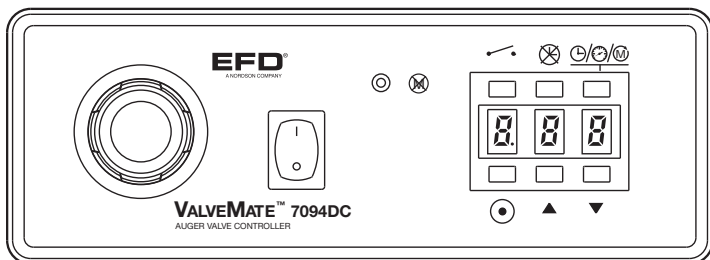
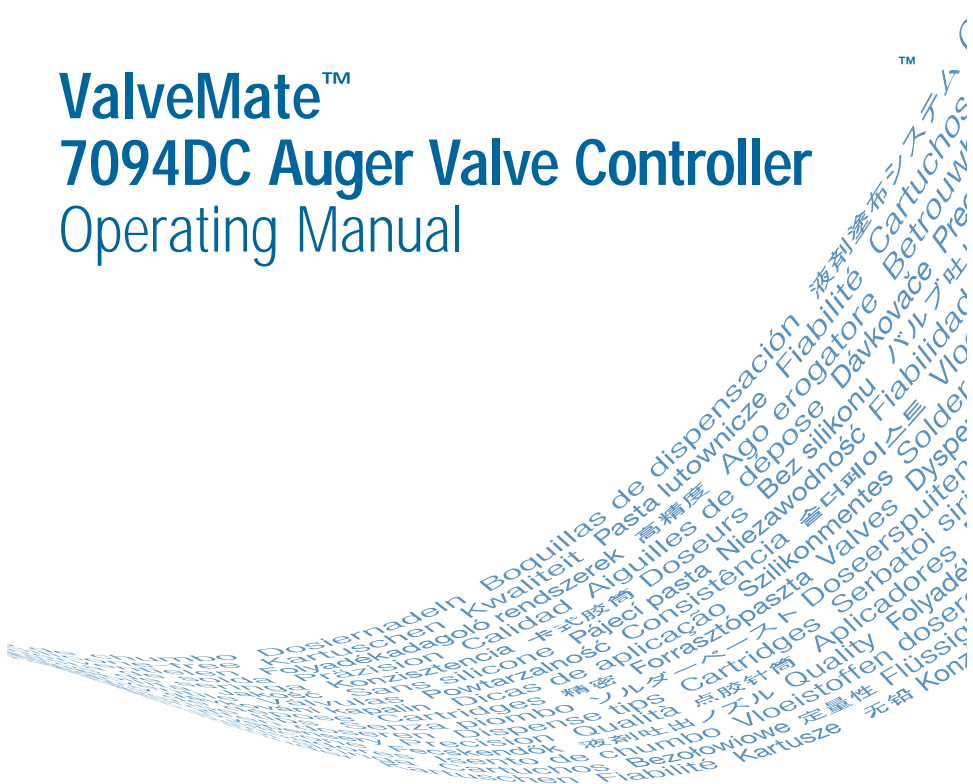




# ValveMate™ 7094DC Auger Valve Controller Operating Manual



# Introduction

The ValveMate 7094DC 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 794 Series auger valves brush style motors only**, the ValveMate 7094DC 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 7094DC is simple to use and will operate many millions of cycles without maintenance.

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## The EFD Pledge

We pledge that you will be completely satisfied with our products. We endeavor to ensure that every EFD product is produced to our no-compromise quality standards.

If you feel that you are not receiving all the support you require, or if you have any questions or comments, I invite you to write or call me personally.

Our goal is to build not only the finest equipment and components, but also to build long-term customer relationships founded on superb quality, service, value and trust.

