



Cartridge Filling System

Operating Manual

www.nordsonefd.com
info@nordsonefd.com

USA & Canada: 800.556.3484
Europe: +44 (0) 1582 666334
Asia & China: +86 (21) 3866 9006

Sales and service of Nordson EFD LLC dispensing systems are available worldwide.



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





Introduction 4-5

Nordson EFD Product Safety Statement 6-8

Preventative Maintenance & Cleaning 9

Product Familiarization 10-11

Specifications 12

Setup Procedures 13-16

Operating Hints/Troubleshooting Guide 17

Replacement Parts 18

Optimum Cartridge System Components 19

Warranty Back Cover

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

This User's Guide will help you maximize the usefulness of your new System.

Please spend a few minutes to become familiar with the controls and features. Follow our recommended operating procedures. Review the helpful information we have included, which is based on more than 30 years of industrial 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 EFD distributor.

In the USA, call 800.556.3484 between 8:30 a.m. 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 Srini.Subramanian@nordsonefd.com.

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

Thanks again for choosing EFD.

Srini Subramanian

Srini Subramanian, General Manager

INTRODUCTION

The Cartridge Filling System was specifically designed to automatically fill cartridges with precision and consistency. The system is easy to set up, maintain and clean. It fills cartridges from the bottom through the threaded opening. Filling cartridges from the bottom reduces air pockets in the product, increases product quality, dispense performance and productivity.

How the system operates

The Cartridge filling system is essentially a precision metering device. A pneumatic cylinder follows the movement of the piston in a cartridge as it fills. The cylinder's position is tracked by magnetic switches which are set to correlate with the position of a piston in an empty and full cartridge. The machine also has a Manual Mode which bypasses the sensing circuits and leaves the filling process completely under the user's control. This helps the user set up the machine for a particular size of cartridge. Once set, the machine is switched to Auto Mode to accurately and consistently fill the cartridges with a preset amount of product.

Cartridge filling system Installation and Setup

Open the shipping carton and inspect the contents for the following:

- 1 Cartridge Filler Machine
- 1 Tool Kit
- 1 Accessory Kit
- 1 Desktop Power Supply with AC cord
- 1 Quick Start Guide

Out of the box:

- Place the Cartridge filling system on a hard, level surface. The machine can be secured with bolts through the 10mm (0.394 ") holes in the baseplate.
- Check the general condition of the machine after shipping. Inspect the tubing to fitting connections and make sure they are secure. Inspect the terminal strip at the rear of the Controller for loose wires and tighten as necessary.

NORDSON EFD PRODUCT SAFETY STATEMENT

Equipment Misuse Hazard

GENERAL SAFETY – Any use of the equipment and related accessories not consistent with that described in this manual, such as modifying or removing parts, over-pressurizing, using incompatible substances, or using worn, damaged or incompatible parts can cause them to rupture resulting in serious bodily harm, including substances splashed in the eyes or on the skin, or fire, explosion or other property damage. NEVER alter or modify any part of this equipment, as doing so may cause it to malfunction. CHECK all system components regularly and replace any worn or damaged parts with EFD supplied or approved parts. BE SURE that all dispensing equipment and accessories are rated to withstand the maximum operating pressure of the system.

Personal Protective Equipment

Wear all protective eyewear, gloves, clothing, and respirator as recommended by the manufacturer of the materials used.

Material Compatibility

BE SURE that all materials, including their vapors, contained in the system are compatible with all the materials in the Specifications Section of this manual. Read the material manufacturer's literature, including the MSDS (Material Safety Data Sheet) and observe all warnings before circulating materials through the system.

User's Responsibility

It is the responsibility of the user to ensure the Cartridge filling system is installed in a manner that complies with all local and national jurisdictional requirements.

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/cm²).
- 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

Tipping and Dropping Hazard

BE SURE that the Cartridge Filling System is placed on a hard, level surface and that all tubing lengths are sufficient to allow free motion of all movable components attached to the machine. DO NOT pull on tubing to move the machine. Tipping the machine or otherwise supporting it on its side can cause it to be unstable, resulting in possible damage.

