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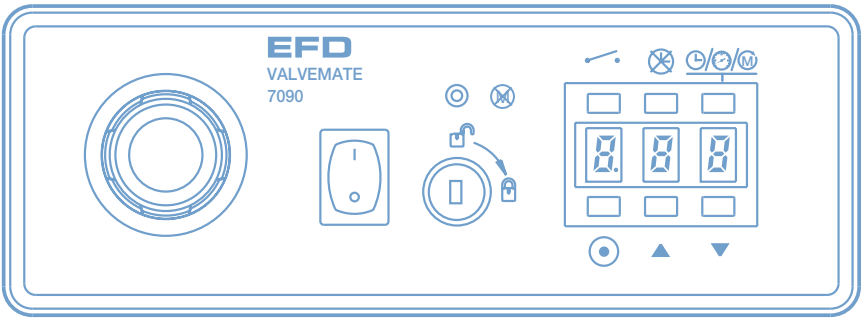
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ValveMate™ 7090 Controller Operating Manual



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Meets CSA and CE standards.

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Introduction

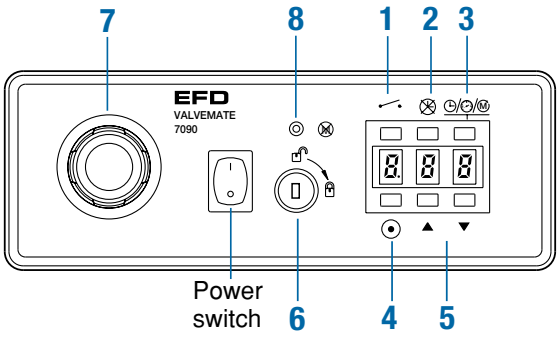
The ValveMate 7090 controller provides precise time, fluid pressure and speed control, incorporating digital status displays for easy process control and set-up. Designed for use with the 790 Series auger valves, the ValveMate 7090 features microprocessor-controlled functions, including motor start-up acceleration limits and maximum current overload protection for extended motor life. The controller can be operated in a continuous or pulse mode for added flexibility. The ValveMate 7090 is simple to use and will operate many millions of cycles without maintenance.

Specifications

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

Size:	7.5" W x 5.6" D x 2.7" H (19 x 14 x 7 cm)
Weight:	3.3 lb (1.5 kg)
Cabinet:	Aluminum
Input Voltage:	Selectable 100/120/220 VAC
Fuse:	T 160 mA 250V
Output protection fuses (F1, F2):	F 315 mA 250V
Power required:	50/60 Hz 20/17 VA
Feedback Circuits:	5 to 24 VDC NC solid-state switch 250 mA maximum
Initiate Circuit:	5 to 24 VDC momentary or dry contact closure
Air Input:	65 psi (4.5 bar)
Cycle Rate:	Exceeds 400 per minute
Time Range:	.001 to 99.9 seconds

Operating Features



1. Cycle

Press to initiate one complete cycle. Green lamp illuminates to indicate cycle is on. Press again to interrupt the current cycle.

2. Time override

Press to override time control. Display will show (---). While in this mode, dispensing is manual using the cycle button or the foot pedal (optional, #2015A).

3. Time/Pressure/Motor Speed

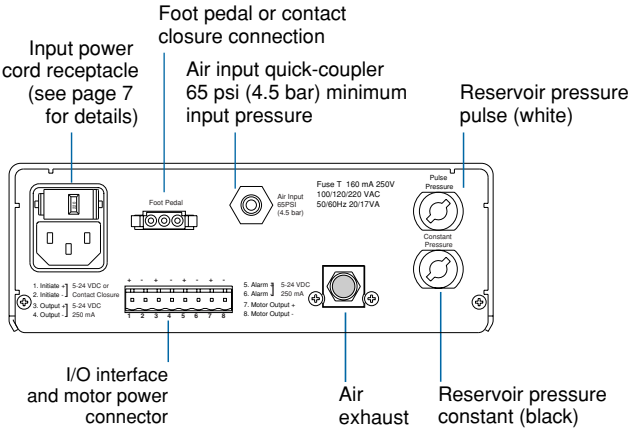
Press to toggle the LED display between time, pressure or motor speed voltage setting.

