

ProcessMate 5000 Universal Centrifuge

Operating Manual



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manuals are also available at
www.nordsonefd.com

Nordson
EFD

You have selected a reliable, high quality ProcessMate™ 5000 centrifuge system from EFD, the world leader in fluid dispensing. The ProcessMate system was designed specifically for industrial dispensing, and will provide you with years of trouble-free, productive service.

This manual will help you maximize the usefulness of your ProcessMate 5000 centrifuge system.

Please spend a few minutes to become familiar with the controls and features. Follow our recommended testing procedures. Review the helpful information we have included, which is based on more than 50 years of industrial dispensing experience.

Most questions you will have are answered in this manual. However, if you need assistance, please do not hesitate to contact EFD or your authorized EFD distributor. Detailed contact information is provided on the last page of this document.

The Nordson EFD Pledge

Thank You!

You have just purchased the world's finest precision dispensing equipment.

I want you to know that all of us at Nordson EFD value your business and will do everything in our power to make you a satisfied customer.

If at any time you are not fully satisfied with our equipment or the support provided by your Nordson EFD Product Application Specialist, please contact me personally at 800.556.3484 (US), 401.431.7000 (outside US), or Ferran.Ayala@nordsonefd.com.

I guarantee that we will resolve any problems to your satisfaction.

Thanks again for choosing Nordson EFD.

Ferran
Ferran Ayala, Vice President

Contents

Contents	3
Nordson EFD Product Safety Statement	4
Halogenated Hydrocarbon Solvent Hazards	5
High Pressure Fluids	5
Qualified Personnel	5
Intended Use	6
Regulations and Approvals	6
Personal Safety	6
Fire Safety	7
Preventive Maintenance	7
Important Disposable Component Safety Information	8
Action in the Event of a Malfunction	8
Disposal	8
Specifications	9
Unpacking the Unit	10
Setup	11
Surface Placement	11
Power Source	11
Component Identification	11
Preparation	12
Operation	13
Service	16
Part Number	16
Replacement Parts	16
Troubleshooting	17
Error Codes	17
Opening Lid Manually — Power Failure	18

Nordson EFD Product Safety Statement

WARNING

The safety message that follows has a WARNING level hazard.
Failure to comply could result in death or serious injury.



ELECTRIC SHOCK

Risk of electric shock. Disconnect power before removing covers and/or disconnect, lock out, and tag switches before servicing electrical equipment. If you receive even a slight electrical shock, shut down all equipment immediately. Do not restart the equipment until the problem has been identified and corrected.

CAUTION

The safety messages that follow have a CAUTION level hazard.
Failure to comply may result in minor or moderate injury.



READ MANUAL

Read manual for proper use of this equipment. Follow all safety instructions. Task- and equipment-specific warnings, cautions, and instructions are included in equipment documentation where appropriate. Make sure these instructions and all other equipment documents are accessible to persons operating or servicing equipment.



MAXIMUM AIR PRESSURE

Unless otherwise noted in the product manual, the maximum air input pressure is 7.0 bar (100 psi). Excessive air input pressure may damage the equipment. Air input pressure is intended to be applied through an external air pressure regulator rated for 0 to 7.0 bar (0 to 100 psi).



RELEASE PRESSURE

Release hydraulic and pneumatic pressure before opening, adjusting, or servicing pressurized systems or components.



BURNS

Hot surfaces! Avoid contact with the hot metal surfaces of heated components. If contact can not be avoided, wear heat-protective gloves and clothing when working around heated equipment. Failure to avoid contact with hot metal surfaces can result in personal injury.

Nordson EFD Product Safety Statement (continued)

Halogenated Hydrocarbon Solvent Hazards

Do not use halogenated hydrocarbon solvents in a pressurized system that contains aluminum components. Under pressure, these solvents can react with aluminum and explode, causing injury, death, or property damage. Halogenated hydrocarbon solvents contain one or more of the following elements.

Element	Symbol	Prefix
Fluorine	F	"Fluoro-"
Chlorine	Cl	"Chloro-"
Bromine	Br	"Bromo-"
Iodine	I	"Iodo-"

Check the Safety Data Sheet (SDS) or contact your material supplier for more information. If you must use halogenated hydrocarbon solvents, contact your EFD representative for compatible EFD components.