If any system components are damaged or worn, they must be replaced with EFD supplied or approved parts before returning to service.

Tubing Safety

Pressurized tubing can be very dangerous. Tubing whose integrity is compromised due to wear, damage or misuse can develop a leak, spraying materials at high pressure. This spray can enter the eyes or cover the skin or cause other serious bodily injury, fire or property damage. Before pressurizing any system, examine all tubing for cuts, wear, bulges and leaks. If any of these conditions exist, replace the tubing immediately with EFD supplied or approved tubing. Do not try to repair a damaged tube.

1. BE SURE all tubing connections to the system are properly secured.
2. BE SURE that the material to be dispensed is compatible with the system.



Disposal of Discarded Wetted Materials

The user should consult local jurisdictional requirements for the proper disposal of all discarded material.

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
<p>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。 0: 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.</p> <p>X: 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 的标准高于 SJ/T11363-2006 限定要求。 X: 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 above the limit requirement in SJ/T11363-2006.</p>						

PREVENTATIVE MAINTENANCE

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

1. Turn off the Cartridge Filling System and release air pressure before servicing any system components.
2. Periodically inspect tube to fitting connections for proper fit. Secure as necessary.
3. Check tubing for cracks and contamination. Replace tubing as necessary.
4. Check all wiring connections for looseness. Tighten as necessary.
5. Confirm the output elbow fitting on the dispense valve remains centered vertically under the air cylinder rod. If it is not, loosen the bolts on the valve mount and center the fitting.

MAINTENANCE AND CLEANING

General Cleaning

Cleaning- Avoid using alcohol-based, solvent-based cleaners or cleaners that contain abrasives.

Valve Cleaning

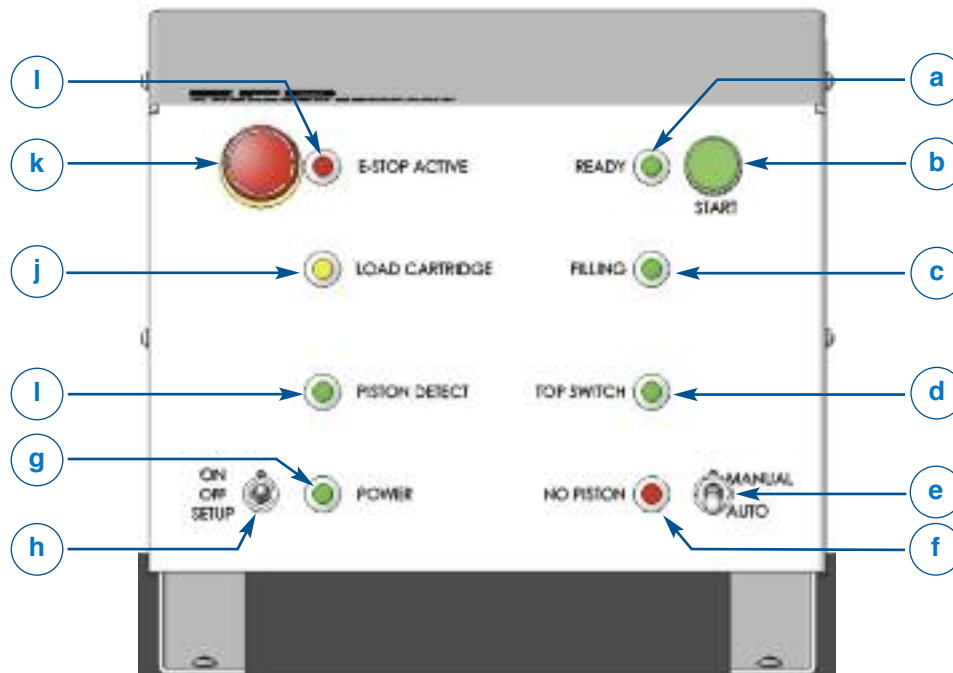
Refer to the EFD 736HP Series Valve Maintenance and Parts Guide for valve disassembly and reassembly procedures. The Guide is available on EFD's website at www.efd-inc.com



