ValveMate 8040 Controller

Operating Manual

Nordson
EFD

You have selected a reliable, high-quality dispensing system from Nordson EFD, the world leader in fluid dispensing. The ValveMate™ 8040 controller 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 ValveMate 8040 controller.

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

Contents

Introduction

IMPORTANT: The primary control of deposit size is the valve open time. The ValveMate 8040 provides easy access and "on the fly" adjustment of valve open time.

The ValveMate 8040 is an EFD spray valve controller, incorporating programmable dispense time, digital time readout, four independent solenoid drivers and input/output communication with host machine PLCs.

Other features include:

- Push-button time setting input or onetouch time programming.
- Floating decimal, providing dispense time ranges of 0.001 to 99.9 seconds.
- Bright red LED display.
- Push-button purge feature.
- Low air-pressure optional tank low level detection, or other alarm detection devices.
- End-of-Cycle feedback signal.

The ValveMate 8040 has been designed with the machine builder and operator in mind. The objectives are to bring spray valve control close to the point of application, and to provide the features necessary to make setup and operation as easy and precise as possible.

The ValveMate is easy to operate. Once you have reviewed the features, you will understand the benefits and the ease of control the ValveMate provides.

As with all EFD products, the ValveMate has been produced to exacting specifications and thoroughly tested prior to shipment.

To obtain maximum performance from this equipment, please read the instructions carefully.

Safety

Please read the EFD product safety statement included in the package. Follow all appropriate safety instructions.

Preventative Maintenance

As part of maintaining continuous trouble-free use of this product, EFD recommends a few very simple preventative maintenance checks.

1. Periodically inspect tube to fitting connections for proper fit. Secure as necessary.

2. Check tubing for cracks and contamination. Replace tubing as necessary.

3. Check all wiring connections for looseness. Tighten as necessary.

4. If front panel requires cleaning, use a clean, soft damp rag with a mild detergent cleaner. DO NOT USE strong solvents (acetone, MEK, etc.) as they will damage the front panel material.

Specifications

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

Cabinet size:	18.3w x 8.5D x 5H cm (7.22w x 3.38D x 2H")
Weight:	0.27 kg (0.6 lb)
Input AC (to power supply):	100–240 VAC (+/-10%) ~, 50/60Hz, 1.0 Amp
Output voltage (from power supply):	24 VDC — 1.25 Amp maximum
Power requirements:	24 VDC — 1.25 Amp maximum
Feedback circuits:	5 to 24 VDC — NC solid-state switch, 100 mA maximum
Initiate circuit:	5 to 24 VDC signal
Cycle rate:	Exceeds 400 per minute
Time range:	Programmable 0.001 to 99.9 seconds
Ambient operating conditions:	Temperature: 5° C to 45° C (41° F to 113° F) Humidity: 5 to 95% Height above sea level: 2,000 meters max (6,562 feet) This equipment is for indoor use only.
Product Classification:	Installation Category I Pollution Degree 2

Meets or exceeds CE and CSA requirements

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

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.

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.

Front Panel Buttons

SEL — Pressing the SEL ⬛ button scrolls sequentially through ❶····❷ and ❸····❹ channel time settings appropriate to the MODE ⬛ selection. Time in seconds is displayed on the three digit LED display.

MODE — Pressing the MODE ⬛ button scrolls through the menu at the left of the LED. Also used for clearing ALARM faults.

| RUN | **RUN** — Enables external initiate inputs. The cycle button is disabled. |

| SETUP | **SETUP** — Setup / testing / and modification of ❶····❷ and ❸····❹ TIMER modes. |

| PURGE | **PURGE** — Enables individual or simultaneous purge of spray valves. Used in conjunction with SEL ⬛ channel selector, PURGE ⬛ can occur with or with out nozzle air function. See page 17 for complete PURGE ⬛ sequence details. |

| TEACH | **TEACH** — For easy setting / teach of times modes longer spray cycle applications. |

| DELAY | **DELAY** — Allows user entry to increase or decrease post nozzle air delay upon completion of spray valve actuation. |

CYCLE — Pressing the CYCLE ⬛ button will provide different results according to the selected MODE.

TIME SET — Pressing the UP ⬛ or DOWN ⬛ buttons will change valve-on time for the selected valve(s) or the DELAY time. Pressing both buttons simultaneously will zero out the time. These buttons are enabled in the RUN, RUN SETUP SETUP, and DELAY DELAY modes only.

