



Operator's Manual

Laboratory Automation System

S - 3000

Stanford Hillview

First Edition



IDS Co., Ltd.

To our customer

Thank you for choosing IDS Laboratory Automation System.

Our system can offer you effective space management, time saving processing power, highly reliable parts selection and peace and quiet in your lab. Our system is designed to meet your specific needs.

Please read this material well in order to use the system safely and properly. Also keep this handy and with care so you can refer to more information at all times.

Please make sure that matters described in this material can be amended without previous notice.

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

FCC WARNING: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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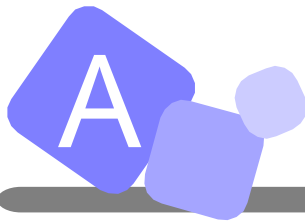
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A

General Information

This section describes the general information of IDS Laboratory Automation System, its configuration, safety instructions, safety labels, and markings.



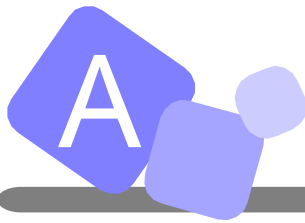


System Overview

This section explains key features of S-3000.

Key Features of S-3000

- **Barcode Control:** All samples are managed by bar code, which eliminates human error including taking a wrong sample.
- **Eliminate hospital infection:** By automating sample preparation processes, the risk of hospital infection can be minimized.
- **Real-time Processing:** Single Tube Transport Method provides maximum flexibility to route samples to each own destination and accomplishes real-time processing.
- **Cell Height Detection:** Serum height and cell height are detected for aliquoting
- **Contamination:** Disposable aliquot tip eliminate risk of contamination and improve maintenance.



Safety Precautions

This sections describes safety precautiions and meanings of safety indications in order to use the system safely.

In order to use the system safely.....

About Symbols:

This manual and system contain indications and symbols for operators to use the system safely and properly. Prior to use, it is important that operators read the manual and understand meanings of symbles and precautions they should take.



WARNING

Indicates that there is the risk of death or serious injury if the system is improperly handled contrary to this indication.



CAUTION

Indicates that there is the risk of personal injury or damage to objects if the machines are improperly handled contrary to this indication.

Meaning of Each Symbol:



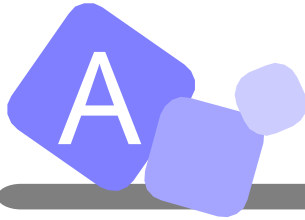
symbol indicates warning items (including caution). Specific waring contents are drawn inside this symbol
(example: the symbol on the left indicates the possibility of electric shock)



symbol indicates prohibited actions. Prohibited action is drawn inside or near the symbol.
(example: the symbol on the left indicates that touching is prohibited)



The symbol indicates actions which must be followed.



Safety Precautions (continued)



WARNING

DO NOT DISASSEMBLE OR REPAIR BY YOURSELF:



DO NOT
DISASSEMBLE

To prevent fire or electric shock. Also, you may be injured by the improper action of system.

TURN THE POWER OFF PRIOR TO MAINTENANCE:



To prevent fire electric shock, or injury.

DO NOT PLACE ANY ITEM ON THE TOP:



In case foreign objects such as metal fragments, water or liquid enters the system, it may cause fire or electric shock.

DO NOT INSERT OR DROP FOREIGN OBJECT:

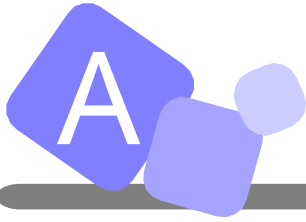


Do not insert or leave metal material or inflammable inside the unit. It may cause fire or electric shock.

AVOID WATER OR LIQUID TO ENTER THE SYSTEM:



It may cause fire or electric shock.



Safety Precautions (continued)



WARNING

DO NOT REMOVE UNIT COVER DURING OPERATION:



If you put your hands or if foreign items fall inside of the unit, it may cause fire, electric shock or injury.

