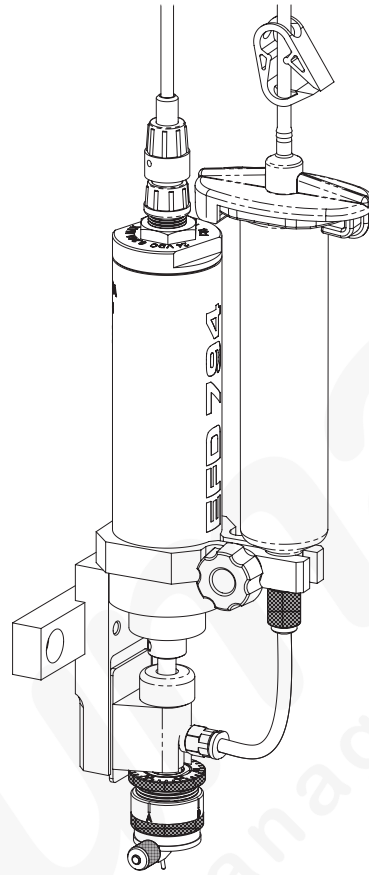


794 Series Auger Valve

Operating Manual



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



You have selected a reliable, high-quality dispensing system from Nordson EFD, the world leader in fluid dispensing. The 794 auger valve 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 794 auger valve.

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 Srini.Subramanian@nordsonefd.com.

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

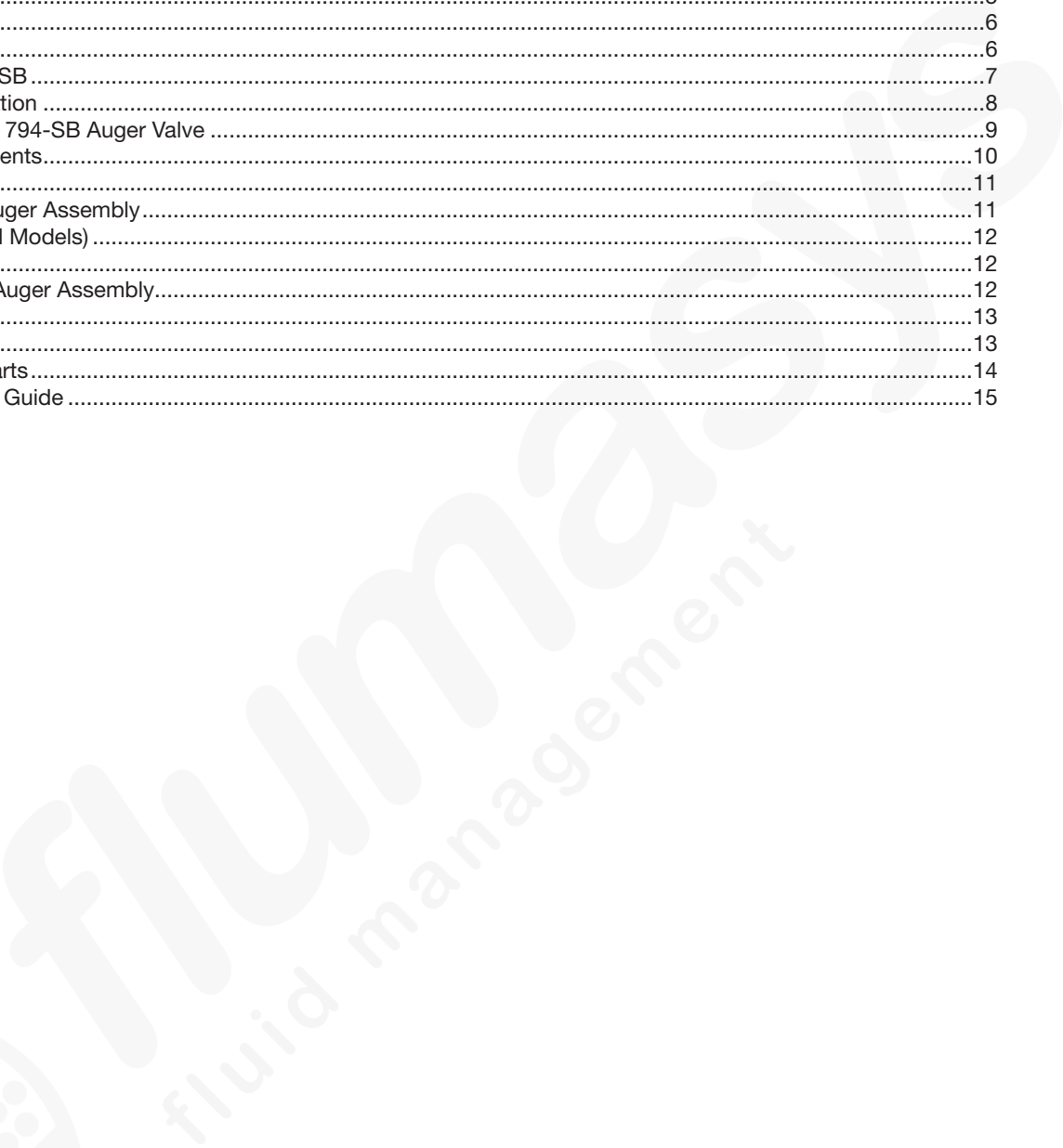
Thanks again for choosing Nordson EFD.

