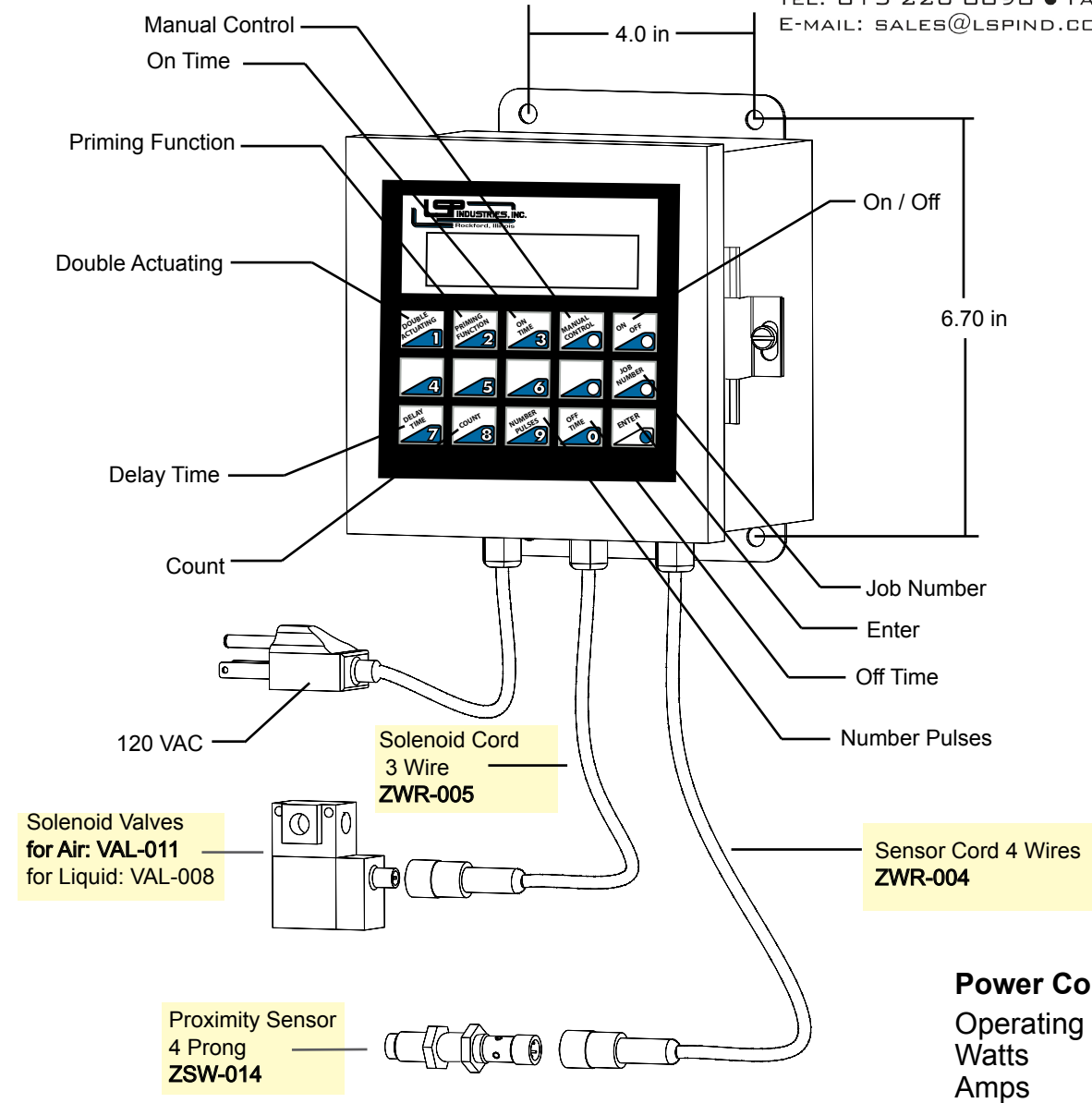


INSTALLATION, OPERATION, and TROUBLESHOOTING

Electronic Controllers Model Nos. E-300, E-305 and E-310



P.O. Box 5303, ROCKFORD, IL • 61125
2511-20TH ST., ROCKFORD, IL • 61104
TEL: 815-226-8090 • FAX: 815-226-9250
E-MAIL: SALES@LSPIND.COM



Power Consumption

Operating Source	110 V
Watts	77
Amps	.7

The LCD Readout

Shown to the right are the readouts given as the Electronic Controller is in the run mode. These readouts with the exception of, Job No., and On/Off Operation, will display in accordance with the Electronic Controllers internal Clock. The Job No., and the On/Off displays will remain lit and static during the operation.

