

**Instruction Manual**

**For**

**Micro-Centaur Centrifuge**



**READ BEFORE USE!**

**Models: MSB010.CX1.1  
MSB010.CX1.5  
MSB010.CX1.7**

**71100-1044-04  
0206**

# SANYO GALLENKAMP PLC

## Health and Safety at Work

Sanyo Gallenkamp is required under the Health and Safety at work, etc. Act, 1974 and other UK legislation as designers, manufacturers, suppliers and importers of articles for use at work to ensure that, as far as is reasonably practicable, articles which we design, produce, supply or import are safe and without risk to health.

We are required to provide information on the safety and handling precautions to be observed when installing, operating, maintaining and servicing our products. Such advice is contained in this manual.

We are also obliged to update this information should circumstances change and to operate a system to this end.

We should also like to point out, however that **you as users have an important responsibility in the provision and maintenance of safe working practices and conditions.**

Accordingly, we draw the following matters to your attention:

- 1. This apparatus should only be used as intended and within its design parameters by suitably qualified and trained personnel who have read and understood the relevant sections of this manual.**
- 2. This manual should be readily available to such personnel at all times.**
- 3. In addition to that which is written in the manual, normal common-sense safety precautions must be taken at all times to avoid the possibility of accidents. Particular care is required when working with apparatus at high temperature or pressure.**
- 4. Installation, maintenance, repairs and servicing should only be carried out by an SANYO Gallenkamp approved engineer, and connection to electrical supplies should only be carried out by suitably trained personnel.**

### TECHNICAL SUPPORT, WARRANTY SERVICE AND MAINTENANCE

UK customers; if you are in any doubt whatsoever regarding the correct use of this apparatus, or if you require any technical data or assistance, please contact the SANYO Gallenkamp Technical Support Department at;

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**OVERSEAS CUSTOMERS:** Should contact their local Sanyo Gallenkamp Distributor, details can be found on our website.

#### **ELECTRICITY SUPPLIES:** Voltage and frequency

Sanyo Gallenkamp electrical apparatus is offered and labelled for one, or for a choice of two or more voltage ranges and, where necessary, different frequencies of mains supply. Sanyo Gallenkamp does not accept any responsibility for the operation of any such apparatus should it be connected to electricity supplies which are normally outside, or vary outside, the stated voltage and frequency values for which it is designed, nor for any consequential loss, damage or injury, howsoever caused.

## Read This Before Use!

Thank you for buying a **Sanyo Micro-Centaur Centrifuge**.  
Please read this operating manual before using your  
centrifuge; it will provide you and your colleagues with  
useful information on all aspects of the equipment.

As our customer, we should like to ensure that you are  
totally satisfied at all times. Do not hesitate to contact:

**Sanyo Gallenkamp** - your views are very important to us.

**Sanyo Gallenkamp plc**

# ELECTRICITY SUPPLY

Before connecting this apparatus to the electricity supply, check the information given on the rating plate and ensure that;

- A) Your supply is single phase a/c. (alternating current) of the stated frequency with neutral nominally at earth potential.
- B) Your supply voltage is within the stated range.
- C) The current rating is within the capacity of your outlet.
- D) Your plug or electricity supply circuit is fitted with a suitable fuse.

**WARNING!** This apparatus must be earthed.

The wires in the mains lead are coloured in accordance with the following code;

	<b>220v - 240v</b>	<b>110v - 120v</b>
Live	Brown	Black
Neutral	Blue	White
Earth	Green and Yellow	Green

Connect the wires to a non-reversible 3-pin plug as follows:-

Green and Yellow or Green to terminal marked E (Earth), G (Ground), coloured Green or Green and Yellow or marked with the Earth symbol.

Blue or white wire to terminal marked N (Neutral) or Common or coloured Blue.

Brown or black wire to terminal marked L (Live) or Phase or coloured brown.

**Note: 110v - 120v installations to comply with National and State Wiring Codes.**

**IMPORTANT** Consult an electrician if in any doubt or if your supply system has any of the following:

- No earth
- A colour code different from above
- Reversible plugs
- Supply and return leads that are both above earth potential.

**SANYO GALLENKAMP PLC PRODUCT WARRANTY**  
**Terms and Conditions**

We hope that you do not have the need to use the extensive warranty cover that Sanyo Gallenkamp Plc. extend to you. However should you have a problem, our prompt response is greatly helped if you have filled in and posted the pre-paid Warranty Registration Card supplied with your new equipment.

