Performus™ I
Dispensing System
User's Guide

To order the Performus I Dispensing System, refer to part number 7012330

Original Document

Electronic pdf files of Nordson EFD manuals are also available at www.nordsonefd.com

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Nordson EFD

Introduction

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

The User's Guide will help you maximize the usefulness of your Performus dispensing 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 30 years of industrial dispensing experience.

Most questions you will have are answered in this guide. However, if you need assistance, please do not hesitate to contact EFD or your authorized distributor.

In the USA, call 800-556-3484 between 8:00 and 5:30 p.m. Eastern time.

In Europe, call +44 (0) 1582 666334.

In Asia, call +86 (21) 3866 9006.

In all other areas, call your authorized EFD distributor or +1-401-431-7000.

The Nordson EFD Pledge

Thank You!

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

I want you to know that all of us at 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 EFD Product Application Specialist, please contact me personally at 800-556-3484 (US), 401-431-7000 (outside US), or jeff.pembroke@nordsonefd.com.

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

Thanks again for choosing EFD.

Jeff Pembroke
Jeffrey Pembroke, President

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IMPORTANT SAFETY INFORMATION

All 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.

Do not exceed maximum operating pressure of 100 psi (7.0kg/cm^2).

Do not heat syringe barrels or cartridges to a temperature greater than 100°F (38°C).

Dispose of components according to local regulations after one-time use.

Do not clean components with strong solvents (e.g. MEK, Acetone, THF).

Cartridge retainer systems and barrel loaders should be cleaned with mild detergents only.

To prevent fluid waste, use EFD SmoothFlow™ pistons.

Nordson EFD Product Safety Statement

This statement provides personal and equipment safety notices for EFD dispensing products.

⚠ 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 cover 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 CAUTION level hazards.
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

Maximum air input pressure 6.9 bar (100 psi). Excessive air input pressure may damage the equipment.

BURST PRESSURE

Maximum air input pressure 6.9 bar (100 psi). Burst pressure 20.7 bar (300 psi). Excessive air input pressure may damage the equipment.

RELEASE PRESSURE

Release pressure before opening. Maximum pressure 2.0 bar (30 psi). Release hydraulic and pneumatic pressure before adjusting or servicing pressurized systems or components.

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 your material MSDS 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 safety 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 this 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

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 EFD equipment will be voided if instructions for installation, operation and service are not followed.

Personal Safety

To prevent injury, follow these instructions:

- This equipment is for indoor use only.
- Do not operate or service equipment unless you are qualified.
- Do not operate equipment unless safety guards, doors or 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.
- Know where emergency stop buttons, shutoff valves and fire extinguishers are located.
- Clean – Remove all electrical and mechanical connections to unit. Apply a small amount of light detergent onto a moist cloth and wipe surface of unit lightly, cleaning any stains or spilled adhesive.
- Maintain – Only use clean dry air and regulated power supply to unit. Equipment does not require any other regular maintenance.

- Test – Verify operation of features and performance of equipment using the 'Features and Controls' and 'Getting Started' sections within this user guide. If necessary, refer to the 'Troubleshooting Guide' elsewhere in this user guide. A faulty or defective unit should be returned to EFD or representative for refurbishment.

- Use only replacement parts that are designed for use with original equipment. Contact your EFD representative for information and advice.

- Caution: Use or wear adequate ear protection when operating the vacuum in close proximity for a prolonged period of time.

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:

- Disconnect and lock out system electrical power. If using hydraulic and pneumatic shutoff valves, close and relieve pressure.

- Identify the reason for the malfunction and correct it before restarting the system.

- For EFD-powered dispensers, remove the syringe barrel from the adapter assembly. For EFD electro-mechanical dispensers, slowly unscrew the barrel retainer and remove the barrel from the actuator.

Disposal

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

RoHS标准相关声明 (China RoHS Hazardous Material Declaration)

产品名称 Part Name	有害物质及元素 Toxic or Hazardous Substances and Elements					
	铅 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Hexavalent Chromium (Cr6)	多溴联苯 Polybrominated Biphenyls (PBB)	多溴联苯醚 Polybrominated Diphenyl Ethers (PBDE)
金属转接头 All Brass Fittings	**X**	**0**	**0**	**0**	**0**	**0**

0: 表示该产品所含有的危险成分或有害物质含量依照EIP–A, EIP–B, EIP–C 的标准低于SJ/T11363–2006 限定要求。
Indicates that this toxic or hazardous substance contained in all the homogeneous materials for this part, according to EIP-A, EIP-B, EIP-C is below the limit requirement in SJ/T11363-2006.