Job No.	On/Off Operation	Input Signal	Elapsed On Time
99	XXX	X	99.99
99.99	999	99	99.99

Elapsed Delay Time	Elapsed Cycle Time	Elapsed PulseTime	Elapsed Output OffTime

INSTALLATION INSTRUCTIONS

The LSP Industries Electronic Controllers are designed to control the operation of the LSP PresSpray Lubricating Systems, the LSP CompuSpray Systems, and the LSP FloaterCoater Systems.

A. The CONTROL BOX

This **CONTROL BOX** is the hub of the Controller. It supplies the connections to power and to the other components. It is the place where the **Job Parameters** are set.

Locate this **CONTROL BOX** where visible and available, but out of the work area. If frequent use of the **MANUAL CONTROL BUTTON** is expected, locate so it can be easily reached.

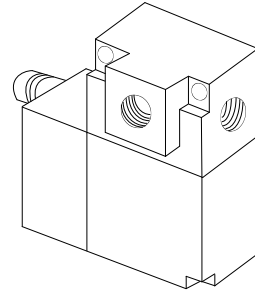
DO NOT locate on surfaces that move or see a lot of shock. On moving surfaces the attached **CORD-SETS** may catch or wear. Although this **CONTROLLER** will take a lot of punishment, shock is never good for anything.

To use the **CORD-SETS** as supplied, the **CONTROL BOX** must be within given distances of the other components.

- Locate within 6 feet of an 110vac outlet.
- Locate within 10 feet of the **SENSOR**.
- Locate within 10 feet of the **SOLENOID**.

NOTE: These distances provide no slack in the lines. Shorter distances are highly recommended for good **CORD SET** routing.

At the location selected, drill and tap four holes using the dimensions shown in drawing on page 1. If using the screws and washers supplied, tap with 1/4-28 thread to 3/8" min. deep. Insert the screws (w/ washers) through the slots in the mounting feet of the **CONTROL BOX** and tighten securely.



B. The SOLENOID VALVE

Whenever it is energized from the **CONTROL BOX** it allows air or solution to pass through on a controlled time sequence as set by the **PARAMETERS**.

C. The PROXIMITY SENSOR

Used to trigger the **CONTROLLER**. When a metal object passes by the **SENSOR**, a **Signal** is seen at the **CONTROL BOX** which triggers an action in the **Operation Cycle**.

NOTE: This is the standard triggering device. Any type switch may be used instead. See the **MODIFICATIONS** area if interested.

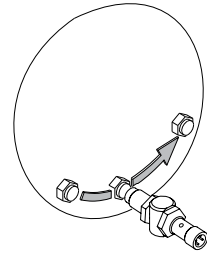
Figures 1, 2 and 3 in the following column describes the proper locating of the **PROXIMITY SENSOR** and the versatility and adjustability of the **MOUNTING BRACKET** used with the **PROXIMITY SENSOR**.

Positioning of the Proximity Switch

ROTATING MOTION

A gear, shaft or fly wheel. Locate a metal object that sticks up at least 1/8 inch higher than the sub plate so that it completes one full revolution each cycle.

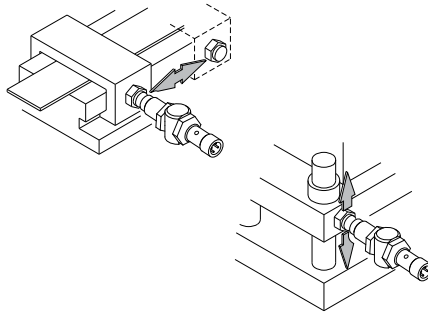
Cam or Shaft shown below.



MIDDLE OF MOTION

Place the metal object so that it passes the **PROXIMITY SENSOR** twice during the cycle. This will give two actuations per cycle.

Use the **DOUBLE ACTUATION** function so that the controller only counts every other pass of the metal object.



