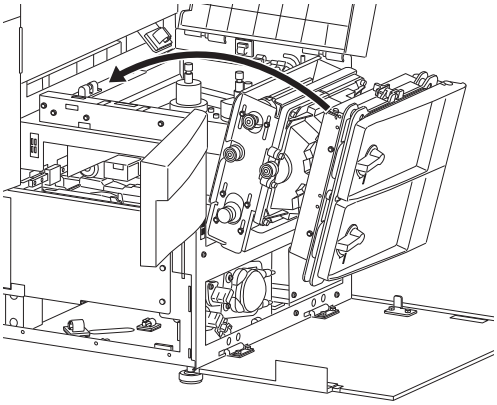
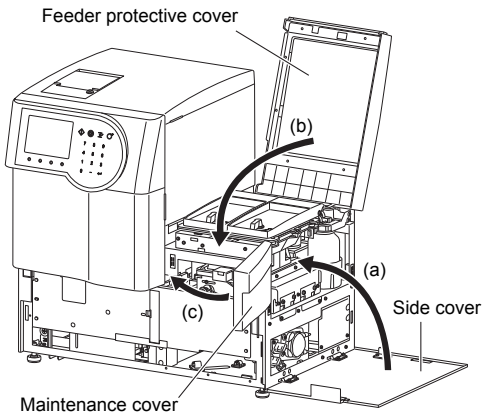
❼ Stand the feeder unit straight up.
- Once the feeder is standing up straight, press the feeder downward until the latch clicks and the unit locks in place.



4 Close the covers.

❶ Close the covers in the order of the side cover (a), feeder protective cover (b), and maintenance cover (c).



1.4.3 Attaching the Sampler

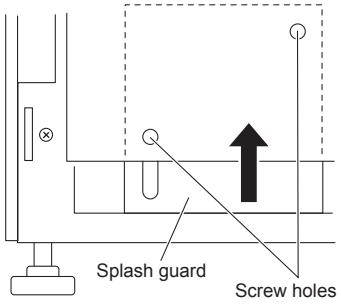
Prepare: Sampler, and Phillips screwdriver

1 Open the splash guard.

❶ Insert the tip of a Phillips screwdriver in the screw holes on the splash guard to loosen the two screws inside.

❷ Slide the cover upward.

❸ Temporarily tighten one of the screws using the screwdriver to prevent the cover from dropping.

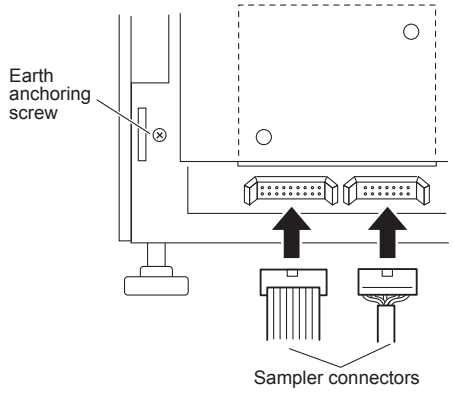


2 Connect the sampler cables to the instrument.

❶ Place the sampler in front of the instrument.

❷ Connect the two cables from the sampler to the connectors on the lower part of the front panel.

❸ Lock the connectors to avoid disconnection.



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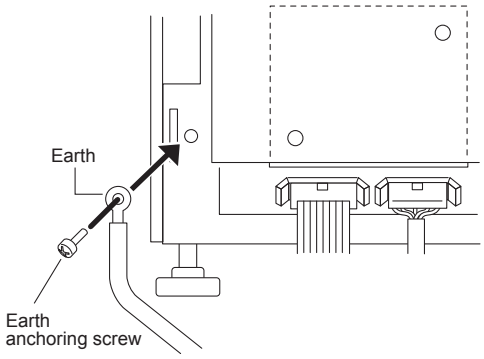
❹ Loosen the earth anchoring screw from the instrument with the Phillips screwdriver, and remove it.

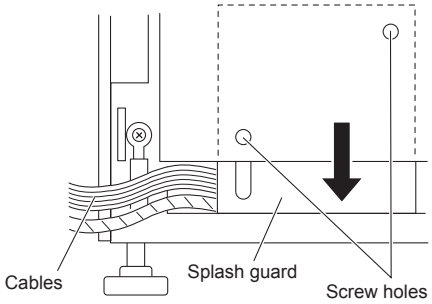
❺ Fit the earth anchoring screw through the eye of the sampler's earth line and reattach the screw in its original position.



❻ Feed the sampler cables through the left side of the instrument.

❼ Loosen the temporarily-tightened screw using a Phillips screwdriver, and slide the splash guard down.

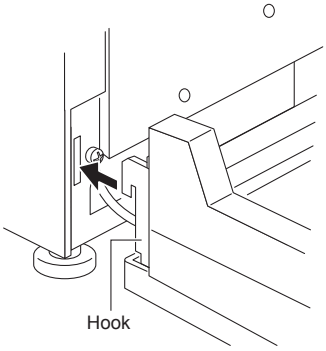
NOTE: Make sure the cables do not get caught in the splash guard.



❽ Tighten the two screws using a Phillips screwdriver to secure the splash guard.

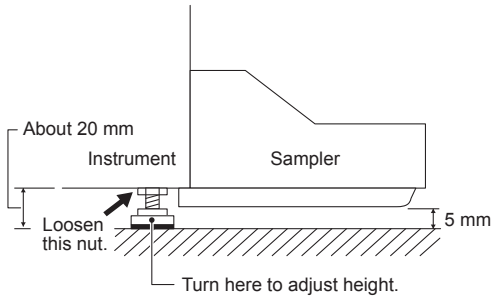
3 Attach the sampler to the instrument.

❶ Fit the hooks on both sides of the sampler into the holes on the instrument.
- Be careful not to pinch the cables and earth line.



❷ Loosen the locking nut on the instrument legs close to the sampler.

❸ Turn the adjuster feet until the sampler rises an even 5 mm off the countertop.
- Check that the instrument has a clearance of about 20 mm from the countertop.



❹ Tighten the locking nuts to lock the adjuster feet in place.

4 Adjust the auxiliary legs of the sampler.

NOTE: Lower the auxiliary legs of the sampler until they contact the countertop. Unless the sampler is stable, it can deform under its own weight and the samples and the nozzle can be damaged.

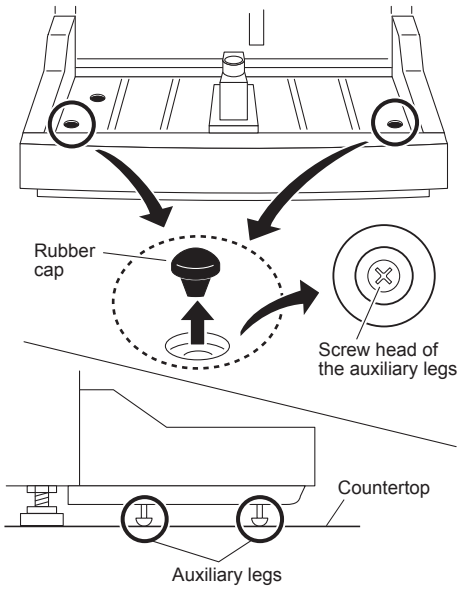
NOTE: The sampler has one auxiliary leg on each the right and left side of the bottom panel and another one below the STAT port. Lower all three legs to the countertop. The sampler is unstable on just one or two auxiliary legs.

❶ Remove the two rubber caps from the sampler.
- You can see the screw heads of the auxiliary legs.

❷ Turn the auxiliary leg screws clockwise with a Phillips screwdriver until the auxiliary legs contact the countertop.

NOTE: Excessively turning the auxiliary legs will cause the sampler to rise. Lower the auxiliary legs until they just contact the countertop.

❸ Reattach the rubber caps.

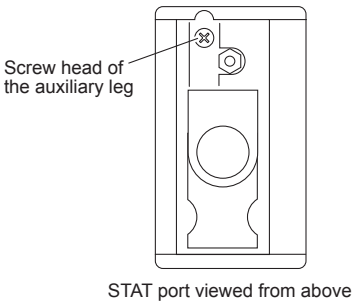


❹ Open the front cover.

❺ Locate the screw head of the auxiliary leg at the back of the STAT port.

❻ Turn the screw until the auxiliary leg below the STAT port contacts the countertop.

❼ Close the front cover.



1.4.4 Installing the Washing Solution Bottle

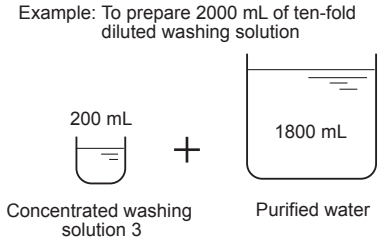
Prepare: Concentrated washing solution 3 (for AUTION MAX), purified water, washing solution bottle, sealing film, and Tygon tube

REFERENCE: Purchase the concentrated washing solution 3, which is not supplied with the instrument.

1 Prepare the washing solution.

❶ Dilute concentrated washing solution 3 with purified water.

NOTE: Check the correct dilution rate on the bottle label of the concentrated washing solution 3.

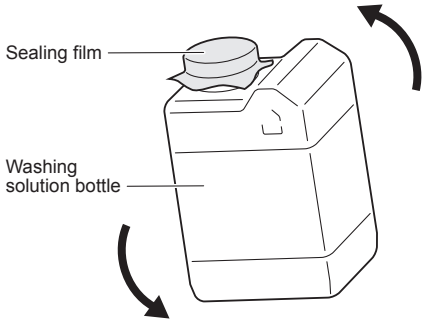


❷ Uncap the washing solution bottle.

❸ Pour the diluted washing solution into the washing solution bottle.

❹ Seal the bottle with a piece of sealing film.

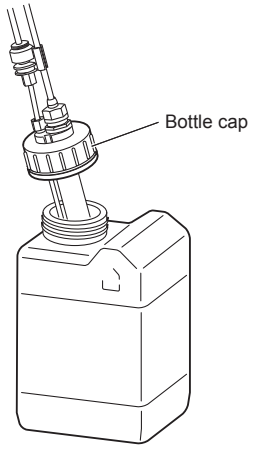
❺ While holding the film in your hand, gently invert the bottle so as not to froth the solution.



NOTE: Keep foreign matter out of the bottle and solution as this may cause the filter in the flow line to clog.

2 Install the washing solution bottle.

❶ Remove the sealing film from the bottle, and attach the bottle cap.



3 Connect the sensor cord and tube.

❶ Connect the liquid sensor cord from the bottle cap to the washing solution sensor terminal "S" on the rear panel.

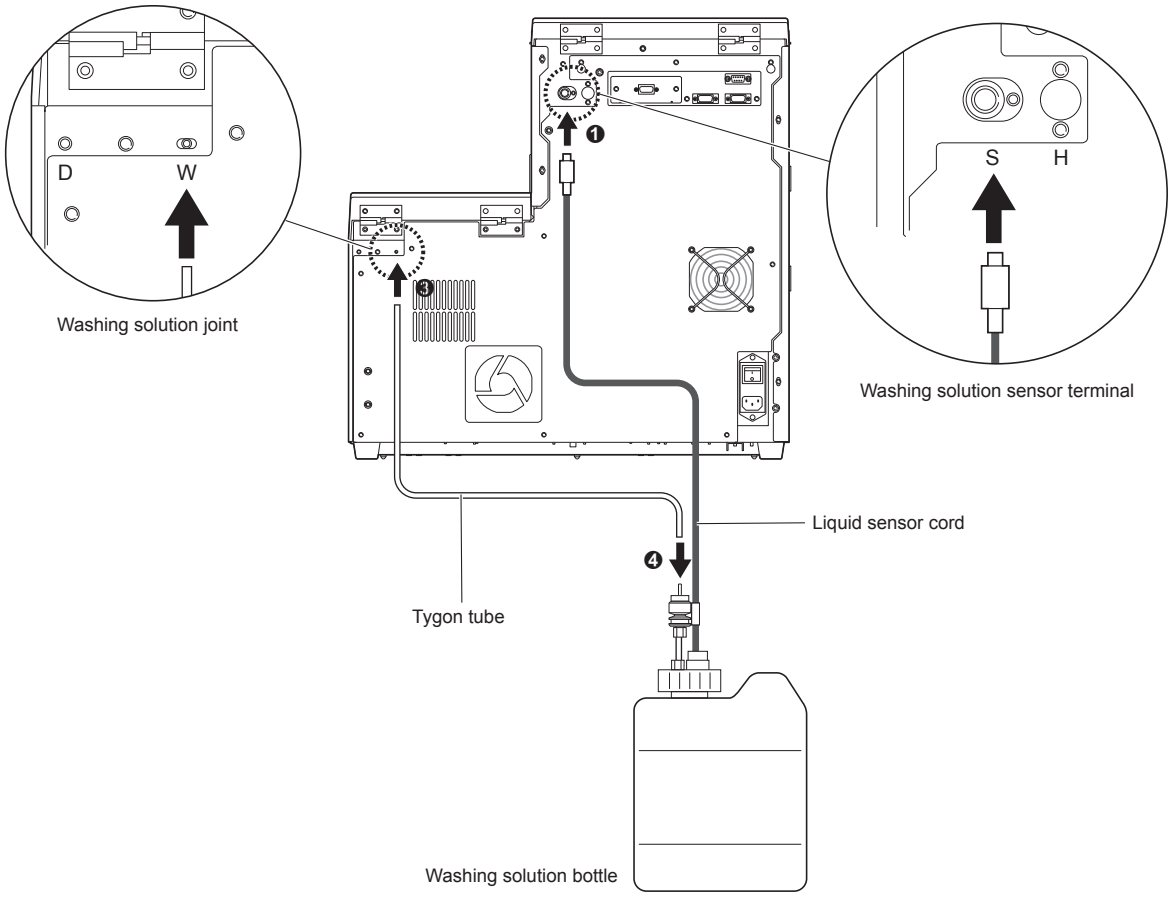
❷ Cut the Tygon tube to an appropriate length (max. 1 m).

NOTE: Use of a longer tube may interfere with solution filling. Keep the remaining tube in the accessory case for replacement.

❸ Fit one end of the Tygon tube over the washing solution joint "W" on the rear panel.

❹ Fit the other end of the tube over the washing solution nozzle of the bottle cap.

NOTE: Care should be taken not to tear the tube by forcing it.



1.4.5 Installing the Drain Bottle

Set the drain bottle at the same or a lower height than the surface that the instrument sits on. If higher than the instrument base, liquid waste may not drain properly and consequently leak. Contacting liquid waste with unprotected hands may expose you to pathogenic microbes.

Urine samples and solution are discharged into the drain bottle. Place the bottle on a flat, level surface.

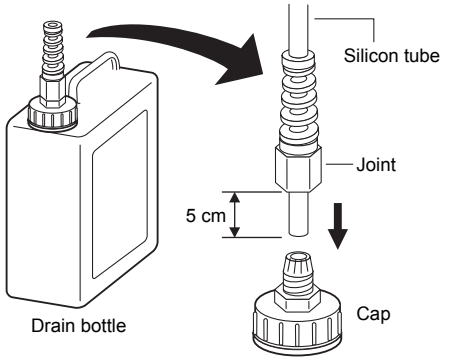
Prepare: Drain bottle and silicon tube [3 mm (i.d.) × 6 mm (o.d.), 4 m]

1 Connect the tube to the drain bottle.

❶ Cut the silicon tube to an appropriate length.

❷ Remove the joint from the drain bottle. Insert one end of the silicon tube into the joint until the tube extends about 5 cm from the joint.

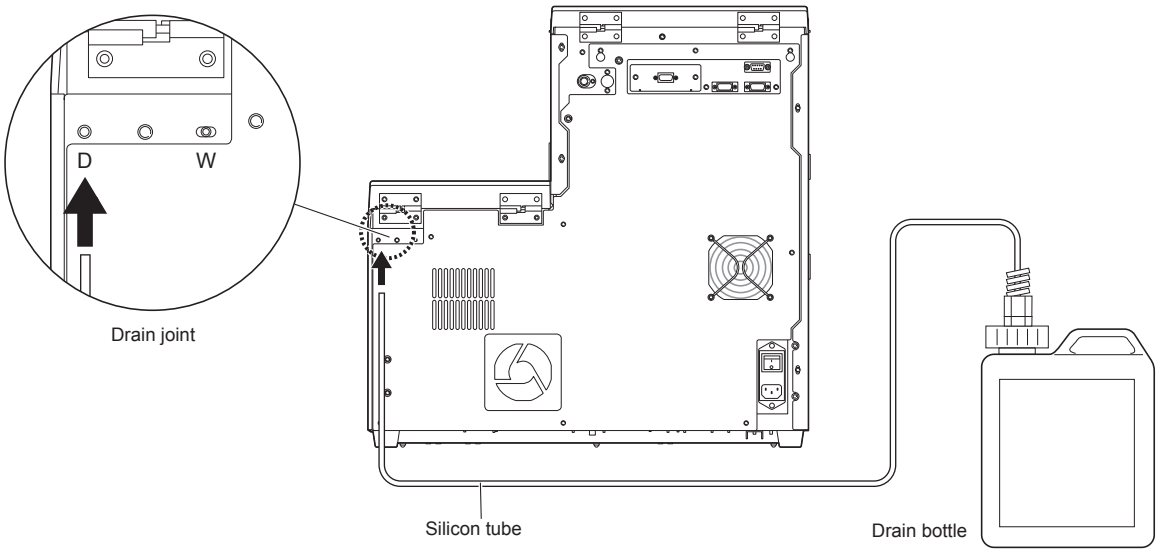
❸ Reattach the joint to the bottle cap, and tighten it securely.



2 Connect the tube to the instrument.

Do not bend or pinch the silicon tube of the drain bottle. Also, keep objects off of the tube. If liquid waste clogs inside the tube, the tube may disconnect from the instrument and spill contained liquid. Contacting liquid waste with unprotected hands may expose you to pathogenic microbes.

❶ Fit the other end of the tube over the drain joint "D" on the rear panel.

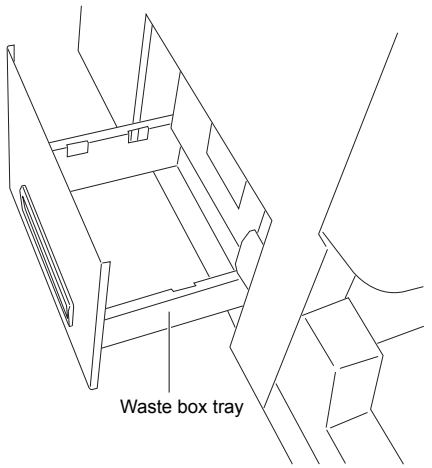


1.4.6 Installing the Waste Box

Install the waste box for collecting used test strips.

1 Pull out the waste box tray.

❶ Pull out the waste box tray from the left panel of the instrument.

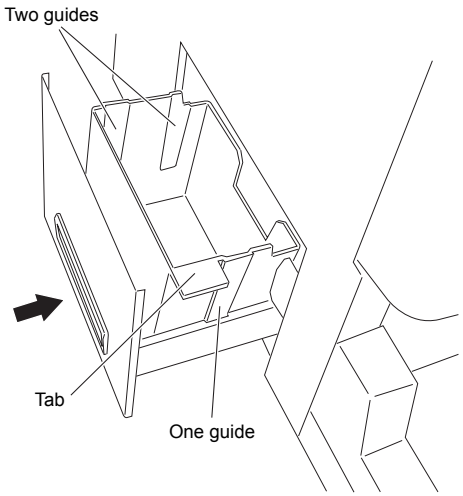


2 Install the waste box.

❶ Hold the waste box tab facing forward, and place the box on the waste box tray.
- Ensure the waste box guides fit the concaves inside the tray.

❷ Store the waste box tray in the instrument.
- If the waste box is correctly set in the tray, it is held steadily by the magnets.
- If the waste box gets caught halfway, it is set incorrectly.

NOTE: Ensure the waste box correctly fits into the tray before pushing it in. Incorrect installation may cause used test strips to be scattered around inside the instrument or to clog the test strip path.



1.4.7 Connecting the Power Cord and External Devices

Connect the instrument to a receptacle using the supplied power cord, and also to an external device as needed.

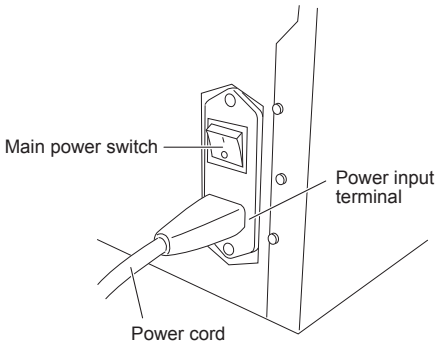
Prepare: Power cord and, if necessary, communication cable for the external device

Use the specified RS-232C cross cable or Ethernet cable to connect an external device to the instrument. Connections using cables other than these can cause electric shock and fire. For more information, contact your distributor.

1 Connect the power cord.

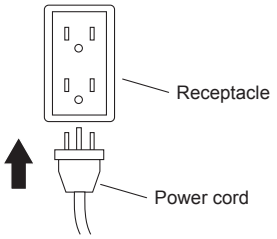
❶ Ensure the main power switch is in the off position.
- The main power switch should be depressed to the ○ (off) side.

❷ Insert the female connector of the power cord into the power input terminal on the rear panel.



❸ Insert the male connector of the power cord into a receptacle.

REFERENCE: The type of power cord supplied varies depending on the country.



2 Connect an external device (if necessary).

NOTE: Use the specified RS-232C cross cable or Ethernet cable to connect an external device to the instrument.

❶ Connect one end of the communication cable to a data output terminal on the rear panel.

❷ When using an RS-232C cable, tighten the safety screws to secure it.

❸ For the connection of the other end of the cable, see the manual of the external device.

REFERENCE: The external output capability is disabled by default. To have the instrument communicate with an external device, change the appropriate parameter setting. See *"3.4.3 Enabling/Disabling the External Output"* on page 3-20.

1.5 Starting Up

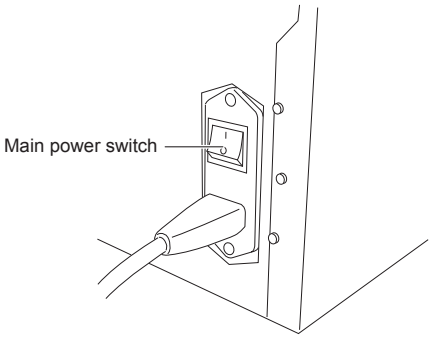
This section describes what you should do next after completing installation; it includes turning on the power and setting up the printer and system clock. How to turn off the power is also explained at the end of this section.

1.5.1 Turning On the Power for the First Time

Use the following procedure to turn on the instrument for the first time after installation. It will take about 2 minutes for the instrument to complete warm-up.

1 Turn on the main power switch.

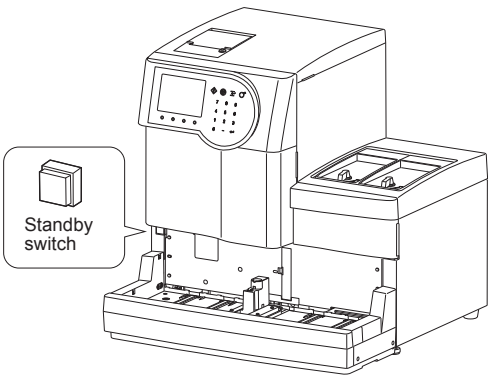
❶ Press the I (on) side of the main power switch on the rear panel.



2 Turn on the standby switch.

❶ Press the standby switch on the left side of the front panel.

- The standby switch will light green.

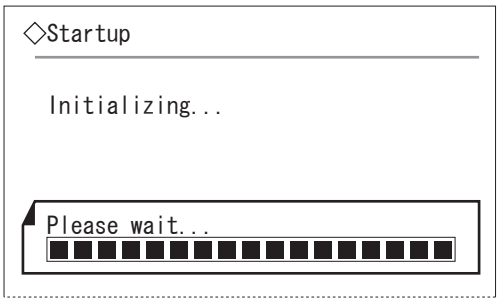


- The message “Please wait...” will appear for a maximum of 20 seconds, followed by the product name and program version for about 2 seconds.

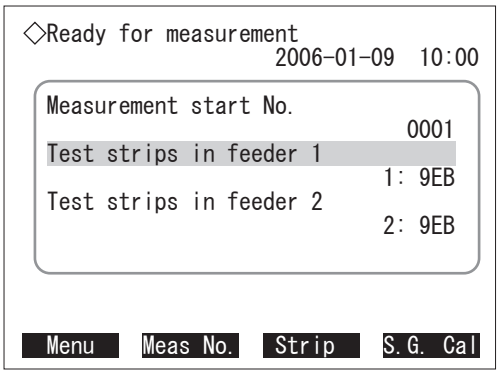
```
Please wait...

AX-4030      V1.00
```

NOTE: If the initial memory check detects a problem, the instrument will inform you of it by indicating an appropriate warning (W), error (E), or trouble (T) code before displaying the program version. For more information, see Chapter 5, *“Troubleshooting”*.

- The instrument will read the parameter settings, and then initialize the hardware.



- Warm-up will complete in 2 minutes and the *standby screen* shown at right will appear. You will see the current date and time, the factory-set measurement start number, and test strip settings.



Standby screen

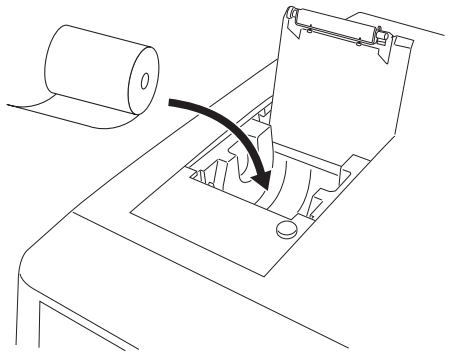
1.5.2 Setting up the Printer and System Clock

Before using the instrument, load the thermal printer paper into the built-in printer and set the system clock.

Prepare: Thermal printer paper

1 Load the thermal printer paper.

❶ Load a roll of paper into the built-in printer.
- For more information, see steps **2** in *"4.3.2 Replacing the Thermal Printer Paper"* on page 4-17.



2 Set the system clock.

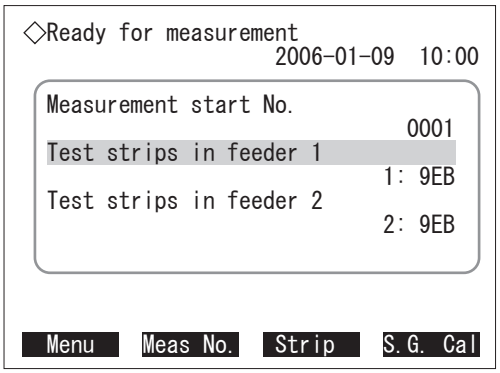
❶ Set the clock to the current date and time.
- For detailed instructions, see *"3.4.1 Setting the System Clock"* on page 3-17.

```
◇System clock setup
 (3100)                2006-01-09  10:00

 Date
 <05-12-22> (YY-MM-DD)
 Time
 <11:30>
```

1.5.3 Turning Off the Power

Use the following procedure to turn off the instrument.

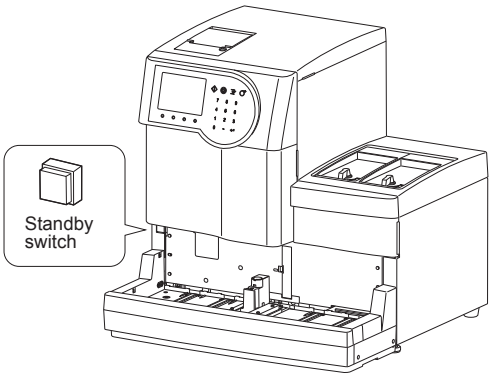
❶ Make sure the standby screen is displayed.
- If a different screen is displayed, press Go back to return to the standby screen.



---

❷ Press the standby switch.
- The light of the standby switch will turn off, indicating the instrument has powered off.

REFERENCE: When you are to use the instrument almost every day, keep the main power switch on and use the standby switch to turn on or off the instrument.



1.6 Relocation

1.6.1 Precautions in Instrument Relocation

Before relocating the instrument, read the following instructions and always take proper safety precautions.

- **Remove the drain bottle, washing solution bottle and sampler from the instrument.**
- **Drain washing solution from the flow line. Moving the instrument with washing solution in the flow line may damage the instrument.**
- **Turn off the power by pressing the standby switch followed by the OFF side of the main power switch. Then, disconnect the power cord.**
- **Disconnect the optional hand-held barcode reader and the communication cables for external devices, if any, from the rear panel of the instrument.**
- **Make sure the front, maintenance and side covers are closed before relocating the instrument. Moving the instrument with any of the covers open may expose you to pathogenic microbes or damage the instrument.**
- **Make sure there are no test strips left inside the instrument before relocating the instrument. Moving the instrument with used test strips inside may expose you to pathogenic microbes or damage the instrument.**
- **For safety reasons, always move the instrument with the help of at least one other person. Hold the bottom of the instrument with both hands and be careful not to impact or shake the instrument. Rough handling may damage the instrument.**
- **Read *"1.4.1 Precautions in Instrument Installation"* on page 1-18 before relocating the instrument.**

1.6.2 Checking for Leftover Test Strips

Prepare: Protective gloves

Wear protective gloves to prevent exposure to pathogenic microbes.

Discard used protective gloves, test strips and liquid waste in accordance with local regulations for biohazardous waste.

1 Check for test strips in the feeders.

❶ Make sure the standby screen is displayed.

❷ Open the 2 feeder covers.

❸ Return any test strips found in the feeders to the bottle.

2 Check for used test strips.

❶ Pull out the waste box tray to check if there are any used test strips in the box.
• Discard the used strips, if there are any.

1.6.3 Discharging the Washing Solution

Prepare: Protective gloves and tissue paper

Wear protective gloves to prevent exposure to pathogenic microbes.

Discard used protective gloves and liquid waste in accordance with local regulations for biohazardous waste.

1 Discharge the washing solution from the flow lines.

❶ Make sure the standby screen is displayed, then press the standby switch to turn off the power.

❷ Uncap the washing solution bottle.
• Place the cap on tissue paper to protect it against dust.

❸ Press the standby switch to turn on the power.
• During warm-up, washing solution will be discharged from the flow lines.

1.6.4 Unplugging the Power Cord

❶ Make sure the standby screen is displayed, then press the standby switch to turn off the power.

❷ Press the OFF side of the main power switch on the rear panel to turn off the main power.

❸ Pull out the power cord from the receptacle.

❹ Disconnect the power cord from the power input terminal on the rear panel.

1.6.5 Disconnecting the Tubes, Sensor Code, and Cables

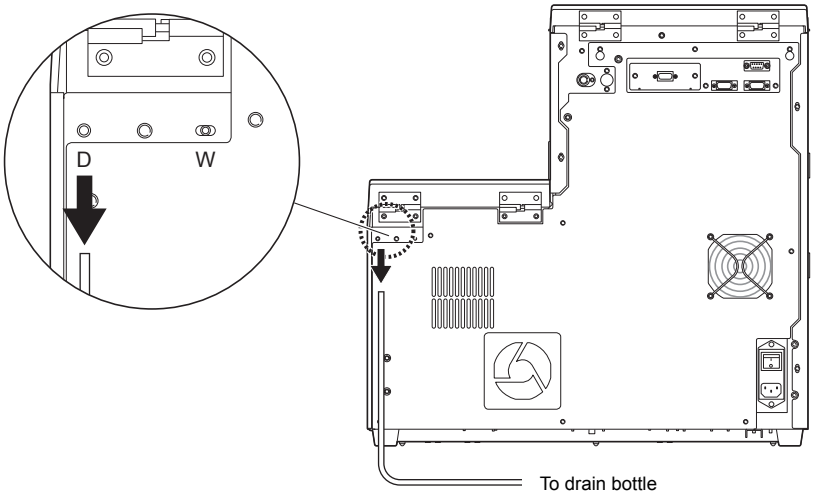
Prepare: Protective gloves

Wear protective gloves to prevent exposure to pathogenic microbes.

Discard used protective gloves and liquid waste in accordance with local regulations for biohazardous waste.

1 Disconnect the tube of the drain bottle.

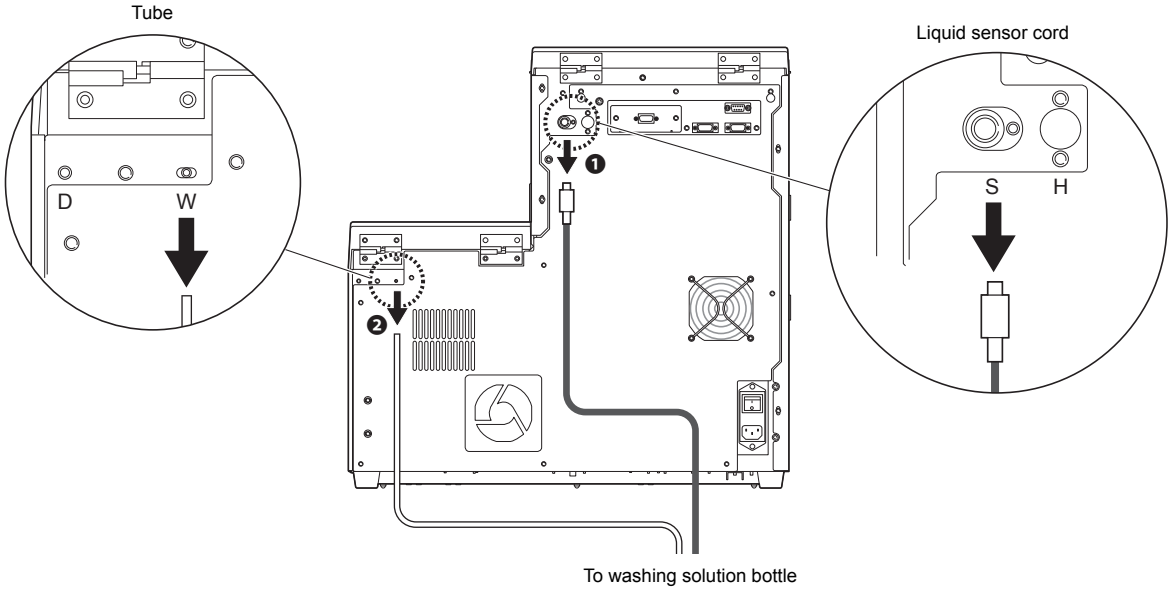
❶ Disconnect the tube of the drain bottle from the drain joint "D" on the rear panel.



2 Disconnect the liquid sensor cord and tube of the washing solution bottle.

❶ Disconnect the liquid sensor cord from the washing solution sensor terminal “S” on the rear panel.

❷ Disconnect the tube of the washing bottle from the washing solution joint “W” on the rear panel.



3 Disconnect cables to the optional part and external devices.

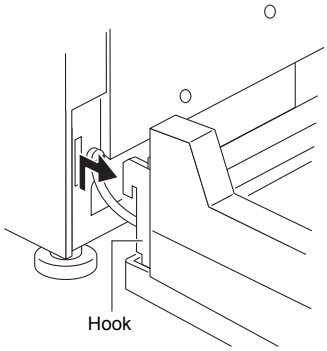
❶ If an optional hand-held barcode reader or external device is connected to the instrument, disconnect their cables from the instrument.

1.6.6 Detaching the Sampler

Prepare: Phillips screwdriver

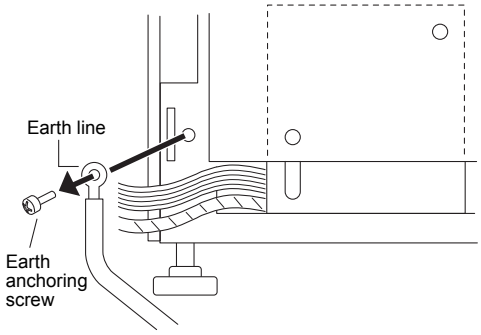
1 Detach the sampler.

❶ Carefully lift the sampler straight upward with both hands and pull to the front.
- This unhooks the sampler in 2 locations.



2 Disconnect the sampler cables from the instrument.

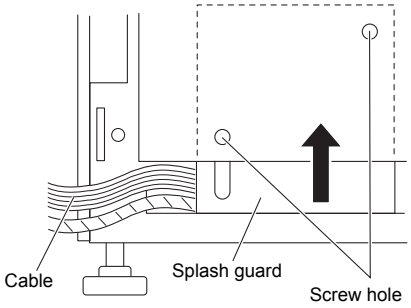
❶ Loosen the earth anchoring screw with a Phillips screwdriver and disconnect the earth line from the instrument.



❷ Insert the tip of a Phillips screwdriver in the screw holes on the splash guard to loosen the two screws inside.

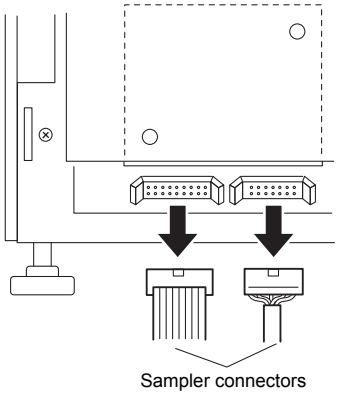
❸ Slide the splash guard upward.

❹ Temporarily tighten one of the screws using the screwdriver to prevent the splash guard from dropping.



❺ Disconnect the two sampler cables from the connectors on the lower part of the front panel.

- The sampler is now detached completely from the instrument.



1.6.7 Relocating the Instrument

❶ Move the instrument to its new location.

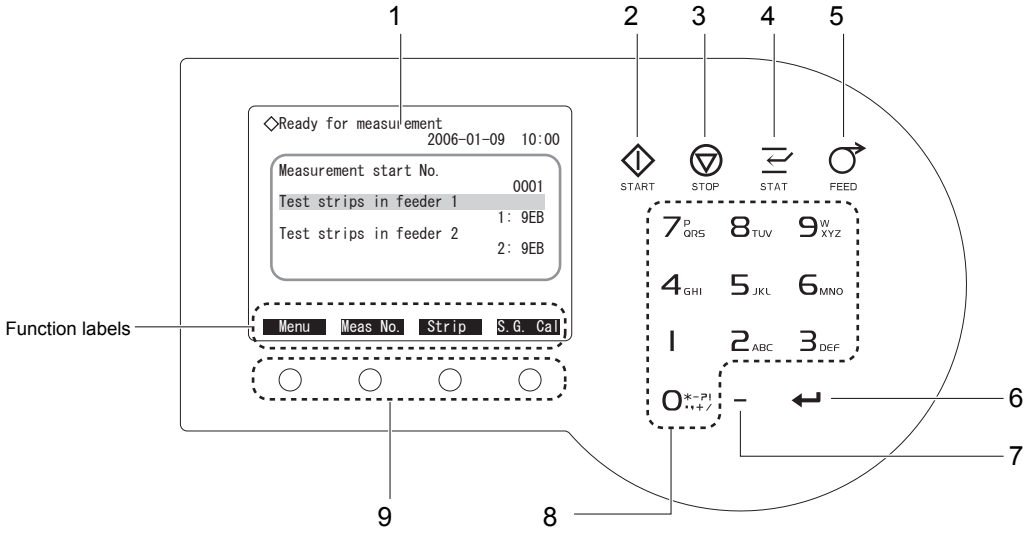
IMPORTANT: For safety reasons, always move the instrument with the help of at least one other person. Hold the bottom of the instrument with both hands when carrying it.

❷ See *"1.4 Installation"* on page 1-18 to install the instrument.

1.7 Basic Operations

The operator panel has 16 operation keys and a 34-column by 14-line color liquid crystal display. This section describes basic instructions you should learn in order to run urine tests and make parameter settings.

1.7.1 Components on the Operator Panel



No.	Icons	Names	Descriptions
1		Display	Up to 4 currently available function labels appear on the lowest line of the display.
2		Start key	Press this key to start measurement.
3		Stop key	Press this key to stop measurement in progress or menu operation.
4		Stat key	Press this key to reserve a STAT measurement.
5		Feed key	Hold down this key to advance the thermal printer paper of the built-in printer.
6		Enter key	Press this key to confirm your entry or selection or to move the cursor down.
7	—	Hyphen key	Press this key to select an option for a setup item, move the cursor between entry fields, or enter a hyphen for IDs.
8	0 to 9	Alphanumeric keys	Use these keys to enter numeric values. On the menu screens, these keys can work as cursor keys (see the *"REFERENCE"* below). For ID entries, use these keys to enter alphabetical characters.
9		Function keys	Press the function key just below the function label to activate the corresponding function.

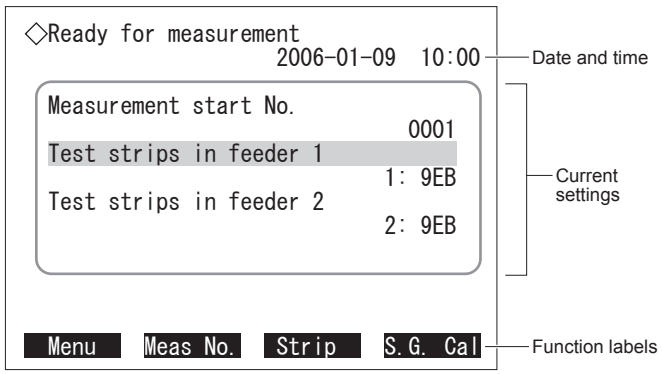
REFERENCE: Using the numeric keys as cursor keys
The numeric keys, **8**, **2**, **4**, **6**, double as cursor keys for selecting options on the setup screens. The cursor key functions are disabled for alphanumeric entry fields.
8: Select the last option. **4**: Select the previous option.
2: Select the first option. **6**: Select the next option.

1.7.2 Screen Configuration

This section describes the configuration of the screens you will see while operating the instrument.

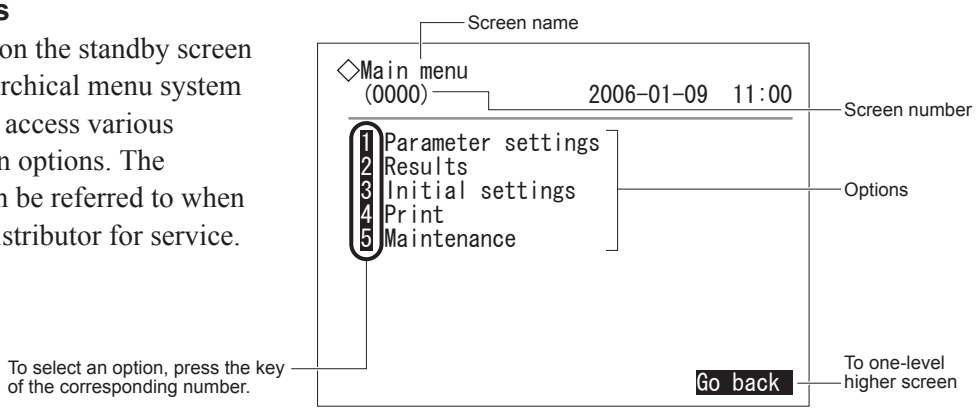
■ Standby screen

The standby screen is initially displayed after warm-up completes, telling you the instrument is ready to accept instructions from you (e.g. to measure samples or set parameters). Always return to the standby screen after the completion of these tasks.



