

# DiffSpin<sup>®</sup> 2

Slide Spinner for  
Technique Independent  
Blood Films

## Quality "Diffs" Without the Differences!

- Minimizes damage to WBC's and improves RBC morphology
- Produces uniformly distributed cell monolayers
- Improves counting accuracy, especially for monocytes
- Patented slide holders contain excess blood, minimize aerosol generation
- Simple, neat and clean procedure

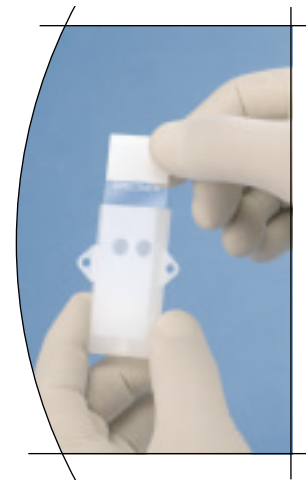
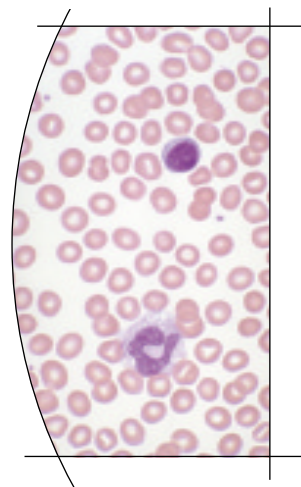
## The Modern Alternative to Wedge Smears

- Consistent results with simplicity and safety
- Simple controls allow optimized results for a wide range of sample hematocrits
- Takes three seconds -- helps streamline workflow
- Less exposure to blood
- Ideal for clinical and research applications in hospitals, schools and veterinary facilities



## Technique Independence... the *DiffSpin 2* Difference.

- Eliminates technician-to-technician variations
- Simple to use... almost anyone can produce top quality slides with minimal training
- Promotes even staining and easier counting
- Ideal as a reference method



Easy to use slide  
holders help reduce  
biohazard risk

**StatSpin<sup>®</sup>**

PRODUCTIVITY TOOLS.



## DiffSpin<sup>®</sup> 2 Slide Spinner

**DiffSpin 2 is ready-to-use with a starter kit containing supplies for 70 blood films.**

**Warranty:  
One year with validation of warranty card.**

### System Specifications

Applications	<ul style="list-style-type: none"> <li>Blood films for WBC differentials and blood cell morphology studies</li> <li>Q.C. of automated CBC instruments</li> </ul>
Method	<ul style="list-style-type: none"> <li>Centrifugal spreading of cells on a microscope slide</li> </ul>
Duration Control	<ul style="list-style-type: none"> <li>Seven settings from 0.4 seconds to 3 seconds</li> </ul>
Acceleration Control	<ul style="list-style-type: none"> <li>Microprocessor controlled</li> </ul>
Sample Volume	<ul style="list-style-type: none"> <li>30 <math>\mu</math>L to 150 <math>\mu</math>L*</li> </ul>
Type of Sample	<ul style="list-style-type: none"> <li>Capillary blood or anticoagulated venous blood (K<sub>2</sub>EDTA, K<sub>3</sub>EDTA)</li> </ul>
Safety Features	<ul style="list-style-type: none"> <li>Cover interlock system</li> <li>Gasketed chamber with transparent cover</li> <li>Patented Slide Holders contain excess blood and minimize aerosol generation</li> </ul>
Microscope Slides	<ul style="list-style-type: none"> <li>Accepts 1" x 3" microscope slides -- DiffSpin slides are recommended for optimum results</li> </ul>
Dimensions	<ul style="list-style-type: none"> <li>15.2 x 16.8 x 21.8 cm</li> </ul>
Weight	<ul style="list-style-type: none"> <li>1.7 kg.</li> </ul>
Electrical Power Requirements	<ul style="list-style-type: none"> <li>100 - 240 V, 50/60 Hz</li> </ul>

Specifications subject to change without notice.

