

# xxpress® Centrifuge

PCR plate centrifuge with programmable speed and duration



## User Manual



**BJS BIOTECHNOLOGIES**  
A LIFESCIENCE COMPANY

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**xxpress xxplates, and xxsealer** are the brand names for BJS Biotechnologies own range of PCR thermal cycler products and accessories. For further details please visit our web site.

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## Contents

1	Glossary of Terms and Abbreviations .....	4
2	Symbols Used in this Instruction Manual .....	5
3	Unit Description .....	6
4	Technical Specification.....	9
5	Safety Precautions and Limitations of Use.....	10
6	Unit Installation .....	14
7	Unit Operation .....	16
7.1	User Display and Controls.....	16
7.2	Operating the Controls of the xxpress Centrifuge .....	18
7.3	Fault Diagnosis.....	21
8	Maintenance and Servicing .....	22
8.1	Routine Cleaning and Inspection .....	22
8.2	Decontamination Procedure .....	23
8.3	Transportation and Storage.....	23
9	Warranty and Returns .....	25
10	Product Disposal .....	26

## Tables








<b>Table 1: Advisory Symbol Meanings.....</b>	<b>5</b>
<b>Table 2: Rotors and Adaptor Types.....</b>	<b>7</b>
<b>Table 3: User Buttons and Status LEDs.....</b>	<b>16</b>

## 1 Glossary of Terms and Abbreviations

<b>ANSI</b>	American National Standards Institute
<b>BJS Bio</b>	BJS Biotechnologies Limited, UK Company Number 02959160
<b>EMC</b>	Electro-Magnetic Compatibility
<b>Microtitre Plate</b>	Plate with an SBS footprint featuring 24, 48, 96 or 384 wells
<b>MTP</b>	Microtitre plate
<b>PCR</b>	Polymerase Chain Reaction
<b>PPE</b>	Personal Protective Equipment
<b>RCF</b>	Relative Centrifugal Force
<b>RPM</b>	Revolutions per Minute
<b>SBS</b>	Society for Bio molecular Screening
<b>Semi-skirted PCR Plate</b>	PCR plate with an outer surrounding half edge
<b>Skirted PCR Plate</b>	PCR plate with an outer surrounding edge
<b>Un-skirted PCR Plate</b>	PCR plate without an outer surrounding edge
<b>Well</b>	A single sample cavity in a Microtitre plate, PCR plate or Deepwell plate
<b>xxplate</b>	BJS Bio PCR test plate for the xxpress real- time thermal cycler. Available in 24, 54, and 96 well formats.

## 2 Symbols Used in this Instruction Manual

The following advisory symbols are used in this manual.