High Pressure Fluids

High pressure fluids, unless they are safely contained, are extremely hazardous. Always release fluid pressure before adjusting or servicing high pressure equipment. A jet of high pressure fluid can cut like a knife and cause serious bodily injury, amputation, or death. Fluids penetrating the skin can also cause toxic poisoning.

WARNING

Any injury caused by high pressure liquid can be serious. If you are injured or even suspect an injury:

- Go to an emergency room immediately.
- Tell the doctor that you suspect an injection injury.
- Show the doctor the following note.
- Tell the doctor what kind of material you were dispensing.

Medical Alert — Airless Spray Wounds: Note to Physician

Injection in the skin is a serious traumatic injury. It is important to treat the injury surgically as soon as possible. Do not delay treatment to research toxicity. Toxicity is a concern with some exotic coatings injected directly into the bloodstream.

Qualified Personnel

Equipment owners are responsible for making sure that EFD equipment is installed, operated, and serviced by qualified personnel. Qualified personnel are those employees or contractors who are trained to safely perform their assigned tasks. They are familiar with all relevant safety rules and regulations and are physically capable of performing their assigned tasks.

Nordson EFD Product Safety Statement (continued)

Intended Use

Use of EFD equipment in ways other than those described in the documentation supplied with the equipment may result in injury to persons or damage to property. Some examples of unintended use of equipment include:

- Using incompatible materials.
- Making unauthorized modifications.
- Removing or bypassing safety guards or interlocks.
- Using incompatible or damaged parts.
- Using unapproved auxiliary equipment.
- Operating equipment in excess of maximum ratings.
- Operating equipment in an explosive atmosphere.

Regulations and Approvals

Make sure all equipment is rated and approved for the environment in which it is used. Any approvals obtained for Nordson EFD equipment will be voided if instructions for installation, operation, and service are not followed. If the equipment is used in a manner not specified by Nordson EFD, the protection provided by the equipment may be impaired.

Personal Safety

To prevent injury, follow these instructions:

- Do not operate or service equipment unless you are qualified.
- Do not operate equipment unless safety guards, doors, and covers are intact and automatic interlocks are operating properly. Do not bypass or disarm any safety devices.
- Keep clear of moving equipment. Before adjusting or servicing moving equipment, shut off the power supply and wait until the equipment comes to a complete stop. Lock out power and secure the equipment to prevent unexpected movement.
- Make sure spray areas and other work areas are adequately ventilated.
- When using a syringe barrel, always keep the dispensing end of the tip pointing towards the work and away from the body or face. Store syringe barrels with the tip pointing down when they are not in use.
- Obtain and read the Safety Data Sheet (SDS) for all materials used. Follow the manufacturer's instructions for safe handling and use of materials and use recommended personal protection devices.
- Be aware of less-obvious dangers in the workplace that often cannot be completely eliminated, such as hot surfaces, sharp edges, energized electrical circuits, and moving parts that cannot be enclosed or otherwise guarded for practical reasons.
- Know where emergency stop buttons, shutoff valves, and fire extinguishers are located.
- Wear hearing protection to protect against hearing loss that can be caused by exposure to vacuum exhaust port noise over long periods of time.

Nordson EFD Product Safety Statement (continued)

Fire Safety

To prevent a fire or explosion, follow these instructions:

- Shut down all equipment immediately if you notice static sparking or arcing. Do not restart the equipment until the cause has been identified and corrected.
- Do not smoke, weld, grind, or use open flames where flammable materials are being used or stored.
- Do not heat materials to temperatures above those recommended by the manufacturer. Make sure heat monitoring and limiting devices are working properly.
- Provide adequate ventilation to prevent dangerous concentrations of volatile particles or vapors. Refer to local codes or the SDS for guidance.
- Do not disconnect live electrical circuits when working with flammable materials. Shut off power at a disconnect switch first to prevent sparking.
- Know where emergency stop buttons, shutoff valves, and fire extinguishers are located.