\* Application specific

### Ordering Information

<b>DS02</b>	<b>DiffSpin 2 Slide Spinner</b> DiffSpin Slide Spinner with one DiffSpin Slide Preparation Kit  100-240 V, 50/60 Hz, CE Mark
<b>DSPK</b>	<b>DiffSpin 2 Slide Preparation Kit**</b> Consists of microscope slides, slide holders and 50 $\mu$ L drop size transfer pipettes. Kit contains 70 test sets
<b>SL72</b>	<b>DiffSpin 2 Microscope Slides**</b> 1" x 3". Pack of 144
<b>PD50</b>	<b>Transfer Pipettes, 50 <math>\mu</math>L</b> DiffSpin disposable pipettes for transferring 50 $\mu$ L drops onto the microscope slide. Bag of 70
<b>SC01</b>	<b>Slide Holder</b> DiffSpin disposable microscope slide holders. Bag of 100
<b>SC01-10</b>	<b>Slide Holder</b> DiffSpin disposable microscope slide holders. Box of 1,000 (10 bags of 100)

\*\* For use with DiffSpin and DiffSpin 2 Slide Spinner

**StatSpin<sup>®</sup>**

PRODUCTIVITY TOOLS.

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A Subsidiary of International Remote Imaging Systems, Inc.

64-004474-001 Rev. A

# ***DiffSpin***<sup>®</sup> **2 Slide Spinner**

Operator's Manual

***StatSpin***<sup>®</sup>

**Operator's Manual**  
***DiffSpin*<sup>®</sup> 2**  
**Model Number M701-22**

FOR *IN VITRO* DIAGNOSTIC USE

**Product Number**  
DS02 - DiffSpin 2 for 100-240 VAC, 50/60 Hz

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# How to use this manual

This manual along with information contained on product labels and in package inserts should provide you with all the information you need to operate and maintain the DiffSpin 2.

Notes appear in italics to highlight information. When the information requires special attention, a caution symbol appears next to the italicized text.



Please pay close attention to the instructions that accompany the notes and symbols as well as the standard laboratory practices outlined by your facility and local regulatory agencies. The table below lists all the CAUTIONS/WARNINGS for the DiffSpin 2.

	<p><b>WARNING - North American Installation:</b> <i>Only use the power supply included with the unit. Use of other power supplies or transformers will damage the DiffSpin 2 electronics and void the warranty.</i></p>
	<p><b>WARNING - Outside of North America:</b> <i>Do Not Use the Line Cord Supplied. Use power cord for at least 1.0 Amp or more with an IEC320/CEE22 female connector and male connector suitable for the power outlet to be used.</i></p>
	<p><b>CAUTION -</b> <i>The cover interlock bypass is designed for emergency use only. If the equipment is not used properly, safety may be impaired.</i></p>
	<p><b>CAUTION-</b> <i>The DiffSpin 2 prepares blood smears for microscopic examination. Use of the DiffSpin 2 places a responsibility upon administrative personnel to ensure adequate training of operators.</i></p>
	<p><b>IMPORTANT –</b> <i>The frosted edge of the slide should rest between the slide mounting posts of the cradle.</i></p>
	<p><b>WARNING-</b> <i>Check that the slide holder is seated properly. Failure to verify proper alignment may result in slide breakage and damage to the centrifuge.</i></p>
	<p><b>WARNING –</b> <i>Do not open the cover until the slide has stopped rotating.</i></p>
	<p><b>CAUTION –</b> <i>Unplug the DiffSpin 2 from the wall outlet before performing maintenance.</i></p>
	<p><b>WARNING –</b> <i>Do not expose DiffSpin 2 and its cradle to strong or concentrated acids, bases, esters, aromatic or halogenated hydrocarbons, ketones or strong oxidizing agents.</i></p>
	<p><b>CAUTION – DO NOT</b> <i>spray the bowl or outer surfaces with detergent or bleach. Excess liquid will harm the electronics and subsequent problems may not be covered under warranty.</i></p>
	<p><b>CAUTION -</b> <i>Universal Precautions should be followed on all specimens, regardless of whether a specimen is known to contain an infectious agent. (See references)</i></p>

Please use the system as intended. Improper use of the DiffSpin 2 Slide Spinner and/or its accessories may cause damage to the system, inaccurate results, or potentially nullify warranties.

