

HumaMax Micro

| User Manual



Cat No. 15150/1

Human

Diagnostics Worldwide

REVISION

Revision History	
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Service and Support

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1 SAFETY INSTRUCTIONS

1.1 Introduction

This manual is considered part of the instrument and must be available to the operator and the maintenance personnel. For accurate installation, use and maintenance, please read the following instructions carefully. In order to avoid damage to the instrument or personal injury, carefully read the "GENERAL SAFETY WARNINGS" describing the appropriate operating procedures. Please contact the technical Service in the event of instrument failure or other difficulties with the instrument.

1.2 User Warranty

HUMAN warrants that instruments sold by one of its authorised representatives shall be free of any defect in material or workmanship, provided that this warranty shall apply only to defects which become apparent within one year from the date of delivery of the new instrument to the purchaser.

The HUMAN representative shall replace or repair any defective item at no charge, except for transportation expenses to the point of repair.

This warranty excludes the HUMAN representative from liability to replace any item considered as expendable in the course of normal usage, e.g.: lamps, valves, syringes, glassware, fuses, diskettes, tubing etc.

The HUMAN representative shall be relieved of any liability under this warranty if the product is not used in accordance with the manufacturer's instructions, altered in any way not

specified by HUMAN, not regularly maintained, used with equipment not approved by HUMAN or used for purposes for which it was not designed.

HUMAN shall be relieved of any obligation under this warranty, unless a completed installation / warranty registration form is received by HUMAN within 15 days of installation of this product.

This warranty does not apply to damages incurred in shipment of goods. Any damage so incurred shall be reported to the freight carrier for settlement or claim.

1.3 Intended Use of the Instrument

The instrument must be used for its intended purpose. It must be operated in perfect technical conditions by qualified personnel in such working conditions and maintained as described in this manual in the GENERAL SAFETY WARNINGS. This manual contains instructions for qualified professional operators.

1.4 General Safety Warnings

Use only chemical reagents and accessories specified and supplied by HUMAN and/or mentioned in this manual.

Place the product so that it has proper ventilation.

The instrument should be installed on a flat, stationary working surface that is free of vibrations.

Do not operate in area with excessive dust.

Operate at room temperature and at a humidity level in accordance with the specifications listed in this manual.

Do not operate this instrument with covers and panels removed.

Use only the power cord specified for this product, with the grounding conductor of the power cord connected to earth ground.

Use only the fuse type and rating specified by the manufacturer for this instrument. The use of fuses with improper ratings may pose electrical and fire hazards.

To avoid fire or shock hazard, observe all ratings and markings on the instrument.

Do not power the instrument in environments that are potentially explosive or at risk of fire.

Prior to cleaning and/or performing maintenance on the instrument, switch off the instrument and remove the power cord.

Only cleaning materials described in this manual may be used, as other materials may damage parts.

It is recommended to always wear protective apparel and eye protection while using this instrument.

All warning symbols that appear in this manual must be carefully observed.

1.5 Disposal Management Concept

The applicable local regulations governing disposal must be observed. It is the user's responsibility to arrange for the proper disposal of the individual components.

All parts which may contain potentially infectious materials must be disinfected by suitable, validated procedures (auto-

claving, chemical treatment) prior to disposal. Applicable local regulations for disposal must be carefully observed.

The instruments and electronic accessories (without batteries, power packs etc.) must be disposed of according to the regulations for the disposal of electronic components.

Batteries, power packs and similar power sources must be removed from electric/electronic parts and disposed of in accordance with applicable local regulations.

1.6 Instrument Disinfection

Instruments or parts which may come in contact with biological samples (patient specimens, controls etc.) should be considered at least potentially infectious.

Before performing any service work on the instrument, it is very important to thoroughly disinfect all possibly contaminated parts. Before the instrument is removed from the laboratory for disposal or servicing, it must be decontaminated/disinfected. Decontamination/disinfection must be performed by authorised, well trained personnel and in observance of all necessary safety precautions. Instruments to be returned must be accompanied by a disinfection certificate completed by the responsible laboratory manager. If a disinfection certificate is not supplied, the returning laboratory will be responsible for charges resulting from non-acceptance of the instrument by the servicing centre or from intervention by governmental authorities.