Peter Lambert, President

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# Specifications

## ValveMate 7094DC Controller

**Size:** 19 cm W x 14 cm D x 7 cm H (7.5" x 5.6" x 2.7" )

**Weight:** 1.36 kg (2.99 lb)

**Cabinet:** Aluminum

**Input AC (to power supply):** 100-240 VAC(+/-10%) ~, 50/60Hz, 0.8A

**Output Voltage (from power supply):** 30 VDC - 1.2 Amp maximum

**Output Protection Fuses (F1, F2):** F 315mA 250V

**Power Required:** 30 VDC - 1.2 Amp maximum

**Feedback Circuits:** 5 to 24 VDC NC solid-state switch 250mA 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

**Ambient Operating Conditions:** Temperature: 5°C to 45°C (41°F to 113°F)

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

Height above sea level: 2000 meters max (6,562 feet)

This equipment is for indoor use only.

**Product Classification:** Installation Category II

Pollution Degree 2

## 794 Valve

**Size:** 237.4 mm x 31.7 mm diameter (9.35" length x 1.25")

**Weight:** 544 grams (19.2 oz)

**Fluid Chamber:** Type 440C hardened stainless steel

**Auger:** Type 440C hardened stainless steel

**"U" Cup:** Filled PTFE, spring energized

**Liquid Feed Fitting:** Type 304SS #10-32x5/32" (push-in optional: polypro)

**Auger Speed:** 450 RPM

**Auger Pitch:** 8 or 16 threads per inch

**Input Voltage:** 12-24 VDC (<10% ripple)

**Input Air:** 0-30 psi (0-2.07 bar) clean and dry

**Maximum Acceleration:** 2g

**Maximum Continuous Current:** SR & FR – 240 mA, SB & FB – 670 mA  
(Time delay fuse recommended)

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

# 794 Auger Valve Models

## 8-Pitch Auger

7021916	Sliding Head, Brush Motor, Footed Tip Adapter
7021910	Fixed Head, Brush Motor

## 16-Pitch Auger

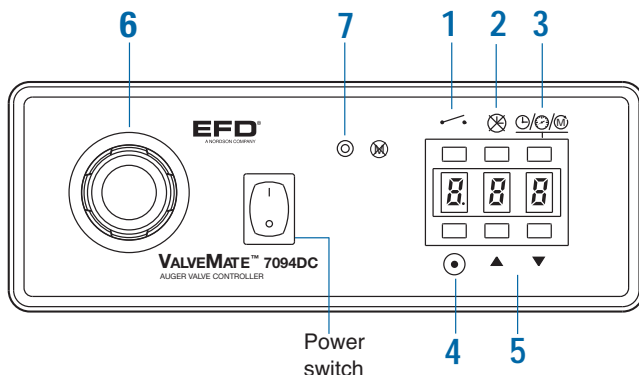
7021917	Sliding Head, Brush Motor, Footed Tip Adapter
7021911	Fixed Head, Brush Motor
7021918	Sliding Head, Brush Motor, DL Tip

**Note: Only brush style 794 motors can be used with the 7094DC Auger Valve Controller**

## 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	<b>X</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<p><b>0:</b> 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><b>X:</b> 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>						

# 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, #7016714).

## 3. Time/Pressure/Motor Speed

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

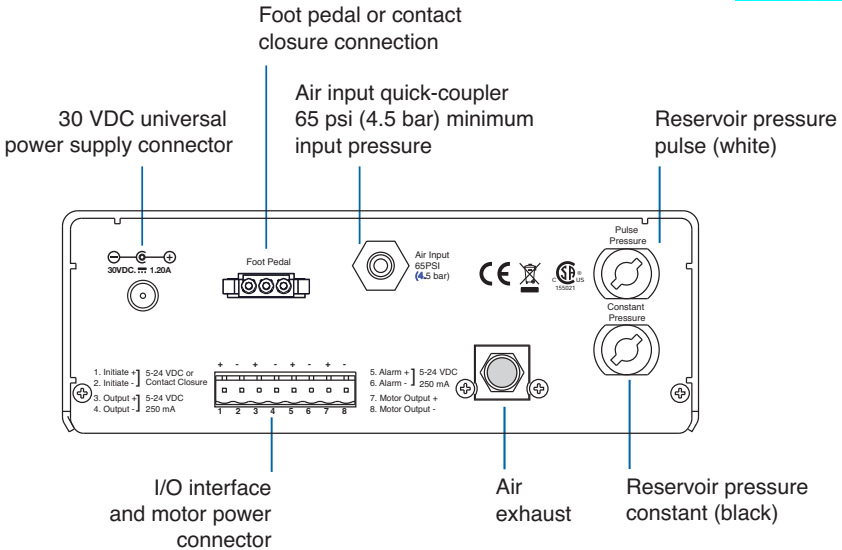
Time is displayed in real time from .001 to 99.9 seconds. In settings less than 1.0 seconds, the decimal will not show. Pressure is identified with a flashing "P" for pounds per

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.