Srini Subramanian
Srini Subramanian, General Manager



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Introduction

The 794 Auger Valve is a precision dispense valve specifically designed for metering controlled deposits of solder pastes, thick sealants, and other particle-filled materials. By combining screw-feed principles with precise time, pressure, and dispensing control, the 794 valve is able to provide accurate, repeatable deposits without damaging the metal particles of the solder. These features are not possible with any other type of conventional control valve. In addition, the 794 offers precise control of very small deposits through the use of a sliding head for machine over-travel and micro-adjustable gap control featuring a contacting foot.

General Information

It is intended that the 794 auger valve be rigidly mounted to and positioned by a suitable factory automation system and controlled by a suitable valve controller. See the “Specifications” section of this manual to select, install, and configure the automation system and valve controller.

Prohibited Uses

The 794 auger valve should not be operated in the following ways:

- Hand-held
- In damp or wet conditions
- In explosive atmospheres
- Under conditions which violate limits set in the “Specifications” section
- Without all system guards, interlocks, and other safety features in place and operational

Warning

It is the responsibility of the factory automation system designer, builder, and / or installer to include safety features sufficient to prevent personal injury or loss of life during operation.

Safety Precautions

The 794 auger valve should be installed, configured, and operated only by qualified personnel who have read and understood all appropriate sections of this manual as well as the operating instructions supplied with the factory automation system onto which it is installed. Protective eyewear should always be worn while operating, adjusting, and servicing the valve. Additional personal protective equipment should be used appropriate to the material being dispensed. An SDS for all materials to be dispensed should be available at or near the operator’s station. The factory automation system should be designed and installed so as to allow the operator to be positioned at a safe distance while operating and adjusting the valve.

Specifications

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

Item	Specification
Size	237.5 mm length x 31.8 mm diameter (9.35 x 1.25")
Weight	544.0 g (19.2 oz)
Auger speed (dry)	250–500 RPM based on voltage input
Auger pitch	8, 16
Input voltage	10–24 VDC (<10% ripple)
Maximum acceleration	2.0 g (0.07 oz)
Maximum continuous current	SR & FR – 240 mA SB & FB – 670 mA (Time delay fuse recommended)
Input air pressure	0–2.07 bar (0–30 psi)
Maximum fluid pressure	2 bar (30 psi)
Fluid inlet	304 stainless steel, #10-32 UNF x 5/32" Optional push-in fitting: Polypropylene
Mounting	10-32, low profile
Fluid body	440C hardened stainless steel
Auger	440C hardened stainless steel
Approvals	China RoHS

All stainless steel parts are passivated.

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)
外部接口 External Electrical Connectors	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。 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。 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>						

Packing List

The following items are included with the 794 auger valve.

Part #	Description	Qty.
7016129	Adapter, 10cc, 6 ft	1
7016134	Adapter, 30cc, 6 ft	1
7019147	8 g Valve Purge Compound	1
7021996	794 Valve Tip Kit	1
7023704	Dot Test Kit Sheet	3
7023750	Valve Purge SDS	1
7023785	Valve Purge Instructions	1

Valve Models

8-Pitch Auger, Brushless

Sliding Head, Brushless Motor, Footed Tip Adapter (SB)

Fixed Head, Brushless Motor (FB)

16-Pitch Auger, Brushless

Sliding Head, Brushless Motor, Footed Tip Adapter (SB)

Fixed Head, Brushless Motor (FB)

8-Pitch Auger, Brush

Sliding Head, Brush Motor, Footed Tip Adapter (SR)

Fixed Head, Brush Motor (FR)

16-Pitch Auger, Brush

Sliding Head, Brush Motor, Footed Tip Adapter (SR)

Fixed Head, Brush Motor (FR)

Installation 794-SB

⚠ WARNING

Disconnect the electrical power and inlet air pressure to the factory automation system and valve controller prior to proceeding.