Sanyo Gallenkamp Plc. give a one year warranty from the date of delivery. During this period, component parts proven to be defective in materials or workmanship will be repaired or replaced at our expense. Installation, commissioning and calibration are not covered by this warranty agreement. The Sanyo Gallenkamp Plc. approved service agent must be contacted for warranty determination and direction prior to any work being carried out.

These warranties are only applicable to new products, and not second hand nor refurbished products even if repaired by Sanyo Gallenkamp Plc. Any such products are covered by separate warranty terms and conditions which will be made available on request.

Replacement or repair of component parts or equipment under this warranty shall not extend the warranty to either the equipment or the component part beyond the original one year warranty period unless agreed in writing by Sanyo Gallenkamp Plc.

The above warranties are extended to the original purchaser upon full invoice payment. A purchase receipt or other proof of purchase may be required before warranty service will be performed. These warranties only cover failures due to defective workmanship which occur during the normal operation of the product by the original purchaser, and not failures which result from accident, misuse, abuse, neglect, mishandling, misapplication, alteration, faulty installation, electrical power fluctuations, dust, or other environmental extremes, modification or service other than by an approved service agent or following the written authority of the manufacturer, or damage that is attributable to acts of God. Expendable items such as motor brushes, door seals, lid seals, "O" rings or lamps are excluded.

Sanyo Gallenkamp Plc., or its approved service agent, reserves the right to repair defective equipment on the premises of the customer, or at a service station, at the sole discretion of Sanyo Gallenkamp Plc. or their approved agent. In the event of return to an approved service centre the customer is responsible for the safe packaging of the instrument and notification to the service centre. Neither Sanyo Gallenkamp Plc. nor its agents are responsible for any damage occurring during shipment.

Specification and Material Changes:- Sanyo Gallenkamp Plc. reserves the right to supply our latest and improved models at time of shipment.

Taxes:- The prices quoted do not include any taxes imposed by the State or Country in which the purchase was made.

Installation:- Installation of all equipment shall be by, and at the expense of the purchaser unless stated otherwise. Access to the site, and the provision of required utilities e.g. Power, water and drainage to suitable connections, will be the responsibility of the purchaser, and at the purchaser's expense.

Limitation of liability:- In no event, whether as a result of breach of contract or warranty, shall Sanyo Gallenkamp Plc. be liable for any consequential or incidental damages including, but not limited to, loss of profit or revenues, loss of use of the equipment or any associated equipment, down time costs, costs of substitute equipment, costs of labour, costs due to delays or claims of purchaser's own customers for such damages. The purchaser agrees to indemnify Sanyo Gallenkamp Plc. and to hold them harmless from any and all liability, claims, demands, actions, suits, expenses or costs, including attorney's fees relating to such consequential or incidental damages.

All expressed and implied warranties, including the warranties of merchantable quality and fitness for a particular purpose, are limited to the application period of one year.

Validity:- Legal rights vary from country to country and states within countries, so some or all of the exclusions or limitations listed above may not apply, but if any part of these conditions shall be found to be unenforceable it shall not affect the validity or enforceability of the remainder of the conditions.

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## 1. Introduction to the centrifuge

This instruction book is designed to help users get the best from their centrifuge.

### **PLEASE READ IT BEFORE USING THE CENTRIFUGE FOR THE FIRST TIME.**

The Micro-Centaur is a small, light weight bench-top centrifuge. It will carry test tubes of 0.4ml, 0.75ml and 1.5ml by changing the tube support plate.

Other important features include:

- Mechanical release knob ensuring positive lock release.
- A safety interlock on the lid so that you cannot open the centrifuge until it has stopped rotating. See page 17.
- Variable speed of centrifuging of up to 13,000 RPM. See page 17.
- A timer that lets you run the centrifuge for between 1 and 30 minutes and shows remaining time. See page 17.
- An alternative 'pulse' setting that lets you manually centrifuge test tubes for periods of less than 1 minute. See page 17.
- A fully enclosed, top loading rotor. The design is very easy to use, it prevents spills from getting into the centrifuge and it allows you to remove the whole rotor for cleaning or autoclaving. See page 14.

### 1.1 Electricity supply

The centrifuge needs a power supply that operates at either 240/220 volts 50/60Hz or 120/110 volts 50/60Hz. See page 10, connecting to electricity supply.