DO NOT PUT ANY OBJECT IN FRONT OF THE FAN:



By blocking fan, warm air is not able to escape from the inside unit and may cause electric shock, ground-fault or short.



CAUTION

DO NOT TOUCH CONVEYOR MOTOR OR MOVING PARTS:



DO NOT
TOUCH

Do not touch moving parts while the system is running. It may cause injury. Also, do not touch conveyor motor while the system is running or 30 minutes after motor is stopped. It may cause skin burn.

KEEP DOORS CLOSED DURING THE SYSTEM OPERATION:



Always make sure the door is closed during the operation. Opening this door or entering hands or foreign object into a unit during operation may cause an injury or system failure.

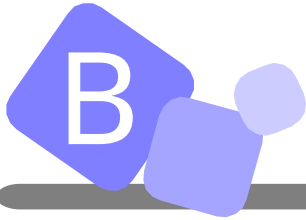
When necessary to to open the door during the operation for some reason, turn off the power of the unit or pause the unit as pressing “PAUSE/RUN” button, and ensure moving parts are completely stopped.

B

Basic Operation

This section explains operating instructions for the control panel and how to begin/terminate the operation.





Startup/ Shutdown

This section describes how to startup or shutdown IDS-3000.

How to startup the system:

Step 1: Turn on the air compressor to supply air to the system.

Step 2: Verify that the display on air compressor shows 0.6 or above and turn on the power of S-3000.

Step 3: Check the following for each unit.
Inlet/Outlet Unit for primary samples ... Set empty racks.
Outlet Unit for secondary samples ...Set empty racks.
Decapper Unit ... Remove caps from disposal box and clean the chute.
Labeler Unit ... Refill with tubes and set labels.
Aliquoter Unit ... Refill with tips. Remove used aliquot tips from disposal box and clean the chute.

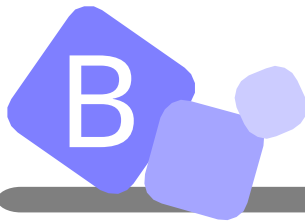
Step 4: Turn on the power of C-CPU.

How to startup the system:

Step 1: Shutdown the system at C-CPU (refer to the procedures of C-CPU.)

Step 2: Turn off the power of S-3000.

Step 3: Turn off the power the air compressor.

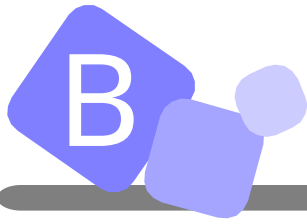


System Operation

This section describes the flow of samples and type of racks used on S 3000.

Sample Flow

1. Primary samples are introduced to the conveyor of S 3000 from the rack placed on Primary Inlet/Outlet of S 3000.
 - + The gripper arm picks up sample tubes in the rack from the right to the left. If no samples are picked up from five positions in the tray, the arm moves onto the next tray.
 - + If rack 01 is set while samples are loaded from rack 02, the gripper arm stops picking up tubes from rack 02 and moves on to rack 01. After picking up all the samples from rack 01, the gripper arm goes back to rack 02 and start picking up samples from the tray again.
 - + To begin Auto Operation, set empty racks on the outlet side of Primary Inlet/Outlet.
2. Serum Level Detector measures cell height of each primary tube.
3. Decapper removes caps from primary tubes.
 - + If Decapper fails to remove a cap, an audio alarm notifies operator of the error.
To resume operation, operator needs to remove cap from the tube manually.
4. Labeler prints barcode label and places it onto secondary tube supplied from bin feeder.
 - + When Labeler fails to affix label properly and barcode is not readable, the secondary tubes is to be discarded in the designated area.
5. At Aliquoter, aliquot tip supplied from tip feeder aspirates the requested volume of serum from primary tubes and dispenses it into secondary tubes.
 - + If clot including fibrin is detected during aspiration, any aspirated sample will be placed back into the primary tube and sort to error rack.
 - + If sample volume is insufficient to make the requested aliquots, no aliquot will be made and the primary tube sort to error rack.