1. Mount the valve securely to the Z-axis of the robot using the bracket provided for the valve or another appropriate mounting bracket for other machines.
2. Connect the motor lead wire to the valve controller. The white wire connects to the (+) terminal and the brown wire to the (-) terminal.
3. Attach the barrel outlet fitting to the end of a barrel of material to be dispensed.
4. Insert the barrel into the barrel clamp, position as required and clamp securely.
5. Snap the auger assembly into the sliding head after first aligning the inlet fitting toward the front of the valve.
6. Trim a length of the supply hose provided to approximately 80 mm (3 1/8") and push into the barrel outlet and auger assembly input fittings.
7. Attach the blue end of the barrel adapter assembly to the end of the barrel. Connect the bayonet fitting to the valve controller air output.
8. Install an EFD 1/4" long dispensing tip of the appropriate gauge. (Refer to "Changing Tips" on page 11.)

NOTE: For 794FB and 794FR Series (Fixed Head, Brushless / Brush Motor), refer to above installation instructions, steps 1 through 8.

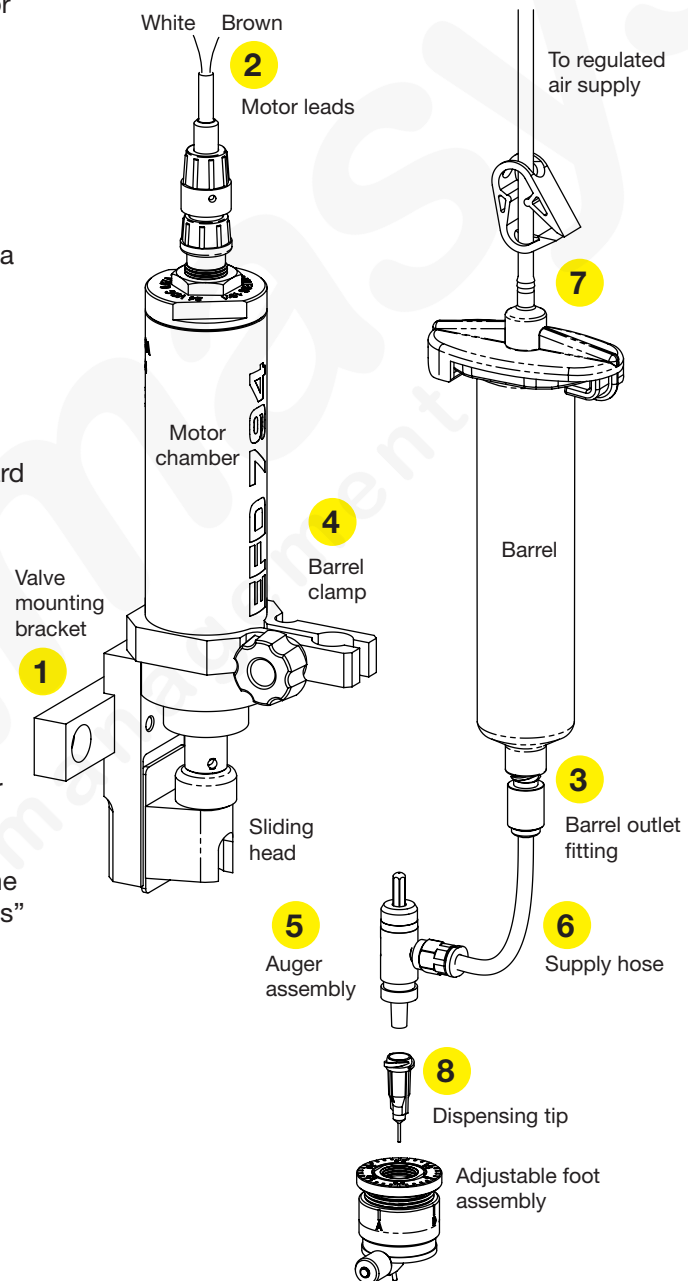


Figure 2. Valve Components
(Model 794-SB shown)

Theory of Operation

Input air pressure at up to 2.1 bar (30 psi) is applied to the material reservoir (1), forcing fluid into the path of the auger. As the auger rotates, fluid moves along the auger flutes (2) and is forced out through the dispense orifice. The valve controller regulates the reservoir pressure, ensuring that there is enough pressure to keep the valve primed with fluid without forcing it past the auger. The duration of the dispensing time is controlled by adjusting the time control up or down until the required deposit size is established, at which point it is repeated with each initiate cycle.