Preventive Maintenance

As part of maintaining continuous trouble-free use of this product, Nordson EFD recommends the following simple preventive maintenance checks:

- Periodically inspect tube-to-fitting connections for proper fit. Secure as necessary.
- Check tubing for cracks and contamination. Replace tubing as necessary.
- Check all wiring connections for looseness. Tighten as necessary.
- Clean: If a front panel requires cleaning, use a clean, soft, damp rag with a mild detergent cleaner. DO NOT USE strong solvents (MEK, acetone, THF, etc.) as they will damage the front panel material.
- Maintain: Use only a clean, dry air supply to the unit. The equipment does not require any other regular maintenance.
- Test: Verify the operation of features and the performance of equipment using the appropriate sections of this manual. Return faulty or defective units to Nordson EFD for replacement.
- Use only replacement parts that are designed for use with the original equipment. Contact your Nordson EFD representative for information and advice.

Nordson EFD Product Safety Statement (continued)

Important Disposable Component Safety Information

All Nordson EFD disposable components, including syringe barrels, cartridges, pistons, tip caps, end caps, and dispense tips, are precision engineered for one-time use. Attempting to clean and re-use components will compromise dispensing accuracy and may increase the risk of personal injury.

Always wear appropriate protective equipment and clothing suitable for your dispensing application and adhere to the following guidelines:

- Do not heat syringe barrels or cartridges to a temperature greater than 38° C (100° F).
- Dispose of components according to local regulations after one-time use.
- Do not clean components with strong solvents (MEK, acetone, THF, etc.).
- Clean cartridge retainer systems and barrel loaders with mild detergents only.
- To prevent fluid waste, use Nordson EFD SmoothFlow™ pistons.

Action in the Event of a Malfunction

If a system or any equipment in a system malfunctions, shut off the system immediately and perform the following steps:

1. Disconnect and lock out system electrical power. If using hydraulic and pneumatic shutoff valves, close and relieve pressure.
2. For Nordson EFD air-powered dispensers, remove the syringe barrel from the adapter assembly. For Nordson EFD electro-mechanical dispensers, slowly unscrew the barrel retainer and remove the barrel from the actuator.
3. Identify the reason for the malfunction and correct it before restarting the system.

Disposal

Dispose of equipment and materials used in operation and servicing according to local codes.

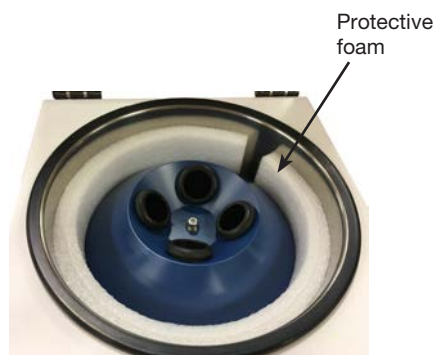
Specifications

NOTE: Specifications and technical details are subject to change without prior notification.

Item	Specification
Dimensions	320W x 400D x 325H mm (12.6W x 15.7D x 12.7H")
Weight	16.0 kg (35.2 lb), approx.
Speed range	1,000–5,000 RPM adjustable*, LED display *depending on size of barrels and weight of contents
Timer	2-digit, 99 min LED display
Chamber	Stainless steel
Motor	80 W
Speed control	Microprocessor
Imbalance detection	Yes, alarm and brake
Error detection	Yes (4-error detection)
Brake	Automatic braking system
Safety interlocking lid	Yes
Lid open override device	Yes, manual
Safety shutout device	Yes
Over-heating alarm	Yes
Emergency stop	Yes
Power source	Multi-voltage 100–240V, 50/60Hz
Approvals	CE, UKCA, RoHS

Unpacking the Unit

1. Make sure the packaging is laid out in the correct orientation before opening the box.
2. Remove all packaging material from around the PM5000 centrifuge before attempting to remove the unit from the box.
3. Carefully remove the PM5000 centrifuge unit from the box.
4. Carefully remove the protective foam from the inside of the unit, around the rotor.
5. Check the unit for damage before discarding the shipping packaging and box.
6. Should any damage be detected, call your local representative of EFD Technical Services for assistance.



CAUTION

- Be careful not to drop the PM5000 centrifuge, or place / rest the unit upside down. The unit is heavy and you may require assistance in lifting the PM5000 centrifuge.
- Do not place the PM5000 centrifuge in a high draft area, in direct sunlight, or near equipment emitting heat and / or electromagnetic conduction.
- Conditions for transportation & storage:
Temperature: 10–40° C (50–104° F)
Humidity: 40–90%
- Check the specification label located on back of this equipment; the power source must conform to your local codes.