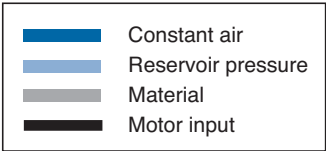
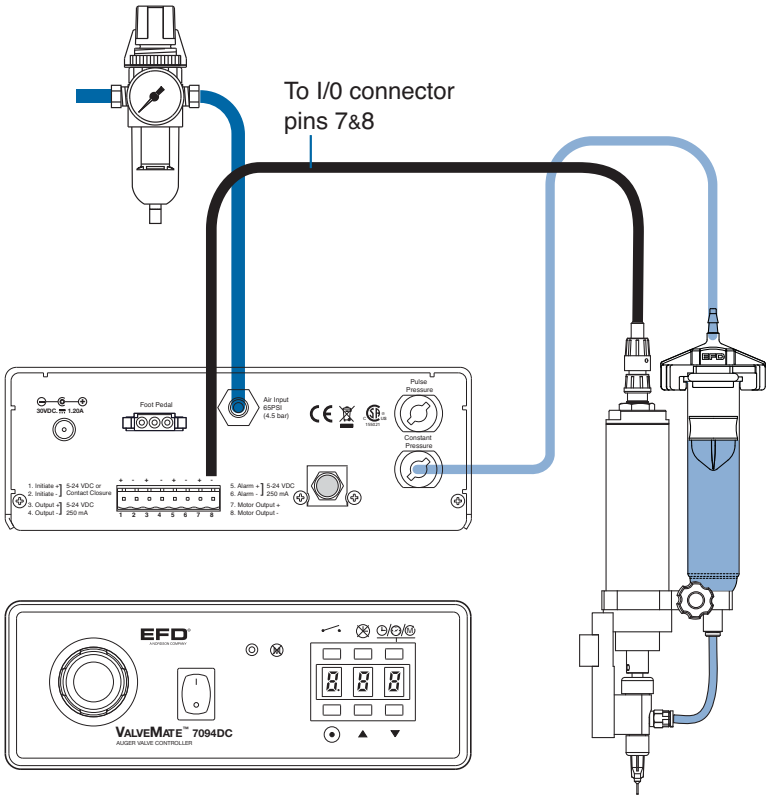
## 6. Air Regulator Control

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).

## 7. Motor Failure Indicator

Illuminates when an overload condition exceeding 300mA has shut-down the motor controller. To reset the controller, turn the power switch off and then on again.