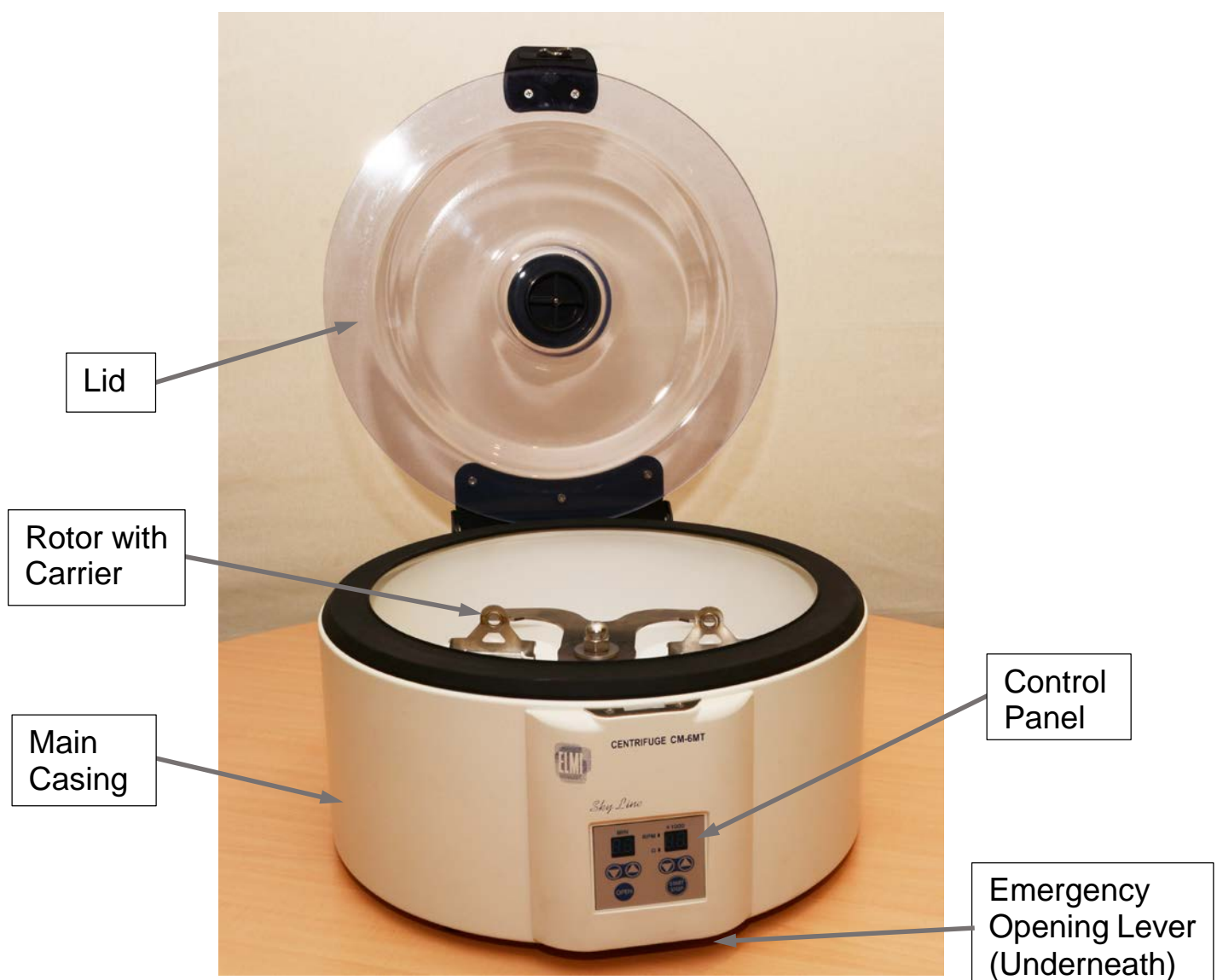
Table 1: Advisory Symbol Meanings	
 <p><b>DANGER</b></p>	Indicates a Risk of Electric Shock which could, if not avoided, result in severe injury or death.
 <p><b>DANGER</b></p>	Indicates a Burn Hazard which could, if not avoided, result in severe injury or death.
 <p><b>DANGER</b></p>	Indicates a Risk of Explosion which could, if not avoided, result in severe injury or death.
 <p><b>WARNING</b></p>	Indicates a hazardous situation which could, if not avoided, result in severe injury or death; or severely damage the unit.
 <p><b>CAUTION</b></p>	Indicates a hazardous situation which could, if not avoided, result in minor or moderate injury; or degrade or impair the functionality of the unit.
 <p><b>CAUTION</b></p>	Indicates a Risk of Crush hazard due to moving parts which could, if not avoided, result in minor or moderate injury.
	Advisory note or other useful information.
	Refer to "Section NN" for more details.

