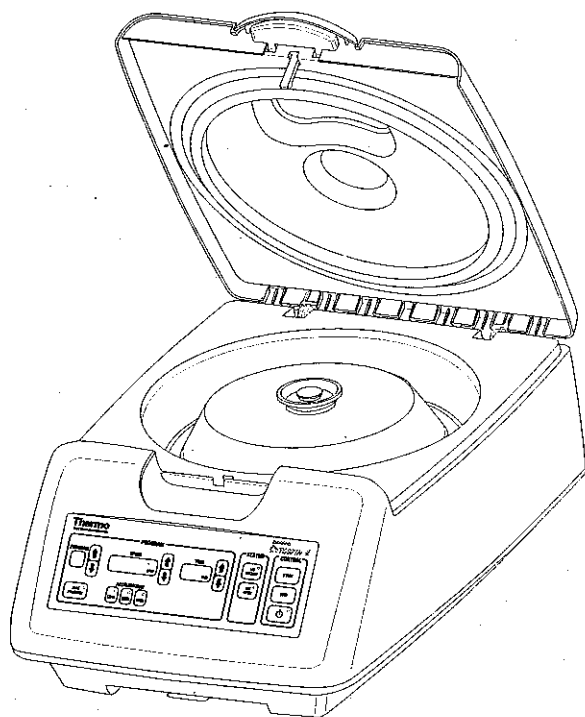


Shandon Cytospin 4

Operator Guide - English

A78310250

Issue 4



© 2004 Thermo Electron Corporation. All rights reserved.

Thermo Shandon Limited is an ISO 9001 and TickIT Accredited Company
Thermo Electron Corporation is the trading name of Thermo Shandon Limited

Clorox® is the trademark of Clorox Company;

Decon® is the trademark of Decon Laboratories Limited;

CytoRich® is the trademark of TriPath Imaging Inc;

Carbowax® is the trademark of Union Carbide Corporation;

Ficoll® is the trademark of Amersham Biosciences;

Hypaque® is the trademark of Stirling Drug

All other trademarks are the property of Thermo Electron Corporation and its subsidiaries

Thermo Electron Corporation makes every endeavour to ensure that the information contained in its support documentation is correct and clearly stated but does not accept responsibility for any errors or omissions. The development of Thermo products and services is continuous. Make sure that any published information that you use for reference is up to date and relates to the status of the product. If necessary, check with Thermo or your local Thermo representative.

This manual may not, in whole or in part, be copied, photocopied, reproduced, translated, or converted to any electronic or machine readable form without prior written consent of Thermo.

All information contained in this manual is proprietary and confidential, and the exclusive property of Thermo Electron Corporation. This manual is protected by copyright and any reproduction is prohibited. This manual is for use only by the individuals to whom it has been made available by Thermo Electron Corporation.

Contact Addresses

Clinical Diagnostics
Anatomical Pathology
93-96 Chadwick Road
Astmoor, Runcorn
Cheshire, WA7 1PR, UK
Tel: +44 (0) 1928 566611
Fax: +44 (0) 1928 565845
www.thermo.com/shandon

Clinical Diagnostics
Anatomical Pathology
171 Industry Drive
Pittsburgh
PA 15275, USA
Tel: 1-800-547-7429
+1 412 788 1133
Fax: +1 412 788 1138
www.thermo.com/shandon



The Shandon Cytospin 4 range meets the following CE Mark requirements:
In Vitro Diagnostic Directive 98/79/EC
Low Voltage Directive 73/23/EEC, as amended by 93/68/EEC.



Contents

1	Welcome Introduction; Safety	5
2	Description Overview	9
3	Installation And Setting Up Procedure; Unpacking; Setting Up the Instrument; Electrical Requirements; Accessories	11
4	Controls Introduction; Main Control Panel;	27
5	Operation Introduction; Operating the Cytospin	35
6	Cleaning And Maintenance	51
7	Troubleshooting Introduction; Equipment Status Checks; Error Codes; Troubleshooting Results	63
8	Specification And Accessories	75
9	Warranty Statement Warranty Statement; Declaration of Conformity	81
Appendix A	Standard Workflow Diagram	85
Appendix B	Methodology Guidelines	87
Appendix C	Transportation Instructions Instructions; Product Return Safety Declaration	109
Appendix D	Approved Reagent List	113
	Index	115

Symbols

The following symbols and conventions are used throughout this manual and on the instrument.



THIS SYMBOL IS USED ON THE EQUIPMENT, OR IN A DOCUMENT, TO WARN THAT INSTRUCTIONS MUST BE FOLLOWED FOR SAFE AND CORRECT OPERATION. IF THIS SYMBOL APPEARS ON THE INSTRUMENT, ALWAYS REFER TO THIS OPERATOR GUIDE. ▲



THIS SYMBOL IS USED ON THE EQUIPMENT, OR IN A DOCUMENT, TO WARN THAT THERE MAY BE A BIOHAZARD ASSOCIATED WITH THE INSTRUMENT. ALWAYS ACT WITH COMMON SENSE AND BE AWARE OF THE SAMPLES USED. TAKE SUITABLE PRECAUTIONS. ▲

WARNING

A warning is given in the document if there is a danger of personal injury or damage to samples or equipment. ▲

Note Notes give more information about a job or instruction but do not form part of the instruction. ▲

Chapter 1 Welcome

Welcome to the Thermo Electron Corporation Shandon Cytospin® 4 cytocentrifuge. Designed and made with care, the instrument is safe to use, simple to operate, and easy to maintain.

The Shandon Cytospin 4 is a self-contained cytocentrifuge whose primary function is to produce a monolayer of cells onto a glass slide from any fluid suspension under the safest conditions possible.

This Operator Guide gives instructions for the correct operation and use of the Shandon Cytospin 4.

Safety

Thermo products are designed for convenient and reliable operation and to accepted standards of safety. The use of the Shandon Cytospin 4 does not entail any hazard if operated in accordance with the instructions given in this manual. However, incorrect actions by a user may damage the equipment, or cause a hazard to health. It is important for you to obey the following safety precautions:



THIS PARAGRAPH DETAILS IMPORTANT SAFETY INFORMATION. PLEASE READ THIS SECTION CAREFULLY. ▲

- 1 All users must read and understand the Operator Guide and only operate the unit in accordance with the instructions. If the instructions are not followed, then the protection provided by the instrument may be impaired.

