

QUANTOM™ Centrifuge

User Manual



DISCLAIMER

The contents of this document are subject to change without notice.
The QUANTOM™ Centrifuge is a laboratory instrument for scientific research use only.
It is not a medical, therapeutic, or in vitro diagnostics device.
Do not disassemble the device on any occasion as this will invalidate your warranty.

TRADEMARKS

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The CE mark indicates that this instrument conforms to all applicable European Community provisions for which this marking is required. Users must be aware of and follow the conditions described in this manual for operating the instrument. The protection provided by the instrument may be impaired if the instrument is used in a manner not specified by this manual.

**FCC
COMPLIANCE**

This device complies with Part 18 of the FCC Rules.

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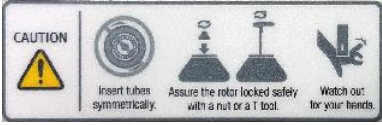
Safety Precautions

Read this manual carefully before you begin to use this instrument to ensure that you know how to operate it safely and correctly. Use the instrument as specified by Logos Biosystems. Keep this manual in an easily accessible location for future reference.

1. Install the instrument on a flat, rigid and stable table capable of withstanding the weight of the instrument and its spinning operation.
2. Operate the instrument in the conditions described in the Environmental Conditions for Operation.
3. Use the components provided or authorized by Logos Biosystems. If the proper combination of components are not used, product safety performance cannot be guaranteed.
4. Always use AC power cord provided by Logos Biosystems. If the proper AC power cord is not used, the electrical safety of the product cannot be guaranteed.
5. Ensure that the input voltage is compatible with the instrument's power supply voltage.
6. Connect the instrument to a grounded electrical outlet.
7. Turn the instrument on only after connecting AC power cord to both the power source and the instrument. Turn the instrument off before disconnecting the power cord and/or moving the instrument.
8. Should not use unapproved rotors and accessories.
 - Only use rotors from Logos Biosystems with appropriate centrifugal tubes and suitable adaptors to embrace sample containers tightly enough inside rotors.
9. Always make a safety zone of 30 cm around the centrifuge to indicate that neither hazardous materials nor persons should be permitted within the area during operation.
 - Always position the instrument with enough space on each side of instrument to ensure proper air circulation.
10. Do not stop the rotor by touching with hand during the instrument is running.
11. Always load the slides symmetrically with evenly weighted samples to avoid rotor imbalance. If necessary, use the the blank slide to counterbalance the unpaired sample.
12. Do not disassemble the instrument in any event. If the instrument is malfunctioning or broken, please contact your local distributor or Logos Biosystems. Disassembling the instrument invalidates its warranty.
13. Should not centrifuge flammable, toxic, radioactive, explosive, or corrosive materials.
14. When it is necessary to use toxic or radioactive materials or pathogenic micro-organisms which belong to the Risk Group II of WHO: "Laboratory Bio-safety Manual," should follow national regulations.
15. Should not exceed the rated speed or specific gravity. Samples whose density is greater than 1.2 g/mL must have reduced maximum rotational speed to avoid rotor failure.
16. Never try to open or move the instrument if it is not completely stopped.
17. Emergency door open should be performed only when spinning is completely stopped.
18. When disposing of this instrument, check and observe the rules and regulations of your local government.
19. Do not reuse QUANTOM™ M50 Cell Counting Slides. Used slides must be disposed as biohazardous waste according to the rules and regulations of your local government.
20. Wear proper personal protective equipment (PPE) when handling stains and cell samples to avoid exposure.
21. The QUANTOM™ Centrifuge is a laboratory instrument for scientific research use only. It is not a medical, therapeutic, or in vitro diagnostics device.

Meanings of Symbols

Symbols on the instrument indicates the following information.