The DiffSpin 2 slide spinner and its associated components are covered under one or more of the following US patent nos.: 4,846,974 & 4,981,585 & 5,326,398.

## Unpacking and Installation

### Inspect Packaging

The DiffSpin 2 and its accessories are delivered in one carton. If the centrifuge or accessories have suffered any damage in transport, please inform your carrier immediately.

*NOTE: Save shipping carton and components to simplify return should service be required.*

### Verify Contents

The package contains:

One DiffSpin 2 Slide Spinner (Model No. M701-22)

One Universal Switching Power Supply  
(StatSpin Product No. 01-3553-001, APS Product No. AD-740U-1240)

One grounded line cord (for North American use only)

One Operator's Manual

One DiffSpin Slide Preparation Pack (DSPK)

The DiffSpin Preparation Pack contains:	Product Number
Microscope Slides, package of 72 slides	SL72
Disposable Transfer Pipettes (50µL), bag of 70	PD50
Slide Holder, bag of 70	SC01

### Install System

1. Place the DiffSpin 2 on a level surface suitable for laboratory instrumentation.
2. Maintain a 300mm clearance boundary around the centrifuge for ventilation and safety.
3. Position the DiffSpin 2 away from direct sunlight and sources of heat or cold.  
(See Appendix A for specifications.)

### Connect Power

Plug the power supply into a grounded outlet supplying the voltage and frequency indicated on the power supply. When power is connected the cover lock will release.



**WARNING - North American Installation:** Only use the power supply included with the unit. Use of other power supplies or transformers will damage the DiffSpin 2 electronics and void the warranty.



**WARNING - Outside of North America:** Do Not Use the Line Cord Supplied. Use power cord for at least 1.0 Amp or more with an IEC320/CEE22 female connector and male connector suitable for the power outlet to be used.

# Section 2

## System Overview








### Principle and Intended Use

**IVD** For in vitro diagnostic use in preparing blood smears.







The DiffSpin 2 is a compact slide spinner (centrifuge) that is used for the preparation of uniform monolayer blood smears or films on microscope slides.

The operator may select seven factory-set timed cycles, each cycle spinning for 0.4, 0.6, 1, 1.5, 2, 2.5 and 3 seconds.

### Symbols and Definitions

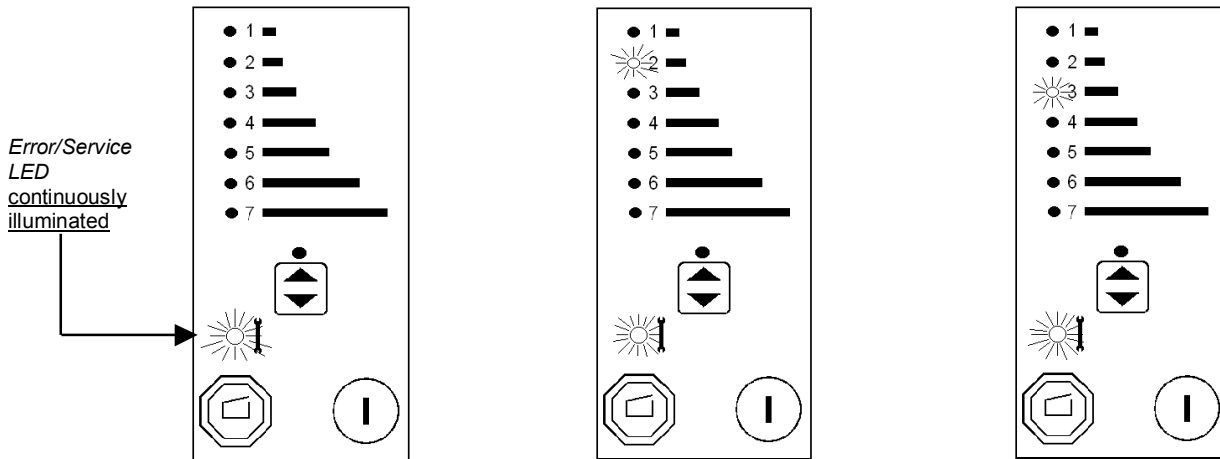
	Start button	The <i>start</i> button initiates a pre-timed cycle at the speed selected. <b>NOTE:</b> <i>The DiffSpin 2 does not have an on/off switch and is normally left plugged in and “on”.</i>
	Stop/Open button	The <i>stop/open</i> button interrupts the cycle and stops the centrifugation. This button may also be used to release the cover.
	Cycle selector	This button allows for selection of the appropriate cycle.
	Error/Service indicator	The red LED identified, as <i>error/service</i> is illuminated continuously or flashing when service is required.
	Power input	DC Power Input: 24V DC Plug-in
<b>REF</b>	Product/Reference Number	Indicates the StatSpin product/catalog number
	Caution	Statement of caution/warning, read instruction carefully
	Temperature limitation	Indicates storage requirements range
<b>EC REP</b>	EC Representative	European Community Authorized Representative