ALARM INDICATORS — At the beginning of any of the spray activities, if ALARM circuit is open, "ALr" ⬛ flashes on the LED display. ALARM condition needs to be corrected — either low pressure, low level, or other alarm open circuit. After the circuit is restored, the flashing "ALr" ⬛ becomes steady. Press MODE ⬛ button to resume normal operation.
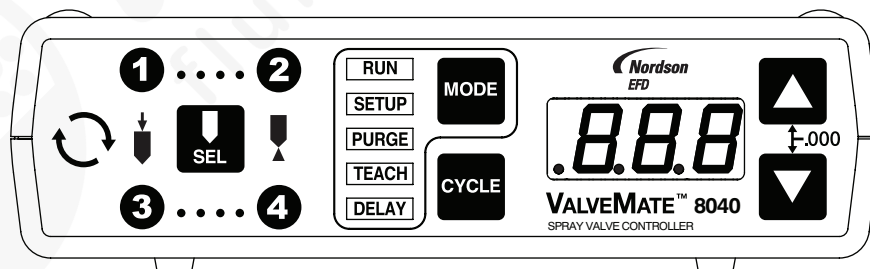
Indicator Lamps

The indicator lamp ↻ at the far left will be lit any time valves are actuated.

The four numbered spray lamps around the SEL ⬇ button will be lit ❶····❷ and ❸····❹ sequentially then all ON by pressing the SEL ⬇ button.

In the center of the front panel are five indicator lamps: RUN SETUP PURGE TEACH DELAY. These lamps indicate the mode of operation.

Modes of Operation

RUN **RUN** — The ValveMate 8040 is ready to be initiated through the I/O, resulting in a spray cycle. Time settings can be made "on the fly" while the machine is running. For "on the fly" adjustment, ❶ select ⬇ appropriate channel, ❶····❷ and ❸····❹. ❷ Press CYCLE CYCLE. LED display will "flash." ❸ Press UP ▲ or DOWN ▼ arrow to add or subtract time to selected channel. ❹ When finished, press CYCLE to lock in new TIME. Initiate signals are only enabled in the RUN mode.

SETUP **SETUP** — In the SETUP SETUP mode, time settings can be changed and spray volume tested.

PURGE **PURGE** — This allows purging from selected ⬇ or all channels for the duration the CYCLE CYCLE button is pressed. PURGE PURGE can occur with or without nozzle air function. (See page 17 for complete PURGE sequence details.)

TEACH **TEACH** — Select ⬇ channel. Pressing and holding the CYCLE CYCLE button in the TEACH TEACH mode will begin "flashing" of the LED display for 5 seconds before TEACH function begins. Add incremental time to selected channel by continued press and hold of CYCLE CYCLE button, or ".000" out channel time and begin TEACH TEACH sequence described above. Repeat sequence for each channel.

FLASHING LED
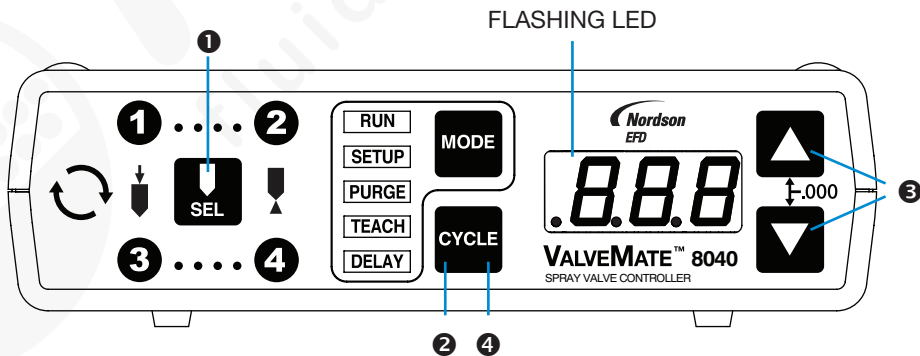
Modes of Operation (continued)

⬚DELAY **DELAY** — In the delay ⬚DELAY mode, the time set buttons can be used to enter a post nozzle air delay for the selected spray valve. This delay is used to ensure that all fluid is atomized after the valve closes leaving a clean nozzle.