Symbol	Meaning
	Attention and warning
	Attention and warning for electric shock
	Indicate a hole for manual door opening in case of emergency
	Attention, and warning for rotor coupling and door opening/closing

Environmental Conditions for Operation

Operating Power	110 V~, 60 Hz, 1A Max. or 220-240 V~, 50/60 Hz, 0.5A Max.
Installation Site	Indoor use only
Operating Temperature	5 - 35 °C
Maximum Relative Humidity	≤ 85%
Altitude	≤ 2,000 m
Pollution Degree	2

Chapter 1 – Introduction

1.1 Product Overview

The QUANTOM™ Centrifuge is an effective tool for imaging microbial cells with QUANTOM Tx™. It is used to immobilize microbial cells within counting slides and it helps to observe cells at same focal plane. The QUANTOM™ Centrifuge is compatible with QUANTOM Tx™ Microbial Cell Counter and QUANTOM M50 Cell Counting Slides.

For detailed information, please refer to the QUANTOM Tx™ user manual.

1.2 Product Contents

The QUANTOM™ Centrifuge product package contains the following components.

Component	Quantity
QUANTOM™ Centrifuge*	1
AC Power Cord	1

*QUANTOM™ Centrifuge includes a rotor for processing counting slides.

Upon receiving the product package, please inspect its contents to ensure that all parts have been included and that no damage has occurred during shipping. The warranty does not cover damage that may occur during shipping and handling. Any damage claims must be filed with the carrier. Contact your local distributor or Logos Biosystems if anything is missing.

1.3 Product Specifications

Instrument Type	Benchtop centrifuge
Dimensions (W x D x H)	21 x 21 x 22 cm (8.3 x 8.3 x 8.7 in)
Weight	5.64 kg (12.4 lb) (Rotor weight: 260 g)
Max. RPM/RCF	4,000 rpm / 662 x g
Max. capacity	8 slots (processing 8 counting slides)
Time control	< 100 min or continuous
Acc./Dec. time to max. speed	≤ 13 sec / ≤ 16 sec
Program memory	10
Noise level	≤ 50 dB
Power supply	110 V~, 60 Hz, 1A Max. or 220-240 V~, 50/60 Hz, 0.5A Max.
Safety lid lock	Yes
Lid drop protection	Yes
Automatic door release at completion	Yes

1.4 Product Description



Chapter 2 – Installation

2.1 Power on/off and Door Release

Action

- 1 Connect the AC power cord at the power inlet on the left back of the instrument.
 - Check that the voltage ratings (110 V~, 60 Hz or 220-240 V~, 50/60 Hz) is compatible with the instrument's power supply voltage.



- 2 Turn on the instrument by pressing a switch on the right side of the instrument.
 - The setting values of program number 1 is displayed with beeping sound.
 - The basic settings of program number1 are 4,000 RPM, 10 minutes.




- 3 Press the **Door** button to open the door.

2.2 Rotor Coupling and Disassembling

Action

- 1 Before coupling a rotor, clean the motor shaft and chamber with soft dry towel.
- 2 Mount a proper rotor into the motor shaft.



- 3 Place the Rotor Locking Nut () at the center hole of the rotor.
 - To assemble the rotor: Rotate the Rotor Locking Nut clockwise until tightly assembled.
 - To disassemble the rotor: Rotate the Rotor Locking Nut counterclockwise.



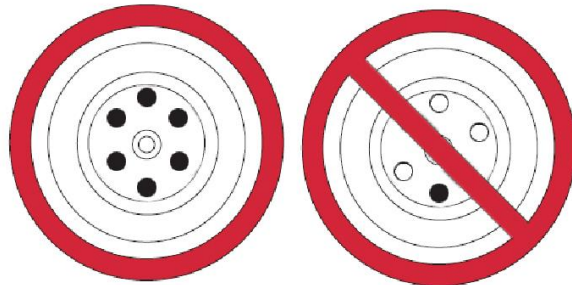
- 4 After loading Counting slides, close the rotor lid until hearing clank shut.
 - When you open the lid, lift the nut.



2.3 Positioning of Sample

Action

- 1 Before loading sample slides, check the water drop or dirt in the rotor hole or inner adaptor.
 - If there is a water drop or dirt in the rotor hole or inner adaptor, remove it with soft dry.
- 2 Counting slides should be placed in the rotor with same amount of samples at symmetrical positions.
 - Only use appropriate centrifugal tubes and do not exceed the speed beyond the tube's max. g-force.