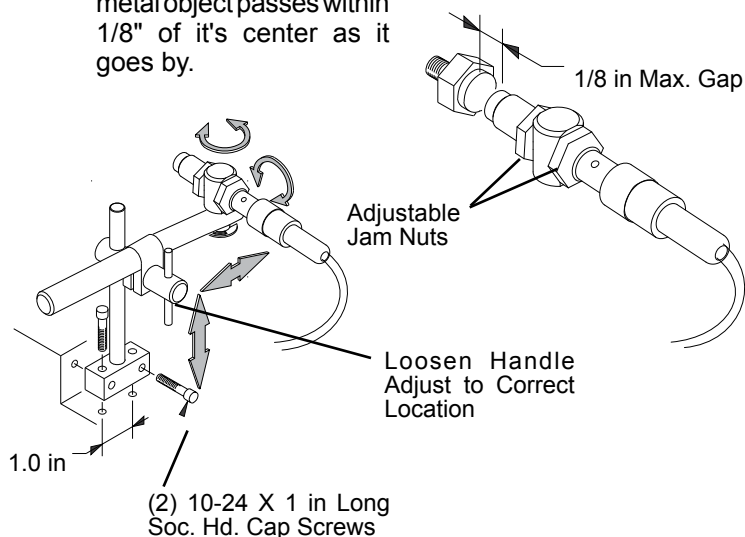
The PROXIMITY SENSOR AND MOUNTING BRACKET

Locate the **PROXIMITY SENSOR** anywhere along the **METAL OBJECTS** travel where there is a surface on which it can be mounted. This surface must be sound enough to insure the **SENSOR** will remain in position during operation. Make sure this location is within reach of the **SENSOR CORD-SET**.

Before mounting the **SENSOR**, assemble it onto its **MOUNTING BRACKET**, and hold this assembly in place to check if the positioning described in **Figure #2** is possible. See **Figure #3** for instruction on using the **MOUNTING BRACKET** to adjust the location of the **SENSOR**.

To mount the **SENSOR**, drill two holes 1 inch apart. If using the screws supplied, tap these holes with #10-24 thread to 3/8" min. deep. Insert the screws thru the holes in the feet of the **MOUNTING BRACKET** and tighten securely.

Adjust **SENSOR** such that metal object passes within 1/8" of its center as it goes by.



MODIFICATIONS

The following modifications may be made should your application warrant.

A. Using a Switch or Relay for a trigger

Any type of switch or relay may be used to trigger the **CONTROLLER** instead of the **PROXIMITY AND SENSOR** supplied.

This must be done as follows or damage may be done to the Controller. The switch/relay must be used in the "normally open" mode. Install it such that it will be triggered (switched) by the operation of the machinery.

Cut off the connector at the end of the **SENSOR CORD-SET**. Then cut back the jacket to reveal its wires. Connect the wires to the switch as described below according to its respective color

a) The Brown Wire

This wire is a 24 Vdc supply. Connect it to one side of the switch/relay.

b) The Blue Wire

This wire is ground and has no purpose when using a switch. Cut this wire off short and insulate it well.

c) The Black Wire

This wire is the sensing lead. When this wire receives 24vdc (shorted to Brown Wire) the **CONTROLLER** is "signaled". Connect it to the other side of the switch/relay.

B. Using another type Sensor for a trigger

Most any other type sensor may be utilized to trigger the

CONTROLLER. The only requirements being that it operates on 12 Vdc and sinks current when triggered. Install the sensor so it trips appropriately. Wire it per its instructions, and the information found in paragraph "A" above.

C. Using a Power Signal for a trigger

Never use a power source to directly trigger the CONTROLLER. Introducing an outside voltage directly to any of the wires in the **ACTUATOR LEAD** will most probably damage the **CONTROLLER** immediately.

Using a powered output to trigger the **CONTROLLER**, may only be done through a relay. Get a relay of the same voltage as the power output you wish to use, and use the relay to trigger the **CONTROLLER**. See paragraph "A" above for instruction on wiring the relay to the **CONTROLLER**.

D. Using longer than standard CORD-SETS.

If required, the **POWER CORD**, **PROXIMITY SENSOR CORD-SET**, or the **SOLENOID VALVE CORD-SET** may be lengthened without detriment to performance. Doing this on site, however, is not recommended. It is best to contact **L.S.P. Industries** or our distributor to request an extension cord Set.