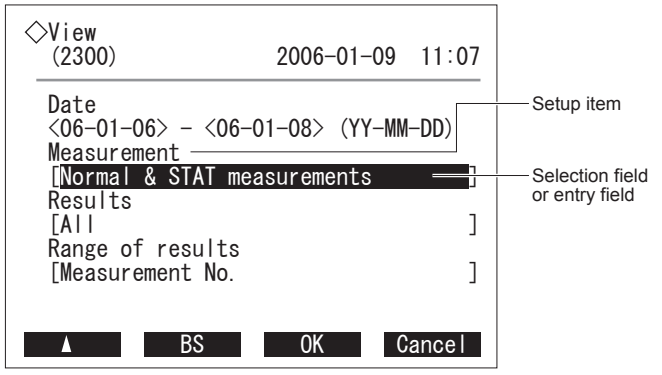
■ Menu screens

Pressing Menu on the standby screen activates the hierarchical menu system that allows you to access various auxiliary operation options. The screen number can be referred to when contacting your distributor for service.



■ Setup screens

When an option is selected on a menu screen, the appropriate setup screen appears. Setup screens contain one or more setup items. Below each setup item is a selection field for selecting an option or an entry field for inputting numbers or characters.

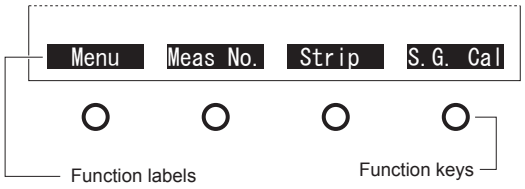


1.7.3 Menu Operations and Examples

Basic Operations

■ Function labels and function keys

The lowest line of the screen contains up to four function labels for activating different functions depending on the status of the instrument. Each function label corresponds to the function key (○) just below it. For example, "Press Menu " refers to "press the function key below the function label Menu ".

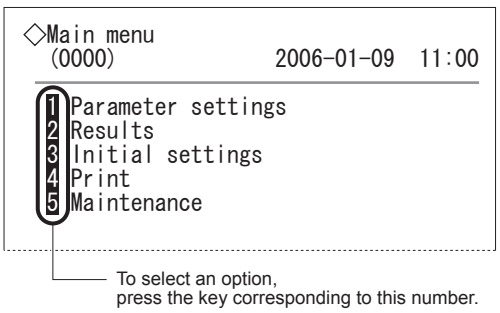


Frequently used functions are also assigned to the hardware keys on the operator panel. It is recommended to learn the functions commonly available through the measurement and setting operations because the later chapters in this manual do not include detailed descriptions of such functions.

Function labels	Descriptions
Start	This function label appears when the instrument is ready for measurement. Press this function key to start measurement, or restart the suspended measurement. The ◇ key on the operator panel also works in the same way.
Stop	This function label appears while measurement is in progress. Press Stop to suspend the measurement process. The instrument then shifts to the end process before going on standby. The ▽ key on the operator panel works in the same way. Until the end process begins, you can press Start to resume the suspended measurement.
Cancel	This function label appears on the setup screens. Pressing Cancel aborts all the settings you made and brings you back to the previous screen.
OK	This function label appears when a warning, error, or trouble occurs. Press OK to clear the problem.
Go back	This function label appears on the menu screens or after the completion of a task. The instrument displays the previous screen each time Go back is pressed until finally reaching the standby screen.

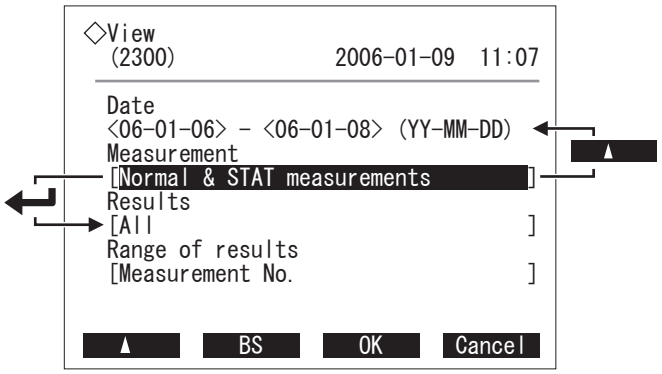
■ Menu screen operations

To select an option from a menu screen, press the numeric key corresponding to the number of that option.



■ Moving between setup items

The setup screen may contain two or more setup items. For example, the [View] screen shown at right has four setup items, [Date], [Measurement], [Results], and [Range of results].



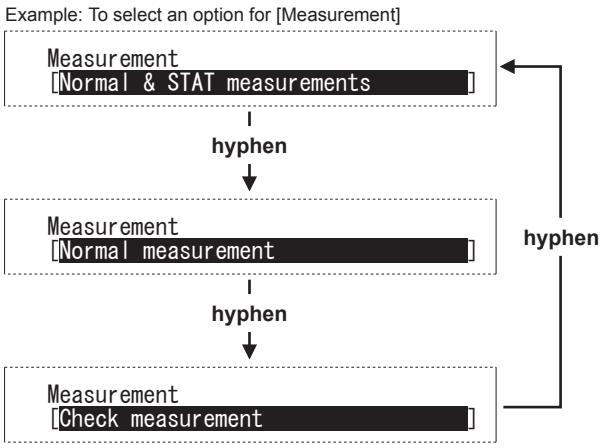
- To go down to the next setup item, press ↵ on the operator panel.
- To go up to the previous item, press ▲ .
- Pressing ↵ with the cursor at the lowest setup item brings the cursor to the top. Pressing ▲ with the cursor at the top item moves the cursor to the bottom.

REFERENCE: About the cursor

The *cursor* for this instrument refers to the highlighted portion on the display and prompts you to change options or to type in numeric values or text.

■ Selecting an option

Below the setup item (e.g. [Measurement] in the right figure), the currently selected option is displayed at first. The setting changes each time you press the **hyphen** key. For example, if the setup item has 4 selectable options, pressing the **hyphen** key four times allows the first option to appear again.



REFERENCE: The numeric keys double as cursor keys.

8: Select the last option.
2: Select the first option.
4: Select the previous option.
6: Select the next option.

Entering Alphanumerics

Use the keys on the operator panel to enter numeric values and alphabetic characters in the entry fields.

■ Numeric values

Entry fields that accept numeric values (e.g. a measurement number) have the cursor at the right-most digit.

For example to enter “1302”:

❶ Press the numeric keys in the following order, **1**, **3**, **0**, and **2**.

REFERENCE: To correct the entry, for example, from “1302” to “1402,” press BS three times to make it “0001”, then type in “4”, “0”, and “2”. The cursor cannot move through digits.

■ Date

Entry fields that accept date information have the cursor at the “year” entry position at first.

REFERENCE: The default date display format is “YY-MM-DD (year-month-day)”. If you are using a different format, “month-date-year” or “date-month-year”, set the date accordingly.

For example, to enter April 15th, 2006:

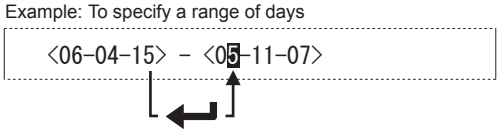
❶ To enter the year “06”,
press **0** and **6** in that order, and
press the **hyphen** key to move to the month entry position.

❷ To enter the month “04 (April)”,
press **0** and **4** in that order, and
press the **hyphen** key to move to the day entry position.

❸ To enter the day “15”,
press **1** and **5** in that order.

REFERENCE: When specifying a period of days...
To move the cursor from the “start” field to the “end” field, press ↵.

Example: To specify a range of days



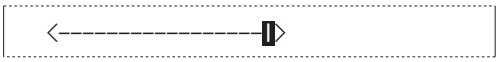
REFERENCE: To modify the entry, just enter a new value. For example, to change “04” to “06”, place the cursor at “04” and press **0** and **6** in that order. The cursor cannot move between the first and second digits (e.g. between “0” and “4”).

■ ID

This instrument can assign an ID to each sample or control. An ID can contain up to 18 digits, and include numbers, alphabetic characters (case sensitive), and hyphens (-).

For example, to enter “IM-060109-134”:

❶ Press **4** four times to enter “I”.
Each time **4** is pressed, the digit at the cursor will rotate in the order of “4”, “G”, “H”, “I”, “g”, “h”, “i” and back to “4” again.



❷ Enter all numbers and characters you want in the same way.

REFERENCE: To enter the same number or character consecutively
Press the **hyphen** key. For example, to enter “AA”, enter “A”, press the **hyphen** key, and enter “A”. Use the same method to enter different characters assigned to the same keys. For example, to enter “NO”, enter “N”, press the **hyphen** key, and enter “O”.

REFERENCE: To enter a special character
Use the **0** key. Number “0” and special characters rotate in the following order each time **0** is pressed:
0 (zero) → * (asterisk) → - (hyphen) → ? (question mark) →
! (exclamation mark) → . (period) → , (comma) → + (plus) → / (slash) → 0

■ To correct an entry

To correct an entry, press BS . The right-most digit is deleted each time BS is pressed. You cannot jump to the second or later digits to delete it. For example, to change “1302” to “1402”, press BS three times to delete “302”. With the field containing “0001”, enter “4”, “0”, and “2” in that order.

Chapter 2 Measurement

2.1 Before Making Measurements

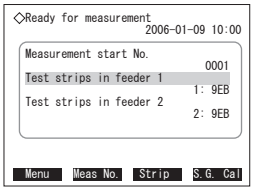
2.1.1 Flowchart of Operational Procedure

Check the instrument

1. Check for used test strips and liquid waste.
2. Check the washing solution and printer paper.

Press standby switch to power on.

Standby screen



Set parameters

- Set the type of test strips for each feeder.
- Select the main feeder.
- Assign the type of test strips to the item racks.
- Set the measurement start No.

*Change the measurement No. assignment and result format as needed.

Load test strips

1. Load test strips into the feeders.

Prepare samples

1. Label sample tubes with barcodes, if needed.
2. Pour samples into tubes.
3. Load samples into sample racks.
4. Load sample racks into sampler.

Port STAT measurement
For single sample

1. Prepare a STAT sample.
2. Place the sample in the STAT port.
3. Press **STAT**.
4. Set the type of test strips, measurement No., and ID.
5. Press **START**.
6. When completed, take out the sample.

Normal measurement

1. Check the type of test strips and main feeder.
2. Set the measurement start No.
3. Press **START**.
4. After completion, take out samples.

Rack STAT measurement
Max. 7 samples

1. Prepare STAT samples.
2. Load the samples into the STAT and control rack.

• Press **STAT** to set the type of test strips and measurement start No.

3. Load the STAT and control rack into the sampler.

Standby screen again

Daily maintenance

1. Return test strips in the feeders to the bottle.
2. Discard used test strips and clean waste box.
3. Discard liquid waste.

Press standby switch to power off.

Make S.G. calibration

1. Prepare S.G. standard solutions and measure S.G. standard values.
2. Load standard solutions.
3. Input standard solution values.
4. Start S.G. calibration.

* It is recommended to perform S.G. calibration once a month.

Control measurement

1. Prepare test strips and check the main feeder.
2. Prepare controls.
3. Load controls into STAT and control rack.
4. Load rack into sampler.
5. Set start measurement No.
6. Press **START**.
7. When completed, take out sample racks.

Check measurement

1. Clean strip transportation path inside instrument.
2. Choose **Check measurement** from menu.
3. Select feeder number for first check strip.
4. Load check strip into feeder.
5. Press **START** to measure strip.
6. Print the first result.
7. Measure second test strip in the same way.
8. Print the second result.
9. Interpret the results.

2.1.2 Measurement and Calibration

This instrument is capable of 4 types of measurements: *normal measurement* and *STAT measurement* for measuring patient samples, *control measurement* made to maintain measurement precision, and *check measurement* for checking to see that the instrument is working correctly.

■ Normal measurement

Normal measurement continuously measures a number of samples loaded in the sample racks. A sample rack can contain up to 10 samples. Place the sample racks with samples in the sampler and press the start key. The instrument then automatically transports the sample racks, aspirates the samples in order, and obtains the results. Up to 5 sample racks (50 samples) can be loaded into the sampler for *one-way* transportation, and up to 10 sample racks (100 samples) for loop transportation. For identification purposes, the results are given under serial measurement numbers, port numbers, and ID numbers from barcodes.

* The instrument is factory-set to the one-way transportation mode. If you prefer loop transportation to measure more samples at a time, contact your distributor.
* For more information about measurement numbers and rack-port numbers, see the next page.

■ STAT measurement

STAT measurement is used to interrupt ongoing normal measurements and measure one or more urgent samples. There are two types of STAT measurements:

Port STAT measurement: Measures a single sample loaded into the STAT port. If you have a sample to test urgently, you can load the sample into the STAT port to interrupt normal measurements in progress.

Rack STAT measurement: Interrupts normal measurements in progress to measure up to 7 samples loaded into the STAT and control rack.

■ Control measurement

The specified controls should be measured at regular intervals to maintain the precision of the instrument. Use the STAT and control rack to load the controls. Up to 3 types (or 3 concentrations) of controls can be used at a time.

■ S.G. calibration

S.G. calibration is for calibrating the instrument using two types of S.G. standard solutions (low and high solutions) that the operator prepares. It is recommended to perform S.G. calibration once a month.

■ Check measurement

If you suspect there is something wrong with obtained results, use the supplied check strips to check if the instrument is working correctly.

2.1.3 Measurement Terminology

■ Batch

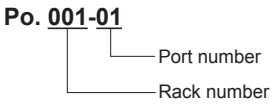
A *batch* is a group of samples that the instrument measures successively. For practicality's sake, a batch includes any number of samples measured after the start key has been pressed and until the instrument puts itself on standby again.

■ Measurement number

A *measurement number* is a 4-digit number given to each sample (or a port of the sample rack), and appears like "No. 0001" on displayed and printed results reports. Once you have set the measurement number for the first sample, the instrument automatically assigns consecutive numbers to the following samples. You have two alternative options for measurement numbering. One is to assign sequential numbers through batches, and the other is to reset the number at the beginning of each batch. Furthermore, you can assign the numbers either to samples or sample rack ports regardless of whether the ports have samples or not (see *"3.2.3. Configuring the Measurement Numbering Method"* on page 3-6). The measurement number is reset to "0001" at power-on.

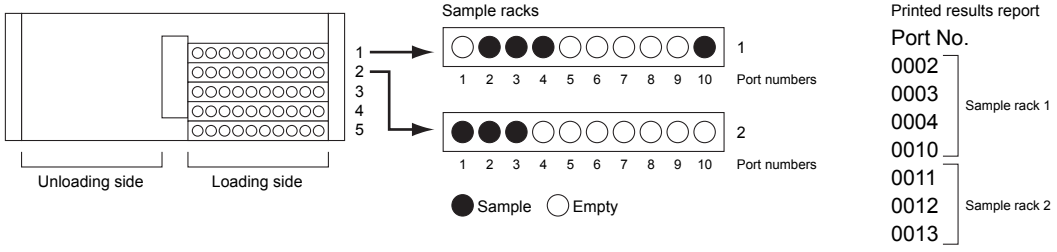
■ Rack-port number

A *rack-port number* identifies the location of a sample by the sample rack port where the sample has been loaded, and consists of a 3-digit rack number and a 2-digit port number. Rack numbers are assigned to sample racks in the order in which they are loaded into the sampler and start with "001". Port numbers are assigned to the ports of the sample rack and start with "01" for port 1. The rack-port number appears like "Po. 001-01" on the displayed and printed results reports.



Example: First sample rack 001-01 001-02 001-03 001-04 001-10
Second sample rack 002-01 002-02 002-03 002-04 002-10

REFERENCE: Four-digit port numbers for result printing, transmitting, and viewing operations
Port numbers in a different format are used to specify a range of results you want to print, transmit, or review on the screen (see page 3-8). They are 4-digit numbers from 0000 to 9999, which identify the order of the sample racks in the sampler and the position of the ports where samples are present.



■ ID

With the barcode reader, the instrument can manage individual samples by *IDs* read from barcoded sample tubes. An ID can contain up to 18 digits and can include numbers, alphabet and special characters (see page 1-45). For port STAT measurement, you can manually input IDs by key operation. The ID edit feature is helpful to manually modify IDs that are misread by the barcode reader during measurement.

REFERENCE: Use of the barcode reader

A barcode reader is built into the instrument as a standard feature, and a hand-held barcode reader is optionally available. The following table lists the ID-managed measurement tasks supported by each barcode reader.

Barcode readers	Normal measurement	Port STAT measurement	Rack STAT measurement
Built-in type	✓	N/A	✓
Hand-held type	N/A	✓	N/A

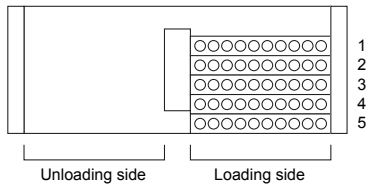
■ Sample rack transportation

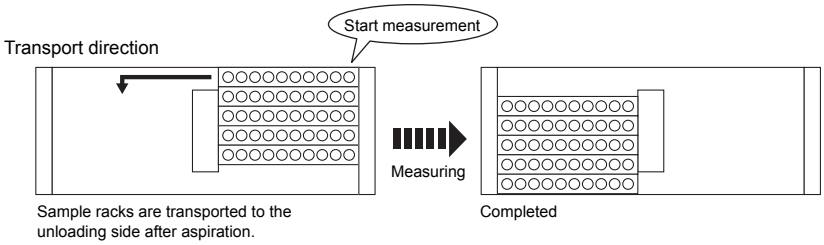
The instrument supports two methods for transporting sample racks in the sampler: *one way* and *loop*. The instrument is configured for one-way transportation when shipped from the factory, and can be changed to loop transportation as needed. For more information, contact your distributor.

One-way transportation (standard)

Up to 5 sample racks (50 samples) can be loaded on the loading side (right side) of the sampler. The racks are discharged to the unloading side (left side) in turn as sample aspiration finishes.

How to load sample racks

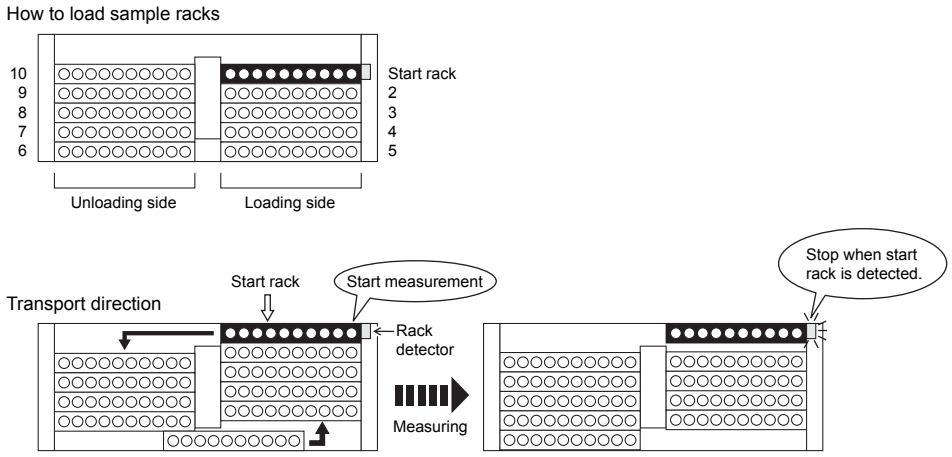




Loop transportation

A total of 10 sample racks can be loaded in the sampler at a time: 5 racks on the loading side and another 5 racks on the unloading side. This means a maximum of 100 samples can be measured continuously.

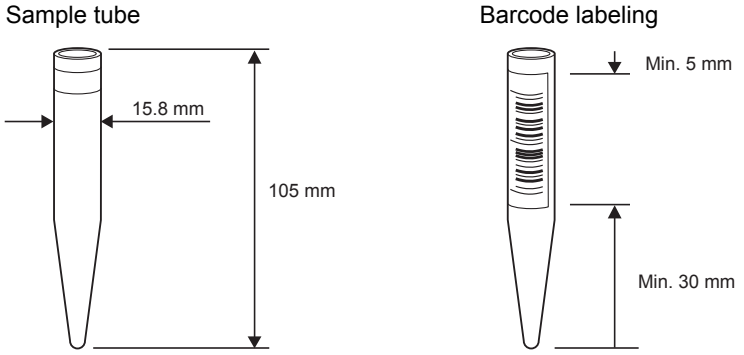
The start rack must be placed at the beginning of a batch, and item racks or normal racks, in remaining locations (numbered 2 to 10 in the figure below). These racks are circulated in the sampler as the samples are aspirated, and the instrument automatically stops aspiration the next time it detects the start rack. To employ loop transportation, contact your distributor and ask to have parameter settings changed.



2.1.4 Sample Containers and Sample Racks

Sample Containers

Use the sample tubes that comply with the standards shown below. To have the built-in barcode reader read barcodes, place the labels in the correct position on the tubes.



Sample Racks

Four types of sample racks are available for use with the instrument. These racks can be identified by the markers on the front.

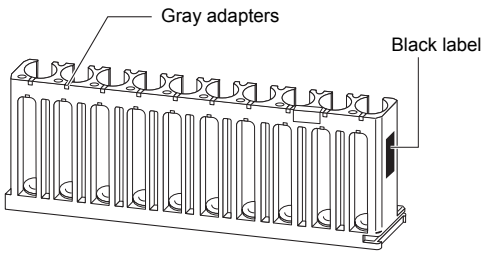
■ Item racks

The *item racks* are mainly used for normal measurement, and allow the instrument to automatically pick up the appropriate type of test strips for these racks from one of the two feeders.

Each item rack supplied with the instrument has a different rack ID (#01 to #10). For successful use of the item racks, assign one of the two feeders to each rack ID before testing samples. For example, you may assign feeder 1 to item racks #01 to #05, and feeder 2 to #06 to #10. For detailed instructions, see *"2.3.4 Assigning the Type of Test Strips to the Item Racks"* on page 2-19.

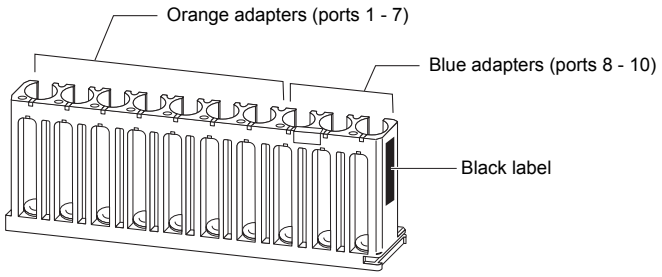
For sample preparation, load samples into the item rack assigned to the feeder that contains the test strips to apply. When detecting the item rack, the instrument automatically ejects the correct test strips from the feeder. This saves you the trouble of manually exchanging test strips.

The rack IDs are factory-set to "×" on the [Rack assignment for test strip] screen which means that the test strips in the main feeder are used. Always select "×" in a two-way communication system where the type of test strips is specified by the host.



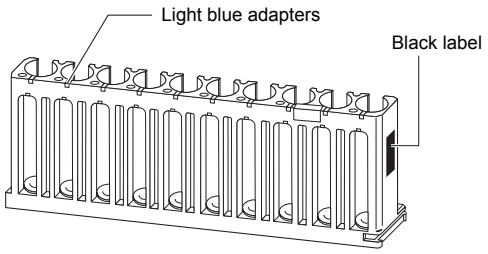
■ STAT and control rack

The *STAT and control rack* is dedicated to STAT measurement and control measurement. STAT measurement requires samples to be loaded into ports 1 to 7, and control measurement requires controls to be loaded into ports 8 to 10.



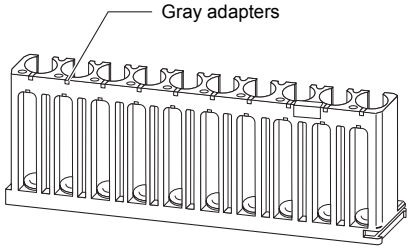
■ Start rack

When the rack transportation method is set to "loop", place the *start rack* at the beginning of a batch, and items racks (or normal racks) in the 2nd to 10th positions. The start rack has a black label that informs the instrument of the beginning and end of the batch to avoid measuring the same sample twice. In other words, when the racks are completely circulated in the sampler and the start rack returns to the initial position, the instrument detects the black label and automatically stops measurement.



■ Normal rack

The separately sold *normal racks* can also be used for normal measurement. These racks do not have rack IDs. So, samples in the normal racks are always measured with the test strips from the main feeder.



2.2 Measurement Precautions

The following sections describe precautions you should take when handing instrument, samples, and test strips. When you use the instrument for the first time, read through these sections before start measurement.

2.2.1 Handling the Instrument

This instrument is to be operated by qualified persons only. A qualified person is one having adequate knowledge of clinical testing and the disposal of infectious waste. Thoroughly read this operating manual before use. Anyone who operates the instrument for the first time must be assisted by a trained person.

Never touch the nozzle, tubing, or other parts where sample may adhere with unprotected hands. During cleaning or maintenance of these parts, wear protective gloves to prevent exposure to pathogenic microbes.

Discard used samples, liquid waste, parts, and instrument in accordance with local regulations for biohazardous waste.

Read *"1.4.1 Precautions in Instrument Installation"* on page 1-18, and ensure the instrument is installed in a proper environment before turning on the power.

Do not place containers or bottles that contain liquid on the instrument. Spilling inside the instrument may cause damage to the components.

Never fail to clean or wash the specified components of the instrument to maintain measurement quality. For more information, see chapter 4 "Maintenance".

If you detect abnormal odors or noise, immediately turn off the standby switch and then main power switch, and unplug the power cord. Continuous operation in such condition may result in fire or damage to the instrument and consequently lead to personal injury.

In case of instrument trouble, contact your local distributor for repair. Unauthorized servicing or remodeling can damage the instrument and consequently lead to personal injury.

Alcohol is sometimes needed to prepare measurements. Alcohol is readily combustible, therefore handle it carefully and keep away from flames, electrical sparks and sources of heat. Also, ventilate the room sufficiently during use.

2.2.2 Handling Samples

TAKE THE UTMOST CARE WHEN HANDLING URINE. This instrument uses urine as sample and as an ingredient of control solution. Urine may be contaminated by pathogenic microbes that can cause infectious diseases. Improper handling of urine may cause infection to the user or other individuals by pathogenic microbes.

Discard used samples, parts and liquid waste in accordance with local regulations for biohazardous waste.

■ Samples must be fresh urine collected within an hour.
If samples cannot be measured within an hour, seal and keep them refrigerated. Leaving samples at room temperature for 2 hours or more may alter chemical composition of the samples. Refrigerated samples must be brought to the measurement environment temperature before testing.

■ Mix each sample well before measurement. Do not centrifuge samples.
Centrifuging may cause blood cells to precipitate, whereby producing incorrect results for some measurement items.

■ Remove bubbles and a film from the surface of the sample with tissue paper, etc.
The liquid level of the sample cannot be correctly detected if covered in bubbles and a film. If it is, the instrument cannot aspirate the volume of sample required for measurement, thus producing incorrect results.

■ Use samples as collected.
Do not add disinfectant or detergent. Preservatives may affect results and should be evaluated before use.

■ Do not place samples where exposed to direct sunlight.
Direct sunlight can alter the quality of samples, whereby producing incorrect results.

■ Hematuria and dense turbid urine may affect S.G. and color-tone measurements.
Measuring hematuria contaminates the S.G. cell, consequently producing incorrect results. The actual color of the macroscopic hematuria (about 10,000 red blood cells/μL) may not correspond with the result determined by the instrument. Measurement of dense turbid urine may produce incorrect S.G. results.

■ Samples containing ascorbic acid can affect measurement results.
Measuring samples with ascorbic acid can produce lower glucose and occult blood values than actual levels.

■ Drug-administered urine and visual hematuria can affect measurement results.
Measurements of drug-administered urine and visual hematuria can produce incorrect results. The instrument alerts you to the error by adding a "!" sign on the displayed and printed reports.

2.2.3 Handling Test Strips

REFERENCE: Purchase the test strips specified for the instrument because the strips are not supplied with the instrument.

■ Use only test strips specified for the instrument.

"AUTION Sticks 9EB" are available for use with the instrument. Carefully read the package insert and observe the expiration date.

■ Check the test strips before use.

Do not use the test strips beyond the expiration date or test strips having discolored pad area even if they are within the expiration date.

■ Prepare the test strips just before testing.

Take as many test strips as you need out of the bottles and load them into the feeders just before testing. Each feeder can contain up to 200 test strips (equivalent to 2 bottles), but the quality of the strips is assured only for 3 days. Test strips absorb moisture in the air, which may alter their quality and produce incorrect results. The test strip bottles should be securely capped immediately after taking out the strips.

■ Do not touch the pad area on the test strips.

Touching the test strips can cause sebum to adhere to the surface, whereby producing incorrect results.

■ Correctly set the type of test strip to be used by key operation.

Before carrying out measurement, set the type of the test strip you are to use by key operation. An incorrect test strip setting can produce incorrect results.

2.3 Preparation for Measurement

This section describes the tasks you should carry out on a daily basis before testing samples, which include checking wastes and consumables, turning on the power, assigning the feeders to the item racks, and preparing test strips and samples.

REFERENCE: Purchase the test strips specified for the instrument because the strips are not supplied with the instrument.

2.3.1 Checking Wastes and Consumables

Wear protective gloves to prevent exposure to pathogenic microbes.

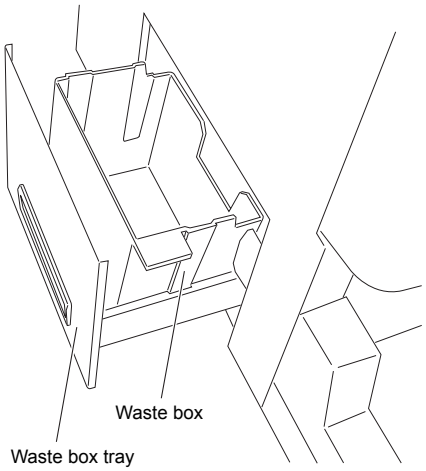
Discard liquid waste, test strips, and protective gloves in accordance with local regulations for biohazardous waste.

1 Check for used test strips.

❶ Pull out the waste tray to check if there are any used test strips in it.
- Discard the used strips, if there are any.
- See *"4.2.1 Cleaning the Waste Box"* on page 4-3.

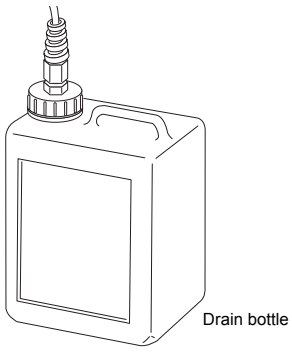
NOTE: Before pushing in the waste box, ensure the box is correctly sitting on the waste box tray. Incorrect installation of the waste box may cause test strips to be scattered inside the instrument or clog the test strip path.

NOTE: If test strips are scattered inside the instrument due to the waste box being detached, make sure the instrument is on standby, and remove the strips with tweezers. Wipe the location where the strips were present using a cloth moistened with alcohol. Then, install the waste box correctly.



2 Check for liquid waste.

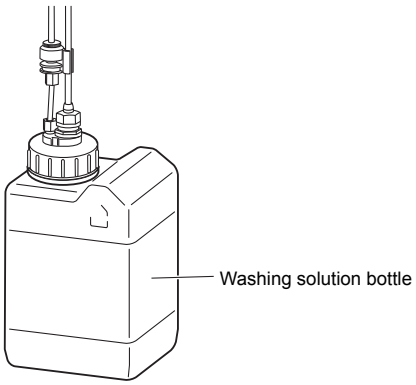
❶ Check if there is any liquid waste in the drain bottle.
- Discard the liquid waste, if there is any.
- See *"4.2.2 Discarding Liquid Waste from the Drain Bottle"* on page 4-5.



3 Check the washing solution.

❶ Check the washing solution bottle to see if it contains a sufficient volume of solution.

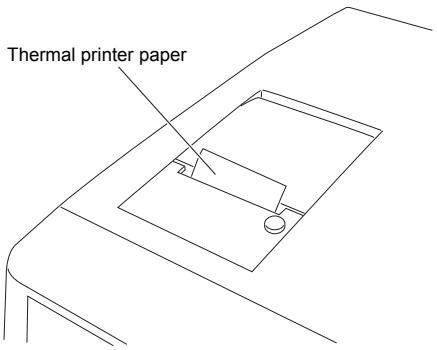
- If the solution is getting low, discard the remaining solution, and transfer newly prepared solution to the bottle.
- See *"4.3.1 Replacing the Washing Solution"* on page 4-15.



4 Check the thermal printer paper.

❶ Check for two red lines appearing on both edges of the thermal printer paper.

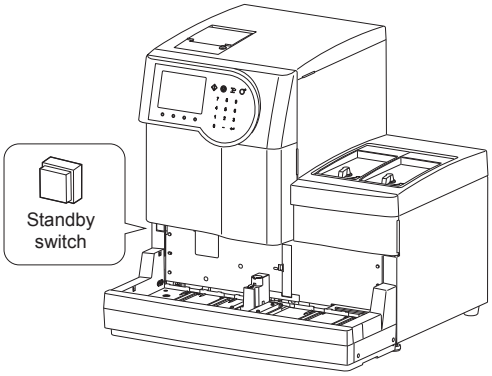
- If red lines are found, replace the paper roll with a new one.
- See *"4.3.2 Replacing the Thermal Printer Paper"* on page 4-17.



2.3.2 Turning On the Power

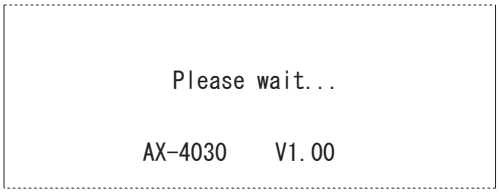
❶ Press the standby switch on the left side of the front panel.

- The standby switch will light green.

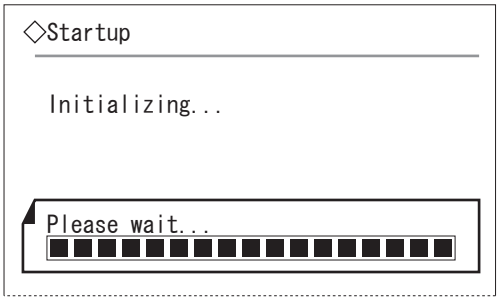


- The message “Please wait...” will appear for a maximum of 20 seconds, followed by the product name and program version for about 2 seconds.

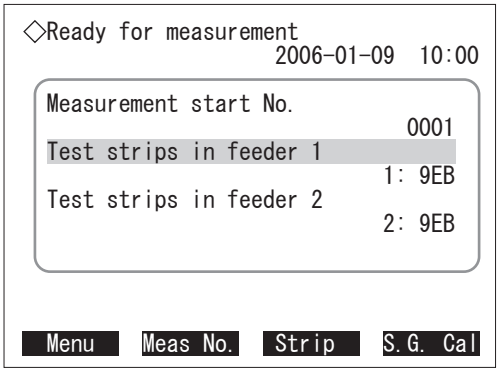
NOTE: If the initial memory check detects a problem, the instrument will inform you of it by indicating an appropriate warning (W), error (E), or trouble (T) code before displaying the program version. For more information, see Chapter 5, “Troubleshooting”.



- The instrument will read the parameter settings, and then initialize the hardware.



- Warm-up will complete in 2 minutes and the standby screen shown at right will appear. You will see the current date and time, the initial measurement start number (0001), and the current test strip settings.



Standby screen

REFERENCE: Measurement-related parameters

The instrument provides the parameters related to measurement operation listed below. Default settings have been made when shipped from the factory, and you can change the settings as you need. A list of current settings can be printed out from the printer (see *"3.5.3 Printing the Current Parameter Settings"* on page 3-25).

Parameters	Descriptions	Default	Page(s)
Use of printer	Enables or disables the built-in printer.	Use	3-18
Use of external output	Enables or disables the external output.	Not use	3-20
Result format	Selects the result format for normal, STAT, and control measurements between "semiquantitative" and "reflectivity" respectively.	Semiquantitative	3-4
Measurement start number assignment	Determines whether sequential measurement numbers are assigned through batches, or the measurement number is reset at the beginning of each batch.	Continue from previous batch	3-6
Measurement number assignment	Determines whether measurement numbers are assigned to samples or to all of the ports regardless of whether the ports have samples or not.	Assign to samples	3-6

2.3.3 Loading Test Strips into the Feeders

On the standby screen, select the main feeder and the types of test strips to be used. Then, load the correct test strips into the feeders.

IMPORTANT: Do not use the test strips beyond the expiration date or test strips having a discolored pad area even if they are within the expiration date. Carefully read the package inserts of the test strips before use, and observe the instructions.

NOTE: Take as many test strips as you need out of the bottles and load them into the feeders just before testing. Each feeder can contain up to 200 test strips (equivalent to 2 bottles), but the quality of the strips is assured only for three days. Test strips absorb moisture in the air, which may alter their quality and produce incorrect results. The test strip bottles should be securely capped immediately after taking out the strips.

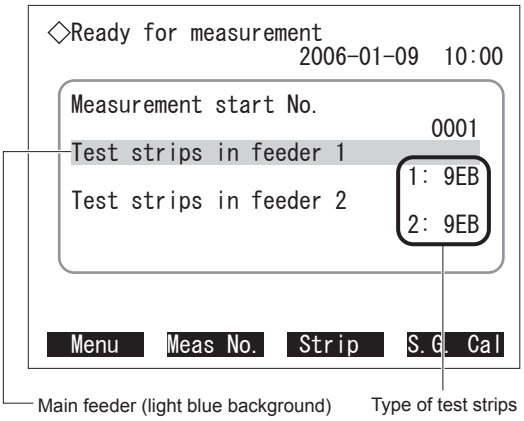
1 Setting the test strips and main feeder by key operation.

Set the types of test strips to be loaded into the feeders, and select the main feeder between feeder 1 or 2.

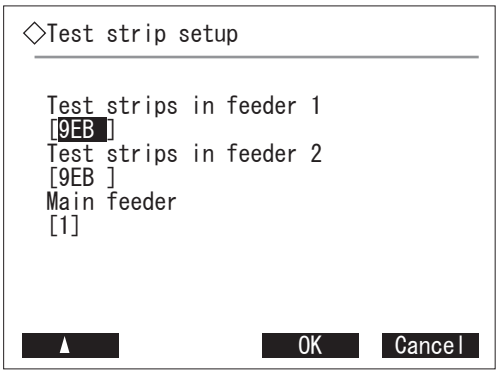
REFERENCE: When to select the “main feeder”
You can select either feeder 1 or 2 as the main feeder usually. However, you should explicitly specify the main feeder to use the sample racks listed below. These racks always use the test strips in the feeder specified as the main feeder.
- Start rack
- Normal racks (optional)
- Item racks whose rack IDs are set to [×] on the [Rack assignment for test strip] screen.

❶ On the standby screen, check the current settings for the type of test strips and the main feeder (in light blue background).
• If you use the current settings, go to step **2** .

❷ To change the settings, press **Strip** .
• The [Test strip setup] screen will appear.



❸ Below [Test strips in feeder 1] and [Test strips in feeder 2], select the type of test strips to be loaded into each feeder.
- Press the **hyphen** key to change the options.
- Press ↵ to move the cursor down.



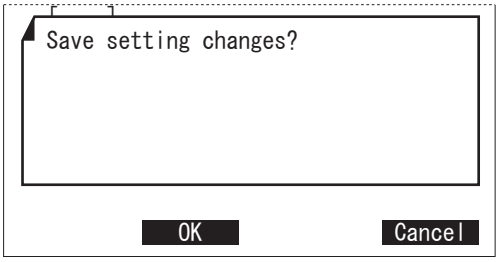
❹ Below [Main feeder], select the feeder you want to use as the main feeder.
- Press the **hyphen** key to switch between feeders 1 and 2.

❺ Press OK .
- A message window will open to ask if you want to save your settings.

❻ Press OK to save your changes.
- The standby screen will appear with the new settings displayed.

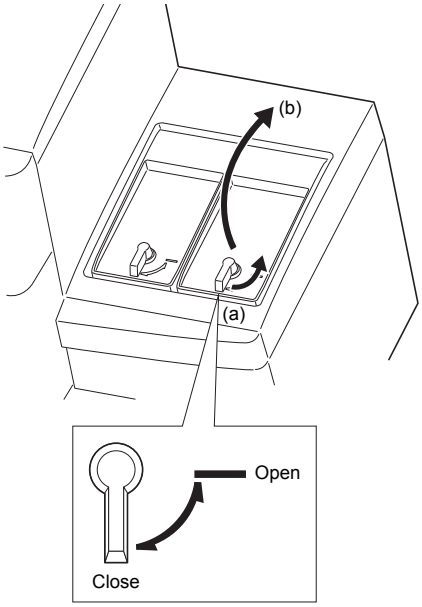
REFERENCE: Press Cancel to abort your changes and return to the standby screen.

IMPORTANT: Keep the instrument on while saving the settings.



2 Attach a desiccant bag to the feeder cover.

❶ Turn the locking lever (a) to unlock the feeder cover, and open the cover (b).



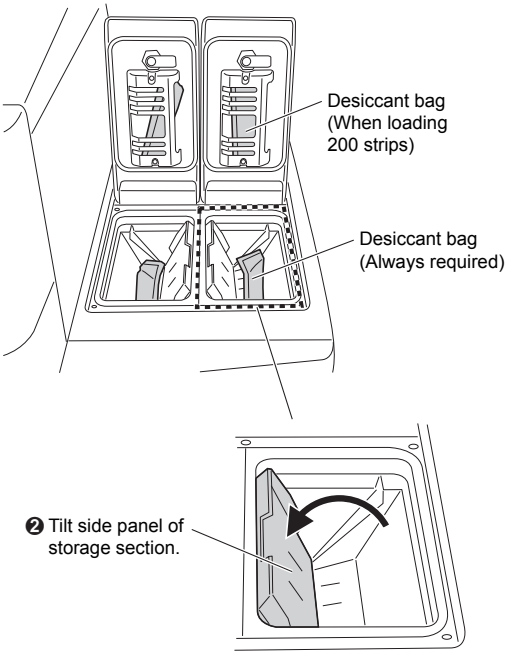
❷ Tilt the side panel of the storage section in the direction of the arrow.

❸ Take out a desiccant bag from the test strip bottle and attach it to the feeder cover.

- For loading 100 test strips, attach a desiccant bag on the side panel of the storage section. If loading 200 test strips, attach one bag on the back of the cover, and another bag on the side panel of the storage section.

❹ Place the side panel as before.

REFERENCE: Replace the desiccant bags on the feeders each time a new test strip bottle is opened.



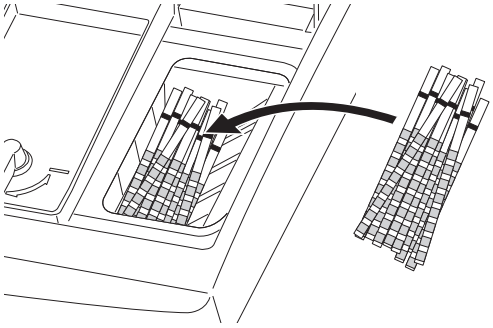
3 Load the test strips into the feeders.