If you are not sure whether or not your power supply is suitable contact the manufacturers at the address given inside the front cover or the address on your guarantee card.

### 1.2 Size and weight

The size and weight of the centrifuge are as follows:

height:	200mm
width:	188mm
depth:	212mm
weight:	6kg with a 12 place, empty rotor

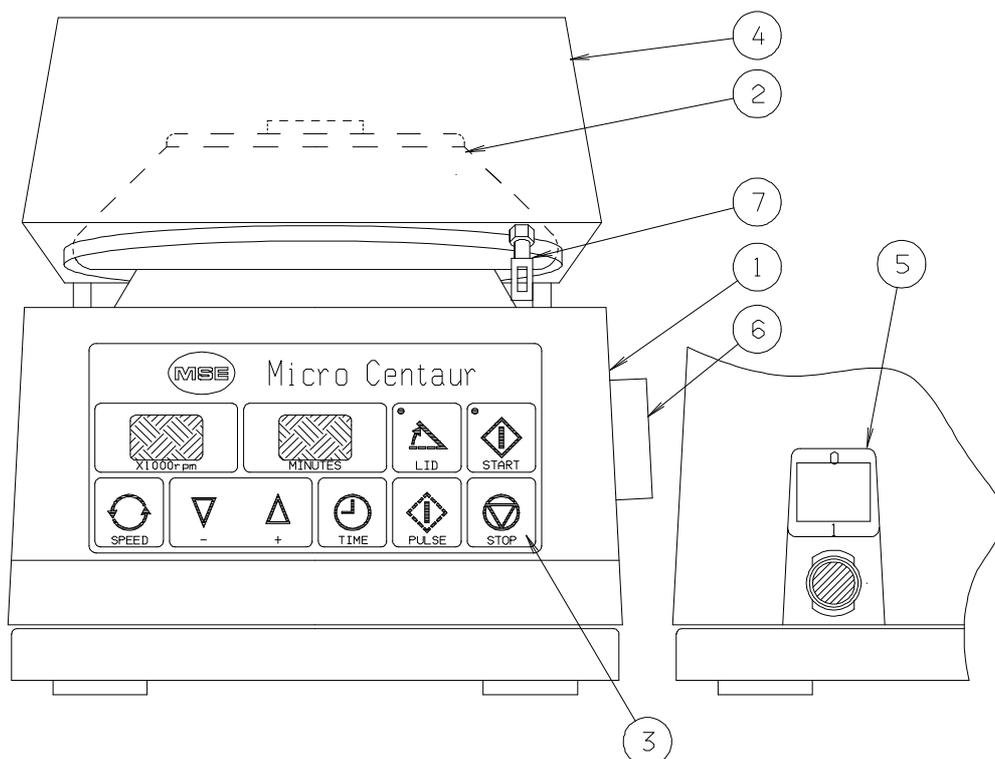
### 1.3 The main features

The main features of your centrifuge are shown below.

The centrifuge is made up of:

- 1) The body.
- 2) The centrifuge rotor.
- 3) The control panel.
- 4) The lid.
- 5) On/off switch at rear of the unit.
- 6) Lid opening knob
- 7) Lid lock latch

#### The Centrifuge



## 2. Operational Safety

The Micro-Centaur has been designed to be safe in use. However, as with all pieces of laboratory equipment there are a few sensible precautions that you should take. If you follow this advice you should have no problems with your centrifuge.

### 2.1 The lid safety lock.

The lid of the centrifuge has a safety interlock fitted. This means that you cannot open the lid when the rotor is still going round. The only time you can open the lid is when the rotor has come to a stop and the light on the "LID" button on the control panel is lit up.

### 2.2 Lid "sleep" mode.

Should the Micro be left on for more than 5 minutes without use, the unit will shutdown.

### 2.3 Spills and how to deal with them.

Always wipe up any liquid that is spilt in or on the centrifuge. This will help to prevent corrosion.

### 2.4 Care with corrosive liquids.

If you are using corrosive liquids you should take extra care with spills including using sealed test tubes and wiping up spills immediately

If you are not sure whether a solution you are using is corrosive, you should ask your safety adviser for advice.

### 2.5 Care with infectious materials.

If you are using infectious material in the centrifuge you should always:-

Use sealed tubes.

Sterilise all tubes immediately after use.

If any spillage's occur, autoclave the rotor (120°C maximum) and properly dispose of any contaminated materials.

Again, if you are in any doubt ask your safety adviser for advice.