Setup

Surface Placement

The PM5000 centrifuge weighs approximately 16 kg (35.2 lb) and will be spinning at high speeds. Select a level, sturdy, and stable surface on which to place the PM5000 centrifuge before use.

Power Source

The ProcessMate PM5000 centrifuge is a multi-voltage unit with a built-in power converter. The unit is capable of operating in the range of 100–240 VAC, 50/60Hz. Locate the power cord shipped with the unit, plug one end into the unit, and the other into a suitable power source. Make sure the ground pin on the power cord is connected to ground on the power source.

Component Identification



ProcessMate 5000 centrifuge and power cord



Adapter sets, 3cc, 5cc, 10c, and 30cc
(4 adapters in each package)



Rotor sleeve
(4 included)

Preparation

Before using the centrifuge, follow these steps to ensure that the PM5000 centrifuge is ready and safe for use in a production setting.

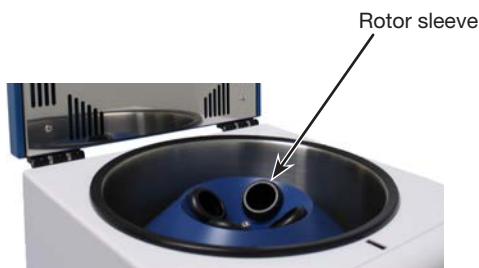
1. Plug the power cord into a grounded outlet.
2. Switch on the power.
The power lamp, Speed Indicator display, and Timer display must be illuminated.
3. If the Speed Indicator display shows an Err-5 code, cycle the power to clear the error.

NOTE: An Err-5 can be caused by the removal of (or failure to remove) the protective foam around the rotor, which in some cases may slightly unbalance the rotor. This is a normal occurrence and is easily remedied by cycling the power.

4. Press the green LID OPEN button; when the lid releases (you will hear a clicking sound), open the lid.

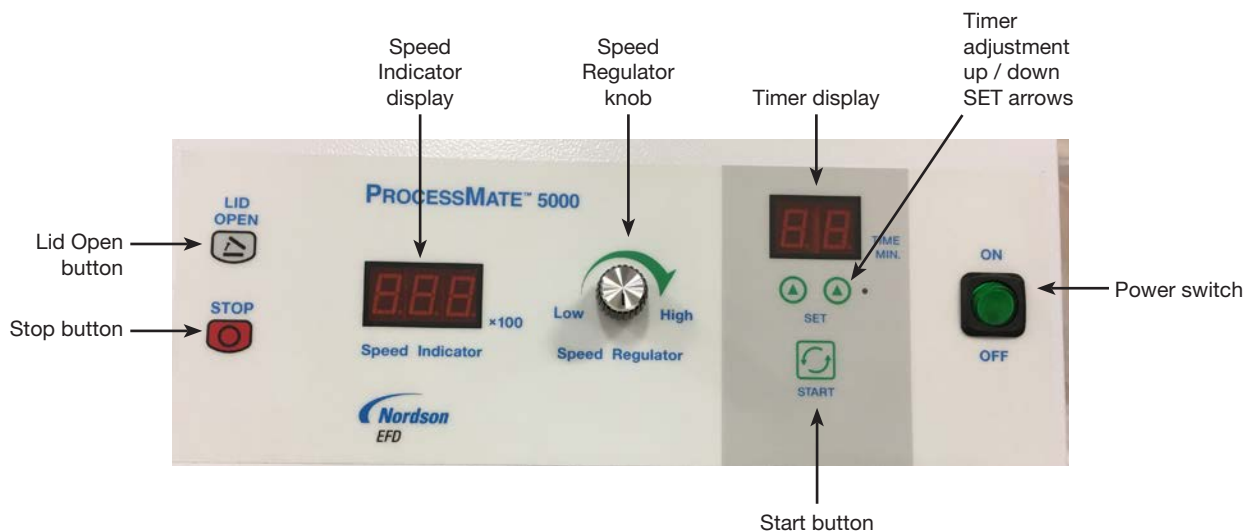
NOTE: The lid will not open if there is no power to the unit.

5. Ensure that the rotor sleeves are properly positioned in the rotor openings.



6. Switch off the power to verify that the power can be shut off in case of emergency.

If the above steps work as detailed, the centrifuge is operating as designed and ready for production use.