Steady Mode Operation

Channel ❶····❷ and ❸····❹ can be put into a steady mode / time override operation. ❶ In Setup mode ⬚SETUP, ❷ press SEL ⬚ for selected channel. ❸ Press both UP / DOWN ▲▼ buttons to ".000" out channel time. ❹ Press and hold DOWN ▼ button for 5 seconds or until ❺ "– – –" appears on LED display. Repeat steps for each channel requiring steady mode. To return to TIME setting, enter SETUP ⬚SETUP mode. Select ⬚ appropriate channel. Press UP / DOWN ▲▼ buttons simultaneously. ".000" will appear on LED display. Re-enter time value as needed.
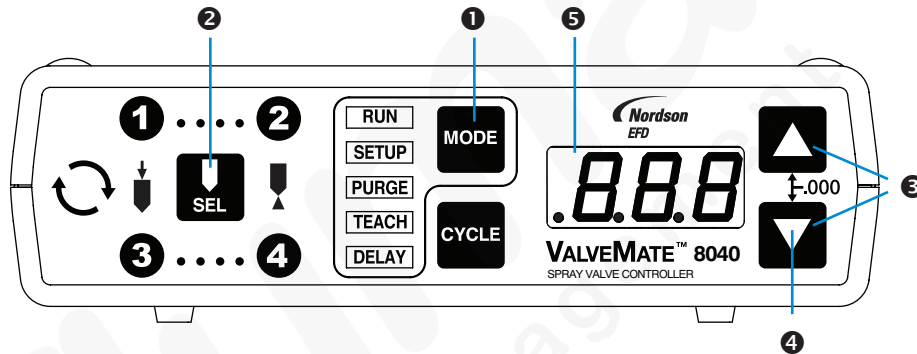
Typical Setup — Two Valve System Installation

Alarm In

Low Pressure Switch

Filter Regulator

ValveMate 8040 Controller

Solenoid Cables

Nozzle Air Solenoid

Nozzle Air Supply

Nozzle Air Regulator

Actuating Air Solenoid

Actuating Air Supply

Tank Air Line

Nozzle Air

Actuating Air

Fluid Feed Line

1-Liter Tank

Spray Valves

VALVE AIR PRESSURE 70 PSI (4.8) BAR SN 000000 MADE IN THE USA

	Electrical
	Constant Air
	Fluid
	Actuating Air
	Nozzle Air

Mounting the ValveMate 8040

The ValveMate 8040 can be mounted either over or under a cabinet using screws or panel mounted using the optional bezel mount #7022038.

Panel thickness (see table)

Fits M4 or UNC / UNF #8 screws for under or over cabinet mounting

Spring clamps

Panel mount bezel

Panel Cutout Dimensions

A

B

C (4X)
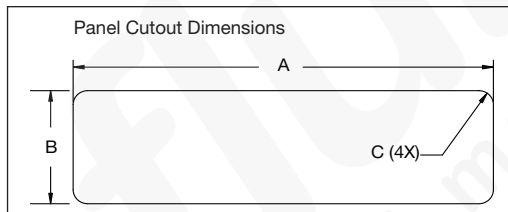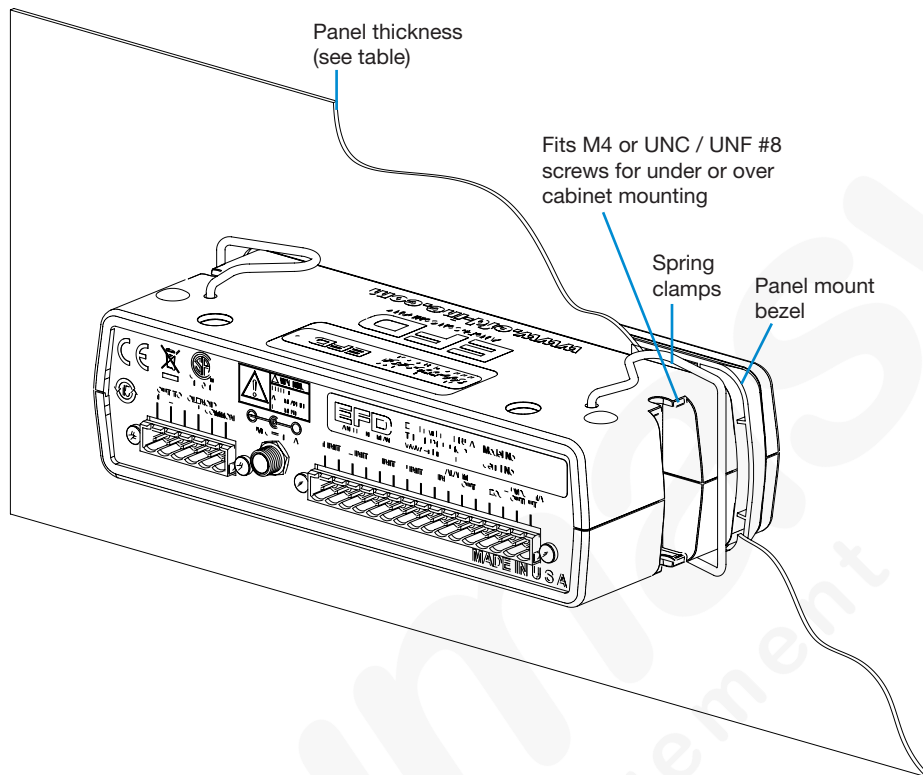
	Min		Max	
Dimension	**mm**	**in.**	**mm**	**in.**
A	183.6	7.23	185.2	7.29
B	51.6	2.03	53.1	2.09
C	R3.3	R.13	R9.4	R.37
Thickness	1.6	0.063	2.3	0.091