## Symbols and Definitions (cont.)

	For <i>in vitro</i> diagnostic use	Clarifies for use as <i>in vitro</i> diagnostic only
	Non sterile	Indicates non-sterile product
	Serial Number	Indicates instrument serial number code
	Consult Instructions	Consult instruction manual or insert sheet for further explanation
	Do Not Reuse	Product is designed for single use only
	Biological Risk	Universal precautions should be followed on all specimens

## Error Indicators

### Malfunction Codes



The unit has achieved a total cycle count of 18,000, which is the useful life of the drive system. This indicates the cradle assembly is in need of replacement. Contact an authorized service center for repair.

Cover not closed properly prior to spinning.

Unit has insufficient power to maintain rpm.

## Accessories

Product No.	Description
DSPK	Slide Preparation Pack - Contains SC01 (70 ea), PD50 (70 ea) and SL72 (72)
SC01	Slide Holder, bag of 100
PD50	Disposable Transfer Pipettes (50 $\mu$ L), bag of 70
SL72	Microscope Slides, package of 144 slides

# Section 3

## Operating Instructions

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### Opening and Closing the Cover

The system's electrically operated cover interlock mechanism prevents operation until the cover is completely closed and latched, and prevents the cover from being opened while the rotor is turning. When the cover is completely closed and locked an operating cycle can be initiated.

The system is also equipped with a manually operated latch that holds the cover down after spinning is complete. The interlock is automatically released at the end of the operating cycle or by pushing the *stop/open* button. Squeeze the black latch pieces together to open the cover.

#### **Cover Interlock By-pass**

The electronically operated cover interlock mechanism can be released manually by inserting the straightened end of a large paper clip or similar object into the small hole in the center of the front membrane panel. Manually push the lock lever inward about one inch (25mm) to release the interlock mechanism if the stop/open button does not release the cover.



**CAUTION** - The cover interlock bypass is designed for emergency use only. If the equipment is not used properly, safety may be compromised.

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### Collection and Preparation of Blood Sample

- Slides should be prepared within 4 hours of collection using whole venous blood in anticoagulated tubes with Tripotassium (K<sub>3</sub>) or Dipotassium (K<sub>2</sub>) EDTA.<sup>1</sup>
- Blood with macroscopically visible blood clots are cause for rejection. Microscopically visible platelet clumps are acceptable provided their presence is noted.
- Blood samples must be kept at room temperature and continuously mixed prior to slide preparation.

---

### Sample Volume

For best results, use two 50  $\mu$ L drops of whole blood (Pipette PD50). The density of the cellular layer depends on the sample's viscosity, cell content and surface tension of the glass slide. The volume applied to the slide also affects the cell density on the blood film. Operator's preference of volume varies greatly.

For lower cell density: Some laboratories report best results with total volume 40  $\mu$ L of blood into each hole of the slide holder. The smear will not completely cover the slide, however the spacing between the cells will be greater.

For higher cell density: Some laboratories use 65  $\mu$ L of blood. Although this produces a more covered slide, this additional volume is not necessary. Do not exceed 75  $\mu$ L per drop, as blood will exit the slide holder and cause excessive aerosols.

