Automated Tip Loader

Operator's Manual

Document information

Manual	Revision date	Changes
1.0	August 2013	New document
1.1	June 2015	Tip tray information for **MODULAR** *PRE-ANALYTICS* **EVO** Minor revisions Addition of tip sorting roller

Table 1 Revision history

Edition notice

This Operator's Manual provides guidance for operators of the Automated Tip Loader.

Every effort has been made to ensure that all the information contained in this document is correct at the time of printing. However, Roche Diagnostics GmbH reserves the right to make any changes necessary without notice as part of ongoing product development.

Intended use

The Automated Tip Loader provides laboratory personnel with an easy, automated way to load aliquot tips (Nozzle Tip 2000 / Aliquot Tips 2000) into tip trays ready for use in one of the following modules:

- AQM module (Aliquot Module) of the **cobas**® 8100 automated workflow series
- AQN module (Online Aliquoter) of the **MODULAR** *PRE-ANALYTICS* **EVO**

It is essential that all users read this Operator's Manual thoroughly before using the instrument.

Any customer modification of the instrument will render the warranty or service agreement null and void.

Instrument approvals

The Automated Tip Loader complies with the emission and immunity requirements described in standard IEC 61326-2-6: 2005.

Furthermore, the Automated Tip Loader is manufactured and tested according to the following international safety standards:

- UL 61010-1
- CAN/CSA-C22.2 No. 61010-1-12: 2012/05/11 Ed:3

Issued by Intertek for Canada and the US.

Trademarks

COBAS is a trademark of Roche.

All other trademarks are the property of their respective owners.

Contact addresses

Inside the European Union and EFTA member states

Manufacturer of the Automated Tip Loader		Hitachi High-Technologies Corporation 1-24-14 Nishi-Shinbashi Minato-ku, Tokyo 105-8717 Japan
Authorized representative		Roche Diagnostics GmbH Sandhofer Strasse 116 68305 Mannheim, Germany

Outside the European Union and EFTA member states

Manufactured by	Hitachi High-Technologies Corporation Ichige, Hitachinaka-shi, Ibaraki-ken, 312-8504 Japan
Manufactured for	Roche Diagnostics GmbH Sandhofer Strasse 116 68305 Mannheim, Germany

Table of contents

General safety information

Before you start working with the instrument, it is essential that you understand the warnings, cautions, and safety requirements contained in this manual.

Safety classifications

This section explains how precautionary information is presented in this manual.

The safety precautions and important user notes are classified according to the ANSI Z535.6 Standard. Familiarize yourself with the following meanings and icons:

Safety alert symbol

The safety alert symbol alone promotes awareness of hazards that are generic or directs the reader to safety information provided elsewhere in the document.

These symbols and signal words are used for specific hazards:

WARNING

Warning

- Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

CAUTION

Caution

- Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

NOTICE

Notice

Indicates a hazardous situation that, if not avoided, can result in damage to the system.

Important information that is not relevant to safety is indicated with the following icon:

Indicates additional information on correct use or useful tips.

Safety precautions

Pay attention to the following safety precautions

If you ignore these precautions, you can suffer minor to moderate injury. Each precaution is important.

Operator qualification

As a user, you are required to have sound knowledge of relevant safety precaution guidelines and standards and of the information and procedures contained in the Operator's Manual.

- Carefully follow the procedures specified in the Operator's Manual for operation and maintenance.
- Leave maintenance, installation, or service that is not described in the Operator's Manual to trained Roche Service representatives.
- Follow Good Laboratory Practices, especially when working with biohazardous material.

Safety summary

This safety summary contains the most necessary general warning and caution messages. Also, you will find specific safety information in other sections of this manual.

Electrical safety

WARNING

Electrical shock or fire due to unsuitable power connections

An ungrounded cable can result in electrical shock. If you connect the instrument to an outlet with multiple plugs, an overcurrent may result and could cause a fire.

- Ground the cable to the instrument.
- Insert the plug into a single outlet rated at 15 A or more.
- Do not forcibly bend the cable.
- When troubleshooting, always disconnect the cable.

