Operating Manual

Monitored Incubator Option 2 (MIO™)

6 Positions
4 Positions

Document Status Sheet

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3	0	2017-08-31	Corrected shutters' description in chapter "Part Locations" Added chapter "Customer Support" MIO2 is available for Freedom EVO and Fluent "Product Safety Signs" added	

Table of Contents

1 About This Manual

This Operating Manual describes the MIO2 and provides all the information required for operating it safely and for maintaining it in good working order. This manual must be read carefully before performing any work on the MIO2 and before using it.

This chapter outlines the purpose of this manual and specifies the product referred to. Furthermore, it explains the use of symbols and conventions as well as further general information.

This Operating Manual contains no software description. For more information on the software please consult the corresponding software manual. Refer to section 1.7 “Reference Documents”, 1-2.

1.1 Scope of This Manual

This manual is applicable for MIO2 (6 positions and 4 positions) valid from the serial number 706005497 designated for operation on instruments (e.g., Freedom EVO and Fluent).

Note: *The MIO2 with 4 position is not compatible with the Freedom EVO 75.*

1.2 Manufacturer

Tecan Schweiz AG
Seestrasse 103
CH-8708 Männedorf
Switzerland

1.3 Intended Use

The MIO2 is used on Tecan instruments to incubate and / or shake substances in microplates.
The MIO2 is an instrument component. The intended use is defined for the instrument where it is used on. Refer to the corresponding Operating Manual of the instrument. Refer to section “1.7 “Reference Documents”, 1-2.

1.4 Improper Use

Improper use may prejudice the MIO2 safety concept.

- The MIO2 must not be used with options or components that are not approved by Tecan.
- The MIO2 is not explosion-proof and should not be installed in locations where there is a hazard of explosion.
- The MIO2 should not be used in the absence of functional safety devices.
- The MIO2 is not suitable to defrost frozen microplates.

Only liquids suitable for the MIO2, with respect to the chemical resistance of the liquid system and explosion/fire hazard, may be used. Special applications requiring the use of hazardous substances are run at the user's own risk.

1.5 Warranty

The MIO2 must not be used with components that are not approved by Tecan. The use of unapproved components may impair the safety concept of the MIO2. This would invalidate any warranty of safety and compliance to national and international standards, as required for UL/CSA certification, by EC directives, etc.

1.6 Trademarks

The product names, whether registered or unregistered trademarks, mentioned in this manual are reproduced solely for identification purposes and remain the exclusive property of their respective owners. For simplicity reasons, the trademark symbols such as ® and ™ are not repeated in the manual.

1.7 Reference Documents

This section provides a list of the documents that are needed or may be useful when using the MIO2.

The Doc IDs listed below are root numbers. Therefore, they do not contain information about the language, document version, or the medium (data storage medium, hard copy, downloadable file, etc.) of the document.

Note: *On the basis of your order configuration, the Operating Manuals for optional equipment apply as well.*

Check the scope of the corresponding document to ensure that you are in possession of the correct version.

The Doc ID does not refer to ordering information. When placing orders, please refer to the number on the binder, CD casing, etc.

1.7.1 Instrument Manuals

- Freedom EVO® Operating Manual (Doc. ID 392886)
- Fluent® Operating Manual (Doc. ID 396327)
- Fluent® Operating Manual (Doc. ID 399706)
- Fluent® Reference Manual (Doc. ID 398090)
- Fluent® Reference Manual (Doc. ID 399937)

1.7.2 Software Manuals

- Freedom EVOware® Software Manual (Doc. ID 393172)
- Freedom EVOlution™ Application Software Manual (Doc. ID 394802)
- FluentControl™ Application Software Manual (Doc. ID 396329)
- Instrument Software Manual (Doc. ID 392888)
- Fluent® Instrument Software Manual (Doc. ID 396330)

1.7.3 Other Reference Documents

- Certificate of Decontamination Form (Doc. ID 40205TMt01)

1.8 Compliance with Laws and Standards

Covered by instrument conformity and certification.
Refer to the corresponding Operating Manual of the instrument. Refer to section 1.7 “Reference Documents”, 1-2.

1.9 Document Conventions

- Cross-references appear as follows—e.g.:
  “Refer to section 1.1.1, 1-1”
  - 1.1.1 refers to the corresponding section number
  - The symbol denotes “page number”
  - 1-1 refers to the page number, whereas the first number stands for the chapter number (chapter 1 - page 1)

Note: *For safety conventions and symbols refer to chapter 2 “Safety”, 2-1.*

1.10 Abbreviations

FSE	Field service engineer
MIO	Monitored Incubator Option

2 Safety

This chapter describes the safety concept of MIO2, provides general rules of correct behavior, and warnings concerning hazards associated with the use of the MIO2.

2.1 Safety Message Conventions

2.1.1 Signal Words

WARNING indicates the possibility of personal injury or even loss of life if the instructions are not followed.

ATTENTION indicates the possibility of equipment damage, malfunctions or incorrect process results, if instructions are not followed.

2.1.2 Safety Symbols

General Warning

Warning for hot surface

Read this

2.2 General Safety Information

WARNING

MIO2 is designed and built in accordance with the present state-of-the-art technology and the recognized technical safety regulations. Nevertheless, risks to users, property and the environment can arise if the MIO2 is used without due care and attention.

The safety of all users and personnel depends on the strict observation of these safety instructions and awareness of the safety-related warnings provided in this manual.

- Please pay great attention to the following general safety information.
- This manual must always be available to all persons performing the tasks described herein.

- Legal regulations, such as local, state and federal laws concerning the use or application, as well as the handling, of dangerous materials in connection with the MIO2 must be strictly followed.
- The operating company is responsible for defining instructions in accordance with company procedures and local legal requirements. The instructions provided by the operating company must be strictly observed.
- Observe the correct environmental conditions for storage and operation.
- Structural changes to the safety devices are forbidden.
- Damaged safety devices must be replaced immediately as described in this manual.
- The MIO2 must not be modified in any way without prior consultation and written approval of Tecan. Authorized modifications to the system may only be performed by an FSE certified for the repair and upgrading of the MIO2. Tecan will reject any claim resulting from unauthorized modifications.
- Fire hazard caused by the improper use of the MIO2. The MIO2 should not be installed in locations where there is a hazard of explosion.
- Chemical, biological, and radioactive hazards can be associated with the
- substances used or the samples and reagents processed with the MIO2 (e.g., during loading and unloading). The same applies to waste disposal.
  - Always be aware of possible hazards associated with these substances.
  - Use appropriate protective clothing, safety goggles and gloves.
  - The handling of substances and the disposal of waste may be subject to local, state, or federal law, or to regulations with regard to health, environment, or safety. Strictly observe the corresponding provisions.
- Any contamination must be dealt with immediately as described in this manual.
- The user is responsible for ensuring that the MIO2 is always operated under proper conditions, and that maintenance, service, and repair tasks are performed with care, on schedule, and only by authorized personnel.
- Risk of incorrect measuring results. After system care or maintenance has been performed, operation must only be resumed after the correct system operating conditions have been verified.
- Always use recommended consumables and original spare parts for maintenance and repair to assure good system performance and reliability.
- Observe all safety instructions of the instrument the MIO2 is used on.
- Maximum microplate fill levels are microplate specific and need to be validated.