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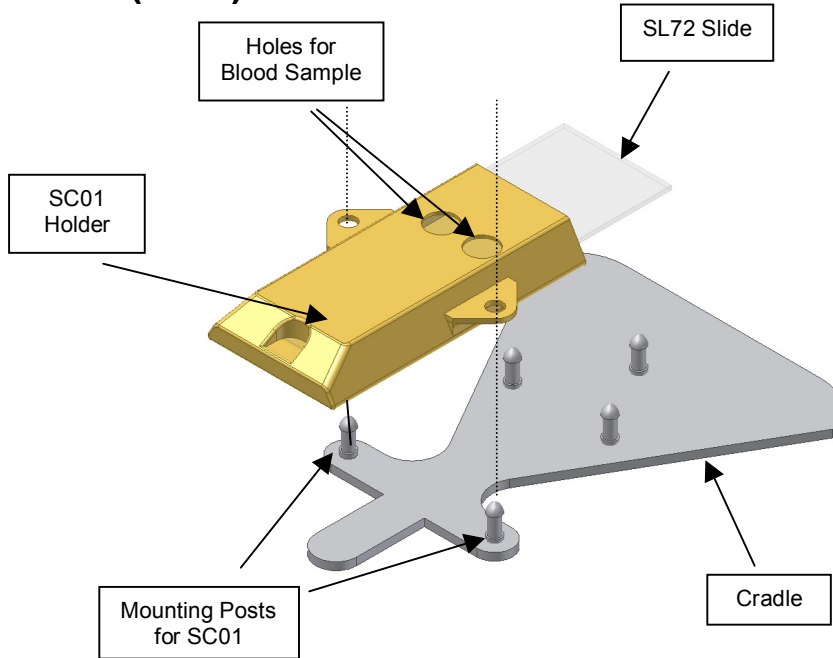
### Operation



**CAUTION** - The DiffSpin 2 prepares blood smears for microscopic examination. Use of the DiffSpin 2 places a responsibility upon administrative personnel to ensure adequate training of operators.

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## Operation (cont.)



1. Open centrifuge cover to access cradle
2. Insert a clean, dry and dust free glass microscope slide (SL72) into the slide holder (SC01) with the frosted side facing out.



**IMPORTANT** – The frosted edge of the slide should rest between the slide mounting posts of the cradle.

3. Position the slide holder (with slide) onto the cradle by placing the holes over the mounting posts.



**WARNING** - Check that the slide holder is seated properly. Failure to verify proper alignment may result in slide breakage and damage to the centrifuge.

4. With the transfer pipette (PD50), place one-drop of blood into each hole on the top of the slide holder. Clean any blood from the outside of the slide holder prior to spinning.
5. Allow blood to pool (approximately 2 seconds).
6. Close cover and select desired cycle. Cycles 4 and 5 are recommended for a normal hematocrit, adjust the cycles according to the patient hematocrit.
7. Press *start* button.
8. When cycle is complete, remove the entire slide holder and remove the slide.



**WARNING** - Do not open the cover until the slide has stopped rotating.

9. Allow the slide to dry and process accordingly.
10. If not staining within one hour of preparation, fix in methanol.
11. Dispose of the used slide holder in a biohazard waste container. The slide holder, pipette and the slide are **single use only**.

# Maintenance

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## Overview

StatSpin recommends that instrument operators perform periodic inspections and preventative maintenance on all StatSpin instruments. Contact StatSpin's customer service department or distributor if, at any time, the instrument is not functioning properly.



**CAUTION** - *Unplug the DiffSpin 2 from the wall outlet before performing maintenance.*



**WARNING** - *Do not expose DiffSpin 2 and its cradle to strong or concentrated acids, bases, esters, aromatic or halogenated hydrocarbons, ketones or strong oxidizing agents.*

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## Cleaning

Clean the outside surfaces and switch overlay panel with a water-dampened cloth and mild detergent. Clean the inner surface or bowl with a mild detergent, and if necessary, a disinfectant, wiping surfaces with a **dampened** cloth using 70% alcohol or 10% bleach solution.