Input Power Supply

A universal 24VDC remote power supply is included with each ValveMate 8040. Select a convenient location and connect to appropriate input voltage.
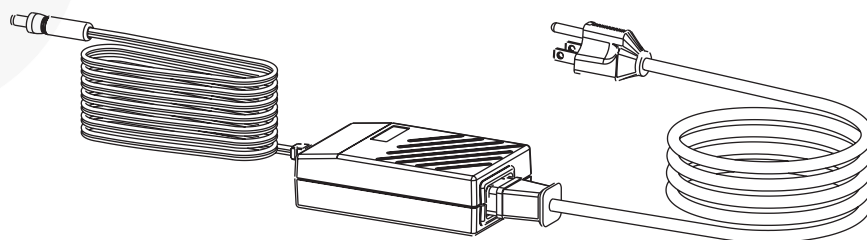
Input/Output Connections

The 16 pin terminal strip includes four dispense valve initiate inputs, an alarm I/O, an End of Cycle output, and a 24VDC courtesy power output.

The four initiate inputs can be connected in series, parallel, or to separate input sources for independent valve control, or ability to disable a specific valve when using "part in place" verification.

For detailed connection schematic and instructions, refer to page 14.

The alarm I/O is used to monitor air supply pressure and/or tank low level. This I/O can be used to operate an audible alarm, or be connected to the machine controls to shut off the machine if air pressure or tank level is low. In addition, when the alarm is activated, the display will flash "ALr" $\boxed{ALr}$, indicating that air pressure or tank level has dropped below minimum.

The End Of Cycle (EOC) feedback can send a signal back to the machine controls, signaling when the dispense cycle is finished. Using this signal can increase machine productivity by eliminating any delay after the dispense cycle and also confirms a dispense cycle has occurred. 2 INIT and 4 INIT are non-active inputs. As long as an initiate sequence is in progress on any channel, the EOC circuit is open. Maximum load is 100 mA from 5 to 24 VDC.
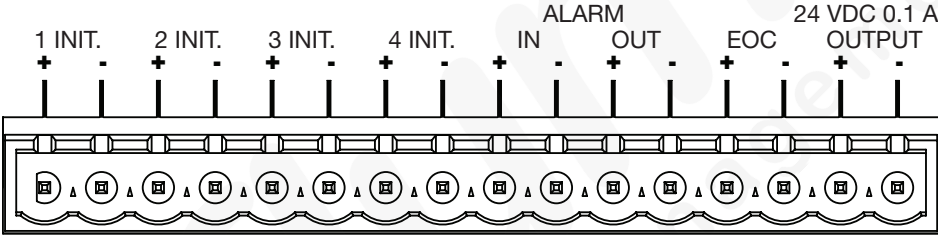
Initiate Connection

See page 14 for a detailed Initiate Connection Schematic.

1····2 and 3····4 Channel Initiate

The 8040 can be initiated through a time cycle by the application of 5 to 24 VDC to the 1 INIT or 3 INIT input terminals. A system set-up schematic is detailed on page 9. 2 INIT and 4 INIT input terminals are not used.

Alarm IN / OUT Connection

The ValveMate 8040 features an ALARM input and output circuits. The ALARM IN can be activated through the connection of either the low air pressure sensor (supplied), low level fluid float switch (if used) or other such device/accessory that may be selected for ALARM purposes. ALARM switches are to be wired in series and must be normally closed switches.