- Risk of spillage. Microplate filled over the specified fill level will lead to spillage during operation resulting in contamination.
  – Make sure the microplate is not filled more than the specified fill level.
- The MIO2 has to be operated with heat-resistant microplates.
- Risk of deformation of microplates. Non heat-resistant microplates will get deformed if heated up.
  – Make sure only heat-resistant microplates are used for incubation.
- Caustic substances can cause burns and eye injury.
  – Avoid exposure to caustic substances.
- Avoid the formation and accumulation of flammable vapors.
- Avoid the spillage of flammable material.
- Prior to using hazardous materials perform a risk assessment.
- Consider specific workplace conditions, such as temperature, air ventilation, electrostatic discharge.
- Make sure that the risk is acceptable prior to use of the instrument.
- The MIO2 is a heated device. The outer surface may develop temperatures up to a maximum of 45°C.
  – Let the MIO2 cool down hand-hot before removal.

2.3 Operating Company

The operating company must ensure that the MIO2 and in particular the safety features, function properly and that all the personnel in contact with the instrument are adequately trained.

Responsibilities

- Method and process validation.
- Defining the processes in compliance with the Standard Operating Procedures.
- Ensuring that installation and operational qualifications (IQ OQs) have been completed.
- Ensuring that all personnel in contact with the MIO2 are adequately trained.
- Ensuring the availability of appropriate protective clothing and equipment.
- Ensuring the maintenance and safe operation of the MIO2.
- Requiring adherence to laboratory safety regulations and directives.

2.4 User Qualification

The laboratory personnel must be fully qualified and trained to operate the MIO2. The work described in this Operating Manual must only be performed by authorized personnel with the qualifications prescribed below.

Laboratory personnel must:

- have suitable technical training,
- be familiar with the laboratory safety regulations and directives,
- be familiar with the instructions for the safety elements of the instrument,
- use protective clothing and equipment,
- be familiar with and adhere to good laboratory practices,

- and have read and understood the instructions in the Operating Manual.

Tecan recommends that the operator attends an operator training course. Please ask the Tecan Customer Service about available courses. Refer to section 10 “Customer Support”, 10-1.

2.4.1 Operator

The operator (lab technician) works for the operating company.

Required Skills

- No specific application or system knowledge
- Command of local languages
- Command of English is preferable

The operator has application software access rights allowing him to run methods and perform system care.

2.4.2 Key Operator

The key operator (application specialist) supports the operating company or works for the same company.

Required Skills

- Extensive application knowledge
- Limited system knowledge
- Command of local languages
- Command of English
- In-depth knowledge of the corresponding software manual

Responsibilities

- Instructing the operator
- Writing, running and validating methods
- Helping the operator to solve problems with the instrument

2.5 Product Safety Signs

Safety signs are affixed for safety purposes. Damaged, lost or illegible safety signs must be replaced immediately as illustrated. For the meaning of safety symbols refer to section 2.1.2 “Safety Symbols”, 2-1.

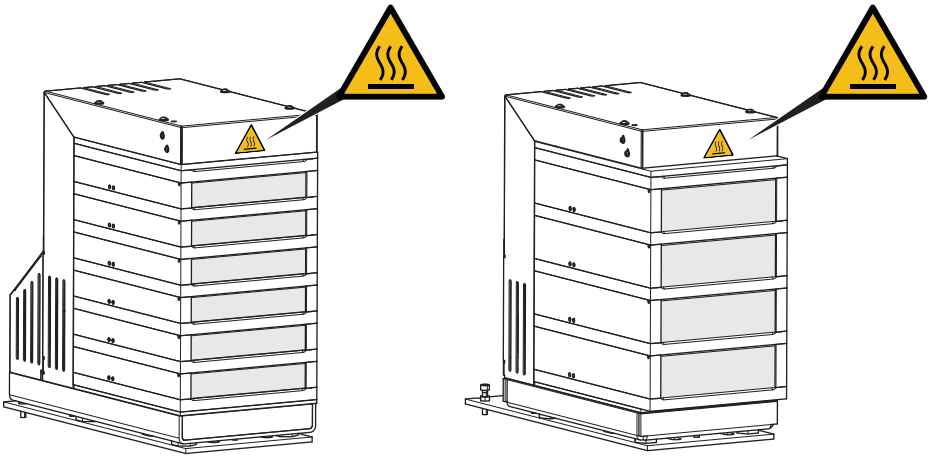

Fig. 2-1 *Safety signs*

2.6 Decontamination Declaration

In addition to regular system care, and in accordance with standard laboratory regulations, the MIO2 and its parts and accessories must be thoroughly decontaminated in the following circumstances:

- Before any maintenance or service work is performed on the MIO2 and, in particular, before an FSE intervention on the MIO2
- In the event of accidents (e.g., crash, spillage, etc.)
- Before returning the MIO2 or its parts or accessories, to Tecan (e.g., for repair)
- Prior to storage
- Prior to disposal
- In general, before moving the MIO2 or its parts from its location

The owner of the instrument has full responsibility for the effective decontamination of all the equipment.

Before any intervention on the MIO2 by an FSE, and before returning the MIO2 or its parts or accessories to Tecan, the owner of the instrument must complete and sign the Decontamination Declaration form, confirming that the decontamination has been performed in accordance with good laboratory practice guidelines. Contact your local service organization to obtain this form and refer to section 7.1 “Decontamination”, 2 7-1.

Note: *Tecan reserves the right to refuse to deal with any MIO2 or its parts or accessories that is not accompanied by the Decontamination Declaration form.*

3 Technical Data

3.1 Overview

Overview

The MIO2 is a precision instrument designed for automating incubating tasks on a heated air incubation concept.

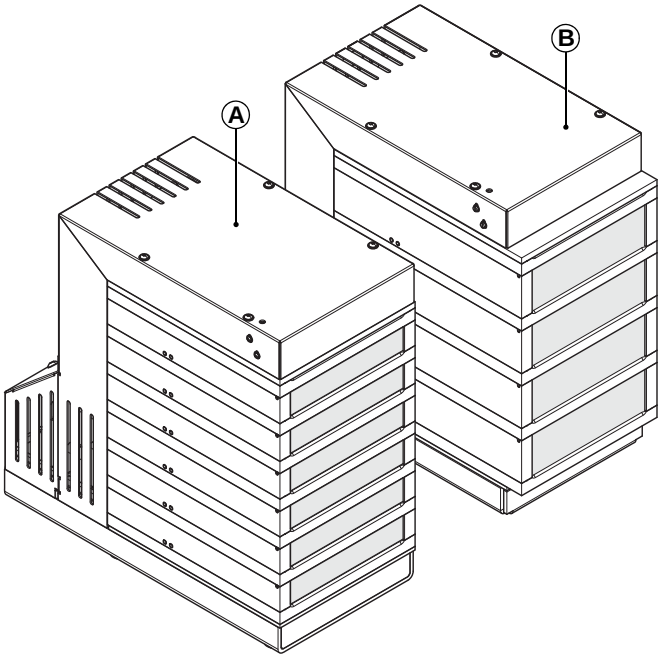

Fig. 3-1 *MIO2*

A *Incubator with 6 positions (slots)* ***B*** *Incubator with 4 positions (slots)*

Configurations

The MIO2 is provided in a 4 and a 6 slot configuration with the following features:

Standard

- The standard configuration does not contain the shaking option.