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Specifications

Cabinet Dimensions:	183 mm x 86 mm x 51 mm (7.22" W x 3.38" D x 2" H)
Weight:	1 Kg (2.2 Lbs)
Input AC (to power supply):	100-240 VAC (+/-10%) ~ 50/60 Hz, 0.6A
Output DC (from power supply):	24VDC ⎓ – 1.04 Amp maximum
Power Requirements:	24VDC ⎓ – 1.04 Amp maximum
Internal Voltage:	24VDC
Footswitch:	
Voltage:	24VDC
Current:	20mA
Cycle Initiate:	Foot Pedal, Finger Switch
Maximum Cycle Rate:	600 cycles per minute
Air Input Requirements:	7 bar (100 psi) maximum
Air Output:	1-7 bar (1-100 psi) dependent on user setting
Ambient Operating Conditions:	
Temperature:	5°C to 45°C (41°F-113°F)
Humidity:	85% RH at 30°C non-condensing
Height above sea level:	2000 meters maximum (6562 feet)
RoHS, WEEE & China RoHS Compliant:	Yes
Approvals:	CE, CSA
Product Class:	Installation category II Pollution degree 2

Features and Controls

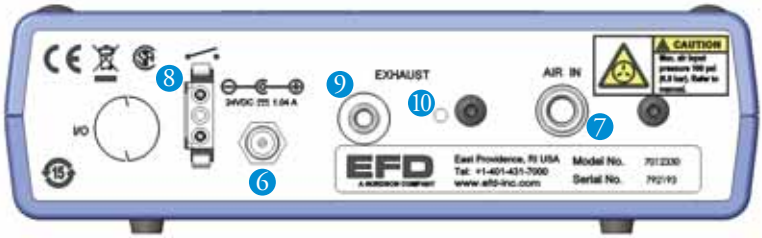
1. Output Air Regulator Adjustment Knob – Controls air pressure in syringe barrel

2. Vacuum Control Adjustment Knob – Controls syringe barrel vacuum

3. Power Switch – Main DC power control switch

4. 0-100 psi Gauge – Measures syringe barrel air pressure

5. Output Quick Connector – Syringe barrel adapter connection



6. Power Input Jack – DC power input

7. Air Input Push-in Fitting – Main filtered air supply input

8. Foot Pedal/Finger Switch Connector – Connection for dispenser actuating device

9. Air Exhaust Port – Syringe barrel air exit

10. Vacuum Exhaust Port – Vacuum air exit

Getting Started

Unpack Unit/Warranty

1

Unpack the contents of the package and lay them out on a clean work bench. The following items should be included with your Performus dispensing system:

A. Dispenser

B. Foot pedal assembly

C. Power supply

D. Syringe barrel adapter

E. Syringe barrel stand

F. Folding wire stand

Now is a good time to activate your EFD Performus Dispensing System One Year Warranty. Register online at www.nordsonefd.com/warranty/dispensers/one.

Connect Air Supply

2

Note: Clean, dry filtered factory air is required to meet warranty. If your air supply is not filtered, order the EFD five micron filter regulator (EFD part 7016547).

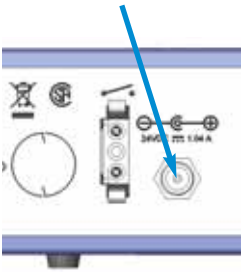
Turn the air regulator adjustment knob to zero before connecting the main air input to the Performus.

- Push one end of the 6mm air input hose into the input fitting on the back of the Performus.
- Connect the other end of the hose to your plant air supply.
- Set plant air supply at minimum 5.5 to 6.9 bar (80 to 100 psi).
- Keep the vacuum feature turned off by turning the vacuum control knob all the way counter-clockwise. If the fluid you are dispensing is a thin, watery, or low viscosity consistency, proceed to “Using the Vacuum Control Feature for Low Viscosity Fluids.”

Connect Power

3

- Locate the DC input connection on the back of your Performus dispensing system.
- Insert the DC Plug securely into the input connection.
- Select the proper adapter from the power supply plug kit and then connect the power supply to a grounded power source.