TROUBLESHOOTING INSTRUCTIONS

PROBLEMS	SOLUTIONS
I. No lights are lit.	A. Make sure the POWER CORD is plugged into an electrical outlet, and that power is present. B. Check Fuse to see if it is bad
II. Does not count down... or count is erratic.	A. Make sure the SENSOR CORD SET is connected at the PROXIMITY SENSOR and the knurled nut is tight. B. Check the distance between the PROXIMITY SENSOR AND SENSING OBJECT . If this gap is too large, triggering may be erratic or nonexistent and cycles might not be counted. See Figure #2 for illustration and details.
III. Equipment does not respond after count down.	A. Check the SOLENOID VALVE for proper function. This solenoid valve should energize and shift positions each time it is activated (at the end of Delay Time when On Time goes on) and should not leak at any other time. If the SOLENOID VALVE is functioning properly, check the INSTRUCTIONS which were supplied with the equipment being operated by the valve. If the SOLENOID VALVE is not functioning properly, make sure the SOLENOID VALVE CORD SET is connected at the SOLENOID and the knurled nut is tight. Check if the SOLENOID VALVE is being powered (w/ 24Vdc) by the CONTROLLER . If there is power to the SOLENOID VALVE at the appropriate times, replace the SOLENOID VALVE . Use L.S.P. Part No. VAL011

If a **SOLUTION** below does not solve the **PROBLEM**, the **CONTROLLER** is probably at fault. Since it is solid-state, there is little that can be done on site. In such cases, contact L.S.P. Industries for return authorization.

REPLACEMENT PARTS

Proximity Sensor ZSW014

Screws into fitting on cable from the Control Box.

Proximity Sensor Mounting Bracket 290BRK03

Adjustable Bracket that allows Sensor to move forward and backwards and swivel in all directions.

Actuator VAL011 Solenoid Valve, screws into fitting on cable from Control Box.

Actuator Tube TUB-019

3/16" O.D. plastic tubing which is used to install the Actuator at a remote location..

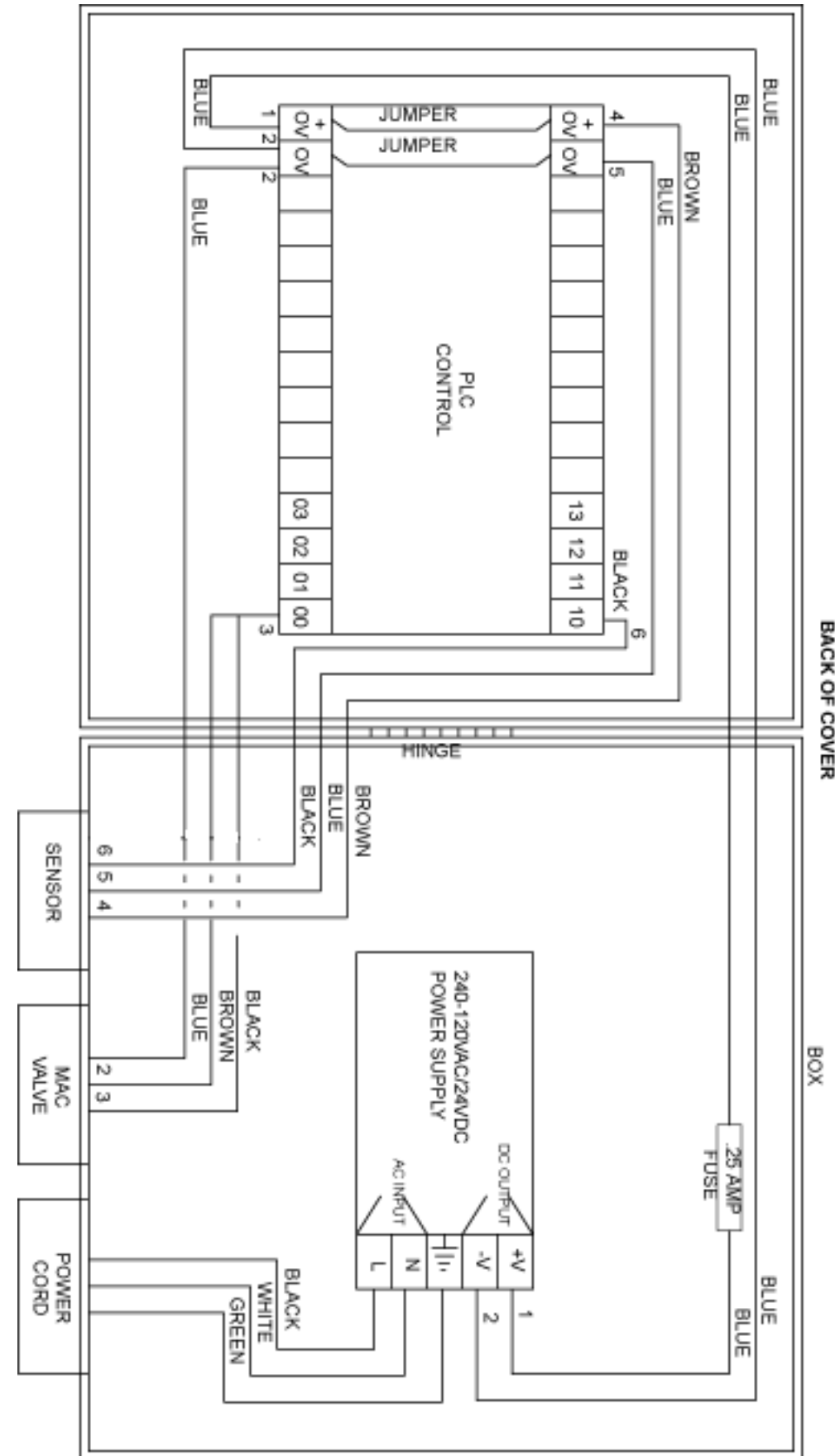
Tube Fittings FIT-020, (2) required.