Time is displayed in real time from .001 to 99.9 seconds. In settings less than 1.0 seconds, the decimal will not show. Pressure is identified with a flashing "P" for pounds per square inch or an "A" for atmosphere in the left display segment. Motor speed is identified with a rotating cursor in the left display segment and voltage in the two right segments. Motor voltage can be set between 10 VDC and 24 VDC.

4. Program

Press to clear display to zero. Display flashes bright/dim while in program mode.

Press cycle button and hold until required deposit is established. Each time it is pressed, time will be added. Press program button again to exit program mode and store new time setting.



5. Status Change Buttons ▲▼

When time is displayed, press the up or down buttons to increase or decrease setting. When pressure is displayed, use these buttons to change display between "psi" or "bar" readout. When motor voltage is displayed, use these buttons to increase or decrease voltage (speed) of the valve motor.

6. Control Lockout

Turn key to the right to lock-out access to program and status change buttons. Cycle, time override and display toggle buttons stay active. The key may be removed in either the locked or unlocked position.

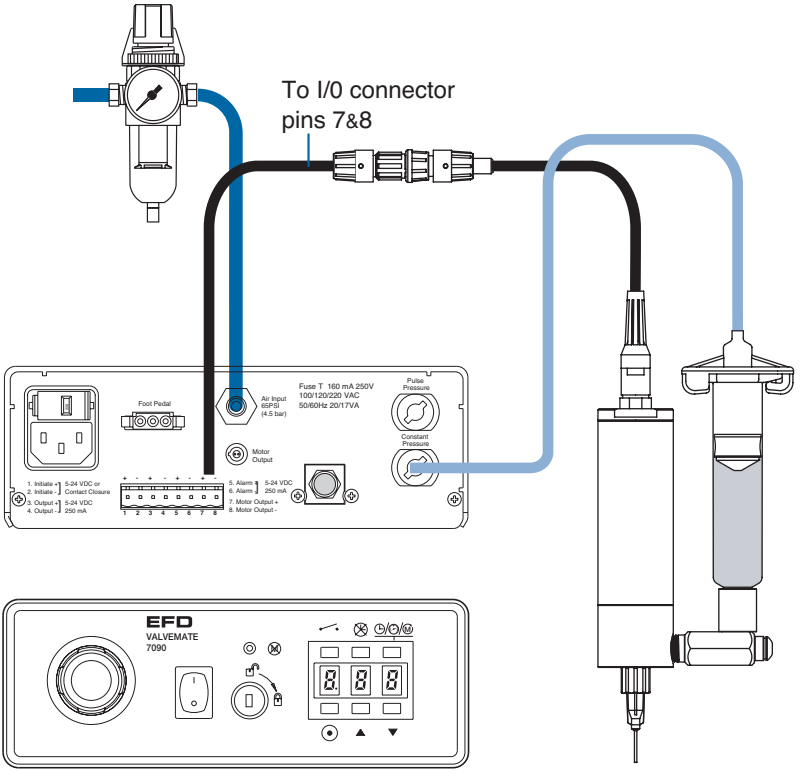
7. Air Regulator Control

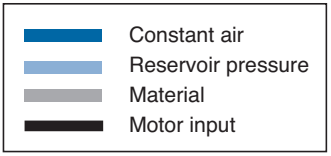
Turn to the right to increase output pressure and to the left to decrease. When decreasing pressure, reduce pressure below desired setting and then increase up to target pressure. Maximum pressure is 30 psi (2.07 bar).

8. Motor Failure Indicator

Illuminates when an overload condition exceeding 135 mA has shut-down the motor controller. To reset the controller, turn the power switch off and then on again.