# Typical Setup

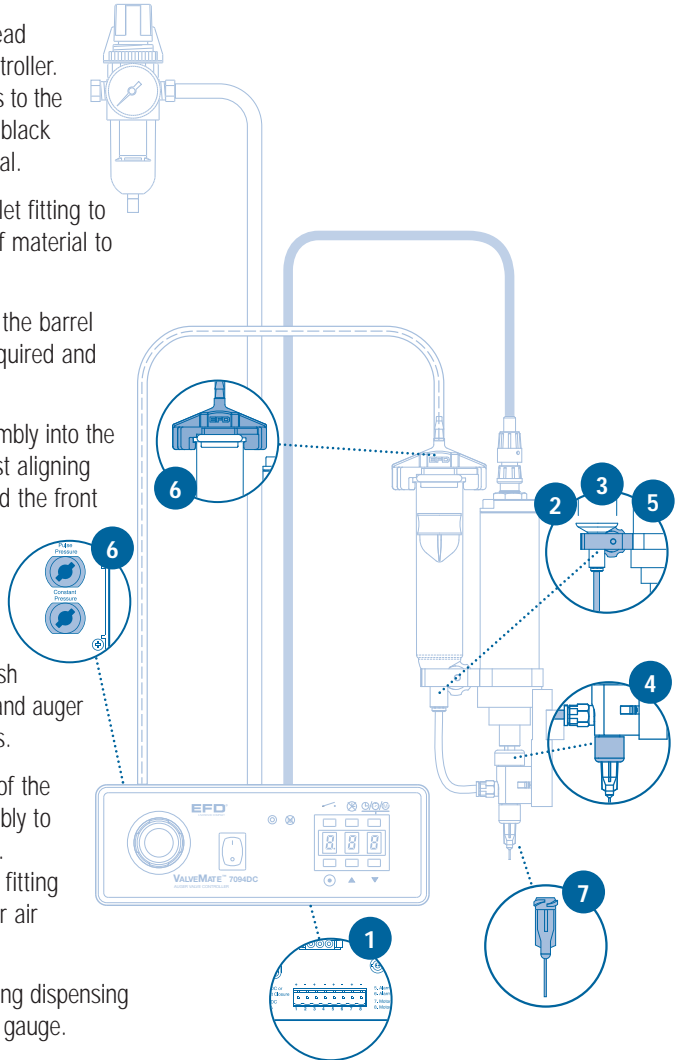


# 794 Valve Installation

Prior to installing this valve, please read the associated reservoir and valve controller operating instructions to become familiar with the operation of all components of the dispensing system.

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

1. Connect the motor lead wire to the valve controller. The red wire connects to the (+) terminal and the black wire to the (-) terminal.
2. Attach the barrel outlet fitting to the end of a barrel of material to be dispensed.
3. Insert the barrel into the barrel clamp position as required and clamp securely.
4. Snap the auger assembly into the sliding head after first aligning the inlet fitting toward the front of the valve.
5. Trim a length of the supply hose provided to approximately 3 1/8" (80 mm) and push into the barrel outlet and auger assembly input fittings.
6. 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.
7. Install an EFD 1/4" long dispensing tip of the appropriate gauge.



# Controller Setup

## Mounting

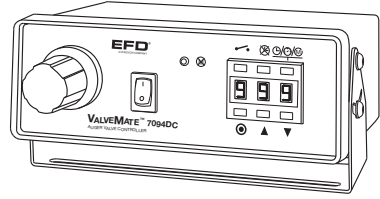
Use the universal mounting bracket (included) to mount the controller either over or under the cabinet. The bracket allows the controller to pivot 30° from a horizontal position. For panel mounting, a panel mount bracket kit is available (#7020501).

## Input Power

A universal 30 VDC remote power supply is included with each ValveMate 7094DC. Select a convenient location and connect to appropriate input voltage.

## Initiate Connection

The 7094DC 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 (#7016714) and plugged into the connector located on the rear panel.



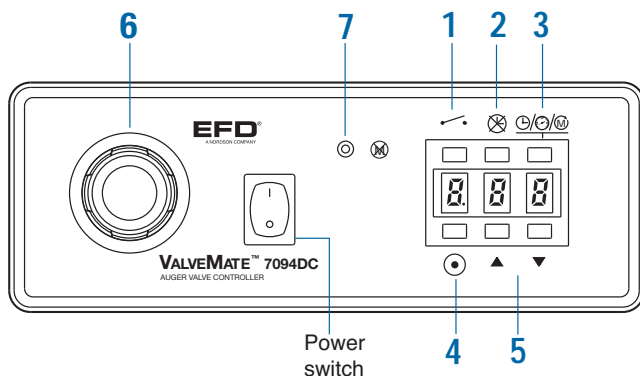
## Air Input Connection

1. Connect the input air hose (supplied) to the EFD five micron filter regulator #7002002, then to air input quick-connect on the rear panel.
2. Adjust input regulator pressure to 65 psi (4.5 bar).

## VALVE CONNECTION

Follow instructions in 794 Installation Guide.