❶ Take out as many test strips as you need from the bottle, and load them into the feeder.

- Level test strips into even piles.

IMPORTANT: Do not touch the pad area on the test strips. Contact can cause sebum to adhere to the surface, whereby producing incorrect results.

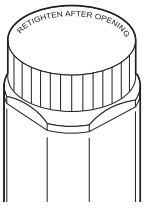
NOTE: Place the test strips with the black marker to the back side of the feeder (see the figure at right).



❷ Close the feeder cover and turn the locking lever clockwise to lock it.

❸ Cap the test strip bottle.

IMPORTANT: Without desiccant bags, the test strips can absorb moisture in the air. Cap the bottle securely to avoid deterioration of the strips.



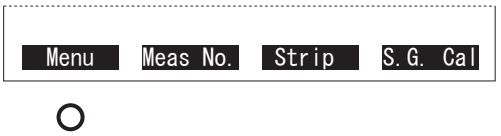
2.3.4 Assigning the Type of Test Strips to the Item Racks

Assign a feeder (1, 2, or main) to each item rack (rack ID #01 to #10) used for normal measurement. This allows the instrument to automatically eject appropriate test strips from the assigned feeder for measuring samples in the item rack. For example, you can set it so that samples in the rack #01 are measured with the test strips in feeder 1. Make correct settings to successfully use the item racks. For more information about the item racks, see *"Sample Racks"* in *"2.1.4 Sample Containers and Sample Racks"* on page 2-7.

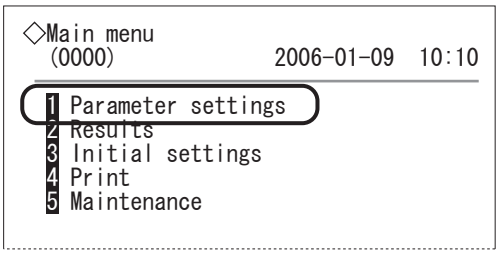
NOTE: In the following procedure, what you actually assign to the item racks are feeders (1, 2, or main), not the type of test strips. If you want to change the type of test strips to load into the feeder, see the instructions in step **1** in *"2.3.3 Loading Test Strips into the Feeders"* on page 2-16.

1 Access the setup screen.

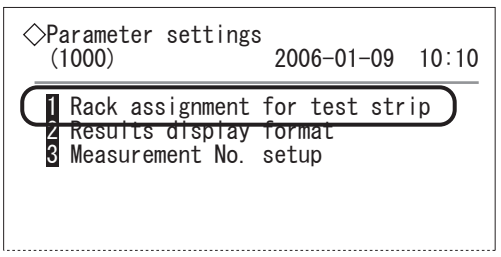
❶ On the standby screen, press **Menu** to go to the [Main menu] screen.



❷ Press **1** to go to the [Parameter settings] screen.

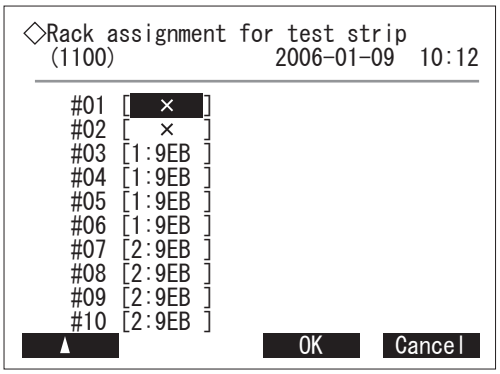


❸ Press **1** to go to the [Rack assignment for test strip] screen.

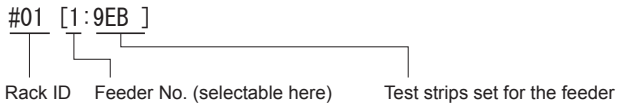


2 Assign the types of test strips to rack IDs.

❶ Choose a rack ID, from #01 to #10.
- To move the cursor down, press ↵.
- To move the cursor up, press ▲.

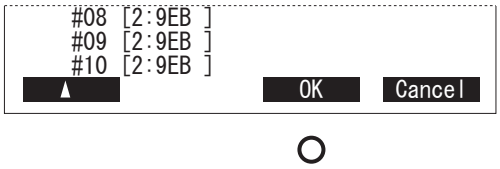


❷ Choose a feeder number.
- To change options, press the **hyphen** key.
- Samples in the item racks will be measured with the test strips in the feeder specified here.
- [×] represents the main feeder.



REFERENCE: You can select one among feeder 1, feeder 2, or the main feeder (×) for each item rack. The type of test strips shown at the right of the feeder number is the one specified in step **1** in *"2.3.3 Loading Test Strips into the Feeders"* on page 2-16. The test strips and main feeder settings cannot be changed here.

❸ Press OK.
- You will be asked to save the changes.

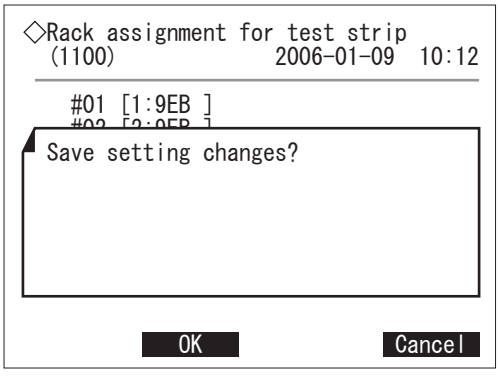


3 Save the changes.

❶ Press OK to save the changes and return to the [Parameter settings] screen.

NOTE: Keep the power on while saving the settings.

❷ Press Go back twice to go back to the standby screen.



2.3.5 Preparing Samples

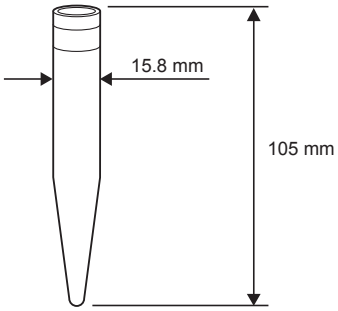
Transfer samples into sample tubes, load the tubes into the sample racks, and place the sample racks in the sampler of the instrument. See *"2.2.2 Handling Samples"* on page 2-10 to learn precautions on samples.

Prepare: Sample tubes, item racks, and protective gloves

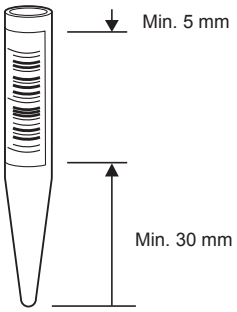
Wear protective gloves to prevent exposure to pathogenic microbes.

1 Prepare sample tubes.

❶ Prepare the sample tubes that comply with the standards shown at right.



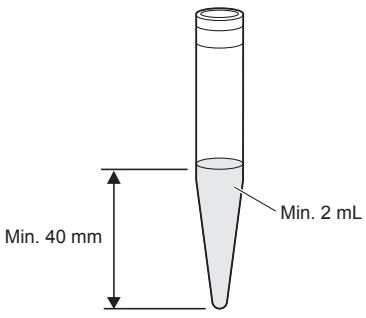
REFERENCE: To have the built-in barcode reader read barcodes successfully, label the tubes as shown at right.



2 Pour samples into sample tubes.

❶ Fill a sample tube with at least 2 mL of sample. Ensure the sample level is at least 40 mm above the bottom of the tube.

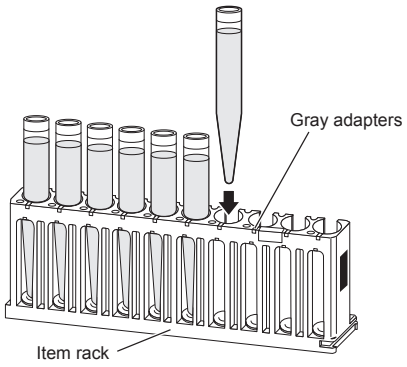
IMPORTANT: An insufficient volume of sample may produce incorrect results.



3 Load the sample tubes into the sample racks.

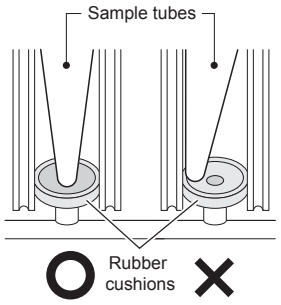
❶ Place the sample tubes into the ports of the item rack.

- Use an item rack (rack ID #01 to #10) assigned to the feeder that contains the test strips to be used for measurement.
- Optional normal racks can also be used as an alternative.

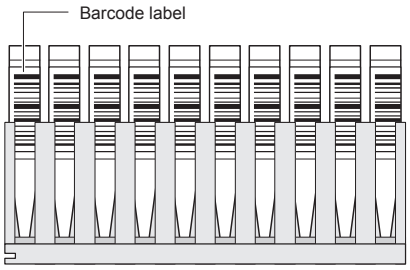


NOTE: If the rack transportation method is set to "loop", load the first 10 samples into the start rack. Starting a batch with another type of rack may cause double measurement on samples. See page 2-6.

NOTE: Fit the bottom of the sample tubes into the recessed portion of the rubber cushions so that the tubes stand straight. Placing tubes out of position may cause sample aspiration to fail and could even damage the nozzle.



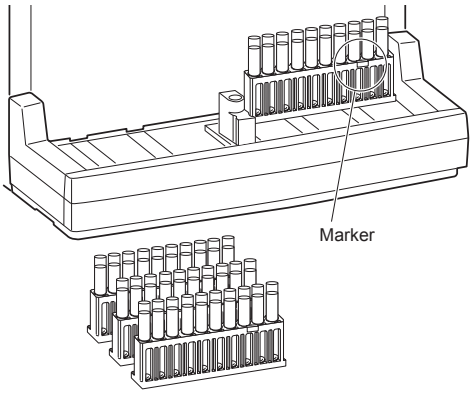
REFERENCE: To have the built-in barcode reader read barcodes successfully, labels on the tubes must be facing to the rear side of the sample rack.



4 Load the sample racks into the sampler.

❶ Hold the sample rack with the marker facing you and place it on the loading side of the sampler.

- First, place the rack at the frontward of the loading side, fit the recesses at the lower right of the rack into the guides inside the sampler, and slide the rack backward.
- The loading side can contain up to 5 racks.



REFERENCE: When the rack transportation method is set to "loop", place the start rack at the beginning. The unloading side of the sampler can also be used to load racks (up to 5 racks). See page 2-6.

NOTE: If a sample spills on the sampler, immediately wipe it off. A crystallized sample may hinder smooth transportation of the sample racks, and consequently cause trouble.

2.4 Measurement Operations

This section gives instructions for measuring samples continuously (normal measurement), and measuring higher priority samples (port/rack STAT measurement).

2.4.1 Normal Measurement: Measuring Samples Continuously

Prepare: Item racks or optional normal racks, sample tubes, and protective gloves

Wear protective gloves to prevent exposure to pathogenic microbes.

Discard used samples, test strips and protective gloves in accordance with local regulations for biohazardous waste.

Safety devices may trip and automatically stop operation of the instrument if the front cover, maintenance cover, feeder protective cover, or side cover is opened. Do not open the covers unless required. In the case of an automatic stop, some aspirated samples may not be measured successfully. Check the printed results reports thoroughly, and test the samples again if necessary.

1 Perform S.G. calibration.

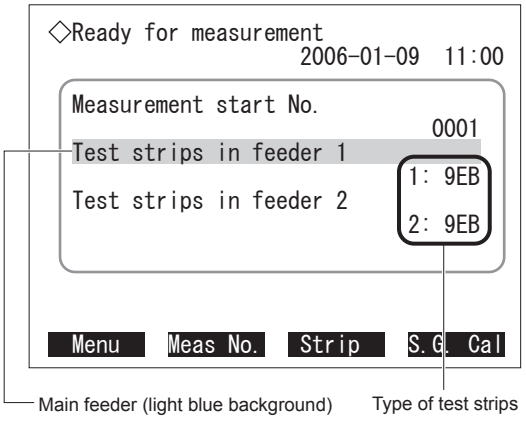
Calibrate the instrument using low and high specific gravity standard solutions once a month. For instructions, see *"2.5 S.G. Calibration"* on page 2-34.

2 Load test strips into the feeders.

❶ Load the test strips into the feeders.
- See *"2.3.3 Loading Test Strips into the Feeders"* on page 2-16.

3 Check the settings of the test strips and feeders.

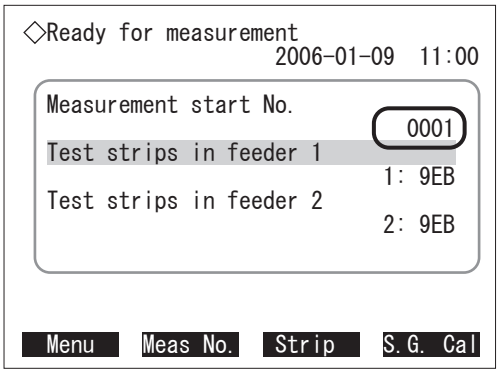
❶ On the standby screen, check if the settings of the test strips and main feeder are correct.
- To change the settings, see step **1** in *"2.3.3 Loading Test Strips into the Feeders"* on page 2-16.
- For information on the main feeder, see *"REFERENCE: When to select the main feeder"* on page 2-16.



4 Set the measurement start number.

For information on the measurement start number, see *"Measurement number"* in *"2.1.3 Measurement Terminology"* on page 2-4.

❶ On the standby screen, check the measurement start number.
- To use the current number, skip to step **5** .



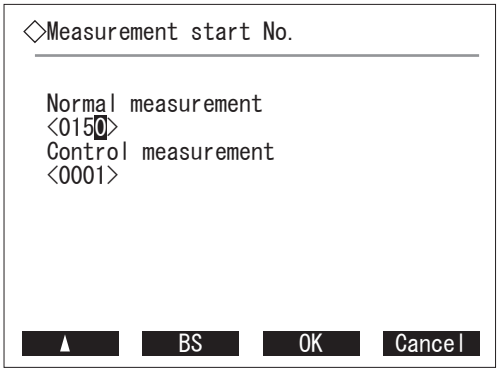
❷ To set a new number, press Meas No. .
- The [Measurement start No.] screen will appear.

---

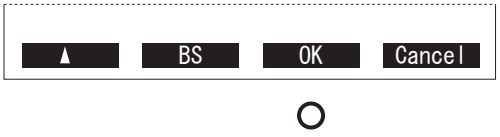
❸ Below [Normal measurement], enter a number from 0000 to 9999, using the numeric keys (0 to 9).

REFERENCE: For example, to enter "0150", press **0**, **1**, **5**, and **0** in that order. To correct the number, press BS to delete the digits one by one, and enter a new number.

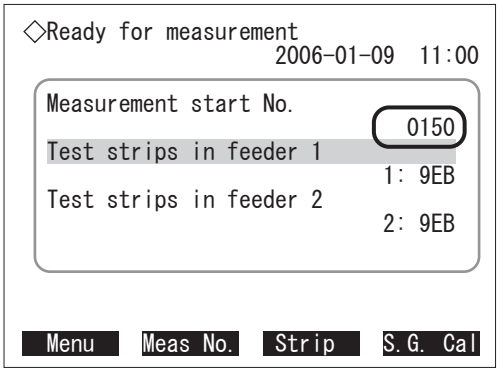
REFERENCE: If the cursor is placed below [Control measurement], press ↵ to move up to the [Normal measurement] entry field.



❹ Press OK to save your changes.



- The standby screen will appear again with a new measurement start number.



5 Prepare samples.

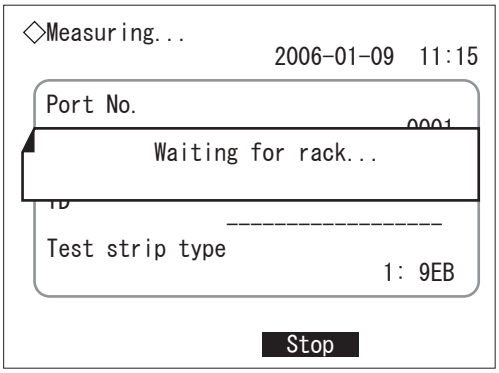
❶ Pour samples into sample tubes and load them into the sampler.

• See *"2.3.5 Preparing Samples"* on page 2-21.

6 Start the normal measurement.

❶ Press ◇ to start.

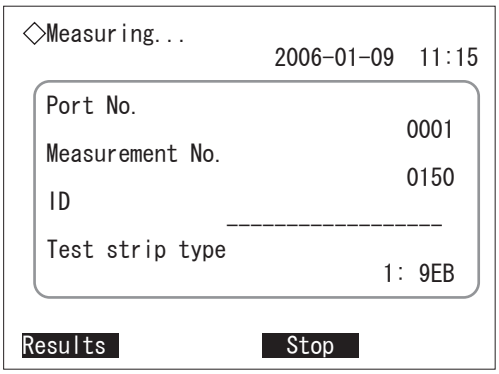
• The first sample rack will be transported to the aspiration position while "Waiting for rack..." is displayed.



• The nozzle will come down to aspirate the sample from the first sample tube, and then the measurement operation will take place.

• When the result of the sample is obtained, it is reported on a printout. See *"2.8.2 Printed Results Report"* on page 2-50.

• The following samples are processed in the same way.



Do not touch the sample rack being grabbed at the rear of the sampler. The rack can move suddenly, which is very dangerous. When adding sample racks to the sampler during measurement, keep hands away from the rack at the rear and place new racks at the front.

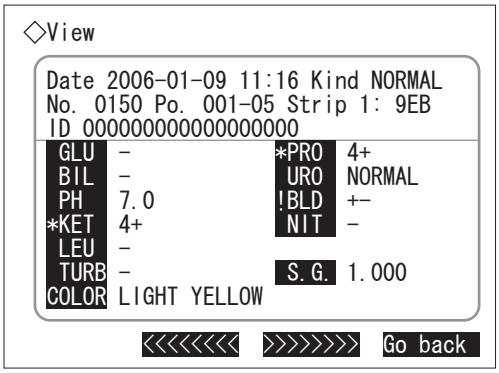
The test strip storage section may be driving while measurement is in progress. Do not touch inside the storage section directly with hands when adding test strips in the feeder. Contact with the drive mechanism may cause injury.

REFERENCE: To add test strips during measurement

Open the feeder cover. You will see "W006: Close the feeder cover." on the screen. Add new test strips in the feeder, close the cover, and then press OK to clear the warning.

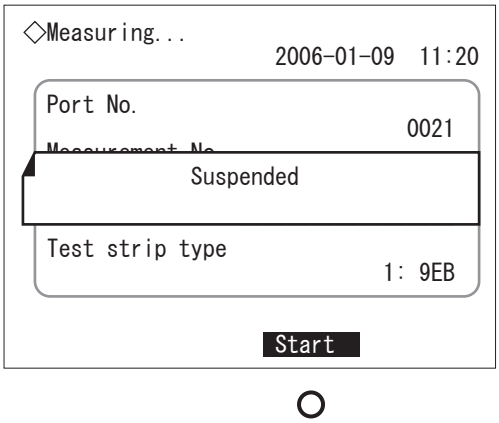
REFERENCE: To view results

Press Results to view the latest result. Pressing <<<<<<<< or >>>>>>>> can view the previous or next result. To return to the [Measuring...] screen, press Go back .



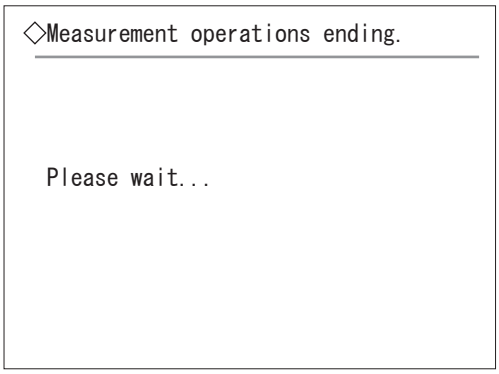
REFERENCE: To suspend measurement in progress

Press Stop or ▽. The instrument will display “Suspended”, and stop the measurement operation. You can resume the operation by pressing Start within a minute. If more than 1 minute elapses, the instrument will proceed with end process and can no longer resume the suspended operation. Depending on the timing the stop key is pressed, some already-aspirated samples may not be measured successfully. View the printed reports to check if correct results are obtained.



7 When measurements of all samples are completed…

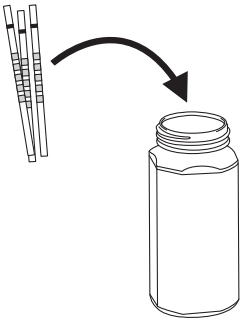
- The message “Measurement operations ending” will appear after the entire batch of samples has been measured. The instrument will proceed with flow line flushing and other end processes.
- When the end processes are completed, the standby screen will appear again.



❶ Take out the sample racks from the sampler.

8 At the end of the day…

❶ Take the test strips out of the feeder, and put them back in the bottle.



❷ Dispose of liquid waste and used test strips.

- See *“4.2.1 Cleaning the Waste Box”* on page 4-3, and *“4.2.2 Discarding Liquid Waste from the Drain Bottle”* on page 4-5.

❸ Press the standby switch to power off.

2.4.2 Port STAT Measurement: Measuring a Higher Priority Sample

Port STAT measurement is for measuring a single sample loaded into the STAT port located at the center of the sampler. You may use the STAT port when you have only one sample to measure, or when you are asked to measure a new sample urgently while normal measurement is in progress. If you want to interrupt normal measurement to quickly measure additional two or more samples, use rack STAT measurement (see *"2.4.3 Rack STAT Measurement: Measuring Higher Priority Samples"* on page 2-31).

Prepare: Sample tube and protective gloves

Wear protective gloves to prevent exposure to pathogenic microbes.

Discard used samples, test strips and protective gloves in accordance with local regulations for biohazardous waste.

1 Prepare a sample for STAT measurement.

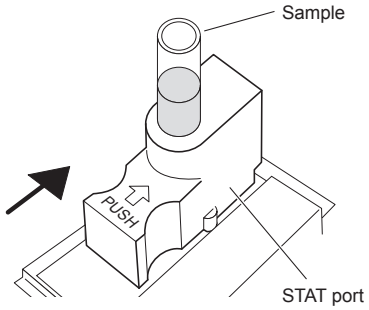
❶ Pour the sample for STAT measurement in a sample tube.
- See *"2.3.5 Preparing Samples"* on page 2-21.

2 Load the sample tube into the STAT port.

❶ Place the sample tube straight into the STAT port.

❷ While pressing the "PUSH" mark, slide the STAT port backward and push it in place.

❸ Gently pull the STAT port toward you to ensure the port is locked.

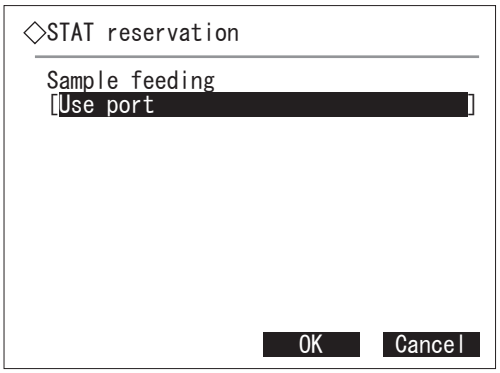


3 Switch to the port STAT measurement mode.

❶ During normal measurement or on standby, press ⇄ to go to the [STAT reservation] screen.

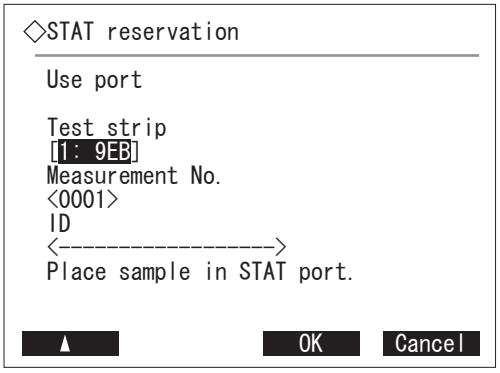
❷ Below [Sample feeding], choose [Use port].
- Press the **hyphen** key to switch between [Use port] and [Use rack].

❸ Press OK .
- The next [STAT reservation] screen will appear.



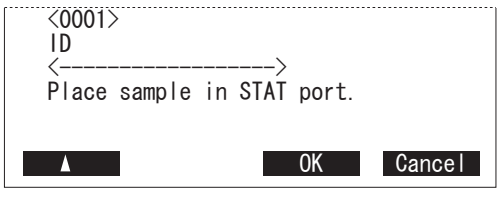
4 Set the measurement parameters.

❶ Set the parameters for port STAT measurement.
- See the table below.
- To move the cursor downward, press ↵ .



Items	Descriptions
Test strip	Select the feeder to use for STAT measurement. Press the **hyphen** key to change the feeder number. At the right of the feeder number, the type of test strips currently set for the feeder is shown.
Measurement No.	Enter the measurement number for the sample. For example, to enter “0200”, press **0**, **2**, **0**, **0** in that order.
ID	Enter the ID for the sample. An ID can be up to 18 digits long and can contain numbers, alphabet, and special characters. For more information, see *“ID”* in *“1.7.3 Menu Operations and Examples”* on page 1-45. The optional hand-held barcode reader can also be used to read the ID from the barcode labeled on the sample tube.

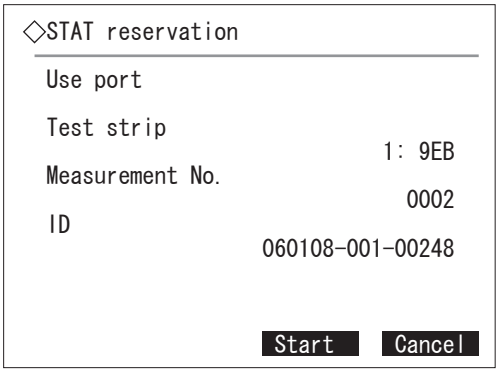
❷ Press OK .



5 Start the port STAT measurement.

How the STAT measurement takes place depends on the status of the instrument when ↵ is pressed in step 3.

On standby



If the instrument is on standby:

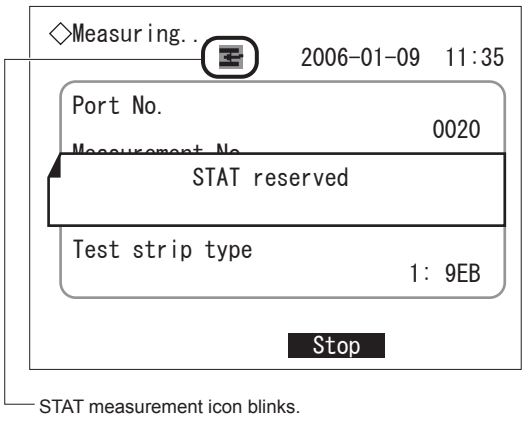
❶ Check the settings on the [STAT reservation] screen, and press Start to start measurement.

REFERENCE: Warning "W002" occurs with a beep if the STAT port is out of the sample aspirating position. Place the sample correctly and press OK .

If measurement is underway:

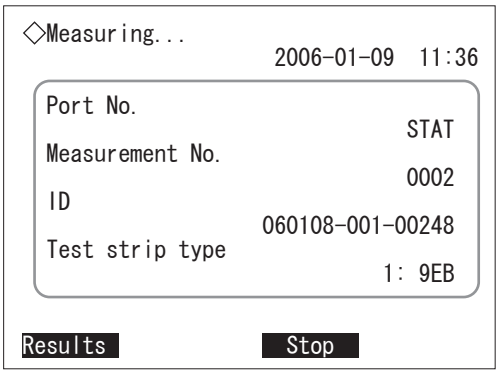
- "STAT reserved" will appear and the STAT measurement icon will blink to indicate STAT measurement has been reserved.

During normal measurement



Keep hands away from the STAT port while the STAT measurement icon is blinking. The aspirating nozzle may descend into the STAT port.

- Port STAT measurement will automatically start when aspiration of the normal measurement sample in process is completed.



REFERENCE: The following keys are operational during STAT measurement.

■ Press Stop to stop STAT measurement. Normal measurement also stops if it was running.

■ Press results to view the latest result. Pressing ◁◁◁◁◁◁◁ or ▷▷▷▷▷▷▷ can view the previous or next result. To return to the [Measuring…] screen, press Go back .

■ Press ↵ to make another reservation for STAT measurement.

6 When port STAT measurement is completed…

- The result of the STAT measurement will be printed.
- The instrument will then operate in a different way depending on the status before performing STAT measurement.

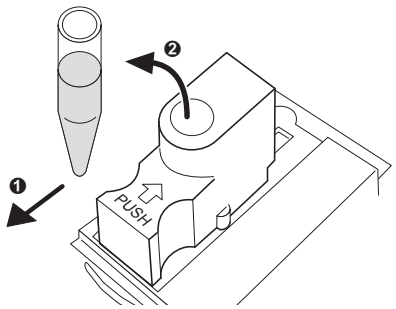
If the instrument was on standby:
The display will show "Measurement operations ending", the flow lines will be flushed, and then the instrument will put itself on standby.

If measurement was underway:
The suspended normal measurement will resume.

---

❶ Press the "PUSH" mark on the STAT port backward to unlock the stopper, and then slide the port toward you.

❷ Take the sample tube out of the STAT port.



2.4.3 Rack STAT Measurement: Measuring Higher Priority Samples

Rack STAT measurement allows you to have up to 7 samples measured prior to the samples waiting for normal measurement in the sampler. This is accomplished by loading the higher priority samples into the STAT and control rack and placing the rack between the sample racks currently loaded in the sampler. Rack STAT measurement can also be carried out during standby.

Prepare: STAT and control rack, sample tubes, and protective gloves

Wear protective gloves to prevent exposure to pathogenic microbes.

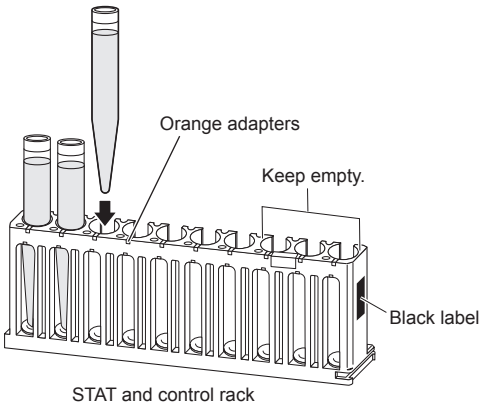
Discard used samples, test strips and protective gloves in accordance with local regulations for biohazardous waste.

1 Prepare samples for STAT measurement.

❶ Pour samples for STAT measurement in sample tubes.
- See *"2.3.5 Preparing Samples"* on page 2-21.

❷ Place the sample tubes straight into ports 1 to 7 with the orange adapters of the STAT and control rack.

REFERENCE: Leave ports 8 to 10 with the dark blue adapters empty as they are for control measurement.

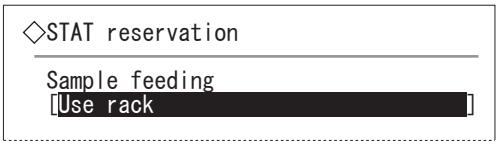


2 Set the measurement parameters.

If you use the test strips in the main feeder, skip this step and go to step **3**. The main feeder is indicated by a light blue background on the standby screen.

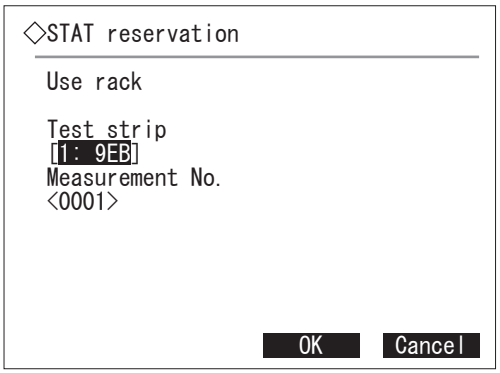
❶ To use the test strips in the non-main feeder, press ⇄ to go to the [STAT reservation] screen.

❷ Below [Sample feeding], choose [Use rack] and press OK to go to the next screen.



❸ Below [Test strip], select the feeder that contains the test strips to use.
Below [Measurement No.], select the measurement start number for STAT measurement.
- For instructions, see step **4** in *"2.4.2 Port STAT Measurement: Measuring a Higher Priority Sample"* on page 2-27.

❹ Press OK .



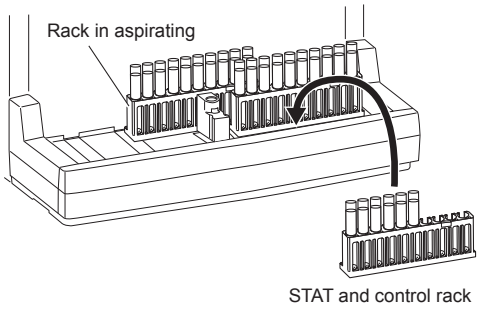
○

3 Load the STAT and control rack into the sampler.

❶ Place the STAT and control rack on the loading side of the sampler.

- If there are some racks waiting for normal measurement on the loading side, keep the rack at the aspirating position (furthest from you) as it is and slide the other racks toward you to make room for the STAT and control rack.

- If the loading side is full with racks, remove one of them and insert the STAT and control rack.



During normal measurement, the aspirating nozzle descends into the ports of the rack located furthest from you. For your safety, do not move the rack in the process of aspiration.

NOTE: If samples spill on the sampler, immediately wipe them off. Crystallized samples may hinder smooth transportation of the sample racks, and consequently cause trouble.

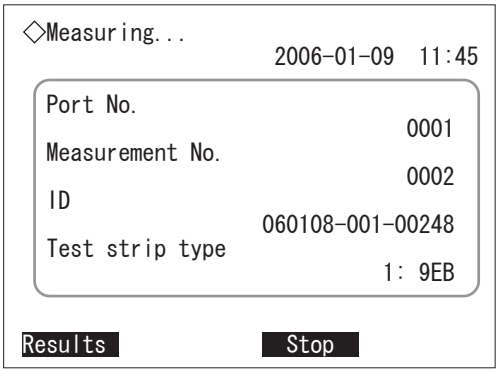
4 Start the rack STAT measurement.

How the STAT measurement takes place depends on the status of the instrument.

If the instrument is on standby:

❶ Press ◇| to measure the samples in the STAT and control rack.

- Samples are processed in the same way as those for normal measurement.



If measurement is underway:

- STAT measurement will start when the STAT and control rack reaches the sample aspirating position. Samples are processed in the same way as those for normal measurement.

5 When rack STAT measurement is completed…

- When the sample aspiration of the STAT and control rack is completed, the rack will be discharged to the unloading side of the sampler.

---

❶ When aspiration of the remaining normal measurement samples is completed, take the sample racks out of the sampler.

2.5 S.G. Calibration

Perform S.G. calibration of the instrument once a month using low and high S.G. standard solutions and a urinometer. Please ensure the urinometer conforms to the Brix – S.G. conversion formula described in *"1.1.4 Measurement Principle"* on page 1-7.

2.5.1 Preparing S.G. Standard Solutions

Prepare: Saccharose, purified water, urinometer, two sample tubes,
sample rack (item rack, STAT and control rack, start rack, or normal rack)

IMPORTANT: Use S.G. standard solutions that meet the following requirements unless preparing the solutions in steps 1 and 2 .
- **Specific gravity readings are between 1.000 to 1.050.**
- **Difference between the S.G. readings of the high and low solutions is 0.03 or higher.**

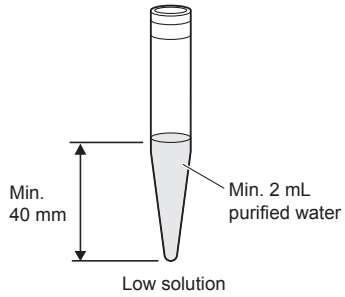
IMPORTANT: Prepare the S.G. standard solutions just before carrying out calibration. Use of solutions stored for a long period of time may produce incorrect calibration results.

1 Prepare a low solution.

Use purified water as a low solution.

❶ Transfer at least 2 mL of purified water into a sample tube. Ensure the water level is at least 40 mm above the bottom of the tube.

IMPORTANT: An insufficient amount of low solution may cause incorrect calibration results.



2 Prepare a high solution.

❶ Add purified water to 9.3 g of saccharose to make 100 mL of high solution.

3 Take specific gravity readings.

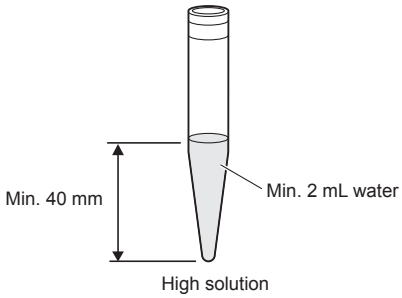
❶ Use the urinometer* to accurately measure the S.G. values of the low and high solutions, and record the values.

* The urinometer should conform to the Brix – S.G. conversion formula described in *"1.1.4 Measurement Principle"* on page 1-7. When the high solution prepared in step 2 is measured using the urinometer, the S. G. value should be 1.040.

4 Load the S.G. solutions into the sample rack.

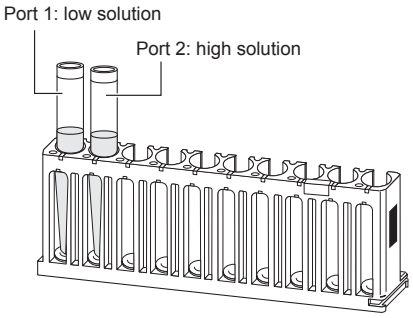
❶ Transfer at least 2 mL of high solution into a sample tube. Ensure the liquid level is at least 40 mm above the bottom of the tube.

IMPORTANT: An insufficient amount of high solution may cause incorrect calibration results.



❷ Place the low solution tube into port 1 of the sample rack, and the high solution tube into port 2.

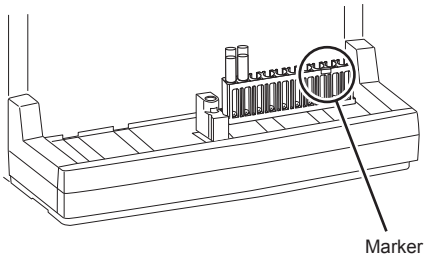
IMPORTANT: Load the two solutions into the correct ports respectively. Loading them into the wrong ports may cause an error.



5 Load the sample rack into the sampler.

❶ Hold the sample rack with the marker facing you and place it on the loading side of the sampler.

- First, place the rack at the frontward of the loading side, fit the recesses at the lower right of the rack into the guides inside the sampler, and slide the rack backward.

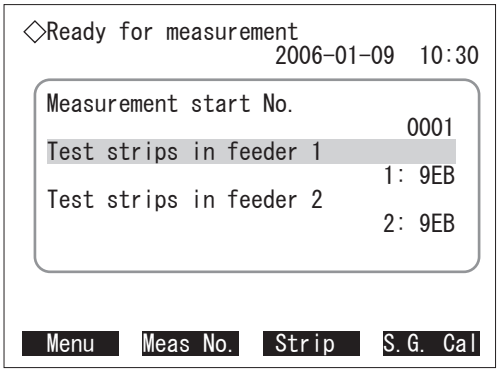


NOTE: If solution spills on the sampler, immediately wipe it off. Crystallized solutions may hinder smooth transportation of the sample racks, and consequently cause trouble.

2.5.2 Starting S.G. Calibration

1 Access the S.G. calibration parameters.

❶ On the standby screen, press S.G. Cal to go to the [S.G. calibration] screen.

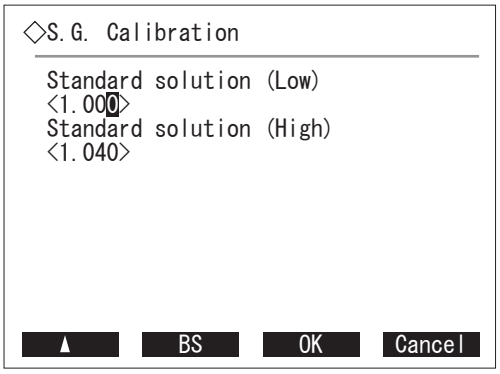


2 Set the obtained standard S.G. values.

Prepare the notes you took in step **3** in *"2.5.1 Preparing S.G. Standard Solutions"* on page 2-34.

❶ Below [Standard solution (Low)], enter the S.G. value of the low solution.
- Use the numeric keys (0 to 9).
- The S.G. value acceptable here is between 1.000 to 1.050.

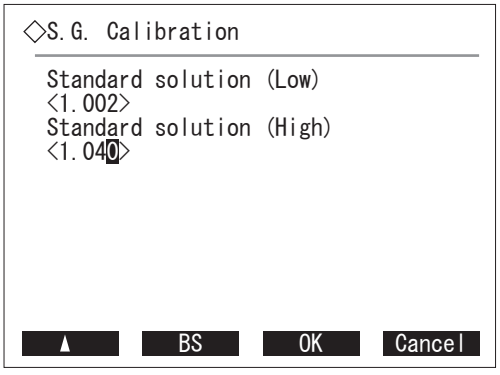
REFERENCE: For example, to enter "1.030", press **1**, **0**, **3**, **0** in that order. A decimal point is automatically added. To correct the entry, press BS to delete the digits one by one, and enter a new value.



❷ Press ↵ to proceed to the [Standard solution (High)] entry field.

---

❸ Below [Standard solution (High)], enter the S.G. value of the high solution.
- Use the numeric keys (0 to 9).
- The S.G. value acceptable here is between 1.000 to 1.050.

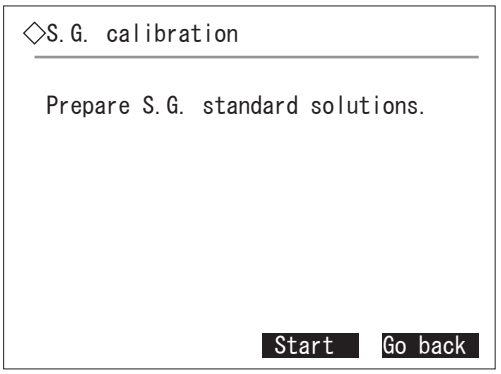


❹ Press OK to save your entries.
- The next [S.G. Calibration] screen will appear.

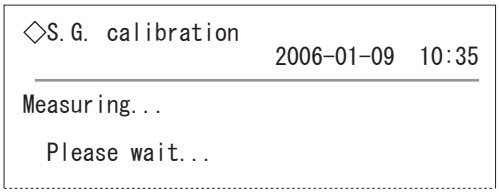
3 Start the S.G. calibration.

❶ Make sure the sample rack with the S.G. standard solutions are correctly loaded into the sampler.

❷ Press Start to start calibration.



- Measurement of the standard solutions will take place when the sample rack reaches the aspirating position.



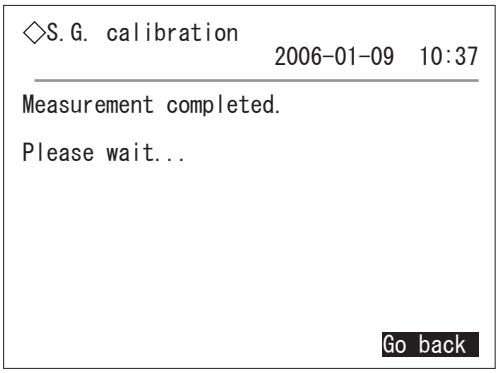
REFERENCE: To stop calibration in progress, press Stop . The instrument will wait until the solution measurement in progress completes and then proceeds to the breaking process before putting itself back on standby. Note that breaking calibration aborts all of the calibration results.