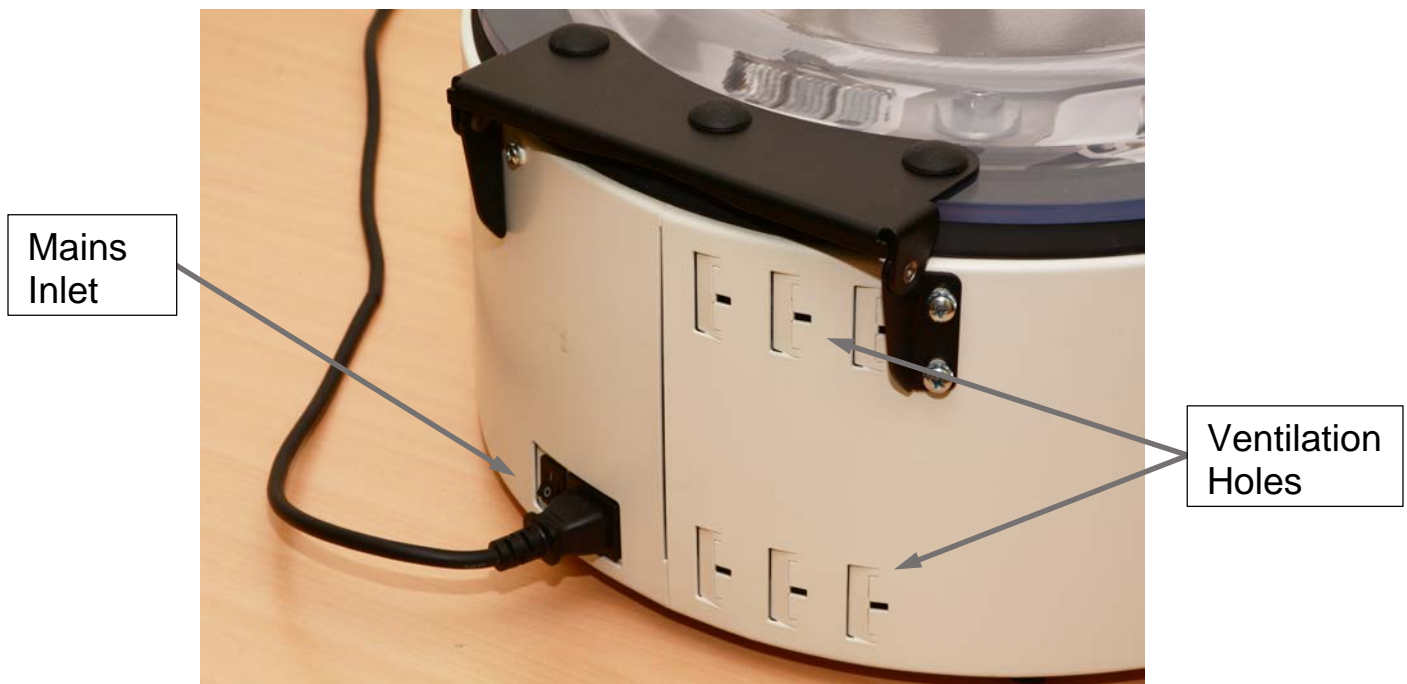
### 3 Unit Description

The **xxpress Centrifuge** is designed to separate solutions into fractions. It is provided alongside the xxpress Real-Time PCR Thermal Cycler to ensure that the sample is correctly located at the bottom of the plate prior to thermal cycling. The centrifuge can also be used in analytical chemistry, microbiology, virology, clinical biochemistry.


The **xxpress Centrifuge** comes equipped with a rotor that will take an xxplate (xxplates are the consumable test plate used by the xxpress Real Time Thermal Cycler); it can also be equipped with different rotors. The centrifuge has a microprocessor control system that provides smoothness of rotor rotation and controls the start, duration and speed of rotation. The unit has a number of safety controls including the locking of the lid during operation and a built-in imbalance sensor.




The unit has the following external features:





The **xxpress Centrifuge** unit is designed to be used with **xxplates**, but there is also a range of rotors that allow the use of other sample plates and consumables – some of which are listed below:

Table 2: Rotors and Adaptor Types	
Adaptor Block Type	Suitable Plate Types
	<p><b>BJS xxplate ROTOR</b>            Rotor for 2 plates.            Suitable for 24, 54, and 96 well <b>xxplates</b>            Top speed: 2500 rpm</p>

	<p><b>ROTOR 6M.04</b> Rotor for 2 plates. Size of the applied plates; (W x L x H) 86 x 128 x 20 mm. Top speed: 2500 rpm.</p>
	<p><b>ROTOR 6M.05</b> Universal rotor for 12 adapters. Maximal volume of applied test tubes: 15 ml. Maximal sizes of the applied test tubes: (D x L) 16.8 x 140mm. Top speed: 3500 rpm.</p>
	<p><b>ROTOR 6M.01</b> Universal rotor for 4 adapters. Maximal volume of applied test tubes: 50 ml. Maximal sizes of the applied test tubes: (D x L) 30 x 135 mm. Top speed: 3500 rpm.</p>

Other specialist adaptor plates may be available at request. Please contact your distributor for details.