Control Panel

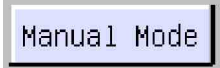
1. Switching Auto/Manual Mode

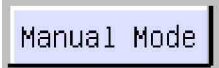
System is operated in either Auto or Manual mode. Mode is switched with startup/shutdown at C-CPU and no operation at control panel is required.

Auto Mode: sample tubes are automatically processed at each unit. The mode is used for processing samples.

Manual Mode: each unit is not processing samples and Lane through/Maintenance mode can be executed.

Switching the mode from Manual to Auto

1. When display shows  system is in manual mode. Press


 to switch the mode to Auto.

2. The dialog box  is displayed and choose OK.

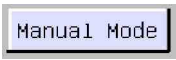
 is displayed and mode switches to Auto.

Switching the mode from Auto to Manual

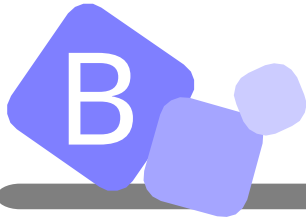
When control switch shows , the system is in Auto mode.

Press  to switch the mode to Manual.

2 The dialog box  is displayed and choose OK.

 is displayed and mode switches to Manual.

When system is process (communicating), mode switches when the process is completed.



Control Panel

2. Pause Button

When pause button is pressed during operation, entire system pauses operation.

Pausing the system

1. When the button shows , system is in operation.

Press the button to pause the system.

2. The button turns  and system pauses operation.

Resuming operation of the system

1. When the button shows , system is in pause.

Press the button to resume operation.

2. The button turns  and system resumes operation.

3. Interlock Switch

1. Each unit is equipped with safety interlock.



Note: Green indicates that the cover of the unit is locked. Press the button of unit to unlock the door. When the door is unlocked the button turns white and operator can open the cover.



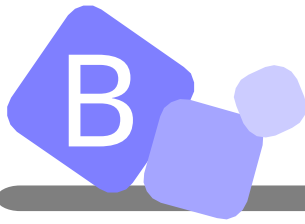
When the door is unlocked, moving parts of the unit pauses operation.

The door is automatically locked by closing it.

After closing the door, the unit is still paused. Press pause button to resume operation.

4. Maintenance button

System goes into maintenance mode by pressing the button. Maintenance mode is intended for the use by service engineers.




Control Panel


5. Lane Through button


With Lane Through Mode, carriers on the lane moves to the loading position.


Switching to Lane Through Mode

1. When the button shows , the system is not in Lane Through Mode.

Press the button to enter Lane Through Mode.

2. The button turns green  indicating that the system is in Lane Through Mode.

 **Check** The system shall be in Manual Mode to enter Lane Through Mode.


 **Check** Lane Through Mode can also be set at C-CPU as well.

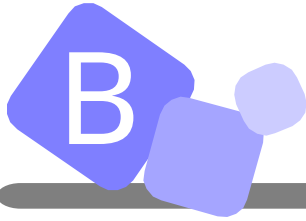
Exiting Lane Through Mode

1. When the button shows , the system is in Lane Through Mode.

Press the button to exit the mode.

2. The button turns gray  and the system exits Lane Through Mode.

 **Check** The system can also exit Lane Through Mode at C-CPU.



Control Panel

6. Alarm Stop Button


Tube bin feeder supply alarm

1. When bin feeder needs tubes, operator is notified with alarm.
2. Press Alarm Stop button to stop the alarm.

The button  turns to .

Tube Feeder button  turns to  indicating the unit in pause.

3. Supply tube in bin feeder.

After supplying tube in bin feeder, press Tube Feeder button  to resume operation.

Tip bin feeder supply alarm

1. When tip feeder needs tips, gray Tip-Rack Change button 



turns green .