4 When S.G. calibration is completed…

- The message "Measurement completed" will appear.

❶ Press Go back to return to the standby screen.

❷ Remove the sample rack of the standard solutions from the sampler.



REFERENCE: If the error "E120" occurs
See *"E120"* in *"5.2.2 Causes and Remedies"* on page 5-8 to determine the cause of the error, and retry from step 1 . If the error persists, there is something wrong with the instrument. Contact your distributor.

2.6 Control Measurement

Perform control measurement at regular intervals so as to maintain the status of the instrument and measurement quality. Up to 3 types or concentrations of controls can be measured by loading them into the STAT and control rack (control measurement can be performed using at least one control, and does not always require three different controls). Up to 200 control measurement results can be stored in memory.

Prepare: Commercially available controls, STAT and control rack, sample tubes, and protective gloves

Wear protective gloves to prevent exposure to pathogenic microbes.

Discard used controls, test strips, and protective gloves in accordance with local regulations for biohazardous waste.

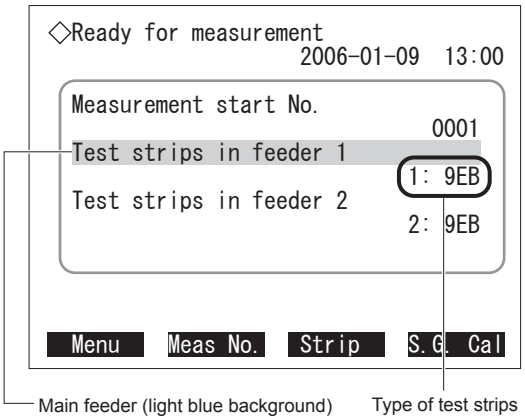
REFERENCE: This section describes how to perform control measurement when on standby. However, controls can also be measured before or in course of normal measurement by inserting the STAT and control rack at the beginning of or between the racks containing patient samples.

REFERENCE: For the controls labeled with barcodes, “control IDs” read from the barcodes are automatically assigned to the corresponding control measurement results.

1 Check the main feeder.

The test strips in the main feeder are always used for control measurement.

❶ On the standby screen, check if the main feeder and the test strips for the feeder are set as you desire.
- The main feeder is indicated by a light blue background.



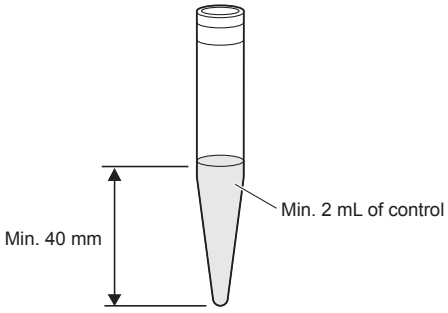
2 Load the test strips into the main feeder.

❶ Place the test strips in the main feeder.
- Any types of test strips can be used as long as they are supported by the instrument.
- For detailed instructions, see *“2.3.3 Loading Test Strips into the Feeders”* on page 2-16. The main feeder and test strips settings can be changed in step **1** in that section.

3 Prepare controls.

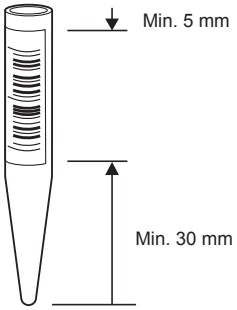
IMPORTANT: Read through the package inserts before using the controls.

❶ Transfer at least 2 mL of control into a sample tube. Ensure the liquid level is at least 40 mm above the bottom of the tube.



IMPORTANT: An insufficient amount of controls may produce incorrect results.

REFERENCE: To have the built-in barcode reader read barcodes successfully, label the tubes as shown in the figure.

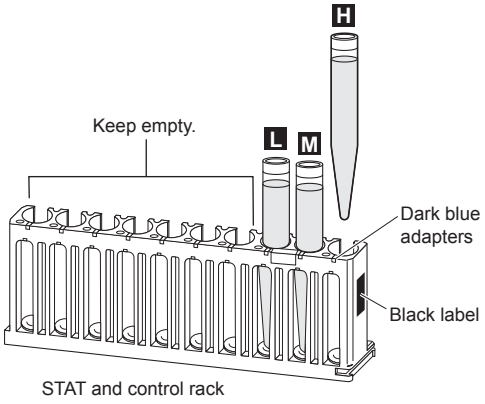


4 Load the controls into the STAT and control rack

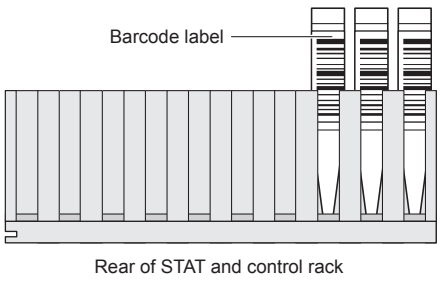
❶ Insert the sample tubes into ports 8, 9, and 10 (with dark blue adapters) in that order.

Port 8: Low density control **L**
Port 9: Middle density control **M**
Port 10: High density control **H**

REFERENCE: Do not place the controls in ports 1 to 7 with the orange adapters, as they are dedicated to rack STAT measurement.



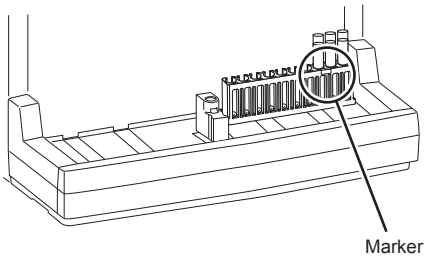
REFERENCE: To have the built-in barcode reader read barcodes successfully, labels on the tubes must be facing to the rear side of the sample rack.



5 Load the STAT and control rack into the sampler.

❶ Hold the sample rack with the marker facing you and place it on the loading side of the sampler.

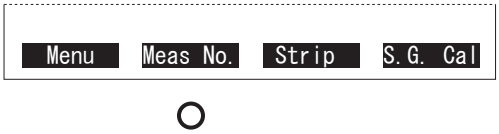
- First, place the rack at the frontward of the loading side, fit the recesses at the lower right of the rack into the guides inside the sampler, and slide the rack backward.



NOTE: If a control spills on the sampler, immediately wipe it off. A crystallized control may hinder smooth transportation of the sample racks, and consequently cause trouble.

6 Set the measurement start number.

❶ On the standby screen, press Meas No. to go to the [Measurement start No.] screen.

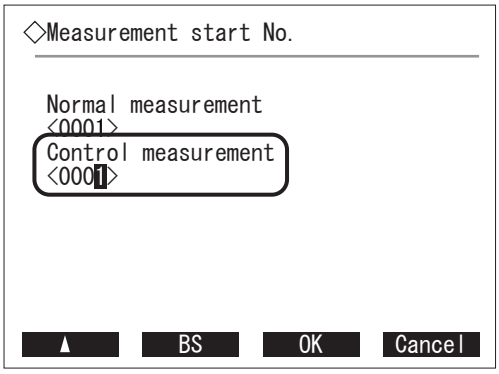


❷ Press ↵ to move down to [Control measurement].

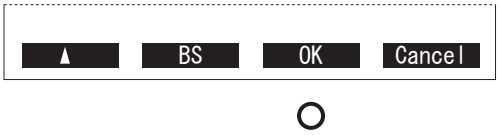
❸ Enter a number between 0000 to 9999 to be assigned to the first control.

- Use the numeric keys (0 to 9).

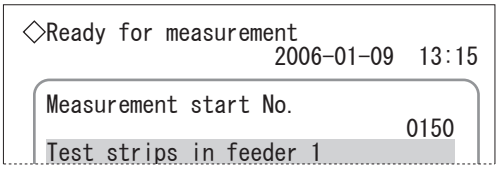
REFERENCE: For example, to enter “0150”, press **0**, **1**, **5**, and **0** in that order. To correct the number, press BS to delete digits one by one, and enter a new number.



❹ Press OK to save your changes.



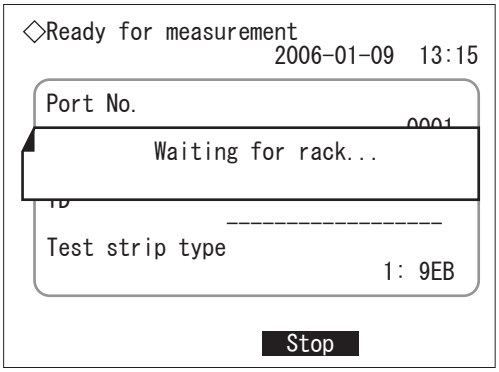
- The standby screen will appear again with a new measurement start number.



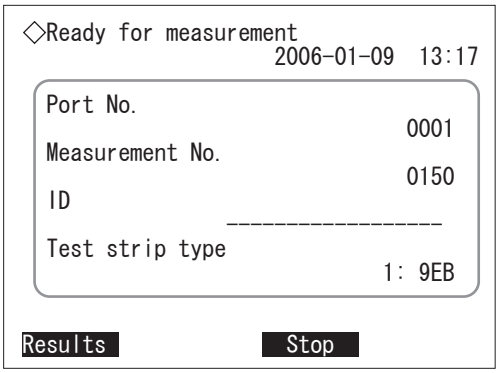
7 Measure the controls.

❶ Press ◇ to start.

- The STAT and control rack will be transported to the aspirating position while "Waiting for rack…" is displayed.

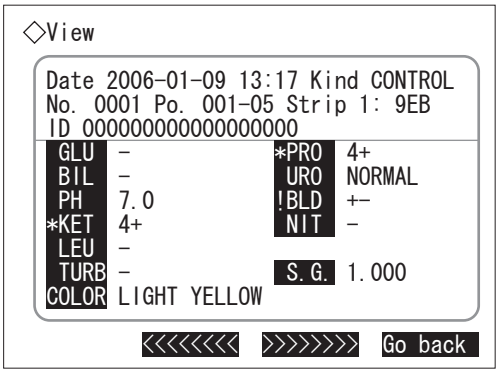


- The nozzle will come down to aspirate the first control, and then the measurement operation takes place.
- When the result is obtained, it will be printed. See *"2.8.2 Printed Results Report"* on page 2-50.
- The following controls are processed in the same way.



REFERENCE: To view results

Press Results to view the latest result. Pressing ‹‹‹‹‹‹‹‹ or ›››››››› can display the previous or next result. To return to the [Measuring…] screen, press Go back .



REFERENCE: To stop control measurement in progress, press Stop . The instrument will perform the breaking process and put itself on standby.

8 When control measurement is completed…

- The STAT and control rack will be discharged to the unloading side of the sampler.

REFERENCE: In the case that control measurement was carried out at the beginning or in course of normal measurement, normal measurement will start or resume at this point.

❶ Remove the STAT and control rack from the sampler.

2.7 Check Measurement

If you suspect obtained results are inadequate, use the supplied check strips to examine the status of the instrument. The check strip container holds two gray strips and two white strips. Use a pair of white and gray strips for check measurement at a time.

Prepare: Gray and white check strips (one for each color), blower brush, alcohol, cloth, tissue paper, and protective gloves.

Wear protective gloves to prevent exposure to pathogenic microbes.

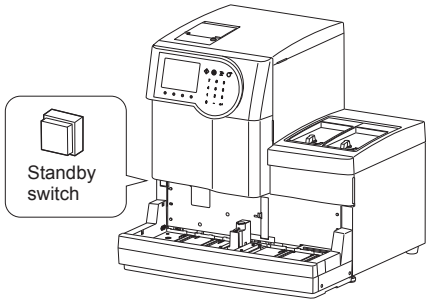
Discard cleaning tools and used protective gloves in accordance with local regulations for biohazardous waste.

IMPORTANT: Do not touch the pad area on the check strips. Use of strips contaminated by sebum can produce incorrect results.

NOTE: Ensure you have the check strips that came with the instrument. Measuring other test strips in the check measurement mode can cause trouble or damage to the instrument.

1 Clean the test strip transportation path.

❶ If the instrument is powered on, make sure the standby screen is displayed. Then, press the standby switch to turn off the power.



❷ Clean the components listed below.

Feeders:	See page 4-6.
Introduction tray:	See page 4-12.
Transport tray:	See page 4-19.
Waste box:	See page 4-3.

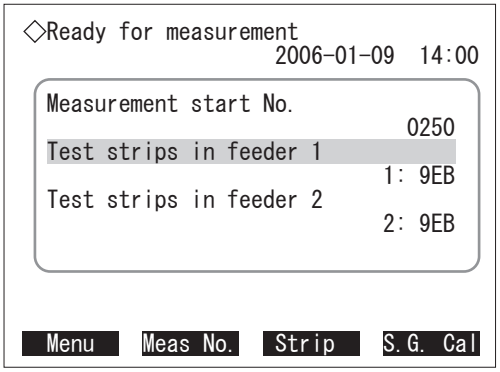
NOTE: Without cleaning these parts before check measurement, the check strips may be contaminated and become unusable.

NOTE: After taking the test strips out of the feeders for cleaning, wrap the strips with tissue paper to protect from dust.

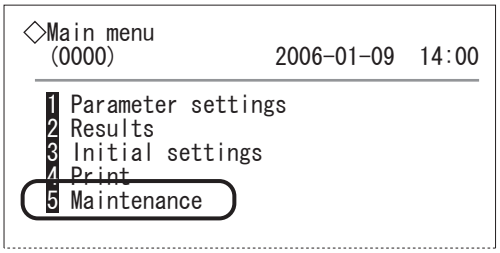
2 Select the type of measurement.

❶ Press the standby switch to turn on the power.
- Allow the instrument to warm up for about 2 minutes until it puts itself on standby.

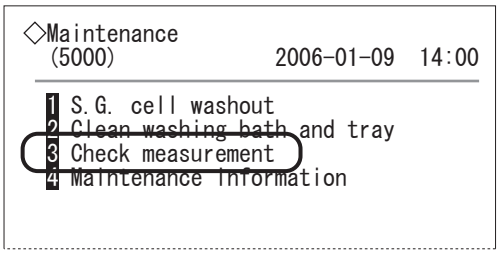
❷ Press Menu to go to the [Main menu] screen.



❸ Press **5** to go to the [Maintenance] screen.



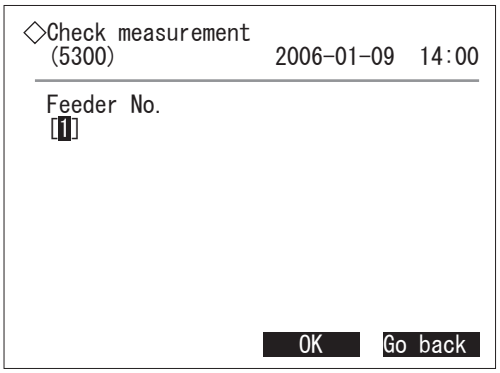
❹ Press **3** to go to the [Check measurement] screen.



3 Select the feeder for the first check strip (white strip).

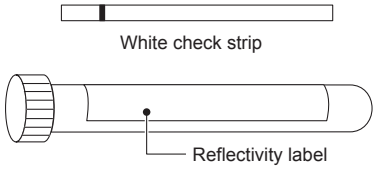
❶ Select the feeder to load the first white check strip.
- Press the **hyphen** key to switch between feeders 1 and 2.

❷ Press OK .
- You will be asked to load the check strip.



4 Prepare a white check strip.

❶ Take a white check strip out of the container.
- Keep the container handy for reference to the reflectivity after measurement.



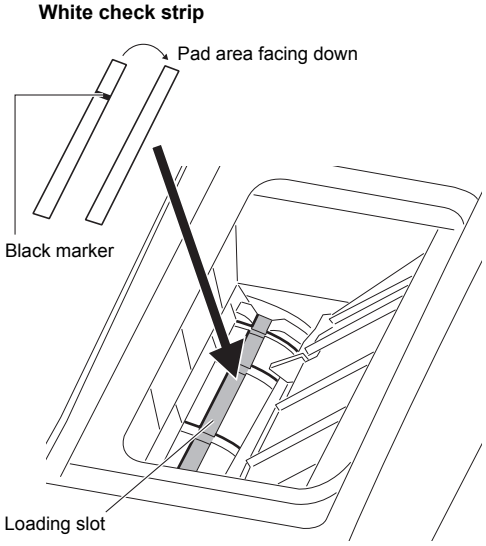
5 Measure the first check strip (white).

❶ Open the cover of the feeder selected in **3** .
- Turn the locking lever of the feeder counterclockwise to open the feeder.

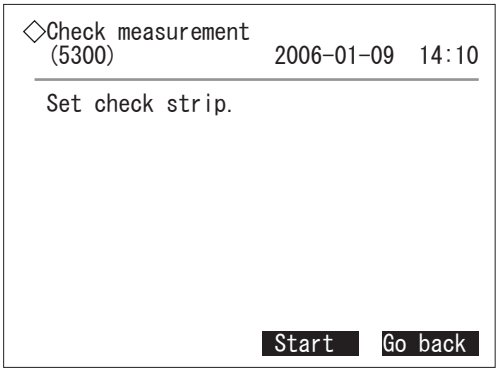
❷ Make sure the loading slot is visible.

❸ Place the first check strip (white strip) in the loading slot.

NOTE: Hold the test strip with the black marker to the rear of the feeder and facing down. Put the whole strip down on the loading slot. Incorrect loading may cause trouble to occur.

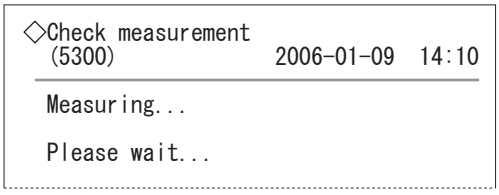


❹ Press Start .



- Check measurement will start.

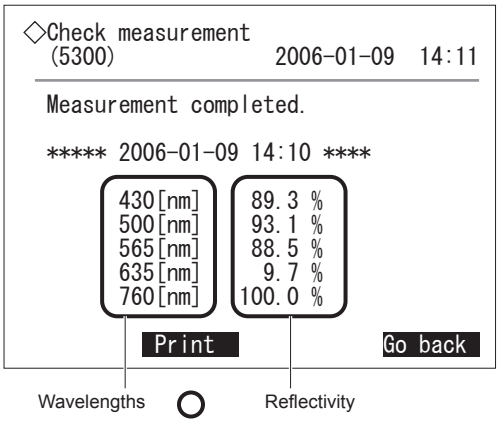
REFERENCE: To stop check measurement in progress, press Stop . The instrument will proceed to the breaking process before putting itself back on standby.



• When check measurement is completed, the obtained result will be reported on the screen.

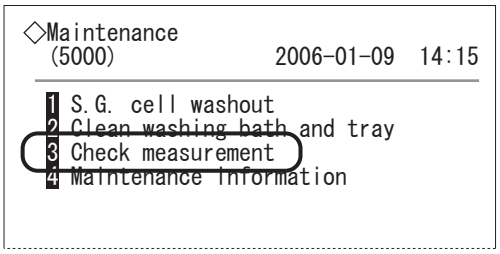
❺ Press Print to print the result.

❻ Press Go back to return to the [Maintenance] screen.

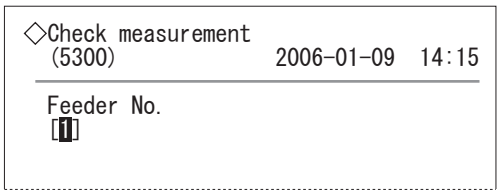


6 Measure the second test strip (gray strip).

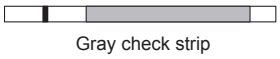
❶ Press **3** to go to the [Check measurement] screen.



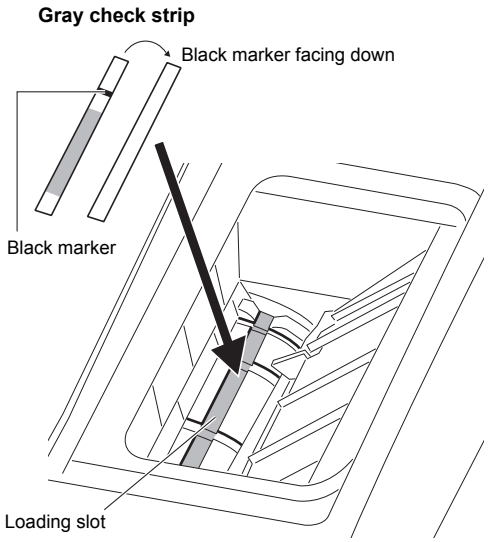
❷ Select the same feeder as the one for the first strip.
• For detailed instructions, see step **3** .



❸ Take a gray test strip out of the container.

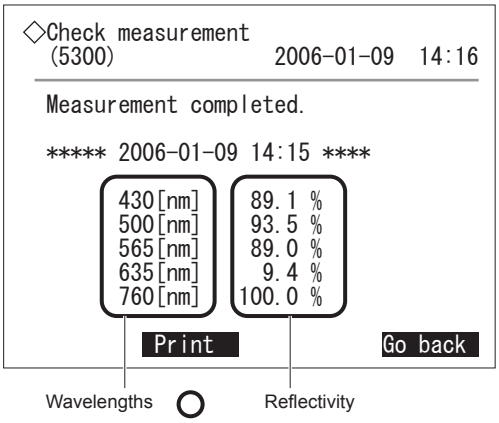


❹ Load the gray test strip into the feeder selected in step ❷.
• For detailed instructions, see step **5** .



❺ Press Start to start check measurement.
- When check measurement is completed, the obtained result will be reported on the screen.

❻ Press Print to print the result.



7 Evaluate the check measurement results.

❶ Check the two printed result reports to see if the obtained reflectivity of each wavelength falls within the range listed on the container label.

REFERENCE: For information on the result reports of check measurement, see *"2.8.6 Check Measurement Result Report"* on page 2-56.

When the results are:

Within range
The instrument is working normally. Go to step **9** .

Out of range
Either the instrument or the test strips are abnormal. Perform a check measurement again. Press Go back to return to the [Maintenance] screen. Take the remaining two check strips out of the container, and repeat from step **2** - ❹ on page 2-44. Go to step **8** when completed.

NOTE: If the printed results report includes an error message, clear the error as follows.

Reflection light intensity drift:	Internal measurement operation is interfered by lights coming from outside of the instrument. Remove the cause, and use the same check strips to retry check measurement.
Test strip out-of-position:	The check strip is out of position. Use the same check strips to retry check measurement.

8 Evaluate the results again.

❶ Check the second result reports to see if the results fall within the range listed on the container label.

If the results are:

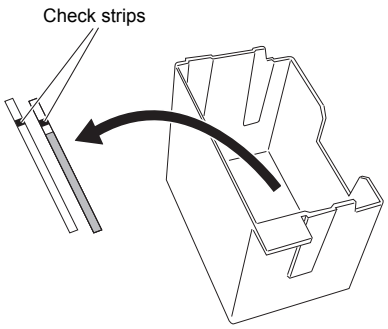
Within range:
The instrument is working correctly. However, the check strips used for the first check measurement are abnormal. Do not use these strips from now on. Go to step **9** .

Out of range:
There is something wrong with the instrument. Go to step **9** , and then, contact your distributor.

9 Take the check strips out of the waste box.

❶ Press Go back three times to put the instrument on standby.

❷ Pull out the waste box tray and take the check strips out of the box.



❸ Store the check strips in the container.

❹ Load the test strips removed from the feeder in step **1** into the feeder as they were.
- View the standby screen to see if the combination of the test strips and feeder is correct.

❺ Close the feeder cover, and turn the locking lever clockwise to lock the cover.

2.8 Displayed and Printed Reports

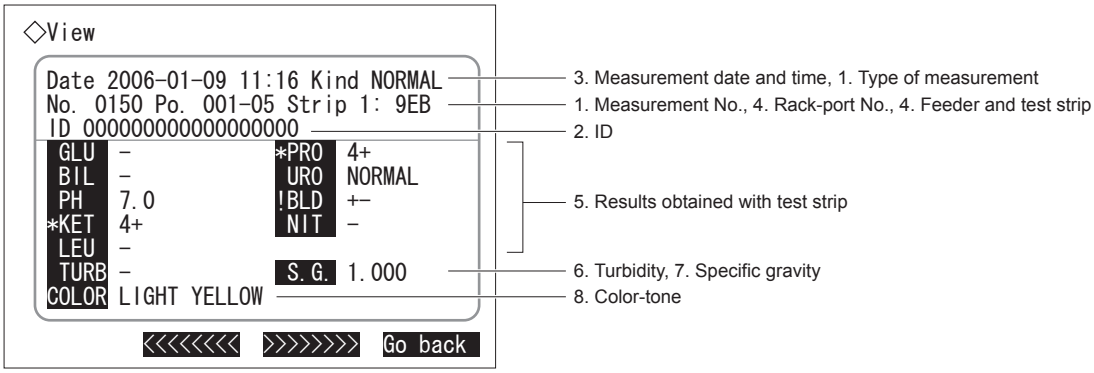
This section describes what information the displayed and printed reports provide.

REFERENCE: Any information including results and error lists is not printed out if the built-in printer is disabled (see *"3.4.2 Enabling/Disabling the Built-in Printer"* on page 3-18).

2.8.1 Displayed Results Report

When at least one result is obtained by normal measurement, Results will appear on the lowest line of the screen. Pressing Results displays the result on the screen in the format shown below. The obtained results are stored in memory and can be retrieved on the screen later by key operation. For more information about the components from 1 to 8 in the figure, see the appropriate sections in *"2.8.2 Printed Results Report"* on the next page.

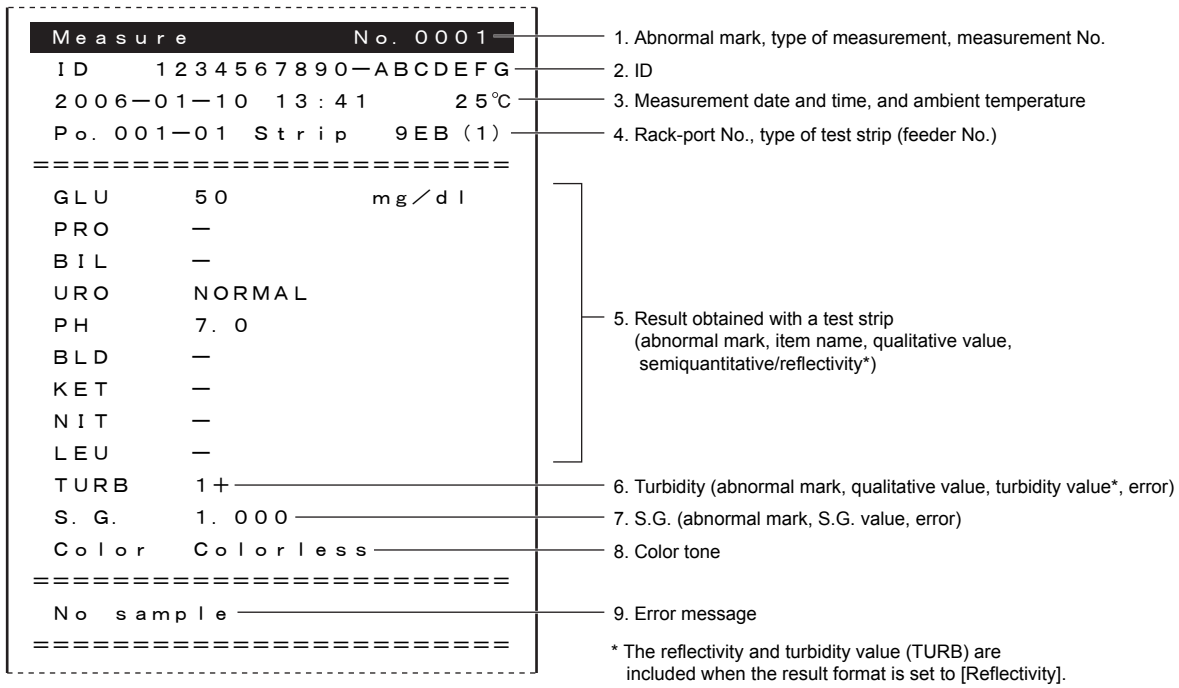
Example



2.8.2 Printed Results Report

During measurement of urine samples and controls, the instrument prints a results report each time it obtains a result by analyzing an individual sample or control. See the following figure for information on what the printed results report includes.

Example



1. Abnormal Mark, Type of Measurement, and Measurement Number

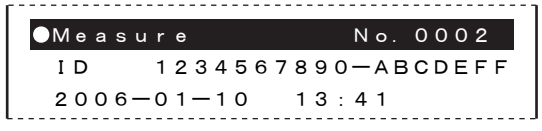
An abnormal mark, the type of measurement and measurement number appear at the beginning of the results report.

■ Abnormal mark

An abnormal result is flagged with a black circle (●) or question mark (?). The whole first line appears in reverse video to make it immediately recognizable. The question mark has a higher priority than the black circle.

●	The sample is positive or abnormally colored.
?	The instrument is operating abnormally.

Example



■ Type of measurement

There are 6 types of measurements as listed below.

Measure	Normal measurement
Stat	Port or rack STAT measurement
Control-L	Low-density control measurement
Control-M	Middle-density control measurement
Control-H	High-density control measurement
Check	Check measurement

■ Measurement number

An assigned measurement number, from 0000 to 9999, appears.

2. ID

An ID number appears when the barcode reader reads a barcode from a labeled sample tube. An ID can contain up to 18 characters, and shorter IDs are preceded by spaces to fill all the 18 digits. For samples with no ID, 18 hyphens (-) appear instead.

3. Measurement Date and Time, and Ambient Temperature

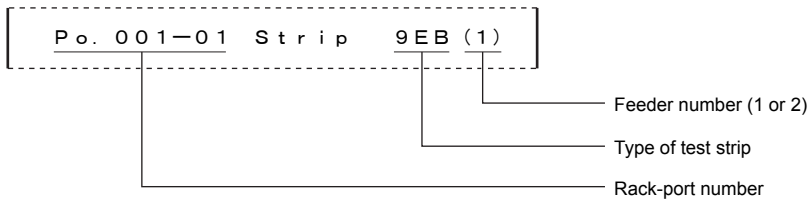
The date and time when the measurement is carried out and the ambient temperature in centigrade appear here. The default date format is “year (4 digits) - month (2 digits) - day (2 digits)”.

REFERENCE: The date format can be changed to “day (2 digits) - month (2 digits) - year (4 digits)” or “month (2 digits) - day (2 digits) - year (4 digits)”. To have the parameter settings changed, contact your distributor.

4. Rack-Port Number, Type of Test Strip, and Feeder Number

The rack-port number identifies where the sample is located. The first 3 digits represent sample rack count from the beginning of the batch, and the following 2 digits represent the port number on the sample rack (see also *“Rack-port number”* in *“2.1.3 Measurement Terminology”* on page 2-4).

Example: “Po. 004-08” shows the sample is loaded in port 8 of the forth sample rack.



5. Results Obtained with the Test Strip

Example

■ Abnormal mark

Abnormal results obtained with the test strips are flagged with an asterisk (*) or exclamation mark (!). The exclamation mark flag has a higher priority than the asterisk flag.

(Blank)	Normal (negative)
*	Abnormal value (positive)
!	Abnormal color (positive)

■ Qualitative value

Qualitative values are represented as “NORMAL” or as a plus (+) or minus (-) assigned numeric value.

■ Semiquantitative value/reflectivity

A semiquantitative value is the concentration and its unit.

REFERENCE: The qualitative or semiquantitative values appear by default, however they can be replaced with qualitative value and reflectivities. For instructions, see *“3.2.2 Using a Different Results Format”* on page 3-4.

6. Turbidity

REFERENCE: The turbidity measurement value is added if the result format is set to [Reflectivity] (see *“3.2.2 Using a Different Results Format”* on page 3-4).

■ Abnormal turbidity mark

The result is flagged with an asterisk (*) if it is abnormal. Normal results are printed with no abnormal marks.

■ Qualitative values

Qualitative values are shown as follows:

Clear	-
Turbid	1+
Dense turbid	2+

■ Error

If an incorrect turbidity result is obtained, either of the following messages will be added. For more information, see *“5.4.3 Turbidity Measurement-Related Errors”* on page 5-20.

CAL. ERR.	The calibration result of the turbidity meter is abnormal.
ERROR	Turbidity measurement was not performed for some reason.

7. Specific Gravity (S.G.)

■ Abnormal S.G. mark

Abnormal S.G. results are flagged with an asterisk (*).

(Blank)	Normal
*	The GLU and PRO correction is beyond capability (their results are shown as “OVER”).
	The S.G. value falls out of the upper or lower thresholds set for the instrument.

■ Errors

If an incorrect S.G. result is obtained, any of the following messages will be added. For more information, see *“5.4.2 S.G. Measurement-Related Errors”* on page 5-19.

UNDER	The result is lower than the specified range.
OVER	The result is higher than the specified range.
--------	Specific gravity was not measured for some reason.
CAL. ERR.	S.G. calibration has not been performed yet.

8. Color tone

The color tone of samples is determined from 23 colors, which includes 21 combinations of 7 colors (yellow, orange, brown, red, violet, blue, and green) and 3 intensity levels (light, normal, dark), colorless, and others.

COLORLESS	
YELLOW	LIGHT, normal and DARK are indicated for each color. Example: LIGHT YELLOW, YELLOW, and DARK YELLOW
ORANGE	
BROWN	
RED	
VIOLET	
BLUE	
GREEN	
OTHER	

REFERENCE: If the result format is set to [Reflectivity], the color tone results are represented as [x] and [y].

9. Error Messages

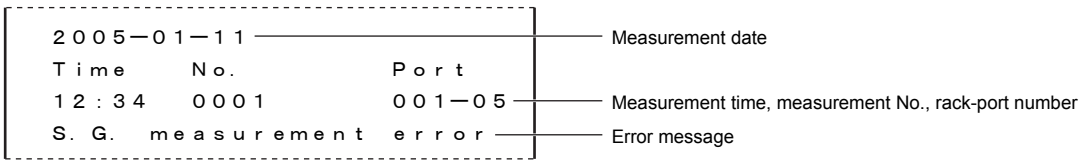
If an error related to measurement or computing occurs, an appropriate message is added at the end of the results report. For more information, see *"5.4.1 Results-Related Errors"* on page 5-17.

Messages	Descriptions
No sample	No sample was detected.
Skipped	The sample was not measured.
Reflection light intensity drift	The light intensity is drifting.
Excess reflectivity	The reflectivity was excessively high.
Test strip out-of-position	The test strip was placed out of the correct position.
Abnormal sampling	The nozzle could not spot the sample on the test strip.

2.8.3 Abnormal Results List

If incorrect results are obtained, you can manually print an *abnormal results list* to determine the cause of the error. This list includes information related to the results that are obtained after powering-on. For instructions, see *"3.5.2 Printing the Abnormal Results List"* on page 3-24. For information on the error messages that can appear in this list, see *"5.4.4 Messages on the Abnormal Results List"* on page 5-20.

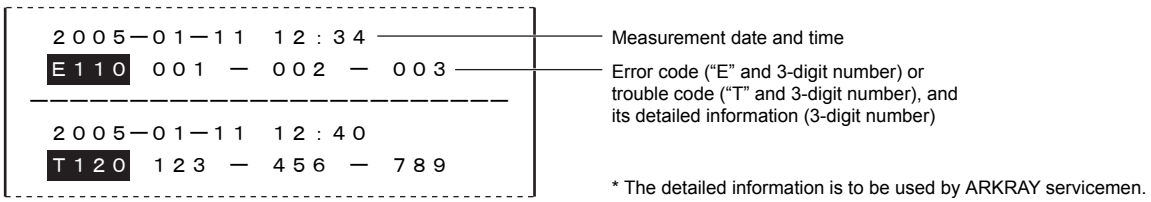
Example



2.8.4 Error and Trouble List (Automatic Report)

If an error or trouble occurs, the appropriate code is automatically reported on a printout. An error code consists of an "E" and a 3-digit number and a trouble code, a "T" and a 3-digit number. For information on the error and trouble codes, see *"5.2 When an Error Occurs*" on page 5-6 and *"5.3 When Trouble Occurs"* on page 5-10.

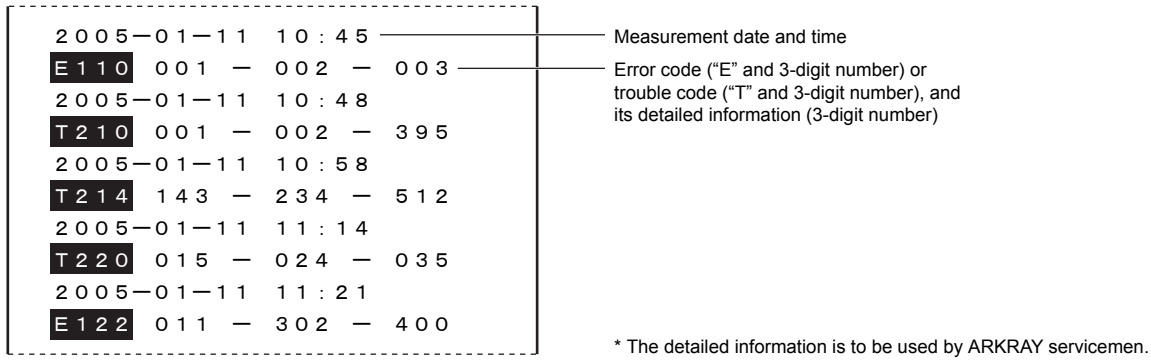
Example



2.8.5 Trouble List (Manual Report)

You can manually print the trouble list, which contains error and trouble history records. For instructions for printing it out, see *"3.5.1 Printing a Trouble List"* on page 3-23. For information on the error and trouble codes, see *"5.2 When an Error Occurs"* on page 5-6 and *"5.3 When Trouble Occurs"* on page 5-10.

Example

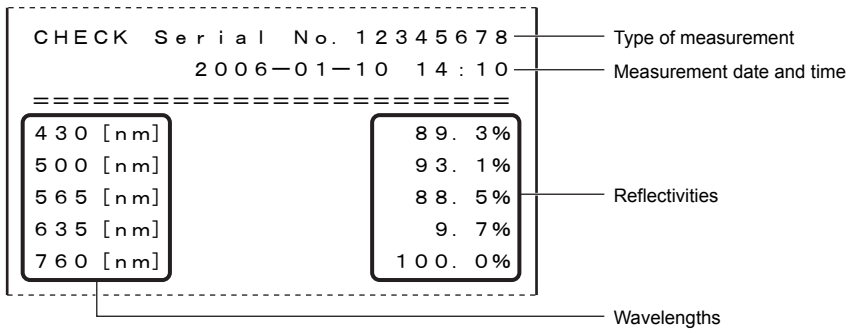


* The detailed information is to be used by ARKRAY servicemen.

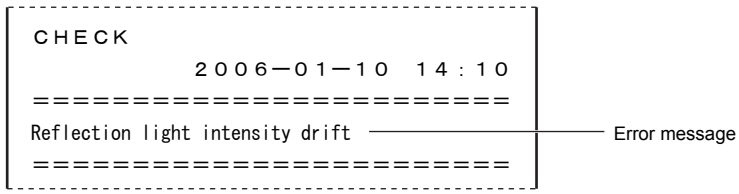
2.8.6 Check Measurement Result Report

Once check measurement has been completed, you can press **Print** to obtain a printed results report.

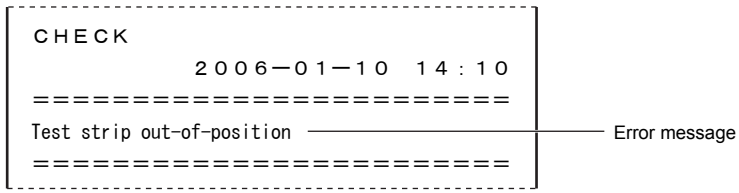
Example



When measurement was interfered with lights from outside of the instrument:



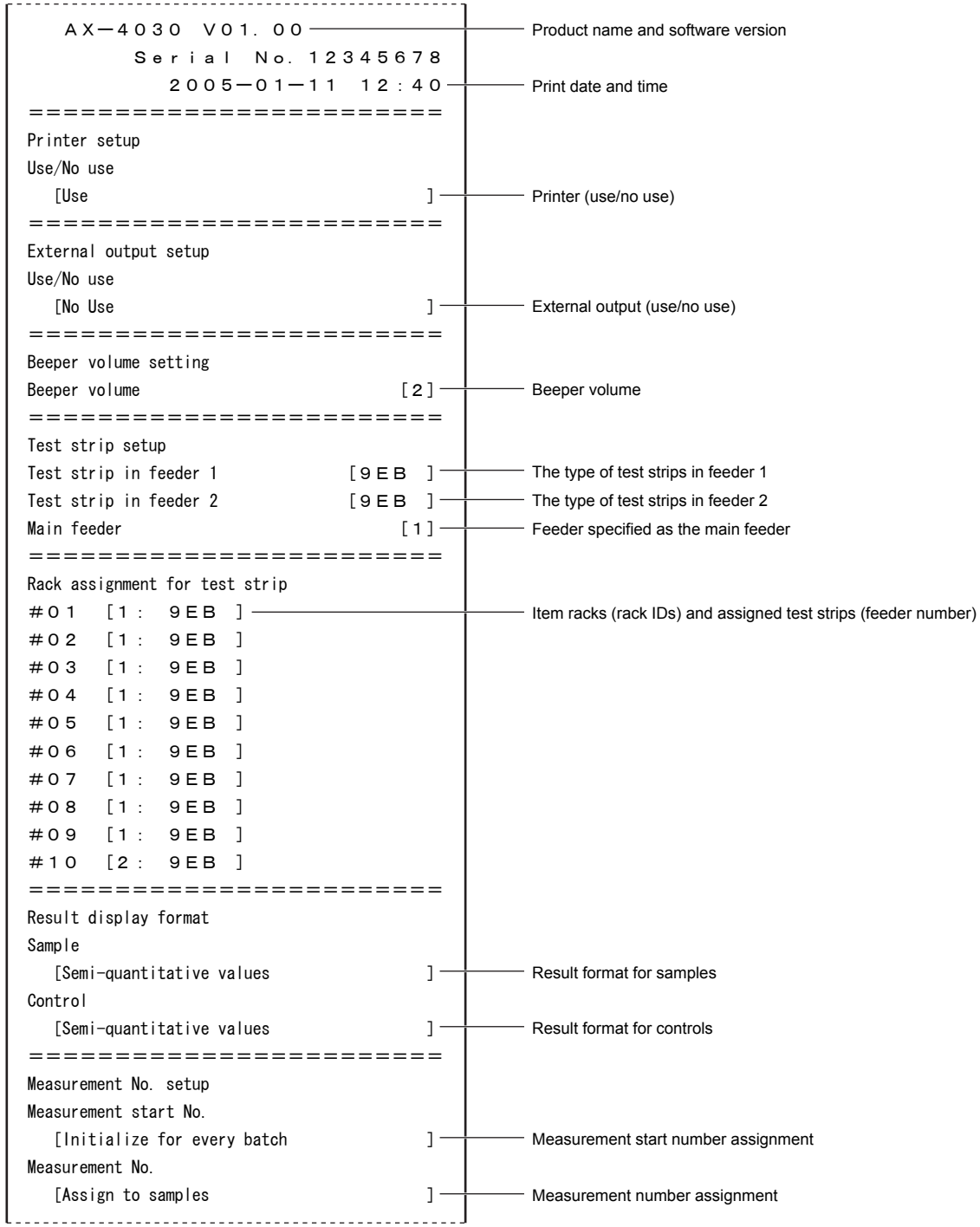
When the check strip was placed out of position and could not be measured:



2.8.7 List of Current Parameter Settings

A list of the current parameter settings can be manually printed out. For instructions, see *"3.5.3 Printing the Current Parameter Settings"* on page 3-25.