Shaking Incubator

- Both incubators can be equipped with a shaking option.
- The 6 positions incubator can optionally be equipped with a cooling fan to provide room temperature incubation in conjunction with shaking.

Area of Application

The MIO2 is designated for all Fluent and Freedom EVO instruments—except for Freedom EVO 75 that is incompatible with MIO2 with 4 positions.

Delivery

It is recommended that theMIO2 is only delivered and installed by Tecan authorized field service engineers.

3.2 Product Identification and Appendix Labels

6 Slot MIO

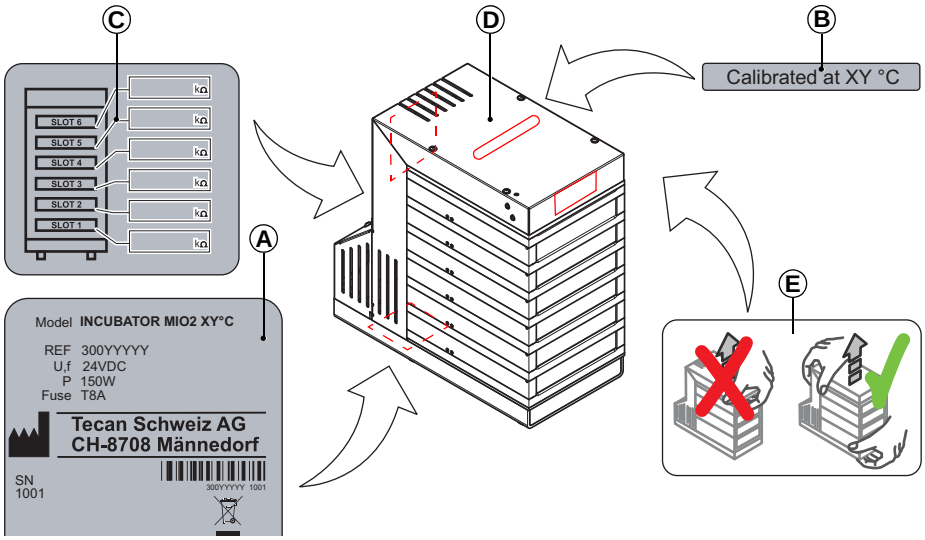

Fig. 3-2 *MIO2, 6 positions, product identification and appendix labels*

A *Product identification label*
B *Calibration label*
C *Configuration label*
D *Monitored Incubator Option*
E *Caution label*

4 Slot MIO

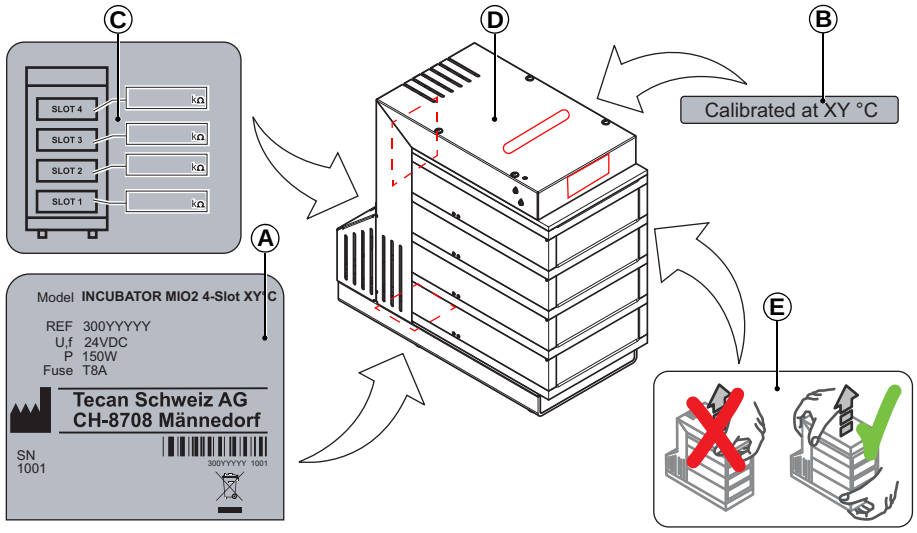

Fig. 3-3 *MIO2, 4 positions, product identification and appendix labels*

A *Product identification label*
B *Calibration label*
C *Configuration label*
D *Monitored Incubator Option*
E *Caution label*

Product Identification Label

The product identification label (A) provides the following instrument details Fig. 3-2, 🗎 3-2:

Tab. 3-1 *MIO2 product identification label*

Note	Definition
Identification data	Model: Product name / model REF: Reference number / Revision / Bar code Manufacturing date SN: Serial number
Technical data	Voltage: supply voltage (Volts), 24 V DC Power: power consumption (Watts) 150 W Fuse: T8A 250V Manufacturer's name and address: Tecan Schweiz AG, CH-8708 Männedorf
Barcode	Barcode: Serial number and product type

Calibration Label

The calibration label (B) states the temperature the MIO2 was calibrated and tested for Fig. 3-2, 🗎 3-2.

Configuration Label

The configuration label (C) Fig. 3-2, 🗎 3-2 specifies the resistance of the slots.

3.3 Dimensions and Weights

6 Slot MIO

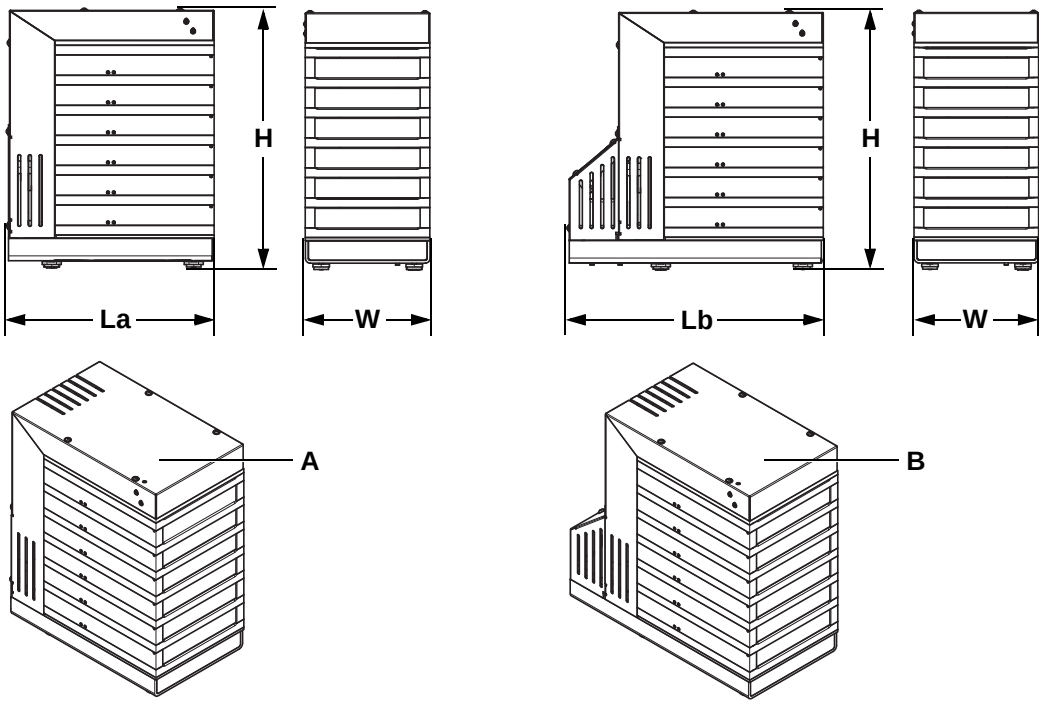

Fig. 3-4 *Dimensions of the MIO2, 6 positions*

A *MIO2 standard* ***B*** *MIO2 with shaker option*

Dimensions

Tab. 3-2 *Dimensions of the MIO2, 6 positions*

Dimensions		Value
La	Length of standard configuration	213 mm (8.38 in.)
Lb	Length with shaking assembly / fan option configuration	265 mm (10.43 in.)
W	Overall width	130.5 mm (5.13 in.)
H	Overall height	267.5 mm (10.53 in.)