# Trial Run



1. Turn power switch to the ON position, then press toggle button **3** until pressure is displayed (P00).
2. Adjust pressure regulator **6** to 8 psi (0.5 bar).
3. Press the up/down buttons **5** 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 **2**; display will show (---).
6. Press and hold the cycle button **1**. 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 **4** until the display flashes bright to dim. Press and hold the cycle button **1**. The valve will begin to dispense while accumulating time on the display. Release the cycle button **1**, then press again; time will be added to the prior sum. Press the program button **4** to save the time.
8. Press the cycle button **1** 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 **5** 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 **3** twice to enter the motor speed mode (24 will show on the display). Press the down button **5** to reduce the voltage to 15. Press the cycle button **1** and notice the change in dispensing rate. Press the up button **5** to return to normal operating speed of 24.

# 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 794 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 7094DC 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 7094DC Controller

## 1. Voltage Initiate Circuit

To start the dispense cycle for multiple 7094DC controllers at the same time, connect the voltage initiate circuit in parallel as illustrated.

**Note #1:** The amperage consumption for the voltage initiate circuit will increase with each controller that is connected. The initiate power supply should be sized accordingly.

**Note #2:** When using a 5-24VDC initiate signal, care should be taken to limit any leakage current.

Leakage current from a voltage source or transistor will be manifested as a continuous contact closure signal.

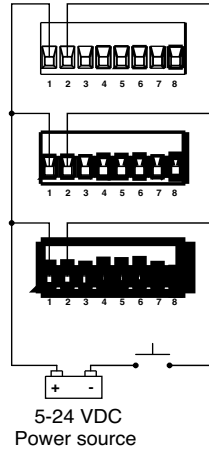
For best performance an isolated signal (i.e. relay) should be used.

## 2. End-of-Cycle Feedback Circuit

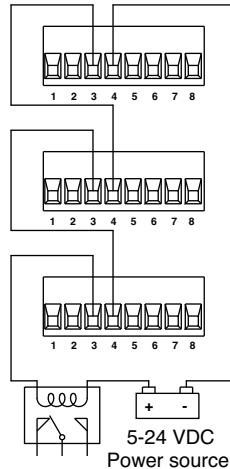
This circuit will ensure that the end-of-cycle signal will come from the last 7094DC to complete a dispense cycle. Connect in series as illustrated.

**Note:** There will be a maximum voltage drop of 2.0 VDC through the feedback circuit with each 7094DC 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.

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



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



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# 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.

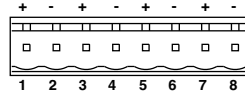
Upon closure, power from an external 5 to 24 VDC source is allowed to pass through the circuit to operate a load. The load illustrated is a relay, but this could be any device that will operate within the 5 to 24 volt range. Power consumption of the load must not exceed 250mA.

## 3. Alarm

The 7094DC 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.