Example



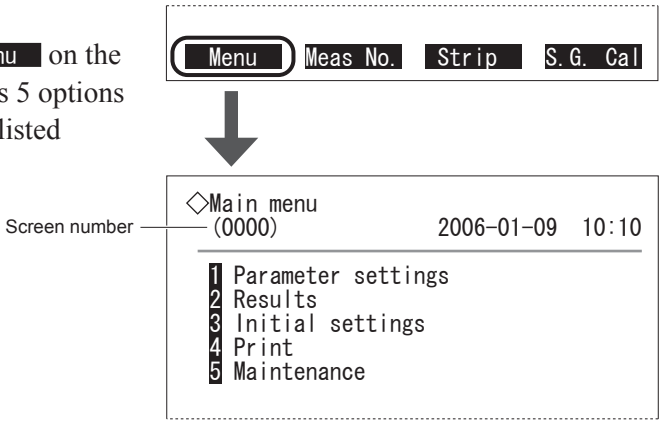
Chapter 3 Auxiliary Operations

3.1 Menu Configuration

This section describes the hierarchy of the menu system starting with the [Main menu] screen, and lists the lower-layer menu screens and the options accessible from these screens.

■ [Main menu] screen (No. 0000)

To go to the [Main menu] screen, press Menu on the standby screen. The [Main menu] screen lists 5 options for accessing the lower-layer menu screens listed below.



■ [Parameter settings] screen (No. 1000)

No.	Options	Description (default bolded)	See page(s)
1100	Rack assignment for test strip	Assigns a feeder (type of test strips in it) to each item rack (#01 - #10). #01 to #10 : × **(main feeder)**, 1 (feeder 1), 2 (feeder 2)	2-19
1200	Results display format	Selects the result format for patient samples and controls. Normal measurement: **Semiquantitative**, Reflectivity Control measurement: **Semiquantitative**, Reflectivity	3-4
1300	Measurement No. setup	Configures the measurement numbering system. Measurement start No.: **Continue from previous batch**, Initialize for every batch Measurement No.: **Assign to samples**, Assign to ports	3-6

■ [Results] screen (No. 2000)

No.	Options	Description (default bolded)	See page(s)
2100	Print	Reprints the results stored in memory. Date: Specify a range of days. **(today)** Measurement: **Normal & STAT measurements**, Normal measurement, STAT measurement, Control measurement, Check measurement Results: **All**, Normal results only, Include abnormal results, Barcode misread Range of results: **All**, Measurement No., Port No., ID	3-8
2200	Transmit	Transmits the results stored in memory to an external device. Date: Specify a range of days. **(today)** Measurement: **Normal & STAT measurements**, Normal measurement, STAT measurement, Control measurement, Check measurement Results: **All**, Normal results only, Include abnormal results, Barcode misread Range of results: **All**, Measurement No., Port No., ID	3-8

No.	Options	Description (default bolded)	See page(s)
2300	View	Allows you to view the results stored in memory. Date: Specify a range of days. **(today)** Measurement: **Normal & STAT measurements**, Normal measurement, STAT measurement, Control measurement, Check measurement Results: **All**, Normal results only, Include abnormal results, Barcode misread Range of results: **All**, Measurement No., Port No., ID	3-12
2400	Delete	Deletes results and trouble data from memory. Measurement: **All**, Normal & STAT measurements, Control measurement, Check measurement, Trouble list	3-15

■ [Initial settings] screen (No. 3000)

No.	Options	Description (default bolded)	See page(s)
3100	System clock setup	Allows you to adjust the system date and time that appears on the display and printed reports. Date: present date, Time: present time	3-17
3200	Printer setup	Enables or disables the built-in printer. Use/No use: **Use**, No use	3-18
3300	External output setup	Enables or disables the external output. Use/No use: Use, **No use**	3-20
3400	Beeper volume setting	Controls the volume of the beeper that alerts you to an error or trouble. Beeper volume: 00 to 09 **(The default is 05.)**	3-21

■ [Print] screen (No. 4000)

No.	Options	Description (default bolded)	See page(s)
4100	Trouble list	Prints a list of errors and troubles that have arisen so far. Date: A range of days	3-23
4200	Abnormal results list	Prints a list of abnormal results obtained after power-on.	3-24
4300	Parameter settings	Prints a list of current parameter settings for the instrument.	3-25

■ [Maintenance] screen (No. 5000)

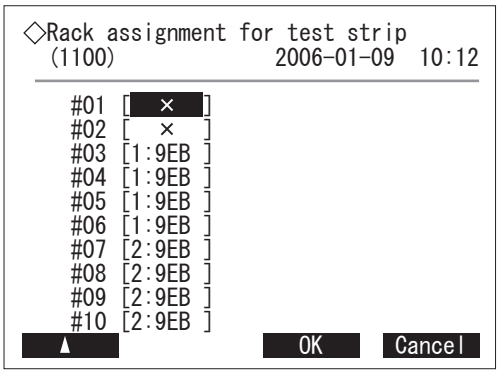
No.	Options	Description (default bolded)	See page(s)
5100	S.G. cell washout	Washes the S.G. cell.	4-24
5200	Clean washing bath and tray	Moves the mechanical parts to make room for you to access the washing bath and transport tray.	4-19 4-26
5300	Check measurement	Measures a check strip for instrument diagnosis.	2-43
5400	Maintenance information	Allows you to check the days when the maintenance tasks were last performed. (S.G. calibration, S.G. cell washout, washing bath and transport tray cleaning, and check measurement)	3-27

3.2 [Parameter settings] Menu

3.2.1 Assigning the Type of Test Strips to the Item Racks

For successful use of the item racks, assign feeder 1 or 2 to each item rack (rack IDs #01 to #10) before running tests. For example, you can set it so that samples in the item rack "#01" are measured with the test strips in "feeder 1". The feeder can be feeder 1, 2, or the main feeder (represented as [×]).

For detailed instructions, see *"2.3.4 Assigning the Type of Test Strips to the Item Racks"* on page 2-19.



3.2.2 Using a Different Results Format

Results obtained from sample and control measurements can be reported as qualitative values, semiquantitative values and/or reflectivities. This results format takes effect on the displayed and printed reports and the data transmitted to external devices as listed below.

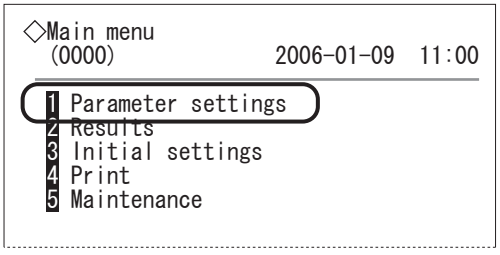
Options	[Semiquantitative]	[Reflectivity]
Displayed report	Qualitative or semiquantitative values*	Reflectivity only
Printed report	Qualitative or semiquantitative values*	Qualitative values and reflectivity
External output data	Qualitative and semiquantitative values	Qualitative values and reflectivity

* Either qualitative or semiquantitative values are automatically selected depending on measurement items.

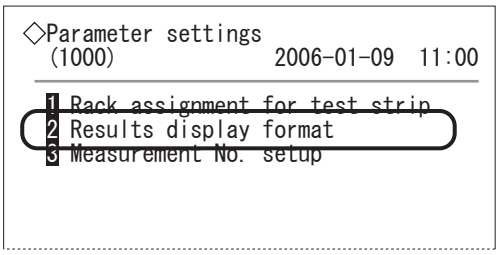
1 Access the setup screen.

❶ On the standby screen, press Menu to go to the [Main menu] screen.

❷ Press **1** to go to the [Parameter settings] screen.

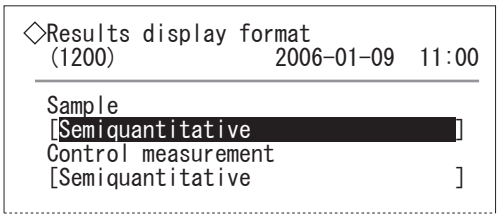


❸ Press **2** to go to the [Results display format] screen.



2 Select the results format for samples and controls.

❶ Select the options by pressing the **hyphen** key.
- To move the cursor up or down, press ▲ .
- For information on the available options, see the table on the previous page.

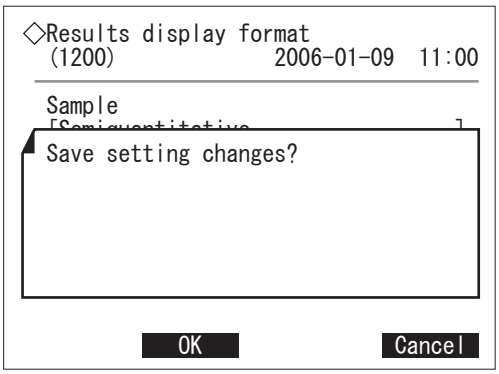


❷ Press OK .
- A message window will open to ask if you want to save your changes.

3 Save your settings.

❶ Press OK to save your settings.
- The [Parameter settings] screen will appear again.

NOTE: Keep the power on while saving the settings.



❷ Press Go back twice on the [Parameter settings] screen to return to the standby screen.

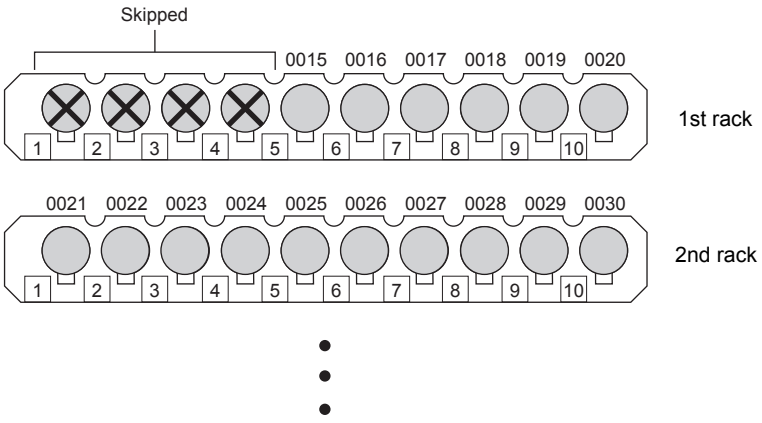
3.2.3 Configuring the Measurement Numbering Method

You can configure how measurement numbering is performed.

[Measurement start No.]	[Continue from previous batch]	Assigns serial measurement numbers through batches.
	[Initialize for every batch]	Resets the measurement numbering at the beginning of each batch.
[Measurement No.]	[Assign to samples]	Assigns measurement numbers to samples.
	[Assign to ports]	Assigns measurement numbers to all of the ports regardless of whether the ports have samples or not.

IMPORTANT: When [Measurement No.] is set to [Assign to ports], the instrument skips one or more samples from the beginning of a batch depending on the set measurement start number. This takes place because measurement numbering is made so that the ones place of the port number matches that of the measurement number. For example, when the measurement start number is set to "5", the instrument skips ports 1 to 4 and measures samples from port 5.

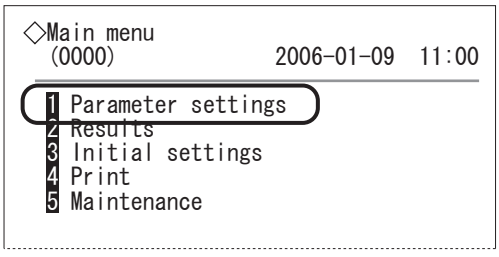
When [Measurement No.] is set to "5":



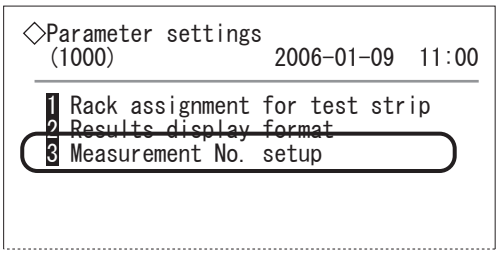
1 Access the setup screen.

❶ On the standby screen, press Menu to go to the [Main menu] screen.

❷ Press **1** to go to the [Parameter settings] screen.

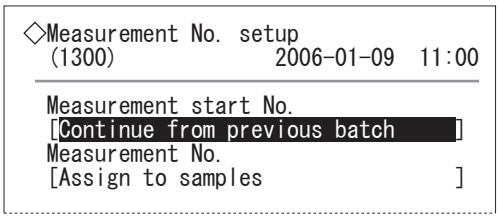


❸ Press **3** to go to the [Measurement No. setup] screen.



2 Set the measurement numbering method.

❶ Select the options by pressing the **hyphen** key.
- To move the cursor up or down, press ▲ .
- For information about available options, see the table on the previous page.

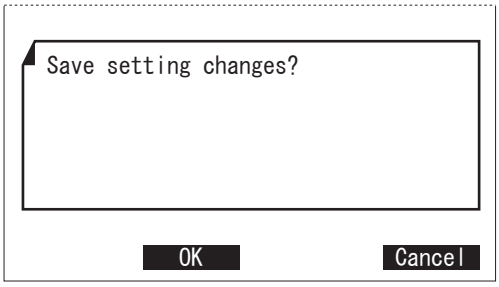


❷ Press OK .
- A message window will open to ask if you want to save your changes.

3 Save your changes.

❶ Press OK to save your changes.
- The [Parameter settings] screen will appear again.

NOTE: Keep the power on while saving the settings.



❷ Press Go back twice on the [Parameter settings] screen to return to the standby screen.

3.3 [Results] Menu

The results obtained by measurement are stored in memory, and can be retrieved anytime as printed or displayed reports or external output data. If the memory becomes full, the oldest data is replaced with the latest one. Note that the deleted results can never be recovered. The maximum number of results that can be stored in memory depend on the type of measurement as below.

Normal and STAT measurement	Total of 2500 measurements
Control measurement	Max. 200 measurements
Check measurement	Max. 50 measurements

REFERENCE: You may not obtain printed reports or transmit data to an external device if the built-in printer or external output capability is disabled. For more information, see *"3.4.2 Enabling/Disabling the Built-in Printer"* on page 3-18 and *"3.4.3 Enabling/Disabling the External Output"* on page 3-20.

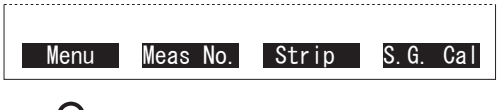
REFERENCE: Lists of errors, abnormal results, and parameter settings can also be printed out. For instructions, see *"3.5 [Print] Menu"* on page 3-23.

3.3.1 Printing/Transmitting Results

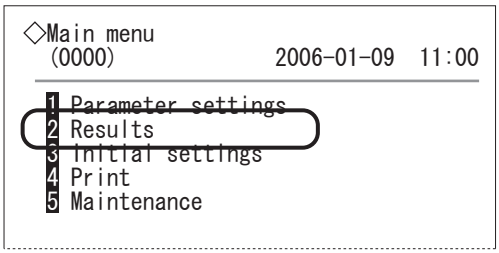
The results stored in memory can be manually printed out or transferred to a connected external device. You can specify what results you want by date, type of measurement, type of results, and measurement number. Use the same procedure for printing and transmitting results (the following procedure is explained with the screen images for printing as an example).

1 Access the setup screen.

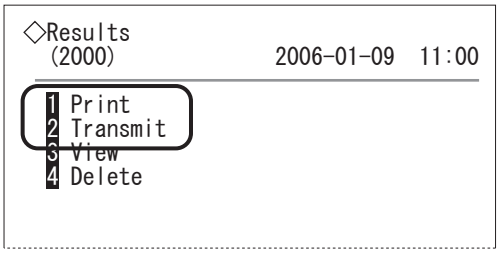
❶ On the standby screen, press **Menu** to go to the [Main menu] screen.



❷ Press **2** to go to the [Results] screen.



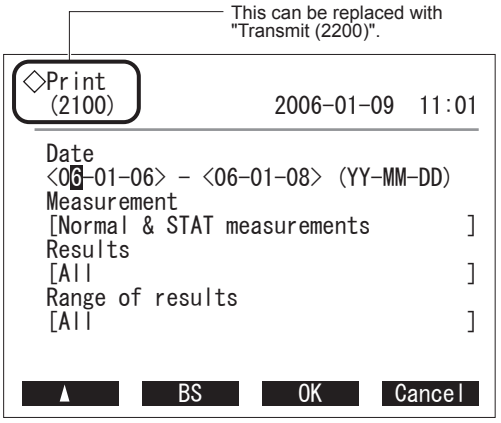
❸ Press **1** to go to the [Print] screen.
Press **2** to go to the [Transmit] screen.



2 Select the results you want.

❶ Select the results you want.

- See the table below for information on available options.
- To select an option, press the **hyphen** key.
- To move the cursor down, press ↵, and to move up, press ▲.
- Below [Date], press the **hyphen** key to move the cursor between the year, month, and day entry fields, and press ↵ to move from the start date field (left) to the end date fields (right). For more information, see *"Date"* in *"1.7.3 Menu Operations and Examples"* on page 1-44.

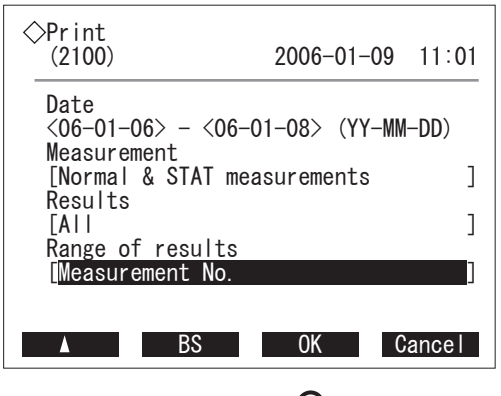


Parameters	Description
Date	Specify the range of days when the results you want were obtained. Enter the start date in the left field, and the end date in the right field. Ensure the right field contains a later date than the left field.
Measurement	Select the type of measurement from: [Normal & STAT measurements], [Normal measurement], [STAT measurement], [Control measurement], and [Check measurement].
Results	Select the type of results from: [All]: Normal and abnormal results, and barcode misread results [Normal results only]: Normal results only [Include abnormal results]: Normal and abnormal results [Barcode misread]: Barcode misread results only
Range of results	Select how you want to specify a range of results from: [All]: Include all results. [Measurement No.]: Specify a range of results by measurement number. [Port No.]: Specify a range of results by 4-digit port number. [ID]: Specify a specific result by ID.

REFERENCE: For the [Range of results] setting, [Measurement No.] and [Port No.] allow you to specify one or more consecutive results, whereas [ID] allows a single result only.

❷ Press OK.

- When [Range of results] is set to [All], the results are soon output to the printer or external device.
- When another option is selected, go to step **3**.



3 Specify a range of results.

❶ Specify a range of results you want.

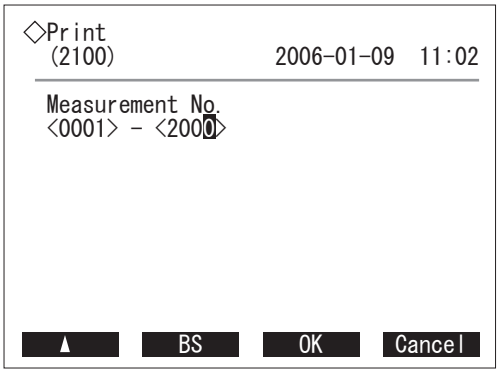
For [Measurement No.]/[Port No.]

- Enter the start number.
- Press ↵ to go to the end number entry field.
- Enter the end number, and go to step ❷.
- Ensure the end number is larger than the start number.

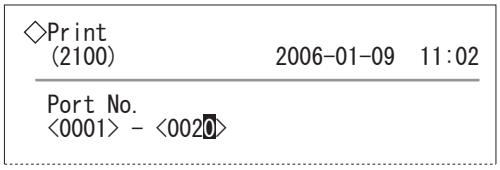
REFERENCE: For example, to enter "0150", press **0**, **1**, **5**, **0** in that order. To correct the entry, press BS to delete digits one by one, and enter a new value.

REFERENCE: For information on 4-digit port numbers used here, see *"REFERENCE"* in *"Rack-port number"* in *"2.1.3 Measurement Terminology"* on page 2-4.

[Measurement No.] setup



[Port No.] setup

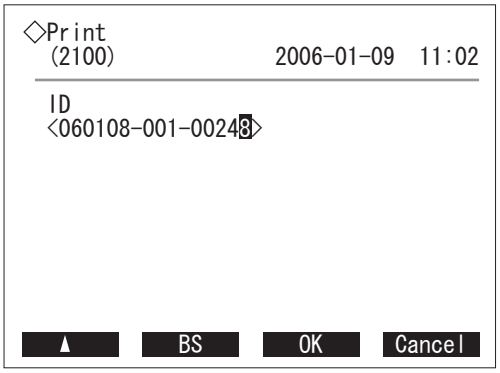


For [ID]

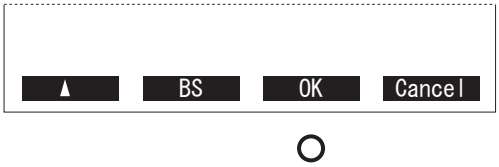
- Enter the ID of the result you want using the alphanumeric keys. An ID can contain up to 18 digits, and can include numbers, alphabet, and special characters (see page 1-45).
- Go to step ❷.
- The ID can also be input by having the optional hand-held barcode reader read a barcode from the labeled sample.

REFERENCE: For detailed instructions, see *"ID"* in *"Entering Alphanumerics"* in *"1.7.3 Menu Operations and Examples"* on page 1-45. To correct the entry, press BS to delete digits one by one, and enter a new value.

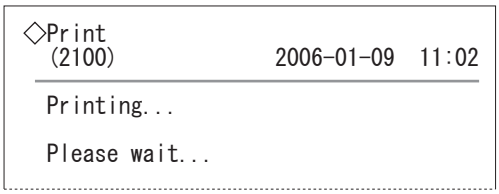
[ID] setup



❷ Press OK .



- The results will be sent to the printer or external device.



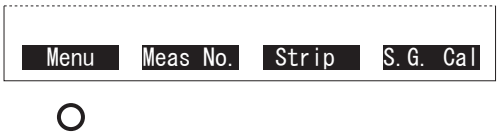
REFERENCE: If “Not found.” is displayed, there is no matching data in memory. Press OK to return to the previous screen.

3.3.2 Reviewing Results/Editing IDs

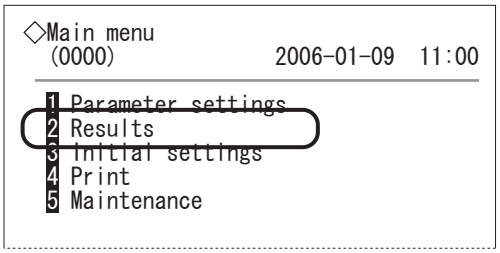
The results stored in memory can be reviewed on the screen. You can view all the results in turn or retrieve only results specified by type of measurement, type of results, and measurement number. The ID edit feature is useful when you have a result with the ID field filled with hyphens (-) due to barcode misreading. You can use the alphanumeric keys or optional hand-held barcode reader to correct the ID.

1 Access the setup screen.

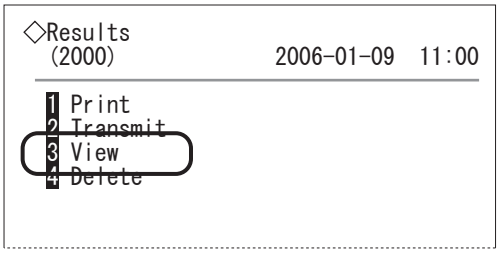
❶ On the standby screen, press Menu to go to the [Main menu] screen.



❷ Press **2** to go to the [Results] screen.



❸ Press **3** to go to the [View] screen.



2 Select the results you want.

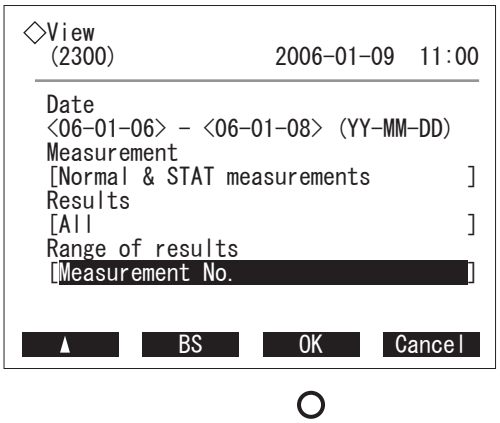
❶ Select the results you want to view.

REFERENCE: For detailed instructions, see step **2** on page 3-9.

❷ Press OK .

- Go to the appropriate step according to the selection below [Results].

[All]: Go to step **4** .
[Measurement No.], [Port No.], or [ID]:
Go to step **3** .



3 Specify a range of results.

❶ Specify the range of results you want.

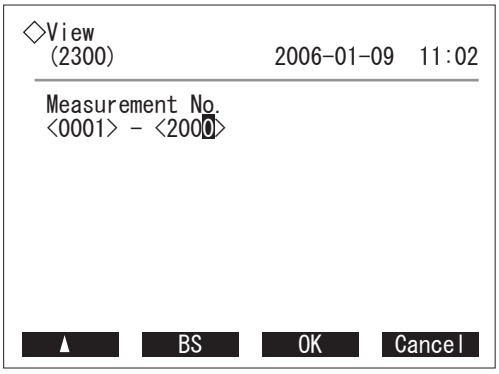
For [Measurement No.]/[Port No.]

- Enter the start number.
- Press ↵ to go to the end number entry field.
- Enter the end number, and go to step ❷.
- Ensure the end number is larger than the start number.

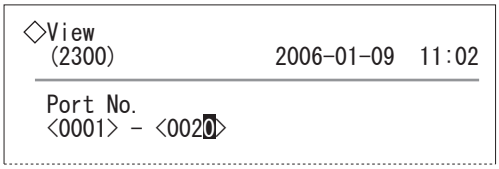
REFERENCE: For example, to enter "0150", press **0**, **1**, **5**, **0** in that order. To correct the entry, press BS to delete digits one by one, and enter a new value.

REFERENCE: For information on 4-digit port numbers used here, see *"REFERENCE"* in *"Rack-port number"* in *"2.1.3 Measurement Terminology"* on page 2-4.

[Measurement No.] setup



[Port No.] setup

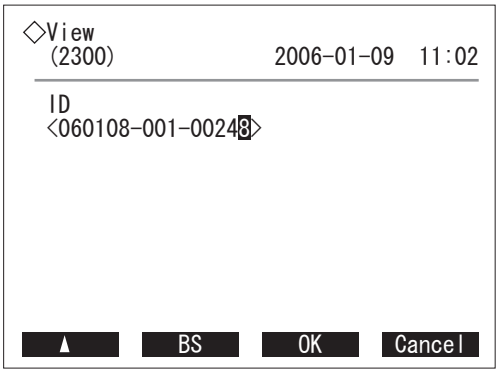


For [ID]

- Enter the ID of the result you want using the alphanumeric keys. An ID can contain up to 18 digits, and can include numbers, alphabet, and special characters (see page 1-45).
- Go to step ❷.
- The ID can also be input by having the optional hand-held barcode reader read a barcode from the labeled sample.

REFERENCE: For detailed instructions, see *"ID"* in *"Entering Alphanumerics"* in *"1.7.3 Menu Operations and Examples"* on page 1-45. To correct the entry, press BS to delete digits one by one, and enter a new value.

[ID] setup



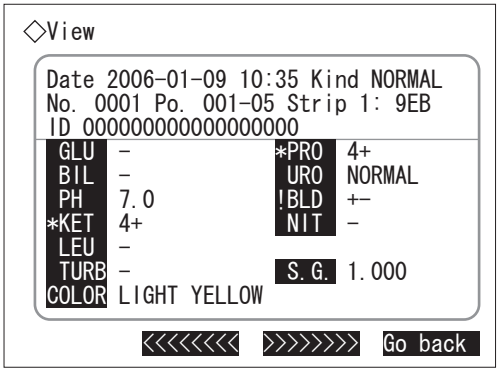
❷ Press OK to display the results.

4 Display the results report.

❶ Display the results on the screen.
- To modify the ID, go to step **5** .

REFERENCE: A results report is displayed for a single sample at a time. To view the previous or next result, press ‹‹‹‹‹‹‹‹ or ›››››››› respectively. Pressing Go back returns to the setup screen.

REFERENCE: For detailed information on the displayed results reports, see *"2.8.1 Displayed Results Report"* on page 2-49.



5 Edit the ID (if necessary).

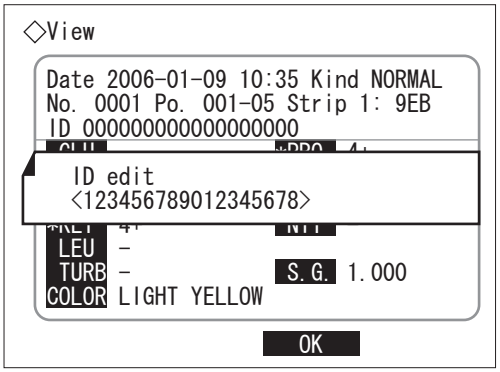
If the ID is filled with hyphens only due to barcode misreading, you can enter a correct number using the alphanumeric keys or optional hand-held barcode reader.

❶ Display the results whose ID you want to modify.

❷ Press the **hyphen** key to open the [ID edit] window.

❸ Enter a correct ID number.
- An ID can contain up to 18 digits, and can include numbers, alphabet, and special characters (see page 1-45).
- The ID can also be input by having the optional hand-held barcode reader read a barcode from a labeled sample.

REFERENCE: For detailed instructions, see *"ID"* in *"Entering Alphanumerics"* in *"1.7.3 Menu Operations and Examples"* on page 1-45. To correct the entry, press BS to delete digits one by one, and enter a new value.



❹ Press OK to save your changes.
- The [ID edit] window will close.

3.3.3 Deleting Results and Trouble Logs from Memory

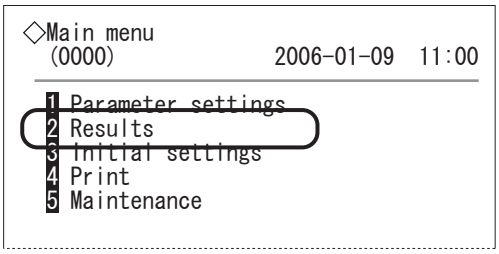
Unwanted results and trouble logs can be deleted from the memory. You can delete all of the results and trouble information at once, or specific types of data only (normal and STAT measurement results, control measurement results, check measurement results, or trouble list).

NOTE: Deleted results and trouble logs can never be recovered.

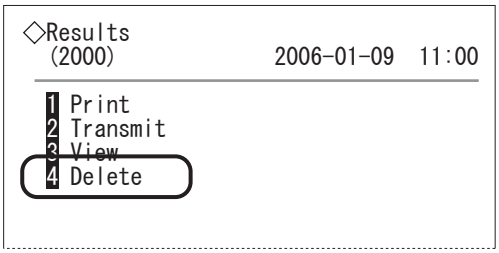
1 Access the setup screen.

❶ On the standby screen, press Menu to go to the [Main menu] screen.

❷ Press **2** to go to the [Results] screen.



❸ Press **4** to go to the [Delete] screen.



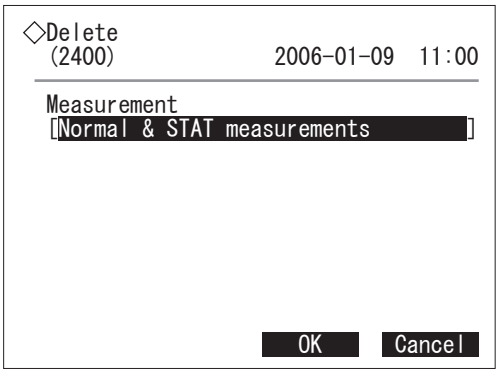
2 Select the type of data you want to delete.

❶ Select the type of data you want to delete, using the **hyphen** key.

- The available options include: [All], [Normal & STAT measurements], [Control measurement], [Check measurement], and [Trouble list].

❷ Press OK .

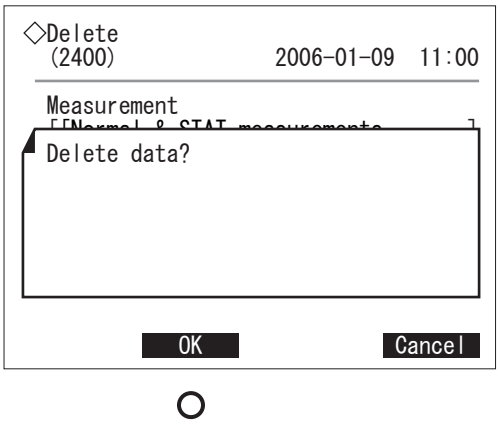
- You will be asked if you want to delete the data.



3 Delete the data.

❶ Press OK to delete the data from memory.
- The [Results] screen will appear again.

❷ Press Go back twice on the [Results] screen to return to the standby screen.



3.4 [Initial settings] Menu

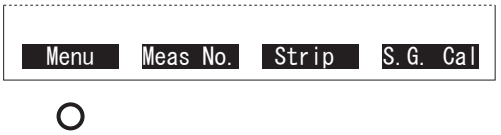
3.4.1 Setting the System Clock

The internal system clock may not keep the right time after initially installing the instrument or a long period of disuse. Set the system clock to the exact time. The date and time that appear on the display and printed reports follow the system clock.

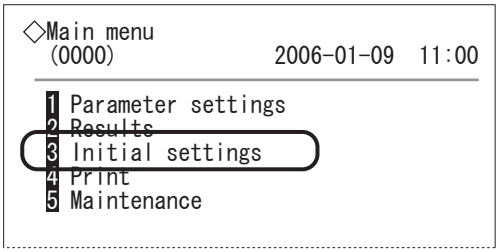
REFERENCE: The instrument supports three date formats: “year-month-day (default)”, “day-month-year”, and “month-day-year”. This section explains the procedure based on the “year-month-day” format. If you are using another format, set a new date accordingly. To have the date format parameter setting changed, contact your distributor.

1 Access the setup screen.

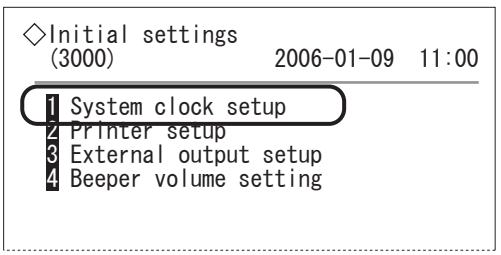
❶ On the standby screen, press Menu to go to the [Main menu] screen.



❷ Press **3** to go to the [Initial settings] screen.



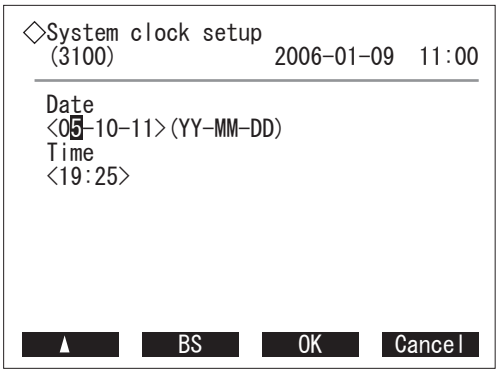
❸ Press **1** to go to the [System clock setup] screen.



2 Adjust the date and time.

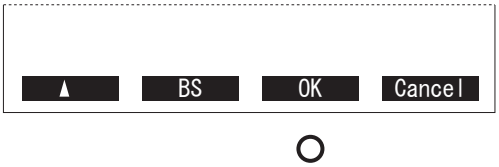
❶ Below [Date], enter the date of today.
- To move through the year, month, and day entry fields, press the **hyphen** key.
- To move down to the [Time] entry field, press ↵.

❷ Below [Time], enter the current time.
- To move between the hour and minute entry fields, press the **hyphen** key.



❸ Press OK to save your changes.
- The [Initial settings] screen will appear again.

NOTE: Keep the power on while saving the settings.



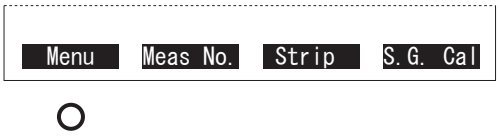
❹ Press Go back twice on the [Initial settings] screen to return to the standby screen.

3.4.2 Enabling/Disabling the Built-in Printer

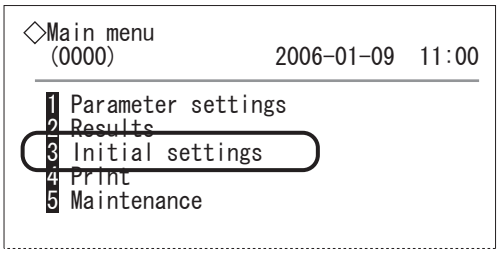
The built-in printer is enabled by default, and can be disabled as needed. Once the printer has been disabled, it does not print any information.

1 Access the setup screen.

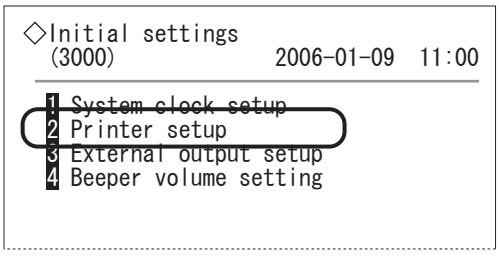
❶ On the standby screen, press Menu to go to the [Main menu] screen.



❷ Press **3** to go to the [Initial settings] screen.



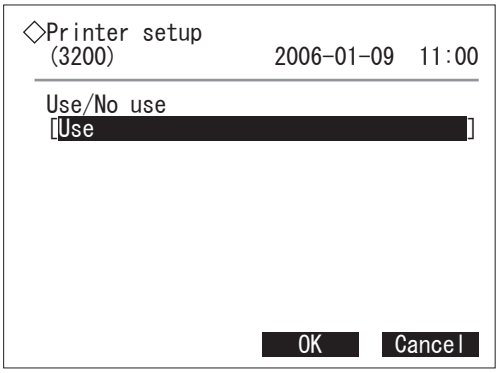
❸ Press **2** to go to the [Printer setup] screen.



2 Enable or disable the printer.

❶ Below [Use/No use], select [Use] or [No use] using the **hyphen** key.

❷ Press OK .
- A message window will open to ask if you want to save the new setting.

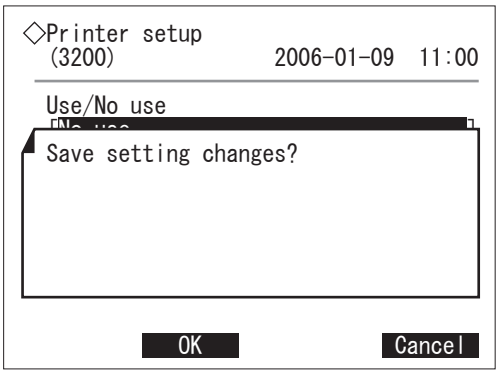


3 Save your setting.

❶ Press OK to save your setting.
- The [Initial settings] screen will appear again.

NOTE: Keep the power on while saving the setting.

❷ Press Go back twice on the [Initial settings] screen to return to the standby screen.



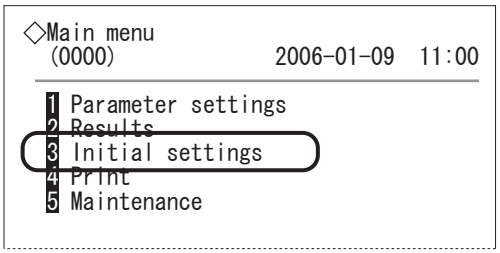
3.4.3 Enabling/Disabling the External Output

The instrument has two data output terminals on the rear panel, which are disabled by default. When you connect external devices to these terminals, change the parameter setting to enable the external output.

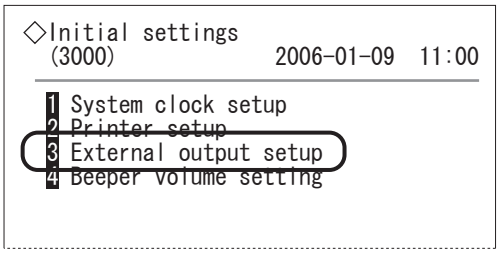
1 Access the setup screen.

❶ On the standby screen, press Menu to go to the [Main menu] screen.

❷ Press **3** to go to the [Initial settings] screen.



❸ Press **3** to go to the [External output setup] screen.

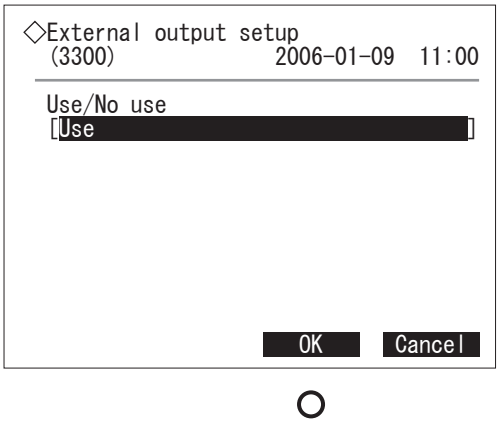


2 Enable or disable the external output.

❶ Below [Use/No use], select [Use] or [No use] using the **hyphen** key.

❷ Press OK .

- A message window will open to ask if you want to save the new setting.

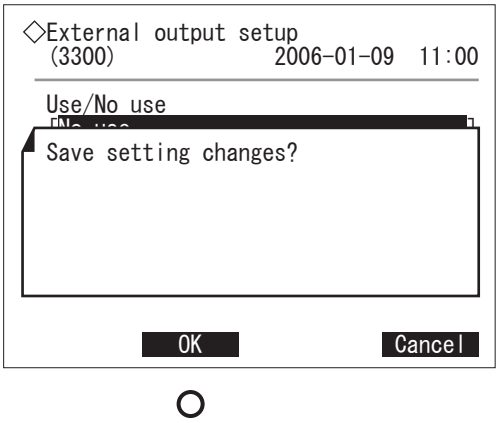


3 Save your setting.

❶ Press OK to save your setting.
- The [Initial settings] screen will appear again.

NOTE: Keep the power on while saving the setting.

❷ Press Go back twice on the [Initial settings] screen to return to the standby screen.