- 2 The Shandon Cytospin 4, as supplied, conforms with IEC1010-2-020.
- 3 Potentially lethal voltages above 110V a.c. or 50V d.c. are present inside the instrument. Do not remove any access covers unless specifically instructed to do so.
- 4 This instrument must be properly connected to a good earth (Ground) via the mains input supply.
- 5 Do not remove any panels or covers. The Shandon Cytospin 4 does not have any user serviceable parts inside the instrument.
- 6 The Shandon Cytospin 4 weighs approximately 12 kilograms (26.5 lbs); if necessary, get help to move or lift it.
- 7 Shandon Cytospin 4 is not intended for use with flammable materials or solvents, nor with materials which could be explosive or chemically reactive.
- 8 Always load and unload the sealed head in a biologically safe fume cupboard. Assume that the samples are biologically hazardous.
- 9 Bioseals and other biosafety components cannot be relied upon as a sole safeguard against contamination by pathogenic micro-organisms.
- 10 It is important that normal standards of safety and good laboratory practices are employed. Always use common sense and the best known practice when operating the instrument.
- 11 Refer to your own laboratory procedures and manufacturer's data sheets when using reagents.
- 12 Any problems and queries should be referred to your Thermo supplier.

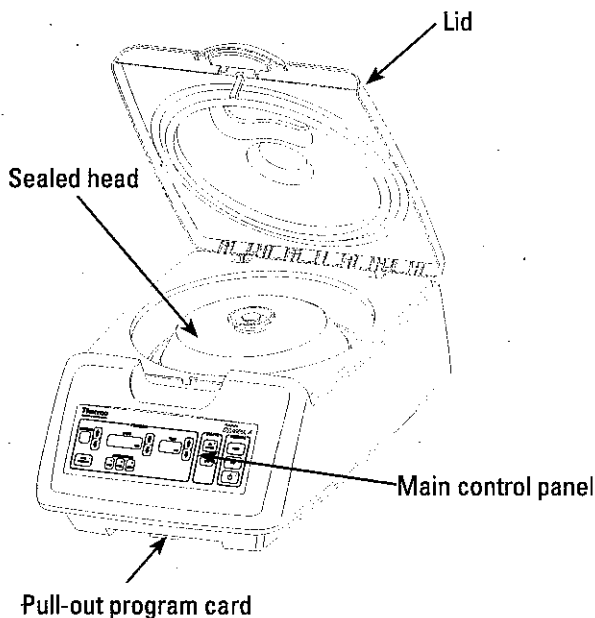
- 13 Correct maintenance procedures are essential for consistent performance. It is recommended that a Maintenance Contract is taken out with the Thermo Service Department.
- 14 The instrument must be serviced by a Thermo trained engineer in accordance with the instructions contained in the Shandon Cytospin 4 Service manual (A78310251).
- 15 If the instrument has been used with materials that are toxic or contaminated with pathogenic microorganisms, follow the cleaning instructions given in Chapter 5. The Product Return Certificate (*see Appendix C*) must be filled in if the instrument is to be returned to Thermo.
- 16 Use only factory approved accessories or replacement parts with the Shandon Cytospin 4.

Welcome

Chapter 2 Description

Overview

The different components of the Shandon Cytospin 4 centrifuge are shown in the diagram below.



Special design features of the Shandon Cytospin 4 include:

- 1 Lid release mechanism that allows for easy one-handed opening of the Shandon Cytospin 4 to load and unload the sealed head
- 2 New control panel for easy user interface.
- 3 An intuitive way to set programs and interact with all Shandon Cytospin 4 applications
- 4 Additional visual and audible indicators that help to trouble-shoot the instrument

Description

- 5 Fully programmable memory - up to 23 programs can be easily stored and recalled
- 6 A pull-out program card allows you to easily reference each program
- 7 Power Save feature

The only routine maintenance of the Shandon Cytospin 4 centrifuge that the operator is required to do is contained in Chapter 5 - Cleaning and Maintenance.

It is recommended that a Maintenance Contract is taken out with the Thermo Service Department or a Thermo approved distributor.

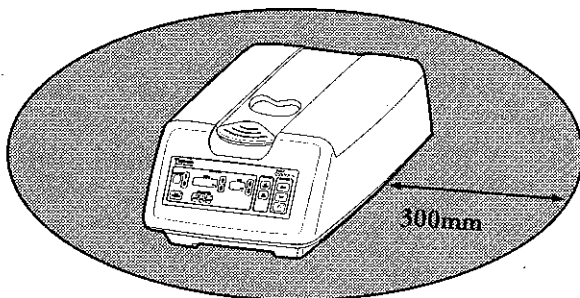
Chapter 3 Installation and Setting Up

The Shandon Cytospin 4 is a precision instrument that must be unpacked and installed with care.

The bench should be rigid and level, and made of a non-flammable material.



THERE MUST BE AT LEAST 300mm OF CLEAR SPACE AROUND SHANDON CYTOSPIN 4. ▲



MAKE SURE THE VENTS ON THE SIDES AND UNDERNEATH THE SHANDON CYTOSPIN 4 ARE NOT COVERED. ▲

The bench must be stable and capable of supporting a weight of 12 kg, and the environment must be dust free.

The maximum overall dimensions of the Shandon Cytospin 4 centrifuge are:

Width	405 mm	(16 ins)
Depth	620 mm	(24½ ins)
Height (<i>lid down</i>)	240 mm	(9½ ins)
(<i>lid up</i>)	625 mm	(25 ins)
Weight (<i>with sealed head</i>)	12kg	(26½ ins)

WARNING

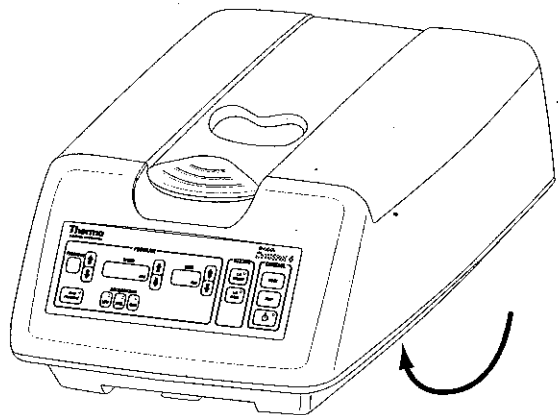
The Shandon Cytospin 4 weighs approximately 12 kilograms. If necessary, get help to safely move or lift the instrument without risk of injury. ▲

Unpacking

If the packaging has been damaged, check the condition of the instrument. Contact your Thermo dealer if there is any damage.

Remove the starter kit box (if supplied). Remove the top layer of packaging from the Shandon Cytospin 4. Get help if necessary to lift the instrument from the box and to place it on the bench.