### 2.6 Balancing the load.

To make sure that the rotor can spin smoothly you must arrange the test tubes so that the load is evenly balanced around the adapter plate.

Instructions of how to do this are given on page 16.

### 3. Preparations for use

#### 3.1 Choosing a place to use it.

You should always use your centrifuge on a firm, level surface such as a table or bench. If you don't, then the centrifuge could vibrate and possibly be damaged.

#### 3.2 Connecting to the electricity supply

Before connecting this centrifuge to the electricity supply, check the information given on the rating plate at the back and make sure that:

- 1) Your supply is single phase alternating current (a.c.)
- 2) The frequency is the same as that shown on the rating plate.
- 3) The neutral of your supply is nominally at earth potential.
- 4) The voltage of your supply is within the range given on the plate.
- 5) The current rating is within the capacity of your supply outlet.
- 6) Your plug, if appropriate, should be fitted with a fuse as follows:-

	220/240V	120/110V
<b>Fuse rating</b>	3 amp	N/A

**If you do not understand any of these, or are not sure, ask an electrician.**

**WARNING: THIS APPLIANCE MUST BE EARTHED.**

The wires in the mains lead to the centrifuge are colour coded in the following way:-

	220/240V	120/110V
<b>Live</b>	Brown	Black
<b>Neutral</b>	Blue	White
<b>Earth</b>	Green and Yellow	Green

Connect the wires to a **3-pin plug** as follows:

**Green and yellow or Green** wire to the terminal marked E (Earth), G (Ground), coloured green or green and yellow or marked with the Earth symbol.

**Blue or White** wire to the terminal marked N (Neutral) or Common or coloured blue.

**Brown or Black** wire to the terminal marked L (live) or Phase or coloured brown.

**THE 120 VOLT INSTRUMENT** - supplied with fitted plug.

**IMPORTANT:**

Consult a qualified electrician if you are in any doubt or if your electrical supply system has any of the following:

No earth

Reversible plugs

A colour code that is different from the above code

Supply and return leads that are both above earth potential.

When the centrifuge is connected to the electricity supply and switched on, two lights will appear on the front control panel to show that the power is on (green) and that you can open the lid (yellow). The time and speed display windows will also light up.

To open the lid push the button marked "Lid" and the lid will spring partly open. You can then lift the lid with your hand until it is fully open.

**WARNING, DO NOT ALLOW THE LID TO FALL BACK FULLY OPEN, OR FALL SHUT, AS THIS COULD CAUSE DAMAGE TO THE UNIT OR SPOIL CENTRIFUGED SAMPLES.**

### 3.3 Accessories

The centrifuge comes complete with the following accessories:

3 tube support plates.

One that holds 12 x 1.5ml tubes (maximum 'g' 11,600).

One that holds 14 x 0.75ml tubes (maximum 'g' 10,500).

One that holds 18 x 0.4ml tubes (maximum 'g' 13,400)

You will find the instructions for changing the support plates on page 14

A lid release key to open the lid if the power supply fails

You will find instructions for using the key on page 16.

Two 2 amp fuses (240/220V version) or two 6.25 amp fuses (120/110V version) to replace the one's in the base of the centrifuge.

You will find advice on replacing the fuses on the Electricity Supply page at the front of this manual.

Centrifuge tubes are not supplied with the centrifuge but you can order these from the address on the inside of the front cover.

### 3.4 Tachometer Port (120/110V versions only).

For calibration purposes only, the top of the lid has a clear port to enable the speed of the rotor to be checked.

This can be accomplished by using an optically coupled tachometer.

Speed accuracy should be  $\pm 3.85\%$  of maximum speed.

