PDC-2000 SERVO VALVE CONTROLLER

OPERATING MANUAL

The PDC-2000 is a compact valve controller with an integrated shot timer designed for use exclusively with the PDV-1000 servo controlled dispensing valve. The unit can be used in a stand-alone setup or combined with an existing robot for automated dispensing.

The basic operation is as follows: when the system is triggered either by the foot pedal or an external signal, the valve motor and the feed air to the syringe are turned on. The amount of time that the valve is on depends upon the timer settings and whether the unit is in auto, manual or teach mode. At the end of the dispense sequence, the feed air shuts off and the motor reverses direction for a set amount of time, which is adjustable.

Specifications

Programmable Timer Range:	0.010 – 99.99 seconds
Cycle Initiation:	Maintained or Momentary
Operation Modes:	Manual, Automatic, or Teach
Input Voltage:	110 or 220 Vac / Externally Adjustable
Internal Voltage:	24 Vdc
Foot Pedal Voltage:	5 Vdc
Max Air Input:	100 psi
Max Air Output:	100 psi
Repeat Tolerance:	0.5 ms.
Cycle Speed:	12 ms.
Fuse:	0.5 Amp. (2 each)

Input Electrical Connection

The PDC-2000 can take either 110V or 220V, 50/60Hz. This input voltage can be changed externally to the controller within the power module. Before connecting power to the PDC-2000, check the input voltage setting on the power module to be sure it has been set to the proper voltage.

Refer to Schematic:

1. Locate power module on back of the controller (12,13,14).
2. Check fuse holder (14) on the power module. Each side of the fuse holder will display an arrow pointing in opposite directions with a corresponding voltage of 110-120 or 220-240 Vac.
3. Locate the third arrow, which is located just outside of the fuse holder on the upper right corner.
4. The third arrow will point to the arrow on the fuse holder of the corresponding voltage setting.

Note: If the voltage needs to be changed. Remove the fuse holder using a flat head screwdriver. Rotate the fuse holder 180 degrees and reinsert into the power module. Check that the proper arrows are aligned to reveal voltage.

Definition of Pneumatics

Refer to Schematic:

There is a ¼" fnpt connection (11) at the back of the unit for the inlet Air. The max inlet pressure for this unit is 100 psi. There is a check valve fitting (2) on the front of the machine to feed the syringe mounted on the dispense valve. This fitting will accommodate a 5/32"od hose.

Controller to Valve Set-Up Insctructions

1. Connect a filtered air supply to the ¼" fnpt brass fitting (11) on the back of the PDC-2000. This will supply air to the controller. Be sure the input does not exceed 100 psi.
2. Plug the foot switch to the connector (10) on the back of the controller. Plug the electrical cord to the outlet (13) on the back of the controller.
3. Connect one end of the servo motor cable to the quick connect fitting (1) on the front of the controller. Connect the other end to the servo driven motor on the PDV-1000 Dispense Valve.
4. Connect one end of the 5/32"od air line to the syringe air adapter cap. Connect the other end to the quick connect air fitting (2) on the front of the controller.
5. Adjust the air regulator (4) and pressure gauge (3) on the front of the PDC-2000. This will regulate air pressure that will be supplied to the syringe of material during dispensing.
   Note: Pressure will vary due to material viscosity.
6. To adjust motor settings, follow instructions below (Set Button).

Set Button

The Set button (15) allows the operator to cycle through a series of options to control the motor on the PDV-1000 Dispense Valve. With each press of this button the display will cycle between "SP", "rE" and "IR".

Depress the Set button (15) once to bring up the speed range, "SP", which is a percentage of voltage between 10%-100% that the motor will receive. Minimum speed is 10% and maximum speed is at 100%. Use arrow keys to adjust the desired speed up or down.

Depress the Set button (15) once again to bring up the reverse time, "rE", which signifies the on time that the motor will go in reverse at the end of a forward dispense cycle. This provides material suck back at the dispense tip. Use the arrow keys to set a desired time.

Depress the Set button (15) once again to bring up the IR Comp setting, "IR", which changes the boost for the servo motor. The motor drive incorporates digital back EMF control. This compensation provides a maximum boost of +5vdc. When the PDC-2000 speed setting is 80% the no load voltage to the motor is 24vdc. The output voltage of the power supply is 36vdc to handle a stall situation at a speed setting of 100% and the current limit is matched to the servo valve motor.

When the limits of these settings are reached, any additional attempts at adjustments in that direction will be ignored. If the unit is inactive for more than 3 seconds it will return to its ready to dispense mode. If the foot pedal is pressed the PDC-2000 returns to the ready to dispense mode and cycles normally. The mode button (5) is ignored during reverse time and speed programming. If the set button is then left un-pressed for approximately ½ a second the display will cycle between the current description and the corresponding setting.