To lift or move the Shandon Cytospin 4, hold the instrument securely under the sides of the unit:



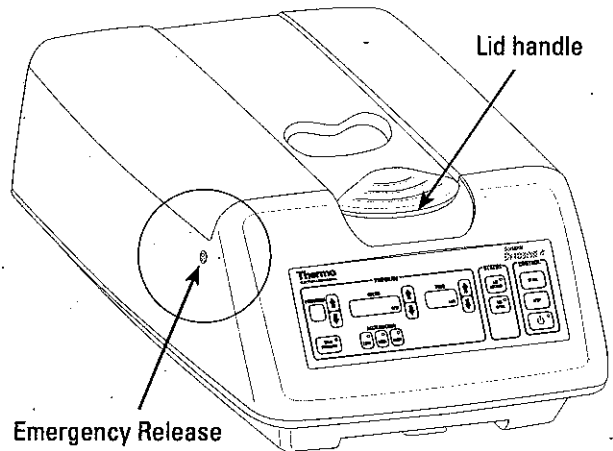
Make sure that you have received all the parts listed on the packing list supplied with the instrument. Contact your Thermo dealer if necessary.

Note Inform your Thermo dealer immediately if there are any breakages or shortages. Quote the instrument serial number, your order number, invoice number, delivery note (or packing slip) number and the date. ▲

Note If you ever need to transport the instrument, refer to Appendix C for instructions about how to repack the instrument. ▲

Opening and Closing the Cytospin 4 Lid

The lid handle is situated at the front of the instrument, with the latch just underneath it.



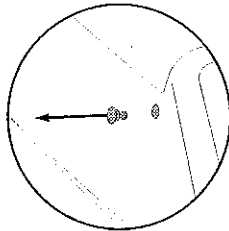
To open the lid, squeeze the lid handle and latch together.

To close the lid, lower the lid and make sure that the lid latch has engaged.

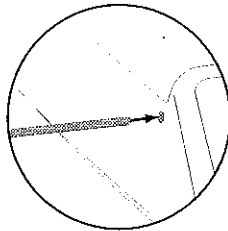
It is necessary to open and close the lid when the Shandon Cytospin 4 is first switched on in order to initialise the instrument. (If the lid is open, it is only necessary to close the lid). The Lid Open LED will flash until this procedure is carried out.

Note If the lid is locked and power is not available, use the Emergency Release.

To use the Emergency Release, remove the small cap on the left side of the instrument:



and then insert the lock release tool:



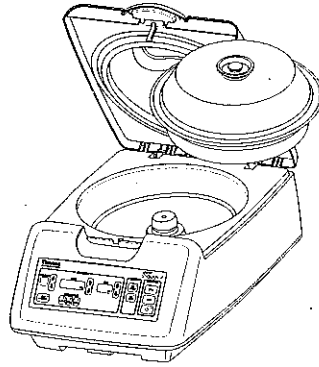
Push the tool inward to release the lock. Then use the lid handle and latch to open the lid. ▲



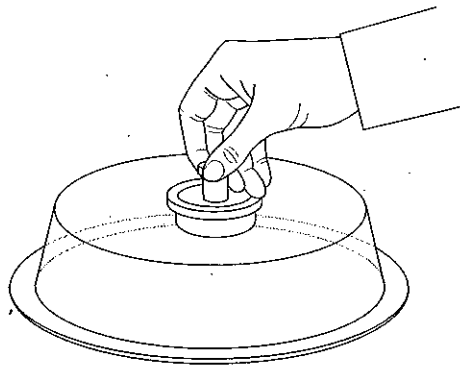
DO NOT OPEN THE LID IF THE HEAD IS STILL SPINNING. NEVER FORCE THE LID OPEN. ▲

Opening and Closing the Sealed Head

Open the lid and remove the foam packing from the top of the sealed head assembly then lift the sealed head assembly out of the Shandon Cytospin. Remove all the packing pieces.



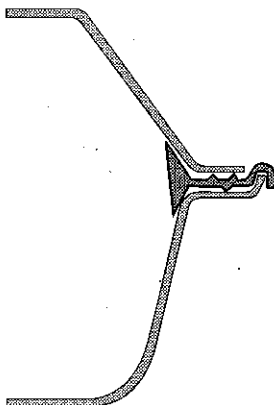
To open the sealed head, pull up the centre button of the lid of the sealed head until it 'clicks', then lift off the lid.



Note *The lid of the sealed head fits snugly in the rubber seal of the base. You may need to tilt the lid gently before you lift it off. ▲*

Note *If necessary, hold the lid of the sealed head with one hand and pull up the centre button with the other. ▲*

To close the sealed head, place the lid in position on the seal of the base. Make sure that the lid sits on the seal correctly. To secure the lid, push down the centre button.





NEVER LIFT THE SEALED HEAD BY THE CENTRAL LOCKING KNOB. ▲

WARNING

To avoid damage to the Shandon Cytospin 4, do not open or close the sealed head assembly when it is installed in the instrument. ▲

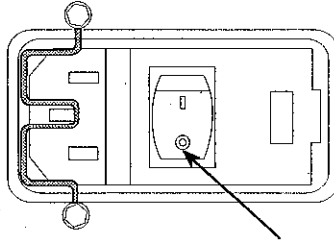
Electrical Requirements

Make sure that the voltage of the mains supply corresponds with the voltage rating on the rating plate on the back of the instrument. .

Thermo	93-96 Chadwick Road, Astmoor, Runcorn, Cheshire, WA7 1PR, UK
ELECTRON CORPORATION	
Product:	SHANDON CYTOSPIN® 4
Cat No:	A78300101 Issue 10
Serial No:	CY0018 0201
Nominal Ratings:	100 - 240 V~ 50/60 Hz 150VA
Fuse Rating:	2 x T5A, 250V
	  C US MADE IN UK

Note The - symbol on the rating plate indicates that the instrument operates on an alternating current supply (a.c.). ▲

Make sure that the I / O power switch at the rear of the instrument is switched off (O side of the switch pushed inward).



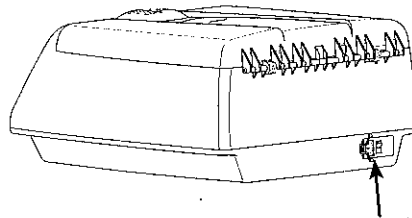
Instruments are supplied with an appropriate power cord with a moulded plug. If another plug is required, it is necessary for a technically competent person to remove the moulded plug from the supplied power cord and fit a suitably rated, and where appropriate, fused plug using the wiring convention shown below:

European cable	US cable	Terminal
Brown	Black	Live (L or L2)
Blue	White	Neutral (N or L1)
Green / yellow	Green	Earth - E, ground or \perp

Insert the power cord into the mains connector on the rear panel of the instrument and clip the cable restraint over the mains connector. Connect the power cord to the local power supply outlet.