> **If no ALARM switch is being used, the ALARM IN positive (+) and negative (-) terminals must have a jumper installed to disable the ALARM feature.**

The ALARM OUT circuit is a normally OFF electronic switch that can switch an external 5–24 VDC circuit to an external signaling device or PLC input. Maximum load is 100 mA, 5–24 VDC.

Initiate Connection (continued)

End of Cycle Connection (EOC)

Upon completion of a spray cycle, an open collector circuit closes and remains closed until the next spray cycle. This circuit can be utilized to signal back to a host computer, start another device in sequence or other operations that need to be tied into the completion of the spray cycle. This circuit will close when all spray activity has completed.

Upon closure, power from an external source is allowed to pass through the circuit to operate a 5 to 24 VDC load or be monitored by the host machine controls.

The load illustrated is a relay, but this could be any device that will operate within the 5 to 24 volt range. Power consumption of the load must not exceed 250 mA.

24 VDC Output

Courtesy 24 volt DC 100 mA (maximum) can be used to provide power to EOC and ALARM out circuits for signaling purposes. Also, can be used as a power source for an indicator device or initiate signal through a contact closure switch to the 4-channel Initiate circuit.

Initiate Connection Schematic

INPUTS		**POWER IN** **24 VDC** **1.25 A MIN.**	**VOLTAGE INITIATE** **5–24 VDC** **2.2 mA AT 5 VDC** **15 mA AT 24 VDC**

ALARM IN
NC SWITCH
10 mA MAX.

OUTPUTS

3 WAY, 2 POSITION
2 SOLENOID VALVES
24 VDC
5 WATT EACH MAXIMUM
NEG. COMMON

SWITCH CLOSURES
5–24 VDC SOURCE
100 mA MAX.

COURTESY
SUPPLY 24 VDC
100 mA MAX.
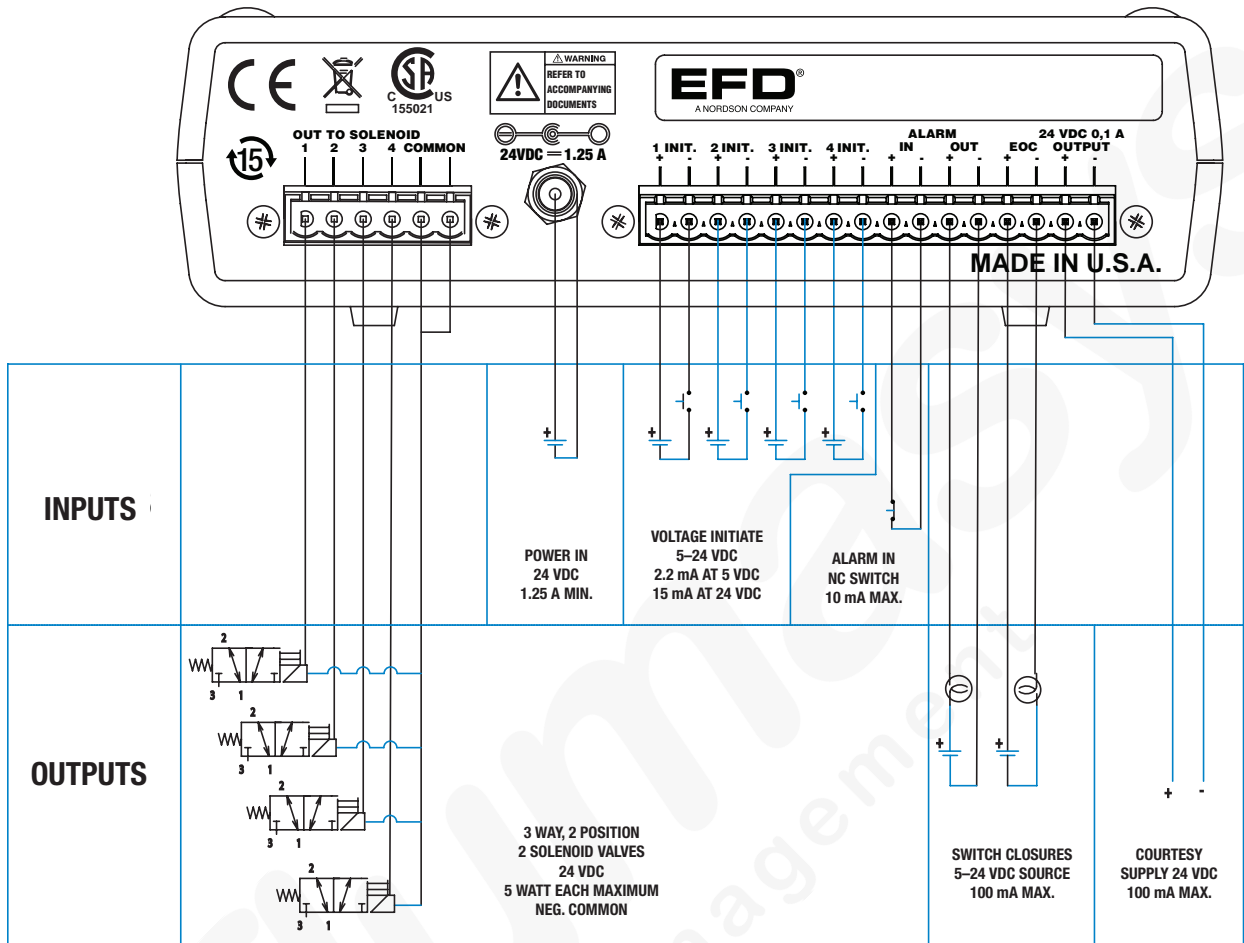
Installing the Air Solenoids