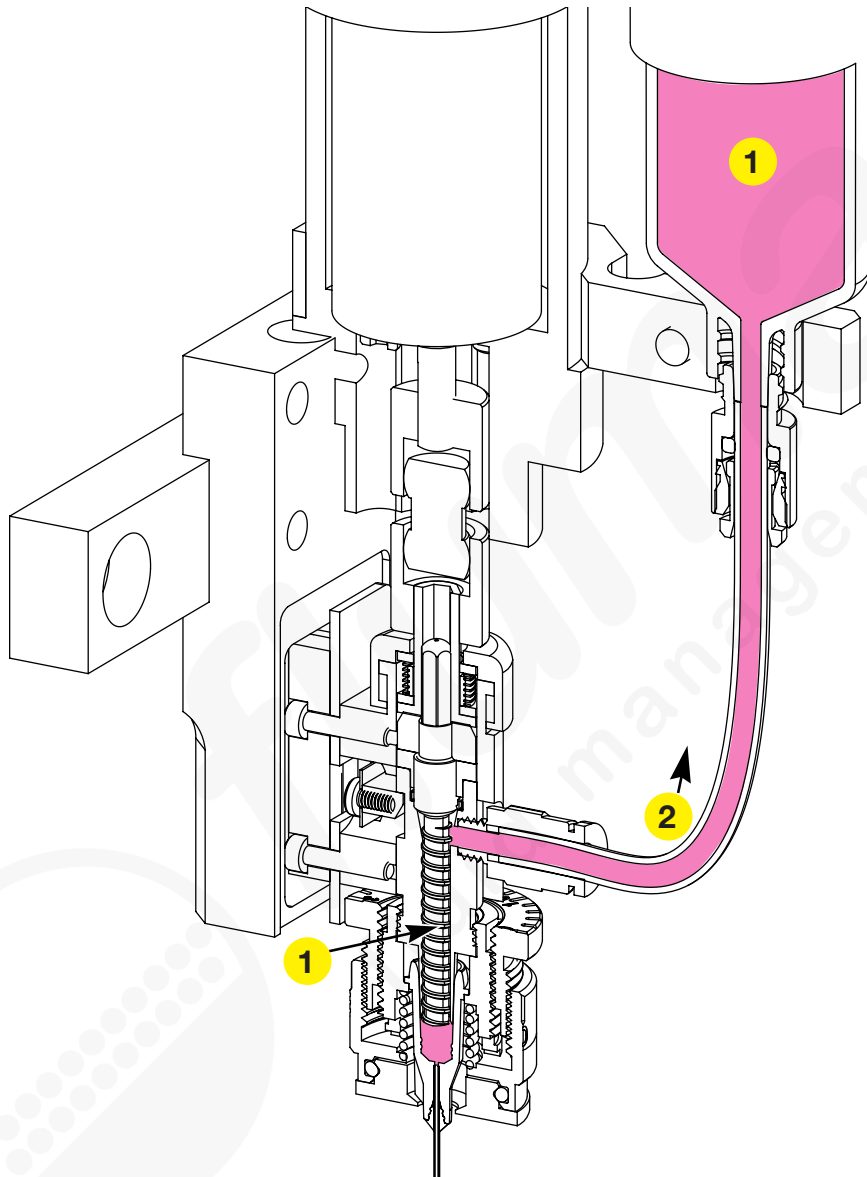


Figure 3. Theory of Operation
(Model 794-SB shown)

Setup for Model 794-SB Auger Valve

⚠ CAUTION

Prior to setting up and operating this valve, read and understand the operating instructions for all components of the dispensing system and become familiar with system programming techniques.

For sliding head, footed tip, and fixed head versions:

1. Initiate a suitable purge routine to cause the valve to run continuously for several seconds. Repeat until all air has been purged from the delivery path.

Continue setup instructions for sliding head and footed tip versions only:

2. First loosen the thumb nut, push the foot all the way in, and tighten the thumb nut. Then follow the procedure outlined in Figures 4 through 6 to “zero” the adjustable foot.

Figure 4. Setup 1. Following the three steps indicated, set the Z-axis stop of the automated dispensing system such that the sliding head is approximately at the middle of its travel. For 20 gauge and larger tips, touch the tip only onto shim stock of about 1/4" of the outside diameter.

Figure 5. Setup 2. Zero the adjustable foot following the three steps indicated in Figure 5.