US ONLY: FOR 208Vac SUPPLY SYSTEM, CONNECT THE INSTRUMENT TO A CENTRE-TAPPED, SINGLE PHASE SUPPLY CIRCUIT. ▲



Mains Connector



THE SHANDON CYTOSPIN 4 MUST BE PROTECTIVELY EARTHED. MAKE SURE THAT THE INSTRUMENT IS PLUGGED INTO A PROPERLY EARTHED MAINS SUPPLY. ▲



IT MUST BE POSSIBLE TO INTERRUPT THE MAINS SUPPLY AT SOURCE BY REMOVING THE PLUG FROM THE MAINS SUPPLY SOCKET. ▲



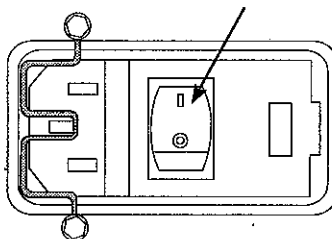
ALWAYS DISCONNECT THE SHANDON CYTOSPIN 4 FROM THE MAINS POWER BEFORE LIFTING OR MOVING THE INSTRUMENT. ▲

Switching On and Off

Follow these instructions to turn the instrument on and off.

To Switch On


Press the I (ON) side of the I/O switch inward to switch the instrument on.

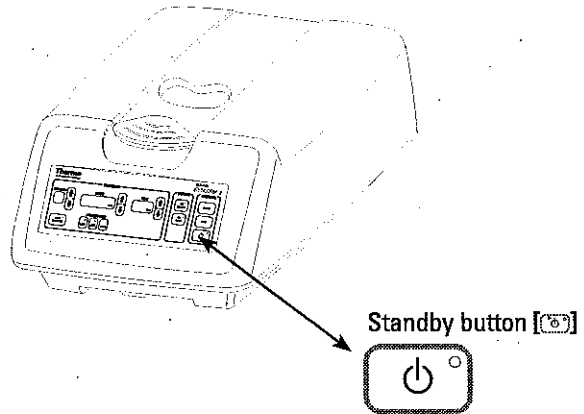


When the Shandon Cytospin 4 is switched on, you should notice the following:


- 1 All the displays and LEDs will light.
- 2 The power up tune will be played
- 3 The last program used will be displayed.
- 4 The Lid Open LED will flash

To Switch Off

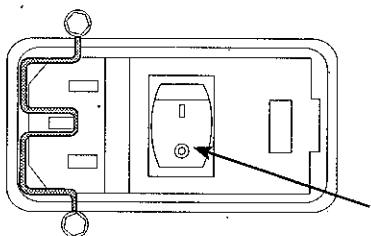
When the instrument is regularly used, the instrument should be switched off by using the Standby button  on the Main Control Panel.



Note The red LED is lit when the instrument is in Standby mode. ▲

To restart the instrument, press the  button again. The displays will show the previous settings.

If the instrument is to be left unattended for long periods of time, or is to be moved, the power to the instrument should be turned off. Press the **O (OFF)** side of the power switch to switch off the Shandon Cytospin 4.

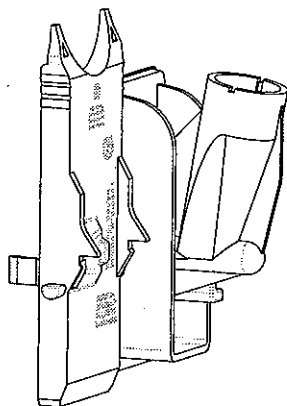


Accessories

The following accessories are available for the Shandon Cytospin 4.

Shandon EZ Single Cytofunnel

The Shandon EZ Single Cytofunnel is a single use, disposable sample chamber.



There are two versions of the Shandon EZ Single Cytofunnel:

White filter card

- for sample volumes up to 0.5ml
- filter card for high absorbency

Brown filter card

- for sample volumes up to 0.4ml
- filter card for low absorbency - excellent for scanty specimens such as CSF

Note *Use only 1.0mm thick glass slides.* ▲

The Shandon EZ Single Cytofunnel is loaded, spun and unloaded as described in Chapter 5 - Operation.



MAXIMUM RUN DURATION FOR SHANDON EZ SINGLE CYTOFUNNELS IS 60 MINUTES. IF THIS IS EXCEEDED, THERE IS A SMALL RISK THAT THE SLIDE MAY CRACK. ▲

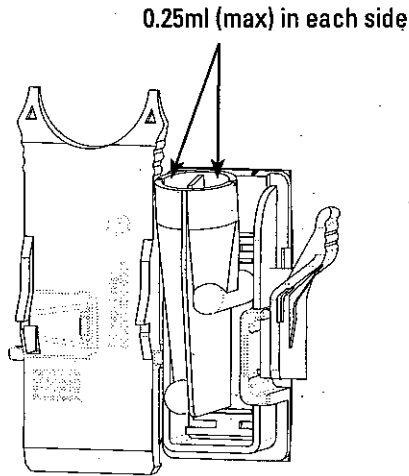


BE AWARE OF SAMPLES USED. THEY MAY POSE A BIO HAZARD. ▲

Shandon EZ Double Cytofunnel

The Shandon EZ Double Cytofunnel is a single use, disposable sample chamber that allows 2 samples to be prepared at the same time.

A maximum of 0.25ml of sample can be loaded into each side of the double cytofunnel (0.5ml in total).



Note *It is recommended that the same sample is used in each side of the Shandon EZ Double Cytofunnel. ▲*

The Shandon EZ Double Cytofunnel is loaded, spun and unloaded in the same way as the Shandon EZ Single Cytofunnel described in Chapter 5 - Operation.



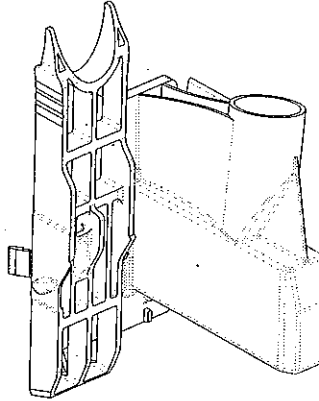
MAXIMUM RUN DURATION FOR SHANDON EZ DOUBLE CYTOFUNNELS IS 60 MINUTES. IF THIS IS EXCEEDED, THERE IS A SMALL RISK THAT THE SLIDE MAY CRACK.▲



BE AWARE OF SAMPLES USED. THEY MAY POSE A BIO HAZARD. ▲

Shandon EZ Megafunnel

Shandon EZ Megafunnels are single use, disposable sample chambers designed for larger volumes of fluids (0.5ml - 6ml).

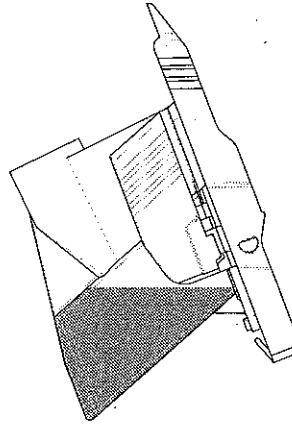


Load and spin the samples in the same way as the Single Shandon EZ Cytofunnel (described in Chapter 5 - Operation).