Used to connect the Actuator Tube (above) to another piece of equipment

Actuator Bracket 459BRK01 Union Nipple Fitting used to mount the Actuator assembly (above) directly to another piece of equipment.

SCHEMATIC DRAWING

Power Consumption
 Operating Source 110 V
 Watts 77
 Amps .7



OPERATION INSTRUCTIONS

A. Power Up

When the **POWER CORD-SET** is plugged in, the **CONTROLLER** will go through a **Power-Up** routine. Briefly, the following information will be displayed.

1. LSP INDUSTRIES, Inc.
2. Model No E-999 (999 is 300, 305, or 310)
3. Version No.

B. Input Signal

When the **CONTROLLER** receives an **Input Signal**, it will begin its **Operation Cycle**. The **PROXIMITY SENSOR** provides the **Input Signal** when it sees the Metal Object. At that moment, a small LED will illuminate from the **PROXIMITY SENSOR** while an asterisk "*" illuminates on the **CONTROLLER DISPLAY**.

C. Operating Modes

During operation, the **CONTROLLER** will be in one of two **Modes**, either **Run Mode** or **Set Mode**. In **Run Mode**, the **CONTROLLER DISPLAY** will be full of **CONTROLLER** and **JOB PARAMETERS**. To change to **Set Mode**, press any named key. In **Set Mode**, the **CONTROLLER DISPLAY** will give a prompt to enter a specific **CONTROLLER** or **JOB PARAMETER**. Changes to **PARAMETERS** are stored immediately after pressing the **ENTER** key and will effect the current **Operation Cycle**.

D. Setting CONTROLLER PARAMETERS

The **CONTROLLER PARAMETERS** are universal settings which take effect during each **Operation Cycle** regardless of the **JOB PARAMETERS**.

1. DOUBLE ACTUATION KEY

Used to compensate for when the **PROXIMITY SENSOR** is placed in the middle of a reciprocating motion. In such cases triggering can occur on the forward and return stroke of the machinery. When set to **ON**, only every other **Input Signal** from the **PROXIMITY SENSOR** is counted. Press key to toggle setting between **OFF** and **ON**.

2. PRIMING FUNCTION Key

Used to help prime equipment during the initial setup. Set to **ON** to continuously energize **SOLENOID VALVE** on/off at rate of 3 times per second. Press key to toggle setting between **OFF** and **ON**.

3. ON TIME Key

Sets the time duration for **SOLENOID VALVE** to be energized during the **Operation Cycle**. The range is 1 to 999; incremented at 10mSec; giving .01 to 9.99 seconds.

4. MANUAL CONTROL Key

Used to manually energize the **SOLENOID VALVE**. When pressed, the **SOLENOID VALVE** becomes energized until key is released. This function is available at any time.

5. ON/OFF Operation Key

Used to turn **CONTROLLER** operation **ON** and **OFF**. It is used during setups and other times the machinery is operated but the **CONTROLLER** operated equipment of the necessary. Press key to toggle setting between **OFF** and **ON**.

E. Setting JOB PARAMETERS

There are 5 parameters stored with each **JOB NUMBER**.