1.7 Notice

Every effort has been made to avoid errors in text and diagrams. HUMAN, however, assumes no responsibility for any errors which may appear in this publication. It is the policy of HUMAN to improve products as new techniques and components become available. HUMAN therefore reserves the right to change specifications if necessary in the course of such improvements.

1.8 Biohazard Warning

Analytical instruments for use in the clinical laboratory environment may come into contact with human samples and controls which should be considered at least potentially infectious. Therefore every part and accessory of the respective instrument which may have come into contact with such samples must equally be considered as potentially infectious. For safety reasons, we recommend to label such instruments with the “BIOHAZARD” warning label below.



FIGURE 1

Biological Hazard
Symbol

1.9 Servicing Note

Before doing any servicing on the instrument it is very important to thoroughly clean all possibly contaminated parts. If the instrument has come into contact with potentially infectious materials, it must be decontaminated before the instrument is removed from the laboratory for disposal or servicing. Decontamination should be performed by authorised well-trained personnel only, observing all necessary safety precautions. Instruments to be returned have to be accompanied by a decontamination certificate completed by the responsible laboratory manager. If a decontamination certificate is not supplied, the returning laboratory will be responsible for charges resulting from non-acceptance of the instrument by the servicing centre, or from authority's interventions.

2 SYSTEM DESCRIPTION

The HuMax Micro bench-top centrifuge is especially designed for the separation of blood samples, urine particles sedimentation and for carrying out the other routine applications in microbiology laboratories.

The HuMax Micro is ideal for hospital and research laboratories.

The HuMax Micro ensures safe and easy operation by means of a system, which does not allow the centrifuge to operate if the lid is not closed.

The HuMax Micro bench-top centrifuge is manufactured in accordance with the following standards:

EN 61010-1, EN 61326-1, EN 61010-2-020

2.1 Abbreviations

rpm	revolutions per minute
RCF	relative centrifugal force
xg	gravity 9,81 m/s ²
sec	second
min	minute
w	watt
v	volt
Hz	Hertz
kg	kilogram
µl	microliter
mm	milimeter
cm	centimeter
g	gram
ml	mililiter

3 INSTALLATION

3.1 Contents of Package

- HuMax Micro
- 1 user manual
- PCR Rotor
- Microliter Rotor
- 8x 200µl Adapter
- 8x 500µl Adapter
- Rotor seat
- 2mm hexagonal wrench
- 2 x M4*6 jackscrews

3.2 Mains Supply

The HuMax Micro requires 110-240V 50/60 Hz.

The centrifuge should be connected only to a grounded outlet.

3.3 Environmental Conditions

The instrument is designed to operate safely under the following conditions:

Indoor use only

Ambient temperature: 5°C - 40°C.

Maximum relative humidity of 80%.

Maximum altitude 4000 m.

! When the centrifuge is running, no persons, dangerous substances or objects may be within the safety margin of 30cm around the centrifuge

! Rotor imbalance may cause major damage to the rotor and centrifuge. Never attempt to introduce liquids into the tube inserts.

3.4 Positioning

Place the centrifuge on a bench-top able to support its weight and vibrations, in clean, non-corrosive environment. Leave a 30 cm space each side of the centrifuge.

3.5 Inspection

Before installation, the rotor should be inspected for damage and cleanliness. Dirt and particles inside the inserts can cause the breakage of tubes and lead to a major imbalance. The central hole of the rotor and the motor shaft must also be kept clean and dry at all times.

3.6 Loading

Each tube insert must be the same weight as the one diametrically opposite for balancing. If the number of tubes to be centrifuged is less than the capacity of the rotor, the tubes must be placed in opposite inserts. If an odd number of tubes is to be centrifuged, a water-filled tube of the same weight must be used for balance.

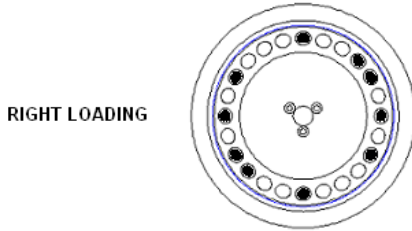


FIGURE 1

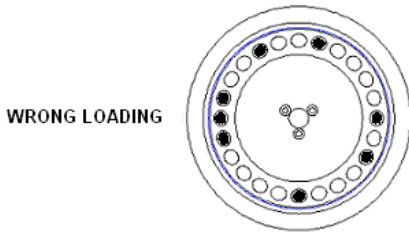


FIGURE 2

3.7 Load and replace the rotor

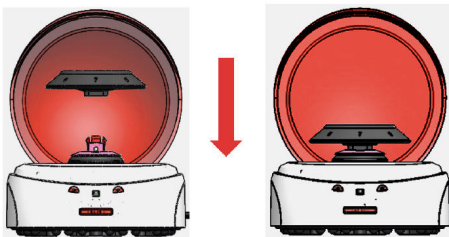


FIGURE 3

Load the rotor

Install and attach the rotor seat to the centrifuge. Place the rotor on the seat by pressing it down firmly using two hands

! Use both hands to pull down the rotor.