2. Press Alarm Stop button to stop the alarm.

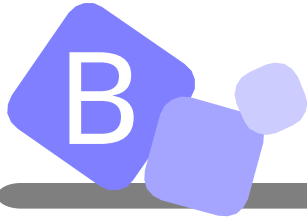
The button  turns to .

3. Supply tip in bin feeder.

After supplying tip in bin feeder, Tip-Rack Change button

 turns to .

Press  to resume operation.



Control Panel


Replacing Label Roll

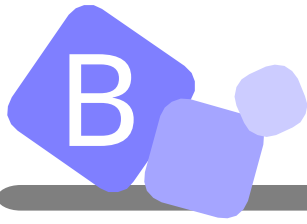
1. When rabel roll needs replacement, alarm notifies operator.
2. Press Alarm Stop button to stop the alarm.

Alarm Stop buttorn  turns to .

Labeler button  turns to  indicating the unit in pause.

3. When the unit pauses opeation, replace the label roll and press

 button to resume operation.

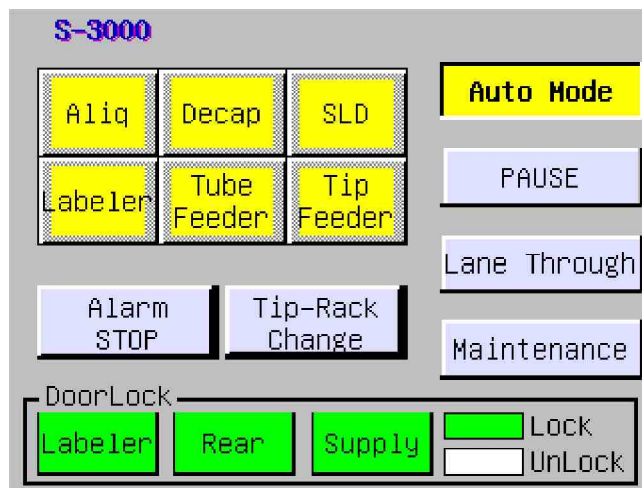


Control Panel

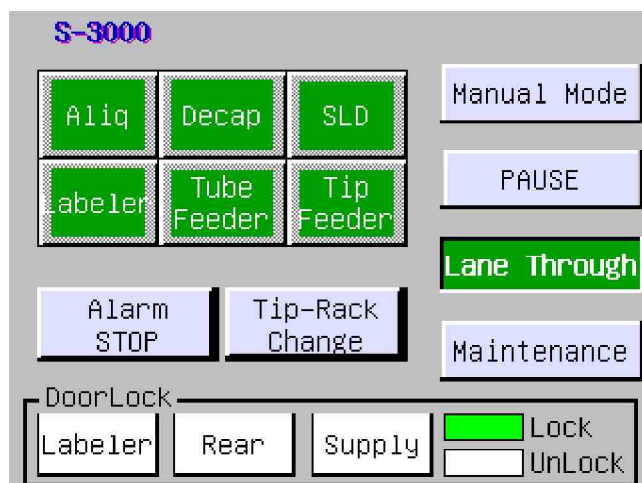
7. Unit button

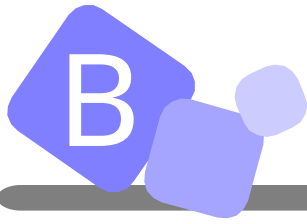
Color of Each unit button indicates the current state of the unit.

During operation in Auto Mode, the unit buttons are yellow.



During Lane Through Mode, the unit buttons are green.