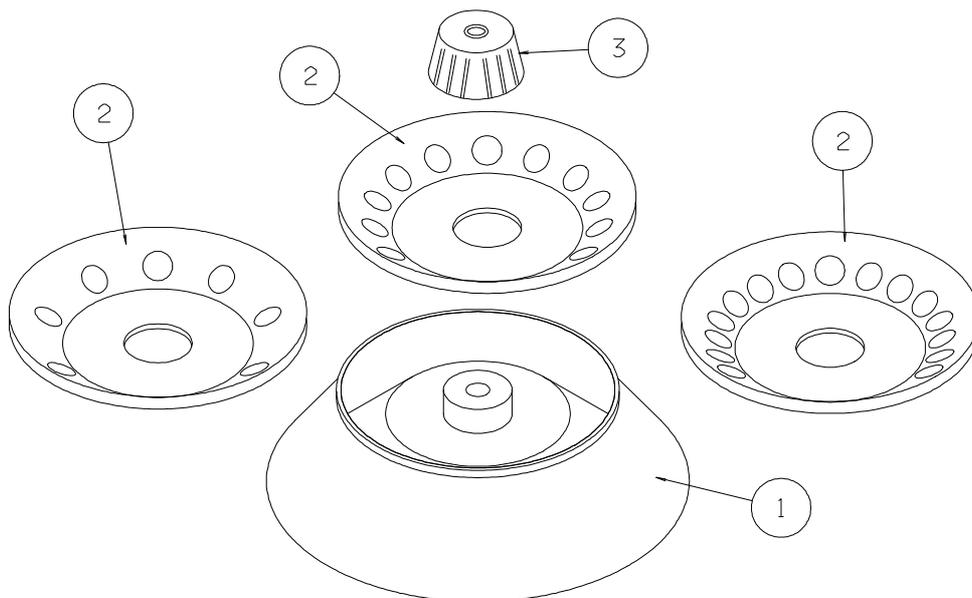
## 4. Rotors

The motor drives the rotor round at speeds of up to 13,000 revolutions per minute by a spindle.

The centrifuge rotor is made up of:-

- 1) A windshield that forms the main body of the rotor.
- 2) The three interchangeable tube support plates.
- 3) The rotor locking nut that holds the support plates onto the central spindle from the motor in the base as shown below.

**The Centrifuge Rotor**



#### 4.1 Cleaning the rotor

To take the centrifuge rotor off for cleaning you will need to:-

- 1) Unscrew the rotor locking nut at the top of the spindle by turning it in an anti-clockwise direction. (this may be opposite to what you are used to)
- 2) Lift the whole of the centrifuge rotor (tube support plate and windshield) straight off the spindle

To put the rotor back you will need to:-

- 1) Slide the whole rotor down onto the spindle and turn it around until the slot on the underneath of the rotor fits over the pin on the spindle.
- 2) Screw the locking nut back on so that it is finger tight. If there does not appear to be enough thread to screw the nut onto then you have probably not fitted the rotor right down onto the spindle. Remove the rotor and try again.

If you just want to change the support plates then you will need to:-

- 1) Take all the tubes out of the support plate.
- 2) Unscrew the rotor locking nut.
- 3) Hold both sides of the support plate by the outside lip and lift it off the spindle.
- 4) Put the new support plate on by holding it in the same way as the one you have removed.
- 5) Tighten the locking nut.

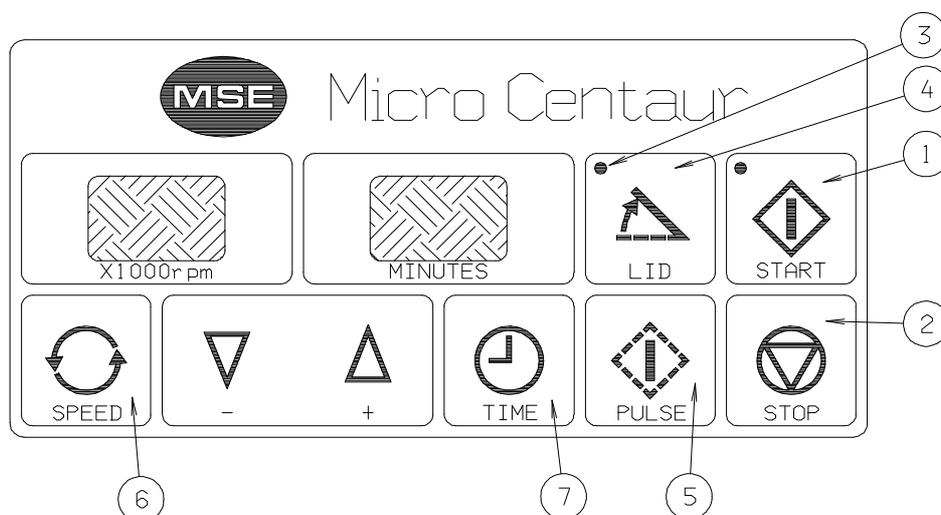
## 5. The control panel.

The control panel has both controls for setting the centrifuge's speed and time as well as indicator lights to tell you what is happening. The diagram below shows details of the panel with an explanation of the different controls and lights.