❶ Mount the solenoid packs in a convenient location near the spray valve station.

❷ Interconnect the solenoid pack to the ValveMate 8040 controller using the cable supplied.

❸ Refer to the inset for color coded wire designation

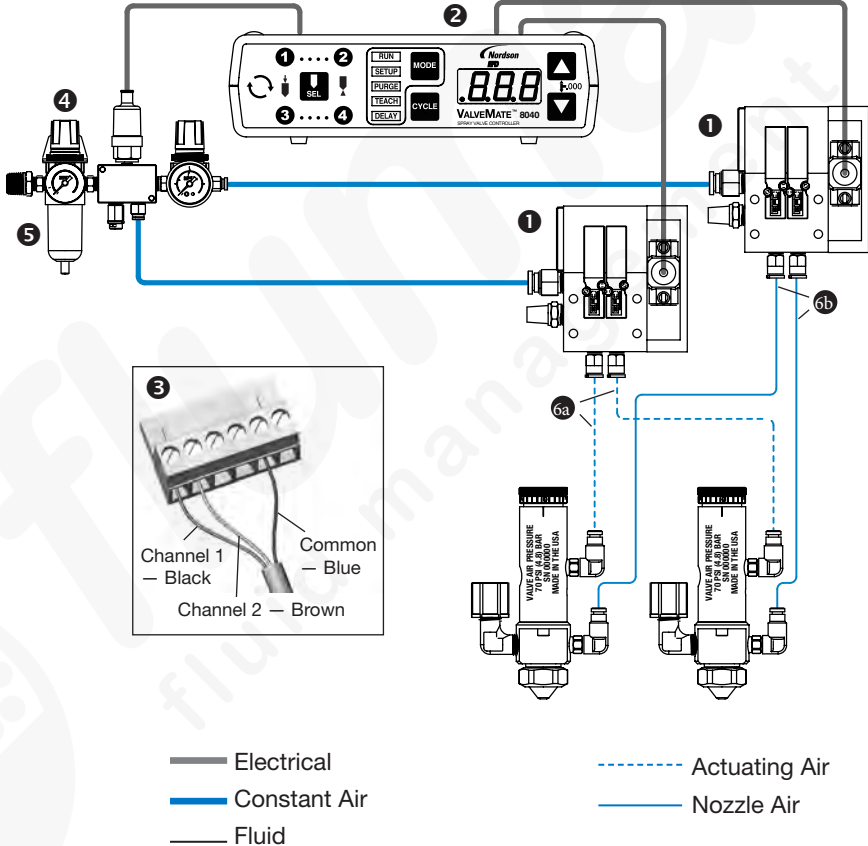❹ Connect a regulated and filtered air supply to the solenoid pack.

❺ Supply pressure to the solenoids should be set to 5.5 bar (80 psi).

Installing the Dispense Valves

All EFD spray valves are supplied with an installation manual. The manual will explain the operation of the spray valve and also how to set up the valve with the fluid reservoir. ❻ Connect the valve actuating air hoses to the appropriate solenoid output. ❻ₐ White hoses to white push-in fittings for actuating air. ❻ᵦ Black hoses to black push-in fittings for nozzle air.