## 4 Technical Specification

### Model Type

Model Name	<b>xxpress Centrifuge by Elmi</b>
Model No	CM-6MT

### Physical Unit Properties

Dimensions (W x D x H)	430 mm x 400 mm x 225 mm
Weight (without adaptor)	10 kg

### Mains Supply

Power Cord Rating	IEC C13, 3-Core, 5A min
Inlet Module Type	IEC C14, DPST
Supply Voltage	220 to 240 VAC $\pm 10\%$
Supply Frequency Range	50 to 60 Hz $\pm 5\%$
Power Consumption	320 W max
Fuse Ratings	Where cable/plug fused 3A fuse should be used.

### Operating Environment

Temperature Range	+4 to +40 °C
Relative Humidity Range	20% to 80% non-condensing
Maximum Operating Altitude	2000 m above sea-level

### Storage and Transportation

Temperature Range	-10 to +50 °C
Relative Humidity Range	20% to 95% non-condensing

### Operating Parameters

Rotor Speed	from 100 to 3,500 RPM
Maximum Centrifugal Force	2,300 RCF
Rotor Speed Accuracy	$\pm 2\%$
Duration Range	1 to 99 minutes
Max Sound Level	55db(A) at 1 metre

## 5 Safety Precautions and Limitations of Use

It is essential that all users of this equipment have fully read and understood the following safety precautions and limitations of use before installing or operating the **xxpress Centrifuge** unit.

### IMPORTANT



**WARNING**

The protection provided by this equipment may be impaired if it is not used in a manner described in this manual.



**WARNING**

It is essential that the user of this equipment is aware of the potential hazards associated with the unit and its accessories. All operators should be familiar with the safety precautions and warnings given in these instructions before attempting to operate the unit. Improper use of this unit or its accessories may impair their functionality and invalidate the manufacturer's warranty.

### Unit Handling Precautions



**CAUTION**

Care should be taken not to drop the unit or subject it to rough physical handling, both during normal use and during transportation and storage.



**WARNING**

The unit should only be held by the painted casework when being lifted or moved. Do not lift the unit by the lid or rotor. Care should be taken when lifting the unit due to its weight.



**CAUTION**

Care should be taken not to knock the LED display. Do not use excessive force when pressing the control buttons or closing the lid.

## Unit Installation and Operating Environment



**DANGER**

The **xxpress Centrifuge** unit is designed for indoor laboratory use only.

The acceptable operating temperature range is 4°C to 40°C, with a relative humidity of 20% to 80% non-condensing, at a maximum altitude of 2000m above sea level.



**WARNING**

If the unit is stored in conditions outside of these ranges, it must be left to stand unpowered until it has acclimatised to within these environmental limits before being powered.



**DANGER**

Use only the AC mains power cord provided with the unit or as specified in Section 4.

The unit must be connected to a suitably earthed mains supply, with appropriate earth-leakage and over-current protection.



**WARNING**

Always ensure that the mains power connector is securely inserted into the rear of the unit, and any excess power cord does not pose a potential trip or pull hazard.



**DANGER**

Do not operate the unit in any area which is, or has been, or is thought to have been exposed to explosive or flammable gases, vapours or liquids.



**WARNING**

The unit must be installed and operated on a solid, stable and level working surface; ensuring that the ventilation holes at the rear and underneath the unit are not obstructed.

## General Operating Precautions



**DANGER**

Ensure that the power is switched off at both the AC mains supply outlet and at the back of the unit before inserting or removing the mains power cord.



**DANGER**

The rotor can spin very fast during operation and would cause serious injury if it came into contact with hands, fingers or other soft tissue.

Operators must not defeat the safety locks on the unit and gain access to the rotor whilst it is still spinning.



**DANGER**

The unit is intended for use with plates containing biological samples only.

Never use the unit to centrifuge any explosive, volatile or highly reactive substances or chemicals.



**CAUTION**

There is a possible finger crush hazard due to the lid falling or being pushed closed.

Care should be taken when opening the lid.

## Unit Maintenance and Serviceability



**DANGER**

There are no user or operator serviceable parts inside the unit.  
Do not remove the unit casework.



**WARNING**

Removal of the unit's casework will void the manufacturer's warranty and may expose the user to a Risk of Electric Shock resulting in serious injury or death.



**DANGER**

Once installed, the fused supply to the equipment will only blow under a fault condition. This fuse should only be changed after the unit has been thoroughly inspected by a qualified engineer.



**DANGER**

Always switch off the unit and disconnect the power cord before performing any cleaning or decontamination procedure.  
If liquid is spilt into or over the unit, switch off and disconnect the power from the AC mains outlet before attempting to deal with the spillage.