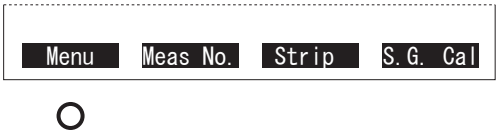


3.4.4 Controlling the Beeper Volume

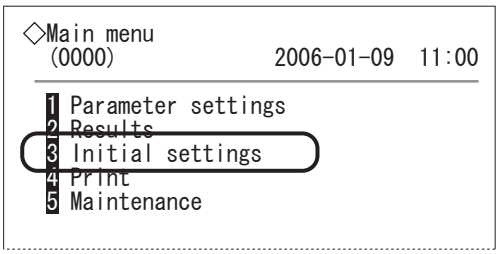
Beeps sound when an error or trouble occurs. The volume of the beeper can be controlled in 10 levels, from 00 (muted) to 09 (max.).

1 Access the setup screen.

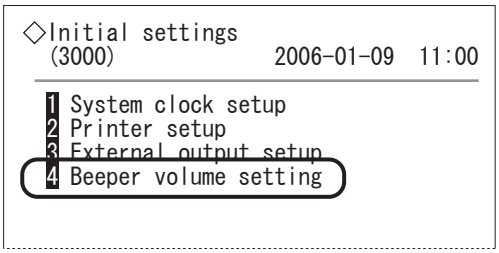
❶ On the standby screen, press Menu to go to the [Main menu] screen.



❷ Press **3** to go to the [Initial settings] screen.



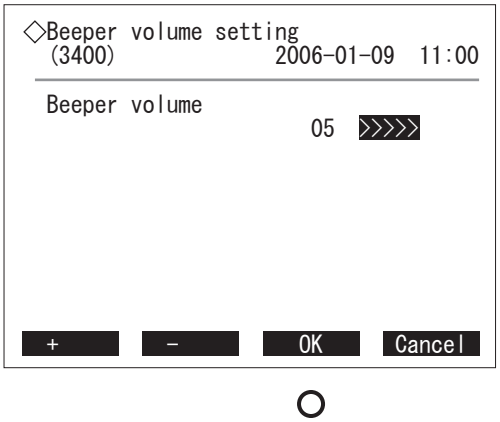
❸ Press **4** to go to the [Beeper volume setting] screen.



2 Select the level of the beeper volume.

❶ Below [Beeper volume], select the level of the beeper volume from 00 to 09.
- Press + to increase the volume level, and press − to lower the level.
- The beeper sounds at the set level each time you press these function keys.
- Selecting “00” mutes the sound.

❷ Press OK .
- A message window will open to ask if you want to save your setting.

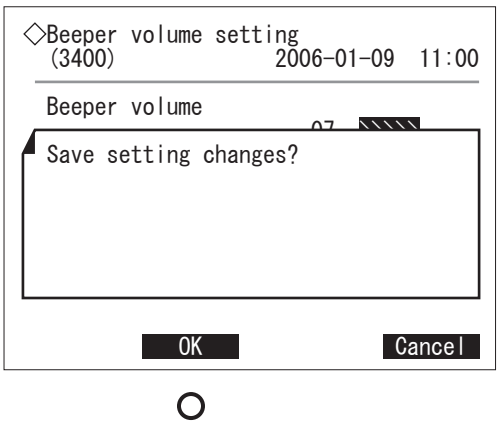


3 Save your setting.

❶ Press OK to save your setting.
- The [Initial settings] screen will appear.

NOTE: Keep the power on while saving the setting.

❷ Press Go back twice on the [Initial settings] screen to return to the standby screen.



3.5 [Print] Menu

You can obtain printed lists of trouble logs, abnormal results, and current parameter settings.

NOTE: The printer does not work if it is disabled by key operations. For more information, see *"3.4.2 Enabling/Disabling the Built-in Printer"* on page 3-18.

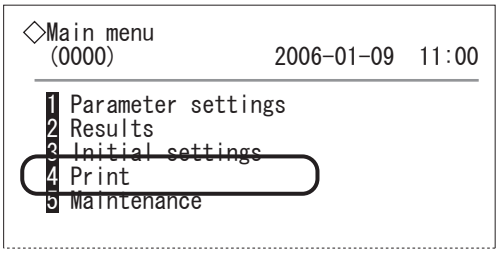
3.5.1 Printing a Trouble List

The *trouble list* is a history of errors and troubles. Up to 100 errors and troubles can be recorded. You can include all logs or those recorded in a specific period of days in the trouble list.

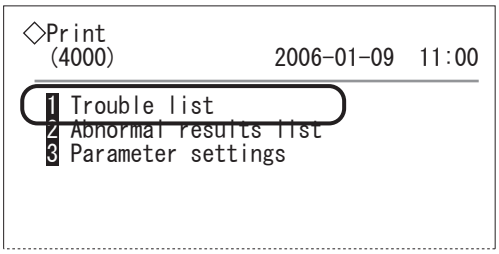
1 Access the setup screen.

❶ On the standby screen, press Menu to go to the [Main menu] screen.

❷ Press **4** to go to the [Print] screen.



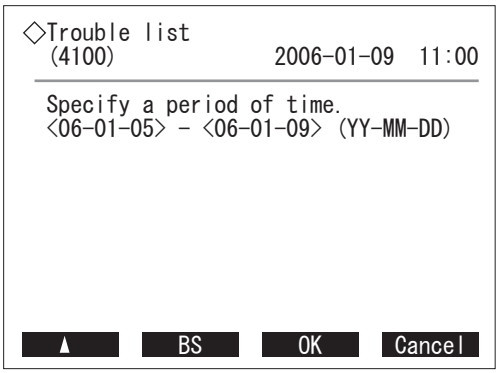
❸ Press **1** to go to the [Trouble list] screen.



2 Specify a range of history.

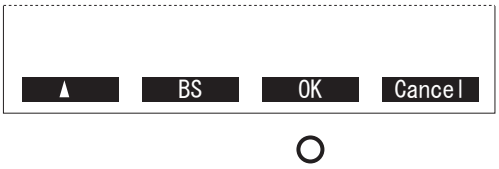
❶ Specify the range of history to print.

- To move through the year, month, and day entry fields, press the **hyphen** key.
- To move from the start date field (left field) to the end date field (right field), press ↵.
- For detailed information on setting dates, see *"Date"* in *"1.7.3 Menu Operations and Examples"* on page 1-44.
- Ensure the end date (right field) is later than the start date (left field).



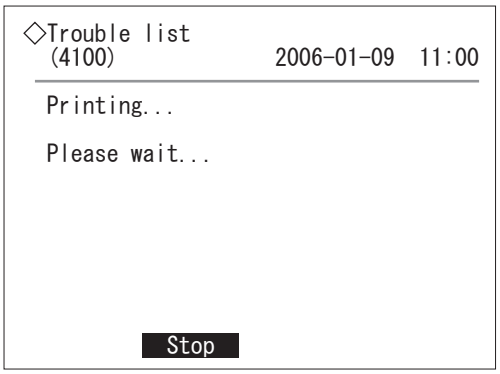
3 Print the trouble list.

❶ Press OK to start printing.



- The trouble list will be printed, starting with the latest log.

  REFERENCE: The message “Not found.” will appear if there is no matching data in memory. Press OK to return to the [Print] screen.



- After the completion of the printout, the [Print] screen will appear again.

❷ Press Go back twice on the [Print] screen to return to the standby screen.

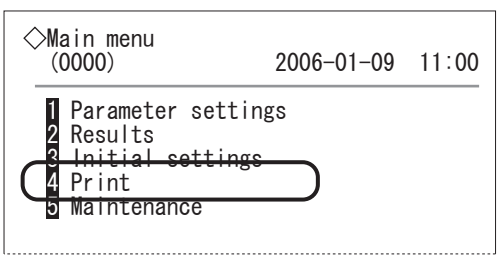
3.5.2 Printing the Abnormal Results List

If you obtain abnormal results, try to print the abnormal results list to determine the causes by the error messages. The abnormal results list includes error information related to measurement results that have recorded after powering-on.

1 Access the setup screen.

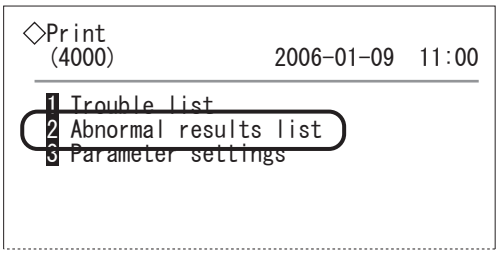
❶ On the standby screen, press Menu to go to the [Main menu] screen.

❷ Press **4** to go to the [Print] screen.

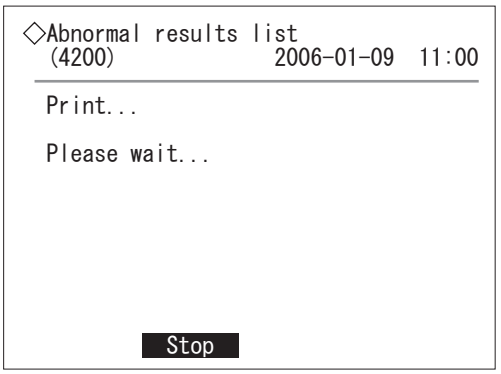


2 Print the abnormal results list.

❶ Press **2** to print the abnormal results list.



REFERENCE: The message “Not found.” will appear if there is no matching data in memory. Press OK to return to the [Print] screen.



- After the completion of the printout, the [Print] screen will appear again.

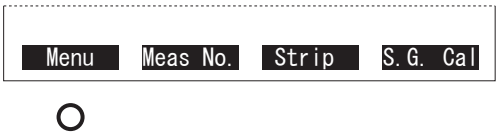
❷ Press Go back twice on the [Print] screen to return to the standby screen.

3.5.3 Printing the Current Parameter Settings

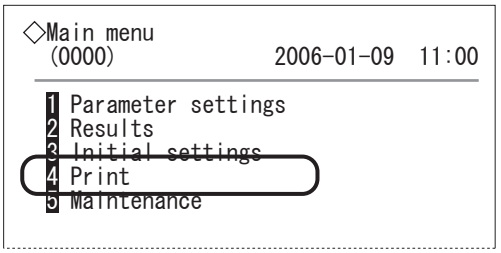
You can obtain a list of parameter settings that includes printer and external output use, beeper volume, and the type of test strips for each feeder.

1 Access the setup screen.

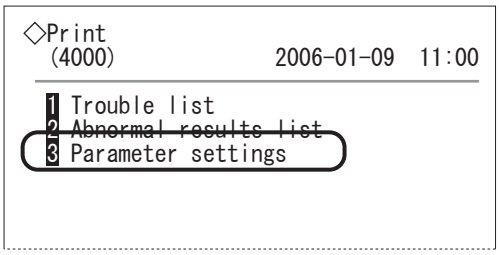
❶ On the standby screen, press Menu to go to the [Main menu] screen.



❷ Press **4** to go to the [Print] screen.

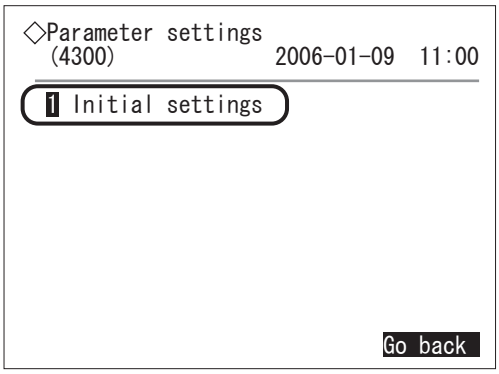


❸ Press **3** to go to the [Parameter settings] screen.

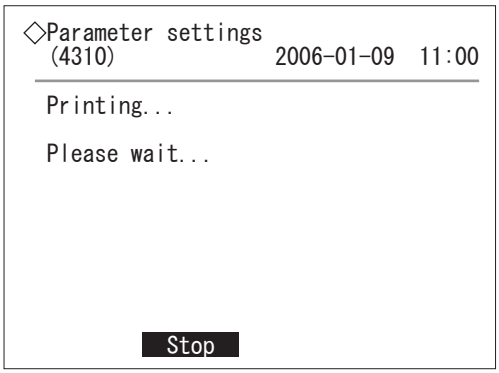


2 Print a list of the parameter settings.

❶ Press **1** to go to the [Initial settings] screen.



- A list of the parameter settings will be printed out.



- After the completion of printing, the [Print] screen will appear again.

❷ Press Go back twice on the [Print] screen to return to the standby screen.

3.6 [Maintenance] Menu

The [Maintenance] menu screen has 4 hardware maintenance options. This section describes the procedure for the [4. Maintenance information] option only. For instructions for other options, see the respective pages in chapters 2 and 4.

Options	Descriptions	See page(s)
1. S.G. cell washout	Washes the S.G. cell.	4-24
2. Clean washing bath and tray	Moves the mechanical parts to make enough room to access the washing bath and transport tray.	4-19 4-26
3. Check measurement	Measures a check strip to examine the instrument.	2-43
4. Maintenance information	Allows you to view a list of dates when maintenance tasks were last performed (S.G. calibration, S.G. cell washout, washing bath/tray cleaning, and check measurement).	This page

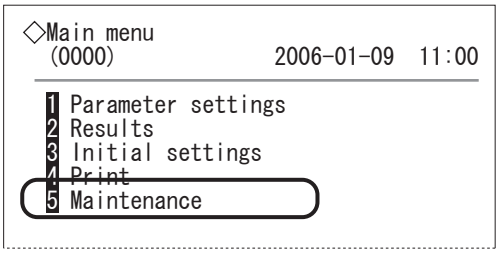
3.6.1 Viewing Maintenance Information

You can view a list of dates when maintenance tasks were last performed. These tasks include S.G. calibration, S.G. cell washout, washing bath and transport tray cleaning, and check measurement.

1 Access the setup screen.

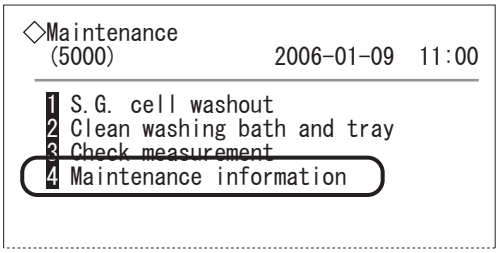
❶ On the standby screen, press Menu to go to the [Main menu] screen.

❷ Press **5** to go to the [Maintenance] screen.

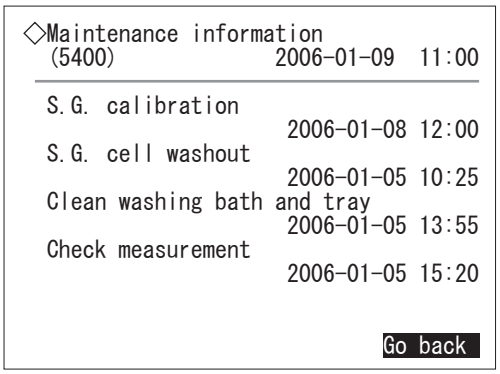


2 Display the maintenance information.

❶ Press **4** to go to the [Maintenance information] screen.



- The [Maintenance information] screen will appear, listing the last date that maintenance tasks were performed.



❷ Press Go back three times on the [Maintenance information] screen to return to the standby screen.

Chapter 4 Maintenance

4.1 Frequency of Maintenance

The following table lists the maintenance tasks required at directed intervals.

Wear protective gloves to prevent exposure to pathogenic microbes when performing maintenance tasks marked with a checkmark (✓).

Discard liquid waste, used parts, and cleaning tools in accordance with local regulations for biohazardous waste.

Alcohol is sometimes used to clean the instrument. Alcohol is readily combustible, therefore handle it carefully and keep away from flames, electrical sparks and sources of heat. Also, ventilate the room sufficiently during use.

	Maintenance task	Cycle	See page(s)
✓	Waste box cleaning	Every day or before reaching 400 measurements	4-3
✓	Liquid waste disposal (drain bottle)	Every day or before reaching 600 measurements	4-5
	Feeder cleaning	Every three days	4-6
	Test strip stopper cleaning	Every three days	4-8
✓	Introduction tray washout	Every three days	4-12
	Washing solution replacement	Every 600 measurements	4-15
	Thermal printer paper replacement	If red lines appear at both edges of the paper	4-17
	Air filter washout	Every month	4-18
✓	Transport tray washout	Every week	4-19
	S.G. cell washout	Every week	4-24
✓	Washing bath washout	Every month	4-26
	Washing solution filter replacement	Every month	4-29
✓	Drain pinch valve tube replacement	If drainage is leaking from the pinch valve tube (e.g. “T280”)	4-30
	White plate replacement	If warning “W007” occurs	4-32

4.2 Daily Maintenance

4.2.1 Cleaning the Waste Box

Before starting the first batch of tests for the day, discard used test strips from the waste box and sterilize the box. The waste box can contain about 400 test strips. So, discard the test strips before the measurement count reaches 400. Disinfection is required each time the box is emptied out. If warning “W004” occurs due to the waste box reaching capacity, dispose of the test strips immediately.

Prepare: Alcohol, cloth, and protective gloves

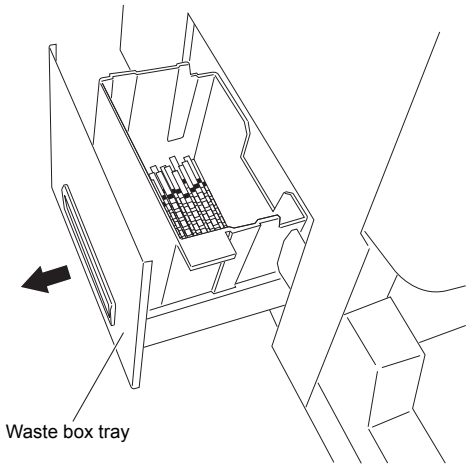
Wear protective gloves to prevent exposure to pathogenic microbes.

Discard used test strips and protective gloves in accordance with local regulations for biohazardous waste.

1 Discard used test strips from the waste box.

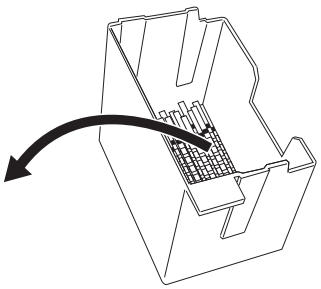
❶ Make sure the standby screen is displayed.

❷ Pull out the waste box tray located on the left panel of the instrument.



❸ Take the waste box out of the waste box tray.

❹ Discard used test strips from the box.

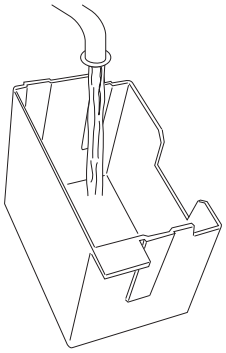


2 Sterilize the waste box.

❶ Sterilize the waste box with alcohol.

❷ Rinse the box with water to remove dirt.

❸ Wipe water off the surface.

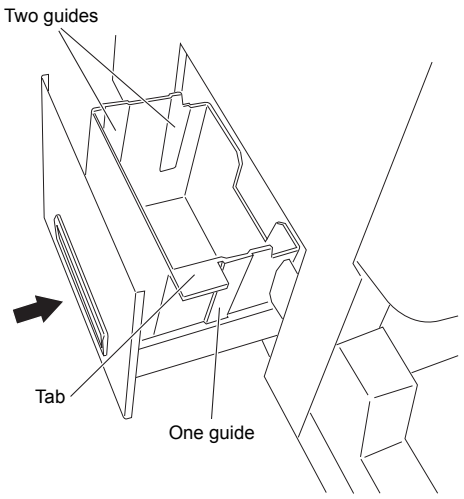


3 Install the waste box.

❶ Hold the waste box tab facing forward, and place the box on the waste box tray.
- Ensure the waste box guides fit the concaves inside the tray

❷ Store the waste box tray in the instrument.
- If the waste box is correctly set in the tray, it is held steadily by the magnets.
- If the waste box gets caught halfway, it is set incorrectly.

NOTE: Ensure the waste box correctly fits into the tray before pushing it in. Incorrect installation may cause used test strips to be scattered around inside the instrument or to clog the test strip path.



4.2.2 Discarding Liquid Waste from the Drain Bottle

Liquid waste discharged from the instrument flows out to the external drain bottle. Discard the liquid waste to empty the bottle before starting the first batch of tests every day. The drain bottle can contain as much liquid as an amount discharged by about 600 measurements. Check the drain bottle at times and discard liquid waste before the bottle becomes full.

Prepare: Alcohol and protective gloves

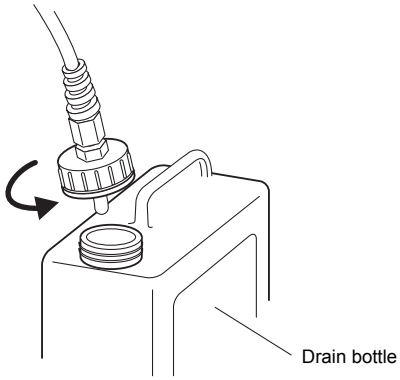
Wear protective gloves to prevent exposure to pathogenic microbes.

Discard liquid waste and protective gloves in accordance with local regulations for biohazardous waste.

1 Discard liquid waste.

❶ Make sure the standby screen is displayed.

Do not try to discard liquid waste while the instrument is mechanically working (e.g., measuring samples). Uncapping the drain bottle in operation may splash the liquid from the tube, causing exposure to pathogenic microbes.



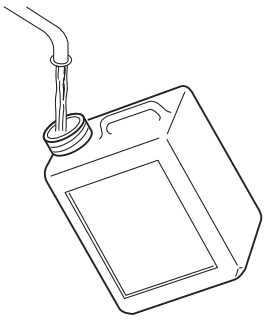
❷ Uncap the drain bottle.

❸ Discard liquid waste from the bottle.

2 Sterilize the drain bottle.

❶ Sterilize the drain bottle with alcohol.

❷ Rinse the bottle with water to remove dirt.



3 Install the drain bottle.

❶ Cap the drain bottle, and place it where it was.

4.2.3 Cleaning the Feeders

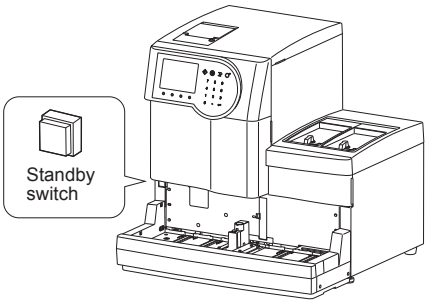
Particles from the test strips can accumulate inside the feeders. This may cause the roller slot to clog or soil the reagent pad area of the test strips, whereby producing incorrect measurement results. Clean the feeders every three days.

Prepare: Supplied blower brush, tissue paper, and protective gloves

IMPORTANT: Wear protective gloves when taking the test strips out of the feeders. Do not touch the pad area on the test strips with unprotected hands. Test strips contaminated with sebum may produce incorrect results.

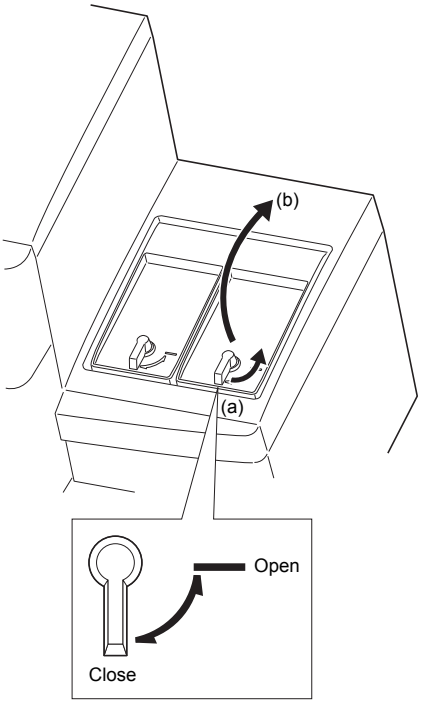
1 Turn off the power.

❶ Make sure the standby screen is displayed, then press the standby switch to turn off the power.



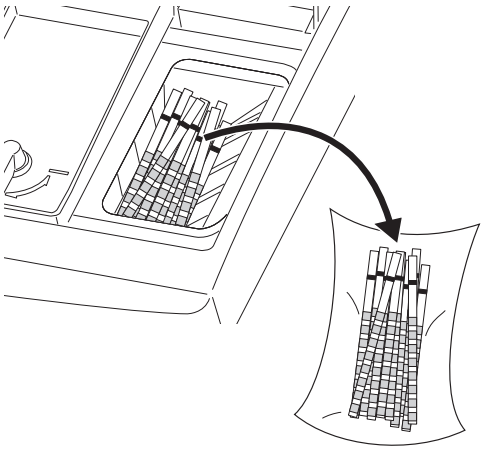
2 Take the test strips out of the feeder.

❶ Turn the locking lever (a) to unlock the feeder cover, and open the cover (b).



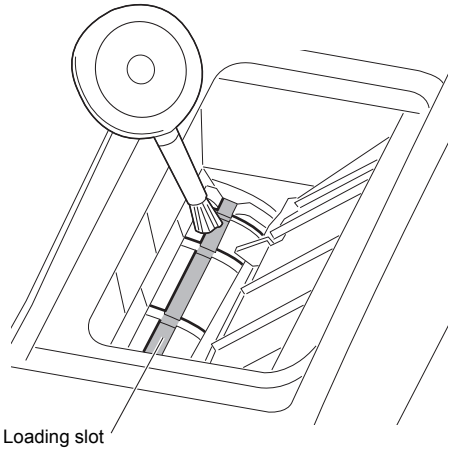
❷ Wearing protective gloves, grasp the test strips in the feeder, and take them out.

❸ Wrap the test strips with tissue paper to protect the strips from dust.



3 Clean inside of the feeder.

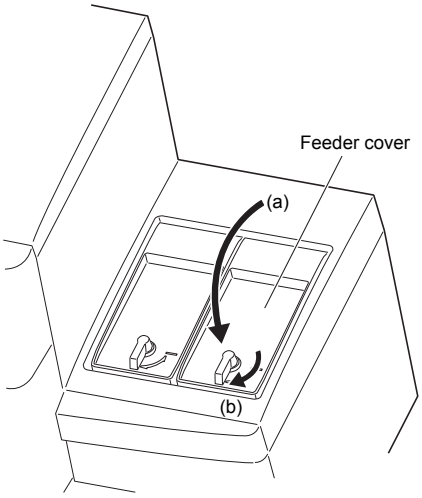
❶ Blow dust off the roller using the blower brush.
- Carefully remove dust as much as possible from the loading slot shown in the right figure.
- Rotating the roller by hand, clean the internal surfaces entirely.



❷ Load the test strips that were taken out in step **2** - ❷ back into the feeder.

❸ Close the feeder cover (a). Turn the locking lever to lock the cover (b).

❹ Clean the other feeder using the same procedure.



4.2.4 Cleaning the Test Strip Stopper

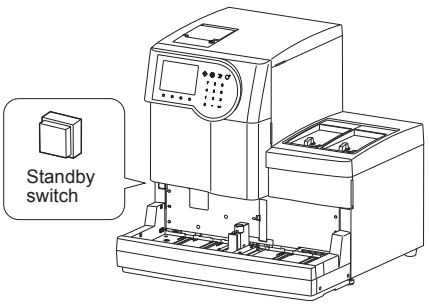
Particles from the test strips can accumulate on the test strip stopper located at the bottom of the feeders. This may cause running test strips to clog the stopper, consequently leading the measurement operation to stop with a trouble alert. Clean the test strip stopper every three days along with the feeders.

Prepare: Supplied blower brush, tissue paper, and protective gloves

IMPORTANT: Wear protective gloves when taking the test strips out of the feeders. Do not touch the pad area on the test strips with unprotected hands. Test strips contaminated with sebum may produce incorrect results.

1 Turn off the power.

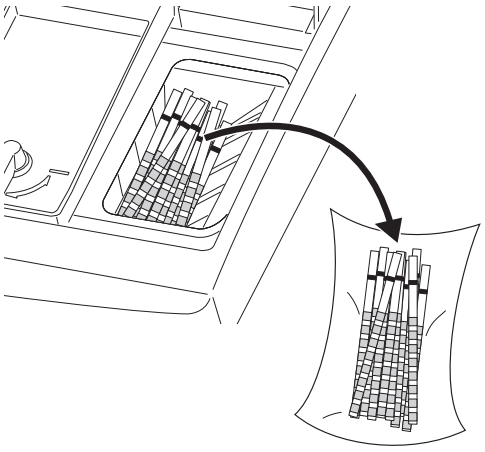
❶ Make sure the standby screen is displayed, then press the standby switch to turn off the power.



2 Take the test strips out of the feeder.

❶ Wearing protective gloves, grasp the test strips in the feeder, and take them out.
- For detailed instructions, see step 2 on page 4-6.

❷ Wrap the test strips with tissue paper to protect the strips from dust.



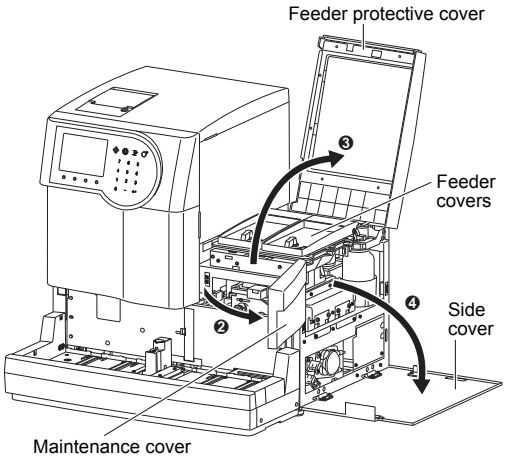
3 Open the covers.

❶ Make sure both feeder covers are locked.

❷ Open the maintenance cover.

❸ Open the feeder protective cover.
- The cover stops at a 120° angle.
- This cover can be removed from the instrument by unhooking the hinge.

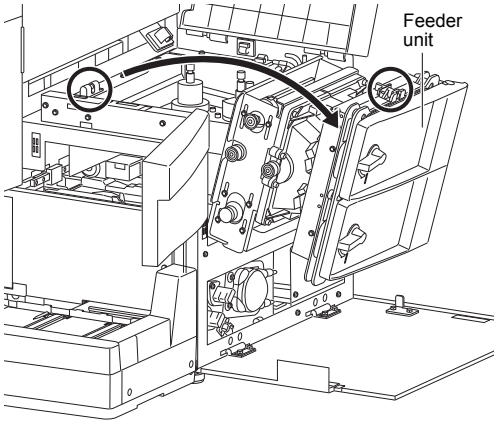
❹ Open the side cover.



4 Tilt the feeder unit down to the right.

❶ Tilt the feeder unit to the right.
- The feeder unit is locked with the latch shown with the circles in the figure. So, first you need to pull the whole feeder unit to the right with a little force to open the latch.

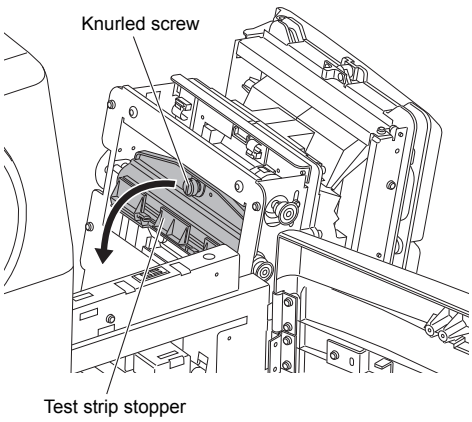
NOTE: Do not apply excessive pressure to the feeder unit when in the tilted position, as this may cause damage to the instrument.



5 Clean the test strip stopper and roller.

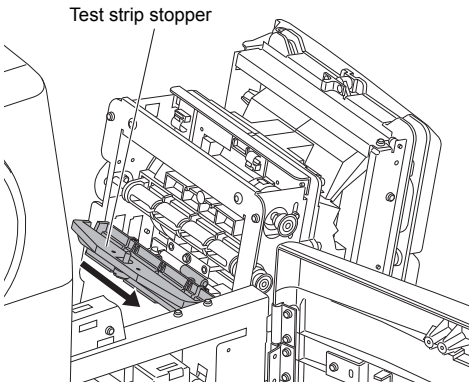
❶ Loosen the knurled screw on the test strip stopper.

❷ Tilt the test strip stopper forward.

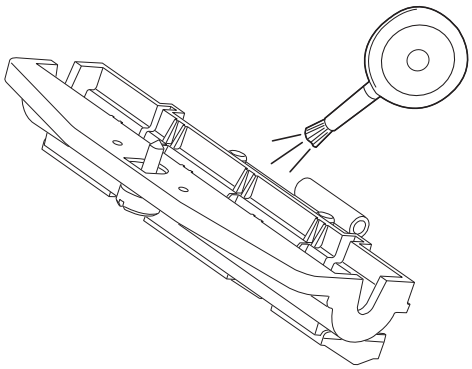


❸ Slide the stopper in the direction of the arrow to remove it from the feeder unit.

NOTE: Be careful not to touch the nozzle while accessing the test strip stopper and roller.

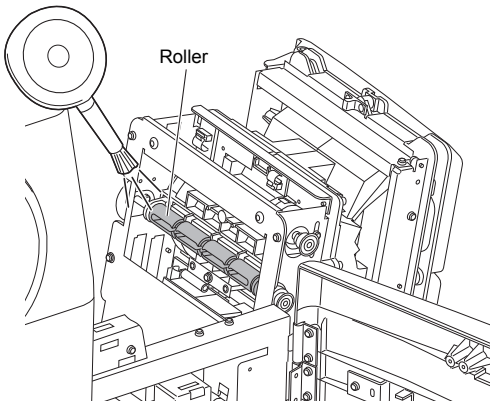


❹ Blow dust off the stopper using the blower brush.



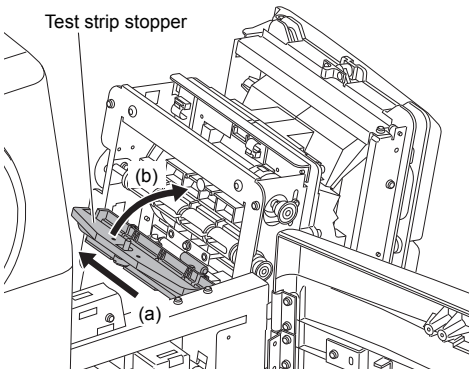
❺ Blow dust off the roller using the blower brush.

NOTE: The shaded area ▭ in the right figure attracts particles from the test strips. Blow the dust off using the blower brush.

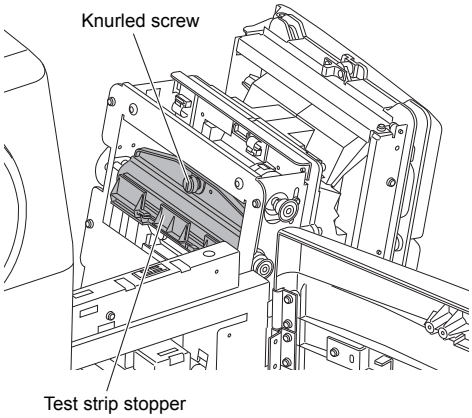


❻ Insert the test strip stopper in the direction of the arrow to attach it to the feeder unit (a).

❼ Close the stopper (b).

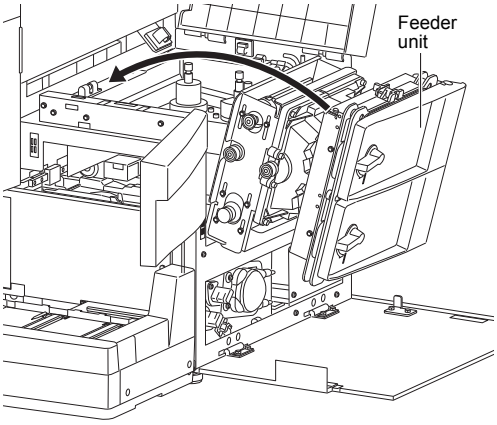


❽ Tighten the knurled screw to lock the test strip stopper.

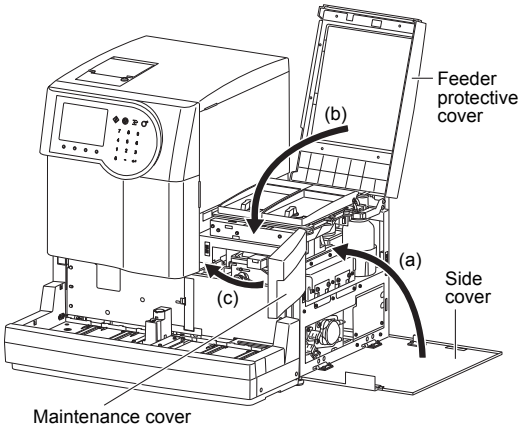


6 Close the cover.

❶ Stand the feeder unit straight up.
- Once the feeder is standing up straight, press the feeder downward until the latch clicks and the unit locks in place.



❷ Close the side cover (a), feeder protective cover (b), and maintenance cover (c) in that order.



4.2.5 Washing the Introduction Tray

Particles from the test strips can accumulate on the introduction tray inside the instrument. Wash and sterilize the tray thoroughly every three days. This maintenance task can also be done in the course of transport tray cleaning that should be performed once in a week. For instructions on cleaning the transport tray at the same time as the introduction tray, see *"4.4.2 Washing the Transport Tray"* on page 4-19.

Prepare: Alcohol, cloth, and protective gloves, and sponge (soft enough to avoid scratching the tray)

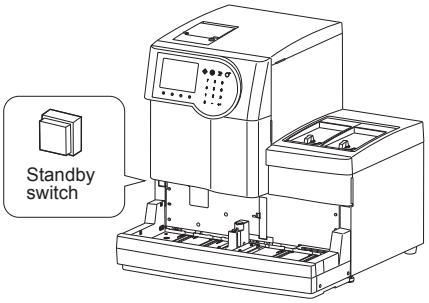
Wear protective gloves to prevent exposure to pathogenic microbes.

Discard used cleaning tools and protective gloves in accordance with local regulations for biohazardous waste.

NOTE: Do not use thinner or other organic solvents to wash the introduction trays. Do not subject the tray to ultrasonic cleaning. Inappropriate cleaning may deform or discolor the tray, possibly making it unusable.

1 Turn off the power.

❶ Make sure the standby screen is displayed, then press the standby switch to turn off the power.



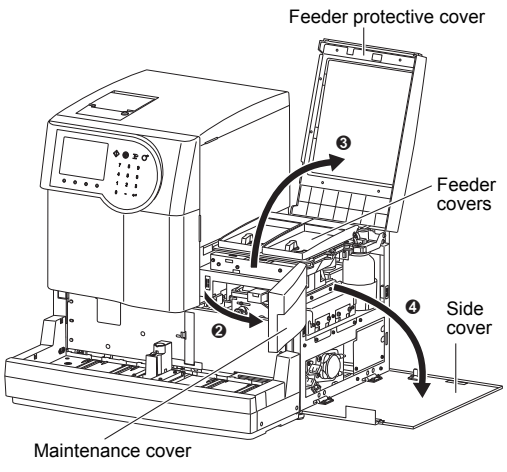
2 Open the covers.

❶ Make sure both feeder covers are locked.

❷ Open the maintenance cover.

❸ Open the feeder protective cover.
- The cover stops at a 120° angle.
- This cover can be removed from the instrument by unhooking the hinge.

❹ Open the side cover.

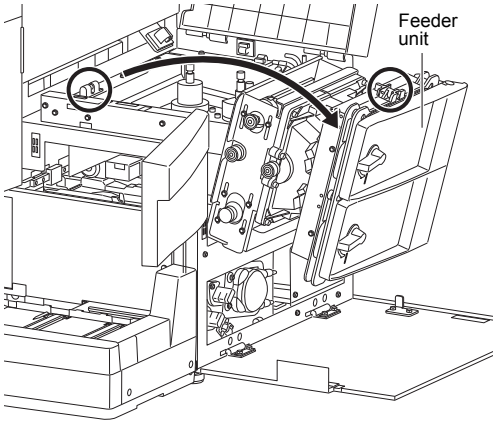


3 Tilt the feeder unit down to the right.

❶ Tilt the feeder unit to the right.

- The feeder unit is locked with the latch shown with the circles in the figure. So, first you need to pull the whole feeder unit to the right with a little force to open the latch.

NOTE: Do not apply excessive pressure to the feeder unit when in the tilted position, as this may cause damage to the instrument.



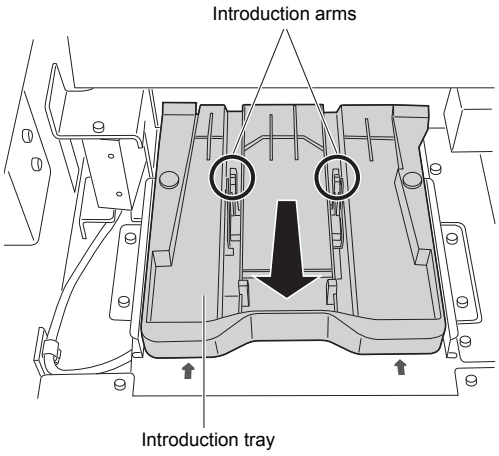
4 Remove the introduction tray.

❶ Pull out the introduction tray about 20 mm in the direction of the arrow along the introduction arms.

❷ Taking care not to hit the tray against the arms, lift the introduction tray up at an angle and remove the tray.

NOTE: Avoid strong impact to the introduction arms while removing the introduction tray. These arms are made of fragile materials.

NOTE: Be careful not to touch the nozzle while removing the introduction tray.



5 Wash and sterilize the introduction tray.

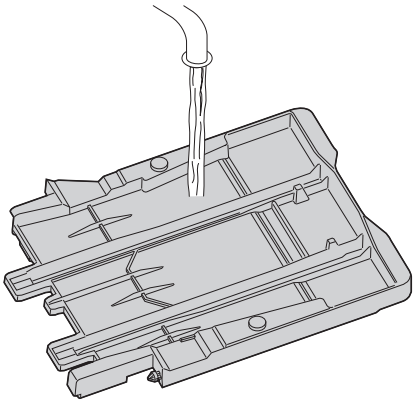
❶ Sterilize the introduction tray with alcohol.

❷ Rinse the tray using a sponge to thoroughly remove dirt.

NOTE: Do not use hot water to rinse the tray, as it may deform the tray.

NOTE: Protect the tray from scratches, which may prevent smooth transportation of test strips.

NOTE: Some portions of the tray attract more dirt than others. Rinse the tray thoroughly until the whole tray is visually clean.



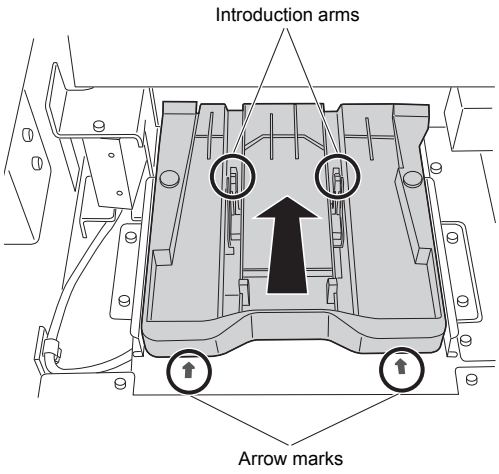
❸ Use a cloth to wipe water off the tray, and allow it to dry.

6 Install the introduction tray.

❶ Insert the introduction tray along the introduction arms in the grooves until the tray is sitting flat.