Weights

Tab. 3-3 *Weight of configurations, 6 positions*

Type	Value
Standard configuration weight	3.5 kg (7.7 lbs.)
Shaking assembly configuration	4.8 kg (10.6 lbs.)
Shaking assembly with fan option configuration	4.9 kg (10.8 lbs.)

4 Slot MIO

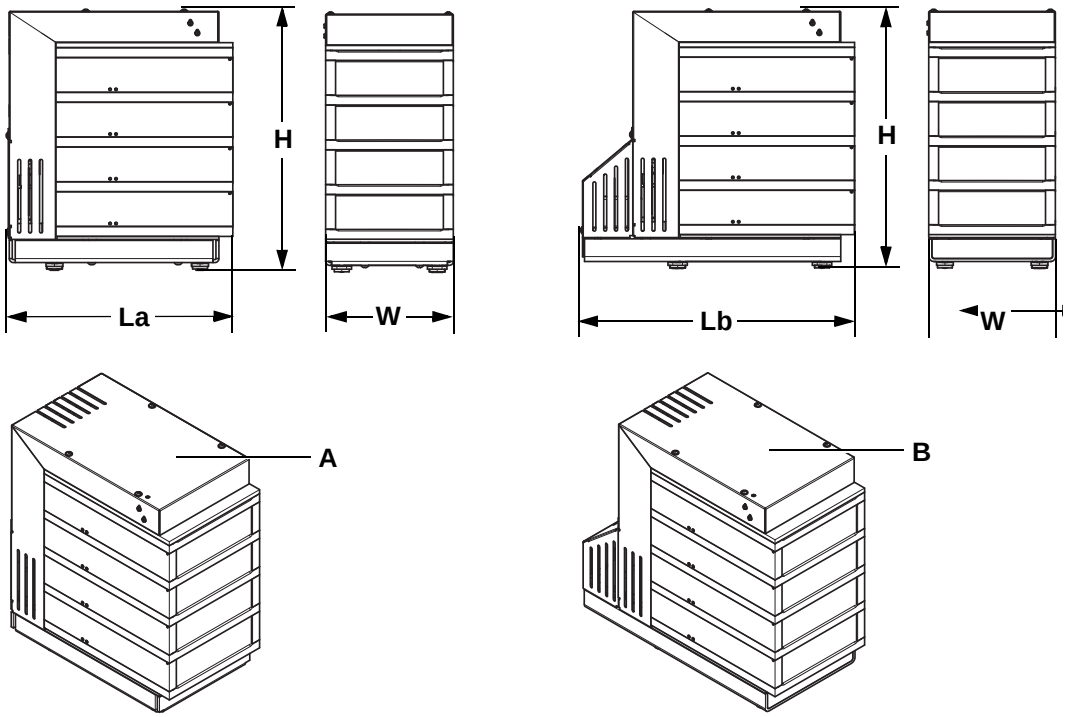

Fig. 3-5 *Dimensions of the MIO2, 4 positions*

A *MIO2 standard configuration* ***B*** *MIO2 with shaker option*

Dimensions

Tab. 3-4 *Dimensions of the MIO2, 4 positions*

Dimensions		Value
La	length of standard configuration	228 mm (8.98 in.)
Lb	length with shaking assembly / fan option configuration	278 mm (10.95 in.)
W	Overall width	130.5 mm (5.13 in.)
H	Overall height	267.5 mm (10.53 in.)

Weights

Tab. 3-5 *Weight of configurations, 4 positions*

Type	Value
Standard configuration weight	3.6 kg (7.9 lbs.)
Shaking assembly configuration	4.6 kg (10.1 lbs.)

3.4 Operating Range

6 Slot MIO

Tab. 3-6 Operating ranges, 6 positions

Number of Slots	6
Incubating temperature range	from (actual room temperature + 5°C) to 60°C from (actual room temperature + 9°F) to 140°F
Accuracy of chamber temperature	max. ±0.5°C at 37°C (max. ±0.9°F at 99°F) max. ±0.5°C at 46°C (max. ±0.9°F at 115°F) max. ±2.0°C at 60°C (max. ±3.6°F at 140°F)
Accuracy of temperature in microplate in the chamber	max. ±1°C at 37°C (max. ±1.8°F at 99°F) max. ±1°C at 46°C (max. ±1.8°F at 115°F) max. ±2°C at 60°C (max. ±3.6°F at 140°F)
Warm-up time from 20°C to 37°C	max. 20 min.
Warm-up time from 20°C to 45°C	max. 20 min.
Warm-up time from 20°C to 60°C	max. 30 min.
Shaking / rotation frequency	1–8.5 Hz
Linear shaking	max. 2 mm amplitude in Y-dimension

4 Slot MIO

Tab. 3-7 Operating ranges, 4 positions

Number of Slots	4
Incubating temperature range	from (actual room temperature + 5°C) to 60°C from (actual room temperature + 9°F) to 140°F
Accuracy of chamber temperature	max. ±1°C at 37°C (max. ±1.8°F at 99°F) max. ±1°C at 46°C (max. ±1.8°F at 115°F) max. ±2°C at 60°C (max. ±3.6°F at 140°F)
Accuracy of temperature in microplate in the chamber	max. ±1°C at 37°C (max. ±1.8°F at 99°F) max. ±1°C at 46°C (max. ±1.8°F at 115°F) max. ±2°C at 60°C (max. ±3.6°F at 140°F)
Warm-up time from 20°C to 37°C	max. 30 min.

Tab. 3-7 Operating ranges, 4 positions

Warm-up time from 20°C to 45°C	max. 30 min.
Warm-up time from 20°C to 60°C	max. 30 min.
Shaking / rotation frequency	1–8.5 Hz
Linear shaking	max. 2 mm amplitude in Y-dimension

3.5 Electrical Module Interface

Supply Ratings

Tab. 3-8 Operating ranges

Connector	9 pin sub D CAN-Bus
Power consumption	<150W (90W [a])
Voltage range	24V DC (±10%)
Fuses	T8A 250V

a) Setup in current limitation mode with the Instrument Software 6.0 or later version.

Electrical Safety

Classification according to EN 61010-1 with regard to electrical safety:

Tab. 3-9 Electrical specifications (safety)

Overvoltage category	II

3.6 Requirements

The interface cable is a 9 Pin Sub D CAN-Bus connecting the instrument with the MIO2.