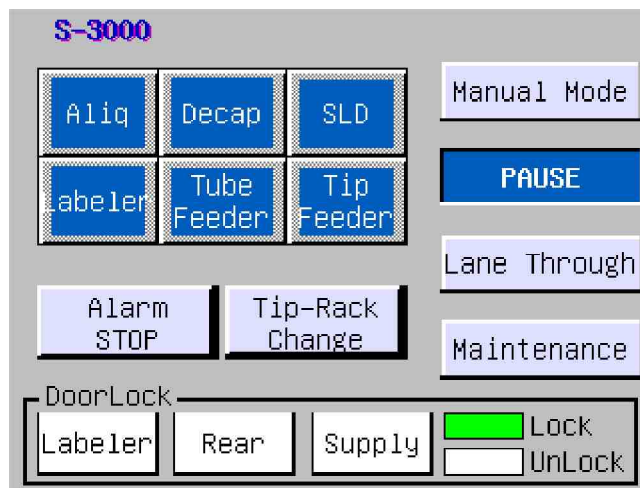


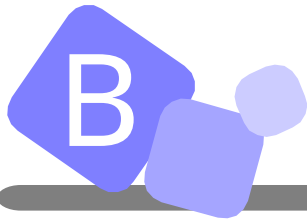


Control Panel

When unit is paused, the unit button is blue.

1. When the unit button is pressed while the unit is running, it pauses operation.
2. The unit button turns blue indicating that the unit is paused.
3. Press the unit switch to resume operation.

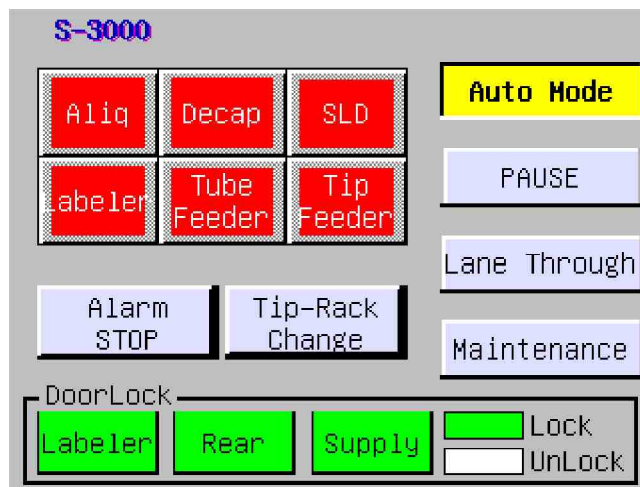




Control Panel

Red unit button indicate that error at the unit.

1. Alarm notifies operator of the error.
Press the red unit switch to stop the alarm.



2. Error description appears on the panel. Press Door Lock button to unlock the door for error recovery.
3. All the moving parts shall be paused when door is unlocked.
4. After error recovery, close the door and press Re-Start button to resume operation.

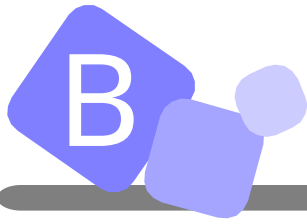
Clear button: with this button, sample tube is forced to pass.

Ex) when sample barcode cannot be read, the samples pass through by pressing clear button.

Note: At inlet/outlet, samples sort to error rack if clear button is pressed.

Alarm and Pause button at the back of IDS 3000: In addition to Alarm and Pause button on the control panel, the buttons at the back of IDS 3000 function the same way.

Rear interlock can also be unlocked with the button located at the back of IDS 3000.



Control Panel

8. Control Panel at Inlet and Outlet.

Switching Auto/Manual Mode

- In order to switch from Manual to Auto Mode,



press MAN Mode button once and press the same button

when it is flashing. The panel shows



indicating that the

unit is in Auto mode.

- In order to switch from Auto to Manual Mode,



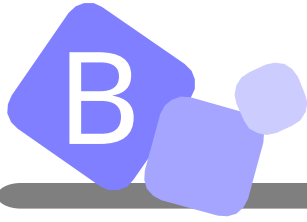
press AUTO MODE button once and press the same

button when it is flashing. The panel shows




indicating

that the unit is in Manual mode.



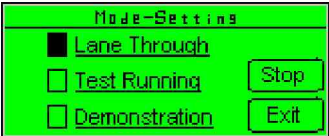
Control Panel

Switching to Lane Through Mode

1.  When the unit is in Manual mode, press FUNC button.

2. The display shows  and press the button of

Lane Through.