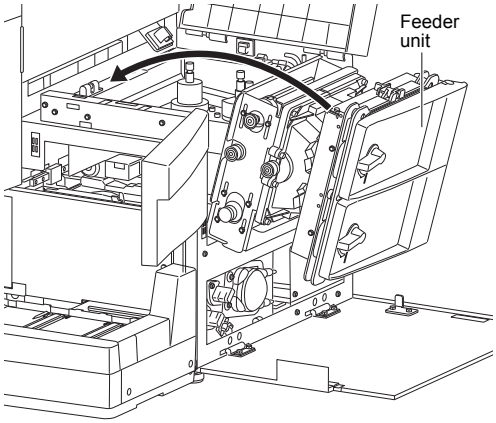
❷ Slide the tray backward until the arrow marks are completely visible.
- Push the tray until you feel some resistance and hear a click.

NOTE: Be careful not to hit the introduction arms while installing the tray.

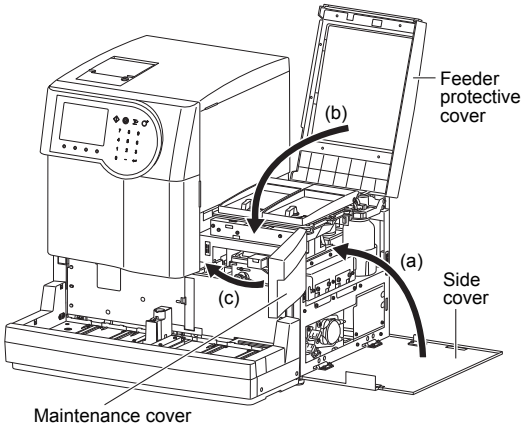


7 Close the covers.

❶ Stand the feeder unit straight up.
- Once the feeder is standing up straight, press the feeder downward until the latch clicks and the unit locks in place.



❷ Close the side cover (a), feeder protective cover (b), and maintenance cover (c) in that order.



4.3 Replacement of Consumables

4.3.1 Replacing the Washing Solution

When the instrument is getting low on washing solution, discard the remaining solution and refill the bottle with newly prepared solution. A maximum of about 600 measurements can be made with 2 L of washing solution. If warning “W003” occurs due to low washing solution, replace the solution immediately.

Prepare: Concentrated washing solution 3 (for AUTION MAX), purified water, and sealing film

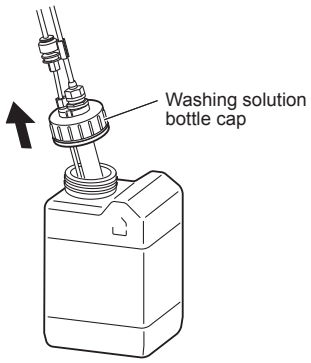
NOTE: Do not try to replace the washing solution while the instrument is running. Replacement while in operation may produce incorrect measurement results or even cause trouble.

1 Remove the washing solution bottle.

❶ Make sure the standby screen is displayed.

❷ Uncap the washing solution bottle, and discard the remaining solution.

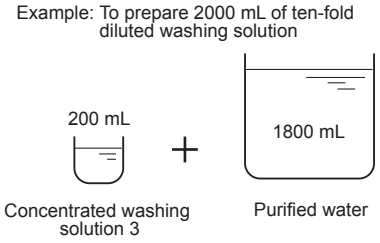
❸ Rinse the bottle with purified water to wash out old solution.



2 Prepare new washing solution.

❶ Dilute concentrated washing solution 3 with purified water.

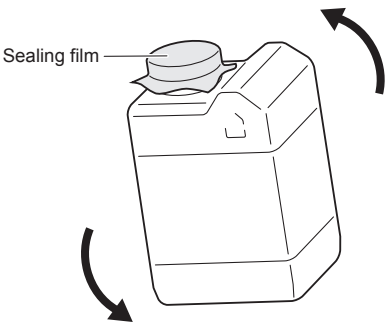
NOTE: Check the correct dilution rate on the bottle label of the concentrated washing solution 3.



❷ Pour the diluted washing solution into the washing solution bottle.

❸ Seal the bottle with a piece of sealing film.

❹ While holding the film in your hand, gently invert the bottle so as not to froth the solution.



3 Install the washing solution bottle.

❶ Remove the sealing film from the washing solution bottle.

❷ Cap the bottle and place it where it was.

4.3.2 Replacing the Thermal Printer Paper

Red lines appear along both edges of the thermal printer paper when the paper is near the end of the roll. Replace the paper roll as soon as possible. If warning "W009" occurs because of a paper shortage, immediately load a new paper roll.

Prepare: Thermal printer paper

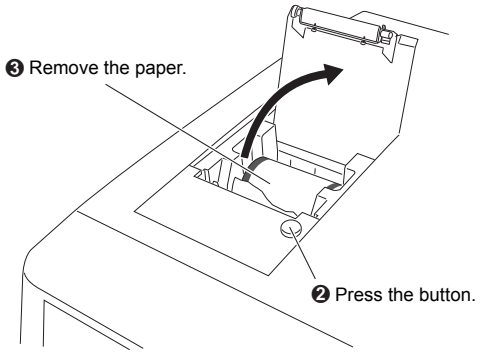
NOTE: Keep your hands away from the printer head to avoid damage to the printer.

1 Take the old paper roll out of the printer.

❶ Make sure the standby screen is displayed.

❷ Press the printer cover button to open the cover.

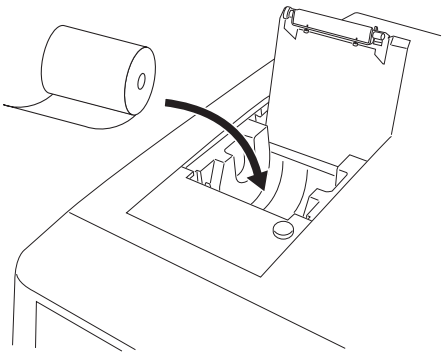
❸ Take the old paper roll from the printer.



2 Load a new paper roll.

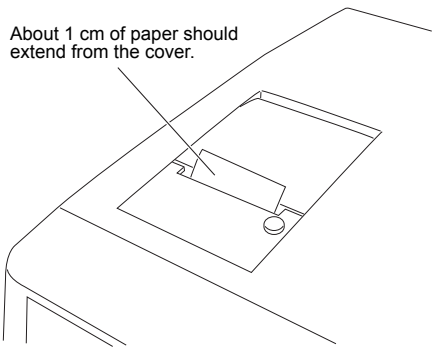
❶ Orient a new paper roll so the paper can unroll from the bottom, and place it in the paper compartment.

❷ Pull out about 1 cm of paper from the printer cover when it closes.



❸ Gently press the printer cover to close it.

REFERENCE: Paper extended from the cover can be cut at the paper cut slot. To advance the paper, press ↻ on the operator panel.



4.4 Regular Maintenance

4.4.1 Washing the Air Filter

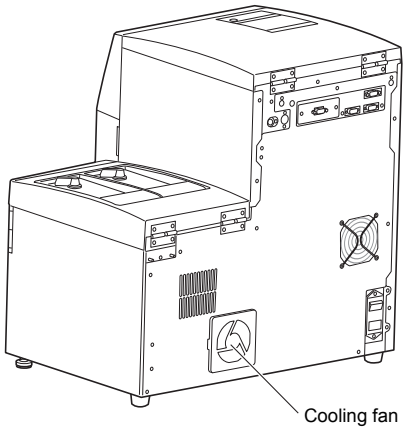
The cooling fan of the instrument has an air filter that protects the internal mechanism from dust. Accumulation of dust in the filter results in decreased cooling efficiency.
Wash the filter once a month.

1 Turn off the power.

❶ Make sure the standby screen is displayed, then press the standby switch to turn off the power.

❷ Wait until the cooling fan comes to a complete stop.

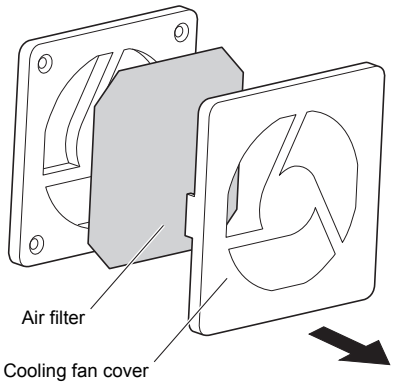
Make sure the cooling fan stops completely before proceeding to the next step. Failure to do so may result in injury.



2 Remove the air filter.

❶ Pull the cooling fan cover toward you and remove it.

❷ Remove the air filter.



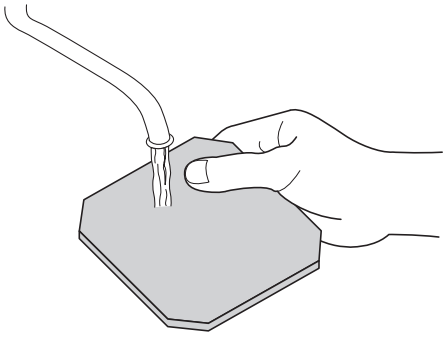
3 Wash the air filter.

❶ Wash the filter thoroughly under running tap water to remove accumulated dust.

❷ Gently wring out the filter to remove water. Dry the filter well.

❸ Attach the air filter and cooling fan cover in their original positions.

NOTE: Replace the air filter if it becomes damaged or stains remain even after washing.



4.4.2 Washing the Transport Tray

Particles from the test strips can accumulate and sample residue can crystallize on the transport tray as more urine tests are run. This may hinder smooth transportation of the test strips. Wash and sterilize the tray once a week to keep it clean. Introduction tray cleaning can also be done in the course of the following procedure.

Prepare: Alcohol, cloth, and protective gloves

Wear protective gloves to prevent exposure to pathogenic microbes.

Discard used cleaning tools and protective gloves in accordance with local regulations for biohazardous waste.

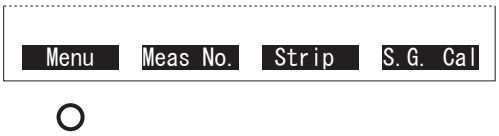
IMPORTANT: Observe the instructions in this section when washing the transport tray. Improper procedures may misalign the tray from the designated position. This may hinder smooth transportation of the test strips, consequently producing incorrect results.

NOTE: Do not use thinner or other organic solvents to wash the transport and introduction trays. Do not subject the trays to ultrasonic cleaning. Inappropriate cleaning may deform or discolor the trays, possibly making it unusable.

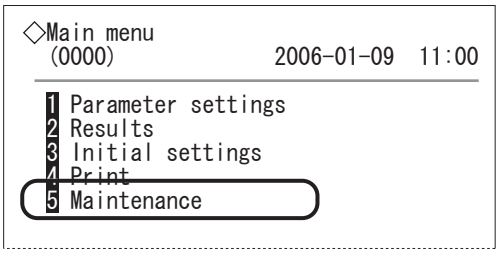
1 Move the nozzle.

Move the nozzle before performing the cleaning procedures.

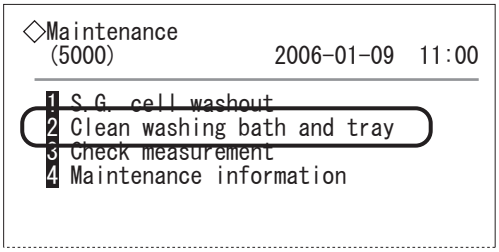
❶ On the standby screen, press Menu to go to the [Main menu] screen.



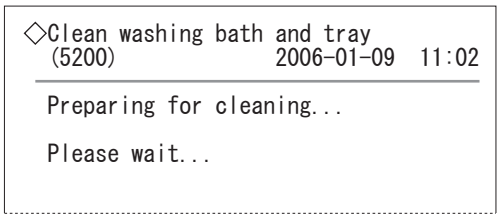
❷ Press **5** to go to the [Maintenance] screen.



❸ Press **2** to go to the [Clean washing bath and tray] screen.

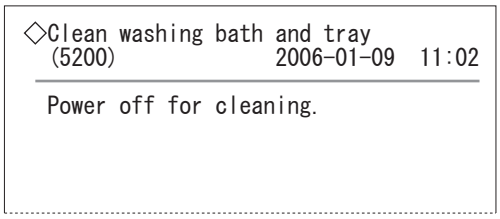


• The nozzle will move to the designated position.

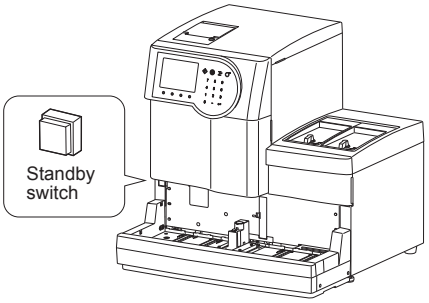


2 Turn off the power.

❶ Turn off the power when prompted.



REFERENCE: Trouble “T290” occurs if you open the cover without turning off the power.

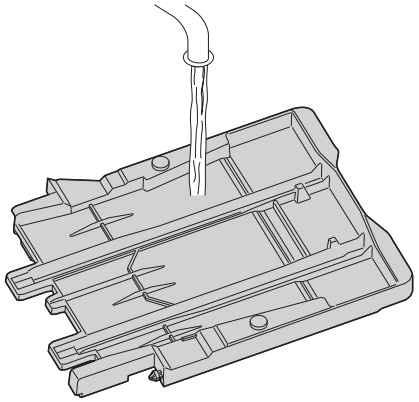


3 Wash and sterilize the introduction tray.

❶ Take the introduction tray out of the instrument and sterilize it.

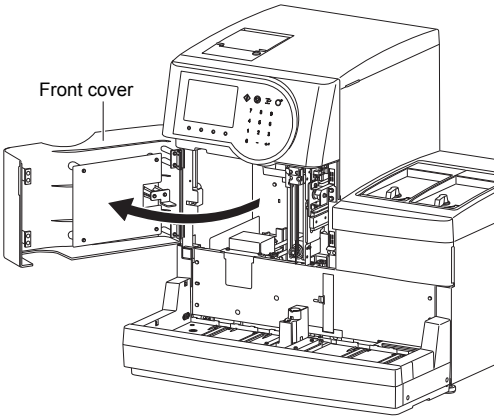
• See steps **2** to **5** in *“4.2.5 Washing the Introduction Tray”* on page 4-12.

NOTE: The introduction and transport trays are similar in shape. It is recommended to wash the introduction tray first and keep it in another place. When washing the two trays at the same time, handle the trays with care not to confuse them.



4 Open the front cover.

❶ Open the front cover to make the transportation section accessible.



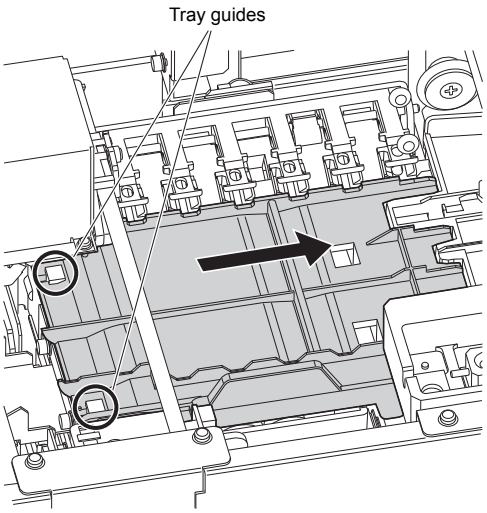
5 Take the transport tray out of the instrument.

❶ Slightly slide the transport tray to the right to unlock the tray guide.

❷ Slide the tray further to the right.

❸ Taking care not to hit the tray against the surrounding components, pull the tray forward and out of the instrument.

NOTE: Be careful not to touch the nozzle when removing the transport tray.



6 Wash and sterilize the transport tray.

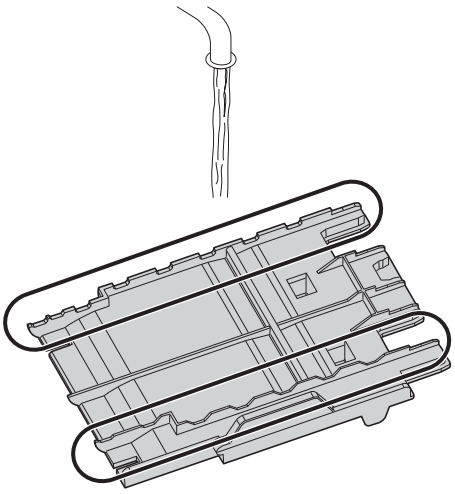
❶ Sterilize the introduction tray with alcohol.

❷ Rinse the tray using running water to thoroughly remove dirt.

NOTE: Do not use hot water to rinse the tray so as to avoid deformation.

NOTE: Protect the tray from scratches, which may prevent smooth transportation of test strips.

NOTE: The portions circled in the figure attract more dirt than others. Rinse the tray thoroughly until the whole tray is visually clean.



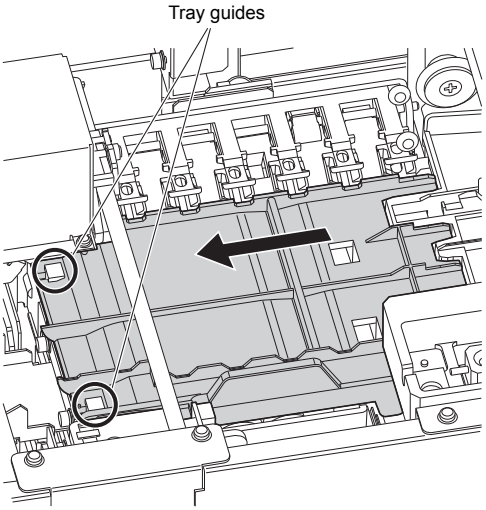
❸ Wipe water off the tray with a cloth, and allow it to dry.

7 Install the transport tray.

❶ Place the transport tray horizontally inside the instrument.

❷ Insert the two tray guides into the slots at the left part of the tray, and slide the tray to the left.
- Press the tray until the tray is locked to the tray guides and a click is heard.

NOTE: Keep the tray horizontally while installing it. Do not insert the tray at a slant.

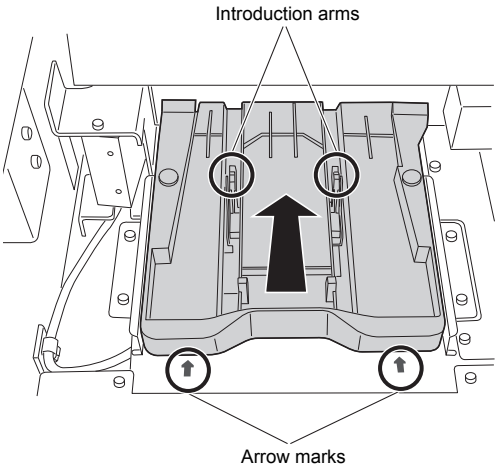


8 Install the introduction tray.

❶ Insert the introduction tray along the introduction arms in the grooves until the tray is sitting flat.

❷ Slide the tray backward until the arrow marks are completely visible.
- Push the tray until you feel some resistance and hear a click

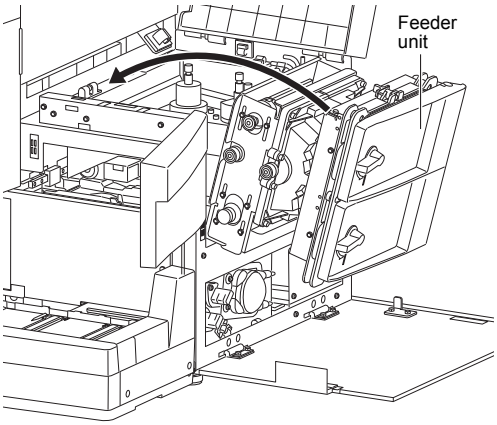
NOTE: Take care not to bend the introduction arms while installing the tray.



9 Close the cover.

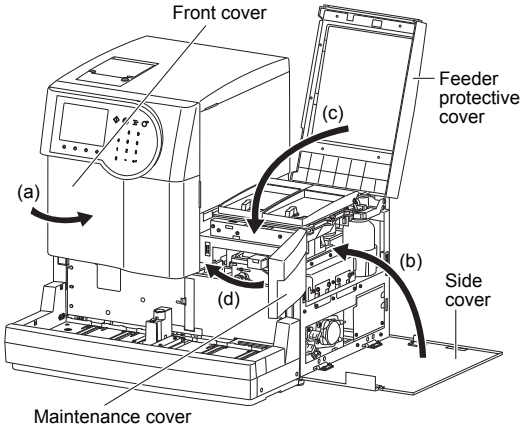
❶ Stand the feeder unit straight up.

- Once the feeder is standing up straight, press the feeder downward until the latch clicks and the unit locks in place.



❷ Close the front cover (a), the side cover (b), feeder protective cover (c), and maintenance cover (d) in that order.

❸ If necessary, press the standby switch to turn on the power.



4.4.3 Cleaning the S.G. Cell

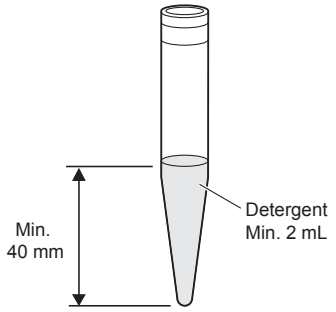
The S.G. cell and flow lines become contaminated with protein or other matter as more urine tests are run. Remove the dirt once a week. It takes about 5 minutes to complete the cleaning.

Prepare: 0.5% sodium hypochlorite solution (or commercially available detergent containing sodium hypochlorite of the same concentration) and sample tube

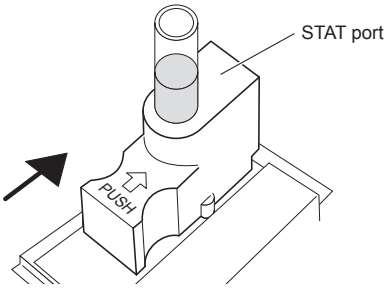
1 Prepare a detergent.

❶ Transfer 2 mL or more detergent into a sample tube.

❷ Make sure the standby screen is displayed, and load the sample tube into the STAT port.



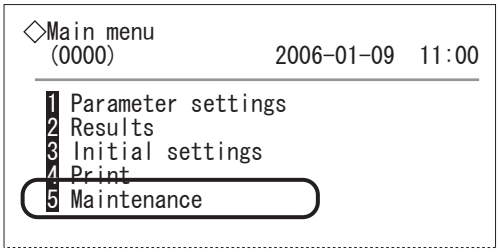
❸ While pressing the "PUSH" mark, slide the STAT port backward and push it in place. Then, gently pull the port out to make sure the port is locked with the stopper.



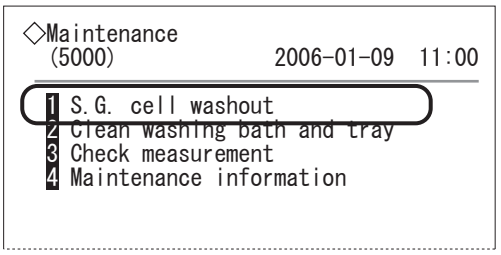
2 Flush the S.G. cell.

❶ On the standby screen, press **Menu** to go to the [Main menu] screen.

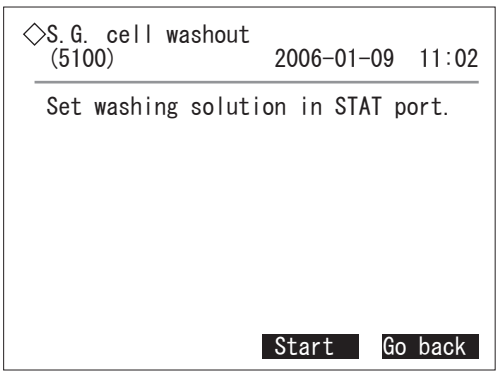
❷ Press **5** to go to the [Maintenance] screen.



❸ Press **1** to go to the [S.G. cell washout] screen.

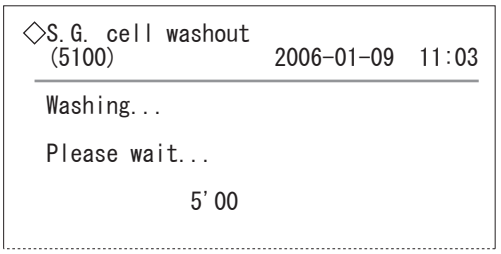


❹ Press Start to start washing.



○

- During S.G. cell washout, the remaining time before completion is displayed.

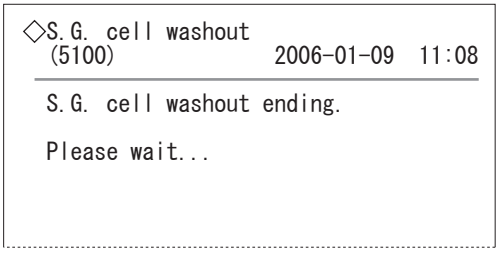


REFERENCE: If warning "W002" occurs
The sample tube containing the detergent may be incorrectly placed in the STAT port. Load the tube correctly, and press OK to clear the warning.

REFERENCE: To stop washout
Press Stop . The instrument will flush the flow lines, and displays the [Maintenance] screen again.

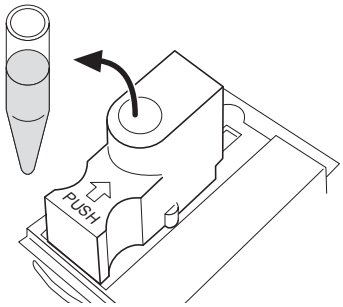
3 When washout is completed…

- The end process will automatically start, and then the [Maintenance] screen will appear again.
- Press Go back twice on the [Maintenance] screen to return to the standby screen.



❶ Press the “PUSH” mark on the STAT port backward to unlock the stopper, and then slide the port toward you.

❷ Take the sample tube out of the STAT port.



4.4.4 Cleaning the Washing Bath

The washing bath becomes contaminated as more urine tests are run. Clean the washing bath at least once a month or when the washing bath looks seriously contaminated.

Prepare: Purified water, cotton swabs, and protective gloves

Wear protective gloves to prevent exposure to pathogenic microbes.

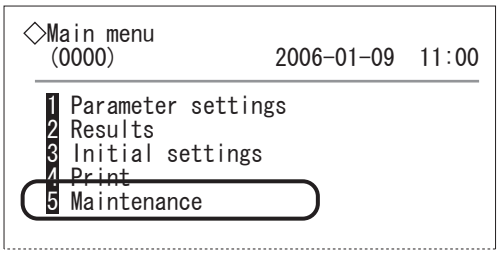
Discard used cleaning tools and protective gloves in accordance with local regulations for biohazardous waste.

1 Move the nozzle.

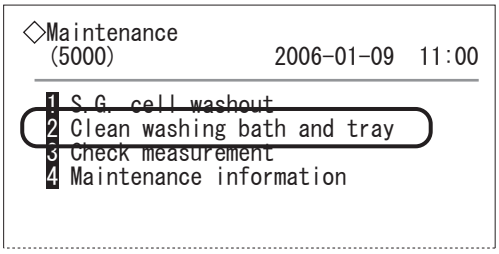
Move the nozzle to make enough room for you to access the washing bath.

❶ On the standby screen, press Menu to go to the [Main menu] screen.

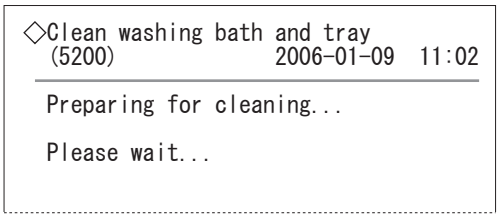
❷ Press **5** to go to the [Maintenance] screen.



❸ Press **2** to go to the [Clean washing bath and tray] screen.

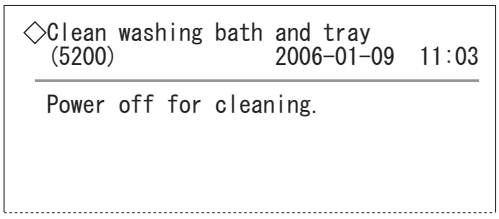


• The nozzle will move to the designated position.

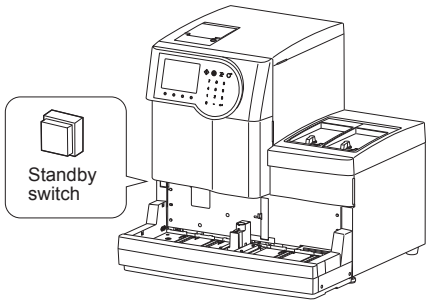


2 Turn off the power.

❶ Press the standby switch to turn off the power when prompted.

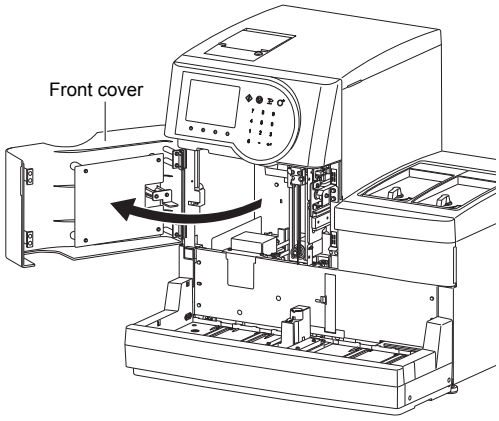


REFERENCE: Trouble “T290” will occur if the cover is opened with the power on.



3 Open the front cover.

❶ Open the front cover.

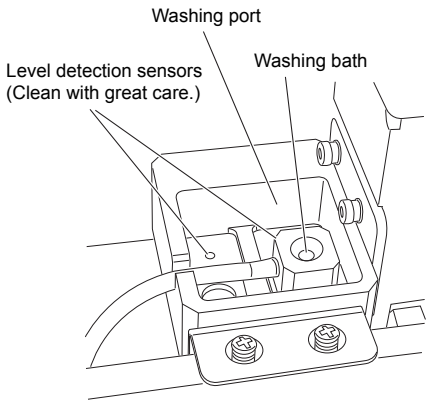


4 Clean the washing bath.

❶ Wipe dirt off inside the washing bath and port using cotton swabs moistened with purified water.
- Pay additional attention when cleaning the two level detection sensors in the washing port.

NOTE: Do not touch the nozzle while cleaning the washing bath and port.

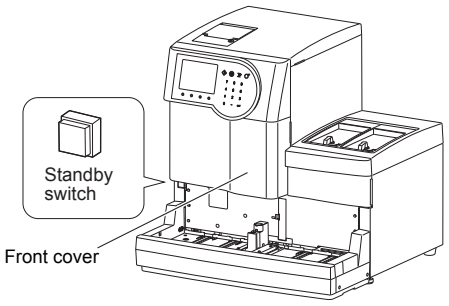
NOTE: After cleaning, check inside the washing bath and port for lint or other dust, which may cause the flow line filter to clog.



5 Close the cover and turn on the power.

❶ Close the front cover.

❷ Press the standby switch to turn on the power.
- Allow the instrument to warm up.
- The nozzle will automatically return to its home position.



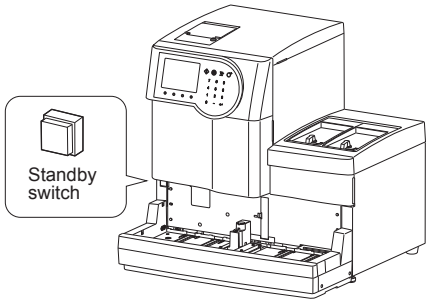
4.4.5 Replacing the Washing Solution Filter

The nozzle of the washing solution bottle has a stainless steel filter. A clogged filter may cause trouble with the flow line system. Replace the filter with a new one once a month.

Prepare: Washing solution filter (supplied as "filter set") and tweezers

1 Turn off the power.

❶ Make sure the standby screen is displayed, then press the standby switch to turn off the power.



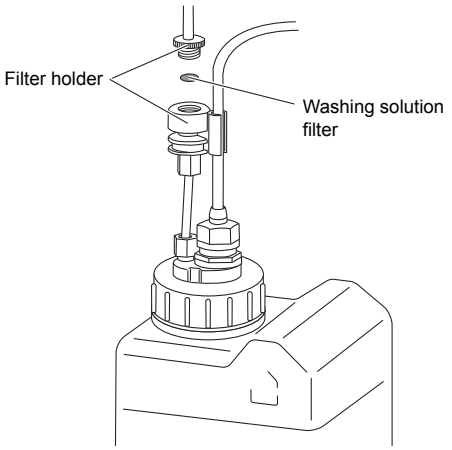
2 Replace the washing solution filter.

❶ Turn the filter holder by hand to disassemble it, and remove the filter with tweezers.

❷ Fit a new filter into the recess of the filter holder.

NOTE: The washing solution filter is easily deformed. Handle the filter with care.

❸ Screw the filter holder in to assemble it.

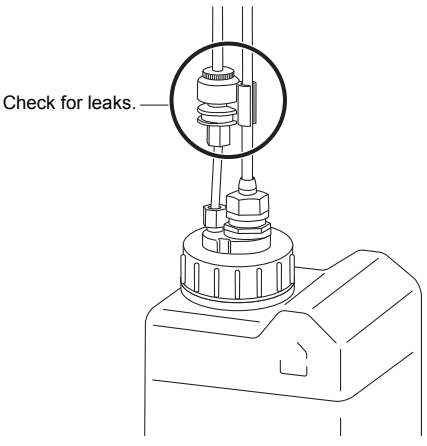


3 Check for leaks.

❶ Press the standby switch to turn on the power.

❷ During warm-up, check the filter holder connection for leaks.
- If a leak is found, tighten the filter holder securely.

❸ Make sure the standby screen appears.



4.4.6 Replacing the Drain Pinch Valve Tubes

The tubes of the drain pinch valves wear out during long periods of use. If you find the tubes leaking, replace them with new ones. If trouble "T280" occurs due to leaks, replace the tubes immediately.

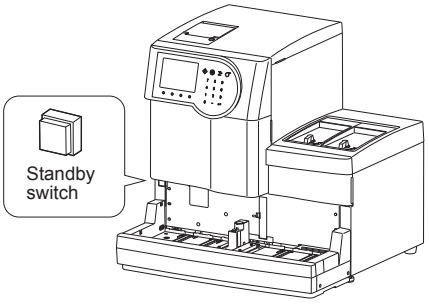
Prepare: Replacing tube (silicone tube, I.D. 2 mm×O.D. 4 mm – L 100 mm) and protective gloves

Wear protective gloves to prevent exposure to pathogenic microbes.

Discard used cleaning tools and protective gloves in accordance with local regulations for biohazardous waste.

1 Turn off the power.

❶ Make sure the standby screen is displayed, then press the standby switch to turn off the power.

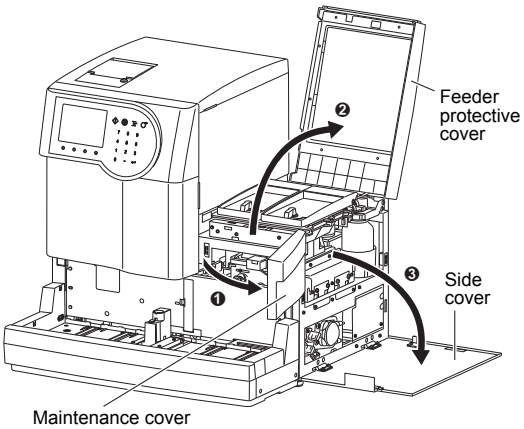


2 Open the covers.

❶ Open the maintenance cover.

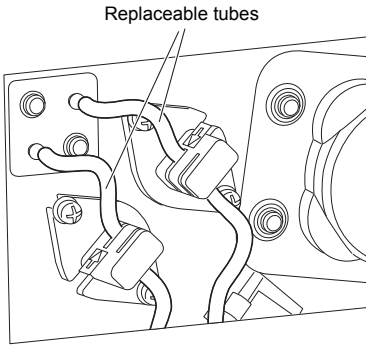
❷ Open the feeder protective cover.
- The cover stops at a 120° angle.
- This cover can be removed from the instrument by unhooking the hinge.

❸ Open the side cover.



3 Replace the tubes.

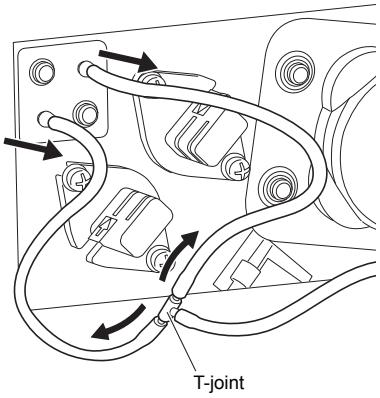
❶ Unhook the tubes.



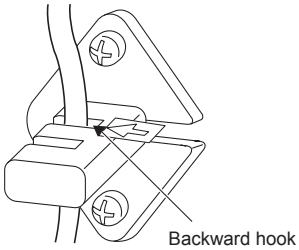
❷ Disconnect both ends of the tube from the joints.
• One end should be removed from a T-joint.

❸ Connect both ends of a new tube to the joints.

❹ Feed the tube through the backward hook.

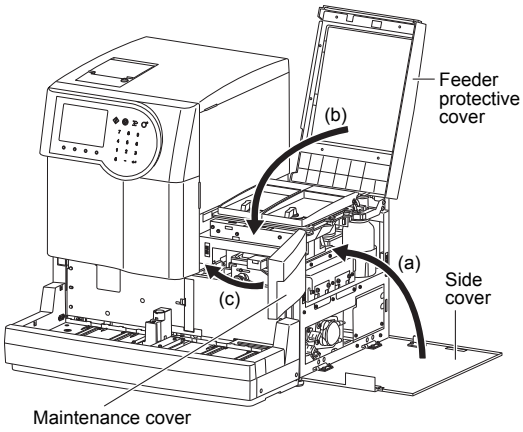


NOTE: The drain pinch valve has two hooks. The tube must pass through the backward hook.



4 Close the covers.

❶ Close the side cover (a), feeder protective cover (b), and maintenance cover (c) in that order.



NOTE: After replacing the tubes, check trouble "T280" does not occur at the next startup. If it occurs, check the bottom of the instrument and drain tube connections for leaks. If there is a leak, secure the connections.

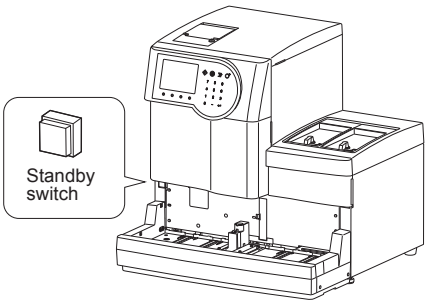
4.4.7 Replacing the White Plate

If the white plate in the optical system is contaminated, incorrect measurement results may be obtained. If warning "W007" occurs, replace the white plate with a new one.

Prepare: White plate and tweezers

1 Turn off the power.

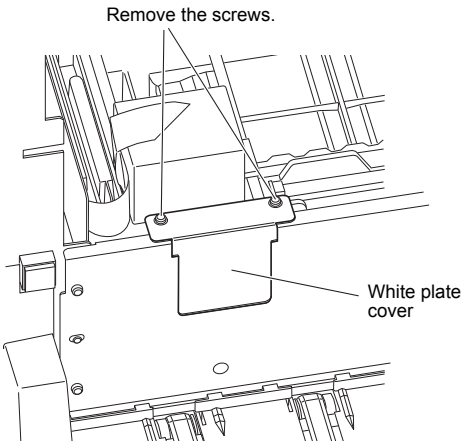
❶ Make sure the standby screen is displayed, then press the standby switch to turn off the power.



2 Remove the white plate cover.

❶ Open the front cover.

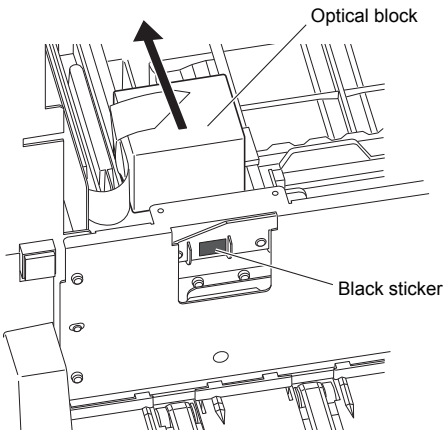
❷ Remove the white plate cover.
- Use the Phillips screwdriver to loosen the two screws on the cover, and slide the cover up to remove it.



3 Move the optical block.

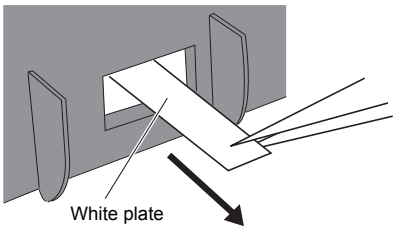
❶ Slide the optical block backward by hand to make enough room for you to access the white plate.

❷ Remove the black sticker.



4 Remove the old white plate.

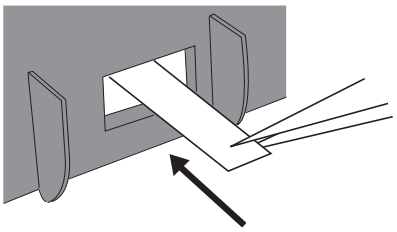
❶ Slowly pull out the old white plate with a pair of tweezers.



5 Insert a new white plate.

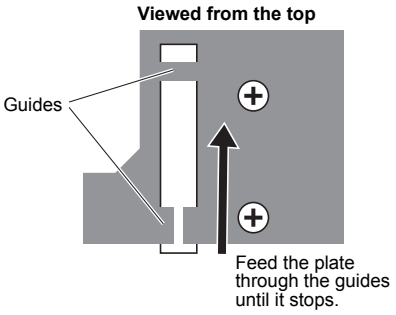
❶ Take a new white plate out of the bag with the tweezers and, without resting it anywhere, slowly insert the plate into the slot.
- Feed the plate through the guides at the entrance and halfway point, as far as it can go.

IMPORTANT: Do not touch the white plate with unprotected hands. Touching the plate can contaminate the surface with sebum, whereby producing incorrect results.



❷ Attach the black sticker to cover the opening.

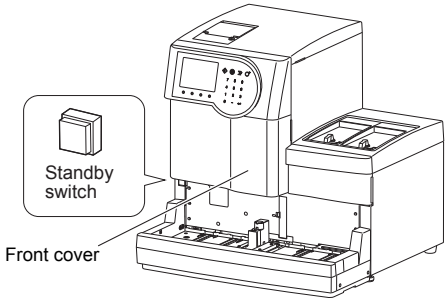
❸ Attach the white plate cover.
- Ensure the cover is inserted in the slit (between the two plates).
- Use a Phillips screwdriver to tighten the screws.



6 Close the cover and turn on the power.

❶ Close the front cover.

❷ Press the standby switch to turn on the power.
- Allow the instrument to warm up.
- The optical block will automatically return to its home position.



7 Perform check measurement.

❶ Measure the check strips to make sure you can obtain correct results.
- See *"2.7 Check Measurement"* on page 2-43.

4.5 Before/After Long Periods of Disuse

4.5.1 Preparing the Instrument Before Long Periods of Disuse

When you intend not to use the instrument for a week or more, use the procedure below to clean each section. Failure to do that can cause fluid remaining in the flow lines to crystallize and consequently damage the instrument.