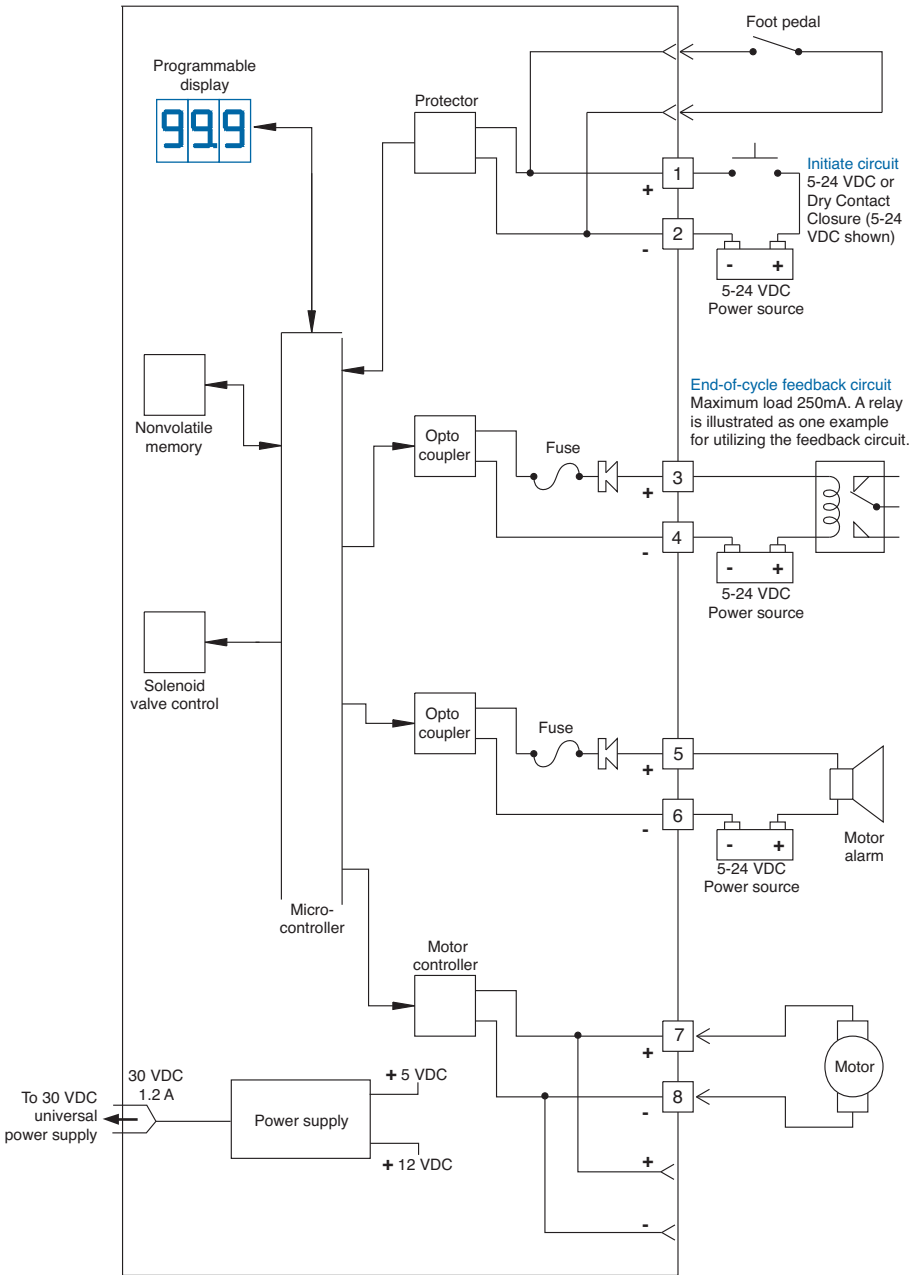
### I/O Connection

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.
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 250mA.
Timer seems inoperative	Check to be sure time override mode is off.
Motor failure indicator light is on, indicating a current overload condition	<p>Dispensing tip may be clogged, stalling the motor. Replace tip and reset by turning power off, then back on.</p> <p>Auger is frozen. Remove fluid body and service fluid path.</p> <p>Motor has failed. Replace motor.</p>

If trouble cannot be corrected, or if you need further assistance, **please contact us.**

# Schematic and Replacement Parts List

- |            |  |             |   |
|------------|--|-------------|---|
| 1. 7016406 | Regulator assembly<br>0 to 30 psi, 0 to 2.07 bar | 10. 7016822 | Air input quick-connect                           |
| 2. 7016437 | Constant solenoid assembly                       | 11. 7016831 | 1/8 NPT x 1/4 barb - low profile                  |
| 3. 7016436 | Control solenoid assembly                        | 12. 7016832 | 1/8 NPT x 1/4 barb 90° - brass                    |
| 4. 7016451 | Display PCB assembly                             | 13. 7021981 | Cable assembly for<br>794 auger valve (not shown) |
| 5. 7016471 | Foot pedal receptacle assembly                   | 14. 7014066 | Power supply - 7094DC                             |
| 6. 7016487 | Motor failure indicator                          | 15. 7020769 | Exhaust muffler                                   |
| 7. 7016641 | Female quick-connect – black<br>(not shown)      | 16. 7020770 | Power switch                                      |
| 8. 7016655 | Female quick-connect – white<br>(not shown)      | 17. 7016714 | Optional foot pedal (not shown)                   |
| 9. 7016751 | 1/4" OD x .160" ID tubing                        | 18. 7012985 | 30 VDC universal power supply<br>(not shown)      |
|            |  | 19. 7020833 | Fuse - output protection (2)                      |