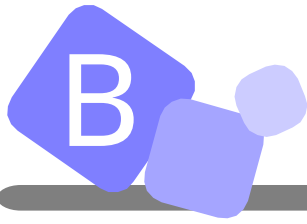
-  The display indicates that the unit is in Lane Through.

Press the button to undo Lane Through.

Press Stop button to stop lane through.

3. Press Exit button to go back to the first screen.

Test Running and Demonstration modes are intended for service engineers.





Control Panel

Replacing racks when they become full

1. When racks require replacement, audible alarm sounds

and the display shows . Press Rack button and the screen

turns to  and enters rack change mode.

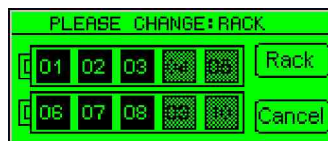
Note: Rack number (i.e., 01 to 10) is indicated as above .

2. Inlet: F04, 05, 09 and 10 iUnit#4: 04 and 09)

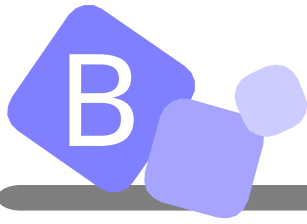
Remove empty trays and set new trays onto the rack base.
After replacing the rack, the button turns shaded color.

Outlet: 01, 02, 03, 06, 07 and 08

Remove trays filled with sample tubes. Scan the barcode label of empty rack with hand scanner and then set the tray on rack base. Repeat the same procedures for other trays that became full.



3. After changing trays, set the rack base into IDS 3000 and press Rack button.



Control Panel

Changing trays before they become empty/full.

1. Press Rack button



to enter rack change mode

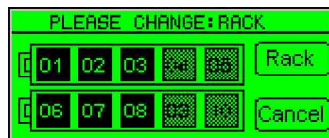


2. Inlet: F04, 05, 09 and 10 (Unit#4 04 and 09)

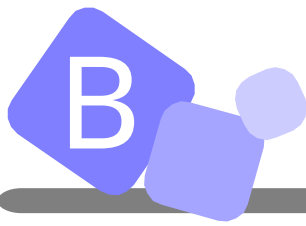
Remove the rack to be changed and set new trays on rack base.
After replacing the rack, the button turns shaded color.

Outlet: 01, 02, 03, 06, 07 and 08

Remove the rack to be changed. Scan the barcode label of new rack with hand scanner and then set the tray on rack base. Repeat the same procedures for other trays if necessary.



3. After changing trays, set the rack base into IDS 3000 and press Rack button.



Control Panel

When error is generated,

1. The display shows



with audible alarm.

2. Press Alarm button to stop the alarm



3. Press Lock button to unlock interlock.

After all the moving parts stops moving, recover from the error.

Press Err Infor to see error description

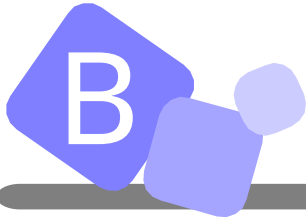


4. After recovering from the error, close the door and press Re-Start button to resume operation.

Clear button: with this button, sample tube is forced to pass.

Ex) When sample barcode cannot be read, the samples passes through by pressing clear button.


Note: At inlet/outlet, samples sort to error rack if clear button is pressed.