Typical Setup

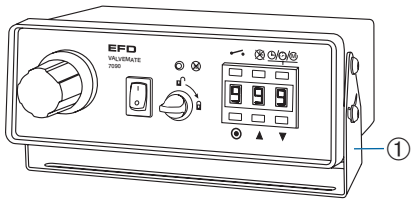




Controller Setup

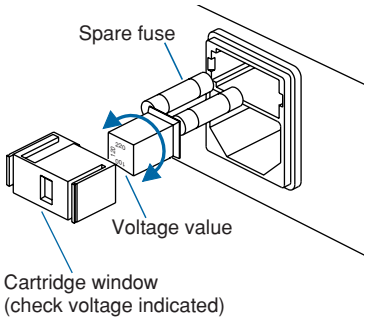
① Mounting

Use the universal mounting bracket (included) to mount the controller either over or under the cabinet. The bracket allows the controller to pivot 30° from a horizontal position. For panel mounting, a panel mount bracket kit is available (#7000PMK).



② Input Power

1. View cartridge window in power-cord receptacle to ensure that the voltage is set properly.
2. If it does not match, remove the fuse cartridge. Then remove the fuse holder from the cartridge, rotate the holder and position the correct voltage to show through the cartridge window. Reassemble in reverse order.
3. Connect the power cord.



③ Initiate Connection

The 7090 can be operated by applying a 5 to 24 VDC pulse to terminal pins

1 and 2, or install a contact closure device. Alternatively, a foot pedal may be ordered (#2015A) and plugged into the connector located on the rear panel.

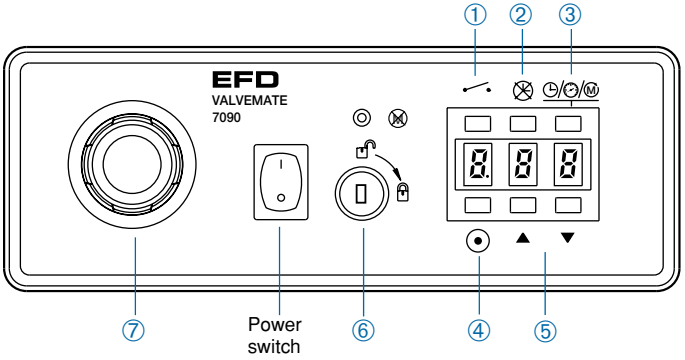
④ Air Input Connection

1. Connect the input air hose (supplied) to the EFD five-micron filter regulator #2000F755, then to air input quick-connect on the rear panel.
2. Adjust input regulator pressure to 65 psi (4.5 bar).

⑤ VALVE CONNECTION

Follow instructions in 790 Installation Guide.

Trial Run



1. Turn power switch to the ON position, then press toggle button until pressure is displayed (P00).
2. Adjust pressure regulator to 8 psi (0.5 bar).
3. Press the up/down buttons to change the pressure display from psi (P) to the metric equivalent in atmosphere (A) if preferred.
4. Place the dot-pattern card (supplied) with the purge compound under the dispensing tip.
5. Press the time override button; display will show (---).

6. Press and hold the cycle button. The motor will begin to run. Continue to hold the button until the red purge compound begins to dispense from the tip. Continue dispensing until valve is purged of all air.
7. To determine deposit size, press and hold the program button until the display flashes bright to dim. Press and hold the cycle button. The valve will begin to dispense while accumulating time on the display. Release the cycle button, then press again; time will be added to the prior sum. Press the program button to save the time.
8. Press the cycle button or optional foot pedal to initiate a complete cycle. Each press on the button or pedal will repeat the same timed deposit. Pressing the button or pedal while the valve is dispensing will stop the cycle.
9. Press up/down buttons to make fine adjustments to the time. Press the buttons momentarily to single step, or press and hold to scroll the time display.
10. Press the toggle button twice to enter the motor speed mode (24 will show on the display). Press the down button to reduce the voltage to 15. Press the cycle button and notice the change in dispensing rate. Press the up button to return to normal operating speed of 24.
11. Turn the key lock to the locked position. Notice that the program, up and down buttons are not operative. The cycle, time override and toggle buttons, however, do function in the locked mode.