**CAUTION**

The use of harsh chemicals and cleaning agents may damage the unit and degrade its performance.

Always follow the cleaning and decontamination procedures specified in Sections 8.1 and 8.2 of this instruction manual.



**CAUTION**

Do not autoclave any part of the unit or its accessories.

## 6 Unit Installation

Before installing the **xxpress Centrifuge**, please check that the delivery is complete and that the unit and any accessory parts are intact and free from any signs of transportation damage. Also ensure that all external and internal packaging has been removed from the unit before installation.



Please retain all packaging for future transportation and storage of the unit and its accessories.

The centrifuge should be installed in a location which meets the following requirements:

- Safe and suitable operating environment (see Section 5)
- Solid, stable, level working surface
- At least 10cm clearance around the unit to adjacent objects and walls
- Sufficient clearance to enable the lid to be opened fully
- Earthed AC mains power connection (see Section 4)



**WARNING**

Please also observe and abide by the **Unit Installation and Operating Environment** safety precautions and preconditions listed in Section 5.

It is important to check that the Mains Voltage is correct before use, the voltage specification label is at the rear of the unit on the underside.



Install and test the **xxpress Centrifuge** using the following procedure:

- 1) Place the unit on the suitably selected working surface (as specified above), ensuring that the ventilation holes on the rear and underneath of the unit are not obstructed.
- 2) Connect the unit to the AC mains power outlet using the mains power cord supplied or as specified in Section 4.
- 3) Switch the mains power on at supply outlet first, and then switch the unit on using the power switch located at the rear of the unit.
- 4) Check that the unit is stable and safe by performing a trial centrifuging operation, as described in Section 7.2.



**DANGER**

If the unit has been stored in a cool environment, it must be left to stand unplugged until it has acclimatised to the new room temperature before being powered.

## 7 Unit Operation

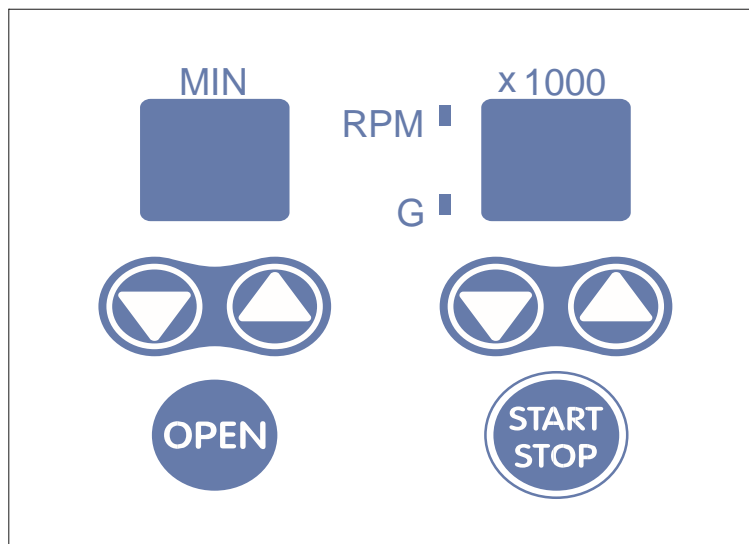


**WARNING**

Please ensure that you have read and fully understood all of the **Safety Precautions and Limitations of Use** listed in Section 5 before attempting to operate the **xxpress Centrifuge**.


### 7.1 User Display and Controls

The **xxpress Centrifuge** consists of a stainless steel inner casing within a painted steel housing; a rotor is mounted in it powered by an electric motor and control system. Rotor is covered with self-locking transparent lid. In the back of the casing the power switch is mounted. On the front of the casing a control panel is placed with displays and buttons, having the followings functions:








The button and LED functions are listed in Table 3.