The controls and indicator lights are:

- 1) A start button and power on indicator light.
- 2) A stop button.
- 3) A lid "status" LED. When on, the lid can be opened by turning the knob.
- 4) A "LID" button and "LID" indicator light.
- 5) A pulse button. Normally used for runs of less than one minute.
- 6) A set speed button. When pressed will allow you to alter set speed by pressing or + triangle. The speed will be displayed in the window marked x1000rpm. Minimum displayed speed 1000 (1) and maximum displayed speed 13000 (13).
- 7) A set timer button. Operation as for speed button. Minimum displayed time 1 minute (1) and maximum displayed time 30 minutes (30).

**The Control Panel.**



## 6. How to use the centrifuge

To use the centrifuge you need to carry out the following steps:-

- 1) Open the lid.
- 2) Load the support plate with the filled tubes taking care to balance them.
- 3) Close the lid.
- 4) Set the speed of the centrifuge.
- 5) Set the time of the centrifuge.
- 6) Press the green start button.
- 7) Wait for the centrifuge to finish spinning and the "LID" light to come on.
- 8) Open the lid and remove the tubes.

Each of these stages is explained in full below.

### 6.1 Opening the lid.

You can only lift the lid when the centrifuge is plugged in **and** the rotor has stopped moving. If the rotor has stopped and the lid will not open, check that the 'Power-on' light is lit. If there is a power failure, you can open the lid by using the lid release key. The instructions for this are given on page 18.

### 6.2 Loading the support plate with centrifuge tubes

The minimum number of centrifuge tubes you can use is 2 as this allows the load to be evenly balanced. You should make sure that all the tubes contain approximately the same amount of liquid and that they are firmly closed. If you only wish to centrifuge one sample tube then fill the other tube with an equal amount of water. If you are using more than 2 tubes, spread them evenly around the support plate. This will make sure that the centrifuge stays balanced. The maximum number of tubes you can centrifuge at one time is between 12 and 18 depending on the size of the tubes and the support plate you are using.

### 6.3 Closing the lid

Once you have put the tubes in the support plate close the lid and push it firmly down. You will hear a 'click' that means that the lid has locked down.

**6.4 Choosing the centrifuge speed.**

You can choose any speed of centrifuge up to 13,000 RPM. See page 15 for method of operation.

**6.5 Choosing the centrifuge time.**

You can either use the pulse switch for times of less than 1 minute or the automatic timer for longer periods of up to 30 minutes.

**6.6 How and when to use the pulse switch**

If you want to centrifuge for short times of less than 1 minute you should use the pulse switch instead of the timer. Once you have loaded the centrifuge, close the lid and set the speed, press the 'pulse' switch to start the centrifuge. The "LID" light will go out and the centrifuge will spin for as long as you keep your finger on the switch. When you release the switch the centrifuge will slow down and stop. The "LID" light will come on again to show you that you can now open the lid. The pulse feature can also be used for runs of more than 1 minute if you wish.

**6.7 Using the automatic timer.**

If you want to centrifuge for between 1 minute and 30 minutes you can set the time on the automatic timer. See page 15 for method of operation. Once set and running the timer will display remaining time until coming to rest, then it will revert back to its pre-set value ready for the next run.

**6.8 Starting and stopping the centrifuge.**

Once the timer is set you should press the green start button to begin centrifuging. The "LID" light will go out. The centrifuge will spin until the set time has elapsed, when it will slow down and stop, displaying "END". When it has stopped the "LID" light will come on again to show that you can open the lid.

If you want to stop the centrifuge during its spin you can press the red Stop button.

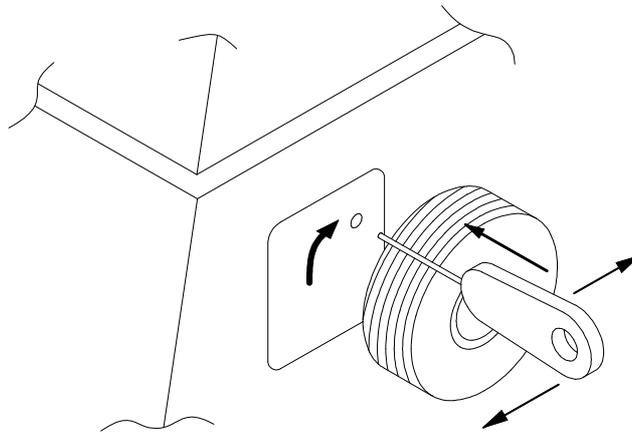
NOTE: If at the end of a run "END" is not displayed, then the unit has not completed the set run time.