Mechanical safety

WARNING

Personal injury due to contact with moving parts

- Do not touch any parts of the instrument other than those specified. Keep away from moving parts during operation.
- Keep doors and covers closed and in place while the instrument is operating.
- If the instrument fails during operation, turn off the power to the instrument and disconnect the cable before you take any action to investigate the problem.
- Do not disassemble or modify the instrument.

Consumables safety

WARNING

Personal injury due to use of non-approved, dirty, damaged, or used consumables

Use of non-approved consumables can result in injury.

Reuse of consumables can result in injury.

- Use only Roche-approved consumables.
- Do not reuse consumables.

Disposal

WARNING

Installation, removal from use, transportation, and disposal of the instrument

- Only trained Roche Service representatives, or similarly qualified personnel supervised by authorized Roche Service representatives, are qualified to install, transport, and dispose of the instrument.

Operating conditions

NOTICE

Instrument damage due to an unsuitable installation location

The instrument may fall and be damaged if you install it in an unsuitable location.

- Place the instrument on a work surface that can support loads of up to 100 kg.
- Locate the work surface on a floor that can support loads of up to 200 kg.

NOTICE

Instrument malfunction due to unsuitable environmental conditions

The instrument may malfunction if you operate it under unsuitable conditions.

- Ensure that the instrument is not exposed to vibration, dust, electromagnetic interference, excessive humidity, direct sunlight, or severe variations in temperature.

NOTICE

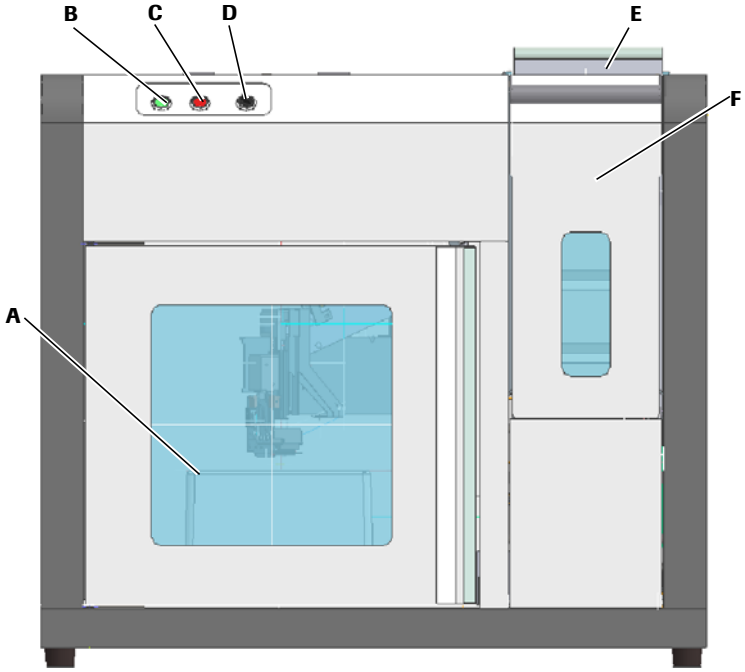
Instrument damage due to use of non-approved, dirty, damaged, or used consumables

Use of non-approved consumables can result in damage to the instrument.

Reuse of consumables can result in damage to the instrument.

- Use only Roche-approved consumables.
- Do not reuse consumables.