- You should feel a 'click' when the rotor is properly loaded on the shaft. If not, there may be something stuck between the rotor and the shaft. Double check and clean it if necessary.
- Rotate the rotor slightly with your fingers to check if the rotor vibrates, if so attach the rotor again.
- Close the door and then start running.
- The method of removing the rotor is as same as the above mentioned.

3.8 Routine Lid Opening

! Open the Lid while
the rotor is running
will stop the rotor

1. Switch off the power switch on the back
2. Wait until the rotor stops completely
3. Open the Lid

4 SPECIFICATIONS

Technical Specifications	HuMax Micro		TABLE 1
Rotor	15150/14 Microliter	15150/15 PCR	
Maximum speed	7000 rpm		
Maximum RCF	2680 x g		
Tube capacity	8 x 2 ml	16 x 0,2ml	
Motor	DC Motor		
Noise level	<45db		
Operation temperature	5-40°C		
Operation humidity	Max 80%		
Maximum altitude	4000m		
Supply Values	110-240V 50/60 Hz		
Power Consumption	18 W		
Dimensions (WxDxH)	Instrument without any components:	15 x 15 x 11,7	
	Space required for routine use:	25 x 25 x 20	
	Packaging:	20 x 20 x 15	
Weight	Gross: 1 kg, Net: 0,5 kg		

5 ACCESSORIES & CONSUMABLES

Cat. No.	Description	Capacity	RPM	RCF
15150/14	Microliter	8x2ml	7000rpm	2680xg
15150/15	PCR	16x0,2ml	7000rpm	2680xg

TABLE 2

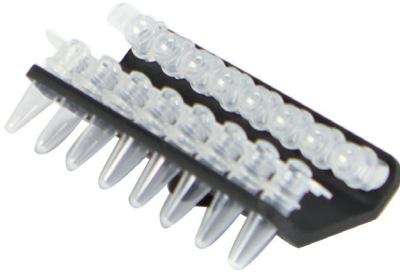


FIGURE 4

PCR Rotor

Cat. No.	Description	Max. Tube Diameter (mm)
15150/12	8x Adapter 200µl for 15150/10	Ø 6.3 mm
15150/13	8x Adapter 500µl for 15150/10	Ø 8 mm

TABLE 3

5.1 Rotor Notice

1. The centrifuge rotor can separate samples with a density lower than 2.0g/ml. If the samples density is over 2.0g/ml, please calculate allowable speed depending on the following formula. Allow Speed (rpm)= Maximum speed $\times(2.0(\text{g/ml})/\text{Sample density (g/ml)})^{1/2}$
2. All the rotors are made of plastic, they cannot be subjected to high-pressure sterilization and UV irradiation, only ordinary sterilization can be used (see chapter 8).

5.2 Safety System

! Use rotor and tubes within their actual capacities.

The HuMax Micro Centrifuge is equipped with a system that prevents the centrifuge lid from running when the rotor is open.

The centrifuge will not operate until the lid is closed completely. The lid should be closed until the rotor stops spinning. The run can not be started before the lid is correctly closed.

6 INSTRUCTIONS FOR USE

6.1 Normal operation

- Open the Lid
- load the centrifuge rotor symmetrical
- close the Lid
- switch on the centrifuge
- switch off the centrifuge, the rotor will gradually stop
- open the lid when the rotor has completely stopped and remove samples

7 TROUBLESHOOTING

7.1 Possible problems and solutions

Symptom	Causes	Solutions
Centrifuge don't startsafter switch on	Lid was not closed completely	Close the Lid
	Power is not connected	Connect power

TABLE 4

Possible problems and solutions

8 HAZARDS, PRECAUTIONS AND LIMITATIONS OF USE

8.1 Cautions

The following precautions must be observed:

- Never try to bypass the safety lid while the rotor is spinning.
- Only use a correctly grounded mains supply.