When the Shandon Cytospin has stopped spinning, remove the sealed head to a safe and convenient area. Make sure the sealed head is kept level.

Installation and Setting Up

Remove each Shandon EZ Megafunnel from the sealed head. Make sure that you keep the EZ Megafunnel tilted away from the slide to prevent the excess fluid touching the filter paper and slide.



Press the release lever so that the lock catch is released. This allows the funnel to be opened and the slide carefully removed. Pour off the excess fluid from the Megafunnel.

Discard the EZ Megafunnel directly into the appropriate waste receptacle depending on the specimens and materials used, according to your local laboratory procedure.

Hold the slide with the rectangular cell deposition area upward. Place on the bench for 5 minutes. (Depending on the application, slide preparations may be air-dried, spray fixed or placed into 95% alcohol). Stain the slide as required.

Note Spray fixed slides or preparations that used Shandon Cytospin® collection fluid should be placed into 95% alcohol for 10 minutes (to remove the Carbowax®) before proceeding with the staining procedure. ▲

Note Store unused EZ Megafunnels in a clean, dry environment before use. ▲



MAXIMUM SPEED FOR SHANDON EZ MEGAFUNNELS IS 1500 RPM. IF THIS IS EXCEEDED, THERE IS A SMALL RISK THAT THE SLIDE MAY CRACK. ▲



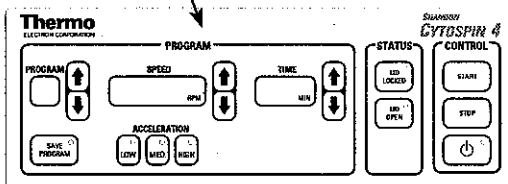
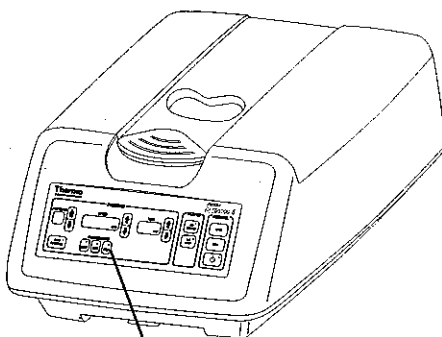
BE AWARE OF SAMPLES USED. THEY MAY POSE A BIO HAZARD. ▲

Chapter 4 Controls

This chapter describes the functions of all the controls on the instrument.

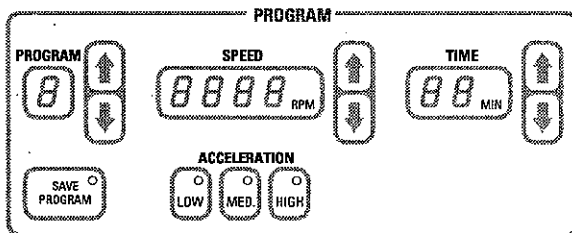
Main Control Panel

The Main Control Panel is situated on the front of the instrument.



Program Keypad

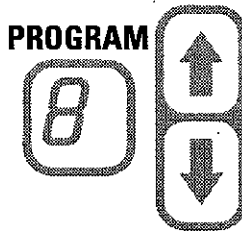
This keypad allows the user to select or save a program, set the speed, time and rate of acceleration for a run.



Program The display shows the program selected. Up to 23 programs can be stored, indicated by the following numbers and letters:

1, 2, 3, 4, 5, 6, 7, 8, 9,

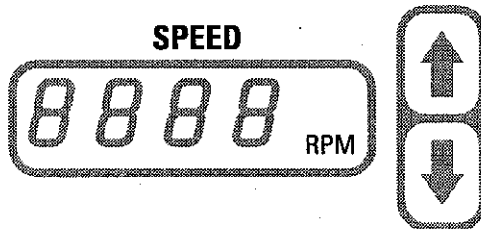
A, c, d, E, F, H, L, n, o, P, r, t, u, Y



The up arrow increments the program indicator; the down arrow decrements the program indicator.

Note The instrument has programs loaded at the factory. The program locations can be overwritten. ▲

Speed The display shows the run speed in revolutions per minute (rpm) (from 200 to 2000 rpm).

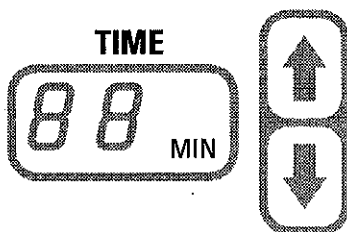


The up arrow increments the speed. If it is pressed once, the speed will be increased in steps of 10 rpm.

The down arrow decrements the speed. If it is pressed once, the speed will be decreased in steps of 10 rpm.

If either button is held down, the speed will be incremented or decremented in steps of 50 rpm.

Time The display shows the run time in minutes (from 1 to 99 minutes).

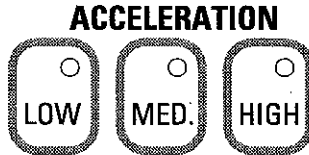


The up arrow increments the time. If it is pressed once, the time will be increased in steps of 1 minute.

The down arrow decrements the time. If it is pressed once, the time will be decreased in steps of 1 minute.

If either button is held down, the time will be incremented or decremented in steps of 10 minutes.

Acceleration Press [LOW]; [MED.] or [HIGH] to select the rate of acceleration required. The LED will light to show which rate has been selected.



Save Program The [SAVE PROGRAM] button stores the set time, acceleration and speed information into the program selected.



The LED will flash if a program or amended program have not been saved. The LED will switch off when the program is saved.

End of Run Specimen Warning This warning is a safety feature to protect the specimen in the Shandon Cytospin 4 after the program has finished.

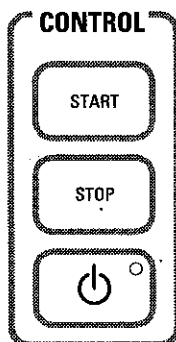
When the program has finished, a tune will be played to alert the operator. If it is likely that the operator will be away from the Shandon Cytospin 4 when the program is due to finish, it is possible to program the Shandon Cytospin 4 to repeat the 'end of run' tune at 1 minute intervals.

To repeat the tune at 1 minute intervals, hold down the speed up arrow [↑] when the Shandon Cytospin 4 is switched on at the mains.

To disable the tune repeat, hold down the speed down arrow [↓] when the Shandon Cytospin 4 is switched on at the mains.

Control Keypad

This keypad allows the user to start or stop a run and to switch the instrument into standby mode.



Start Press [START] to begin a run using the parameters selected on the Program Keypad.



Stop Press [STOP] to interrupt the program that is currently running.