Instrument description

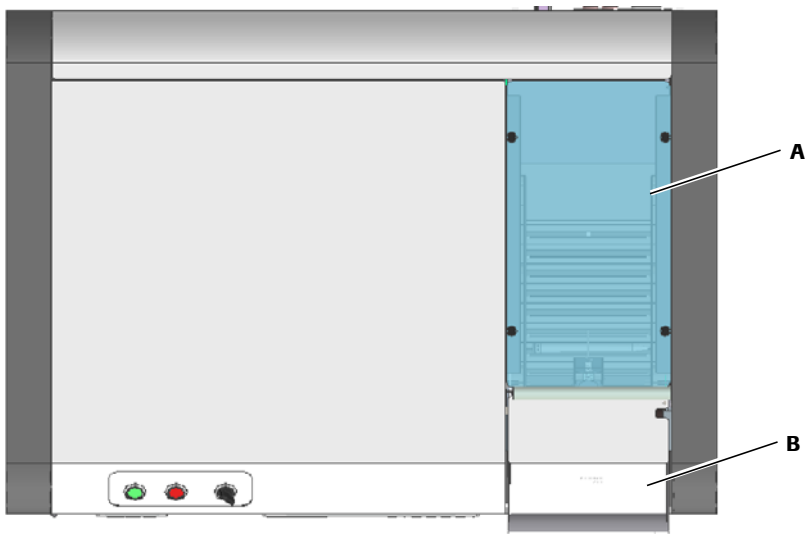


A Front door
B **START** button
C **STOP** button
D Power switch
E Flap handle
F Flap of the tip container

Figure 1 Front view

Symbol	Description
	On
	Off

Table 2 Symbols of the power switch

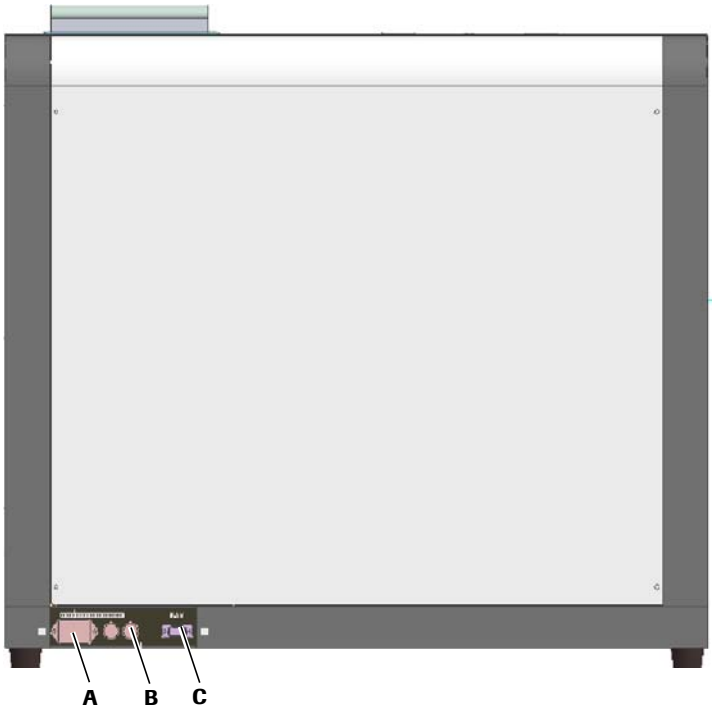


A Window to the inside of the tip container **B** Flap of the tip container

Figure 2 Top view

A Flap handle of the tip container

Figure 3 Right-side view



A AC inlet

B Fuses

C Serial port

Figure 4 Rear view

Specification

Model	ATI-180/264
External dimensions	690 mm W x 510 mm D x 645 mm H
Weight	45 kg
Power voltage	AC 100 V to AC 240 V (50/60 Hz)
Power consumption	50 VA
Control method	16-bit CPU controlled
External communication	RS-232C (serial port for use by Roche Service representatives only)
Environmental conditions	Altitude of 2000 m or less Pollution level 2 Room temperature in the range 5 to 35 °C Humidity level in the range 30% to 95% with no condensation Indoor use Overvoltage category II
Transport and storage conditions	Temperature in the range -20 to 75 °C Humidity level in the range 5% to 95%

Accessories

The instrument is supplied with the following accessories.

No.	Name	Quantity
1	Adapter for 180-tip trays	1
2	Fuse	2
3	Cleaning brush	1
4	Tip sorting roller	1

Table 3 Accessories supplied with the instrument

Installation

Ensure that you meet the following requirements when you install the instrument.

Environmental conditions Install the instrument in a room where it is not exposed to vibration, dust, ferromagnetic interference, excessive humidity, direct sunlight, or severe variations in temperature.

Supporting surface Place the instrument on a level work surface that can bear a weight of 100 kg. If you place the instrument on an uneven surface, it may malfunction.