PRODUCT FAMILIARIZATION

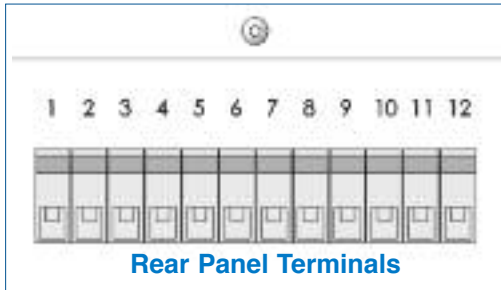
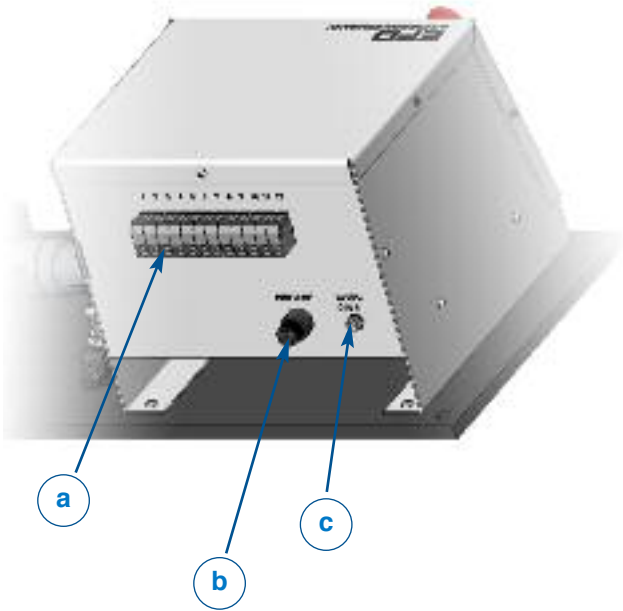
Controller Front Panel

- a. **READY** - Illuminates when a cartridge is in place to be filled.
- b. **START** - In AUTO Mode, START initiates the filling process. In MANUAL Mode, it opens the valve as long as the button is held down.
- c. **FILLING** - Illuminates when the valve is activated.
- d. **TOP SWITCH** - Illuminates when the air cylinder piston is aligned with the Upper Switch. In AUTO Mode, this indicates a full cartridge and ends the filling process.
- e. **AUTO/MANUAL** - Switch in down position selects AUTO Mode, in up position selects MANUAL Mode.
- f. **NO PISTON** - Illuminates when the machine has detected a cartridge with no piston installed. Resets when a cartridge with a piston installed is replaced.
- g. **POWER** - Illuminates when the machine is powered for use.
- h. **POWER ON/OFF-SETUP** - 3-Position switch. Up position is for Power On, middle position is Power Off and the down position is used during the machine setup process.
- i. **PISTON DETECT** - Illuminates when the air cylinder piston is aligned with the Piston Detect switch.
- j. **LOAD CARTRIDGE** - Illuminates when the Cartridge Detect switch indicates no cartridge is mounted on the machine.
- k. **EMERGENCY STOP** - Pushing the E-Stop Switch sets the machine to its lowest energy state, i.e., turns off all electrical power and dumps all air pressure.
Rotate the E-Stop Switch knob clockwise to reset.
- l. **E-STOP ACTIVE** - Illuminates when the E-Stop Switch has been activated. Indicates the machine's inputs and outputs have been inhibited.



Controller Rear Panel (7014123):

- a. I/O TERMINALS-** Screw terminals for electrical signals to/from the Controller to the rest of the machine. Wires omitted for clarity.
- b. Fuse** 250 Volt, Slow-Blow, 1 Amp, 3 AG Glass Cartridge Fuse.
- c. POWER INPUT JACK-** Screw locked jack for 24 VDC power input. Mates with Switchcraft S760K plug or equivalent.