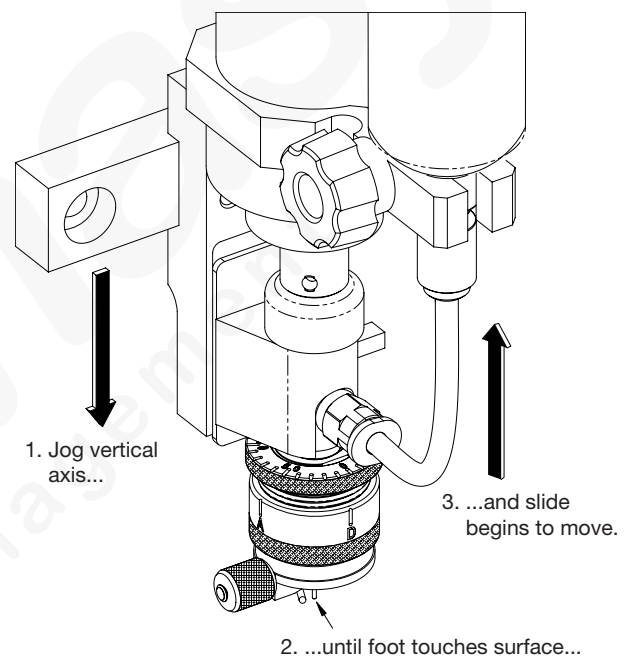


Figure 4. Setup 1

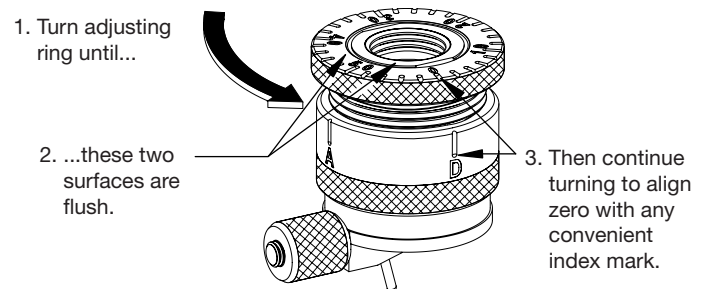


Figure 5. Setup 2

Setup for Model 794-SB Auger Valve (continued)

Figure 6. Setup 3. Orient the foot, Figure 6, following steps 4, 5, 6 so it does not interfere with electrical components or other parts of the workpiece or fixture.

3. Follow the procedure outlined in Figure 7 to set the gap between the substrate and the tip. If a non-chamfered tip is being used, set the gap to approximately 25% of the outside tip diameter.

For chamfered tips, set to 25% of the inside diameter.

Each division on the adjustment dial is $2\ \mu\text{m}$, or $0.000076''$. One revolution is $60\ \mu\text{m}$, or $0.0024''$.

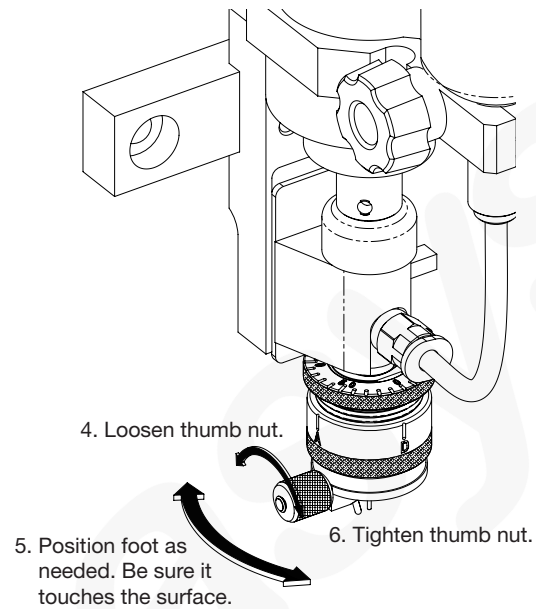


Figure 6. Setup 3

Making Adjustments

Sliding Head, Footed Tip, and Fixed Head Versions

Dispense time is the primary method of making small adjustments in deposit size. In general, larger deposits require longer dispense times, larger diameter tips, and larger gaps (see Figure 7). Be sure to allow settling time (before dispense) and dwell time (after dispense). Very small deposits may require chamfered tips. Air pressure should be set to a point just below where drooling occurs without the auger turning.

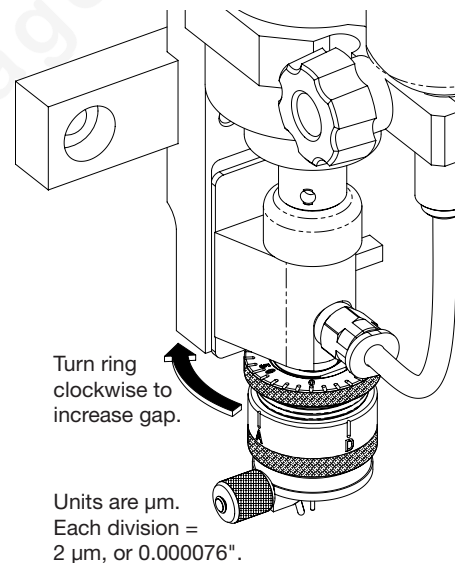


Figure 7. Adjusting Gap

Changing Tips

Follow the directions in Figure 8 to change tips. To assure proper axial location of the tip, the cap on the fine-adjust assembly should be tightened until it bottoms out firmly against the end of the auger assembly. Use only EFD 1/4" long tips, tip sizes 7018029 through 7018462. Refer to the EFD Precision Dispense Tip Sheet for available gauge sizes and dimensions. Always re-zero the foot after changing tips.