**CAUTION** - *DO NOT spray the bowl or outer surfaces with detergent or bleach. Excess liquid will harm the electronics and subsequent problems will not be covered under warranty.*

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## Service

There are no user-serviceable parts. Refer all service to qualified service personnel. Reference the StatSpin Warranty for further instruction. Be sure to complete and return the warranty card as directed.

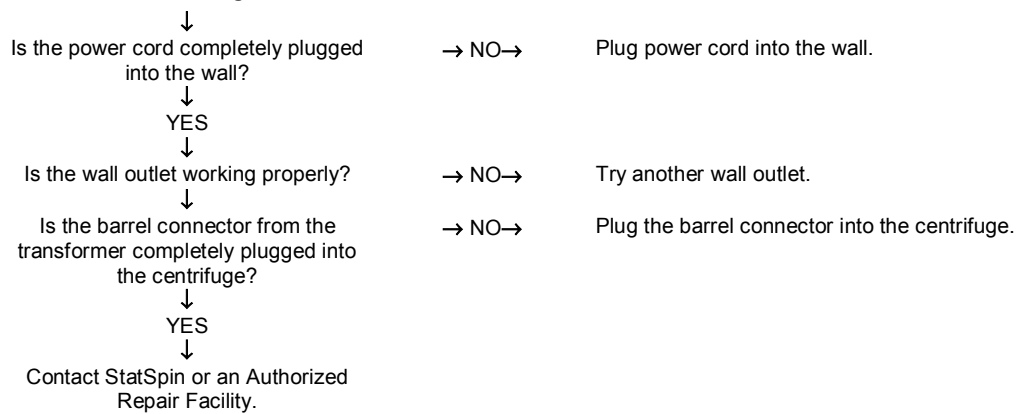
### **Decontamination before returning for service**

Any instrument or accessory containing accumulated blood and/or other biological or chemical deposits must be cleaned prior to shipment to the manufacturer/dealer for service. This decontamination is required by Federal Law (Title 48 and 49 of the Federal Regulations) and in accordance with the Environmental Protection Agency's Regulations for Biohazard Waste Management. StatSpin personnel cannot perform this decontamination.

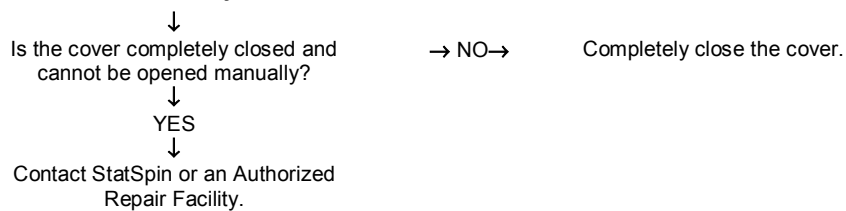
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## Troubleshooting

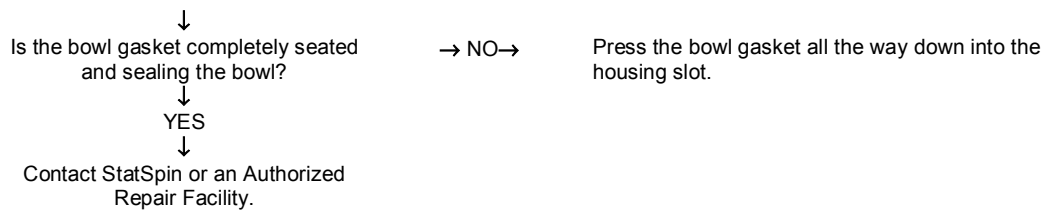
### No Power Light



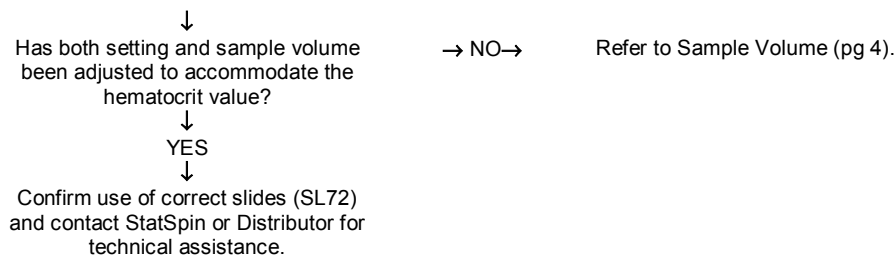
### Unit Will Not Spin/Shuts Off Prematurely