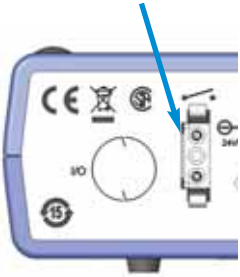


Note: The power supply is multi-voltage, therefore no external adjustments are required.

Connect Foot Pedal

4

- The Performus is normally operated using the foot pedal provided.
- Connect the foot pedal to the back of thePerformus.
- If you prefer, you can also operate the Performus with an optional finger switch (EFD part 7016718).



Attach Syringe Barrel/Dispense Tip

5

- Attach an EFD syringe barrel filled with your fluid to the adapter assembly.
- Snap the safety clip on the adapter hose closed to prevent dripping. Remember to unsnap the clip when ready to dispense.
- Replace the tip cap with an EFD precision dispense tip.
- Place the syringe barrel in the barrel holder.

Connect Air Output

6

- Push in the black male quick-connect on the syringe barrel adapter into the front of the Performus.
- Twist clockwise to lock.

Initial setup is now complete. At this point you are ready to set up your dispensing flow rate and time to suit your application needs.

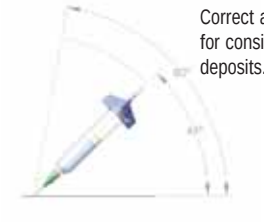
Dispensing System Setup

1. Pull the air regulator adjustment knob out until it clicks into the unlocked position. Start with pressure set to zero.
2. Place the syringe barrel over a piece of paper or test surface.
3. Unsnap the safety clip. Depress and hold the foot pedal for the remainder of this setup.
4. While resting the tip on the paper (test surface), SLOWLY turn the air pressure regulator clockwise until fluid starts to exit from the tip.
5. Keep increasing the air pressure until you have reached the desired fluid dispensing flow rate.

Note: Always use the lowest possible pressure and the largest possible tip size. The combination of the lowest possible output pressure + largest possible tip size + longest possible dispense duration = most consistent and accurate deposits.

6. Release the foot pedal.
7. Retest the dispensing rate a few more times. Fine tune as required by making small changes in pressure.
8. Push the air regulator adjustment knob in to lock the setting.

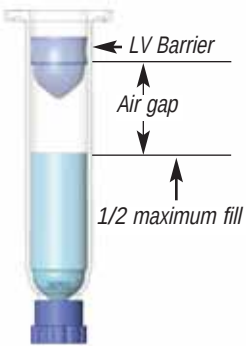
Remember - always bring the tip in contact with the work surface at the illustrated angle. After the tip is in position, press the foot pedal. Release pedal and remove tip by lifting straight up.



Correct angle for consistent deposits.

Using the Vacuum Control Feature for Low Viscosity Fluids

The Vacuum Control feature allows you to dispense low viscosity fluids consistently without dripping between cycles. The vacuum overcomes head pressure on the fluid within the barrel, which prevents dripping.



1. Make sure that you have attached an EFD barrel filled with the fluid intended for dispensing, and that the air pressure is turned all the way to zero. EFD recommends the use of a Blue LV Barrier piston for watery, low viscosity materials.
2. Remove the tip cap and replace it with an appropriate EFD precision dispense tip. Dispense tips are listed on the components poster included with your Performus system.
3. While pointing the tip over a container or resting on a test surface, release the safety clip on the adapter hose assembly.
4. .Depress the foot pedal for the duration of this setup.
5. Slowly turn the air regulator adjustment knob up until fluid starts to exit from the tip.
6. Keep increasing the air pressure until you have reached the desired fluid flow rate.
7. Release the foot pedal. At this point, fluid will continue to exit the tip.
8. Slowly turn the vacuum control knob clockwise until the fluid deposit size stabilizes without growing.

Note: Do not increase the vacuum to the point where the deposit is actually sucked back into the tip. Excessive vacuum causes inconsistent dispensing.

9. Lift the tip off the paper, wipe the tip end and retest by pressing the foot pedal momentarily. The deposit dispensed should stay at the intended size and not increase or decrease in size. If it does, repeat steps 4 –8 to fine-tune the vacuum control.