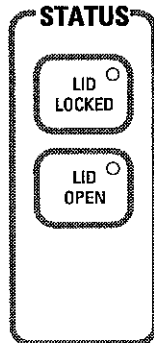


Standby Press [⏻] to switch the instrument into standby mode. The red LED will light when standby is selected and all other displays and LEDs will be turned off.

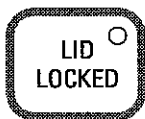


Press [⏻] again to restart the instrument. The instrument will revert to the previous setup information.

Status Display This display area allows the user to see if the lid is locked or open.



Lid Locked The LED will light if the lid is locked.



Note *The lid is automatically locked during a run.* ▲

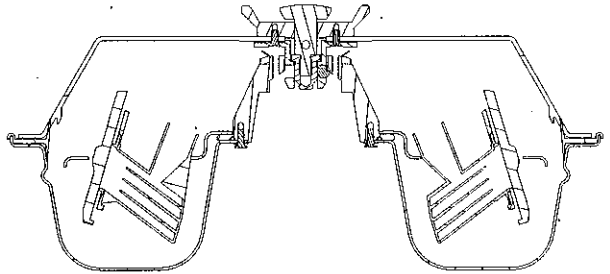
Lid Open The LED will light if the lid is open.



Controls

Chapter 5 Operation

Shandon Cytospin 4 uses centrifugal force to deposit a monolayer of cells in a defined area on glass slides. It effectively by-passes the difficulties normally associated with depositions obtained by direct smear or filtration.



Maximum protection for the operator is ensured by completely containing potentially hazardous specimens in a sealed head assembly. In addition, individual funnel caps give the user another layer of protection from aerosols.



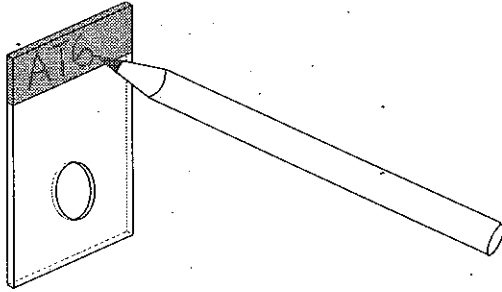
ALWAYS LOAD AND UNLOAD THE SEALED HEAD IN A BIOLOGICAL SAFETY CABINET. AFTER SPINNING, TAKE THE SEALED HEAD TO THE SAFETY CABINET TO OPEN IT. THIS IS PARTICULARLY IMPORTANT IF THE SAMPLES UNDER INVESTIGATION CONTAIN, OR COULD CONTAIN, PATHOGENIC MICRO-ORGANISMS. ▲

WARNING

Shandon Cytospin 4 has been designed with safety in mind. However, if it is not used in accordance with the instructions in this Operator Guide, the protection may be impaired. ▲

Operation

Pencil marking of frosted end slides is a common method for identifying samples and is a recommended practice that takes into account the expected use of the slide.



The instrument should be regularly cleaned, disinfected and sterilized as described in Chapter 6.

Each laboratory has its own techniques for preparing cells. The following table - 'Shandon Cytospin 'g' Forces' - provides helpful information regarding the forces generated in Shandon Cytospin 4. The 'g' forces quoted apply at the face of the slide that receives the cells.

Note Single user validated procedures are available for guidance upon request from Thermo. Methodology guidelines are included in Appendix B. ▲

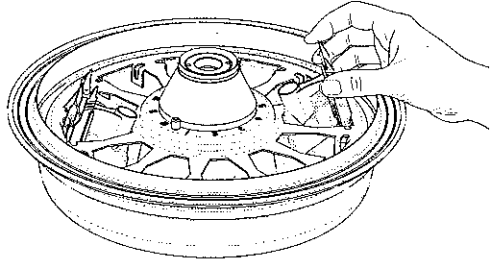
Table 1. Shandon Cytospin 'g' Forces

Speed (rpm)	Force (g)	Speed (rpm)	Force (g)
200	5	1150	149
250	7	1200	163
300	10	1250	176
350	14	1300	191
400	18	1350	206
450	23	1400	221
500	28	1450	237
550	34	1500	254
600	41	1550	271
650	48	1600	289
700	55	1650	307
750	64	1700	326
800	72	1750	346
850	82	1800	366
900	91	1850	386
950	102	1900	408
1000	113	1950	429
1050	124	2000	452
1100	137		

Running the Shandon Cytospin 4

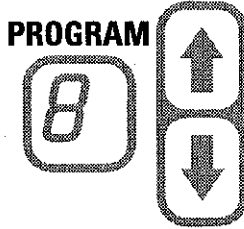
Follow these simple steps to run a program on the Shandon Cytospin 4:

- 1 Load the samples into the sealed head. Fit the lid onto the sealed head and place it in the Shandon Cytospin 4. Close the instrument lid.



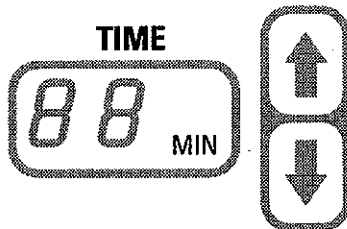
Then, either point 2, followed by point 6:

- 2 Use the arrows to select an existing program.

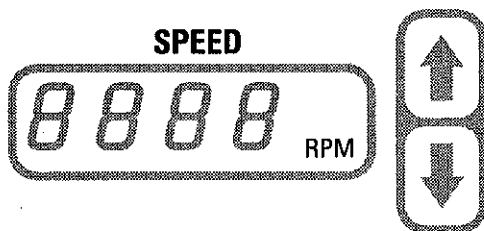


Or points 3, 4, 5, 6:

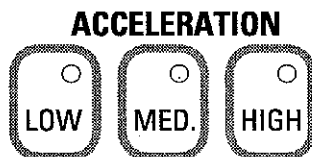
- 3 Enter the time required.



- 4 Enter the speed required.



- 5 Choose the rate of acceleration required.



Then

- 6 Press [START] to begin the run.



Note The run will stop automatically once the program has finished. However, if it is necessary to stop the run prematurely, press [STOP]. ▲

Note If you want to save the parameters that have been entered, press [SAVE]. The information will be saved in the program location that is currently displayed (see page 45). Take care - this will overwrite the program information currently saved under that program number. ▲

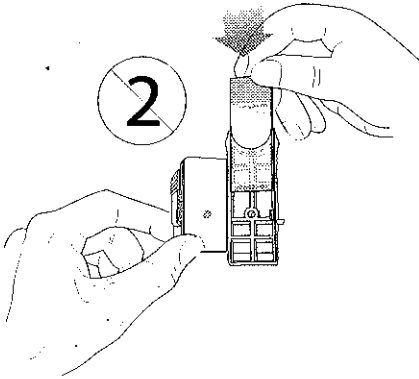
Loading the Shandon Cytospin 4

Follow the instructions below to load the Shandon EZ Cytofunnels and the Shandon Cytospin 4.