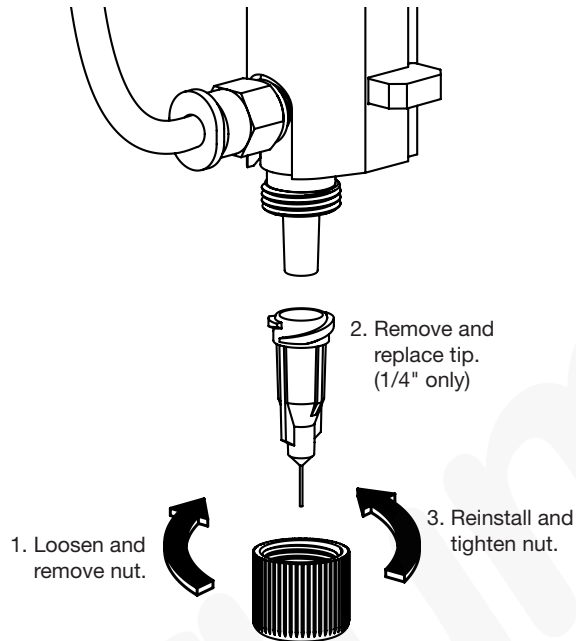


Figure 8a. Changing Tips — Fixed Head

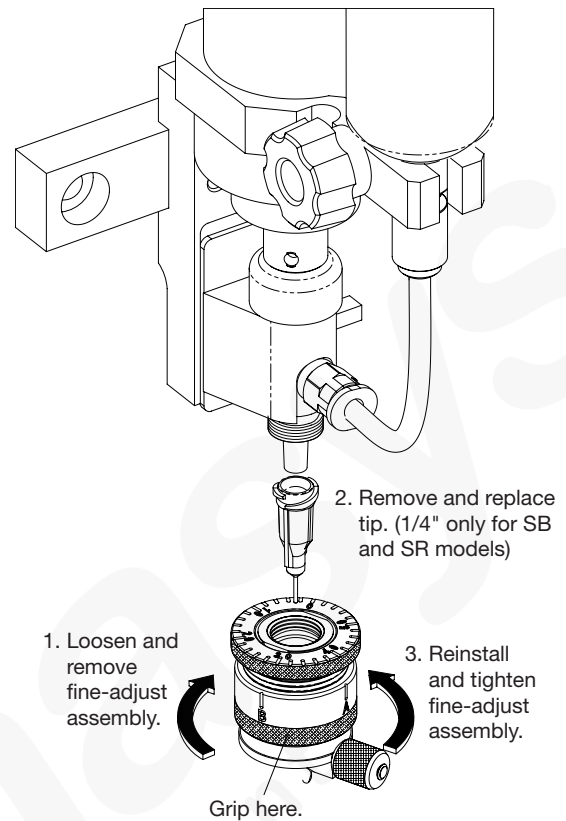


Figure 8b. Changing Tips — Footed Tip

Changing the Auger Assembly

Footed Tip and Fixed Head Versions

Follow the directions in Figure 9 to change the auger assembly. To keep the delivery path intact, loosen the barrel clamp, raise the barrel, and pass the supply hose through the slot in the clamp. To replace the auger assembly, insert the hex drive into the body assembly, rotate the auger assembly until the hex engages, and then push up until the auger assembly snaps into place.

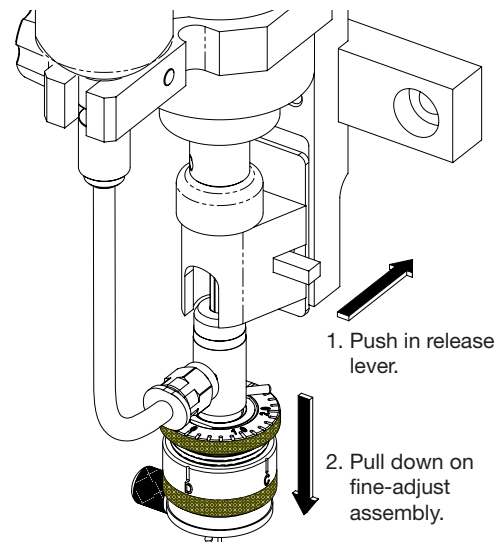


Figure 9. Changing Auger Assembly

Maintenance (All Models)

⚠ CAUTION

Prior to servicing the valve, read and understand the operating instructions for all components of the dispensing system, especially this manual. Perform a complete service shutdown of the automated dispensing system before proceeding.

Purging

The use of valve purge compound (P/N 7019147) between production shifts or after every eight hours of run time is highly recommended. The compound cleans any material residue from the fluid path and conditions the valve for future use.

1. Install the barrel of valve purge compound on the fluid inlet fitting.
2. Apply reservoir pressure and cycle the valve until the valve purge compound has pushed all residual material from the valve. Leave the compound in the valve until future use.
3. To remove the valve purge compound, install material to be dispensed and cycle valve until all compound has been pushed from the valve.