- 1.** Cartridge Detect Switch +24 VDC output.
- 2.** NO CARTRIDGE signal input
- 3.** CARTRIDGE DETECTED signal input
- 4.** PISTON DETECT signal input
- 5.** Magnetic Switch +24 VDC output
- 6.** NO PISTON signal input
- 7.** TOP SWITCH signal input
- 8.** MASTER SOLENOID ON signal output
- 9.** CYLINDER DOWN command signal output
- 10.** FILLING command (open dispense valve) output
- 11.** CYLINDER UP command output
- 12.** Sensor and Solenoid DC Ground output

SPECIFICATIONS

Overall Dimensions: 71.1cm (28.00 in) H x 52.34cm (21.00 in) W x 22.9cm (9.00 in) D

Max Extended Tower Height: 100.00 cm (39.38 in)

Weight: 9.1kg (20.0 lbs.)

Input AC (to power supply): 100-240 VAC, 50/60 Hz

Machine Power Requirement: 24 VDC, 0.5 amp maximum

Max input shop air pressure: 120 psi (8.27 bar)

Ambient operating conditions:

Temperature: 5°C to 45°C (41°F to 113°F)

Humidity: Max 85% RH at 30°C non-condensing

Height above sea level: 2000m (6,562 Feet) max

An electrical fuse: 250 volt, 1 Amp, Slow Blow, 3AG Cartridge Fuse

Cartridge Filler:

Baseplate: Anodized Aluminum

Controller Enclosure: Type 303 Stainless Steel

Valve Mounts: Anodized Aluminum

Valve Components:

Air Cylinder Body: Type 303 Stainless Steel

Fluid Body and Cap: Type 303 Stainless Steel

Piston: Hard-coated Aluminum

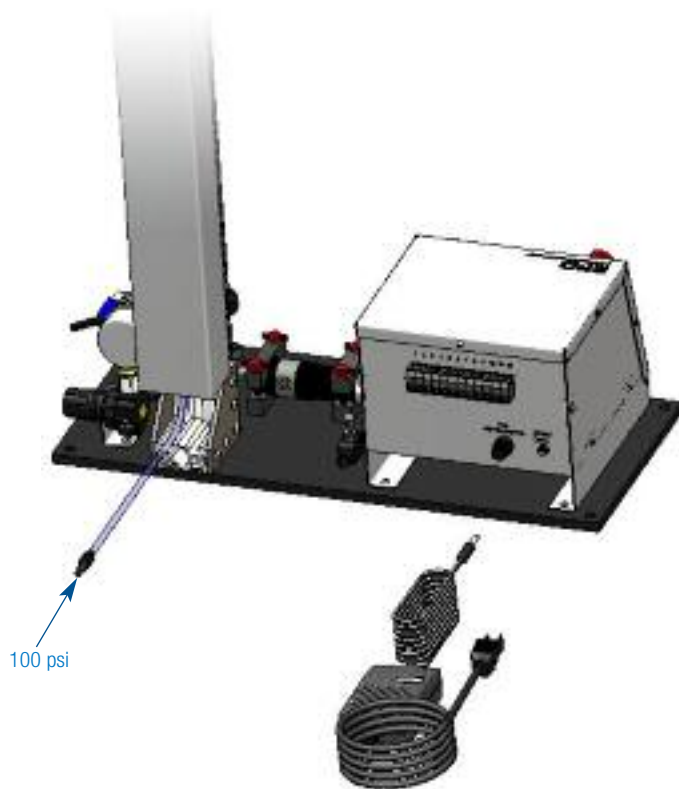
Spool: Hardened Stainless, Hard-Chrome Coated

Spool Seals: HytreI® (Viton® Optional)

Note: Specifications and technical details are subject to engineering changes without prior notification.