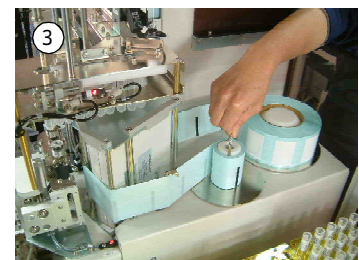
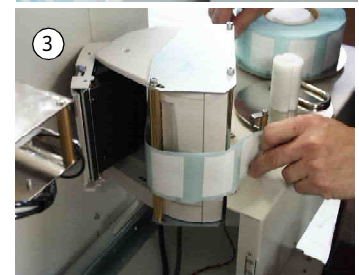
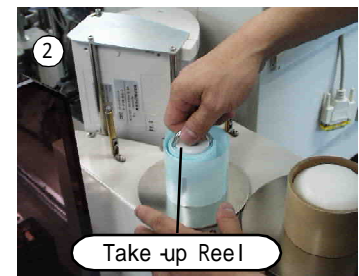
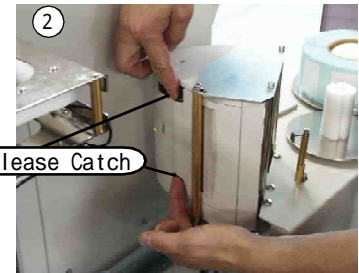
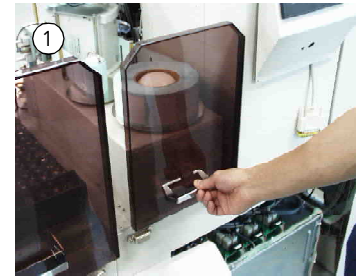
Replacement Procedure for Barcode Label

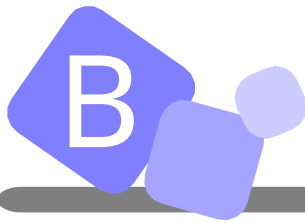
(Ensuring Labeler is paused as described in B-9)

1. Pull out Labeler.
2. Open the printer as pushing Cover Release Catch toward. Remove the take-up roller and remove the used roll.
3. Place a new roll of barcode label, put label through the printer head. Put the clasp back, and wrap labels around Take-up Reel two or three times.
4. Close the printer by pressing the printer cover until the two Cover Release Catches click back into the lock position. The printer automatically aligns the label.

 **Check** Ensure that there is not labels stuck around the printer.

5. Press FEED/RE-PRINT button.
6. Push back the printer to the original position.





Daily Maintenance of Printer

How to clean up Printer head

Pause Labeler or turn off power. Open the front cover of Labeler Unit. After ensuring the unit is not in operation, hold printer handle and pull out the printer drawer.

Open the printer (open the levers inward), and take the label off from the printer.

Clean up printer head as below.

Regular cleaning will extend the life of the printer head.

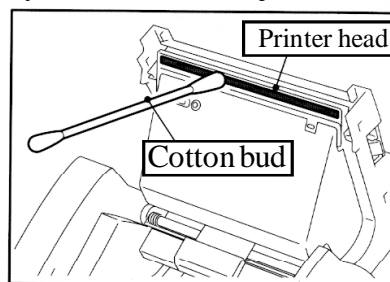


1. Turn off the power of printer.
2. Push right-and-left release levers toward the center, release the lock and open the top cover.

Note! Open the top cover vertically.

If it is opened halfway, it may automatically close and cause injuries.

3. Use cotton buds on the shelves to clean up stains on and around the heating part of printer head.

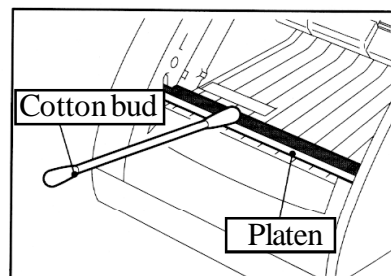


High-temperature warning!

Do not touch the printer head and its surrounding right after printing.

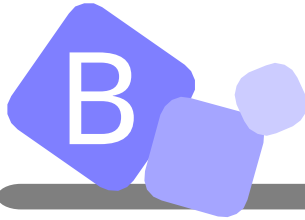
It may cause burn.

4. Clean the platen with a cotton bud.



Referenced the manual of Tec Portable Printer B-419-GS23.

After cleaning, set the label according to the procedures on B-14.



Daily Maintenance of Printer

How to clean up interior sheet detection sensor of the printer

Pause Labeler or turn off power. Open the front cover of Labeler Unit.

After ensuring the unit is not in operation, hold printer handle and pull out the printer drawer.