Cleaning the Auger Assembly

If the purging procedure detailed above is not sufficient to clean the valve, disassemble the auger assembly as follows (see Figure 10):

1. Pull the auger straight out of the fluid body, being careful not to damage the seal.
2. Carefully pry the bearing out of the fluid body using a fingernail.
3. Remove the seal using a cotton swab.
4. Clean all parts using any suitable solvent and brushes or an ultrasonic cleaning device.
5. Inspect the seal and bearing for signs of wear or damage and replace if needed.
6. Insert the seal, spring side inward, into the fluid body using the bearing to gently push.
7. Fully press the bearing into the fluid body.
8. Insert the auger, being careful not to damage the seal.

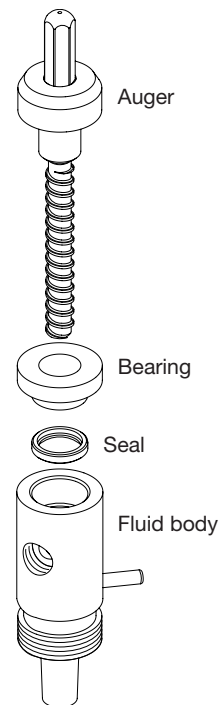


Figure 10. Auger Assembly

Solder Paste

Nordson EFD's comprehensive line of ISO-certified solder paste solutions include high quality printing and dispensing soldering pastes that meet the most stringent application requirements. Visit <http://www.nordsonefd.com/SolderPlusPaste> for details or to request a free sample.

Part Numbers

Brushless Motor Style

Part #	Pitch	Model	Description
7029743	8	794-SB	Auger valve, 8 pitch, brushless motor, sliding head, footed tip
7029742	8	794-FB	Auger valve, 8 pitch, brushless motor, fixed head
7029744	16	794-SB	Auger valve, 16 pitch, brushless motor, sliding head, footed tip
7029463	16	794-FB	Auger valve, 16 pitch, brushless motor, fixed head

Brush Motor Style

Part #	Pitch	Model	Description
7021916	8	794-SR	Auger valve, 8 pitch, brush motor, sliding head, footed tip
7029745	8	794-FR	Auger valve, 8 pitch, brush motor, fixed head
7021917	16	794-SR	Auger valve, 16 pitch, brush motor, sliding head, footed tip
7029746	16	794-FR	Auger valve, 16 pitch, brush motor, fixed head