1. JOB NUMBER Key

Sets the current **JOB NUMBER**. Range is 1 to 99.

2. DELAY TIME Key

Sets the time duration from when the **Sensor** receives a signal at the end of a **Count Cycle** to when the **SOLENOID VALVE** will become energized. Range is 0 to 999; incremented at .01 Sec; giving 0 to 9.99 seconds.

3. COUNT Key (Not available on E-305)

Sets the number of **Input Signals** to receive before continuing **Operation**. Range is 0 to 999; giving 0 to 999 **COUNTS**.

4. NUMBER PULSES Key (Not available on E-310)

Sets the number of times to energize the **SOLENOID VALVE** after reaching the **COUNT**. Range is 1 to 99 **PULSES**.

5. OFF TIME Key (Not available on E-310)

Sets the time duration for **SOLENOID VALVE** to be OFF between **PULSES**. The range is 1 to 999; incremented at .010 Sec; giving .01 to 9.99 seconds of **OFF TIME**.

6. ENTER Key

After entering values into any of the above **JOB PARAMETERS**, press the **ENTER KEY** to save the value.

F. The Operation Cycle

After the **CONTROLLER** is **Powered Up** and starts receiving **Input Signals**, it will perform according to the **Values** set for its **Parameters**. A description of its **Operation** is given below (described as operating in **Run Mode**).

At the start of an **Operation Cycle**, **Input Signals** are counted.

This count (set by **#8 Count Setting**) is displayed at **VALUE DISPLAY**. When an **Input Signal** is received, this count increases by one. While this count is less than the **Count Setting** continues, awaiting the next **Signal**. When the count goes to zero, this **Count Cycle** ends.

When **Count Cycle** ends, a **Time Delay** begins. This time's duration (set by **#7 Delay Time Setting**) is displayed in the **VALUE DISPLAY**. During this wait, the **DISPLAY** shows a count-up of the **Delay Time**.

When **Delay Time** ends, a **Pulsing Cycle** begins. This **Cycle** begins with an **Output** to the **SOLENOID VALVE**. The duration of this **Output Pulse** is set by **#3 On Time**.

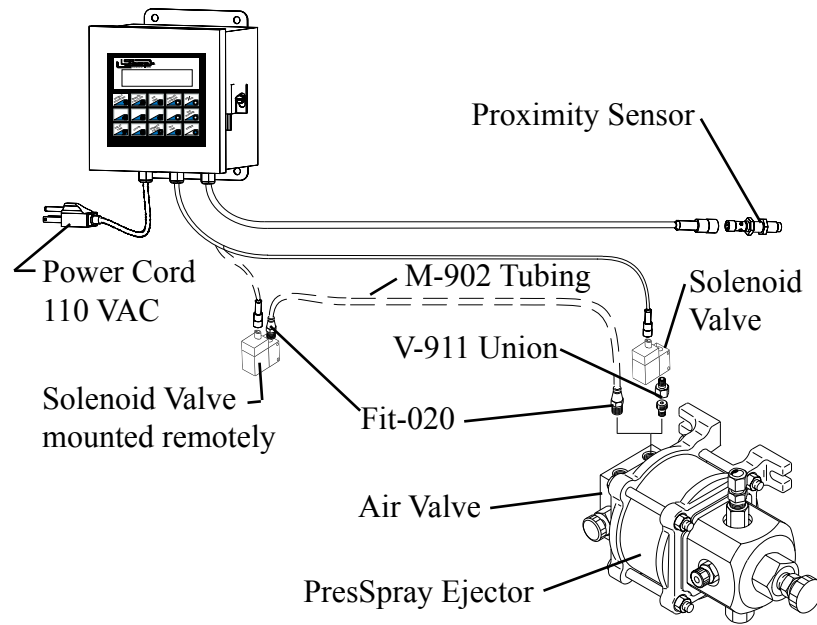
At the same time as the first **Output Pulse**, the number of pulses elapsed (set by **#9 Number of Pulses**) is displayed at the **VALUE DISPLAY**. If this number is greater than one, there will be a time delay for a given duration (set by **#0 Off Time Setting**) after which there will be another **Output Pulse**.

At each **Output Pulse**, the number showing at the **VALUE DISPLAY** will increase by one. When this number equals the **Number of Pulses** the display goes to zero, the **Pulsing Cycle** ends.