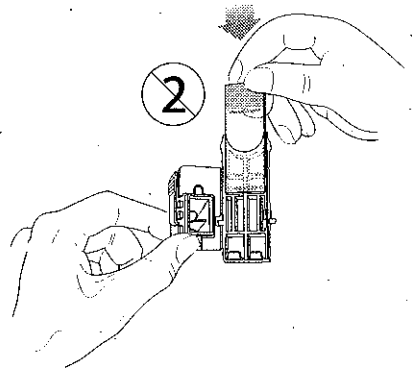
Loading the Disposable Shandon EZ Cytofunnel

- 1 Fit the glass slide as shown. Make sure the slide is correctly oriented with the frosted label end to the top and the frosted side towards the EZ Cytofunnel.

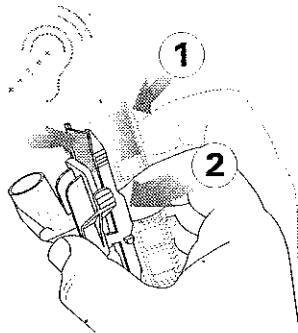
Single and Double EZ Cytofunnel



EZ Megafunnel

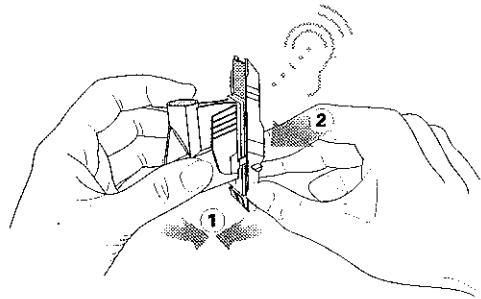


- 2 To close the single or double EZ Cytofunnel, pivot the slide carrier part towards the funnel and press the two halves together. It should close with a positive locking action and an audible click should be heard.



Note *Press on the raised frame around the funnel and not on the funnel itself.* ▲

- 3 To close the EZ Megafunnel, use both hands. Hold the funnel firmly with one hand and pivot the slide carrier part towards the funnel. Press the two halves together. It should close with a positive locking action and an audible click should be heard.



Note *The EZ Cytofunnels have filter cards and gaskets permanently attached to simplify loading and unloading and are designed to be used only once.* ▲

To remove the slide from the EZ Cytofunnel, press the release lever so that the lock catch is released. Open the EZ Cytofunnel and carefully remove the slide.

For EZ Megafunnels only: pour off any excess fluid. Fix as appropriate (see page 24).



BE AWARE OF SAMPLES USED. THEY MAY POSE A BIO HAZARD. ▲

Discard the EZ Cytofunnel directly into the appropriate waste receptacle depending on the specimens and materials used, according to your local laboratory procedure. Do not use the EZ Cytofunnels more than once.

Loading the Sealed Head

To load the sealed head, remove the lid and place up to 12 EZ Cytofunnel assemblies into the slots. Make sure the EZ Cytofunnel assemblies are correctly fitted into the sealed head and that they remain tilted forward.

Note *To remove and replace the sealed head lid, refer to the instructions in Chapter 3 (page 15). ▲*

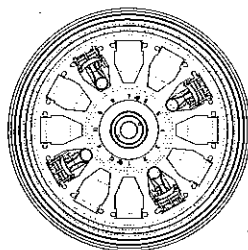
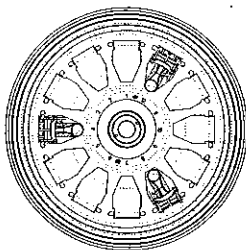


ALWAYS KEEP THE SEALED HEAD LEVEL WHEN IT CONTAINS SPECIMENS. ▲



TO AVOID AN OUT OF BALANCE ERROR (Err 03):

- 1 MAKE SURE THAT THE CYTOFUNNEL ASSEMBLIES ARE EVENLY DISTRIBUTED IN THE SEALED HEAD TO ENSURE THE SEALED HEAD IS BALANCED - for example, place Cytofunnel assemblies into positions 1, 5 and 9 if only three Cytofunnel assemblies are available, or positions 1, 4, 7 and 10 if only 4 Cytofunnel assemblies are available.**



2 DO NOT USE DIFFERENT SIZED CYTOFUNNELS IN THE SAME SEALED HEAD. ▲

Note *When an EZ Cytofunnel assembly is placed into the Support Plate in the sealed head, the chamber is kept at a suitable angle to keep the sample away from the filter paper. ▲*

When the Shandon Cytospin 4 is started, the EZ Cytofunnels will swing into an upright position that allows the cells to be spun onto the slide.

Make sure that the EZ Cytofunnel assembly is in the rest (tilted) position and carefully load the standard EZ Cytofunnel by pipette with between 0.1ml and 0.5ml (maximum) of cells in suspension (0.5ml - 6ml (maximum) for EZ Megafunnels - see Chapter 3 page 23).



**BE AWARE OF SAMPLES USED. THEY MAY POSE A
BIO HAZARD. ▲**

Note *Do not fill the EZ Cytofunnels with more than the amounts specified below:*

<i>EZ Single Cytofunnel (white filter card)</i>	<i>0.5ml (maximum)</i>
<i>EZ Single Cytofunnel (brown filter card)</i>	<i>0.4ml</i>
<i>EZ Double Cytofunnel</i>	<i>0.25ml (each side)</i>
<i>EZ Megafunnel</i>	<i>6ml (maximum). ▲</i>

Note *Caps can be placed on the funnels to avoid spillage. ▲*

Note *Store unused EZ Cytofunnels in a clean, dry environment before use. ▲*

Replace the lid of the sealed head and push down the centre button to lock.



MAKE SURE THAT THE SEALED HEAD LID IS SECURELY FITTED. ▲

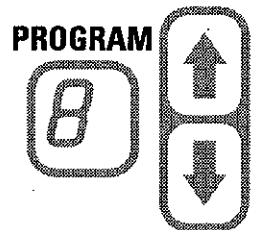
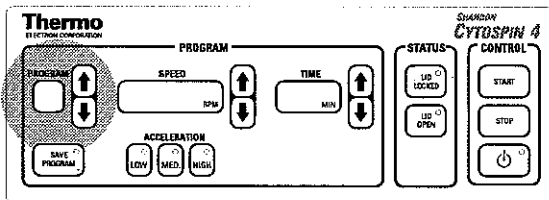
Open the Shandon Cytospin 4 lid (see Chapter 3). Lift the sealed head by the centre knob and carefully place it on the tapered boss in the centre of the Shandon Cytospin 4. Close the Shandon Cytospin lid.