Replacement Parts

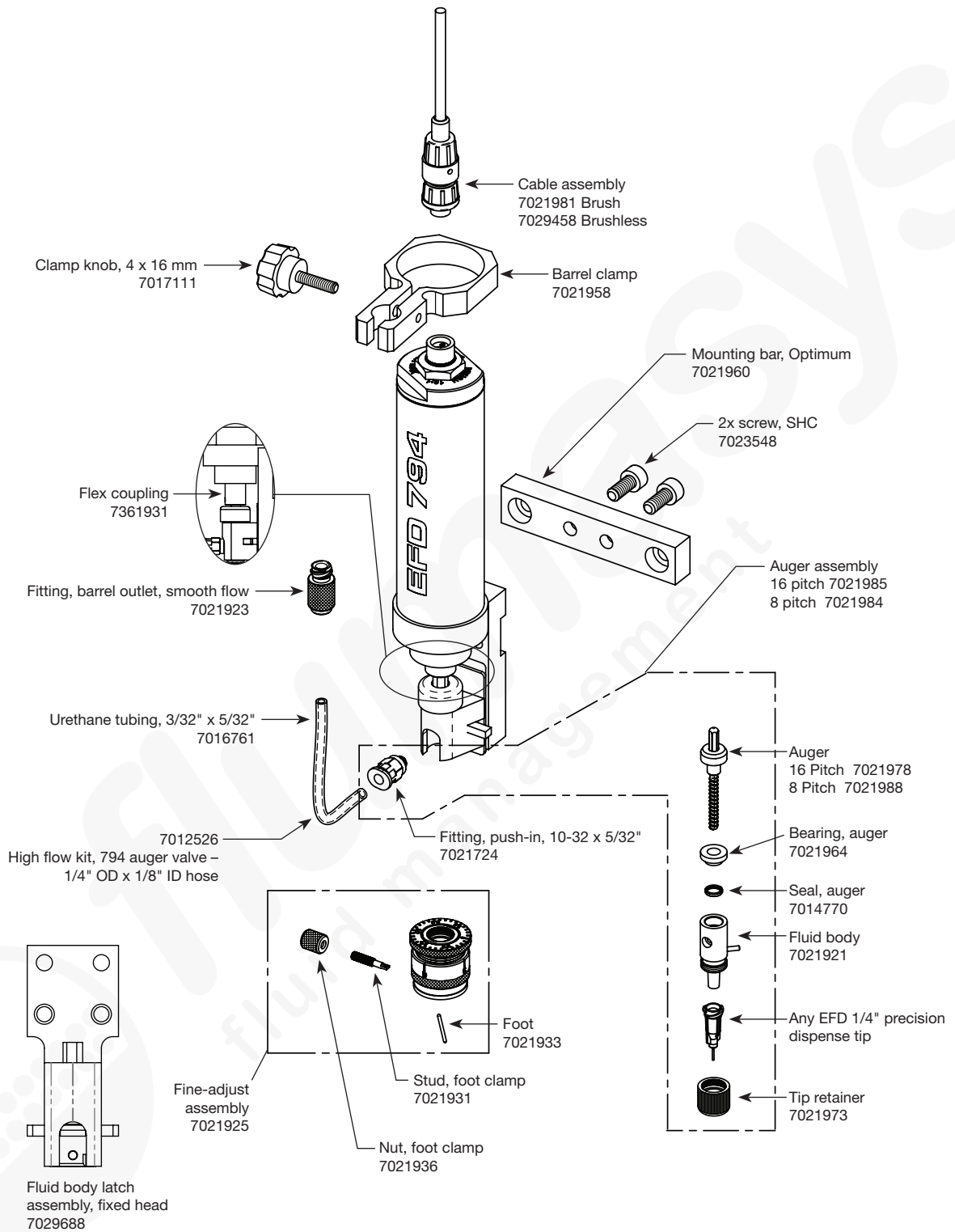


Figure 11. Replacement Parts

Troubleshooting Guide

Problem	Possible Cause	Solution
Auger not turning	Wiring fault	Check accuracy and tightness of all connections
	Cable damaged	Check cable for damage, replace if necessary
	Controller fault	Check controller output with voltmeter; refer to valve "Specifications" section
	Controller set incorrectly	Check settings of controller: motor voltage, direction, dispense duration; refer to "Specifications" section
	Motor fault	Contact your Nordson EFD representative for assistance.
	Auger jammed	Clean auger assembly
	Coupling loose	Tighten set screws
No deposit	Motor turning in wrong direction (should be clockwise when viewed from above)	Check controller motor direction settings
		Reverse motor wires
	Depleted barrel	Replace with filled barrel
	No air pressure	Check controller input air and air settings
	Material cured or dried	Replace with fresh material
	Insufficient air pressure	Increase pressure
	Delivery path clogged	Run one or more purge routines
		Clean delivery path
Replace tip, supply hose and / or fittings		
Smear deposits	Automated dispensing system hunting for position	Tune the automated dispensing system. Contact your Nordson EFD representative for assistance.
	Slide position not settled	Increase settling and / or dwell times
		Decrease velocity and / or acceleration rates
	Valve loose	Tighten mounting connections
Automated dispensing system fault	Service the automated dispensing system. Contact your Nordson EFD representative for assistance.	

Continued on next page

If the problem cannot be corrected, or if you need further assistance, please contact us.

Troubleshooting Guide (continued)

Problem	Possible Cause	Solution
Skipped deposits	Material build-up on outside of tip	Add tip wiping routine to program
		Switch to chamfered tip
	Tip too small	Change to larger (smaller number) tip
	Gap too large	Decrease gap (turn ring counter clockwise)
	Inconsistent material	Check and / or mix material
	Air in material	Run one or more purge routines
		De-air material (vacuum or centrifuge)
Damaged tip	Replace tip	
Inconsistent deposits	Poor material cut-off	Reverse motor briefly at end of deposit routine
		Switch to chamfered tip
	Tip too large	Change to smaller (larger number) tip
	Gap too small	Increase gap (turn ring clockwise)
	Inconsistent material	Replace and / or mix material
	Air in material	Run one or more purge routines until cleared
		De-air material (vacuum or centrifuge)
	Premature retraction	Increase dwell time
Process temperature changing	Install temperature control system, such as an EFD ProcessMate® 6500	
Damaged tip	Replace tip	
Leaking at fittings	Fittings loose	Tighten fittings
	Hose loose on fittings	Replace hose
	Fitting(s) cracked	Replace barbed fitting(s) (P/N 7021919 and / or P/N 7014845)
	Material incompatibility	Replace fitting(s) with optional metal fittings (P/N 7021724)
Leaking at auger	Worn or damaged auger seal	Replace auger seal
Material being damaged	Bent auger	Replace auger
	Worn auger bearing	Replace auger bearing
Residual material at material change-over	Dead spots in material path at barbs	Switch to optional metal fittings (P/N 7021724)

NORDSON EFD ONE YEAR LIMITED WARRANTY

Nordson EFD products 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. Nordson 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. In no event shall any liability or obligation of Nordson 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.

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.