Tab. 3-10 Software requirements MIO2

		6 Positions	4 Positions
Setup & Service	Instrument Software	V 6.0 or later	V 6.4 or later
Application Software	Freedom EVOlution	V 2.0 or later	-
Application Software	EVOware	V 1.4 SP1 or later	V 1.4 SP1 or later
Application Software	FluentControl	V 1.0 or later	
Setup & Service	FluentSetup	V 1.0 or later	

3.7 Environmental Conditions

The MIO2 is intended for indoor operation and storage only. For detailed information on operating conditions refer to the Operating Manual of the instrument the MIO2 is used with. Refer to section 1.7 “Reference Documents”, 1-2.

Storage temperature	1–60°C (34–140°F)
Storage humidity	5–80% relative (non condensing) at 30°C (86°F) or below
Transport temperature	-20 to +60°C (-4 to 140°F)
Transport humidity	20–80% relative (non condensing)

MIO2 must be protected against dust and debris with a cover. Only store MIO2 in its original packaging.

3.8 Emissions

Refer to the operating manual of the instrument. Refer to section 1.7 “Reference Documents”, 1-2.

4 Description of Function

Purpose of This Chapter

This chapter explains the basic principle of the MIO2, shows how it is structured and gives a functional description of the assemblies.

4.1 Principles of Operation

The MIO2 contains the following features:

- Six or four slots for one microplate each
- Shutter mechanism to darken chamber or slots.

4.1.1 Part Locations

Overview

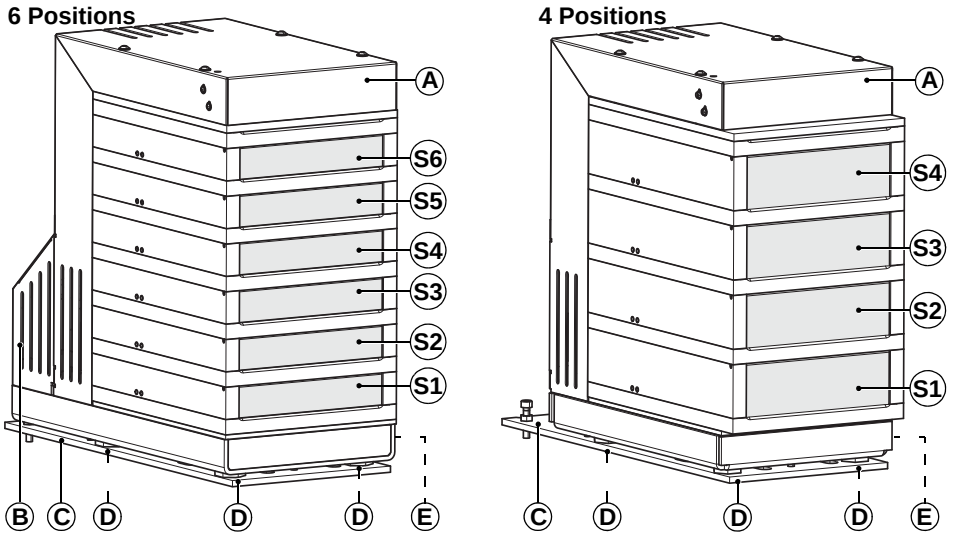

Fig. 4-1 *Overview of MIO2*

A	*Cover*	***D***	*Adjustable Stand*
B	*Shaker cover*	***E***	*Support Stand*
C	*Support Plate*	***S***	*Slots 1–6 with shutters resp. slots 1–4 with shutters*

Shutters

The slots are equipped with shutters to darken the chambers during the incubation process. Shutters open—and remain open—when pushed by the robotic arm to load the slots with microplates.

Slots

The MIO2 is provided in a 6 and a 4 slot configuration providing the dispatching of 6 and 4 microplates, respectively, at the same time.

Fixing devices prevent the microplates from dislocating.

Heating devices provide uniform temperatures.

Adjustable stands

Three adjustable stands provide correct positioning and aligning on the instrument work table.

Shaker

The shaker option installed in conjunction with a fan provides the shaking of microplates at a defined frequency as well as room temperature incubation for a defined period of time

Support Plate

The MIO2 is installed in the instrument on a support plate.

5 Installation

Purpose of This Chapter

This chapter describes how the MIO2 is reinstalled after maintenance task have been performed.

5.1 Unpacking

How to Unpack the Option

Before you completely unpack the MIO2, check the following:

- Is the packaging damaged in any way?
- Is there any damage visible on the device?
- Is the material complete according to the “Order Configuration/Packing List” for the MIO2?

Note:

- *The MIO2 must be handled with care.*
- *Tecan recommends that you retain the original packaging for future transport or storage of the MIO2.*
  The packaging has been carefully designed to prevent damage.

5.1.1 Labels on the Packaging

Correct and complete marking of packing helps to prevent incorrect handling, accidents, incorrect delivery, loss of weight and damages during storage.

Tab. 5-1 *Packaging symbols*

Symbol	Significance	Description
	Recycle	The packaging material can be recycled. Do not dispose of as domestic waste. Information on the material used for this packaging is provided beneath the symbol.
	This side up	Ensure that the package is transported and stored with the top side, indicated by the arrows, uppermost. Do not topple over.
	Keep dry	Ensure that the package does not get wet during transport and storage.
	Fragile	Handle the package with care. There are fragile goods inside.
	Keep away from sunlight	Ensure that the package will not be exposed to heat during transport and storage. Protect against strong sunlight.
	Do not stack	Do not stack packages. The package is not designed to carry extra weight.

5.2 Incubator Installation

Note: *Please note that the MIO2 models shown in various illustrations in this manual do not necessarily correspond to the configuration installed onto the platform.*

Assuming that the MIO2 support plate for the respective instrument has already been installed proceed as follows to install the incubator.

ATTENTION

Risk of damage to equipment. Incubators that are installed in disorder will lead to damage to equipment.

- Make sure that the incubators are in correct order if multiple incubators are installed.

ATTENTION

Risk of contamination. Incorrectly installed incubators will lead to spillage, contamination or damage to equipment.

- Make sure the incubator option has been installed and aligned accurately.

ATTENTION

Risk of damage to equipment. Lifting the incubator by the slot will lead to damage to equipment.

- Lift the incubator by the edges.

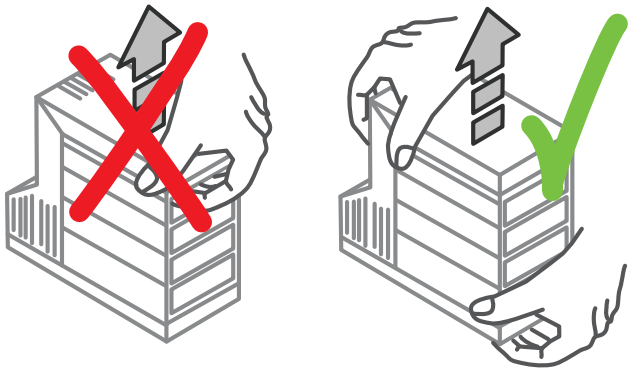

Fig. 5-1 *Do not lift the incubator by the slot*

5.2.1 Connecting

D-Sub Cable

Note: *One or two MIO2 can be connected in series (CAN) and have a device address switch each.*

1 Connect the interface cable D-sub connector (A) to the incubator and tighten the connector's fixing screws.

If installing one incubator skip to section 5.2.3, 5-6.