Operation Review

Reservoir Pressure Setting

Air pressure is used to maintain a constant flow of fluid from the reservoir to the auger. In general, 8 to 12 psi (0.5 bar to 0.8 bar) is enough pressure for solder paste. Some experimentation may be necessary to find the correct pressure for other fluids.

Set the pressure so there is enough to keep the auger primed at all times, but not so much pressure that the fluid is forced past the auger when the valve is off.

Begin by setting the pressure at 10 psi (0.68 bar). Operate the valve in time override mode without a dispensing tip installed until material flows from the outlet. If after 10 seconds material does not flow, increase pressure. The pressure setting is correct when fluid does not flow between cycles when the valve is off.

Controlling Deposit Size

Dispense time is one of the three means to control the output from the 790 valve. For optimum results, the minimum time setting should not be less than .070 seconds.

The diameter of the dispensing tip also affects deposit size. Reducing the diameter reduces deposit size by restricting the fluid flow. It is recommended to use as large a tip as practical for the application. This will keep the time setting low, thereby maximizing productivity.

Motor Speed

The motor-speed control provides fine-tuning of output. The reference for motor speed on the LED display is in voltage. Normal operating voltage is 24 VDC, which is the maximum speed and may be reduced to 10 VDC minimum. Reducing motor speed will reduce the dispensing rate.

This feature is useful when stripes or beads of material are being dispensed. The dispensing rate may be coordinated with the linear travel speed of the valve, as in the case of XY motion control.

Power Off

The power switch controls both the power and air supply within the 7090 controller. With power on, air pressure is available to the pressure-output connectors and material reservoir. Turning the power off closes the pressure control solenoid and exhausts all air from the reservoir.

It is recommended to turn power off whenever the system will not be used for an extended period of time.

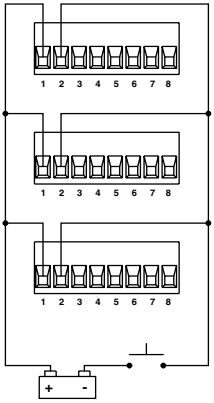
Connecting more than one 7090 Controller

1. Voltage Initiate Circuit

To start the dispense cycle for multiple 7090 controllers at the same time, connect the voltage initiate circuit in parallel as illustrated.

Note: The amperage consumption for the voltage initiate circuit will increase with each controller that is connected. The initiate power supply should be sized accordingly.

1. Parallel circuit diagram for **Voltage Initiate.**

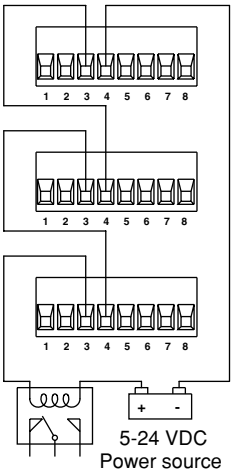


2. End-of-Cycle Feedback Circuit

This circuit will ensure that the end-of-cycle signal will come from the last 7090 to complete a dispense cycle. Connect in series as illustrated.

Note: There will be a maximum voltage drop of 2.0 VDC through the feedback circuit with each 7090 that is added to the series. The input power should be adjusted for this drop to ensure that the required voltage is available to operate the load. Maximum input voltage to terminals 3 and 4 must not exceed 30.0 VDC.

2. Series circuit for **End-of-Cycle Feedback** feature. A relay is illustrated as one example for utilizing the feedback circuit.



Input/Output Connections

1. Voltage Initiate Circuit

The controller may be initiated with a 5 to 24 VDC signal or contact closure across pins 1 and 2. The signal can be momentary (no less than 0.02 seconds) or maintained. A new cycle will begin once power is removed and then applied again or contacts are opened and closed again.

2. End-of-Cycle Feedback Circuit

Upon completion of a dispense cycle, an open collector circuit closes and remains closed until the next dispense 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 completion of the dispense cycle.