Mode Button

Manual Mode

This mode gives the operator control over volumes of material to be dispensed. Manual mode can be selected by pressing the Mode Switch (5) on the front of the controller. When the controller is in manual mode a series of broken lines will be displayed on the LED screen (6).

In Manual Mode, the PDC-2000 will control the PDV-1000 dispense valve to dispense material continuously while the foot pedal is depressed. When the foot pedal is released material will cease to dispense and run the preset reverse function.

The PDC-2000 should be set in Manual Mode when purging the valve.

Automatic Mode

This mode is used to dispense repeatable volumes of material using a timed shot method. Automatic mode can be selected by pressing the Mode Switch (5) on the front of the controller. In automatic mode, the controller will display a numerical value on the LED display (6).

To operate the controller in Automatic Mode use the up and down arrow keys (7,8) to adjust the time shown on the LED display (6). The arrow keys can be pressed once to make small changes in time or held down to speed up change in time. When the correct time is displayed, the foot pedal can be pressed and released once. This will trigger the timer to count down as material is dispensing. Material will continue to dispense until the controller has counted down to zero.

Teach Mode

Teach mode is a third function available with the PDC-2000 servo valve controller. It allows the operator to manually dispense material for a given period of time, record that time, and display it on the LED Screen. This time is then displayed as the new setting to be used in automatic mode when the foot pedal is depressed.

1. Press and hold down the Mode button (5) for three seconds. The LED screen (6) will begin to blink.
2. Depress the foot pedal to begin dispensing. When the desired amount of material has been deposited, the foot pedal can be released to stop dispensing.
3. The time that was used to dispense the visually determined amount of material is recorded and displayed on the LED screen. (Use the up/down arrows to adjust time if needed.)
4. The controller is now in Automatic mode and the shot can be repeated by depressing the foot pedal

Externally Connecting to PDC-2000

In certain cases it may be necessary to connect the PDC-2000 to be initiated using an external source other than a foot pedal. This is common when connecting to a robot.

There are two ways to connect an external source to the PDC-2000 to initiate dispense. The first method is to remove the foot pedal from the connector (10) on the back of the controller. The quick connect fitting (10) will reveal a four pin connector. The next method is to connect directly to the DB-9 Connector (9) on the back of the unit.

1. Foot Pedal Connector

Pins 1 and 2 represent a Normally Open Switch
Pin 3 represents a ground wire
Pin 4 is left blank (not used)

Using an external source such as a relay, connect Pins 1 and 2 such that a contact can be closed between those pins to connect the signal and initiate the controller. A 5-volt source will travel through the connection. Then pin 3 should be connected to ground.

Another option is to cut the foot pedal from its cord and hard wire into the foot pedal cord. To do this, cut and remove the foot pedal from the cord. Strip back the outside cable and reveal the three wires. The white and black wires represent pins 1 and 2 as the Normally Open switch, and the green wire represents the ground wire. Connect wires as outlined above.