Distance from walls Ensure that the distance from the rear of the instrument to the nearest wall is at least 20 cm. If the distance is less, the mains cable or communication cable may break due to excessive bending and instrument failure may result.

Power supply Connect the instrument to the power supply that offers the least fluctuation in voltage. Do not use a socket that supplies multiple plugs. Ensure that the socket is located so the plug of the instrument cable can be easily removed.

Ensure that the mains cable is connected to a single outlet with a rating of at least 15 A. Set the instrument's power switch to OFF before you connect the cable to the power supply.

Transportation The instrument should be lifted by two people, positioned on the left and right of the instrument. When lifting the instrument, support it using the bottom surfaces.

Injury from dropping the instrument

If you drop the instrument during transportation or if the instrument falls from an unstable installation location, personal injury may result.

- If the instrument is dropped or falls, do not touch the broken pieces with your bare hands.

Operation

This section explains how to prepare the instrument and how to load tip trays with tips.

Preparing for use

▶ To prepare the instrument for use

Electrical shock due to wet hands

▶ Perform this task only if your hands are dry.

WARNING

1 Open the front door.

2 Remove any loose tips or other unwanted objects.

3 Ensure that the sliding switch on the right is set to a tip tray capacity of 180 (for a **MODULAR** *PRE-ANALYTICS* **EVO**) or 264 (for a **cobas**® 8100 automated workflow series).

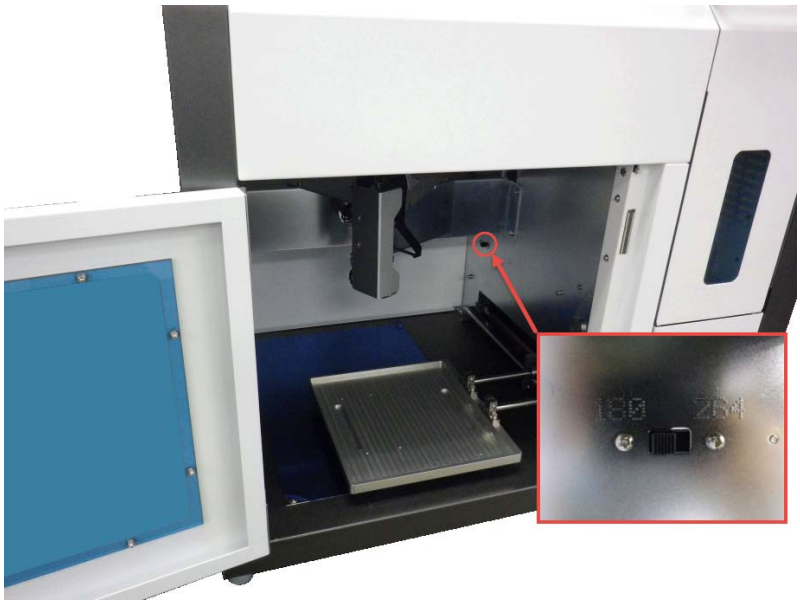


Figure 5 Setting the tip tray capacity

4 If you wish to load a tip tray for a **MODULAR** *PRE-ANALYTICS* **EVO**, place the adapter for 180-tip trays on the tip tray base.