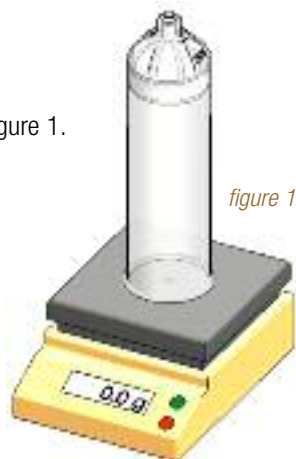
SETUP PROCEDURES

- Start with input air DISCONNECTED or OFF at the source and electrical power OFF.
- Loosen the two cylinder plate mounting screws and adjust the height of the cylinder assembly so the cylinder mounting block is level with the top of the extrusion. Tighten the mounting screws.



To set the machine for a particular size cartridge:

1. Weigh an empty cartridge with piston installed as shown in figure 1.
2. Place Auto/Manual switch in Manual position (up).
3. Install a cartridge with no piston on the machine.
4. Power switch to ON
5. Extend the cylinder rod by hand until the No Piston LED illuminates.
Be sure to stop when the No Piston LED illuminates.



- Loosen the two cylinder plate mounting screws and adjust the height of the cylinder assembly until the tip of the cylinder rod just touches the bottom of the cartridge. When the assembly is in place, tighten the cylinder plate mounting screws as shown in figure 2.

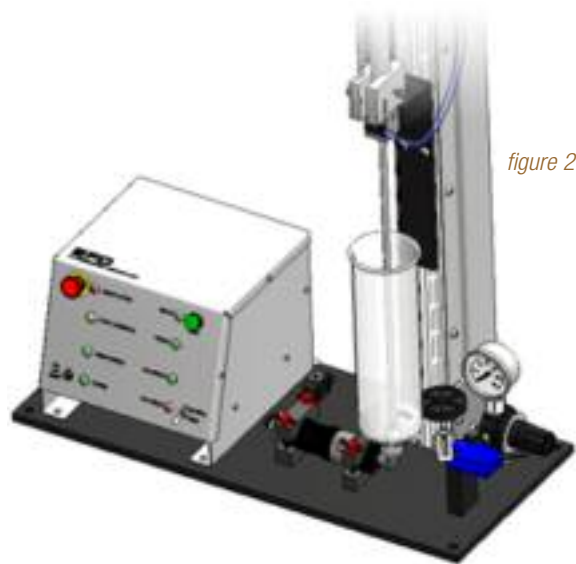


figure 2

- Power switch to OFF
- Retract the cylinder by hand. Replace the cartridge with one that has a piston installed. Confirm that the piston is located at the bottom of the cartridge.
- Power switch to SETUP
- Extend the cylinder by hand until the tip of the cylinder rod touches the boss on the inside of the piston as shown in figure 3.

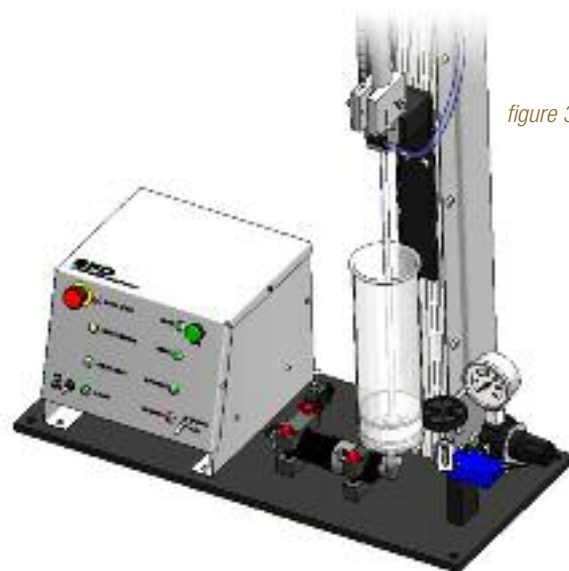
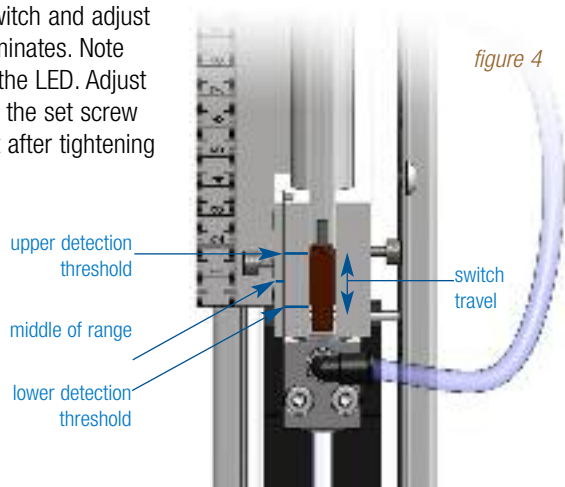