**Table 3: User Buttons and Status LEDs**

Table 3: User Buttons and Status LEDs	
<p>MIN</p> 	<p><b>Displays the time remaining on the chosen cycle in minutes.</b></p>



<p>x 1000</p> 	<p><b>Displays the Speed or G-force of the rotor during operation</b></p>
<p>RPM ■</p>	<p><b>Rotational Speed measured in RPM (Revolutions per minute)</b></p>
<p>G ■</p>	<p><b>Rotor rotation measured in RCF</b></p>
	<p><b>Button to increase / reduce the parameter</b></p>
	<p><b>Button to unlock the lid of the xpress Centrifuge</b></p>
	<p><b>Button to Start or Stop the xpress Centrifuge cycle</b></p>
<p>Note: To change RPM to RCF (G-force), or vice versa, press and hold the  buttons under the x1000 display for 5 seconds.</p>	

## 7.2 Operating the Controls of the xpress Centrifuge

When the unit is switched on, it recalls the last operation settings and displays the speed/G-force and the duration (depending on the display mode).

Press the OPEN button to unlock the lid, then lift the lid from the front edge to provide access to the rotor.

Load the xplate onto the one of the carriers sample side up as shown in the picture below. The rotor should always be loaded symmetrically to minimise imbalance so place another xplate in the other carrier if it is empty. (The total imbalance should not exceed 5 grams).



Close the lid and press down until you hear or feel a click indicating that the lock has engaged.



Set the speed and duration of the cycle using the buttons under the displays. Press the UP or DOWN arrows until the desired value is obtained.



Duration is in minutes and can be set between 1 and 99  
Speed is in RPM and can be set between 100 and 3500 in steps of 100

It is possible to change the speed reading to G-force by pressing both the UP and DOWN arrows simultaneously for 5 seconds. Once selected the G-Force reading can be adjusted between 0.1 and 2.3 in steps of 0.1, it is measured in RCF



Once the desired parameters are set press the START/STOP button once to start the cycle

The **xxpress Centrifuge** will ramp its speed to the desired maximum and hold until the cycle is complete. NOTE that the centrifuge can take 30 seconds to achieve maximum speed.

Once the cycle is complete the **xxpress Centrifuge** will cut the drive to the rotor and let it slow down. This will take a few seconds. Once the rotor has come to a halt the **xxpress Centrifuge** will beep to indicate that the cycle is complete and automatically release the lid lock making it ready for sample removal.

(To centrifuge that sample further the lid will need to be pressed down and locked)

The **xxpress Centrifuge** can be stopped in mid-cycle by pressing the START/STOP button once then waiting for the rotor to come to a stop and the lid lock to be automatically released.

(To enter GELL mode which is used for size exclusion chromatography select G-force settings and then using the UP/DOWN buttons select the minimum setting)

### 7.3 Fault Diagnosis

If the **xpress Centrifuge** does not start, you hear a beep and the displays show ErOP, it means that the lid is not closed properly. Press on the lid and start the centrifuge.

If the **xpress Centrifuge** does not start, you hear a beep and the displays show Erbd, it means that there is a mechanical obstruction of the rotor, or malfunction in the engine. (At the end of centrifugation cycle the rotor will stop and a sound signal will sound and lid will automatically unlock.)



If the overall imbalance of test tubes in the rotor exceeds 5 grams, the **xpress Centrifuge** when reaching 1000 rpm will start emergency braking and the displays will show Erdb - error code imbalance.

Below are a list of all possible error codes;

MIN display	X1000 display	Sound signal	Cause	Remedy
Er	OP	+	Opened lid	Close by pressing on the lid
Er	bd	+	Rotor or motor is blocked	Remove any mechanical obstacle and check rotor moves freely
Er	HE	+	Motor overheat	Check that there are no obstacles blocking the air circulation vents of centrifuge
Er	LV	-	Not enough voltage to run the centrifuge	Use voltage stabilizer
Er	dd	+	Residual rotation of the rotor	Wait till the rotor stops
Er	db	+	Total imbalance of test tubes is more than 5gr	Reload the rotor to get symmetrical loading

## 8 Maintenance and Servicing

Although the **xxpress Centrifuge** unit does not require any scheduled maintenance or servicing, the operator should regularly clean and inspect the unit for any detects, as described in Section 8.1 below.

 <b>DANGER</b>	Please observe and comply with all of the <b>Unit Maintenance and Serviceability</b> precautions listed in Section 8.
 <b>WARNING</b>	Never removed the unit casework. There are no user or operator serviceable parts inside the unit. Always switch off and unplug the unit before performing any cleaning or disinfecting tasks.

For technical and service related enquiries, please contact your distributor or BJS Bio at the address given on Page 2 of this manual.