### 6.9 Opening the lid if there is a power failure.

It is possible that you might have a power failure when you are using the centrifuge. If this happens you will not be able to open the lid by the normal method of pushing the "LID" button. This is what you will need to do instead:

- 1) Switch the centrifuge OFF.
- 2) Turn the centrifuge until you can see the small hole near the opening knob on the right hand side of the unit.
- 3) Push the Lid Release Key, that was supplied as an accessory, into the small hole with the end of the key pointing towards the front of the centrifuge. Lever against the case so that you rotate the point of the key backwards in a level curving movement. When you have moved the key about half way you will feel the point touch the end of the lid lock. Carry on pushing against this lock until it releases and the lid opens slightly. The diagram below shows how to do this.

#### How to Open the Lid if there is a Power Failure.



## 7. How to look after the centrifuge.

### 7.1 Cleaning the centrifuge

You should clean all the containers and the rotor after use. This will help prevent the inside of the centrifuge from corroding. You should always wipe up any spills in the centrifuge immediately, especially if the liquid is corrosive (See page 9). You may also autoclave the rotor if you have been using infective materials (See page 9).

The outside of the centrifuge will need to be cleaned occasionally. To do this you should not remove rotor. Proceed as follows:-

- 1) Disconnect the centrifuge from the electricity supply.
- 2) Wipe the surface with a mild detergent solution, such as washing up liquid.
- 3) Wipe dry and buff with a soft cloth.

**Do not use solvents or abrasive cleaners on the centrifuge !**

**Do not allow water to run into slots at the rear or the front of the unit !**

Lightly coat the lid seal with French chalk occasionally and in particular after cleaning.

### 7.2 How to maintain the centrifuge

Apart from changing the support plates and cleaning the centrifuge after use, the only maintenance that may be needed is to replace the fuses or brushes. This should only be done by a competent electrician.

### 7.3 Problem solving.

If your centrifuge does not work properly you should check the following things before getting in touch with the service centre:

- 1) Is the centrifuge connected to the electricity supply ?
- 2) Has the fuse in the base of the centrifuge blown? Check it and if necessary replace it with the spare one provided.
- 3) Do the motor brushes require changing? See page 22.

Recommendation.

Brushes of the motor in this centrifuge will gradually wear with use. It is therefore recommended that the brushes are checked occasionally and replaced when the brush length is less than 8mm (5/16").

If your centrifuge still does not work contact the service centre at the address inside the front cover. The service centre will then give you more advice.

If you are not in the UK you should first contact your nearest MSE distributor or Sanyo Gallenkamp service agent. If there is no local supplier, contact the UK address.

#### **7.4 Expert servicing**

You should get the centrifuge checked regularly by a service engineer from MSE. The address is given inside the front cover.

### 7.5 Spare parts/ Accessories

The following spare parts that users can fit are available for your centrifuge from your local supplier or the address shown on the front cover.

Part Number	Description
FIS-63500.998	Rotor complete
76600.004	Lid release key
32600.084	2 amp fuse
32600.085	6.25 amp fuse.
43551.604	0.4ml disposable tube (Packs of 1000).
43551.603	0.75ml disposable tube (Packs of 1000).
43551.602	1.5ml disposable tube (Packs of 1000).
34500.014	Motor brushes (1 pair required).
66500.905	Foot assembly.

**7.6 Replacing the motor brushes.**

To be carried out by a qualified electrician.

- 1) Disconnect from mains, place unit upside down and remove 4 off M3 screws.
- 2) Place unit on its side, open lid manually and remove motor base taking care not to strain ribbon cable.
- 3) Disconnect motor earth wire, remove 4 off M4 nuts and lift motor clear of studs, unplug from PCB.
- 4) Lift brush spring and drop into slot next to brush, undo terminal screw and remove brush. Refit new brush noting correct orientation of spring slot. Refit terminals ensuring brush braid is clear of motor frame. Replace spring in slot.
- 5) Repeat (4) for second brush.
- 6) Plug motor into PCB, reposition on studs and reconnect earth wire.
- 7) Depress catch block (white) and refit motor base, ensuring no wires are trapped and that the motor shaft plus sponge is centrally located.
- 8) Run the centrifuge with an unloaded rotor for half an hour at 2000 rpm to bed in the brushes.





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