Prepare: 0.5% sodium hypochlorite solution (or commercially available detergent diluted appropriately), sample tube, cotton swabs, purified water, alcohol, blower brush, tissue paper, and protective gloves

Wear protective gloves to prevent exposure to pathogenic microbes.

Discard used cleaning tools and protective gloves in accordance with local regulations for biohazardous waste.

1 Wash the S.G. cell.

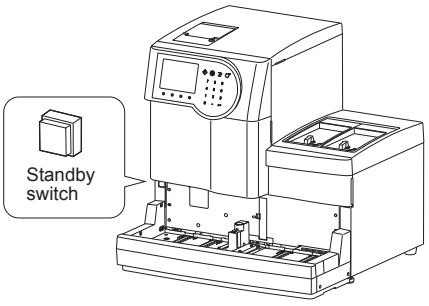
❶ Wash the S.G. cell.
- See *"4.4.3 Cleaning the S.G. Cell"* on page 4-24.
- Keep the power on after the completion of the washout.

2 Clean the washing bath.

❶ Clean the washing bath.
- See *"4.4.4 Cleaning the Washing Bath"* on page 4-26.

3 Flush the flow lines.

❶ Make sure the standby screen is displayed, then press the standby switch to turn off the power.

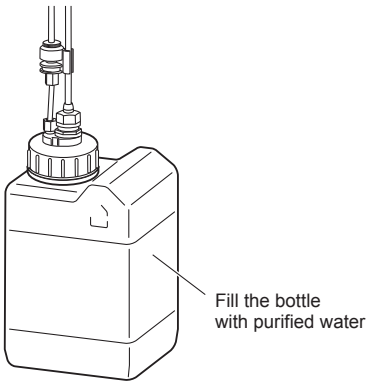


❷ Uncap the washing solution bottle and discard the remaining solution.

❸ Rinse the bottle with purified water.

❹ Fill the bottle with purified water and cap it.

❺ Press the standby switch to turn on the power.
- During warm-up, the instrument will aspirate the purified water to fill the flow lines.

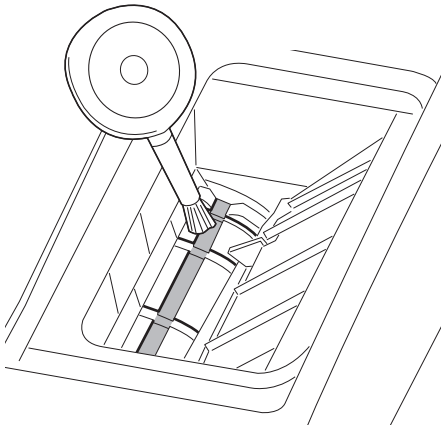


4 Clean the components.

❶ Clean the feeders.
- See *"4.2.3 Cleaning the Feeders"* on page 4-6.

❷ Clean the waste box.
- See *"4.2.1 Cleaning the Waste Box"* on page 4-3.

❸ Wash the introduction and transport trays.
- See *"4.4.2 Washing the Transport Tray"* on page 4-19.

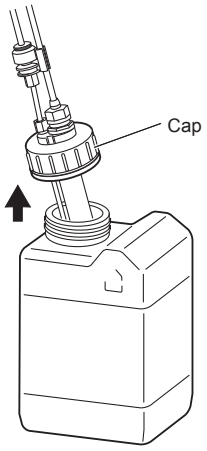


5 Discharge the purified water from the flow lines.

❶ Make sure the standby screen is displayed, then press the standby switch to turn off the power.

❷ Uncap the washing solution bottle.
- Place the cap on tissue paper to protect it against dust.

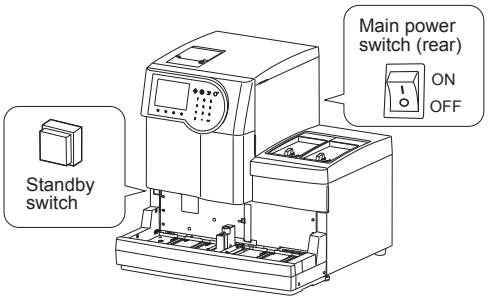
❸ Press the standby switch to turn on the power.
- During warm-up, purified water will be discharged from the flow lines.



6 Turn off the power.

❶ Make sure the standby screen is displayed, then press the standby switch to turn off the power.

❷ Press the OFF side of the main power switch to turn off the main power.



7 Discard the purified water from the washing solution bottle.

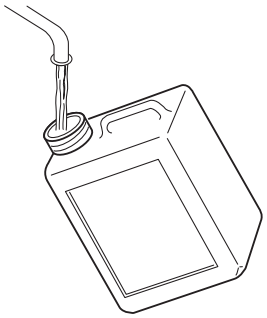
❶ Uncap the washing solution bottle and discard the water.

❷ Cap the washing solution bottle.

8 Discard liquid waste.

❶ Discard the liquid waste in the drain bottle. Wash and sterilize the bottle and place it where it was.

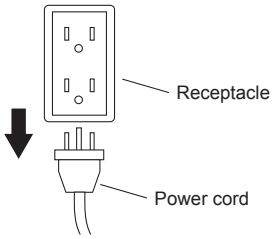
- See *"4.2.2 Discarding Liquid Waste from the Drain Bottle"* on page 4-5.



9 Unplug the power cord.

❶ Pull out the power cord from the receptacle.

REFERENCE: The type of power cord supplied varies depending on the country.



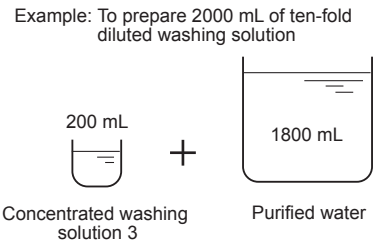
4.5.2 Starting the Instrument Up After Long Periods of Disuse

Use the following procedure to start up the instrument after 1 week or more of disuse.

Prepare: Concentrated washing solution 3 (for AUTION MAX), and purified water

1 Fill the washing solution bottle with the washing solution.

❶ Prepare the washing solution and transfer it to the washing solution bottle.
- See *"4.3.1 Replacing the Washing Solution"* on page 4-15.

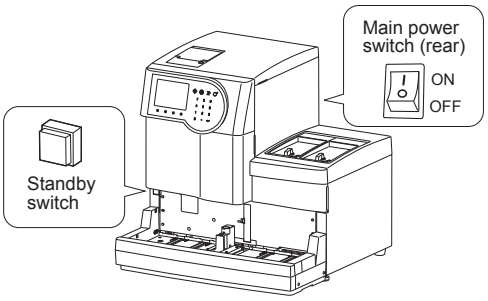


2 Turn on the power.

❶ Plug the power cord into an AC receptacle.

❷ Press the ON side of the main power switch.

❸ Press the standby switch to turn on the power.
- During warm-up, the instrument will fill the flow lines with washing solution.

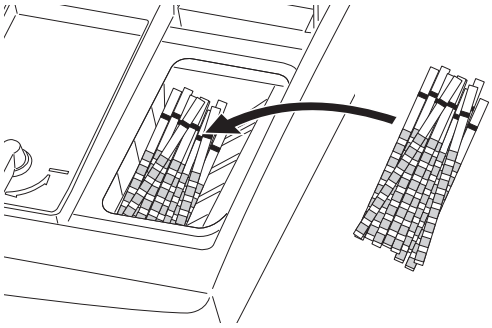


3 Load the test strips.

❶ Make sure the standby screen is displayed.

❷ Load the test strips into the feeders.
- See *"2.3.3 Loading Test Strips into the Feeders"* on page 2-16.

IMPORTANT: The quality of the test strips in the feeders is ensured for three days. Using the strips left in the feeders for longer periods may produce incorrect results.



Chapter 5 Troubleshooting

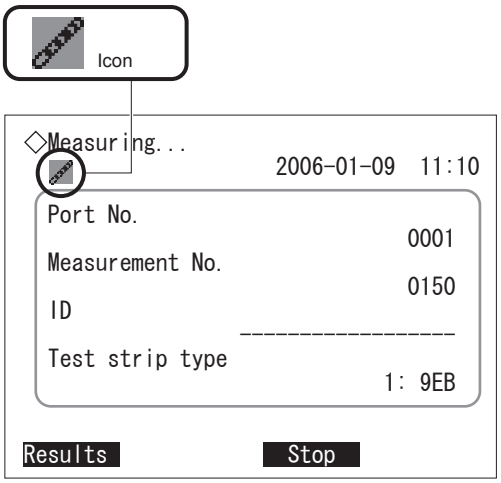
5.1 When a Warning Occurs

A *warning* occurs when the instrument is asking you to take action to enable measurement of more samples. For example, you may be requested to add test strips or to dispose of used test strips. You will be notified of warnings by beeps, and can determine the causes by a displayed warning code, message, and graphic icon. If running measurement halts due to a warning, you can manually resume the tests after clearing the cause. No samples are skipped.

5.1.1 From Warning Generation to Remedy

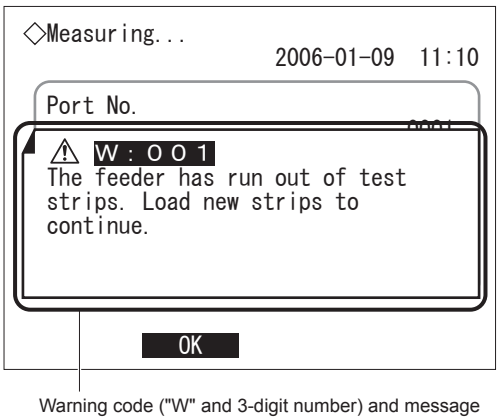
This section describes the procedure from how you will be notified of a warning until how you can clear it.

❶ While measurement is in progress, a "graphic icon" will appear to notify you that a warning has occurred.
- Sample aspiration will be suspended.
- The instrument will wait for the ongoing measurement to complete if there are test strips reacting with samples inside.



❷ Consecutive short beeps sound for about 10 seconds, and a warning code appears along with a message.
- If a warning occurs while on standby, the instrument will be brought to this status immediately.

Tee-tee-tee, tee-tee-tee



❸ Check the warning code and message, and take the necessary action to remove the cause.
- See *"5.1.2 Causes and Remedies"* on page 5-3.

❹ Press OK .

❺ If measurement was in progress, you will be asked whether to resume the sample tests or not. To resume the tests, press Continue . To cancel them, press Stop .

❻ If the warning persists, turn off the power and contact your distributor.

5.1.2 Causes and Remedies

Wear protective gloves to prevent exposure to pathogenic microbes before any operation that may expose you to samples.

Discard used samples, test strips and protective gloves in accordance with local regulations for biohazardous waste.

NOTE: If a warning occurs during measurement, you will be asked whether to continue the sample tests or not. Select Continue to measure the remaining samples, and Stop to cancel the tests.

W001 	**The feeder has run out of test strips. Load new strips to continue.**
Cause	The feeder has run out of test strips.
Remedy	Add new test strips to the feeder. ↓ Press OK to clear the warning.

W002	**The STAT port is empty. Set a sample as explained in the operating manual and try again.**
Cause	There is no sample in the STAT port, or the sample is incorrectly placed in the STAT port.
Remedy	Place the sample in the STAT port correctly (see page 2-27). ↓ Press OK to clear the warning.

W003 	**The washing solution has run out. Add fresh washing solution to continue.**
Cause	1. The washing solution bottle is empty. 2. The liquid sensor of the washing solution bottle is not working correctly because the bottle is uncapped or the liquid sensor cord is disconnected from the instrument.
Remedy	1. Discard the remaining washing solution and add newly prepared solution to the bottle (see page 4-15). ↓ Press OK to clear the warning. 2. Connect one end of the liquid sensor cord to the cap of the washing solution bottle, and cap the bottle. Connect the other end of the cord to the washing solution sensor terminal “S” on the rear of the instrument (see page 1-27). ↓ Press OK to clear the warning.

W004 	**The waste box is full; empty the box.** **Or, strips cannot drop in the box; fit the box in the tray correctly and close the tray.**
Cause	1. The waste box is full of used test strips. 2. The waste box is not installed correctly or the waste box tray is open.
Remedy 	1. Pull out the waste box tray and discard the used test strips (see page 4-3). ↓ Press OK to clear the warning. 2. Install the waste box correctly and close the waste box tray (see page 1-29). ↓ Press OK to clear the warning.

W005 	**The rack unloading side is full.** **Remove racks.**
Cause	The unloading side of the sampler is full of the sample racks.
Remedy 	Take the sample racks out of the unloading side. ↓ Press OK to clear the warning.

W006	**Close the feeder cover.**
Cause	The feeder cover was opened while measurement is in progress.
Remedy	Close the feeder cover. ↓ Press OK to clear the warning.

W007	**Replace the white plate to adjust LED intensity, and then cancel this warning.**
Cause	The white plate in the optical unit is dirty or has deteriorated.
Remedy	Replace the white plate with a new one (see page 4-32). ↓ Press OK to clear the warning.

W008 	**The test strip type for the selected feeder is not specified.** **Press [Continue] to use test strips in the main feeder.**
Cause	The feeder assigned to this item rack is disabled because the test strip setting was not made for the feeder.
Remedy	To use the test strips in the main feeder, press Continue . Press Stop to cancel the tests. To use the other feeder, set the type of test strips for that feeder by key operation (see page 2-16).

W009 	**Printer paper has run out. Load new paper.** * The icon shown at left appears when W009 occurs during measurement but it does not appear while on standby.
Cause	The thermal printer paper has run out, or is not loaded correctly.
Remedy	Load the printer paper correctly (see page 4-17). ↓ Press OK to clear the warning.

W010	**Measurement cannot start. Perform S.G. calibration to enable measurement.**
Cause	The existing S.G. calibration result was invalidated after the specified period of time elapsed since the last calibration.
Remedy	Press OK to clear the warning. ↓ Perform S.G. calibration to update the result (see page 2-34), and retry the tests.

W011 	**The test strips are not sent out of the feeder correctly. To continue measurement, mix the test strips in the feeder.**
Cause	Several test strips are trapped inside the feeder or sticking together.
Remedy	Mix the test strips in the feeder. ↓ Press OK to clear the warning.

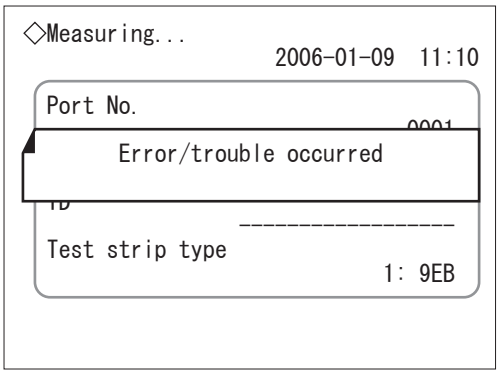
5.2 When an Error Occurs

An *error* occurs when there is something wrong with the power unit, memory, connections, or parameter settings. You will be notified of errors by beeps, and can determine the causes by displayed error codes. The ongoing measurement ceases if an error occurs. You can still obtain the results of samples that have already been aspirated. However, after remedying the error, you need to run the tests again on the samples that could not be measured due to the error.

5.2.1 From Error Generation to Remedy

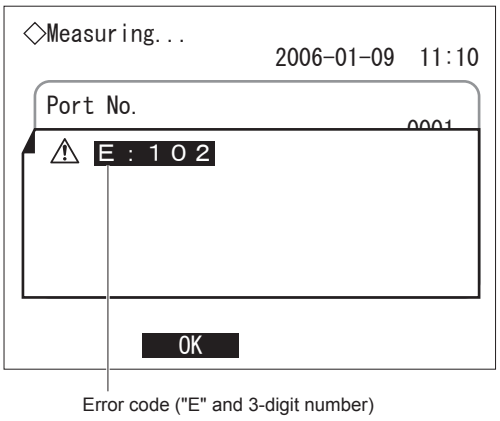
This section describes the procedure from how you will be notified of an error until you clear it.

❶ While measurement is in progress, the message "Error/trouble occurred" appears to notify you that an error (or trouble) has occurred.
- Sample aspiration will cease.
- The instrument will wait for the ongoing measurement to complete if there are test strips reacting with samples.



❷ Consecutive short beeps sound for about 10 seconds and an error code appears on the screen.
- If an error occurs while on standby, the instrument will be brought to in this status immediately.

Tee-tee-tee, tee-tee-tee



❸ Check the error code and press OK to stop the beeping.

❹ Take the necessary action to clear the error.
- See *"5.2.2 Causes and Remedies"* on page 5-7.

❺ Run the tests on the samples that could not be measured due to the error.

❻ If the error persists, turn off the power and contact your distributor.

REFERENCE: For information on printed lists of error codes reported when an error occurs, see *"2.8.4 Error and Trouble List"* on page 2-54. For information on lists of errors and troubles that have occurred so far, see *"2.8.5 Trouble List"* on page 2-55 and *"3.5.1 Printing a Trouble List"* on page 3-23.

5.2.2 Causes and Remedies

Wear protective gloves to prevent exposure to pathogenic microbes before any operation that may expose you to samples.

Discard used samples, test strips and protective gloves in accordance with local regulations for biohazardous waste.

E101	Version change
Cause	The main ROM was exchanged before the instrument was turned on.
Remedy	Press OK to clear the error.

E102	Power down
Cause	The instrument was accidentally turned off during measurement.
Remedy	Press OK to clear the error. ↓ Allow the instrument to warm-up. When the instrument puts itself on standby, retry testing the remaining samples.

E103	Battery voltage error
Cause	The backup battery naturally discharged while the instrument was not in use for several days.
Remedy	Press OK to clear the error. ↓ Keep the instrument powered on for at least 25 hours to charge the battery. ↓ Set the system clock correctly (see page 3-17).

E104	Backup data error
Cause	The backup data was corrupted.
Remedy	Press OK to clear the error. ↓ Keep the instrument powered on for at least 25 hours to charge the battery. ↓ Set the system clock correctly (see page 3-17).

E110	**Test strip pads error**
Cause	1. The setting of test strip type is wrong. 2. The feeder contains two or more types of test strips. 3. The test strips were not transported correctly. 4. The transport tray is dirty.
Remedy 	1. Press OK to clear the error. ↓ Make the correct setting for the type of test strips loaded into the feeder (see page 2-16). 2. Press OK to clear the error. ↓ Open the feeder cover and remove the wrong types of test strips from the feeder, if there are any. 3. Press OK to clear the error. ↓ Load the test strips into the feeder correctly (see page 2-17). 4. Press OK to clear the error. ↓ Clean the transport tray (see page 4-19).

E120	**S.G. calibration failure**
Cause	1. No sample rack was placed in the sampler. 2. The low and high solutions are not loaded in the appropriate ports of the sample rack. 3. The volume of S.G. standard solution in the sample tubes is insufficient. 4. The S.G. standard solutions are inadequate in specific gravity value.
Remedy	1. Press OK to clear the error. ↓ Correctly place the sample rack containing the S.G. standard solutions in the sampler, and retry S.G. calibration (see page 2-35). 2. Press OK to clear the error. ↓ Correctly place the low solution in port 1, and the high solution in port 2 on the sample rack. Then, retry S.G. calibration (see page 2-35). 3. Press OK to clear the error. ↓ Ensure both of the sample tubes contain at least 2 mL of S.G. standard solution each, and retry S.G. calibration (see page 2-34). 4. Press OK to clear the error. ↓ Prepare S.G. standard solutions of proper S.G. values, and retry S.G. calibration.

E130	**Two-way communication error**
Cause	The communication cable is not connected correctly to the external device.
Remedy	Press OK to clear the error. ↓ Securely connect the communication cable to both the instrument and host.

E140	**Test strip marker error**
Cause	The test strip type detected from the strip marker and the test strip type setting do not match.
Remedy	Press OK to clear the error. ↓ Make the correct setting for the type of test strips loaded into the feeder (see page 2-16). ↓ Check the feeder contains the correct type of test strips, and remove the wrong types of test strips, if there are any.

5.3 When Trouble Occurs

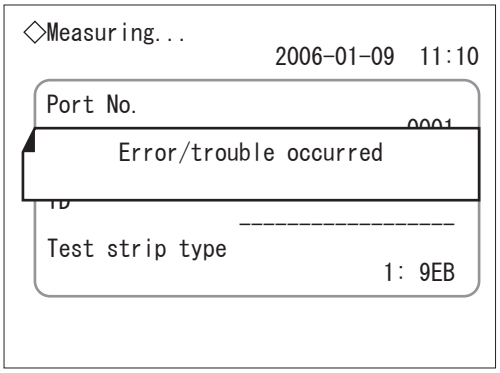
Trouble occurs when the instrument encounters a serious problem with the ROM, optical unit, driving section or other hardware components. You will be notified of troubles by beeps and can determine the causes by the displayed trouble codes.

The ongoing measurement usually ceases if trouble occurs. So, after remedying the trouble, you need to run the tests again on the samples that could not be measured due to the trouble. As for the samples that have already reacted with reagent on the strips, the instrument tries to output as many results as possible. For example, in the case of nozzle drive trouble "T240", you will miss the result of the sample that was just aspirated (before being dropped on a strip), but can obtain the results of currently reacting samples. This means you should retry to measure the sample that was just aspirated and later samples.

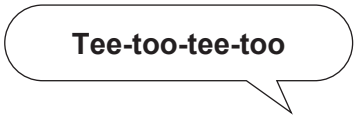
5.3.1 From Trouble Generation to Remedy

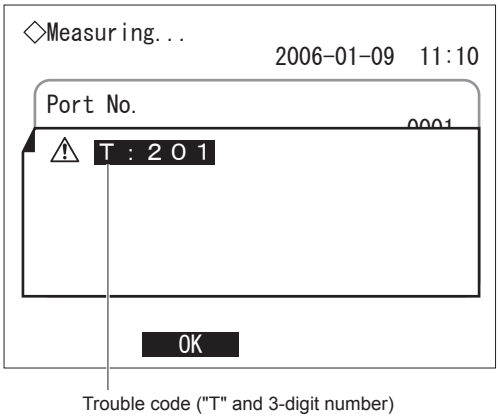
This section describes the procedure from trouble notification to remedy.

❶ While measurement is in progress, the message "Error/trouble occurred" appears to notify you that trouble (or an error) has occurred.
- The instrument will cease operations.
- For some troubles, the instrument will wait for the ongoing measurement to complete if one or more test strips inside are still under reaction.



❷ Two different long tones sound in turn for about 1 minute, and a trouble code appears on screen.
- If trouble occurs while on standby, the instrument will be brought to this status immediately.





❸ Check the trouble code and press OK to stop the beeping.
- The message "Initializing…" will appear, and the mechanical sections will be initialized.

❹ Take the appropriate action to solve the problem. Or, turn off the power and contact your distributor.
- For more information, see *"5.3.2 Causes and Remedies"* on page 5-11.

❺ Run the tests on the samples that could not be measured due to the trouble.

❻ If the trouble persists, turn off the power and contact your distributor.

REFERENCE: For information on the printed list of trouble codes reported when trouble occurs, see *"2.8.4 Error and Trouble List"* on page 2-54. For information on the printed list of errors and troubles that have occurred so far, see *"2.8.5 Trouble List"* on page 2-55 and *"3.5.1 Printing a Trouble List"* on page 3-23.

5.3.2 Causes and Remedies

Wear protective gloves to prevent exposure to pathogenic microbes before any operation which may expose you to samples.

Discard used samples, test strips and protective gloves in accordance with local regulations for biohazardous waste.

T999	**Unknown trouble**
Cause	A system failure occurred.
Remedy	Take notes of what appears on the screen, and contact your distributor.

T201	**Data ROM trouble**
Cause	1. The main ROM (version) has been upgraded. 2. Trouble occurred in the flash ROM that stores the parameter settings.
Remedy	1 and 2. Press OK to clear the trouble. ↓ Turn off the power, and contact your distributor.

T202	**Internal communication trouble**
Cause	Internal communication trouble(s) occurred.
Remedy	Press OK to clear the trouble. ↓ Turn off the power, and contact your distributor.

T203	**No calibration curve**
Cause	The calibration curve is not set for the test strip, or the calibration curve information is incomplete.
Remedy	Press OK to clear the trouble. ↓ Turn off the power, and contact your distributor.

T210	**Test strip introduction section drive trouble**
Cause	1. The transport tray or introduction tray is not installed correctly. 2. The test strips cannot be transported because the transport section is dirty or obstructed.
Remedy	1. Press OK to clear the trouble. ↓ Install the tray correctly (see pages 4-12 or 4-19). 2. Press OK to clear the trouble. ↓ Clean the dirty transport tray, or remove the obstacles, if there are any.

T211	**Test strip transport section drive trouble**
Cause	1. The waste box is overflowing with used test strips. 2. The transport section did not work correctly.
Remedy	1. Press OK to clear the trouble. ↓ Pull out the waste box and discard the used test strips (see page 4-3). ↓ Remove the test strips scattered on the analysis section. 2. Press OK to clear the trouble. ↓ Check the test strip transport section. If the section is damaged, turn off the power and contact your distributor.

T212	**Test strip identification section drive trouble**
Cause	The test strip flip section of the feeder is clogged with test strips.
Remedy	Press OK to clear the trouble. ↓ Remove the clogged test strips from the feeder.

T220	**Optical unit drive trouble**
Cause	1. The transport tray is not installed correctly. 2. The waste box is overflowing with used test strips that are blocking the measurement light and the optical unit movement. 3. Trouble occurred in the optical unit.
Remedy	1. Press OK to clear the trouble. ↓ Install the transport tray correctly (see page 4-19). 2. Press OK to clear the trouble. ↓ Pull out the waste box and discard the used test strips (see page 4-3). 3. Press OK to clear the trouble. ↓ Check the optical block. Remove the test strips that are blocking movement. If the optical block is damaged, turn off the power and contact your distributor. ↓ Remove the test strips scattered on the analysis section.

T221	A/D overflow
Cause	1. The transport tray is not installed correctly. 2. The waste box is overflowing with used test strips that are blocking the measurement light and the optical unit movement. 3. The test strip was not placed correctly in the optical unit. 4. The white plate is dirty.
Remedy 	1. Press OK to clear the trouble. ↓ Install the transport tray correctly (see page 4-19). 2. Press OK to clear the trouble. ↓ Pull out the waste box and discard the used test strips (see page 4-3). ↓ Remove the test strips or other obstacles that are blocking the measurement light and the optical unit movement. 3. Press OK to clear the trouble. ↓ Install the transport tray correctly. ↓ Remove the obstacles that are blocking the measurement light and the optical unit movement. ↓ Remove the test strips scattered on the analysis section. 4. Press OK to clear the trouble. ↓ Replace the white plate with a new one (see page 4-32), and perform a check measurement (see page 2-43).

T222	Optical unit trouble
Cause	1. The white plate is dirty. 2. The test strip was not transported correctly.
Remedy 	1. Press OK to clear the trouble. ↓ Replace the white plate with a new one (see page 4-32), and perform a check measurement (see page 2-43). 2. Press OK to clear the trouble. ↓ Remove the test strips scattered on the analysis section.

T223	Optical unit undetected marker
Cause	1. The transport tray is not installed correctly. 2. The test strips could not be transported to the optical unit. Or the test strips could not be placed on the optical unit correctly. 3. The waste box is overflowing with used test strips that are blocking the measurement light and the optical unit movement.
Remedy	1. Press OK to clear the trouble. ↓ Install the transport tray correctly (see page 4-19). ↓ Remove the test strips scattered on the analysis section. 2. Press OK to clear the trouble. ↓ Remove the test strips scattered on the analysis section. 3. Press OK to clear the trouble. ↓ Pull out the waste box and discard the used test strips (see page 4-3).

T230	Feeder drive trouble
Cause	1. Damaged or wrong type of test strips are loaded in the feeder. Or, test strip waste has accumulated in the feeder. 2. The feeder did not work correctly.
Remedy	1. Press OK to clear the trouble. ↓ Remove the clogged test strips from the feeder and clean the feeder (see page 4-6). ↓ Load the specified type of new test strips into the feeder, and retry measurement. 2. Press OK to clear the trouble. ↓ Check the feeder. If the feeder is damaged, turn off the power, and contact your distributor.

T240	Nozzle drive trouble
Cause	The nozzle did not work correctly.
Remedy	Press OK to clear the trouble. ↓ Make sure the instrument is not in operation, then open the front cover. ↓ Check the nozzle. If the nozzle is damaged, turn off the power, and contact your distributor.

T241	**Sampling trouble**
Cause	1. Consecutive sample containers had an insufficient volume of sample: less than 2 mL or a level lower than 40 mm. 2. The sample container in the STAT port has an insufficient volume of washing solution for cleaning the S.G. cell.
Remedy 	1. Press OK to clear the trouble. ↓ Make sure the sample tubes each contain at least 2 mL of sample and the sample level is at least 40 mm above the bottom of the tube, and retry measurement. 2. Press OK to clear the trouble. ↓ Make sure the sample tube contains at least 2 mL of washing solution and the liquid level is at least 40 mm above the bottom of the tube, and retry cleaning operation.

T250	**S.G. hydrometer trouble**
Cause	The S.G. hydrometer is not connected correctly.
Remedy	Press OK to clear the trouble. ↓ Turn off the power, and contact your distributor.

T251	**Turbidimeter trouble**
Cause	The turbid/Hb/color cell is dirty, or the tubing is clogged.
Remedy 	Press OK to clear the trouble. ↓ Wash the S.G. cell (see page 4-24).

T252	**Tintometer trouble**
Cause	The turbid/Hb/color cell is dirty, or the tubing is clogged.
Remedy 	Press OK to clear the trouble. ↓ Wash the S.G. cell (see page 4-24).

T260	**Washing solution pump trouble**
Cause	The washing solution pump did not work correctly.
Remedy 	Press OK to clear the trouble. ↓ Turn off the power, and contact your distributor.

T261	**Sampling pump trouble**
Cause	The sampling pump did not work correctly.
Remedy 	Press OK to clear the trouble. ↓ Turn off the power, and contact your distributor.

T270	**Measurement lever drive trouble**
Cause	1. A sample rack was forced into the sampler. 2. The measurement- or return-side lever of the sampler did not work correctly.
Remedy 	1. Press OK to clear the trouble. ↓ Take the sample racks out of the sampler. 2. Press OK to clear the trouble. ↓ Check the sampler. If the sampler is damaged, turn off the power and contact your distributor.

T271	**Return lever drive trouble**
Cause	1. A sample rack was forced into the sampler. 2. The measurement- or return-side lever of the sampler did not work correctly.
Remedy 	1. Press OK to clear the trouble. ↓ Take the sample racks out of the sampler. 2. Press OK to clear the trouble. ↓ Check the sampler. If the sampler is damaged, turn off the power and contact your distributor.

T272	**Loading side full**
Cause	Another rack was added to the loading side when the sampler was fully loaded with 5 racks.
Remedy 	Press OK to clear the trouble. ↓ Take the sample racks out of the loading side of the sampler.

T280	**Overflow**
Cause	An overflow has occurred, or the tubing is detached.
Remedy 	Press OK to clear the trouble. ↓ Check the drain pinch valves. Replace the damaged tubes with new ones (see page 4-30). ↓ Check to see if tubing is disconnected.

T290	**Cover open**
Cause	The front cover, maintenance cover, side cover, or feeder protective cover is open.
Remedy	Press OK to clear the trouble. ↓ Ensure all the covers are closed.

5.4 Measurement-Related Messages

This section lists the messages that can possibly appear on the printed results reports and abnormal results lists when incorrect results are obtained.

5.4.1 Results-Related Errors (Printed Results Reports: on the lowest line)

The instrument cannot produce any results when measuring abnormal samples such as drug-administered or dense turbid urine. In such a case, an appropriate error message is added to the end of the results reports (see page 2-50). See the table below to solve the problem. If the error persists, turn off the power and contact your distributor.

Wear protective gloves to prevent exposure to pathogenic microbes before any operation that may expose you to samples.

Discard used samples, test strips and protective gloves in accordance with local regulations for biohazardous waste.

No sample	
Description	No sample was detected.
Cause	The sample tube is empty.
Remedy	Ensure the sample tube contains at least 2 mL of sample, and the sample level is 40 mm above the bottom of the tube. ↓ Retry measurement.

Skipped	
Description	The sample was not measured.
Cause	1. The host instructs the instrument not to measure the sample. 2. The sample tube is not labeled with a barcode, or the label is too dirty to read. 3. The barcode is labeled out of position. 4. The built-in barcode reader is out of order.
Remedy	1. There is no problem with the instrument. 2. Newly label the sample tube, and retry measurement. 3. Reattach the label in the correct position and retry measurement. 4. Turn off the power, and contact your distributor.

Reflection light intensity drift	
Description	Light intensity varied during measurement.
Cause	Outside light is penetrating the optical block.
Remedy 	Install the waste box correctly (see page 1-29), and retry measurement.

Excess reflectivity	
Description	The reflectivity for a measurement item exceeded 120%. * The result will be obtained regardless of this error.
Cause	1. The instrument measured a test strip other than that set by key operation. 2. The instrument measured an abnormal sample (e. g. drug-administered urine).
Remedy 	1. Make the correct settings for the type of test strips to be loaded into the feeder (see page 2-16). ↓ Load the correct test strips into the feeder (see page 2-18). ↓ Measure the sample again. 2. Check to see if the sample is of acceptable quality for the instrument. ↓ If the sample is acceptable, retry measurement.

Test strip out-of-position	
Description	The test strip is placed out of the correct position.
Cause	The test strip was not properly positioned in the optical unit.
Remedy 	Pull out the waste box tray and discard the used test strips (see page 4-3). ↓ Make sure the instrument is not in operation, then press the standby switch to turn off the power. ↓ Pull out the transport tray. ↓ Remove test strips scattered around. ↓ Attach the transport tray and close the covers. ↓ Press the standby switch to turn on the power, and retry measurement.

Abnormal sampling	
Description	The nozzle could not drop the sample on the test strip.
Cause	1. The sample is unacceptable to the instrument (e. g. drug-administered urine). 2. Trouble occurred in the flow lines. 3. The liquid sensor of the washing solution bottle is damaged.
Remedy 	1. Check to see if the sample is acceptable to the instrument. ↓ If the sample is an acceptable kind of urine, retry measurement. 2. Make sure the instrument is not in operation, then press the standby switch to turn off the power. ↓ Check the flow lines and washing solution filter for clogging or leaks. ↓ Press the standby switch to turn on the power, and retry measurement. 3. Check to see if the washing solution bottle contains a sufficient volume of solution. ↓ If “W003” does not occur though the washing solution bottle is empty, turn off the power and contact your distributor.

5.4.2 S.G. Measurement-Related Errors (Printed Results Report: S.G.)

This section lists the error messages that may be added below the "S.G." line of the printed results report (see page 2-50) if incorrect S.G. results are obtained. When you encounter a message of this kind, see the table below to solve the problem. If the error persists, turn off the power and contact your distributor.

Wear protective gloves to prevent exposure to pathogenic microbes before any operation that may expose you to samples.

Discard used samples, test strips and protective gloves in accordance with local regulations for biohazardous waste.

UNDER	**The S.G. cell is dirty.**
Cause	The result obtained from S.G. measurement is lower than the allowable range.
Remedy	Wash the S.G. cell (see page 4-24). ↓ Retry measuring the sample.

OVER	**The S.G. cell is dirty.**
Cause	The result obtained from S.G. measurement is higher than the allowable range.
Remedy	Wash the S.G. cell (see page 4-24). ↓ Retry measuring the sample.

---------	**The S.G. was not measured.**
Cause	The S.G. measurement was not made for some reason.
Remedy	Eliminate the cause. ↓ Retry measuring the sample.

CAL. ERR	**S.G. calibration has not been made.**
Cause	S.G. calibration has not been performed.
Remedy	Perform S.G. calibration (see page 2-34).

5.4.3 Turbidity Measurement-Related Errors (Printed Results Report: TURB)

This section lists the error messages that may be added to the "TURB" line on the printed results reports when incorrect turbidity results are obtained. See the tables below to solve the problem. If the error persists, contact your distributor.

CAL. ERR	
Cause	The result obtained from turbidity measurement is outside the specified range.
Remedy	Turn off the power, and contact your distributor.

ERROR	
Cause	Turbidity measurement was not made for some reason.
Remedy	Remove the cause. ↓ Retry to measure the sample.

5.4.4 Messages on the Abnormal Results List

If you obtain an abnormal result, see the printed abnormal results list (see pages 2-54 and 3-24) to determine the cause, and solve the problem by referencing the tables below. The abnormal results list includes only the errors that occurred after power-on. If an error persists, turn off the power and contact your distributor.

Wear protective gloves to prevent exposure to pathogenic microbes before any operation that may expose you to samples.

Discard used samples, test strips and protective gloves in accordance with local regulations for biohazardous waste.

Barcode misread	
Description	The barcode could not be read from the sample tube.
Cause	1. The sample tube is not labeled with a barcode, or the barcode is too dirty to read. 2. The barcode is labeled out of position. 3. The built-in barcode reader is out of order.
Remedy	1. Newly label the sample tube, and retry measurement. 2. Reattach the label in the correct position and retry measurement. 3. Turn off the power, and contact your distributor.

No sample	
Description	No sample was detected.
Cause	The sample tube is empty.
Remedy	Ensure the sample tube contains at least 2 mL of sample, and the sample level is 40 mm above the bottom of the tube. ↓ Retry measurement.

Measurement error	
Description	A measurement error occurred.
Cause	1. Measurement was not made on this sample. * This error occurs when the instrument is configured to skip measurement when a barcode is misread. 2. Light intensity varied during measurement. 3. The reflectivity of a measurement items exceeded 120%. 4. The test strip is out of the correct position. 5. Sampling failed.
Remedy	1. See *"Skipped"* on page 5-17. 2. See *"Reflection light intensity drift"* on page 5-17. 3. See *"Excess reflectivity"* on page 5-18. 4. See *"Test strip out-of-position"* on page 5-18. 5. See *"Abnormal sampling"* on page 5-18.

Abnormal data	
Description	Abnormal colors were developed on one or more reagent pads on the test strip.
Cause	Abnormal colored urine was measured, or the obtained result includes abnormal data.
Remedy 	Check the sample.

Positive sample	
Description	The obtained result includes positive values for one or more measurement items.
Cause	The instrument measured a positive sample
Remedy 	Check the sample.

S.G. measurement error	
Description	The instrument could not obtain a correct S.G. calibration result.
Cause	1. No S.G. measurement result is present. 2. The S.G. measurement result exceeds the specified range. 3. The S.G. cell is dirty. 4. Abnormally colored urine was measured.
Remedy 	1 and 2. Perform S.G. calibration (see page 2-34). 3. Wash the S.G. cell (see page 4-24). 4. Check the sample.

Turbidity measurement error	
Description	The instrument could not obtain a correct turbidity measurement result.
Cause	1. No turbidity measurement result is present. 2. An abnormal turbidity measurement result was obtained.
Remedy	1 and 2. Turn off the power, and contact your distributor.

5.5 If This Happens

5.5.1 If the Instrument Does Not Start Up (Replacing Fuses)

If the instrument does not start up after turning on both the main power switch (rear panel) and standby switch (front panel), it is possible that a fuse has blown. The instrument has a pair of fuses that can be accessed and replaced from the rear panel. Replace whichever is blown.

Prepare: Fuse (T5AE250V~) and flat-head screwdriver

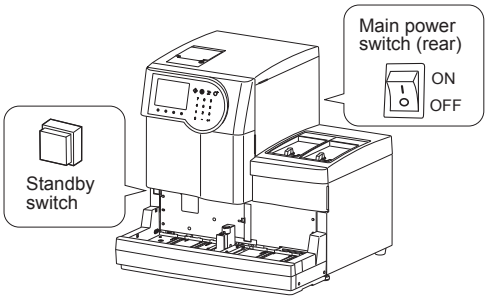
Use only fuses of the specified capacity. Over- or under-rated fuses can lead to equipment damage and fire. Make sure you have fuses of correct capacity before replacement.

NOTE: If the fuses blow soon after the replacement, there is something wrong with the instrument. In such case, contact your distributor.

1 Turn off the power.

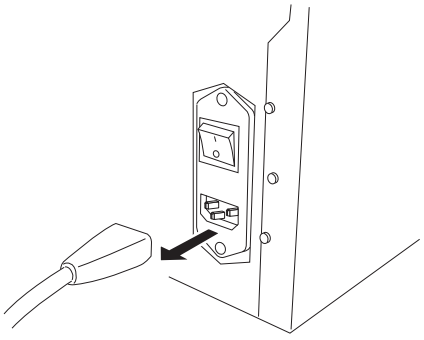
❶ Press the standby switch to turn off the power.
- The green light turns off.

❷ Turn off the main switch.
- Press the O side ("off" side) of the main power switch on the rear panel.



❸ Unplug the power cord from its receptacle.

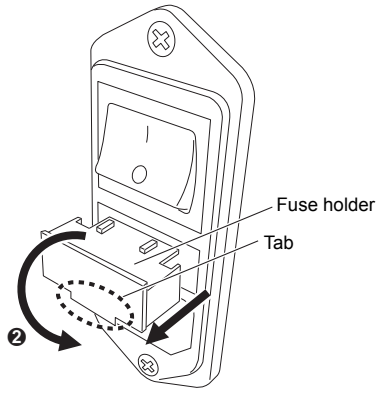
Keep the power cord unplugged until otherwise instructed in this procedure.



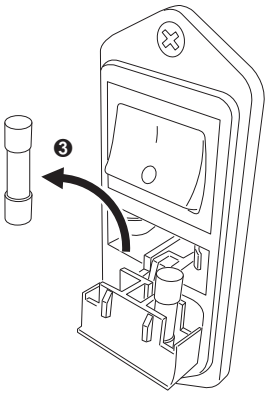
2 Remove the old fuse.

❶ Put the tip of your finger under the tab at the bottom of the fuse holder, and pull the holder frontward.

❷ Push the top of the fuse holder to rotate it frontward.
- This makes the fuses accessible.



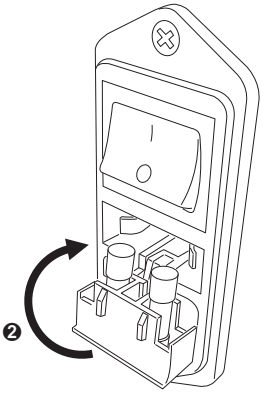
❸ Remove the blown fuse from the fuse holder.



3 Insert a new fuse.

❶ Insert a new fuse into the fuse holder, making sure it stands up straight.

❷ Store the fuse holder as before.
- Lift the holder from the bottom, and rotate it backward until it clicks in place.
- Push the holder in until it stops.



4 Turn on the power.

❶ Plug in the power cord.

❷ Press the main power switch.
- Press the I (“on”) side of the switch on the rear panel.

❸ Press the standby switch to turn on the power.
- The standby switch will illuminate.

DISTRIBUTED BY
ARKRAY USA, Inc.
5182 W.76th St. Minneapolis,
MN 55439 USA

SUPPLIED BY
ARKRAY, Inc.
57 Nishi Aketa-cho, Higashi-kujo,
Minami-ku, Kyoto 601-8045, Japan

84-02160K

Rev.: MAY. 2019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