When **Pulsing Cycle** ends, the value of **#8 Count Setting** is reloaded and displayed at **VALUE DISPLAY**, and **Operation** returns to **Count Cycle** as described above.

INSTALLATION INSTRUCTIONS

The LSP Electronic Controllers are the perfect actuating system for all LSP lubricating equipment. They offer versatility and controllability for precision lubrication.



Installing the LSP Electronic Contollers with a LSP Industries PresSpray system.

The solenoid valve is used as a BLEEDER Valve. It bleeds air out of the air valve causing the valve to shift, thus allowing air to enter from the air line, actuating the PresSpray. The solenoid valve can be attached directly to the LSP UniValve with union fitting or attached remotely with 3/16" tubing and fittings.

Attach the "IN" Port on the Solenoid Valve to the "EXHAUST" Port on the air valve powering the PresSpray system.

Never attach shop air to the Solenoid Valve.

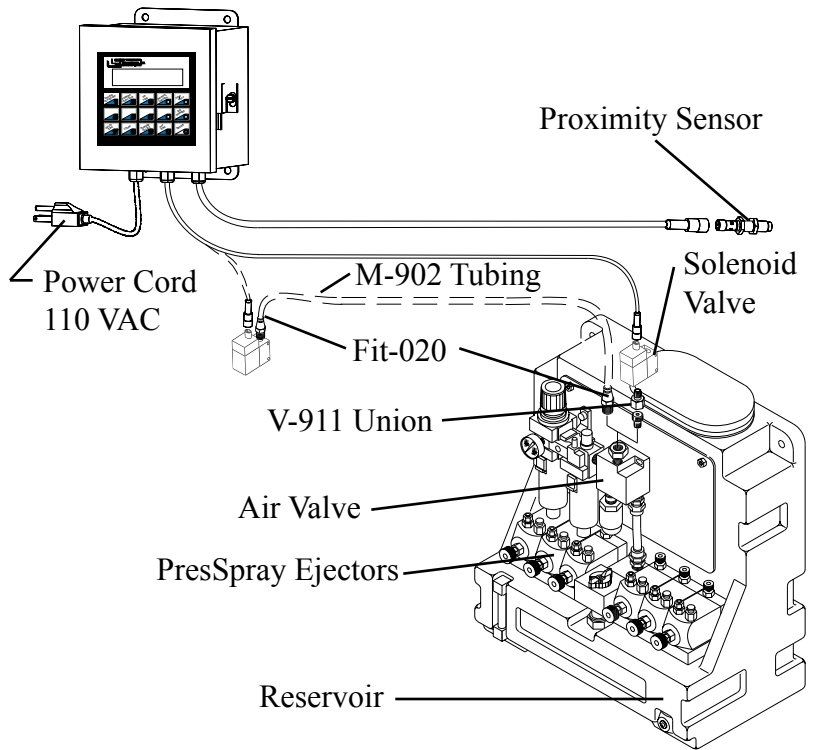
An Electronic Controller Used with a PresSpray Ejector

Installing the LSP Electronic Contollers with a LSP Industries PresSpray-II System.

The solenoid valve is used as a BLEEDER Valve. It bleeds air out of the air valve causing the valve to shift, thus allowing air to enter from the air line, actuating the PresSpray. The solenoid valve can be attached directly to the LSP UniValve with union fitting or attached remotely with 3/16" tubing and fittings.

Attach the "IN" Port on the Solenoid Valve to the "EXHAUST" Port on the air valve powering the PresSpray system.