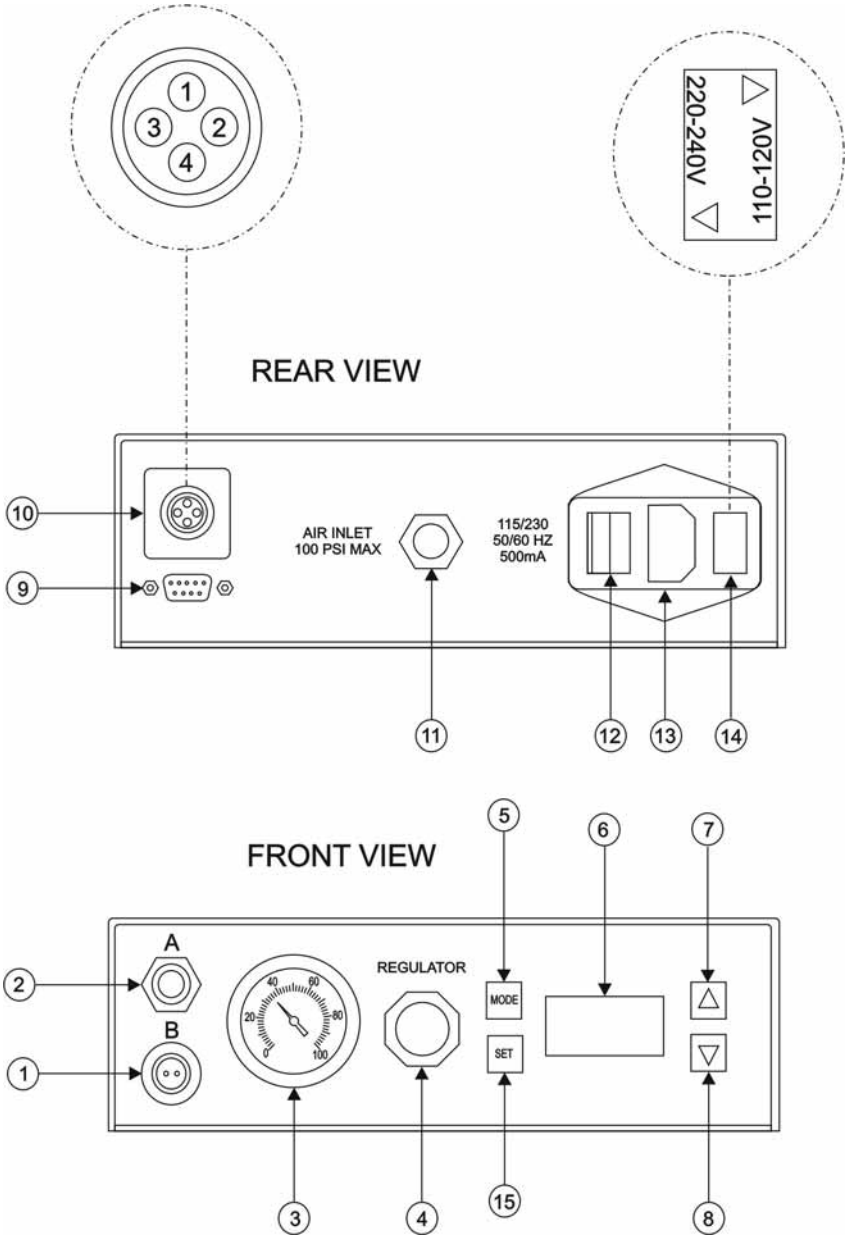
2. DB-9 Connector

Pin 1 represents, initiate positive voltage (5v-24v)
Pin 2 represents, initiate negative voltage (5v-24v)
Pin 6 represents, a ground wire

Using an external voltage source, connect the positive voltage to Pin1 and negative voltage to Pin 2. Then connect a ground wire to Pin 6. Send a voltage signal between 5 volts to 24 volts through pins 1 and 2 to initiate the controller to dispense.

Troubleshooting

Problem	Possible Cause	Corrective Action
Display does not light up when unit is powered on	- Wrong input voltage supplied - Blown fuse in power module (14)	- Check input voltage switch (14), correct if necessary - Check fuse and replace if necessary
Air not cycling when foot pedal is depressed	- Pressure gauge set too close to zero - Air hose not pushed into quick connect fittings (1,2) far enough	- Increase air pressure on regulator (4) - Press hose into fitting further
Material drips from tip	- Suck back time set too low	- Increase time for “rE”.
LED Display stuck on number value	- Wrong input voltage connection - Voltage was supplied to foot pedal connector	- Contact I&J Fisnar Inc. for repair Suggestion - Contact I&J Fisnar Inc. for repair Suggestion



No	Description	No	Description
1	Quick connect fitting	9	DB-9 connector
2	Quick connect air fitting	10	Foot switch connector
3	Pressure gauge	11	¼" fnpt air inlet fitting
4	Air regulator	12	Power switch
5	Mode switch	13	Electrical outlet
6	LED display	14	Fuse Holder
7	Up arrow key	15	Set button
8	Down arrow key		

Warranty Policy

I&J Fisnar Inc. warrantees the enclosed product against defects in material or workmanship on all components for one year from the date of shipment.

The warranty does not extend to components damaged due to misuse, negligence, or installation and operation that is not in accordance with the recommended factory instructions. Unauthorized repair or modification of the enclosed product, and/or the use of spare parts not directly obtained from I&J Fisnar Inc. (or from factory authorized dealers) will void all warranties.

All I&J Fisnar Inc. warranties extend only to the original purchaser. Third party warranty claims will not be honored at any time.

Prior to returning a product for a warranty claim, a return authorization must be obtained from I&J Fisnar Inc.

To qualify as a valid warranty claim, the defective product must be returned prepaid to the factory during the warranty period. Upon return, I&J Fisnar Inc. will repair (or replace) all components to be defective in material or workmanship.

Note: Upon receipt of your PDC-2000 unpack the shipping box and carefully inspect the contents for any damage that may have occurred in transit. Please notify I&J Fisnar Inc. at once of such damage due to transit.

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