Filling the Syringe Barrel

Barrel Filling Techniques:

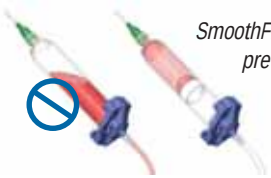
Caution: Do not completely fill syringe barrels. The optimum fill is a maximum 2/3 of the barrel capacity and 1/2 of the barrel capacity when using the EFD blue LV Barrier piston.

For best results, we strongly recommend that you use a piston as part of your dispensing system. The white EFD SmoothFlow piston is appropriate for most fluids and has several advantages:

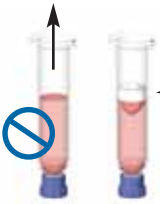
- Vacuum adjustment is less sensitive.
- The piston prevents fumes from the fluid being exhausted into the work environment.
- The piston prevents fluid from flowing back into the dispenser if the syringe barrel is inadvertently turned upside down.
- The piston makes it easy and safe to change tips without dripping. For watery solvents and cyanoacrylates, request the blue EFD LV Barrier piston, available in 3cc, 10cc and 30/55cc sizes. Contact EFD for assistance in selecting a suitable piston.

Remember

For best results, EFD strongly recommends the use of a piston as part of your dispensing system.



SmoothFlow piston prevents fluid backflow.

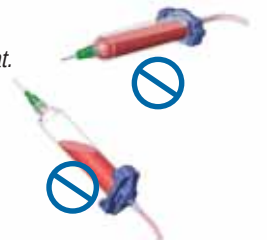


Fumes cannot escape.

No air gap when using the SmoothFlow piston.

If you choose to not use a piston when dispensing thin fluids, remember these important points.

Do not tip the barrel upside down or lay flat. This will cause the liquid to run into the dispenser.



When changing tips or attaching a tip cap, snap the safety clip completely closed to prevent any dripping or bubbling.

Filling Procedure for Pourable Low and Medium Viscosity Fluids

If the fluid you are dispensing is pourable, take the syringe barrel, twist on tip cap and pour your fluid in. Insert a white SmoothFlow piston and carefully press down until it contacts the fluid. The syringe barrel is now ready for use.

Filling Procedure for Thick Fluids

If your fluid is thick or non-leveling, you can spoon it into the syringe barrel with a spatula. Or, if the fluid comes packed in a 1/10 gallon (300 ml) cartridge, try loading the barrel with a caulking gun. Then, press the SmoothFlow piston to move the fluid to the bottom of the syringe barrel and remove trapped air.

Trapped air in thick fluids can lead to drooling and oozing. Also, repetitive air cycles can bore tunnels through non-leveling fluids, causing spitting and inconsistent deposits. The SmoothFlow piston eliminates these problems. It prevents tunneling by providing a barrier to the pulsed-air cycles. And it prevents oozing by responding to the pressure of trapped air with a slight suck-back movement after the dispense cycle.

Barrel Loaders

Barrel Loading Alternatives

EFD offers productive alternatives to traditional syringe barrel loading methods. Here are a few suggestions that can help keep your work area clean, save time and reduce the chance of entrapped air in the fluid.

1. For fast, accurate volumetric filling, the Atlas Filling System #7022068 can be used with any pressure reservoir or cartridge. Recommended for high production barrel filling.

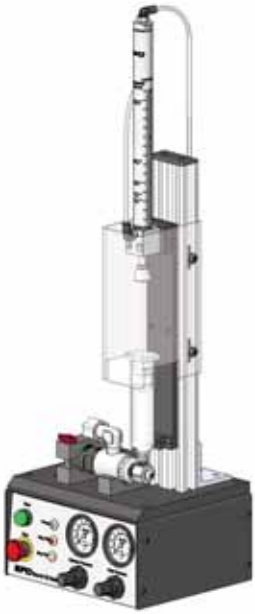
2. You could use the #7022445 (12 fl oz) Atlas™ Filling System. Pack the fluid into a 2.5 fl oz, 6 fl oz, 20 fl oz or 32 fl oz cartridge. Then place the pre-filled cartridge into the barrel loader. Using air pressure, the barrel loader fills the syringe barrel (with a piston installed) from the bottom up.

   If the fluid comes packed in a 1/10 gallon (300 ml) caulking type cartridge, use the EFD #7022452 filling system.