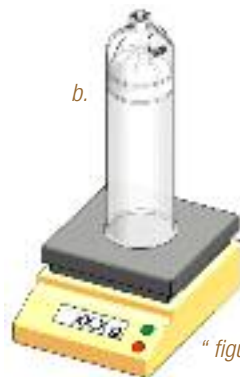
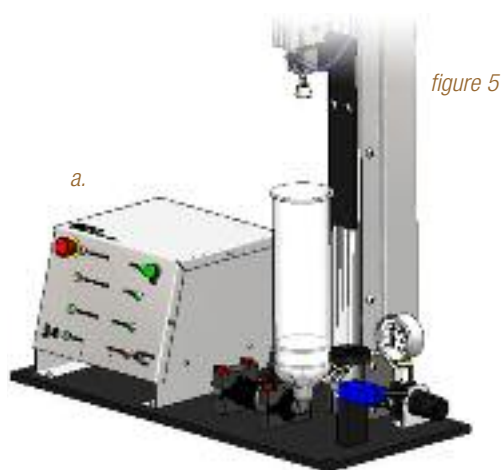
figure 3

- 11.** Loosen the set screw for the piston detect switch and adjust it vertically until the Piston Detected LED illuminates. Note the range of vertical travel which illuminates the LED. Adjust the switch to the middle of the range. Tighten the set screw after adjustment. Confirm the LED remains lit after tightening the set screw as shown in figure 4.

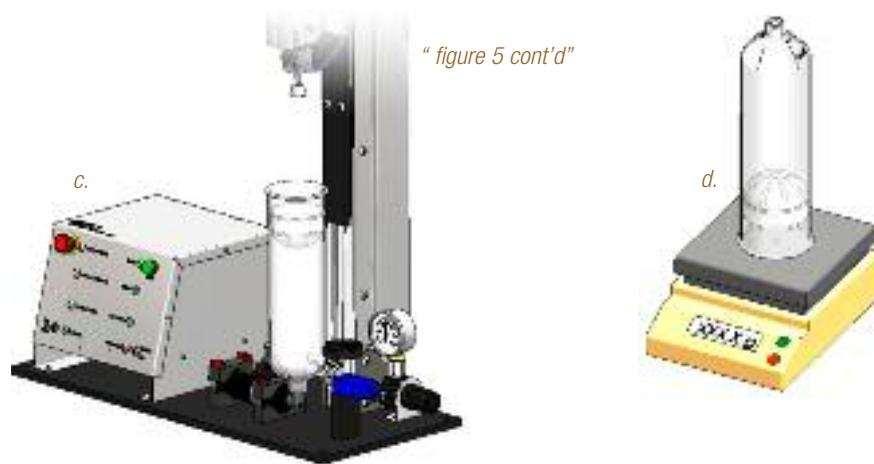


- 12.** Retract the cylinder by hand. The Piston Detect LED will turn off.
13. Power Switch to OFF.
14. Connect the Cartridge Filler to the shop air supply.
15. Power Switch to ON
16. Set the air pressure regulator to 5 to 8 psi (.34 - .55 bar).
17. Fill a cartridge to the desired level using Manual Mode. In Manual Mode, the Cartridge filling system dispenses anytime the START button is pressed and a cartridge is present. The machine will not extend the cylinder to check for a piston in Manual Mode. Stop periodically and weigh the cartridge until the desired weight is reached as shown in figure 5.