Special attention to the following is necessary:

- Installation of the unit: Proper ventilation, levelling of the centrifuge, rigidity and stability of the bench.
- Rotor installation: Check that the rotor is tightened firmly.
- Cleaning of the accessories and the rotor chamber.
- Load balancing
- Samples: The cleaning of the accessories is particularly important when using potentially infectious materials.
- This Centrifuge is not explosion-proof. Never use explosive or flammable samples
- Do not install the centrifuge in or near places where inflammable gases are generated or chemicals are stored
- Do not place dangerous materials within 30 cm of the centrifuge.
- Do not centrifuge toxic or radioactive sample or contaminated sample with pathogenic micro-organisms.
- If you require service at site, please decontaminate the centrifuge in advance, and then notify the service center the details of the materials and procedure.
- To avoid electrical shocks, insure hands are dry before hand-

! Rotor and other Accessories must be cleaned if any spillage, specially chemicals, occurs.

! If the recommended instructions for cleaning or disinfecting are not followed this may damage the centrifuge.

! Do not directly pour water, neutral detergent or disinfectant solution into the rotor chamber, otherwise fluids may leak into the drive units and cause corrosion or deterioration to the bearings.

! Don't clean the Lid with alcohol to prevent dolling

ling the power cord or turning on/off the power switch.

- For safety purposes, do not enter within 30 cm around this centrifuge when it is in operation.
- Unauthorized repairs, disassembly, or modifying the centrifuge except by a trained service are strictly prohibited.
- The centrifuge rotor can separate samples with a density lower than 2.0 g/ml. If the samples density is over 2.0 g/ml, please calculate allowable speed depending on the following formula.
- Allowable Speed (rpm)= Maximum speed $\times(2.0(\text{g/ml})/\text{Sample density (g/ml)})^{(1/2)}$
- Never put hands in the rotor area unless the rotor has stopped

8.2 Cleaning

Disconnect the centrifuge before cleaning. Ideally, the rotor should be washed after every use but at least weekly in warm water containing a few drops of mild liquid soap (domestic washing liquid is ideal) and any time after spillage has occurred.

Each rotor insert must be washed thoroughly using a small nylon brush. Do not use metal wire brushes.

Dry the rotor with a soft, absorbent, non-woven cloth or tissue. Drying may be finished off with a warm air jet (e.g. a hair-dryer).

8.3 Contamination Hazards

Our centrifuges are used in medical research, where hazardous substances, including radioactive chemicals, are frequently found.

Always use the appropriate decontamination procedures where the rotor is exposed to these chemicals.

Examples of commonly used techniques are outlined below. The information is given as a guide only. It is the responsibility of the owner to use the most suitable procedure.

The rotor should always be completely disassembled before being subjected to heat and after external chemical cleaning.

8.4 Disinfection

Alcohol (70% ethanol or 70% isopropanol) applied for 10 minutes is ideal for destroying bacteria and viruses.

8.5 Electrical

High voltage is present behind the panels of the centrifuge.

! Do not open the instrument! There are no user-servicable parts inside. In the case of a malfunction, please contact your local HUMAN representative.

8.6 Improper Use

- Use only rotors and accessories designed for use in this centrifuges.
- Do not attempt to override the lid interlock assembly.
- Load and lock the rotor only in the recommended way. As the centrifuge starts to spin, an improperly loaded rotor could cause sufficient force to damage the drive shaft and the rotor chamber.

9 CLEANING AND PREVENTIVE MAINTENANCE

9.1 Daily

No daily cleaning is required, except in the case of accidental glass breakage or a large amount of spillage in the bowl.

9.2 Weekly

Clean the bowl and the accessories with a cotton wool pad dipped in 70% alcohol solution.

9.3 Monthly

Maintenance for drive shaft. You can wipe the drive shaft with soft cloth, and then apply a thin coat of silicon grease.

! All cleaning should
• be performed with the centrifuge disconnected from the power outlet.

! Never use metallic
• implements to clean the rotor or the inserts. After cleaning the accessories, always rinse them with clean water and dry.

! Don't clean the Lid
• with alcohol to prevent dolling

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The logo graphic consists of a stylized red and white shape resembling a folded ribbon or a stylized 'H' that is part of the Human brand identity.

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