Open the printer (open the levers inward), and take the label off from the printer.

Clean up interior sheet detection sensor as below.

Regular cleaning will prevent printer errors.



1. Turn off the power of printer.
2. Push right-and-left release levers to the center, remove the locked condition and then open the top cover.

Note! Open the top cover vertically.

If it is opened halfway, it may automatically close and cause injuries.

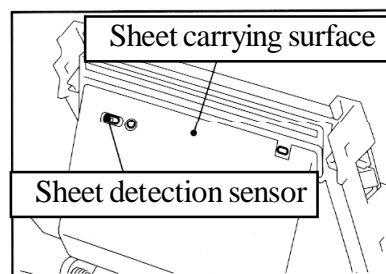
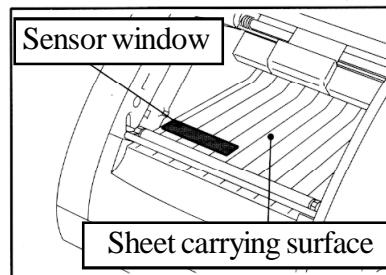
3. Use dried soft cloth to clean stains from sheet carrying surfaces and sensor window.

High-temperature warning!

Do not touch the printer head and surrounding areas right after its operation.

It may cause burn.

Clean the sheet detection sensor with a brush.



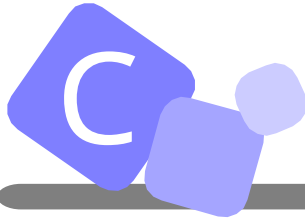
Referenced the manual of Tec Portable Printer B-419-GS23.

After cleaning, set the label according to the procedures on B-14

Troubleshooting & Maintenance

This section covers troubleshooting and recommended daily maintenance.





Troubleshooting

Problem	Cause	Countermeasure	
Errors occurred on the entire system after system was powered on.	The compressor is not turned on.	Turn on the compressor.	
"SL" errors occurred throughout the system.	The air valve of compressor or air tank is not opened.	Open the valve.	
Cylinder error	Cylinder is not functioning properly.	There is an obstruction within the operating range of the cylinder.	Remove the obstruction.
		Movement of the cylinder is too slow.	Check the air pressure. Adjust the speed controller.
		The cylinder is damaged.	Replace the cylinder.
	Malfunction of solenoid valve.		Replace the solenoid valve.
	Air duct is damaged.		Replace the air duct.
	Auto-switch is not reacting properly.	There is a break in the auto switch cable.	Replace the cable.
		A connector pin is not connected.	Connect the connector pin.
		The auto-switch is not at the proper position.	Adjust the position of auto-switch.
Conveyor does not move or move smoothly.	Dust in pulley interferes with the movement.	Clean the pulley.	
	Bearing is damaged.	Replace the bearing.	
	Motor is damaged.	Replace the motor.	
	Belt is damaged.	Replace the belt.	
	Chain is damaged.	Replace the timing belt.	
	Connector pin came off.	Connect the connector pin.	
	Fuse of the control board blew out.	Replace the fuse.	
Barcode read error	Malfunction of barcode reader.	Replace the barcode reader.	
	LED area is not clean.	Clean the LED area of barcode reader.	
A unit does not function properly.	Sensitivity of fiber amplifier is not appropriate.	Adjust the sensitivity of amplifier, or replace the part.	
	fiber head is not clean.	Clean the fiber head.	
	Proximity sensor is damaged.	Replace the sensor.	
	Motor is damaged.	Replace the motor.	
	There is a break in the cable.	Replace the cable.	
	Fuse blew out.	Replace the fuse.	
	Connector pin is not connected.	Connect the connector pin.	
	Screw is loose.	Tighten the screw.	
Lack of grease.	Grease the driving part.		
Barcode printer does not work properly.	Printer head is damaged.	Replace the printer head.	
	Poor print quality (too light)	Clean the printer head	

NOTE ! Adjustment or replacement of parts shall be performed by authorized engineers.