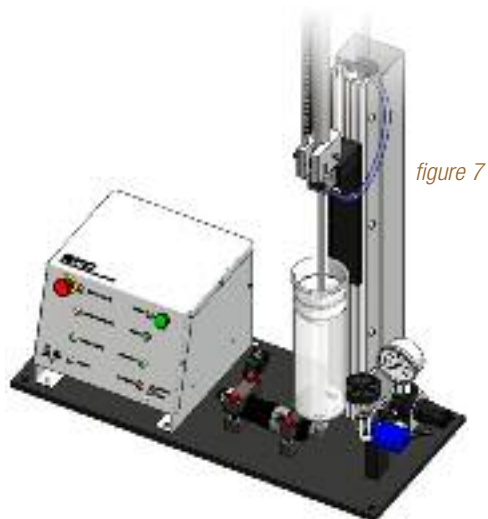
Note: The cartridge piston should not be filled to a point that drives the piston closer than 1/2 inch from the top of the cartridge as shown in figure 6.



“ figure 5 continues on pg 16.”



18. Turn the power OFF and disconnect the shop air supply.
19. Power switch to SETUP
20. Extend the cylinder by hand until it touches the piston in the full cartridge as shown in figure 7.



21. Adjust the upper magnetic switch until the top Switch LED illuminates.
22. Retract the cylinder by hand. The Upper Switch LED will turn off.
23. Power OFF.
24. Place the Auto/Manual switch in the Auto position (down).
25. Power ON.
26. The Cartridge filling system is now set to fill in the Auto Mode.

OPERATING HINTS

To avoid spills, be sure to thread the cartridge onto the elbow fitting until it is hand tight.

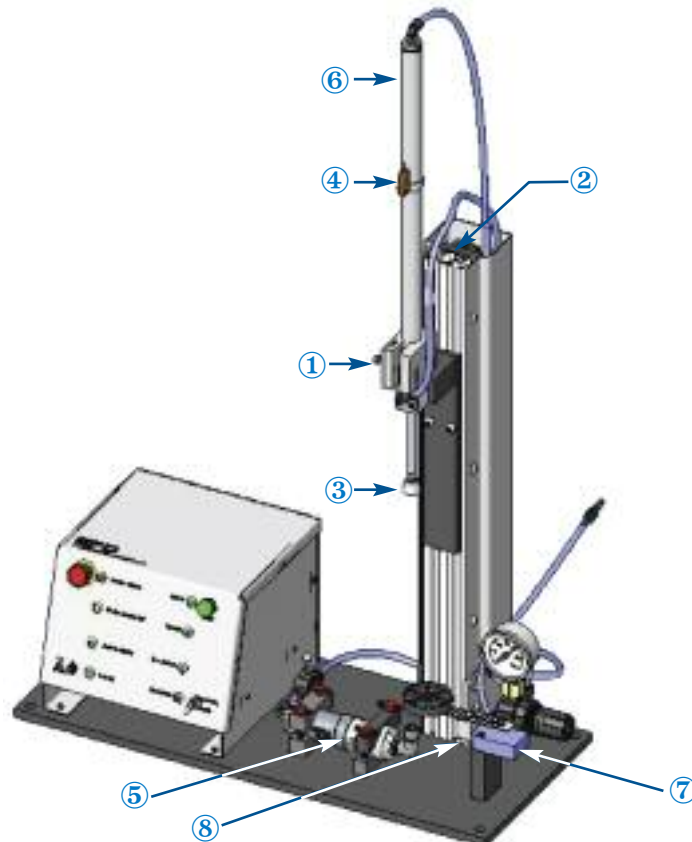
To ensure consistent filling results, install every cartridge onto the elbow with the same number of turns.