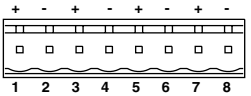
Upon closure, power from an external 5 to 24 VDC source is allowed to pass through the circuit to operate a load. The load illustrated is a relay, but this could be any device that will operate within the 5 to 24 volt range. Power consumption of the load must not exceed 250 mA.

3. Alarm

The 7090 monitors motor current draw. If an overload is detected, the controller will shut-off motor power. An open-collector circuit will close and remain closed until the motor-control mode switch is turned off. This circuit is used to signal the host computer that a motor failure has occurred.

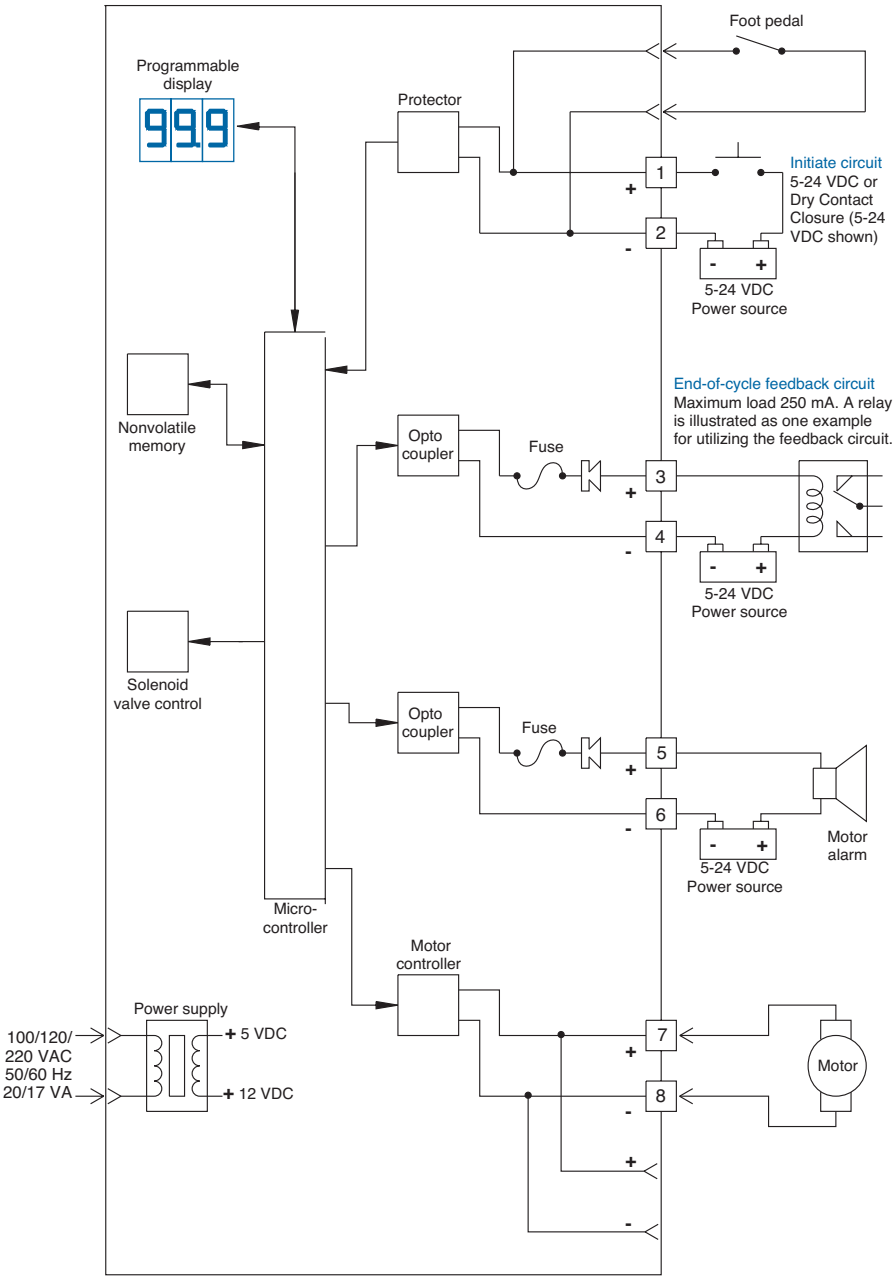
I/O Connection

The 8 pin D connector and internal circuitry provide external initiate and end-of-cycle feedback signal. The pin connections are shown below.