Chapter 3 – Operation

3.1 Key functions of Control Panel



[RPM/RCF]: Use to set the rotor speed and for RPM/RCF conversion

- Once KEY_IN : RPM LED ON
- Twice KEY_IN : RCF LED ON

[<] (Down) , [>] (Up): Use to adjust each value up or down

[TIME]: Use to set centrifuge time, available range up to 99 min (00:00 continuous)

[PROG]: Use to save a set of setting values or load saved program number, available to save program up to 10.






- **[PROG]:** Program is loaded
- **[PROG]** more than 3 sec: Program is saved

[DOOR]: Use to open the door

- LED: Door open – ON / Door close – OFF

[START/STOP]: Use to start or stop the device

- Only can use the door closed
- LED: During operation – ON / Stop – OFF

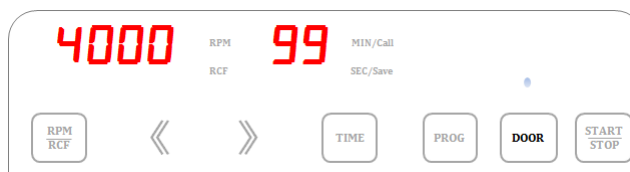
Contents	Display	Action
Version		A2: Project code 1_00: Firmware Version
Initial display		MAIN screen
Start operation		When the instrument run, "RUN" word is displayed
Lid OPEN		Lid open: "Open" displayed Lid close: Condition for centrifugation is displayed
End operation		After running, "End" word is displayed.

3.2 Door

Use to open door. LED is OFF when the door closed and LED is ON when the door opened.

Action

- 1 Press the [DOOR] button to open the door.
 - Close the door completely until it clicks into place.
 - A [DOOR] LED is turned on when the door is open.



2. After operation, the door is open automatically.

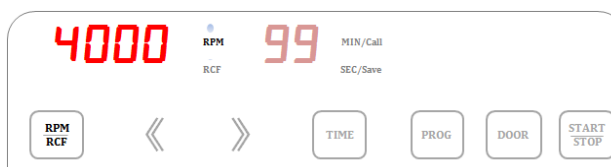
3.3 Setting RPM/RCF

- Maximum RPM/RCF is 4,000 RPM/ 660 x g
- The value automatically can converts, RPM to RCF or RCF to RPM

3.3.1 Setting "RPM"

Action

- 1 Press the [RPM/RCF] button once.
 - RPM MODE is generated by pressing a [RPM/RCF] button once.
 - A [RPM/RCF] LED is turned on by pressing [RPM/RCF] button.



- 2 Press the [**<**], [**>**] buttons to change input value and press the [**RPM/RCF**] button again for saving.

- RPM value is changed in tens.
- After keeping holding finger on the [**<**], [**>**] buttons for 5 seconds, the unit of setting value is changed to 100 rpm from 10rpm.
- If you do not press the [**<**], [**>**] buttons for 5 second, the setting mode is cleared.

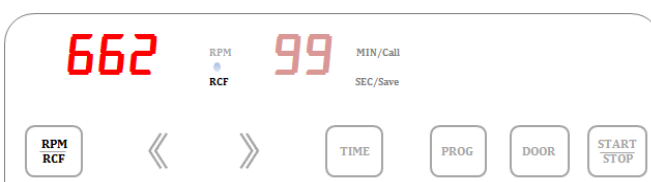


3.3.2 Setting “RCF”

Action

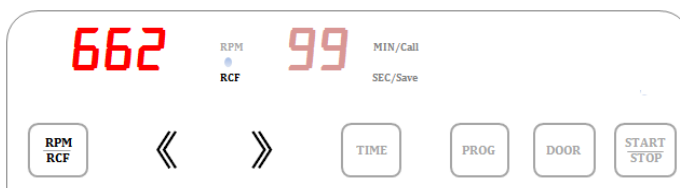
- 1 Press the [**RPM/RCF**] button twice.