### 8.1 Routine Cleaning and Inspection

The unit casework should be cleaned and inspected at regulator internals, and whenever contamination or spillage occurs, as follows:

1. Switch off the unit and disconnect the power before performing any inspection checks or cleaning.
2. Before cleaning, always inspect the unit casework, lid and moving parts for any signs of wear, damage, cracks or other defects.
3. Clean the casework using a damp cloth soaked with a disinfectant solution (such as Virkon), whilst wearing suitable PPE.
4. Carefully clean the rotor, lid, and stainless steel inner casing to remove any debris or spillage. Check that the xxplates carriers swing freely on the rotor.
5. Clean the display and buttons, taking care to avoid over wetting.
6. Check that the ventilation holes on the rear and underneath of the unit are clear of dust and fluff build-up.

**DANGER**

After cleaning, ensure that the unit is thoroughly dry, especially around the mains power inlet, before reconnecting the power cord and switching the unit on.

## 8.2 Decontamination Procedure

The unit and accessories should be decontaminated using the following procedure before being stored or transported.

### Decontamination Procedure

Thoroughly clean all outside surfaces of the product (including any accessories, power cords, manuals, packaging, etc) with a damp cloth soaked with suitable disinfectant solution (such as Virkon).

## 8.3 Transportation and Storage

The **xxpress Centrifuge** unit and its accessories should be thoroughly decontaminated using the procedure detailed in Section 8.2 before being placed in its original packaging for transportation or storage.

**WARNING**

Refer to Section 4 for the acceptable range of Storage and Transportation environmental conditions.

Always ensure that the unit and accessories are completely dry and free of any condensation before being packed.



## Certificate of Decontamination

We respect the health and safety of our clients and employees, and request that any products or accessories being returned are decontaminated in accordance with the procedure below.

### 1. Decontamination Procedure

Thoroughly clean all outside surfaces of the product (including any accessories, power cords, manuals, packaging, etc) with a damp cloth soaked with suitable disinfectant solution (such as Virkon).

Allow to dry fully before packing.

### 2. Decontamination Declaration

Company Name: \_\_\_\_\_

Address: \_\_\_\_\_

Product Code:           xxpress Centrifuge CM-6MT          

Serial Number: \_\_\_\_\_

Reason For Return: \_\_\_\_\_

Where Product Used: \_\_\_\_\_

Please tick the appropriate option(s) below:

- I certify that I have decontaminated the product as per the above procedure.

Decontaminant Used: \_\_\_\_\_

- I certify that the product has not been exposed to any chemical or biological materials.

Title: \_\_\_\_\_

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Telephone: \_\_\_\_\_

Email: \_\_\_\_\_



## 9 Warranty and Returns

BJS Biotechnologies Ltd. warrants the **xxpress Centrifuge** product, when purchased new and installed and operated in accordance with the instructions of this manual, to be free from defects in materials and workmanship, and will repair or replace, at their discretion, any unit or accessory which exhibits such defects.

In no event will BJS Biotechnologies be liable for any indirect, incidental or consequential damages resulting from any defect or warranty claim.

**NOTE**

Unspecified use or unauthorised modification of any part of the **xxpress Centrifuge** unit or its accessories or the use or attachment of any adaptor or peripheral not supplied, specified or sanctioned by BJS Biotechnologies will invalidate this warranty.

This warranty is provided to the original purchaser of the product for one year from the date of purchase.

Under the terms of this warranty, the product must be returned in its original packaging, transportation prepaid by the sender, with a copy of the Proof of Purchase and a detailed description of the problem.

**WARNING**

The product must be decontaminated using the procedure detailed in Section 2 and a Certificate of Decontamination supplied with any return. If the product is considered too hazardous to be shipped, please contact BJS Biotechnologies on the number given on Page 2 of this manual for further instructions.

Please contact your distributor (or BJS Biotechnologies on the number given on Page 2 of this manual) to assess the defect and arrange the return the product if necessary.

## 10 Product Disposal

At end-of-life, this product must be disposed of in accordance with your local authority regulations for the disposal of potentially hazardous waste and electronic equipment.

The unit and its accessories should be decontaminated using the procedure detailed in Section 8.2 before disposal or shipping.



Do not dispose of this product into unsorted municipal waste or public landfill.

Please contact your distributor (or BJS Biotechnologies at the address on Page 2 of this manual) for details of how to correctly dispose of this product.