### Unit will not open at end of cycle



### Poor Blood Smear



# Appendix

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## Appendix A - Specifications

<b>Product No.</b>	DS02
<b>Model No.</b>	M701-22
<b>Speeds</b>	Maximum speed 3000 rpm
<b>Cycles</b>	Cycle 1 (0.4 seconds)
	Cycle 2 (0.6 seconds)
	Cycle 3 (1.0 seconds)
	Cycle 4 (1.5 seconds)
	Cycle 5 (2.0 seconds)
	Cycle 6 (2.5 seconds)
	Cycle 7 (3.0 seconds)
<b>Electrical</b>	24 Volts, DC, 1.7 amp. Includes switching power supply for 100-240 VAC, 50/60 Hz
<b>Dimensions</b>	Diameter 8.6"/ 21.8 cm
	Height 6.0"/15.2 cm
	Weight 3.75 lbs/1.7 kg
<b>Environmental</b>	Indoor use
	Altitude up to 2000m
	Temperature 5°C to 40°C
	Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C
	Main supply voltage fluctuations not to exceed +/- 10% of the nominal voltage
	Transient over-voltages according to installation category II
	Pollution degree 2

## References

1. NCCLS. "Reference Leukocyte Differential Count (Proportional) and Evaluation of Instrumental Methods; Approved Guideline." NCCLS document H20-A [ISBN 1-56238-131-8]. NCCLS, 771 E. Lancaster Ave. Villanova PA 19085 USA, 1992.
2. NCCLS. "Protection of Laboratory Workers from Occupationally Acquired Infections; Approved Guideline-Second Edition." NCCLS document M29-A2 [ISBN 1-56238-453-8]. NCCLS, 940 West Valley Rd, Suite 1400, Wayne, Pennsylvania 19087-1898 USA, 2001.
3. CDC. Recommendations for prevention of HIV transmission in health care settings. MMWR (Suppl. No. 2S):2S-18S, 1987.
4. CDC. Updated: US Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV and HIV and Recommendations for Post Exposure Prophylaxis. Appendix A and B. MMWR 50 (RR-11): 1-42, June 29, 2001.
5. American Journal of Medical Technology. Blood Sample Preparation for Automated Differential Systems; Volume 39, Number 11, November 1973. 435-442.

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Made in USA



55-004435-001 Rev. D

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## **StatSpin Warranty**

StatSpin, Inc., a Subsidiary of IRIS International, Inc. warrants that the instruments shall be free from defects in material and/or workmanship, under normal use and service, for the period expiring twelve (12) months from the date of installation, provided the purchaser has completed and forwarded to StatSpin the Warranty Registration Card. StatSpin will, at its discretion repair or replace any unit covered under this warranty returned to StatSpin with shipping costs prepaid. Repaired or replaced instruments supplied under this warranty carry only the remaining portion of the original warranty and repairs shall not interrupt or prolong this warranty. For warranty terms and conditions outside the United States, contact your Authorized StatSpin Distributor.

No warranty extended by StatSpin shall apply to any instrument that has been damaged due to misuse, negligence, accident, or damage resulting from unauthorized repairs, alterations, or improper installation.

StatSpin makes no warranty other than the one set forth herein. This warranty is given expressly in lieu of all other warranties, expressed or implied. The purchaser agrees that there is no warranty of merchantability or of fitness for any intended purpose and that there are no other remedies or warranties, expressed or implied, which extend beyond the description on the face of the agreement. No agent or employee of StatSpin is authorized to extend any other warranty or assume for StatSpin any liability except as set forth above. This warranty is only applicable to the original purchaser.

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## **Limitation of Liability**

StatSpin shall not be liable for any loss of use, revenue or anticipated profits, or for any consequential or incidental damages resulting from the sale or use of the products. The purchaser shall be deemed liable for any and all claims, losses, or damages incurred by the use or misuse of the StatSpin instrument by the purchaser, its employees or others, following receipt of the instrument or other items.