Operation

The unit includes many safety features to minimize the risk of personal injury. Use the following operational steps to safely operate the PM5000 centrifuge.

1. Turn On Power

Switch on the power. The switch will light up green when the unit is powered up.

2. Open Lid

Press the green LID OPEN button; when the lid releases (you will hear a clicking sound), open the lid.

NOTE: The lid will not open under the following conditions:

- If the centrifuge is still in use and / or the rotor is still spinning.
- If there is no power to the unit.

WARNING

Do not use flammable and dangerous chemical solutions in the centrifuge.

CAUTION

Ensure that the requirements noted below for positioning syringe barrels inside the centrifuge are met. Failure to fill to the same levels, spinning without the correct adapters, or placing an odd number of syringes (i.e., 1 or 3 syringes) will result in damage to the syringes and an unbalanced spin, causing the unit to go into an error mode.

3. Place Syringe Barrels

The PM5000 centrifuge can accommodate up to four (4) syringe barrels. Ensure that the placement of barrels inside the centrifuge meets the following requirements:

- Fill all syringe barrels to approximately the same level and secure the end cap on each barrel.
- Use the appropriate size adapter to secure the barrels inside the rotor sleeves. Adapters are provided for 3cc, 5cc, 10cc, and 30cc barrels.
- Insert only two or four barrels; never insert one or three barrels.
- When inserting two barrels, position them opposite each other.

Refer to “Placement of Barrels Inside the Centrifuge” on page 14 for examples of correct and incorrect syringe barrel placement.

4. Shut Lid

Shut the lid and make sure that the barrels are not protruding or contacting the inner side of the lid.

Operation (continued)

Placement of Barrels Inside the Centrifuge



Correct: Four barrels loaded using the correct adapter size



Correct: Axially symmetrical placement of two barrels



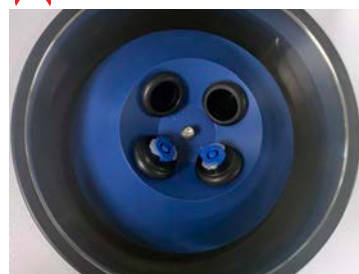
Incorrect: Three barrels loaded



Incorrect: No rotor sleeves or adapters used; retained foam insert



Incorrect: Wrong size adapters used, thus creating interference



Incorrect: Non-symmetrical placement of two barrels

Operation (continued)

5. Set Spin Time

Use the SET up / down arrows to set the spin time. The spin time can be adjusted from 1–99 minutes in increments of 1 minute. During setting, the spin time is shown in the Timer display. During operation, the Timer display counts down the spin time.

6. Set Speed

Use the Speed Regulator knob to set the rotor speed in RPM. The speed setting is shown in the Speed Indicator display. The speed cannot be adjusted or altered once the unit is in operation. To change the speed, simply press the red “stop” button, allow the rotor to come to a complete stop, open and close the lid, reset the speed, reset the time, and then restart the spin.

Important Note: If the set RPM exceeds the maximum speed for the rotor and contents, Err-8 will display and the unit will shut down the spin cycle. Remove or reduce the contents, open and shut the lid, and then re-initiate the spin cycle.