- RCF MODE is generated by pressing a [**RPM/RCF**] button twice.
- A 'Start LED' is turned on by pressing [**RPM/RCF**] button.



- 2 Press the [**<**], [**>**] buttons to change input value and press the [**RPM/RCF**] button again for saving.

- After keeping holding finger on the [**<**], [**>**] buttons for 5 seconds, the unit of setting value is changed to 10 rcf from 1 rcf.
- If you do not press the [**<**], [**>**] buttons for 5 second, the setting mode is cleared.



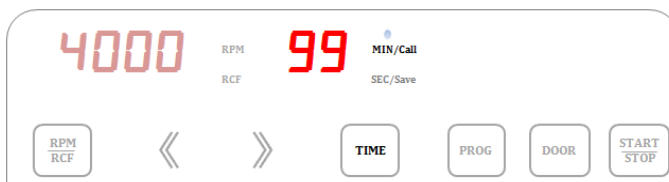
3.4 Setting Time

3.4.1 Setting “MIN”

Action

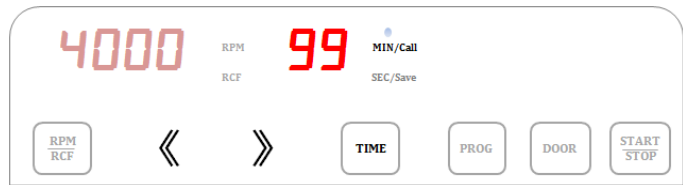
- 1 Press the [**TIME**] button once.

- Minutes MODE is generated with pressing a [**TIME**] button once.
- A [**MIN**] LED is turned on.



2 Press the [**<**], [**>**] buttons to change input value and press the [**TIME**] button again for saving.

- After keeping holding finger on the [**<**], [**>**] buttons for 5 seconds, the unit of setting value is changed to 10min from 1 min.
- If you do not press the [**<**], [**>**] buttons for 5 second, the setting mode is cleared.

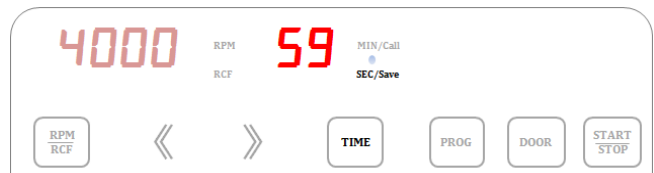


3.4.2 Setting “SEC”

Action

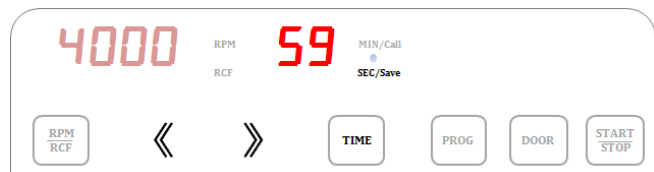
1 Press the [**TIME**] button twice.

- Seconds MODE is generated with pressing a [**TIME**] button twice.
- A [**SEC**] LED is turned on.



2 Press the [**<**], [**>**] buttons to change input value and press the [**TIME**] button again for saving.

- When keeping press the [**<**], [**>**] buttons for 5 seconds, the unit of setting value is changed to 10 sec from 1 sec.
- If you do not press the [**<**], [**>**] buttons for 5 second, the setting mode is cleared.
- For continuous operation, set time to “00:00”



3.5 Start/Stop

Action

1 After setting RPM/RCF and Time, press [**START/STOP**] button.

- An operation of QUANTOM™ Centrifuge only can start the door closed
- In case of pressing the [**START/STOP**] button during running, the running is stopped.
- During running, a ‘Start LED’ is turned on.