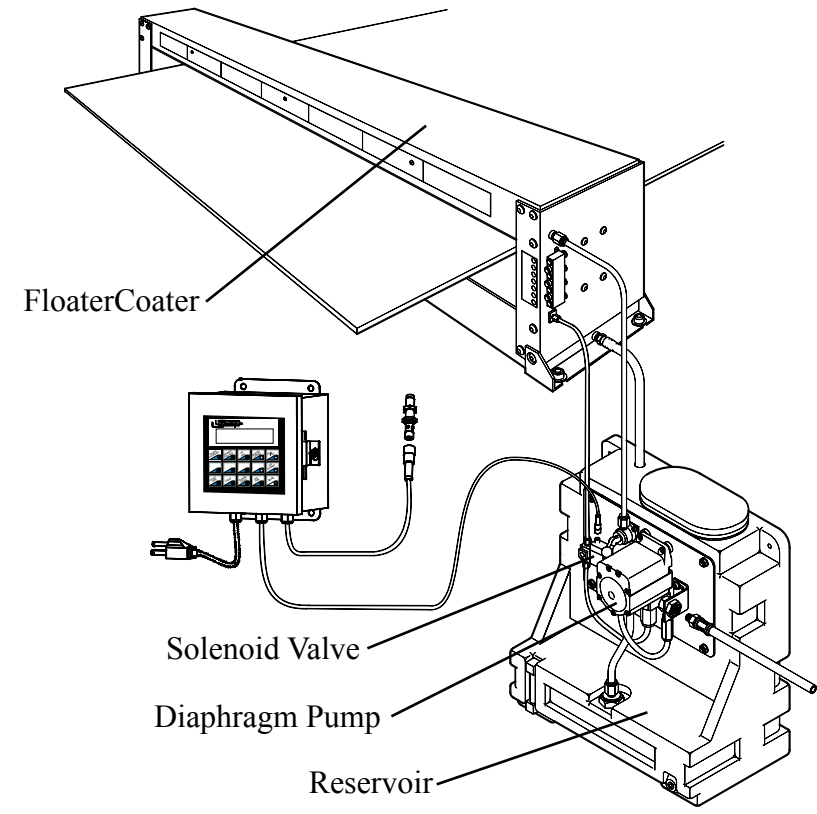
Never attach shop air to the Solenoid Valve.



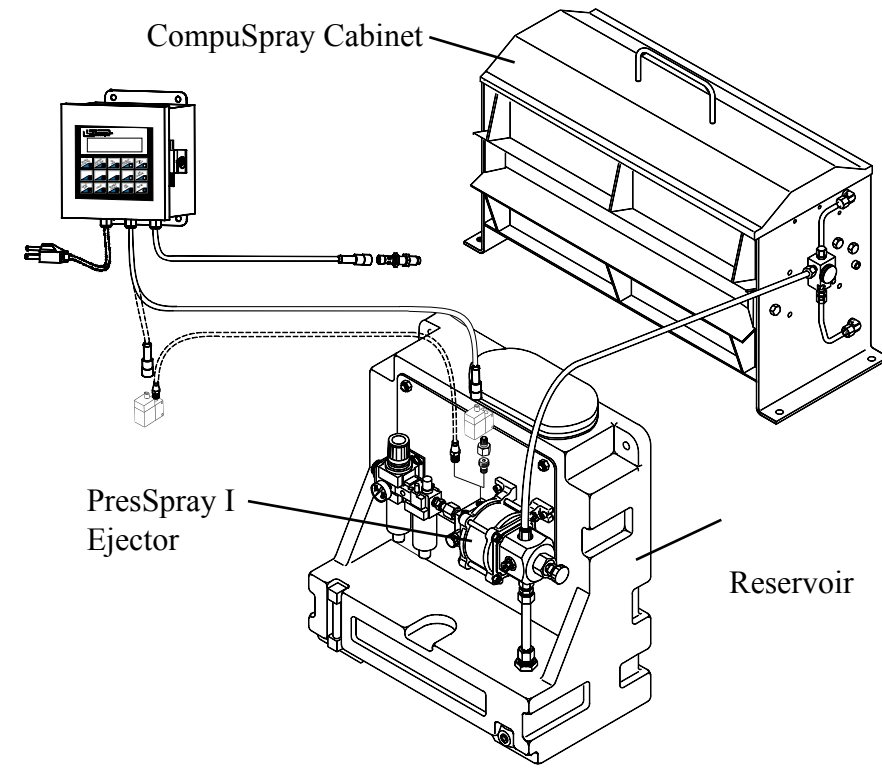
An Electronic Controller used with a PresSpray II System.

Installing the LSP Electronic Contollers with a LSP Industries FloaterCoater.

The Electronic Controller is used to control the flow of lubricant and not the flow of air. It is attached to the fluid outlet port of the diaphragm pump. Whenever the Electronic Controller receives a signal it opens the valve as programmed and allows just the correct amount of lubricant to flow to the FloaterCoater. This finite contolling of the lubricant saves on lubricant, saves parts cleaning and keeps the work area clean.



An Electronic Controller with a FloaterCoater.



An Electronic Controller Used with a PresSpray-I System Supplying a CompuSpray.

Refer to Page 1 for Instructions on Installing an Electronic Controller with a PresSpray Unit.



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