Pin	Function
1.	Initiate +
2.	Initiate -
3.	Output +
4.	Output -
5.	Alarm +
6.	Alarm -
7.	Motor output +
8.	Motor output -

Input/Output Connections



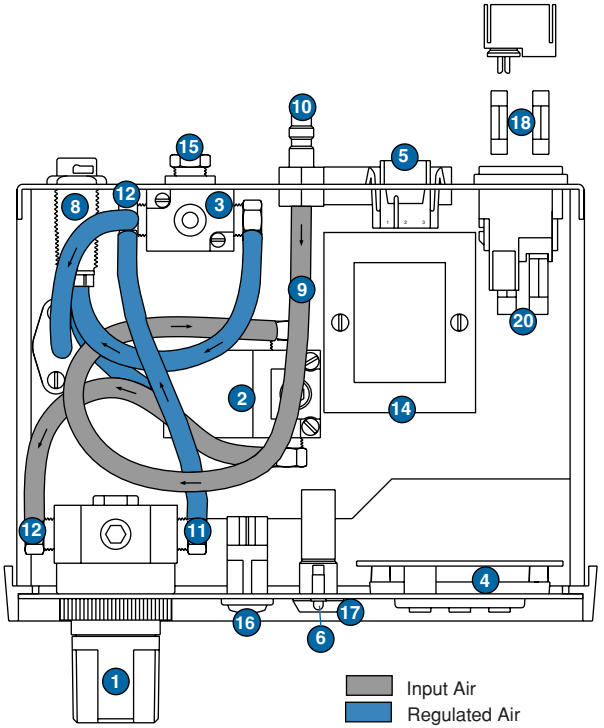
Troubleshooting Guide

Trouble	Possible cause and correction
No power	Be sure that there is power at the wall receptacle. Check the input power fuse. If the fuse has blown, check the voltage value in the fuse cartridge window. Be sure that it matches the input voltage.
End-of-cycle feedback circuit is not functioning	Ensure that the external voltage to the circuit is between 5 and 24 VDC and that the load does not exceed 250 mA.
Timer seems inoperative	Check to be sure time override mode is off.
Motor failure indicator light is on, indicating a current overload condition	Dispensing tip may be clogged, stalling the motor. Replace tip and reset by turning power off, then back on. Auger is frozen. Remove fluid chamber and service fluid path. Motor has failed. Replace motor.

If trouble cannot be corrected, or if you need further assistance, **please call us**.
In the US, call 888-333-0311. In the UK, phone 0800 585733.
In Mexico, 001-800-556-3484.

Schematic and Replacement Parts List

1.	2-2002-7090	Regulator assembly 0 to 30 psi, 0 to 2.07 bar
2.	2-2003-7090B	Constant solenoid assembly
3.	2-2003-7090	Control solenoid assembly
4.	2-2006DB-790	Display PCB assembly
5.	2-2017-1500	Foot pedal receptacle assembly
6.	2-2033-7060	Motor failure indicator
7.	2004B	Female quick-connect – black (not shown)
8.	2004B-W	Female quick-connect – white
9.	2024-160	1/4" OD x .160" ID tubing
10.	2081A	Air input quick-connect
11.	2085	1//8 NPT x 1/4 barb - low profile
12.	2086	1/8 NPT x 1/4 barb 90° - brass
13.	79012	Motor power harness receptacle (not shown)
14.	2-7090PS	Power supply
15.	7108	Exhaust muffler
16.	7109	Power switch
17.	7122	Key lock switch
18.	7111E	Fuse – AC power
19.	2015A	Optional foot pedal (not included)
20.	7143-01	Fuse – output protection (2)



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All components of EFD ValveMate™ controllers 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.

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