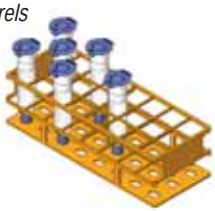
3. If you receive frozen epoxies or other fluids in medical type syringes with a manual plunger, request the EFD luer-to-luer fitting to transfer the material.

Please contact an EFD Fluid Application Specialist for additional assistance.

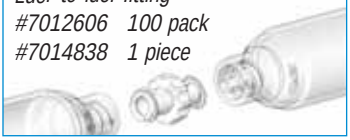
#7022068 Atlas Filling System



Barrel Rack
#7022411 for 3cc & 5cc barrels
#7022429 for 10cc, 30cc and 55cc barrels



Luer-to-luer fitting
#7012606 100 pack
#7014838 1 piece

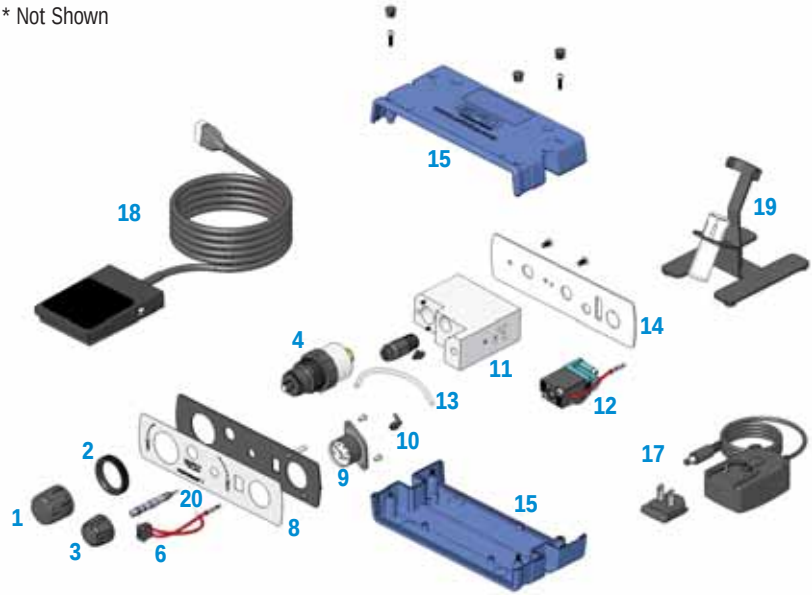


#7022445 (12 fl oz) Atlas Filling System.
Also available in 2.5, 6, 20 and 32 fl oz.
#7022452 for pre-filled 1/10 gal (300 ml) caulking tubes.

Replacement Parts

Item	Part Number	Description
1	7012274	Regulator Knob, Black
2	7012276	Regulator Bezel
3	7017073	Vacuum Rotary Dial Knob
4	7012277	Regulator Assembly 0-100 psi
5	7014752	Regulator Replacement o-rings*
6	7012279	ON/OFF Rocker Switch Assembly
7	7012595	Quick Connector Assembly Kit*
8	7012284	Overlay, Front, Performus I
9	7012281	Gauge, Pressure 0-100 psi
10	7012283	Fitting, 10-32 x 3/32 Barb, Elbow
11	7012293	Manifold Assembly Performus I
12	7012298	Valve, Solenoid Assembly Performus I
13	7016761	Urethane Tubing (12")
14	7012302	Panel, Rear, Performus I
15	7022009	Case, Pack of 2 - top/bottom
16	7012597	Power Supply Plug Kit*
17	7015199	Universal Power Supply Kit
18	7014865	Foot Pedal Assembly
19	7016728	Barrel Stand with Bottle
20	7012280	Stem, Vacuum Control

* Not Shown



Dispensing System Accessories

Ergonomic Hand Grip

Ergonomic grip fits all sizes of syringe barrels from 3cc to 55cc. Specify EFD part #7017133.

Liquid Filter Trap

Helps prevent fluid from being sucked back into the dispenser. Specify EFD part #7016077.

Five Micron Filter Regulator/Coalescing Filter Regulator

Required for production areas where clean, dry filtered factory air is not available, or to stabilize the plant air supply for more consistent deposits. Specify EFD part #7016547.

For dispensing cyanoacrylates, order the regulator with a coalescing filter that removes liquid aerosols from the air supply. Specify EFD part #7016548.

Syringe Barrel Production Stand

Holds syringe barrel in a fixed position for bringing the production part to the dispense tip. Specify EFD part #7021053.