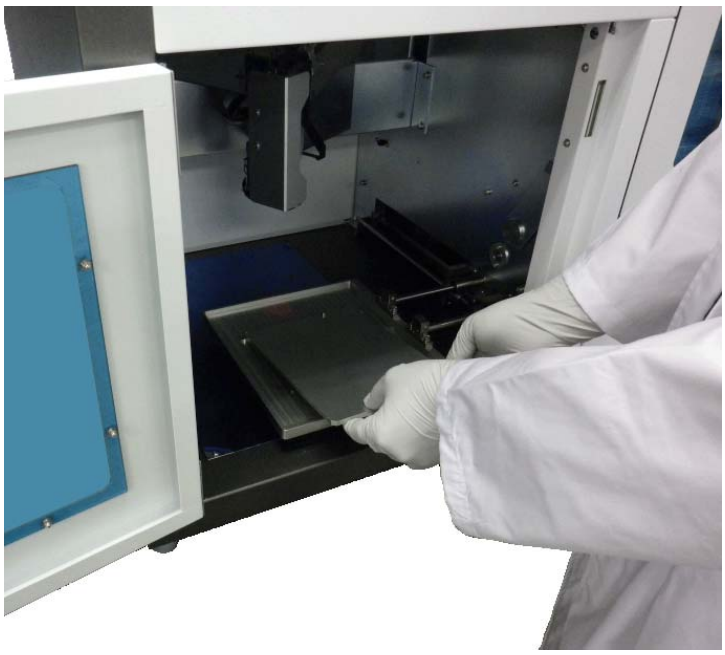


Figure 6 Placing the adapter for 180-tip trays

NOTICE

Instrument failure due to incorrect use of the adapter

The instrument may fail if you set the tip tray capacity to 264 but start operation with the adapter for 180-tip trays inside.

- Place the adapter inside the instrument only if you have set the tip tray capacity to 180.

5 Close the front door and switch the power to ON if the power supply is not on already.

6 Wait for the instrument to begin and complete its start up routine.

■

Preparing the pack of tips

▶ To prepare the pack of tips

1 To reduce tip blockages, align the direction of the tips by gently shaking the pack of tips back and forth.

Figure 7 Shaking the pack of tips to align the direction of the tips

2 Hold and lightly press three points (A, B, C) on the side of the pack of tips.

Figure 8 Holding and lightly pressing three points on the side of the pack of tips

3 Remove the top film of the pack of tips.

4 Manually align tips if they are not uniformly aligned as shown in Figure 9.

NOTICE

Tip blockage may occur

▶ Make sure that all tips point in the same direction.

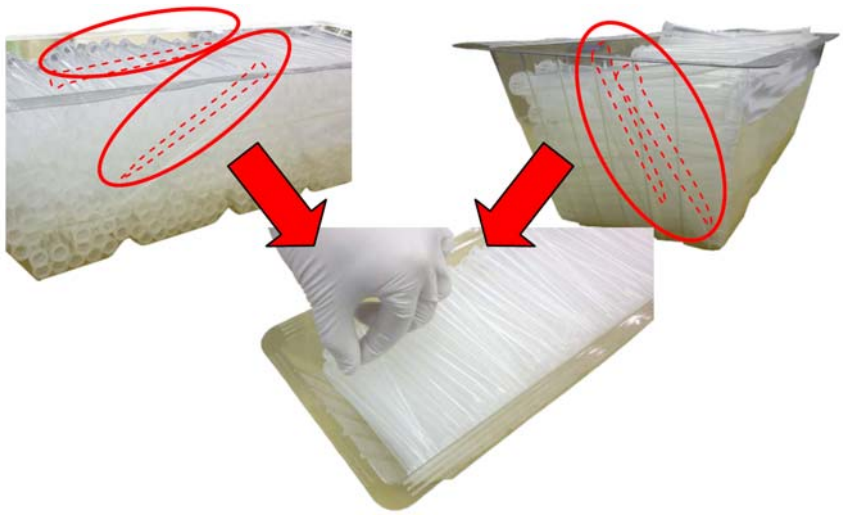


Figure 9 Aligning the tips in the pack of tips

■

Filling the tip container with tips

▶ To fill the tip container

1. Pull the flap handle towards you and gently lower the flap until it stops in a horizontal position.
2. Remove the shutter.
3. Place an opened pack of new tips into the flap.

   Ensure that all of the tips lie horizontally and parallel to the short sides of the pack so that they will remain horizontal when you close the flap. If any tips are not correctly aligned before you close the flap, they may create a blockage during operation.

NOTICE

Failure to supply tips

▶ Make sure that there is no tip in longitudinal direction in the pack of tips.