7. Start

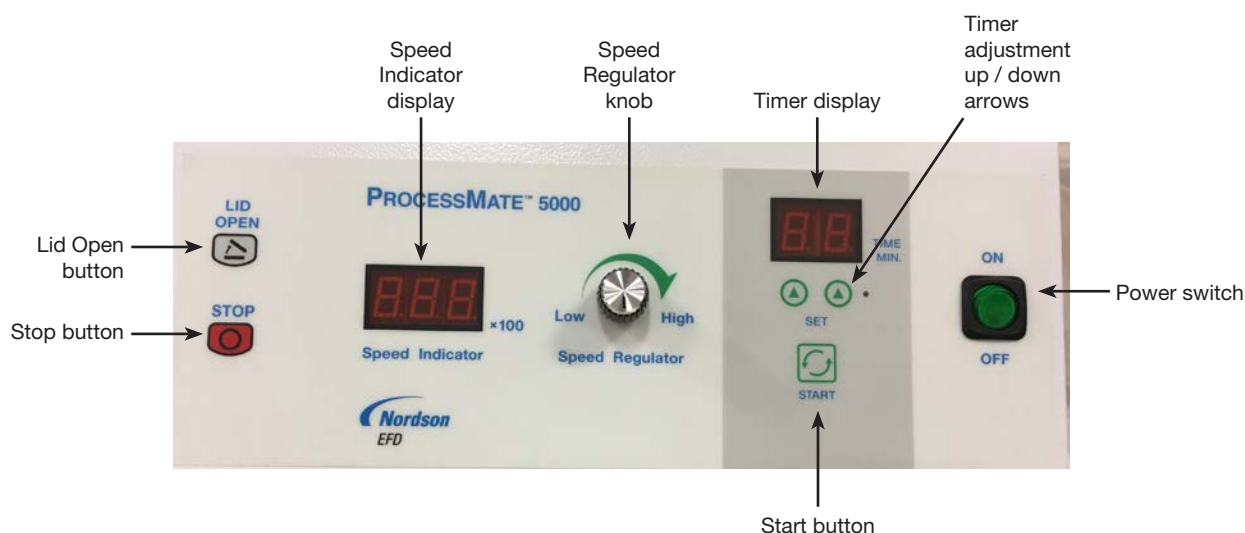
Once the time and speed are set, press the START button to start the PM5000 centrifuge. The centrifuge will spin at the speed and duration of the set parameters. Upon completion, the unit will automatically apply a brake on the rotor to slow down and stop the rotor within the centrifuge. Once the rotor is at a complete stop, an audible buzzer will alarm, notifying the user that the spin cycle has completed.

The centrifuge takes approximately 15–20 seconds to accelerate to the set speed.

After the set time has elapsed, the PM5000 centrifuge will automatically activate the automatic braking system to slow down and stop the rotation of the rotor. The TIME and RPM values will reset to 0, and three audible “beep” alarms will alert you of the completion of the spin cycle.

NOTE: If ERROR code Err5 is displayed on the screen at any time, the cause is usually due to an imbalanced rotor. Check the contents within the centrifuge and make sure the syringe barrels are equally loaded and filled.

8. Press the LID OPEN button and the lid release knob to open the lid and safely remove the contents.



Service

There are very few serviceable items on the PM5000 centrifuge. Check with EFD Technical Services before servicing the centrifuge.

WARNING

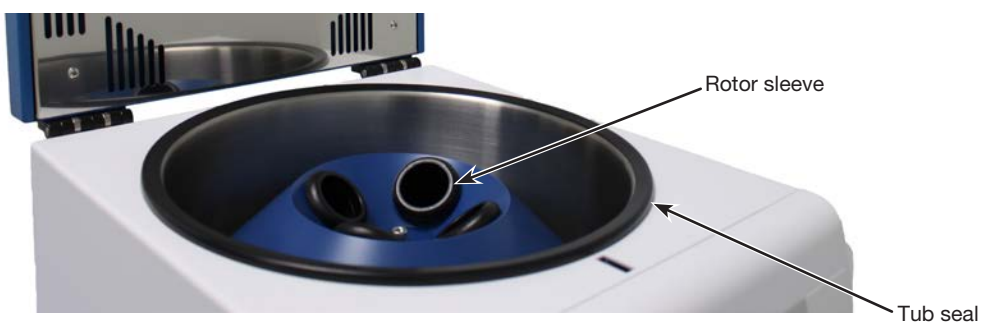
- To avoid electrical shock, always disconnect from power supply prior to maintenance or service.
- Only qualified personnel or licensed engineers should attempt any maintenance or service of the PM5000 centrifuge.
- Always use a properly grounded electrical outlet of the correct voltage rating.
- Inspect the centrifuge unit before use to make sure there are no issues.