TROUBLESHOOTING GUIDE

Problem	Possible Cause and/or Resolution
No Electrical Power	External power supply is not plugged into AC source or is not connected to machine
	Power switch set to OFF or SETUP
	E-stop switch is set
Air pressure gauge registers zero	Shop air not connected
	Power switch not in ON position
	E-stop switch is set
	Air Pressure Regulator set to zero
Air cylinder extends; then machine stops	Cartridge is not threaded far enough onto elbow fitting
	Check Controller terminals for loose wires
In Auto mode, cartridge fills beyond desired level	Upper Switch position is incorrect
	Check Controller terminals for loose wires

REPLACEMENT PARTS

	Description	Part#
	CARTRIDGE FILLING MACHINE	7014123
	POWER SUPPLY, 40 W	7022019
	KIT, EUROPEAN INPUT POWER CORD	7014872
	FUSE KIT, CF 3 (PACKAGE OF 3)	7015447
①	MAGNETIC SWITCH ASSEMBLY, CF	7015377
②	SOLENOID VALVE, CF	7015378
③	PLUNGER, CF	7015379
④	MAGNETIC SWITCH	7015380
⑤	736 HPA-NV VALVE	7013449
⑥	KIT, AIR CYLINDER ASSEMBLY WITH SWITCH	7015448
⑦	CARTRIDGE DETECT SWITCH, CF	7015458
⑧	LEVER ARM, CF	7015460
	USER MANUAL	7015184



OPTIMUM CARTRIDGE SYSTEM COMPONENTS

Cartridge with Pistons Installed		
Clear Cartridges with Pistons Installed		
Part#	Size	Qty/Box
7012395	2.5 fl oz (75 ml)	250
7012404	6 fl oz (180 ml)	250
7012413	12 fl oz (360 ml)	250
7012418	20 fl oz (600 ml)	100
7014096	32 fl oz (960 ml)	100
Amber Cartridges with Pistons Installed		
Part#	Size	Qty/Box
7012396	2.5 fl oz (75 ml)	250
7012405	6 fl oz (180 ml)	250
7012414	12 fl oz (360 ml)	250
7012738	20 fl oz (600 ml)	100
7014097	32 fl oz (960 ml)	100
Black Cartridges with Pistons Installed		
Part#	Size	Qty/Box
7012397	2.5 fl oz (75 ml)	250
7012406	6 fl oz (180 ml)	250
7012415	12 fl oz (360 ml)	250
7013880	20 fl oz (600 ml)	100
7014099	32 fl oz (960 ml)	100
Green Cartridges with Pistons Installed		
Part#	Size	Qty/Box
7014169	2.5 fl oz (75 ml)	250
7014172	6 fl oz (180 ml)	250
7014175	12 fl oz (360 ml)	250
7014178	20 fl oz (600 ml)	100
7014098	32 fl oz (960 ml)	100

Nordson EFD One Year Limited Warranty

In no event shall any liability or obligation of EFD arising from this warranty exceed the purchase price of the equipment. This warranty is valid only when oil-free, clean, dry, filtered air is used.

All components of the EFD Cartridge filling system are warranted for one year from 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. EFD will repair or replace free of charge any part of the equipment thus found to be defective, on authorized return of the part prepaid to our factory during the warranty period.

See www.nordsonefd.com for information about how to properly dispose of this equipment.

EFD makes no warranty of merchantability or fitness for a particular purpose. In no event shall EFD be liable for incidental or consequential damages. This equipment is regulated by the European Union under WEEE Directive (2002/96/EC).



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

Global

East Providence, RI USA
800-556-3484; +1-401-431-7000
info@nordsonefd.com

Europe

Dunstable, Bedfordshire, UK
0800 585733; +44 (0) 1582 666334
europe@nordsonefd.com

Asia

China: +86 (21) 3866 9006; china@nordsonefd.com
India: +91 80 4021 3600; india@nordsonefd.com
Japan: +81 03 5762 2760; japan@nordsonefd.com
Korea: +82-31-736-8321; korea@nordsonefd.com
SEAsia: +65 6796 9522; sin-mal@nordsonefd.com

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