Figure 10 Placing a pack of tips into the flap

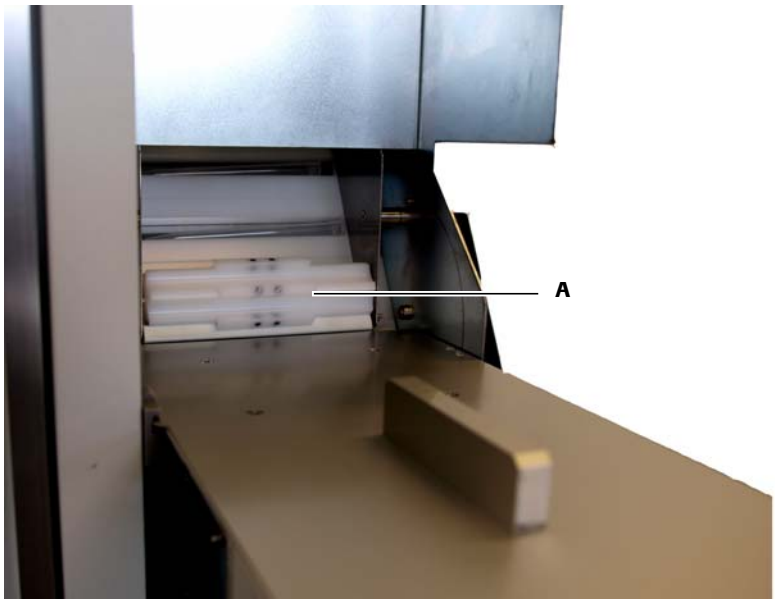
4 Cover the pack of tips by using the shutter.

Place the shutter, with the grip uppermost, on top of the pack of tips. Grasp the grip, and slide the shutter towards the instrument. Ensure the left-hand edge of the shutter passes beneath the gray guiding rail.

A Guiding rail
B Shutter
C Grip
D Flap handle

Figure 11 Covering the flap

5 Place the tip sorting roller at the end of the shutter as shown in Figure 12.



A Tip sorting roller

Figure 12 Placing the tip sorting roller

6 Grasp the flap handle and lift it until you close the tip container fully.

Figure 13 Closing the tip container

7 Grasp the end of the shutter and lift it sufficiently to release the new tips into the tip container. Take care not to open the flap when you lift the shutter.

Figure 14 Lifting the shutter to release the tips

■

Loading an empty tip tray

▶ To load an empty tip tray with tips

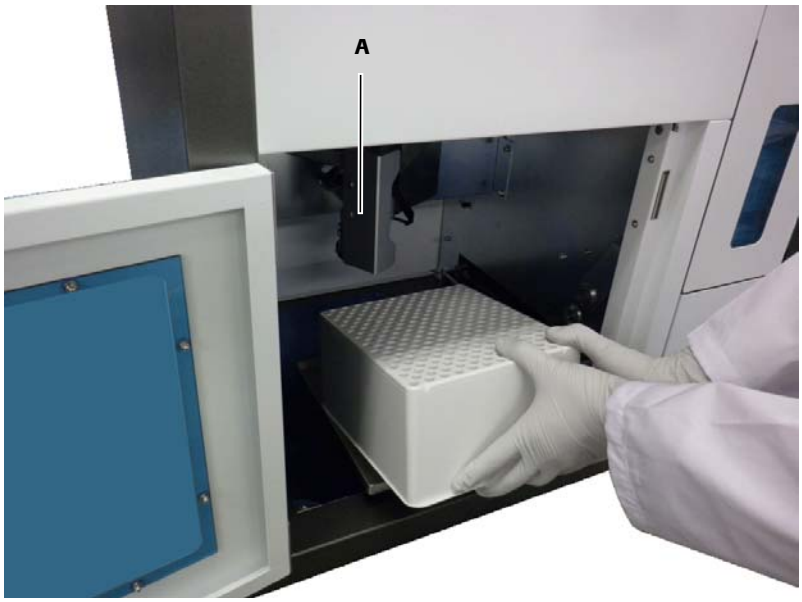
1 Open the front door, and ensure that there are no tips or other objects lying inside.

2 Place an empty tip tray on the tip tray base. Take care not to hit the tip loading mechanism with the tip tray.

NOTICE

Instrument failure due to use of a filled tip tray (for a cobas® 8100 automated workflow series) during restart

▶ When using tip trays for the **cobas**® 8100 automated workflow series, make sure that you always load an empty tip tray before restarting the system.