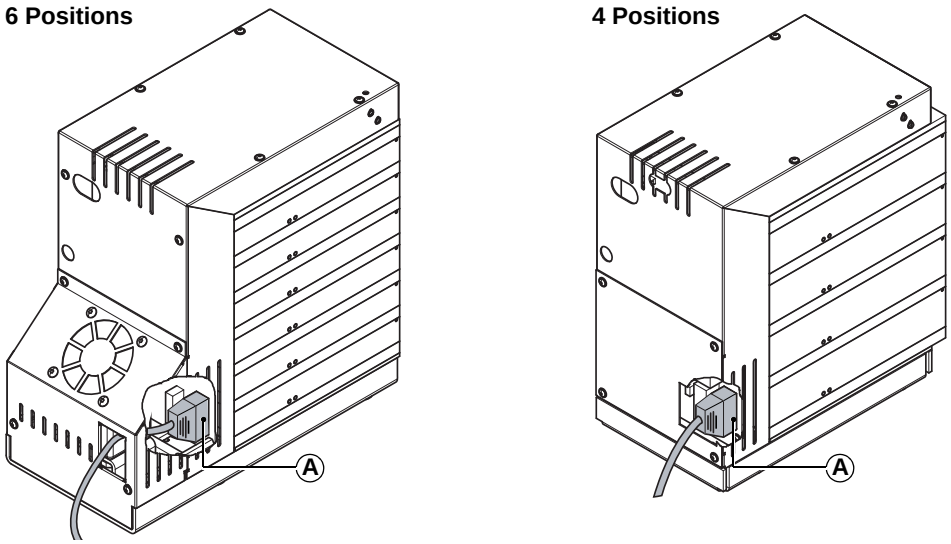

Fig. 5-2 *MIO2, D-Sub cable connector*

5.2.2 Multiple Incubators

Proceed as follows when installing multiple incubators:

1. Connect the loop cable (C) to the next incubator as shown in Fig. 5-3, 🗎 5-5.
2. Perform the Setup procedure in the current limitation mode.
   Refer to the Instrument Software Manual for further information.
3. Perform the setup procedure with the Instrument software.

ATTENTION

Risk of malfunctions. An incorrectly performed setup may lead to malfunctions or damage of the incubator option.

- Activate the current limitation mode with the Instrument Software.

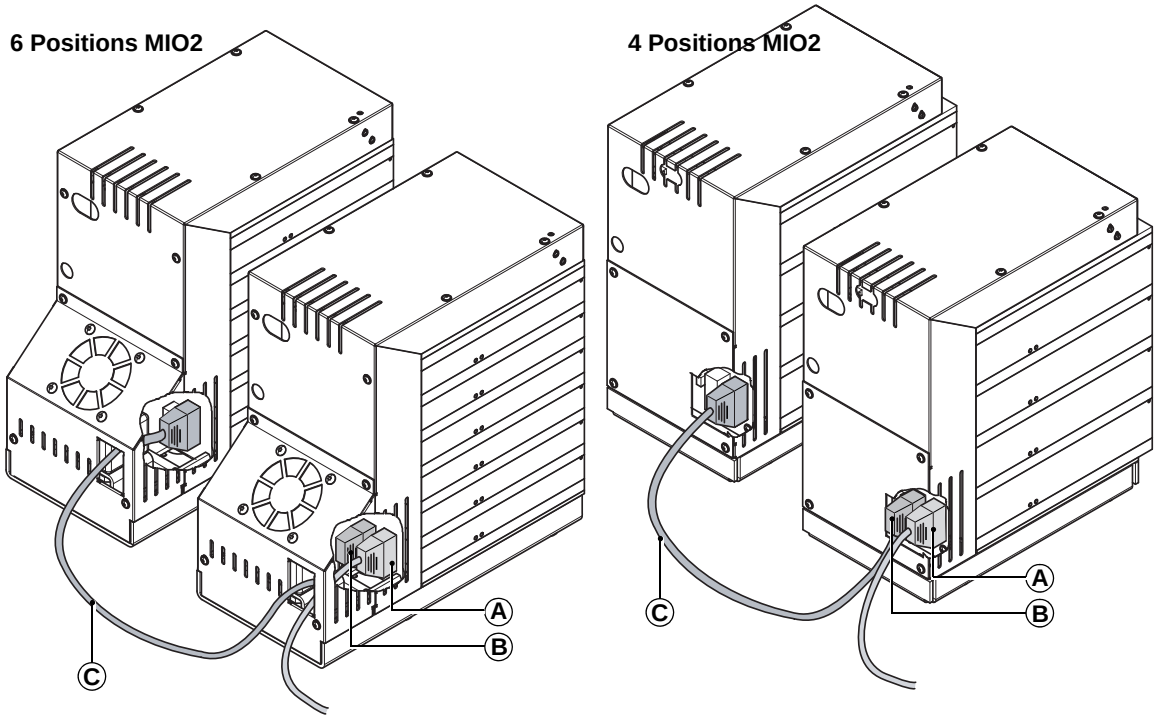

Fig. 5-3 *Multiple MIO2, D-Sub cable and Loop cable connected*

5.2.3 Leveling Incubator

Proceed as follows to level the incubator:

1 Put the incubator (A) on the support plate *Fig. 5-4,* 5-6.

Note: *Make sure that the feet rest precisely in the designated positioning cavities of the support plate.*

2 Use the special tool (D) to adjust the three adjustable incubator feet (E) *Fig. 5-4,* 5-6.

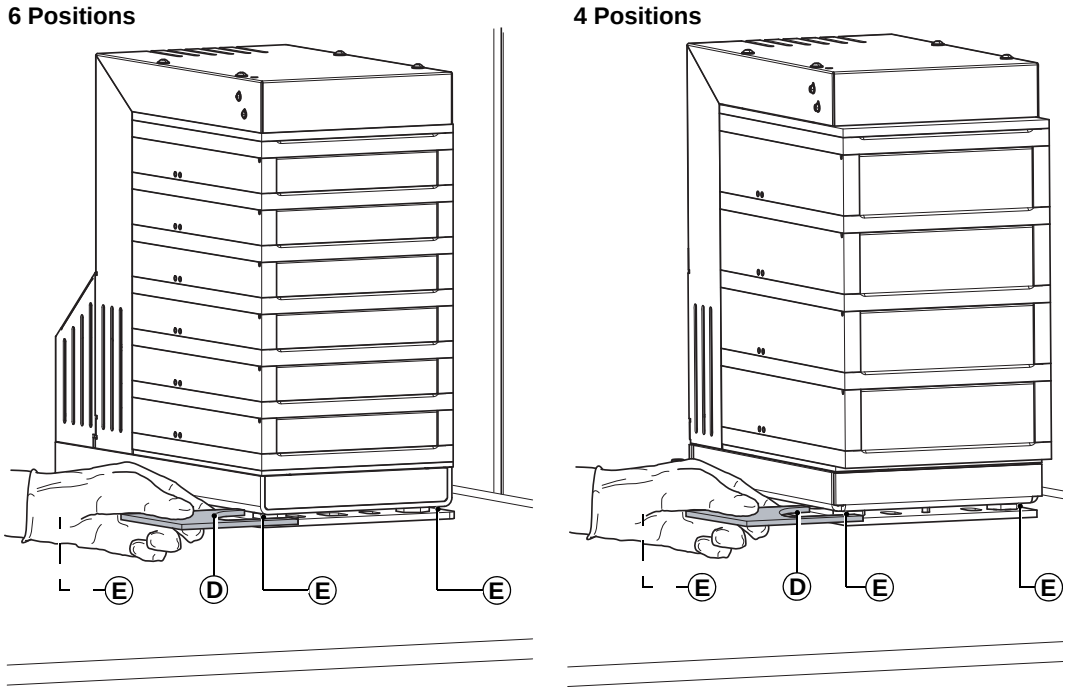

Fig. 5-4 *Special tool to adjust feet*

Verify Leveling

3 Using the special tool (D), adjust the left feet until the incubator is perpendicular to the worktable *Fig. 5-4,* 5-6. Use a precision level (F) to check *Fig. 5-5,* 5-7.