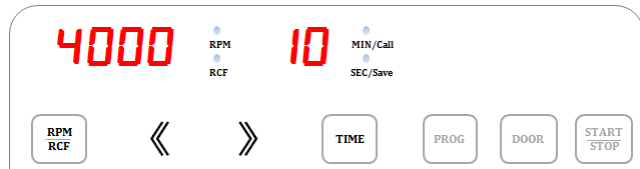


3.6 Setting Programs

3.6.1 Save Programs

Action

- 1 Set parameters of Rotor speed and time.
(Refer to 3.4 section)



- 2 Press **[PROG]** more than 3 seconds to save setting values.

- The LED of **[PROG]** button and SEC/Save is turned on.



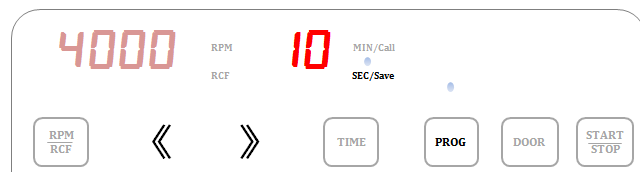
- 3 Press **[<], [>]** to select the program number.

- You are available to save program up to 10.



- 4 Press **[PROG]** to complete the saving.

- If you do not touch the **[PROG]** for 5 second, the setting mode is cleared.

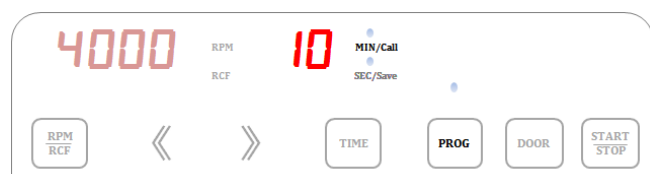


3.6.2 Load Programs

Action

- 1 To Load the saved program, press the **[PROG]** button shortly.

- The LED of **[PROG]** and MIN/Load LED is turned on.



- 2 Select the program number to load and enter the program number you want to load by adjusting [**<**], [**>**] button.



- 3 Press [**PROG**] button once again.
 - The setting values are displayed according to saved conditions.
 - If you do not press the [**PROG**] buttons for 5 second, the setting mode is cleared.



3.7 Emergency Door Open

Use Emergency Door open function when the door button on the control panel is dumb due to the power failure. Use this function under the condition of complete stop of rotor running.

Action

- 1 Check the instrument is completely stopped.
- 2 Find the emergency hole at the rear side of the instrument and remove a cap beside "Emergency Door Open" label.
- 3 Door is open when pull the string connected on cap. If you pull a cap, it might be destroyed.



! Caution! Do not use Emergency Door function during the instrument is running.

3.8 Fuse Replacement

When the power is not turned on, please check the connection of power consent / power switch. Replace the fuse as following instruction, if the power is still not turned on.

Action

- 1 Separate the AC power Cord at the back of the instrument and push the flat-head screwdriver for bring out the fuse case.



- 2 Replace the damaged fuse with new one from the fuse case and then connect in the power.

- Rating: 3.15 A, 250 V

! **Caution!** Choose and replace a new fuse according to supply voltages.



Chapter 4 – Maintenance and Troubleshooting

4.1 Maintenance

Outer part of instrument

1. Install the instrument on a flat, rigid and stable table capable of withstanding the weight of the instrument and its spinning operation.
2. Operate the instrument in the conditions described in the Environmental Conditions for Operation.
3. Before clean the instrument, turn the instrument off and disconnect the power cord.
4. Clean the outside of the instrument with dry soft cloth. If necessary, dip the cloth in neutral detergent and clean contaminated area. Keep completely dry after cleaning.
5. Do not use any volatile chemicals such as alcohol and benzene, etc.
6. Be careful not to make scratches on the surface of the instrument. The scratches can cause corrosion on the surface of the instrument.
 - If any rust appears, clean it with neutral detergents and keep dry.

Chamber

1. Keep dry inside the chamber after every use.
2. If the chamber is contaminated, dip the cloth in neutral detergent and clean contaminated area.

Shaft

1. Always make special attention to clean the motor shaft to avoid any imbalance problem due to the contaminants.
2. After using the instrument, take out the rotor from the shaft, and clean the shaft with dry soft cloth to keep dry.
3. Do not use excessive force to remove the rotor from the shaft.