Channel 1 — Black
Common — Blue
Channel 2 — Brown

— Electrical
— Constant Air
— Fluid
----- Actuating Air
— Nozzle Air

Final Setup Checklist

❶ Air pressure to solenoid pack is set to 5.5 bar (80 psi).

❷ Nozzle air pressure regulator is set to 1.02 bar (10 psi).

❸ Solenoids and I/O are wired correctly.

❹ Spray valves and fluid reservoir are properly connected.

❺ Spray valves are set up and installed in accordance with the spray valve installation guide.

❻ Turn power on. Confirm indicator lamps and display is lit.

NOTE: The ValveMate 8040 is not equipped with an ON / Off switch and remains in ON condition as long as input power supply voltage is maintained.
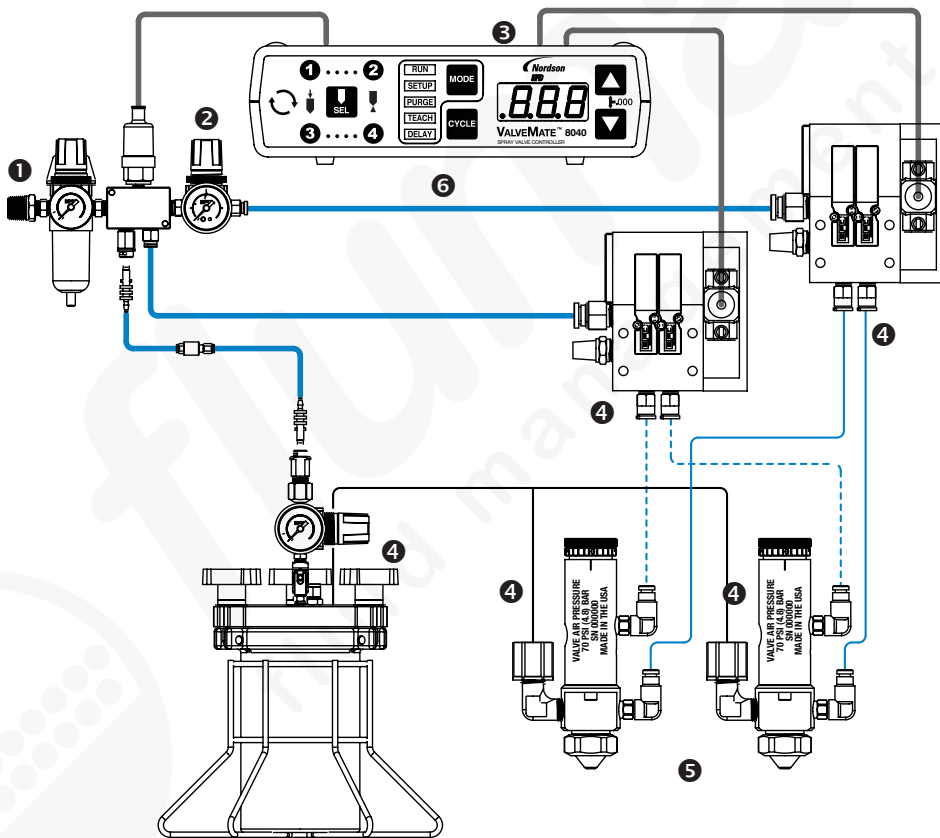
Testing the Spray Valves

Set tank pressure. For low viscosity, low pressures and high viscosity, higher pressure.

Using the Mode `MODE` button on the ValveMate controller, place the controller in the PURGE `PURGE` mode. In PURGE `PURGE` mode only, channels ❶····❷ and ❸····❹ can be selected independently without nozzle air pressure.

Using the SEL `SEL` button, press to sequence as follows:

Place a container under the spray valve and press the CYCLE `CYCLE` button to open the spray valve and flow material until all air is purged from the system. Adjust the tank pressure, or valve stroke knob to set a flow rate that is not too low or too high. A goal starting point for a fine spray is one drop of fluid per second. For heavier spray, increase the drop rate just below where the flow becomes a steady stream. Adjust flow using a combination of tank pressure and valve needle stroke.

Set nozzle air pressure regulator to 0.7 bar (10 psi).