A Tip loading mechanism

Figure 15 Inserting an empty tip tray for loading with tips

3 Close the front door.

4 Press the **START** button on the top of the instrument.

■

Maintenance

NOTICE

Damage by solvents

Attempts to clean the instrument with solvents may cause the deformation, malfunction, or breakage of the instrument.

- Never use solvents to clean any part of the instrument.

Cleaning the surfaces of the instrument

To keep the external and internal surfaces clean, they have to be wiped periodically.

To clean the surfaces of the instrument

1. Wipe the internal and external surfaces of the instrument with a lint-free cloth moistened with mild neutral cleaning solution.
2. Dry the cleaned surfaces with a dry cloth.

■

Cleaning the rail of the instrument

To keep the rail run smoothly, clean it with the cleaning brush once a week.

▶ To clean the rail of the instrument

NOTICE

Potential sources of blockage

Tips or other unwanted objects that are present within the instrument may cause blockages.

- ▶ Before and after using the instrument, open the front door and check for tips or other unwanted objects.

1 Turn the power off.

2 Open the front door.

3 Use the cleaning brush to clean the opening at the top end of the rail.

Figure 16 Cleaning the opening at the top end of the rail

4 Use the cleaning brush to clean the rail. Do not scratch the rail.

Figure 17 Using the cleaning brush to clean the rail

5 Close the front door.

6 Restart the instrument.

■

Troubleshooting


WARNING

Risk of electric shock

▶ Before investigating or resolving any operational failure, turn the power switch to OFF.

Observed problem	Alarm	Possible cause	Action
The instrument does not start when the power switch is set to ON.	Silence	A front door or the flap on the tip container is open.	Close the open door or flap.
		The mains cable has become disconnected.	Connect the mains cable.
The instrument does not start if you press the **START** button.	Intermittent tone	The tip container is empty.	Refill the tip container with tips.
		The tip loading mechanism has become blocked.	Open the front door and remove any trapped tips from the tip loading mechanism.

Table 4 Possible solutions if the instrument fails

If you are unable to diagnose and resolve a problem, contact your Roche Service representative.

Resolving blockages caused by tips

Occasionally, the instrument may fail during operation due to a blockage caused by a tip. Tip blockages typically have two causes:

- An incorrectly aligned tip in the tip container. See *To resolve a tip blockage in the tip container* (p. 23).
- The tip loading mechanism attempting to insert a tip into a tray position that is already filled. See *To resolve a blockage at the end of the tip loading mechanism* (p. 25).

▶ To resolve a tip blockage in the tip container

1 Use the window at the top of the instrument to check for blockages in the tip container.

2 Turn the power off.

3 If a tip is stuck in the tip container, move the shutter slowly.

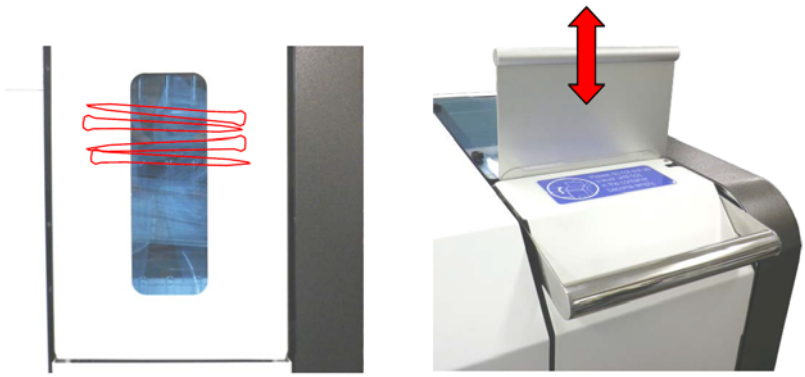


Figure 18 Moving the shutter slowly

4 If moving the shutter did not solve the problem, remove the four screws on top of the instrument, then remove the window.