Use only Shandon Cytospin accessories from Thermo. Failure to do so may result in unsafe operation and/or give inaccurate diagnostic information. ▲

Selecting a Program

To select a program, use the arrows to step through the programs that have been saved.



Up to 23 programs can be saved using the following numbers and letters to identify them:

- 1, 2, 3, 4, 5, 6, 7, 8, 9,
A, c, d, E, F, H, L, n, o, P, r, t, u, y

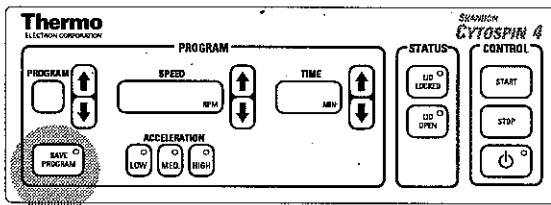
The settings for each program will be displayed. When the required program is displayed, press [START] to begin.

Saving a Program

Note *An existing program may be overwritten.* ▲

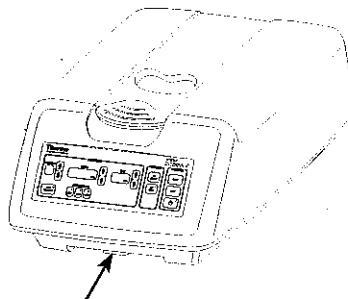
To save a program, select a program number.

Enter the required time, speed and acceleration choices as described in following paragraphs.



Press [SAVE PROGRAM].

Note *The Pull-out Card is intended for you to note down program information for up to 9 programs. Use a water soluble felt pen (supplied with the instrument) to update the program information.* ▲



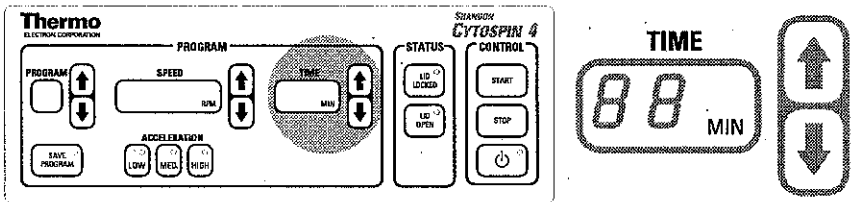
Pull out card

Note *If a program is altered in any way, the LED on the [SAVE PROGRAM] button will flash either until the program is saved, or until another program is selected. Any changes will be lost if the program is not saved.*

If the program that is currently displayed has been saved, the LED on the [SAVE PROGRAM] button will remain OFF. ▲

Entering the Time Required

To enter the time, use the arrows to alter the display. The display shows the current time in minutes (from 1 to 99 minutes).



The up arrow increments the time. If it is pressed once, the time will be increased in steps of 1 minute.

The down arrow decrements the time. If it is pressed once, the time will be decreased in steps of 1 minute.

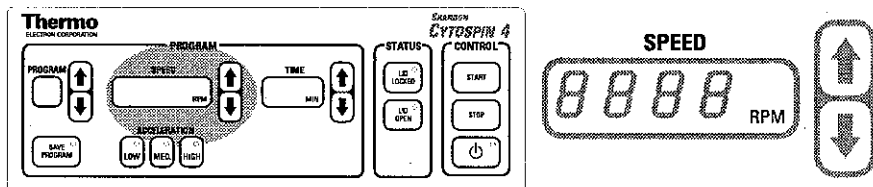
If either button is held down, the time will be incremented or decremented in steps of 10 minutes.



MAXIMUM RUN DURATION FOR SHANDON EZ SINGLE AND DOUBLE CYTOFUNNELS IS 60 MINUTES. ▲

Entering the Speed Required

To enter the speed, use the arrows to alter the display. The display shows the current speed in rpm (revolutions per minute) (from 200 to 2000 rpm).



The up arrow increments the speed. If it is pressed once, the speed will be increased in steps of 10 rpm.

The down arrow decrements the speed. If it is pressed once, the speed will be decreased in steps of 10 rpm.

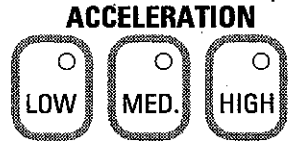
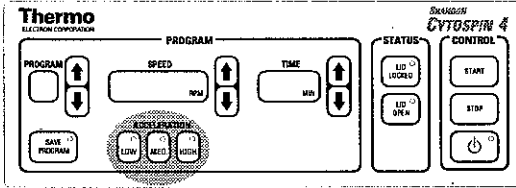
If either button is held down, the speed will be incremented or decremented in steps of 50 rpm.



MAXIMUM SPEED FOR SHANDON EZ MEGAFUNNELS IS 1500 RPM. ▲

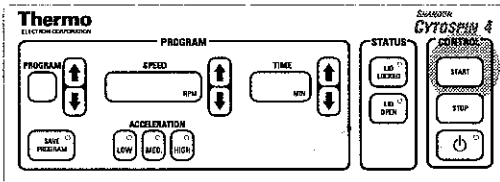
Entering the Acceleration Required

Press the [LOW], [MED.] or [HIGH]. to select the rate of acceleration required. The LED will light to show which rate has been selected.



Starting a Run

Make sure that a correctly balanced head is loaded into the Shandon Cytospin 4. Close the lid.



Select or enter the required program and press [START].

The lid will lock automatically and the head will accelerate to the programmed speed. The speed will be maintained for the programmed time and then the head will slow down until it has stopped.

When the head has reached a safe speed (less than 20 rpm) and has almost stopped, the lid will unlock automatically and can be opened.

Unloading the Shandon Cytospin 4

To remove the sealed head from the Shandon Cytospin 4, allow the instrument to stop spinning. Open the lid and remove the sealed head to a biologically safe cabinet. Only open the sealed head assembly in a biologically safe cabinet.

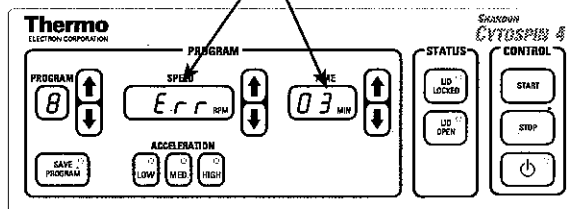


BE AWARE OF SAMPLES USED. THEY MAY POSE A BIO HAZARD. ▲

Error Codes, Audible Tones and Warnings

If an error occurs while the Shandon Cytospin 4 is operating, a warning tone will be sounded and the relevant error code will be displayed in the Speed and Time windows. The error codes are detailed in Chapter 7 - Troubleshooting.

Speed and Time windows



The Shandon Cytospin 4 will also play tunes or tones during the normal operation of the instrument, for example when the instrument is switched on, a key is pressed or held down, or at the end of a run.