Finger Switch

Replaces the foot pedal in applications where operators prefer to initiate the dispense cycle by hand. Specify EFD part #7016718.

Troubleshooting Guide

An EFD Customer Service or Technical Services representative is always available to assist you with any question you may have about your Performus Dispensing System. Please feel free to call or email us at the addresses on the back cover of this User's Guide.

Trouble	Solution
No power	Check the power supply connection and DC power supply to the unit.
No fluid being dispensed	Check the main air supply and primary regulator.
	Check to make sure that the main air supply is connected to the back of the unit and has not come loose.
	Check to make sure that the regulator is not turned off (fully counterclockwise).
	If dispensing thicker materials, try increasing output air pressure slightly.
Inconsistent dispense output	Check the dispensing tip, barrel and material for possible contamination or clogs.
	Note: Dispensing System Components are disposable. Do not attempt to reuse.
	Check for air supply pressure fluctuation.
	Air bubbles in the fluid path and entrapped air within the fluid may cause inconsistency. For best dispensing results, remove all entrapped air before dispensing.
Material suck-back	Always use an appropriate piston to prevent material from being drawn back into the dispenser. For thick to medium viscosity fluids use EFD SmoothFlow pistons. For thin, low viscosity fluids, use EFD LV Barrier pistons.
	Another option is to order optional barrel adapters with filter traps. Part numbers for all adapters are listed on the components poster included with your Performus system.

Helpful Hints/Suggestions on Settings

Helpful Hints

1. There are three core variables to the Performus dispenser: dispense time, pressure and vacuum. Adjust just one of these at a time, in small increments, to achieve the correct deposit.

2. Another variable is tip size. Choose the right tip for the deposit type. Remember, smaller tips require more pressure and more time pressing the foot pedal. Try different tips without changing the time or pressure settings and observe the results.

3. Tapered tips reduce the amount of air pressure needed to dispense thick materials. They also help prevent drooling at the end of a dispense cycle.

4. .To ensure smooth fluid flow and to make consistent deposits, keep the dispense tip at a 45° angle to the work surface.

5. Use EFD SmoothFlow pistons to make barrel loading, dispensing and handling cleaner, safer and more accurate. Caution: If you dispense watery fluids and choose not to use EFD pistons, do not increase vacuum pressure rapidly and do not tip the barrel. Vacuum may pull fluid into the adapter hose, or if the syringe barrel is tipped, fluid may flow back into the dispenser.

6. Always use new EFD syringe barrels and tips. Carefully dispose of after use. This procedure ensures maximum cleanliness, prevents contamination and provides proper safety.

7. Do not completely fill the syringe barrel. For most fluids, optimum fill is a maximum 2/3 of the barrel capacity. For cyanoacrylates or watery fluids, optimum fill is 1/2 of the barrel capacity.

Suggestions on Settings:

1. To reduce air pressure, turn the knob counterclockwise until the display reads at a lower-than-needed pressure setting. Then turn clockwise to increase pressure until you reach the correct setting.

2. Avoid high pressure settings with very small deposit settings. The ideal setup matches air pressure and tip size to create a “workable” flow rate – no splashing, but not too slow either.

3. With any fluid, always give the air pressure time to do its job. Moderate time and pressure provides the best results since dispensing pressure remains at its peak for a longer period of time.

Nordson EFD One Year Limited Warranty

This EFD dispenser is warranted to the original end user for one year from date of purchase. Within the period of this warranty, EFD will repair or replace any defective component, or the entire dispenser at EFD's option, on authorized return of the part or the complete dispenser, prepaid to the factory.

In no event shall any liability or obligation of EFD arising from this warranty exceed the purchase price of the equipment. Before using, user shall determine the suitability of the product for its intended use, and user assumes all risk and liability whatsoever in connection therewith.

EFD makes no warranty whatsoever of merchantability or fitness for a particular purpose. In no event shall EFD be liable for incidental or consequential damages.

To register your warranty in the USA, please call 800-828-3331 within 30 days, or go to www.nordsonefd.com/warranty/dispensers/one.

For Nordson EFD sales and service in over 30 countries, contact EFD or go to www.nordsonefd.com

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This equipment is regulated by the European Union under WEEE Directive (2002/96/EC). See www.nordsonefd.com for information about how to properly dispose of this equipment.

Nordson EFD

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