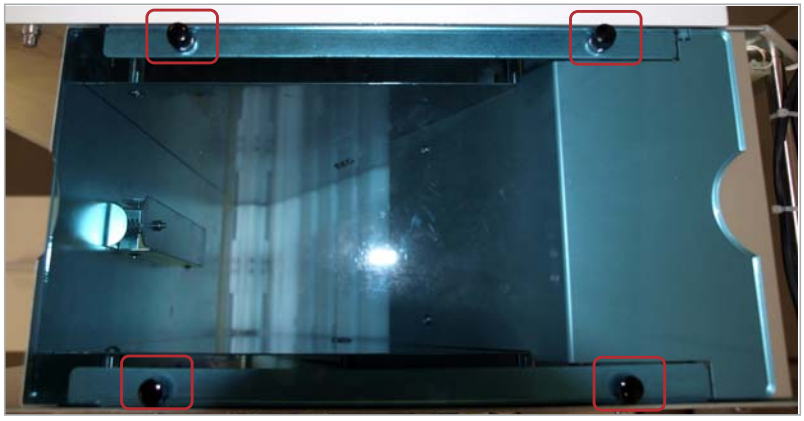


Figure 19 Removing the four screws and the window

5 Remove all tips.

A Incorrectly aligned tip causing a blockage

Figure 20 A tip causing a blockage in the tip container

6 Replace the window and fasten the screws before restarting operation.

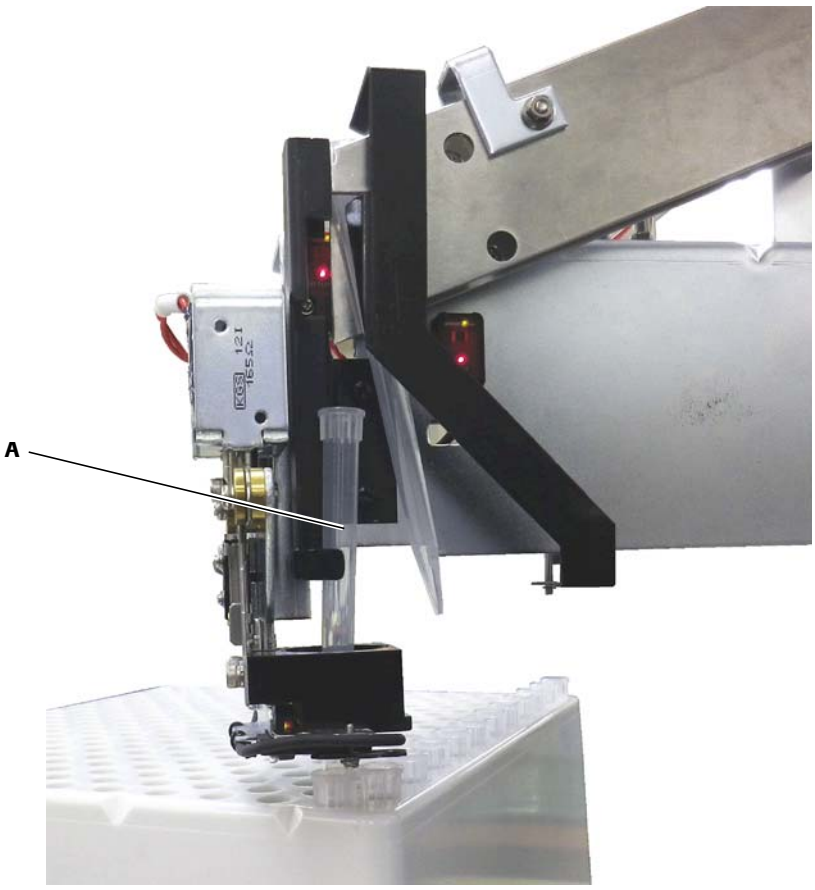
■

To resolve a blockage at the end of the tip loading mechanism

1 Turn the power off.

2 Open the front door.

3 Remove the tip from the end of the tip loading mechanism.



A Tip blocked by the previously loaded tip

Figure 21 Blockage at the end of the tip loading mechanism

4 Restart the instrument.

■