Rotor

1. If any parts are contaminated with samples, clean the rotor with soft wet cloth and keep the rotor dry. Stand it upside down.
2. If you do not use the instrument, keep the rotor separately from the motor shaft and stand it upside down.

4.2 Troubleshooting

4.2.1 Check List

Symptom	Check list
Power failure	Connect the AC power cord and make sure that the line is completely connected between the instrument and power outlet. Check the power switch is turned on. (Please refer to 2.1. Power on/off and Door Release)
Can't be started	If the door is not closed completely, the instrument can't run. Check the Door LED on the display window and close the door completely.

Can't open the door	If the power is out, check the main fuse for the laboratory to supply the power. If it is not solved in shortly, open the door by pulling the string of emergency door manually for safety of sample. (Please refer to 3.7. Emergency Door Open)
	Please check the balanced status of both the table and the instrument.
Noise and vibration during running	Please re-check the coupling status of the following three matches to minimize the noise 1. the balanced way of coupling of the rotor into the motor shaft 2. the completeness of fixing of the Rotor Locking Nut on the rotor 3. the matching status of Rotor Lid with the rotor (Please refer to 2.2. Rotor coupling and disassembling)
	Check balances of samples in the rotor. (Please refer to 2.3. Positioning of Sample) and load the same weight of samples symmetrically.

4.2.2 Error code

If the instrument shows the error code with beeping sound, press **[STOP]** button to stop the beeping sound.

Error	Possible Causes	Actions
Error 1 or Error 9	RPM Sensor	<ul style="list-style-type: none"> - Shut off the power supply, and then, turn on the power switch again to check the instrument. - If the error code shows continuously although you try to operate again, please contact us.
Error 2	Door	<ul style="list-style-type: none"> - If the door is not closed completely, this message is appeared. - Remove the dirt at the door latch and then close the door completely again. Check the Door LED on the display window. If it is not solved in shortly, open the door by pulling the string of emergency door manually for safety of sample.
Error 3	Motor Overheating	<ul style="list-style-type: none"> - If the motor is overheated, this message is appeared. - Shut off the power supply for an hour, and then turn on the power switch for checking the instrument. - If the error code shows continuously, please contact us.
Error 4	Low Voltage	<ul style="list-style-type: none"> - If the power input of Power supply (V/Hz) is 10% less than required power, this message is appeared. - Shut off the power supply and then check the voltage of the Power supply (V/Hz). - Use AVR to provide proper power.
Error5	High Voltage	<ul style="list-style-type: none"> - If the power input of Power supply (V/Hz) is 10% more than required power, this message is appeared. - Shut off the power supply and then check the voltage of the Power supply (V/Hz). - Use AVR to provide proper power.
Error 6	Over Speed	<ul style="list-style-type: none"> - If the instrument is spun with over speed, there will be some problems
Error 7	Software	<ul style="list-style-type: none"> - If the installed software has bugs, this message is appeared. - Tuning the firmware
Error 8	Imbalance	<ul style="list-style-type: none"> - Check weight-balances of samples and then turn off and on the instrument for checking.

Chapter 5 – Ordering Information

	Cat #	Product	Quantity
Counter	Q10001	QUANTOM Tx™ Microbial Cell Counter	1 unit
Centrifuge	Q10002	QUANTOM™ Centrifuge	1 unit
Slides	Q12001	QUANTOM™ M50 Cell Counting Slides, 50 Slides	1 box
	Q12002	QUANTOM™ M50 Cell Counting Slides, 500 Slides	10 boxes
Reagents	Q13501	QUANTOM™ Total Cell Staining Kit	1 kit
	Q13101	QUANTOM™ Total Cell Staining Dye	1 x 0.5 mL
	Q13001	QUANTOM™ Cell Loading Buffer I	2 x 1 mL
Beads	Q13102	QUANTOM™ Calibration Beads	1 x 0.5 mL
Accessories	P10001	LUNA™ Printer	1 unit
	P12001	LUNA™ Printer Paper - thermal, 700 prints	3 x 2 rolls
	P13001	LUNA™ Printer Cleaning Pen	1 unit
	U10005	USB Drive, 16 GB	1 unit

Chapter 6 - Purchaser Notification

6.1 Limited Use Label License: Research Use Only

The purchaser of this product should use this product only for research for the sole benefit of the purchaser. By use of this product, the purchaser agrees to be bounded by the terms of this limited use statement whether the purchaser is a for-profit or a not-for-profit entity.