Part Number

Part #	Description
7015542	ProcessMate 5000 centrifuge

Replacement Parts

Part #	Description	Quantity
7365995	ProcessMate 5000 centrifuge rejuvenation kit (includes the following components)	—
	• Centrifuge adapter set, 3cc	4
	• Centrifuge adapter set, 5cc	4
	• Centrifuge adapter set, 10cc	4
	• Centrifuge adapter set, 30cc	4
	• Rotor sleeve	4
	• Tub seal	2



Adapter sets

Troubleshooting

Error Codes

Error Code	Cause	Corrective Action
Err-1	Rotor unable to rotate (defective drive motor or malfunctioning PCB)	Contact your Nordson EFD representative for assistance.
Err-3	Attempt made to open lid while rotor still spinning	Wait for the spin cycle to complete before opening the lid. Cycle the power to remove the error code.
Err-5	Imbalanced rotor (related to weight distribution of contents)	Correct the placement of the syringe barrels inside the rotor. Refer to “3. Place Syringe Barrels” on page 13 for correct barrel placement. Cycle the power to remove the error code. If cycling the power does not remove the error code, contact your Nordson EFD representative for assistance.
Err-8	Set RPM exceeds maximum speed for rotor and contents	Reduce the speed or change the placement of the barrels in the rotor. Refer to “3. Place Syringe Barrels” on page 13 for correct barrel placement. Cycle the power to remove the error code.

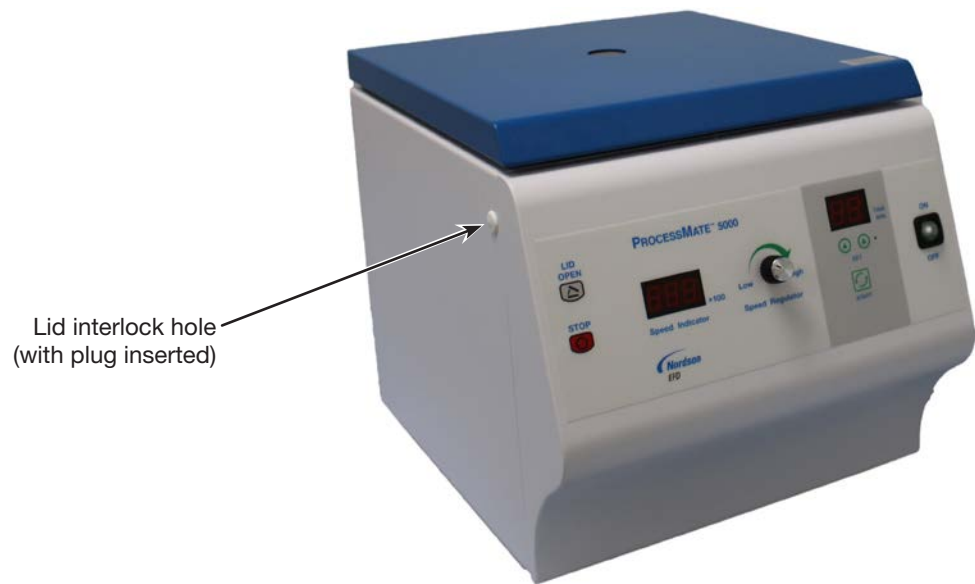
Troubleshooting (continued)

Opening Lid Manually — Power Failure

In the case of power failure, the lid will remain locked as designed. If the lid needs to be opened in this situation, manually overriding the safety switch is required.

To manually open lid, do the following:

1. Remove the hole plug (white) located on the left hand side of the PM5000 centrifuge enclosure.
 2. Insert a screwdriver or any sturdy object into the hole and press down onto the magnetic interlock assembly.
- The lid will now open.



Notes

NORDSON EFD ONE YEAR LIMITED WARRANTY

This Nordson EFD product is warranted for one year from the date of purchase to be free from defects in material and workmanship (but not against damage caused by misuse, abrasion, corrosion, negligence, accident, faulty installation, or by dispensing material incompatible with equipment) when the equipment is installed and operated in accordance with factory recommendations and instructions.

Nordson EFD will repair or replace free of charge any defective part upon authorized return of the part prepaid to our factory during the warranty period. The only exceptions are those parts which normally wear and must be replaced routinely, such as, but not limited to, valve diaphragms, seals, valve heads, needles, and nozzles.

In no event shall any liability or obligation of Nordson EFD arising from this warranty exceed the purchase price of the equipment.

Before operation, the user shall determine the suitability of this product for its intended use, and the user assumes all risk and liability whatsoever in connection therewith. Nordson EFD makes no warranty of merchantability or fitness for a particular purpose. In no event shall Nordson EFD be liable for incidental or consequential damages.

This warranty is valid only when oil-free, clean, dry, filtered air is used, where applicable.



For Nordson EFD sales and service in over 40 countries, contact Nordson EFD or go to www.nordsonefd.com.

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