4 Repeat the procedure substeps for the Y-direction (use a precision level and adjust the front feet).

Alternatively, use a square instead of a precision level to check the position of the incubator. The maximum deviation from the perpendicular line must not exceed 0.3 mm.

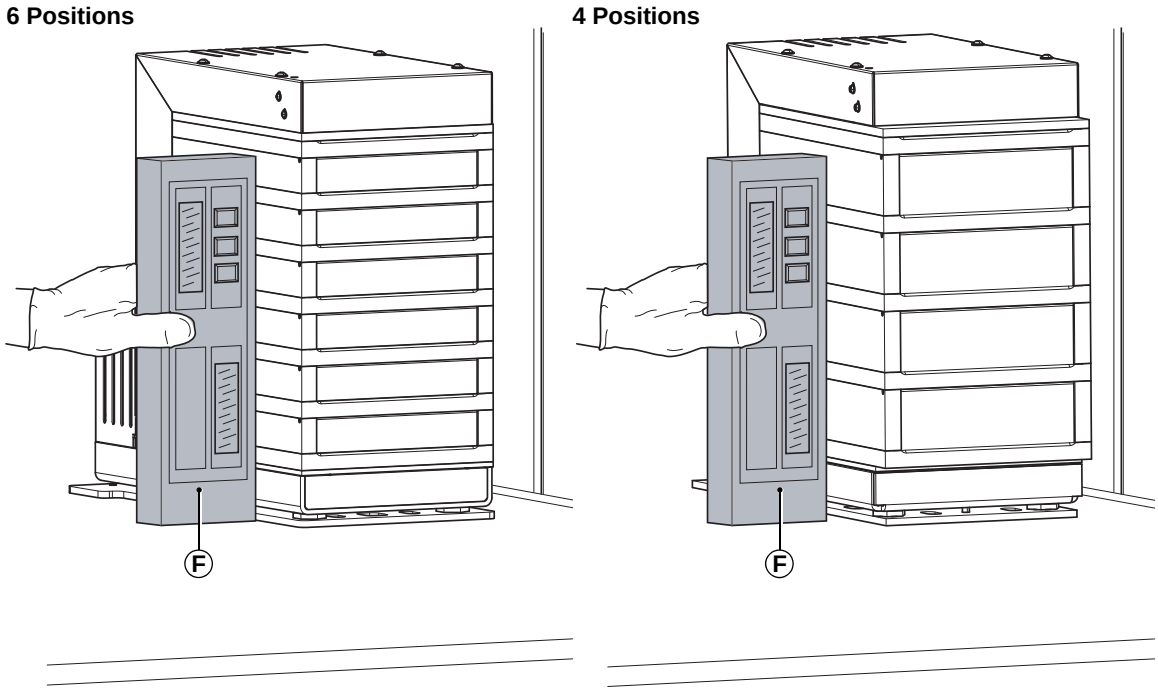

Fig. 5-5 *Levelling the heated incubator*

ATTENTION

Risk of foreign object damage. Foreign objects brought in between the support plate and instrument worktable may lead to damage to equipment.

- Make sure the mounting surfaces are clean.

ATTENTION

Malfunction of the system occurs if two monitored incubator options run on the same CAN bus address.

- If more than one MIO option connect to the instrument, it is required to select individual CAN bus addresses for each MIO device.

5 Connect the CAN cable of the instrument platform to the MIO2.

6 Put the incubator in the designated position on the worktable.

6 Operation

Purpose of This Chapter

This chapter explains the operating elements and possible operating modes. It gives instructions on how to operate the MIO2 properly and safely.

6.1 Operating Elements

User Interface

Display functions and controls are available in the software packages and user interfaces on the PC. Depending on your application, refer to the relevant separate documentation.

6.2 Display and Operating Elements

There are no display elements attached directly to the MIO2. The corresponding data is displayed on the PC screen.

Operating Modes

The MIO2 has following operating modes:

- Incubating microplate
- Shaking microplate (optional)

ATTENTION

Risk of vibrations. An unstable cabinets or instrument platform table may build up strong vibrations.

- Make sure the instrument platform is installed on a stable surface.
- Decrease or increase shaking frequency to avoid vibrations.

6.3 Operating the MIO2

The MIO2 is operated with an application software and cannot be operated with other interfaces.

6.3.1 Safety Instructions

WARNING

Contamination risks through contamination of the slot.

- Visually inspect all slots for possible spillage of hazardous liquids.

Chemical, Biological and Radioactive Hazards

WARNING

All samples and test kit components must be considered potentially hazardous agents.

- A potential risk can arise from the liquids being handled by the instrument, such as infectious biological samples, toxic or corrosive chemicals, or radioactive substances.
- Strictly apply appropriate safety precautions according to local, state and federal regulations.
- Handling and disposing of waste must be in accordance with all local, state and federal environmental, health, and safety laws and regulations.
- Use appropriate protective clothing, safety goggles and gloves.

6.3.2 Process Validation

Tecan recommends to validate the complete system within a specific application according to customers' and kit manufacturers' specifications.

For all applications of the Tecan instrument, the user must ensure that the requirements of each protocol are carefully observed.

A systematic approach of risk analysis, validation of critical parameters, and system validation should be followed to ensure that the system (or a combination with a kit) provides reliable and reproducible performance.

Make sure that the validation process is executed according to national laws and standards.

6.3.3 Switching the Incubator On

Refer to the appropriate Software Application Manual for further instructions.

6.3.4 Switching Incubator Off

Refer to the appropriate Software Application Manual for further instructions.

6.3.5 After an Aborted Run

After a run has been aborted:

- Check if a plate has been loaded into the incubator.

WARNING

Injuries or contamination with hazardous materials possible if the maintenance is not carried out properly.

- Make sure that the instrument worktable and the MIO2 are free from hazardous materials. Decontaminate them (or have them decontaminated) if necessary.
- Use adequate protective clothing, goggles and gloves.
- Make sure MIO2 has cooled down to room temperature before performing maintenance tasks.
- Make sure the incubator slots are empty before performing maintenance tasks.

- Refer to chapter 8 “Troubleshooting”, 8-1 for corrective measures

6.3.6 Incubating

The incubator slots can be operated with different temperatures.
Validate the temperature profiles before operation.