If the purchaser is not willing to accept the conditions of this limited use statement and this product is unused, the Company will accept return of the product with a full refund.

The purchaser cannot resell or otherwise transfer (a) this product (b) its components or (c) materials made using this product or its components to a third party for Commercial Purposes.

Commercial Purposes mean any and all uses of this product and its components by a party for monetary or other consideration, including but not limited to, (a) product manufacture, (b) providing a service, information, or data, (c) therapeutic, diagnostic, or prophylactic purposes, or (d) resale of this product or its components whether or not such product and its components are resold for use in research.

Aligned Genetics, Inc. ("Company") will not claim any consideration against the purchaser of infringement of patents owned or controlled by the Company which cover the product based on the manufacture, use or sale of a therapeutic, clinical diagnostic, vaccine, or prophylactic product developed in research by the purchaser in which this product or its components was employed, provided that neither this product nor any of its components was used in the manufacture of such product.

For any use other than this limited use label license of research use only, please contact the Company or email info@logosbio.com for more information.

6.2 Instrument Warranty

Aligned Genetics, Inc. ("Company") warrants to the original purchaser ("Purchaser") that the instrument ("Instrument"), if properly used and installed, will be free from defects in materials and workmanship and will conform to the product specifications for a period of one (1) year ("Warranty Period") from the date of purchase. If the Instrument under this limited warranty fails during the Warranty Period, the Company, at its sole responsibility, will:

- 1) within and up to 30 calendar days of purchase, refund the purchase price of the Instrument to the Purchaser if the Instrument is in original conditions; or,
- 2) after 30 calendar days of purchase, only replace or repair the Instrument for up to the Warranty Period without issuing a credit.

In no event shall the Company accept any returned instrument (including its components) that might have been used or contaminated in some labs, including but not limited to, HIV or other infectious disease or blood-handling labs. This limited warranty does not cover refund, replacement, and repair incurred by accident, abuse, misuse, neglect, unauthorized repair, or modification of the Instrument. This limited warranty will be invalid if the Instrument is disassembled or repaired by the Purchaser.

In case that the Company decides to repair the Instrument, not to replace, this limited warranty includes replacement parts and labor for the Instrument. This limited warranty does not include shipment of the Instrument to and from service location or travel cost of service engineer, the costs of which shall be borne by the Purchaser. Every effort has been made to ensure that all the information contained in this document is correct at its publication. However, the Company makes no warranty of any kind regarding the contents of any publications or documentation as unintended or unexpected errors including occasional typographies or other kinds are inevitable. In addition, the Company reserves the right to make any changes necessary without notice as part of ongoing product development. If you discover an error in any of our publications, please report it to your local supplier or the Company. The Company shall have no responsibility or liability for any special, incidental, indirect or consequential loss or damage resulting from the use or malfunction of the Instrument.

This limited warranty is sole and exclusive. The Company makes no other representations or warranties of any kind, either express or implied, including for merchantability or fitness for a particular purpose with regards to this Instrument. To obtain service during the Warranty Period, contact your local supplier or the Company's Technical Support team.

OUT OF WARRANTY SERVICE

Please contact your local supplier or the Company's technical support team in order to obtain out-of-warranty service. If necessary, repair service will be charged for replacement parts and labor hours incurred to repair the Instrument. In addition, the Purchaser is responsible for the cost of shipping the Instrument to and from the service facility and, if necessary, the travel cost of a service engineer.



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