Using the PURGE `PURGE` mode again, actuate the spray valves and observe the spray sequence: ❶····❷ `SEL` ❸····❹

Press SEL: Channel ❶ only is active ❷ is off.
Press SEL: Channels ❶····❷ only are active.
Press SEL: Channel ❸ only is active ❹ is off.
Press SEL: Channels ❸····❹ only are active.
Press SEL: Channels ❶ and ❸ only.
Press SEL: All channels are now active.

Press mode and place controller in SETUP `SETUP` mode. Using the ▼ UP / DOWN ▲ buttons, set a spray time of 0.05 seconds for all valves.

Press the CYCLE `CYCLE` button to initiate a spray cycle. Increase or decrease the time or tank pressure to arrive at the desired deposit size. **The primary control of deposit size is the valve open time.** Final time setting may be different for each valve as this is the way we compensate for minor variations in tubing length or tolerance stack up.

The system is now ready to be initiated by the machine controls when the machine is started.

Troubleshooting Guide

| Problem	Possible Cause and Correction
LED is blinking "ALr" $\boxed{\mathit{ALr}}$ and will not accept initiate signal.	Air pressure to the solenoid pack has dropped below 4.1 bar (60 psi) or if low level float switch is used, tank level is low. Raise the input pressure to 4.8 bar (70 psi) or refill the tank. Press CYCLE $\boxed{\text{CYCLE}}$ button to reset.
	If problem persists, make sure devices such as air cylinders are not causing a pressure drop in the ValveMate 8040 solenoid pack input air line. If no ALARM switch is being used, the ALARM IN + / - terminals must have a jumper installed to disable ALARM feature.
Unit is not responding to the initiate signal.	Check to make sure the unit is not in a mode other than RUN $\boxed{\text{RUN}}$. Response delay in pneumatic circuit does not allow the valve to open when time is set at or below 0.010 seconds. Increase time. Initiate signal may have a low level of leakage. The signal must break clean before the next signal is initiated.
Timer is inoperative.	Check to make sure the unit is not in the steady mode. The timer is very reliable. Any failure is total so no inconsistency is possible.
Flashing $\boxed{\mathit{SoL}}$ on LED display.	Short on the OUT TO SOLENOID circuit. Check solenoid wiring connections.

If the problem cannot be corrected, or if you need further assistance, please call us. In the US, call 800.556.3484. In the UK, phone 0800 585733. In Asia, +86 (21) 3866 9006.

Replacement Parts List

ValveMate 8040

7022050: Connector housing, 16 pin
7022027: Plug, terminal block, 16 pin
7022048: Connector housing, 6 pin
7022025: Plug, terminal block, 6 pin
7002002: 5-micron Filter / Regulator
7013433: Cable, solenoid, manifold, 12 ft
7022015: Rubber feet
7022019: Power supply, 40 W
7022023: Stand
7022032: Solenoid valve, manifold mount
7022036: Solenoid valve, Inline, DIN
7022038: Panel mount kit
7022041: Pressure Switch
7022043: Hole plug, 5/16, nylon
7022045: Cable, Inline solenoid, Din Connector
7022054: Control panel – VM8040
7022055: Main PC board, 8040
7022057: Air Manifold Block, VM8040
7022250: Solenoid Valve Kit — Two Inline
7022251: Solenoid Valve Kit — Two Dual
7023284: Cable, 2-cond. 24AWG Hi-Flex
7026543: Kit DC Cable Assembly-2M-Locking Conn
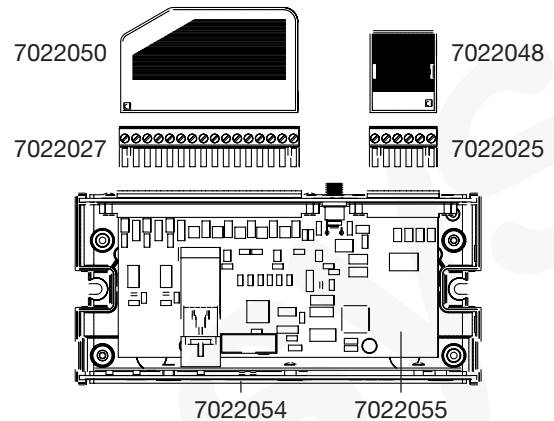
NORDSON EFD ONE YEAR LIMITED WARRANTY

All components of the Nordson EFD ValveMate 8040 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.

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.

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

Nordson
EFD

flumasys
fluid management

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info@flumasys.com