ATTENTION

Risk of crosstalk. Processes with different slot temperatures not validated sufficiently could lead to temperature crosstalk between slots.

- Always let one slot unoccupied between two slots operated with high temperature gradients.

Heating up

The MIO2 is not suitable for warming up of frozen microplates.

ATTENTION

Risk of error occurrence. The MIO2 is unsuitable for warming up of frozen microplates.

- Make sure samples and microplates have ambient temperature before operation.

ATTENTION

Risk of erroneous results. Highly variable fill levels of microplates may lead to temperature gradients between cavities.

- Perform process validation to incubate microplates with variable fill levels.

7 Maintenance

7.1 Decontamination

Decontamination, according to standard laboratory regulations, is required under the circumstances listed in section 2.6 “Decontamination Declaration”, 🗎 2-5.

WARNING

Contamination!
Substance residues on the MIO2 can cause personal injury and affect the integrity of the process.

- Decontaminate the MIO2 and its parts and accessories before any interaction.

The decontamination method must be defined by the key operator based on the type of contaminant and degree of contamination. Guidance on the selection of decontamination agents and application modes is provided in this chapter.

7.2 Cleaning Agents

ATTENTION

Reduced effectiveness and chemical compatibility!
There is no guarantee for the effectiveness of cleaning agents and chemical compatibility if other cleaning agents than those recommended by Tecan are used.

- Only use cleaning agents recommended by Tecan.

The selection of the appropriate decontamination agent depends on the contamination degree and the kind of contaminant.

Decontamination can be performed with the following agents:

- Bleach 5–10%
- Bacillol plus
- 70% ethanol + 30% H_2O

7.3 General

WARNING

Injuries or contamination with hazardous materials possible if the maintenance is not carried out properly.

- Make sure that the instrument worktable and the MIO2 are free from hazardous materials. Decontaminate them (or have them decontaminated) if necessary.
- Protect your body with adequate protective clothing, goggles and gloves.
- Make sure MIO2 has cooled down to room temperature before performing maintenance tasks.
- Make sure the incubator slots are empty before performing maintenance tasks.

Once installed, the MIO2 is part of the instrument.
Decontaminate and clean the MIO2 when decontaminating and cleaning the instrument.

For detailed information on maintenance of the instrument, refer to the Operating and Service Manuals of the instrument. Refer to section 1.7 “Reference Documents”, 1-2.

7.4 Special Maintenance Tasks

7.4.1 Incubator Removal

1 Make sure the electrical power of the instrument is switched off.

ATTENTION

Risk of damage to equipment. Incubators that are installed in disorder will lead to damage of equipment.

- Only remove one incubator at the time if multiple incubators are installed to avoid muddling up.

2 Lift and turn the incubator to remove the D-Sub cable connected to the MIO2.

3 Completely remove the incubator.

7.4.2 Cleaning

ATTENTION

Risk of damage to equipment. Foreign objects caught in the incubator slots from the cleaning procedure could lead to damage to equipment.

- Make sure no foreign objects get caught in the incubator slots.

WARNING

Fire hazard caused by the improper cleaning. Some cleaning agents are flammable liquids.

- Let MIO2 cool down completely before cleaning.
- Avoid the formation and accumulation of flammable vapors.
- Avoid the spillage of flammable material.

1 Use a wet cloth to clean slots and incubator housing.

Note: *Use Bacillol plus or bleach (5–10%) to clean the incubator.*

8 Troubleshooting

Purpose of This Chapter

This chapter helps to resume operation after a minor problem has occurred with the MIO2. It lists possible occurrences, their probable cause and suggests how to remedy the problem.

Which Errors can the Operator Correct?

The troubleshooting table below lists possible malfunctions and errors of the MIO2. The operator is enabled to correct some of those problems or errors by himself. For this, appropriate corrective measures are listed in the column “Corrective measure”.

8.1 Troubleshooting Table

Trouble-shooting by the Operator

The following table lists problems and errors and gives instructions on how to eliminate them:

Tab. 8-1 *Troubleshooting table*

Problem, error	Possible cause	Corrective measure
Problem, error on instrument level		
Spillage	Spillage of substance in slot due to inadequate fill level of microplates	Switch off instrument platform immediately Perform decontamination and/or maintenance *Refer to the manufacturers specification of the microplates for adequate fill level, adapt shaking frequency*
Communication error	interrupted No communication Fuse blown	Check cable and plug Switch off instrument and PC, switch on instrument and PC Notify your local service organization
Shutter does not close properly	Mechanical failure of the shutter locks	Perform shutter test (refer to Instrument Software Manual) Notify your local service organization
Microplate is loose and not held by fixing device	Mechanical failure of the fixing device	Check if foreign objects have been caught in the fixing device. Notify your local service organization
Loading not possible shutter does not open	Slots occupied by other microplate	Remove microplate by opening the shutters by hand
Loading not possible microplate is dropped or not placed in slot	Incubator is not aligned/ installed correctly	Remove incubator and do installation procedure 5.2 “Incubator Installation”, 🗎 5-3
Shaker stops	Incubator not levelled correctly Incubator not properly applied to adapter plate.	Level incubator according to 5.2.3 “Leveling Incubator”, 🗎 5-6 Remove incubator and do installation procedure 5.2 “Incubator Installation”, 🗎 5-3

9 Disposal

ATTENTION

Recycling in accordance with applicable legal regulations!

- Observe the laws applicable in your country for recycling.

For further information refer to the Operating Manual of the instrument. Refer to section 1.7 “Reference Documents”, 1-2.

10 Customer Support

Purpose of This Chapter

This chapter informs you how to contact us in case help is needed. It lists addresses and telephone numbers of the manufacturer's representatives.

How to get Help

Tecan and its representatives maintain a fully trained staff of technical specialists around the world. For any technical question, contact the nearest Tecan representative.

Feedback on This Manual

If you have any comments on this Operating Manual or suggestions for improvement, please send them by e-mail to **docfeedback@tecan.com**.
In your e-mail, please specify the manual name, the document ID and the manual version. This information is shown at the bottom of each printed page and on the first page of the help file (context-sensitive help of software products).

10.1 Contacts

Addresses

Contact your local distributor or one of the addresses below.
Also see our homepage on the web: **www.tecan.com**

Country/Region	Address	Telephone/Telefax/E-mail	
Asia	Tecan Asia Pte Ltd. 18 Boon Lay Way, #10-106 TradeHub 21 Singapore 609966 Singapore	Phone Fax E-mail	+65 6444 1886 +65 6444 1836 tecan@tecan.com.sg
Australia New Zealand Pacific Islands	Tecan Australia Pty Ltd 21 / 3 Westside Avenue Port Melbourne Vic 3207 Australia	Phone Phone Fax E-mail	Toll Free: 1300 808 403 +61 3 9647 4100 +61 3 9647 4199 helpdesk-aus@tecan.com
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Belgium	Tecan Benelux B.V.B.A. Businesspark E19 Battelsesteenweg 455B 2800 Mechelen Belgium	Phone Fax E-mail	+32 15 709 054 (en) +32 15 709 055 (fr) +32 15 421 612 helpdesk.benelux @tecan.com
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11 Index

Purpose of This Chapter

This chapter contains an alphabetical index which offers you help in finding information more quickly.